



GROUPED PROJECTS FOR CAMBODIA IMPROVED COOKSTOVE

(SIPCO)

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Prepared by	Sustainability Investment Promotion and Development Joint Stock Company (SIPCO)

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1 PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

The intention of the grouped project activity involves the installation of energy efficient Improved Cookstove (ICS) in the households (hereafter “users”) of Kingdom of Cambodia for cooking meals and boiling water. For this reason, this proposed project activity aims at reducing the woodfuel consumption of traditional stove users by distributing ICS to households. By reducing the consumption of woodfuel, it can contribute to improving public health problems. Furthermore, this proposed project can contribute to Cambodia's climate change respond and sustainable development.

The project activity targets households with no previous ICS access. The geographical boundary is in Cambodia. ICSs are distributed free of cost to users. Sustainability Investment Promotion and Development Joint Stock Company (SIPCO) financed the implementation of the project in full.

The project activity will promote the dissemination of energy efficient ICS. This will in turn reduce deforestation and degradation of forests in Cambodia through participation of the people in adopting energy efficient stoves. This will also contribute to improvement in quality of lives of the people from Cambodia through reduction of drudgery, time and money spent on fuel wood collection and through improvement of indoor air pollution. Globally, the project will contribute by reducing emission of GHG into the atmosphere.

The scenario existing prior to the implementation of the project is the actual baseline scenario which is equal to the existing common practice by the households i.e. in absence of the project activity the equivalent amount of thermal energy generated using firewood in three stone open fires to meet the cooking energy demand.

Preventing double counting by multiple ICSs in beneficiary households:

Project proponent (PP) chose Women for Peace and Development (CWPD) as its distribution partner, an organization with a wide network from central to local levels, the ability to reach every household to investigate the baseline scenario and the ability to access advanced equipment in other carbon programs. To determine the initial list of beneficiaries for the project, the village and commune level of Cambodia conducted surveys as per the project criteria. One of the primary criteria for selecting beneficiaries is that these households must not receive similar products such as improved stoves and water filters from any another GHG program. The lists of households receiving improved stoves and water purifiers were clearly divided and separated to avoid duplication of beneficiaries. Afterward, the central-level CWPD consolidated the initial list and sent it to PP. PP then randomly selected samples, following the Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities (version 09.0), which refers to the Guidelines for Sampling and Surveys for CDM Project Activities and Programme of Activities (version 04), to conduct the baseline surveys. The final list of beneficiaries was created based

on these results for distribution activities. The devices are distributed to households according to the final list, with each end-user signing an agreement to confirm receipt of the device. This distribution process is overseen by the village/commune-level local authorities to prevent any duplication of households between projects.

PP signed distribution contract with Cambodian Women for Peace and Development (CWPD). CWPD is a local non-government organization (NGO). CWPD is dedicated to progress, moving forward to build a peaceful nation, to contribute to improving the quality of life of Cambodian women and their family, to alleviate poverty and enhance social integration of the disadvantages and the marginal. The structure of CWPD (vertical linkage from central to district to commune to village level), its broad membership base and ongoing meetings and activities facilitate project promotion and implementation.

The improved cookstove under this grouped project is the Ecozen stove which is manufactured by Viet Charcoal Production Company Limited. The thermal efficiency and lifespan of the Ecozen ICS is 38.44% and 10 years, respectively.

The Grouped project will distribute free 800,000 ICSs to households who use the traditional cookstove for cooking meals. All the project instances to be included in this grouped project will be from within Cambodia only.

The first ICS was distributed on 02-May-2022 in Takeo Province. The first, second, third monitoring period is from 02-May-2022 to 31-March-2023 with 200,001 ICSs distributed, 1-April-2023 to 31-December-2023 with 149,999 additional ICSs distributed and 01-January-2024 to 30-June-2024 with 120,000 ICSs additional distributed, respectively. Until the end of this fourth monitoring period from 01-July-2024 to 31-January-2025, a total of 470,000 ICSs was reported installed with 49 project activity instances under the grouped project¹. However, after the third monitoring period, one cookstove reported to not be operated. Hence it has been removed from amount of ICS installed. The detail is illustrated as the table below:

No	Month of installation	Number of ICSs
1.	May-22	32,000
2.	Jun-22	20,493
3.	Jul-22	17,636
4.	Aug-22	23,800
5.	Sep-22	16,071
6.	Oct-22	16,000
7.	Nov-22	40,000
8.	Dec-22	16,000
9.	Jan-23	3,000
10.	Feb-23	15,000

¹ The detail of the 49 project activity instances is mentioned in the section 3.1

11.	Mar-23	11,437
12.	Apr-23	15,231
13.	May-23	16,000
14.	Jun-23	17,900
15.	Jul-23	13,650
16.	Aug-23	13,588
17.	Sep-23	22,058
18.	Oct-23	17,038
19.	Nov-23	16,000
20.	Dec-23	7,097
21.	Jan-24	22,277
22.	Feb-24	24,240
23.	Mar-24	23,541
24.	Apr-24	25,544
25.	May-24	24,398
Total	25 months	469,999

The total GHG emission reductions generated in the fourth monitoring from 01-July-2024 to 31-January-2025 is 318,693 tCO₂e.

1.2 Audit History

Audit type	Period	Program	Validation/verification body name	Number of years
Validation	05-July-2023 is the approval date (Crediting period: 02-May-2022 to 01-May-2032)	VCS	Carbon Check (India) Private Limited	N/A
Verification	From 02-May-2022 to 31-March-2023	VCS	Carbon Check (India) Private Limited	0.915 year
	From 01-April-2023 to 31-December-2023	VCS	EcoLance Private Limited	0.753 year
	From 01-January-2024 to 30-June-2024	VCS	EcoLance Private Limited	0.5 year
	From 01-July-2024 to 31-January-2025	VCS	EcoLance Private Limited	0.589 year
Total	4	1	2	2.756 year

1.3 Sectoral Scope and Project Type

Sectoral scope ²	03 – Energy Demand
Project activity type	Type II – Energy efficiency improvement project

1.4 Project Proponent

Organization name	Sustainability Investment Promotion and Development Joint Stock Company
Contact person	Ms. Nguyen Thi Hong Hanh
Title	Director
Address	6 th Floor, Hop Long Building, No.1, 59 Lang Ha Street, Ba Dinh District, Hanoi, Viet Nam
Telephone	+84 243 519 0955
Email	info@carbonvietnam.com

1.5 Other Entities Involved in the Project

Not applicable.

1.6 Project Start Date

Project start date	02-May-2022
Justification	As per section 3.8 of the VCS Standard (v4.7), The project start date of a non-AFOLU project is the date on which the project began generating GHG emission reductions or removals. The project activity is a non-AFOLU project and first improved cookstove under the project has been operating from 02-May-2022. Thus, the project start date is as 02-May-2022.

1.7 Project Crediting Period

Crediting period	☐ Seven years, twice renewable ☒ Ten years, fixed ☐ Other (state the selected crediting period and justify how it conforms with the VCS Program requirements)
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² Projects, activities, or methodologies may be developed under any of the 16 VCS sectoral scopes: <https://verra.org/programs/verified-carbon-standard/vcs-program-details/#sectoral-scopes>

Start and end date of first or fixed crediting period

02-May-2022 to 01-May-2032

1.8 Project Location

The grouped project is hosted by Cambodia. The grouped project covers Cambodia bounded between: Latitudes: from 10.41 N to 14.80 N; Longitudes: from 102.29 E to 107.83 E.

The detail of coordination of Cambodia was be provided separately in KML file.

The first project activity instance was distributed in Takeo Province of Cambodia with the following geographic coordinates: latitude 10.9321 N; 104.7987 E

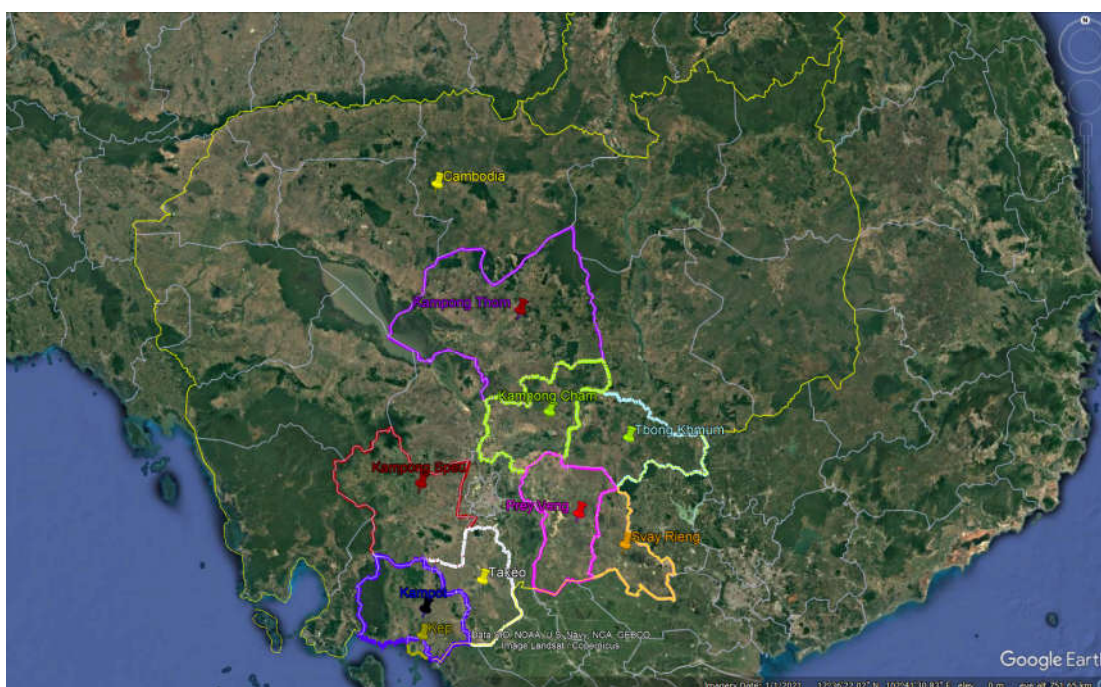


Figure 1: Map of Cambodia and 9 provinces distributed

Cambodia is divided into 25 provinces. To facilitate the management, implementation, monitoring and sampling stages of the project, the project proponent divides the project boundary into 4 zones.

No.	Zones	Provinces
1	North-Western	Banteay Meanchey, Oddar Meanchey, Preah Vihear, Siem Reap
2	Eastern	Kratie, Mondulkiri, Ratanakiri, Stung Treng
3	Mekong Lowlands	Kampong Cham, Kampong Chhnang, Kampong Thom, Kandal, Prey Veng, Svay Rieng, Phnom Penh, Takeo and. Tboung Khmum

4	Cardomom and Elephant Mountains	Battambang, Koh Kong, Pursat, Kampong Speu, Kampot, Kep, Pailin and Preah Sihanouk
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49 project activity instances (PA) during this monitoring were implemented at 9 provinces within Cambodia with the longitude and latitude coordinates the below:

PAI	Province	Coordinate
PA 001, PA 002, PA 003, PA 005, PA 006, PA 043, PA 044	Takeo	104.7987 E, 10.9321 N https://www.google.com/maps/place/Tak%C3%A9o,+Campuchia/@10.9366166,104.4246985,10z-data=!3m1!4b1!4m6!3m5!1s0x31097ea70af3c445:0x73e3a94e2827c36a!8m2!3d10.9321519!4d104.798771!16zL20vMDJoMmRs?hl=vi-VN
PA 004	Kep	104.3559 E, 10.5360 N https://www.google.com/maps/place/Kep,+Campuchia/@10.49245,104.1812881,11z-data=!3m1!4b1!4m6!3m5!1s0x310836851a8b389f:0x1d6a42c22bd268ae!8m2!3d10.536089!4d104.3559158!16s%2Fm%2F0crfr1v?hl=vi-VN
PA 007, PA 008, PA 009, PA 010, PA 011	Svay Rieng	105.7993 E, 11.0878 N https://www.google.com/maps/place/Svay+Rieng,+Campuchia/@11.194139,105.2338395,9z-data=!3m1!4b1!4m6!3m5!1s0x310b07eb6e6a2b43:0xea23edfab65bf0c8!8m2!3d11.142722!4d105.8290298!16zL20vMDJoMmQ1?hl=vi-VN
PA 012, PA 013, PA 014, PA 015, PA 016, PA 017, PA 018	Prey Veng	105.3280 E, 11.4851 N https://www.google.com/maps/place/Prey+Veng,+Campuchia/@11.3648215,105.456473,10z-data=!3m1!4b1!4m6!3m5!1s0x310b936cb013b065:0x3a05a414cdd1429b!8m2!3d11.3802442!4d105.5005483!16zL20vMDJoMmM5?hl=vi-VN
PA 019, PA 020, PA 021, PA 022, PA 023, PA 024	Tbong Khmum	105.6415 E, 11.9057 N https://www.google.com/maps/place/Tbong+Khmum,+Campuchia/@11.9496628,104.6205843,8z/data=!3m1!4b1!4m6!3m5!1s0x310c728a36aeb3ad:0x22401b5bf292b69f!8m2!3d11.8891023!4d105.876004!16s%2Fm%2F0_1n0kq?hl=vi-VN&entry=ttu
PA 025, PA 026, PA 027, PA 028, PA 029	Kampong Speu	104.52085 E, 11.45332 N https://www.google.com/maps/place/Kampong+Speu,+Campuchia/@11.5744359,102.9630898,8z-data=!3m1!4b1!4m6!3m5!1s0x310928256ebe44a9:0x468315122092d785!8m2!3d11.6155109!4d104.3791912!16zL20vMDJoMjQ1?hl=vi-VN

PA 030, PA 031, PA 032, PA 033, PA 034, PA 035	Kampong Thom	104.8887 E, 12.71111 N https://www.google.com/maps/place/Kampong+Thom,+Campuchia/@12.8185296,103.6459975,8z/data=!3m1!4m6!3m5!1s0x310de21fe3d2c3ab:0x64bcff54ced9347c!8m2!3d12.8221829!4d105.1258955!16zL20vMDJoMjRt?hl=vi-VN&entry=ttu
PA 036, PA 037, PA 038, PA 039, PA 040, PA 041, PA 042	Kampong Cham	105.4635 E, 11.9934 N https://www.google.com/maps/place/Kampong+Cham,+Campuchia/@11.9891361,105.3547631,12z/data=!3m1!4m6!3m5!1s0x310c6a648a9f6931:0x3f4e5cee1b275bb4!8m2!3d11.9924294!4d105.4645408!16zL20vMGJnbW1k?hl=vi-VN&entry=ttu
PA 045, PA 046, PA 047, PA 048, PA 049	Kampot	104.1640 E, 10.5942 N https://www.google.com/maps/place/Kampot,+Campuchia/@10.590923,104.085756,12z/data=!3m1!4m6!3m5!1s0x310836897d5fd26f:0x6f50ed443bd607ff!8m2!3d10.5942421!4d104.1640355!16zL20vMGMzb nRi?hl=vi-VN

1.9 Title and Reference of Methodology

Type (methodology, tool or module).	Reference ID, if applicable	Title	Version
Methodology	VM 0050	Energy efficiency and fuel-switch measures in cookstoves	1.0
Methodology	Tool 33	Default value for common parameters	02.0

1.10 Double Counting and Participation under Other GHG Programs

1.10.1 No Double Issuance

Is the project receiving or seeking credit for reductions and removals from a project activity under another GHG program?

☐ Yes ☒ No

1.10.2 Registration in Other GHG Programs

Was the project registered or seeking registration under any other GHG programs?

☐ Yes ☒ No

1.11 Double Claiming, Other Forms of Credit, and Scope 3 Emissions

1.11.1 No Double Claiming with Emissions Trading Programs or Binding Emission Limits

Are project reductions and removals or project activities also included in an emissions trading program or binding emission limit? See the *VCS Program Definitions* for definitions of emissions trading program and binding emission limit.

☐ Yes ☒ No

1.11.2 No Double Claiming with Other Forms of Environmental Credit

Has the project activity sought, received, or is planning to receive credit from another GHG-related environmental credit system? See the *VCS Program Definitions* for definition of GHG-related environmental credit system.

☐ Yes ☒ No

1.11.3 Supply Chain (Scope 3) Emissions

Do the project activities affect the emissions footprint of any product(s) (goods or services) that are part of a supply chain?

☒ Yes ☐ No

If yes:

Is the project proponent(s) or authorized representative a buyer or seller of the product(s) (goods or services) that are part of a supply chain?

☒ Yes ☐ No

If yes:

Has the project proponent(s) or authorized representative posted a public statement on their website saying, "Carbon credits may be issued through Verified Carbon Standard project Verra 2925 for the greenhouse gas emission reductions or removals associated with Ecozen cookstove, manufactured by Viet Charcoal Production Company Limited in Di Su commune, My Hao District, Hung Yen province, Viet Nam, distributed by Sustainability Investment Promotion and Development Joint Stock Company (SIPCO) whose emissions footprint is changed by the project activities."

