Gold Standard®

# Gold standard for the global goals
# Monitoring report


June 2017, version 1

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|---|---|
| **Title of the project** | Improved Cookstoves for Social Impact in Ugandan Communities (formerly "Efficient Cooking with Ugastoves") |
| **Gold Standard project id** | GS 447 |
| **Version number of the monitoring report** | 5.0 |
| **Completion date of the monitoring report** | 23/09/2019 |
| **Date of project design certification** | 12/07/2019 (Date of approval of GS4GG transition)<br>26/03/2009 (Date of initial design certification CP1) |
| **Start date of crediting period** | II$^{nd}$ crediting period start date: 01/04/2014 |
| **Duration of this monitoring period** | 01/10/2017 to 30/09/2018 (both dates inclusive) |
| **Duration of previous monitoring period** | 01/01/2017 to 30/09/2017 (both dates inclusive) |
| **Project representative(s)** | Impact Carbon |
| **Host Country** | Uganda |
| **Certification pathway (activity certification/impact certification)** | Impact Certification |
| **SDG Contributions targeted (as per approved PDD)** | 1 - No Poverty<br>3 - Good Health and Well-Being<br>7 - Affordable and Clean Energy<br>8 - Decent Work and Economic Growth<br>13 - Climate Action |
| **Gold Standard statement/product certification sought (GSVER/ADALYs/RECs etc.)** | GSVER |
| **Selected methodology(ies)** | Technologies and Practices to Displace Decentralized Thermal Energy Consumption (TPDDTEC), version 1.0 – dated 11/04/2011 |
| **Estimated amount of annual average certified SDG impact (as per approved PDD)** | 2,087,069 $tCO_2e$ |
| **Total amount of certified SDG impact (as per approved methodology) achieved in this monitoring period** | SDG 1: 395,339 ICS in use, average 42,254 UGX savings per month per household<br>SDG 3: 0% sampled users reported an increase incidence of coughing, incidence of respiratory illness, and incidence of itchy eyes after shifting to ICS, thus 395,339 housheolds have been benefitted under SDG3<br>SDG 7: 395,339 ICS in use<br>SDG 8: 25 Jobs created<br><br>SDG 13: 769,535 (2017: 194,105 $tCO_2e$, 2018: 575,430 $tCO_2e$) |

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2018: 620,859 $tCO_2e$¶
Total: 830,240 $tCO_2e$

## SECTION A. Description of project

### A.1. Purpose and general description of project

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The purpose of the project is dissemination of improved cookstoves (ICS) in Uganda. The project by dissemination of ICS replaces existing, less efficient traditional cooking stoves using biomass (charcoal or wood-fuel) fuel for cooking. The ICSs significantly reduce biomass fuel consumption and emission of indoor air pollutants, resulting in an improved living environment for recipients. By reducing non-renewable biomass fuel consumption, the ICS results in reduction of equivalent GHG emissions.

Studies conducted to measure the fuel savings introduced by the ICS produced the following results (based on the recent KPT results):

- The charcoal ICS reduced baseline charcoal consumption in sampled households by an average of ~50%[1].
- Results suggested that household savings scaled proportionally with the number of people cooked for and the number of meals prepared.

While project ICS significantly reduces greenhouse gas emissions, they simultaneously provide following co- benefits to users and families

- Reduced exposure to health - damaging indoor air pollutants
- Reduced unsustainable wood harvest and charcoal production
- Diminishing the fuel purchase bill for households and schools and/or save fuel collection time for use in other productive activities
- Contribute to the preservation of wood resources so as to avoid inter-communal conflict over resources

In the baseline, equivalent cooking needs would have been met by traditional inefficient stoves. About 95% of Ugandans rely on solid fuels for cooking, typically charcoal or wood for urban dwellers, and wood for rural households[2] . A series of surveys held in 2013 at the national level in Uganda concluded that the most common domestic cooking devices are the traditional unimproved models of charcoal and wood stoves, such as three-stone cook stoves using wood, fires and traditional metal charcoal stoves.

In total 494,537 stoves have been installed since the beginning of the project (2006). An ICS is credited till the age of 10 years only. Thus, the number of stoves[3] deemed eligible for crediting under the monitoring period is 465,698 in 2017 and 473,571 in 2018 (discounting stoves older than 10 years).

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### A.2. Location of project

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All regions of Uganda:

[1] KPT Analysis in MP#3

[2] http://www.carbonfootprint.com/uganda_cookstoves_447.html

[3] Refer worksheet “Sales Initial Analysis for Iss4”, cell B169 and C169 in ER calculator

Geographical coordinates of Uganda are 1°22'24'' N 32°17'25'' E[4].


Figure 1: Location of Project Activity

### A.3. Reference of applied methodology

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Gold Standard Methodology "Technologies and Practices to Displace Decentralized Thermal Energy Consumption" Version 1.0, 11/04/2011[5].

### A.4. Crediting period of project

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7 years, renewable twice

I[st] crediting period = 01/04/2007 – 31/03/2014

II[nd] crediting period = 01/04/2014 – 31/03/2021

## SECTION B. Implementation of project

### B.1. Description of implemented project

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**Description of Installed Technology, technical processes and equipment**

Based on different utilities and usage requirements, the project ICS are designed to fit different family sizes, with different cooking needs. There are 5 different stove models disseminated under the project. All these stoves are charcoal stoves having same fundamental combustion technologies and their respective average thermal efficiencies are within +/- 5% range. Hence the population under the Project is deemed homogeneous. The models disseminated in the project are given below:

[4] https://www.geodatos.net/en/coordinates/uganda

[5] The first crediting period of the project followed the methodology approved in January 2008 by the Gold Standard Foundation entitled "Improved Cook-Stoves and Kitchen Regimes"

Ugastove

Thermal Efficiency: 27.23%

Energy Uganda Foundation (EUF)

Thermal Efficiency: 26.89%

Safe Energy Saving Stove for Africa (SESSA)

Thermal Efficiency: 23.78%

Friends of Wealthy Environment (FOWE) Thermal Efficiency: 27.56%

African Energy Stoves (AES)

Thermal Efficiency: 25.33%

**Information on Implementation**

The aforementioned stoves are being distributed since 2006. The year wise distribution of stoves are as follows:

| Year | Number of units |
|---|---|
| 2006 | 7,960 |
| 2007 | 13,006 |
| 2008 | 16,850 |
| 2009 | 22,791 |
| 2010 | 22,030 |
| 2011 | 31,603 |
| 2012 | 86,806 |
| 2013 | 166,659 |
| 2014 | 68,625 |
| 2015 | 19,637 |
| 2016 | 12,422 |
| 2017 | 13,628 |
| 2018 | 12,520 |
| **Grand Total** | **494,537** |

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The stoves are deemed under continuous operation since their installation. Also, any stove older than 10 years is not accounted in ER calculations. Hence in the current monitoring period only stoves from October 2007 onwards are considered for ER calculations. Refer ER calculator, worksheet "Sales Analysis for Iss4" for expiry date of the stoves and their eligibility for crediting in the monitoring period.

