



Gold Standard[®]
for the Global Goals

TEMPLATE

MONITORING REPORT

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VERSION **v. 1.1**

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

This document contains the following Sections

Key Project Information

SECTION A - Description of project

SECTION B - Implementation of project

SECTION C - Description of monitoring system applied by the project

SECTION D - Data and parameters

SECTION E - Calculation of SDG Impacts

SECTION F - Safeguards Reporting

SECTION G - Stakeholder inputs and legal disputes

Key Project Information

GS ID (s) of Project (s)	GS 5642
Title of the project (s) covered by monitoring report	Burn Stoves Project in Kenya
Version number of the PDD/VPA-DD (s) applicable to this monitoring report	4.8 09/06/2023
Version number of the monitoring report	1.4
Completion date of the monitoring report	20/12/2024
Date of project design certification	28/02/2018
Date of Last Annual Report	N/A
Monitoring period number	5
Duration of this monitoring period	14/03/2023 to 12/03/2024 (both days included)
Project Representative	ECO Climate Capital
Host Country	Republic of Kenya
Activity Requirements applied	☒ Community Services Activities ☐ Renewable Energy Activities ☐ Land Use and Forestry Activities/Risks & Capacities ☐ N/A
Methodology (ies) applied and version number	Technologies and Practices to Displace Decentralized Thermal Energy Consumption' (TPDDTEC), version 03.1
Product Requirements applied	☒ GHG Emissions Reduction & Sequestration ☐ Renewable Energy Label ☐ N/A

Table 1 - Sustainable Development Contributions Achieved

Sustainable Development Goals Targeted	SDG Impact	Amount Achieved	Units/ Products
13 Climate Action (mandatory)	Emission Reductions	315,956tCO ₂ e	VERs
1 End poverty in all its forms everywhere	Monetary savings related to the purchase of firewood	USD 95.11	Annual monetary savings as calculated in in USD per household
3 Ensure healthy lives and promote well-being for all at all ages	Perceived air quality	99.05%	Percentage of households reporting improved perception of in-door air quality
4. (Quality Education) Ensure equal access for all women and men to affordable and quality technical, vocational, and tertiary education, including university	Number of people receiving skill development training	77(39 Males and 38 females).	Number of people who participated in project training
5. (Gender Equality) Recognize and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies and the promotion of shared responsibility within the household	Average time saving associated with cooking in the project scenario	37(measured in minutes per day reported by end-user)	Average time saved cooking for women in the project scenario
7. (Affordable and Clean Energy) Ensure universal access to affordable, reliable and modern energy services	Number of sold/distributed ICS in use	192,296	Number of sold/distributed ICS in use

8. Promote sustained, inclusive, and sustainable economic growth, full and productive employment and decent work for all	Number of jobs created	68 39 males and 29 females (for this Monitoring period all are contracted staff)	Number of jobs created.
15. (Life on land) Promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally	Total non-renewable biomass saved	232,272.68	Tons of non-renewable biomass saved in the project scenario from continued use of project technologies

Table 2 – Product Vintages

		Amount Achieved
Start Dates	End Dates	VERs
14/03/2023	31/12/2023	253,630
01/01/2024	12/03/2024	62,326
TOTAL		315,956

SECTION A. DESCRIPTION OF PROJECT

A.1. General description of project

>> Burn Stoves Project in Kenya ("the Project") seeks to improve health and incomes throughout Kenya by reducing time and money spent acquiring fuel for household cooking.

Background

This project started as part of GS966 "Paradigm Healthy Water and Cookstoves Project". However, it underwent successfully design change with the Gold Standard and a new project was created for Burn manufacturing and the project was registered on 28th February 2018. In addition, the project underwent success crediting period renewal for CP II and was successfully renewed. On 31/10/2022, BURN transferred its role as Project Developer of the Project to Ecoa Climate capital¹.

Project Objective:

Burn Stoves Project in Kenya ("the Project") seeks to improve health and incomes throughout Kenya by reducing time and money spent acquiring fuel for household cooking.

Project Plan:

To achieve this goal, the project will help Kenyans access healthy, energy saving cookstoves. In order to reach a wide range of Kenyans with the most appropriate technology, the project leverages carbon finance to support the sale and distribution of stoves to households. In addition, the project uses carbon finance to develop local market channels and to support other partners as they create sustainable distribution networks of locally appropriate efficient stoves.

Baseline Household Stoves:

Most Kenyan households spend a significant portion of their time and income acquiring fuel for cooking. The continual collection of firewood and charcoal by Kenyan populations results in the exhaustion of wood supplies around townships and villages across the country. Many people are forced to travel further from the town to collect wood fuel. In the worst cases, mothers are gone for many hours, causing difficulty for children and nursing infants. In some communities,

¹ Source: Amended Cover Letter

girls are also tasked with collecting firewood, a responsibility which can keep them from attending school. An efficient charcoal stove can cut down the daily fuel consumed thus necessitating fewer trips to collect fuel or less money spent on charcoal per week. Efficient, improved stoves are a more sustainable, economic and healthier way to cook.

The project intends to make available to all counties of Kenya each of the project technologies. Additional distribution partners and networks are progressively added to the project activity.

Ecoa Climate capital actively seeks local partnerships to enable access to communities that previously have had limited exposure to new technologies.

The project activity will continually assess technology options with the goal of providing the highest performing, most affordable, and most locally appropriate technologies to Kenyans. These objectives will be carefully balanced to identify the best technology for the project. The first technologies presented for crediting, along with additional new technologies added to the project through the design change are presented below. Household Stoves Burn Charcoal Stove (Jikokoa)



Figure A.1.1: Photo: Burn Design Charcoal Stove

Testing Data²

Power Output: 1.175 kW

Thermal Efficiency: 44.9%

² Kenya Industrial Research and Development Institute (K IRDI) Testing Report

The Jikokoa stove is a charcoal stove featuring a refractory metal combustion chamber backed by abrasion resistant, lightweight ceramic insulation. This combination increases durability, efficiency and safety of the stove.

A.2. Location of project

>> Republic of Kenya

Region/State/Province etc.- All the 47 counties of Kenya are covered by the project.

City/Town/Community etc.- Whole country of Kenya

GPS coordinates³ for the Republic of Kenya:

Latitude: 0° 10' 36.73" N

Longitude: 37° 54' 29.98" E

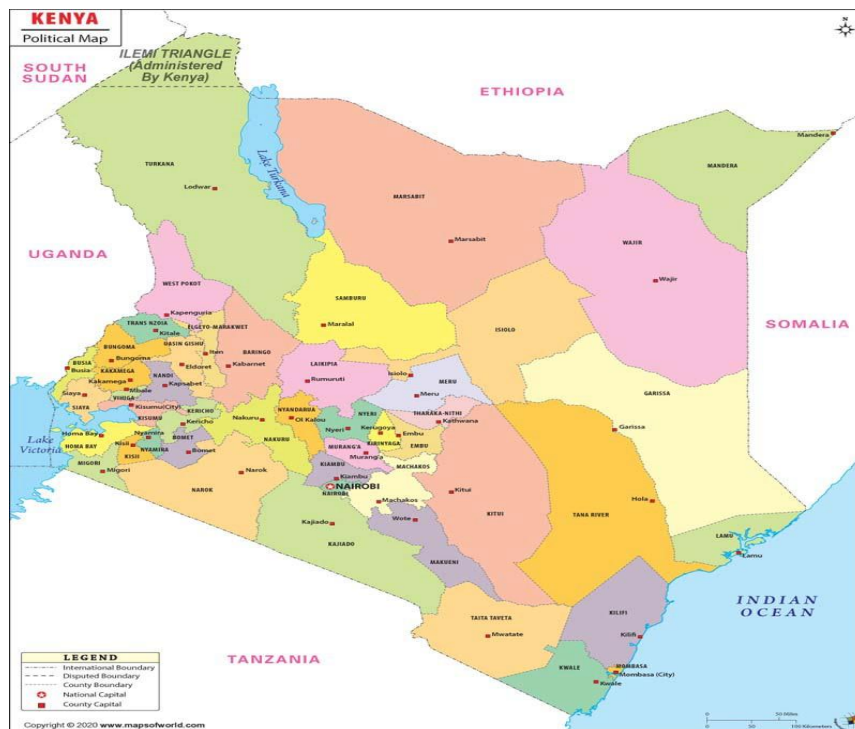


Figure A.2.1 Map of Republic of Kenya

³ <https://latitude.to/map/ke/kenya>

A.3. Reference of applied methodology

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Technologies and Practices to Displace Decentralized Thermal Energy Consumption, version 3.1⁴

- i. Tool for the demonstration and assessment of additionality (TOOL 01 Version 07.0)⁵.
- ii. Tool for Calculation of the fraction of non-renewable biomass (TOOL30 Version 4.0)⁶

A.4. Crediting period of project

>> The 2nd crediting period of the project GS5642 is from 26/04/2017 – 25/04/2024⁷

Renewable crediting period (7 years, renewable 2 times)

⁴ https://globalgoals.goldstandard.org/standards/407_V3.1_EE_ICS_Technologies-and-Practices-to-Displace-Decentralized-Thermal-Energy-TPDDTECConsumption-.pdf

⁵ <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v3.pdf>

⁶ <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-30-v4.0.pdf>

⁷ Documents of renewal of the crediting period will be submitted in September.

