MONITORING REPORT
v07 - 19/11/2012

QoriQ'oncha – Improved Cookstoves Diffusion Programme in Peru – VPA 1
GS 685

2nd MP14/02/2011 – 22/04/2012 (first and last days included)

CONTENTS

A. General description of the project activity
   A.1. Brief description of the project activity
   A.2. Project participants
   A.3. Location of the project activity
   A.4. Technical description of the project
   A.5. Title, reference and version of the baseline and monitoring methodology applied to the project activity
   A.6. Registration date of the project activity
   A.7. Crediting period of the project activity and related information
   A.8. Name of responsible person(s)/entity(ies)

B. Implementation of the project activity
   B.1. Implementation status of the project activity
   B.2. Revision of the monitoring plan
   B.3. Request for deviation applied to this monitoring period
   B.4. Notification or request of approval of changes

C. Description of the monitoring system

D. Data and parameters monitored
   D.1. Data and parameters used to calculate baseline emissions
   D.2. Data and parameters used to calculate project emissions
   D.3. Data and parameters used to calculate leakage emissions
   D.4. Other relevant data and parameters

E. Emission reductions calculation
   E.1. Baseline emissions calculation
   E.2. Project emissions calculation
   E.3. Leakage calculation
   E.4. Emission reductions calculation
   E.5. Comparison of actual emission reductions with estimates in the registered VPA-DD
   E.6. Remarks on difference from estimated value

Annexes

Annex 1 - LPP 2 – PROPERU
   1. Project Survey
   1.1 Project Survey Description
   1.2 Project Survey Matrix
   2. Sustainable Development Indicators
   2.1 Sustainable Development Matrix
   2.2 DNH
   3. Emission reductions calculation
   3.1 Baseline emissions calculation

* Template extracted from the document entitled "Guidelines for completing the monitoring report form (CDM-MR)" (EB 54 meeting report, annex 34).

3.2 Project emissions calculation
3.3 Emission reductions calculation

Annex 2 - LPP 3 – ITYF
1. Project Survey
1.1 Project Survey Description
1.2 Project Survey Matrix
2. Sustainable Development Indicators
2.1 Sustainable Development Matrix
2.2 DNH
3. Emission reductions calculation
3.1 Baseline emissions calculation
3.2 Project emissions calculation
3.3 Emission reductions calculation

Annex 3 Forward Action Request after first issuance
1. Electronic data storage (FAR 1)
2. Aging tests (FAR 2)

SECTION A. General description of the project activity

-

A.1. Brief description of the project activity:

This Voluntary Program Activity (VPA) is part of the PoA "QoriQ'oncha - Improved Cookstoves Diffusion Programme in Peru". The activity is primarily designed for the long-term improvement of the living conditions of local people. This is being allowed by the use of improved stoves.
This VPA, the first of its PoA, includes project activities in four regions of Peru implemented by two LPPs (Local Project Participant).The project activities are the dissemination and transfer of 36,494 improved cookstoves in Peru. Project activities will take place between 2008 and 2015 at least (the actual dissemination and transfer of technology was held in2009, 2010and 2011 but follow up and maintenance will last until 2015 at least), in the regions of Cusco and La Libertad. This monitoring report covers ERs generated during the monitoring period by all the stoves disseminated from the beginning of project activities. This monitoring period is the second in the project and starts on 14/02/2011 until 22/04/2012.

Two main actors, the LPPs, are implementing the project activities that lead to the request of issuance of credits in the second crediting period:

- ProPeru: Local Project Participant n°1 (LPP2) of the VPA, Peruvian NGO. ProPeru is both financing a part of the initial investment of the project activities and implementing Cusco project activities in the field,
- InstitutoTrabajo Y Familia (ITYF): Local Project Participant n°3 (LPP3) of this VPA. National NGO. ITYF is implementing the project activities of La Libertad region in the field.

Two organizations coordinate the carbon related activities:
- Microsol – Managing entity: French company dedicated to help local actors of Peru to implement voluntary actions of cook-stove diffusion. Microsol participates in the investment of project activities developing deep knowledge on social, cultural and environmental impact of cookstove, adequate dissemination mode of cookstove and carbon engineering. It also finances and organizes the writing of carbon market related documents, coordination of information production and monitoring activities, stakeholders' consultation, discussions with Gold Standard and DOEs.
- Myclimate - Credit buyer and carbon processes assistance: Swiss foundation dedicated to develop and support carbon offset projects throughout the whole world. Myclimate carries out the carbon market related processes: revision and submission of carbon market related

documents, relation with carbon market counterparts, and finance and organization of a part of the carbon process (Gold Standard registration, validation, verification, VERs generation).

For the analysis of this project the following methodological tool is used:
- Gold Standard Cook stove Methodology: "Methodology for Improved Cook-stoves and Kitchen Regimes – V.01".

As a result of the pre-feasibility assessment the Gold Standard declared the project eligible for retroactive GS registration. The validation as a Gold Standard VER (Version 2) project was conducted by TÜV NORD CERT GmbH and successfully finished on 31 August 2010 by uploading the validation report to the Gold Standard registry. The registration as a Gold Standard project with the project ID GS 685 was realized on 14th of November 2010.
The second verification covers the monitoring period from 14 February 2011 to 22April 2012, both days included. The total emission reductions achieved in this monitoring report by the LPPs are 109, 893 tCO2eq, as in the next table.

Table A1: Emission Reduction for second monitoring period

LPP	PROPERU	ITYF	TOTAL
Emission reduction (tCO2)	6,458	103,435	109,893

*figures calculated in the ER calculation files

A.2. Project Participants

Table A2: Project Participants

NameofPartyinvolved (*) ((host) indicates a host party)	Private and/or public entity(ies), projectparticipant (*) (as applicable)	Kindly indicate if the party involved wishes to be considered as a project participant (Yes/No)
Peru (host country)	ProPeru	No
Peru (host country)	InstitutoTrabajo Y Familia ITYF	No
France (involved party)	MICROSOL S.A.R.L.	No
Switzerland (involved party)	myclimate – The Climate Protection Partnership	No

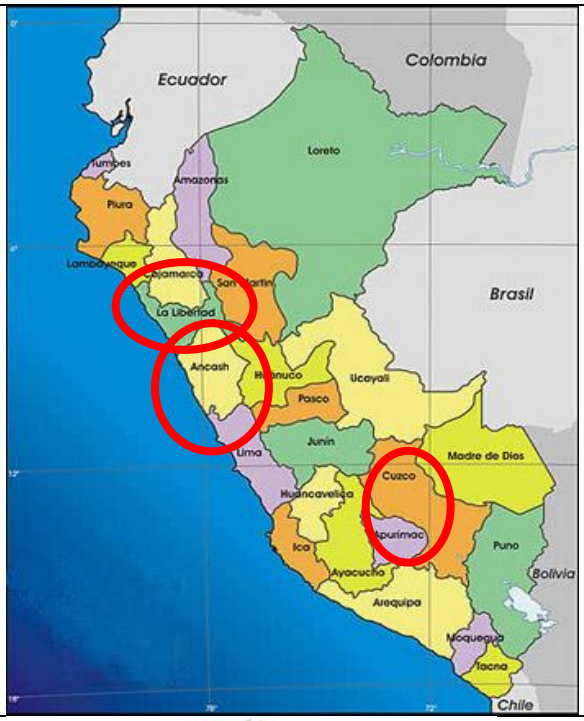
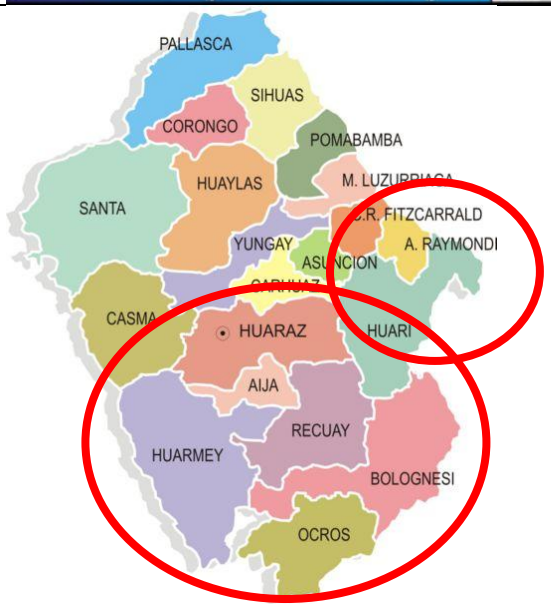
A.3. Location of the project activity:

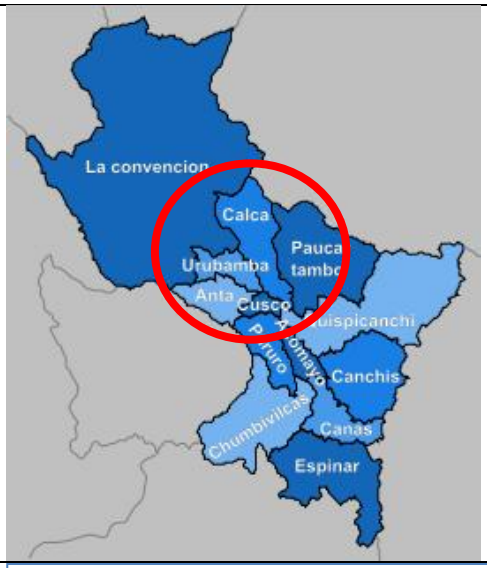
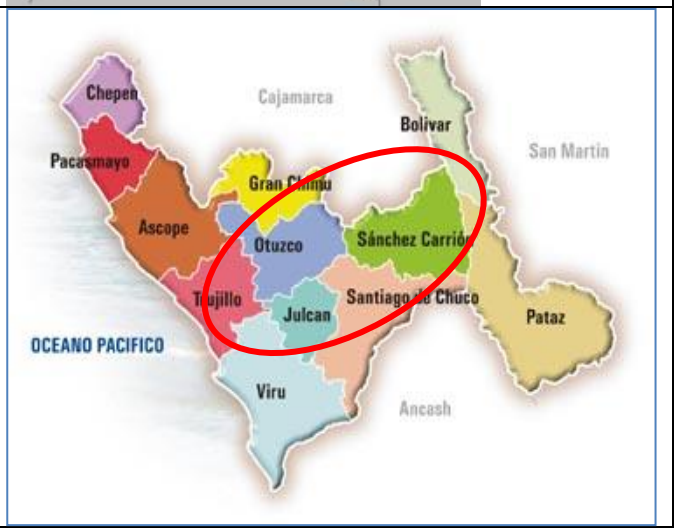
Peru is a 1'285'220 km^2 country with 24 regions. Project activities are located in the following coordinates:

Cusco	**Coordinates**
Latitude	11° 13'19" S
Longitude	72°59′52" W

La Libertad	**Geographic Coordinates**
Latitude	6° 56′ 38'' S
Longitude	79°68′13" W

Table A3: Maps

Project activities take place in three regions: • Ancash region on the Pacific Coast; • Cusco region in the south-east mountainous area; • La Libertad region on the Pacific Coast.	
Ancash region (“Departamento”) has 20 provinces (“provincias”). Project activities take place in 9 southern provinces: • Aija • Antonio Raymondi • Asuncion • Bolognesi • Carlos FerminFitzcarrald • Huari • Huarmey • Ocros • Recuay A small proportion of project activities takes place in Huamalies province of Huanuco region, bordering Ancash region to its eastern border.	

Cusco region has 13 provinces. Project activities take place in 4 central provinces of Cusco region: • Calca, • Urubamba, • Anta • Cusco.	
La Libertad region has 11 provinces. Project activities take place in 3 central provinces of La Libertad region: • Otuzco • Sánchez Carrión • Julcan	

A.4. Technical description of the project

The technology implemented in the project activities are as presented in the VPA DD.

A.5. Title, reference and version of the baseline and monitoring methodology applied to the project activity:

The approved baseline and monitoring methodology applied to each VPA is the Gold Standard approved: “Methodology for Improved Cookstoves and Kitchen Regimes – V.01”.

It is available on the Gold Standard website:
http://www.cdmgoldstandard.org/wp-content/uploads/2011/11/GS_Methodology_Cookstove.pdf

A.6. Registration date of the project activity:

Registration Number: GS 685
Registration date: 14.11.2010 (DD/MM/YYYY)
PoA title: “QoriQ’oncha – Improved Cookstoves Diffusion Programme in Peru”
VPA title: “QoriQ’oncha – Improved Cookstoves Diffusion Programme in Peru – VPA 1”
Registration Number: GS 1005
Registration date: 14.11.2010 (DD/MM/YYYY)

A.7. Crediting period of the project activity and related information (start date and choice of crediting period):

Starting date: 14/02/2011

The monitoring period here considered is the second monitoring period that is one day after the completion of the first crediting period to day before verification site visit. In this case the date is 14/02/2011 to 22/04/2012.

The crediting period is 7 years renewable as stated in part A.4.3 of the VPA-DD.

A.8. Name of responsible person(s)/entity(ies):

Contact information of the entity/individual responsible for completing the monitoring report form:

Organization:	MICROSOL S.A.R.L.
Street/P.O.Box:	128, rue Salvador Allende
City:	NANTERRE
State/Region:	
Postfix/ZIP:	92000
Country:	France
Telephone:	(33) 6.11.12.47.91
Title:	Carbon projects manager
Salutation:	
Last Name:	LAURENT
First Name:	ARTHUR
Mobile:	+51 198 5699055
Direct tel:	+51 1 2415560
Personal E-Mail:	alaurent(a) microsol-int.com

SECTION B. Implementation of the project activity

B.1. Implementation status of the project activity

LPPs included in this MR started the implementation of their activities as follows:

Table B1: Stove implementation

Stovenumbersummary			
	PROPERU	ITYF	TOTAL
2008stovenumber	1,174	6,811	7,985
2009 stovenumber	799	17,081	17,880
2010 stovenumber	810	8,877	9,687
2011 stovenumber	926	16	942
Total	3,709	32,785	36,494

B.2. Revision of the monitoring plan

No revision of the monitoring plan is required here.

B.3. Request for deviation applied to this monitoring period

No deviation has been applied to this monitoring period.

B.4. Notification or request of approval of changes

No changes are requested.

SECTION C. Description of the monitoring system

The monitoring plan applicable for a VPA is based on the "Methodology for Improved Cookstoves and Kitchen Regimes – V.01".

First of all, a final list (sales record) of the families having received an improved stove is compiled by each LPPs and centralized by MICROSOL. The LPP is due to frequently update this list and communicate changes to MICROSOL. This list will help in identifying stove owners for applying monitoring surveys and will serve as a basis for total population emission reductions calculation.

Every two year at least, a general update of cluster differentiation and corresponding total emission reductions will be carried out with basically the same methodology as that used for initial emission reductions measurement combining qualitative and quantitative surveys described in section E.4. of the VPA-DD. A monitoring report will then be produced.

At that point, whenever any major change would be identified, the general update will have to be anticipated in relation with the normal two year period and quantitative surveys (Kitchen Test) will be held so as to determine, as soon as identified, the influence of this new cluster differentiation on total emission reductions.

Finally, other aspects such as leakage, SD matrix, NRB and eventual DNH mitigation parameters analysis will be monitored in the bi-annual general update so as to take into account the influence of its eventual evolution on total emission reductions. Corresponding assessment will be presented in the monitoring report produced in this occasion.

Quality control and analysis will happen both by MICROSOL in Lima as well as by myclimate threw its revision in Switzerland. All data generated will be centralized by MICROSOL in general comprehensive databases so as to be easily accessible and for analysis to be more accurate. MICROSOL's leadership of the process, its permanent control of data and its capacity building to LPP act as a guarantee for data quality. Nevertheless, whenever possible, independent analysis could be considered so as to reinforce confidence in data.
All data will be kept electronically for a period of 2 years after the end of the crediting period.

So, for monitoring reports

- LPP performs KS and KT according to Monitoring Plan under supervision of MICROSOL
- MICROSOL compiles a report for each cluster at least bi-annually.
- Myclimate revises all reports.
- MICROSOL or Myclimate submits the report to the DOE for verification.

Responsible Person: Monitoring manager MICROSOL (data) and myclimate (review of report)

SECTION D. Data and parameters

D.1. Data and parameters determined at registration and not monitored during the monitoring period, including default values and factors

Data / Parameter:	**EFbl.bio,co2**
Data unit:	tCO2/t_biomass
Description:	CO2 emission factor arising from use of wood-fuel in baseline scenario
Source of data used:	2006 IPCC Guidelines for National Greenhouse Gas Inventories, Tables 1.2/1.4
Value(s):	1.7472[1] tCO2/t wood (=112.0 tCO2/TJ * 0.0156 TJ/ t)
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline scenario.
Additional comment:	

Data / Parameter:	**EFpj.bio,co2**
Data unit:	tCO2/t_biomass
Description:	CO2 emission factor arising from use of wood-fuel in project scenario
Source of data used:	2006 IPCC Guidelines for National Greenhouse Gas Inventories, Tables 1.2/1.4
Value(s):	1.7472[2] tCO2/t wood (=112.0 tCO2/TJ * 0.0156 TJ/ t)
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project scenario.
Additional comment:	

Data / Parameter:	**EFbl.bio,non-co2**
Data unit:	Data unit: tCO2/t_wood
Description:	Non-CO2 emission factor arising from use of wood-fuel in baseline scenario
Source of data used:	2006 IPCC Guidelines for National Greenhouse Gas Inventories, Vol.2 Energy, Chapter 2, Stationary Combustion, Table 2.5
Value(s):	**0.11762[3] tCO2eq/t wood** = (0.09828tCO2eq/t wood (CH4 emission) + 0.01934tCO2eq/t wood (N2O emission))
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline scenario.
Additional comment:	

[1]This value has been validated, see PoA –DD, page 33.

