Monitoring Report: 2016-2018
Solar Cook-stoves Project in Bolivia
ID: GS813

Project Name:	**Solar cook stoves project in Bolivia**
Project Number:	**GS - 813**
Monitoring Report:	**1st January 2016 – 10th September 2018**
Monitoring period N°:	5th period.
GS methodology:	Indicative Programme, Baseline, and Monitoring Methodology for Improved Cook-Stoves and Kitchen Regimes, V02
Project start date:	**January 2007** (*VER's claimed from 11th August 2009*).
Project End date:	**31st July 2018**
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Introduction:

The project activity aims to provide solar cook stoves to families in Bolivia. The availability of high incidence of solar light and high altitude in the country makes the solar energy as one of the alternative source of fuel for daily energy needs. Since its implementation, the project activity is being regularly monitored, which has shown that the solar cook-stoves not only meets the daily cooking energy needs of the beneficiaries but has also benefited in other ways- such as income saving, health benefits due to safe drinking water (boiling water) etc. The project is implemented in partnership with the two French organizations namely- Fondation GoodPlanet, Bolivia Inti Sud Soliel (henceforth BISS) and its Bolivian partner, the Inti-Illimani team (henceforth "II").

The project crediting period has ended on the 31st July 2018, this is the last monitoring report for verification.

The purpose of the project is also to reduce the deforestation rate and the use of fossil fuels in Bolivia, and improving the living condition of the women by promoting the use of a clean energy source like the solar energy for cooking. The use of solar cook-stoves has partly replaced fuels like – firewood, LPG and dung for the daily cooking needs of the project population. The project demonstrates the sustainable development in the project areas through parameters like – time saving from the collection of firewood, income-savings occurring from less consumption of LPG (some beneficiaries had to travel for more than 2 hours to purchase the LPG tank), health improvement especially among the women, due to the avoidance of the smoke emissions from firewood, which is the potential cause for lung infections. And finally, the slow and gradual cooking process of the solar stoves preserves most the food nutrients while cooking.

Implementation of the project:

The II team disseminates the solar cook-stoves through construction workshops for group of beneficiaries, and each group consists of a maximum of 25 beneficiaries. In each workshop, the beneficiaries build their own solar cook-stoves under the technical guidance of the II teams. The II team arranges these construction workshops in the same villages/areas of the beneficiaries and preferably held in a village community hall or in an open public space. These workshops usually last for 4-5 days, where the beneficiaries are provided with all the materials that are required for the construction of the solar stoves.

Similar kinds of workshops are held throughout the year as per the demand for the solar cookers, which has been observed to be increasing every year and therefore, these workshops are carried out with an advanced planning. The II team follows-up each of these groups on a regular basis after these construction workshops, to assure that the solar cookers are being regularly used for daily cooking needs and have not faced any problems during.

One the workshops carried out for a group by the II technical experts and the project coordinators.



Monitoring surveys/ Field tests/Follow-up meetings:

a) Kitchen Survey:

The Kitchen surveys were conducted as per the guidelines given in the GS cook-stove methodology. Since the solar cook-stoves are disseminated throughout the year, the kitchen surveys were carried out during each workshop. At least 5 beneficiaries, out of the total (maximum 20 participants) present in the workshop, were asked the survey questions before the use of the solar cookers and the same 5 beneficiaries were followed up after the construction courses. The kitchen survey data was collected and updated regularly by the II team members. As per the kitchen survey data, the clusters are accordingly defined for the project activity.

The pattern of clusters has changed since the year 2013 with the evolving baseline surveys. The previous clusters defined were the LPG cluster and LPG Firewood (LPG Fw) cluster. The new cluster LPG Fw dung was added since 2013 according to the field observations and the monitoring surveys. Since then the same clusters have been followed. All the survey data have been submitted to the Gold Standard for further verification. The following table provides the data for the 3 clusters.

Table 1: Number of Solar Cookers distributed

Year	LPG	*LPG + Fw	*LPG + Fw + Dung	Others	Total
2007	235	146	0	20	401
2008	233	125	0	62	420
2009	235	85	0	80	400
2010	386	119	0	77	582
2011	425	233	0	2	660
2012	197	456	0	7	660
2013	170	132	196	2	500
2014	78	186	138	0	402
2015	75	58	21	0	154
2016	150	0	0	5	155
2017	82	2	26	0	110
2018	11	4	45	0	60
Total	2277	1546	426	255	**4504**

**LPG Fw – LPG and firewood cluster.*

Since 2007, a total of **4504** solar stoves have been disseminated through the workshops.
The II team has carried out a total of 240 workshops in the different regions of Bolivia.
Out of the 240 workshops – i) **7** were held in 2016, ii) **13** in the year 2017 & iii) **3** in the year 2018.