☒ Yes ☐ No

See evidence in Appendix 2 in the document.

1.12 Sustainable Development Contributions

The project activity helps in achieving following co-benefits, which contribute in sustainable development in host country.

A) Environment well-being:

- The project activity contributes to the reduction in GHG emission due to reduction in use of non-renewable biomass and it can ensure natural recovery of forests and-or reforestation.
- The project activity leads to reduction in indoor air pollutants from wood smoke and avoid smoke related health disorders.
- The reduction in non-renewable biomass consumption for cooking and boiling water through efficient use leads to improved ecological balance.
- The project activity supports fire prevention in the household kitchen.

B) Socio and Economic Benefits:

- Implementation of the project activity results in employment opportunities for people involved with installation, maintenance and distribution of these household biomass based cookers.
- The project activity improves the status of living of people in households cooking since the community level implementation of units of these kinds can be carried out at considerably lower costs. There is less dependence on firewood and its expenses and time associated with firewood buying and collection.
- Business development component of the project activity has resulted in the enhancement of capacity development and technical knowhow for moderately educated people in the community through workshops, seminars and training programs.
- The project alleviates the work burden of women and children as they have to spend less time to collect firewood for cooking.
- Community health issues such as chronic lung diseases, acute respiratory infections, cataracts, blindness, and adverse effects on pregnancy are decreased due to improvement of indoor air quality.

C) Technological benefit

The introduction of locally manufactured technology with improved energy efficiency helps in technological self-reliance in the area.

Table 1: Sustainable Development Contributions

Row number	SDG target	SDG indicator	Net impact on SDG indicator	Current project contributions	Contributions over project lifetime
1)	1.4	Project specific indicator: Number of households received ICSs as an access to clean fuel and technology	Increase	During this monitoring period, the operation rate of project device is only 0.8948 so a total of 420,551 households ³ had an access to clean fuel and technology.	The project activity provides 470,000 energy efficient improved cookstove (ICS) for households who use the traditional cookstove for cooking meals. This contribute to providing access to basic services (clean cooking technology considered as basic service under access to modern energy) to 470,000 the poor and vulnerable households of Cambodia.
2)	3.9	Project specific indicator: Number of beneficiary who report they cooked with less smoke	Increase	Through a representative sample survey, the results showed that The operation rate of project device in the this monitoring is only 0.8948, hence 420,551 beneficiaries reported cooking with less smoke ³ .	The grouped project declines to reduction air population thereby in improved health conditions of 470,000 households, especially women and children. Hence contribute to improved health and well-being brought by reduced smoke generated during cooking.

³ During the period monitoring, PP conducted a physical survey for the representative sample which calculated the EB 86, "Guidelines for Sampling and Surveys for CDM Project Activities and Programme of Activities", version 04.0. Among 54 representative samples, one sample was reported to stop using the project cookstove. The remaining samples is using the project cookstoves and all conditions of use are still good. Further information is available in section 4.2 of this document.

3)	4.3	Project specific indicator: Number of people receiving formal and/or non-formal education and training	Increase	No change during this monitoring	Locals gain employment possibilities from the conception and execution of the group projects, and the project proponent provides training that enables them to acquire necessary skills and contribute to sustainable development. The grouped project through its targeted women project leads to train about 40 individuals in its area of project implementation.
4)	5.4	Project specific indicator: Number of end-users reporting reduction in their time spent on unpaid domestic and care work, by sex, age, and location.	Increase	Through a representative sample survey, the results showed that the operation rate of project device in the this monitoring is only 0.8948, hence 420,551 end-users reported saving time spent for collecting fire wood and cooking meals ³ .	By using project ICS helps time savings from cutting, gathering and carrying firewood from far trees to 470,000 households throughout the project lifetime, the initiative lessens the drudgery experienced by women and children. If these responsibilities are carried out without assistance, they constitute a significant contributor to gender inequity.

5)	7.1	Project specific indicator: Increase of population with primary reliance on clean fuels and technology in the project area	Increase	The operation rate of project device in the this monitoring is only 0.8948, hence, increase access to clean cooking technology with ICS installations for 420,551 households with 1,934,534 populations ⁴ under the project activity	The 470,000 ICSs are energy efficiency cooking technology distributed to 470,000 households with 2,162,000 population ⁴ using the traditional cookstove for cooking daily. The grouped project will increase of citizen with primary reliance on clean fuels and technology in project area.
6)	8.3	Project specific indicator: Number of employment by sector and sex	Increase	The project generated 09 employments for distribution of ICSs and post-installation operation & Maintenance of ICSs, spot checks and periodic surveys.	The project activity created 30 employment opportunities for distribution and maintenance and monitoring survey.
7)	13.0	Tonnes of greenhouse gas emissions avoided or removed	Increase	Contribute to GHG emission reduction of 318,693 tCO _{2e} into the atmosphere in this third monitoring period.	The grouped project activity has reduced 963,805 tCO ₂ during the period from 02-May-2022 to 31-January-2025.
8)	15.2	Project specific indicator Amount of non-renewable biomass saved	Increase	During this monitoring period, the project activity saved 161,527 tonnes of non-renewable biomass ⁵	The grouped project contributes an estimated reduction in the removal of about 523,073 tonnes of non-renewable biomass from forests surrounding the communities during the period from 02-May-2022 to 31-January-2025.

⁴ As per the baseline survey of PP, the population size is estimated at 4.6 people/household

⁵ The quantity of wood saved is calculated by multiplying the number of cookstove used, by the fNRB and the quantity of woody biomass saved per cookstove during the calendar year. Calculation details in ER calculation spreadsheet.

1.13 Commercially Sensitive Information

Not applicable. The grouped projects do not have any commercially sensitive information.

2 SAFEGUARDS AND STAKEHOLDER ENGAGEMENT

2.1 Stakeholder Engagement and Consultation

2.1.1 Stakeholder Identification

Below stakeholders were identified since validation, there are no changes at this verification time.

Stakeholder Identification	The process of identifying stakeholders involves categorizing individuals or groups who are expected to have a direct or indirect impact on the project or those who have an interest in it. SIPCO identifies the relevant stakeholders via 3 steps who are associated throughout the grouped project lifetime. The steps are illustrated like as: Step 1: The first step is to determine the expected and unexpected outcomes of the grouped project's activities. Then the results are established, the potential stakeholders affected by these impacts are identified. Step 2: Stakeholder group identification is carried out at each step of project implementation, using a holistic approach to the project's total benefits and co-benefits. The assessment for stakeholder identification at the different stages is as follows: • Project ideation: Stakeholders could include academic institutions, self-help organizations, and local officials who can assist the project promoter in gaining traction in the community. • Project development: government authorities, NGOs, community development, investors would be stakeholders at this stage.
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	• Project implementation: end-user, distribution partners, ICS manufactures, would be the stakeholders during implementation stage. Distribution partner of the grouped project is Cambodian Women for Peace and Development (CWPD) which has signed contract with SIPCO for distributing ICS to households. CWPD have system from central to village, they can know exactly these households who are using the traditional cookstove and they can select the correct end-users. • Project validation and verification: surveyors, distribution partners, end-users... could be some of the main stakeholders during this stage. Almost of project stakeholders affected by the project activity identified in the step 2. Step 3: Make the stakeholder category and determine direct/indirect effects based on each stakeholders identified in step 2 as the final step of the identification process. The final list of stakeholder includes ICS end-users, distribution partner (CWPD), government authorities, local NGOs and ICS manufactures. The full list of stakeholders has been provided to VVB as supporting document.
Legal or customary tenure/access rights	Not applicable. The grouped project only involves distribution ICS to household and it does not involve territories and resources.
Stakeholder diversity and changes over time	Most of stakeholders are identified at period of project activity, from starting, development, implementation and monitoring. There is insignificant change in stakeholders' diversity and therefore have no real impact on their opinion during this monitoring period. 1. ICS end-users: No change was observed in structure & functionality. 2. CWPD: No change in structure and functionality or any organization values.

	3. Government authorities: No change was observed in structure & functionality. 4. Local NGOs: No change was observed in structure & functionality. 5. Manufacturer: More jobs for their employee in manufacturing, transportation and maintenance ICSs
Expected changes in well-being	- Reduce deforestation and forest degradation in Cambodia through involvement of stakeholders in discontinuing the use of firewood for cooking meals - Community health issues such as chronic lung diseases, acute respiratory infections, cataracts, blindness, and adverse effects on pregnancy will be decreased due to improvement of indoor air quality. - Reduce in indoor air pollutants from wood smoke and avoid smoke related health disorders The project activity will support fire prevention in the household kitchen
Location of stakeholders	Except for the ICS manufacture in Viet Nam, the remaining stakeholders are in Cambodia
Location of resources	Cambodia

2.1.2 Stakeholder Consultation and Ongoing Communication

Ongoing consultation	The PP is maintaining ongoing communication with stakeholders through different measures: 1) The stakeholders are informed about the grievance register which is maintained at the local office locations of the PP. CWPDS at hamlet and commune level also serve as medium to escalate grievances received from the project beneficiaries in their respective zones to PP. Further, SIPCO contact number in Cambodia are listed in section 2.1.4 is always maintained to ensure receiving calls from stakeholders at any time. 2) Every month, CWPDS at hamlet and commune level periodically conducts random inspections of households receiving stoves to check their usage status. CWPDS selects households ensures that every quarter all households in the
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	village that have been provided project devices are visited. Further, a meeting between CWPDP and end users will also be held at the village level every six months to listen to feedback from end users and carry out stove usage promotion activities, promoting the benefits of stove usage for users and the environment. 3) During the monitoring survey, project has taken the chance to update information to different stakeholders, and collected comments through interviews, surveys, direct observations, group discussions. The PP also conducts and reports the monitoring result from the random sampling of to all stakeholders on annually basis. Sampling is conducted using stratified random sampling techniques, and detailed calculations are provided within the monitoring plan as per CDM guidelines “Sampling and surveys for CDM project activities and programmes of activities”. Staff of SIPCO communicates & collects end-users’ comments through visits to household at least 1 time per year. 4) Through monitoring survey trip, the field team managers also actively organize and conducts group discussions with different stakeholders. The data from these interactions is compiled into annual reports and updated to the CWPDP & local governmental authority. Through the ongoing communication process, all the implementation information, such as the results of monitoring, the risks, costs and benefits the project and the plan of site visit from verification body has been updated timely to the stakeholders. In addition, the PP also updates workers on relevant law and applicable regulation (if any) and conduct additional educational services as requested by the beneficiary. In case an any grievance or feedback, end-user can contact to PP via phone/email, or CWPDP through the contract information provided in section 2.1.4 of this document. For the grievance redressal process, please refer to section 2.1.4 for more detailed.
Date(s) of stakeholder consultation	On 10-April-2023 SIPCO sent CWPDP the report for the first period covering 02-May-2022 through 31-March-2023

	On 28-January-2024, SIPCO sent CWPD the report for the second monitoring period covering 01-April-2023 through 31-December-2023 On 19-July-2024, SIPCO sent CWPD the report for the third monitoring period covering 01-January-2024 through 30-June-2024 On 26-February-2025, SIPCO sent CWPD the report for this monitoring period covering 01-July-2024 to 31-January-2025
Communication of monitored results	The monitored results have been shared with Woman Union & relevant stakeholders through annual reports include: 1. The list of households has been selected for survey 2. The summarize of the result of SIPCO's representative sample conduct survey.
Consultation records	All formal consultations are logged in the consultation forms. Forms are saved for record of correspondence
Stakeholder input	During this ongoing communication, all households participating in the survey were satisfied with the project's device and their lives have greatly improved since receiving ICSs. There are no negative comments about the grouped projects and its devices.

2.1.3 Free, Prior, and Informed Consent

Consent	It is entirely up to individual homes in the participating villages to decide whether or not they choose to take part in the adoption of ICS; this is a purely optional activity.
Outcome of FPIC	Until the fourth monitoring period, SIPCO distributed free of cost 470,000 ICSs to households under 49 instances which were included to the grouped project in the second monitoring period. Before the installation takes place, free, prior, and informed permission is obtained from households involved. Through the communication channels of CWPD at the village and commune levels, households who are using traditional

stoves for daily cooking register their demand to receive free cookstove from the project. This process is conducted voluntarily, with no force from CWPD/SIPCO towards the people. After CWPD and SIPCO check whether the households meet the project criteria, a list of end-users is compiled. Before receiving the product, the end-users are clearly informed about the beneficiary agreement and given the option to agree to the terms in the beneficiary agreement and accept the cookstove for free. This decision is entirely voluntary, with no force involved. If they agree, the end-users will provide their household information on the agreement, sign it, and receive the project cookstove for use. The grouped project activity involves distribution of ICSs to households and it does not involve any land, relocated people, and physical or economic displacement.

2.1.4 Grievance Redress Procedure

Grievances received	Resolution and outcome																		
In this monitoring period, the grouped project has not received any grievances.	The grievance register is being maintained by the project's distribution partner (CWPD) for submission of input/grievance (if any) related to the project activity. The queries by stakeholders are noted and documented in the grievance register. Also, the contact details of the project proponent and local representative/partner of the project proponent are also provided to the stakeholder's for sharing suggestions/queries either through telegram (the communication application is commonly used in Cambodia)/call/message/email. The information of SIPCO, CWPD at center level and local representative of CWPD where can come and register the feedback as following:																		
	<table> <tr> <th data-bbox="597 1409 678 1556">No</th><th data-bbox="678 1409 922 1556">Address</th><th data-bbox="922 1409 1109 1556">Phone number for call/message and telegram</th><th data-bbox="1109 1409 1279 1556">Contact person</th><th data-bbox="1279 1409 1437 1556">Email</th></tr> <tr> <td data-bbox="597 1556 678 1822">1</td><td data-bbox="678 1556 922 1822">SIPCO's office: 6th Floor, Hop Long Building, No.1, 59 Lang Ha Street, Ba Dinh District, Hanoi, Viet Nam</td><td data-bbox="922 1556 1109 1822">+84243 5190955</td><td data-bbox="1109 1556 1279 1822">Mr. Pham Ngoc Nhan</td><td data-bbox="1279 1556 1437 1822">info@carb.onvietnam.com</td></tr> <tr> <td data-bbox="597 1822 678 1896">2</td><td data-bbox="678 1822 922 1896">CWPD's office: # 128D9-D10, St.</td><td data-bbox="922 1822 1109 1896">+85523 222453</td><td data-bbox="1109 1822 1279 1896">Ms. Meach So Theary</td><td data-bbox="1279 1822 1437 1896">info@cwpsd.net</td></tr> </table>				No	Address	Phone number for call/message and telegram	Contact person	Email	1	SIPCO's office: 6 th Floor, Hop Long Building, No.1, 59 Lang Ha Street, Ba Dinh District, Hanoi, Viet Nam	+84243 5190955	Mr. Pham Ngoc Nhan	info@carb.onvietnam.com	2	CWPD's office: # 128D9-D10, St.	+85523 222453	Ms. Meach So Theary	info@cwpsd.net
No	Address	Phone number for call/message and telegram	Contact person	Email															
1	SIPCO's office: 6 th Floor, Hop Long Building, No.1, 59 Lang Ha Street, Ba Dinh District, Hanoi, Viet Nam	+84243 5190955	Mr. Pham Ngoc Nhan	info@carb.onvietnam.com															
2	CWPD's office: # 128D9-D10, St.	+85523 222453	Ms. Meach So Theary	info@cwpsd.net															

	Samdech Sothearos, Sangkat Tonle Bassac, Khan Chamcarmon, Phnom Penh, Cambodia			
3	CWPD at Takeo province: XQRM+7FG, Krong Doun Kaev, Campuchia	+85953999 95	Ms. Kea Sophou	
4	CWPD at Kep province: F8VC+2X, Krong Kaeb, Campuchia	+85927065 65	Ms. UI Phirun	
5	CWPD at Kampot province: J53J+38X, Krong Kampot, Campuchia	+851275202 1	Ms. Yu Sokun	
6	CWPD at Kampong Speu province: Kampong Spue Prinvince Hall, Krong Chbar Mon, Campuchia	+85923578 63	Ms. Long Bo Nareth	
7	CWPD at Kampong Cham province: XFW5+6VC, Krong Kampong Cham, Campuchia	+85892499 99	Ms. Pang Dany	
8	CWPD at Kampong Thom province: PV6J+XVR, Krong Stueng Saen, Campuchia	+851255531 3	Ms. Lom Sotheavy	
9	CWPD at Tbong Khmum province: VQXM+259,	+859774010 79	Ms. Chan Thida	

	Kandaol Chrum, Campuchia			
10	CWPD at Svay Rieng province: 3RJ3+RX9, Krong Svay Rieng, Campuchia	+85977411886	Ms. Pov Sopheap	
11	CWPD at Prey Veng province: F8MC+2JQ, National Road N° 11, Krong Prey Veng, Campuchia	+8589599971	Ms. Long Kunthea	

If any grievance is received, then the field staff is responsible to address the grievance within 15 days of record. If there is a major grievance which is recorded, then the technical team is responsible to handle the grievance and report to the management.