SECTION B. IMPLEMENTATION OF PROJECT

B.1. Description of implemented project

>> Burn has been selling stoves in Kenya since 2012 and continues to do so. Till 30/11/2020, BURN had distributed 379,652 Jikokoa cookstoves in different regions of Kenya. Out of which 34,675 stoves have aged beyond their self-life of 10 years hence not accounted in the calculations. During this monitoring period, only 344,977 stoves were found within the 10 years lifespan specified by manufacturer. The Jikokoa stove is a charcoal stove featuring a refractory metal combustion chamber backed by abrasion resistant, lightweight ceramic insulation. This combination increases durability, efficiency and safety of the stove.

Each cook stove produced and distributed under GS 5642 has a serial number tag/sticker, which identifies the cookstove assigning it a unique serial number, which can be tracked against other data such as the end user name and location and factory shipment records.

Once the stove is produced, it has a serial number attached which is scanned into the factory's production database. The serial number is also scanned at dispatch and assigned to a customer. The customer details are retained. This process records the dispatch date of the stove and the quantity sold to each customer or retailer. During warranty activation, the serial number is matched, and the end user details are collected through the "Echo mobile" application software. All the records of sales are recorded in electronic format.

The project has been implemented as described in the PDD. With reference to Design change approval dated 28/06/2023, there have been 2 permanent changes have been approved in relation to the Sustainable development goals and frequency of Monitoring of the baseline fuel consumption. The number of project Sustainable Development Contributions has been increased from the current four (4) SDG goals (SDGs 1, 3, 8 & 13) to a total of 8 goals with addition of SDGs 4,5,7 & 15. Baseline Fuel consumption is now fixed ex-ante and not monitored biennially.

At the end of this monitoring period 344,977 had been distributed. The below table shows year wise distribution of the stoves for this project:

Year of distribution	Distributed in GS 5642
2015	51,371
2016	73,709
2017	85,057
2018	54,165

2019	44,772
2020	34,441
2021	1,462
TOTAL	344,977

B.1.1 Forward Action Requests

>> N/A

B.2. Post-Design Certification changes

>>

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

>> N/A - No Temporary deviations.

B.2.2. Corrections

>> No Corrections

B.2.3. Changes to start date of crediting period

>> No Change

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

>> With reference to Design change approval dated 28/06/2023, the following permanent changes have been approved in relation to the Sustainable development goals and applied Baseline:

1. The number of project Sustainable Development Contributions has been increased from the current four (4) SDG goals (SDGs 1, 3, 8 & 13) to a total of 8 goals with addition of SDGs 4,5,7 & 15. Appropriate target indicators, methodological choices and monitoring approaches have been included in the updated PDD version 4.8 dated 09/06/2023.
2. Baseline Fuel consumption (parameter Pb,y) has is now fixed ex-ante and not monitored biennially. This can be seen in the updated PDD version 4.8 dated 09/06/2023

3. The non-CO₂ emission factor that was previously being claimed as 0 has been updated to 9.46 tCO₂/TJ. This value is based on the IPCC guidelines.
4. The Net Calorific Value ("NCV") in the PDD has been adjusted to 0.015 TJ/ton for wood fuel. In furtherance of this change, the PD further adjusted the NCV in the emissions reductions calculations to 0.156 TJ/Ton respecting the Gold Standard clarification CL_171 issued on 08/06/2023.

Impacts of Design Change

a. Additionality

>> There is no impact on the additionality as the project continues to be deemed additional pursuant to the Community Services Activity Requirements, as per which:

"Project activities solely composed of isolated units where the users of the technology/measure are households or communities or institutions and where each unit results in ≤ 600 MWh of energy savings per year" are deemed additional.

b. Applicability of methodology and other methodological regulatory documents with which the project activity has been certified.

>> There is no impact on any applicability of the methodology or other methodological regulatory documents.

c. Compliance with the monitoring plan and the applied methodology >> The approved changes impact the monitoring plan as stated in the updated (post-Design Change) PDD however, all changes are in compliance with the methodology TPDDTEC v3.1.

The parameter Pb,y has been made an ex-ante parameter instead of ex-post monitoring annually.

Additionally, the PP has added 4 more SDGs to the project namely:

- Goal 4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
- Goal 5. Achieve gender equality and empower all women and girls

- Goal 7. Ensure access to affordable, reliable, sustainable and modern energy for all
- Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

The non-CO2 emissions factor, and the NCV have also been updated, both of which are consistent with the IPCC defaults provided in the methodology.

- d. Level of accuracy and completeness in the monitoring of the project activity compared with the requirements contained in the registered monitoring plan

>> *No changes to the level of accuracy or completeness*

- e. Project Scale (note suppressed demand rules for large scale)

>> *No change and the project remains large scale*

- f. Stakeholder feedback on design change

>> Since the proposed design change is on ex-ante monitored parameters, there is no bearing on stakeholders

- g. Sustainable Development Assessment

The PP has added 4 more SDGs to the project namely:

- Goal 4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
- Goal 5. Achieve gender equality and empower all women and girls
- Goal 7. Ensure access to affordable, reliable, sustainable and modern energy for all
- Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

- h. Safeguarding Assessment

>> *There is no change to the Safeguarding Assessment*

- i. Legislation

>> There is no change to compliance with legislation.

B.2.5. Changes to project design of approved project

>> No Change

SECTION C. DESCRIPTION OF MONITORING SYSTEM APPLIED BY THE PROJECT

>> Stoves were distributed to end-users by BURN directly or through dedicated distributors. Distributors were trained on the stove distribution and data collection procedures.

The CME operates and manages an electronic data management system that stores information on and track all efficient cooking technologies under the project. As a minimum the following information will be recorded through Echo Mobile in the database:

- Unique serial number (USN) of the ICS
- Date of shipment to distributor/retailer
- Name of distributor/retailer
- Quantity of ICS distributed
- Geographic area (state) of distributor/retailer
- Model type of the ICS

Besides, the distribution database will contain end-user contact details (name, state, mobile number, or national ID number) of at least 10 times the survey and field test sample size (including usage surveys for each age of product), to ensure an adequate end-user pool to which random sampling can be applied. To claim the ICS warranty, end-users have to register their end-user details through SMS or call.

The USN of each ICS entered into the distribution database will be linked to a distribution date (recorded during distribution) or shipment date. Thus, for any monitoring period it is possible to calculate the period of time for which the stoves included in the emissions reduction calculations are deemed operating. If for e.g. a stove has been operating for 180 days, then the full-year operating fraction is 0.493 ($=180/365$ days stove will be counted as operational (= start crediting) from the next day following the stove distribution or after a conservatively calculated period of the date of shipment. The sum of the operating fractions of all appliances determines the equivalent full-time appliances for the monitoring period.

The USN has the following format comprising of 9 digits:

1 st digit	2 nd digit	3 rd	4 th	5 th	6 th	7 th	8 th	9 th
Product ID	100000 th	10000 th	1000 th	100 th	10 th	Random	Random	1 st
ID	S1	S2	S3	S4	S5	R1	R2	S6

Each section on the USN will identify the product as follows:

- Product type: the first digit identifies the stove type (e.g. Jikokoa)
- # Production number: S1 to S6 are digit slots for a sequential numbering ordered by time of production, allowing for 1 million unique serial numbers. For instance, the first stove off the line would have “000000” for its S1-S6 digits.
- Random digits: R1 and R2 are 2 random digits placed in slots 7 & 8, to make the USN unpredictable to outside parties

Example for USN: 105097338

- “1” stands for Jikokoa product ID
- “050978” for S1-S6, meaning it was the 50,979th Jikokoa produced
- “33” for R1-R2, the random digits

The data for the system will be updated and modified as required to allow for optimal performance the project activity implementation and monitoring. All data will be stored for at least two (2) years after the expiry of the crediting period.

