

## TEMPLATE

### Monitoring Report

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**VERSION v. 1.1**

**RELATED SUPPORT - TEMPLATE GUIDE Monitoring Report v. 1.1**

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Key Project Information

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## KEY PROJECT INFORMATION

### Programme of Activity Information

|                                                                               |                                                                                                                          |
|-------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| <b>GS ID of Programme</b>                                                     | GS 12602                                                                                                                 |
| <b>Title of Programme</b>                                                     | GS12602 PoA Powerstove Multiple Fuel Project                                                                             |
| <b>Version of POA-DD applicable to this monitoring report</b>                 | 04                                                                                                                       |
| <b>Name and GS ID of fully Validated CPA/VPAs (i.e. non compliance check)</b> | To be filled after the real case VPA has been fully validated (i.e., non-compliance check completed) along with the PoA. |

### Key Project Information

|                                                                                  |                                                                                                                                                                                                                                           |
|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>GS ID (s) of Project (s)</b>                                                  | GS 12677                                                                                                                                                                                                                                  |
| <b>Title of the project (s) covered by monitoring report</b>                     | GS 12602 VPA Powerstove Multiple Fuel Project VPA 1                                                                                                                                                                                       |
| <b>Version number of the PDD/VPA-DD (s) applicable to this monitoring report</b> | 4.0                                                                                                                                                                                                                                       |
| <b>Version number of the monitoring report</b>                                   | 3.0                                                                                                                                                                                                                                       |
| <b>Completion date of the monitoring report</b>                                  | 10/05/2026                                                                                                                                                                                                                                |
| <b>Date of project design certification</b>                                      | Not Applicable as the real case VPA is yet to be design certified                                                                                                                                                                         |
| <b>Date of Last Annual Report</b>                                                | Not Applicable as the real case VPA is yet to be design certified                                                                                                                                                                         |
| <b>Monitoring period number</b>                                                  | 01                                                                                                                                                                                                                                        |
| <b>Duration of this monitoring period</b>                                        | 01/07/2024 to 31/12/2025 (Inclusive of both the dates)                                                                                                                                                                                    |
| <b>Project Representative</b>                                                    | EKI Energy Services Limited                                                                                                                                                                                                               |
| <b>Host Country</b>                                                              | Nigeria                                                                                                                                                                                                                                   |
| <b>Activity Requirements applied</b>                                             | <input checked="" type="checkbox"/> Community Services Activities<br><input type="checkbox"/> Renewable Energy Activities<br><input type="checkbox"/> Land Use and Forestry Activities/Risks & Capacities<br><input type="checkbox"/> N/A |
| <b>Methodology (ies) applied and version number</b>                              | Technologies and Practices to Displace Decentralized Thermal Energy Consumption                                                                                                                                                           |

|                                     |                                                                                                                                                                |
|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                     | (TPDDTEC) V4.0                                                                                                                                                 |
| <b>Product Requirements applied</b> | <input checked="" type="checkbox"/> GHG Emissions Reduction & Sequestration<br><input type="checkbox"/> Renewable Energy Label<br><input type="checkbox"/> N/A |

**Table 1 - Sustainable Development Contributions Achieved**

| Sustainable Development Goals Targeted                                                                                                                                                    | SDG Impact                                                               | Amount Achieved | Units/ Products    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|-----------------|--------------------|
| <b>13 Climate Action</b>                                                                                                                                                                  |                                                                          |                 |                    |
|                                                                                                          |                                                                          |                 |                    |
| 13.2 Integrate climate measures into national policies, strategies, and planning                                                                                                          | Indicator 13.2.1: Amount of GHGs emissions avoided or sequestered.       | 159,789         | tCO <sub>2</sub> e |
| <b>4 Quality Education</b>                                                                                                                                                                |                                                                          |                 |                    |
|                                                                                                        |                                                                          |                 |                    |
| 4.4 By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship. | Indicator 4.4.1: Number of employees provided skill development training | 17              | Number             |
| <b>7 Affordable Clean Energy</b>                                                                                                                                                          |                                                                          |                 |                    |
|                                                                                                        |                                                                          |                 |                    |
| 7.3 By 2030, double the global rate of improvement in energy efficiency                                                                                                                   | Indicator 7.3.1: Total energy savings.                                   | 2,526           | TJ                 |

## 8 Decent Work and Economic Growth



8.5 By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value

|                                                                                                  |        |           |  |
|--------------------------------------------------------------------------------------------------|--------|-----------|--|
| Indicator                                                                                        | 8.5.1  |           |  |
| Total number of jobs.                                                                            |        |           |  |
| Project-specific Indicator: Total man-hours of employment created during project implementation. | 29,163 | man-hours |  |

## 15 Life on Land



15.1 By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements.

|                                                        |        |                                 |  |
|--------------------------------------------------------|--------|---------------------------------|--|
| Indicator 15.1.1: Total non-renewable wood fuel saved. | 45,139 | tonnes of non-renewable biomass |  |
|--------------------------------------------------------|--------|---------------------------------|--|

**Table 2 – Product Vintages**

|             |            | Amount Achieved            |
|-------------|------------|----------------------------|
| Start Dates | End Dates  | SDG 13 (VERs)              |
| 01/07/2024  | 31/12/2024 | 53,055 tCO <sub>2</sub> e  |
| 01/01/2025  | 31/12/2025 | 106,734 tCO <sub>2</sub> e |

## SECTION A. DESCRIPTION OF PROJECT

### **A.1. General description of project**

The main purpose of the project activity is the distribution of fuel-efficient improved cook stoves (ICS) in Nigeria. The VPA is implemented in Nigeria, primarily in Enugu State. The project covers selected rural and peri-urban communities within the state. The Improved cook-stoves distributed through this project has replaced the low-efficient traditional cook-stoves.

Through this project, the distribution and installation of high thermal efficient improved cook stoves (ICS) i.e. the Power Stove (dual fuel: firewood and charcoal) developed by Powerstove Energy has been undertaken for households. The ICS burns non-renewable woody biomass and/or charcoal more efficiently thereby improving thermal energy transfer to pots, hence saving fuel wood/charcoal and greenhouse gases. Not only will this halt the rapidly progressing deforestation but will also reduce health hazards from indoor air (smoke) pollution and women and children will have to spend less time collecting firewood.

The project boundary includes households in targeted communities where ICS are distributed. As the target populations are unable to afford these stoves (ICS), project promoters have distributed ICS at a very low cost as compare to its original price. The end-user has been informed in advance that the use of ICS generates carbon finance which in turn is used to cover the price of ICS and for recovering project implementation costs.

The baseline scenario is the ongoing use of non-renewable wood fuel (firewood/charcoal) by the target population. This usage serves to fulfill similar thermal energy needs as those addressed by the project cook stoves in the absence of project activities. Baseline fuel scenario and consumption was determined through Kitchen Performance Tests (KPT) and surveys, confirming inefficient energy use and high emissions.

CME identified and engages the distribution partners having expertise in community-based projects within a particular region, familiarity with the local language, ecosystem, residents, and geography, and the ability to access remote locations.

A pre-survey was conducted to identify the communities, and potential beneficiaries by recognizing the families that are using rudimentary mud or three-stone stoves or traditional cookstove instead of using LPG or any other type of ICS.

CME identified the potential locations where the majority of the population is using the traditional cook stoves, based on previous experiences in other projects, or available

information or baseline survey (The surveys were conducted between 10/07/2025 to 15/08/2025), for the distribution of improved cook stoves. CME prioritized the appointment of a local implementation partner for the delivery of ICS and local men's and women's teams were deployed and trained for the implementation of ICS. This creates more employment opportunities and increases the income of local agents. CME deployed a dedicated team to train end users for the proper use of ICS and to educate users about the benefits to their health, financial conditions with the use of ICS. As a constant endeavor, the project team ensures the proper functioning of ICS by educating and training the end user and taking feedback from users about ICS, and addressing and removing their concerns. From time to time both the distributor and CME team visits the households' site to check the proper functioning of the cook stove or if the household faces any difficulty in proper functioning. In case the household faces any difficulty in proper functioning, the team during the visit helps them, train them, and help them to overcome any issues that they are facing. This way both the CME team and distributor ensure that continuous improvement is ensured for the distributed cook stoves.

The first Improved cook stove (ICS) was implemented on 27/04/2023 under this project activity. The project locations for this VPA Activity are Enugu state of Nigeria. CME has distributed 71,199 ICS.

The baseline scenario is the continued use of non-renewable biomass (firewood/charcoal) by the target population to meet similar thermal energy needs as provided by project cook stoves in the absence of project activity.

The 1<sup>st</sup> usage survey was conducted from that took place from 11/07/2025 to 18/07/2025. The KPT for the project activity was conducted in between 26/08/2024 to 11/12/2024 for Wood and Charcoal respectively. The project results in a total emission reduction of 159,789 tCO<sub>2</sub>e over the monitoring period of 01/07/2024 to 31/12/2025. There is no risk of double counting or double claiming for this project. The project's emission reductions are carefully accounted for and are not claimed under any other national or international framework, ensuring full compliance with all relevant climate policies.

The GSVERs generated by the project are not included within or counted under any regulated domestic climate mitigation target or nationally determined contributions (NDC) for Nigeria. The GSVERs are exclusively accounted for within the project's framework and are not used to fulfill any national obligations under Nigeria's climate policies.

## A.2. Location of project

The VPA is implemented in the host country – Nigeria, in the states of Enugu. The latitudinal extension of Nigeria lies in between  $10^{\circ}$  ( $14^{\circ}\text{N}$ - $4^{\circ}\text{N}$ ) while the longitudinal extent is  $12^{\circ}$  ( $15^{\circ}\text{E}$ - $3^{\circ}\text{E}$ )<sup>1</sup>.

Following are the targeted communities of the states in the project activity-

| State | District (Local Government) | T/A (Community)                                                                                     |
|-------|-----------------------------|-----------------------------------------------------------------------------------------------------|
| Enugu | ENUGU EAST                  | TRANS-EKULU<br>MBULUOWEHE<br>UMUCHIGBO<br>ABAKPA I<br>MBULUIYIUKWU<br>IBAGWA-NIKE/EDEM<br>ABAKPA II |

The map below represents the administrative outline of Nigeria, with the targeted state (Enugu) under the project activity-

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<sup>1</sup> <https://www.tansicollege.edu.ng/content/nigeria-location-position-and-size>



### A.3. Reference of applied methodology

The Gold Standard Methodology “Technologies and Practices to Displace Decentralized Thermal Energy Consumption (TPDDTEC)”, Version 4.0 is applied to this project activity. Following Tool is applied for the project activity:

- Tool 33: Default values for common parameters, Version 03.0<sup>2</sup>.
- Community Services Activity Requirements, Version 1.2<sup>3</sup>

### A.4. Crediting period of project

The start date of the crediting period is 01/07/2024

|                                |            |
|--------------------------------|------------|
| Start date of Crediting Period | 01/07/2024 |
|--------------------------------|------------|

<sup>2</sup> <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-33-v3.pdf>

<sup>3</sup> <https://globalgoals.goldstandard.org/201-ar-community-services-activity-requirements/>

|                                  |                                                        |
|----------------------------------|--------------------------------------------------------|
| 1 <sup>st</sup> Crediting Period | 01/07/2024 to 30/06/2029 (Inclusive of both the dates) |
| Duration                         | 5 Years                                                |
| Type of Crediting Period         | Renewable                                              |

## SECTION B. IMPLEMENTATION OF PROJECT

### B.1. Description of implemented project

The project is currently operational. The distribution of the cook stove started on 27/04/2023 and a total of 71,199 cook stoves have been distributed in the Enugu state of Nigeria till the end date of the monitoring period. All the cook stoves have been implemented from 27/04/2023 to 28/05/2024. The detailed deployment schedule of the stove has been provided in the ERs calculation sheet. The project location details have been provided in section A.2 of this Monitoring Report. During the 1<sup>st</sup> monitoring period, the monitoring of the entire 71,199 distributed cook stoves has been done.