Project proponent has established a grievance mechanism in the project area which has been explained to the stakeholders during stakeholder meetings and the project implementation progress. The stakeholders affected by the project can express any complaint. Any grievances could send to SIPCO email address. Also stakeholders can voice their grievances to any officers who will then escalate using the correct process. For online form, stakeholders can complete a grievance form located on SIPCO website: www.carbonvietnam.com.

The grievance mechanism process could be illustrated as below:



- Receive Grievance

The grievance could be received by all means, such as in person/over the phone, via email/website,

- Record

All formal grievances will be logged in the External Grievance Register and Grievance Lodgment Forms will be saved for record of correspondence.

- Screen

The stakeholder contact officer is responsible for assigning a grievance owner to liaise with the external stakeholders and work on a resolution. Grievances will be screened depending the level of severity in order to determine who the grievance owner will be and how the grievance is approached.

- Acknowledge

A grievance will be acknowledged, the grievance owner, within two working days of a grievance being submitted. Communication will be made either verbally or in written form.

The acknowledgement of a grievance should include a summary of the grievance, method that will be taken to resolve the grievance and an estimated timeframe in which the grievance will be resolved. If required, the acknowledgement provides an opportunity to ask for any additional information or to clarify any issues.

- Investigate

The grievance owner is responsible for investigating the grievance. The investigation may require the grievance owner to make site visits, consult employees, contact external stakeholders and complete other activities. Records of meetings, discussions and activities all need to be recorded during the investigation. Information gathered during the investigation will be analysed and will assist in determining how the grievance is handled and what steps need to be taken in order to resolve the grievance.

- Act

Following the investigation, the grievance owner will use the findings to create an action plan outlining steps to be taken in order to resolve the grievance. The grievance owner is responsible for assigning actions, monitoring actions undertaken and making sure deadlines are adhered to. Once all actions have been completed and the grievance owner feels the grievance has been resolved, they will then formally advise the external stakeholder via their preferred method of contact.

- Follow up and close out

The grievance owner will make contact with the external stakeholder/s three weeks after the grievance is resolved. When contacting the external stakeholder, the grievance owner will verify that the outcome was satisfied and also gather any feedback on the grievance process.

Minutes of the meeting will be recorded and saved.

If required, the grievance owner may need to follow up with the external stakeholder on numerous occasions to confirm all parties are satisfied.

All formal grievances are recorded in summary with the PP to identify if the complaint is a project wide issue that necessitates a system change in the implementation.

2.1.5 Public Comments

Summary of comments received	Actions taken
During the public comment period, the grouped project did not receive any comments.	Not Applicable.

2.2 Risks to Stakeholders and the Environment

2.2.1 Management Experience

SIPCO has many years of experiences in implementing similar project activities and engaging communities. We have policies in place to inform management and employees about the avoidance of corruption, code of conduct, and business ethics. These policies are applied by all project staff, including company management to ensure that the organization is run in accordance with all legal requirements and is held to the highest standards of operation.

2.2.2 Risk assessment

	Risk identified	Mitigation or preventative measure(s) taken
Natural and human-induced risks to stakeholders' wellbeing	No risk identified	The project activity involves distribution of ICS to individual household. There is no trade-off or any negative impact to their livelihood, land, food, etc. Therefore, no any risk identified to stakeholder participation.
Risks to stakeholder participation	No risk identified	The grouped project activities distribute ICS to household. They can decide to receive ICS or not. If they want, they can register to CWPDP. After CWPDP and SIPCO check that the households meet the criteria to participate in the project, before receiving ICS, household voluntarily signs the beneficiary agreement with SIPCO. There is no trade-off or any negative impact to their livelihood, land, food, etc... Hence no risk for stakeholders to participate in this project.
Working conditions	No risk identified	The grouped project activities create jobs for local people, ICS manufacture, distribution unit. All of working condition such as working hours, working environment, physical pressure, rest hour, minimum wage, etc... as per Cambodian

		Labor and Employment Law. Hence, no risk about working conditions for stakeholders to participate in this project.
Safety of women and girls	No risk identified	Until this monitoring, PP distributed 470,000 ICSs to 470,000 households. This helps them access to sustainable and modern energy. The proposed project aims to reduction in indoor air pollutants from wood smoke and avoid smoke related health disorders for households in Kingdom of Cambodia. Moreover, the project activity supports fire prevention in the household kitchen. From there, reduce polluted indoor air due to cook meal. So project's cookstove is safe when using. Hence, no any risk identified relate to safety of women and girls.
Safety of minority and marginalized groups, including children	No risk identified	Until this monitoring, PP distributed 470,000 ICSs to 470,000 households. This helps them access to sustainable and modern energy. The proposed project aims to reduction in indoor air pollutants from wood smoke and avoid smoke related health disorders for households in Kingdom of Cambodia. Moreover, the project activity supports fire prevention in the household kitchen. From there, reduce polluted indoor air due to cook meal. So project's cookstove is safe when using. Hence, no any risk identified relate to safety or minority and marginalized groups, including children.
Pollutants (air, noise, discharges to water, generation of waste, and release of hazardous materials and chemical pesticides and fertilizers)	No risk identified.	The grouped project aims at reducing the woodfuel consumption of traditional cookstove, this can contribute to improving public health problems. This also contributes to improvement in quality of lives of the people from Cambodia through reduction of drudgery, time and money spent on fuel wood collection and through improvement of indoor air pollution. Globally, the project contributes by reducing emission of GHG into the atmosphere. Hence the grouped project brings positive benefits to the citizens and environments. The project activity is not adding any pollutant into the environment.

2.3 Respect for Human Rights and Equity

2.3.1 Labor and Work

Risks identified ⁶		Mitigation or preventative measure(s) taken
Discrimination	No risk identified.	SIPCO distributes ICSs to households who are using woodfuel to cook without distinction in genders, races, religions, educational backgrounds or any other aspects. SIPCO also dedicate to the elimination of discrimination. The same is also governed by government policies and any such discrimination has considered a punishable offence in the host country. Cambodia is also party to the “Convention on the Elimination of All Forms of Discrimination against Women” and the project has aligned its labour policies accordingly.
Sexual harassment	No risk identified.	
Gender equity in labor and work	No risk identified.	SIPCO is committed to ensuring that all stakeholders, regardless of their genders, colours, faiths, educational backgrounds, or any other factors, will be given an equal chance to fill all job positions. This commitment is fulfilled by providing equal access to employment opportunities. Before any full-time or part-time employees for the project are hired, the project proponent advertises applicable employment opportunities by contacting village heads and posting announcements on local notice boards seeking potential candidates for the positions. Also, the initiative encourages women, people with disabilities, and members of underrepresented groups to apply for the positions.
Forced labor	No risk identified.	SIPCO does not tolerate child labor or forced, involuntary or trafficked labor in any form. To ensure this, workers have to give a job application to SIPCO. When recruiting, SIPCO checks ID card each worker to ensure that they are of working age. Besides that, workers also submit curriculum vitae verified by local authority.
Child labor	No risk identified.	
Human trafficking	No risk identified.	

⁶ The identified risks and commensurate mitigation or preventative measure(s) for forced labor, child labor, and human trafficking, must be inclusive of staff and contracted workers employed by third parties.

2.3.2 Human Rights

Risks identified	Mitigation or preventative measure(s) taken
No risk identified	Each of our workers has a contract that states their rights and obligations. The contract details comply with Cambodia labor laws. Specific information is provided on anti-terrorism and anti-corruption efforts, including a code of conduct. Per the Core Labor Conventions of the International Labour Organization (ILO), SIPCO respects, and works in tandem with the elimination of all forms of forced or compulsory labour, the effective abolition of child labour, minimum age convention, the right to organize, and the elimination of discrimination in respect of paid positions and occupation.

2.3.3 Indigenous Peoples and Cultural Heritage

Risks identified	Mitigation(s) or preventative measure taken
No risk identified	The grouped project activities involve installing ICS and it does not involve any indigenous peoples and cultural heritage.

2.3.4 Property Rights

Risks identified	Mitigation or preventative measure(s) taken
No risk identified	The grouped project activity involves distribution of ICSs to households and only install at the informed invitation of the households and these ICSs do not infringe or interact with property rights.

2.3.5 Benefit Sharing

Summary of the benefit sharing plan	The ownership rights of the carbon assets generated from this project will be with the project proponent, SIPCO. SIPCO has signed a detailed end-user beneficiary agreement mentioning all the criteria with all beneficiaries before commissioning the project devices. The agreement also explicitly states that the carbon rights are with SIPCO, and the same was explained to the beneficiaries before the installation of the project cookstoves.
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Benefit sharing during the monitoring period	No benefit sharing through carbon revenue is planned for end-users so this section not applicable.
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2.4 Ecosystem Health

	Risk identified	Mitigation or preventative measure(s) taken during the monitoring period
Impacts on biodiversity and ecosystems	No risk identified	The implementation of the grouped project does not impose any severe impacts on the ecological system in the surrounding areas. The project activities help in reducing the consumption of fuel wood by efficient fuel combustion thereby reducing deforestation and reducing indoor air pollution. The use of ICS technology helps to reduce adverse environmental and social impacts associated with the use of non-renewable biomass. The reduced consumption of the stated baseline fuel has sustainable benefit for all household's traditional cook stoves users included in the project activity. The implementation of the project reduce workloads involved in fuel collection, and by reducing indoor air pollution, reduce the risk of respiratory diseases, especially for women and children. ICSs also contribute to environment protection by reducing biomass consumption and hence greenhouse gas emissions, mainly CO ₂ , when the combusted biomass originates from non-renewable stocks. Therefore, it has no impact to ecosystem health, so this section is not applicable.
Soil degradation and soil erosion	No risk identified	
Water consumption and stress	No risk identified	

2.4.1 Rare, Threatened, and Endangered species

Species or habitat	Not Applicable. The grouped project activity involves distributions of improved cookstoves to households in only and it does not involve rare, threatened and endangered species. This was identified during validation period.
Areas needed for habitat connectivity	

Risks identified		Mitigation or preventative measure(s) taken
Habitats for rare, threatened, and endangered species	No risk identified	The grouped project activity involves distributions of improved cookstoves to households only and it does not involve rare, threatened and endangered species.
Areas for habitat connectivity	No risk identified	

2.4.2 Introduction of species

Species introduced	Classification	Justification for use	Adverse effects and mitigation
Not applicable			

Existing invasive species	Mitigation measures to prevent the spread or continued existence of invasive species
Not applicable	

Risks identified		Mitigation or preventative measure(s) taken
Invasive species	No risk identified	The grouped project activity involves distributions of improved cookstoves to households only and it does not involve introduction of species.

2.4.3 Ecosystem conversion

Risks identified		Mitigation or preventative measure(s) taken
Ecosystem conversion	No risk identified	Not applicable. The grouped project activities only distribute improved cookstove to households and do not involve any ecosystem conversion.

3 IMPLEMENTATION STATUS

3.1 Implementation Status of the Project Activity

Until the end of this fourth monitoring period, a total of 470,000 ICSs was reported installed with 49 project activity instances under the grouped project. Project devices were transported and gathered in district points before distribution about a week before the start distribution date.

Then, SIPCO in conjunction with the partner (Cambodia Women for Peace and Development) organizes one or two-day mass distributions in all communes in the district. Representation of households whose names are on the demand registration list who have been determined to be eligible to participate in the project is invited to the commune center or the distribution points to attend the communication session and receive project cookstoves.

PA 001 was included in the project registration period on 05-July-2023. During the first monitoring period, the 28 instances are PA 002 – PA 017, PA 025 – PA 029. PA 043 – PA 049 were included and approved on 21-December-2023. 20 remaining project activity instances (namely PA 018 to PA 024 and PA 030 to PA 042) were included in the second monitoring period and approved on 05-July-2024. Timeline of project activity instances is illustrated as the table below:

Number instances	PA start date (the first equipment distributed)	Inclusion date	The operational period in this monitoring period	Implementation status as on 31-Jan-2025			Total of ICSs have been distributed as on 31-Jan-2025
				Quantity	Start date of distribution ICS in a month	End date of distribution ICS in a month	
PA 001	02-May-22	05-Jul-23	01-Jul-24 to 31-Jan-25	8,000	2-May-22	3-May-22	8,000
PA 002	04-May-22	21-Dec-23	01-Jul-24 to 31-Jan-25	8,000	4-May-22	5-May-22	8,000
PA 003	07-May-22	21-Dec-23	01-Jul-24 to 31-Jan-25	8,000	7-May-22	8-May-22	8,000
PA 004	07-Jun-22	21-Dec-23	01-Jul-24 to 31-Jan-25	2,272	7-Jun-22	7-Jun-22	6,062
			01-Jul-24 to 31-Jan-25	3,790	1-Jan-24	2-Jan-24	
PA 005	12-May-22	21-Dec-23	01-Jul-24 to 31-Jan-25	8,000	12-May-22	14-May-22	8,000
PA 006	09-Jan-23	21-Dec-23	01-Jul-24 to 31-Jan-25	2,000	9-Jan-23	11-Jan-23	2,000
PA 007	02-Aug-22	21-Dec-23	01-Jul-24 to 31-Jan-25	8,000	2-Aug-22	3-Aug-22	10,077
			01-Jul-24 to 31-Jan-25	2,077	9-Jan-24	9-Jan-24	
PA 008	06-Aug-22	21-Dec-23	01-Jul-24 to 31-Jan-25	8,000	6-Aug-22	7-Aug-22	9,686
			01-Jul-24 to 31-Jan-25	1,686	10-Jan-24	10-Jan-24	
PA 009	04-Sep-22	21-Dec-23	01-Jul-24 to 31-Jan-25	8,000	4-Sep-22	6-Sep-22	9,893
			01-Jul-24 to 31-Jan-25	1,893	11-Mar-24	11-Mar-24	
PA 010	09-Sep-22	21-Dec-23	01-Jul-24 to 31-Jan-25	8,000	9-Sep-22	10-Sep-22	9,921
			01-Jul-24 to 31-Jan-25	1,921	12-Mar-24	12-Mar-24	
PA 011	10-Sep-22	21-Dec-23	01-Jul-24 to 31-Jan-25	71	10-Sep-22	10-Sep-22	11,527
			01-Jul-24 to 31-Jan-25	11,456	13-Mar-24	19-Mar-24	
PA 012	02-Nov-22	21-Dec-23	01-Jul-24 to 31-Jan-25	8,000	2-Nov-22	3-Nov-22	9,998
			01-Jul-24 to 31-Jan-25	1,998	13-Jan-24	13-Jan-24	
PA 013	04-Nov-22	21-Dec-23	01-Jul-24 to 31-Jan-25	8,000	4-Nov-22	5-Nov-22	9,909
			01-Jul-24 to 31-Jan-25	1,909	12-Jan-24	12-Jan-24	
PA 014	07-Nov-22	21-Dec-23	01-Jul-24 to 31-Jan-25	8,000	7-Nov-22	8-Nov-22	8,000
PA 015	08-Nov-22	21-Dec-23	01-Jul-24 to 31-Jan-25	8,000	8-Nov-22	10-Nov-22	8,000
PA 016	05-Jul-22	21-Dec-23	01-Jul-24 to 31-Jan-25	8,000	5-Jul-22	6-Jul-22	14,002
			01-Jul-24 to 31-Jan-25	6,002	12-May24	16-May-24	