[2]This value has been validated, see PoA –DD, page 33.

[3]This value has been validated, see PoA –DD, page 34.

Data / Parameter:	**EFpj.bio,non-co2**
Data unit:	Data unit: tCO2/t_wood
Description:	Non-CO2 emission factor arising from use of wood-fuel in baseline scenario
Source of data used:	2006 IPCC Guidelines for National Greenhouse Gas Inventories, Vol.2 Energy, Chapter 2, Stationary Combustion, Table 2.5
Value(s):	**0.11762[4] tCO2eq/t wood** = (0.09828tCO2eq/t wood (CH4 emission) + 0.01934tCO2eq/t wood (N2O emission))
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project scenario.

D.2. Data and parameters monitored

Data / Parameter:	$B_{bl,y}$
Data unit:	t_biomass/unit-year
Description:	Mass of woody biomass combusted per stove in the baseline in year y
Measured /Calculated /Default:	Measured
Source of data:	Measurements of sample of cluster population (KT).
Value(s) of monitored parameter:	Cluster PROPERU 3.404 t/year/stove Cluster ITYF 3.389 t/year/stove
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline scenario.
Monitoring equipment	Clock type balance calibrated (with a screw moving the pointer to zero) for each measurement.
Measuring/ Reading/ Recording frequency:	Fixed baseline is chosen at VPA level, the data has been defined at validation time.
Calculation method (if applicable):	VPA implements the following procedures: 1°) The mass of the considered non renewable biomass is measured on a 3-day basis, excluded Sunday when specific occasion may increase the consumption. The proportional extrapolation of results to the whole year will therefore be conservative as it will not consider Sunday's higher consumptions. 2°) The measurement is made directly with the considered customers, the balance used for the weighting must have a precision of no less than 50g,
QA/QC procedures applied:	1°) Monitored beneficiaries are clearly identified for allowing further verifications. 2°) Sound capacity building were made with surveys responsible including ethic dimensions of the process and adequate techniques for ensuring confidence of results. 3°) MICROSOL has realized quality control test in digitations of the surveys. 4°) A conservative approach and expert statistics guidelines is systematically followed.

[4]This value has been validated, see PoA –DD, page 34.

Data / Parameter:	**$B_{pj,y}$**
Data unit:	t_biomass/year/stove
Description:	Mass of woody biomass combusted in the project in year one for one stove of cluster y
Measured /Calculated /Default:	Measured.
Source of data:	Measurements of sample of cluster population
Value(s) of monitored parameter:	Cluster PROPERU, 0-1 2.108 t/year/stove Cluster ITYF, 0-1 2.475 t/year/stove
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project scenario.
Monitoring equipment	Clock type balance calibrated (with a screw moving the pointer to zero) for each measurement.
Measuring/ Reading/ Recording frequency:	Bpj was defined for this cluster in 2012 and a new measurement will be due in 2014 as data should be measured biennially.
Calculation method (if applicable):	See Description of measurement methods for the $B_{bl,y}$ parameter.
QA/QC procedures applied:	See Description of QA/QC procedures for the $B_{bl,y}$ parameter.

Data / Parameter:	**$X_{NRB,bl,y}$**
Data unit:	Fraction
Description:	Non-renewability status of woody biomass fuel in year y in baseline scenario
Measured /Calculated /Default:	Calculated
Source of data:	See Annex 3
Value(s) of monitored parameter:	Cluster PROPERU 0.6963 Cluster ITYF: 0.6963
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline scenario.
Monitoring equipment	N/A
Measuring/ Reading/ Recording frequency:	Data was defined for this cluster in 2012 and a new measurement will be due in 2014 as data should be measured biennially.
Calculation method (if applicable):	See the details of measurements processes in Annex 3 of VPA-DD 2.
QA/QC procedures applied:	See the details of QA/QC procedures to be applied in Annex 3 of VPA-DD 2.

Data / Parameter:	$X_{NRB,pj,y}$
Data unit:	Fraction
Description:	Non-renewability status of woody biomass fuel in year y in project scenario
Measured /Calculated /Default:	Calculated
Source of data:	Study See Annex 3 of the VPA DD 2
Value(s) of monitored parameter:	Cluster PROPERU 0.6963 Cluster ITYF: 0.6963
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project scenario.
Monitoring equipment	N/A
Measuring/ Reading/ Recording frequency:	Data was defined for this cluster in 2012 and a new measurement will be due in 2014 as data should be measured biennially.
Calculation method (if applicable):	See the details of measurements processes in Annex 3 of VPA-DD 2.
QA/QC procedures applied:	See the details of QA/QC procedures to be applied in Annex 3 of VPA-DD 2.

Data / Parameter:	$I_{i,y}$
Data unit:	Stove installed/cluster/month
Description:	Represents the number of stoves installed by each LPP whose effective installation and date of installation can be evidenced. Date of installation shall be used for calculating each stove crediting period.
Measured /Calculated /Default:	Measured
Source of data:	Documents provided by LPPs at VPA level.
Value(s) of monitored parameter:	Cluster $PROPERU_{2008}$: 1,174 Cluster $PROPERU_{2009}$: 799 Cluster $PROPERU_{2010}$: 810 Cluster $PROPERU_{2011}$: 926 Cluster $ITYF_{2008}$: 6,811 Cluster $ITYF_{2009}$: 17,081 Cluster $ITYF_{2010}$: 8,877 Cluster $ITYF_{2011}$: 16
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Emission calculation.

Monitoring equipment	N/A
Measuring/ Reading/ Recording frequency:	Installation was realized in year 2008, 2009, 2010 and 2011 and measured once and remains fixed thereafter.
Calculation method (if applicable):	Signed documents by community representative preferably with list of final beneficiaries. Whenever possible documents signed by each beneficiary should be preferred.
QA/QC procedures applied:	Data are collected by LPP and then verified by MICROSOL (double counting, random cross-check with installation evidences).

Data / Parameter:	$U_{i,y}$
Data unit:	Fraction (%)
Description:	Represents the drop-off rate in stove usage by each cluster each year.
Measured /Calculated /Default:	Measured
Source of data:	Data included in kitchen surveys (KS).
Value(s) of monitored parameter:	Cluster PROPERU; 26.% Cluster ITYF: 0.59%
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Emission calculation
Monitoring equipment	N/A
Measuring/ Reading/ Recording frequency:	Data was defined for each cluster in 2011 through project scenario kitchen surveys and a new measurement will be due in 2013 as data should be measured biennially.
Calculation method (if applicable):	Surveys with beneficiaries
QA/QC procedures applied:	1°) Sound capacity building were made with surveys responsible including ethic dimensions of the process and adequate techniques for ensuring confidence of results. 2°) MICROSOL were realized quality control test in digitations of the surveys. 3°) A conservative approach and expert statistics guidelines were systematically followed.

Data / Parameter:	$O_{i,y}$
Data unit:	Fraction (%)
Description:	Represents the removal rate of old stove by each cluster.
Measured /Calculated /Default:	Measured
Source of data:	Data included in kitchen surveys.
Value(s) of monitored parameter:	Cluster PROPERU 100.00%* Cluster ITYF: 86.23%* * These figures only reflect the removal rate of the clusters at the first year of implementation. In years after beneficiaries might get back the traditional stoves but this is reflected in the drop off rate.
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Leakage
Monitoring equipment	N/A
Measuring/ Reading/ Recording frequency:	Biennial (as stated in the PoA monitoring plan)
Calculation method (if applicable):	Surveys with beneficiaries
QA/QC procedures applied:	1°) Sound capacity building were made with surveys responsible including ethic dimensions of the process and adequate techniques for ensuring confidence of results. 2°) MICROSOL were realized quality control test in digitations of the surveys. 3°) A conservative approach and expert statistics guidelines were systematically followed.

Data / Parameter:	$A_{i,y}$
Data unit:	Fraction (%) for a one year period.
Description:	Represents the 'aging factor' in stove by each cluster each year. It will be used so as to determine the decrease or increase of potential emission reduction, taking into account the age of the improved cooktoves. A linear reduction of stove emission reduction is estimated trough out the years.
Source of data to be used:	Measurements of sample of stove model
Value applied:	Cluster PROPERU, 0-1: 0.00% Cluster PROPERU, 1-2: 20.63% Cluster PROPERU, 2-3: 59.42% Cluster PROPERU, 3-4: 59.10% Cluster PROPERU, 4-5: 59.10% [5] Cluster ITYF, 0-1: 0.00% Cluster ITYF, 1-2: 117.69% Cluster ITYF, 2-3: 47.66% Cluster ITYF, 3-4: 49.06%

[5] As no KTs were available for age 4-5, we used the same value as for 3-4.