The month wise distribution details of cookstoves are as follows:

| Month              | Total         |
|--------------------|---------------|
| Apr 23             | 425           |
| Jun 23             | 1,050         |
| Sep 23             | 550           |
| Oct 23             | 4,310         |
| Nov 23             | 3,817         |
| Dec 23             | 2,243         |
| Jan 24             | 2,858         |
| Feb 24             | 2,954         |
| Mar 24             | 9,211         |
| Apr 24             | 22,847        |
| May 24             | 20,934        |
| <b>Grand Total</b> | <b>71,199</b> |

The project activity involves deploying highly efficient biomass cook stoves with better technological design features and high-power thermal efficiency to provide a cleaner burning, increased efficiency and durability device. The improved cook stove is certified to the Standards Organization of Nigeria (SON)<sup>4</sup> and designed in line with the national

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<sup>4</sup> <https://son.gov.ng/>

approach towards fuel conservation, better environment, mitigating health hazards and loss of forest cover caused by burning of wood as cooking fuel, thereby promoting forest conservation.

It is expected that the ICSs shall directly decrease wood fuel demand and reduce the pressure from wood cutting within the project boundary. The time spent foraging for wood fuel is thereby also reduced, saving time for women to engage in other economic driven activities.

### **Technical efficiency:**

#### **WC-200**



- Secondary airflow technology to make it work efficiently.
- 42.4% (Firewood) and 58.6% (Charcoal) thermal efficiency, fuel-saving, time-saving.
- Removable ash tray for firepower management and easy cleaning.
- Stainless-steel to ensure its durability and longer lifespan.

The "Power Stove (Dual fuel- firewood and charcoal)" was fully tested by Water boiling Test (WBT) using Laboratory Emissions Monitoring System (LEMS), developed by Aprovecho Research Center.

Manufacturer Name: POWERSTOVE ENERGY

### **Materials**

| Part name          | Specification                                                                                                   |
|--------------------|-----------------------------------------------------------------------------------------------------------------|
| Stove top          | Stainless Steel top with 6 pot supports, Dia. 26cm                                                              |
| Stove body         | 0.5mm cold-rolled steel with powder coating                                                                     |
| Combustion chamber | Double stainless-steel wall (1mm SS304+0.5mm SS201) with secondary air in to improve durability and performance |

|                     |                                            |
|---------------------|--------------------------------------------|
| Stove grate         | Stainless-steel SS304                      |
| Insulation material | Ceramic fiber                              |
| Door frame          | 1mm cold-rolled sheet with powder coating. |
| Stove bottom        | Stainless steel 304                        |
| Handle              | stainless-steel handles with bakeries      |

### **Spec & Warranty**

- Warranty: 2 years
- Lifespan: Conservative operational lifetime of five (5) years from the date of installation.

The 1<sup>st</sup> usage survey was conducted from 11/07/2025 to 18/07/2025. The KPT for the project activity was conducted in between 26/08/2024 to 11/12/2024. Total carbon credits generation for the current monitoring period from 01/07/2024 to 31/12/2025 is 159,789 tCO<sub>2</sub>e.

### **Data collection of ICS end-user:**

ICS distribution agency is responsible for stove distribution and data collection. The distribution agency follows the SOP designed by Powerstove Energy for stove distribution. The ICS registration process was carried out by manual recording process. The distribution team gets training that includes a brief introduction to the project activity, the objective of the distribution of ICS as well as ICS distribution and data collection process.

The project proponent gathered the necessary information to identify households using its ICS during the course of the project. To facilitate this process, each ICS was assigned a unique serial number. This number was recorded during the registration process together with the following information (as appropriate and as available):

- Name of ICS user or head of the household
- Address/ Village name of ICS household
- Stove model Distributed
- Date of distribution/installation
- ICS serial number
- Retailer/distributor/Manufacturer information

The information collected was stored in the hard copy and/or electronic database excel sheet which serves as a project database for project monitoring and sampling purposes.

#### **B.1.1 Forward Action Requests**

>> Not Applicable

## **B.2. Post-Design Certification changes**

B.2.1. Temporary deviations from the approved Monitoring & Reporting Plan, methodology or standardized baseline

>> Not Applicable

B.2.2. Corrections

>> Not Applicable

B.2.3. Changes to start date of crediting period

>> Not Applicable

B.2.4. Permanent changes from the Design Certified monitoring plan, applied methodology or applied standardized baseline

>> Not Applicable

B.2.5. Changes to project design of approved project

>> Not Applicable

## **SECTION C. DESCRIPTION OF MONITORING SYSTEM APPLIED BY THE PROJECT**

The CME assesses all monitoring data and produce a monitoring report to verify. This report presents the data relating to the emission reductions generated by those ICS during the monitoring period.

The purpose of the monitoring plan is to ensure successful monitoring of the emission reductions of the proposed project during its crediting period.

Activities and performance related to emissions reduction are monitored by EKIESL. The CME proposed the following roles and responsibilities for data monitoring, collection, data archiving, and calibration of equipment for these project activity instances.

The monitoring activities involve data collection during distribution as well as usage information post-distribution. The data collected during distribution also involves information about the stove, the end user, and the location to enable one to uniquely identify each ICS unit and avoid double counting.

Repair and Maintenance – Powerstove has a robust maintenance and repair system for her clean cookstove project that is crucial for ensuring long-term functionality and user satisfaction following the below processes:

1. Technical Support Network: Powerstove established a network of trained technicians and local experts who provides maintenance and repair services for Powerstove clean cookstoves at community level.
2. User Education: Powerstove offer training programs to project partners' NGOs on proper operation, maintenance, and minor repairs of the Powerstove clean cookstoves to extend their lifespan and efficiency.
3. Supply Chain Management: Powerstove developed a streamlined supply chain for replacement parts, ensuring they are readily available for maintenance and repairs.
4. Troubleshooting Guidelines: Provide users with easy-to-understand troubleshooting guidelines to help them address common issues without the need for immediate technician intervention.
5. Responsive Communication Channels: Powerstove set up accessible communication channels (such as hotlines, online platforms, or local service centers) for users to report warranty issues and request maintenance or repair services.
6. Scheduled Maintenance: Powerstove implemented a Management Information System for scheduled maintenance visits to proactively address potential issues and ensure optimal performance of the clean cookstoves.
7. Quality Assurance: Powerstove regularly inspect and assess the performance of clean cookstoves to identify any systemic issues or areas for improvement.
8. Data Collection and Analysis: Powerstove collect and analyze data on maintenance and repair requests to identify recurring issues, inform product improvements, and optimize the maintenance process.
9. Feedback Mechanism: Powerstove established a feedback loop where users can provide input on the maintenance and repair process, helping to improve service quality and user experience.
10. Continuous Training: Finally, Powerstove provide ongoing training for maintenance technicians to keep them updated on the latest repair techniques and product developments.

The monitoring team selects the samples from the distribution record on a random basis and visits the premises where these stoves are located to monitor key parameters pertinent to ER Calculation. The individuals carrying out the monitoring activities followed the instructions provided during training.

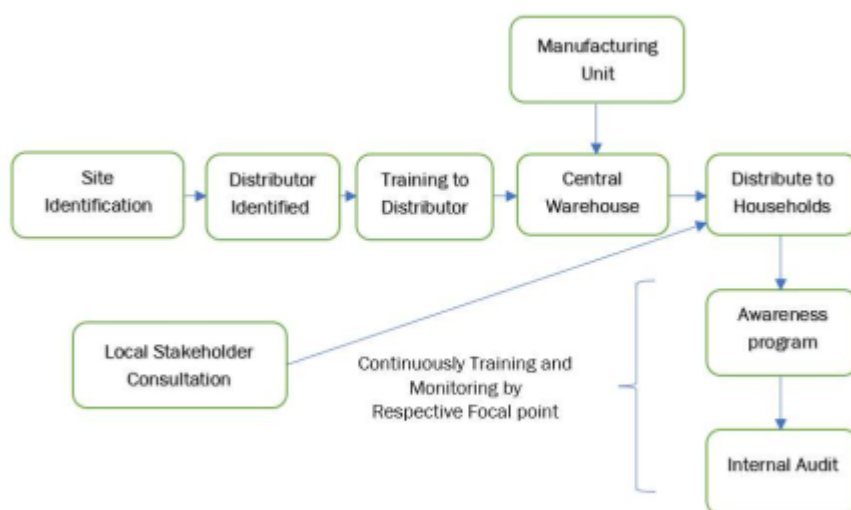
Data collected and monitored were stored electronically in a secure and retrievable manner for at least two years after the end of the project crediting period.

The roles and responsibilities of different participants as follows:

| Entity/Person                                         | Roles & Responsibilities                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CME and its representative                            | <ul style="list-style-type: none"> <li>✓ GS documentation development</li> <li>✓ Communicate with GS</li> <li>✓ Communicate with DOE for validation &amp; verification</li> <li>✓ Identify local partners for local representation and support</li> <li>✓ Identity suitable ICS manufacturers</li> <li>✓ Design the distribution plan for on-ground implementation of ICS</li> <li>✓ Design the monitoring system (including data collection in an electronic database)</li> <li>✓ Training and development of local resources (as may be required)</li> <li>✓ Regular Monitoring and quality assurance of data</li> <li>✓ Monitor &amp; supervise on-ground distribution, etc.</li> <li>✓ Annual Review meeting with Local Teams and other associated entities to ensure continuous improvements in the project activity</li> </ul> |
| Distributor / Operational Team (Local Representative) | <ul style="list-style-type: none"> <li>✓ To support &amp; assist CME in achieving the stated goal of the project activity</li> <li>✓ Assist and facilitate CME in baseline data collection, efficiency testing, data of biomass consumption for new ICS through sampling survey, etc.</li> <li>✓ To be the local representative and communicate, act, and engage in implementation activities of project activity</li> <li>✓ To identify and deploy suitable local teams and resources for ICS distribution, data collection, and regular spot-checks at households, etc.</li> <li>✓ Assist and facilitate CME during the training of the Operational Team and capacity building across the end users.</li> </ul>                                                                                                                    |

|                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                              | <ul style="list-style-type: none"> <li>✓ To bridge any gap between end users of ICS and CME to ensure the smooth operation of the program to achieve the overall objective of the project activity</li> </ul> <p>ICS Distributor(s)–who will be responsible for deploying the ICS at the household and registering the end user in the digital tool. They will also be responsible for giving demonstrations of ICS use, discussing with the end users on its benefits, and educating them on the continued use of ICS and discontinuation of the use of conventional/traditional open firing practice. They will also conduct periodic check at households to gather feedback, address any technical concerns, collect necessary data, and transmit the information.</p> |
| ICS Manufacturer or Supplier | <ul style="list-style-type: none"> <li>✓ To design and develop ICS as per the required standard</li> <li>✓ To provide technical parameters and manufacturer's efficiency etc. at the time of supply</li> <li>✓ To educate and train the team on the installation (delivery), uses, handling, etc. of the ICS in households.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                    |

The following diagram represents the management structure of the VPA. This structure may still be amended.



### Cookstove Flow Chart

Powerstove prioritizes the appointment of a local implementation partner for the delivery of ICS, and local men's and women's teams are contracted and trained for implementation. This approach boosts local employment and increases the income of

local people. Awareness about the implementation and use of ICS is provided to the local community through awareness programs. Powerstove Energy conducts the distribution of ICS either door-to-door or through a dedicated central point accessible to the intended users. A dedicated team is deployed to train end users on the proper use of ICS and to educate them about the climate benefits of using ICS. The team ensures the proper functioning of ICS, collects user feedback, and addresses any concerns.