PA 017	03-Aug-22	21-Dec-23	01-Jul-24 to 31-Jan-25	8,000	3-Aug-22	3-Apr-23	13,516
			01-Jul-24 to 31-Jan-25	5,516	1-Apr-24	2-Apr-24	
PA 018	03-Apr-23	05-Jul-24	01-Jul-24 to 31-Jan-25	7,181	3-Apr-23	5-Apr-23	9,794
			01-Jul-24 to 31-Jan-25	2,613	3-Apr-24	3-Apr-24	
PA 019	06-Apr-23	05-Jul-24	01-Jul-24 to 31-Jan-25	8,000	6-Apr-23	10-Apr-23	11,476
			01-Jul-24 to 31-Jan-25	3,476	5-Feb-24	7-Feb-24	
PA 020	3-Jul-23	05-Jul-24	01-Jul-24 to 31-Jan-25	8,000	3-Jul-23	7-Jul-23	11,487
			01-Jul-24 to 31-Jan-25	3,487	6-Feb-24	7-Feb-24	
PA 021	10-Jul-23	05-Jul-24	01-Jul-24 to 31-Jan-25	8,000	10-Jul-23	2-Oct-23	10,646
			01-Jul-24 to 31-Jan-25	2,646	3-May-24	3-May-24	
PA 022	2-Oct-23	05-Jul-24	01-Jul-24 to 31-Jan-25	8,000	3-Oct-23	6-Oct-23	11,422
			01-Jul-24 to 31-Jan-25	3,422	6-May-24	8-May-24	
PA 023	3-Oct-23	05-Jul-24	01-Jul-24 to 31-Jan-25	8,000	9-Oct-23	4-Dec-23	10,307
			01-Jul-24 to 31-Jan-25	2,307	7-May-24	7-May-24	
PA 024	9-Oct-23	05-Jul-24	01-Jul-24 to 31-Jan-25	1,149	5-Dec-23	5-Dec-23	1,846
			01-Jul-24 to 31-Jan-25	697	9-May-24	9-May-24	
PA 025	02-Dec-22	21-Dec-23	01-Jul-24 to 31-Jan-25	8,000	2-Dec-22	3-Dec-22	13,783
			01-Jul-24 to 31-Jan-25	5,783	27-Feb-24	28-Feb-24	
PA 026	03-Oct-22	21-Dec-23	01-Jul-24 to 31-Jan-25	8,000	3-Oct-22	4-Oct-22	11,236
			01-Jul-24 to 31-Jan-25	3,236	3-Feb-24	3-Feb-24	
PA 027	06-Oct-22	21-Dec-23	01-Jul-24 to 31-Jan-25	8,000	6-Oct-22	7-Oct-22	8,000
PA 028	05-Jun-22	21-Dec-23	01-Jul-24 to 31-Jan-25	8,000	5-Jun-22	6-Jun-22	8,000
PA 029	06-Jun-22	21-Dec-23	01-Jul-24 to 31-Jan-25	2,222	6-Jun-22	6-Jun-22	9,923
			01-Jul-24 to 31-Jan-25	5,778	1-Mar-23	2-Mar-23	
			01-Jul-24 to 31-Jan-25	1,923	1-May-24	1-May-24	
PA 030	12-Apr-23	05-Jul-24	01-Jul-24 to 31-Jan-25	5,659	3-Mar-23	5-Mar-23	8,796
			01-Jul-24 to 31-Jan-25	3,137	2-May-24	2-May-24	
PA 031	2-May-23	05-Jul-24	01-Jul-24 to 31-Jan-25	8,000	2-May-23	9-May-23	11,885
			01-Jul-24 to 31-Jan-25	3,885	4-Apr-24	5-Apr-24	

PA 032	10-May-23	05-Jul-24	01-Jul-24 to 31-Jan-25	8,000	10-May-23	16-May-23	12,005
			01-Jul-24 to 31-Jan-25	4,005	8-Apr-24	25-Apr-24	
PA 033	1-Aug-23	05-Jul-24	01-Jul-24 to 31-Jan-25	8,000	1-Aug-23	7-Aug-23	9,983
			01-Jul-24 to 31-Jan-25	1,983	10-Apr-24	10-Apr-24	
PA 034	8-Aug-23	05-Jul-24	01-Jul-24 to 31-Jan-25	8,000	8-Aug-23	4-Sep-23	9,852
			01-Jul-24 to 31-Jan-25	1,852	9-May-24	9-May-24	
PA 035	1-Sep-23	05-Jul-24	01-Jul-24 to 31-Jan-25	5,546	5-Sep-23	7-Sep-23	7,958
			01-Jul-24 to 31-Jan-25	2,412	10-May-24	10-May-24	
PA 036	5-Sep-23	05-Jul-24	01-Jul-24 to 31-Jan-25	8,000	1-Jun-23	7-Jun-23	10,410
			01-Jul-24 to 31-Jan-25	2,410	8-Feb-24	8-Feb-24	
PA 037	1-Jun-23	05-Jul-24	01-Jul-24 to 31-Jan-25	8,000	8-Jun-23	13-Jun-23	9,452
			01-Jul-24 to 31-Jan-25	1,452	9-Feb-24	9-Feb-24	
PA 038	8-Jun-23	05-Jul-24	01-Jul-24 to 31-Jan-25	8,000	14-Jun-23	12-Sep-23	10,508
			01-Jul-24 to 31-Jan-25	2,508	12-Feb-24	12-Feb-24	
PA 039	14-Jun-23	05-Jul-24	01-Jul-24 to 31-Jan-25	8,000	13-Sep-23	18-Sep-23	9,888
			01-Jul-24 to 31-Jan-25	1,888	13-Feb-24	13-Feb-24	
PA 040	8-Sep-23	05-Jul-24	01-Jul-24 to 31-Jan-25	8,000	1-Nov-23	7-Nov-23	11,063
			01-Jul-24 to 31-Jan-25	3,063	11-Apr-24	11-Apr-24	
PA 041	13-Sep-23	05-Jul-24	01-Jul-24 to 31-Jan-25	8,000	8-Nov-23	13-Nov-23	11,075
			01-Jul-24 to 31-Jan-25	3,075	12-Apr-24	12-Apr-24	
PA 042	1-Nov-23	05-Jul-24	01-Jul-24 to 31-Jan-25	4,486	5-Dec-23	8-Dec-23	5,890
			01-Jul-24 to 31-Jan-25	1,404	15-Apr-24	15-Apr-24	
PA 043	11-Jan-23	21-Dec-23	01-Jul-24 to 31-Jan-25	8,000	11-Jan-23	8-Mar-23	8,000
PA 044	07-Feb-23	21-Dec-23	01-Jul-24 to 31-Jan-25	8,000	7-Feb-23	8-Feb-23	8,000
PA 045	07-Nov-22	21-Dec-23	01-Jul-24 to 31-Jan-25	8,000	7-Nov-22	27-Nov-22	8,000
PA 046	04-Jun-22	21-Dec-23	01-Jul-24 to 31-Jan-25	8,000	4-Jun-22	7-Jun-22	11,537
			01-Jul-24 to 31-Jan-25	3,537	3-Jan-24	4-Jan-24	
PA 047	05-Dec-22	21-Dec-23	01-Jul-24 to 31-Jan-25	8,000	5-Dec-22	13-Dec-22	12,032
			01-Jul-24 to 31-Jan-25	4,032	5-Jan-24	6-Jan-24	

PA 048	03-Jul-22	21-Dec-23	01-Jul-24 to 31-Jan-25	8,000	3-Jul-22	5-Jul-22	11,248
			01-Jul-24 to 31-Jan-25	3,248	8-Jan-24	8-Jan-24	
PA 049	06-Jul-22	21-Dec-23	01-Jul-24 to 31-Jan-25	1,636	6-Jul-22	6-Jul-22	9,907
			01-Jul-24 to 31-Jan-25	8,271	4-Mar-24	7-Mar-24	
Total							470,000

3.2 Deviations

3.2.1 Methodology Deviations

The project was originally developed under methodology VMR0006 version 1.1 but has now transitioned to methodology VM0050 version 1.0. This change was made to better align with the latest best practices and ensure compliance with the most updated requirements under the Verra framework. The deviation is more conservative than what is set out in the old methodology.

It includes several updates and changes that reflect current best practices of project design and implementation in distributed thermal energy generation. It also incorporates streamlined monitoring approaches such as prescribes robust means for the determination of parameter values (like fNRB), and contains updated default values for various ex-ante parameters (like baseline device efficiency).

No deviations from VM0050 have been made in the application of the methodology. All calculations, baseline assessments, and monitoring approaches strictly adhere to the provisions outlined in VM0050.

3.2.2 Project Description Deviations

The project activity involves the distribution of ICSs to households in Cambodia that traditionally rely on traditional cookstove for cooking meals. The project was originally developed and implemented under the methodology VMR 0006 version 1.1.

During this monitoring period, a deviation from the original project description has been implemented to allow the project to transition from VMR 0006 version 1.1 to VM 0050 version 1.0. The purpose of this deviation is to improve the accuracy and consistency of emission reduction calculations by applying the updated and more robust methodological framework provided by VM0050.

The deviation includes adoption of updated default values, equations and procedures from VM 0050 version 1.0. The deviation does not affect the fundamental design or implementation of the grouped project activity. The improved cookstove distribution remains consistent with the original project goals and scope as described in the registered PD. The deviation has been made in accordance with Verra's rules and guidance for transitioning between methodologies and is justified on the basis of methodological advancement and improved emission reduction accuracy.

This deviation has been reflected in an updated version of the Project Description that has been submitted to Verra for approval. No additional deviations have been implemented during this monitoring period beyond those described in the updated PD.

3.3 Grouped Projects

Not applicable. During this monitoring period, no new project activity instances are included in the grouped projects.

3.4 Baseline Reassessment

Did the project undergo baseline reassessment during the monitoring period?

☐ Yes ☒ No

4 DATA AND PARAMETERS

4.1 Data and Parameters Available at Validation

Data / Parameter	EF _{b,i,CO2}
Data unit	t CO ₂ e/TJ
Description	CO ₂ emission factor for fuel used by baseline device type <i>i</i> in the baseline scenario
Source of data	Option 3: Default value from the most recent version of the IPCC Guidelines for National Greenhouse Gas Inventories
Value applied	112
Justification of choice of data or description of measurement methods and procedures applied	The value is determined ex ante by using of default values from the most recent version of the <i>IPCC Guidelines for National Greenhouse Gas Inventories for wood</i>
Purpose of Data	Calculation of baseline emissions
Comments	N/A

Data / Parameter	EF _{b,i,nonCO2}
Data unit	t CO ₂ e/TJ
Description	Non-CO ₂ emission factor for fuel used by baseline device type <i>i</i> in the baseline scenario
Source of data	Option 3: Default value from the most recent version of the IPCC Guidelines for National Greenhouse Gas Inventories
Value applied	9.46

Justification of choice of data or description of measurement methods and procedures applied	The value is determined ex ante by using of default values from the most recent version of the <i>IPCC Guidelines for National Greenhouse Gas Inventories</i> for wood
Purpose of Data	Calculation of baseline emissions
Comments	N/A

Data / Parameter	NCV _{b,i}
Data unit	TJ/tonne
Description	Net calorific value of baseline fuel used by baseline device type <i>i</i>
Source of data	Option 3: Default value from the most recent version of the <i>IPCC Guidelines for National Greenhouse Gas Inventories</i>
Value applied	0.0156
Justification of choice of data or description of measurement methods and procedures applied	The value is determined ex ante by using of default values from the most recent version of the <i>IPCC Guidelines for National Greenhouse Gas Inventories</i> for wood
Purpose of Data	Calculation of baseline emissions
Comments	N/A

Data / Parameter	BC _{ex-ante,b,i}
Data unit	tonne
Description	Ex-ante annual average quantity of fuel used per baseline device type <i>i</i>
Source of data	Option 1: A measurement campaign following the Kitchen Performance Test Protocol must be designed, carried out, and analyzed in compliance with the most recent version of the CDM Standard for Sampling and Surveys for CDM Project Activities and Programmes of Activities. The campaign must achieve a confidence and precision of at least 90/10 for the target parameter of average daily fuel consumption per adult equivalent. Where the project does not achieve the target precision in a monitoring period, the project proponent must apply an appropriate conservativeness deduction as per Section 4 of the most recent version of the CDM Standard for Sampling and Surveys for CDM Project Activities and Programmes of Activities.

	The result must be scaled appropriately using the average household size to obtain the value of $BC_{ex-ante,b,i}$
Value applied	3.5696
Justification of choice of data or description of measurement methods and procedures applied	PP applied the value of $BC_{ex-ante,b,i}$ equal to the parameter $BC_{b,i,y}$. In accordance with the applied methodology VM0050, the average quantity of firewood consumed by the baseline stove is determined through the Kitchen Performance Test (KPT) conducted on representative samples from 13-January-2025 to 08-February-2025. Based on the KPT survey results, $BC_{b,i,y} = 3.5696$ tonnes/household/year = $BC_{ex-ante,b,i}$, as referenced in Section 3.4 of this document. Furthermore, the parameter $BC_{b,i,y}$ has been cross-checked against published literature: According to emission reduction methodology, utilizing a lower baseline consumption value considered a conservative approach. This practice ensures that the calculated emission reductions are not overstate. Referring to the research paper under an international journal released in 2018, per capital consumption in Cambodia was 760 kg/capita/year⁷. End-users who are participated in the project activity are near-poor and poor households in rural with household size at 4.7 people/household⁸. Hence, quantity of firewood consumption is estimated at $760 \times 4.7 / 1000 = 3.57$ tonnes/household/year. Also, according to a public research released in 2024, firewood is Cambodia's primary energy source, particularly in rural areas and among the poor. As of 2022, two million households used firewood for cooking⁹. Besides, reference is made to a project that has already been issued credits under the UNFCCC platform, with the project number PoA 10030, issued in 2020. The component project activity 10030-P1-0004-CP1, implemented in Cambodia, was registered under the methodology AMS II.G approved by the UNFCCC¹⁰. According to the project report, the amount of firewood

⁷ Differences in consumption rates and patterns between firewood and charcoal: A case study in a rural area of Yedashe Township, Myanmar by Zar Chi Win et al. dated 2018; <https://doi.org/10.1016/j.biombioe.2017.12.011>

⁸ <https://www.eria.org/uploads/LPG-Supply-Master-Plan-for-Cambodia.pdf>

⁹ <https://www.ebsco.com/research-starters/environmental-sciences/cambodias-natural-resources>

¹⁰ <https://cdm.unfccc.int/UserManagement/FileStorage/AOIR2UGTELHMZCB9DQXS4FV0K183Y5>

	saved through the use of the project stove is 3 tonnes/household/year, while the firewood consumption of the project stove is reported as 1.118 tonnes/household/year. Accordingly, the baseline stove consumption can be estimated at 4.118 tonnes/household/year. In the other project on Verra platform with project ID 3116 issued in 2024¹¹, quantity of woody biomass used by project devices is 1.09 tonnes/household/year, the amount of firewood saved by the project cookstove is 2.47 tonnes/household/year. Hence, the baseline stove is calculated at 3.56 tonnes/households/year. Based on a comparative analysis of published study and existing project data with the region as above, the value determined by KPT survey of PP to calculate emission reductions is deemed highly conservative.
Purpose of Data	Calculation of baseline emission
Comments	Energy consumption must be determined once prior to validation.

Data / Parameter	$\eta_{old,avg}$
Data unit	Fraction
Description	Weighted average efficiency of baseline devices that are replaced by project devices
Source of data	The applied methodology. Default value for three-stone fire using firewood or a cookstove with no improved combustion air supply or flue gas ventilation
Value applied	0.15
Justification of choice of data or description of measurement methods and procedures applied	These methods and sources are recognized by the VCS Program
Purpose of Data	Calculation of baseline emission
Comments	N/A.

¹¹ <https://registry.terra.org/app/projectDetail/VCS/3116>

Data / Parameter	Hh _i
Data unit	Equivalent standard male adults
Description	Average household size of the target population using device type <i>i</i>
Source of data	Baseline survey The campaign must achieve a confidence and precision of at least 90/10 for the target parameter of average household size.
Value applied	4.34
Justification of choice of data or description of measurement methods and procedures applied	Recognized survey methods based on the CDM <i>Standard for Sampling and Surveys for CDM Project Activities and Programmes of Activities</i>
Purpose of Data	Estimation of average energy consumption
Comments	This parameter must be determined ex ante via the baseline survey as described in Section 6.2 of the applied methodology. Equivalent standard male adults according to Guidelines for Woodfuel Surveys for FAO by Keith Openshaw, cited in Joseph, S. (1990). <i>Guidelines for Planning, Monitoring and Evaluating Cookstove Programmes</i> , UNFAO: Community Forestry Field Manual 1.

Data / Parameter	EF _{p,j,CO2}
Data unit	t CO ₂ e/TJ
Description	CO ₂ emission factor for fuel used by project device type <i>j</i> in the project scenario
Source of data	Option 3: Default value from the most recent version of the <i>IPCC Guidelines for National Greenhouse Gas Inventories</i>
Value applied	112
Justification of choice of data or description of measurement methods and procedures applied	The value is determined ex ante by using of default values from the most recent version of the <i>IPCC Guidelines for National Greenhouse Gas Inventories</i> for wood
Purpose of Data	Calculation of project emissions
Comments	N/A

Data / Parameter	$EF_{p,j,nonCO2}$
Data unit	t CO ₂ e/TJ
Description	Non-CO ₂ emission factor for fuel used by project device type j in the project scenario
Source of data	Option 3: Default value from the most recent version of the <i>IPCC Guidelines for National Greenhouse Gas Inventories</i>
Value applied	9.46
Justification of choice of data or description of measurement methods and procedures applied	The value is determined ex ante by using of default values from the most recent version of the <i>IPCC Guidelines for National Greenhouse Gas Inventories</i> for wood
Purpose of Data	Calculation of project emissions
Comments	N/A

Data / Parameter	$NCV_{p,j}$
Data unit	TJ/tonne
Description	Net calorific value of project fuel used by project device type j
Source of data	Option 3: Default value from the most recent version of the <i>IPCC Guidelines for National Greenhouse Gas Inventories</i>
Value applied	0.0156
Justification of choice of data or description of measurement methods and procedures applied	The value is determined ex ante by using of default values from the most recent version of the <i>IPCC Guidelines for National Greenhouse Gas Inventories</i> for wood
Purpose of Data	Calculation of project emissions
Comments	N/A

4.2 Data and Parameters Monitored

Data / Parameter	$N_{j,k,y}$
Data unit	Number
Description	Number of commissioned project devices of type j from batch k in year y
Source of data	Monitoring

Description of measurement methods and procedures to be applied	The following data must be recorded during project activity implementation: 1) Number of new devices distributed under the project activity, identified by the type of device and date of commissioning; and 2) Identification information of the recipient of the device distributed under the project. Data management and reporting of this information must adhere to both data privacy requirements and good practice.
Frequency of monitoring/recording	Every time that new project devices are distributed
Value applied	470,000
Monitoring equipment	Monitoring survey
QA/QC procedures to be applied	-
Purpose of data	Calculation of baseline and project emissions
Calculation method	-
Comments	The number of project devices must be recorded in a database, sales record, or similar to ensure transparency

Data / Parameter	$n_{j,k,y}$
Data unit	Fraction
Description	Proportion of commissioned project devices of type j from batch k that are still being used regularly in year y
Source of data	Monitoring
Description of measurement methods and procedures to be applied	Option 2 (surveys): Based on an adoption rate determined by a survey according to the most recent version of the CDM Standard for Sampling and Surveys for Project Activities and Programmes of Activities and achieving 90/10 confidence precision for the proportion of devices in operation. The lower end of the 90% confidence interval must be used to ensure conservativeness. The adoption survey must include: a) Kitchen observation (which includes visual and physical checks of the stove and its components), including photographic evidence; and b) Interview with the primary cook. The project proponent must provide proof of training and supervision to ensure field teams have the capacity required to complete adoption surveys successfully.

