Gold standard for the global goals
Monitoring report

June 2017, version 1

Title of the project	GS 1220 Ecological Stoves for Better Living – Microscale PoA – VPA1 Bolivia
Gold Standard project id	GS1221
Version number of the monitoring report	3.1
Completion date of the monitoring report	01/06/2020
Date of project design certification	19/06/2014
Start date of crediting period	19/06/2012
Duration of this monitoring period	(04/04/2018) to (30/11/2019) 4th Monitoring Period
Duration of previous monitoring period	(01/01/2017) to (03/04/2018)
Project representative(s)	Fundación CEDESOL Foundation myclimate – The Climate Protection Partnership
Host Country	Bolivia
Certification pathway (activity certification/impact certification)	Impact certification
SDG Contributions targeted (as per approved PDD)	SDG1, SDG3, SDG4, SDG5, SDG7, SDG8, SDG12, SDG13, SDG15 and SDG17
Gold Standard statement/product certification sought (GSVER/ADALYs/RECs etc.)	GS VER
Selected methodology(ies)	Technologies and Practices to Displace Decentralized Thermal Energy Consumption version 1
Estimated amount of annual average certified SDG impact (as per approved PDD)	SDG1: No Poverty Perception of time and monetary savings 100% of households (measured) Proportion of families which noticed their income increased 60% (measured) SDG3: Good health and well-being Air quality improvement 100% of households (measured) Proportion of families which noticed lesser visit to medical facilities 70% of households (measured) SDG4: Quality Education Number of people trained in educational program 832 of folks completing the Modular Environmental Training (measured) SDG5: Gender equality Number of women trained by CEDESOL 41 Innovative Leaders (measured) SDG7: Affordable and clean energy

	Number of persons that benefit from efficient and clean technologies 2909 persons benefit by the project (calculated) SDG8: Decent work and economic growth Number of jobs offered 56 people employed from 2012 to present (measured) 4 full time CEDESOL employees, 2 temporary jobs (measured) SDG12: Responsible consumption and production Fuel savings achieved 55.39% (calculated) SDG13: Climate Action ER expected in the crediting period: 15,155 GS VERs / year (calculated) SDG15: Life on Land Amount of wood equivalents saved by the project 1992 tons of wood saved for domestic rocket stoves installed per year and (calculated) 44 tons of wood saved commercial/institutional rocket stoves installed per year (calculated) SDG17: Partnership for the goals Number of ecological stoves units installed in Bolivia 814 domestic rocket stoves installed and 18 commercial/institutional rocket stoves installed (measured)
Total amount of certified SDG impact (as per approved methodology) achieved in this monitoring period	SDG1: No Poverty Perception of time and monetary savings 100% of households (measured) Proportion of families which noticed their income increased 0% (measured) SDG3: Good health and well-being Air quality improvement 92% of households (measured) Proportion of families which noticed lesser visit to medical facilities 80% of households (measured) SDG4: Quality Education Number of people trained in educational program 832 of folks completing the Modular Environmental Training (measured) SDG5: Gender equality Number of women trained by CEDESOL 41 Innovative Leaders (measured) SDG7: Affordable and clean energy Number of persons that benefit from efficient and clean technologies 2594 persons benefit by the project (calculated) SDG8: Decent work and economic growth

	Number of jobs offered 56 people employed from 2012 to present (measured) 4 full time CEDESOL employees, 2 temporary jobs (measured) SDG12: Responsible consumption and production Fuel savings achieved 46.09% (calculated) SDG13: Climate Action ER expected in the crediting period: 2018: 1,743 tCO_{2e} (calculated) 2019: 2,142 tCO_{2e} (calculated) SDG15: Life on Land Amount of wood equivalents saved by the project 2743 tons of wood saved for domestic rocket stoves installed per year and (calculated) 60 tons of wood saved commercial/institutional rocket stoves installed per year (calculated) SDG17: Partnership for the goals Number of ecological stoves units installed in Bolivia 814 domestic rocket stoves installed and 18 commercial/institutional rocket stoves installed (measured)

SECTION A. Description of project

A.1. Purpose and general description of project

>> (Provide a brief summary of the detailed description given in section B.1 including purpose of the project, brief description of the installed technology and equipment and relevant dates for the project (e.g. construction start/end, commissioning, continued operation periods, etc.)

This micro-scale VPA 1 (GS 1221) in Bolivia is the first activity of the 'Ecological Stoves for Better Living – Micro Scale PoA' (GS 1220) in Bolivia and Paraguay. The main objective of the program is *holistic environmental well-being*[1]. In keeping with that concept; this VPA concerns the distribution of high efficient rocket stoves in Bolivia. This activity is designed to generate GS VERs during a fixed 10-year Gold Standard (GS) crediting life cycle by installing and monitoring **814 domestic rocket stoves and 18 institutional/commercial rocket stoves** in two Departments of Bolivia, areas designated as qualified[2] populations in the country of Bolivia by the Coordination Managing Entity (CME) CEDESOL. Without carbon finance obtained in association with Foundation *myclimate* our beneficiaries would not be able to access the program and receive the education and cooking devices.
Due to the current practices, almost negligible voluntary uptake of improved cooking devices[3] and high number of households, institutions and business using inefficient technology[4] (almost all wood cook stoves currently in use in Bolivia are highly inefficient) the scale of change will be significant.
The project replaces traditional inefficient stoves with efficient designs, in the areas of the population most in need, e.g. communities with wood as a primary fuel. The activity includes the use of the stoves for domestic, commercial and institutional purposes. This means that all of CEDESOLs' rocket stove sizes described in the PoA-DD and first VPA-DD can be delivered according to the needs identified by the beneficiary, along with their participation in the Environmental Well Being Squads (EWBS).

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[1] Our program of holistic well being meets the "first of its kind" guideline, as described in EB 69 REPORT annex 7, GUIDELINES ON ADDITIONALITY OF FIRST-OF-ITS-KIND PROJECT ACTIVITIES (Version 02.0) for project activities and is actually a first of its kind in concept as well since we will work to equally give our beneficiaries educational as well as technological tools that they can use to make continually better decisions about their lives. We incorporate empowerment of women as part of our value chain and support that, by attitude change in conjunction with technological interventions we can achieve a "lasting impact", especially considering propagation of the better attitudes and knowledge through the "kitchen classroom" most children unconsciously learn in.

[2] Beneficiaries are qualified through a participative group diagnostic where it is established that wood fuel is their primary fuel, that the potential beneficiaries believe the intervention will improve their living standards, that the beneficiaries will become active members of the Environmental Well-being Squads (EWBS), will provide usage information, allow monitoring and will assign their rights to emissions reduction credits to CEDESOL in exchange for participation in the subsidized program and acquiring the improved cooking devices via subsidized prices. They must also accept paying a % of the cost of the devices (usually around 50%) and cannot receive the devices for free.

[3] According to the Global Alliance for Clean Cookstoves' (GACC) Adoption Indicators, the % of Population using improved biomass cookstoves in Bolivia (0.687) is less than 1%, which demonstrates that without this intervention improved cookstoves are NOT being taken up voluntarily by the population. https://web.archive.org/web/20140511024315/http://www.cleancookstoves.org:80/countries/america/bolivia.html

[4] In rural areas the supply of hydrocarbons is very low. The main energy source in these scattered and remote areas is biomass (especially wood), which on average covers 80% of the total rural energy demand (there are some areas where this resource covers up to 97% of this demand, a situation that has not changed in recent years).
Instead, the use of Liquefied Petroleum Gas (LPG), widespread in urban, is only present in major rural centers. In the rest of the country there simply is no availability of the fuel, said the report. http://plataformaenergetica.org/content/3308

CEDESOL Rocket stove for domestic application

CEDESOL Rocket stove for institutional and commercial application.