The Sampling Plan for this monitoring period is explained in Section D.4

## SECTION D. DATA AND PARAMETERS

### D.1. Data and parameters fixed ex ante or at renewal of crediting period

>>

|                                                      |                                                                                                                                       |
|------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| Data/parameter                                       | <b>EF<sub>fuel, CO2</sub></b>                                                                                                         |
| Unit                                                 | tCO <sub>2</sub> /TJ                                                                                                                  |
| Description                                          | CO <sub>2</sub> emission factor arising from the use of wood fuel that is reduced                                                     |
| Source of data                                       | Gold Standard Methodology "Technologies and Practices to Displace Decentralized Thermal Energy Consumption", version 4.0 <sup>5</sup> |
| Value(s) applied                                     | 112 (Wood)<br>165.22 (Charcoal; (includes charcoal production emissions))                                                             |
| Choice of data or Measurement methods and procedures | The default value is applied                                                                                                          |
| Purpose of data                                      | Calculation of baseline and project emissions                                                                                         |
| Additional comment                                   | -                                                                                                                                     |

|                |                                                                                                                                             |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| Data/parameter | <b>EF<sub>fuel, non-CO2</sub></b>                                                                                                           |
| Unit           | tCO <sub>2</sub> /TJ                                                                                                                        |
| Description    | Non-CO <sub>2</sub> emission factor arising from the use of fuel f, when the baseline fuel f is biomass or charcoal (tCO <sub>2</sub> e/TJ) |

<sup>5</sup> <https://globalgoals.goldstandard.org/407-ee-ics-technologies-and-practices-to-displace-decentralized-thermal-energy-tpddtec-consumption/>

|                                                      |                                                                                                                          |
|------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| Source of data                                       | Gold Standard Methodology "Technologies and Practices to Displace Decentralized Thermal Energy Consumption", version 4.0 |
| Value(s) applied                                     | 9.46 tCO <sub>2</sub> e/TJ (Wood)<br>44.83 tCO <sub>2</sub> e/TJ (Charcoal; includes charcoal production emissions)      |
| Choice of data or Measurement methods and procedures | The default value is applied                                                                                             |
| Purpose of data                                      | Calculation of baseline and project emissions                                                                            |
| Additional comment                                   | -                                                                                                                        |

|                                                      |                                                                                                                          |
|------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| Data/parameter                                       | <b>NCV<sub>b,fuel</sub></b>                                                                                              |
| Unit                                                 | TJ/ton                                                                                                                   |
| Description                                          | Net calorific value of the fuel used in the baseline scenario                                                            |
| Source of data                                       | Gold Standard Methodology "Technologies and Practices to Displace Decentralized Thermal Energy Consumption", Version 4.0 |
| Value(s) applied                                     | 0.0156 TJ/tonne (Wood)<br>0.0295 TJ/tonne (Charcoal)                                                                     |
| Choice of data or Measurement methods and procedures | Not applicable                                                                                                           |
| Purpose of data                                      | Calculation of emission reduction                                                                                        |
| Additional comment                                   | The methodology default emission factor has been applied.                                                                |

|                                                      |                                                                             |
|------------------------------------------------------|-----------------------------------------------------------------------------|
| Data/parameter                                       | <b>f<sub>NRB,b,y</sub></b>                                                  |
| Unit                                                 | Fraction                                                                    |
| Description                                          | Fractional non-renewability status of woody biomass fuel during year y      |
| Source of data                                       | Tool 33- Default values for common parameters<br><sup>6</sup>               |
| Value(s) applied                                     | 0.38 for Nigeria                                                            |
| Choice of data or Measurement methods and procedures | Default value considered from Tool 33- Default values for common parameters |
| Purpose of data                                      | Calculation of baseline and project emissions                               |
| Additional comment                                   | -                                                                           |

<sup>6</sup> <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-33-v3.pdf>

## D.2 Data and parameters monitored

### SDG 4

|                                    |                                                                                                                                                                                                                                                                                                              |
|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Data / Parameter                   | <b>SDT<sub>y</sub></b>                                                                                                                                                                                                                                                                                       |
| Unit                               | Number                                                                                                                                                                                                                                                                                                       |
| Description                        | Number of employees who have undergone skill development training in year y                                                                                                                                                                                                                                  |
| Source of data                     | Awareness programs (training records)                                                                                                                                                                                                                                                                        |
| Value(s) applied                   | 17                                                                                                                                                                                                                                                                                                           |
| Measurement methods and procedures | The measurement of the parameter is based on the Providing proper training on the use of ICS and running awareness programs on environmental protection can help to promote gender equality, improve ICS adoption rates, and protect the environment, thereby contributing to sustainable development goals. |
| Monitoring frequency               | Annual                                                                                                                                                                                                                                                                                                       |
| QA/QC procedures                   | -                                                                                                                                                                                                                                                                                                            |
| Purpose of data                    | For SDG-4 contribution                                                                                                                                                                                                                                                                                       |
| Additional comment                 | -                                                                                                                                                                                                                                                                                                            |

### SDG 8

|                                    |                                                                                                                                                                                                        |
|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Data / Parameter                   | <b>QEG<sub>y</sub></b>                                                                                                                                                                                 |
| Unit                               | man-hours                                                                                                                                                                                              |
| Description                        | Quantitative Employment generation (Total number of man-hours of Employment (administrative, sales, distribution, monitoring and management) opportunities generated under Project scenario) in year y |
| Source of data                     | Declaration of distributor and HR records                                                                                                                                                              |
| Value(s) applied                   | 29,163                                                                                                                                                                                                 |
| Measurement methods and procedures | Not Applicable                                                                                                                                                                                         |
| Monitoring frequency               | Annual                                                                                                                                                                                                 |
| QA/QC procedures                   | -                                                                                                                                                                                                      |
| Purpose of data                    | For SDG-8 contribution                                                                                                                                                                                 |
| Additional comment                 | -                                                                                                                                                                                                      |

### SDG 13, 7 & 15

|                  |                          |
|------------------|--------------------------|
| Data / Parameter | <b>N<sub>b,p,y</sub></b> |
| Unit             | Number                   |

|                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                  |              |                  |                          |           |           |      |            |            |
|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|--------------|------------------|--------------------------|-----------|-----------|------|------------|------------|
| Description                        | Number of project technology-days included in the project database for baseline b/project p pair in year y                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                  |              |                  |                          |           |           |      |            |            |
| Source of data                     | <ul style="list-style-type: none"><li>Number of days in calendar year y</li><li>Number of ICS distributed in year y from the ICS distribution record.</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                  |              |                  |                          |           |           |      |            |            |
| Value(s) applied                   | <p>For current monitoring period: 01/07/2024 to 31/12/2025.</p> <p><b><math>N_{b,p,y}</math> = Days*Number of ICS</b></p> <table><tr><td>Year</td><td>Wood</td><td>Charcoal</td></tr><tr><td>2024</td><td>4,343,139</td><td>8,757,477</td></tr><tr><td>2025</td><td>10,751,049</td><td>15,236,586</td></tr></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Year             | Wood         | Charcoal         | 2024                     | 4,343,139 | 8,757,477 | 2025 | 10,751,049 | 15,236,586 |
| Year                               | Wood                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Charcoal         |              |                  |                          |           |           |      |            |            |
| 2024                               | 4,343,139                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 8,757,477        |              |                  |                          |           |           |      |            |            |
| 2025                               | 10,751,049                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 15,236,586       |              |                  |                          |           |           |      |            |            |
| Measurement methods and procedures | <p>Calculated from the Project as the sum of the number of ICS distributed times the calendar days during the year y that they were present at the end-user locations.</p> <p>For project calculations:</p> <ul style="list-style-type: none"><li><b>Wood fuel</b> usage was considered during <b>non-rainy days</b> (dry season).</li><li><b>Charcoal fuel</b> usage was considered during <b>rainy days</b> (wet season).</li></ul> <table><tr><td></td><td>Rainy season</td><td>Non-Rainy season</td></tr><tr><td>No. of days<sup>7</sup></td><td>151</td><td>214</td></tr></table> <p>The number of rainy (151 days) and non-rainy days (214 days) was derived from Nigeria’s seasonal climate pattern, where the rainy season typically occurs from April to October and the dry season from November to March.</p> |                  | Rainy season | Non-Rainy season | No. of days <sup>7</sup> | 151       | 214       |      |            |            |
|                                    | Rainy season                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Non-Rainy season |              |                  |                          |           |           |      |            |            |
| No. of days <sup>7</sup>           | 151                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 214              |              |                  |                          |           |           |      |            |            |
| Monitoring frequency               | Calculated at least once in a year.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                  |              |                  |                          |           |           |      |            |            |
| QA/QC procedures                   | The results of the usage survey have been cross-checked with the contents of the project database to confirm whether the project technology units surveyed are present at end-user locations as expected, or not. There is no discrepancy found.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                  |              |                  |                          |           |           |      |            |            |
| Purpose of data                    | To calculate the SDG 15, SDG 7 contribution, as well as emission reduction (SDG 13).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                  |              |                  |                          |           |           |      |            |            |
| Additional comment                 | -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                  |              |                  |                          |           |           |      |            |            |

<sup>7</sup> [The Climate in Nigeria](#)

|                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Data / Parameter                   | $U_{p,y}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Unit                               | Fraction/Percentage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Description                        | Weighted average usage rate in project scenario p during year y                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Source of data                     | 1 <sup>st</sup> Monitoring Survey (conducted from 11/07/2025 to 18/07/2025)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Value(s) applied                   | 0.9 or 90%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Measurement methods and procedures | The measurement of the parameter is based on qualitative information collected during Monitoring surveys. The end users were asked whether the project stove is operational. The result was extrapolated on all stove users for this project. PP has followed the "Requirements and Guidelines: Usage Rate Monitoring", v.2.0 <sup>8</sup> for the estimation of the usage rate of the implemented cook stoves. The "Good Practice" requirement was carried out during the actual monitoring in accordance with section 2.3 of the "Requirements and Guidelines: Usage Rate Monitoring" v.2.0. Usage Rate Monitoring".                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Monitoring frequency               | Annually                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| QA/QC procedures                   | <p>The surveyor checked the operating condition of the project cook stove visually during the survey. 100% stoves of all the age groups found in working condition and being used by the users on site. But, since the CME is following the "good practice level"<sup>9</sup>, hence the usage rate of 90% is claimed.</p> <p>The usage surveys were conducted in line with the GS Usage Survey Guidelines. The following confirms compliance with each step of the guideline, as elaborated below:</p> <ol style="list-style-type: none"> <li>1. Mandatory Monitoring Requirements <ol style="list-style-type: none"> <li>a. Step 1. Defining stove use and non-use:<br/>The project has clearly defined "use" and "non-use" of the cookstoves based on criteria such as frequency of use, time since last use, and the extent of displacement of traditional stoves. These criteria are documented and consistently applied to determine eligible usage under the project.</li> <li>b. Step 2. Household Usage Survey:<br/>In-person household usage surveys were conducted in accordance with the prescribed</li> </ol> </li> </ol> |

<sup>8</sup> [https://globalgoals.goldstandard.org/standards/407G\\_V2.0\\_EE\\_ICS\\_TPDDTEC\\_Usage-guidelines.pdf](https://globalgoals.goldstandard.org/standards/407G_V2.0_EE_ICS_TPDDTEC_Usage-guidelines.pdf)

<sup>9</sup> From Requirements and Guidelines: Usage Rate Monitoring" v.2.0

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    | <p>methodology. Surveyors performed kitchen observations and visually inspected the cookstoves during field visits. It was observed that 100% of the cookstoves across all age groups were in working condition and being actively used by the end-users at the time of the survey. The survey process also included interaction with users to understand usage patterns and confirm actual usage.</p> <p>c. Step 3. Verification checks:<br/>To ensure the reliability and accuracy of the collected data, verification checks were conducted as part of QA/QC procedures. This included internal cross-checking of survey responses and validation of field data to confirm that the recorded information accurately reflects on-ground conditions.</p> <p>2. Good Practice Monitoring Requirements</p> <p>a. Field team training and supervision:<br/>It was ensured that field personnel involved in the survey were adequately trained prior to deployment. Regular supervision and performance monitoring of the field team were carried out to maintain data quality and consistency during the survey process.</p> <p>b. End-User Training and follow up visits:<br/>End-users were provided with appropriate training on the correct usage of cookstoves at the time of distribution, along with follow-up visits to reinforce proper usage practices and ensure sustained adoption.</p> <p>c. Awareness campaign:<br/>Awareness campaigns were conducted to educate beneficiaries on the benefits of continuous use of improved cookstoves, including efficiency, health, and environmental advantages. These activities supported sustained usage behavior among users.</p> |
| Purpose of data    | To calculate the SDG 15 contribution, as well as emission reduction (SDG 13).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Additional comment | -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