Frequency of monitoring/recording	Annually
Value applied	0.8948
Monitoring equipment	Monitoring survey
QA/QC procedures to be applied	Where the project device is not working or not being used at the time of conducting the survey, it should be conservatively assumed that the project device has not been active since the date on which the last adoption survey was conducted.
Purpose of data	Calculation of baseline and project emissions
Calculation method	The result of the monitoring survey, there is one project cookstove unused among 54 representative samples. Therefore, operation fraction was measured at 0.9814. However, to meet the requirement of the applied methodology, the lower boundary level of the 95% confidence interval has been used to ensure conservativeness. As such, a value of 0.9454 has been applied for this fourth monitoring period. Also, in the last monitoring period, the value of Proportion of commissioned project devices is 0.9465. Hence, $n_{j,k,4th} = 0.9465 * 0.9454 = 0.8948$ Calculation details in emission reduction calculation spreadsheet.
Comments	To ensure sustained usage of the improved cookstoves and support the entire target population, the project has implemented a comprehensive customer support system in alignment with the three required criteria: 1. Before stove distribution, the project team, in collaboration with CWPD (local implementing partner) and SIPCO, conducted a field survey to investigate the cooking practices, fuel types, and attitudes of the target households currently using traditional three-stone stoves (with average efficiency of 15%). The survey confirmed that the improved cookstoves being distributed (with 38.44% thermal efficiency) are compatible with the typical cooking habits, pot sizes, fuel types (primarily wood), and dishes commonly prepared by the target population. The selected stoves are thus capable of fully meeting the daily cooking needs of the households. The stove model was selected based on its compatibility with local cooking practices, durability, and ease of use, which was validated during field testing with representative households. 2. Prior to distribution, CWPD and SIPCO organized structured communication sessions in Khmer language in each commune to introduce the stove, provide demonstrations on its proper use, maintenance, and storage.

	Additionally, CWPD village-level coordinate with village lead conduct monthly or quarterly community meetings where CWPD addresses content to provide ongoing guidance, address user questions, and reinforce good practices. 3. The grievance register is being maintained by the project's distribution partner (CWPD) and SIPCO for submission of input/grievance (if any) related to the project activity. End-users can easily access through several widely accessible channels: • Contacting CWPD focal persons at the village or commune level to request stove maintenance or replacement. • Calling a dedicated phone number printed on the stove packaging, which connects them directly to SIPCO's support staff in Cambodia. • Visiting SIPCO's official website for guidance and assistance. All communication and support materials are provided in Khmer – the primary language of the target area – ensuring accessibility and comprehension across the entire user population.
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Data / Parameter	$f_{NRB,y}$
Data unit	Fraction
Description	Fraction of woody biomass that is established to be non-renewable used by device in year y
Source of data	Default value of the most recent version of CDM TOOL33
Description of measurement methods and procedures to be applied	See "Source of data"
Frequency of monitoring/recording	Ex-ante for each crediting period
Value applied	0.3
Monitoring equipment	N/A
QA/QC procedures to be applied	N/A
Purpose of data	Calculation of baseline and project emissions
Calculation method	N/A
Comments	N/A

Data / Parameter	$BC_{b,i,y}$
Data unit	Tonnes
Description	Fuel used per baseline device type i during year y
Source of data	This parameter has been determined as per option 1 given below in line with requirements of applied methodology and monitoring plan of the updated PD. Option 1: A measurement campaign following the <i>Kitchen Performance Test Protocol</i> in control households that do not participate in the project, established prior to validation as statistically equivalent to the pre-project conditions of project households regarding baseline fuel consumption
Description of measurement methods and procedures to be applied	Follow-up baseline surveys must be conducted at most every five years from the date of the last survey in control households that do not participate in the project, established prior to validation as statistically equivalent to the pre-project conditions of project households regarding baseline fuel consumption. Measurement campaign must be updated where follow-up baseline surveys show that the fuels, fuel sources, or technologies used by the control group are no longer statistically equivalent to the pre-project conditions of project households. The measurement campaign must be designed, carried out, and analyzed in compliance with the most recent version of the CDM <i>Standard for Sampling and Surveys for CDM Project Activities and Programmes of Activities</i>. The result must be scaled appropriately using the average household size to obtain the value of $BC_{b,i,y}$.
Frequency of monitoring/recording	At most every five years from the date of the last survey.
Value applied	3.5696
Monitoring equipment	Based on KPT method, the equipment need to be calibrated every year is weighing scale and moisture content meters. Weighing scale: Calibrated frequency: Annual Calibrated by Intertek Type: ELECTRONIC BALANCE - Serial number: SI-001 - Manufacture: DAHONGYING - Capacity: 40 kg x 5g - Accuracy class: +/- 5 g - Ambient Temperature: 22 ± 2 °C - Relative humidity: 62 ± 4 % RH - Calibration Certificate No.: KHMTT25002267, dated 06-January-2025

	Due date: 06-January-2026 2. Serial number: SI-002 Manufacture: DAHONGYING Capacity: 40 kg x 5g Accuracy class: +/- 5 g Ambient Temperature: 22 ± 2 °C Relative humidity: 62 ± 4 % RH Calibration Certificate No.: KHMTT25002269, dated 06-January-2025 Due date: 06-January-2026 Moisture content meters: Calibrated frequency: Annual Calibrated by VMI Type: Laser liner 1. Serial number: 18042925 Manufacturer: Dampfinder compact Accuracy class: 0.1% Calibration Certificate No.: V06.CN5.177.26, dated 15-April-2024 Due date: 30-April-2025 2. Serial number: 18042926 Manufacturer: Dampfinder compact Accuracy class: 0.1% Calibration Certificate No.: V06.CN5.177.27, dated 15-April-2024 Due date: 30-April-2025
QA/QC procedures to be applied	The campaign must achieve a confidence and precision of 95/10 for the target parameter of average daily fuel consumption per adult equivalent. Where the project does not achieve the target precision in a monitoring period, the project proponent must apply an appropriate conservativeness deduction as per Section 4 of the most recent version of the <i>CDM Standard for Sampling and Surveys for CDM Project Activities and Programmes of Activities</i>. <u>Comparison with the published literature</u> According to emission reduction methodology, utilizing a lower baseline consumption value considered a conservative approach. This practice ensures that the calculated emission reductions are not overstate. Referring to the research paper under an international journal released in 2018, per capital consumption in Cambodia was 760

	kg/capita/year¹². End-users who are participated in the project activity are near-poor and poor households in rural with household size at 4.7 people/household¹³. Hence, quantity of firewood consumption is estimated at $760 \times 4.7 / 1000 = 3.57$ tonnes/household/year. Also, according to a public research released in 2024, firewood is Cambodia's primary energy source, particularly in rural areas and among the poor. As of 2022, two million households used firewood for cooking¹⁴. Besides, reference is made to a project that has already been issued credits under the UNFCCC platform, with the project number PoA 10030, issued in 2020. The component project activity 10030-P1-0004-CP1, implemented in Cambodia, was registered under the methodology AMS II.G approved by the UNFCCC¹⁵. According to the project report, the amount of firewood saved through the use of the project stove is 3 tonnes/household/year, while the firewood consumption of the project stove is reported as 1.118 tonnes/household/year. Accordingly, the baseline stove consumption can be estimated at 4.118 tonnes/household/year. In the other project on Verra platform with project ID 3116 issued in 2024¹⁶, quantity of woody biomass used by project devices is 1.09 tonnes/household/year, the amount of firewood saved by the project cookstove is 2.47 tonnes/household/year. Hence, the baseline stove is calculated at 3.56 tonnes/households/year. Based on a comparative analysis of published study and existing project data with the region as above, the value determined by KPT survey of PP to calculate emission reductions is deemed highly conservative.
Purpose of data	Calculation of baseline emissions
Calculation method	N/A

¹² Differences in consumption rates and patterns between firewood and charcoal: A case study in a rural area of Yedashe Township, Myanmar by Zar Chi Win et al. dated 2018; <https://doi.org/10.1016/j.biombioe.2017.12.011>

¹³ <https://www.eria.org/uploads/LPG-Supply-Master-Plan-for-Cambodia.pdf>

¹⁴ <https://www.ebsco.com/research-starters/environmental-sciences/cambodias-natural-resources>

¹⁵ <https://cdm.unfccc.int/UserManagement/FileStorage/AOIR2UGTELMZCB9DQXS4FV0K183Y5>

¹⁶ <https://registry.terra.org/app/projectDetail/VCS/3116>

Comments	The last survey for this parameter was also the first one conducted from 07-January-2025 to 11-February-2025. The next survey would be completed no later than 10-February-2030.									
Data / Parameter	$\eta_{new,avg,y}$									
Data unit	Fraction									
Description	Weighted average efficiency of project devices in year y									
Source of data	Calculation									
Description of measurement methods and procedures to be applied	Certification from the host country's national standards body or certifying agency. The decrease in thermal efficiency of project device j from batch k due to aging must be accounted for during the monitoring period. The project devices using biomass, PP has chosen A linear decrease approach, applying a default schedule of linearly decreasing efficiency up to the terminal efficiency (assumed to be 25%) through the lifespan of the project device									
Frequency of monitoring/recording	Annually									
Value applied	<table><tr><th>Age</th><th>$\eta_{new,avg,y}$</th></tr><tr><td>1</td><td>0.3777</td></tr><tr><td>2</td><td>0.3642</td></tr><tr><td>3</td><td>0.3508</td></tr></table>		Age	$\eta_{new,avg,y}$	1	0.3777	2	0.3642	3	0.3508
Age	$\eta_{new,avg,y}$									
1	0.3777									
2	0.3642									
3	0.3508									
Monitoring equipment	N/A									
QA/QC procedures to be applied	N/A									
Purpose of data	Calculation of baseline and project emission									
Calculation method	N/A									
Comments	N/A									

Data / Parameter	$BC_{p,j,k,y}$
Data unit	Tonnes
Description	Average quantity of fuel used by project device type j from batch k during year y
Source of data	Monitoring survey
Description of measurement methods and procedures to be applied	This parameter has been determined through a KPT campaign in line with updated PD and applied methodology's option 1 as listed below: Option 1: A measurement campaign following the Kitchen Performance Test protocol must be designed, carried out, and analyzed in compliance with the most recent version of the CDM Standard for Sampling and Surveys for CDM Project Activities and Programmes of Activities. The campaign must achieve confidence and precision of at least 90/10 for the target parameter of average daily fuel consumption per adult equivalent. The result must be scaled appropriately using the average household size to obtain the value of $BC_{p,j,k,y}$. Project activities applying KPTs must also measure the quantity of fuel used by pre-project devices that are still operational and provide it in the calculation sheet and monitoring reports (this is a reporting-only requirement). Also, the PP has applied a confidence precision of 95/10, although the methodology only requires 90/10 as mentioned above. Further details are provided in Section 4.3 of the document.
Frequency of monitoring/recording	Annually
Value applied	Based on the survey, - Ecozen 1 year old: 1.4127 - Ecozen 2 year old: 1.3772 - Ecozen 3 year old: 1.3369
Monitoring equipment	Based on KPT method, the equipment need to be calibrated every year is weighing scale and moisture content meters. Weighing scale: Calibrated frequency: Annual Calibrated by Intertek Type: ELECTRONIC BALANCE - Serial number: SI-001 - Manufacture: DAHONGYING - Capacity: 40 kg x 5g - Ambient Temperature: 22 ± 2 °C - Relative humidity: 62 ± 4 % RH

	Calibration Certificate No.: KHMTT25002267, dated 06-January-2025 Due date: 06-January-2026 2. Serial number: SI-002 Manufacture: DAHONGYING Capacity: 40 kg x 5g Ambient Temperature: 22 ± 2 °C Relative humidity: 62 ± 4 % RH Calibration Certificate No.: KHMTT25002269, dated 06-January-2025 Due date: 06-January-2026 Moisture content meters: Calibrated frequency: Annual Calibrated by VMI Type: Laser liner 1. Serial number: 18042925 Manufacturer: Dampfinder compact Accuracy class: 0.1% Calibration Certificate No.: V06.CN5.177.26, dated 15-April-2024 Due date: 30-April-2025 2. Serial number: 18042926 Manufacturer: Dampfinder compact Accuracy class: 0.1% Calibration Certificate No.: V06.CN5.177.27, dated 15-April-2024 Due date: 30-April-2025
QA/QC procedures to be applied	Refer to the study of Chan Somanta, the average households' fuelwood consumption for cooking is 3.23 ± 0.30 ($\pm$ refers to 90% of confidence level), 3.73 ± 0.23, and 4.83 ± 0.50 kg day⁻¹ household⁻¹ for small, medium, and large families, respectively. This study was conducted in Cambodia with sampling is households who were using the improved cookstove¹⁷. Findings in this study were similar to that found by San et al, average fuelwood consumption for cooking and boiling water per family per day is 5.21 ± 0.11 kg and 2.82 ± 0.11 kg respectively¹⁸. Compare to the parameter $BC_{p,j,k,y}$ that has been determined by PP is 3.87 kg/day for device in the first year, this value does not exceed the public references listed above.

¹⁷ https://u-hyogo.repo.nii.ac.jp/record/305/files/Dr_39a.pdf

¹⁸ <https://www.sciencedirect.com/science/article/abs/pii/S0360544212004768>

Purpose of data	Calculation of project emissions
Calculation method	N/A
Comments	N/A

4.3 Monitoring Plan

(a) Sampling Methodology

Representative sampling will be undertaken that is designed in line with the requirements of the VM 0050 methodology applied and the “Standard for sampling and surveys for CDM project activities and programme of activities”, version 09.0. This sampling plan follows the recommended outline as contained in “Guidelines for sampling and surveys for CDM project activities and programme of activities”, version 04.0.

Monitoring Parameters

Parameter	Description	Type of parameter	Parameter type /frequency	Methods to be applied
$N_{j,k,y}$	Number of commissioned project devices of type j from batch k in year y	Mean value	Every time that new project devices are distributed	Visiting to the premises, visual inspection and interview with ICS end-user
$n_{j,k,y}$	Proportion of commissioned project devices of type j from batch k that are still being used regularly in year y	Proportion value	Annually	Visiting to the premises, visual inspection and interview with ICS end-user
$BC_{b,i,y}$	Fuel used per baseline device type i during year y	Mean value	At most every five years from the date of the last survey	Visiting to the premises, visual inspection, interview with household representative and weigh firewood
$BC_{p,j,k,y}$	Average quantity of fuel used by project device type j from batch k during year y	Mean value	Annually	Visiting to the premises, visual inspection, interview with ICS end-user and weigh firewood

To monitor the required parameters data will be collected from a statistically valid sample of ICS in the database for the monitoring period, as per this sampling plan. Data are collected through field surveys at the frequency defined for each parameter in below. Survey data are then entered into the database and included in the monitoring report.

As per the approved methodology and the Standard for Sampling and Surveys for CDM Project Activities and Programmes of Activities (Version 09), the representative sampling method requires that:

“A statistically valid sample of the locations where the devices are deployed, with consideration in the sampling design of occupancy and demographic differences, can be used to determine parameter values used to calculate emission reductions, as per the relevant requirements in the Standard. When biennial inspection is chosen, a 95% confidence interval and a 10% margin of error shall be achieved for the sampling parameter. When the project proponent chooses to inspect annually, a 90% confidence interval and a 10% margin of error shall be achieved. In cases where survey results indicate that the required precision is not achieved, the lower bound of the 90% or 95% confidence interval of the parameter value may be chosen as an alternative to repeating the survey.”

For this project, the sample size has been determined to achieve a 95/10 precision level (95% confidence interval and 10% margin of error), in line with the monitoring plan of the revised PD. In cases where survey results do not achieve the 95/10 precision, the lower bound of the 95% confidence interval may be applied as an alternative, consistent with the approved methodology.

