



**SMALL-SCALE CDM PROGRAMME OF ACTIVITIES DESIGN DOCUMENT FORM  
(CDM SSC-PoA-DD) - Version 01**

**NAME /TITLE OF THE PoA: Programme for replacement of traditional cookstoves  
with modern cookstoves in India**



CDM – Executive Board

page 1

**CLEAN DEVELOPMENT MECHANISM  
SMALL-SCALE PROGRAMME OF ACTIVITIES DESIGN DOCUMENT FORM  
(CDM-SSC-PoA-DD) Version 01**

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**NOTE:**

- (i) This form is for the submission of a CDM PoA whose CPAs apply a small scale approved methodology.
- (ii) At the time of requesting registration this form must be accompanied by a CDM-SSC-CPA-DD form that has been specified for the proposed PoA, as well as by one completed CDM-SSC-CPA-DD (using a real case).



**SECTION A. General description of small-scale programme of activities (PoA)**

**A.1 Title of the small-scale programme of activities (PoA):**

>>

Programme for replacement of traditional cookstoves with modern cookstoves in India

Version: 1

**A.2. Description of the small-scale programme of activities (PoA):**

>>

1. General operating and implementation framework of PoA

This small scale programme of activities involves the stimulation of distribution of modern cookstoves in rural India by making them affordable for local communities. These higher efficiency cookstoves will replace the traditional mud based cookstoves prevalent in the villages. The programme will include different kinds of modern cookstoves depending on the beneficiary needs. By reducing fuel consumption, the PoA reduces greenhouse gas emissions from the use of non-renewable biomass. Carbon finance will be used to facilitate the purchase, distribution and marketing of stoves, without which the activities would not take place. The modern cookstoves disseminated under this programme would depend on models available in the market and beneficiary choice. These stoves would replace only traditional biomass based stoves.

Zero Emissions Technologies S.A. (Zeroemissions) is the Managing Entity for this PoA. Zeroemissions will be assisted by Greenway Ecodevelopment Pvt Ltd (Greenway) which will be the co-managing entity for some or all CPAs. The on the ground distribution of the modern cookstoves would be undertaken by Non-Governmental Organisations (NGO) or any other participating organization working or interested in that specified area. The NGO/participating organization will be selected by Zeroemissions and Greenway for individual CPAs. The NGO/participating organization would be involved in purchasing the modern cookstoves from the selected suppliers and distribution of the same thus acting as CPA activity implementer.

When purchasing the modern cookstove from the NGO/participating organization at reduced costs, the beneficiary will sign an agreement with the NGO containing necessary information about the cookstove. The agreement will also contain necessary identification details of final beneficiary, thus avoiding any duplicity. The agreement would also give the NGO/participating organization the rights to the CERs.

The NGO/participating organization will use revenue from the sale of CERs to reduce the costs of the modern cookstove to the beneficiary, provide free or subsidized maintenance of the cookstove and to recoup the NGOs incurred associated costs of disseminating the stoves, research & development, training, marketing and other incidental expenses.

2. Policy/measure or stated goal of the PoA

The goal of this PoA is to make modern cookstoves available at affordable prices in households of rural India that predominantly rely on non renewable biomass for their cooking energy needs using traditional cookstoves. The project proponents aim to replace the traditional cookstoves prevalent in these parts since



these are extremely inefficient and lead to health and environmental risks. The PoA will have specific impacts and lead to sustainable development as defined below:

### **Environmental Well Being**

The programme would lead to reduction in deforestation and greenhouse gas emissions on account of lesser fuel usage and cleaner combustion with modern cookstoves.

- **Reduced Deforestation**

The traditional cookstoves being used at present have very low efficiency, thus by replacing them with modern cookstoves the quantity of non-renewable biomass needed will be reduced which will reduce cutting down of forest cover.

- **Abatement in GHG Emissions**

Enhanced thermal efficiency of modern cookstoves will lead to reduction in GHG emissions on account of lesser combustion of fuel and better heat transfer.