## SDG 7,13 & 15

|                  |                                                                                          |
|------------------|------------------------------------------------------------------------------------------|
| Data / Parameter | $P_{b,y}$                                                                                |
| Unit             | kg/household-day                                                                         |
| Description      | Quantity of fuel that is consumed in baseline scenario b during y year                   |
| Source of data   | 1 <sup>st</sup> Monitoring KPT Test Results (conducted between 09/09/2024 to 12/09/2024) |
| Value(s) applied | 9.02 for Wood                                                                            |

|                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                    | 2.47 for Charcoal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Measurement methods and procedures | <p>Following the methodology “Technologies and Practices to Displace Decentralized Thermal Energy Consumption, Version 4.0”, <math>P_{b,y}</math> is determined using the KPT protocol, included in Annex 4 of the methodology, performed biennially by the PP Quality, control, and Monitoring Manager on a representative sample of stove users taken from the Project database.</p> <p>The sample size was selected so that the use of the point estimator of the mean is justified because the data complies with the 90/30 rule.</p> |
| Monitoring frequency               | At the start of the crediting period. Fixed for one crediting period.                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| QA/QC procedures                   | Trained field Officers of PP were carried out the data collection. KPT was supervised and checked by PP’s Quality Control, and Monitoring Manager. The sample size of stove users has been chosen for a 90/30 precision (90% confidence interval+ and 30% margin of error). In cases where the result indicates that 90/30 precision is not achieved, the lower limit of a 30% confidence interval of the parameter value is chosen as an alternative to repeating the survey efforts to achieve the 90/30 precision.                     |
| Purpose of data                    | To calculate the SDG 7 & SDG 15 contribution, as well as emission reduction (SDG 13).                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Additional comment                 | There is only one baseline cooking practice namely cooking on an open fire                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

## SDG 7,13 & 15

|                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Data / Parameter                   | $P_{p,y}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Unit                               | kg/household-day                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Description                        | Quantity of fuel that is consumed in project scenario p during year y                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Source of data                     | 1 <sup>st</sup> Monitoring KPT Test Results (conducted between 26/08/2024 to 11/12/2024)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Value(s) applied                   | <p>2.49 for Wood</p> <p>1.06 for Charcoal</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Measurement methods and procedures | <p>Following the methodology “Technologies and Practices to Displace Decentralized Thermal Energy Consumption, Version 4.0”, <math>P_p</math> is determined using the KPT protocol, included in Annex 4 of the methodology, performed biennially by the PP’s Quality, control, and Monitoring Manager on a representative sample of stove users taken from the Project database.</p> <p>The sample size is selected so that the use of the point estimator of the mean is justified because the data complies with the 90/30 rule.</p> <p><b><u>Calibration procedures for equipment:</u></b></p> |

|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                      | <p>To measure the weight of fuel consumed by the project stove during project KPT, weighing scales were used. The weighing scales used for project purposes were calibrated before starting the survey, as per the national/international standard, or as specified in the user manual of the respective weighing scale.</p> <ul style="list-style-type: none"> <li>Details of weighing scales is given below: <ul style="list-style-type: none"> <li>Serial No.: 217129166001028292, 217129166001028293, 217129166001028294, and 217129166001028295</li> <li>Accuray Class: 5g (0-10kg) &amp; 10g (10-45kg)</li> <li>Date of calibration: 26-August-2024</li> </ul> </li> </ul> <p>Details of moisture meter is given below:</p> <ul style="list-style-type: none"> <li>Serial No.: 217429166001028292</li> <li>Accuracy: <math>\pm 0.5\%</math></li> <li>The digital moisture meter used is auto-calibrated.</li> </ul> <p>The parameter value is derived from in situ Kitchen Performance Tests (KPTs) conducted for 125 and 122 households sampled for wood and charcoal respectively, from project activity. The project KPT campaign was undertaken between 26/08/2024 to 11/12/2024 by locally engaged field staff who received specialized training. All measurements followed the procedures, quality control requirements, and data handling provisions of the protocol.</p> <p>Comprehensive analysis of the KPT data is provided in the accompanying Excel file. The observed standard deviation for wood and charcoal was 0.05 and 0.03, with a resulting precision of 2% and 3% respectively. These results demonstrate compliance with the methodology's 90/30 confidence precision requirement and justify the use of the measured parameter value for baseline estimation.</p> |
| Monitoring frequency | Updated every two years, or more frequently.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| QA/QC procedures     | Trained field Officers of PP were carried out the data collection. KPT was supervised and checked by PP's Quality Control, and Monitoring Manager. The sample size of stove users has been chosen for a 90/30 precision (90% confidence interval+ and 30% margin of error). In cases where the result indicates that 90/30 precision is not achieved, the lower limit of a 30% confidence interval of the parameter value is chosen as an alternative to repeating the survey efforts to achieve the 90/30 precision.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Purpose of data      | To calculate the SDG 7 & SDG 15 contribution, as well as emission reduction (SDG 13).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Additional comment   | There is only one project cooking practice namely cooking on an improved cook stove.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

|                                    |                                                                                                                             |
|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| Data / Parameter                   | <b>LE<sub>p,y</sub></b>                                                                                                     |
| Unit                               | fraction                                                                                                                    |
| Description                        | Leakage in project scenario p during year y                                                                                 |
| Source of data                     | As per methodology- Technologies and Practices to Displace Decentralized Thermal Energy Consumption (TPDDTEC), version 4.0. |
| Value(s) applied                   | 0.95 (default value)                                                                                                        |
| Measurement methods and procedures | Not applicable as the default value of 0.95 was applied for the calculation.                                                |
| Monitoring frequency               | Not applicable as the default value of 0.95 was applied for the calculation.                                                |
| QA/QC procedures                   | Not applicable as the default value of 0.95 was applied for the calculation.                                                |
| Purpose of data                    | Calculation of leakage emissions (SDG 7 & SDG 13).                                                                          |
| Additional comment                 | -                                                                                                                           |

|                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Data / Parameter                   | <b>Presence of stove stacking</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Unit                               | NA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Description                        | Descriptive statistics of the presence and usage practices of baseline- and other non-project-technology by project technology end users.                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Source of data                     | Ist Usage Survey                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Value(s) applied                   | 0%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Measurement methods and procedures | NA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Monitoring frequency               | Annual                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| QA/QC procedures                   | <p>The calculation of <math>SFS_{p,b,y}</math> has been cross-checked with the observed presence of stove stacking during the usage survey, to ensure any stove stacking is considered so that emission reductions are calculated only from real reduction of baseline fuel use.</p> <p>During the latest usage survey, it was found that the end users were not using their traditional or any other cook stoves, apart from the project stoves provided to them by the project developer.</p> <p>Since, no case of using cook stoves by the end users, other than the project stove itself was found during the</p> |

|                    |                                                                             |
|--------------------|-----------------------------------------------------------------------------|
|                    | usage survey <sup>10</sup> , hence 0% of stove stacking has been accounted. |
| Purpose of data    | Usage of baseline stove (SDG 13)                                            |
| Additional comment | NA                                                                          |

### D.3. Comparison of monitored parameters with last monitoring period

| Data/Parameter     | Value obtained in this monitoring period |            |            | Value obtained last monitoring period |
|--------------------|------------------------------------------|------------|------------|---------------------------------------|
| QEG <sub>y</sub>   | 29,163                                   |            |            | -                                     |
| N <sub>b,p,y</sub> | Year                                     | Wood       | Charcoal   |                                       |
|                    | 2024                                     | 4,343,139  | 8,757,477  |                                       |
|                    | 2025                                     | 10,751,049 | 15,236,586 |                                       |
| U <sub>p,y</sub>   | 90%                                      |            |            | -                                     |
| P <sub>b,y</sub>   | 9.02 for Wood<br>2.47 for Charcoal       |            |            | -                                     |
| P <sub>p,y</sub>   | 2.49 for Wood<br>1.06 for Charcoal       |            |            | -                                     |
| LE <sub>p,y</sub>  | 0.95                                     |            |            | -                                     |

### D.4. Implementation of sampling plan

For measurement/ monitoring of five parameters based on a representative sample. As demonstrated below under "Sample Size", the simplified approach proposed in KPT version 4.0, 2018<sup>11</sup> of the Kitchen Performance Test were used for determining the minimum sample size.

#### **Monitored Parameters:**

The project involves the Introduction of an improved cook stove as energy efficiency measures:

| No. | Monitoring Parameters | Sampling Parameters                                      | Parameter type   | Monitoring frequency |
|-----|-----------------------|----------------------------------------------------------|------------------|----------------------|
| 3   | U <sub>p,y</sub>      | Weighted average usage rate in project scenario p during | Weighted average | Updated every year   |

<sup>10</sup> The corresponding results could be traced from the "Household Information" cell in the provided Usage Survey Sheet.

<sup>11</sup> <https://cleancooking.org/binary-data/DOCUMENT/file/000/000/604-1.pdf>

|   |               |           |                                                                        |            |                                                                       |
|---|---------------|-----------|------------------------------------------------------------------------|------------|-----------------------------------------------------------------------|
|   |               |           | year y.                                                                |            |                                                                       |
| 4 | $SFS_{p,b,y}$ | $P_{b,y}$ | Quantity of fuel that is consumed in baseline scenario b during y year | Mean value | At the start of the crediting period. Fixed for one crediting period. |
|   |               | $P_{p,y}$ | Quantity of fuel that is consumed in project scenario p during year y  | Mean value | Updated every two years                                               |

### **Target Population:**

The target population is the complete set of appliances (ICS) deployed under the project.

### **Sampling Method:**

In the project, traditional cooking appliances were replaced with ICS distribution throughout the project area. The population is scattered around the nation and is homogeneous in nature, using common technologies with similar operational characteristics. Since the characteristics of the population (for example type of biomass consumed) are more similar. Therefore, the samples were calculated using a simple random sampling technique. Samples were drawn by using the random number generator.

To determine the parameters, sampling was involved the following approaches (outcome in brackets):

**$U_{p,y}$**  Visual inspection of the premises to see if ICS is operational and in use. Interview with the end user if required to verify that ICS is still in use (Yes/No)

**$SFS_{p,b,y} (P_{b,y})$**  KPT conducted at the end user's kitchen to estimate the daily consumption of woody biomass of traditional stove/ Three stone stove (Daily consumption of woody biomass)

**$SFS_{p,b,y} (P_{p,y})$**  KPT conducted at the end user's kitchen and estimate the daily consumption of woody biomass of ICS (Daily consumption of woody biomass)

### **Sample Size:**

- According to KPT protocol Version 4.0<sup>12</sup> -

<sup>12</sup> <https://cleancooking.org/binary-data/DOCUMENT/file/000/000/604-1.pdf>

The Kitchen Performance Test (KPT) is the principal field-based procedure to measure household fuel consumption. The primary objective of the KPT is to quantify fuel consumption under typical household and stove usage conditions. The materials in KPT protocol version 4.0 provide guidance on the minimum set of procedures needed to meet the primary aim of the KPT, a quantitative measure of fuel consumption. KPTs are often combined with household surveys, which help to contextualize fuel consumption practices.

Sample size is also an important consideration because samples should be large enough to ensure statistically valid results. Gold Standard recommends the following sizes based on the overall size of the target population (The Gold Standard Foundation, 2011):

- Group size < 300: either 30 or population size, whichever is smaller
- Group size 300 to 1000: 10% of group size
- Group size > 1000: at least 100

**- According to GS methodology "TPDDTEC" -**

CME opt for independent sample for the Baseline and project KPT.