Additional requirements for grouped projects, as per the Sampling Standard (Version 09, paragraphs 21–23, EB 110), will be followed. In cases where a single sampling plan covers more than one instance, parameter values shall be estimated separately for each instance, unless a single sampling plan applying 95/10 confidence/precision is undertaken.

(b) Sample Frame

For parameter $N_{j,k,y}$, $n_{j,k,y}$, $BC_{p,j,k,y}$: The sampling frame refers to all the information in the database. The grouped project is open to different models of ICS. As explained below, to take the different characteristics of ICS models and other factors that may affect estimates into consideration, type of ICSs shall be either sampled separately and independently, or grouped together under a single sampling plan across the age and model of ICS, in each case using strata that have unique combinations of these factors.

For parameter $BC_{b,i,y}$: PP selected a control household group as statistically equivalent to the pre-project conditions of project households.

(i) Target Population

For parameter $N_{j,k,y}$, $n_{j,k,y}$, $BC_{p,j,k,y}$: The overall target population is the ICS distributed. The ICS to be sampled will be drawn from the list of individual ICS serial ID numbers contained in the sales record database, which is maintained by the distributor.

For parameter $BC_{b,i,y}$: The overall target population is the control household group. Each household is numbered separately in the data file.

(ii) Sampling method

Sampling has conducted using stratified random sampling techniques, and detailed calculations are provided within the monitoring plan as per CDM guidelines “Sampling and surveys for CDM project activities and programmes of activities”. Optionally, other sampling approaches may be used in accordance with “Sampling and surveys for CDM project activities and programmes of activities” and Guideline for Sampling and Surveys for CDM Project. Activities when sampling techniques or statistical analysis necessitates it.

(iii) Sample size

The sample size has been calculated using the EB 86, “Guidelines for Sampling and Surveys for CDM Project Activities and Programme of Activities”, version 04.0.

According to the “Standard for sampling and surveys for CDM project activities and programme of activities”, if there is more than one parameter to be estimated, then a sample size calculation should be done for each of them. Then either the largest number for the sample size is chosen as sampling effort with one common survey, or separate sampling efforts and surveys are undertaken for each parameter.

In order to calculate the required sample size estimates, values for the proportions, mean values, and standard deviations are required. As per Guidelines for Sampling and surveys for CDM project activities and programmes of activities (version 04.0) Appendix 1 paragraph 5, there are different ways available to obtain the estimates of the parameter of interest:

- (a) Refer to the result of previous studies and use these results;
- (b) In a situation where information from previous studies is not available, a preliminary sample as a pilot could be conducted and use that sample is used to provide the estimates;
- (c) Use best guesses based on the researcher’s own experiences.

For the registration/inclusion purpose of instance, option C shall be applied. Thus, there are different equations to calculate a required sample size for different situations. Different equation that will be used, depends on the type of parameter of interest, that is either:

- (a) A percentage – the proportion value
- (b) A numeric value – the mean value

For all of the parameters 95% confidence is required that the margin of error in the estimate is not more than $\pm 10\%$ in relative terms.

For a percentage – the proportion value

$$n \geq \frac{1.96^2 N \times p(1-p)}{(N-1) \times 0.1^2 \times p^2 + 1.96^2 p(1-p)}$$

Where:

- N : Sample size
N=N_y : Number of ICS in the instance project activity installed in year y = total number of households.
p : Our expected proportion ([proportion] assuming [proportion] of the installed (ICS) will be in use and operating at the specified efficiency)
1.96 : Represents the 95 % confidence required
0.1 : Represents the 10 % relative precision

Substituting the values in above equation gives the value of n = [Number of users to be sampled] (rounded up).

In case the resulting sample size to achieve the desired confidence/precision levels is smaller than 30 ICSs, a minimum sample size of 30 shall be chosen when the parameter of interest is a proportion. The sample size is 43.

For a numeric value –the mean value

The following equation is used:

$$n \geq \frac{1.96^2 NV}{(N-1) \times 0.1^2 + 1.96^2 \times V}$$

Where: V = (SD/mean)²

n = Sample size

N = Population size

Mean= Expected mean

SD = Expected standard deviation

1.96 = Represents the 95% confidence required

(In the case of 90% confidence, 1.645 shall be used)

0.1 = Represents the 10% relative precision

For parameter BC_{b,l,y} - This is a numeric value –the mean value

Based on the above assumption, the resulting sampling size for a 95/10 confidence/precision is calculated for total population size, the result below:

Monitoring Parameter	BC _{b,i,y}			
Sampling frame(s)	Given stove model			
Sampling approach	Simple random sampling			
Type of cookstove	Stove population	Expected Mean	Expected Standard Deviation	Calculated Sample Size
Traditional cookstove	1,000	10	1	11
Sample size determination				
Mean				10
Standard Deviation (SD)				1
$V_{\text{mean}} = (SD/\text{mean})^2$				0.01
Minimum Sample Size required				4
tDistribution sample size adjustment			Iteration 1	11
			Iteration 2	5
			Iteration 3	8
			Iteration 4	6
			Iteration 5	7
			Iteration 6	6

As the sample size calculated above is less than 30, the Student's t-distribution has been used to calculate the sample size (in accordance with paragraph 14 of standard: sampling and survey for CDM project activities and programmes of activities (version 09.0)).

The adjusted sample size obtained after applying Student's t-distribution is 11.

For parameter $n_{j,k,y}$ – This is a percentage – the proportion value

Based on the above assumptions, the improved cookstove resulting sampling size for a 95/10 confidence/precision is calculated for total population size, the result below:

Monitoring parameter(s)		$n_{j,k,y}$			
Sampling frame(s)		Given stove model and age			
Sampling approach		Stratified random sampling based on model and operation age of cookstove			
Type of ICS	Age	Stove population	Expected operational proportion	Calculated Sample Size (n)	Actual Monitored sample size
Ecozen	1	97,723	0.90	9	12
Ecozen	2	187,276	0.90	17	21
Ecozen	3	185,000	0.90	17	21
Total		469,999		43	54
Sample size determination					
Estimated Operation (p)				0.90	
$V_{\text{operation}} = p(1-p)/p^2$				0.111	
Sample Size required (SOF)				43	

Since $n_{j,k,y}$ share the same sampling units, project proponent may choose to have one common survey for this parameter. PP expected response rate from the sampled households to be 80%. Thus, we would decide to sample $43/0.8 = 54$ samples.

For parameter $BC_{p,j,k,y}$ – This is a numeric value – the mean value

Based on the above assumptions, the improved cookstove resulting sampling size for a 95/10 confidence/precision is calculated for total population size, the result below:

Monitoring Parameter	$BC_{p,j,k,y}$					
Sampling frame(s)	Given stove model and age					
Sampling approach	Stratified random sampling based on model and operation age of cookstove					
Type of ICS	Age	Stove population	Expected Mean	Expected Standard Deviation	Calculated Sample Size	Actual Monitored sample size
Ecozen	1	97,723	1.50	0.150	2	3
Ecozen	2	187,276	1.45	0.145	5	6
Ecozen	3	185,000	1.40	0.140	4	5
Total		469,999			11	14
Sample size determination						
Mean					1.4407	
Standard Deviation (SD)					0.1441	
$V_{mean} = (SD/mean)^2$					0.01	
Minimum Sample Size required					4	
tDistribution sample size adjustment				Iteration 1	11	
				Iteration 2	5	
				Iteration 3	8	
				Iteration 4	6	
				Iteration 5	7	
				Iteration 6	6	

As the sample size calculated above is less than 30, the Student's t-distribution has been used to calculate the sample size (in accordance with paragraph 13 of standard: sampling and survey for CDM project activities and programmes of activities (version 09.0)).

The adjusted sample size obtained after applying Student's t-distribution is 11. PP expected response rate from the sampled households to be 80%. Thus, we have decided to sample $11/0.8 = 14$ samples.

In the other hand, 14 samples for this parameter were selected using a stratified random approach based on stove age and stove model from the 54 samples of parameter $n_{j,k,y}$ for the survey. The KPT test was conducted from 08-January-2025 to 08-February-2025. Detailed survey results are presented in Section 5.2 of the document.

Finally, The number of samples for 3 parameters below:

Parameter	Sample size
$BC_{b,i,y}$	11
$n_{j,k,y}$	54
$BC_{p,j,k,y}$	14

Analysis of data collected and confidence/precision achieved

Analysis of data monitored through sampling revealed the following results:

ANALYSIS for parameter $n_{j,k,y}$	
Samples Monitored	54
Operation fraction Measured	0.9814
Standard Error of operation	0.0184
Upper Boundary Level	101.74%
Lower Boundary Level	94.54%
Relative precision (Margin of error)	3.54%
Check precision	3.67%
Result	Ok, reliability level met
Lower Bound confidence value	Not applicable

ANALYSIS for parameter $BC_{p,j,k,y}$	
Samples Monitored	14
Average fuel used based on age	
Age 1	3.870
Age 2	3.773
Age 3	3.663
Standard deviation	0.737
1st Quartile	3.41
3rd Quartile	4.39
Inter Quartile	0.98
Upper Bound	5.865
Lower Bound	1.935

ANALYSIS for parameter $BC_{b,i,y}$	
Samples Monitored	11
Mean value	9.780
Standard deviation	1.116
Upper boundary level	10.435
Lower boundary level	9.124
check precison	6.71%
Lower outlier limit	8.106
Upper outlier limit	11.454

For detailed calculations refer to ER sheet.

(iv) Survey and Data Collection Method

The sample to be surveyed is be drawn randomly with a geographical spread within the project boundary of the project activity instance. The survey was conducted through: physical on-site visit (face-to-face) from 07 January to 08 February 2025. For the physical on-site visit (face-to-face interview), data is collected through hardcopy questionnaires.

Training

The sample to be surveyed is be drawn randomly with a geographical spread within the project boundary of the project activity instance. The project proponent conducted a training programme for project participant's representative and its nominated distributor and distribution partner (CWPD) for survey framework and approach on 03-January-2025. Major focus is on understanding collection of data as per the survey questionnaire.

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

Baseline emissions are calculated as follows:

$$BE_y = \sum_{i,j,k} EC_{i,y} \times N_{j,k,y} \times n_{j,k,y} \times (EF_{b,i,CO2} \times f_{NRB,y} + EF_{b,i,nonCO2})$$

BE_y	:	Baseline emissions during year y (t CO ₂ e)
$EC_{i,y}$	:	Average energy consumption of baseline device type i in year y (TJ)
$N_{j,k,y}$	:	Number of commissioned project devices of type j from batch k in year y
$n_{j,k,y}$	:	Proportion of commissioned project devices of type j from batch k that remain operating in year y (fraction)
$EF_{b,i,CO2}$	:	CO ₂ emission factor for fuel used by baseline device type i in the baseline scenario (t CO ₂ /TJ)
$f_{NRB,y}$	:	Fraction of woody biomass that is established to be non-renewable used by baseline device in year y ; this variable is not considered for fossil fuels (fraction)
$EF_{b,i,nonCO2}$	:	Non-CO ₂ emission factor for fuel used by baseline device type i in the baseline scenario (t CO ₂ e/TJ)
i	:	Baseline device type and its respective fuel type
j	:	Project device type and its respective fuel type

For parameter $EC_{i,y}$ is calculated as follow:

$$EC_{i,y} = BC_{b,i,y} \times NCV_{b,i}$$

Where:

$BC_{b,i,y}$	:	Fuel used per baseline device type i during year y (tonnes)
$NCV_{b,i}$	:	Net calorific value of baseline fuel for baseline device type i (TJ/tonne)

PP has conducted the Kitchen Performance Test (KPT) in line with the applied methodology VM0050, ver 1.0 and KPT protocol. the sample size for the baseline KPTs was calculated in line with section 8.4(b) of the applied methodology, using the CDM Guideline for Sampling and Surveys, version 4.0. Using CDM Guidelines, the sample size for each parameter $BC_{b,i,y}$ (mean parameter) was 11 and the survey was conducted from 13-January-2025 to 08-February-2025

Procedures followed for Conducting KPT:

The KPT surveys were conducted by a competent team trained for the KPT surveys by SIPCO for performing KPTs, based on the KPT protocol. Once the villages were selected by the operational team, enumerators were issued with protocols for the selection of the individual households. These protocols outlined that the selected households should, but are not limited to, the following criteria in accordance with the KPT protocol:

- Have the person who is primarily responsible for cooking available for visits once a day for the next 3-4 days (For households where the survey took three days, the SIPCO team arrived early in the morning on the first day to provide an introduction and instructions to the families. For households where the survey lasted four days, the first day was dedicated to providing information and guidance);

- Not have any events scheduled that would disrupt normal cooking practices during this time (e.g Weddings, community events);

- Primarily cook on wood

Additionally, the enumerators were instructed to follow, but are not limited to, the following criteria in accordance with the KPT protocol

- Avoid a measurement campaign during special occasions, holidays, or any day when cooking is not normal and be aware of local events like market days that may involve above-average fuel consumption.

- To explain the purpose of the test to the family members and arrange to measure their fuel consumption.

- Stress to household members that their cooking practices should remain as close to normal as possible for the duration of the test.

- Explain to family members that the surveyor will visit the respondent daily to collect the information.

- Ask the family to define an inventory area to store the fuel during the test. Record the weight and moisture content of the initial stock of fuels and if the family is going to collect or purchase fuel during the days of the test, ask them to keep newly collected or purchased fuel separate from fuel that has already been tested for moisture and weighed.

- Visit each household at roughly the same time each day, without being intrusive.

- Record fuel consumption by weighing the remaining fuel. Record the weight and moisture content of newly collected fuel before it is added to the family's stock.

KPT results for the baseline fuel consumption

The annual baseline fuel consumption per household was calculated from the KPT survey results of 11 households. The parameter was within the 95/10 confidence/precision which can be checked in the table below:

No	Member in household					Fuel used by traditional cookstove (kg/day)			
	Children (0-14 years)	Female > 14 years	Male 15-59 years	Male > 59 years	Total member Equivalent to adult male standard	Day 1	Day 2	Day 3	Average
HH 1	1	2	1	1	3.9	8.72	9.14	8.78	8.88
HH 2	1	2	1	1	3.9	9.14	8.49	9.52	9.05
HH 3	2	1	3	0	4.8	11.49	10.14	11.62	11.08

HH 4	1	2	1	1	3.9	8.57	8.93	9.54	9.01
HH 5	0	2	2	1	4.4	10.02	9.84	10.41	10.09
HH 6	1	2	2	0	4.1	9.38	10.5	8.75	9.54
HH 7	1	2	2	0	4.1	9.93	9.52	8.49	9.31
HH 8	1	2	3	1	5.9	12.04	12.92	11.06	12.01
HH 9	1	3	2	0	4.9	10.92	10.81	9.07	10.27
HH 10	2	2	1	0	3.6	9.14	7.11	7.89	8.05
HH 11	0	3	2	0	4.4	10.51	9.87	10.47	10.28
Average					4.35				9.78

According to the table above, the woody fuel used per baseline household ($BC_{b,i,y}$) is 9.78 kg/day = 3.5696 tonnes/year/stove

The project activity is replacing the traditional cookstove to improved cookstove. The traditional cookstoves only use wood fuel, so according to 2006 IPCC Guidelines for National Greenhouse Gas Inventories, the value of $NCV_{b,i}$ is 0.0156 TJ/tonne.