The use of ecological cookers and improved practices will directly reduce the amount of fuel (wood fire or LPG) that is being burned therefore avoiding the release of *GHG* that are being emitted due to current practices [5]. It is expected that during the first 3 years of the life of the VPA the projected number of stoves will be installed and a significant impact from the educational component as a behavioral change agent will be apparent. During the 10 year crediting period, the educational component shall achieve lasting behavior change in use, especially through incorporation of the retained heat practices and peer monitored stove maintenance which will assist in more stoves staying on line longer, proved by biannual monitoring.
There is a noted lack of national/local policies being instituted to promote a shift to other fuels. Additionally, there is limited economical and technical capacity to change the common practice as evidenced by:

Table 1-A.1[6]

INDICATOR	BOLIVIA
Population size	**10,496,285**
Number of people affected by HAP*	**2,624,071**
Number of households affected by HAP	**624,779**
% of population using solid fuels for cooking	**25%**
% of Rural population using solid fuels	**75.4 %**
% of Urban population using solid fuels	**6%**

**HAP is the new designation for Indoor Air pollution (IAP), meaning Household Air Pollution as defined by the Global alliance for Clean Cookstoves.*

Table 1-A.1 documents the existing common practice scenario as well as reveals how extremely important this VPA activity is to our project, where fully more than 600,000 ***households*** use solid fuels for cooking. In Bolivia, 25% of the population (2,624,071 people) still use solid fuels for cooking.

Brief description of the installed technology and equipment:

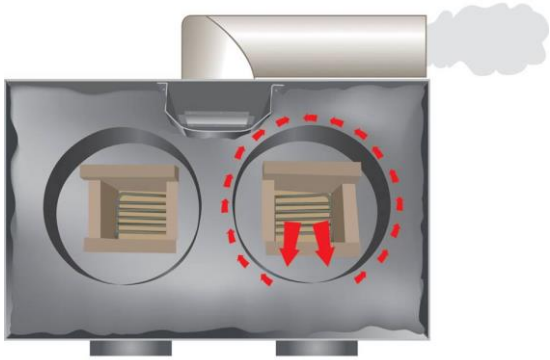
Rocket Stove

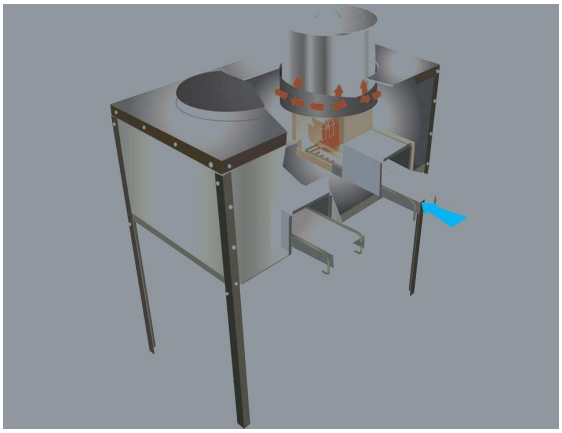
The rocket stove is a variety of biomass cooking stoves. This design provides for efficient combustion coupled with efficient heat transfer to the pot. Wood, carbon, sticks, or dung can be used with this cooker. Rocket

[5] Bolivia, with a population of approximately 10.4 million inhabitants, is considered one of the poorest countries in Latin America. While urban areas such as La Paz and Santa Cruz are modern cities with a relatively good supply of modern energy services, the majority of Bolivia's rural areas are still experiencing a lack of most basic services, including reliable and affordable access to electricity and improved biomass cooking stoves. https://energypedia.info/wiki/Bolivia_Country_Situation

[6] This table was developed from information obtained from the Global Alliance for Clean Cookstoves, in which they cited as their Source: Food and Agriculture Organization, United Nations Development Programme, World Bank World Economic Forum, and World Health Organization - http://cleancookstoves.org/country-profiles/92-bolivia-plurinational-state-of.html

stoves operate roughly twice as efficiently, and substantially more cleanly, than the open fire cooking methods still used in many areas of the world.





Rocket stove

A detailed technical description is available as a separate confidential document.

Institutional Rocket Stove

Within the rocket stoves technology a model was designed for the institutional use. This stove is called Institutional Rocket stove and it can be used with 60, 80 or 100 liters pots. It works under the same principle as the standard rocket stove described above and it is made out of a metal barrel as shown in the next picture.

Improved Institutional Rocket Stove

A detailed technical description is available as a separate confidential document.

Relevant dates for the project activity:

The starting date of operation: 03/11/2011 – First rocket stove installed

Registration date of the project activity: 19/06/2014
1st GS Crediting Period: 19/06/2012 – 19/06/2022
2nd GS Monitoring Period: 01/01/2016 – 31/12/2016
3rd GS Monitoring Period: 01/01/2017 – 03/04/2018
4th GS Monitoring Period: 04/04/2018 – 30/11/2019

Actual GHG emission reductions in this monitoring period: 3,885 t CO_2e

A.2. Location of project

>> (Provide host country, state/province, city/town details along with GPS co-ordinates.)

This VPA 1 is developed inside the country of Bolivia, in the departments of Chuquisaca and Cochabamba.

Map of Bolivia with its departments.

GPS coordinates

Department	Latitude	Longitude
Cochabamba	-17° 22' 59.99" S	-66° 09' 60.00" W
Chuquisaca	-20°00'0.00" S	-64°24'59.99" W

A.3. Reference of applied methodology

>>*(Indicate title and version number of the methodology.)*

Technologies and Practices to Displace Decentralized Thermal Energy Consumption version 1 (GS TPDDTEC).
http://www.goldstandard.org/sites/default/files/documents/gs_tpddtec_meth_110411.pdf

A.4. Crediting period of project

>> (*Provide start date and length of the crediting period as given in approved PDD.)*

The project has a 10 year fixed crediting period.

1st GS Crediting Period: 19/06/2012 – 19/06/2022

The starting date of operation: 03/11/2011 – First rocket stove installed

Registration date of the project activity: 19/06/2014

SECTION B. Implementation of project

B.1. Description of implemented project

>> (*Provide information on the implementation status of the project during this monitoring period. Specify any deviations / delays compared to information in approved project.)*

Project implementation methodology

1. Project request or dialogue with the municipal authority. The project is requested through the respected Municipality by letter or verbally with the pertinent authority.
2. Local Stakeholder Consultation (LSC) Diagnosis and Demonstration of the technology, and explanation of the project. Once a meeting is held with the interested community, CEDESOL conducts demonstrations on the ecological cookers based on a previous agreement and on a proposed schedule that needs to be followed. After the demonstration is finished, the following steps are performed in order to cover all the needs of the beneficiaries.
3. Schedule to follow:
   - 3.1. List of participants. A list of the participants is made to keep in CEDESOL's database.
   - 3.2. Formation of the Environmental Well- being Brigades (EWB).This is one of the principle aspects of the Educational Component, which deals with a co-participatory training process of group learning and teaching along with the housewives within the Environmental Well-being Brigades.

     The EWB's will be guided by the "Innovative Leaders (IL's)", women who are chosen for their Brigade to be trained by experts from CEDESOL with the Modular Environmental Training Program (MET).

     This training program includes several modules of instruction. Within each module there are 4 sessions. Each session with the IL's will last approximately 3 hours, reaching a total of twelve hours of intensive training per module.

     Once trained, they will in turn train their EWB, if they successfully learned the material in the module, they will be able to replicate this knowledge with their EWB in 2 days. Therefore, each module conducted by a IL with her respective EWB will be carried out once a month for 1 day at a time.

     Following this structure, each module will be completed after 2 months. During each term, CEDESOL will also identify the needs of the community. This training aims to equip the beneficiaries with the necessary tools for self-development, a sustainable community and achieving a better quality of life and social equity through the holistic use of the acquired cookers.
   - 3.3. Delivery of equipment / rrc general training

3.3.1. Formation of the brigades. As mentioned above, the brigades are formed once the community decides to participate in the project and the beneficiaries are identified. CEDESOL establishes a meeting with the Community and the steps to follow are stated.

3.3.2. Formation of lines of communication. These lines are formed with the objective of keeping in contact and strengthen ties with the communities.

3.3.3. Set a specific work schedule. Depending on the needs and limitations of the beneficiary community, a list of activities and responsibilities will be established.

3.3.4. Sales record and surveys. This list is made into the baseline, which will be used later in all the documents that are evaluated.