Independent Samples – Independent sample selection is a method in research where separate sets of kitchens or households are chosen for the BEFORE and AFTER phases. Each set represents a distinct group with similar socio-economic and cultural conditions. This approach allows for testing the baseline and project scenarios independently. It requires larger sample sizes but provides a reliable comparison when concurrent testing or a fixed baseline is necessary. By selecting independent samples, the study can assess the impact of the improved stoves in different contexts, ensuring the validity and generalizability of the results.

Households sampled in the project situation are different from households sampled in the baseline situation.

|                 |     |     |     |     |     |     |     |     |     |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| COV             | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 1.7 | 1.8 | 1.9 | 2   |
| 90/30 precision | 90  | 105 | 122 | 140 | 159 | 184 | 201 | 224 | 248 |

Additionally, in accordance with the GS approach, the "TPDDTEC" sample size depends on the COV (Coefficient of Variation), and proposed that "as a good starting point is to choose a mid-way value in the range given in the tables".

In all of the cases, during the monitoring survey and KPT survey, the sample size has been kept 20% larger than the KPT-conducted households to consider "sample size attrition". In line with the above criteria 125 sample were selected for wood and charcoal respectively.

A total sample have been selected on a random basis from the project database using an online random number generator application. And baseline for the selection of baseline stoves, Powerstove Energy will select a similar household in the same

geographic location (preferably in the same village) that is using only the baseline stove. A sample shall be select on a random basis.

Oversampling is strongly encouraged, not only to compensate for any attrition, outliers, or non-response associated with the sample, but also to prevent a situation at the analysis stage where the required reliability is not achieved, and additional sampling efforts would be required. The sample size shown above has been adjusted upwards to account for non-responses, Project proponent has determined the appropriate non-responses rate based on previous experience.

SFS<sub>p,b,y</sub> (P<sub>b,y</sub> & P<sub>p,y</sub>):

This survey involves interviews with the end user and estimating the daily consumption of woody biomass on three stone stove/ Traditional stove/ baseline stove. The staff has visited the site and asked each household about their daily consumption of wood and charcoal respectively for the baseline stove and conducted the KPT for continuous three days as described below:

On the first day, a bundle of wood stoke/ charcoal has been obtained from the household inventory or provided by the PP, according on what is appropriate, and then weighed using a weighing scale and with the accurate moisture test of the provided wood/charcoal. Next day, the weight of remaining wood/charcoal has been measured and another stock on pre-measured wood/charcoal has be provided to the survey household. The same process has been repeated till the consecutive three days.

The surveys hard copies and soft copies is being kept until the project receives credit. Whichever is an everlasting backup, both can be used. A backup of the survey results is also being stored on an electric medium. All data monitored and required for verification and issuance is being kept for two years after the end of the crediting period or the last issuance of credits for the project activity, whichever is later.

### **Calibration procedures for monitoring equipment:**

A weighing scale were needed to calculate how much firewood/charcoal the project stove and baseline stove use each day, as well as a moisture meter to gauge the amount of moisture in the wood while conducting the KPT.

The calibration details of weighing scale are as follows

To measure the weight of fuel consumed by the project stove during project KPT, weighing scales were used. The weighing scales used for project purposes were calibrated before starting the survey, as per the national/international standard, or as specified in the user manual of the respective weighing scale.

- Details of weighing scales is given below:
  - Serial No.: 217129166001028292, 217129166001028293, 217129166001028294, and 217129166001028295
  - Accuray Class: 5g (0-10kg) & 10g (10-45kg)
  - Date of calibration: 26-August-2024

Details of moisture meter is given below:

- Serial No.: 217429166001028292

- Accuracy:  $\pm 0.5\%$

The moisture meters are auto calibrated; hence separate calibration is not required for the moisture meters.

### Survey results:

|              | Sample drawn |          | Sample conducted |          |
|--------------|--------------|----------|------------------|----------|
| Fuel         | Wood         | Charcoal | Wood             | Charcoal |
| Baseline KPT | 125          | 125      | 125              | 122      |
| Project KPT  | 125          | 125      | 125              | 125      |

CME conducted KPT on stoves for measurement of wood/charcoal consumption in project stoves ( $P_{p,y}$ ) and on baseline stoves for measurement of wood/charcoal consumption in baseline stoves ( $P_{b,y}$ ) for wood and charcoal respectively and calculated a mean value of  $P_{p,y}$  kg/capita/day and  $P_{b,y}$  kg/ capita/day & average family size per hh is monitored; resulting the value of parameter  $SFS_{p,b,y}$  kg/ capita/day. The precision achieved by the conducted survey that is within the range of 90/30 precision range, hence acceptable.

Below are the result and analysis for  $SFS_{p,b,y}$  ( $P_{b,y}$  &  $P_{p,y}$ ):

#### 1. For Wood

ced

| 90/30 assessment                        |                   |                                |                          |
|-----------------------------------------|-------------------|--------------------------------|--------------------------|
|                                         |                   | Baseline fuel consumption      | Project fuel consumption |
| Sample Mean                             |                   | 1.9                            | 0.5                      |
| Sample Size (valid count)               |                   | 125.0                          | 123.0                    |
| Standard Deviation                      |                   | 0.2                            | 0.1                      |
|                                         |                   |                                | Fuel saving              |
| Standard error                          |                   |                                | 0.02                     |
| What is the precision attained?         |                   |                                | 2%                       |
| Does the result satisfy the 90/30 rule? |                   |                                | YES                      |
| Fuel saving Use mean value              |                   |                                |                          |
| Mean value                              | kg/per capita/day |                                | 1.40                     |
| Family size                             | 4.6               | Result (SFS <sub>p,b,y</sub> ) | 2.38 ton/hh/year         |

#### 2. For charcoal

| 90/30 assessment          |                           |                          |
|---------------------------|---------------------------|--------------------------|
|                           | Baseline fuel consumption | Project fuel consumption |
| Sample Mean               | 0.55                      | 0.2                      |
| Sample Size (valid count) | 118.0                     | 113.0                    |
| Standard Deviation        | 0.1                       | 0.0                      |
|                           |                           | Fuel saving              |

|                                         |                   |                                |                  |
|-----------------------------------------|-------------------|--------------------------------|------------------|
| Standard error                          |                   | 0.01                           |                  |
| What is the precision attained?         |                   | 3%                             |                  |
| Does the result satisfy the 90/30 rule? |                   | YES                            |                  |
| Fuel saving                             |                   | Use mean value                 |                  |
| Mean value                              | kg/per capita/day | 0.31                           |                  |
| Family size                             | 4.49              | Result (SFS <sub>p,b,y</sub> ) | 0.51 ton/hh/year |

### **Quality Assurance/Quality Control:**

The project proponent considered the non-response and the possible removal of outliers from the sample, as part of a Quality Control/Quality Assurance system. The choice of measure applied to each parameter depends on the cost of each data collection approach and the logistics required. The project proponent determines the most effective measure for each parameter from the following list:

- Oversampling: Randomly draw a sample more than the calculated number (say 20%) and collect data for each parameter
- Buffer Group: Randomly draw additional samples (say 20%) and collect data from only minimum numbers of ICS as per sample size calculation. If this would not result in the required sample size data would be collected from the additional ICS that were selected in the sample.

The sampling plan has the following procedures in place to ensure good-quality data. The project proponent ensures that field personnel have reviewed, understand, and agreed to follow the monitoring plan procedures, including provisions for maximizing response rates and documenting out-of-population cases, refusals, and other sources of non-response. Quality control and assurance strategies include addressing non-sampling errors, such as non-response or bias from the interviewer. The project proponent or a competent third party designated by the project proponent with the proper skills were train the monitoring personnel on how to properly survey households to prevent bias from the interviewer. In the case a household refuses to participate, another household were chosen at random. To reduce interviewer bias, a good questionnaire design and well-tested questionnaires were used. The surveyor at the site gets training from EKI for the monitoring survey & KPT, which includes interviewing the beneficiaries and weighing the wood/charcoal to use with weighing equipment. Additionally, give weighing machine calibration instructions.

The sample data for the mean value parameter is continuous and therefore the presence of outliers is possible. To identify and address outliers for the parameter, outliers were defined as those data points with values greater than three standard deviations from the mean of the sample. Data points identified as outliers were omitted from the analysis.

**Operational arrangements:** The Quality, Control, and Monitoring Manager together with the Operations Manager were responsible for planning and managing the survey. Roles were divided amongst field officers and project staff at every stage and the

Quality, Control, and Monitoring Manager was the overall coordinator ensuring completion and quality at every stage.

### **Stove Usage and other SDG parameters Survey (annual structured household interviews)**

**Objective:** The stove usage and other SDG parameters survey is used to determine the usage rate ( $U_{p,y}$ ) and other SDG parameters.

#### **Sampling Frame:**

The sampling frame for the monitoring survey consists of all households on the project database. Overall, ICS have the same group of end users which is household users, thus the geographical locations do not influence the parameter of interest. Therefore, all monitoring parameters can be assumed to be highly homogeneous for each ICS model regardless of how the end user group and distribution/installation location are defined.

#### **Data collected:**

Field Measurement:

The table below summarizes field measurement data requirements:

| <b>Parameter</b> | <b>Timing (indicative)</b>                                | <b>Frequency as required by the methodology</b> | <b>Methods applied</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------|-----------------------------------------------------------|-------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| $U_{p,y}$        | Before every verification or annually whichever is early. | Every year                                      | The primary cook of the household was interviewed to gather information on project technology use patterns, including information on duration and frequency of use, and seasonal trends. Also, objective information were gathered while visiting the household to support the usage survey findings e.g. whether the cooking device is warm to touch, ashes present, etc. to counter against survey bias from the respondent answering questions in a way that they think the interviewer wants to hear. |

The surveys hard copies and soft copies are kept until the project receives credit. Whichever is an everlasting backup, both can be used. A backup of the survey results is stored on an electric medium. All data monitored and required for verification and issuance will be kept for two years after the end of the crediting period or the last issuance of credits for the project activity, whichever is later.

**Sample procedure:** A simple random sampling procedure was adopted for the stove usage survey.

**Sample size:** CME has considered different samples for usage surveys for the parameters  $SPM_y$ ,  $TS_y$ , and  $U_{p,y}$ .

Also, the usage survey would incorporate the monitoring of "stove stacking". If a case of stove stacking is found during the usage survey; the appropriate measures would be taken and the corresponding emission reductions would be deducted from the annual emission reductions.

The following equation for the sample size will be used to calculate minimum sample size when applying simple random sampling (As provided in the Guidelines for Sampling and Surveys for CDM Project Activities and Programme of Activities', Version 04.0):

**Sample size determination for proportion parameter**

The equation for a 90/10 confidence/precision to give the required sample size is:

$$n \geq \frac{1.645^2 N \times p(1-p)}{(N-1) \times 0.1^2 \times p^2 + 1.645^2 \times p(1-p)}$$

Where:

- $n$  = Sample size for households
- $N$  = Total number of households
- $p$  = Expected proportion of parameter of interest
- 1.645 = Represents the 90% confidence required
- 0.1 = Represents the 10% relative precision

**Minimum calculated sample size is given below:**

|                                                       |                                |
|-------------------------------------------------------|--------------------------------|
| Sample Size Determination for a Proportion Parameter  | confidence/precision criterion |
| Survey design: Simple random sampling                 | 90/10                          |
| Calculation method: Precision via confidence interval |                                |
| Parameter                                             | Nigeria                        |
| N (Total number of households)                        | 71,199                         |
| p (Expected proportion of parameter of interest)      | 0.8                            |
| 1.645 (Represents the 90% confidence required)        | 1.645                          |
| 0.1 (Represents the 10% relative precision)           | 0.1                            |
| n (Min Sample Size)                                   | 68                             |

**Quality Control:**

The project proponent considered the non-response and the possible removal of outliers from the sample, as part of a Quality Control/Quality Assurance system. The choice of measure applied to each parameter depends on the cost of each data collection approach and the logistics required. The project proponent determines the most effective measure for each parameter from the following list:

- Oversampling: Randomly draw a sample more than the calculated number (say 20%) and collect data for each parameter
- Buffer Group: Randomly draw additional samples (say 20%) and collect data from only minimum numbers of ICS as per sample size calculation. If this would not result in the required sample size data would be collected from the additional ICS that were selected in the sample.