So $EC_{i,y} = 3.5696 \times 0.0156 = 0.05569$ (TJ)

Cross-check of $EC_{i,y}$ to address stove stacking

$$EC_{est,y} = EC_{p,y} \times \frac{\eta_{new,avg,y}}{\eta_{old,avg}}$$

Where:

- $EC_{est,y}$: Back-calculated energy consumption of the potential mix of devices and fuels in the baseline in year y (TJ)
- $EC_{p,y}$: Energy used in project scenario by project devices during year y (TJ)
- $\eta_{new,avg,y}$: Weighted average efficiency of project devices in year y (fraction)
- $\eta_{old,avg}$: Weighted average efficiency of baseline devices that are replaced by project devices (fraction)

$$EC_{p,y} = \sum_{j,k} BC_{p,j,k,y} \times NCV_{p,j}$$

Where:

- $BC_{p,j,k,y}$: Average quantity of fuel used by project device type j from batch k during year y (tonnes or m³)
- $NCV_{p,j}$: Net calorific value of project fuel used in project device type j (TJ/tonne or TJ/m³)

Through the monitoring survey, the result of average quantity of fuel used by project device based on the operation year of project cookstove as following (details of the process, time and results of KPT implementation to determine the parameter in the section 5.2 of this document):

$$BC_{p,Ecozen,age\ 1} = 1.4127 \text{ (tonnes)}$$

$$BC_{p,Ecozen,age\ 2} = 1.3772 \text{ (tonnes)}$$

$$BC_{p,Ecozen,age\ 3} = 1.3369 \text{ (tonnes)}$$

So energy used in project scenario by project devices for each operation age of project cookstove as following:

$$EC_{p,age\ 1} = 1.4127 \times 0.0156 = 0.0220 \text{ (TJ)}$$

$$EC_{p,age\ 2} = 1.3772 \times 0.0156 = 0.0215 \text{ (TJ)}$$

$$EC_{p,age\ 3} = 1.3369 \times 0.0156 = 0.0209 \text{ (TJ)}$$

Weighted average efficiency of project devices in the operation age year of project cookstove as following:

Age	$\eta_{new,avg,y}$
1	0.3777
2	0.3642
3	0.3508

So back-calculated energy consumption of the potential mix of devices and fuels in the baseline in the cookstove age as following:

$$EC_{est,age\ 1} = 0.0220 \times (0.3777 / 0.15) = 0.05550$$

$$EC_{est,age\ 2} = 0.0215 \times (0.3642 / 0.15) = 0.05217$$

$$EC_{est,age\ 3} = 0.0209 \times (0.3508 / 0.15) = 0.04877$$

Cross check to $EC_{b,i,y} = 0.05569 \text{ TJ}$ as calculating above:

$$EC_{b,i,age\ 1} > EC_{est,age\ 1} \text{ therefore, } EC_{i,age\ 1} = EC_{est,age\ 1} = 0.05550 \text{ (TJ)}$$

$$EC_{b,i,age\ 2} > EC_{est,age\ 2} \text{ therefore, } EC_{i,age\ 2} = EC_{est,age\ 2} = 0.05217 \text{ (TJ)}$$

$$EC_{b,i,age\ 3} > EC_{est,age\ 3} \text{ therefore, } EC_{i,age\ 3} = EC_{est,age\ 3} = 0.04877 \text{ (TJ)}$$

The values of the remaining parameters are applied for all of instance as follows:

$$EF_{b,i,CO_2} = 112 \text{ tCO}_2/\text{TJ}$$

$$EF_{b,i,nonCO_2} = 9.46 \text{ tCO}_2/\text{TJ}$$

$$f_{NRB} = 0.3$$

$$\eta_{j,k,y} = 0.8948$$

Therefore, the baseline emission calculated each project instances as follows:

Project Activity Instance	Age	Quantity distributed	Average energy consumption of baseline device	Vintage 2024 (01-Jul-2024 to 31-Dec-2024)		Vintage 2025 (01-Jan-2025 to 31-Jan-2025)	
				Equivalent Operational year in the vintage 2024 during the fourth monitoring period	Baseline Emission	Equivalent Operational year in the vintage 2025 during the fourth monitoring period	Baseline Emission
PA 001	3	8,000	0.04970	0.50	7,579	0.08	1,277
PA 002	3	8,000	0.04970	0.50	7,579	0.08	1,277
PA 003	3	8,000	0.04970	0.50	7,579	0.08	1,277
PA 004	3	2,272	0.04970	0.50	2,152	0.08	363
	1	3,790	0.05569	0.50	4,086	0.08	688
PA 005	3	8,000	0.04970	0.50	7,579	0.08	1,277
PA 006	2	2,000	0.05314	0.50	2,027	0.08	341
PA 007	2	8,000	0.05314	0.50	8,106	0.08	1,366
	1	2,077	0.05569	0.50	1,968	0.08	331
PA 008	2	8,000	0.05314	0.50	8,106	0.08	1,366
	1	1,686	0.05569	0.50	1,817	0.08	306
PA 009	2	8,000	0.05314	0.50	8,106	0.08	1,366
	1	1,893	0.05569	0.50	2,041	0.08	344
PA 010	2	8,000	0.05314	0.50	8,106	0.08	1,366
	1	1,921	0.05569	0.50	2,071	0.08	349
PA 011	2	71	0.05314	0.50	72	0.08	12
	1	11,456	0.05569	0.50	12,349	0.08	2,081
PA 012	2	8,000	0.05314	0.50	8,106	0.08	1,366
	1	1,998	0.05569	0.50	2,154	0.08	363
PA 013	2	8,000	0.05314	0.50	8,106	0.08	1,366
	1	1,909	0.05569	0.50	2,058	0.08	347
PA 014	2	8,000	0.05314	0.50	8,106	0.08	1,366
PA 015	2	8,000	0.05314	0.50	8,106	0.08	1,366
PA 016	2	8,000	0.05314	0.50	8,106	0.08	1,366
	1	6,002	0.05569	0.50	6,470	0.08	1,090
PA 017	2	8,000	0.05314	0.50	8,106	0.08	1,366
	1	5,516	0.05569	0.50	5,946	0.08	1,002
PA 018	2	7,181	0.05314	0.50	7,276	0.08	1,226
	1	2,613	0.05569	0.50	2,817	0.08	475
PA 019	2	8,000	0.05314	0.50	8,106	0.08	1,366
	1	3,476	0.05569	0.50	3,747	0.08	631
PA 020	1	8,000	0.05569	0.50	7,579	0.08	1,277
	1	3,487	0.05569	0.50	3,759	0.08	633
PA 021	1	8,000	0.05569	0.50	8,624	0.08	1,453
	1	2,646	0.05569	0.50	2,852	0.08	481

PA 022	1	8,000	0.05569	0.50	8,624	0.08	1,453
	1	3,422	0.05569	0.50	3,689	0.08	621
PA 023	1	8,000	0.05569	0.50	8,624	0.08	1,453
	1	2,307	0.05569	0.50	2,487	0.08	419
PA 024	1	1,149	0.05569	0.50	1,239	0.08	209
	1	697	0.05569	0.50	751	0.08	127
PA 025	2	8,000	0.05314	0.50	8,106	0.08	1,366
	1	5,783	0.05569	0.50	6,234	0.08	1,050
PA 026	2	8,000	0.05314	0.50	7,579	0.08	1,277
	1	3,236	0.05569	0.50	3,488	0.08	588
PA 027	2	8,000	0.05314	0.50	8,106	0.08	1,366
PA 028	3	8,000	0.04970	0.50	7,579	0.08	1,277
PA 029	3	2,222	0.04970	0.50	2,105	0.08	355
	2	5,778	0.05314	0.50	5,855	0.08	986
	1	1,923	0.05569	0.50	2,073	0.08	349
PA 030	2	5,659	0.05314	0.50	5,734	0.08	966
	1	3,137	0.05569	0.50	3,382	0.08	570
PA 031	2	8,000	0.05314	0.50	8,106	0.08	1,366
	1	3,885	0.05569	0.50	4,188	0.08	706
PA 032	2	8,000	0.05314	0.50	8,106	0.08	1,366
	1	4,005	0.05569	0.50	4,317	0.08	727
PA 033	1	8,000	0.05569	0.50	8,624	0.08	1,453
	1	1,983	0.05569	0.50	2,138	0.08	360
PA 034	1	8,000	0.05569	0.50	8,624	0.08	1,453
	1	1,852	0.05569	0.50	1,996	0.08	336
PA 035	1	5,546	0.05569	0.50	5,979	0.08	1,007
	1	2,412	0.05569	0.50	2,600	0.08	438
PA 036	2	8,000	0.05314	0.50	8,106	0.08	1,366
	1	2,410	0.05569	0.50	2,598	0.08	438
PA 037	2	8,000	0.05314	0.50	8,106	0.08	1,366
	1	1,452	0.05569	0.50	1,565	0.08	264
PA 038	2	1,900	0.05314	0.50	1,925	0.08	324
	1	6,100	0.05569	0.50	6,576	0.08	1,108
	1	2,508	0.05569	0.50	2,704	0.08	455
PA 039	1	8,000	0.05569	0.50	8,624	0.08	1,453
	1	1,888	0.05569	0.50	2,035	0.08	343
PA 040	1	8,000	0.05569	0.50	8,624	0.08	1,453
	1	3,063	0.05569	0.50	3,302	0.08	556
PA 041	1	8,000	0.05569	0.50	8,624	0.08	1,453
	1	3,075	0.05569	0.50	3,315	0.08	558
PA 042	1	4,486	0.05569	0.50	4,836	0.08	815

	1	1,404	0.05569	0.50	1,513	0.08	255
PA 043	2	8,000	0.05314	0.50	8,106	0.08	1,366
PA 044	2	8,000	0.05314	0.50	8,106	0.08	1,366
PA 045	2	8,000	0.05314	0.50	8,106	0.08	1,366
PA 046	3	8,000	0.04970	0.50	7,579	0.08	1,277
	1	3,537	0.05569	0.50	3,813	0.08	642
PA 047	2	8,000	0.05314	0.50	8,106	0.08	1,366
	1	4,032	0.05569	0.50	4,346	0.08	732
PA 048	2	8,000	0.05314	0.50	8,106	0.08	1,366
	1	3,248	0.05569	0.50	3,501	0.08	590
PA 049	2	1,636	0.05314	0.50	1,658	0.08	279
	1	8,271	0.05569	0.50	8,916	0.08	1,502
Total		470,000			484,476		81,630

See detailed calculations in ERR spreadsheet.

5.2 Project Emissions

The project devices only use biomass. Hence, project emissions are calculated as following:

$$PE_y = \sum_j \sum_k BC_{p,j,k,y} \times N_{j,k,y} \times NCV_{p,j} \times n_{j,k,y} \times (EF_{p,j,CO_2} \times f_{NRB,y} + EF_{p,j,nonCO_2})$$

Where:

- PE_y : Project emissions during year y (t CO₂e)
- $BC_{p,j,k,y}$: Average quantity of fuel used by project device type j from batch k during year y (tonnes or m³)
- $N_{j,k,y}$: Number of commissioned project devices of type j from batch k in year y
- $n_{j,k,y}$: Proportion of commissioned project devices of type j from batch k that remain operating in year y (fraction)
- $NCV_{p,j}$: Net calorific value of project fuel for project device type j (TJ/tonne)
- EF_{p,j,CO_2} : CO₂ emission factor for fuel used by project device type j in the project scenario (t CO₂/TJ)
- $EF_{p,j,nonCO_2}$: Non-CO₂ emission factor for fuel used by project device type j in the project scenario (t CO₂e/TJ)

For parameter Average quantity of fuel used by project device type j from batch k during year y ($BC_{p,j,k,y}$):

PP has conducted the Kitchen Performance Test (KPT) In line with the applied methodology VM0050, ver 1.0 and KPT protocol. the sample size for the project KPTs was calculated in line

with section 8.4(b) of the applied methodology, using the CDM Guideline for Sampling and Surveys, version 4.0. Using CDM Guidelines, the sample size for each parameter $BC_{p,j,k,y}$ (mean parameter) was 14 and the survey was conducted from 08-January-2025 to 08-February-2025.

Procedures followed for Conducting KPT:

The KPT surveys were conducted by a competent team trained for the KPT surveys by SIPCO for performing KPTs, based on the KPT protocol. Once the villages were selected by the operational team, enumerators were issued with protocols for the selection of the individual households. These protocols outlined that the selected households should, but are not limited to, the following criteria in accordance with the KPT protocol:

- Have the person who is primarily responsible for cooking available for visits once a day for the next 3-4 days (For households where the survey took three days, the SIPCO team arrived early in the morning on the first day to provide an introduction and instructions to the families. For households where the survey lasted four days, the first day was dedicated to providing information and guidance);
- Not have any events scheduled that would disrupt normal cooking practices during this time (e.g Weddings, community events);
- Primarily cook on wood

Additionally, the enumerators were instructed to follow, but are not limited to, the following criteria in accordance with the KPT protocol

- Avoid a measurement campaign during special occasions, holidays, or any day when cooking is not normal and be aware of local events like market days that may involve above-average fuel consumption.
- To explain the purpose of the test to the family members and arrange to measure their fuel consumption.
- Stress to household members that their cooking practices should remain as close to normal as possible for the duration of the test.
- Explain to family members that the surveyor will visit the respondent daily to collect the information.
- Ask the family to define an inventory area to store the fuel during the test. Record the weight and moisture content of the initial stock of fuels and if the family is going to collect or purchase fuel during the days of the test, ask them to keep newly collected or purchased fuel separate from fuel that has already been tested for moisture and weighed.
- Visit each household at roughly the same time each day, without being intrusive.
- Record fuel consumption by weighing the remaining fuel. Record the weight and moisture content of newly collected fuel before it is added to the family's stock.

KPT results for the project fuel consumption

The annual baseline fuel consumption per household was calculated from the KPT survey results of 14 households. The parameter was within the 95/10 confidence/precision which can be checked in the table below:

Serial Number	Age	Member in household					Fuel used by traditional cookstove (kg/day)			
		Children (0-14 years)	Female > 14 years	Male 15-59 years	Male > 59 years	Total member Equivalent to adult male standard	Day 1	Day 2	Day 3	Average
CAM025-ICS-6964	Age 3	0	2	3	0	4.6	3.92	3.71	4.09	3.907
CAM026-ICS-3182	Age 3	2	1	2	0	3.8	3.41	3.09	3.22	3.240
CAM008-ICS-1309	Age 3	2	1	1	0	2.8	2.49	2.29	2.35	2.377
CAM018-ICS-7613	Age 1	1	2	2	0	4.1	3.62	3.77	3.41	3.600
CAM018-ICS-9672	Age 1	2	1	2	0	3.8	3.42	3.31	3.79	3.507
CAM018-ICS-7313	Age 1	1	2	2	0	4.1	3.77	3.52	3.49	3.593
CAM018-ICS-6591	Age 2	1	2	1	1	3.9	3.52	3.19	3.42	3.377
CAM018-ICS-5119	Age 2	0	2	2	1	4.4	3.91	3.72	3.82	3.817
CAM021-ICS-5852	Age 2	2	1	3	1	5.6	4.92	4.83	4.8	4.850
CAM022-ICS-7382	Age 2	1	2	1	0	3.1	2.74	2.63	2.7	2.690
CAM019-ICS-0714	Age 2	0	3	3	0	5.4	4.94	4.61	4.82	4.790
CAM033-ICS-3784	Age 2	1	3	2	0	4.9	4.11	4.26	4.16	4.177
CAM041-ICS-3440	Age 2	1	2	3	0	5.1	4.59	4.35	4.45	4.463
CAM047-ICS-0562	Age 3	0	3	3	0	5.4	4.19	4.74	4.52	4.483
Average						4.36	Age 1			3.870
							Age 2			3.773
							Age 3			3.663

According to the table above, the result of average quantity of fuel used by project device based on the operation year of project cookstove as following:

$$BC_{p,Ecozen,age\ 1} = 3.870 \text{ (kg/day)} = 1.4127 \text{ (tonnes/year)}$$

$$BC_{p,Ecozen,age\ 2} = 3.773 \text{ (kg/day)} = 1.3772 \text{ (tonnes/year)}$$

$$BC_{p,Ecozen,age\ 3} = 3.663 \text{ (kg/day)} = 1.3369 \text{ (tonnes/year)}$$

The values of the remaining parameters are applied for all of instance as follows:

$$EF_{b,i,CO_2} = 112 \text{ tCO}_2/\text{TJ}$$

$$EF_{b,i,nonCO_2} = 9.46 \text{ tCO}_2/\text{TJ}$$

$$f_{NRB} = 0.3$$

$$NCV_{biomass} = 0.0156 \text{ (TJ/tonne)}$$

$$n_{j,k,y} = 0.8948$$

Therefore, the project emission calculated each project instances as follows:

Project Activity Instance	Age	Quantity distributed	Fuel used per project device	Vintage 2024 (01-Jul-2024 to 31-Dec-2024)		Vintage 2025 (01-Jan-2025 to 31-Jan-2025)	
				Equivalent Operational year in the vintage 2024 during the fourth monitoring period	Project Emission	Equivalent Operational year in the vintage 2025 during the fourth monitoring period	Project Emission
PA 001	3	8,000	1.3369	0.50	3,241	0.08	546
PA 002	3	8,000	1.3369	0.50	3,241	0.08	546
PA 003	3	8,000	1.3369	0.50	3,241	0.08	546
PA 004	3	2,272	1.3369	0.50	920	0.08	155
	1	3,790	1.4127	0.50	1,622	0.08	273
PA 005	3	8,000	1.3369	0.50	3,241	0.08	546
PA 006	2	2,000	1.3772	0.50	835	0.08	141
PA 007	2	8,000	1.3772	0.50	3,338	0.08	562
	1	2,077	1.4127	0.50	841	0.08	142
PA 008	2	8,000	1.3772	0.50	3,338	0.08	562
	1	1,686	1.4127	0.50	722	0.08	122
PA 009	2	8,000	1.3772	0.50	3,338	0.08	562
	1	1,893	1.4127	0.50	810	0.08	137
PA 010	2	8,000	1.3772	0.50	3,338	0.08	562
	1	1,921	1.4127	0.50	822	0.08	139
PA 011	2	71	1.3772	0.50	30	0.08	5
	1	11,456	1.4127	0.50	4,904	0.08	826
PA 012	2	8,000	1.3772	0.50	3,338	0.08	562
	1	1,998	1.4127	0.50	855	0.08	144
PA 013	2	8,000	1.3772	0.50	3,338	0.08	562
	1	1,909	1.4127	0.50	817	0.08	138
PA 014	2	8,000	1.3772	0.50	3,338	0.08	562
PA 015	2	8,000	1.3772	0.50	3,338	0.08	562
PA 016	2	8,000	1.3772	0.50	3,338	0.08	562
	1	6,002	1.4127	0.50	2,569	0.08	433