SECTION D. DATA AND PARAMETERS

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

>>

SDG13

Data/parameter	EF_{b, CO_2}
Unit	tCO ₂ /TJ
Description	CO ₂ emission factor arising from use of fuels in baseline scenario
Source of data	2006 IPCC Guidelines for National Greenhouse Gas Inventories, volume 2, chapter 2 (Table 2.5) ⁸
Value(s) applied	112
Choice of data or Measurement methods and procedures	Default IPCC value for fuel wood is applied
Purpose of data	Calculation of baseline emissions
Additional comment	If EF is in units of tCO ₂ /t _{fuel} , remove NCV term from emission calculations. Term can include a combination of emission factors from fuel production, transport, and use.

Data/parameter	$EF_{b, non-CO_2}$
Unit	tCO ₂ e/TJ
Description	Non-CO ₂ emission factor arising from use of fuel wood in baseline scenario
Source of data	IPCC defaults are applied in conjunction with credible published literature
Value(s) applied	9.46

⁸ https://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_2_Ch2_Stationary_Combustion.pdf

Choice of data or Measurement methods and procedures	IPCC Default value
Purpose of data	Non-CO2 Emission calculation in baseline
Additional comment	The non-CO2 emission factor is based on the AR5 GWP values.

Data/parameter	EF _{p, CO2}
Unit	tCO ₂ /TJ
Description	CO2 emission factor arising from use of fuels in project scenario
Source of data	2006 IPCC Guidelines for National Greenhouse Gas Inventories, volume 2, chapter 2 (Table 2.5)
Value(s) applied	112
Choice of data or Measurement methods and procedures	Default IPCC value for fuel wood is applied.
Purpose of data	CO ₂ emission calculation in project scenario
Additional comment	

Data/parameter	EF _{p,non-CO2}
Unit	tCO ₂ e/TJ
Description	Non-CO2 emission factor arising from use of fuel wood in project scenario
Source of data	IPCC Default value
Value(s) applied	9.46
Choice of data or Measurement methods and procedures	IPCC Default value

Purpose of data	Non-CO ₂ emission calculation in project scenario
Additional comment	The non-CO ₂ emission factor is based on the AR5 GWP values.

Data/parameter	NCV _b
Unit	TJ/ton of fuel wood
Description	Net calorific value of wood fuel used in baseline
Source of data	IPCC default 2006, volume 2, chapter 1 (Table 1.2)
Value(s) applied	0.0156
Choice of data or Measurement methods and procedures	Default IPCC value for fuel wood is applied.
Purpose of data	CO ₂ emission calculation in baseline scenario
Additional comment	A wood to charcoal conversion factor of 6 is used.

Data/parameter	NCV _p
Unit	TJ/ton of fuel wood
Description	Net calorific value of the fuel wood used in project scenario
Source of data	IPCC default 2006, volume 2, chapter 1 (Table 1.2)
Value(s) applied	0.0156
Choice of data or Measurement methods and procedures	Default IPCC value for fuel wood is applied.
Purpose of data	CO ₂ emission calculation in project scenario
Additional comment	This has same value as NCV _{baseline} in projects which reduce use of the same fuel. A wood to charcoal conversion factor of 6 is used.

Data/parameter	$f_{NRBi,y}$
Unit	fraction
Description	Non-renewability status of woody biomass fuel in scenario i during year y
Source of data	C4EcoSolutions report
Value(s) applied	0.8383
Choice of data or Measurement methods and procedures	fNRB assessment based on CDM fNRB tool, Tool 30, version 04.0 ⁹
Purpose of data	Emission Reduction calculation
Additional comment	The fNRB value will remain fixed during the crediting period

Data/parameter	$P_{b,y}$
Unit	t/household/year
Description	Quantity of charcoal (in firewood equivalent terms) that is consumed in baseline scenario b during year y
Source of data	Baseline Survey
Value(s) applied	0.5962
Choice of data or Measurement methods and procedures	KT measurements using weighing scale and moisture meter <u>Digital Moisture Detector</u> - Wood moisture Wood range- 4-75% Accuracy- $\pm 0.5\%$ <u>Weighing scale</u> Hook type with temperature 50 kgs
Purpose of data	Calculation of baseline emissions
Additional comment	A single baseline fuel consumption parameter is weighted

⁹ <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-30-v4.0.pdf>

to be representative of baseline technologies being compared for project crediting.

The average charcoal consumption per household in the baseline was 1.6335 kg/hh/day . This was validated and verified in the second Monitoring period of the second crediting cycle. In addition, Gold Standard has approved the use of these results from the baseline via email communication dated 17 June 2022 which stated:

"Have you conducted any survey for the baseline KPT in the second crediting period and derived any value?

a. If yes, then use the most conservative one out of the value fixed at design certification renewal and the value derived from baseline KPT"

The Baseline fuel consumption applied is the most conservative value as compared to the fixed value applied in CP1.

D.2 Data and parameters monitored

>>

Data / Parameter	$N_{p,y}$
Unit	Number of project cookstove credited (units)
Description	Cookstoves in the project database for project scenario p through year y
Source of data	Distribution database
Value(s) applied	192,296
Measurement methods and procedures	BURN keeps records of all distributed ICS in an electronic database. As a minimum the following information will be recorded through Echo Mobile¹⁰ in the database: • Unique serial number (USN) of the ICS • Date of shipment to distributor/retailer • Name of distributor/retailer • Quantity of ICS distributed. • Geographic area of distributor/retailer • Model type of the ICS Besides, the distribution database will contain end-user contact details (name, address, mobile number, or national ID number, mode of use) of at least 10 times the survey and field test sample size (including usage surveys for each age of product), in order to ensure an adequate end-user pool to which random sampling can be applied. In order to claim the ICS warranty, end-users have to register their end-user details through SMS or call.
Monitoring frequency	Continuously
QA/QC procedures	Transparent data analysis and reporting
Purpose of data	Estimation of CO ₂ e emission reductions

¹⁰ <https://www.echomobile.org>

Additional comment

The total distribution record is divided based on project scenario to create the project database.
Any multiple use of the same BURN ICS as well as the lag time between sale/shipping and actual usage is conservatively taken into account.

Data / Parameter	$U_{p,y}$														
Unit	Percentage														
Description	Usage rate in project scenario p during year y														
Source of data	Annual Usage Survey														
Value(s) applied	Weighted usage average of 55.74% applied <table border="1"> <thead> <tr> <th>Usage Rate</th><th>55.74%</th></tr> </thead> <tbody> <tr> <td>Age group 3-4</td><td>86.67%</td></tr> <tr> <td>Age group 4-5</td><td>76.47%</td></tr> <tr> <td>Age group 5-6</td><td>72.73%</td></tr> <tr> <td>Age group 6-7</td><td>61.84%</td></tr> <tr> <td>Age group 7-8</td><td>46.77%</td></tr> <tr> <td>Age group 8-9</td><td>20.00%</td></tr> </tbody> </table>	Usage Rate	55.74%	Age group 3-4	86.67%	Age group 4-5	76.47%	Age group 5-6	72.73%	Age group 6-7	61.84%	Age group 7-8	46.77%	Age group 8-9	20.00%
Usage Rate	55.74%														
Age group 3-4	86.67%														
Age group 4-5	76.47%														
Age group 5-6	72.73%														
Age group 6-7	61.84%														
Age group 7-8	46.77%														
Age group 8-9	20.00%														
Measurement methods and procedures	Calculated														
Monitoring frequency	Annual														
QA/QC procedures	Transparent data analysis and reporting														
Purpose of data	To calculate the Usage rate in project scenario p during year y.														
Additional comment	A single usage parameter is weighted to be representative of the quantity of project technologies of each age being credited in the given project scenario. The mandatory and Good Practice level as per the 'GS Requirements and Guidelines: Usage rate Monitoring¹¹' is being followed as follows -. • A "user" is defined as a household which uses the project stove for at least 7 meals per week and who indicated the last usage within a week. Additionally, the condition of the stoves is checked where "users" are those with stoves which have with combustion chambers and grate in good working conditions. Usage was confirmed during monitoring/usage surveys. • All surveys were in person physical household visits. • The primary cook was interviewed to ascertain the kitchen practices along with some photographs of the General kitchen area showing all stoves in use in the household taken.														