Monitoring frequency	Biennial (as stated in the PoA monitoring plan)
Description of measurement methods and procedures to be applied:	Surveys with beneficiaries. Then, for example, an aging factor will be used as: ER_{0-1} = Emission reduction from cookstoves that had 0 to 1 year old when surveys were performed. ER_{3-4} = Emission reduction from cookstoves that had 3 to 4 years old when surveys were performed A = Aging factor of ER per year (if + increases, if – decreases)
QA/QC procedures to be applied:	1°) Sound capacity building were made with surveys responsible including ethic dimensions of the process and adequate techniques for ensuring confidence of results. 2°) MICROSOL were realized quality control test in digitations of the surveys. 3°) A conservative approach and expert statistics guidelines were systematically followed.

Data / Parameter:	**DNH parameter – Corruption**
Data unit:	%
Description:	Percentage of carbon revenues subject to corruption or suspicion of corruption if the LPP does not comply with the principles of the Do Not Harm Declaration. See Annex 2 of this VPA-DD.
Measured /Calculated /Default:	Measured
Source of data:	Carbon revenues use report by LPPs, one year after receiving carbon revenues
Value(s) of monitored parameter:	No carbonrevenueuntilnowsoparameterisnotavailable. Carbon revenues have been available since date of issuance so at the moment of start of this verification the one year period was not concluded so that the information is not required at this point. The corresponding information will be necessary one year after receiving carbon revenues.
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	N/A
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	N/A
Measuring/ Reading/ Recording frequency:	Annualafter first issuance.
Calculation method (if applicable):	LPP provides a detailed report on how they use carbon revenues with references to evidences available for consultation.
QA/QC procedures applied:	Microsol revises LPPs reports and correspondence with evidences as well as the validity of those.

Data / Parameter:	$A_{Bl,i,y}$
Data unit:	t_fuel/unit-year
Description:	Mass of alternative fuel i combusted in the baseline in year y
Measured /Calculated /Default:	N/A Alternative Fuel are not integrated to ER calculation of that VPA
Value(s) of monitored parameter:	0

Data / Parameter:	$A_{Pj,i,y}$
Data unit:	t_fuel/unit-year
Description:	Mass of alternative fuel i combusted in the project in year y
Measured /Calculated /Default:	N/A Alternative Fuel are not integrated to ER calculation of that VPA
Value(s) of monitored parameter:	0

SECTION E. Emission reductions calculation

E.1. Baseline emissions calculation

As described in the VPoA-DD the equation to calculate the baseline emissions is the following:

$$\begin{cases} \boldsymbol{BE_y} = X_{NRB,bl,y} * B_{bl,y} * EF_{bl,bio,CO2} + \sum(AF_{bl,i,y} * EF_{af,CO2,i}) \\ \quad + \sum(Non-CO2\ emissions\ during\ cooking) \\ \quad + \sum(GHG\ emissions\ during\ production\ of\ the\ fuels) \\ \\ \boldsymbol{Non-CO2\ emissions\ during\ cooking} = \sum(B_{bl,y} * EF_{bl.bio,non-co2,i}) \\ \quad + \sum(AF_{bl,i,y} * EF_{af.i,non-co2\ gas\ i}) \\ \\ \boldsymbol{GHG\ emissions\ during\ production\ of\ the\ fuels} = X_{NRB} * B_{bl,y} * EF_{bio,prod.CO2} \\ \quad + \sum(AF_{bl,i,y} * EF_{af,prod.CO2,i}) + \sum(B_{bl,y} * EF_{bio,prod.non-co2\ gas\ i}) \\ \quad + \sum(AF_{bl,i,y} * EF_{af,i,prod.non-co2\ gas\ i}) \end{cases}$$

In this VPA, we do not consider emissions during production of the fuel.
In this VPA we don't consider any alternative fuel as gas use is very negligible and not part of the project. Not considering it is conservative and in accordance with approach 3 described in the Gold Standard Methodology.

The simplified baseline equation used is:

$$BE_{y,per\ stove} = X_{nrb} * B_{bl,y} * EF_{bl.bio.CO2} + \sum B_{bl,y} * EF_{bl.bio.nonCO2}$$

In the calculation of baseline emission shown in table E1, the two parts of the equation above are considered. Yet, in order to summarize the sum of both is directly included in the last row of the table E1.

Table E1: Baseline emissions[6]

BASELINE EMISSIONS	**PROPERU**	**ITYF**
X_{nrb}	0.6963	0.6963
$EF_{bl.bio.CO2}$	1.7472 tCO2/t wood	
$EF_{bl.bio.nonCO2}$	0.11762 tCO2eq/t wood	
Bbl,d Average(Kg/day/stove)	9.32	9.29
BEy per stove(tCO2eq)	**4.541**	**4.522**

E.2. Project emissions calculation

As described in the VPoA-DD the equation to calculate the project emissions is the following:

$$\begin{cases} \boldsymbol{PE_y} = X_{NRB,pj,y} * B_{pj,y} * EF_{pj,bio,CO2} + \sum(AF_{pj,i,y} * EF_{af,CO2,i}) \\ \quad + \sum(Non - CO2\ emissions\ during\ cooking) \\ \quad + \sum(GHG\ emissions\ during\ production\ of\ the\ fuels) \\ \\ \boldsymbol{Non - CO2\ emissions\ during\ cooking} = \sum(B_{pj,y} * EF_{pj.bio,non-co2,i}) \\ \quad + \sum(AF_{pj,i,y} * EF_{af.i,non-co2\ gas\ i}) \\ \\ \boldsymbol{GHG\ emissions\ during\ production\ of\ the\ fuels} = X_{NRB} * B_{pj,y} * EF_{bio,prod.CO2} \\ \quad + \sum(AF_{pj,i,y} * EF_{af,prod.CO2,i}) + \sum(B_{pj,y} * EF_{bio,prod.non-co2\ gas\ i}) \\ \quad + \sum(AF_{pj,i,y} * EF_{af,i,prod.non-co2\ gas\ i}) \end{cases}$$

In this VPA, we do not consider emissions during production of the fuel.
In this VPA we don't consider any alternative fuel as gas use is very negligible and not part of the project. Not considering it is conservative and in accordance with approach 3 described in the Gold Standard Methodology.

The simplified project emission equation used is:

$$PE_{y\ per\ stove} = X_{nrb} * B_{pj,y} * EF_{pj.bio.CO2} + \sum B_{pj,y} * EF_{pj.bio.nonCO2}$$

[6]For more details see section 3.1 of Annex LPP.

In the calculation of baseline emission shown in table E2, the two parts of the equation above are considered. Yet, in order to summarize the sum of both is directly included in the last row of the table E2.

Table E2: Project scenario emissions[7]

PROJECT SCENARIO EMISSIONS	**PROPERU**	**ITYF**
X_{nrb}	0.6963	0.6963
$EF_{bl.bio.CO2}$	1.7472 tCO2/t wood	
$EF_{bl.bio.nonCO2}$	0.11762 tCO2eq/t wood	
Bpj,d Average(Kg/day/stove)	5.77	6.78
PEy per stove(tCO2eq)	**2.812**	**3.302**

E.3. Leakage calculation

As specified in the Gold Standard "Methodology for Improved Cook-stoves and Kitchen Regimes – V.01", six types of leakage have to be considered. This is done as mentioned below:

x L1: Increasing consumption of GHG emitting fuels by the project population, consecutively to the project activities (rebound effect).

This potential leakage source is intrinsically included in KTs as KTs consider general house fuel consumption. Whenever a necessity would occur because of project activity its corresponding fuel use will then be included into KTs. Thus, no specific monitoring of the leakage is done and this leakage can be considered as:

L1=0

x L2: Increasing use of GHG emitting fuels outside the project boundary

An increased use of GHG emitting fuels outside of project boundary due to project activity could be thought to as a result of a decrease in prices provoked by a decrease in demand due to fuel savings stoves. Nevertheless, this is very unlikely in the Peruvian context as stove fuel savings are very likely to be un-significant in the wood market ".

L2=0

x L3: Purchase of the improved stove by population whose baseline is less GHG emitting than the emissions linked to the use of the improved stove.

In the Peruvian context cleaner stoves than the improved stove would be LGP stoves that have been demonstrated to represent high costs and refer then to a certain sector of population. Unless gas prices would increase very significantly (should be more than the simple opportunity cost as switching back form gas to wood can be considered as very uncomfortable). Whenever this would occur, it should be considered as an evolving baseline and not leakage. Therefore:

L3=0

[7] For more details see section 3.2 of Annex LPP.

x L4: Adoption of a new device specifically dedicated to heating, or adoption of a new practice specifically dedicated to heating, consequently to the project activities (ex: due to lack of heating ability of the disseminated stoves).