PA 017	2	8,000	1.3772	0.50	3,338	0.08	562
	1	5,516	1.4127	0.50	2,361	0.08	398
PA 018	2	7,181	1.3772	0.50	2,997	0.08	505
	1	2,613	1.4127	0.50	1,119	0.08	188
PA 019	2	8,000	1.3772	0.50	3,338	0.08	562
	1	3,476	1.4127	0.50	1,488	0.08	251
PA 020	1	8,000	1.4127	0.50	3,241	0.08	546
	1	3,487	1.4127	0.50	1,493	0.08	251
PA 021	1	8,000	1.4127	0.50	3,424	0.08	577
	1	2,646	1.4127	0.50	1,133	0.08	191
PA 022	1	8,000	1.4127	0.50	3,424	0.08	577
	1	3,422	1.4127	0.50	1,465	0.08	247
PA 023	1	8,000	1.4127	0.50	3,424	0.08	577
	1	2,307	1.4127	0.50	988	0.08	166
PA 024	1	1,149	1.4127	0.50	492	0.08	83
	1	697	1.4127	0.50	298	0.08	50
PA 025	2	8,000	1.3772	0.50	3,338	0.08	562
	1	5,783	1.4127	0.50	2,475	0.08	417
PA 026	2	8,000	1.3772	0.50	3,241	0.08	546
	1	3,236	1.4127	0.50	1,385	0.08	233
PA 027	2	8,000	1.3772	0.50	3,338	0.08	562
PA 028	3	8,000	1.3369	0.50	3,241	0.08	546
PA 029	3	2,222	1.3369	0.50	900	0.08	152
	2	5,778	1.3772	0.50	2,411	0.08	406
	1	1,923	1.4127	0.50	823	0.08	139
PA 030	2	5,659	1.3772	0.50	2,361	0.08	398
	1	3,137	1.4127	0.50	1,343	0.08	226
PA 031	2	8,000	1.3772	0.50	3,338	0.08	562
	1	3,885	1.4127	0.50	1,663	0.08	280
PA 032	2	8,000	1.3772	0.50	3,338	0.08	562
	1	4,005	1.4127	0.50	1,714	0.08	289
PA 033	1	8,000	1.4127	0.50	3,424	0.08	577
	1	1,983	1.4127	0.50	849	0.08	143
PA 034	1	8,000	1.4127	0.50	3,424	0.08	577
	1	1,852	1.4127	0.50	793	0.08	134
PA 035	1	5,546	1.4127	0.50	2,374	0.08	400
	1	2,412	1.4127	0.50	1,032	0.08	174
PA 036	2	8,000	1.3772	0.50	3,338	0.08	562
	1	2,410	1.4127	0.50	1,032	0.08	174
PA 037	2	8,000	1.3772	0.50	3,338	0.08	562
	1	1,452	1.4127	0.50	622	0.08	105

PA 038	2	1,900	1.3772	0.50	793	0.08	134
	1	6,100	1.4127	0.50	2,611	0.08	440
	1	2,508	1.4127	0.50	1,074	0.08	181
PA 039	1	8,000	1.4127	0.50	3,424	0.08	577
	1	1,888	1.4127	0.50	808	0.08	136
PA 040	1	8,000	1.4127	0.50	3,424	0.08	577
	1	3,063	1.4127	0.50	1,311	0.08	221
PA 041	1	8,000	1.4127	0.50	3,424	0.08	577
	1	3,075	1.4127	0.50	1,316	0.08	222
PA 042	1	4,486	1.4127	0.50	1,920	0.08	324
	1	1,404	1.4127	0.50	601	0.08	101
PA 043	2	8,000	1.3772	0.50	3,338	0.08	562
PA 044	2	8,000	1.3772	0.50	3,338	0.08	562
PA 045	2	8,000	1.3772	0.50	3,338	0.08	562
PA 046	3	8,000	1.3369	0.50	3,241	0.08	546
	1	3,537	1.4127	0.50	1,514	0.08	255
PA 047	2	8,000	1.3772	0.50	3,338	0.08	562
	1	4,032	1.4127	0.50	1,726	0.08	291
PA 048	2	8,000	1.3772	0.50	3,338	0.08	562
	1	3,248	1.4127	0.50	1,390	0.08	234
PA 049	2	1,636	1.3772	0.50	683	0.08	115
	1	8,271	1.4127	0.50	3,540	0.08	596
Total		470,000			197,401		33,253

See detailed calculations in ERR spreadsheet

5.3 Leakage Emissions

Leakage emissions of the grouped project associated with reduced or avoided use of non-renewable biomass. Hence, as detailed in section 8.3 of the methodology VM 00050, Version 1.0, an adjustment factor of 0.95 is applied to the GHG emission reduction in Equation in section 4.4 below.

See detailed calculations in ERR spreadsheet.

5.4 GHG Emission Reductions and Carbon Dioxide Removals

Emission reductions are calculated by the equation as follows:

$$ER_y = (BE_y - PE_y) \times 0.95$$

Where:

ER_y Emission reductions during year y in tCO₂e

BE_y Baseline emissions during year y in tCO₂e

PE_y Project emissions during year y in tCO₂e

Result calculation for each instances depend on number of distributed ICS and proportion activity days in a year, detail below (refer to ER sheet):

Project Activity Instance	Age	Quantity distributed	Vintage 2024 (01-Jul-2024 to 31-Dec-2024)				Vintage 2025 (01-Jan-2025 to 31-Jan-2025)			
			Equivalent Operational year in the vintage 2024 during the fourth monitoring period	Baseline Emission	Project Emission	Emission Reduction	Equivalent Operational year in the vintage 2025 during the fourth monitoring period	Baseline Emission	Project Emission	Emission Reduction
PA 001	3	8,000	0.50	7,579	3,241	4,121	0.08	1,277	546	694
PA 002	3	8,000	0.50	7,579	3,241	4,121	0.08	1,277	546	694
PA 003	3	8,000	0.50	7,579	3,241	4,121	0.08	1,277	546	694
PA 004	3	2,272	0.50	2,152	920	1,170	0.08	363	155	198
	1	3,790	0.50	4,086	1,622	2,341	0.08	688	273	394
PA 005	3	8,000	0.50	7,579	3,241	4,121	0.08	1,277	546	694
PA 006	2	2,000	0.50	2,027	835	1,132	0.08	341	141	190
PA 007	2	8,000	0.50	8,106	3,338	4,530	0.08	1,366	562	764
	1	2,077	0.50	1,968	841	1,071	0.08	331	142	180
PA 008	2	8,000	0.50	8,106	3,338	4,530	0.08	1,366	562	764
	1	1,686	0.50	1,817	722	1,040	0.08	306	122	175
PA 009	2	8,000	0.50	8,106	3,338	4,530	0.08	1,366	562	764
	1	1,893	0.50	2,041	810	1,169	0.08	344	137	197
PA 010	2	8,000	0.50	8,106	3,338	4,530	0.08	1,366	562	764
	1	1,921	0.50	2,071	822	1,187	0.08	349	139	200
PA 011	2	71	0.50	72	30	40	0.08	12	5	7
	1	11,456	0.50	12,349	4,904	7,073	0.08	2,081	826	1,192
PA 012	2	8,000	0.50	8,106	3,338	4,530	0.08	1,366	562	764
	1	1,998	0.50	2,154	855	1,234	0.08	363	144	208
PA 013	2	8,000	0.50	8,106	3,338	4,530	0.08	1,366	562	764
	1	1,909	0.50	2,058	817	1,179	0.08	347	138	199
PA 014	2	8,000	0.50	8,106	3,338	4,530	0.08	1,366	562	764
PA 015	2	8,000	0.50	8,106	3,338	4,530	0.08	1,366	562	764

PA 016	2	8,000	0.50	8,106	3,338	4,530	0.08	1,366	562	764
	1	6,002	0.50	6,470	2,569	3,706	0.08	1,090	433	624
PA 017	2	8,000	0.50	8,106	3,338	4,530	0.08	1,366	562	764
	1	5,516	0.50	5,946	2,361	3,406	0.08	1,002	398	574
PA 018	2	7,181	0.50	7,276	2,997	4,065	0.08	1,226	505	685
	1	2,613	0.50	2,817	1,119	1,613	0.08	475	188	273
PA 019	2	8,000	0.50	8,106	3,338	4,530	0.08	1,366	562	764
	1	3,476	0.50	3,747	1,488	2,146	0.08	631	251	361
PA 020	1	8,000	0.50	7,579	3,241	4,121	0.08	1,277	546	694
	1	3,487	0.50	3,759	1,493	2,153	0.08	633	251	363
PA 021	1	8,000	0.50	8,624	3,424	4,940	0.08	1,453	577	832
	1	2,646	0.50	2,852	1,133	1,633	0.08	481	191	276
PA 022	1	8,000	0.50	8,624	3,424	4,940	0.08	1,453	577	832
	1	3,422	0.50	3,689	1,465	2,113	0.08	621	247	355
PA 023	1	8,000	0.50	8,624	3,424	4,940	0.08	1,453	577	832
	1	2,307	0.50	2,487	988	1,424	0.08	419	166	240
PA 024	1	1,149	0.50	1,239	492	710	0.08	209	83	120
	1	697	0.50	751	298	430	0.08	127	50	73
PA 025	2	8,000	0.50	8,106	3,338	4,530	0.08	1,366	562	764
	1	5,783	0.50	6,234	2,475	3,571	0.08	1,050	417	601
PA 026	2	8,000	0.50	7,579	3,241	4,121	0.08	1,277	546	694
	1	3,236	0.50	3,488	1,385	1,998	0.08	588	233	337
PA 027	2	8,000	0.50	8,106	3,338	4,530	0.08	1,366	562	764
PA 028	3	8,000	0.50	7,579	3,241	4,121	0.08	1,277	546	694
PA 029	3	2,222	0.50	2,105	900	1,145	0.08	355	152	193
	2	5,778	0.50	5,855	2,411	3,272	0.08	986	406	551
	1	1,923	0.50	2,073	823	1,188	0.08	349	139	200
PA 030	2	5,659	0.50	5,734	2,361	3,204	0.08	966	398	540
	1	3,137	0.50	3,382	1,343	1,937	0.08	570	226	327
PA 031	2	8,000	0.50	8,106	3,338	4,530	0.08	1,366	562	764

	1	3,885	0.50	4,188	1,663	2,399	0.08	706	280	405
PA 032	2	8,000	0.50	8,106	3,338	4,530	0.08	1,366	562	764
	1	4,005	0.50	4,317	1,714	2,473	0.08	727	289	416
PA 033	1	8,000	0.50	8,624	3,424	4,940	0.08	1,453	577	832
	1	1,983	0.50	2,138	849	1,225	0.08	360	143	206
PA 034	1	8,000	0.50	8,624	3,424	4,940	0.08	1,453	577	832
	1	1,852	0.50	1,996	793	1,143	0.08	336	134	192
PA 035	1	5,546	0.50	5,979	2,374	3,425	0.08	1,007	400	577
	1	2,412	0.50	2,600	1,032	1,490	0.08	438	174	251
PA 036	2	8,000	0.50	8,106	3,338	4,530	0.08	1,366	562	764
	1	2,410	0.50	2,598	1,032	1,488	0.08	438	174	251
PA 037	2	8,000	0.50	8,106	3,338	4,530	0.08	1,366	562	764
	1	1,452	0.50	1,565	622	896	0.08	264	105	151
PA 038	2	1,900	0.50	1,925	793	1,075	0.08	324	134	181
	1	6,100	0.50	6,576	2,611	3,767	0.08	1,108	440	635
	1	2,508	0.50	2,704	1,074	1,549	0.08	455	181	260
PA 039	1	8,000	0.50	8,624	3,424	4,940	0.08	1,453	577	832
	1	1,888	0.50	2,035	808	1,166	0.08	343	136	197
PA 040	1	8,000	0.50	8,624	3,424	4,940	0.08	1,453	577	832
	1	3,063	0.50	3,302	1,311	1,891	0.08	556	221	318
PA 041	1	8,000	0.50	8,624	3,424	4,940	0.08	1,453	577	832
	1	3,075	0.50	3,315	1,316	1,899	0.08	558	222	319
PA 042	1	4,486	0.50	4,836	1,920	2,770	0.08	815	324	466
	1	1,404	0.50	1,513	601	866	0.08	255	101	146
PA 043	2	8,000	0.50	8,106	3,338	4,530	0.08	1,366	562	764
PA 044	2	8,000	0.50	8,106	3,338	4,530	0.08	1,366	562	764
PA 045	2	8,000	0.50	8,106	3,338	4,530	0.08	1,366	562	764
PA 046	3	8,000	0.50	7,579	3,241	4,121	0.08	1,277	546	694
	1	3,537	0.50	3,813	1,514	2,184	0.08	642	255	368
PA 047	2	8,000	0.50	8,106	3,338	4,530	0.08	1,366	562	764

	1	4,032	0.50	4,346	1,726	2,489	0.08	732	291	419
PA 048	2	8,000	0.50	8,106	3,338	4,530	0.08	1,366	562	764
	1	3,248	0.50	3,501	1,390	2,005	0.08	590	234	338
PA 049	2	1,636	0.50	1,658	683	926	0.08	279	115	156
	1	8,271	0.50	8,916	3,540	5,107	0.08	1,502	596	861
Total		470,000		484,476	197,401	272,731		81,630	33,253	45,962

Vintage period	Baseline emissions (tCO ₂ e)	Project emissions (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Reduction VCUs (tCO ₂ e)	Removal VCUs (tCO ₂ e)	Total VCUs (tCO ₂ e)
01-Jul-2024 to 31-Dec-2025	484,476	197,401	-	272,731	-	272,731
01-Jan-2025 to 31-Jan-2025	81,630	33,253	-	45,962	-	45,962
Total	566,106	230,654	0	318,693	0	318,693

Vintage period	Ex-ante estimated reductions/removals	Achieved reductions/removals	Percent difference	Explanation for the difference
01-Jul-2024 to 31-Dec-2025	555,239	272,731	-50.88%	- Operation rate of project cookstove was reduced. - Total number of cookstoves incompletely distributed.
01-Jan-2025 to 31-Jan-2025	93,546	45,962	-50.87%	
Total	648,785	318,693	-50.88%	

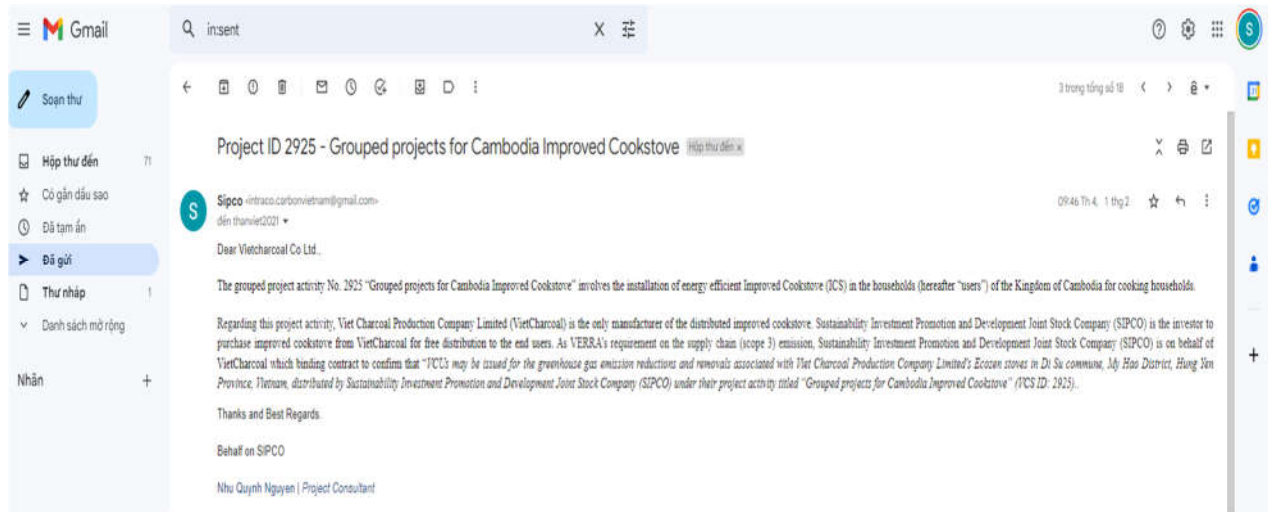
APPENDIX 1: COMMERCIALY SENSITIVE INFORMATION

Not Applicable.

Section	Information	Justification

APPENDIX 2: SUPPLY CHAIN (SCOPE 3)

1. Email of SIPCO sent to Viet Charcoal about supply chain



2. Public statement has been posted on SIPCO's website:

<https://intracocarbon.com/public-announcement-on-grouped-projects-for-cambodia-improved-cookstove-id-2925>