## B.2. Post-registration changes

### B.2.1. Temporary deviations from Certified Key Project Information, Project Design Document, Monitoring & Reporting Plan, applied methodology or applied standardized baseline

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Not applicable

### B.2.2. Corrections

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The following correction (from the CP2 PDD) have been made. There corrections were also applied in last issuance request and were approved by the Gold Standard. For details refer the CP2 MP#3 monitoring report.

For the calculation of Emission Reduction, in this Monitoring Period the default values of Emission Factor and NCV of Charcoal has been used because all the HHs uses Charcoal as the fuel.

All parameters listed in the registered PD as ex-ante are for wood fuel. It was mentioned in the PD that "A general trend of fuel mixture in the form of firewood and charcoal is observed across the country. Thus, the charcoal and wood fuels are quantified separately and subsequently combined into a unique fuel consumption value in the form of woody biomass using the charcoal conversion factor".

Hereafter following values has been used for the calculation.

| | As per registered PD | Value used in the MP | Rationale |
|---|---|---|---|
| NCV of Fuel that has been substituted | Wood = 15.6 TJ/Gg | Charcoal = 29.5 TJ/Gg[6] | As mentioned above the substitute fuel is charcoal. Hence value of charcoal is used. |
| $CO_2$ Emission Factor (Fuel Consumption) | Wood = 112,000 $kgCO_2$ / TJ | Charcoal = 112,000 $kgCO_2$ / TJ[7] | As mentioned above the substitute fuel is charcoal. Hence value of charcoal is used. |
| Non-$CO_2$ Emission Factor | Wood = 33,952.2 $kgCO_2$ / TJ | Charcoal = 9.88 $tCO_2$ / TJ[8] | As mentioned above the substitute fuel is charcoal. Hence value of charcoal is used. |
| Emission Factor from Fuel Production | - | Charcoal = 1.802 $kgCO_2$ / kg of charcoal production[9] | Net EF can include a combination of emission factor from fuel production |

[6] http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_1_Ch1_Introduction.pdf (table 1.2)

[7] http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_1_Ch1_Introduction.pdf (table 1.4)

[8] http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_2_Ch2_Stationary_Combustion.pdf (table2.9) - $CH_4$ EF for charcoal stoves is 330.5 {(275+386)/2} $kgCH_4$/TJ; hence $CO_2$eq EF for charcoal stoves is 8,262.5 (330.5*25) $kgCO_2$/TJ. $N_2O$ EF for charcoal stoves is 5.45 {(1.6+9.3)/2} $kgN_2O$/TJ; hence $CO_2$eq EF for charcoal stoves is 1,624.1 (5.45*298) $kgCO_2$/TJ. Therefore Charcoal Non-$CO_2$ EF is 9,886.6 (8,262.5+1,624.1) $kgCO_2$/TJ.

[9] http://ehsdiv.sph.berkeley.edu/krsmith/publications/JGRPennise.pdf (table 6.a) {As per " Consolidated GHG database for the charcoal sector" (https://www.google.com/url?q=https://cdm.unfccc.int/methodologies/standard_base/GHDdatabase.xls&sa=U&ved=0ahUKEwj1kKms84_LAhXMV44KHWo-CCAQFggEMAA&client=internal-uds-cse&usg=AFQjCNHxfn6_0vdrn0E4c368OrOJqKUa1g). The emission of CO2 from 1 Kg of Charcoal Production is 6513 Grams. The value we are using here for the calculation is 1802 Grams and that is conservative.

In line with the FAR raised by GS during the GS4GG transition annex AA review feedback, the PDD has been corrected to update the error in ex-ante calculation in the originally registered PDD (CP2). In the originally registered PDD, the ex-ante value for a given year were calculated considering only the stoves sold in that year. However, the ex-ante calculations should consider the total cumulative number of stoves distributed till that year. Thus, the ex-ante values have now been corrected considering total cumulative number of stove installations in a year, thereby yielding correct ex-ante VER projections. For details refer the CP2 PRC PDD and CP2 .

The summary of revised ex-ante estimates of ERs is as follows:

| Year | Baseline estimate | Project estimate | Net benefit |
|---|---|---|---|
| 2014* | 1,313,273 | 888,173 | 425,099 |
| 2015 | 2,504,141 | 1,692,784 | 811,356 |
| 2016 | 3,813,174 | 2,577,385 | 1,235,789 |
| 2017 | 5,252,189 | 3,549,972 | 1,702,217 |
| 2018 | 6,838,134 | 4,621,371 | 2,216,763 |
| 2019 | 8,581,357 | 5,799,235 | 2,782,122 |
| 2020 | 10,497,585 | 7,094,210 | 3,403,375 |
| 2021** | 11,024,219 | 7,450,160 | 3,574,059 |
| Total | 49,824,070 | 33,673,291 | 16,150,779 |
| Total number of crediting years | 7 | | |
| Annual average over the crediting period | 6,228,009 | 4,209,161 | 2,018,847 |
| * 2014 represents estimates for April -December 2014 | | | |
| ** 2021 represents estimates for January - March 2021 | | | |

### B.2.3. Changes to start date of crediting period

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Not applicable

### B.2.4. Permanent changes from registered monitoring plan, applied methodology or applied standardized baseline

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Not applicable

### B.2.5. Changes to project design of approved project

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Not applicable

## SECTION C. Description of monitoring system applied by the project

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**A. Total Sales Record**

Sales records are maintained continuously by various partners. Partner Sales records provide a summary of daily sales. Partner sales records are first captured in paper form on

warranty cards. These are entered into electronic databases (QuickBooks / excel etc.) using paper records and are submitted monthly for spot-checked internally by Impact Carbon's Business Development team on a monthly basis, for accuracy and to catch any data entry errors. The sales record is used to create the Project Database. Paper invoices and receipts are archived to provide an additional cross-check. The PP updates the project database every month based on the sales data received from Partners. Project Database is a conservative record of all stoves that have entered use (stoves are considered to be in use on the first day of the month, following the month in which they have been sold as a conservative measure).

B. Monitoring Data Management and Storage

The results of all Usage cum Kitchen Surveys (UKS) and Kitchen Performance Tests (KPT's), as applicable are collated in excel spreadsheets and stored on a central server in an electronic format with original copies of our project documentation are retained in our Uganda HQ.

All surveys are administered by trained staff who are conversant in the local dialect to ensure that response collection was consistent and not affected by any regional language barriers. Field staffs were provided with an English and local language version of the questionnaire to provide for the greatest possible standardisation of responses.