### **Social Well Being**

The use of traditional cookstoves is understood to be a dangerous chore which affects women and children the most on account of indoor air pollution and time spent on fuel collection.

- **Improvement in health conditions**

The traditional cookstoves are a risk to the health of the women and children present in the kitchen. The ill effects on health of such systems have also been adequately established; it is estimated by the World Health Organization that the pollution caused by such stoves is the third most significant health risk faced by rural communities in India<sup>1</sup>. Thus by replacing these Cookstoves many health risks can be averted. Studies indicate that over 5,70,000 deaths were caused in the country in 2009 on account of indoor air pollution (CO, CO<sub>2</sub> and Particulate Matter) caused by the usage of traditional cookstoves<sup>2</sup>.

- **Reduction in time spent in collection of firewood**

Collection of firewood or other biomass entails drudgery for children and womenfolk in rural areas. Reduction in the amount of firewood required would lead to them spending more time productive activities such as education, employment etc.

- **Employment generation in rural areas**

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<sup>1</sup> World Health Organization

[http://www.searo.who.int/en/Section1243/Section1310/Section1343/Section1344/Section1357\\_5349.htm](http://www.searo.who.int/en/Section1243/Section1310/Section1343/Section1344/Section1357_5349.htm)

<sup>2</sup> C. Venkataraman , A.D. Sagar , G. Habib , N. Lam , K.R. Smith , The Indian National Initiative on Advanced Biomass Cookstoves : The benefits of clean combustion, March 2010



Dissemination, capacity building, monitoring, maintenance and other activities mandated by the programme would lead to gainful employment generation in rural areas.

### Economic Well Being

The programme engages the labour force in manufacture, dissemination and awareness creation thus generation employment.

- The programme will lead to investments towards manufacturing and dissemination of modern cookstoves thus benefitting the economy on the whole. Distribution and awareness building initiatives associated with the same will generate employment in rural areas.

### Technological Well Being

The programme propagates modern cookstoves based on sound, superiors and environmentally safe combustion and heat transfer technologies; this would further encourage others to develop and distribute efficient cookstoves.

### 3. Confirmation that the proposed PoA is a voluntary action by the coordinating/managing entity.

There are no laws or mandatory requirements in India stipulating or encouraging the adoption of modern cookstoves by households and other kitchen establishments. Presently no central or state level government policies exist that specifically promote modern cookstoves/improved chulhas/smokeless chulhas through subsidies, distribution schemes, excise exemptions etc. Government linked initiatives include a National Programme on Improved Cookstoves (NPIC) under the Ministry of New and Renewable Energy (MNRE), the NPIC was formally closed in 2004, a new initiative by MNRE presently focuses on dissemination strategies and rigorous testing of commercial cookstove models however no policy initiative on this subject has been introduced or envisaged by the MNRE. Thus this PoA is a voluntary action by the managing entities Zeroemissions and Greenway.

### **A.3. Coordinating/managing entity and participants of SSC-POA:**

>> The following information shall be included here:

1. Coordinating or managing entity of the PoA as the entity which communicates with the Board

The managing entity for this PoA is Zero Emissions Technologies S.A. and shall be responsible for communicating with Executive Board. Greenway Ecodevelopment Pvt Ltd will be the co managing entity for the purpose of project execution.

2. Project participants being registered in relation to the PoA. Project participants may or may not be involved in one of the CPAs related to the PoA.