¹¹ https://globalgoals.goldstandard.org/standards/407G_V2.0_EE_ICS_TPDDTEC_Usage-guidelines.pdf

- The geo coordinates of all the Households visited in person were also recorded.
- The results were cross verified by BURN Manager by calling sampled HH to check if they were called or visited by BURN team and verify the response.
- As a Good practice training is provided to field staff on how to carry out the Usage surveys.
- The records of training, demonstrations at the point of sale, post-sale follow up with end users and awareness campaigns has been submitted to VVB.

As per the manufacturer's specifications the lifetime of the Jikokoa stove is between 7 to 10 years. As a significant drop in the usage rate is observed, some stoves have not been considered for calculation from the database during the lifetime and not credited anymore.

Data / Parameter	$P_{p,y}$
Unit	t/household/year
Description	Quantity of charcoal (in firewood terms) that is consumed in project scenario p during year y
Source of data	Project FT
Value(s) applied	0.356
Measurement methods and procedures	Determined through project KPT.
Monitoring frequency	Updated every two years
QA/QC procedures	Transparent data analysis and reporting
Purpose of data	Used to calculate the fuel savings
Additional comment	A single project fuel consumption parameter is weighted to be representative of the quantity of project technologies of each age being credited in a given project scenario. PD purchased 70 brand new Wood (BSIDE EMT01 Digital LCD Portable 0~99.9% Wood Moisture Meter on 01/03/2024 and 70 Weighing scales (weighing scale hook type with temp 50kg weighing scale) for the KPT on 02/02/2024. The KPT protocol

	published at Clean Cooking Alliance website ¹² and the guidelines of methodology were followed.
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Data / Parameter	LE _{p,y}
Unit	tCO ₂ e per year
Description	Leakage in project scenario p during year y
Source of data	Baseline and monitoring surveys
Value(s) applied	0.05
Measurement methods and procedures	Methodology default value
Monitoring frequency	Every two years
QA/QC procedures	Transparent data analysis and reporting
Purpose of data	Used to calculate leakage emissions
Additional comment	Aggregate leakage can be assessed for multiple project scenarios, if appropriate

SDG 1

Data / Parameter	Monetary savings related to the purchase of charcoal
Unit	Monetary savings based on fuel savings and prevailing fuel cost
Description	Monetary savings related to the purchase of charcoal Per household per day
Source of data	Usage/monitoring survey

¹² <https://cleancooking.org/research-evidence-learning/standards-testing/protocols/>

Value(s) applied	USD 95.11
Measurement methods and procedures	Carrying out surveys (either site visits or telephone surveys) to check on the money spent for purchasing charcoal in the project scenario compared to the baseline scenario.
Monitoring frequency	At least once every two years (biennial)
QA/QC procedures	-
Purpose of data	Reporting on SDG 1
Additional comment	This parameter is measured qualitatively, but not quantitatively.

SDG 3

Data / Parameter	Perceived air quality
Unit	-
Description	Smoke levels, itchy eyes and breathing problems
Source of data	Usage/monitoring survey
Value(s) applied	99.05%
Measurement methods and procedures	Carrying out usage surveys (either site visits or telephone surveys) to check on the pollution-related inconveniences (such as smoke levels, itchy eyes and breathing problems) in the project scenario
Monitoring frequency	At least once every two years (biennial)
QA/QC procedures	-
Purpose of data	Reporting on SDG 3
Additional comment	This parameter is measured qualitatively, but not quantitatively.

SDG 4

Data / Parameter	Number of people trained/ year
Unit	Number

Description	Number of people who participated in project trainings
Source of data	Training records and participation lists
Value(s) applied	77
Measurement methods and procedures	Training records and participation lists
Monitoring frequency	Annual
QA/QC procedures	Transparent data analysis and reporting
Purpose of data	Reporting on sustainable development of the project
Additional comment	

SDG 5

Data / Parameter	Average number of minutes saved while cooking in project scenario (user estimate of comparative cooking time in baseline to project scenario)
Unit	Minutes per day
Description	Number of minutes spent on average for cooking in the project scenario
Source of data	Project monitoring survey
Value(s) applied	37
Measurement methods and procedures	Statistical average of the end-user reported difference between the number of minutes spent cooking in the project scenario compared to baseline conditions for similar meals
Monitoring frequency	Annual
QA/QC procedures	Transparent data analysis and reporting
Purpose of data	Reporting on sustainable development of the project
Additional comment	

SDG 7

Data / Parameter	Number of sold/distributed ICS in use
Unit	Number of units in use
Description	Number of sold/distributed ICS in use
Source of data	Project database & supporting files
Value(s) applied	192, 296 The usage rate is 55.7%
Measurement methods and procedures	Calculated: Total stoves Distributed * Weighted Average Usage rate
Monitoring frequency	Annual
QA/QC procedures	Transparent data analysis and reporting
Purpose of data	Reporting on sustainable development of the project
Additional comment	This value is calculated by Multiplying the Total Number of stoves to be distributed in the Project over the Crediting Period by the Usage rate per year

SDG 8

Data / Parameter	Average hourly earnings of female and male employees, by occupation, age and persons with disabilities
Unit	Number
Description	Number of people directly employed by the project
Source of data	Project records
Value(s) applied	68
Measurement methods and procedures	Direct measurement based on employment numbers of those employed directly by the project
Monitoring frequency	Annually
QA/QC procedures	Employee list can be cross-checked with contracts/payment slips or others

Purpose of data	Reporting on SDG 8
Additional comment	-

SDG 13

Data / Parameter	Number of people/households with access to the energy efficient cook stoves and the usage rates of efficient cook stoves.
Unit	Number of stove users and usage rate
Description	Number of stove users and usage rates
Source of data	Stove database records and surveys
Value(s) applied	The project has been selling stoves in Kenya since inception and currently there are 344,977 active households who have access to the stove within the period of monitoring. However, by adjusting with usage rate, the number of stoves reduces to 192,296 and this is the number which claims emission reductions. The weighted average usage rate for the project is 55.7%
Measurement methods and procedures	Usage Surveys
Monitoring frequency	Annually
QA/QC procedures	Check of database to ensure consistency of reported data Reporting on sustainable development of the project
Purpose of data	Reporting on SDG Impacts of the projects
Additional comment	-

SDG 15

Data / Parameter	Total amount of non-renewable fuel savings due to displacement or energy efficiency improvements of baseline technology
Unit	Tons
Description	Reduced non-renewable biomass consumption attributed to charcoal savings

Source of data	Project database, Monitoring & Usage Surveys
Value(s) applied	232,272.68
Measurement methods and procedures	Computed as a function of specific fuel savings for an individual technology multiplied by the total number of operational technologies (discounted for usage rate in the monitoring period) and the non-renewable Biomass fraction in Kenya.
Monitoring frequency	Annually
QA/QC procedures	Transparent data analysis and reporting
Purpose of data	Reporting on sustainable development of the project
Additional comment	-

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

Data/Parameter	Value obtained in this monitoring period	Value obtained last monitoring period
$P_{b,y}$	0.5962tons/hh/yr	0.5962tons/hh/yr
$P_{p,y}$	0.356tons/hh/yr	0.327/hh/yr
$U_{p,y}$	55.7%	66.39%
$N_{p,y}$	192,296 technology days	303,298 technology days
$LE_{p,y}$	0	0
Perceived Air quality	99.05%	95.63%
Monetary savings related to the purchase of charcoal	USD 95.11	USD 68.61
Number of people trained/ year	77 persons(39 male and 38 female)	37 persons (5 male and 32 female)
Average number of minutes saved while cooking in project scenario (user estimate of comparative cooking time in baseline to project scenario))	37 minutes per day	83 minutes per day

Average hourly earnings of female and male employees, by occupation, age and persons with disabilities	68 jobs39 males and 29 females (all are contracted casual staff)	26 jobs6 males 20 females (all contracted casual staff)
Number of sold/distributed ICS in use	192,296 ICS units active Usage rate- 55.7%	243,830 ICS units active Usage rate- 66.39%
Total amount of non-renewable fuel savings due to displacement or energy efficiency improvements of baseline technology	232,272.68tons	381,830 tons
Emission Reductions	315,956	492,874

D.4. Implementation of sampling plan

>>

Monitoring/Usage Surveys

Methodology Followed

Data collection for usage/monitoring survey was conducted from 12 March 2024 to 13 June 2024, where a total of 306 Usage Monitoring surveys were conducted. KPT surveys commenced on 2nd April to 14th June 2024 where a total of 60 surveys were done. A team of 68 enumerators were trained for the data collection by BURN team to ensure understanding of usage/monitoring requirements, data collection procedure, and specific requirements pertaining to KPTs.