4. First Innovative Leader (IL) Training (within 45 days of the general training). This training integrates different learning modules, which will guide and teach the best practices for taking care of one's health and the environment. This project has two main components which are the provision of clean ecological cookers and a program that will teach, monitor and evaluate the use of the cookers. The duration of the Project Activities (PoA) is 28 years, with a period of evaluation through surveys every 2 years within a fixed 10 year period that is determined in this VPA.

   4.1. Session 1. Thermal Cooker (in accordance with an agreed upon schedule with the community). This training session focuses on, among other things, teaching how the cookers works, their assembly, use and maintenance.

   4.2. Module 2. Rocket Stove (in accordance with an agreed upon schedule with the community). This training focuses on, among other things, teaching how the Rocket Stoves work, their assembly, use and maintenance.

5. Follow up. The follow up on the use of the Ecological Cookers is done by the Innovative Leaders after they have received their training and are then able to transmit this knowledge to their Brigades. In this follow up, the leaders monitor and receive information on how they are cooking and problems that could have come up during their use. The follow ups are conducted between training sessions every 30 days, in which the Brigade makes a report of monitoring performed to CEDESOL.

6. Monitoring. Monitoring the development of the MET Program will be assessed within 30 days after the ILs have completed their community based modules, at 3 months and annually so as to learn their observations both early and later on in the process.

   Through this monitoring, CEDESOL will receive comments and reactions from the EWB's, then providing this valuable information to the trainers and the overall design of the MET.

   It should be noted that the beneficiaries will learn to use and maintain themselves the ecological stoves that have been acquired by the Program. The purpose of the educational program is to ensure that the beneficiaries learn how to better handle their resources, both economically and naturally, so that in the future there is an exponential reduction of CO_2 emissions. All this is described in further detail in the POA attached.

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

>> (Indicate whether any temporary deviations have been applied during this monitoring period. If applied, provide a description of the deviation(s). Include the reasons for the deviation(s), how it deviates from the monitoring plan, applied methodology(ies) and/or applied approaches, the duration for which the deviation(s) is(are) applicable and justification on the conservativeness of the approach. Also indicate if prior approval from GS-TAC have been sought on the deviation.)

Not applicable.

B.2.2. Corrections

>> (Indicate whether any corrections to project information or parameters fixed at validation have been applied.)

Not applicable.

B.2.3. Changes to start date of crediting period

>> (Indicate whether any changes to the start date of the crediting period have been approved by Gold Standard that is relevant for this monitoring period.)

Not applicable.

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

>> (Indicate whether any permanent changes from the approved monitoring plan, applied methodologies or applied approaches have been approved by GS-TAC that is relevant for this monitoring period.)

Not applicable.

B.2.5. Changes to project design of approved project

>> (Indicate whether any changes to the design of the project have been approved by GS-TAC that is relevant for this monitoring period.)

Not applicable.

SECTION C. Description of monitoring system applied by the project

>>

The monitoring plan for this VPA follows the guidelines of the Monitoring Methodology in Section III of the applied GS TPDDTEC Meth. as described in the PoA-DD in section D.7.2.1.

Sales record

A sales form is filled out for every delivered ecological stove. Besides required personal data as explained in the TPDDTEC Meth. on page 22 further data in terms of fuel consumption is collected already at this stage to get a first impression of the specific behaviour.
A total sales record and project database are maintained continuously. The project database is derived from the total sales record with project technologies differentiated by different project scenarios (rocket domestic, rocket institutional/commercial) leading to the two parameters project technology days $\mathbf{N_{r\text{-}d,y}}$ and $\mathbf{N_{r\text{-}ic,y}}$.

Prior to first Verification – Field Tests - $P_{r\text{-}ic,ic,y}$

Prior to first Verification a project Field Survey for the domestic and institutional-commercial scenario was performed.
Afterwards a Baseline Field Test and a Project Field Test were conducted for Rocket Domestic stoves to define the average fuel savings for every distributed stove based on real field measurements. Paired sampling was applied for the first verification.
For institutional rocket stoves, no kitchen tests have been conducted so far, due to too low implementation rates. As a very conservative assumption the KT values of the domestic stoves are taken. This is proved with Field surveys and lab tests (Centro de Pruebas de Cocinas, CPC, La Paz 2013).

Ongoing Monitoring Studies

The following on-going monitoring studies are conducted for the project scenario of this VPA (rocket stoves) following first verification of the associated initial ex-ante project studies. These monitoring studies investigate and define parameters that could not be determined at the time of the initial project studies or that change with time.

1a) Monitoring Survey (including Usage Survey) –

Completed annually, beginning after first verification

The monitoring survey investigates changes over time in every project scenario (and in a baseline scenario in case renewal of crediting period), by surveying end users with improved stoves on an annual basis. It provides critical information on year-to-year trends in end user characteristics such as technology use, fuel consumption and seasonal variations.

Monitoring Survey Representativeness:
End users from a given project scenario are selected using representative sampling techniques to ensure adequate representation of users with technologies of different ages. Common sampling approaches such as clustered random sampling are allowed and geographic distribution should be factored into selection criteria. End users can be surveyed at any time throughout the year with care taken to collect information pertaining to seasonal variations in technology and fuel use patterns.

Monitoring Survey sample sizing:

- Project Scenario Rocket Domestic:
  Minimum sample size 100 if more than 1000 stoves are distributed in total, else 10% of group size.
- Project Scenario Rocket Institutional/Commercial:
  Minimum sample size 30 or population size, whichever is smaller.

A monitoring survey has been conducted to families who has rocket domestic stove, 109 surveys were performed in Chuquisaca in December 2019.

The main results of this survey:

- 100% of the families used two or three times the ecological stove per day.
- 100% of the families use firewood and 100% collect it from the forest.
- 16% of the families use LPG as a second fuel, one 'garrafa' (10 kg) is used during two months and used for emergencies during the evening.
- On average families goes 1.02 times per week to collect firewood.
- 99% of the families state that 'there has been significant change in the use of fuel' (compared with the old stove).
- 100% of the families state that five years ago it was easier to obtain fuel than now. The main reasons are it was easier to collect, less distance to collect and high quantity of fuel.
- 100% of the families state that fuel is more expensive than 5 years ago because shortage of fuel and there is a 57% increase in the price of fuel.

1b) Usage Survey (part of Monitoring Survey) – Ur-d,y, Ur-ic,y

Completed annually, beginning after first verification

The usage survey provides a single usage parameter $U_{r\text{-}d,y}$ and $U_{r\text{-}ic,y}$ for the two project scenarios of this VPA that is weighted based on drop off rates that are representative of the age distribution for project technologies in the total sales record.

A usage parameter must be established to account for drop off rates as project technologies age and are replaced. Prior to a verification, a usage parameter is required that is weighted to be representative of the quantity of project technologies of each age being credited in a given project scenario. For example, if only technologies in the first year of use (age0-1) are being credited, a usage parameter must be established through a usage survey for technologies age0-1. If an equal number of technologies in the first year of use (age0-1) and second year of use (age1-2) are credited, a usage parameter is required that is weighted to be equally representative of drop off rates for technologies age0-1 and age1-2.

The minimum total sample size is 100 (or population size, whichever is smaller), with at least 30 samples for project technologies of each age being credited. The majority of interviews are conducted in person and include expert observation by the interviewer within the kitchen in question in combination with the Monitoring Survey, while some remainder may be conducted via telephone by the same interviewers on condition that in kitchen observational interviews are first concluded and analyzed such that typical circumstances are well understood by the telephone interviewers.

A usage survey has been conducted (at the same time with the monitoring survey) to families who has rocket domestic stove, 109 surveys were performed in Chuquisaca in December 2019, 96 were done in families with stoves age$_{7-8}$ and 13 to stove age$_{6-7}$. These two stoves ages represent the 96% of the domestic rocket stove installed, despite that stoves exists from ages $_{3-4}$ and $_{4-5}$ these were not surveyed because of the reduced number of stoves installed.

The main results of this survey:

- 100% of the families used the ecological stove.
- 100% of the families declare that the stove is in good or regular state.
- The interviewer confirms that 100% of the ecological stoves are being used.

2) Project Field Test (PFT) Update –

Completed every other year, or more frequently after first verification.