Zeroemissions and Greenway are the project participants and may or may not be involved in one of the CPAs related to the PoA

Name of Party involved ((host)	Public or private entities	Parties involved wish to
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indicates a host party)	Project Participants	considered as project participant?
India (host)	Greenway Ecodevelopment Pvt. Ltd.	No
Spain	Zero Emissions Technologies S.A.	No

**A.4. Technical description of the small-scale programme of activities:**

>>

**A.4.1. Location of the programme of activities:**

>>

India

**A.4.1.1. Host Party(ies):**

>>

India

**A.4.1.2. Physical/ Geographical boundary:**

>> Definition of the boundary for the PoA in terms of a geographical area (e.g., municipality, region within a country, country or several countries) within which all small-scale CDM programme activities (SSC-CPAs) included in the PoA will be implemented, taking into consideration the requirement that all applicable national and/or sectoral policies and regulations of each host country within that chosen boundary;

All SSC-CPAs and SSC-POAs will be implemented within the geographical boundaries of Republic of **India**. (Geographic co-ordinates of 6°44' North - 35°30' North, 68°7' East - 97°25' East) as shown in figure below:



*Illustration 7: Map of India showing the area within this PoA.*

#### **A.4.2. Description of a typical small-scale CDM programme activity (CPA):**

>>

Considering that the PoA covers India as a target geography, it is important to discuss in brief about the diversity generally observed in rural cooking practices, which entails working across varied and diverse cultures and topographies which further leads to diversity in cooking practices as well however biomass (including non renewable biomass) usage for cooking needs is a dominant practice in all parts of the country.

Over 80% of the primary energy used in India comes from biomass, of which wood accounts for 56%<sup>4</sup>. However the cooking habits of villagers in rural India are varied in nature. Some of the parameters that vary across households in India are:

##### 1) Type of firewood used

<sup>4</sup> C. Venkataraman , A.D. Sagar , G. Habib , N. Lam , K.R. Smith , The Indian National Initiative on Advanced Biomass Cookstoves : The benefits of clean combustion, March 2010



The type of firewood used by households for combustion varies widely across India based on availability in that region.

2) Size to which wood is chopped down before burning

Based on the particular design of Mud cookstove used in the region the wood is either chopped down or used as a whole by lateral insertion into the stove.

3) Size of traditional mud cookstove used

The height and circumference of the traditional Cookstove depends on the preference of the local population in that rural district and varies widely across India.

4) Hours of cooking

The hours of cooking area based on the number of people in the households and different needs give rise to different stove designs.

These parameters vary region by region across India based on the following factors:

1) Socio-Economic condition of the Villagers:

The economic conditions in the village decide the mud cookstove design used predominantly in the area. It has been witnessed that in districts where the villagers are more affluent the traditional cookstoves are larger and made of mud moulds along with brick reinforcements whereas in poor regions even a simple 3 brick formation is used apart from all mud constructions. A fundamental correlation between cooking practices and income level is that of the presence of a separate kitchen area in rich households compared to the use of the cookstove in the living room itself. Additionally while the poorer households use simple mud constructions, the use of brick and metal is witnessed in relatively better off households, the next higher income group often uses metal, cement and brick based constructions.

2) Type of trees and biomass used:

The design of the stove also is also dependent on the type of biomass combusted for cooking purposes. As the type of biomass varies by region depending on climate and topography so does the design of the cookstoves.

Species of Biomass commonly used in certain regions:

Scientific Name	Indian Name
Prosopis Joliflora	Jund
Acacia Nilotica	Babul



Acacia Tortlis	Israeli Babul
Zizyphus Mauritania	Ber
Capparis Decidua	Karir
Calatropis Procera	Ok

Richer village households tend to use greater quantities of dried cow dung (if no alternate use is being employed) given more cattle ownership.

3) Social Customs:

Social customs also play a major role in cookstove design and cooking practices across India.

4) Preferences of the local population:

Sometimes people of different regions have different sets of needs and preferences, such as height of cookstove etc. Based on regional preferences the cookstove designs vary.



*Illustration 1: Mud based cookstove and fuel storage in Wardha, Maharashtra*







*Illustration 2: Mud based cookstove in Chandrapur, Maharashtra*



*Illustration 3: Mud based cookstove and fuel storage in Madela, Pali, Rajasthan*



*Illustration 4: Mud and brick cookstove used in Polay Kalan, Kalapipal, Shajapur, Madhya Pradesh*



*Illustration 5: Mud stove being used in Nawanshahar, Punjab*



*Illustration 6: Mud stove in use at Wardha, Maharashtra*

As is evident from the above, there are a variety of mud cookstove designs being used in rural India dependent on various parameters. Thus it becomes difficult to replace all these different kinds of mud cookstoves with a single modern cookstove. The preferences and needs of the local population have to be kept in mind when replacing the mud cookstove with a modern and high efficiency cookstove. This is to ensure that the acceptance of the modern cookstove is not compromised on account of drastic changes in the cooking practices.



### **Selection of Cookstoves by the final beneficiary:**

As been described above due to diversity in the cooking habits of villagers in rural their requirements or expectations from a modern cookstove vary within each CPA as well, and thus project proponents plan to distribute different modern cookstoves based on demands by the villagers/beneficiaries. The process for selection of the preferred cookstove will take place in the following way:

#### 1) Discussion with NGOs/CBOs active in that CPA:

The project proponents will have discussions with the NGOs and **Community Based Organisations** CBOs working in that CPA. This is because the NGOs have been active in that region since a long period of time and are well aware of the current habits of the local population and would be a fair judge of the requirements of the villagers. The project proponents would take and demonstrate the various modern cookstoves to the NGO/CBO so that they can have a better understanding. The cookstoves would be left behind with the NGOs/CBOs so that they can ask a few sample villagers to try them out and provide the feedback. After a period of a few weeks, when the NGO/CBO and the project proponent has narrowed down the list of the preferred cookstoves the selected modern cookstoves will be showcased at a broader scale during the stakeholder meeting.

#### 2) Showcasing the selected modern cookstoves during the stakeholder meeting:

A stakeholder meeting will be held in the CPA where the various local stakeholders and local population will be invited to provide their comments and feedback at the project. Among the various stakeholders such as government officials, members from the environment ministry and forest officers, the various heads of the village Panchayats will be invited. The panchayat heads and heads of villagers will be shown the different modern cookstoves selected for the region and their feedback will be taken.

#### 3) Leaving the various prototypes with the village panchayats

A few models of the selected stoves will be left with the village heads and the Panchayat heads so that the villagers may look at them at close quarters and decide on which model and design suits them the best. This way the beneficiaries will be able to decide for themselves based on their preferences and requirements and help in easy replacement from traditional Cookstoves.

#### 4) Demonstration at the time of signing of contract with villagers:

When the contracts (formalizing the beneficiary's engagement in the CDM programme) will be signed with the villagers the various cookstoves will be demonstrated to them in person so that they can select which model they prefer based on their requirements. The villagers will be asked to put in their selection in their respective contracts and their preferred cookstove will be the model used to replace their traditional mud cookstoves.



### **Description of a Typical CPA**

A typical CPAs would entail the distribution of modern cookstoves at affordable subsidized costs to beneficiaries found willing to switch to modern cookstoves (thus completely discontinuing the use of traditional stoves) and unable to afford them at prevailing market prices. The programme would be undertaken where traditional cookstove usage is dominant and LPG, kerosene, electricity is either not available or considered unaffordable – these are understood to be households, school kitchens, tea stalls, eateries etc. in rural areas; regions of implementation would be those where usage of non renewable biomass is established for cooking purposes thus contributing to deforestation.

Each CPA will be implemented by a NGO and will consist of selling the modern cookstove at an affordable and subsidised price to the beneficiary. The NGO will also be responsible for after sales servicing and monitoring in their CPA and be entitled to receiving and managing carbon revenues generated on account of switch to and usage of modern cookstove by beneficiary, The NGOs would put in effect contractual agreements with modern stove suppliers that ensure warranties, user training etc. The choice of modern cookstove provided to a beneficiary would be done in stakeholder consultations and discussions between the NGO and beneficiary.