The households selected for Kitchen Performance Test were visited on 4 consecutive days, avoiding worship days or any holiday. The first day was used to make introductions to the project and conduct in person interviews and observations, while the next 3 days were used for weighing all fuel types used on all cooking devices in the household during the duration of the visit. The charcoal, firewood and LPG consumption was measured over 3 days. PD purchased 70 brand new Wood (BSIDE EMT01 Digital LCD Portable 0~99.9%

Wood Moisture Meter moisture meters and 70 Weighing scales (weighing scale hook type with temp 50kg weighing scale) for the KPT.

sample selection for the KPTs was randomly generated to eliminate potential bias in end-user profiles.

The training was adequately tailored to usage surveys and included an interactive discussion of questions with surveyors, going through the questions of the usage survey questionnaire (data collection form), role plays as well as interview techniques.

Monitored Parameters related to SDG 13

1. $U_{p,y}$ - Usage rate in project scenario p during year y
2. $N_{p,y}$ - Project technologies credited (units)
3. $LE_{p,y}$ - Leakage in project scenario p during year y

Sampling frame

The sampling frame for the usage/monitoring survey, and KPTs consisted of households registered with end-user details (like location, phone number etc) in BURN's sales database.

Sampling Method

The simple random sampling approach was used.

Registered households were randomly selected by using a random generator. With random numbers generated, the matching stoves were then selected from the database and their details were identified and contacted via telephone to make bookings for availability for physical visits.

Sample size

The total sample sizes for Usage Monitoring surveys selected was 366 surveys i.e. 306 for Usage Monitoring surveys, and 60 Project KPTs.

Usage Monitoring Survey Sample Size

As per the applied methodology, the minimum total sample size is 100, with at least 30 samples for project technologies of each age being credited. Since there were no stove distributed in the project from December 2020 onwards, and the end date of the Monitoring period was on 12 March 2024, there were consequently no stoves to sample in Ages 0-1, 1-2 and 2-3. No stoves were sampled from Age 9-10 as this age is deemed to exceed their useful life, and therefore conservatively not sampled or considered in the ER calculations. The project developer sampled from the 6 age groups as follows:

Age Group	Number of Usage Surveys Sampled	Users	Non Users

Age group 0-1	0	0	0
Age group 1-2	0	0	0
Age group 2-3	0	0	0
Age group 3-4	30	27	3
Age group 4-5	34	28	6
Age group 5-6	44	35	9
Age group 6-7	76	48	28
Age group 7-8	62	34	28
Age group 8-9	60	14	46
Age group 9-10	0	0	0
TOTAL	306	186	120

Of these 306 sampled HHs 186 HHs reported using ICS whereas 120 HHs had damaged ICS or were being used for commercial purpose.

In person Surveys

In person surveys were conducted for the purpose of both the usage/monitoring survey. Data was collected by trained enumerators who spoke the local language.

Unreachable and declining households

Out of all surveys conducted, there were households that declined to participate in the surveys, while others were unreachable during the duration of the survey period. For all unreachable households, the PP ensured to make at least 3 separate attempts to reach the household before they were discounted as unreachable. To replace such households, the PP ensured to select the next available household in the randomized list of households until they found a household available for the surveys. A total of 360 households were replaced due to unreachability of the households at the time of the surveys, while another 246 households declined to participate in the surveys for various reasons.

The main reasons for replacement of households selected were:

- i. The telephone number could not be reached at least 3 attempts made on 3 days
- ii. Uncooperative/Hostile respondents; e.g. did not want to participate
- iii. The primary cook unavailable during the data collection period e.g. travelled.

1. Mandatory Monitoring Requirements: The Project has met the Mandatory requirements for Usage surveys in MP5 as demonstrated below:

Step 1. Defining stove use and non-use: A Jikokoa User has been defined based on last day of use of the stove, Frequency of use of the stove, Mode of use of the stove, signs of use of the Stove, as summarized below:

<u>Category</u>	<u>Definition of a User</u>	<u>Definition of Non User</u>
Frequency of Use	At least 7 times in a week	Less than 7 times in a week
Last day of Use	Less than or equal to 7 days ago	More than 7 days ago
Mode of Use	Domestic	Commercial
Observable Signs of Use (Ashes/warm to touch, etc)	1. Warm to the touch 2. Ashes/Embers visible 3. Food debris on stove 4. Cooking taking place	No observable signs of use Broken grate Broken combustion chamber

In MP5, only households who meet the definition of a User have been considered as users as per step 1 above.

Step 2: Household Usage Surveys:

All surveys were conducted via in person household visits to determine the project technology use. The usage surveys included the following activities as per usage guidance¹³:

- i. Kitchen Observation: The enumerators visited households to gather objective information to support usage findings e.g. checking if there were any observable signs that the stove was in use by checking if the stove was warm to the touch, whether there were ashes present on

¹³ https://globalgoals.goldstandard.org/standards/407G_V2.0_EE_ICS_TPDDTEC_Usage-guidelines.pdf

the stove, embers of charcoal on the stove, food debris on the stove, or whether there was cooking taking place at the time of the Usage survey visit. Any of these observations would indicate that the stove is indeed in use. Outcomes of these observations would counter against survey bias from the respondent answering questions in a way that they think the interviewer wants to hear. Any household that showed no sign of use of the stove was discounted as a non-user.

ii. Interview with the Primary cook: The enumerators made sure to interview the Primary cook of the household to gather information on the project stove use patterns including information on frequency of use, and presence of any other stoves in the home in use. All respondents interviewed for the Usage surveys confirmed to be the primary cooks.

iii. Photos of the Cooking Area(s): The enumerators took photographs of the project technology to gather visual data on the status of the project technology, whether the stove is abandoned, damaged, or being actively used was all captured via clear photographs. The photos took showed the whole kitchen, including all the stoves in use. The Photos also serve to provide confirmation that the household was visited.

All households visited for the usage surveys have photos of their general kitchen areas taken.

iv. GPS Coordinates: The enumerators recorded the GPS coordinates of the households visited. The Geo coordinates provide verification that the household was visited.

All households in the Usage survey sample set had their Geo location captured and recorded.

Step 3: Verification Checks:

The verification checks of survey data was performed by the project developer prior to verification by the Verification/Validation Body (VVB). At the conclusion of the data collection phase of the survey, the project developer representative telephoned a randomly selected 6% of the surveyed households to verify that homes were visited by surveyors and the recorded responses are correct. The project developer has recorded the audio telephone calls with the details of the households and responses provided that have been reached via telephone.

In total 19 randomly selected households out of the total 306 households in the sample frame were taken through verification checks and in all cases, the responses confirmed what was

reported in the Usage surveys as well as confirmed that the households were visited for the Usage Surveys.

PD has therefore met all the requirements for the Mandatory Usage requirements in the Requirements and Guidelines: Usage Rate Monitoring version 2.0

2. Good Practice Monitoring Requirements:

BURN has claimed a 55.7% usage rate following the below Monitoring requirements in addition to the Mandatory requirements described above:

i. **Field Team Training and Supervision:** BURN provided training and supervision necessary to ensure enumerators had the capacity required to complete usage survey successfully. The training of the field team was key to obtain a complete and accurate stove use dataset. Both male and female enumerators were trained. A training workshop was held on 27th -29th February 2024, which was 13 days away from the first Usage Monitoring survey conducted. The aim of the training workshop was to ensure that all team members have the knowledge and skills to carry out the usage surveys with confidence and to a high standard. The team members were trained on among other things the usage survey objectives, data collection and management processes, and protocols for troubleshooting issues arising during the field work.

Daily supervision was conducted in the following ways:

- i. WhatsApp Group:** The Project Manager created a group WhatsApp for the enumerators. In this way the Project Manager could ensure that all questions coming in from the field were addressed in real time as they were happening
 - ii. Direct Observation:** The Project Manager ensured to accompany enumerators in the first days of the data collection exercise to ensure that correct procedures were being followed as per training given to the teams.
 - iii. Data Review:** The survey data was reviewed daily in team meetings with the project manager, and the field team supervisors. The surveys were created in such a way that as soon as the enumerator finished his/her survey, they would sync the data and it would immediately be received in the BURN database. In that way, the data analysis report could be generated daily, and errors flagged. The Project manager and team leaders would then call enumerators to seek clarifications and provide additional guidance where a clear lack of understanding of survey questionnaire or survey protocols were addressed.
- The training of enumerator can be evidenced by signed participant lists which were signed by the trained team of enumerators at the end of the training workshop.

ii. End-User Training and follow up visits: In a bid to encourage ensure correct and sustained use of the project stove, BURN engages its sales agents to conduct post-purchase visits with a random sample of households who purchase the Jikokoa stoves. The in-person visits provide a useful interface through which BURN can provide personalized messaging on stove use and to understand any concerns that end users might have on stove-use, repairs, or warranty information.

During this Monitoring period, BURN conducted household visits to some of the end users to check on the use of stove and retrain the proper use to the stove where needed.



Figure D.4.1 A customer in Mombasa County being explained on how to use the stove

iii. Awareness campaigns: In this Monitoring period, BURN has carried out awareness campaigns to make sure end users of the Jikokoa stoves are aware about the continuous use of the ICS and the key benefits of the stove. These are carried out during sales promotion as well as during end user household training visits. A record of all awareness campaigns held has been provided as a support document.

Within the monitoring period, BURN rolled out its awareness campaigns through the following mediums:

1. Market Activations

Market activations are organized as a combined promotional activity as well as an opportunity to demonstrate the use of the stoves to potential end users as well as an opportunity to show case the benefits of the use of the Jikokoa in comparison to traditional stoves. These market activations are a particular useful medium because they are conducted in the local language and allow for an interface where trained sales agents can communicate stove use in an interactive setting. Market activations are conducted in all regions in which BURN distributes stoves and conducted at least 5 times a month. BURN trains its team of sales agents prior to the market activations to ensure that the correct end user messaging is provided. As with all training and employment, BURN ensures that the sales agents recruited have an equal number of men and women in participation.



Figure D.2. Sales Agent, explaining the stove usage in Homabay County



Figure D.3 Market Activation in Murang'a County

2. Media Advertisements

To further amplify end user awareness, BURN engages different mass media communication channels to communicate stove use and benefits. Within this monitoring period, BURN employed radio and social media advertisements, both in English and the local language.

The use of social media promotion (Facebook & YouTube) represents an evolution in the communication channels used to reach out to a wider audience of potential end users in Kenya. The messaging here retains the traditional focus on stove use, access and benefits but also allows for a visual medium that provides real time end user testimonials.



Figure 3: Post on Facebook creating awareness on stove's Fuel savings and Money savings on charcoal expenditure



jikokoa® Stove Benefits

- **More durable**
Made with stainless steel material that lasts even longer.
- **Uses less charcoal**
Uses half the charcoal compared to any other jiko in Kenya.
- **Rustproof**
Made from high quality stainless steel material that does not rust.
- **Improved efficiency**
Made with an innovative conical chamber that has improved thermal efficiency.
- **World's No.1 cookstove**
The cookstove with the highest customer satisfaction.

jikokoa® comes with a warranty
Register for your warranty today!

Call the number below for support.
0700667788

Agent:

Figure D.4: Photograph of Social Media Advertisement

The efficacy of these end user awareness mechanisms is evident from the usage survey results, column "JH" of the "Kobo Usage Survey Results" as is summarized below:

How did you learn about how to use the Jikokoa	Usage Survey Count of Respondents by End User Awareness Mechanism
Media like Radio,TV,Newspaper	39
Cooking Demonstration	17
Leaflet	25
Info by salesperson	58
Info at point of sale	20

Sales promotion	24
Household visit	14
Other	13
Grand Total	210

Results

Usage survey

Type of survey	Period of survey	Actual number of samples conducted	Achieved precision
Usage/monitoring survey	12/03/2024 to 13/06/2024	306	N/A

Usage Survey Results:

<u>Age Cohort</u>	<u>Number of users</u>	<u>Achieved Usage Rate</u>	<u>Usage Rate Applied – “Good Practice”</u>
Entire Sample	186	56.21%	55.74%
Age group 3-4	27	86.67%	86.67%
Age group 4-5	28	76.47%	76.47%
Age group 5-6	35	72.73%	72.73%
Age group 6-7	48	61.84%	61.84%
Age group 7-8	34	46.77%	46.77%
Age group 8-9	14	20.00%	20.00%

The Usage Monitoring survey results further corroborate the efficacy of the end-use awareness mechanisms with 100% of the respondents reporting that they felt they were sufficiently informed on how to use the project stove, while 100% reported that they felt they were sufficiently informed on the benefits of the project stove.

Kitchen Performance Test

Type of survey	Period of survey	Actual number of samples conducted	Achieved precision
Kitchen Performance Test	18/03/2024-14/06/2024	60	12.30% with a confidence level of 90%

The Kitchen Performance Test was designed to capture the entire quantum of fuels used by households. Using the Gold Standard TPDDTEC Multifuel KPT result analyzer template, all fuel consumption readings were assessed with the following results:

Fuel Type	Metric Applied	Result	Unit
Charcoal	Mean value	0.356	ton/hh/year
Firewood	Mean value	0.257	ton/hh/year
LPG	Mean value	0.047	ton/hh/year

Since the precision level attained were lower than 30%, no upper bound values were required to be applied to be conservative. Following the multi fuel analyzer template, outliers in fuel consumption were identified using the calculated upper and lower bound values. As such, outliers were identified automatically as values that lies outside most of the other values in set of data.

Sequentially, outlier identification follows the below steps:

- Calculate the 1st and 3rd quartiles.
- Calculates the interquartile range.
- Calculate the upper and lower bound of our data range.
- Using the upper and lower bounds to identify the outlying data points.

This approach is evident in the Project Multi Fuel KPT sheet in the "Outlier Identification" in columns G through J.

SECTION E. CALCULATION OF SDG IMPACTS

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

>> SDG 13: The transparent ex-ante calculations of the outcomes of SDG 13 (i.e. CO2e reductions) are provided in a separate excel spreadsheet uploaded to GS registry for the performance certification review.

The methodology directly provides the following equation for emission reductions;without separate baseline, project or leakage emission reduction equations.

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

Equation (1)

Baseline Emissions is calculated by:

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

Equation (1)

Baseline Emissions								
Item	Unit	Stoves distributed in 2015	Stoves distributed in 2016	Stoves distributed in 2017	Stoves distributed in 2018	Stoves distributed in 2019	Stoves distributed in 2020	Stoves distributed in 2021
Project Technology Days (N)	Days	50,270	72,130	83,234	53,004	43,813	33,703	1,431
Cumulative Usage Rate (U)	Percentage	55.7%	55.7%	55.7%	55.7%	55.7%	55.7%	55.7%
Baseline fuel consumption (Pb,y)	tons/household/year (charcoal ba	0.5962	0.5962	0.5962	0.5962	0.5962	0.5962	0.5962
Non-renewable biomass fraction (baseline)	fraction	83.83%	83.83%	83.83%	83.83%	83.83%	83.83%	83.83%
Wood to charcoal conversion factor	fraction	6	6	6	6	6	6	6
EFb,CO2 (combined)	tCO2e/TJ	112	112	112	112	112	112	112
EFb, nonCO2 (combined)	tCO2e/TJ	9.46	9.46	9.46	9.46	9.46	9.46	9.46
Net Caloric Value	TJ/wood	0.0156	0.0156	0.0156	0.0156	0.0156	0.0156	0.0156
Net Caloric Value _{PG}	TJ/ton	0.0473	0.0473	0.0473	0.0473	0.0473	0.0473	0.0473
EF _{3,LPGCO2}	tCO2/TJ	63.1	63.1	63.1	63.1	63.1	63.1	63.1
HH LPG use Baseline	t/bh/yr	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
HH Firewood use Baseline	t/bh/yr	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Leakage LE	tCO2e/t year	0.05	0.05	0.05	0.05	0.05	0.05	0.05
ER(tCO2e)		153,532	226,293	254,209	161,082	133,809	102,933	4,369
								Calculated

Table showing: Calculation of Baseline emissions.

The total baseline emissions are 1,031,027 ¹⁴tCO₂e.

SDG 1

In the baseline scenario, it is estimated that the households are spending on average USD 0.22 per household per day on charcoal¹⁵.

SDG 3

In the baseline scenario, it is estimated that 100% of the households suffer pollution- related inconveniences (such as smoke levels, itchy eyes and breathing problems).

Improved air quality is a result of the implementation of the project activity.

SDG 4

In the baseline scenario, it is estimated that no trainings are held in the absence of the Project, and therefore baseline value of 0¹⁶ is applied for the baseline.

SDG 5

In the baseline scenario, there are no time savings related to use of an ICS.

14 Source: File Name - CONFIDENTIAL 14th NOV GS5642 Kenya Ex Post ER calculations MPV (1)-Revised Outlier Calculation-5%leakage "Baseline and Project Emissions" cell C28

15 Source: File Name - CONFIDENTIAL 14th NOV GS5642 Kenya Ex Post ER calculations MPV (1)-Revised Outlier Calculation-5%leakage, Tab "KOBO Usage Survey Results" cell

KE14

16 Source: File Name - CONFIDENTIAL 14th NOV GS5642 Kenya Ex Post ER calculations MPV (1)-Revised Outlier Calculation-5%leakage, Tab "SDG Calculations" cell C12

SDG 7

In the baseline scenario, it is estimated that no improved cookstoves are implemented, hence the baseline value is 0¹⁷. The distribution of improved cookstoves is a result of the implementation of the carbon project activity.

SDG 8

In the baseline scenario, it is estimated that no jobs are being generated. Job creation is a result of the implementation of the carbon project activity.

SDG 15

In the baseline scenario, 576,660.43 tons of nonrenewable biomass are consumed. This is a calculated value which is a function of:

Number of ICS * Weighted average Usage rate*Baseline Fuel consumption* FNRB

Where:

Number of ICS = 344,977¹⁸

Up,y = 55.74%¹⁹

FNRB = 83.83%²⁰

Pb,y = 0.5962²¹ t/hh/year

Wood to charcoal conversion Factor = 6²²

Baseline Consumption NRB = Number of ICS * Weighted average Usage rate*Baseline Fuel consumption* FNRB

= 344,977 * 55.74% * 83.83% * (0.596*6)

= 576,660.43²³ Tons

¹⁷ Source: File Name - CONFIDENTIAL 14th NOV GS5642 Kenya Ex Post ER calculations MPV (1)-Revised Outlier Calculation-5%leakage, Tab "SDG Calculations" cell C20

¹⁸ Source: File Name - CONFIDENTIAL 14th NOV GS5642 Kenya Ex Post ER calculations MPV (1)-Revised Outlier Calculation-5%leakageTab "Technology Days" cell D26

¹⁹ Source: File Name - CONFIDENTIAL 14th NOV GS5642 Kenya Ex Post ER calculations MPV (1)-Revised Outlier Calculation-5%leakage, Tab "Usage Analysis" cell D4

²⁰ Source: File Name - CONFIDENTIAL 14th NOV GS5642 Kenya Ex Post ER calculations MPV (1)-Revised Outlier Calculation-5%leakage, Tab "ER ICS TPDDTEC" cell D15

²¹ Source: File Name - CONFIDENTIAL 14th NOV GS5642 Kenya Ex Post ER calculations MPV (1)-Revised Outlier Calculation-5%leakage, Tab "ER ICS TPDDTEC" cell D13

²² Source: File Name - CONFIDENTIAL 14th NOV GS5642 Kenya Ex Post ER calculations MPV (1)-Revised Outlier Calculation-5%leakage, Tab "ER ICS TPDDTEC" cell D16

²³ Source: File Name - 25JUNE2024 GS5642 Kenya Ex Post ER calculations MPV , Tab "SDG Calculations" cell C28

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

>> SDG 13:

The transparent ex-post calculations of the outcomes of SDG 13 (i.e. CO₂e reductions) are provided in a separate excel spreadsheet uploaded to GS registry for the performance certification review.

The methodology directly provides the following equation for emission reductions; without separate baseline, project or leakage emission reduction equations.

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

Equation (1)

Item	Unit	Project Emissions						Source
		Stoves distributed in 2015	Stoves distributed in 2016	Stoves distributed in 2017	Stoves distributed in 2018	Stoves distributed in 2019	Stoves distributed in 2020	Stoves distributed in 2021
Project Technology Days (N)	days	50,270	72,130	83,234	53,004	43,813	33,703	1,431
Cumulative Usage Rate (U)	Percentage	55.7%	55.7%	55.7%	55.7%	55.7%	55.7%	55.7%
Project fuel consumption (P _{p,y})	tons/household/year (charcoal based)	0.36	0.36	0.36	0.36	0.36	0.36	0.36
Non-renewable biomass fraction (baseline)	fraction	83.83%	83.83%	83.83%	83.83%	83.83%	83.83%	83.83%
Wood to charcoal conversion factor	fraction	6	6	6	6	6	6	6
EF _{b,CO₂} (combined)	tCO ₂ e/TJ	112	112	112	112	112	112	112
EF _{b,nonCO₂} (combined)	tCO ₂ e/TJ	9.46	9.46	9.46	9.46	9.46	9.46	9.46
Net Caloric Value	TJ/t wood	0.0156	0.0156	0.0156	0.0156	0.0156	0.0156	0.0156
Net Caloric Value _{avg}	TJ/ton	0.0473	0.0473	0.0473	0.0473	0.0473	0.0473	0.0473
EF _{b,CO₂}	tCO ₂ /TJ	63.1	63.1	63.1	63.1	63.1	63.1	63.1
HH LPG use Project	cbh/yr	0.04722	0.04722	0.04722	0.04722	0.04722	0.04722	0.04722
HH Firewood use Project	cbh/yr	0.26	0.26	0.26	0.26	0.26	0.26	0.26
Leakage LE	tCO ₂ e/t year	0.05	0.05	0.05	0.05	0.05	0.05	0.05
ER(tCO ₂ e)		106,482	152,785	176,307	112,274	92,804	71,390	3,030

Source: NON-CONFIDENTIAL_02SEP2024_ GS5642 Ex Post ER calculations v5.0 Tab: ER calculation

Results from this monitoring period shows that in MP5, the project emissions are 715,071 tCO₂e .

Item	Unit	Emission reductions						Source
		Stoves distributed in 2015	Stoves distributed in 2016	Stoves distributed in 2017	Stoves distributed in 2018	Stoves distributed in 2019	Stoves distributed in 2020	Stoves distributed in 2021
Project Technology Days (N)	days	50,270	72,130	83,234	53,004	43,813	33,703	1,431
Cumulative Usage Rate (U)	Percentage	55.7%	55.7%	55.7%	55.7%	55.7%	55.7%	55.7%
Baseline fuel consumption (P _{b,y})	tons/household/year (charcoal based)	0.5962	0.5962	0.5962	0.5962	0.5962	0.5962	0.5962
Project fuel consumption (P _{p,y})	tons/household/year (charcoal based)	0.356	0.356	0.36	0.36	0.36	0.36	0.36
Specific fuel savings (P _{b,y})	tons/household/year (charcoal based)	0.2401	0.2401	0.2401	0.2401	0.2401	0.2401	0.2401
Non-renewable biomass fraction (baseline)	fraction	0.8383	0.8383	0.8383	0.8383	0.8383	0.8383	0.8383
Wood to charcoal conversion factor	fraction	6	6	6	6	6	6	6
EF _{b,wood, CO₂} (combined)	tCO ₂ e/TJ	112	112	112	112	112	112	112
EF _{b,nonCO₂} (combined)	tCO ₂ e/TJ	9.46	9.46	9.46	9.46	9.46	9.46	9.46
Net Caloric Value	TJ/t wood	0.0156	0.0156	0.0156	0.0156	0.0156	0.0156	0.0156
Leakage LE	tCO ₂ e/t year	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Net Caloric Value _{avg}	TJ/ton	0.0473	0.0473	0.0473	0.0473	0.0473	0.0473	0.0473
EF _{b,CO₂}	tCO ₂ /TJ	63.1	63.1	63.1	63.1	63.1	63.1	63.1
HH LPG use Project	cbh/yr	0.04722	0.04722	0.04722	0.04722	0.04722	0.04722	0.04722
HH LPG use Baseline	cbh/yr	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
HH Firewood use Project	cbh/yr	0.26	0.26	0.26	0.26	0.26	0.26	0.26
HH Firewood use Baseline	cbh/yr	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Adjusted Leakage LE								
ER(tCO ₂ e)		47,049	67,508	77,902	49,608	41,006	31,544	1,239

Source: NON-CONFIDENTIAL_02SEP2024_ GS5642 Ex Post ER calculations v5.0 Tab: ER calculation

Results from this monitoring period shows that in MP5, the project has achieved 315,956 tCO₂e emission reductions.

SDG 1

The monitoring of SDG 1 has been made through a qualitative evaluation of a sample of households during the usage/monitoring survey (physical in person household visits) to check on the money spent for purchasing charcoal in the project scenario as compared to the baseline scenario. Results from this monitoring period show that on average the monetary savings are USD 95.11 per household per year related to the purchase of charcoal in the project scenario.

SDG 3

The monitoring of SDG 3 has been made through a qualitative evaluation of a sample of households during the usage/monitoring survey (physical in person household visits) to check on the pollution-related inconveniences (such as smoke levels, itchy eyes and breathing problems) in the project scenario compared to the baseline scenario. Results from this monitoring period show that 99.05% of respondents perceive air quality improvements at their homes since purchasing and cooking with the project stove as compared to the baseline.

SDG 4

The number of people trained in this monitoring period has been determined for the respective years of the monitoring period. In total, 77 members of staff (casual/contract) have been trained. Participant lists have been provided as support documents.

SDG 5

The time savings achieved in relation to cooking time between the project and baseline scenario was calculated based on results from the Usage monitoring survey and the baseline estimate in the Design certified PDD. Households reported on average time savings of 37²⁴ minutes per day.

24 CONFIDENTIAL 14th NOV GS5642 Kenya Ex Post ER calculations MPV (1)-Revised Outlier Calculation-5%leakage

SDG 7

The project stoves distributed under this project is multiplied with the usage rate (Up,y) to determine the SDG 7. In this monitoring period, the project stoves in use have been calculated as 192,296 ICS in use.

Total Distributed stoves * Up,y

Where:

Total distributed stoves = 344,977

Weighted average Usage rate = 55.74%

SDG 7 = 192,296 ²⁵

SDG 8

The number of created jobs has been determined for the respective years of the monitoring period. Both Casual and Contract employees have been considered for this parameter. An employee list has been provided as a supporting document.

	Male	Female
Contract	0	0
Casual	39	29
TOTAL	39	29

Table showing Jobs created in MP5

Total jobs created: 68

SDG 15

The tons of non-renewable biomass saved in the project scenario from continued use of project technologies was achieved as by calculation of baseline Tons of NRB and Project NRB. The exact approach is as follows:

Number of ICS * Up,y * $Ppby$ * FNRB

Where:

Number of ICS = 344,977

Up,y = 55.74%

²⁵ CONFIDENTIAL 14th NOV GS5642 Kenya Ex Post ER calculations MPV (1)-Revised Outlier Calculation-5%leakage

$$P_{p,b,y} = 0.356$$

$$CF = 6$$

$$FNRB = 83.83\%$$

$$\begin{aligned} \text{SDG 15} &= 344,977 * 55.74\% * (0.356 * 6) * 83.83\% \\ &= 344,387.75\text{Tons} \end{aligned}$$

E.3. Calculation of leakage

>> The value applied for Leakage is 0 tCO₂ source "02SEP2024 GS5642" Kenya Ex Post ER calculations MPV tab Leakage: Leakage surveys were conducted in a sample of 210 households. A Leakage survey was conducted on these households and the results of this was provided in the ER calculations sheet. The duration of the Leakage survey was from 12th March to 13th June 2024. However, for conservativeness, the PD has applied 0.05% leakage default value.

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

SDG	SDG Impact	Baseline estimate	Project estimate	Net benefit
SDG 13	Climate Action	1,031,027	715,071	315,956 tCO ₂ e
SDG 1	End poverty in all its forms everywhere	0%	54%	54%
SDG 3	Ensure healthy lives and promote well-being for all at all ages	0%	99.05%	99.05%
SDG 4	Ensure equal access for all women and men to affordable and quality technical, vocational, and tertiary education, including university	0	77	77
SDG 5	Recognize and value unpaid care and domestic work through the provision of public	77	40	37

	services, infrastructure and social protection policies and the promotion of shared responsibility within the household				
SDG 7	Ensure access to affordable, reliable, sustainable and modern energy for all	0	192,296	192,296	
SDG 8	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	0	68	68	
SDG 15	Promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally	576,660.43	344,387.75	232,272.68	

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

SDG	Values estimated in ex ante calculation of approved PDD for this monitoring period	Actual values ²⁶ achieved during this monitoring period
SDG 13: Climate actions	1,293,951	'315,956
SDG 1: End poverty in all its forms everywhere	USD 77.99/hh/year	USD 95.11 /hh/year
SDG 3: Ensure healthy lives and promote well-being for all at all ages	96%	99.05%
SDG 4: Ensure equal access for all women and men to affordable and quality technical, vocational, and tertiary education, including university	50	77
SDG 5: Recognize and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies and the promotion of shared responsibility within the household	25	37
SDG 7: Ensure access to affordable, reliable, sustainable and modern energy for all	293,444	192,296

²⁶ Whenever emission reductions are capped, both the original and capped values used for calculations must be transparently reported. Use brackets to denote original values.

SDG 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	242	68
SDG 15: Promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally	384,394	232,272.68

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

>> The actual emission reductions achieved in this monitoring period are less than the ex-ante estimations (see SDG 13). The pro-rata ex-ante estimations for the current Monitoring period (14/03/2023-12/03/2024) has been shown in detail in the ER calculation sheet.

PDD Period	Current MP	No. of days	Pro-rata PDD ERs (in tCO2e)

14/03/2023 to 12/03/2024	14/03/2023 to 12/03/2024	365	1,293,951 ²⁷
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SDG 1: From the monitoring surveys, more financial savings per household have been reported by households than what was estimated in the Ex-Ante determination in the approved PDD. This is because the usage monitoring surveys is based on real case situations as reported by households as opposed to estimations and assumptions made in the ex-ante scenario.

SDG 3: From the monitoring surveys, a higher percentage of households reported improvement in health as a result of reduced smoke on the Jikokoa while cooking as compared to the baseline scenario. This is because the usage monitoring surveys is based on real case situations as reported by households as opposed to estimations and assumptions made in the ex-ante scenario.

SDG 4: In this monitoring period, more people participated in training than was anticipated in the ex-ante assumptions.

SDG 8: In this monitoring period, fewer jobs were created than what was anticipated in the ex-ante scenario, and this is because distribution of stoves which contributes the highest number of jobs came to an end (no additional distribution was carried out during MP5).

SDG 7: In this monitoring period, fewer stoves were found to be in use than what was estimated in the Ex-Ante scenario. SDG 7 is a function of Number of distributed stoves in the Monitoring period and the Usage rate. Both parameters were assumed to be higher in the ex ante than in the ex post scenario and this led to the SDG 7 number during MP5 being less than what was anticipated in the ex-ante case.

SDG 15: The calculated value of SDG 15 achieved in MP5 is lower than what was calculated in the ex-ante scenario. SDG 15 is a function of Usage rate and number of stoves distributed (as well fuel savings and FNRB which remain constant for the MP as well as Ex Ante figures).

²⁷ CONFIDENTIAL 25JUNE2024 GS5642 Kenya Ex Post ER calculations MPV

Given that the ex-ante had assumed a higher usage rate and stove distribution than what was actually achieved in MP5, SDG 15 achieved in MP5 is consequently lower than what was calculated in the ex-ante.

SDG 5: SDG 5 shows more time savings reported by households when cooking on the project ICS as opposed to when using the baseline stove. This is based on actual account from the household during the Usage monitoring surveys, which points to the fact that the project is having a positive impact on the BURN Jikokoa stove end users.

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

>>

In the PDD, SDG 1,3,4 and 5 were estimated, where the estimations were lower than what has been achieved during the current monitoring period. However, during the current monitoring period, SDG 1, 3 and 5 have been based on actual data collection representing feedback from households on their perceived benefits from the project (Which points to end users gaining benefits from the project than was initially anticipated in the project design phase).

For SDG 4, there were more people trained during these period as opposed to the number to the estimated number. This is because training is based on real case situations as reported by households as opposed to estimations and assumptions made in the ex-ante scenario.

SECTION F. SAFEGUARDS REPORTING

>> Since, No Safeguarding principles were identified during the Validation of the project which could potentially affect the project activity and require any mitigation measures, therefore no monitoring or reporting is required for the Safeguards.

SECTION G. STAKEHOLDER INPUTS AND LEGAL DISPUTES

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

>>N/A: No grievances and complaints have been received during this Monitoring period

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

>> Not applicable

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

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

Revision History

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