The sampling plan has the following procedures in place to ensure good-quality data. The project proponent ensures that field personnel have reviewed, understand, and agreed to follow the monitoring plan procedures, including provisions for maximizing response rates and documenting out-of-population cases, refusals, and other sources of non-response. Quality control and assurance strategies include addressing non-sampling errors, such as non-response or bias from the interviewer. The project proponent or a competent third party designated by the project proponent with the proper skills were train the monitoring personnel on how to properly survey households to prevent bias from the interviewer. In the case a household refuses to participate, another household were chosen at random. To reduce interviewer bias, a good questionnaire design and well-tested questionnaires were used. The surveyor at the site gets training from EKI for the monitoring survey & KPT, which includes interviewing the beneficiaries and weighing the wood/charcoal to use with weighing equipment. Additionally, give weighing machine calibration instructions.

The sample data for the mean value parameter is continuous and therefore the presence of outliers is possible. Data points identified as outliers were omitted from the analysis.

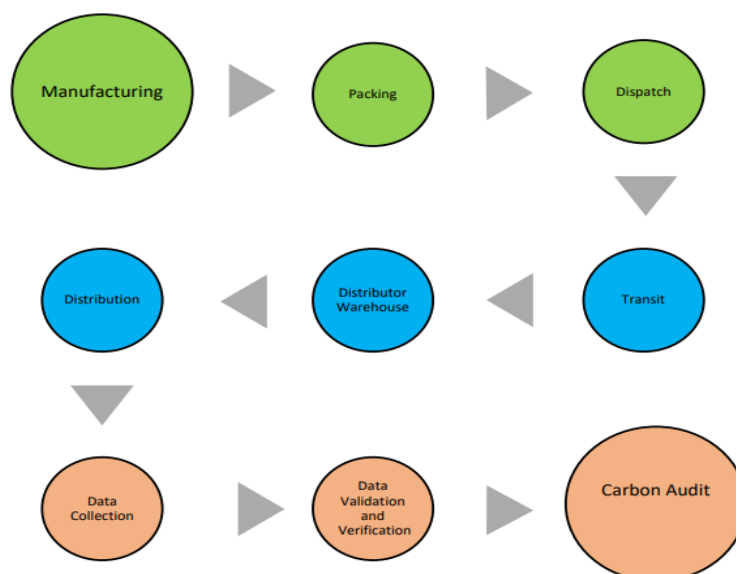
#### **Data collection and management methods:**

The methods for distribution, monitoring, and reporting data and parameters are described below.

Each distributed ICS is equipped with a label stating the unique serial number which is used for references and monitoring. The unique serial numbers provide the basis for monitoring activities and prevent instances of double counting.

The ICS were transported by the distributing entity around the Project site. Users receive the ICS through distributing entities. The ICS data management and collection procedure uses a safe, data storage system manually.

The ICS flow is described in the following figure:



### **Monitoring questionnaires:**

The distributing entities records each sample ICS user's contact information and pertinent data on standardized monitoring questionnaires concerning the corresponding serial number of the ICS that was distributed.

The interviewer collected survey data from each sample of the households, by utilizing the GS Survey Questionnaire.

Stoves Users were requested to provide the required information as per the GS Survey Questionnaire to the interviewer. Users shared their background information in several ways, including by speaking directly with designated focal points who may reside in their communities. This includes:

- Stove Serial No. /Unique ID, Date of ICS Receipt/onset of usage, Address, Beneficiary Name, etc.
- Improved Cook stove Specific Information such as the functioning of ICS, benefits observed from the use of improved cook stoves – e.g. reduction in smoke, fire incident, fuel collection time and cooking time.
- Traditional Cook stove Specific uses information
- Other Cooking fuel-specific information – LPG, Kerosene, etc.
- Fuel use pattern of your household – Purpose of fuel use
- Fuel Details – Quantity, sources, Cost, Quantity, Problem in collecting fuel, etc.

**Survey results:** survey results for all the parameters are as given below:

|                 | Sample drawn | Sample conducted |
|-----------------|--------------|------------------|
| Baseline survey | 125          | 101              |
| Usage Survey    | 85           | 87               |

| Sustainable Development Goals Targeted | SDG Impact Indicator | Survey result |
|----------------------------------------|----------------------|---------------|
|----------------------------------------|----------------------|---------------|

|                                   |                                                                                                                                                            |                  |
|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| 4 Quality Education               | <b>Indicator 4.4.1:</b> Number of employees provided skill development training                                                                            | 17               |
| 8 Decent Work and Economic Growth | <b>Indicator 8.5.1</b><br>Total number of jobs.<br><b>Project-specific Indicator:</b> Total man-hours of employment created during project implementation. | 29,163 man-hours |

**Management:** PP's Quality, Control, and Monitoring Manager were responsible for planning and management of the annual usage survey in collaboration with the Operations Manager.

## SECTION E. CALCULATION OF SDG IMPACTS

### E.1. Calculation of baseline value or estimation of baseline situation of each SDG Impact

#### For SDG 13

As per the applied Methodology TPDDTEC ver. 4.0, baseline emission and project emission need not be calculated separately. A formula for emission reduction for the installed cook stoves has been provided in the methodology. Therefore, the Actual calculation for SDG 13 during the current monitoring period

Thus, according to the methodology "Technologies and Practices to Displace Decentralized Thermal Energy Consumption", version 4.0 the overall GHG reductions achieved by the project activity in year y are calculated as follows:

$$ER_y = \sum_{b,p} (N_{b,p,y} * U_{p,y} * SFS_{p,b,y} * NCV_{b,fuel} * (f_{NRB,b,y} * EF_{fuel,CO2} + EF_{fuel,nonCO2})) - \sum LE_{p,y} \text{ ---}$$

---Equation 1 of the methodology-

Where,

$ER_y$  = Emission reduction for total project activity in year y (tCO<sub>2</sub>e/yr)

$\sum_{b,p}$  = Sum over all relevant baseline b/project p pairs

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

$U_{p,y}$  = Cumulative Usage rate for technologies in Project scenario p in year y (fraction)  
= 0.9

$SFS_{p,b,y}$  = Specific fuel savings for an individual project technology of baseline b/project p pair in year y (tonnes/technology\*day)  
= 6.508 kg/HH/day (For wood)  
= 1.407 kg/HH/day (For charcoal)

$NCV_{b,fuel}$  = Net calorific value of the fuel(s) that is substituted or reduced in baseline b (TJ/mass units)  
= 0.0156 TJ/tonne (Wood)

$$= 0.0295 \text{ TJ/tonne (Charcoal)}$$

$f_{\text{NRB},b,y}$  = Fractional non-renewability status of woody biomass fuel during year  $y$  (fraction) = 0.38 for Nigeria

$$\begin{aligned} \text{EF}_{\text{fuel},\text{CO}_2} &= \text{CO}_2 \text{ emission factor from use of fuel } f \text{ (tCO}_2\text{/TJ)} \\ &= 112 \text{ tCO}_2\text{/TJ (Wood)} \\ &= 165.22 \text{ tCO}_2\text{/TJ (Charcoal)} \end{aligned}$$

$$\begin{aligned} \text{EF}_{\text{fuel},\text{nonCO}_2} &= \text{Non-CO}_2 \text{ emission factor arising from use of fuel } f, \text{ when the baseline fuel } f \text{ is biomass or charcoal (tCO}_2\text{e/TJ)} \\ &= 9.46 \text{ tCO}_2\text{e/TJ (Wood)} \\ &= 44.83 \text{ tCO}_2\text{e/TJ (Charcoal)} \end{aligned}$$

$\Sigma \text{LE}_{p,y}$  = Leakage for project scenario  $p$  in year  $y$  (tCO<sub>2</sub>e/yr)  
For leakage emission calculations, PD has used a default adjustment factor of 0.95 as per para 3.11.2 of the applied methodology, version 4.0. So, we can write  
( $-\Sigma \text{LE}_{p,y}$ ) = \*0.95

$$\text{ER}_y = \sum_{b,p} (N_{b,p,y} * U_{p,y} * \text{SFS}_{p,b,y} * \text{NCV}_{b,\text{fuel}} * (f_{\text{NRB},b,y} * \text{EF}_{\text{fuel},\text{CO}_2} + \text{EF}_{\text{fuel},\text{nonCO}_2})) * 0.95$$

To calculate  $\text{SFS}_{p,b,y}$ , in line with para 4.1.15 & 4.1.18 of the applied methodology, version 4.0 the difference between the quantity of fuel that is consumed in baseline scenario  $b$  during year  $y$  in units of kg/household-day ( $P_{b,y}$ ) and the quantity of fuel that is consumed in project scenario  $p$  during year  $y$  in units of kg/household-day ( $P_{p,y}$ ) shall be used<sup>13</sup>.

There is only one baseline – project couple. That is that the baseline scenario is the use of a three-stone fire and the project scenario is the use of a project stove. There is therefore no need for the summation ( $\Sigma b,p$ ).

### **Sample calculation for Year 2024 is shown below:**

ER calculations for wood fuel use during the non-rainy season (November to March) for cooking purposes:

$$\begin{aligned} &\text{Number of Project Technology-days (01/11/2024 to 31/12/2024) in Wood} \\ &= 61 \text{ (No. of days)} * 71,199 \text{ (No. of ICS)} \\ &= 4,343,139 \end{aligned}$$

$$\begin{aligned} \text{ER}_y &= \{4,343,139 * 0.9 * 6.508 * 10^{-3} * 0.0156 * (0.38 * 112 + 9.46)\} * 0.95 \text{ (for Wood)} \\ \text{ER}_y &= 19,611 \text{ tCO}_2\text{/year} \end{aligned}$$

ER calculations for charcoal fuel use during the rainy season (April to October) for cooking purposes:

---

<sup>13</sup> Please refer KPT analyser

Number of Project Technology-days (01/07/2024 to 31/10/2024) in charcoal  
 = 123 (No. of days) \* 71,199 (No. of ICS)  
 = 8,757,477

$ER_y = \{8,757,477 * 0.9 * 1.407 * 10^{-3} * 0.0295 * (0.38 * 164.22 + 44.83)\} * 0.95$  (for Charcoal)

$ER_y = 33,444 \text{ tCO}_2/\text{year}$

=  $ER_y$  (for Wood) +  $ER_y$  (for Charcoal)

= 19,611 + 33,444

**$ER_y = 53,055 \text{ tCO}_2\text{e}/\text{yr}$**

**Hence, the total ER for the complete monitoring period = 159,789 tCO<sub>2</sub>e/yr**

| Sustainable Development Goals Targeted | SDG Impact Indicator                                                                                                                                       | Baseline Value                |
|----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| 4 Quality Education                    | <b>Indicator 4.4.1:</b> Number of employees provided skill development training                                                                            | 0                             |
| 7 Affordable and Clean Energy          | <b>Indicator 7.3.1:</b> Total energy savings.                                                                                                              | 0                             |
| 8 Decent Work and Economic Growth      | <b>Indicator 8.5.1</b><br>Total number of jobs.<br><b>Project-specific Indicator:</b> Total man-hours of employment created during project implementation. | 0 man-hours                   |
| 15 Life on Land                        | <b>Indicator 15.1.1:</b> Total non-renewable wood fuel saved.                                                                                              | 0 tonnes of renewable biomass |

Detailed information can be referred to from the survey report that was carried out for this monitoring period.