The ER's calculations for the years 2016, 2017 & 2018 are carried out considering the usage factor and total number of solar stoves in the three clusters as mentioned above.

- **In 2016**, out of the total 4079 solar stoves distributed, 2503 are considered for ER calculations.
- **In 2017**, out of the total 4189 solar stoves distributed, 2353 are considered for ER calculations.
- **In 2018**, out of the total 4249 solar stoves distributed, 2122 are considered for ER calculations. *(For the year 2018, the ER's area calculated till the 31st July 2018 - end of crediting period).*

b) Kitchen Tests:

The Kitchen tests were also carried out in the year 2016 & 2017 for each of the above-mentioned clusters as per the guidelines given in the GS methodology. The results are as follows:

Cluster	LPG consumption **without SC** kg/day/hh	Firewood consumption **without SC** kg/day/hh	Dung consumption **without SC** kg/day/hh	LPG consumption **with SC** kg/day/hh	Firewood consumption **with SC** kg/day/hh	Dung consumption **with SC** kg/day/hh
Average LPG	0.50	-	-	0.22	-	-
Low IC LPG	0.35	-	-	0.15	-	-
Average LPG + Fw	0.34	5.05	-	0.27	2.12	-
Low IC LPG + Fw	0.24	3.53	-	0.19	1.48	-
Average LPG + Fw + Dung	0.30	-	4.79	0.29	-	1.04
Low IC LPG + Fw + Dung	0.21	-	3.35	0.20	-	0.73

Selection of the sample for the Kitchen tests:

Following considerations have been taken into account for KT:

Paired samples have been taken to compare pre- and post-installation consumption in the same houses. The selection of beneficiaries groups has been randomly chosen however practical aspects for carrying out the tests have been taken into account:

a. The user's availability and motivation to participate in the required tests,
b. Dispersion of the households in the communities and ease of accessibility the areas,
c. Distance between households of the same clusters located in different villages.
d. The seasonal variations (to assure conservative approach while calculating the fuel consumption).

The period over which the tests have been carried out is one week of pre- and one week of post-installation to avoid risks of heterogeneity cooking habits and to include weekend cooking in the correct annual ratio to the weekday cooking. For the emission reduction calculations, the most conservative value has been taken into account.

The sample sizes used in the different KTs are bigger than the simple size calculated using the KPT methodology by Rob Bailis to show statistically significant reductions in per capita fuel consumption. Also, as it can be verified in the ER excel sheet, the end-points of the 90% confidence interval lie within +/- 30% of the estimated mean, so the rule 90/30 is met, it proves that the sample size is big enough. Therefore, the estimated mean value has been used to calculate the total VER's.

Summary of the Kitchen survey and kitchen tests:

Year	Number of households included in the Kitchen Tests		
	LPG cluster	LPG + Firewood cluster	LPG + Firewood + dung cluster
2009	26 hh*		
2010	19 hh	21 hh	
2011			
2012		21 hh	
2013	30 hh	27 hh	
2014			29 hh
2015		27 hh	
2016	21 hh	29 hh	
2017	27 hh		

**hh – households*

Year	Kitchen Surveys
2012	✓
2013	✓
2014	✓
2015	✓
2016	✓
2017	✓

Year	Usage Survey
2011	✓
2012	✓
2013	
2014	✓
2015	✓
2016	
2017	
2018	✓

c) Follow-up meetings with the beneficiaries:

The Inti Illimani team followed up with the group of beneficiaries after each of the construction workshops. This first follow-up meeting was usually planned after 2 weeks from the end of the workshops. These follow-ups were carried out to ensure that the beneficiaries have started using the solar cookers with the instructions already provided by the II team experts to use and maintain the solar cookers during the training programs.

The Inti Illimani team member and a local co-coordinator from the village carried out these follow-up meetings. The beneficiaries were asked to demonstrate and discuss the problems that they might have come across while using the cookers during the first 2 weeks. This was a good opportunity for

II team to monitor and understand various aspects of the project activity and also to learn if the beneficiaries have tried any new food recipes during this period. It has been observed by the II team, that the beneficiaries have used the solar cookstoves regularly. The meeting includes an individual basis consultation with each of the beneficiaries.