The UKS provides information regarding the usage or project stoves, kitchen conditions (use of multiple stoves, number of meals cooked, commercial / domestic cooking etc) and sustainable development indicators to the project scenario. UKSs are carried out via physical visit to project households. Data collected during an UKS contains the following type of data:

- General information - Name, address, telephone number etc.
- Household socio-demographic information
- Cooking behaviour (number of meals cooked, commercial cooking), Stove type (number of project stoves & mix)
- Usage levels

The answer sheets completed in the field are returned to the Uganda office for transcribing into an excel spreadsheet. Once completed, the data is sent to the US office for analysis. As required by the applicable Gold Standard Methodology the UKS is conducted annually to capture any emerging trends.

C. Periodic Monitoring Task

The periodic monitoring tasks are as follow:

- Usage cum Kitchen Surveys are conducted annually to determine usage, emerging trends in demographics, fuel use and sustainability indicators.
- A project KPT is carried out every two years to assess any changes in performance of the project stoves. Given, KPTs were carried out in the last monitoring period (MP#3), hence in the current monitoring period, the KPT results (biomass saving per stove) established in MP#3 have been used.
- Project Technology Days is reviewed continuously throughout the project in order to determine the number of crediting stoves and the period for which they should

be credited in a given monitoring period (based on stove installation and expiry date).

- Leakage estimates (identified in the PDD and possible new sources) is surveyed every two years. Given, leakage assessment was carried out in the last monitoring period (MP#3), hence in the current monitoring period, the same results have been applied instead of carrying a new assessment.
- NRB fraction assessed by literature review every two years – The UNFCCC approved CDM standardized baseline ASB0002 for Uganda provides a $f_{NRB}$ value of 0.88.

All data recorded will be stored by the project proponents for a minimum of two years after the end of the crediting period or the last issuance of VERs, whichever occurs later.

## SECTION D. Data and parameters

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

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|---|---|
| **Relevant SDG Indicator** | SDG 13: Climate Action |
| **Data/parameter:** | $EF_{b,CO2}$ |
| Unit | $kgCO_2/TJ$ |
| Description | $CO_2$ emission factor arising from use of fuels (wood or wood equivalents) in baseline scenario |
| Source of data | IPCC defaults |
| Value(s) applied) | 173.085 |
| Choice of data or measurement methods and procedures | Deemed valid by applied GS VER Methodology,<br>2006 IPCC Guidelines for National Greenhouse Gas Inventories, and project scenario specific calculations.<br>The consolidated GHG database for the informal charcoal sector (Table 6A of "Emissions of greenhouse gases and other airborne pollutants from charcoal making in Kenya and Brazil, David M. Pennise, Kirk R. Smith, Environmental Health Sciences, University of California, Berkeley, California. Journal of Geophysical Research Vol 106 October 27, 2001".),<br>Please refer the ER sheet for detailed calculation of the parameter |
| Purpose of data | Baseline emission calculations. |
| Additional comments | When EF is in units of $tCO_2/t\_fuel$, NCV term will be removed from emission calculations. Term can include a combination of emission factors from fuel production, transport, and use.<br>Measuring emission factors from stove technologies is costly and difficult to do accurately. Lacking measurable emission factors from the project technologies, PP applies default IPCC emission values. |

| | |
|---|---|
| **Relevant SDG Indicator** | SDG 13: Climate Action |
| **Data/parameter:** | $EF_{b,nonCO2}$ |
| Unit | $kgCO_2e/TJ$ |
| Description | Non-$CO_2$ emission factor arising from use of fuels (wood and wood equivalents) in baseline scenario |
| Source of data | IPCC 2006 Guidelines for National Greenhouse Gas Inventories<br>IPCC 2007 4th Assessment report |
| Value(s) applied | 9.88 |
| Choice of data or measurement methods and procedures | Deemed valid by GS VER Methodology |
| Purpose of data/parameter | Baseline emission calculations. |
| Additional comments | Term can include a combination of emission factors from fuel production, transport, and use.<br>Measuring emission factors from stove technologies is costly and difficult to do accurately. Lacking measurable emission factors from the project technologies, PP applies default IPCC emission values. |

| | |
|---|---|
| **Relevant SDG Indicator** | SDG 13: Climate Action |
| **Data/parameter:** | $EF_{p,CO2}$ |
| Unit | $kgCO_2/TJ$ |
| Description | $CO_2$ emission factor arising from use of fuels (wood and wood equivalents) in project scenario |
| Source of data | IPCC 2006 Guidelines for National Greenhouse gas Inventories<br>The consolidated GHG database for the informal charcoal sector (Table 6A of "Emissions of greenhouse gases and other airborne pollutants from charcoal making in Kenya and Brazil, David M. Pennise, Kirk R. Smith, Environmental Health Sciences, University of California, Berkeley, California. Journal of Geophysical Research Vol 106 October 27, 2001".), |
| Value(s) applied | 173.085 |
| Choice of data or measurement methods and procedures | Deemed valid by applied GS VER Methodology<br>2006 IPCC Guidelines for National Greenhouse Gas Inventories<br>Please refer the ER sheet for detailed calculation of the parameter |

| | |
|---|---|
| Purpose of data/parameter | Project emission calculations. |
| Additional comments | When EF is in units of $tCO_2/t\_fuel$, NCV term will be removed from emission calculations. Term can include a combination of emission factors from fuel production, transport, and use.<br>Measuring emission factors from stove technologies is costly and difficult to do accurately. Lacking measurable emission factors from the project technologies, PP applies default IPCC emission values. |

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|---|---|
| **Relevant SDG Indicator** | SDG 13: Climate Action |
| **Data/parameter:** | $EF_{p,nonCO2}$ |
| Unit | kg $CO_2e/TJ$ |
| Description | Non-$CO_2$ emission factor arising from use of fuels (wood and wood equivalents) in project scenario |
| Source of data | Options: IPCC defaults, credible published literature, project-relevant measurement reports, or project-specific field tests prior to first verification.<br>Chosen:<br>IPCC 2006 Guidelines for National Greenhouse gas Inventories<br>IPCC 2007 4th Assessment report |
| Value(s) applied | 9.88 |
| Choice of data or measurement methods and procedures | Deemed valid by GS VER Methodology |
| Purpose of data/parameter | Baseline emission calculations. |
| Additional comments | Term can include a combination of emission factors from fuel production, transport, and use.<br>Measuring emission factors from stove technologies is costly and difficult to do accurately. Lacking measurable emission factors from the project technologies, PP applies default IPCC emission values. |

| | |
|---|---|
| **Relevant SDG Indicator** | SDG 13: Climate Action |
| **Data/parameter:** | $NCV_b$ |
| Unit | TJ/Gg |
| Description | Net calorific value of the fuel (wood and wood equivalents) used in the baseline |
| Source of data | IPCC default value<br>2006 IPCC Guidelines for National Greenhouse Gas Inventories |
| Value(s) applied | 29.5 |

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|---|---|
| Choice of data or measurement methods and procedures | Adopt IPCC default values, for the wood and charcoal fuel mix.<br>Net Calorific Values were not measured in actual baseline; thus, the project uses IPCC default values. |
| Purpose of data/parameter | Baseline emission calculations. |
| Additional comments | When EF is in units of $tCO_2$/fuel, the NCV term will be removed from emission calculations. |