## E.2. Calculation of project value or estimation of project situation of each SDG Impact

The estimation of project situation of each SDG impact is shown in below table: -

| Sustainable Development Goals Targeted | SDG Impact Indicator                                                            | Calculation           | Project Value |
|----------------------------------------|---------------------------------------------------------------------------------|-----------------------|---------------|
| 4 Quality Education                    | <b>Indicator 4.4.1:</b> Number of employees provided skill development training | Net Benefit = $SDT_y$ | 17 nos.       |

|                                   |                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                        |
|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|
| 7 Affordable and Clean Energy     | Total energy savings                                                                                                                                                      | <p>Net Benefit = <math>ES_y</math></p> <p><math>ES_y</math> = Total energy savings achieved by the number of improved cookstoves distributed and in use annually, replacing traditional stoves</p> <p>Net Benefit (SDG 7) = <math>ES_y</math></p> <p>Where:<br/> <math>ES_y</math> = Total energy savings achieved by the number of improved cookstoves distributed and in use annually, replacing traditional stoves.<br/> <math>= \sum_{b,p} (N_{b,p,y} * SFS_{p,b,y} * NCV_{b,fuel})</math></p> | 2,526 TJ                               |
| 8 Decent Work and Economic Growth | <p><b>Indicator 8.5.1</b></p> <p>Total number of jobs.</p> <p><b>Project-specific Indicator:</b> Total man-hours of employment created during project implementation.</p> | <p>Net Benefit = <math>QEG_y</math></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 29,163 man-hours                       |
| 15 Life on Land                   | <p><b>Indicator 15.1.1:</b></p> <p>Total non-renewable wood fuel saved.</p>                                                                                               | <p><math>R_{nr,b,y} = [N_{b,p,y} * U_{p,y} * SFS * 10^{-3} * f_{NRB,b,y}]</math></p>                                                                                                                                                                                                                                                                                                                                                                                                               | 45,139 tonnes of non-renewable biomass |

### E.3. Calculation of leakage

As per the Technologies and Practices to Displace Decentralized Thermal Energy Consumption (TPDDTEC), for Leakage emission calculation, the Project Developer has opted option 1 i.e. "Apply a default adjustment factor of 0.95 to the emission reductions to approximate leakage emissions."

### E.4. Calculation of net benefits or direct calculation for each SDG Impact

| SDG | SDG Impact        | Units/ Products    | Baseline estimate | Project estimate | Net benefit |
|-----|-------------------|--------------------|-------------------|------------------|-------------|
| 13  | Climate Action    | tCO <sub>2</sub> e | 159,789           | -                | 159,789     |
| 4   | Quality Education | Number             | 0                 | 17               | 17          |

|    |                                 |                                 |   |        |        |
|----|---------------------------------|---------------------------------|---|--------|--------|
| 7  | Affordable Clean Energy         | TJ                              | 0 | 2,526  | 2,526  |
| 8  | Decent Work and Economic Growth | man-hours                       | 0 | 29,163 | 29,163 |
| 15 | Life on Land                    | tonnes of non-renewable biomass | 0 | 45,139 | 45,139 |

#### E.5. Comparison of actual SDG Impacts with estimates in approved PDD

| SDG | Values estimated in ex ante calculation of approved PDD for this monitoring period | Actual values <sup>14</sup> achieved during this monitoring period |
|-----|------------------------------------------------------------------------------------|--------------------------------------------------------------------|
| 13  | 159,789 tCO <sub>2</sub> e                                                         | 159,789 tCO <sub>2</sub> e                                         |
| 4   | 15                                                                                 | 17                                                                 |
| 7   | 2,526 TJ                                                                           | 2,526 TJ                                                           |
| 8   | 22,562 man-hours                                                                   | 29,163 man-hours                                                   |
| 15  | 35,613 tonnes of non-renewable biomass                                             | 35,613 tonnes of non-renewable biomass                             |

E.5.1. Explanation of calculation of value estimated ex ante calculation of approved PDD for this monitoring period

>>

#### SDG 4: Quality Education

| Estimated ex ante calculation of approved PDD |                                                         |
|-----------------------------------------------|---------------------------------------------------------|
| SDG indicator                                 | Equation/calculation                                    |
| Indicator 4.4.1: Number of                    | Ex ante estimates as per the current monitoring period: |

<sup>14</sup> Whenever emission reductions are capped, both the original and capped values used for calculations must be transparently reported. Use brackets to denote original values.

|                                                                                                                                                   |                                                                                                                                                                                 |                         |                       |                   |                                         |                          |
|---------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-----------------------|-------------------|-----------------------------------------|--------------------------|
| <p>employees provided skill development training.</p> <p><b>Approach:</b><br/>Monitoring the number of soft skill programs running in a year.</p> | <p>Net Benefit (SDG 4) = <math>SDT_y</math></p> <p>Where:</p> <p><math>SDT_y</math> = Number of employees who have undergone skill development training in year y = 19 nos.</p> |                         |                       |                   |                                         |                          |
|                                                                                                                                                   | <p><b>Nos from VPA-DD</b></p>                                                                                                                                                   | <p><b>No of ICS</b></p> | <p><b>MP Days</b></p> |                   | <p><b>ex ante estimates</b></p>         |                          |
|                                                                                                                                                   |                                                                                                                                                                                 |                         | <p><b>Begin</b></p>   | <p><b>End</b></p> | <p><b>No. of days</b></p>               | <p><b>No. of ICS</b></p> |
|                                                                                                                                                   |                                                                                                                                                                                 |                         |                       |                   | <p><b>Nos for comparable period</b></p> |                          |
|                                                                                                                                                   | 10                                                                                                                                                                              | 71,199                  | 01/07/2024            | 31/12/2025        | 549                                     | 71,199                   |

The “Number of employees who have undergone skill development training” (e.g.  $SDT_y$ ) during the first Monitoring Period was available during validation, the final PDD incorporated these actual values (from original training records submitted to the VVB at validation) and these ex-ante values were adjusted for the given monitoring period for comparison. Consequently, there is no much variance between the estimated ex ante calculation in the validated PDD and that for the current monitoring period. During the current monitoring period total 17 employees got engaged in the execution of the project activity and got professional training in climate change issues prior to the survey and KPT, honing their operational and surveying abilities for stove distribution and monitoring under GS project. These skilled workers are able to handle a variety of circumstances, are fluent in the local language, and have in-depth knowledge of the locality, enabling efficient and culturally aware project implementation.

## SDG 7: Affordable Clean Energy

| Estimated ex ante calculation of approved PDD                                                                                                                                                           |                                                                                |                                                     |            |            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|-----------------------------------------------------|------------|------------|
| SDG indicator                                                                                                                                                                                           | Equation/calculation                                                           |                                                     |            |            |
| <p><b>Indicator 7.3.1:</b> Total energy savings.</p> <p><b>Approach:</b><br/>Calculating the fuel saving from use of ICS operating under the project as an indicator of providing clean technology.</p> | <p>Net Benefit (SDG 7) = <math>ES_y</math></p> <p>Estimated Energy Saving:</p> |                                                     |            |            |
|                                                                                                                                                                                                         | Calander year                                                                  | Fuel                                                | Wood       | Charcoal   |
|                                                                                                                                                                                                         | 2024                                                                           | Number of Project Technology-days in (Estimated ER) | 4,343,139  | 8,757,477  |
|                                                                                                                                                                                                         |                                                                                | Estimated Energy Saving                             | 440        | 363        |
|                                                                                                                                                                                                         |                                                                                | Number of Project Technology-days in (Actual)       | 4,343,139  | 8,757,477  |
|                                                                                                                                                                                                         |                                                                                | Final Estimated Energy Saving as per the current MP | 440        | 363        |
|                                                                                                                                                                                                         |                                                                                | Actual ER Energy Saving                             | 440        | 363        |
|                                                                                                                                                                                                         |                                                                                | Percentage difference                               | 0%         | 0%         |
|                                                                                                                                                                                                         | 2025                                                                           | Number of Project Technology-days in (Estimated ER) | 10,751,049 | 15,236,586 |
|                                                                                                                                                                                                         |                                                                                | Estimated Energy Saving                             | 1,091      | 632        |

|  |  |                                                     |            |            |
|--|--|-----------------------------------------------------|------------|------------|
|  |  | Number of Project Technology-days in (Actual)       | 10,751,049 | 15,236,586 |
|  |  | Final Estimated Energy Saving as per the current MP | 1,091      | 632        |
|  |  | Actual Energy Saving                                | 1,091      | 632        |
|  |  | Percentage difference                               | 0%         | 0%         |

During validation, the values of the ex-post monitored parameters (e.g., ICSDy) were already available; therefore, the final PDD incorporated these actual values based on original records and user survey results submitted to the VVB during validation. For comparison purposes, the ex-ante estimates were adjusted to a comparable period of 549 days, considering the same number of ICS units (71,199). Consequently, there is no variance between the estimated ex-ante calculations presented in the validated PDD and those for the current monitoring period, as all input information remains the same.

## SDG 8: Decent Work and Economic Growth

| Estimated ex ante calculation of approved PDD                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                        |                |            |                              |                   |                  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|------------|------------------------------|-------------------|------------------|
| SDG indicator                                                                                                                                                                                                                                                                                                                           | Equation/calculation                                                                                                                                                                                                                   |                |            |                              |                   |                  |
| <b>Indicator 8.5.1</b><br>Total number of jobs.<br><b>Project-specific Indicator:</b><br>Total man-hours of employment created during project implementation.<br><br><b>Approach:</b><br>Recording the number of man-hours of the employees (male/female) involved in the project under administrative, sales, distribution, monitoring | <b>Employment records</b>                                                                                                                                                                                                              |                |            |                              |                   |                  |
|                                                                                                                                                                                                                                                                                                                                         | Net Benefit (SDG 8) = $QEG_y$                                                                                                                                                                                                          |                |            |                              |                   |                  |
|                                                                                                                                                                                                                                                                                                                                         | <u>Where:</u>                                                                                                                                                                                                                          |                |            |                              |                   |                  |
|                                                                                                                                                                                                                                                                                                                                         | $QEG_y$ = Quantitative Employment generation (Total number of man-hours of Employment (administrative, sales, distribution, monitoring and management) opportunities generated under Project scenario) in year y<br>= 28,973 man-hours |                |            |                              |                   |                  |
| <b>ex ante estimates as per the current monitoring period:</b>                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                        |                |            |                              |                   |                  |
|                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                        |                |            | ex ante estimates            |                   |                  |
| <b>Man Hours from VPA-DD</b>                                                                                                                                                                                                                                                                                                            | <b>No of ICS</b>                                                                                                                                                                                                                       | <b>MP Days</b> |            | <b>No. of days</b>           | <b>No. of ICS</b> | <b>Man Hours</b> |
|                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                        | <b>Begin</b>   | <b>End</b> | <b>for comparable period</b> |                   |                  |
| 15,000                                                                                                                                                                                                                                                                                                                                  | 71,199                                                                                                                                                                                                                                 | 01-07-2024     | 31-12-2025 | 705                          | 71,199            | 22,562           |

|                                                   |  |
|---------------------------------------------------|--|
| and management positions of the project activity. |  |
|---------------------------------------------------|--|

During the verification, the value of the ex-post monitored parameter (e.g. QEG<sub>y</sub>) for the first monitoring period was available, thus the final validated PDD incorporated these actual values (from original employment records submitted to the VVB at validation).