When doing KTs, the use of a cooking device for eating is assessed and, if it is demonstrated it is due to project, the corresponding fuel use is included in the KTs so that this leakage is intrinsically included into KTs and, as well as L1 can be considered as:

L4=0

x L5: Reuse of the old stoves inside or outside the boundary, and more important use of these unimproved stoves than in the baseline situation:

The traditional unimproved stoves cannot usually be moved from a house to another and have to be rebuilt. So that reuse is very unlikely and considered null outside the project boundary. As far as the inside project boundary is concerned, even if old stove destruction is strongly recommended, beneficiaries can keep using their old stove. Thus, no leakage has to be considered here as KTs do take this into account: wood consumption in project scenario corresponds to general consumption including eventual remaining stoves or other stove use .

The LPP is asked by Microsol to remove the old stove but cannot make it compulsory. The carbon mechanism is per se an incentive as, because the kitchen test are made with all wood consumption of the house, whenever the old stove is still used, wood consumption will be higher and then emission reduction lower. So whenever old stove is still in use, carbon incomes will be lower but when it is no more in use, carbon incomes will be higher. Whenever data show that less than 80% of the old stoves have been removed from inside the kitchen after two years of project, the LPP will be asked for to implement a direct incentive scheme so as to ensure removal of old stoves up to 80% by the fourth year. After this date restrictive actions shall be taken against corresponding LPP including reduction of ERs.

L5=0

x L6: Significant emissions linked to stove transport or fuel transport:

Calculations have been made with basis on the first VPA and it has been demonstrated that emission reduction are inferior to 1% of total emission reduction so that it can be considered as not significant. In this respect, it has been agreed with GS to considerer that

L6=0

E.4. Emission reductions calculation / table

$$ERy = \sum BEi,y - \sum PEi,y - \sum LEi,y$$

$$= \sum Xnrb^* Bbl,y * EFbl.bio.CO2 + \sum Bbl,y * EFbl.bio.nonCO2$$
$$-\sum Xnrb^* Bpj,y * EFbl.bio.CO2 + \sum Bpj,y * EFbl.bio.nonCO2$$
$$- \sum LEi,y$$
$$= \sum Xnrb * (Bbl,y – Bpj,y) * EFbl.bio.CO2 + \sum (Bbl,y – Bpj,y) * EFbl.bio.nonCO2$$
$$- \sum LEi,y$$

As we are in the updating process of the methodology, according to the “Technologies and Practices to Displace Decentralized Thermal Energy Consumption”methodology, a statistical analysis is required to determine the emission reductions confidence interval. A t-test is performed. The difference between both baseline and project consumption scenario means is taken as the estimation of the fuel saving (Bbl,y-Bpj,y) as long as the confidence interval satisfies the 90/30 rule[8].

In this VPA the test is performed with unpaired samples.

[8] , page 47

The result of this test is then compared to 10%, whenever it is under, then hypothesis H0 (Average difference = 0) is rejected.

Table E4a: Statistical analysis of emission reduction[9]

BASELINE - Bl KT (*BE*)	**PROPERU**	**ITYF**
Bbl,y Average (kg/day/stove)	9.32	9.29
Standard deviation (kg/day)	3.88	3.77
PROJECT SCENARIO - PS KT	**PROPERU**	**ITYF**
Bpj,y Average (kg/day/stove)	5.77	6.78
Standard deviation (kg/day)	2.60	2.62
ANSWER	Ho is rejected	Ho is rejected

We can now calculate the difference between the two averages for clusters for which H0 has been rejected, with a 90% confidence level as defined by the GS methodology and we concluded that the 90/30 GS statistical rule is complied, so the difference between means is taken as estimation of the overall fuel savings. See section 3 of Annex LPP of this document for the statistical explanation.

Table E4b: Emission reduction calculation

Emission Reductions Calculation	**PROPERU**	**ITYF**
BEy per stove(tCO2eq)	4.541	4.522
PEy per stove(tCO2eq)	2.812	3.302
Leakage(tCO2eq)	0	0
ER per stove$_{0\text{-}1}$ (tCO2eq/year)	1.729	1.220

At this point one has to consider the drop-off rate of the stove. The data is as follows:

Table E4c: Drop-off rate

Drop off rate	**PROPERU**	**ITYF**
Drop off rate Ui,y	**26.%**	**0.59%**

After consider the drop-off rate, the value for CWCPy (Cumulated Weighted Crediting Period) is shown in the table E4d.As stated in the VPA-DD 1 section B.5.3, the calculation of the Cumulated Weighted Crediting Period is made as follows:

$$CWCP_{y} = (\sum I_{i,y} * (12 - I_m)/12) * (1\text{-}U_{i,y})$$

Where:
$I_{i,y}$= Number of stoves implemented during the month/year by each LPPat VPA level (to be traceable the calculation takes into account the table B1: Stove implementation, of this document).

[9]For more details see section 3.3 of Annex LPP.

Im = Codification of the month (m) in which the crediting period starts for a stove implemented in month m-1(taking into account the table B1: Stove implementation, of this document).
$U_{i,y}$ = Drop-off rate in stove (of a certain age) usage by each cluster each year.
$A_{i,y}$ = Aging factor by each cluster each year.

Table E4d: Cumulated Weighted Crediting Period

Cumulated Weighted Crediting Period		
	PROPERU	**ITYF**
$CWCP_{2011}$	1,428	28,522
$CWCP_{2012}$	610	10,056

As stated in the VPA-DD 1 section B.5.3, the calculation of emission reductions is made as follows:

$ER_{i,y}$= CWCPi,y*ERi (t/year/stove)* $A_{i,y}$* (6+"Seasonality factor"*6)/12*"Share of initially wood stoves households"

Where:

$ER_{i,y}$= Total Emission Reduction for cluster i in year y in tones.
$CWCP_{i,y}$= Cumulated Weighted Crediting Period in year y for cluster i. (fraction of year for an average stove)
ER_i(t/year/stove)= Emission Reduction per year per cookstove in tones.

Therefore the total emission reductions requested in the 1st monitoring period are 131,564t CO_2, detailed are showed in the table below.

Table E4c: Emission reduction calculation

Emission reductions summary			
	PROPERU	**ITYF**	**TOTAL**
ER (t/year/coostkove)			
2008 stove number	**1,174**	**6,811**	**7,985**
2009 stove number	**799**	**17,081**	**17,880**
2010 stove number	**810**	**8,877**	**9,687**
2011 stove number	**926**	**16**	**942**
ER 2011 (t/year)	**4,676**	**76,473**	**81,149**
ER 2012 (t/year)	**1,783**	**26,962**	**28,745**
TOTAL CUMULATED ER	**6,458**	**103,435**	**109,893**

E.5. Comparison of actual emission reductions with estimates in the VPA-DD

Item	Values applied in ex-ante calculation of the registered VPA-DD	Actual values reached during the monitoring period
Emission reductions (tCO_2e)	**25,746for 365 days.**	**109,893* for 424days**

*Projected to 365 days, the data would be 94, 601 that is larger than expected.

E.6. Remarks on difference from estimated value in the VPA-DD

The design change operated on VPA increased the number of crediting stoves by 10 453 stoves. This explains an increase of ERs generated of around 20 000 tons.

The remaining gap is explained by the integration of a modified ageing and seasonality factors in the calculations:

1) Ageing factor monitoring showed improvement of stove efficiency through-out time.

The ageing factor presented in the the VPADD was a 10% discount applied each year after second year with basis on an emission reduction calculation measured on stoves recently installed.
During this new monitoring period, ageing tests were performed, and results showed that previous assumption made for VPADD estimation was not accurate: in fact, during the first year stoves have low efficiency, but after the efficiency increases significantly.
These results can be explained by the learning curve inherent to every switch of technology. In case of improved cook stoves, beneficiaries have to get use to their new constraints for cooking (ex. prepare and use smaller pieces of wood) which can take time. Capacity building and sensitization provided by the LPPs can accelerate the learning curve of beneficiaries, and is thus a key criteria factor determining the project efficiency.

2) Seasonality monitoring showed higher wood savings during rainy season

For this second monitoring, quantitative data on seasonality was produced and allowed integration in the ER calculation of the higher households' consumptions during the rainy season (+64% compared to dry season). ERs initially estimated in the VPADD were dry season data, this way conservatively assuming no seasonality (conservative approach as detailed in VPA-DD). Thus, the integration of the seasonality factor (64% higher consumption during the 6 months of rainy season) increases the total ER calculation of about 30% compared to what was previously estimated in VPADD.

ANNEXES

ANNEX 1 - LPP 2 - PROPERU

1. Project Survey

As it is stated in the VPA-DD, baseline and project scenario KS was used to determine whether another cluster differentiation was needed inside the PROPERU clusters. This analysis was done first for the improved cookstoves built in 2008 and 2009, and then for improved cookstoves built in 2010 and 2011. Conclusions were no for both of them. For further details see Annex 3 of VPA-DD.
For verification stage, baseline and project scenario KS is submitted for all improved cookstoves. Information has been gathered under the same methodology of previous KS to test possible changes in factors assessments. Conclusion was no in PROPERU, we will explain why.

