MONITORING REPORT

Proyecto Mirador
Enhanced distribution of efficient wood stoves in Honduras
GS Project No. 690

Third verification period: 1 December 2011 – 30 November 2012
Version 04: 11 February 2013

CONTENTS

MONITORING REPORT

Proyecto Mirador
Enhanced distribution of efficient wood stoves in Honduras
GS Project No. 690

Third verification period: 1 December 2011 – 30 November 2012
Version 04: 11 February 2013

SECTION A. General description of the project activity

A.1. Brief description of the project activity: >>

1. Purpose of the project activity and the measures taken to reduce greenhouse gas emissions.

The objective of our non-profit project, Proyecto Mirador, is to grow an organization that utilizes carbon finance, a market based solution, to disseminate fuel-efficient stoves that address the problems of deforestation, indoor air pollution, global warming, and slow economic development through the creation of microenterprises in rural Honduras. Proyecto Mirador has proven its ability to serve as a model for other stove projects by monetizing certified carbon savings and greatly accelerating the dissemination of fuel-efficient stoves in rural Central America where degraded conditions of forests, indoor air pollution and rural poverty exceed acceptable levels.

Proyecto Mirador disseminates the Estufa Dos por Tres (2x3), an adaptation of the original La Justa stove. The original model La Justa stove was pioneered by the Aprovecho Research Lab and was engineered to burn hotter and use 1/2 to 1/3 the wood of traditional *fogón* stoves, thus reducing the time devoted to wood collection and/or money spent on wood. The La Justa also efficiently vents smoke outside of the house, helping to prevent respiratory and other illnesses caused by excessive exposure to toxic gases and particulate matter emitted by burning wood.

La Justa stoves reduce emissions of greenhouse gases (GHG) that are causing the Earth's average temperature to rise to dangerous levels. A field study was conducted by Professor Robert Bailis, PhD, author of the Kitchen Performance Test (the Gold Standard baseline methodology for cookstoves, hereinafter referred to as "KT"), and at that time an assistant professor at the Yale School of Forestry and Environmental Studies (FES), in June and July of 2007. This study, hereinafter referred to as the "Yale 2007 Study," showed that the replacement of one traditional *fogón* stove with one La Justa stove reduces GHG emissions by between 1.2 and 1.7 $mtCO_2e$ /year.

Subsequent to the Yale 2007 Study, PM made additional design improvements to the original La Justa stove with assistance from Aprovecho Research Center. The Aprovecho Center studies methods for designing, building, and disseminating cooking and heating technology by using vernacular (locally available) low cost materials that can be found easily in the towns and villages where improved stoves are needed.

A study completed by Nordica MacCarty of Aprovecho Research Center on April 28, 2009, showed that the improved "La Justa Model 2x3" (now called the Estufa 2x3) generates even greater wood savings than the original La Justa. Further, laboratory tests showed that the La Justa Model 2x3 reduced Carbon Monoxide emissions and particulate matter by 79%, CO_2 by 43% and CH4 by 94% compared to traditional stoves (McCarty, N., Apr. 2009). What was referred to as the La Justa Model 2x3 during the First Verification Period is now called the "Estufa Dos por Tres" to reflect the uniqueness of Proyecto Mirador's improved design. It is the same stove as the improved La Justa Model 2x3, and is the stove installed throughout the Third Verification Period.

Since the 2009 Aprovecho lab test, and in accordance with a Forward Action Request issued by the

Gold Standard as part of the final Registration Review in June 2010, Proyecto Mirador completed a paired sample, n=55 quantitative Fuelwood Consumption Study (July-September 2010) indicating that each stove reduces GHG emissions by 2.73 $mtCO_2e$ /year. This study was conducted under the supervision of Professor Robert Bailis, with data collected from July to September 2010.

PM's previously projected GHG emissions reduction of 2.23 $mtCO_2e$ /year, as set forth in the original PDD, was based on Aprovecho's findings, together with the Yale baseline study conducted in 2007, and calculated based on mean fuel consumption. The projected emissions reduction of 2.23 $mtCO_2e$/year was replaced with a revised projection of 2.73 $mtCO_2e$/year for the purposes of the First Verification Period (1 May 2009 – 30 November 2010) and the Second Verification Period (1 December 2010 – 30 November 2011).

In 2012 Proyecto Mirador submitted a Design Change Request that was approved the Gold Standard. The Design Change Request asked for approval to use the Gold Standard methodology described in "Technologies and Practices to Displace Decentralized Thermal Energy Consumption" (11/04/2011), Annex 1, Section A1.3, "NRB Assessment similar to approach of CDM methodology AMS-IIG" to calculate the NRB fraction (an "NRB Exception"). For the purposes of the Third Verification Period we have revised our emissions reduction figure to 3.31 $mtCO_2e$/year to reflect an updated NRB of 77% using "similar CDM Methodology AMS-IIG" in accordance with the approved 2012 Design Change Request. The stove design has not changed and all other factors previously established remain valid.

A revision to the cluster definition was also approved as part of the 2012 Design Change Request in order to accommodate a boundary expansion to include all of Honduras. The cluster definition is discussed in Section A.5 below.

At the Gold Standard's request PP has revised the PDD according to the 2012 Design Change Request and the final, Gold Standard approved version is attached as "ANNEX 13: A13_PM PDD v.5 2012.doc."

2. Brief description of the installed technology and equipments.

A standard La Justa stove consists of a ceramic firebox for the stove mouth, a steel plancha, a chimney, and a sophisticated system of insulated interior walls constructed from adobe blocks or ceramic bricks that channels the heat under the plancha and smoke and particulates out the chimney.

The improved model of La Justa stove is called the "Estufa Dos por Tres" and is the model covered in this Third Monitoring Report. The Estufa Dos por Tres includes a few important structural modifications relative to the original La Justa stove: First, the grate in the stove mouth has been raised slightly in order to raise the fuel off the stove floor, thus making the wood burn more thoroughly and efficiently. Second, the dimensions of the steel cooktop *(plancha)* have been changed, allowing the *plancha* to heat up faster and distribute the heat more evenly than before. Third, the *plancha* has been lowered closer to the level of the wood ash insulation in order to use the firepower of the stove more efficiently. From the user's point of view the Estufa Dos por Tres is functionally the same stove as the traditional *fogón,* and PM staff have observed that it has been positively received by the beneficiaries.

PM donates to each beneficiary the steel cooktop (*plancha*), the chimney and chimney top, and the six custom ceramic pieces for the stove mouth or firebox, and the installation and training. These components are sourced and manufactured locally in Santa Barbara Province, creating local jobs through nine material provider businesses. Beneficiaries contribute the remaining components, including cement, rebar, bricks, adobe blocks and wood ash, all of which are common items available in all villages of Honduras. This cost-sharing arrangement is part of PM's philosophy of *"No Cuesta, No Cuida,"* which asserts that beneficiaries will better care for their donated stove if they invest some

of their own resources in its acquisition. It is required that old stoves are removed at the time the new Estufa Dos por Tres stoves are installed.

Traditional La Justa stove

New Estufa Dos por Tres stove

3. <u>Relevant dates for the project activity (e.g. construction, commissioning, continued operation periods, etc.).</u>

Construction of stoves under the Gold Standard crediting period began on May 1, 2009 and will continue through April 30, 2019. Construction of fuel-efficient stoves by Proyecto Mirador began in June, 2004.

Qualitative surveys conducted by Proyecto Mirador in 2012 indicate Estufa Dos por Tres stoves are used in homes an average of 8.8 hours per day, every day. We expect stoves to operate in homes for the duration of 5-7 years, after which time they will be retired and replaced.

The stoves are not all installed at the start of the project, but are installed progressively during the 10-year crediting period. The chart on the following page reflects an actual installation rate for stoves installed from 1 May 2009 – 30 November 2011 and subsequent years adjusted according to current projections. Our estimates reflect Proyecto Mirador's growing experience as an organization, and also the success of Proyecto Mirador's *Programa de Ejecutores* (formerly called the *Programa de Contratistas,* or Associates Program) in scaling the project. In this microenterprise program, entrepreneurs (whom we call Ejecutores) are trained and paid by Proyecto Mirador to build and install Estufa Dos por Tres stoves under Proyecto Mirador's leadership and verification. As of October 2012, 6 Ejecutores and 27 stove technicians work for Proyecto Mirador. Scaling the project at currently projected rates will create additional jobs for more Ejecutores and Stove Technicians; middle managers; Proyecto Mirador supervisors and inspectors; material suppliers; IT providers and other support organizations. Proyecto Mirador is counting on proceeds from the sale of Gold Standard certified carbon credits to fund the added employees and stove building materials.

In this way Proyecto Mirador will continue to expand its own operations and support our partners through the *Programa de Ejecutores.* Using carbon finance we are empowering stove builders to expand their operations, ultimately resulting in an overall expansion of the stove industry.

Total emission reductions estimated for the crediting period.

The results of the 2010 Paired Fuelwood Consumption Study, applying a revised NRB of 77% in accordance with the methodology approved in our 2012 Design Change Request, determined that each Estufa Dos por Tres generates actual emissions reductions of 3.31 $mtCO_2e$/year. All calculations set forth herein are based on an emissions reduction of 3.31 $mtCO_2e$/year per stove. (Verification of the Third Verification Period will be confined to the figures presented in Section E.4 of this report.)

Crediting Term	Average Number of Net Stoves in Operation	Annual estimation of emission reductions ($mtCO_2e$)
1 May 2009 - 30 Nov 2010	4,667	12,368
1 Dec 2010 - 30 Nov 2011	11,115	28,229
1 Dec 2011 - 30 Nov 2012	23,454	78,023
1 Dec 2012 - 30 Nov 2013	36,613	107,488
1 Dec 2013 - 30 Nov 2014	40,071	108,497
1 Dec 2014 - 30 Nov 2015	35,071	87,889
1 Dec 2015 - 30 Nov 2016	28,835	65,987
1 Dec 2016 - 30 Nov 2017	20,665	42,155
1 Dec 2017 - 30 Nov 2018	10,783	18,912
1 Dec 2018 - 30 May 2019	2,828	4,967
Total estimated reductions for the crediting period ($mtCO_2e$)		**554,515**
Total number of crediting years		10
Annual average over the crediting period of estimated reductions ($mtCO_2e$)		55,452

Table 1

Table 1 above shows the total estimated emissions reductions of the project activity in the 10-year crediting period (1 May 2009 - 30 April 2019), with year end adjusted to 30 November to match the project verification cycle. This was necessary to ensure accurate reporting given the upward shift in 2011 of emissions reduction per stove following the raise of NRB to 77%. The figures in Table 1 are revised to reflect realistic expectations of capital and project capacity. The reduction of GHG emissions per stove is raised to 3.31 $mtCO_2e$/year per stove from December 1, 2011 forward to reflect an adjusted NRB of 77% as of December 1, 2011, per the approved 2012 Design Change Request.

The estimates above also account for drop-off estimates based on 2012 survey results (see attached ANNEX 1: "A01_Dropoff Summary 2012") and stove degradation (See "ANNEX 2: "A02_Aging Stove KT Report 2012.docx," and ANNEX 3: "A03_Aging Stove KT 2012 Raw Data.xls") increasing appropriately by year. The numerical analysis can be found in ANNEX 4: "A04_Financing Plan 2012.xls" (see "CO2 Projections" worksheet, Rows 108 and 122). The table above is meant only as an estimate, and the chart above matches that reported in the PDD v5 (2012). Any differences between the above chart and the Financing Plan are reflect minor adjustments to actual stove numbers made recently. The actual emission reductions for the Second Verification Period are calculated and reported in Table 2 in Section E.4 of this Monitoring Report. Estimates are substantiated in Parameter ID 11 and the degradation and abandonment rates are substantiated in Section E.4.

A.2. Project Participants

Project Participant is a non-profit organization, Proyecto Mirador Foundation, which uses the sale of VERs along with donations to install improved stoves in Honduras. In 2004, the Overlook International Foundation (OIF), a U.S.-based 501(c)3 corporation, created Proyecto Mirador LLC (PM), a registered charity in Honduras led by Doña Emilia Giron de Mendoza. Together the two organizations initiated a program to reduce indoor air pollution by disseminating improved Estufa Dos por Tres wood stoves into poor, rural homes in the highlands of Western Honduras with operational headquarters in Santa Barbara Province.

In 2010 the corporate structure was revised as follows: Proyecto Mirador Foundation was established as a separate entity with $2M in capital ($1M from The Grantham Foundation for the Protection of the Environment and $1M from the Overlook International Foundation). Proyecto Mirador Foundation subsequently replaced OIF as the Sole Member and funding entity for Proyecto Mirador LLC. Proyecto Mirador Foundation's official date of establishment as a 501(c)(3) non-profit organization is June 10, 2010.

Since inception in early 2004 PM has installed over 30,000 stoves for individual families, built an efficient organization that has provided employment for 74 direct and indirect employees, and overcome the challenges of executing a successful stove project.

Richard H. Lawrence Jr., Managing Director of Proyecto Mirador Foundation, is also the Executive Director of Overlook Investments Limited, an investment management business headquartered in Hong Kong. Richard founded the organization over 20 years ago. Overlook Investments Limited invests in public listed equities in Asia. Dee Lawrence and Esther Adams also help manage the activities of Proyecto Mirador.

A.3. Location of the project activity:

Complete information of the location of the project activity: town, city, country and GPS coordinates.

Country: Honduras
Region: All of Honduras (as per the boundary expansion approved by the Gold Standard in association with the 2012 Design Change Request)

GPS Coordinates for the center of operations for the project are:
Latitude 14º 55' 26" N
Longitude 88º 13' 44" W

The following statistics are quoted from the CIA World Factbook in 2012:

Honduras
Population: 8,296,693 (July 2012 estimate)
Capital – Tegucigalpa (Department of Francisco Morazán)
Area: 112,090 km^2
Geographic Coordinates: 15 00 N, 86 30 W
(https://www.cia.gov/library/publications/the-world-factbook/geos/ho.html)

A.4. Technical description of the project

Description of the technology applied in the project activity and detailed technical process, including diagrams.

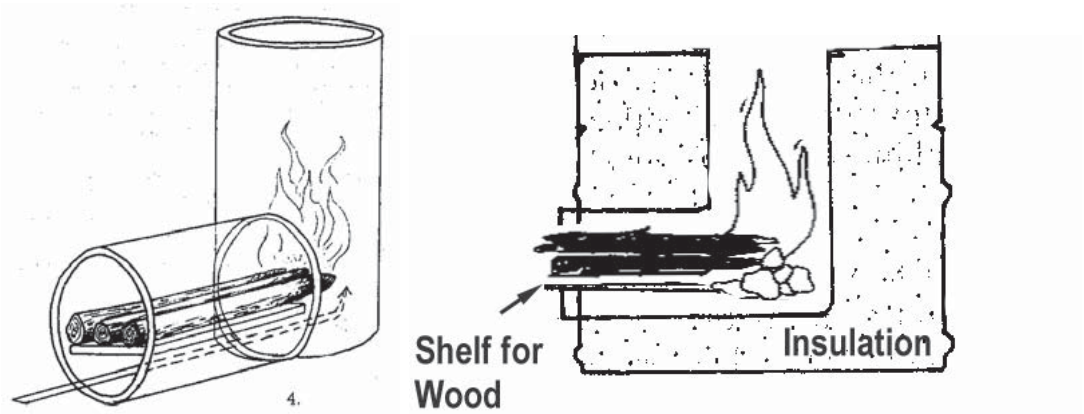
The original La Justa fuel-efficient stove was invented by Dr. Larry Winiarski of Aprovecho Research Center in association with Trees, Water and People, a non-profit organization headquartered at Fort Collins, Colorado. The La Justa stove was specifically designed for Honduran cooking habits and optimizes cooking temperatures by placing the *plancha* (reinforced steel rectangle cooktop) at the hottest point above the combustion chamber, and using the conductivity of the metal plancha to spread the heat evenly over the cooking surface. Compared with other stove alternatives, the La Justa stove is an effective and easily assimilated replacement for the traditional *fogón* type of stove already prevalent in Honduras.

The La Justa stove combines an adaptation of clean combustion principles (known as Rocket Elbow technology) to the local cooking practices of Honduran families. The rocket elbow is an easy-to-build, highly adaptable and inexpensive cooking device characterized by a hollow, L-shaped shaft made of ceramic that acts as the combustion chamber. The firebox sits in an adobe or brick container and the space around the elbow and within the container is filled-in with wood ash or other lightweight insulation.

Rocket Elbow technology uses a grate under the fire to enable air to pass under the fuel source. Optimum results are achieved when the air passes under the shelf and through the coals so that when it reaches the fire it is preheated to help the gases reach complete combustion.

The key advantages of the La Justa stove technology are:

1) The design promotes the flow of air across the wood, into the firebox and out the chimney. This improves the efficiency of the combustion and removes the smoke from the house.
2) The small size of the firebox encourages beneficiaries to utilize small pieces of wood or alternative fuel sources such as corncobs and reduces wood consumption.
3) The La Justa allows beneficiaries to use identical cooking habits, which permits quick and easy cultural adoption of the stove.



More information can be found in the Aprovecho publication, "Design Principles of Wood Burning Cook Stoves," at the following address: http://www.aprovecho.org/lab/pubs/arcpubs.

The Estufa Dos por Tres uses all the principles of Larry Winiarski's technology, but with a few important design and structural improvements that maximize the reduction of GHG emissions reduction. First, the grate in the stove mouth has been raised slightly in order to raise the fuel off the

stove floor, thus making the wood burn more thoroughly and efficiently. Second, the dimensions of the steel cooktop *(plancha)* have been adjusted, allowing the *plancha* to heat up faster and distribute the heat more evenly than before. In addition, the *plancha* has been lowered closer to the level of the wood ash insulation in order to use the firepower of the stove more efficiently. Also, a maintenance tool called the *Cinco* has been introduced to help stove users carry out the comprehensive cleaning and maintenance of the stove. Lastly, stove beneficiaries are thoroughly educated on the use of the stove during three or more separate training sessions, and through written materials that are left behind. From the user's point of view the Estufa Dos por Tres is functionally the same stove and PM staff have observed that it has been positively received and easily assimilated by the beneficiaries.

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

According to the Gold Standard Tool Kit the project fits into the category of:
End-use Energy Efficiency Improvement category is defined as the reduction in the amount of energy required for delivering or producing non-energy physical goods or services.

The project uses Gold Standard approved baseline and monitoring methodology: *Methodology for Improved Cook-stoves and Kitchen Regimes,* Version 01.

This methodology is applicable to programs or activities introducing improved cook-stoves and practices to households within a distinct geographical area. The project activity is implemented by a project coordinator who acts as a project participant. The individual households will not act as project participants.

The methodology addresses the switch from cook-stoves and kitchen regimes used in domestic homes having significant greenhouse gas emissions to those having considerably less or zero emissions.

Reference and version of the baseline.

The baseline scenario reflects that each household uses a traditional *fogón* stove prior to becoming a project beneficiary, and assumes that installation of the new improved stove has not yet occurred. This scenario is captured by assessing fuel wood supply, wood consumption patterns and environmental behaviors among households that use traditional wood stoves. These data define the baseline situation, which we use to characterize conditions that would prevail in the absence of the project activity. The baseline is defined based on the assumption that, in the absence of PM's activity, all households in the community would continue to utilize the traditional *fogón.* Their fuel consumption is defined in the KT discussed above, and is applied to the entire population.

The population sampled in quantitative field-testing in the 2010 n=55 Paired Fuelwood Consumption Study showed a mean household size of 3.64 adult equivalent persons. Baseline fuelwood consumption totaled 1.26 kg per adult equivalent person-meal (as opposed to the project scenario of 0.59 kg). Raw data for both baseline and project scenarios are attached in ANNEX 5: "A05_PM Fuel Usage Study Data 2010.xls" and a summary description of the study is attached in ANNEX 6: "A06_PM Fuel Usage Study Summary Report 2010.pdf."

A similar study was carried out in 2011 using the same guidelines and identical data sheets, but conducted for 1-year-old stoves. This Aging Stove KT confirmed a degradation of 6% in the second year.

The same study was repeated in 2012 using the same guidelines and identical data sheets, but conducted for stoves in their 2nd-3rd year. This 2012 Aging Stove KT confirmed further degradation between 2011 and 2012 to be statistically insignificant (see "ANNEX 2: "A02_Aging Stove KT Report 2012.pdf" and ANNEX 3: "A03_Aging Stove KT 2012 Raw Data.xlsx"). However, to

maintain conservativeness, we are reporting 6% stove degradation rates for the Third Verification, for both Year 2 and Year 3 stoves. The results are further substantiated in Section E.5.

The original data collection sheet used in each study is provided as ANNEX 7: "A07_PM Fuel Usage Study Data Sheet SPANISH.pdf" and an English translation of the data collection sheet is attached as ANNEX 8: "A08_PM Fuel Usage Study Data Sheet ENGLISH.pdf." The 2010, 2011 and 2012 studies were all conducted according to guidelines provided to Proyecto Mirador by Prof. Robert Bailis of the Yale School of Forestry & Environmental Studies and those guidelines are attached as ANNEX 9: "A09_PM Fuel Usage Study Guidelines.pdf."

The previous estimate of 2.23 $mtCO_2e$ /year as stated in the PDD v.4, the version accepted at Registration, was based on prior baseline studies (Yale, 2007, and Aprovecho, 2009), as the 2010 Paired Fuelwood Consumption Study had not yet been undertaken at the time of project submission for Registration to the Gold Standard. Approval of our First Verification confirms that the results of the 2010 Paired Fuelwood Consumption Study should replace all previous data as contained in the PDD v.4, for both baseline and project scenarios, as it confirms accurate fuelwood savings at a greater confidence level than any previously available data due to the large sample size, paired design, and field testing.

In 2012 the cluster was redefined as "One cluster for poor, rural households in Honduras, defined as traditional *fogón* users that rely on woody biomass fuels, and the project focuses on this cluster exclusively." This change, which is reflected in the PDD v.5 (2012), enabled a boundary expansion into other areas of Honduras, outside the 4 Departments approved in the original PDD, wherever baseline conditions are similar. Since the baseline social, economic, and environmental conditions are not likely to consistently improve during the crediting period, a fixed baseline will be used for the duration of the crediting period.

A.6. Registration date of the project activity:

29 June, 2010

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

The crediting period is stated as May 1, 2009 through April 30, 2019.

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

Richard H. Lawrence, Director
rlawrence@overlookinv.com
(415) 464-9590

Dee M. Lawrence, Director
dlawrence@proyectomirador.org
(415) 461-6162

Esther L. Adams, Program Manager
eadams@proyectomirador.org
(415) 464-9590

SECTION B. Implementation of the project activity

B.1. Implementation status of the project activity

1. ***The starting date of operation of the project activity. For project activities that consist of more than one site, the report shall clearly describe the status of implementation and starting date of operation for each site. For GS project activities with phased implementation, the report shall indicate the progress of the proposed GS project activity achieved in each phase.***

The starting date of operation of the project activity was 1 May, 2009. The geographic scope of the project is limited to the defined project boundary. The project boundary for the distribution of the La Justa stoves is Honduras.

2. ***The information regarding the actual operation of the project activity during this monitoring period, including information on special events, for example overhaul times, downtimes of equipment, exchange of equipment, etc.***

The original PDD assumed a project build rate of 3,500 stoves during the first year of the crediting period, with the build rate increasing by 8% per year for each subsequent year of the crediting period. The project is ahead of schedule in meeting its objectives as stated in the original PDD.

Proyecto Mirador has revised its projections to reflect a year end of November 30 to match the Verification cycle, to reflect an increased number of stoves, a revised NRB and an appropriate rate of drop off and degradation consistent with new data. Actual numbers have been used in the ER Projections chart in section A.1 above for stoves installed from May 1, 2009, through November 30, 2012 (a period that encompasses the first 3 Verification Periods). Figures for subsequent years are adjusted according to current growth projections. The numbers used for emission reduction calculations in this document are based on net stoves in operation (rather than the gross number of stoves built), and adjusted for drop-off and stove degradation rates, increasing appropriately by year. These projections are also reflected in the updated PDD v.5 (2012).

3. ***A brief description of: (i) events or situations that occurred during the monitoring period, which may impact the applicability of the methodology, and (ii) how the issues resulting from these events or situations are being addressed.***

The project has been and will continue to be subject to typical monthly variability resulting from factors such as: (1) availability of raw materials; (2) weather; (3) holidays; (4) project cycle for building and installation; (5) research activities in line with Gold Standard requirements; and (6) availability of personnel. We consider the above variables to be normal in scope, and none should impact the applicability of the Monitoring Methodology.

B.2. Revision of the monitoring plan

The monitoring plan was revised as of 15 June, 2010 and was approved on 29 June, 2010. The monitoring plan is set forth here with changes from the PDD Version 4. The Gold Standard's final approved Registration Review was posted to the Gold Standard Registry on 29 June, 2010, signifying the official date of project Registration. The monitoring plan was not revised on submission of the PDD v.5; only items relevant to the 2012 Design Change Request were included in that revision.

For the Third Verification Period, changes to the monitoring plan involve the implementation of an electronically based monitoring system based on the Salesforce.com platform. The overall workflow remains unchanged while our recording mechanisms have been technologically enhanced.

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

In 2012 PP submitted a Design Change Request to the Gold Standard that was approved. Documents associated with the 2012 Design Change Request are attached as follows:

1) Original Design Change Request (in 2 parts):
    a. Request for Boundary Expansion (ANNEX 10: "A10_Design Change Request 2012a.pdf")
    b. Request for NRB Exception (ANNEX 11: "A11_Design Change Request 2012b.pdf")
2) Gold Standard Design Change Review (ANNEX 12: "A12_Design Change Review.pdf")
3) PDD v.5 (2012) (ANNEX 13: "A13_PDD v5 2012.doc")
4) Berkeley Air Monitoring Group *Non Renewable Biomass Assessment* "Berkeley Air NRB Study" December, 2011 (ANNEX 14: "A14_Berkeley Air NRB Analysis 2011.pdf")

Request for Deviation – NRB
The approved 2012 Design Change Request includes a Request for Deviation with regard to the methodology used to calculate NRB. Our current calculations use a 77% NRB fraction for the Third Verification Period and forward. Justification for a 77% figure can be found in the Response by Project Proponent on Page 3 of the Gold Standard Design Change Review, and is also restated below:

> PP has already undergone, in December 2011, a third-party analysis of NRB based on current CDM Methodology (also attached hereto), which produced a fraction of 95.4%. While this number is consistent with the CDM Methodology as allowed in "Technologies and Practices to Displace Decentralized Thermal Energy Consumption", we question whether the methodology itself may be too generous. Still, we are confident our existing NRB of 59% is too low…
>
> …favoring a conservative approach, we have incorporated an NRB fraction of 77% into the PDD (a reduction of 18.4% from the results of PM's third-party NRB analysis). PP will submit updated ER Calculations based on 77% NRB, together with the third-party NRB analysis, on time for verification, and the adjustment to NRB is substantiated in the revised PDD attached hereto.

Accordingly, PM requests that the DOE validate the change 77% NRB based on the above explanation, and on the attached ANNEX 14: "A14_Berkeley Air NRB Analysis 2011.pdf."

Request for Deviation – Boundary Expansion
The approved 2012 Design Change Request includes the approval of a revised cluster definition, as applied to the PDD v.5 (2012), as follows: "One cluster for poor, rural households in Honduras, defined as traditional *fogón* users that rely on woody biomass fuels, and the project focuses on this cluster exclusively." The 2012 Design Change thus enables the project's expansion into areas of Honduras other than the 4 Departments approved in the original PDD, wherever baseline conditions are otherwise similar.

In order to show that beneficiary households withing the expanded boundary meet the newly defined cluster, The Gold Standard issued a Forward Action Request as follows:

> PP shall proceed with qualitative Kitchen Surveys for each new province as expansion occurs, and will submit the KS results to the DOE for each province on time for the first Verification for which the province is included in the project boundary.

Accordingly, PM has conducted 100 simple Kitchen Surveys on random households that do not have the 2x3 cookstove, including 25 surveys in several villages within each of the new Departments in our expanded project area. The survey template is submitted as ANNEX 15: "A15_KS New

Territory.pdf" and summarized as ANNEX 16: "A16_KS New Territory Summary.pdf." Results indicate that households in the expanded project area meet the revised cluster definition "One cluster for poor, rural households in Honduras, defined as traditional *fogón* users that rely on woody biomass fuels, and the project focuses on this cluster exclusively."

B.4. Notification or request of approval of changes

There have been no changes in the project activity and thus, no request for approval of changes.

SECTION C. Description of the monitoring system

In 2011 Proyecto Mirador hired Tact L3C to build an electronic monitoring system on the Salesforce.com platform to track all data asssociated with stove installations. The system is fully operational and serves as the source for the majority of data associated with the Third Verification Period, including everything from basic household and contact information to survey data. PM's Salesforce.com database is designed to accept survey data both on- and offline through a handheld interface based on the iPhone platform and laptop computers.

Other than the addition of an electronic monitoring system using Salesforce.com, the Monitoring Plan is intact as before and general training and monitoring procedures have not been modified since the Second Verification Period closed in 2011.

Sales Record/Installation Record/Stove Database
PM keeps a sales record (installation database) of every stove contructed. As of 2012 PM's sales record is kept on Salesforce.com and includes the beneficiary name, government ID number, stove ID number (serial number), locating information and date of construction for all the households that receive a stove. This information has been tracked since the inception of the project in 2004, and all stoves installed during the Gold Standard crediting period have been entered into Salesforce.com. Homes in rural Honduras do not have specific street addresses, and most do not have fixed or mobile telephone lines. Thus the majority of the households are not identified by street as much as by village, neighborhood, and surname, and for stoves installed recently, the GPS mark.

Our sales record for the Third Monitoring Period has been exported directly from Salesforce.com to an Excel file and the raw data is attached as ANNEX 17: "A17_Sales Record 120111-113012.xlsx.".Also attached as ANNEX 18: "A18_Stoves Installed by Month.pdf" is a summary of stoves installed by month from 1 December, 2011, through 30 November, 2012. The latter file is a screen shot taken directly from Salesforce.com.

The number of stoves built during the Third Monitoring Period (1 December 2011 through 30 November 2012) is 17,000.

Salesforce.com Hierarchy
Every household stove installation is recorded in a database on the Salesforce.com platform. Every household is filed according to a hierarchy with "Village" at the top level, followed by a "Village Installation" indicating a group of stoves has been built at the same time within the parent village. Within the Village Installation, any number of Household records may exist. Every household record has at least one "Contact" associated with it, which in most cases represents the household's primary cook; however, multiple contacts may be associated with a single household record as needed to ensure efficient communication. There is a single "Stove ID Number" in Salesforce for every stove installed, being the unique identifier through which all associated items are traced by the system. A GPS data point is captured for each stove and this information is also kept under the household record, and multiple GPS marks can be captured for a single record to maximize accuracy of the marking.

GPS points are recorded immediately following installation by the Stove Technician using a handheld Garmin GPS device. The Stove Technicians name each GPS point using the Stove ID Number associated with the relevant household, which number they obtain from a list provided by the Ejecutores. Periodically the Stove Technicians provide the GPS file directly from their Garmin device to PM's Director of Technology, who in turn uploads the GPS data to Salesforce.com. The GPS points are automatically associated with their corresponding household records through the Stove ID Number (by which the GPS points are manually named).

Survey Data

The Monitoring System also includes routine inspection of stoves as well as systematic data collection and reporting of surveys to assess Leakage and Sustainability. Additional studies are carried out to maintain the accuracy of emissions reduction reporting, including an Aging KT Survey to assess quantitative fuelwood consumption and quantify emissions; and a Usage Survey to assess drop-off.

When PM conducts any type of survey in a given household, the survey is created from within the household record and is thus automatically associated with that household. Multiple surveys can be amassed over time in association with a single household (*see Training of Beneficiaries, Leakage and Sustainability Studies and Additional Studies below*).

Training of Beneficiaries

Proyecto Mirador's Monitoring System includes extensive training of stove beneficiaries at various stages in the process, including Community Meetings staged before construction; direct training at the time of stove construction; and Follow-up Visits after stove construction. The Ejecutores perform the up-front communication, organization and training to prepare the villages for installation; Stove Technicians perform direct training to beneficiaries at the time of construction, and Supervisors are responsible for all follow-up and training visits to the beneficiaries.

Prior to the commencement of stove construction in each community, the Ejecutores conduct a Community Information Meeting to prepare the beneficiaries for installation. At that meeting the Ejecutores introduce stove beneficiaries to the structural and functional aspects of the Estufa Dos por Tres and provide an initial overview of stove use and maintenance. They instruct the beneficiaries to obtain the materials they must contribute for stove construction. Also, Ejecutores collect a list of specific beneficiaries who are scheduled to receive stoves and enter that list into Salesforce.com, creating a new household record and associated contact entry for each planned stove. The Stove ID Number (serial number) is automatically assigned by the system in permanent association with the household.

On entry all stoves are marked by default as being in the "Planning" stage. The stage is updated in Salesforce.com by the Ejecutores only after stoves are actually built; at that time stoves are marked as "Construction Complete" and become permanent records. If a stove originally planned does not reach construction, it will receive a stage of "Construction Stopped" or "Not Built." All stoves originally planned that did not reach the final stage of "Construction Complete" are removed by the Ejecutores, and only stoves marked "Construction Complete" are listed on the Sales Record.

Upon stove installation the Stove Technician trains the stove beneficiary extensively in the use and maintenance of the Estufa 2x3, reinforcing the training previously conducted in the initial Community Meeting (http://www.proyectomirador.org/stove-program/training). At that time the Technican also leaves training materials behind with each beneficiary (see attached ANNEX 19: A19_Training Brochure Rev 2012.pdf"), along with the *Cinco* maintenance tool described below. All training materials are visually oriented to accommodate for the high rate of illiteracy among stove beneficiaries. The photo below shows a new Estufa Dos por Tres owner holding the training brochure provided by PM upon stove installation.

Four to six weeks after construction is completed in each community, Supervisors perform an initial Follow-up Visit to the home of each stove beneficiary. In these Follow-up Visits, Supervisors review the training initially provided by the Technicians upon installation and address all individual concerns and issues that may arise. Supervisors also use iPhones to complete a Maintenance Survey in order to (1) determine drop-off if applicable and (2) ensure that the stoves are functioning properly. At that time the Supervisors use iPhones to collect data on stove condition and maintenance using the Maintenance Survey module, which functions both on- and offline. When necessary, Supervisors either replace defective stove parts or instruct Ejecutores and Stove Technicians to do so.

Supervisors also carry out a statistically significant number of more extensive surveys in order to assess Leakage and ensure continued compliance with the Gold Standard's Sustainability requirements. These surveys are further elaborated below in the section *Installation Record, Leakage & Sustainability Monitoring.*

Coordination of Follow-up Visits
All Follow-up Visits are scheduled systematically following Proyecto Mirador's schedule stove installation cycle to ensure proper timing for follow-up. PM's Coordinator of Supervisors uses Salesforce.com to manage the Supervisors' assignments, with Follow-up Visits scheduled in relation to the date of stove installation. Follow-up Visits are grouped visually and geographically using the DigitalGlobe mapping system linked with Salesforce.com, which maximizes the Supervisors' efficiency. In addition, personal safety has increased since the Supervisors have begun to work in teams rather than alone in the field. Through a proprietary handheld interface developed in 2012 by Tact L3C, the first system in the world of its kind, Supervisors will soon have access to high-resolution Digital Globe maps through their iPhones, and the GPS locations of their assigned Follow-up Visit locations will be accessed at a simple touch of the iPhone screen.

Training, Manual of Procedures and Audit of Proyecto Mirador Representatives
Before conducting any meetings or surveys, our Supervisors as well as our Ejecutores and Stove Technicians are extensively trained. They spend ample time in the field learning to build stoves and learning all aspects of the stove's operation and the management of Proyecto Mirador. This training process generally takes longer than a month to complete. Training Materials have been developed to facilitate the training process; and training procedures are constantly under review for further improvements.

A manual of operational procedures was created in 2012 to ensure that all proceedings are applied uniformly throughout the organization. Additionally, a Director of Training and Human Resources was hired in October 2012 to strengthen, support and improve the training process at all levels, from the education of PM employees to the training of beneficiaries by the Ejecutores, Stove Technicians and Supervisors. In addition to the training of PM employees, visual aids, audiovisual materials and equipment are being introduced to enhance consumer retention of training procedures.

The work of the Supervisors and Ejecutores is subject to audit by Elder Mendoza, Chief Operating Officer, and Emilia Mendoza, Director of Proyecto Mirador LLC. The objective of the reviews is to ensure that the stove construction, training of the beneficiaries, and the collection of monitoring information are being completed in an accurate and timely manner, as well as to support any ongoing third party verification as part of the Gold Standard certification.

Scale of the Organization
Because the number of Ejecutores and the project build rate expand in direct proportion to each other, we continue to have the capacity to provide Community Information Meetings and Follow-up Visits in proportion to the needs of the beneficiary communities. We are thus able to expand at a rate sufficient to provide timely follow-up and monitoring for all beneficiary communities, with Follow-up Visits conducted four to six weeks following completion of stove construction in each community.

At the current stove build rate, five Supervisors are sufficient to sustain the collection of Leakage and Sustainability data at a statistically significant level and to oversee the ongoing inspection of existing stoves. As the capacity of each Supervisor is reached, PM will continue to employ additional personnel to meet operational standards. When necessary, PM will also employ outside resources to assist with research and analysis. Such resources may include the Regional Stove Testing Center at Zamorano University, Aprovecho Research Center and Yale University, to name a few.

Since ongoing research and stakeholder consultation are vital components of a successful Gold Standard project, having solid "on-the-ground" resources is a critical advantage for PM. Recommendations from the beneficiaries as to functional improvements are explored and researched, then implemented if appropriate. Furthermore, as PM expands into new areas of Honduras, local leaders and NGOs are informed and consulted on an ongoing basis. When relevant, stakeholder feedback is channeled through the Ejecutores or Supervisors to PM management and reviewed by the Director and Chief Operating Officer as appropriate.

Leakage & Sustainability Monitoring:

PM's Supervisors carry out a statistically significant number of more extended Leakage and Sustainability Surveys in order to assess Leakage and Sustainability issues as recorded in the PDD (Sections a, b, d, and e) and Passport Section G (#1, Air Quality; #7, Livelihood of the Poor; and #9, Human and Institutional Capacity).

Examples of questions covered with the Leakage and Sustainability Surveys are as follows:

- Number of People in home
- Estimated wood consumption per day (with the traditional *fogón* and with the new Estufa Dos por Tres)
- Length of time Estufa Dos por Tres stove is in use each day
- Presence of any other alternative type of stove in the house
- Source of wood (bought or collected)

The Leakage and Sustainability Surveys were designed with the assistance of Professor Robert Bailis at the Yale School of Forestry and Environmental Studies and Professor Timothy Longwell from Zamorano University in Honduras, and PM, and are collected by Supervisors using iPhones using the Leakage and Sustainability Survey module, which functions both on- and offline.

237 monitoring surveys have been conducted during the Third Verification Period that include leakage, sustainability and qualitative fuelwood use data. The results of these surveys have been exported directly from Salesforce.com to Excel and summarized in Excel, and are attached as ANNEX 20: "A20_Leakage Sustainability Results 2012.xlsx."

Sustainability Analysis

Since inception Proyecto Mirador has been a clear leader in sustainable development. First, beneficiaries enjoy the health benefits of reducing indoor air pollution as smoke is diminished by cleaner burning stoves and channelled outside the home through effective chimneys. Second, Proyecto Mirador continues to create stable, safe jobs with competitive salaries within communities where opportunities for full-time employment are exceedingly rare and working conditions are generally substandard at best. Proyecto Mirador currently supports 15 microenterprises in addition to its direct employees. Third, deforestation is slowed due to the reduction in fuelwood of the Estufa Dos por Tres. This is particularly important in Honduras, which boasts the fourth largest rainforest in the world, and where deforestation is occurring at an alarming rate. Beneficiaries enjoy a greater amount of time to devote to activities other than collecting wood, and/or are relieved of a corresponding part of the financial burden of purchasing wood.

In addition to the benefits listed above, it should be noted that there is no evidence that Proyecto Mirador has any negative effects on sustainability. All sustainability parameters will be monitored as outlined in Parameters ID 14, ID 15, and ID 16 of this Monitoring Report.

Annually, Proyecto Mirador's Management Team will report on the Passport's Sustainability Monitoring Plan, Section G, including assessment of #6, Quality of Employment, by means of an annual employee survey, and #10, the Quantitative Employment and Income generation of the project, is addressed in an annual report on the quantity and type of jobs created by the project. Income figures are confidential and, as such, are not included in this report; however, all employees are paid at or above the minimum wage and Proyecto Mirador has provided the Verifier with a complete list of current salaries by employee type as part of the Quantitative Employment report.

The results of our October 2012 annual employee survey are attached as ANNEX 21: "A21_Employee Questionnaire Summary 2012.xlsx" and the survey template is attached as ANNEX 22: "A22_Employee Questionnaire.doc." Quantitative Employment is reported in ANNEX 23: "A23_Quantitative Employment.xlsx."

#12, Technology Transfer, includes training on stove use, stove technology and stove installation. Proyecto Mirador conveys sustainable technology to its employees through on-the-job training. Employees who construct stoves all undergo a paid training period. In addition, the implementation of the new Salesforce.com based monitoring system means that Technicians are now trained in the use of GPS devices; Supervisors are trained in the use of survey modules and digital mapping and navigation using Salesforce.com on the iPhone platform; Ejecutores are trained on the use of laptops, sophisticated mapping techniques, and a broad range of reporting and analysis tools available in Salesforce.com; and office staff are trained to use Salesforce.com to manage the scheduling of employees to accomplish stove installation, Follow-up Visits and survey collection as efficiently as possible.

Stove beneficiaries also receive training and instruction in the new stove technology, up to as many as five times, to ensure proper use and maintenance of the Estufa Dos por Tres. Proof of technology transfer to beneficiaries lies in the fact that they are able to keep stoves working well because they understand how the stoves work. Training is performed on an ongoing basis for all stove recipients as follows:

- The first round of training is conducted by the Ejecutores at the time the community is first introduced to Proyecto Mirador and the Estufa Dos por Tres. This takes place at the Community Information Meeting, at which the major components of maintenance are introduced and beneficiaries are informed of their responsibilities to correctly operate the stove.

- The Technicians carry out the second round of training. The Technicians, who build the stoves, are in charge of providing Beneficiaries with a comprehensive training on the use of the stoves upon installation. Technicians carry notes to assist with following a standard training procedure, and brochures are left behind with full details of the stove's operation and maintenance.

- Supervisors carry out the third round of training in a series of house to house Follow-up Visits, four to six weeks after the completion of construction in each community, to review the training provided by the Technicians and ensure that the stoves are functioning properly. Checklists and surveys are used at this time to address all concerns and issues that may arise and insure the beneficiaries are following continued proper maintenance of the stoves.

- Supervisors continue to follow up with stove beneficiaries as needed, up to two additional times beyond the third round of training, in order to ensure that stoves are being properly used and maintained.

Project beneficiaries are consistently informed that Proyecto Mirador owns all carbon credits issued as a result of emission reductions from all stoves installed. This is first articulated at the Community Meetings staged before stove construction begins in each area, then reiterated when beneficiaries are individually trained. The PM Training Brochure, which is given to stove beneficiaries after stove installation, also includes a written statement of Proyecto Mirador's ownership of carbon credits, and the consent of all beneficiaries is required as a precondition to stove installation. The training brochure, which was revised in 2012, is attached as ANNEX 19: "A19_Training Brochure Rev 2012.pdf" and the translation of the relevant clause (at bottom of the brochure) is as follows:

> "By accepting a new stove from Proyecto Mirador, you agree that any reductions in CO_2 emissions created by the stove are the property of PM."

Additional Studies:

Aging Stove KT Survey: Quantitative Fuelwood Consumption Study

A quantitative Fuelwood Consumption Study will be conducted biennially in order to determine whether there is a decline in stove efficiency as determined by a change in fuelwood usage. An appropriately sized sample group is drawn in part from the same 55 homes surveyed in the original 2010 Paired Fuelwood Consumption Study described above, and supplemented by other households in these communities. The biennial follow-up survey will account for any changes in the number and ages of household members. We will ask questions including: "What is your family size?" and "What is the age and gender of each household member?" and will also perform wood weighing over 4 days, similar to the original study, to determine if fuel use patterns have changed.

We completed our first such follow-up survey in 2011, and repeated the survey again in 2012 to include older stoves. The data collected from the 2012 study was analyzed by the Yale School of Forestry and Environmental Studies and the results are reported herewith.

Aging Stove KT Survey: Emissions Test

Emission factors for CO2, CH4 and N2O were determined in the Aprovecho lab tests for traditional and La Justa stoves.

Gold Standard Methodology states as follows: "If IPCC defaults are not used, testing of EFs of new stoves is only required if there is evidence that the new stove may give rise to significantly different EFs leading to possible over-estimation of emission." ("Methodology for Improved Cook-stoves and Kitchen Regimes V.01," footnotes for pp. 24 & 25.)

Thus, further monitoring is not required, as the fixed baseline emission factors remain constant throughout the project period.

Usage (Drop-off) Survey

As per Gold Standard methodology, PM will conduct a biennial Usage Survey of a statistically relevant number of beneficiaries with stoves that were built during the First Verification Period (1 May, 2009, to 30 April, 2010) to determine whether or not they are still using the La Justa stove, and to assess why or why not. The quantification of carbon emissions will systematically account for usage drop-off according to the results of the Usage Survey.

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:	**ID 1/ $X_{nrb,bl,y}$**
Data unit:	%
Description:	The non-renewable fraction of the woody biomass harvested in the project collection area in year y in the baseline scenario
Source of data used:	Berkeley Air 2011 NRB Analysis (ANNEX 14: A14_Berkeley Air NRB Analysis 2011); Yale 2007 Study and Yale 2009 Study
Value applied:	77%
Indicate what the data are used for (Baseline/Project/ Leakage emission calculations)	Baseline
Justification of the choice of data or description of measurement methods and procedures actually applied:	In accordance with the approved 2012 Design Change Request, NRB was reassessed by Berkeley Air Monitoring Group in 2012 according to "NRB Assessment similar to approach of CDM Methodology AMS-II.G" as follows, with the result of 95.4%: $f_{NRB} = \frac{NRB}{NRB+DRB}$ Favoring a conservative approach, we have based our ER Calculations for the Third Verification Period on an NRB fraction of 77%, which is the midpoint between the 59% originally estimated by Yale and the 95.4% estimated by Berkeley Air Monitoring Group.
Any comment:	

Data / Parameter:	**ID 2/ $B_{bl,y}$**
Data unit:	T woody biomass/year/household
Description:	The mass of woody biomass consumed during cooking in the baseline scenario
Source of data used:	2010 Paired Fuelwood Consumption Study
Value applied:	3.87 tonnes per household
Indicate what the data are used for	Baseline

(Baseline/Project/ Leakage emission calculations)	
Justification of the choice of data or description of measurement methods and procedures actually applied:	Data obtained during the 2010 Paired Fuelwood Consumption Study. The number 3.87 was calculated by taking the average fuelwood consumption for the baseline scenario expressed in kg per day, multiplying by 365 days/year and converting to metric tonnes.
Any comment:	Value above (3.87) differs from the value in the PDD (3.97) because the PDD was based on the Yale 2007 Study. Baseline information used in the PDD has been replaced with data obtained in the 2010 Paired Fuelwood Consumption Study as described in Section A.5 of the Monitoring Report.

Data / Parameter:	**ID 3/ $EF_{bl,bio,co2}$**
Data unit:	tCO_2/t woody biomass
Description:	The CO_2 emission factor for use of the biomass fuel in the baseline scenario
Source of data used:	Aprovecho Stove Test (28 April 2009)
Value applied:	87.6 g/MJ is the emission factor measured in laboratory testing of traditional fogón stoves.
Indicate what the data are used for (Baseline/Project/Leakage emission calculations)	Baseline
Justification of the choice of data or description of measurement methods and procedures actually applied:	Data is obtained by use of the net calorific value (NCV) of wood 18.6 MJ/kg., the calorific value listed for Red Oak (the common fuel used in Honduras) in Cheremisinoff, N. (1980), *Properties of Wood*; Wood for Energy Production. Ann Arbor, MI, Ann Arbor Science: 31-43 (cited in Aprovecho 2009 Study, p. 2).
Any comment:	

Data / Parameter:	**ID 4/ $EF_{bl,bio\ nonCO2,CH4}$**
Data unit:	tCH_4/t woody biomass
Description:	The CH_4 emission factor for use of the biomass fuel in the baseline scenario
Source of data used:	Aprovecho Stove Test (28 April 2009)
Value applied:	0.47 g/MJ is the emission factor measured in laboratory testing of traditional fogón stoves.
Indicate what the data are used for (Baseline/Project/ Leakage emission calculations)	Baseline
Justification of the choice of data or description of measurement methods and procedures actually applied:	Data is obtained by use of the net calorific value (NCV) of wood 18.6 MJ/kg.
Any comment:	

Data / Parameter:	**ID 5/ $EF_{bl,bio,nonCO2,N2O}$**
Data unit:	t N_2O /t woody biomass
Description:	The N_2O emission factor for use of the biomass fuel in the baseline scenario
Source of data used:	Aprovecho Stove Test (28 April 2009)
Value applied:	0
Indicate what the data are used for (Baseline/Project/ Leakage emission calculations)	Baseline
Justification of the choice of data or description of measurement methods and procedures actually applied:	
Any comment:	N_2O emissions are de minimis.

Data / Parameter:	**ID 6/ $EF_{pe,bio,co2}$**
Data unit:	tCO_2/t woody biomass
Description:	The CO_2 emission factor for use of the biomass fuel in the project scenario
Source of data used:	Aprovecho Stove Test (28 April 2009)
Value applied:	98.3 g/MJ is the emission factor measured in laboratory testing of Estufa Dos por Tres model stoves.
Indicate what the data are used for (Baseline/Project/ Leakage emission calculations)	Project
Justification of the choice of data or description of measurement methods and procedures actually applied:	Data is obtained by use of the net calorific value (NCV) of wood 18.6 MJ/kg.
Any comment:	

Data / Parameter:	**ID 7/ $EF_{pe,bio\ nonCO2,CH4}$**
Data unit:	tCH_4/t woody biomass
Description:	The CH_4 emission factor for use of the biomass fuel in the project scenario
Source of data used:	Aprovecho Stove Test (28 April 2009)
Value applied:	0.05 g/MJ is the emission factor measured in laboratory testing of traditional fogón stoves.
Indicate what the data are used for (Baseline/Project/ Leakage emission calculations)	Project
Justification of the choice of data or	Data is obtained by use of the net calorific value (NCV) of wood 18.6 MJ/kg

description of measurement methods and procedures actually applied:	
Any comment:	

D.2. Data and parameters monitored

Data / Parameter:	**ID 8 / Stove Sales**
Data unit:	Number of stoves
Description:	Identification of household that has received an Estufa Dos por Tres stove.
Measured/Calculated/ Default:	Measured
Source of data to be used:	Installation record database ("Database of Beneficiaries")
Value(s) of monitored parameter:	**34,130** total stoves, as follows: • 6,621 stoves installed in the First Verification Period (1 May 2009 – 11 November 2010) • 10,509 stoves installed in the Second Verification Period (1 December 2010 – 30 November 2011) • 17,000 stoves installed in the Third Verification Period (1 December 2011 – 30 November 2012)
Description of measurement methods and procedures to be applied:	The electronic database will hold the following information for each household: - Installation record - Date of installation - Location of installation - Name of beneficiary - Note presence of old stove in the household if applicable
QA/QC procedures to be applied:	Data integrity is checked and maintained in Salesforce.com by the Director of Technology in Honduras on an ongoing basis. Because of the high-touch model of Proyecto Mirador, there are many checkpoints along the process to gather and verify data from individuals getting a stove: 1) All villagers meet with an Ejecutor to understand who will get a stove. At that point key data is entered into the system such as government ID, Name of Person and number of residents. 2) When a Technician arrives at the house to build the stove the Technician will verify, using a list provided to them on paper by the Ejecutores, that the contact information for each household is correct and make sure they are building the house under the right record/account in Salesforce. The Technician will also gather accurate GPS coordinates that are recorded with the household & stove record in Salesforce.com. 3) On data creation, all forms have data validation to require completion of any fields that are basic and indispensable. 4) At scheduled intervals, a Supervisor will visit the house to survey the stove and its use and performance, verify that GPS and contact information are correct, and make sure the stove is recorded in the correct account in Salesforce. 5) The office team, under the supervision of the Director of

	Technology, checks for Government ID duplicates and checks survey dates for consistency. 6) "Dashboards" that visually summarize key reports are distributed to all levels of PM management and reviewed weekly. All data is verified or updated through this process including adding additional contacts and their relevant information into the system. Simply having different team members checking and verifying the data provides a high level of quality control. In the first year, up to 5 different people might visit a single home to verify and update data. Throughout the process by which data is gathered and verified in the field, the office team, under the supervision of the Director of Technology, cross checks and reviews the data with various data de-duplication tools, checking the data for quality, eliminating duplicates if found, and making sure that the required data is being captured on all records. Certain controls exist in the Salesforce.com system that restrict certain users from modifying data or changing the status of a household. For example, after the Ejecutor and Technician are paid for installing a stove, they are automatically locked out from modifying that stove record going forward. *Salesforce.com Technology:* The PM Salesforce.com database is automatically backed up on a weekly basis. If any data is modified or changed, a record history is tracked. Salesforce provides redundancy and backup in their clean data rooms located internationally. See this link for specific details: http://trust.salesforce.com/trust/security/
Any comment:	In accordance with the 2012 Design Change Request, the PDD was updated. The new version, PDD v.5 (2012), (ANNEX 13: "A13_PDD v5 2012.doc"), includes a modified emission reduction chart which mirrors the ER Projections in this Third Monitoring Report. All stoves installed during the Gold Standard crediting period will be the "Estufa Dos por Tres" (formerly named the "La Justa Model Dos por Tres") and all will replace a traditional *fogón*. Therefore, the items "Model/type of stove installed" and "Model of use prior to installation of the Estufa Dos por Tres" will not specifically be tracked on the Master Sales Database as was reported in Parameter ID 8 on the PDD.

Data / Parameter:	**ID 9 / $B_{,pj,y}$**
Data unit:	Tonne
Description:	Fuelwood consumed per household per year (This is the mass of woody biomass consumed during cooking in the project in year y in tonnes per year per household by users of the Estufa Dos por Tres stove aged one year or less.)
Measured/Calculated/ Default:	Measured
Source of data to be used:	Biennial Fuelwood Consumption Study (Aging Stove KT).
Value(s) of monitored parameter:	2,126.47 kg
Description of measurement methods and procedures to be applied:	Biennial survey of tonnes of woody biomass per year per household consumed by beneficiaries, to determine whether there is a decline in stove efficiency as determined by a change in fuel wood usage. An appropriately sized sample group will be drawn from the same 55 homes as surveyed in the 2010 Paired Fuelwood Consumption Study.
QA/QC procedures to be applied:	We will ask questions including: "What is your family size" and "What is the age and gender of each household member?" and will also perform wood weighing over 4 days, similar to the original study, to determine if fuel use patterns have changed.
Any comment:	We acknowledge an error in the PDD, in which 2.73 mtCO2e/yr was reported as the Value of the Monitored Parameter for ID 9. This error was pointed out by SGS and we have adjusted the above value accordingly. The value of 2.73 mtCO2e/yr was calculated on the basis of 2.126.47 kg; therefore, the monitored parameter of 2,126.47 kg was moved to the "Value of Monitored Parameter" section above for the First Monitoring Report and forward.

Data / Parameter:	**ID 10/ $EF_{pj,bio,co2}$**
Data unit:	tCO_2/tonne woody biomass
Description:	The CO_2 emission factor for use of the biomass fuel in the project scenario in tonnes CO_2 per tonne of woody biomass fuel.
Measured/Calculated/ Default:	Calculated
Source of data to be used:	If the Verifier deems it necessary (as indicated by the Verifier's belief that there has been a significant change in this parameter), a laboratory study will be conducted to measure the CO_2 emission factor of woody biomass consumption in the project boundary.
Value(s) of monitored parameter:	98.3 g/MJ is the emission factor measured in laboratory testing of Estufa Dos por Tres model stoves.
Description of measurement methods and procedures to be applied:	Data is obtained by use of the net calorific value (NCV) of wood 18.6 MJ/kg. Value will be measured by same method biennially only if Verifier determines it necessary.
QA/QC procedures to be applied:	N/A
Any comment:	Per Gold Standard Methodology: "If IPCC defaults are not used, testing of EFs of new stoves is only required if there is evidence that the new stove may give rise to significantly different EFs leading to possible over-estimation of emission."

Data / Parameter:	**ID 11/ Continued use of stoves over time**
Data unit:	Households
Description:	Drop off rate
Measured/Calculated/ Default:	Measured
Source of data to be used:	Survey and visual observation
Value(s) of monitored parameter:	7.5%
Description of measurement methods and procedures to be applied:	Going forward, Proyecto Mirador will determine drop-off by conducting usage surveys for each Verification Period on a sample group of at least 30 households for each age category of stove by year.
QA/QC procedures to be applied:	Survey shall include the questions: "Have you stopped using your Estufa Dos por Tres?" and "Has the stove mouth been removed?" A positive response to either constitutes stove drop-off.
Any comment:	For the First Verification Period, a 7.5% drop-off rate was approved by SGS based on surveys taken by SGS during onsite verification with the assistance of Zamorano University, also during onsite verification. For the Second Verification Period, the following non-cumulative drop-off rates were approved and verified: First year: 3% Second year: 4% Third year: 5% For the Third Verification Period, the following non-cumulative, monitored drop-off rates are applied: First year: 4% Second year: 5% Third year: 13% Fourth year: 6% Drop-off rates for the Third Verification Period are substantiated in ANNEX 1: "A01_Dropoff Summary 2011.xlsx"

Data / Parameter:	**ID 12 / Leakage**
Data unit:	Households
Description:	Assess agreement with statements regarding possible leakage effects, including: a. Rebound Effect b. Stimulation of increased use of a high emission fuel c. Promotion of new stove type stimulates substitution of a cooking fuel or stove type with relatively high emissions d. Loss of space heating causes users to use alternative sources of (and thus, a greater amount of) fuel e. Traditional stoves are reused f. Other types of stoves are present in the household g. Length of time auxiliary stoves are used each day
Measured/Calculated/ Default:	Measured
Source of data to be	Ongoing questionnaires.

used:	
Value of data applied for the purpose of calculating expected emission reductions in section B.5	0
Description of measurement methods and procedures to be applied:	Survey, on an ongoing basis, a statistically significant number of La Estufa Dos por Tres stove owners. (Randomness of the sample will be maintained by surveying every *n*th beneficiary.) Questionnaires to be administered by Proyecto Mirador's Supervisors and Community Organizers.
QA/QC procedures to be applied:	Questionnaires include questions to assess agreement with statements a-g under "Description" above.
Any comment:	Comments on the "Description" field above: a. PM's approach values training the beneficiaries on conservation practices. To remain conservative, however, our emission reduction calculations are based on relative wood savings between the *fogón* and the Estufa Dos por Tres. We do not assume an increase in emission reductions based on improvements in conservation practices among the beneficiaries. Furthermore, as we have carefully measured absolute fuelwood consumption before and after the introduction of the Estufa Dos por Tres, any possible rebound effect would have been captured in absolute terms and reported in the 2010 Fuelwood Consumption Study in comparing baseline with initial project scenario. Therefore, we do not anticipate any effect on leakage. b-c: Though some people have reported using paper, corn or cardboard as supplementary materials with their stoves, these were used minimally, primarily as fire starters, and used exactly as before the installation of the Estufa Dos por Tres. Further, the method of starting the fire is exactly the same for the Estufa Dos por Tres and the *fogón*. Thus, these auxiliary materials have no effect on leakage. d-g: 237 homes were surveyed to see if auxiliary cookstoves were present. Survey results are reported in ANNEX 20: "A20_Leakage Sustainability Results 2012.xls" and cell references below pertain to the "Reported Results" worksheet within that file. 23% of the homes surveyed (55 out of 237 homes) reported having a gas or electric stove in the home (Cell D13). Among those 55 homes (Cell C13), the auxiliary stoves were only in use an average of 18 minutes per day (Cell C19), whereas the Estufa Dos por Tres was in use an average of 8.81 hours per day (Cell C25). This indicates that homes with the new Estufa Dos por Tres are still using wood as their primary fuel, with gas and electric only used occasionally as a supplement. As the auxiliary stoves were also present before the *fogón* was replaced with the Estufa Dos por Tres in each of these households, their existence has no effect on leakage. Dos por Tres cookstoves are not used to heat the home in 97% of households (Cell C29); and it is likely that the 3% that use their 2x3 to heat the home formerly used the *fogón* for the same purpose, which suggests enhanced fuelwood savings (not leakage) with the 2x3.

Data / Parameter:	**ID 13 / Leakage due to Transportation**
Data unit:	Kilometers
Description:	Assess agreement with statement regarding possible leakage effects described in the PDD: "f. Significant emissions from transportation or other suggest more impact than if project did not exist."
Measured/Calculated/ Default:	Measured
Source of data to be used:	Mileage records; Sales Database (for total # of stoves built per year).
Value of data applied for the purpose of calculating expected emission reductions in section B.5	43,088 km driven within the First Verification Period. 122,259 km driven within the Second Verification Period. 168,541 km driven within the Third Verification Period.
Description of measurement methods and procedures to be applied:	Annual report to assess changes in mileage from year to year. Reported annual mileage (reported in km) is to be compared with the number of stoves built within the same year to see if mileage is increasing significantly beyond the relative increase in project activity.
QA/QC procedures to be applied:	Mileage records track kilometers driven on an ongoing basis for each vehicle, and the results are tabulated annually.
Any comment:	Transportation results for the First Monitoring Period are reported in ANNEX 24: "A24_Transportation Summary 2012.xls." For the First Verification Period a ratio of 15.61% was determined using the total number of stoves constructed : total kilometers driven. It was approved that this 15.61% ratio would serve as the baseline for further monitoring of leakage due to transportation. For the Second Verification Period this ratio has decreased to 8.81% signifying an even more insignificant impact on leakage. Hence 122,259 km represents <1% of total ER and is *de minimis* per Gold Standard methodology. For the Third Verification Period the ratio is 10.16%, well below the 15.61% baseline established in the First Verification Period. The Gold Standard approved PDD and the First Monitoring Report were both approved assuming 0 leakage due to transportation. Based on the reduced ratio of 10.16% for the Third Verification Period, PM is again reporting 0 for the Third Monitoring Report. PM will continue to assume 0 leakage from transportation going forward if the transportation does not increase significantly beyond the relative increase in project activity. Thus, it is the ratio of stoves constructed : km driven that is primarily relevant to our assessment of leakage, rather than raw annual mileage. The PDD stated the Data Unit as "Miles" for Parameter ID 13, but it was since determined that original mileage records are tracked in kilometres. In order to avoid any possibility of error due to unit conversion, we have modified the data unit to "kilometres" to agree with the original data we are provided.

Data and Parameters used to assess Sustainability.	
Data / Parameter:	**ID 14 / Number and percentage of individuals**
Data unit:	**Individuals**
Description:	Assess agreement with statements in Sustainability Monitoring Plan Sections, Passport Issues 1, 7, & 9. Air Quality, Livelihood of Poor, Human & Institutional Capacity.
Monitored /Calculated /Default:	Responses to questionnaire.
Value (s) of monitored parameter:	Number of positive responses to questionnaires.
Monitoring equipment (type, accuracy class, Calibration frequency, date of last calibration, validity)	Questionnaire administered by Supervisors.
Measuring/Recording frequency:	Survey, on an ongoing basis, a statistically significant number of Estufa Dos por Tres stove owners. (Randomness of the sample will be maintained by surveying every *n*th beneficiary.) Questionnaires to be administered by Supervisors.
Source of data:	Survey.
Calculation method (if applicable):	Data tabulation and report issued on an annual basis.
QA/QC procedures applied:	Sufficient sample size. Questionnaires administered by both local community organizers and PM.
Any comment:	237 Leakage and Sustainability Surveys collected during the Third Verification Period which returned the following results. Cell references below pertain to the "Reported Results" worksheet within the file ANNEX 20: "A20_Leakage Sustainability Results 2012.xls." • 100% of respondents reported the air is cleaner in their homes with the new Dos por Tres cookstove (Cell C33). • 100% of respondents who collect their own wood reported that they have more free time since having the Dos por Tres (Cell C37). Repondents reported saving an average of 2.28 hours per week (Cell C40), representing a reduction of 41% in time spent collecting wood (Cell C41). 60% of those respondents reported that they invest the time saved from collecting fuelwood to work in the fields (Cell C44). Other reported uses of extra time include setting up a business (5%); attending school (2%); helping their partner (17%); resting (10%) and other activities (7%) (Cells C45-C49).. • 100% of respondents reported they cook faster with the Dos por Tres (Cell C53), indicating that women have more time to participate in the activities previously listed. • 92% of respondents who purchase their fuelwood reported using the funds saved after installation of the 2x3 to purchase food (Cell C58).

Data and Parameters used to assess Sustainability.	
Data / Parameter:	**ID 15 / Number of individuals**
Data unit:	**Individuals**
Description:	Assess agreement with statements in Passport Sustainability Monitoring Plan sections regarding wider social and economic impact of the project including 6. Quality of Employment, 10. Quantitative employment and income generation, 12. Technology Transfer (to stove builders.)
Monitored /Calculated /Default:	Responses to questionnaire.
Value (s) of monitored parameter:	*Quality of Employment:* % of employees over the age of 16: 100% % of employees who receive 1 or more day of rest per week: 100% % of full-time employees who receive paid vacation (after 1 year of employment): 100% % of complaints about sleeping/eating conditions when traveling: 0% % of employees reporting they are required to carry >50 kg.: 36% % of employees reporting better working conditions than other people in their communities: 100% *Quantitative Employment and Income Generation:* # of direct employees of PM at 1 May 2009 (start date of Gold Standard Crediting Period): 16 # of direct employees of PM at end of 1st year of crediting period: 29 # of direct employees of PM at end of 2nd Verification Period: 38 # of direct employees of PM at end of 3nd Verification Period: 10 % of employees that earn minimum salary or more: 100% Total # of full time employees (both direct and indirect): 74 *Technology Transfer (to stove builders)* % of employees who report familiarity with work regulations: 90%
Monitoring equipment (type, accuracy class, Calibration frequency, date of last calibration, validity)	Questionnaire
Measuring/Recording frequency:	Annual
Source of data:	Surveys of employees, management report on number of employees, and copies of training materials used by employees.
Calculation method (if applicable):	Annual written report of number of employees and record of employee surveys. No calculation needed.
QA/QC procedures applied:	Results for Quality of Employment are tabulated in the attached ANNEX 21: "A21_Employee Questionnaire Summary 2012.xlsx." Results for Quantitative Employment are tabulated in the attached ANNEX 23: "A23_Quantitative Employment 2012.pdf."

	Though income figures are confidential, ANNEX 21: "A21_Employee Questionnaire Summary 2012.xlsx" reflects that all employees of Proyecto Mirador are compensated with minimum wage or greater.

Data and Parameters used to assess Sustainability.	
Data / Parameter:	**ID 16 / Number and percentages of individuals**
Data unit:	**Individuals**
Description:	Assess agreement with statements in Passport Sustainability, PDD Leakage, and Emissions Monitoring Plans. Sustainability: social and economic impact of the project including, 7. Livelihood of the poor (wood is collected or bought), 12. Technology Transfer to users (do they know how to maintain and use their stove properly)
Monitored /Calculated /Default:	Responses to Leakage & Sustainability Surveys.
Value (s) of monitored parameter:	Positive score
Monitoring equipment (type, accuracy class, Calibration frequency, date of last calibration, validity)	Survey, on an ongoing basis, a statistically significant number of La Estufa Dos por Tres stove owners. (Randomness of the sample will be maintained by surveying every *n*th beneficiary.) Questionnaires to be administered by Proyecto Mirador's Supervisors and Community Organizers.
Measuring/Recording frequency:	Ongoing
Source of data:	Survey
Calculation method (if applicable):	Data tabulation and annual report.
QA/QC procedures applied:	100% of beneficiaries reported that the air in the homes is cleaner since installing the La Justa 2x3. The results are included in ANNEX 20: "A20_Leakage Sustainability Results 2012.xls" and are further articulated under Parameter ID 14 above. Technology Transfer to beneficiaries is evident in the Community Meetings prior to stove construction as well as the Follow-up Visits conducted after stove installation. Technology transfer to employees ranges from stove building practices to the use of state-of-the-art technology using Salesforce.com and hi-res GPS mapping on both iPhones and laptops.

SECTION E. Emission reductions calculation

E.1. Baseline emissions calculation

>>

Shall include the formulae used and description to calculate the baseline emissions.

Emissions reductions are calculated as follows:

$$ER_y = BE_y - PE_y - LE_y \qquad (10)$$

ER_y	Emission reductions in year y in tCO_2/year
PE_y	Project emissions in year y in tCO_2/year
BE_y	Baseline emissions in year y in tCO_2/year
LE_y	Leakage emissions in year y in tCO_2/year

E.2. Project emissions calculation

As described in Section **A.5** above, an estimated emissions reduction of 2.23 $mtCO_2e$/year was reported in the PDD, which was completed prior to the 2010 Paired Fuelwood Consumption Study. As the 2010 study provides data at a much higher confidence level than any data previously available, for the purposes of the First and Second Verification Periods we modified our Emission Reduction Calculations accordingly and arrived at an adjusted estimate of 2.73 $mtCO_2e$/year. Now, for the Third Verification, we have again adjusted the Emission Reductions per stove to 3.31 $mtCO_2e$/year to reflect a 77% NRB ratio.

For the calculation of 3.31 $mtCO_2e$/year, we refer you to ANNEX 25: "A25_ER Calculations 2012.xls" ("ER-La Justa Improved" Worksheet, Cell C4).

E.3. Leakage calculation

The emissions reductions calculation assumes an estimated leakage of zero (0) tCO2/year. This value will be substantiated by qualitative surveys referenced and articulated in the table "**ID 12 / Leakage**" above. Accordingly, the surveys (which will be conducted in a statistically significant number of households receiving the Estufa Dos por Tres, with randomness of the sample maintained by surveying every *n*th beneficiary) will assess agreement with statements regarding possible leakage effects, including:

a. Rebound Effect
b. Stimulation of increased use of a high emission fuel
c. Promotion of new stove type stimulates substitution of a cooking fuel or stove type with relatively high emissions
d. Loss of space heating causes users to use alternative sources of (and thus, a greater amount of) fuel
e. Traditional stoves are reused

E.4. Emission reductions calculation / table

Table 2 below is based on an initial emissions reduction of 2.73 $mtCO_2e$/year per stove in the first year, multiplied by the average number of stoves in operation on a monthly basis (adjusted for aging and drop-off) as set forth in ANNEX 4: "A04_ Financing Plan 2012.xls" for the Third Monitoring Period (1 December 2011 – 30 November 2012). Further explanation is provided below the following chart. Row references in the chart pertain to the Monthly Results worksheet within the above file.

Crediting Month	Average Number of Net Stoves in Operation (Row 83)	Estimation of leakage (tCO2/year)	Monthly estimation of emission reductions ($mtCO_2e$) (Row 104)
Dec-11	17,745	0	4,688
Jan-12	18,245	0	4,889
Feb-12	19,518	0	5,233
Mar-12	21,103	0	5,652
Apr-12	22,120	0	5,918
May-12	23,547	0	6,290
Jun-12	24,841	0	6,624
Jul-12	26,239	0	6,977
Aug-12	27,906	0	7,405
Sep-12	29,349	0	7,771
Oct-12	30,765	0	8,139
Nov-12	31,926	0	8,435
Total (tCO_2) (Cell AS-108)		**0**	**78,023**

Table 2

Total emission reductions achieved during the Second Monitoring Period: **78,023** tCO_2 as displayed in ANNEX 4: "A04_Financing Plan 2012.xls," in the "Monthly Results" spreadsheet, Cell AS108.)

We have arrived at the above calculation of total emission reductions based on the total of 17,000 stoves built in the Third Monitoring Period. The value of **78,023** tCO_2 is calculated on a monthly basis, not an annual average.

The stoves in operation by month are reduced by the drop-off rates of 4%, 5%, 13%, and 6%, for stoves in their first, second, third and fourth years, respectively. The emissions reductions are further reduced to account for a reduction of 6% in the efficiency of the stoves that are in their second and third years of operation ("degradation rate"). Correspondingly, the calculation of the emission reductions for stoves in operation for 12 months or less utilizes 3.31 $mtCO_2e$/year as set forth in ANNEX 25: "A25_ER Calculations 2012.xls." The assumptions are included in ANNEX 4 "A04_Financing Plan 2012.xls" (see "CO2 Projections" worksheet, Cells D9-D15 and D18-D24).

For formulae used to calculate the emission factor of 3.31 $mtCO_2e$/year, we refer you to ANNEX 25: "A25_ER Calculations 2012.xls." For the calculation of the average number of net stoves in operation by month, as well as the monthly estimation of emission reductions, we refer you to the "Monthly Results" worksheet in ANNEX 4: "A04_Financing Plan 2012.xls." The numbers for net stoves in operation by month are shown in Row 83; the emission reduction totals by month are stated in Row 104.

Aging Calculations
The aging factor of 6% for Year 2 stoves was calculated in 2011 according to the 2011 Aging Stove KT by Professor Rob Bailis of Yale University and approved by the DOE. In 2012 we repeated the Aging Stove KT and Professor Bailis again conducted the analysis (see "ANNEX 2: "A02_Aging Stove KT Report 2012.docx").

The 2012 Aging Stove KT was performed on Year 3 stoves in 78 households, with 30 of those households taken from the original group of households studied in the 2010 Paired Fuelwood Consumption Study (the baseline study currently in use) and the rest randomly selected from the same four communities. Professor Bailis performed several comparisons based on both paired and unpaired data, and between 2010, 2011 and 2012 project scenarios relative to baseline. Professor Bailis concluded the following:

> "The results, shown in Figure 2, indicate that there were slight increases in all measures of wood consumption between 2010 and 2011, but these either leveled off or fell slightly between 2011 and 2012. In addition, few differences are statistically significant… Notably, none of the comparisons between fuel consumption per meal are significant. Thus we can conclude there is little degradation of stove performance in this sample of households."

Based on Professor Bailis' analysis there is no reportable degradation between stoves surveyed in 2011 and 2012 despite the stove age difference of one year. However, to maintain conservativeness, we are reporting 6% stove degradation rates for the Third Verification, for both Year 2 and Year 3 stoves (see "ANNEX 4: "A04_Financing Plan 2012.xls," "CO2 Projections" worksheet, Cells D19-D20). This assumption aligns with the degradation rates projected in 2011 for purposes of the Second Verification Period.

Drop-off Calculations
The attached ANNEX 1: "A01_Dropoff Summary 2012.xls" shows the data that supports our monitored drop-off rates of 4%, 5%, 13%, and 6%, for stoves in their first, second, third and fourth years, respectively. All raw data, exported directly from Salesforce.com, is included in worksheets within the "Dropoff Summary" file, labeled according to stove year. Pie graphs are also included with each corresponding raw data report; these graphs are direct screen-shots from Salesforce.com.

Due to our rigorous training and supervision schedule we have amassed over 12,500 surveys during the Third Monitoring Period on stoves aged 1-18 months. The results are reported in Table 3 below:

Monitored quarterly rates (actual survey results)

Period	# of Stoves Dropped Off	Total Stoves Considered	Monitored Dropoff Rate
Y1 Q1	22	1606	1.37%
Y1 Q2	29	2704	1.07%
Y1 Q3	82	3276	2.50%
Y1 Q4	86	2109	4.08%
Y2 Q1	118	2090	5.65%
Y2 Q2	58	824	7.04%

Table 3

The above numbers may be understood as cumulative because every time Supervisors approach a village, they survey the universe of stoves installed without avoiding households that were marked as abandoned during previous visits. Thus, each village visit shows an accurate snapshot of total drop-off at the time of the visit. It should be noted that the calculations in the Financing Plan use drop-off rates that are distinct by year, rather than cumulative (see "CO2 Projections" worksheet, Cells D9-D15).

Monitored annual drop-off rates (including surveys taken throughout the year for Year 1, and throughout the 1st and 2nd quarters for Year 2) are displayed in Table 4 below. Monitored drop-off rates for 3rd and 4th year stoves are based on a smaller sample of surveys conducted in October 2012 on stoves built from May–August, 2010, and May–August, 2009, respectively.

Monitored Year 1-4 rates based on surveys taken throughout the stove year				
			Monitored	Isolated Yearly
	# of Stoves	Total Surveys	Dropoff	Dropoff
	Dropped Off	Considered	Rate	Rate
1st year	219	9692	2.26%	2.26%
2nd year	174	2915	5.97%	3.71%
3rd year	15	68	22.06%	16.09%
4th year	11	39	28.21%	6.15%

Table 4

The following modified chart (Table 5 below) represents a conservative treatment of the above survey results. For stoves in their first year, the 4.08% rate below reflects only surveys taken on stoves in their 4th quarter and excludes results for younger stoves. Because the surveys of stoves in their 2nd year were all conducted during the 1st and 2nd quarters of stove age for 2nd year stoves, resulting in a drop-off rate of 3.71%, we have estimated 2nd year drop-off at 9.00% (or a non-cumulative rate of 4.92%). Based on an extension of the steady quarterly progression presented above in Table 3, we believe this figure to be conservative.

Year 1-4 analysis based on Stove Year End for Y1					
			Monitored	Isolated Yearly	
	# of Stoves	Total Stoves	Dropoff	Dropoff	
	Dropped Off	Considered	Rate	Rate	
1st year	86	2109	4.08%	4.08%	
2nd year	*Estimated*		9.00%	4.92%	E
3rd year	15	68	22.06%	13.06%	
4th year	11	39	28.21%	6.15%	

Table 5

Based on the conservative "Isolated Yearly Dropoff Rate" stated in Table 5, and for purposes of the Third Verification Period, we have incorporated the following monitored dropoff figures into the Financing Plan: 4%, 5%, 13% and 6% for stoves in their 1st, 2nd, 3rd and 4th years, respectively.

Note that our conservative handling of Stove Aging figures contributes to an overall balance that progresses in close alignment with the projections in the Financing Plan submitted in 2011. To illustrate, we have constructed a sensitivity analysis (see ANNEX 1: "A01_Dropoff Summary 2012.xls," "Plan vs. Actual" worksheet, Cells I27:L38). This analysis shows that, if we view the result of our 2011 projections for dropoff and aging, and compare them with the result using 2012 monitored dropoff and aging rates, the difference in tonnage is only 3.4% *(de minimis*) based on a fictional 1,000 stove project. Table 6 below (pasted directly from the "Plan vs. Actual" worksheet) illustrates the difference graphically.

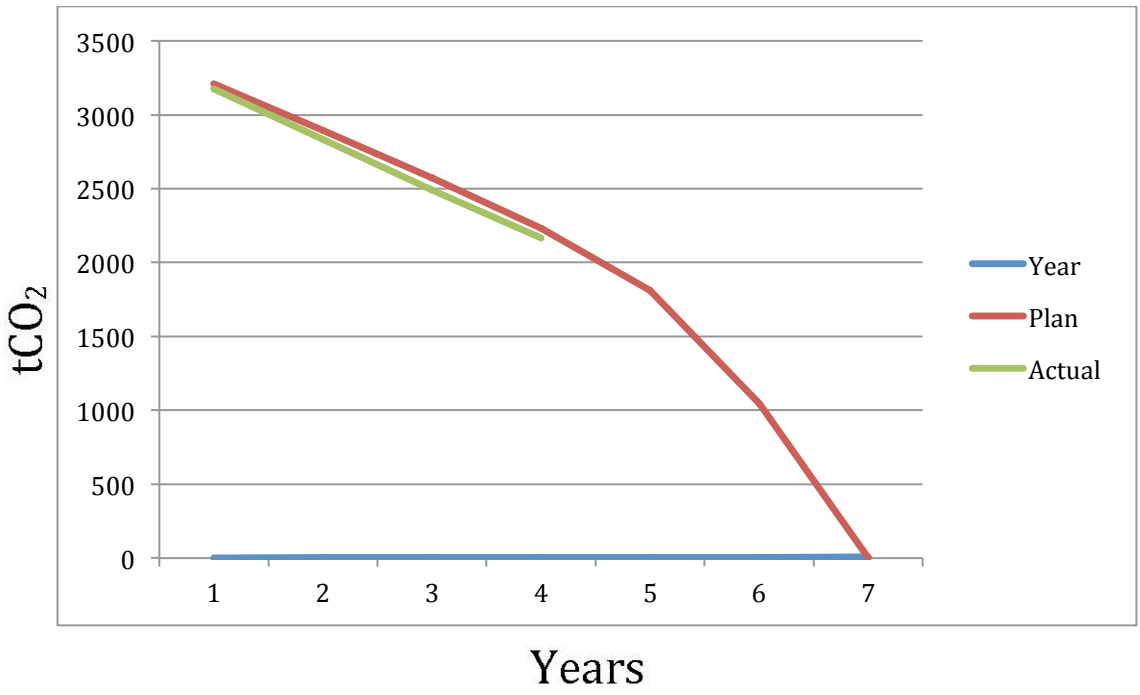


Table 6

E.5. Comparison of actual emission reductions with estimates in the GS-PDD

A quantitative Fuel Consumption Study, requested by the Gold Standard, was completed in 2010 to confirm actual fuelwood consumption rates of the Estufa Dos por Tres.

The estimated savings of 2.23 mtCO_2e /year as stated in the PDD was based on a prior baseline study (Yale, 2007 and Aprovecho, 2009), as the 2010 Paired Fuelwood Consumption Study had not yet been undertaken at the time of project submission for Registration to the Gold Standard. The results of the 2010 Paired Fuelwood Consumption Study, with a revised NRB figure of 77%, indicate emissions reduction of 3.31 mtCO_2e /year as reflected in the PDD v.5 (2012).

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

The Gold Standard, subsequent to issuance of its Round 2 Response above, agreed to proceed with Registration based on emissions reductions of 2.23 mtCO2e/year, and to calculate actual savings for the purposes of issuance of VERs based on the 2010 Paired Fuelwood Consumption Study. The Gold Standard's directive is summarized in an e-mail from Meinrad Bürer to Richard Lawrence dated 3 June 2010, which reads as follows:

> *Discussion has now taken place within the TAC with regards to the Kitchen Test issue. We still need to review your responses to the other issues that had been raised, but provided these will be addressed and closed, we are willing to register the project activity with a temporary figure of 2.23 tCO2 per stove per year for the wood savings in the PDD, under the condition that a new Kitchen Test comparing Fogón and La Justa 2x3 wood consumptions will indeed be performed prior to request for issuance to cross-check this value with results from the field. This means the Validation DOE does not have to look into this issue anymore.*
>
> *Delivery of the VERs will be as per the actual savings, i.e. based on the results obtained with the new Kitchen Test. The savings will have to consider the lower bound and not the mean savings, as there is no basis for granting such a deviation from the methodology to this project activity solely. This topic needs to be discussed in the context of the revised version of the methodology. Only if and when approved will the 'mean approach' be applicable within project activities.*
>
> *... This approach above will be formulated as a Forward Action Request (FAR) within our formal registration review feedback once we will have received the complete version of your responses. The FAR will have to be taken care of by the contracted verifier at the time of verification.*

Subsequently, as part of its Final Registration Review, the Gold Standard issued a FAR as described above. The FAR reads as follows:

> *PP shall conduct a new Kitchen Test prior to first request for issuance in order to confirm the assumed annual emission savings per stove. This study will be a paired-sample test. The goal is to measure daily fuel consumption over a 4-day period in 50 households. First, stoves will be monitored before adoption of the La Justa 2x3, while the family uses a traditional fogón, and several weeks after the adoption of the La Justa 2x3, when the family is accustomed to its use.*

It should be understood that not only did the 2010 Paired Fuelwood Consumption Study meet the parameters of the Forward Action Request in detail, but the study even exceeded the Gold Standard's specifications in two areas: first, the sample size was larger (reaching n=55); and second, wood was weighed over a 5-day period (not just a 4-day period as requested by the Gold Standard), resulting in four 24-hour periods of fuelwood consumption data rather than 3.

The revised figure of 2.73 $mtCO_2e$ /year, and all baseline and project scenario data confirmed in the 2010 Paired Fuelwood Consumption Study, superseded the previous projection of 2.23 $mtCO_2e$ /year as contained in the PDD, as the 2010 Paired Fuelwood Consumption Study confirmed accurate fuelwood savings at a much greater confidence level than any previously available data due to the large sample size and paired design. The revised figure of 2.73 was used in the First and Second Verification Periods.

Then, in 2012, the Gold Standard approved a revised approach to calculate the NRB fraction resulting in an updated NRB fraction of 77%. Accordingly, the emissions reduction per stove was revised to 3.31 $mtCO_2e$ /year, the number used for the Third Verification Period and forward, based on a 77% NRB fraction. The PDD was also updated to reflect the change: see PDD v.6 (2012).

LIST OF ANNEXES			
Monitoring Report - Third Verification Period			
Annex #	***File Name***	***Page Ref.***	**Description**
1	A01_Dropoff Summary 2012.xlsx		Summary of 2012 dropoff survey results
2	A02_Aging Stove KT Report 2012.docx		Summary and analysis of 2012 Aging Stove KT, reported by Rob Bailis
3	A03_Aging Stove KT 2012 Raw Data.xlsx		2012 Aging Stove KT - raw data
4	A04_Financing Plan 2012.xls		Carbon credits calculated based on net stoves in operation over the crediting period
5	A05_PM Fuel Usage Study Data 2010.xlsx		2010 Fuelwood Consumption Study - raw data
6	A06_PM Fuel Usage Study Summary Report 2010.pdf		2010 Fuelwood Consumption Study - summary report
7	A07_PM Fuel Usage Study Data Sheet SPANISH.pdf		2010 Fuelwood Consumption Study - data collection sheet in Spanish
8	A08_PM Fuel Usage Study Data Sheet ENGLISH.pdf		2010 Fuelwood Consumption Study - data collection sheet in English
9	A09_PM Fuel Usage Study Guidelines.pdf		2010 Fuelwood Consumption Study - Guidelines provided by Prof. Robert Bailis
10	A10_Design Change Request 2012a.pdf		2012 Design Change Request - Request for Boundary Expansion
11	A11_Design Change Request 2012b.pdf		2012 Design Change Request - Request for NRB Exception
12	A12_Design Change Review.pdf		Gold Standard Design Change Review
13	A13_PDD v5 2012.doc		PDD modified in conjunction with the 2012 Design Change Request
14	A14_Berkeley Air NRB Analysis 2011.pdf		NRB study done by Berkeley Air Monitoring Group using CDM AMS II-g
15	A15_KS New Territory.pdf		Simple Kitchen Surveys for expanded area to show agreement with cluster definition
16	A16_KS New Territory Summary.xlsx		Summary of Simple Kitchen Surveys for expanded area
17	A17_Sales Record 120111-113012.xlsx		Stove installation database for the Third Verification Period
18	A18_Stoves Installed by Month.xlsx		Monthly summary of stove installation database for the Third Verification Period
19	A19_Training Brochure Rev 2012.pdf		Brochure given to beneficiaries when trained in stove use and maintenance
20	A20_Leakage Sustainability Results 2012.xlsx		Results and summary totals for monitoring surveys conducted Dec. 2011 - Oct. 2012
21	A21_Employee Questionnaire Summary 2012.pdf		Summary of 2012 employee questionnaires
22	A22_Employee Questionnaire.pdf		Sample employee questionnaire (in Spanish & English translation)
23	A23_Quantitative Employment 2012.xls		Report on number of employees and salaries by employee type (as of October, 2012)
24	A24_Transportation Summary 2012.xls		Report on mileage for all vehicles used during the Third Verification Period
25	A25_ER Calculations 2012.xls		Calculations for emission reductions *per stove*

- - - - -

History of the document

Version	Date	Nature of revision
01	Nov. 1, 2012	Initial submission of 3rd Monitoring Report Draft 1 to DNV
02	Dec. 4, 2012	Adjust documentation to reflect final stove build numbers for November
03	Dec. 18, 2012	Temporary shift to unconfirmed NRB factor of 75%
04	Feb. 11, 2013	Shift to final NRB factor of 77% & 3.31 $mtCO_2e$/yr ER per stove

Decision Class: Regulatory
Document Type: Guideline, Form
Business Function: Issuance