The PFT update is an extension of the project PFT and provides a fuel consumption assessment representative of project technologies currently in use every two years. Hence the PFT update accounts for changes in the project scenario over time as project technologies age and new customers are added, also as new models and designs are introduced. It is legitimate to apply an Age Test instead of a PFT, to project technologies, which remain materially the same year after year.

It was conducted Project Field Test to 35 Rocket Domestic stoves in December 2019 to define the fuel consumption of this scenario. The previous PFT was conducted in June 2017, the goal is to perform every other year this test as registered PDD, but because some delay in getting finance, besides National elections held in October (due to problems during this election, the whole country was on strike with roads blocked all throughout the country). By the end of November, the situation became calm, but CEDESOL had to schedule the monitoring trip with the rural stove owners, and depended upon them to give adequate advice as to the safety of CEDESOL traveling and working in their area. For those reason the current monitoring session was completed in December 2019 which was the absolute soonest is could have been done.

The main results of this survey:

- On average, each family used 6.53 kg/day per ecological stove. A reduction of 46.09% compared with baseline consumption of firewood.

For institutional rocket stoves, no kitchen tests have been conducted so far, due to too low implementation rates. As a very conservative assumption the PFT update values of the domestic stoves are taken. This is proved with Field surveys and lab tests (Centro de Pruebas de Cocinas, CPC, La Paz 2013).

3) Baseline FT Update –

In this VPA a fixed baseline is adopted. Baseline Field Test do not have to be updated because it's a fixed ten years crediting period.

4) Leakage Re-Assessment –

Leakage is assessed on VPA Level and is reassessed with the latest surveys conducted.

As defined on PoA Level and as described in the TPDDTEC meth., every VPA must discuss the following potential sources of leakage:

L1) The displaced baseline technologies are reused outside the project boundary in place of lower emitting technology or in a manner suggesting more usage than would have occurred in the absence of the project.

→ Not possible: the baseline kitchen equipment needs to be destroyed before it can be removed (fixed installation of adobe bricks or three stone fire).

L1 = 0

L2) The non-renewable biomass or fossil fuels saved under the project activity are used by non-project users who previously used lower emitting energy sources.

→ Not reasonable: Similar baseline for neighboring families, so no fuel switch is possible due to the project.

L2 = 0

L3) The project significantly impacts the NRB fraction within an area, where other CDM or VER project activities account for NRB fraction in their baseline scenario.

→ Not realistic: The project boundary is too big to have influence on the NRB fraction on a national scale. Only 832 ecological stoves have been installed and its effect over the NRB fraction is negligible. However, locally some variations are expected. Based on Monitoring Survey 2019, the main results of this survey in NRB fraction within project area are described as:

- Five years ago, it was easier to obtain fuel than now, the main reason were: Less distance to collect, high quantity of fuel and easier to collect and also the price has increased more than 50% in the last 5 year which impact the availability of firewood.

It is confirmed that local variations has been occurred at project level in terms of a shortage of firewood which would increase the NRB fraction, but for conservatism is not applied for this monitoring period. Therefore is reasonable to consider that the fNRB has not been impacted.

L3 = 0

L4) The project population compensates for loss of the space heating effect of inefficient technology by adopting some other form of heating or by retaining some use of inefficient technology.

→ Negligible. In the project region, stoves are mainly integrated in the kitchen and not in the living room. Based on CEDESOL experience beneficiaries don't use stoves as a heating device. Furthermore as an outcome of the first Kitchen Survey for VPA1 it could be demonstrated that only 2.2% of the beneficiaries used their old stove for heating purposes. And based on monitoring surveys 2019 0% of the families us the stove for heat the room.

L4 = 0

L5) By virtue of promotion and marketing of a new technology with high efficiency, the project stimulates substitution within households who commonly used a technology with relatively lower emissions, in cases where such a trend is not eligible as an evolving baseline

→ Not possible: As described under D.4.1 of PDD the existing Baseline Scenario is inefficient kitchen equipment and confirm with Monitoring Survey 2019 (100% of the household confirm the use clay wood-fired stoves). There is currently almost no technology used that is more efficient than the stoves distributed by the project.

L5 = 0

The result of the leakage assessment is that no potential source of leakage could be found at PoA Level that would lead to significant emissions. Therefore:

$L = \sum L_i = 0$

Procedure for old Baseline stove

Beneficiaries will be asked to but not be forced to destroy their old stoves when purchasing a new more efficient one. We think it is not in our position to do so. However families will be trained about the benefits of the new technology and its positive impacts on health, energetic consumption, smoke and more in CEDESOLs environmental programme (see MET program description in PoA DD). So the goal of the programme is that participants disclaim the old technology on a voluntary base. Anyway, if old stoves are still in use during the project this will be included in the Field Tests and thus accounted in the Emission Reduction calculation.
Based on Monitoring Surveys 2019, traditional stoves have been:

- 95% of the families destroyed or threw away the old stove or it is in the house and never being used.
- The interviewer confirms this affirmation: 94% of the families do not use the traditional stove.

5) Non-Renewable Biomass Assessment Update

Completed annually, if new CDM default values are published.

There is no DNA submissions to UNFCCC https://cdm.unfccc.int/DNA/fNRB/index.html about fNRB

Sustainable Development Goals Monitoring Plan

The SDG monitoring is discussed inside the Verification Appraisal Report of the VPA1. More details of the parameters and its indicators in section D below.

SECTION D. Data and parameters

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

(Copy this table for each piece of data and parameter)

Relevant SDG Indicator	SDG 13: Climate Action
Data/parameter:	$f_{NRB, Bolivia}$
Unit	Fractional non-renewability (%)
Description	Fraction of biomass used in year y for baseline scenario b that can be established as non- renewable biomass
Source of data	CDM Small Scale Working group, meeting 37 annex 14, ssc_37_an14.pdf
Value(s) applied)	84%
Choice of data or measurement methods and procedures	To justify this value a national governmental proof (by DNA) is needed according Gold Standard rules. CEDESOL tried to get this confirmation. However, for Bolivia the chance for governmental approval is very low, since the country does not accept the CDM and does not have an operating DNA. Thus, Gold Standard proposed to have the value revised by stakeholders: CEDESOL discussed this issue during Stakeholder Consultation Feedback round on PoA Design Level. This includes a renewed contacting of both DNA.
Purpose of data	For SDG 13 contribution
Additional comments	This value is fixed for the duration of the crediting period.

Relevant SDG Indicator	SDG 12: 12.2.2 Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP SDG 13: Climate Action
Data/parameter:	$NVC_{b,\ wood}$
Unit	TJ/ton
Description	t calorific value of woody biomass
Source of data	Value from applied Methodology.
Value(s) applied)	0.015
Choice of data or measurement methods and procedures	Default value
Purpose of data	For SDG 12 and SDG 13 contribution
Additional comments	

Relevant SDG Indicator	SDG 12: 12.2.2 Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP SDG 13: Climate Action
Data/parameter:	$EF_{b,wood,\ co2}$
Unit	tCO2/TJ (tones of CO2 per terajoule)
Description	CO2 emission factor for Wood
Source of data	GS TPDDTEC Meth.
Value(s) applied)	112
Choice of data or measurement methods and procedures	Default value
Purpose of data	For SDG 12 and SDG 13 contribution
Additional comments	

Relevant SDG Indicator	SDG 12: 12.2.2 Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP SDG 13: Climate Action
Data/parameter:	$EF_{b,wood,\ non\ co2}$
Unit	tCO2/TJ (tones of CO2 per terajoule)
Description	Non_CO2 emission factor of the fuel that is reduced
Source of data	G2006 IPCC Guidelines for National Greenhouse Gas Inventories, Vol.2 Energy, Chapter 2, Stationary Combustion, Table 2.5
Value(s) applied)	9.592
Choice of data or measurement methods and procedures	Default IPCC values for CH4 and N2O emissions for wood / wood waste, are applied. The following GWP100 are applied: 25 for CH4, 298 for N20 EF_wood_CH4= 0.3tCH4/TJ EF_wood_N2O = 0.004tN2O/TJ
Purpose of data	For SDG 12 and SDG 13 contribution
Additional comments	