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|---|---|
| **Relevant SDG Indicator** | SDG 13: Climate Action |
| **Data/parameter:** | $NCV_p$ |
| Unit | TJ/Gg |
| Description | Net calorific value of the fuel (wood and wood equivalents) used in the project |
| Source of data | IPCC default value for wood.<br>2006 IPCC Guidelines for National Greenhouse Gas Inventories |
| Value(s) applied | 29.5 |
| Choice of data or measurement methods and procedures | Adopt IPCC default values.<br>Net Calorific Values were not measured in the project; thus the project uses IPCC default values. |
| Purpose of data/parameter | Project emission calculations |
| Additional comments | When EF is in units of tCO2/fuel, the NCV term will be removed from emission calculations. |

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| **Relevant SDG Indicator** | SDG 13: Climate Action |
| **Data/parameter:** | $f_{nrb,i,y}$ |
| Unit | Fractional non-renewability |
| Description | Non-renewability status of woody biomass fuel in scenario i during year y |
| Source of data | Approved CDM Standardized Baseline ASB0002 – https://cdm.unfccc.int/methodologies/standard_base/2015/sb41.html |
| Value(s) applied | 0.88 |
| Choice of data or measurement methods and procedures | Published literature, approved by UNFCCC |
| Purpose of data/parameter | Baseline emission calculations |
| Additional comments | |

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## D.2. Data and parameters monitored

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|---|---|
| **Relevant SDG Indicator** | SDG 13: Climate Action |
| **Data/parameter:** | $P_{b,y}$ |
| Unit | Kg/person-meal |
| Description | Quantity of fuel (Charcoal) that is consumed in baseline scenario b during year y |
| Measured/calculated/default | Calculated |
| Source of data | CP2 MP#3 Monitoring report, section D.2, page number 11 (based on KPTs conducted in MP3) |
| Value(s) of monitored parameter | **Description** / **Value** / **Unit**<br>Baseline KPT (Commercial) / 0.1980 / kg/person/meal<br>Baseline KPT (Domestic) / 0.2015 / kg/person/meal |
| Monitoring equipment | N.A. (using last MP results) |
| Measuring/reading/recording frequency | Biennially |
| Calculation method (if applicable) | N. A |
| QA/QC procedures | N. A |
| Purpose of data/parameter | ER Calculation |
| Additional comments | Updated every two years, or more frequently |

| | |
|---|---|
| **Relevant SDG Indicator** | SDG 13: Climate Action |
| **Data/parameter:** | $P_{p,y}$ |
| Unit | Kg/person-meal |
| Description | Quantity of fuel that is consumed in project scenario b during year y |
| Measured/calculated/default | Calculated |
| Source of data | CP2 MP#3 Monitoring report, Section D.2 page number 11 (based on KPTs conducted in MP3) |
| Value(s) of monitored parameter | **Description** / **Value** / **Unit**<br>Project KPT (Commercial) / 0.1093 / kg/person/meal<br>Project KPT (Domestic) / 0.0997 / kg/person/meal |
| Monitoring equipment | N.A. (using last MP results) |
| Measuring/reading/recording frequency | Biennially |
| Calculation method (if applicable) | N. A |
| QA/QC procedures | N. A |
| Purpose of data/parameter | ER Calculation |

| | |
|---|---|
| Additional comments | Updated every two years, or more frequently |

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|---|---|
| **Relevant SDG Indicator** | SDG 13: Climate Action |
| **Data/parameter:** | $U_{p,y}$ |
| Unit | Fraction/% |
| Description | Cumulative Usage rate for technologies in project scenario p in year y, based on cumulative adoption rate and drop off rate revealed by the usage surveys. |
| Measured/calculated/default | Calculated |
| Source of data | Usage Survey |
| Value(s) of monitored parameter | 81.25% |
| Monitoring equipment | N.A. |
| Measuring/reading/recording frequency | Annually |
| Calculation method (if applicable) | By doing survey and then analysing the survey data |
| QA/QC procedures | Usage Survey are carried out by staff trained by Impact Carbon to meet the specific requirements of the methodology. All data presented in excel is subject to checking and cross referencing of a sample of the raw data by Impact Carbon. |
| Purpose of data/parameter | ER Calculation |
| Additional comments | |

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| **Relevant SDG Indicator** | SDG 13: Climate Action |
| **Data/parameter:** | $N_{p,y}$ |
| Unit | Project technologies days credited (stove days) |
| Description | Technologies in the project database for project scenario p through monitoring period |
| Measured/calculated/default | Measured and Calculated |
| Source of data | Total Sales records |
| Value(s) of monitored parameter | 2017: 42,505,098<br>2018: 126,007,540 |
| Monitoring equipment | N.A. |
| Measuring/reading/recording frequency | Continuously |
| Calculation method (if applicable) | Cumulative stoves installed under project * average number of operational days in the monitoring period |

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Total: 171,611,714

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|---|---|
| QA/QC procedures | Values can be cross checked by sales records. |
| Purpose of data/parameter | ER Calculation |
| Additional comments | ICS that have expired before the monitoring period have the count of "operational days in the monitoring period" as 0 thus ensuring that the average number of operational days in the monitoring period corresponds to un-expired stoves only. |

| | |
|---|---|
| **Relevant SDG Indicator** | SDG 13: Climate Action |
| **Data/parameter:** | $LE_{p,y}$ |
| Unit | $t\_CO_2e$ per year |
| Description | Leakage in project scenario p during year y |
| Measured/calculated/default | N.A. |
| Source of data | CP2 MP#3 Monitoring report page number 11 |
| Value(s) of monitored parameter | 0 |
| Monitoring equipment | N.A. |
| Measuring/reading/recording frequency | Biennially |
| Calculation method (if applicable) | N.A. |
| QA/QC procedures | N.A. |
| Purpose of data/parameter | ER calculation |
| Additional comments | No leakage was identified |

| | |
|---|---|
| **Relevant SDG Indicator** | SDG 13: Climate Action |
| **Data /parameter:** | Implementation of baseline stove disposal incentive or education campaign |
| Unit | Fraction |
| Description | Proportion of project end users that are reached through the incentive mechanism or education campaign to discourage old stove disposal |
| Measured/calculated/default | Measured |
| Source of data | Disclaimer on Warranty cards |
| Value(s) of monitored parameter | 1.00 |
| Monitoring equipment | N.A. |
| Measuring/reading/recording frequency | Updated every two years, or more frequently |
| Calculation method (if applicable) | - |

| | |
|---|---|
| QA/QC procedures | Transparent data analysis and reporting. |
| Purpose of data/parameter | To determine the reach and effectiveness of the baseline stove disposal incentive or education campaign |
| Additional Comments | An extended warranty clause on warranty cards ensures that all users are informed on the incentive mechanism for disposal of old stove. As warranty cards accompany all sales, hence the fraction is deemed as 1 (100%) |