These follow-up meetings are carried out for 4 months with each group. After completion of the 4-month follow-up meetings, the II team gives a gift to the beneficiary who has regularly completed all the activities/training/improvements proposed during the previous follow-up meetings. The gifts are usually in the form of plates/cooking pots/cups etc. as recognition of their proactive participation in the project activity.

The follow-up meetings are carried out by the BISS team member along with the help of the local coordinator of the village.

Sustainable Development Parameters:

Data / Parameter:	Access to affordable and clean energy services
Data unit:	4504 households
Description:	It has been evaluated with the number of solar cook stoves distributed since 2007. From the year 2007 till July 2018, a total of 4504 solar stoves have been distributed. Of these 4504 solar stoves: - 4249 solar stoves were defined into clusters. - Considering a conservative approach to calculate the total VER's for the year 2016, 2017 and 2018, the remaining 255 solar stoves in 'other clusters' were not taken into account for calculations but were considered while evaluating the SD parameters.
Source of data used:	Project database.
Monitoring frequency	Continuous throughout the year.
QA/QC procedures to be applied:	The total number of households in the project activity is determined from the project database. The II team collects the information of beneficiaries and records them in a database. This project database is maintained and regularly updated by the Inti Illimani team.
Any comment:	As a part of the internal verification process, the GoodPlanet team also crosschecked the database maintained by the II team members.

Data / Parameter:	Human and institutional capacity
Data unit:	240 workshops carried out from 2007 till July 2018.
Description:	It has been evaluated with the number of solar cook stoves distributed in the project activity. Out of the 240 workshops – i) 07 workshops were held in 2016, ii) 13 workshops were held in 2017 & iii) 03 workshops were held in 2018. During these workshops, apart from technical trainings to construct the solar stoves, the II team also gives each group of beneficiaries a special training on nutrition, environment and health benefits of the use of the solar cook-stoves. After the training workshops, the Inti Illimani team also visits the households as a part of the continuous monitoring of the project.
Source of data to be used:	Trainings programs database.
Monitoring frequency	Throughout the year.
QA/QC procedures to be applied:	The details of each beneficiary participating in the project activity are recoded in a database, which is maintained by the Inti Illimani team. This database also includes the details of the training programs carried out during the year (e.g.- date, total beneficiaries, project area/village etc.).
Any comment:	As a part of the internal verification process, the GoodPlanet team crosschecked the details of the total number of training workshops carried out during the year.

Data / Parameter:	Quantitative employment and income generation
Data unit:	20 Bs/hh/month (*Bs – Bolivian Boliviano*)
Description:	On an average the beneficiaries have been able to reduce their LPG consumption and on an average are able to save from 1 to 4 cylinders of LPG per year. During the field visits of the II team, they have observed that certainly some of the beneficiaries have shown additional usage of the cookstove for income generating activities like selling peanuts, api, corn, etc. There has been no change in the total number of Inti Illimani staff. There are 6 members.
Source of data to be used:	Survey among the beneficiaries
Monitoring frequency	Continuous survey
QA/QC procedures to be applied:	The data is collected during the follow up meetings or during the regular field visits to the project areas.
Any comment:	Savings from LPG use.

Data / Parameter:	Technology transfer and technological self-reliance
Data unit:	4504 households
Description:	It has been evaluated with the number of solar cook stoves distributed since 2007. 4504 households have participated in the construction and maintenance workshops, where the beneficiaries were trained to construct their own solar cookers by the II team. The II team members also provided all the materials that are required for the construction of the solar stoves.
Source of data to be used:	Beneficiaries database managed by II team.
Monitoring frequency	Continuous throughout the year
QA/QC procedures to be applied:	The details of each beneficiary participating in the project activity are recoded in a database, which is maintained and regularly updated by the Inti Illimani team. The beneficiaries construct their own solar stoves under the technical guidance of the Inti Illimani experts. In these workshops the technical experts also train the beneficiaries on the maintenance of the stoves. A total of 240 workshops have been carried out till July 2018. The workshops show that there is a direct transfer of technology to the project beneficiaries.
Any comment:	As a part of the internal verification process, the GoodPlanet team (GPF) crosschecked the data on the total number of workshops held during the year.

Data / Parameter:	Biodiversity
Data unit:	80.49 %
Description:	There have been no large deforestation or reforestation initiatives observed in the project areas. Therefore, the NRB rate is constant.
Source of data to be used:	GS default value - https://www.goldstandard.org/articles/tac-rule-updates
Monitoring frequency	-
QA/QC procedures to be applied:	-
Any comment:	The GS default value of NRB for Bolivia is valid till October 14, 2021.

Data / Parameter:	Soil condition
Data unit:	80.49 %
Description:	The project allows the people to use less firewood, which leads to the reduction in the deforestation rate in the project areas and which also helps conserves the soil, as there are less possibilities of soil-erosion in the areas. There has been no large deforestation or reforestation initiative in the project areas. Therefore, the NRB rate has been constant.
Source of data to be used:	GS default value - https://www.goldstandard.org/articles/tac-rule-updates
Monitoring frequency	-
QA/QC procedures to be applied:	-
Any comment:	The GS default value of NRB for Bolivia is valid till October 14, 2021.

Data / Parameter:	Air quality
Data unit:	100 %
Description:	From the present KT, we can see that there has been a reduction on firewood and dung consumption of about 2.9 kg/day & 3.74 kg/day respectively. Therefore it can be concluded that there has been a gradual decrease in indoor air pollution due to the use of solar cookers for daily cooking needs.
Source of data to be used:	KT studies.
Monitoring frequency	
QA/QC procedures to be applied:	KT has been carried out as per the guidelines given in the GS methodology.
Any comment:	A total of 4504 solar cook stoves have been disseminated since the year.

Data / Parameter:	Livelihood of the poor
Data unit:	20 Bs/hh/month (*Bs – Bolivian Boliviano*)
Description:	There are savings on fuel consumption for both- the LPG and firewood. The total amount (Bolivian Boliviano) that has been saved by the beneficiaries has been recorded/documented by the Inti Illimani team.
Source of data to be used:	Follow-up surveys.
Monitoring frequency	Continuously
QA/QC procedures to be applied:	
Any comment:	Savings from LPG use.

Emission Reductions Calculations:

As per the registered PDD of the project activity, the Baseline Emissions per stove are, therefore, calculated as follows (for each cluster separately);

(1) $BEy = X_{nrb,bl,y} * B_{bl,y} * EFbl.bio,CO2 + \Sigma(AF_{bl,i,y} * EFaf,CO2,i)$
+ Σ(Non-CO2 emissions during cooking)
+ Σ(GHG emissions during production of the fuels)

(2) Non-CO2 emissions during cooking =

Σ (Bbl,y * EFbl.bio,non-co2,i) + Σ(AFbl,i,y * EFaf,i,non co2 gas i)

(3) GHG emissions during production of the fuels =

Xnrb * Bbl,y * EFbio,prod,co2 + Σ(AFbl,i,y * EFaf,prod,co2,i) + Σ (Bbl,y * EFbio,prod,non-co2 gas i) + Σ(AFbl,i,y * EFaf,i,prod,non-co2 gas i)

Where

Parameter	Description	unit
BEm	Baseline emissions per stove in month m specific to cluster	tonnes CO2e/month
$X_{nrb,bl,y}$	The non-renewable fraction of the woody biomass harvested in the project collection area in year y in the baseline scenario	%
$B_{bl,y}$	The mass of woody biomass (firewood) consumed during cooking in the baseline in year y	tonnes/month
$EF_{bl.bio,co2}$	The CO2 emission factor for use of the biomass fuel (firewood) in the baseline scenario	tonnes CO_2/ tonne FW
$AF_{bl,i,y}$	The mass of alternative fuel i in the baseline in month m in accordance with trends projected throughout the project period. This mass can be set to zero in cases where the KT is appropriately designed to subsume alternative fuels (approach 3).	tonnes/month
$EF_{af,co2,i}$	The CO2 emission factor for use of the alternative fuel i in the baseline	tonnes CO_2/ tonne LPG
$EF_{bl.bio,\ CH4}$	Emission factor for CH4 in the baseline scenario	tonnes CH4 / tonne FW
$EF_{bl.bio,N2O}$	Emission factor for N_2O in the baseline scenario during cooking	tonnes NO2 / tonnes FW
$EF_{af,i,CH4}$	Non-CO2 Emission factor during cooking for LPG for CH4	tonnes CH4 / tonnes LPG
$EF_{af,i,N2O}$	Non-CO2 Emission factor during cooking for LPG for N_2O	tonnes NO2 / tonnes LPG
$EF_{bio,prod,co2}$	CO2 Emission factor for wood-fuel during production	tonnes gas / tonnes fuel
$EF_{af,prod,co2,i}$	CO2 Emission factor for LPG during production	tonnes gas / tonnes fuel
$EF_{bio,prod,non-co2}$	Non-CO2 Emission factor for wood-fuel during production	tonnes gas / tonnes fuel
$EF_{af,i,prod,non-co2}$	Non-CO2 Emission factor LPG for GHG gas i during production	tonnes gas / tonnes fuel

The project emissions depend on the aging and the non usage of the SCS. The project emissions per stove are calculated for each cluster applying the following equations;

(1) PEy =

Xnrb,pj,y * Bpj,y * EFpj.bio,CO2 + Σ(AFpj,i,y. EFaf,CO2,i) + Σ(Non-CO2 emissions during cooking) + Σ(GHG emissions during production of the fuels)

(2) Non-CO2 emissions during cooking =

Σ (Bpj,y * EFpj.bio,non-co2,i) + Σ(AFpj,i,y * EFaf,i,non-co2 gas i)

(3) GHG emissions during production of the fuels =

Xnrb . Bpj,y * EFbio,prod,co2+ Σ(AFpj,i,y * EFaf,prod,co2,i)

Taking into account aging and usage factors:

PEi,m = Ni,m * PEm * Age

Where:
Ni,m = the number of Units in cluster I (100% working)
Ni,m = sold stoves,x * Usage,x,z

Where (noting that parameters common to baseline equations are not repeated):

Parameter	Description	Unit
Xnrb,pj,m	Non-renewable fraction of the woody biomass harvested in the project collection area in year y in the project scenario	%
PEm	Project emissions in month m specific to cluster and Unit chosen	tCO2e / month
Bpj,m	Mass of woody biomass consumed during cooking in the project each month.	tonnes/month
AFpj,i,m	Mass of alternative fuel i in the project in month m in accordance with trends projected throughout the project period	tonnes

The overall reductions of GHG induced by the project are calculated as follows:

ERy = Σ BEi,y – Σ PEi,y – Σ LEi,y

Where:

Parameter	Description	Unit
ERy	Emission reduction in total project population in month m	tCO2e/m
BEi,m	Baseline emissions of cluster i in month m	tCO2e/m
PEi,m	Project emissions of cluster i in month m, depending on the year of installation z	tCO2e/m
LEi,m	Leakage of cluster i in month m	tCO2e/m

Emission reduction monitoring parameters:

Data / Parameter:	**P.1** Number of Solar cookstoves (SCS)
Data unit:	4079 solar cookstoves in 2016 4189 solar cookstoves in 2017 & 4249 solar cookstoves in 2018
Description:	Total number of beneficiaries by each cluster since 2007. In the project activity, a total of 4504 solar stoves have been distributed till July 2018. Of these 4504 solar stoves: - 4249 solar stoves were defined into clusters. - Considering a conservative approach, the remaining 255 solar stoves in 'other clusters' were not taken into account for calculations.
Source of data to be used:	Project database
Monitoring frequency	Measured every month according to the data collected during the workshops.
QA/QC procedures to be applied:	Parameter double-checked by Inti Illimani and GoodPlanet
Any comment:	The project database has been established from the very beginning of the project activity, giving all the all the details of each beneficiary. The Inti Illimani team members update this database regularly.

Data / Parameter:	**P.2** LPG consumption by cluster in the project scenario
Data unit:	*LPG cluster:* 6.83 Kg/month/household *LPG + FW cluster*: 8.32 Kg/month/household *LPG + FW* + Dung *cluster*: 8.87 Kg/month/household
Description:	Amount of LPG consumed by beneficiaries having solar cookstoves
Source of data to be used:	Kitchen Tests, precision level of 90% for confidence interval.
Monitoring frequency	Study led biennially on a representative sample of beneficiaries
QA/QC procedures to be applied:	Parameter double-checked by Inti Illimani and GoodPlanet
Any comment:	KT has been done according with guidelines given in the GS methodology. The "90/30 rule" is met, so mean value have been used.

Data / Parameter:	**P.3** firewood consumption by cluster in the project scenario
Data unit:	LPG + Fw cluster: 63.67 Kg/month/household
Description:	Amount of firewood consumed by beneficiaries having solar cookstoves
Source of data to be used:	Kitchen Tests, precision level of 90% for confidence interval.
Monitoring frequency	Study led biennially on a representative sample of beneficiaries
QA/QC procedures to be applied:	Parameter double-checked by Inti Illimani and GoodPlanet

Any comment:	KT has been done according with guidelines given in the GS methodology. The "90/30 rule" is met, so mean value have been used.

Data / Parameter:	**P.4** Dung consumption by cluster in the project scenario
Data unit:	LPG Fw Dung cluster: 31 Kg/month/household
Description:	Amount of dung consumed by beneficiaries having solar cookstoves
Source of data to be used:	Kitchen Tests, precision level of 90% for confidence interval.
Monitoring frequency	Study led biennially on a representative sample of beneficiaries
QA/QC procedures to be applied:	Parameter double-checked by Inti Illimani and GoodPlanet
Any comment:	KT has been done according with guidelines given in the GS methodology. The "90/30 rule" is met, so mean value have been used.

Data / Parameter:	**P.5 - X_{NRB}**
Data unit:	80,49 %
Description:	Non-renewable fraction of biomass
Source of data to be used:	Gold standard default value - https://www.goldstandard.org/articles/tac-rule-updates
Monitoring frequency	The NRB fraction may be updated if there any updates on the GS default NRB value for the country
QA/QC procedures to be applied:	
Any comment:	

Data / Parameter:	**P.6 - Usage in year 2016, 2017 and 2018**
Data unit:	**2016:** 50% people who got their solar cookstove in 2008 50 % people who got their solar cookstove in 2009 60 % people who got their solar cookstove in 2010 60 % people who got their solar cookstove in 2011 60 % people who got their solar cookstove in 2012 70 % people who got their solar cookstove in 2013 80 % people who got their solar cookstove in 2014 90 % people who got their solar cookstove in 2015 **2017:** 50% people who got their solar cookstove in 2009 60 % people who got their solar cookstove in 2010 60 % people who got their solar cookstove in 2011 60 % people who got their solar cookstove in 2012 70 % people who got their solar cookstove in 2013 75 % people who got their solar cookstove in 2014

	80 % people who got their solar cookstove in 2015 90 % people who got their solar cookstove in 2016 **2018:** 60 % people who got their solar cookstove in 2010 60 % people who got their solar cookstove in 2011 60 % people who got their solar cookstove in 2012 70 % people who got their solar cookstove in 2013 75 % people who got their solar cookstove in 2014 80 % people who got their solar cookstove in 2015 80 % people who got their solar cookstove in 2016 90 % people who got their solar cookstove in 2017
Description:	Percentage of stoves of age x remaining in use in year y
Source of data to be used:	A study carried out by third party for the solar cookers implemented in Bolivia.
Monitoring frequency	Survey led once a year on a representative sample of beneficiaries
QA/QC procedures to be applied:	Parameter double-checked by Inti Illimani and BISS
Any comment:	A survey will be taken up in the next verification period to get the use of stoves data more precisely.

Data / Parameter:	**P.7 – Age**
Data unit:	2016, 2017 & 2018: Efficiency of solar cookstoves built in 2008: 100 % Efficiency of solar cookstoves built in 2009: 100 % Efficiency of solar cookstoves built in 2010: 100 % Efficiency of solar cookstoves built in 2011: 100 % Efficiency of solar cookstoves built in 2012: 100 % Efficiency of solar cookstoves built in 2013: 100 % Efficiency of solar cookstoves built in 2014: 100 % Efficiency of solar cookstoves built in 2015: 100 % Efficiency of solar cookstoves built in 2016: 100 % Efficiency of solar cookstoves built in 2017: 100 % Efficiency of solar cookstoves built in 2018: 100 %
Description:	Efficiency compared with a new Solar Cooker
Source of data to be used:	Monitoring Survey
Monitoring frequency	Survey led once every two years on a representative sample of Solar Cookers well maintained.
QA/QC procedures to be applied:	Parameter double-checked by Inti Illimani and GoodPlanet
Any comment:	All tests results show that older solar cookers are more efficient than new ones. But in order to simplify calculations and to keep a conservative approach, we consider that efficiency of old solar cookers is the same that new ones.