1.1 Project Survey Description

Table 1.1: Survey Description

Clusters description	
KS SURVEYS	**PROPERU**
Survey dates	May-June 2011
Sample size	146
Family size average - Total - Dry	5.4
Children(<10)	1.7
Adults (>10)	3.7
Family size average - Total - Rainy	
Children(<10)	N/A
Adults (>10)	5.4
Ui,y (drop-off rate in stove-with-chimney usage)	26%
Oi,y (removal rate of old stove)	100.00%
% rural population	86.99%
% 1st type of wood used Eucalyptus	95.17%
Gas price (including transportation)	N/A
Weekly time spent on wood collecting (min.)	N/A
% of Wood buyers	90.41%

1.2. Project Survey Matrix

Taking into account the cluster differentiation factors assessment in Annex 3 and 4 of the VPA-DD, no major change has been observed in the cluster in the project survey.

Table 1.2: Factors assessment

Clusterdifferentiationfactors	Sub-factor	Information	Pre-definition	PS/ BL	Season	LPP: PROPERU
Type of cookstoves	Baseline cookstove	Type of cookstove used in baseline scenario	Traditional cookstove	BL		100.00 %
			Partially traditional cookstove	BL		0.00%
Stove use	Commercial or institutional use of stove	Number of people that use their stove for commercial or institutional purposes	>= 30% &<=70%	PS		0.00%
				BL		0.00%
	Heating function forstove	Number of people that use their stove for heating	>= 30% &<=70%	PS		0.00%
				BL		0.00%
	Water sterilization use	Number of people that do not use their stove for water sterilization	>= 30% &<=70%	PS		0.00%
				BL		100.00 %
Fuel use	Variation in fuel type use	Number of people that do not use wood as 1st fuel	>= 30% &<=70%	PS		0.00%
				BL		0.00%
	Variation in fuel mix	Number of people with significant fuel mix	>= 30% &<=70%	PS		21.23%
				BL		65.07%
CONCLUSION						One Cluster

Seasonal differentiation

During the first monitoring period, Kitchen Surveys showed that no significant seasonal impact existed on beneficiary wood consumption and savings. All quantitative data used for ER calculation were produced in dry season in order to be conservative on that issue (assuming people consume less wood in dry season than rainy season).
During the second monitoring period, quantitative monitoring was produced in rainy season and showed that in fact seasons have a significant impact on wood consumptions and savings. The seasonal factor monitored is 64%, meaning that a given household consumes in baseline situation 64% more wood in rainy season compared to dry season.
This seasonal factor was integrated in ER calculation of second monitoring period, with a direct impact on wood savings monitored.

2. Sustainable Development Indicators

2.1. Sustainable Development Matrix

As stated in Section B.6.1 of the VPA-DD (page 38-40), the following sustainability indicators are monitored.

Table 2.1 Sustainable Development Matrix

SustainableDevelopmentIndicator	Data variable	Data type	Data unit	Value PROPERU	Source	Measured (m), calculated (c) or estimated (e)	Recordingfrequency
Air quality	Presence of smoke in the household	Environmental impact	%	100%	Kitchen Survey	estimated	Biennially
Quality of employment	Number of employment	Social impact	#	14	Email	measured	Biennially
Livelihood of thepoor	Presence of an improved cookstove with chimney	Social impact	%	100%	Kitchen Survey	estimated	Biennially
Access to affordable and clean energy services	Presence of an improved cookstove	Social impact	%	100%	Kitchen Survey	estimated	Biennially
Human and institutional capacity	Capacity Building for beneficiaries	Social impact	%	100%	KitchenSurvey	estimated	Biennially
Quantitative employment and income generation	Number of people contracted for the project	Economic impact	#	12	Email	measured	Biennially
Technology transfer and technological self-reliance	Capacity building of beneficiaries	Social impact	%	76%	KitchenSurvey	estimated	Biennially

The estimation was made by the implementation of kitchen surveys (KS) by the LPP.

2.2. Do Not Harm Assessment

The following documents are the DNH Declaration signed by PROPERU.

PROPERU
SERVICE CORPS

Declaración Jurada de Ausencia de Daño – Programa Qori Q'oncha

Nombre del Participante al Proyecto: ***PROPERU SERVICE CORPS***

La institución abajo firmante certifica que todas sus actividades que formen parte de algún VPA, durante todo el periodo crediticio de este VPA (7 años renovable dos veces), siendo este VPA integrado dentro del marco del Programa Qori Q'oncha, respetan los siguientes principios:

1. El proyecto respeta los derechos humanos internacionalmente proclamados incluso la dignidad, la propiedad cultural y la unicidad de los pueblos indígenas. El proyecto no es cómplice de abusos de los derechos humanos.
2. El proyecto no implica ni es cómplice de reasentamiento involuntario.
3. El proyecto no implica ni es cómplice de la alteración, daño o eliminación de ningún legado cultural crítico.
4. El proyecto respeta la libertad de asociación de los empleados y su derecho a la negociación colectiva y no es cómplice de la restricción de estas libertades y derechos.
5. El proyecto no implica ni es cómplice con ningún tipo de trabajado forzado u obligatorio.
6. El proyecto no implica ni es cómplice con ningún tipo de trabajo infantil.
7. El proyecto no implica ni es cómplice con ningún tipo de discriminación basada en el género, la raza, la religión, la orientación sexual o con ninguna otra base.
8. El proyecto provee a los trabajadores de entornos de trabajo seguros y saludables y no es cómplice de la exposición de trabajadores a entornos de trabajo inseguros e insalubres.
9. El proyecto asume un acercamiento preventivo con respeto a desafíos ambientales y no es complica con prácticas contrarias al principio de precaución. Este principio se puede definir de la siguiente manera: "Cuando una actividad levanta amenazas de daño a la salud humana o al medio ambiente, medidas preventivas deberían de ser tomadas aun si la relación de causa a efecto no está totalmente establecida acientíficamente"
10. El proyecto no implica ni es cómplice de una conversión o degradación significativa de hábitats naturales incluyendo los que son (a) legalmente protegidos, (b) oficialmente propuestos para protección (c) identificados por las autoridades por su alto valor de conservación o (d) reconocidos como protegidos por comunidades locales tradicionales.
11. El proyecto no implica ni es cómplice con corrupción.

Cusco, 06 de diciembre del 2010

Properu Service Corps.
CPC Milagro R. Montufar Pa:
Directora Ejecutiva

3. Emission Reductions calculation

3.1. Baseline Emission calculation

Here, the baseline emissions table with detailed information for its estimation.

Table 3.1: Baseline Emission Calculation

BASELINE EMISSIONS	PROPERU
Bbl,d Average(Kg/day/stove)	9.32
standard deviation	3.88
Bbl,y Average(t/year/stove)	3.404
Xnrb	0.6963
2008stovenumber	1,174
2009 stovenumber	799
2010 stovenumber	810
2011stove number	926
EFbl.bio.CO2 (tCO2eq/twood)	1,7472
EFbl.bio.nonCO2(tCO2eq/twood)	0.11762
BEy per stove(tCO2eq)	**4.541**

3.2. Project Emission calculation

Now, the same structure of the table above but applied to project emission values.

Table 3.2: Project Emission Calculation

PROJECT SCENARIO EMISSIONS	PROPERU
Bpj,d Average(Kg/day/stove)	5.77
Standard deviation	2.60
Bpj,y Average(t/year/stove)	2.108
Xnrb	0.6963
2008 stove number	1,174
2009 stove number	799
2010 stove number	810
2011 stove number	926
EFp.bio.CO2 (tCO2eq/twood)	1,7472
EFp.bio.nonCO2(tCO2eq/twood)	0.11762
PEy per stove(tCO2eq)	**2.812**

3.3. Emission reductions calculation

The next table presents all the steps and the data that is needed to estimate the fuel saving using a confidence Interval with 90% of confidence,

Table 3.3a: Statistical analysis of fuel savings

Test description	
BASELINE - BL KT	**PROPERU**
Sample size	126
Test dates	June 2009
Duration of test (days)	3
PROJECT SCENARIO - PS KT	**PROPERU**
Sample size - PS KT	69
Test dates	June 2009
Duration of test (days)	3
TYPE OF SAMPLES RELATION	Unpaired

Consumption difference statistical analysis	
BASELINE - BL KT (*BE*)	**PROPERU**
Bbl,y Average (kg/day/stove)	9.32
Standard deviation (kg/day)	3.88
PROJECT SCENARIO - PS KT	**PROPERU**
Bpj,y Average (kg/day/stove)	5.77
Standard deviation (kg/day)	2.60
The two samples are unpaired	YES
Do they have the same variance ?	
BL variance	15.028
PS variance	6.738
Fisher ProbabilityFunction	0.000
If the result is < 10%, hypothesis H0 (equal variance) is rejected	
ANSWER	Ho isrejected
CONCLUSION	No
TEST FOR NON PAIRED TWO-SAMPLE UNEQUAL VARIANCE	
T student, 2, 3	1.24221E-12
If the result is < 10%, hypothesis H0 (Average difference = 0) is rejected	
ANSWER	Ho isrejected
Statistically proven daily wood savings. Average diferences (kg/day/stove)	3.55
degrees of freedom	185.23
t value for 90% Confidence Interval	1.65
Bpj,y Upper bound (kg/day/stove)	4.32
Bpj,y Lower bound (kg/day/stove)	2.78

Statistically proven stove age 0-1 dry season wood savings (kg/year/stove)	1296.0

We have seen on the table that the null hypothesis Ho (average difference=0) has been rejected, as the statistical analysis shows a confidence interval error of 0.8 kg, then to find the precision of the confidence interval, the error is divided by the average difference between the consumption of wood in baseline and project scenario. The result is 22%. This precision is even smaller than the 30 % required by Gold Standard. In consequence, the confidence interval complies with the 90/30 rule. Further details see file "VPA 2- KT- ER Calculation".

Once we have proof that the 90/30 rule was complied, the emission reduction estimation is done using the mean difference between the consumption of wood in baseline and project scenario as next.

Table 3.3b: Emission Reduction Calculation

Emission reduction calculation	
	PROPERU
Annual savings wood (kg/year)	**1296.0**
Leakage (t)	**0.0E+00**
NRB (%)	**69.63%**
EF CO2 (tCO_2/TJ)	**112**
NCV (TJ/ton fuel)	**0.0156**
ER CO_2 (tCO2/t fuel)	**1.58**
EF CH_4 (tCH_4/TJ)	**0.3**
EF CH4 (CO_2eq/TJ)	**6.3**
NCV (TJ/ton fuel)	**0.0156**
ER CH_4 (tCO2/t fuel)	**0.13**
EF N_2O (tN_2O/TJ)	**0.004**
EF N2O (CO_2eq/TJ)	**1.24**
NCV (TJ/ton fuel)	**0.0156**
ER N_2O (CO_2eq/t)	**0.025**
ER (t/year/cookstove)$_{APROPERU,0-1}$	**1.729**
ER (t/year/cookstove) $_{APROPERU,1-2}$	**3.089**
ER (t/year/cookstove) $_{APROPERU,2-3}$	**4.078**
ER (t/year/cookstove) $_{APROPERU,3-4}$	**4.069**
ER (t/year/cookstove) $_{APROPERU,4-5}$	**4.069**

Table 3.3c: Drop-off rate

KS SURVEYS	PROPERU
Ui,y (drop-off rate in stove usage)	26%

This 26% means that 74% the beneficiaries that were surveyed are cooking with their improved cook stove.

Table 3.3d: Cumulated Weighted Crediting Period.

The following table shows the application of the formula described in section E.4 for data from PROPERU.

Cumulated Weighted Crediting Period	PROPERU
$CWCP_{2011}$	1,428
$CWCP_{2012}$	610

Table 3.3e: Emission Reduction Summary

The total emission reductions requested in the 2nd monitoring period are 6,458 $tCO_2$for PROPERU, detailed are showed in the table below.

	Emission reduction summary	
	PROPERU	TOTAL
ER 2011 (t/year)	4,676	4,676
ER 2012 (t/year)	1,783	1,783
TOTAL CUMULATED ER	6,458	6,458

ANNEX2 - LPP 3 - ITYF

1. Project Survey

As it is stated in the VPA-DD, baseline and project scenario KS was used to determine whether another cluster differentiation was needed inside the ITYF clusters. This analysis was done first for the improved cookstoves built in 2008 and 2009, and then for improved cookstoves built in 2010 and 2011. Conclusions were no for both of them. For further details see Annex 3 and 4 for VPA-DD.
For verification stage, baseline and project scenario KS is submitted for all improved cookstoves. Information has been gathered under the same methodology of previous KS to test possible changes in factors assessments. Conclusion was no in ITYF, we will explain why.

1.1. Project Survey Description

Table 1.1: Survey Description

Clusters description	
KS SURVEYS	**ITYF**
Survey dates	Dec 2011
Samplesize	169
Family size average - Total - Dry	4.5
Children(<10)	1.2
Adults (>10)	3.3
Family size average - Total - Rainy	4.5
Children(<10)	1.2
Adults (>10)	3.3
Ui,y (drop-off rate in stove-with-chimney usage)	0.59%
Oi,y (removal rate of old stove)	86.23%
% rural population	100.00%
% 1st type of wood used Eucalyptus	98.22%
Gas price (including transportation)	39.0
Weekly time spent on wood collecting (min.)	100.1
% of Wood buyers	9.47%

1.2. Project Survey Matrix

Taking into account the cluster differentiation factors assessment in Annex 3 and 4 of the VPA-DD,no major change has been observed in the cluster in the project survey.

Table 1.2: Factors assessment

Cluster differentiation factors	Sub-factor	Information	Pre-definition	PS/BL	Season	ITYF LA LIBERTAD
Type of cookstoves	Baseline cookstove	Type of cookstove used in baseline scenario	Traditional cookstove	BL		99.41%
			Partially traditional cookstove	BL		0.59%
Stove use	Commercial or institutional use of stove	Number of people that use their stove for commercial or institutional purposes	>= 30% &<=70%	PS		1.18%
				BL		--
	Heating function for stove	Number of people that use their stove for heating	>= 30% &<=70%	PS		8.93%
				BL		--
	Water sterilization use	Number of people that do not use their stove for water sterilization	>= 30% &<=70%	PS		0.00%
				BL		--
Fuel use	Variation in fuel type use	Number of people that do not use wood as 1st fuel	>= 30% &<=70%	PS		0.00%
				BL		0.00%
	Variation in fuel mix	Number of people with significant fuel mix	>= 30% &<=70%	PS		1.18%
				BL		1.18%
CONCLUSION						One cluster

Seasonal differentiation

During the first monitoring period, Kitchen Surveys showed that no significant seasonal impacted existed on beneficiary wood consumption and savings. However, all quantitative data used for calculation were produced in dry season in order to be conservative on that issue (assuming people consume less wood in dry season than rainy season).
During the second monitoring period, quantitative monitoring was produced in rainy season and showed that in fact seasons have a significant impact on wood consumptions and savings. The seasonal factor monitored is 64%, meaning that a given household consumes in baseline situation 64% more wood in rainy season compared to dry season.
This seasonal factor was integrated in ER calculation of second monitoring period, with a direct impact on wood savings monitored.

2. Sustainable Development Indicators

2.1. Sustainable Development Matrix

As stated in Section E.7 of the VPA-DD (page 32-34), the following sustainability indicators are monitored.

Table 2.1 Sustainable Development Matrix

Sustainable Development Indicator	Data variable	Data type	Data unit	Value ITYF	Source	Measured (m), calculated (c) or estimated (e)	Recordingf requency
Air quality	Presence of smoke in the household	Environmentali mpact	%	99%	Kitchen Survey	estimated	Biennially
Quality of employment	Number of employment	Social impact	#	106	Email	measured	Biennially
Livelihood of thepoor	Presence of an improved cookstove with chimney	Social impact	%	99%	Kitchen Survey	estimated	Biennially
Access to affordable and clean energy services	Presence of an improved cookstove	Social impact	%	99%	Kitchen Survey	estimated	Biennially
Human and institutional capacity	Capacity Building for beneficiaries	Social impact	%	95%	Kitchen Survey	estimated	Biennially
Quantitative employment and income generation	Number of people contracted for the project	Economic impact	#	14	Email	measured	Biennially
Technology transfer and technological self-reliance	Capacity building of beneficiaries	Social impact	%	99%	Kitchen Survey	estimated	Biennially

The estimation was made by the implementation of kitchen surveys (KS) by the LPP.

2.2. Do Not Harm Assessment

The following documents are the DNH Declaration signed by ITYF.

INSTITUTO TRABAJO Y FAMILIA

Declaración Jurada de Ausencia de Daño – Programa Qori Q'oncha

En esta declaración la institución correspondiente en su calidad de participante al Programa Qori Q'oncha.