D.2. Data and parameters monitored

(Copy this table for each piece of data and parameter)

Relevant SDG Indicator	SDG 1: 1.2.2 Proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions
Data/parameter:	Perception of time and monetary savings
Unit	%
Description	Proportion of families confirming the reduction of time or monetary expenditures after installation of ecological stoves units
Measured/calculated/default	Calculated
Source of data	Monitoring survey (December 2019)
Value(s) of monitored parameter	100%
Monitoring equipment	N.A
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	Annual household surveys provide data if time and monetary expenditures for has been reduced
QA/QC procedures:	Transparent data analysis and reporting
Purpose of data:	SDG 1 Contributions
Additional comments:	Surveys with questions about the amount fuel, money and time saved. Monitoring survey excel file – Survey Responses (cell NA116)

Relevant SDG Indicator	SDG 1: 1.2.2 Proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions
Data/parameter:	Proportion of families which noticed their income increased
Unit	%
Description	Percentage families confirming the increasing of their income after installation of ecological stoves units
Measured/calculated/default	Calculated
Source of data	Monitoring survey (December 2019)
Value(s) of monitored parameter	0%
Monitoring equipment	N.A
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	Annual household surveys provide data if family income has increased
QA/QC procedures:	Transparent data analysis and reporting
Purpose of data:	SDG 1 Contributions
Additional comments:	Surveys with questions about increasing of their income. Monitoring survey excel file – Survey Responses (cell NB116)

Relevant SDG Indicator	SDG 3: 3.9.1 Mortality rate attributed to household and ambient air pollution
Data/parameter:	Air quality improvement
Unit	%

Description	Proportion of families confirming the reduction on smoke in households
Measured/calculated/default	
Source of data	Monitoring survey (December 2019)
Value(s) of monitored parameter	92%
Monitoring equipment	N.A
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	Question about the improvement of air quality after using ecological stove
QA/QC procedures:	Transparent data analysis and reporting
Purpose of data:	SDG 3 Contributions
Additional comments:	Surveys with question confirming the reduction on smoke in households Monitoring survey excel file – Survey Responses (cell LY116)

Relevant SDG Indicator	SDG 3: 3.9.1 Mortality rate attributed to household and ambient air pollution
Data/parameter:	Proportion of families who noticed better health and less medical problems because the introduction of an ecological stove
Unit	%
Description	Percentage families confirming better health and less medical problems since installing the ecological stove
Measured/calculated/default	
Source of data	Monitoring survey (December 2019)
Value(s) of monitored parameter	80%
Monitoring equipment	N.A
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	Annual household surveys provide data if family have reduced their visit to medical facilities.
QA/QC procedures:	Transparent data analysis and reporting
Purpose of data:	SDG 3 Contributions
Additional comments:	Surveys with questions confirming better health and less medical problems Monitoring survey excel file – Survey Responses (cell NC116)

Relevant SDG Indicator	SDG 4: 4.4.1 Proportion of youth and adults with information and communications technology (ICT) skills, by type of skill
Data/parameter:	Number of people trained in educational program
Unit	Number of persons
Description	Number of folks completing the Modular Environmental Training (MET)
Measured/calculated/default	
Source of data	CEDESOL records
Value(s) of monitored parameter	832 of folks completing the Modular Environmental Training (MET)
Monitoring equipment	N.A
Measuring/reading/recording frequency:	Annual

Calculation method (if applicable):	Counting number of people trained
QA/QC procedures:	Transparent data analysis and reporting
Purpose of data:	SDG 4 Contributions
Additional comments:	The project will have a strong educational component through a Modular Environmental Training (MET).

Relevant SDG Indicator	SDG 5: 5.5.2 Proportion of women in managerial positions
Data/parameter:	Number of women trained by CEDESOL
Unit	Number of women
Description	Number of women trained by CEDESOL as innovative leaders
Measured/calculated/default	
Source of data	CEDESOL training records
Value(s) of monitored parameter	41 (Innovative Leaders trained)
Monitoring equipment	N.A
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	Counting number of female leaders
QA/QC procedures:	Transparent data analysis and reporting
Purpose of data:	SDG 5 Contributions
Additional comments:	N.A

Relevant SDG Indicator	SDG 7: 7.1.2 Proportion of population with primary reliance on clean fuels and technology
Data/parameter:	Number of persons that benefit from efficient and clean technologies
Unit	Number of beneficiaries
Description	Number of persons that benefit from efficient and clean technologies
Measured/calculated/default	
Source of data	Project database, Monitoring survey
Value(s) of monitored parameter	2594
Monitoring equipment	N.A
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	Total number of units installed multiplied with usage rates multiplied with average household size
QA/QC procedures:	Transparent data analysis and reporting
Purpose of data:	SDG 7 Contributions
Additional comments:	Number of domestic ecological stoves: 814 Usage rate: 90% Average household size: 3.54 (Monitoring survey cell BC112- December 2019)

Relevant SDG Indicator	SDG 8: 8.5.1 Average hourly earnings of female and male employees, by occupation, age and persons with disabilities
Data/parameter:	Number of jobs offered
Unit	Number of employees
Description	Number of jobs offered by CEDESOL to local employees
Measured/calculated/default	
Source of data	CEDESOL employment records
Value(s) of monitored parameter	56 (Total number of people employed from 2012 to present) In addition to the 4 full time CEDESOL employees, 2 temporary jobs (every time a monitoring activity is performed) Average salary is above Bolivian minimum wage (2122 BOB per month)
Monitoring equipment	N.A
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	Total number of employees
QA/QC procedures:	Transparent data analysis and reporting The wages are in line with Bolivian minimum wage salary approved by the Government https://www.ine.gob.bo/subtemas_cuadros/salarioMinimo_html/SalarioMinimo_41201.htm
Purpose of data:	SDG 8 Contributions
Additional comments:	Currently CEDESOL do not offer jobs except when doing monitoring and then during that time period usually 1 to 2 weeks it contracts 2 woman leaders that were trained in the MET program according to the villages is monitored

Relevant SDG Indicator	SDG 12: 12.2.2 Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP
Data/parameter:	Fuel savings achieved
Unit	%
Description	Fuel savings in % achieved by project technologies compared to baseline.
Measured/calculated/default	Calculated
Source of data	Baseline and Project Scenario Field Test (December 2019)
Value(s) of monitored parameter	46% for ecological stoves installed
Monitoring equipment	N.A
Measuring/reading/recording frequency:	Every other year
Calculation method (if applicable):	Fuel savings divided by baseline fuel consumption expressed in %
QA/QC procedures:	Transparent data analysis and reporting
Purpose of data:	SDG 12 Contributions
Additional comments:	Consumption baseline scenario: 0.0121 t wood/day/unit Consumption project scenario: 0.0065 t wood/day/unit

Relevant SDG Indicator	SDG 12: 12.2.2 Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP SDG 13: Climate Action
Data/parameter:	$P_{r\text{-}d,d,y}$
Unit	Tons/year
Description	Specific fuel savings for domestic rocket stoves in Bolivia of project scenario r-d (rocket domestic) against the baseline scenario d (domestic) in year y
Measured/calculated/default	Calculated
Source of data	Relevant Field Test, verified with Lab test results (Centro de Pruebas de Cocinas, CPC, La Paz 2013) See relevant FT spread sheet.
Value(s) of monitored parameter	0.0065 tons/day
Monitoring equipment	Hand held portable electronic scale. This compact, accurate, and highly functional scale has features such as automatic shut-down, tare weight, display lock and audible feedback. The scale weighs in units of kilograms, pounds or ounces, and can convert between units. It is accurate to 1% for loads above 1kg (2.2 lb). Accuracy drops to 4% for loads between 0.25kg (0.55 lb) and 1kg (2.2 lb). Holds a maximum of 40kg (88 lb). It is resettable to 0 after every use or during use via the TARE feature and is accurate to 1% for our purposes.
Measuring/reading/recording frequency:	Every other year
Calculation method (if applicable):	See Description of measurement methods for the parameter.
QA/QC procedures:	CEDESOL performs the data collection and puts the data into the project database. myclimate revises and analyses this data.
Purpose of data:	For SDG 12 and SDG 13 contribution
Additional comments:	See excel file " GS1221_MR4_Domestic-Rocket Stove_Field test_CEDESOL"

Relevant SDG Indicator	SDG 13: Climate Action
Data/parameter:	$N_{r\text{-}d,y}$
Unit	Days
Description	Cumulative number of project technology-days included in the project database for project scenario r-d (rocket domestic) in year y
Measured/calculated/default	
Source of data	Sales record
Value(s) of monitored parameter	See relevant ER calculation spread sheet For y = 2018: 220,594 2019: 271,062
Monitoring equipment	N.A
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	N.A
QA/QC procedures:	CEDESOL performs the data collection and puts the data into the sales record. myclimate revises and analyses this data
Purpose of data:	SDG 13 Contributions
Additional comments:	N.A.

Relevant SDG Indicator	SDG 13: Climate Action
Data/parameter:	$N_{r\text{-}ic,y}$
Unit	Days
Description	Cumulative number of project technology-days included in the project database for project scenario r-ic (rocket institutional/commercial) in year y
Measured/calculated/default	
Source of data	Sales record
Value(s) of monitored parameter	See relevant ER calculation spread sheet For y = 2018: 4878 2019: 5994
Monitoring equipment	N.A
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	N.A.
QA/QC procedures:	CEDESOL performs the data collection and puts the data into the sales record. myclimate revises and analyses this data
Purpose of data:	SDG 13 Contributions
Additional comments:	N.A.

Relevant SDG Indicator	SDG 13: Climate Action
Data/parameter:	$U_{r\text{-}d,y}$
Unit	Fraction
Description	Cumulative usage rate for technologies in project scenario r-d (rocket domestic) in year y, based on first linear assumption.
Measured/calculated/default	
Source of data	Usage survey
Value(s) of monitored parameter	See relevant ER calculation spread sheet For y = 2018: 0.90 2019: 0.90
Monitoring equipment	N.A
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	N.A
QA/QC procedures:	CEDESOL performs the data collection and puts the data into the sales record. myclimate revises and analyses this data
Purpose of data:	SDG 13 Contributions
Additional comments:	N.A

Relevant SDG Indicator	SDG 13: Climate Action
Data/parameter:	$U_{r\text{-}ic,y}$
Unit	Fraction
Description	Cumulative usage rate for technologies in project scenario r-d (rocket institutional/commercial) in year y, based on first linear assumption.
Measured/calculated/default	

Source of data	Usage survey
Value(s) of monitored parameter	See relevant ER calculation spread sheet For y = 2018: 0.90 2019: 0.90
Monitoring equipment	N.A.
Measuring/reading/recording frequency:	Annually
Calculation method (if applicable):	N.A
QA/QC procedures:	CEDESOL performs the data collection and puts the data into the sales record. myclimate revises and analyses this data
Purpose of data:	SDG 13 Contributions
Additional comments:	N.A

Relevant SDG Indicator	SDG 13: Climate Action
Data/parameter:	$P_{r\text{-}ic,ic,y}$
Unit	Tons/year
Description	Specific fuel savings for institutional/commercial rocket stoves in Bolivia of project scenario r-ic (rocket institutional/commercial) against the baseline ic (institutional/commercial) in year y, as derived from the statistical analysis of the data collected from the baseline field survey and the lab test.
Measured/calculated/default	
Source of data	R No kitchen tests available due to too low implementation rate. As a very conservative assumption the KT values of the domestic stoves are taken, proved with baseline survey and thermal efficiency of project stove from lab test (Centro de Pruebas de Cocinas, CPC, La Paz 2013). See relevant KT spread sheet (Domestic rocket stove scenario)
Value(s) of monitored parameter	0.0065 tons/day
Monitoring equipment	Hand held portable electronic scale. This compact, accurate, and highly functional scale has features such as automatic shut-down, tare weight, display lock and audible feedback. The scale weighs in units of kilograms, pounds or ounces, and can convert between units. It is accurate to 1% for loads above 1kg (2.2 lb). Accuracy drops to 4% for loads between 0.25kg (0.55 lb) and 1kg (2.2 lb). Holds a maximum of 40kg (88 lb). It is resettable to 0 after every use or during use via the TARE feature and is accurate to 1% for our purposes.
Measuring/reading/recording frequency:	Every other day
Calculation method (if applicable):	See Description of measurement methods for the parameter.
QA/QC procedures:	CEDESOL performs the data collection and puts the data into the project database. myclimate revises and analyses this data.
Purpose of data:	For SDG 13 contribution
Additional comments:	Field tests (in baseline and project scenario) were not performed for institutional/commercial rocket stoves, for conservatism purpose is used the value obtained in domestic rocket stoves.

Relevant SDG Indicator	SDG 13: Climate Action
Data/parameter:	$LE_{p,y}$
Unit	$tCO_{2e/yr}$
Description	Leakage for project scenario p in year y

Measured/calculated/default	
Source of data	Leakage assessment on VPA-DD under B.5.2.
Value(s) of monitored parameter	0
Monitoring equipment	N.A
Measuring/reading/recording frequency:	N.A
Calculation method (if applicable):	N.A
QA/QC procedures:	N.A
Purpose of data:	For SDG 13 contribution
Additional comments:	N.A.

Relevant SDG Indicator	SDG 15: 15.1.1 Forest area as a proportion of total land area
Data/parameter:	Amount of wood equivalents saved by the project
Unit	Tons of wood equivalents
Description	Amount of wood savings achieved by the project per year expressed in wood equivalents
Measured/calculated/default	
Source of data	Baseline and Project Scenario Field Test
Value(s) of monitored parameter	1231 tons of wood saved for domestic rocket stoves installed and 27 tons of wood saved commercial/institutional rocket stoves installed in 2018. 1512 tons of wood saved for domestic rocket stoves installed and 33 tons of wood saved commercial/institutional rocket stoves installed in 2019.
Monitoring equipment	N.A
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	Project technology days multiplied with wood savings in t/day/stove
QA/QC procedures:	Transparent data analysis and reporting
Purpose of data:	SDG 15 Contributions
Additional comments:	N.A.

Relevant SDG Indicator	SDG 17: 17.7.1Total amount of approved funding for developing countries to promote the development, transfer, dissemination and diffusion of environmentally sound technologies
Data/parameter:	Number of ecological stoves units installed in Bolivia
Unit	Number (quantity)
Description	Number of ecological stoves units installed in Bolivia
Measured/calculated/default	
Source of data	814 domestic rocket stoves installed and 18 commercial/institutional rocket stoves installed
Value(s) of monitored parameter	Based on latest Total Sales Record

Monitoring equipment	N.A
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	Total number of ecological stove units installed since project start
QA/QC procedures:	Transparent data analysis and reporting
Purpose of data:	SDG 17 Contributions
Additional comments:	N.A.

D.3. Implementation of sampling plan

>> (If data and parameters monitored described in section D.2 above are determined by a sampling approach, provide a description on how project participants implemented the sampling plan and surveys for those data and parameters according to the approved PDD.)

Monitoring and Usage surveys

The monitoring and usage survey was carried out for Domestic rocket stoves for Project scenario using representative and random sampling, following the guidelines of the methodology the sample sizes:

- Minimum sample size 100 if more than 1000 stoves are distributed in total, else 10% of group size. In the case of monitoring survey.
- The minimum total sample size is 100 (or population size, whichever is smaller), with at least 30 samples for project technologies of each age being credited. In the case of usage survey.

The VPA includes domestic and institutional rocket stove.

- Domestic rocket stove group size : 814

Department	Number of stoves
Chuquisaca	702
Cochabamba	112

- Institutional rocket stove group size :18

Department	Number of stoves
Chuquisaca	11
Cochabamba	7

Domestic Scenario:
109 monitoring and usage surveys were performed in the department of Chuquisaca as almost 88% of the domestic rocket stoves were installed in this department. 96 surveys in families with the project technologies for 7-8 years (79% of the total stoves installed has 7-8 ages) and 13 surveys in families with 6-7 years with the project technology (17% of the total stoves installed has 6-7 ages) and. It was only consider these two ages because stove with 4 or 5 years does not represent a significant amount (only 4% of the total stoves installed).

The families selected were beneficiaries that received the rocket stoves.

A summary of the main findings are included in the annex 3 and the excel file "GS1221_MR4_Monitoring & Usage Surveys_CEDESOL.xls".

Project Field Test Update

As stated in the PoA-DD section D.6.1 for every scenario CEDESOL performs a performance field tests update for a representative sample of the group as an extension of the previous project PFT and provides a fuel consumption assessment representative of project technologies currently in use.

In this VPA, 35 surveys were conducted for domestic rocket stoves in the Department of Chuquisaca because almost 88% of the domestic rocket stoves were installed in this department.
The project field test update has been conducted in December 2019.

The field tests for institutional/commercial rocket stoves were not performed because the small number of installed stoves. But according to the results of the Baseline Survey and the thermal efficiency of project stove from lab test (Centro de Pruebas de Cocinas, CPC, La Paz 2013), the wood consumption in baseline scenario is 37.2 kg wood/unit/day and the laboratory thermal efficiency is 27%, therefore the wood consumption in project scenario is 13.8 kg wood/unit/day, this results in a fuel savings of 23.4 kg wood/unit/day.

According to the field tests the domestic rocket stoves have a fuel savings of 5.58 kg wood/unit/day, therefore the option to use the results from domestic rocket stoves to estimate the emission reduction in institutional or commercial stoves are conservative.

The baseline test for domestic stoves was done in this first monitoring report and it will be used for this or different VPAs e.g. same baseline for rocket and solar stoves.

Statistical analysis following the guidelines of the methodology of the test results lead to the specific fuel consumption per family. More details Field Test spreadsheet "GS1221_MR4_Domestic-Rocket Stove_Field test_CEDESOL".

SECTION E. Calculation of SDG outcomes

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

>> (*Provide details of equations and approaches used to calculate/estimate baseline values.*)

SDG1: No Poverty
Without the project, there is no time and monetary savings
Baseline value = 0%

Without the project, there are no families, which noticed their income increased time and monetary savings.
Baseline value = 0%

SDG3: Good health and well-being
Without the project, there is no air quality improvement
Baseline value = 0%

Without the project, there is not a reduction in visiting medical facilities
Baseline value = 0%

SDG4: Quality Education
Without the project, there is not people trained in educational program
Baseline value = 0.

SDG5: Gender equality
Without the project, there is not women trained as innovative leaders
Baseline value = 0.

SDG7: Affordable and clean energy
Without the project, there is anybody with an ecological stove
Baseline value = 0.

SDG8: Decent work and economic growth

Without the project, there is no local people employed by a sustainable project
Baseline value = 0.

SDG12: Responsible consumption and production
Without the project, there would be families which consumes firewood for cooking
Baseline value $_{2018}$ = 0.0121 tonnes wood/day/unit
Baseline value $_{2019}$ = 0.0121 tonnes wood/day/unit

SDG13: Climate Action
It is not applicable as the methodology used only has a formula for Emission Reduction (see section E.3).

SDG15: Life on Land
Without the project, there would be families which consumes firewood for cooking
Baseline value domestic stoves $_{2018}$ = 0.0121*220594 = 2,671 tonnes
Baseline value domestic stoves $_{2019}$ = 0.0121*271062 = 3,281 tonnes
Baseline value commercial/institutional rocket stoves $_{2018}$ = 0.0121*4878 = 59 tonnes
Baseline value commercial/institutional rocket stoves $_{2019}$ = 0.0121*5994 = 73 tonnes

SDG17: Partnership for the goals
Without the project, there are not any stoves installed
Baseline value domestic stoves = 0.
Baseline value commercial/institutional = 0.

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

>> (*Provide details of equations and approaches used to calculate/estimate project values.*)

SDG1: No Poverty
Proportion of families confirming the reduction in time or money since the use of ecological stove
Project value = 100%

Proportion of families confirming the increasing of their income since the use of ecological stove
Project value = 0%

SDG3: Good health and well-being
Proportion of families confirming the reduction on smoke in households
Project value = 92%

Proportion of families confirming a better health and less medical problems because the introduction of an ecological stove
Project value = 80%

SDG4: Quality Education
Number of folks completing the Modular Environmental Training (MET)
Project value = 832.

SDG5: Gender equality
Number of innovative leaders women.
Project value = 41.

SDG7: Affordable and clean energy
Number of persons that benefit from efficient and clean technologies
Project value = 2594 persons benefit by the project.

SDG8: Decent work and economic growth
Number of local people employed due to the project activity (permanent and temporary).
Project value = 4 full time CEDESOL employees, 2 temporary jobs.

SDG12: Responsible consumption and production

With the project, still there are families which consumes firewood for cooking
Project value $_{2018}$ = 0.0065 tonnes wood/day/unit
Project value $_{2019}$ = 0.0065 tonnes wood/day/unit

SDG13: Climate Action
It is not applicable as the methodology used only has a formula for Emission Reduction (see section E.3).

SDG15: Life on Land
With the project, still there are families which consumes firewood for cooking
Project value domestic stoves $_{2018}$ = 0.0065*220594 = 1,440 tonnes
Project value domestic stoves $_{2019}$ = 0.0065*271062 = 1,769 tonnes
Project value commercial/institutional rocket stoves $_{2018}$ = 0.0065*4878 = 32 tonnes
Project value commercial/institutional rocket stoves $_{2019}$ = 0.0065*5994 = 39 tonnes

SDG17: Partnership for the goals
Number of ecological stove units produced and disseminated in Bolivia.
Project value domestic stoves = 814.
Project value commercial/institutional = 18.

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

>>

SDG1: No Poverty
Net benefit = project value - baseline value
Proportion of families confirming the reduction in time or money since the use of ecological stove
100% - 0% = 100 %

Net benefit = project value - baseline value
Proportion of families confirming the increasing of their income since the use of ecological stove
0% - 0% = 0 %

SDG3: Good health and well-being
Net benefit = project value - baseline value
Proportion of families confirming the reduction on smoke in households
Without the project, there is no air quality improvement
92% - 0% = 92 %

Net benefit = project value - baseline value
Proportion of families confirming a better health and less medical problems because the introduction of an ecological stove
80% - 0% = 80 %

SDG4: Quality Education
Net benefit = project value - baseline value
Number of folks completing the Modular Environmental Training (MET)
832 - 0 = 832

SDG5: Gender equality
Net benefit = project value - baseline value
Number of innovative leaders women.
41 - 0 = 41

SDG7: Affordable and clean energy
Net benefit = project value - baseline value
Number of persons that benefit from efficient and clean technologies
2594 - 0 = 2594

SDG8: Decent work and economic growth
Net benefit = project value - baseline value
Number of local people employed due to the project activity (permanent and temporary).
6 - 0 = 6.

SDG12: Responsible consumption and production
Net benefit = baseline value minus project value/ project value %
Fuel savings in % achieved by project technologies compared to baseline.
Fuel saving $_{2018}$ = (0.0121 – 0.0065) / 0.0121 = 46%
Fuel saving $_{2019}$ = (0.0121 – 0.0065) / 0.0121 = 46%

SDG13: Climate Action
Net benefit = Emission reductions
Emissions reduction $_{2018}$: 1743 tCO_2e
Emissions reduction $_{2019}$: 2142 tCO_2e

SDG15: Life on Land
Net benefit = baseline value minus project value
Amount of wood equivalents saved by the project
Wood saved domestic stoves $_{2018}$ = (0.0121 – 0.0065)*220594 = 1231 tonnes
Wood saved domestic stoves $_{2019}$ = (0.0121 – 0.0065)*271062 = 1512 tonnes

Wood saved commercial/institutional rocket stoves $_{2018}$ = (0.0121 – 0.0065)*4878 = 27 tonnes
Wood saved commercial/institutional rocket stoves $_{2019}$ = (0.0121 – 0.0065)*5994 = 33 tonnes

SDG17: Partnership for the goals
Net benefit = project value - baseline value
Number of ecological stove units produced and disseminated in Bolivia.
832 - 0 = 832.