Data / Parameter:	**P.8** Money savings
Data unit:	LPG cluster: 21 Bs/hh/month
Description:	Amount of money saved by the beneficiaries by using a mix of LPG/solar cookstoves/firewood.
Source of data to be used:	Monitoring survey (scanned copy of the KS with the parameter has been provided)
Monitoring frequency	Calculated from KS data and from price of LPG.
QA/QC procedures to be applied:	Crosschecked by Inti Illimani, BISS and GoodPlanet.
Any comment:	

Data / Parameter:	**P.9** Time savings
Data unit:	100%
Description:	% of people who consider that time-saving is one of the main benefits of the solar cooker.
Source of data to be used:	Monitoring survey (scanned copy of the KS with the parameter has been provided)
Monitoring frequency	Continuously done by the Inti Illimani team members
QA/QC procedures to be applied:	Parameter double-checked by Inti Illimani and BISS
Any comment:	Questions were asked to the beneficiaries to collect information about time saved due to the use of the solar cookers and from the responses provided it shows that they have more time for other activities.

Data / Parameter:	**P.10** Share of the solar energy in the total energy mix
Data unit:	LPG cluster: 44% is solar energy LPG Fw cluster: 48% is solar energy LPG Fw Dung cluster: 63 % is solar energy
Description:	% of the solar energy used along with others fuel mix
Source of data to be used:	Monitoring survey
Monitoring frequency	Biennially during the KT studies.
QA/QC procedures to be applied:	Parameter double-checked by Inti Illimani and GoodPlanet
Any comment:	Calculated from fuel consumption reduction (KT) and its energy equivalence.

Data / Parameter:	**P.11 Distance**
Data unit:	Around 4908 Km/year
Description:	Total annual distance from La Paz city to communities.
Source of data to be used:	Monitoring survey
Monitoring frequency	Annually.
QA/QC procedures to be applied:	Parameter double-checked by Inti Illimani and BISS
Any comment:	As the project is carried out throughout the year, this parameter is calculated from distance per course and it is included in the reports from each course.

Data / Parameter:	**P.12** Fraction of the distance using common transport
Data unit:	100 %
Description:	Fraction of the distance using common transport (bus)
Source of data to be used:	Monitoring survey
Monitoring frequency	Calculated from distance per course and kind of transport used included in the reports from each course.
QA/QC procedures to be applied:	Parameter double-checked by Inti Illimani and BISS
Any comment:	As Inti Illimani doesn't have their own vehicle, the team uses the public transports during the travel.

Data / Parameter:	**P.13**
Data unit:	100%
Description:	Fraction of the courses where measures have been taken to ensure that not damage to soil is being caused by the paint
Source of data to be used:	Monitoring survey
Monitoring frequency	Final evaluation course questionnaire made by beneficiaries
QA/QC procedures to be applied:	Parameter double-checked by Inti Illimani and BISS
Any comment:	During the courses the instructors make sure that during painting soil is protected by a plastic sheet or the activity is carried out in a large community hall. This parameter will also be separately documented during the courses in the next verification period.

The present monitoring report gives the emission reduction calculations for the years 2016, 2017 & 2018. The emission reductions data for each year is provided in the tables below: -

Emission reductions for the year 2016

	Baseline Emissions kg CO2/month			Project Emissions kg CO2/month			Emission Reductions kg CO2/month			Total ER T CO2/month
	LPG	LPG Fw	LPG Fw Dung	LPG	LPG Fw	LPG Fw Dung	LPG	LPG Fw	LPG Fw Dung	
Jan	56225	234326	54373	25300	110239	18122	30926	124087	36251	**191**
Feb	56225	234326	54373	25300	110239	18122	30926	124087	36251	**191**
Mar	56225	234326	54373	25300	110239	18122	30926	124087	36251	**191**
Apr	56225	234326	54373	25300	110239	18122	30926	124087	36251	**191**
May	57776	234326	54373	25997	110239	18122	31779	124087	36251	**192**
Jun	57776	234326	54373	25997	110239	18122	31779	124087	36251	**192**
Jul	59844	234326	54373	26928	110239	18122	32916	124087	36251	**193**
Aug	62015	234326	54373	27905	110239	18122	34110	124087	36251	**194**
Sep	62015	234326	54373	27905	110239	18122	34110	124087	36251	**194**
Oct	62015	234326	54373	27905	110239	18122	34110	124087	36251	**194**
Nov	62532	234326	54373	28137	110239	18122	34394	124087	36251	**195**
Dec	63979	234326	54373	28789	110239	18122	35190	124087	36251	**196**
Total (tCO2/yr)										**2316**