Following parameters were not listed in the monitoring parameters in the PDD but have been monitored for the transparency of the calculation.

| | |
|---|---|
| **Relevant SDG Indicator** | SDG 13: Climate Action |
| **Data/parameter** | Multi-ICS Usage |
| Unit | Fraction / number |
| Description | number of stoves per user |
| Measured/calculated/default | Calculated |
| Source of data | Usage Survey MP3 data |
| Value(s) of monitored parameter | Average number of Commercial stoves per user: 2.528 ; Average number of domestic stoves per user: 1.656 |
| Monitoring equipment | N.A. |
| Measuring/reading/recording frequency | Annually |
| Calculation method (if applicable) | Analysing the survey data. For detailed calculation, please refer to usage survey excel sheet. |
| QA/QC procedures | The value used here is based on Usage survey data. |
| Purpose of data/parameter | ER Calculation |
| Additional comments | The KPT results provide information of biomass usage in the kitchen and not on per-stove basis. Thus, the average number of stoves in a kitchen has been monitored to determine the biomass usage per stove. The biomass savings per stove are then used to determine the emission reduction over the stove population.<br>FTs are carried out by staff trained by Impact Carbon to meet the specific requirements of the methodology. All data presented in excel is subject to checking and cross referencing of a sample of the raw data by Impact Carbon. |

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The following SD indicators have been monitored in line with the GS4GG transition Annex AA.

| | |
|---|---|
| **Relevant SDG Indicator/Safeguarding Principle** | **1.4.1 Proportion of population living in households with access to basic services** |
| **Data / Parameter** | $ABS_{HH}$ |
| Unit | Number |
| Description | Access to basic service to households/institutions |

| | |
|---|---|
| Source of data | 1. ICS distribution records<br>2. Ex-post Monitoring Survey Records |
| Value(s) applied | 1. 395,339 (ICS in use)<br>2. As per Survey, more than 92% users said that they noticed a reduction in fuel consumption after purchasing ICS. The Monitoring KS estimates the average money saved from fuel savings after using ICS is around 42,254 UGX per month |
| Measurement methods and procedures | 1. Monitoring and recording of number of ICS distributed under the project<br>2. Ex-post monitoring survey to assess money savings due to reduced fuel consumption |
| Monitoring frequency | Annually |
| QA/QC procedures | - |
| Purpose of data | SDG 1 contribution |
| Additional comment | |

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|---|---|
| **Relevant SDG Indicator/Safeguarding Principle** | **3.9.1Mortality rate attributed to household and ambient air pollution** |
| **Data / Parameter** | $AQ_{HH}$ |
| Unit | - |
| Description | Air Quality in project households/institutions |
| Source of data | Ex-post monitoring surveys |
| Value(s) applied | No sampled user reported an increase in incidence of coughing, incidence of respiratory illness, and incidence of itchy eyes after shifting to ICS |
| Measurement methods and procedures | Qualitative assessment of change in smoke levels, incidence of coughing, incidence of respiratory illness, and incidence of itchy eyes after shifting ICS (via ex-post monitoring surveys) |
| Monitoring frequency | Annually |
| QA/QC procedures | - |
| Purpose of data | SDG 3 contribution |
| Additional comment | |

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| | |
|---|---|
| **Relevant SDG Indicator/Safeguarding Principle** | **7.1 By 2030, ensure universal access to affordable, reliable and modern energy services** |
| **Data / Parameter** | $AACS_{HH}$ |
| Unit | Number |
| Description | Number of households and institutions having access to affordable, reliable and modern project ICS. |
| Source of data | ICS distribution records |
| Value(s) applied | 395,339 (ICS in use) |
| Measurement methods and procedures | Monitor the number of ICS distributed under the project as an indicator of providing reliable, clean and modern technology (relative to baseline stoves). |
| Monitoring frequency | Continuous |
| QA/QC procedures | - |
| Purpose of data | SDG 7 contribution |
| Additional comment | - |

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| Relevant SDG Indicator/Safeguarding Principle | 8.5.1Average hourly earnings of female and male employees, by occupation, age and persons with disabilities |
|---|---|
| **Data / Parameter** | QE IG |
| Unit | Number |
| Description | Quantitative Employment and income generation |
| Source of data | Employment records |
| Value(s) applied | 25 |
| Measurement methods and procedures | Recording the number of employees (male / female) in the project under administrative, sales, production and management positions |
| Monitoring frequency | Annually |
| QA/QC procedures | - |
| Purpose of data | SDG 8 contribution |
| Additional comment | - |

### D.3. Implementation of sampling plan

>>

The parameters above have been monitored through a Random Sampling. 40 random samples were drawn for each vintage with a target to cover minimum 30 samples in each vintage. Along with data captured in Sales Record further contact details are compiled for a subset of stove customers in a Customer Database. The Customer Database is used for customer follow-up and sampling for monitoring surveys.

**Kitchen Performance Test- Project Stove**

The kitchen performance test-project stove was performed for 3rd monitoring period of 2nd crediting period and same values has been used for this monitoring period. The project KPT values are as follows:

| Parameter | Symbol | Value | Unit | Source |
|---|---|---|---|---|
| Project KPT (Commercial) | $P_{p,y}$ | 0.1093 | kg/person/meal | KPT data MP#3 |
| Project KPT (Domestic) | $P_{p,y}$ | 0.0997 | kg/person/meal | KPT data MP#3 |

**Kitchen Performance Test- Baseline Stove**

The kitchen performance test-baseline stove was performed for 3rd monitoring period of 2nd crediting period and same values has been used for this monitoring period. The baseline KPT values are as follows:

| Parameter | Symbol | Value | Unit | Source |
|---|---|---|---|---|
| Baseline KPT (Commercial) | $P_{b,y}$ | 0.1980 | kg/person/meal | KPT data MP#3 |
| Baseline KPT (Domestic) | $P_{b,y}$ | 0.2015 | kg/person/meal | KPT data MP#3 |

Using the aforesaid and other results established in MP3, specific fuel savings from project stove (tonnes/stove/week) = 0.008,222,753 has been used as a conservative measure.

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**Usage and Kitchen Survey (UKS)**

As stipulated in the Methodology a Usage Survey needs to be conducted on a minimum sample size of 100, with at least 30 samples for project technologies of each age being credited. As the stoves in the monitoring period were built over the course of 10 years, 30 stoves from each age were tried to include in the survey and then the cumulative (resulting) usage parameter is

weighted based on the proportion of technologies in the total sales records of each age. The detailed calculation is presented in "Usage and KS data" in ER calculator.
Usage Rate = 81.25%

| Monitoring results and Reliability Check - Usage | |
|---|---|
| Usage measured | 81.25% |
| Standard Error of Usage | 0.019 |
| relative precision | 3.10% |
| Result | Ok passed |

Kindly refer to Usage Survey excel sheet for detailed calculation.