Nombre del Participante al Proyecto INSTITUTO TRABAJO Y FAMILIA

La institución abajo firmante certifica que todas sus actividades que formen parte de algún VPA, durante todo el periodo crediticio de este VPA (7 años renovable dos veces), siendo este VPA integrado dentro del marco del Programa Qori Q'oncha, respetan los siguientes principios:

1. El proyecto respeta los derechos humanos internacionalmente proclamados incluso la dignidad, la propiedad cultural y la unicidad de los pueblos indígenas. El proyecto no es cómplice de abusos de los derechos humanos.
2. El proyecto no implica ni es cómplice de reasentamiento involuntario.
3. El proyecto no implica ni es cómplice de la alteración, daño o eliminación de ningún legado cultural crítico.
4. El proyecto respeta la libertad de asociación de los empleados y su derecho a la negociación colectiva y no es cómplice de la restricción de estas libertades y derechos.
5. El proyecto no implica ni es cómplice con ningún tipo de trabajado forzado u obligatorio.
6. El proyecto no implica ni es cómplice con ningún tipo de trabajo infantil.
7. El proyecto no implica ni es cómplice con ningún tipo de discriminación basada en el género, la raza, la religión, la orientación sexual o con ninguna otra base.
8. El proyecto provee a los trabajadores de entornos de trabajo seguros y saludables y no es cómplice de la exposición de trabajadores a entornos de trabajo inseguros e insalubres.
9. El proyecto asume un acercamiento preventivo con respeto a desafíos ambientales y no es complica con prácticas contrarias al principio de precaución. Este principio se puede definir de la siguiente manera: "Cuando una actividad levanta amenazas de daño a la salud humana o al medio ambiente, medidas preventivas deberían de ser tomadas aun si la relación de causa a efecto no está totalmente establecida acientíficamente"
10. El proyecto no implica ni es cómplice de una conversión o degradación significativa de hábitats naturales incluyendo los que son (a) legalmente protegidos, (b) oficialmente propuestos para protección (c) identificados por las autoridades por su alto valor de conservación o (d) reconocidos como protegidos por comunidades locales tradicionales.
11. El proyecto no implica ni es cómplice con corrupción.

Representante del Participante al Proyecto: Fecha, Responsabilidad en la Organización, Nombre y Firma

Lima, 03 de Febrero del 2011

INSTITUTO TRABAJO Y FAMILIA
PROGRAMA SEMBRANDO

RICARDO MARAVI SEGURA
DIRECTOR EJECUTIVO

INSTITUTO TRABAJO Y FAMILIA
VºBº
DIRECCIÓN EJECUTIVA

Jr. De la Unión 264 - 3er Piso, oficina 310-311 • Cercado de Lima
Teléfono: 428-5036 / 428-3096 • e-mail: institutotrabajoyfamilia@yahoo.com / e-mail: contacto@ityf.org.pe
www.ityf.org.pe

3. Emission Reductions calculation

3.1. Baseline Emission calculation

Here, the baseline emissions table with detailed information for its estimation.

Table 3.1: Baseline Emission Calculation

BASELINE EMISSIONS	ITYF
Bbl,d Average(Kg/day/stove)	9.29
standard deviation	3.77
Bbl,y Average(t/year/stove)	3.389
Xnrb	0.6963
2008 stove number	6,811
2009 stove number	17,081
2010 stove number	8,877
2011 stove number	16
EFbl.bio.CO2 (tCO2eq/twood)	1.7472
EFbl.bio.nonCO2(tCO2eq/twood)	0.11762
BEy per stove(tCO2eq)	**4,522**

3.2. Project Emission calculation

Now, the same structure of the table above but applied to project emission values.

Table 3.2: Project Emission Calculation

PROJECT SCENARIO EMISSIONS	ITYF
Bpj,d Average(Kg/day/stove)	6.78
Standard deviation	2.62
Bpj,y Average(t/year/stove)	2.475
Xnrb	0.6963
2008 stove number	6,811
2009 stove number	17,081
2010 stove number	8,877
2011 stove number	16
EFp.bio.CO2 (tCO2eq/twood)	1.7472
EFp.bio.nonCO2(tCO2eq/twood)	0.11762
PEy per stove(tCO2eq)	**3.302**

3.3. Emission reductions calculation

The next table presents all the steps and the data that is needed to estimate the fuel saving using a confidence Interval with 90% of confidence,

Table 3.3a: Statistical analysis of fuel savings

Test description	
BASELINE - BL KT	**ITYF**
Samplesize	179
Test dates	Sept 2009
Duration of test (days)	3
PROJECT SCENARIO - PS KT	**ITYF**
Samplesize - PS KT	199
Test dates	Sept 2009
Duration of test (days)	3
TYPE OF SAMPLES RELATION	Unpaired

Consumption difference statistical analysis	
BASELINE - BL KT (*BE*)	**ITYF**
Bbl,y Average (kg/day/stove)	9.29
Standard deviation (kg/day)	3.77
PROJECT SCENARIO - PS KT	**ITYF**
Bpj,y Average (kg/day/stove)	6.78
Standard deviation (kg/day)	2.62
The two samples are unpaired	YES
Do they have the same variance ?	
BL variance	14.213
PS variance	6.851
Fisher ProbabilityFunction	0.000
If the result is < 10%, hypothesis H0 (equal variance) is rejected	
ANSWER	Ho isrejected
CONCLUSION	no
TEST FOR NON PAIRED TWO-SAMPLE UNEQUAL VARIANCE	
T student, 2, 3	1.06639E-12
If the result is < 10%, hypothesis H0 (Average difference = 0) is rejected	
ANSWER	Ho isrejected
Statistically proven daily wood savings. Averages difference (kg/day/stove)	2.51
Degrees of freedom	312.93
t value for 90% Confidence Interval	1.65
Bpj,y Upper bound (kg/day/stove)	3.06
Bpj,y Lower bound (kg/day/stove)	1.95
Statistically proven stove age 0-1 dry season wood savings (kg/year/stove)	914.6

We have seen on the table that the null hypothesis Ho (average difference=0) has been rejected, as the statistical analysis shows a confidence interval error of 0.6 kg, then to find the precision of the confidence interval, the error is divided by the average difference between the consumption of wood in baseline and project scenario. The result is 22%. This precision is even smaller than the 30 % required by Gold Standard. In consequence, the confidence interval complies with the 90/30 rule. Further details see file "VPA 2- KT- ER Calculation".

Once we have proof that the 90/30 rule was complied, the emission reduction estimation is done using the mean difference between the consumption of wood in baseline and project scenario as next.

Table 3.3b: Emission Reduction Calculation

Emission reduction calculation	
	ITYF
Annual savings wood (kg/year)	914.6
Leakage (t)	0.0E+00
NRB (%)	69.63%
EF CO2 (tCO_2 /TJ)	112
NCV (TJ/ton fuel)	0.0156
ER CO_2 (tCO2/t fuel)	1.11
EF CH_4 (tCH_4/TJ)	0.3
EF CH4 (CO_2eq/TJ)	6.3
NCV (TJ/ton fuel)	0.0156
ER CH_4 (tCO2/t fuel)	0.09
EF N_2O (tN_2O/TJ)	0.004
EF N2O (CO_2eq/TJ)	1.24
NCV (TJ/ton fuel)	0.0156
ER N_2O (CO_2eq/t)	0.018
ER (t/year/cookstove) A ITYF,0-1	1.220
ER (t/year/cookstove) A ITYF,1-2	2.656
ER (t/year/cookstove) A ITYF,2-3	1.802
ER (t/year/cookstove) A ITYF,3-4	1.819

Table 3.3c: Drop-off rate

KS SURVEYS	ITYF
Ui,y (drop-off rate in stove usage)	0.59%

This 0.59% means that almost all the beneficiaries (99.41%) that were surveyed are cooking with their improved cook stove.

Table 3.3d: Cumulated Weighted Crediting Period

The following table shows the application of the formula described in section E.4 for data from ITYF.

Cumulated Weighted Crediting Period	ITYF
$CWCP_{2011}$	28,522
$CWCP_{2012}$	10,056

Table 3.3e: Emission Reduction Summary

The total emission reductions requested in the 2nd monitoring period are 103,436 $tCO_2$for ITYF, detailed are showed in the table below.

	Emission reduction summary	
	ITYF	TOTAL
ER 2011 (t/year)	76,473	76,473
ER 2012 (t/year)	26,962	26,962
TOTAL CUMULATED ER	103,435	103,435

Annex 3 - Forward Action Request after first issuance

1. Electronic data storage (FAR 1)[10]

As it was mentioned by the DOE *"Registered VPoA-DD version 09 states the following "After presentation, validation and verification of each VPA, every data will be kept electronically until 2 years after the final of the crediting period."*
At the time of site visit not all data from the verification period was archived electronically. The DOE shall verify in the next (second) periodic verification if all project data has been kept electronically in order to evaluate if all records of monitoring parameters are archived according to the monitoring plan."
All project data has been kept electronically to prove that all records of monitoring parameters are archived according to the monitoring plan.
Corresponding evidences will be presented to DOE during site-visit.

2. Aging tests (FAR 2)[11]

As it was mentioned by GS *"Aging tests need to be conducted before next verification and if any aging is seen then PP will have to forego corresponding emission reductions during next issuance to compensate for the extra issuance in this monitoring period."*
The aging factor is being determined in the framework of quantitative survey implementation presented now at second verification, see section 3, table 3.1 for each LPP in its corresponding annex for the application.
Also see the file *"VPA 1 - 2008-2009 - KT - ER calculation FAR1 v21.xls"* with the detail of recalculation for the 1st issuance using the aging factor and the conclusion about the resignation or not of extra issuance.

Corresponding evidences and document are attached in the evidence file.

[10] See 1st verification report - QQ, page 36.

[11] See 3 weeks issuance review period document - VPA 1, page 12.