Emission reductions for the year 2017

	Baseline Emissions kg CO2/month			Project Emissions kg CO2/month			Emission Reductions kg CO2/month			Total ER T CO2/month
	LPG	LPG Fw	LPG Fw Dung	LPG	LPG Fw	LPG Fw Dung	LPG	LPG Fw	LPG Fw Dung	
Jan	56592	213737	52537	25465	100553	17510	31128	113184	35027	**179**
Feb	56592	213737	52537	25465	100553	17510	31128	113184	35027	**179**
Mar	56592	213737	52537	25465	100553	17510	31128	113184	35027	**179**
Apr	56592	213737	52537	25465	100553	17510	31128	113184	35027	**179**
May	56592	213737	52537	25465	100553	17510	31128	113184	35027	**179**
Jun	56592	213737	52537	25465	100553	17510	31128	113184	35027	**179**
Jul	56592	213737	52537	25465	100553	17510	31128	113184	35027	**179**
Aug	57368	213737	52537	25814	100553	17510	31554	113184	35027	**180**
Sep	57368	213737	52537	25814	100553	17510	31554	113184	35027	**180**
Oct	57368	213737	52537	25814	100553	17510	31554	113184	35027	**180**
Nov	59177	214268	57842	26628	100803	19278	32549	113465	38563	**185**
Dec	60831	214268	57842	27372	100803	19278	33459	113465	38563	**185**
Total (tCO2/yr)										**2165**

Emission reductions for the year 2018

	Baseline Emissions kg CO2/month			Project Emissions kg CO2/month			Emission Reductions kg CO2/month			Total ER T CO2/month
	LPG	LPG Fw	LPG Fw Dung	LPG	LPG Fw	LPG Fw Dung	LPG	LPG Fw	LPG Fw Dung	
Jan	53558	202939	57311	24099	95473	19102	29459	107466	38210	**175**
Feb	54127	204000	66493	24355	95972	22162	29771	108028	44331	**182**
Mar	54127	204000	66493	24355	95972	22162	29771	108028	44331	**182**
Apr	54127	204000	66493	24355	95972	22162	29771	108028	44331	**182**
May	54127	204000	66493	24355	95972	22162	29771	108028	44331	**182**
Jun	54127	204000	66493	24355	95972	22162	29771	108028	44331	**182**
Jul	54127	204000	66493	24355	95972	22162	29771	108028	44331	**182**
Aug	-	-	-	-	-	-	-	-	-	**-**
Sep	-	-	-	-	-	-	-	-	-	**-**
Oct	-	-	-	-	-	-	-	-	-	**-**
Nov	-	-	-	-	-	-	-	-	-	**-**
Dec	-	-	-	-	-	-	-	-	-	**-**
									Total (tCO2/yr)	**1268**

Conclusion:

A total of 4504 solar stoves have been distributed from 2007 till 31st July 2018.

The emission reduction calculations have been considered from the period of

i) 1st January 2016 to 31st December 2016
ii) 1st January 2017 to 31st December 2017
iii) 1st January 2018 to 31st July 2018

The project activity not only promotes sustainable development but also reduces the demand for firewood and LPG in the project areas. The following data summarizes the emission reduction for the year 2016, 2017 & 2018.

- Total emission reductions for the year 2016**:** **2316 tCO2/yr**
- Total emission reductions for the year 2017**:** **2165 tCO2/yr**
- Total emission reductions for the year 2018**:** **1268 tCO2/yr**

Annexe 1

Kitchen survey scanned copies from the project database have been uploaded on the Gold Registry for further verification.

Annexe 2

Kitchen tests scanned copies from the project database have been uploaded on the Gold Registry for further verification.

Annexe 3

Scanned copies the exam carried out at the end of the workshop for the beneficiaries to assure that they have followed the training programs have been uploaded on the Gold Registry for further verification.

Annexe 4

Scanned copies the follow-up meetings sample sheets filled in by beneficiaries from the project database have been uploaded on the Gold Registry for further verification.

Glossary:

Solar SC/ SC: Solar Cookers

LPG: Liquefied petroleum gas

Fwd/FW: Firewood

NRB: Non-renewable Biomass.

Bs: Bolivianos (Bolivian currency)

II: Inti Illimani

BISS: Bolivia Inti Sud Soliel