## SECTION E. Calculation of SDG outcomes

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

>>

SDG 1

Net Benefit = $ABS_{HH\text{-}Baseline} - ABS_{HH\text{-}Project}$

Where:

$ABS_{HH\text{-}Baseline}$ Access to basic service to households/institutions (number of ICS distributed and in use in baseline)

$ABS_{HH\text{-}Project}$ Access to basic service to households/institutions (number of ICS distributed and in use in project)

SDG 1

Net Benefit = $ABS_{HH\text{-}Baseline} - ABS_{HH\text{-}Project}$

Where

$ABS_{HH\text{-}Baseline}$ Average money savings due to reduced fuel consumption from using ICS per household per month in baseline

$ABS_{HH\text{-}Project}$ Average money savings due to reduced fuel consumption from using ICS per household per month in project

SDG 3

Net Benefit = $AQ_{HH\text{-}Baseline} - AQ_{HH\text{-}Project}$

Where

$AQ_{HH\text{-}Baseline}$ Change in incidence of coughing, incidence of respiratory illness, and incidence of itchy eyes before shifting ICS in baseline

$AQ_{HH\text{-}Project}$ Change in incidence of coughing, incidence of respiratory illness, and incidence of itchy eyes after shifting ICS in project

SDG 7

Net Benefit = $AACS_{HH\text{-}Baseline} - AACS_{HH\text{-}Project}$

Where

$AACS_{HH\text{-}Baseline}$ Number of households and institutions having access to affordable, reliable and modern project ICS (number of ICS distributed and in use in baseline)

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Average number of Commercial stoves per HH ... [1]
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$AACS_{HH\text{-}Project}$ Number of households and institutions having access to affordable, reliable and modern project ICS (number of ICS distributed and in use in project)

SDG 8

Net Benefit = $QE\ IG_{Baseline}$ - $QE\ IG_{Project}$

$QE\ IG_{Baseline}$ Employment generated in baseline

$QE\ IG_{Project}$ Employment generated in project

SDG 13:

When the baseline and the project fuel are the same and the baseline and project emission factors are considered the same, the overall GHG reductions achieved by the project activity in year y are calculated as follows:

$$ERy = \Sigma_{b,p} (N_{p,y} * U_{p,y} * P_{p,b,i,y} * NCV_{b,fuel} * (f_{NRB,b,y} * EF_{fuel,CO2} + EF_{fuel,nonCO2})) - \Sigma\ LE_{p,y}$$

Where

$\Sigma b,p$ Sum over all relevant (baseline b/project p) couples

$N_{p,y}$ Cumulative number of project technology-days included in the project database for project scenario p against baseline scenario b in year y

$U_{p,y}$ Cumulative usage rate for technologies in project scenario p in year y, based on cumulative adoption rate and drop off rate revealed by usage surveys (fraction)

$P_{p,b,y}$ Specific fuel savings for an individual technology of project p against an individual technology of baseline b in year y, in tons/day, as derived from the statistical analysis of the data collected from the field tests

$f_{NRB,b,y}$ Fraction of biomass used in year y for baseline scenario b that can be established as non--renewable biomass (drop this term from the equation when using a fossil fuel baseline scenario)

$NCV_{b,fuel}$ Net calorific value of the fuel that is substituted or reduced

$EF_{b,fuel,CO2}$ CO2 emission factor of the fuel that is substituted or reduced.

$EF_{b,fuel,nonCO2}$ Non-CO2 emission factor of the fuel that is reduced

$LE_{p,y}$ Leakage for project scenario p in year y

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

>>

Refer the equations given above in section E.1 for calculation of Net SDG Benefits and net benfits for all SDGs are being calculated directly as per section E.1 above.

## E.3. Calculation of net benefits as difference of baseline and project values or direct calculation for each SDG outcome

>>

SDG 1: No Poverty

| Item | $ABS_{HH\text{-}Baseline}$ (ICS in use) | $ABS_{HH\text{-}Project}$ (ICS in use ) | Net Benefits = $ABS_{HH\text{-}Project}$ - $ABS_{HH\text{-}Baseline}$ |
|---|---|---|---|
| SDG 1 | 0 | 395,339 | 395,339 |

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| Item | $ABS_{HH\text{-}Baseline}$ (average money savings due to reduced fuel consumption from using ICS per household per month) | $ABS_{HH\text{-}Project}$ (average money savings due to reduced fuel consumption from using ICS per household per month) | Net Benefits = $ABS_{HH\text{-}Project}$ - $ABS_{HH\text{-}Baseline}$ |
|---|---|---|---|
| SDG 1 | 0 | 42,254 UGX | 42,254 UGX |

SDG 3: Good Health and Well Being

| Item | $AQ_{HH\text{-}Baseline}$ (incidence of coughing, incidence of respiratory illness, and incidence of itchy eyes before shifting ICS) | $AQ_{HH\text{-}Project}$ (incidence of coughing, incidence of respiratory illness, and incidence of itchy eyes after shifting ICS) | Net Benefits = $AQ_{HH\text{-}Baseline}$ - $AQ_{HH\text{-}Project}$ |
|---|---|---|---|
| SDG 3 | 100% | 0% | 100% |

SDG 7: Affordable and Clean Energy

| Item | $AACS_{HH\text{-}Baseline}$ (ICS distributed) | $AACS_{HH\text{-}Project}$ (ICS in use) | Net Benefits = $AACS_{HH\text{-}Project}$ - $AACS_{HH\text{-}Baseline}$ |
|---|---|---|---|
| SDG 7 | 0 | 395,339 | 395,339 |

SDG 8: Decent Work and Economic Growth

| Item | QE $IG_{Baseline}$ (employment generated) | QE $IG_{Project}$ (employment generated) | Net Benefits = QE $IG_{Project}$ - QE $IG_{Baseline}$ |
|---|---|---|---|
| SDG 8 | 0 | 25 | 25 |

SDG 13: Climate Action

| Item | Baseline GHG emissions or baseline net GHG removals (t $CO_2e$) | Project GHG emissions or actual net GHG removals (t $CO_2e$) | Leakage GHG emissions (t $CO_2e$) | GHG emission reductions or net anthropogenic GHG removals (t $CO_2e$) | | |
|---|---|---|---|---|---|---|
| | | | | Before 01/01/2013 | From 01/01/2013 | Total amount |
| SDG 13 (2017) | 194,105 | 0 | 0 | 0 | 194,105 | 194,105 |
| SDG 13 (2018) | 575,430 | 0 | 0 | 0 | 575,430 | 575,430 |
| SDG 13 (Total) | 769,535 | 0 | 0 | 0 | 769,535 | 769,535 |

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In line with the Gold Standard Methodology 'Energy Efficiency – Technologies and Practices to Displace Decentralized Thermal Energy Consumption V.01' baseline and project emissions are only used for ex-ante ER estimation (see Methodology p.17) and are therefore not applicable. Actual ER calculations are based on fuel savings of the specific project technology against the baseline technology, as derived from the Kitchen Performance tests. As explained in section E.3. no leakage has been detected.

Equation used for the calculation of emission reductions in line with Gold Standard Methodology 'Technologies and Practices to Displace Decentralized Thermal Energy Consumption' v.1.0:

$$ERy = \Sigma_{b,p} (N_{p,y} * U_{p,y} * P_{p,b,i,y} * NCV_{b,fuel} * (f_{NRB,b,y} * EF_{fuel,CO2} + EF_{fuel,nonCO2})) - \Sigma LE_{p,y}$$

N(p,y) (the number of Project Technology Days) was determined by calculating the cumulative number of crediting days of all stoves during this monitoring period.

| Parameter | Description | Method | Value |
|---|---|---|---|
| $\Sigma b,p$ | The sum over all relevant (baseline b/project p) couples. | In the case of this Project there was only one baseline/project scenario. | - |
| $N_{p,y}$ | Cumulative number of Project Technology Days | For detailed calculation, please refer to Sales database and ER Sheet | See Section D.2. |
| $U_{p,y}$ | Cumulative Usage rate for technologies in the project scenario p in year y based on cumulative adoption rate and drop off rate | Usage Survey | 81.25 |
| $P_{p,b,i,y}$ | Specific fuel savings for an individual technology of the project against an individual technology in the baseline in tons/day. | Derived from KPTs and Kitchen surveys data in MP3 as a conservative measure. | 0.008222753 Ton/stove/day |
| $NCV_{b,fuel}$ | Net calorific value of the fuel that is substituted or reduced | IPP default value for Charcoal | 0.0295 TJ/Ton |
| $fNRB_{b,y}$ | Non renewability status of woody biomass fuel in scenario i during year y. | CDM ASB0002 | 0.88 |
| $EF_{fuel,CO2}$ | CO2 emission factor arising from use of fuels in baseline scenario | From IPCC and Pennise in JGR 2001, table 6a | 173.085 tCO2/TJ |
| $EF_{fuel,nonCO2}$ | Non-CO2 emission factor arising from use of fuels in baseline scenario | From IPCC and Pennise in JGR 2001, table 6a | 9.88tCO2/TJ |
| $LE_{p,y}$ | Leakage for project scenario in year y | As defined in the PDD | 0 |

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The KPTs conducted recently have also incorporated the effect of multiple project stove units in one household. The fuel savings because of the project accounts the same to ensure that baseline in such cases is adequately distributed amongst the stoves being used. For detailed calculation, please refer to ER Calculation Sheet.

### E.4. Summary of ex-post values of each SDG outcome for the current monitoring period

| Item | Baseline estimate | Project estimate | Net benefit |
|---|---|---|---|
| SDG 13 (2017) | 194,105 | 0 | 194,105 |
| SDG 13 (2018) | 575,430 | 0 | 575,430 |
| SDG 13 (Total) | 769,535 | 0 | 769,535 |

### E.5. Comparison of actual value of outcomes with estimates in approved PDD

| Item | Values estimated in ex ante calculation of approved PDD | Actual values achieved during this monitoring period |
|---|---|---|
| SDG 13 (2017) | 429,052 | 194,105 |
| SDG 13 (2018) | 1,658,017 | 575,430 |
| SDG 13 (Total) | 2,087,069 | 769,535 |

### E.6. Remarks on difference from estimated value in approved PDD

>>

The actual emission reductions are much lower as compared to ex-ante calculation on the registered PDD (revised). This is on account of a lower number of ICS distributed in the project compared to that envisaged-ex-ante in the registered PDD(revised).

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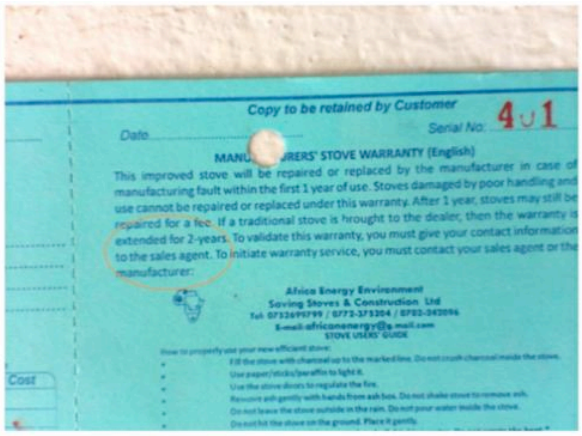
## SECTION F. Stakeholder inputs and legal disputes

### F.1. List all inputs/grievances which have been received for the project during the monitoring period together with their respective answers/actions

A grievance redress mechanism is constituted into the system, in order to ensure continuous quality service delivery to end user/consumer. Here, the grievance redress team tries to resolve usage & safety related issues associated with the product/project technology. All the customer's product related queries are first noted once received. Post that, based on the possible solutions, the customer is advised with relevant solutions, and as necessary, the technical team visits the customer's household for ensuring a smooth grievance redress.

To help customers voice their concerns, technology supplier contact points are imprinted on the sales receipt. In case, the technology supplier team fails to provide a resolution, Impact Carbon team approaches the customers, as a next step to the grievance redress mechanism.

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The customer can contact the technology supplier team. Once they resolve the issue, the case is closed. In case, they are not able to resolve, the grievance is escalated to Impact Carbon team for addressal. Though it happens rarely, as most of the issues are resolved at the technology supplier end itself.

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F.2. List all inputs/grievances from previous monitoring period where follow up action is to be verified in this monitoring period

Not Applicable

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

Not Applicable

Appendix 1: Contact information of project participants and responsible persons/entities

| | |
|---|---|
| **Project participant and/or responsible person/ entity** | ☒ Project participant<br>☐ Person/entity responsible for completing the MR-FORM |
| **Organization name** | Impact Carbon |
| **Street/P.O. Box** | 47 Kearny Street |
| **Building** | Suite 600 |
| **City** | San Francisco |
| **State/region** | California |
| **Postcode** | 94108 |
| **Country** | United States |
| **Telephone** | +1 415 968 9087 |
| **Fax** | - |
| **E-mail** | ehaigler@impactcarbon.org |
| **Website** | www.impactcarbon.org |
| **Contact person** | Evan Haigler |
| **Title** | Director |
| **Salutation** | Mr. |
| **Last name** | Haigler |
| **Middle name** | - |
| **First name** | Evan |
| **Department** | - |

| | |
|---|---|
| **Project participant and/or responsible person/ entity** | ☐ Project participant<br>☒ Person/entity responsible for completing the MR-FORM |
| **Organization name** | Climate-Secure Services |
| **Street/P.O. Box** | Club Road |
| **Building** | Pragati Apartments |
| **City** | West Delhi |
| **State/Region** | Delhi |
| **Postcode** | 110063 |
| **Country** | India |
| **Telephone** | +91 11 2521 3080 |
| **Fax** | -- |
| **E-mail** | info@climate-secure.com |
| **Website** | www.climate-secure.com |
| **Contact person** | Rohit Lohia |

| | |
|---|---|
| **Title** | Principal Consultant |
| **Salutation** | Mr. |
| **Last name** | Lohia |
| **Middle name** | -- |
| **First name** | Rohit |
| **Department** | -- |