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

Item	Baseline estimate	Project estimate	Net benefit
SDG 1 (Time or Money)	0%	100%	100%
SDG 1 (Income)	0%	0%	0%
SDG 3 (Air)	0%	92%	92%
SDG 3 (Health)	0%	80%	80%
SDG 4 (MET)	0	832	832
SDG 5 (Women)	0	41	41
SDG 7 (Beneficiaries)	0	2594	2594
SDG 8 (Jobs)	0	6	6
SDG 12 (% Wood)	0.0121 tonnes wood/day/unit	0.0065 tonnes wood/day/unit	2018: 46% 2019: 46%
SDG 13 (ERs)	2018: 3786 2019: 4652	2018: 2043 2019: 2510	2018: 1743 2019: 2142
SDG 15 (Tonnes Wood)	2018: 2730 2019: 3354	2018: 1472 2019: 1808	2018: 1258 2019: 1546
SDG 17 (Ecological stoves)	0	832	832

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 1 (Time or Money)	**100%**	**100%**
SDG 1 (Income)	**60%**	**0%**
SDG 3 (Air)	**100%**	**92%**
SDG 3 (Health)	**70%**	**80%**
SDG 4 (MET)	**832**	**832**
SDG 5 (Women)	**41**	**41**
SDG 7 (Beneficiaries)	**2909**	**2594**
SDG 8 (Jobs)	**6**	**6**
SDG 12 (% Wood)	**55%**	**2018: 46%** **2019: 46%**
SDG 13 (ERs)	**2018: 7,059** **2019: 8,096**	**2018: 1,743** **2019: 2,142**
SDG 15 (Tonnes Wood)	**2,036**	**2018: 1,258** **2019: 1,546**
SDG 17 (Ecological stoves)	**832**	**832**

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

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In case of SDG 1 No poverty, the 100% of households surveyed perceived time or monetary savings after the installation of the ecological stove, the same percentage as expected in GS4GG transition annex.
Also for SDG 1 No poverty, none households surveyed perceived an increasing in their income because the introduction of the ecological stove. The proportion is less than expected in GS4GG transition annex. The possible reason is that families perceived a monetary savings but a proper increase of their income.

In case of SDG 3 Good health and well-being, 92% of households surveyed confirm the reduction on smoke in households. The proportion is less than expected in GS4GG transition annex, which was 100% (based on previous monitoring surveys), but still is a higher value that infers the positive impact over the health of families after the installation of the ecological stove.
Also for SDG 3 Good health and well-being, 80% of households surveyed confirm a better health and less medical problems because the introduction of an ecological stove. The proportion is above the value expected in GS4GG transition annex, which confirm the conclusion of the first indicator for this SDG, the positive impact of the project over the health of the families.

In case of SDG 4 Quality education, 832 folks completed the Modular Environmental Training (MET), the same number expected in GS4GG transition annex.

In case of SDG 5 Gender Equality, 41 innovative leader women were trained as part of project goals, the same number expected in GS4GG transition annex.

In case of SDG 7 Affordable and clean energy, 2594 persons were benefited from efficient and clean technologies. The proportion is less than expected in GS4GG transition annex because a slight reduction in the number of person per household based on monitoring survey conducted in 2019 (3.54 persons vs 3.97 person in 2018 survey).

In case of SDG 8 Decent work and economic growth (number of local people employed), the same values are accomplish as there are no change with the situation of the last year (ex-ante values in GS4GG transition annex used are from latest monitoring report).

In case of SDG 12 Sustainable consumption and production, the fuel savings was 46% a slightly below than expected in GS4GG transition annex because an increase of the firewood consumption for the households who installed the ecological stove (based on Field test results).

In case for SDG 13 Climate Action, the quantity of net GHG emission reductions (t CO2e) was 3885 t CO2e and it was below than expected (15,155 t CO2e) during the monitoring period. The project considered the implementation of 2500 domestic rocket stoves between 2011-2019 and 200 institutional/commercial rocket stoves in the same period, but because some delays in the project implementation, until December of 2019, 814 domestic rocket stoves and 18 institutional/commercial rocket stoves were installed.

In case of SDG 15 Life on land the wood savings was 1546 (in 2019) and 1258 (in 2018) a below than expected in GS4GG transition annex because an increase of the firewood consumption for the households who installed the ecological stove (based on Field test results).

In case of SDG 17 Partnerships for the goals the total of stove installed was 832, the same value is accomplish as there are no change with the situation of the last year (ex-ante values in GS4GG transition annex used are from latest monitoring report).

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

Table of Verification after monitoring in 2019.

Date	Hours	Name	Place	check	Responsible
01/08/2020	10:00 AM	José Roque	La Mendoza	It was called through the cell phone to verify if the CEDESOL team did the monitoring. Verification was also carried out by mobile with the participant	Norma Camacho
01/08/2020	11:30 AM	Carmelo Palma	La Mendoza	It was called through the cell phone to verify if the CEDESOL team did the monitoring.	Norma Camacho
01/09/2020	11:00 AM	Maria Torrez	Pulqui Avaroa	It was called through the cell phone to verify if the CEDESOL team did the monitoring. The lady was called by cell phone to conduct the surveys	Norma Camacho
01/13/2020	9:00 AM	Margaret Mollo	San Jose de Molles	It was called by cell phone to verify if the CEDESOL team did the monitoring. In each community the ecological kitchens project was executed	Norma Camacho
01/14/2020	15:00 PM	Honorata Soliz	Pulqui Avaroa	It was called through the cell phone to verify if the CEDESOL team did the monitoring. It was confirmed	Norma Camacho
01/16/2020	17:00 PM	René León	Scana	It was called through the cell phone to verify if the CEDESOL team did the monitoring. At home if	Norma Camacho
01/17/2020	2:00 PM	Arminda Zubelsa	Laundry	It was called through the cell phone to verify if the CEDESOL team did the monitoring. The team's visit was confirmed and the survey was also carried out	Norma Camacho
01/20/2020	9:00 AM	Ernesto Diaz	Katana	It was called through the cell phone to verify if the CEDESOL team did the monitoring. It was confirmed	Norma Camacho
01/20/2020	10:00 AM	Raul Duran	Mendoza	It was called by cell	Norma

				phone to verify if the CEDESOL team did the monitoring. It was confirmed	Camacho
01/21/2020	15:00 PM	Leonardo Rollano	San Jose de Molles	It was called through the cell phone to verify if the CEDESOL team did the monitoring. It was confirmed	Norma Camacho
01/22/2020	12:15 PM	Reyna Rivera	Central axis	It was called through the cell phone to verify if the CEDESOL team did the monitoring. It was confirmed	Norma Camacho
01/22/2020	17:30 PM	Corcino Arancibia		It was called through the cell phone to verify if the CEDESOL team did the monitoring. It was confirmed	Norma Camacho

The communication was made through the cell phone with the 12 people, to verify the monitoring in the different communities of Chuquisaca Bolivia.

Table Description of the part delivered during the site visit – December 2019

Date of deliveries of the spare parts	Name s of the beneficiary	Names communities	Observations	Change bricks to kitchens	Carried out by CEDESOL
12/06/2019	Cecilio Garrón	Sorojchi		A complete combustion chamber was delivered	yes
12/06/2019	Angelica Arancibia	Laundry		A complete combustion chamber was delivered	yes
12/06/2019	Miguel Arancibia	Laundry		A complete combustion chamber was delivered	yes
12/06/2019	Arminda Zubelsa	Laundry		A complete combustion chamber was delivered	yes
12/07/2019	Leonardo Rollano	San Jose de Molles		A complete combustion chamber was delivered	yes
12/05/2019	Honorata Solíz	Pulqui Avaroa		A complete combustion chamber was delivered	yes
12/08/2019	Alfredo Barrientos	Scana		A complete combustion chamber was delivered	yes
12/02/2019	Tiburcio Jacome	Katana		A complete combustion chamber was delivered	yes

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

There are not any inputs/grievances from previous monitoring period where follow up action is to be verified in this monitoring period, they were closed as stated in previous ANNEX AR Verification Report Template.

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

There is not any legal contest or dispute during the monitoring period.