Total number of man-hours of Employment (administrative, sales, distribution, monitoring, management, maintenance and KPT) opportunities generated under project scenario in current monitoring period = 29,163 man-hours

### SDG 13: Climate Action

| Estimated ex ante calculation of approved PDD                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SDG indicator                                                                | Equation/calculation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Indicator 13.2.1:</b><br>Amount of GHGs emissions avoided or sequestered. | <p>Net Benefit (SDG 13) = The overall GHG reductions achieved by the project activity in year y.<br/>The calculation is done in the following manner.</p> <p>PD has used method 1 of the applied methodology version 4.0 because Baseline and project fuel(s) are identical and emission reductions are exclusively from improved efficiency</p> $ER_y = \sum_{b,p} (N_{b,p,y} * U_{p,y} * SFS_{p,b,y} * NCV_{b,fuel} * (f_{NRB,b,y} * EF_{fuel,CO2} + EF_{fuel,nonCO2})) * - \sum LE_{p,y}$ <p>...(equation 1 of the applied methodology)</p> <p><u>Where,</u><br/> ER<sub>y</sub> = Emission reduction for total project activity in year y (tCO<sub>2</sub>e/yr)</p> <p>Σ<sub>b,p</sub> = Sum over all relevant baseline b/project p pairs</p> <p>N<sub>b,p,y</sub> = Number of project technology-days included in the project database for baseline b/project p pair in year y (days)</p> <p>U<sub>p,y</sub> = Cumulative Usage rate for technologies in project scenario p in year y (fraction) = 0.9</p> <p>SFS<sub>p,,</sub> = Specific fuel savings for an individual project technology of baseline b/project p pair in year y (tonnes/technology*day)<br/> = 6.508 kg/HH/day (For wood)<br/> = 1.407 kg/HH/day (For charcoal)</p> <p>NCV<sub>b,fuel</sub> = Net calorific value of the fuel(s) that is substituted or reduced in baseline b (TJ/mass units)</p> |

= 0.0156 TJ/tonne (Wood)  
= 0.0295 TJ/tonne (Charcoal)

$f_{NRB,b,y}$  = Fractional non-renewability status of woody biomass fuel during year y (fraction)  
= 0.38 for Nigeria

$EF_{fuel, CO_2}$  = CO<sub>2</sub> emission factor from use of fuel  $f$  (tCO<sub>2</sub>/TJ)  
= 112 tCO<sub>2</sub>/TJ (Wood)  
= 165.22 tCO<sub>2</sub>/TJ (Charcoal)

$EF_{fuel, nonCO_2}$  = Non-CO<sub>2</sub> emission factor arising from use of fuel  $f$ , when the baseline fuel  $f$  is biomass or charcoal (tCO<sub>2</sub>e/TJ)  
=9.46 tCO<sub>2</sub>e/TJ (Wood)  
=44.83 tCO<sub>2</sub>e/TJ (Charcoal)

$\Sigma LE_{p,y}$  = Leakage for project scenario p in year y (tCO<sub>2</sub>e/yr)

For leakage emission calculations, PD has used a default adjustment factor of 0.95 as per para 3.11.2 of the applied methodology, version 4.0. So, we can write  
(-  $\Sigma LE_{p,y}$ ) = \*0.95

Hence, the updated equation becomes-

$$ER_y = \sum_{b,p} (N_{b,p,y} * U_{p,y} * SFS_{p,b,y} * NCV_{b,fuel} * (f_{NRB,b,y} * EF_{fuel,CO_2} + EF_{fuel,nonCO_2})) * 0.95$$

To calculate  $SFS_{p,b,y}$ , in line with para 4.1.15 & 4.1.18 of the applied methodology, version 4.0 the difference between the quantity of fuel that is consumed in baseline scenario b during year y in units of kg/household-day ( $P_{b,y}$ ) and the quantity of fuel that is consumed in project scenario p during year y in units of kg/household-day ( $P_{p,y}$ ) is used.

So, we can write

$$SFS_{p,b,y} = (P_{b,y} - P_{p,y})$$

= (9.02 – 2.52) for wood

$$SFS_{p,b,y} = (P_{b,y} - P_{p,y})$$

= (2.47 – 1.06) for Charcoal

$P_{b,y}$  = quantity of fuel that is consumed in baseline scenario b during year y in units of kg/household-day  
=9.02 kg/household-day for wood

$P_{b,y}$  = quantity of fuel that is consumed in baseline scenario b during year y in units of kg/household-day  
=2.52 kg kg/household-day for charcoal

$P_{p,y}$  = quantity of fuel that is consumed in project scenario p during year y in units of kg/household-day  
 = 2.47 kg/household-day for wood

$P_{p,y}$  = quantity of fuel that is consumed in project scenario p during year y in units of kg/household-day  
 = 1.06 kg/household-day for charcoal

Thus, we can rewrite the ER estimation equation as-  

$$ER_y = \sum_{b,p} (N_{b,p,y} * U_{p,y} * (P_{b,y} - P_{p,y}) * NCV_{b,fuel} * (f_{NRB,b,y} * EF_{fuel,CO2} + EF_{fuel,nonCO2})) * 0.95$$

Hence, the total ER for the complete monitoring period = 159,789 tCO<sub>2</sub>e/yr

**Ex ante estimates as per the current monitoring period:**

| Calander year | Fuel                                                | Wood       | Charcoal   |
|---------------|-----------------------------------------------------|------------|------------|
| 2024          | Number of Project Technology-days in (Estimated ER) | 4,343,139  | 8,757,477  |
|               | Estimated ER                                        | 19,611     | 33,444     |
|               | Number of Project Technology-days in (Actual)       | 4,343,139  | 8,757,477  |
|               | Final Estimated ER as per the current MP            | 19,611     | 33,444     |
|               | Actual ER                                           | 19,611     | 33,444     |
|               | Percentage difference                               | 0%         | 0%         |
| 2025          | Number of Project Technology-days in (Estimated ER) | 10,751,049 | 15,236,586 |
|               | Estimated ER                                        | 48,546     | 58,188     |
|               | Number of Project Technology-days in (Actual)       | 10,751,049 | 15,236,586 |
|               | Final Estimated ER as per the current MP            | 48,546     | 58,188     |
|               | Actual ER                                           | 48,546     | 58,188     |
|               | Percentage difference                               | 0%         | 0%         |

During the validation, the value of the ex-post monitored parameter (e.g.  $N_{b,p,y}$ ,  $P_{b,y}$ ,  $P_{p,y}$ ,  $U_{p,y}$ ,  $SFS_{p,b,y}$ ) were available during validation, the final PDD incorporated these actual values (from original records and KPT test results submitted to the VVB at validation). Consequently, there is no variance between the estimated ex ante calculation in the validated PDD and that for the current monitoring period.

## SDG 15: Life on Land

| Estimated ex ante calculation of approved PDD |                      |
|-----------------------------------------------|----------------------|
| SDG indicator                                 | Equation/calculation |

|                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                             |                                                     |            |           |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|------------|-----------|
| <b>Indicator 15.1.1:</b><br>Total non-renewable wood fuel saved.<br><br><b>Approach:</b><br>Fuel savings reported by users in the project and using method 1 of the applied methodology version 4.0 because Baseline and project fuel(s) are identical. | Net Benefit (SDG 15) = The overall reduction in use of non-renewable biomass in year y.<br>The calculation is done in the following manner.<br>PD has used method 1 of the applied methodology version 4.0 because Baseline and project fuel(s) are identical and reduction in use of non-renewable biomass is given below: |                                                     |            |           |
|                                                                                                                                                                                                                                                         | $R_{nr,b,y} = [N_{b,p,y} * U_{p,y} * (SFS) * 10^{-3} * f_{NRB,b,y}]$                                                                                                                                                                                                                                                        |                                                     |            |           |
|                                                                                                                                                                                                                                                         | $R_{nr,b,y}$ (for wood) =<br>= 38,470 tonnes of non-renewable biomass                                                                                                                                                                                                                                                       |                                                     |            |           |
|                                                                                                                                                                                                                                                         | $R_{nr,b,y}$ (for Charcoal)=<br>= 14,143 tonnes of non-renewable biomass                                                                                                                                                                                                                                                    |                                                     |            |           |
|                                                                                                                                                                                                                                                         | $R_{nr,b,y}$ (for wood & Charcoal)=<br>= 38,470+14,143 = 52,613 tonnes of non-renewable biomass<br>(Rounded down value)                                                                                                                                                                                                     |                                                     |            |           |
|                                                                                                                                                                                                                                                         | <b>Ex ante estimates as per the current monitoring period:</b>                                                                                                                                                                                                                                                              |                                                     |            |           |
|                                                                                                                                                                                                                                                         | Calander year                                                                                                                                                                                                                                                                                                               | Fuel                                                | Wood       | Charcoal  |
|                                                                                                                                                                                                                                                         | 2024                                                                                                                                                                                                                                                                                                                        | Number of Project Technology-days in (Estimated ER) | 4,343,139  | 8,757,477 |
|                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                             | Estimated non-renewable biomass                     | 9,666      | 4,214     |
|                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                             | Number of Project Technology-days in (Actual)       | 4,343,139  | 8,757,477 |
| Final Estimated non-renewable biomass as per the current MP                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                             | 9,666                                               | 4,214      |           |
| Actual ER non-renewable biomass                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                             | 9,666                                               | 4214       |           |
| Percentage difference                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                             | 0%                                                  | 0%         |           |
| 2025                                                                                                                                                                                                                                                    | Number of Project Technology-days in (Estimated ER)                                                                                                                                                                                                                                                                         | 10,751,049                                          | 15,236,586 |           |
|                                                                                                                                                                                                                                                         | Estimated non-renewable biomass                                                                                                                                                                                                                                                                                             | 23,928                                              | 7,331      |           |
|                                                                                                                                                                                                                                                         | Number of Project Technology-days in (Actual)                                                                                                                                                                                                                                                                               | 10,751,049                                          | 15,236,586 |           |
|                                                                                                                                                                                                                                                         | Final Estimated non-renewable biomass as per the current MP                                                                                                                                                                                                                                                                 | 23,928                                              | 7,331      |           |
|                                                                                                                                                                                                                                                         | Actual non-renewable biomass                                                                                                                                                                                                                                                                                                | 23,928                                              | 7331       |           |
|                                                                                                                                                                                                                                                         | Percentage difference                                                                                                                                                                                                                                                                                                       | 0%                                                  | 0%         |           |

During the validation, the value of the ex-post monitored parameter (e.g.  $N_{b,p,y}$ ,  $P_{b,y}$ ,  $P_{p,y}$ ,  $U_{p,y}$ ,  $SFS_{p,b,y}$ ) were available during validation, the final validated PDD incorporated these actual values (from original records and KPT test results submitted to the VVB at validation). Consequently, there is no variance between the estimated ex ante calculation in the validated PDD and that for the current monitoring period.

## **E.6. Remarks on increase in achieved SDG Impacts from estimated value in approved PDD**

There is a slight increase in the achieved impacts for SDG 4 and SDG 8 compared to the estimated values provided in the final PDD. The variation is due to the distribution process was actively carried out during this monitoring period.

## **SECTION F. SAFEGUARDS REPORTING**

>> As per the safeguarding Principal Assessment in Appendix-1 of the GS4GG PDD, there are no safeguarding principles which are to be included in the monitoring plan or hold any relevance to the project activity. Also, there are no any impact (positive/negative/slightly) for any mitigation measures, being applicable to any of the safeguarding principles. Hence, this section is not relevant.

## **SECTION G. STAKEHOLDER INPUTS AND LEGAL DISPUTES**

### **G.1. List all Inputs and Grievances which have been received via the Continuous Input and Grievance Mechanism together with their respective responses/mitigations.**

>> End users are informed about the grievance register, wherein the local stakeholders can provide their feedback or comments. Apart from this, the local stakeholders can also directly communicate with the salesperson (representative of distribution/retail partners etc.) in case of any feedback / complaints with the product post distribution. During this monitoring period, no comments/feedback have been received.

PP also contacts the end users on a regular basis to ensure the proper functioning of cook stoves, takes feedback to address grievances, and adds more users by spreading awareness. The team visits the site selection random location for this purpose and mainly records the information related to regular usage of ICS, the physical condition of ICS, benefits observed by the usage of ICS, information related to the usage of baseline cook stoves, etc.

### **G.2. Report on any stakeholder mitigations that were agreed to be monitored.**

>> Not Applicable

### **G.3. Provide details of any legal contest that has arisen with the project during the monitoring period**

>> No legal contests have arisen with the project during the monitoring period.

## Revision History

| Version | Date            | Remarks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.1     | 14 October 2020 | <p>Hyperlinked section summary to enable quick access to key sections</p> <p>Improved clarity on Key Project Information</p> <p>Section for POA monitoring</p> <p>Forward action request section</p> <p>Improved Clarity on SDG contribution/SDG Impact term used throughout</p> <p>Clarity on safeguard reporting</p> <p>Clarity on design changes</p> <p>Leakage section added for VER/CER projects</p> <p>Addition of Comparison of monitored parameters with last monitoring period</p> <p>Provision of an <a href="#">accompanying Guide</a> to help the user understand detailed rules and requirements</p> |
| 1.0     | 10 July 2017    | Initial adoption                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |