Component project activity design document form for small-scale CDM component project activities

(Version 05.0)

Complete this form in accordance with the Attachment "Instructions for filling out the component project activity design document form for CDM component project activities" at the end of this form.

COMPONENT PROJECT DESIGN DOCUMENT (CPA-DD)	
Title of the CPA	Improved Cookstoves Project Activity in Honduras "Vida Mejor con Ecofogones de Alto Rendimiento" – CPA No 001
Version number of the CPA-DD	Version 5.1
Completion date of the CPA-DD	11/01/2017
Title of the PoA to which the CPA is included	Improved Cookstoves Program in Honduras "Vida Mejor con Ecofogones de Alto Rendimiento"
Host Party	Honduras
Estimated amount of annual average GHG emission reductions	42,222 tCO_2e
Applied methodology(ies) and, where applicable, applied standardized baseline(s)	AMS II.G. version 6.0
Sectoral scope(s) linked to the applied methodology(ies)	3.0

SECTION A. General description of CPA

A.1. Title of the proposed or registered PoA

>>
Improved Cookstoves Program in Honduras "Vida Mejor con Ecofogones de Alto Rendimiento"

A.2. Title of the CPA

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Improved Cookstoves Project Activity in Honduras "Vida Mejor con Ecofogones de Alto Rendimiento" – CPA No 001.
11/01/2017
Version 5.1

Details of applicable Generic CPA-DD
Title: Improved Cookstoves Program in Honduras "Vida Mejor con Ecofogones de Alto Rendimiento" – Generic CPA
Identification: Part II of PoA-DD version 5.0 dated 16/01/2015
Reference:
https://cdm.unfccc.int/filestorage/Y/4/S/Y4SOEA0NL6GWTFXVUPZD915JCR2B83/Untitled%20%28uploaded%2006%20Aug%2015%2011%3A36%3A51%29.pdf?t=bzB8bzZkbW5zfDCum2p60WwGbdjQFEr4OUe5
Version: 1.0

A.3. Description of the CPA

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The goal of this small-scale CPA (SSC-CPA) is to facilitate the transition away from inefficient conventional biomass stoves by providing high efficiency, clean burning biomass cooking stoves (ICS) to residential households.

The baseline scenario was identified using the published report "Programa de aumento del aprovechamiento de fuentes renovables de energía (srep) plan de inversiones de Honduras" Page 24, table 13: the source of this information in the report is is Study on fuelwood consumption, April 2011 Produced by SERNA, EAP and ECLAC. As per the same 44.7% urban households and 76.8% of rural households use fuelwood stoves for cooking. The remaining users rely on gas / electricity based cookstoves. However, in the fuelwood stove category (i.e. 44.7% urban and 76.8% rural households). More than 90% of households (both in case of urban as well as rural) rely on traditional / conventional stoves for cooking. The report also states that (para 64), "The energy matrix has a high consumption of firewood, which is done more in inefficient stoves..... The experience of the main institutional actors and cooperation International shows that the problem lies not in the use of firewood, but the inadequacy of the traditional technology....." and para 65, "Although it has been well received by users, the introduction of improved stoves in Honduras has been limited: its current share is only 9.9% in rural areas and 2.9% in the urban area"

This SSC-CPA aims to provide both climate and livelihood benefits to the large population of Honduran households currently using inefficient biomass burning stoves.

Several greenhouse gases (GHG), including carbon dioxide, are produced because of the combustion of non-renewable biomass used in inefficient cooking stoves. ICS improve heat transfer efficiency as compared to the baseline conventional stoves, thereby reducing both the amount of wood fuel used by unit appliance implemented and equivalent emission of GHGs.

In addition to direct climate benefits, this SSC-CPA achieves several co-benefits that contribute to sustainable development:

Environmental Benefits

The project reduces the demand for biomass required for cooking stoves thus reducing the rate of deforestation connected to wood consumption. In addition, the reduction in use of less efficient stoves will yield a reduction in emissions from fuel combustion thus improving air quality and reducing the emission of harmful gases that contribute to climate change.

Social and economic benefits

Project beneficiaries using the ICS reduce their wood consumption. The reduction in fuel needs will also save project beneficiaries time and income. This means that biomass users who gather wood will see a reduction in the amount that they must collect, leaving that time available for other productive activities. Biomass users that purchase their fuel will be able to direct more of their income to other needs. From the economic perspective, the project will contribute to the scale-up of local businesses and organizations, with the potential to create jobs in retail, marketing and distribution.

A.4. Entity/individual responsible for the operation of CPA

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Envirofit International Ltd is the coordinating/managing entity to the SSC-PoA, and Focal Point to all Scopes of Authority. The CPA is run in coordination with the local partner Fundación para el Desarrollo Integral de Honduras (FUNDEIH), the Distributing Organization (DO) for the CPA and is responsible for implementing the SSC-CPA in accordance with agreement with CME.

FUNDEIH is a foundation dedicated to improving the quality of life of the most vulnerable Honduran populations through the development of social and productive initiatives. FUNDEIH's activities aim to provide the tools to enhance empowerment, improve health, education, economy and culture. Their dedication to this project will take part by enabling the means for the adequate distribution and use of ICS. (FUNDEIH)

CME confirms hereby the approval for this CPA to be included into its registered PoA.

A.5. Technical description of the CPA

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This SSC-CPA will replace conventional firewood stoves of the types "fogon suelo", "fogon tradicional", "Justa traditional", "Justa 2x3" and "other inefficient" stoves with higher efficiency ICS model of the HM-5000 type to residential users by leveraging resources provided by the PoA.

The first ICS prototype was designed by Envirofit Quality Test Services in December 2011. With the support of FUNDEIH, the first local retailer for CPA 1, in-field testing and focus groups were conducted to provide input on stove design and function. This ICS model is fuel efficient, resulting in a decrease in fuel use in comparison to conventional stoves while also reducing particulate matter and carbon emissions. This is achieved by improving the combustion chamber using modern design techniques that include the use of more durable materials such as metal. Design considerations have also sought to streamline assembly and construction to reduce cost and production times. Quality assurance is provided through uniform fabrication techniques.

Understanding these weaknesses gathered from the field work conducted Envirofit International Ltd design a completely new stove incorporating cutting edge computational fluid dynamic (CFD) modelling, advanced heat transfer numeric modelling and a robust material selection process. The HM-5000 cookstove model incorporates not only user feedback but also improves both heat intensity and distribution (both major customer complaints) and replaces the fragile ceramic chamber with a new metal one based on Envirofit International Ltd's proven cookstove chamber alloy. The HM-5000 incorporates 4 major design advances not seen in Honduras stoves before.

1. High quality metal combustion chamber: All "improved" cookstoves currently in Honduras rely on ceramic combustion chambers. This reliance means that only very simple geometries can be used in the design. The reason that metal chambers are not typically used is that most metal alloys cannot stand up to the temperature and chemical environment that is seen in a cookstove. Envirofit International Ltd worked with Oak Ridge National Laboratory's High

Temperature Materials Lab (One of the most prominent high temperature material labs in the world) for over a year to evaluate and tailor various alloys to be able to handle the rigorous conditions within a cookstove while still maintaining a low cost. With these alloys, Envirofit International Ltd designed features into the combustion chamber such as a variable cross section that increases performance and efficiency. These kinds of design features would be impractical with clay chambers. Because of the specific composition of the alloy it is typically only made in special foundries in the United States and China.

2. Cast iron plancha: All "improved" stoves currently in Honduras use a steel plate for the plancha. As mentioned above, these sheets warp over time reducing stove performance. Also, unless they are very thick they tend to burn out over time. Envirofit International Ltd chose to utilize a cast iron as the plancha material due to its better heat resistance and resistance to warping. Additionally, by casting the plancha instead of using plate steel, the cross-sectional thickness of the material can be varied to improve heat transfer and heat distribution.

3. Hot gas path: One of the key performance drivers for a plancha stove is the interaction of the hot gasses from the fire with the plancha surface. Boundary layer flow effects in conjunction with gas temperature and velocity determine how much of the heat is transferred to the plancha, and how much is lost out the chimney. Envirofit International Ltd employed advance computational fluid dynamics in conjunction with significant experimental work to optimize the design of the hot gas path of the stove. This optimization allows for much higher efficiency than seen in any other "improved" stove in Honduras as well as more even temperature distribution across the plancha.

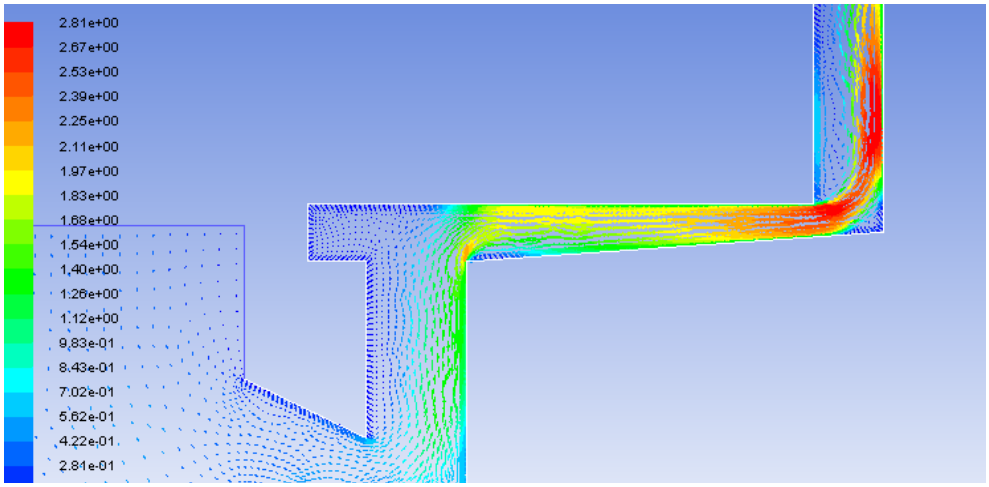

Figure 1: CFD Modeling of Hot Gas Path

4. Insulation: To improve performance and reduce heat loss to the structure that the stove is mounted into Envirofit International Ltd uses special high temperature ceramic fiber insulation that has superior performance characteristics to the ash or pumice insulation used by existing "improved" stoves in Honduras.

Figure 2: Illustration of HM-5000 cookstove model to be implemented.

ICSs are more efficient than conventional firewood stoves as they reduce heat loss and improve heat transfer and/or combustion efficiency. A standard manufacturer WBT test on each model implemented in this CPA substantiates stove performance (efficiency).

The CME confirms hereby that only new ICS will be disseminated under the CPA to residential biomass users by means of any of the distribution mechanisms described in the PoA-DD.
By incorporating these features Envirofit International Ltd could develop a patent pending stove design that significantly improves the distribution and intensity of the heat across the plancha. By doing this the thermal efficiency of the stove was also significantly increased over "improved" cookstove available in the country as tested by Colorado State University.

The project activity will continually assess biomass stove technology options with the goal of providing the high performing, affordable, and locally appropriate technologies to the local environments when possible. As the CPA expands, several models of biomass stoves produced by Envirofit International Ltd and/or other manufacturers may also be included in the CPA. Inclusion of such stoves would be subject to compliance with requirements of the methodology and the eligibility criteria of the PoA. The CME is committed to investing in research and development for the improvement of the current stoves being disseminated. Thus, during the life of the project, research and development work may result in dissemination of more efficient ICS models, which shall be absorbed by this SSC-CPA, subject to methodological and eligibility criteria of the PoA. Upon inclusion into the project activity, all appliances will remain valid throughout the lifetime of the project period until the CME chooses to discontinue crediting of the stove.

In absence of implementation of the project activity the baseline scenario would have been used of inefficient conventional firewood stoves for cooking which is same as the pre-project scenario.

Operational and management plan

Contractual obligations
The CME will coordinate the activities to be undertaken under this CPA. As part of the inclusion of the CPA under the PoA, an agreement will be signed by the DO and the CME, if separate entities. The agreement will include, but is not limited to the following:

(i) Commercial arrangements between the CME and the DO;

(ii) Arrangements to pass on ownership of the carbon emission reduction rights from customers to CME;

(iii) Specific provisions and declarations that the retailer agrees that their activity is being integrated into the PoA;

(iv) The retailer's CDM-specific responsibilities and deliverables during the stove distribution to ensure accurate collection of information from customers;

(v) Provisions outlining the consequences of non-compliance with the above requirements.

Training and guidance

Suitable training will be provided by the CME to ensure that the DO is fully aware of the rules of the PoA and the correct protocol to be followed during ICS distribution and data collection. The DO will provide training of third-party itself.

Distribution model

Envirofit International Ltd. will manufacture the stoves. Envirofit International Ltd. shall sell these stoves to the DO. The DO would use their own networks to further distribute the stoves. In some cases, either Envirofit International Ltd. or the DO will engage third-party "Distributors" for stove distribution. These entities are hereafter collectively referred to as Distribution Entities.

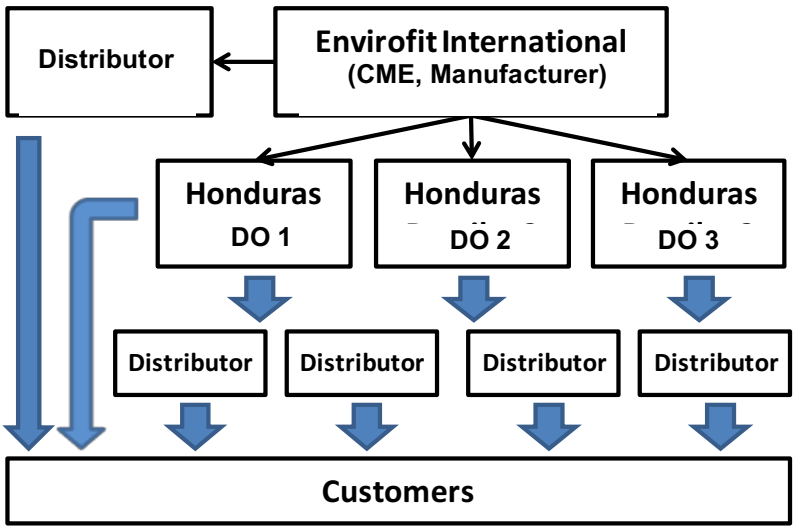

Figure 3: Distribution model - organizational hierarchy

Initial interest will be generated by the demonstration of the stove benefits in a local area (e.g. public market) and where appropriate via advertising campaigns in local media. Users will also receive guidance from the DO/Distribution Entity on how to use and maintain the ICS at the time of sale. A warranty is offered for all Envirofit stoves, giving the customer an added incentive to provide correct contract information at the time of sale. The warranty guarantees the combustion chamber of the Envirofit stoves for 5 years. In this time the customer can obtain a replacement stove or part if their stove is found to be defective or stops working properly.

Transfer of carbon rights

At the time of sale, the DO/Distribution Entity will obtain the customer's approval to assign his or her exclusive carbon rights to the CME. The DO/Distribution Entity will adequately communicate to end users that carbon credits have been waived in exchange of pricing the products therefore discounting their true costs. This will be done through having a clear message printed out on stove packaging / warranty cards cum sales record (CPA distribution Record)

Transfer of information to the CME

The data contained in CPA Distribution Records will be compiled by the DO/Distribution Entity into a CPA Distribution Report. This approach has been designed to integrate data seamlessly with the CME's master database covering all CPAs under the PoA.

Incentive structure

DO/Distribution Entity are incentivized to fill out the CPA Distribution Records correctly. DO/Distribution Entity responsible will undertake an initial screening of CPA Distribution Records before transferring them to the CME. The DO is then responsible for checking the accuracy of the information collected prior to compiling a CPA Distribution Report and transferring the collected data to the CME.

CME responsibilities

The CME will keep a record of the serial numbers of the ICS units distributed to the DO/Distribution Entity under this CPA and all other CPAs under the PoA. This will enable cross-checking of the data provided by the DO/Distribution Entity to ensure no double counting of stoves across CPAs. The CME is responsible for cross-checking the data contained in the CPA Distribution Reports provided by the DO/Distribution Entity to confirm authenticity. If erroneous CPA Distribution Records are identified (e.g. inconsistency between sales claimed by Sales Entities and stove serial numbers supplied to the DO/Distribution Entity) these will not be included in the emissions reduction calculations.

Double counting of emissions reductions will be avoided because each CPA and each ICS distributed will have a unique identification number. The CME will maintain the information required for emissions reduction calculations and verification in a secure electronic database, the "PoA Distribution and Monitoring Database". A CPA can be uniquely identified by its identification number allocated in the database and by the serial ID numbers associated with the ICS units that are distributed under that specific CPA. During monitoring, it will thus be possible to distinguish between the individual stoves included under each CPA. The CME is fully in control of the security of the Database and the data contained within it.

Archiving

The DO/Distribution Entity will send CPA Distribution Records to the CME as requested by the CME. The CME will ensure that all CPA Distribution Records (either original or electronic copy) are archived securely. Archives will be maintained for at least 2 years after end of crediting of each CPA or after last issuance - whichever is later. If the collection of data is through an electronic CPA Distribution Record, a backup copy of the database will also be kept at least 2 years after the end of the crediting of each CPA or after last issuance. A copy of the PoA Distribution and Monitoring Database will be kept in an electronic format.

Technology Transfer to the host country

The CPA does not result in transfer of technology / knowledge to the host party from an Annex 1 party. The stoves have been designed by Envirofit and are manufactured in Honduras.

A.6. Party(ies)

Name of Party involved (host) indicates host Party	Private and/or public entity(ies) CPA implementer(s) (as applicable)	Indicate if the Party involved wishes to be considered as CPA implementer (Yes/No)
Honduras (host)	Envirofit International Ltd (Private entity, CME of the POA, project participant)	No
Honduras (host)	Fundación para el Desarrollo Integral de Honduras (FUNDEIH) (CPA's Distributing Organisation)	No

A.7. Geographic reference or other means of identification

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The physical boundary of the SSC-CPA is determined by the location of installed ICS. This SSC-CPA's geographic boundary is the national borders of Honduras, which is within the boundary of the POA.

Figure A.7: Map of SSC-CPA project boundary –Honduras.[1]

The country is located in the Central American region with coordinates 14°6'N 87°13'W.

Technologies distributed throughout the SSC-CPA are identified through unique serialization recorded in the project sales database. The CME cross-checks and verifies the sales database against sales records.

See photographs below showing the exemplary stove ID numbers, which will be located in two places: riveted to the side of each stove on a metal plate and on a sticker on the side of the cardboard box which contains each stove. The logo will be also located close to the stove ID numbers as a separate mark and will be available at the verification stage.

A.8. Duration of the CPA

A.8.1. Start date of the CPA

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The start date of the CPA is 07/07/2013 which is the date of shipment as per bill of lading of first shipment of HM5000 cookstoves to Honduras. The CME hereby confirms that no ICS have been sold under this CPA before the start date of the PoA.

A.8.2. Expected operational lifetime of the CPA

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21 years

A.9. Choice of the crediting period and related information

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Renewable crediting period, 7 years, 2 times renewable = total of 21 years.

[1] Map Source: Honduras map: http://geography.about.com/library/cia/blchonduras.htm

A.9.1. Start date of the crediting period

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The start date of the crediting period will be the date of registration or 15/06/2015 whichever is later.

A.9.2. Length of the crediting period

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7 years, twice renewable.

A.10. Estimated amount of GHG emission reductions

Emission reductions during the crediting period	
Years	**Annual GHG emission reductions (in tonnes of CO_2e) for each year**
15 June 2015 -14 June 2016	42,222
15 June 2016 -14 June 2017	42,222
15 June 2017 -14 June 2018	42,222
15 June 2018 -14 June 2019	42,222
15 June 2019 -14 June 2020	42,222
15 June 2020 -14 June 2021	42,222
15 June 2021 -14 June 2022	42,222
Total number of crediting years	7
Annual average GHG emission reductions over the crediting period	42,222
Total estimated reductions (tonnes of CO_2e)	295,554

A.11. Public funding of the CPA

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This CPA does not receive public funding from Annex I parties that could result in a diversion of official development assistance.

A.12. Debundling of small-scale component project activities

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In accordance with para 10, page 3 of "Guidelines on assessment of de-bundling for SSC project activities" (EB54, Annex 13) if each independent subsystem/measures included in the CPA of a PoA is no greater than 1% of the small scale threshold defined by the methodology applied, than that CPA of PoA is exempted from performing the debundling check, i.e. considered as being not a de-bundled component of a large scale activity.

The small scale threshold, as defined by AMS II.G, is for a maximum energy saving of 180 GWh_{th}/year. The calculation in the table below shows that domestic stoves do not exceed 1% of the SSC threshold, and that therefore the program is exempted from the de-bundling check[2].

Residential ICS			
Parameter		**Unit**	**Source**
Energy generation by traditional equivalent stove ($B_{old,i}$*$NCV_{biomass}$)	0.012882	GWh_{th}/year	Refer CPA ER calculator
Energy generation by improved stove ($B_{old,I}$ * $NCV_{biomass}$* η_{old} / $\eta_{new,i,a=1}$)	0.005174	GWh_{th}/year	
Energy savings per improved stove (account 100% usage)	0.007709	GWh_{th}/year	

[2] See CPA-DD Appendix 5 for more details.

SSC Type II limit	180	GWh_{th}/year	Default
Percentage of the Type II limit	**0.004**	**Percentage**	**-**

A.13. Confirmation for CPA

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The SSC-CPA is neither registered as an individual CDM project activity nor is it part of another Registered PoA. All ICS under this SSC-CPA are uniquely identified by its serial number in the Sales Database and cross-checked against invoices. Signed contractual agreements with partner organizations and distributors, along with carbon rights waivers received by end-users, transfer the rights of the carbon credits solely to the CME of the SSC-CPA.

Up to the date no CDM activities are registered in the boundary of Honduras disseminating ICS[3]. Therefore, no risk of double-counting is observed.

A.14. Contact information of responsible persons/ entities for completing the CDM-CPA-DD-FORM

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Rohit Lohia
Envirofit International
rohit.lohia@envirofit.org

SECTION B. Environmental analysis

B.1. Analysis of the environmental impacts

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This information is provided at the PoA level.

SECTION C. Local stakeholder consultation

C.1. Solicitation of comments from local stakeholders

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This information is provided at the PoA level.

C.2. Summary of comments received

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This information is provided at the PoA level.

C.3. Report on consideration of comments received

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This information is provided at the PoA level.

SECTION D. Eligibility of CPA and estimation of emissions reductions

D.1. Reference of methodology(ies) and standardized baseline(s)

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This PoA applies the methodology: AMS-II.G. Energy Efficiency Measures in Thermal Applications of Non-Renewable Biomass Version 06.0, Sectoral Scope 03.

The approved SSC baseline and monitoring methodology is approved for use in a PoA by the EB.

[3] On the 16/01/2015 project activities were checked at the http://cdm.unfccc.int/Projects/projsearch.html and PoAs were checked on the http://cdm.unfccc.int/ProgrammeOfActivities/index.html

D.2. Applicability of methodology(ies) and standardized baseline(s)

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A unique methodology is applied across the PoA. Therefore, the methodology measures established in the PoA-DD, Part I, section B.3 constitutes the justification for the choice and applicability of the selected methodology.

D.3. Sources and GHGs

Source		GHGs	Included?	Justification/Explanation
Baseline scenario	Combustion of non-renewable biomass for cooking	CO_2	Yes	Important source of emissions
		CH_4	No	Not considered as per the methodology. Exclusion is conservative assumption.
		N_2O	No	Not considered as per the methodology. Exclusion is conservative assumption.
Project scenario	Combustion of non-renewable biomass for cooking	CO_2	Yes	Important source of emissions
		CH_4	No	Not considered as per the methodology. Exclusion is conservative assumption.
		N_2O	No	Not considered as per the methodology. Exclusion is conservative assumption.

D.4. Description of the baseline scenario

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As per paragraph 12 of AMS II.G., it is assumed that in the absence of the project activity, the baseline scenario is the use of fossil fuels for meeting similar thermal energy needs. The baseline scenario was identified using published literature, data as explained in Appendix 3. This SSC-CPA aims to provide both climate and livelihood benefits to the large population of Honduran households currently using inefficient biomass burning stoves.

See Appendix 3 of the CPADD for further details.

D.5. Demonstration of eligibility for a CPA

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The SSC-CPA meets all the eligibility criteria for inclusion as outlined in the SSC-PoA. This is demonstrated below:

Eligibility Criteria			Accepted Mean of Proof / Evidence Document (to be checked at CPA inclusion)	Compliance of Eligibility Criteria
#	Category	Description		
1	Geographical Boundary and location of the CPA	All distributed ICS in each CPA shall be located within geographical boundary of Honduras. Please note that all ICS installations may not have been deployed at CPA inclusion stage, however the location of the ICS can also be checked during verification. In the event that any deployed ICS is found to be outside of the	Location and boundary is specified in the specific CPA-DD stating that the ICS location is limited to Honduras and is supported by Sales Records.	Yes, CPA-DD section A.7: The CPA boundary is limited to Honduras, coordinates 14°6′N 87°13′W. Any sales which is outside Honduras shall not form a part of this CPA

		PoA boundary/location, those ICS will not be counted in the emission reduction calculation.		
2	No Double counting of ICS and CPAs within this PoA and across other PoAs	A unique numbering or identification system for the ICS installed is applied. . This shall ensure no double counting of stoves within the PoA and ensure that stoves can be identified as belonging to this PoA and not to a PoA managed by any other CME. Please note that all ICS installations may not have been deployed at CPA inclusion stage, however the ICS unique numbering can also be checked during verification. In the event that any deployed ICS is found not in line with CPA double counting criteria, those ICS will not be counted in the emission reduction calculation.	The ICS installed in the PoA shall be uniquely identifiable by unique numbering and will be supported by the distribution records. Document: ICS Sales information in the Total Sales Record will include CPA assignment and user details (i.e. name, address) Additionally, unique id shall be displayed on the stove itself. The unique numbering or identification regime is included in the specific CPA-DD and will be verifiable by the DOE.	Yes, An example of the stove ID serial number to be used is shown in the CPA-DD, section A.7. The actual serial numbers displayed on the stove itself will be available at the CPA verification.
3	No Double counting of CPA	The CPA is exclusively bound to the PoA. Confirmation that the programme activity has not been and will not be registered either as a single CDM project activity or as a CPA under another PoA.	A statement by the CME is included in the CPA-DD the specific CPA will not be part of another single CDM project activity or CPA under another PoA Evidence: Check UNFCCC website with date of access.	Yes, - CPA-DD section A.13. - Up to the date no CDM activities are registered in the boundary of Honduras disseminating ICS of the model type specific to this CPA.
4	Awareness and agreement of those operating a CPA on PoA subscription	Contractual provisions to ensure that those operating the CPA are aware and have agreed that their activity is being subscribed to the PoA. In the case that the CME is not responsible for	Contractual agreement for CPA operators (DO) as part of their contract with the CME, stating that they are aware and have agreed that their activity is	Yes, the CME is responsible for implementation of this CPA. Therefore a contractual agreement is not required.

		implementing the CPA, the organization responsible for CPA implementation, known as the Distributing Organisation (DO), has signed a contractual agreement with the CME to participate in the PoA. This agreement: - Defines the ownership of the carbon emission reduction rights - Covers the DO's distribution and monitoring related responsibilities - Confirms that the ICS to be distributed under the CPA have not and will not be distributed under any other carbon project (CDM project, PoA or voluntary carbon market project) Cedes the DO's rights to the carbon credits generated from CPAs under the PoA to the CME	being subscribed to the PoA	
5	Non-diversion of ODA in case of Public funding	The CME and the CPA operator (in case of being different from the CME) shall confirm that funding from Annex 1 party, if any shall not be diversion of Official Development Assistance.	A statement is included in the CPA-DD informing whether the specific CPA is funded with Annex I country funding. If Annex I country funding is used, then the following documents will be provided by each funding party (the donor/s): Signed statement by the Annex I country donor party confirming that funding from Annex I country is not a diversionof ODA funding.	Yes, see CPA-DD Appendix 2.

6	CPA Start Date	CPA start date shall not be before PoA validation start date (i.e. i.e. 28 January 2012, date of webhosting of PoA-DD for global stakeholder consultation). Please note that not all ICS installations may have been deployed at CPA inclusion stage, however the ICS start date can also be checked during verification. In the event that any deployed ICS is found not in line with CPA start date, those ICS will not be counted in the emission reduction calculation	Starting date as stated in the CPA-DD. Each CPA shall provide verifiable evidence of the CPA start date as demonstrated. Evidence may include but are not limited to: - First ICS Sale Receipt), and/or - Shipping orders of ICS.	Yes. PoA start date is 28/01/2012 [4] . CPA start date is 07/07/2013 which is the date of bill of lading of first shipment of HM-5000 to Honduras[5].
7	CPA crediting period Life time	CPA crediting period shall be within the life time of the PoA. The start date of the crediting period of a CPA shall be on or after: (i) The date of registration of the PoA, if the corresponding CPA-DD is submitted together with the request for registration; (iii) The date when the CPA was included in accordance with the Project cycle procedure;	A statement is included in the CPA-DD specifying that the crediting period starting date and the duration of the crediting period substantiating that the crediting period starts after the PoA registration date and will not exceed the PoA life time (this is 28 years after the date of registration of the PoA).	Yes, 1) The PoA life time is 28 years. The PoA start date (being 28/01/2012) results in PoA life time extending till 27/01/2040. 2) The start date of the crediting period of this CPA shall be on or after (i) the date of registration of the PoA, currently expected as 15/05/2015. The crediting period of CPA is 21 years and shall extend up to 14/05/2036 and hence shall not extend beyond PoA life time. The start date of the crediting of this CPA will be compared to the actual registration date at the time of verification.

[4] See PoA-DD, Part I, section D.1.

[5]See CPA-DD, section A.8

8	Approval of CPA by CME	CME approved each CPA to be included into its registered PoA.	Statement of CME in each CPA-DD giving approval for the CPA to be included into its registered PoA	Yes, section A.4 CPA-DD
9	Requirement of Methodology AMS-II.G - introduction of high efficiency biomass fired cookstoves to replace existing devices or Efficiency improvements on existing biomass fired cook stoves	The CPA consists of replacement of conventional firewood cooksotves for biomass fired ICS, stove type defined in the PoA-DD., Conventional stoves replaced will be any of the types identified by each baseline scenario and as applied by the specific CPA. Stove types replaced and implemented will be defined in the CPA-DD, and hence appliances involving the efficiency improvements in the thermal applications of non-renewable biomass as per AMS II. G. Please note that all ICS may not have been deployed at CPA inclusion stage, the 'type and number of ICS deployed' will however also be checked during verification, and in case any deployed ICS type will be found not in line with the methodology requirement, those ICS will not be counted for emission reduction calculation.	Type of ICS type and compliance with the technological requirements of AMS II G will be described in the specific CPA-DD. Document: Project product data sheets or specification or product information sheets from manufacturer.	Yes, Envirofit International Ltd: Manufacturers specification for HM-5000 substantiates compliance with the requirement
10	Requirement of Methodology AMS-II.G – single pot or multi pot portable or in-situ cook stoves with rated efficiency of at least 20 per cent.	The ICS disseminated under the CPA will be single pot, multi-pot or in-situ cookstoves that have a specified efficiency of at least 20% at the time of inclusion.	Document: Efficiency specification from manufacturer or certificate from a national standards body or alternatively, manufacturer specifications on efficiency based on water boiling test (WBT) may be used.	Yes, certificate from a recognised body provided to the DOE as supporting documentation. Engines and Energy Conversion Lab, Colorado State University: Emissions and Performance report (HM-5000)
11	Technical requirement	Only ICS of the types below will be disseminated:	Specification of stove type and	Yes,

		- Biomass fuelled ICS - Newly operational ICS - Either fix/portable operation Other requirements (i.e. efficiency, maximum capacity, level of service, distribution mechanisms…) are defined in the relevant eligibility criteria within this table. Please note that all ICS may not have been deployed at CPA inclusion stage, the technical requirement will however also be checked during verification, and in case any deployed ICS type will be found not in line with the technical requirement, those ICS will not be counted for emission reduction calculation.	compliance with the technological requirements of AMS II G will be described in the specific CPA-DD. Document: 1. Statement from CME that only new stoves will be disseminated under the CPA 2. First ICS Sales Receipt (first CPA of PoA), including specific language confirming the stove received by the end-user is new.	1. CPA, Section A.3. 2. First sales receipt will be made available at the CPA verification.
12	Requirement of Methodology AMS-II.G - Non-renewability of biomass	In accordance with methodology AMS IIG: Project participants are able to show that non-renewable biomass has been used since 31 December 1989, using survey methods	Document: Document: PoA-DD section b.3.	Yes, this has been demonstrate at PoA level as whole for all the CPAs
13	De-bundling	In accordance with "Guidance for determining the occurrence of de-bundling under a Programme of Activities (PoA)" [6] , if each independent subsystem/ measures included in the CPA of a PoA is no greater than 1% of the small scale threshold defined by the methodology applied[7], then	Document: 1. Manufacturer specification. 2. CPA-DD to show energy saved by an ICS is less than 1.8GWh/year.	Yes, CPA-DD, section A.12.

[6]According to the "Guidelines on assessment of debundling for SSC project activities, v03 (EB 54, Annex 13, par. 10) for determining the occurrence of debundling under a Programme of Activities (PoA)", if each of the independent subsystem/measures included in the CPA of a PoA is not larger than 1% of the small scale threshold defined by the methodology applied, then that CPA of the PoA is exempted from performing de-bundling check, i.e. considered as being not a de-bundled component of a large scale activity.

[7]Note: a factor of 3 is used for the conversion of electric to thermal installed capacity and hence the energy output is expressed as 180 GWhth/year. This approach was confirmed by the SSC-CDM Working Group with regard to the application of methodology AMS-II.G (Clarification F-CDM-SSCwg ver 01 SSC_233).

		that CPA of PoA is exempted from performing de-bundling check, i.e. considered as being not a de-bundled component of a large scale activity		
14	Requirement of Methodology AMS-II.G SSC Limit for CPAs	The CPA will remain under the thermal threshold of 180 GWh_{th}/annum thermal energy savings (threshold as per clarification request SSC_233) throughout the crediting period of the CPA. If a CPA exceeds the applicable limit in any year, the claimable emission reduction shall be capped based on the estimated GHG reductions in the CPA-DD[8]. Please note that all ICS may not have been deployed at CPA inclusion stage, the SSC limit for CPAs can however also be checked during verification	The maximum number of operational ICS estimated is to be defined in the specific CPA-DD. The number of ICs in operation per year will not exceed the "ICS installation cap" established in the specific CPA-DD. This cap in essence will be the maximum number of ICS installed up to the threshold of 180 GWh_{th}/annum thermal energy savings. Each CPA-DD will establish the "ICS installation cap" through the ER calculation tool developed based on the (180GWh_{th}threshold) and the "energy savings per ICS". This relation will vary according to the parameters monitored along the CPA life cycle, for instance η_{new} and $\mu_{y,i}$ Therefore an updated "ICS installation cap"	Yes, the installation cap of this CPA is 23,350 [9] operational ICS per year. This relation will vary according to the results obtained from the field on the monitoring of the ex-post parameters for each verification period in the specific CPA. For instance the date of installation, $\mu_{y,i}$ and η_{new} will result on an updated $B_{y,savings}$ according to the monitoring findings that will lead to the actual "ICS installation cap" representative of the specific verification period. Total amount of sales receipts and actual calculations of the "ICS installation cap" accounting for the actual monitored results will be updated at the CPA verification.

[8] As per EB 65, Annex 5, paragraph 83.

[9] Please note that this represents operational stove numbers only and is based on other variables as well which might change ex-post during the crediting period. As long as the CPA does not exceed the 180GWh_{th} energy savings/year threshold, any number of operational stoves can be added in the CPA. Also, the number of operational stove may be different from stoves sold/distributed depending upon drop of rate of project stoves.

			will be provided at the time of verification according to the monitoring results.	
15	Additionality	Additionality is demonstrated using EB68 Annex 27 ““Guidelines on the demonstration of additionality of small-scale project activities”,” paragraph 2(c) as described in the PoA DD.	Each of the requirements listed below are proven to define the CPA as automatically additional. The specific CPA is eligible when all evidences are documented: 1) Project size does not exceed small-scale CDM thresholds: This requirement is also checked through eligibility criteria #14 2) The project activities are solely composed of isolated units where the users of the technology/measure are households or communities or Small and Medium Enterprises (SMEs): CPA-DD to show description of the technology and to specify target population. 3) Where the size of each unit is no larger than 5% of the small-scale CDM thresholds: CPA-DD to show energy saved by the ICS is less than (180GWh$_{th}$/year * 0.05 =) 9 GWh/year. This requirement is also checked through	Yes, all three requirements are satisfied as follows: 1) The project size is Small-Scale as per eligibility criteria #14. The number of stoves in the CPA have been fixed at 23,350 operational stoves per year thereby ensuring compliance with small scale limit at all times for the CPA 2) The project activities are solely composed of isolated units as described in section A.5, and the users of the technology/measure are households as described in CPA-D section A.3 3) The size of each unit is no larger than 9GWh/y as demonstrated in CPA-DD section A.12.

			de-bundling check (eligibility criteria #13)	
16	Requirement of methodology-Generalities	Each CPA will ensure compliance with the applicability of the methodology and its requirements. Conditions of the applicability of the methodology and its requirements are specified at the PoA level through the assessment of "justification of the choice of the methodology and why it is applicable to the CPAs".	The applicability requirements of the methodology are established in the PoA-DD. The CPA needs to meet all inclusion eligibility criteria named "Requirement of methodology" to meet the applicability criteria of the methodology.	Yes. All eligibility criteria named "applicability of methodology", being these eligibility criteria 14 is met as per the assessment in this table.
17	Target groups	Target groups have been established by means of the baseline at the PoA level, as described this PoA-DD. In summary, eligible target groups are any of the following: 1. Residential biomass users 2. Commercial biomass users 3. Institutional biomass users Assumptions made at the PoA level for any scope regarding these target groups are deemed valid through all CPAs (i.e. baseline studies, ER calculation, monitoring plan).	The selected target groups that shall be included in each CPA are distinguished in each CPA.	Yes, the target group of this CPA are residential biomass users as per CPA-DD, section A.3.
18	Distribution Mechanisms	Distribution mechanisms have been specified in the PoA-DD by means of the "General operating and implementing framework of PoA" at the PoA level.	The selected distribution mechanisms included in each CPA are distinguished in each CPA.	Yes, distribution mechanisms as per CPA-DD section A.5.
19	Local Stakeholder Consultation	The Local Stakeholder Consultation is established at the PoA level [10] as described in the PoA-DD. No further actions needed	Document: The conditions to meet the requirements on undertaking the local stakeholder	Yes, no action requested. See PoA-DD, Part I, section F.

[10] EB55 Annex 38, paragraph 6 (g).

		at the CPA level to satisfy the eligibility criteria.	consultation have been proven the PoA-DD.	
20	Environmental Impact Assessment	The EIA is established at the PoA level as described in the PoA-DD[11]. No further actions needed at the CPA level to satisfy the eligibility criteria.	Document: The conditions to meet the requirements on undertaking the environmental impact assessment have been proven in the PoA-DD.	Yes, no action requested. See PoA-DD. Part I, section E.
21	Sampling Requirements	Sampling of appliances within the CPA must meet the requirements of AMS-II.G and the "Standard on Sampling and Surveys for CDM Projects and Programmes of Activities" (the Sampling Standard). Each CPA will ensure compliance with the framework established for sampling requirements for quantification of parameters not established at the ex-ante and monitoring tasks during the crediting period. Conditions and its requirements are outlined for baselines and monitoring tasks at the PoA-DD.	Specification of the sampling methods applied and compliance with the sampling requirements are established at the PoA-DD. The CPA-DD either specifies that: a) Sampling will be undertaken as part of the PoA Sampling Plan, and in the CPA-DD describes how the PoA Sampling Plan is to be applied; or b) If CPA-specific sampling is to be undertaken, a CPA-specific Sampling Plan must be provided and meet the requirements of AMS-II.G and the Sampling Standard. The sampling approach shall follow the	Yes, CPA-DD and Appendix 3 outlines the sampling approaches used for determining parameters.

[11] EB55 Annex 38, paragraph 6 (f).

			approach outlined in the PoA Sampling Plan except where specifically indicated otherwise in the CPA Sampling Plan.	
22	Baseline parameters to be established at CPA level	Each CPA shall demonstrate the baseline parameters that are to be established at the CPA level have been determined, and shall do so applying the following approaches: a) $B_{old,i}$: as per the approach outlined in PoA-DD, applying Option (a) of (paragraph 19) of AMS-II.G; And, a) η_{old} and/or SC_{old} : η_{old} : When Option 2 of (paragraph 17) of AMS-II.G is applied SC_{old} : When Option 3 of (paragraph 18) of AMS-II.G is applied	CPA-DD shall outline the approach and provide supporting documents including copies of any official government reports, statistics or literature sources used for determining parameters. If local surveys or representative sampling are used then copies of questionnaires, sampling design etc shall be provided.	Yes, CPA-DD Section D.6.2 and Appendix 3 outlines the approach and provide supporting documents used for determining parameters.

D.6. Estimation of emission reductions

D.6.1. Explanation of methodological choices

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The methodological choices explained in the PoA-DD, Part I, Section B.6.1 apply to this CPA.

D.6.2. Data and parameters fixed ex-ante

(Copy this table for each data and parameter.)

Data / Parameter	$B_{old,i}$
Unit	tonnes / year / project device
Description	Quantity of woody biomass that would be used in the absence of the project activity for Residential users
Source of data	Baseline for residential stoves used for residential purposes was determined from the report “Energy Efficiency in Central America: Progress and Action towards the fulfilment of Goals of the Central American

	Sustainable Energy Strategy" by Victor Hugo Ventura and Ryan Carvalho, published by UN-CEPAL, 2014.
Value(s) applied	3.10 for Residential biomass user stoves used for residential purposes
Choice of data or Measurement methods and procedures	Per the methodology, the value is based on historical data as reported in the "Energy Efficiency in Central America: Progress and Action towards the fulfilment of Goals of the Central American Sustainable Energy Strategy" by Victor Hugo Ventura and Ryan Carvalho, published by UN-CEPAL, 2014 report
Purpose of data	Calculation of Baseline Emissions
Additional comment	This parameter is applicable as AMS-II.G. step-6 option-3 is chosen for this CPA. The UN CEPAL, 2014 report gives the value of Quantity of biomass consumed per household and not per project device. Thus, it is assumed ex-ante that there is only one project stove being used per household for calculating $B_{old,i.}$ Ex-post sampling based monitoring shall also include assessment of presence of multiple operational project stoves in a sampled household. The number of project stoves in the CPA shall be adjusted accordingly to claim emissions reduction only for one project stove per household to ensure equivalence with the baseline established. As long as only one project device per household is credited, the value of $B_{old,i}$ as determined from the UN CEPAL report (i.e. per household) shall be equivalent to per project device. Refer section D.7.1, parameter table $N_{y,i,a}$ additional comment for detail on adjustment to be applied in case multiple project devices in a household are identified during monitoring.

Data / Parameter	η_{old}
Unit	Percentage
Description	Efficiency of the system being replaced as part of the SSC-CPA
Source of data	Default value from AMS II.G
Value(s) applied	10 %
Choice of data or Measurement methods and procedures	Refer Appendix 3. The baseline has been established using reference literature.
Purpose of data	Calculation of Baseline Emissions
Additional comment	This parameter is applicable as AMS-II.G step-6 option-2 is chosen for this CPA.

Data / Parameter	LE_y
Unit	tCO_2e
Description	Leakage
Source of data	AMS-II.G.. Paragraph 30
Value(s) applied	0

Choice of data or Measurement methods and procedures	
Purpose of data	Account for leakage adjustment in calculation of baseline emissions
Additional comment	A default leakage correction factor of 0.95, as per AMS II.G. paragraph 30, has already been applied to adjust the $B_{old,i}$ during period y instead of separate calculation of $LE_{y.}$ Hence LE_y has been considered as 0

Data / Parameter	$NCV_{biomass}$
Unit	TJ/tonne
Description	Net calorific value for biomass
Source of data	AMS-II.G, IPCC default value for wood fuel
Value(s) applied	0.015
Choice of data or Measurement methods and procedures	Adopt IPCC default values as per CDM methodology. Reference: 2006 IPCC Guidelines for National Greenhouse Gas Inventories Volume 2: http://www.ipcc-nggip.iges.or.jp/public/2006gl/vol2.html
Purpose of data	Calculation of Baseline Emissions
Additional comment	None

Data / Parameter	$EF_{projected\_fossil\_fuel}$
Unit	tCO2/TJ
Description	Emission factor for the substitution of non-renewable woody biomass by similar consumers.
Source of data	AMS-II.G, default value.
Value(s) applied	81.6
Choice of data or Measurement methods and procedures	Default value as prescribed by methodology applied
Purpose of data	Calculation of Baseline Emissions
Additional comment	None

Data / Parameter	$f_{NRB,y}$
Unit	Fraction
Description	Fraction of woody biomass saved by the project activity in year y that can be established as non-renewable
Source of data	Study or published literature
Value(s) applied	0.8382 as per Envirofit International Ltd: *NRB Study Honduras*-, version03 dated 22 July 2013

Choice of data or Measurement methods and procedures	
Purpose of data	Calculation of Baseline Emissions
Additional comment	Fixed ex-ante at the PoA level, In case of absence of recent published data, use the default value provided by CDM SSC Small Scale working group or the data established in the previous years' / previous CPAs

D.6.3. Ex-ante calculation of emission reductions

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Emission reductions are calculated[13] as follows:

$$ER_y = \sum_i ER_{y,i} \qquad \text{Equation (1)}$$

Where:

i	=	Indices for the situation where more than one type of project device is introduced to replace the pre-project devices
ER_y	=	Emission reductions during year *y* in tCO_2e
$ER_{y,i}$	=	Emission reductions by project device of type *i* during year *y* in t CO_2e

(a) For household cook stoves:

Equation (2)

$$ER_{y,i} = \sum_{a=1}^{a=y} B_{y,savings,i,a} \times N_{y,i,a} \times \frac{\mu_{y,i}}{365} \times f_{NRB,y} \times NCV_{biomass} \times EF_{projected\_fossilfuel} - LE_y$$

Where:

a	=	'a' is the indices for the age (in years) of the cook stoves that are operating in the year 'y' of the crediting period. At any year y of the crediting period (e.g. y= 1, 2, 3…7 or 10) there will be a population of $N_{y,i,a}$ operational devices of the type i with age varying from a=1 (the cook stoves installed during the current year y) up to the age a=y (the cook stoves installed during the first year of the crediting period). Since the lifetime of cook stoves is often shorter than the length of the crediting period and cook stoves are likely to show significant efficiency losses over time, this aspect needs to be captured through the monitoring plan
$B_{y,savings,i,a}$	=	Quantity of woody biomass that is saved in tonnes per cook stove device of type i and age a in year y (tonnes)
$f_{NRB,y}$	=	Fraction of woody biomass saved by the project activity in year y that can be established as non-renewable biomass using survey methods or government data or default country specific fraction of non-renewable woody biomass (fNRB) values available on the CDM website.[14] The parameter value may be fixed ex ante at the beginning of each crediting period.

[13] See Appendix 5 of each specific CPA for actual values.

[14] Default values endorsed by designated national authorities and approved by the Board are available at <http://cdm.unfccc.int/DNA/fNRB/index.html>.

$NCV_{biomass}$ = Net calorific value of the non-renewable woody biomass that is substituted (IPCC default for wood fuel, 0.015 TJ/tonne, based on the gross weight of the wood that is 'air-dried') (TJ/tonnes)

$EF_{projected\_fossilfuel}$ = Emission factor for the fossil fuels projected to be used for substitution of non-renewable woody biomass by similar consumers. Use a value of 81.6 tCO_2/TJ[15]

$N_{y,i,a}$ = Number of project devices of type i and age a operating in year y

$\mu_{y,i}$ = Number of days of utilization of the project device during the year 'y'. Its value may be considered as 365 where it can be demonstrated that the pre-project device has been decommissioned and is no longer used.

LE_y = Leakage emissions in the year y, to be taken as 0 as leakage correction factor of 0.95 shall be directly applied to $B_{y,savings,i,a}$

When using AMS-II.G, Option 2:

$$B_{y,savings,i,a} = B_{old,i} \times \left(1 - \frac{\eta_{old}}{\eta_{new,i,a=1} \times \Delta\eta_{y,i,a}}\right) \quad \text{Equation (3)}$$

Where:

$B_{old,i}$ = Annual quantity of woody biomass that would be used in the absence of the project activity to generate thermal energy equivalent to that provided by the project device type *i*, if the project device operates throughout the year *y*. (tonnes)

η_{old} = Efficiency of the pre-project device (fraction), determined using one of the following options:

(a) Measured using representative sampling methods or based on literature reporting results of measurements relevant for the type of pre-project devices. Use weighted average values (taking the amount of woody biomass consumed by each device as the weighting factor) if more than one type of device is being replaced;

(b) A default value of 0.10 may be optionally used if the pre-project device is a three-stone fire using firewood (not charcoal), or a conventional device with no improved combustion air supply or flue gas ventilation, that is without a grate or a chimney; for other types of devices, a default value of 0.2 may be optionally used. Use weighted average values (taking the amount of woody biomass consumed by each device as the weighting factor) if more than one type of device is being replaced.

$\eta_{new,i,a=1}$ = Thermal efficiency of the device of type *i* being deployed as part of the project activity (fraction), using the WBT protocol carried out in

[15] This value represents the emission factor of the substitution fuels likely to be used by similar users, on a weighted average basis. It is assumed that the mix of present and future fuels used would consist of a solid fossil fuel (lowest in the ladder of fuel choices), a liquid fossil fuel (represents a progression over solid fuel in the ladder of fuel use choices) and a gaseous fuel (represents a progression over liquid fuel in the ladder of fuel use choices). Thus a 50 per cent weight is assigned to coal as the alternative solid fossil fuel (96 t CO_2/TJ) and a 25 per cent weight is assigned to both liquid and gaseous fuels (71.5 t CO_2/TJ for kerosene and 63.0 t CO_2/TJ for liquefied petroleum gas (LPG).

accordance with national standards (if available) or international standards or guidelines, for the initial efficiency determined in the year of its installation (a=1)

$\Delta\eta_{y,i,a}$ = Factor to consider the efficiency loss of the project device type *i* due to its aging at the year *y*, as expressed as follows:

$$\Delta\eta_{y,i,a} = \frac{\eta_{new,i,a}}{\eta_{new,i,a=1}}$$

where $\eta_{new,i,a}$ is the thermal efficiency of the device '*i*' with age '*a*' determined using the WBT and $\eta_{new,i,a=1}$ is the thermal efficiency of the device at its first year of operation. $\Delta\eta_{y,i,a}$ may be determined through sample surveys of project device type *i* for batches of stoves with the same age at each year of the crediting period. Alternatively, the monitoring may determine annually the thermal efficiency of the devices installed at the first year of the crediting period, and the efficiency loss of this population may be used to correct the initial efficiency of the population of devices installed later on. For example, the loss rate of year 2016 for the project device of type *i* installed in 2015 can be considered the same as that of year 2014 for the project device of the same type installed in 2013. In this way, the monitoring at any year y during the crediting period will consist of the determination of the thermal efficiency for the devices installed during the current year (the initial value $\eta_{new,i,a=1}$ for the population commissioned during this year), and the values of $\eta_{new,i,a}$ and of $\Delta\eta_{y,i,a}$ for oldest population (i.e. the devices from the first year that have now reached the age a=y)

Generalities

$B_{old,i}$ is calculated as (option a from paragraph 19 of the methodology) the estimate of average annual consumption of biomass per appliance (tonnes/year) as derived from historical data or survey of local usage

$B_{y,savings,i,a}$ is determined using option 2. The parameters to be considered for this option are assessed per the program requirements established in Part II section B.6.2 and B.7 of the PoA-DD and the specific requirements established in section D.7.2 and D.6.2 of this CPA. The specific emission reduction calculation tool[16] designed for the chosen option will be used by plugging into the tool the results from the field/lab tests (along with the rest of parameters necessaries for the option) to obtain the resulting $B_{y,savings,i,a}$ value.

No adjustment factors are used for ex-ante calculations. Ex-post parameters will be applied following the results of the monitoring plan.

D.6.4. Summary of the ex-ante estimates of emission reductions

Year	Baseline emissions (t CO_2e)	Project emissions (t CO_2e)	Leakage (t CO_2e)	Emission reductions (t CO_2e)
15 June 2015 -14 June 2016	42,222	0	0	42,222
15 June 2016 -14 June 2017	42,222	0	0	42,222
15 June 2017 -14 June 2018	42,222	0	0	42,222
15 June 2018 -14 June 2019	42,222	0	0	42,222
15 June 2019 -14 June 2020	42,222	0	0	42,222

[16] See Appendix 5 of the CPA-DD.

15 June 2020 -14 June 2021	42,222	0	0	42,222
15 June 2021 -14 June 2022	42,222	0	0	42,222
Total	**295,554**	**0**	**0**	**295,554**
Total number of crediting years	7			
Annual average over the crediting period	**42,222**	**0**	**0**	**42,222**

D.7. Application of the monitoring methodology and description of the monitoring plan

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D.7.1. Data and parameters to be monitored

(Copy this table for each data and parameter.)

Data / Parameter	$N_{y,i,a}$
Unit	number
Description	Number of project devices of type i and age a that are operating in year y
Source of data	Stove sales database and Survey records
Value(s) applied	23,350 stoves is the limit of number of operating cookstoves in any year of the crediting period for this CPA
Measurement methods and procedures	*Target population:* All systems deployed (therefore all populations). *Objective:* To establish the number of devices of type i and age a that are still operating; *Description and Reliability Requirements:* Primary data collection, weighted average if multiple systems. The total number of appliances by type and age deployed during period y is tracked in the Project Database of the specific CPA, which is updated regularly. All appliances distributed will be recorded for installation date and recipient / location. The sales date for each appliance listed in the Project Database of each CPA signifies the start of operation[17] for each appliance type. *Sampling Frame:* Project Database of each CPA (or combined PoA database in case of PoA level sampling) as defined by sales date, appliance type, serial number, and end-user information. *Sample Size and Desired Precision:* see PoA-DD, Part II, Section B.7.2. *Sample Method:* see PoA-DD, Part II, Section B.7.2. The number of stoves still operating will be determined based on representative sampling. The total number of operational stoves shall be calculated as the fraction of stoves of type *i* and age a found operational in the sampling survey multiplied by total number of stoves of type *i* and age a in the project database.
Monitoring frequency	At least once every two years as per section 5.1 and para 39 of the methodology

[17] In case of bulk sales via intermediaries, the information regarding date of sale for each appliance may not be available for all stoves. Thus, in case of absence of date of sale of a given unit a 120 day default lag shall be applied from the date of sale to intermediary as a conservative measure.

QA/QC procedures	Each SSC-CPA project implementer shall maintain a sales record to calculate this parameter. Stove sales records received from each DO will be cross-checked against CME's sales records for each DO. The cross-checking of all DOs will be led by the CME. The CME supervises the activities of each SSC-CPA DO (when not the CME itself), and provides training, guidelines and templates to facilitate accurate testing and record keeping. In the case the desired precision is not met, lower bound values shall be used against repeating the survey to determine the operational fraction of stoves of type *i* and age a.
Purpose of data	Calculation of Baseline Emissions.
Additional comment	Also, it is assumed ex-ante that there is only one project stove being used per household for calculating $B_{old,i.}$ Thus, ex-post sampling based monitoring shall also include assessment of presence of multiple operational project stoves in a sampled household. The number of project stoves in the CPA shall be adjusted accordingly to claim emissions reduction only for one project stove per household to ensure equivalence with the baseline established. For example, if during the survey to check operational status, 10% of the households are found using more than one stove, then the stove population in the PoA / CPA shall be adjusted by 10%.

Data / Parameter	$\eta_{new,i,a}$
Unit	%
Description	Efficiency of the device of type i and age a being deployed as part of the project activity
Source of data	WBTs results conducted on a sampling basis
Value(s) applied	29.4%
Measurement methods and procedures	The WBTs should be carried out in accordance with national standards (if available) or international standards or guidelines *Target population:* project stove users. *Objective:* To establish the operating efficiency of project stove during the project activity for each target population. *Description and Reliability Requirements:* Primary data collection, weighted average if multiple systems. *Sampling Frame:* Project Database of each CPA (or combined PoA database in case of PoA level sampling) as defined by sales date, appliance type, serial number, and end-user information. *Sample Size and Desired Precision:* Mean Value determination; see PoA-DD, Part II, Section B.7.2. *Sample Method:* see PoA-DD, Part II, Section B.7.2.

	Implementation: Sampling will be conducted for representative appliance types A weighted average of stove sales for each vintage will be applied. This value will be used for ex-post emission reduction calculations. In accordance to AMS-II.G. methodological requirements, subsequent WBTs on aging stoves ($\Delta\eta_{y,i,a}$ will measure changes in project stove efficiency and will be used for emission reduction calculations for associated stove vintages. Once applied to a CPA, all applicable future CPAs within the same PoA may use such data to define the value. All data will be kept for 2 years following the crediting period or the last issuance of the CERs of the project activity.
Monitoring frequency	Annually as per section 5.1 and Para 34 of the methodology
QA/QC procedures	CME/DO conducts testing with expert assistance. Training may be provided to enumerators and testers. Database maintenance: managing entity.
Purpose of data	Calculation of Baseline Emissions.
Additional comment	This parameter is applicable only when option 2 (Para 17) of methodology is chosen for a given CPA.

Data / Parameter	$\mu_{y,i}$
Unit	days
Description	number of days of utilization of the project device during the year 'y'
Source of data	Primary data collection as measured through ex-post surveys/ user feedback.
Value(s) applied	365
Measurement methods and procedures	*Target population:* Systems deployed by type and vintage (for example: residential). *Objective:* To establish the average utilization of the project device deployed as part of the SSC-CPA per stove type, measured ex-post through survey/user feedback. *Description and Reliability Requirements:* Primary data collection, weighted average if multiple systems. *Sampling Frame:* Project Database of each CPA (or combined PoA database in case of PoA level sampling) as defined by sales date, appliance type, serial number, and end-user information. *Sample Size and Desired Precision:* Proportional Value determination, see PoA-DD, Part II, and SectionB.7.2. *Sample Method:* see PoA-DD, Part II, Section B.7.2. *Implementation:* A system will be used to select samples from the Project Database. If a selected household opts out of the study, a new household will be selected and the failure rate recorded.

	In case the pre-project device is found decommissioned and no longer used for a given sampled user, this shall be considered as 365 days for the sample. In case the pre-project devices are found in use otherwise, the monitoring surveys will capture cooking habits and stove usage of households in the region, by formulating questions and/or collecting evidences to determine the frequency of usage of both the project devices and baseline devices (in case they are continued). For example: fuel consumption by pre-project stoves may be determined based on ratio of number of meals cooked over pre-project cookstoves Vs that on project stoves during a day/week/month to determine the ratio of baseline stove usage Vs project stove. This will be multiplied by 365 to determine the utilization of project stove. In case the surveys do not reflect an accurate usage of pre-project/project stoves a 50:50 usage rate (pre-project: project) for such samples may be taken.
Monitoring frequency	At minimum every two years as per Para 39 of the methodology
QA/QC procedures	CME/DO to conduct surveys with expert party assistance. Training will be provided to enumerators and testers.
Purpose of data	Calculation of Baseline Emissions.
Additional comment	

D.7.2. Description of the monitoring plan

>>

Sampling Plan across CPAs within the PoA

Due to the large number of ICS envisaged to be distributed as part of the CPAs to be included in the PoA, it is not economically feasible to monitor each individual ICS unit distributed. Therefore, representative sampling will be undertaken as part of a PoA-wide Sampling Plan that is designed in line with the requirements of the methodology applied and the "Standard for sampling and surveys for CDM project activities and programme of activities" version 03.0 (the Sampling Standard). The Sampling Standard (paragraph 20, footnote 18) allows for sampling across a group of CPAs, provided the homogeneity of population can be demonstrated, or differences are considered in the sample size calculation and 95/10 confidence/precision is applied.

Flexibility to apply cross-CPA sampling is critical for the feasibility of the proposed PoA due to the large number of CPAs envisaged. In particular, this is the case for monitoring the parameter $\eta_{new,i,a=1}$ which involves carrying out WBTs in the field and therefore involves considerable time and cost. For this parameter, there is likely to be a very high level of homogeneity amongst CPAs involving distribution of the similar stoves, since the ICS to be distributed have been designed to meet stringent efficiency specifications and are manufactured in modern factories to specification. There is no reason to think the actual efficiency of the similar ICS models will vary significantly from CPA to CPA or even region to region. For the other parameters, the CME will define a sampling frame for each group of CPAs such that the homogeneity of the group can be expected to be sufficient to allow for cross-CPA sampling.

Given the multi-target population groups and multi-regional nature of the proposed PoA, it is not feasible to pre-define a common sampling approach for all CPAs that could be included in the PoA over time. Some aspects of the sampling plan will remain fixed and these are identified clearly below. However, the sampling plan will also be elaborated further over time as additional CPAs are included. The sampling plan therefore provides: a framework for the sampling of all parameters contained in the Monitoring plan, the approach for sampling of these parameters, and an approach for integrating future CPAs to be included in the PoA into the Sampling Plan.

The monitoring activity provides a framework for project preparation and monitoring processes that will be undertaken at the CPA level for each CPA, as required by the CDM rules. This schedule

considers the key parameters that are needed during the crediting periods of the project. All required monitoring and documentation will be implemented, reported, consolidated and managed by the CME or a qualified expert partner to meet verification requirements. Monitored data will be stored in a suite of monitoring databases including the Total Sales Record, the Project Database, and the Stove Monitoring Database. These will be updated each monitoring period.

Sampling Methodology

Sampling Objective – The sampling objective for each parameter is to determine via survey a statistically significant value for the emission reduction calculations. These parameters are defined in the tables presented in PoA-DD, Part II, Section B.7.1under "Data / Parameter".

Field Measurement Objective and data to be collected – This is defined in the tables in PoA-DD, Part II, Section B.7.1under "Description".

Target population and sampling frame – The target population is the total population served under the PoA, and the sampling frame consists of end-users of the ICS as recorded in the Project Database / Sale Record. The sampling frame will be kept for 2 years following the crediting period or the last issuance of the CERs of the project activity. In developing sampling frames the implementer of the survey effort shall compile a clear description of the target population, including those characteristics of the population which define membership. From the description and characteristic the implementer can then select a sampling frame appropriate for the study.

Sample method –Sampling will be conducted using stratified random sampling techniques, and detailed calculations are provided within the monitoring plan as per CDM guidelines "Sampling and surveys for CDM project activities and programmes of activities" the ICS shall be stratified by region, target user group, stove category (fuel) and ICS model combination (model and age)[18]

Implementation - The sampling for surveyed or monitored data will be implemented consistent with the approach described above unless survey results necessitate additional or alternative statistical analysis techniques. Monitoring shall be carried out by the operating entity of the CPA per the procedures and monitoring framework as follows and will be submitted to the managing entity. The managing entity will store the data in an electronic database or another appropriate data archive. Primary data will be stored by the implementing entities/operators.

Desired precision / expected variance and sample size – unless otherwise noted in the description of the monitored parameter in PoA-DD, Part II, Section B.7.1, and as allowed by the methodology, the sample size will be chosen for annual monitoring with 90/10 precision (90% confidence interval and 10% margin of error) if the sampling plan is developed for each CPA. When a single sampling plan covering a group of CPAs is undertaken, 95/10 confidence/precision is applied for the sample size calculation. On the other hand, when a single CPA is sampled and the project proponent chooses to inspect biennially, then a 95% confidence interval and a 10% margin of error shall be achieved for the sampled parameters. For biennial monitoring at PoA level, the desired confidence and precision levels shall be 95% and 5% respectively. For all cases where survey results indicate that required precision are not achieved, the lower bound of the 90% or 95% confidence interval of the parameter value may be chosen as an alternative to repeating the survey efforts to achieve the desired precision.

Stratified Random Sampling will be used to select samples from the Project Database for monitored parameters. Optionally, other sampling approaches may be used in accordance with "Sampling and surveys for CDM project activities and programmes of activities" and Guideline for Sampling and Surveys for CDM Project Activities and Programme of Activities, when sampling techniques or statistical analysis necessitates it.

The sample size shall be determined using the following formula:

[18]Stove models having efficiency values variation of +/-5% shall be treated as same category for determining clusters.

$$n \geq \frac{z^2 * N * V}{(N-1) * precision^2 + z^2 * V}$$

Where,

n = number of stoves to be sampled

N = Total number of ICS in the population

Z = Constant referring to level of confidence (e.g. 1.645 for 90 %; 1.96 for 95 % confidence)

Precision = Required precision (e.g. 10% = 0.1)

For Proportion based parameters

$V = \frac{SD^2}{\overline{p}^2}$ Where:

$$SD^2 = \frac{\sum_{i=1}^{k} g_i * p_i * (1 - p_i)}{N}$$

$$\overline{p} = \frac{\sum_{i=1}^{k} g_i * p_i}{N}$$

Where,

g_i = weight of strata i in the population

p_i = expected proportion of strata i in the population

k = total number of strata in the population

For Mean based parameters

$$V = \left(\frac{SD}{Mean} \right)^2$$

Where

$$SD^2 = \frac{\sum_{i=1}^{k} g_i * SD_i^{\,2}}{N}$$

$$Mean = \frac{\sum_{i=1}^{k} g_i * m_i}{N}$$

Where

SD_i = expected standard deviation of strata i in the population

m_i = expected mean of strata i in the population

Sample Size Calculation

Sample sizes will be sufficient to ensure that the precision of the sample means/proportions are in accordance to the Sampling Frame established for the CPA within the PoA to estimate emissions reductions. In cases where survey results indicate that desired precision is not achieved, the lower bound of corresponding confidence interval of the parameter value may be used as an alternative to repeating the survey. Alternatively, the survey may be expanded to reach the required confidence/precision. Technology types from a given project scenario are selected using representative sampling techniques to ensure adequate representation of technologies types of different ages.

The sampling methodology will be accordance with the representative sampling methods provided by the methodology AMS–II.G. and other CDM sampling guidelines and standards as indicated along this section, with the applicable methodology having precedence. Thus, the sampling plan will be provided to the DOE with a description of the objectives and reliability requirements, target population, sampling approach, sample size, sample frame, field measurements and implementation, quality assurance and control, data analysis, important assumptions, and justification for the selection of the chosen approach.

Actual survey results will inform whether fewer or greater surveys will be needed to meet the required confidence/precision. Although the monitoring team will undertake monitoring of various parameters simultaneously and on the same sample, the CME may decide to stop monitoring of a parameter during the campaign once the required precision for this parameter is achieved.

In the case of parameters monitored for the first time the expected variation for that measure in the sample may be based on results from similar studies, pilot studies, or from the project planner's own knowledge / experience of the data.

To ensure a random stratified sample selection, random number generators shall be applied. Each ICS in the target population is uniquely identifiable by its Serial ID number. Each ICS can thus be allocated a Sample Selection Number in each monitoring period, starting at 1 and increasing up to the total number of ICS in the Database for that pre-defined stratified sampling frame. Applying the random number generators, the ICS can then be randomly chosen from the defined population up to the required sample size as calculated by the CME.

During sampling, there may be non-response from the target population. Over-sampling by 20% may be used to avoid non-response, however, sampling may be cease once required confidence/precision is met.

Monitored Systems

1. **Total Sales Record:** The total sales record documents the information listed below of stove sales to retailers for the technologies implemented under the CPA. The total sales record will be kept electronically and/or in paper records and provided to the DOE at verification. The Total Sales Record contains:
    a. Distributing Organization name / address and telephone
    b. Date of sale and model/type of project technology sold
    c. Quantity of project technology sold as evidenced by database

Frequency: Ongoing

2. **Project Database:** [Parameter Ny] Each CPA will have a specific Project Database that records each ICS crediting in that CPA. Every ICS listed in the Total Sales Record will be transferred into the Project Database of one CPA as needed to grow the number of ICS until the maximum threshold for that CPA is reached. In addition to the information provided in the Total Sales Record, the CPA-specific Project Database will record user details (enough for end-user

identification and household follow-up) for all, or a subset of all, appliances deployed. An individual sales record will be collected from each stove user at the point of sale. The CME makes every effort to retrieve this information (paper form or electronically (eg. SMS)) but cannot guarantee the collection of information with every stove due to challenges such as high rates of illiteracy and logistical challenges. ICS with end-user details recorded will serve as the sampling frame for monitored parameters.

Stove user details recorded are:

a. Name
b. Government department / village / telephone, or address (as available)
c. Stove model and Unique Serial Number
d. Type of pre-project stove
e. Name of Organization name, address and telephone

Frequency: Ongoing

Sampling Methodology

To reduce monitoring efforts a single sample is drawn based on which all the parameters determined via sampling shall be monitored. The CME will determine the number of users/appliances monitored during sampling for each of the parameters separately. The reason is that the variation within the values obtained will be different for each parameter. Since the precision of a sampled parameter depends on the variation of its values, the necessary number of users/appliances to be monitored to achieve the 5% or 10% precision will also depend on the variation of values. Therefore, although the monitoring team will undertake monitoring of various parameters simultaneously and on the same sample, the managing entity may decide to stop monitoring of a parameter during the campaign once the required precision for this parameter is achieved. The monitoring team will continue to monitor appliances in the sample with respect to the remaining parameter(s) until again the required precision for these parameters is achieved.

A series of steps will be carried out for representative sampling, in consideration of the Standards and Guidelines described along this section for sampling and surveys for small-scale CDM project activities. For each monitoring period the same sampling procedures will be followed. These steps and procedures are specific to each possible sampling approach as detailed in the Sampling Size Calculation Tool provided.

Monitored Parameters:

Specific parameters to be monitored and methods are listed in the specific CPA. The on-going monitoring is conducted for each project scenario following approval of the PoA and inclusion of the specific CPA DD. The source of data is based on the sales of ICS. To ensure completeness and accuracy of monitoring information, electronic database(s) will be operated and maintained by the coordinating managing entity.

Training will ensure that all monitoring staff has the appropriate skills and experience to administer relevant tests and quality checks will ensure the integrity of information flow to the CME. On an annual basis, the CME shall review the efficacy of information gathering techniques and information flow, and assess enumerator and partner feedback pertaining to the management structure. This information will inform necessary systems and management improvements required for future monitoring. This continuous process of review will help to ensure robust data tracking and reporting.

Organizational structure of monitoring and inclusions:

Person	Role
Managing Entity database administrator	The database administrator is responsible for updating and maintaining all electronic databases and inclusions. Required competencies include experience with data management systems (eg. Excel, STATA, or SPSS)

Monitoring team	The monitoring team will be assigned by the CME to conduct the user interviews and appliance tests during the periodic sampling and reports the results to the database administrator. The skills and experience required for the data collection activities include: • Experience conducting WBTs • Experience conducting door-to-door surveys of biomass consumption • Local language skills (especially important for input to questionnaire design and interviewing of end users) • English language skills • Cultural awareness • Numerical proficiency • Data entry skills

Quality Assurance/Quality control

As the PoA is intended to include multiple regions within a country with a high level of cultural diversity as well as different end user groups, there is no "one size fits all" approach for dealing with these issues. However, to avoid many of these problems the CME will undertake the following strategies, tailoring the specific approach to the local circumstances:

1) **Ensuring end user awareness.** At the time of sale, the ICS customer is made aware that they are required to participate in monitoring activities. This will be via a written statement (in English and local language where appropriate) on the carbon waiver form, or via alternative means such as training sales personnel to explain the importance of monitoring to each customer.

2) **Questionnaire design.** The design of the questionnaire will ensure that the questions are non-intrusive and easy to understand for both the interviewee and interviewer. For example, when conducting sampling to estimate the parameter $\mu_{y,i}$ a simplified approach has been designed to avoid the need for asking customers how much money they spend on fuel.

3) **Drawing on local knowledge**. The local contractors to be hired by the CME in each country will play an important role in tailoring the approach to suit local circumstances. For example, in some instances, it may be essential for a local person to conduct the interview to obtain accurate results, e.g. to explain to the end user that their old stove will not be removed if they admit to its continued use.

4) **Quality of contractors**. Any third parties hired by the CME to carry out sampling will be required to demonstrate a high level of cultural awareness, local language skills and appropriate experience with data entry and data management. The CME will ensure that contractors are adequately trained for the tasks they are contracted for (eg. carrying out of WBTs in line with a methodology supported by an appropriate international body such as PCIA). Training will also be provided on how to deal with non-responses, refusals and other problems should these occur.

Outliers will be dealt with by applying the CDM materiality principles outlined in CMP7. That is, the outliers will be disregarded if doing so does not lead to an overestimation of the emissions reductions of a group of CPAs of higher than:

- 5% in the case of SSC-CPAs (CMP 7, Paragraph 4(d))

SECTION E. Approval and authorization

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The CME has received approval and authorization from SERNA (DNA of Honduras) via approval letter dated May 17, 2012 for voluntary participation in the PoA as project participant.

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Appendix 1. Contact information of CPA implementer(s) and responsible person(s)/ entity(ies) for completing the CDM-CPA-DD-FORM

CPA implementer and/or responsible person/ entity	☒ CPA implementer(s) ☐ Responsible person/ entity for completing the CDM-CPA-DD-FORM
Organization	Envirofit International Ltd
Street/P.O. Box	109 N College Ave Suite 200
Building	
City	Fort Collins
State/Region	Colorado
Postcode	CO 80524
Country	USA
Telephone	
Fax	
E-mail	
Website	www.envirofit.org
Contact person	Nathan Lorenz
Title	Vice-President - Engineering
Salutation	
Last name	Lorenz
Middle name	
First name	Nathan
Department	
Mobile	
Direct fax	+001 970 221-2874
Direct tel.	+001 970-372-2874
Personal e-mail	nathan.lorenz@envirofit.org

CPA implementer and/or responsible person/ entity	☒ CPA implementer(s) ☐ Responsible person/ entity for completing the CDM-CPA-DD-FORM
Organization	Fundacion para el Desarrollo Integral de Honduras (FUNDEIH)
Street/P.O. Box	Ave. Juan Lindo, Calle Guyana
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City	Col. Palmira
State/Region	Tegucigalpa
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Country	Honduras
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Fax	
E-mail	
Website	www.fundeih.org
Contact person	Eva Collier
Title	
Salutation	
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First name	Eva

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CPA implementer and/or responsible person/ entity	☐ CPA implementer(s) ☒ Responsible person/ entity for completing the CDM-CPA-DD-FORM
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Salutation	
Last name	Lohia
Middle name	
First name	Rohit
Department	
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Direct fax	
Direct tel.	
Personal e-mail	rohit.lohia@envirofit.org

Appendix 2. Affirmation regarding public funding

No public funding is involved in the CPA.

Appendix 3. Applicability of methodology(ies) and standardized baseline(s)

BASELINE INFORMATION

I. Baseline Description

According to Methodology AMS-II.G, the baseline data is the assumed use of fossil fuels for meeting similar thermal energy needs in the absence of the project activity. The baseline is determined through a review of publicly available historical data and surveys. Specifically, baseline information is established for:

(a) η_{old} – Efficiency of the system being replaced. As described in AMS-II.G, the CPA will use a default value of 0.1 or 0.2 as per the stoves being replaced by the CPA or a weighted average in case of a mix of them or conduct surveys to determine the same, if desired

(b) $B_{old,i}$ – Quantity of woody biomass per appliance used in the absence of this project activity to be determined using published literature or surveys at CPA level.

II. Identification of baselines and target populations

The CPA includes the Target consumer group 1: Residential biomass users, which consists of people using biomass for household for residential purposes out of the 3 target consumer groups specified in the PoA-DD.

III. Baseline studies

Baseline scenario 1: Residential biomass users

Target population:
The target population of this baseline consists of all residential users of firewood fuelled cookstoves in Honduras.

Objective:
The purpose of establishing this baseline scenario (Target Consumer group 1: "Residential biomass users") is to facilitate the assessment of baseline stove type and of fuel consumed by this target population in the absence of the program activity. Amongst this population, the project activity provides improved cookstoves to households using firewood or biomass fuel on traditional stoves or 3-stone fires.

(a) η_{old} = *Efficiency of the system being replaced. As described in AMS-II.G, this project will use a default value of 0.1 because the systems being replaced are either three stone fire stoves or conventional systems with no improved combustion air supply or flue gas ventilation system. This will be proven and justified in sections below.*

The baseline stove efficiency has been taken as 0.1 based on the following information available:

1. Ashden Awards Case Study, TWP, Honduras, Ashden Awards 2005 – The case study states that "About 90% of rural households and 50% of urban households in Honduras use fuelwood for cooking, which is done mostly on open fires and often indoors."
   "These stoves waste 90% of the potential wood energy and the burning contributes to global warming."
   http://www.ashden.org/files/TWP%20full.pdf
   http://stoves.bioenergylists.org/stovesdoc/TWP/honduras/Honduras%202%20pager%20Ashden.pdf
2. Promotion of Sustainable Use of Natural Resources and Local Economic Development (PRORENA – EnDev component) – Report by GTZ, July 2007 – "In Honduras, wood is up to date the most important cooking fuel with a share of 84 % of the households using it exclusively for cooking. Another 13 % of the households use both, fuelwood and gas or electricity for cooking and only 3 % of the households cook exclusively with LPG or electricity. In majority the traditional not efficient stoves are in use...."
   https://energypedia.info/images/6/63/Honduras_final_report.pdf
3. Programa de aumento del aprovechamiento de fuentes renovables de energía (srep) plan de inversiones de honduras – refer page 24, table 13: the source of this information is Study on fuelwood consumption, April 2011 Produced by SERNA, EAP and ECLAC. As per the same 44.7% urban households and 76.8% of rural households use fuelwood stoves for cooking. The remaining users rely on gas / electricity based cookstoves. However, in the fuelwood stove category (i.e. 44.7% urban and 76.8% rural households) more than 90% of households (both in case of urban as well as rural) rely on traditional / conventional stoves

for cooking. The report also mentions that, "The energy matrix has a high consumption of firewood, which is done more in inefficient stoves..... The experience of the main institutional actors and cooperation International shows that the problem lies not in the use of firewood, but the inadequacy of the traditional technology....."(para 64)
"Although it has been well received by users, the introduction of improved stoves in Honduras has been limited: its current share is only 9.9% in rural areas and 2.9% in the urban area" (para 65)

Cuadro 13: Tipo de estufa en uso según área (%)

Tipo de estufa	Urbano	Rural	Total
Fuente leña			
Fogón suelo	0.6	1.9	1.3
Fogón tradicional	39.8	63.6	52.0
Fogón mejorado "Justa tradicional"	2.3	6.9	4.6
Fogón mejorado "Justa 2x3"	0.6	3.0	1.8
Otros fogones mejorados (Lorena)	1.4	1.4	1.4
Fuente no leña			
Estufa de gas	23.6	12.4	17.9
Estufa eléctrica	28.5	10.5	19.3
Otra	3.2	0.3	1.7
Total	100.0	100.0	100.0

Fuente: Estudio sobre consumo de leña, Abril 2011. Producido por la SERNA, EAP y CEPAL

http://www.sefin.gob.hn/wp-content/uploads/2011/09/Honduras_Plan_de_Inversiones-SREP.pdf

4. Lastly, most available improved wood stoves are planchas typically placed over inefficient open fires or rudimentary "improved" cookstoves which historically, have been distributed by NGOs or through other non-commercial programs[19]. While these "improved" cookstoves can remove smoke from the kitchen via a chimney if they are properly installed and maintained, they can still have higher wood use and lower thermal efficiency than a three-stone fire. In 2008, Aprovecho Research group evaluated the wood use of a range of stoves, including several "improved" plancha stoves. The study found that three stone fires consumed approximately 1250g to complete the Water Boil Test (WBT)[20], while all of the plancha/griddle stoves with chimney used 1400 to 2100 g[21] for the same task. The results demonstrate that in all cases the plancha stove actually have higher wood consumption compared to a three stone fire. Separate and independent stove testing completed using the same WBT protocol at Zamorano University in Honduras also showed that all of the locally available stoves used more wood than an open fire[22]:

[19] Díaz Giménez, R. (2010) *OLADE Informe: Proyecto apoyo a la Matriz de Acciones para la Integración y Desarrollo Energético de Centroamérica*, page 61.

[20] MacCarty N. (2008) *Proposed Benchmarks For Wood Burning Cookstoves,* page 2, table 1, see "Three Stone Fire", and Aprovecho Research centre, Test Results of Cookstove Performance, chapter 1, page 15, chapter 2, page 51-53 ,

[21] MacCarty N. (2008) *Proposed Benchmarks For Wood Burning Cookstoves,* page 4, table 5, see "Griddle with Holes for Pots" and "Griddle Only" and Aprovecho Research centre, Test Results of Cookstove Performance, chapter 1, page 25, 29, 31, 33, chapter 2, page 51-53

[22] Longwell, T. *Zamorano Improved Stove Certification Center: Evaluation of seven improved efficiency stoves in the laboratory and local communities,* page 2.

Indicadores	Unit	1 Justa Tradicional	2 Justa 2 x 3 Proyecto Mirador	3 Onil	4 Ecofogón	5 Incawasi	6 Patsari	7 Malena
Fuel to Cook 5L (850/1500)	g	3176.0	2962.2	3291.8	3033.5	1860.0	5092.5	3874.1
CO to Cook 5L (20)	g	56.5	37.8	28.6	38.1	21.7	252.3	42.0
PM to Cook 5L (1500)	mg	8270.7	5656.5	2377.3	4297.2	4228.1	34236.3	7550.0
Energy to Cook 5L (15,000/25,000)	kJ	58,483	54,546	60,616	55,860	34,249	93,773	71,338
Time to Boil	min	57.1	54.2	50.7	79.5	54.2	39.7	60.0
CO2 to Cook 5L	g	4488.7	3745.3	4207.8	4324.9	2444.5	3262.5	3669.7

Table 1: Comparison of WBT results for seven improved efficient fuel wood stoves. Testing conducted by Zomorano University, Honduras.

In light of aforesaid, it is substantiated that the used of traditional, inefficient conventional stoves is a prevailing practice in Honduras and the default value of 0.1 for baseline stove efficiency is deemed appropriate.

(b) $B_{old,i}$ – Quantity of woody biomass per appliance used in the absence of this project activity

Baseline fuel usage quantification for residential stoves used for residential purposes was determined from the report "Energy Efficiency in Central America: Progress and Action towards the fulfilment of Goals of the Central American Sustainable Energy Strategy" by Victor Hugo Ventura and Ryan Carvalho, published by UN-CEPAL, 2014.

As per the report, page 18, firewood is a key component of the primary energy mix in Central America and is used primarily for cooking in rural areas. Over the period 2007-2011 per capita firewood consumption in the region has remained steady and no real reduction can be observed. The reduction in firewood consumption through deployment of efficient firewood stoves is one of the goals of energy Strategy 2020.

TABLE 3
CENTRAL AMERICA: FIREWOOD CONSUMPTION PER CAPITA, 2007-2011
(In barrel of oil equivalent (boe)/inhabitant)

Country	2007	2008	2009	2010	2011
Costa Rica	0.76	0.96	0.60	0.66	0.62
El Salvador	0.89	0.90	0.59	0.59	0.59
Guatemala	1.97	1.95	2.02	2.65	2.64
Honduras	1.53	1.57	1.57	1.58	1.58
Nicaragua	1.26	1.25	1.23	1.21	1.23
Panama	1.01	0.93	0.86	0.78	0.71
Central America	0.97	0.97	0.96	0.97	0.97

Source: SIEE, OLADE.

Thus, 1.58 barrels of oil equivalent/capita/year has been used as baseline firewood consumption in project households.

Parameter	Value	Units	Reference / Source

$B_{old,i}$	1.580	barrel of oil equivalent/year /capita	http://www.cepal.org/en/publications/energy-efficiency-central-america-progress-and-action-towards-fulfillment-goals-central
	0.010	TJ/year/capita	conversion of BOE to TJ
	0.645	tonnes/year/capita	conversion of TJ to tonnes of wood using $NCV_{biomass}$
Household size	4.810	number	http://ww2.unhabitat.org/habrdd/conditions/centamerica/honduras.htm
$B_{old,i}$	3.100	tonnes/year (per stove)	Assuming one stove per household. Ex-post only one project stove will be eligible for claiming credits

Appendix 4. Further background information on ex ante calculation of emission reductions

See Emission reduction calculator.

Appendix 5. Further background information on monitoring plan

Details of the monitoring plan are described in the CPA-DD, section D.7.

Appendix 6. Summary of post registration changes

1. Minor Editorial Changes
2. Correcting FUNDEIH as the CPA Implementer (Distributing Organization)
3. Correcting the CPA Operational and management plan to indicate FUNDEIH as the Distributing Organization (DO) instead of Envirofit International. (FUNDEIH was earlier referred as a seller)

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Document information

Version	*Date*	*Description*
04.0	9 March 2015	Revisions to: • Include provisions related to statement on erroneous inclusion of a CPA; • Include provisions related to delayed submission of a monitoring plan; • Provisions related to local stakeholder consultation; • Provisions related to the Host Party; • Editorial improvement.

Version	*Date*	*Description*
03.0	25 June 2014	Revisions to: • Include the Attachment: Instructions for filling out the component project activity design document form for CDM component project activities (these instructions supersede the "Guidelines for completing the component project activity design document form" (Version 01.0)); • Include provisions related to standardized baselines; • Add contact information on a CPA implementer and/or responsible person/ entity for completing the CDM-CPA-DD-FORM in A.13. and **Error! Reference source not found.**; • Add general instructions on post-registration changes in paragraph 4 and 5 of general instructions and **Error! Reference source not found.**; • Change the reference number from *F-CDM-CPA-DD* to *CDM-CPA-DD-FORM*; • Editorial improvement.
02.0	13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the component project activity design document form" (EB 66, Annex 16).
01.0	27 July 2007	EB33, Annex42 Initial adoption.

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