## Appendix 2: MP3 KPT Results

Kitchen Performance Test- Project Stove

In order to fulfil the precision requirements of 90/10 of the methodology for an 'Independent' sample and in view of the variability of the fuel consumption data reported, 97 HHs were enrolled for the kitchen performance test. Prior to the KPT analysis, outliers were examined to check for potential mistakes in data recording. Outliers greater than 1.5 times the IQR from the third quartile were removed from the sample. The results obtained after removal of outliers, is provided below.

| Kg/person/meal assessment | Commercial stoves | Domestic Stoves |
|---|---|---|
| n | 36 | 61 |
| Avg | 0.09453 | 0.09969 |
| Median | 0.08484 | 0.08621 |
| Std. Dev. | 0.05390 | 0.04502 |
| Lower Bound value of confidence interval | 0.08 | 0.09 |
| Upper Bound value of confidence interval | 0.11 | 0.11 |
| Confindece interval | 0.03 | 0.02 |
| Precision (2-sided) | 15.64% | 9.52% |
| 90/10 Rule Met? | NO | YES |
| Quartile (Q1) | 0.05429 | 0.06250 |
| Quartile (Q3) | 0.13988 | 0.12903 |
| IQR | 0.0856 | 0.0665 |
| Upper Quartile limit | 0.2683 | 0.2288 |
| Upper Quartile limit | 0.0000 | 0.0000 |
| Project KPT (Commercial) | 0.1093 | kg/person/meal |
| Project KPT (Domestic) | 0.0997 | kg/person/meal |

Kitchen Performance Test- Baseline Stove

Quantity of fuel wood that is consumed in the baseline scenario during the monitoring period has been examined by the Baseline Field Test. As this is the third issuance of the crediting period 2, the PP conducted KPT on the baseline stoves. In order to fulfil the precision requirements of 90/10 of the methodology for an 'Independent' sample and in view of the variability of the fuel consumption data reported, 119 HHs were enrolled for the Baseline KPT. Prior to the analysis, outliers were examined to check for potential mistakes in data recording. Eight outliers were identified which were not in the range of 1.5 times the IQR from the first and third quartile.

| Kg/person/meal assessment | Commercial stoves | Domestic Stoves |
|---|---|---|
| n | 35 | 75 |
| Avg | 0.1980 | 0.2015 |
| Median | 0.2000 | 0.2034 |
| Std. Dev. | 0.0472 | 0.0862 |
| Lower Bound value of confidence interval | 0.18 | 0.18 |
| Upper Bound value of confidence interval | 0.21 | 0.22 |
| Confidence interval | 0.03 | 0.04 |
| Precision (2-sided) | 7.89% | 9.68% |
| 90/10 Rule Met? | YES | YES |

| | | |
|---|---|---|
| Quartile (Q1) | 0.1710 | 0.1667 |
| Quartile (Q3) | 0.2273 | 0.2353 |
| IQR | 0.0563 | 0.0686 |
| Upper Quartile limit | 0.3117 | 0.3382 |
| Upper Quartile limit | 0.0865 | 0.0637 |
| Baseline KPT (Commercial) | 0.1980 | kg/person/meal |
| Baseline KPT (Domestic) | 0.2015 | kg/person/meal |

Specific fuel saving data

| Parameter | Symbol | Value | Unit | Source |
|---|---|---|---|---|
| Baseline KPT (Commercial) | Pb,y | 0.1980 | kg/person/meal | Annex 01 - GS447 Baseline KPT ver 3.0 Final, tab: Baseline KPT sheet, cell EE19 |
| Baseline KPT (Domestic) | Pb,y | 0.2015 | kg/person/meal | Annex 01 - GS447 Baseline KPT ver 3.0 Final, tab: Baseline KPT sheet, cell EE20 |
| Project KPT (Commercial) | Pp,y | 0.1093 | kg/person/meal | Annex 02 - GS447 Project Surveys - Usage, Kitchen, and KPT V3.0 Final, tab: KPT Data sheet, cell GF19 |
| Project KPT (Domestic) | Pp,y | 0.0997 | kg/person/meal | Annex 02 - GS447 Project Surveys - Usage, Kitchen, and KPT V3.0 Final, tab: KPT Data sheet, cell GF20 |
| Average number of Commercial stoves per user | -- | 2.528 | stove | Annex 02 - GS447 Project Surveys - Usage, Kitchen, and KPT V3.0 Final, tab: KPT Data sheet, cell GE31 |
| Average number of domestic stove per user | -- | 1.656 | stoves | Annex 02 - GS447 Project Surveys - Usage, Kitchen, and KPT V3.0 Final, tab: KPT Data sheet, cell GF31 |
| % Commercial population | -- | 34% | -- | Annex 02 - GS447 Project Surveys - Usage, Kitchen, and KPT V3.0 Final, tab: KPT Data sheet, cell GE35 |
| % Domestic population | -- | 66% | -- | Annex 02 - GS447 Project Surveys - Usage, Kitchen, and KPT V3.0 Final, tab: KPT Data sheet, cell GF35 |
| Average number of PERSON/MEAL commercial | -- | 20.608 | person | Annex 02 - GS447 Project Surveys - Usage, Kitchen, and KPT V3.0 Final, tab: KPT Data sheet, cell GE33 |
| Average number of PERSON/MEAL domestic | -- | 5.824 | person | Annex 02 - GS447 Project Surveys - Usage, Kitchen, and KPT V3.0 Final, tab: KPT Data sheet, cell GF33 |
| Average meals per week (commercial) | -- | 16.16 | Meals/week | Annex 02 - GS447 Project Surveys - Usage, Kitchen, and KPT V3.0 Final, tab: KPT Data sheet, cell GE37 |
| Average meals per week (Domestic) | -- | 18.06 | Meals/week | Annex 02 - GS447 Project Surveys - Usage, Kitchen, and KPT V3.0 Final, tab: KPT Data sheet, cell GF37 |
| Savings (commercial) | -- | 0.0887 | kg/person/meal | Calculated |
| Savings (domestic) | -- | 0.1018 | kg/person/meal | Calculated |
| Savings (commercial) | -- | 0.035080 | kg/person/meal/ | Calculated |

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|---|---|---|---|---|
| | | 796 | stove | |
| Savings (domestic) | -- | 0.061472784 | kg/person/meal/stove | Calculated |
| Savings (commercial) | -- | 11.68579766 | kg/stove/week | Calculated |
| Savings (domestic) | -- | 6.464591874 | kg/stove/week | Calculated |
| Specific fuel savings from project stove | Pp,b,y | 0.008222753 | Tonnes/stove/week | Calculated |

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