### **Location and energy limitation:**

Each CPA will be implemented by a NGO and will be within the boundary of the PoA specified in section 4.1.2. Each CPA will also be within the maximum energy saving of 180 GWh/year. In cases where the number of modern cookstoves per CPA exceeds the energy limit, the number of Certified Emission Reductions (CERs) shall be capped at those generated by cookstoves saving a maximum of 180 GWh/year. As further discussed in section A.4.4.1 below, CPAs under this PoA are considered as being not a de-bundled component of a large scale activity.

### **Implementation Plan:**

The aim of the PoA is to distribute such modern cookstoves across CPAs in India meeting the general requirements of the local population. The project proponents thus offer a variety of cookstove models in across CPA and within each CPA.

The NGO will be responsible for the procurement, installation and after-sales service of the modern cookstove. The operation of the cookstove will be carried out by the beneficiary, and training or instructions on how to operate and maintain the cookstove will also be given by the NGO.

The NGO will follow a monitoring plan and keep track of the cookstoves sold and the beneficiaries. The NGO will also be responsible for storing data so that the monitoring reports can be prepared each year. In order to facilitate this, the NGO will keep records and will pass it on to the managing entities.

### **Beneficiary Contract:**

Before the sale of the cookstove, the beneficiary shall be informed that benefits due to CDM are being generated by the use of the modern cookstove and these benefits are in turn being used to lower the sales price of the cookstove. The user shall agree, as per the contract, to:



1. Transfer all the CERs to the NGO.
2. Cooperate with the NGO and the managing entities for monitoring purposes.
3. To discontinue the use of the traditional cookstove.
4. To inform the NGO, incase the modern cookstove suffers from any issue.
5. To inform the NGO incase of stoppage of use of the modern cookstove

The contract will also contain the following information:

- Name of the head of the beneficiary household.
- Address of the beneficiary
- Date of Purchase
- Signature of beneficiary
- Stove model
- Serial Number
- Name of NGO selling the modern cookstove.

A copy of the contract will be retained by beneficiary and NGO.

#### **Monitoring:**

Each CPA will be monitored separately and the CERs are calculated for each CPA based on data monitored by each NGO for their CPA. The NGO will keep record in their CPA with regard to the cookstoves sold and the other parameters. Duplicate records are kept by the managing entities and all NGO records are screened through spot visits in order to confirm the data is correct and no double counting has taken place.

#### **A.4.2.1. Technology or measures to be employed by the SSC-CPA:**

>>

The activities under this PoA will encourage the residents of rural India to shift from their traditional cookstoves to the proposed modern cookstoves. The modern cook stoves have significantly enhanced thermal efficiency on account of better materials and design. During the course of the PoA, it is expected that the performance and usability of modern cookstoves will improve further. This will helping reduction of biomass consumed for cooking purpose across households in rural India.

The modern cookstove models disseminated under this PoA would be independently tested and certified by appropriate Government authority/agency to determine their power rating, thermal efficiency, safety and air pollution performance as per the applicable standard.

#### **A.4.2.2. Eligibility criteria for inclusion of a SSC-CPA in the PoA:**

>> Here only a description of criteria for enrolling the CPA shall be described, the criteria for demonstrating additionality of CPA shall be described in section E.5

SSC-CPAs that are to be enlisted under this PoA must fulfil the eligibility criteria given below:



- The NGOs/participating organization responsible for each CPA would actively take part in the distribution of the improved cook stove and possess a credible community service record in the CPA geography.
- Must be implemented within the geographical coordinates of Republic of **India**.
- Energy savings must not exceed 180 GWh/yr
- The CPA consists of distribution of modern cookstoves type defined in the CPA-DD, and hence small appliances involving the efficiency improvements in the thermal applications of non-renewable biomass as per AMS II. G and must implement the baseline and monitoring technology AMS II-G version 2 “Energy efficiency measures in thermal editions of non-renewable biomass”, specifically the process outlined in section E.7.2.
- Beneficiaries chosen under the PoA must be from rural area, i.e., the CPA targets the low income group of the society.
- The region of implementation of CPA should not be covered by another CPA or CDM project involving the distribution or installation of modern cookstoves.
- The CPA has not been registered as a separate CDM project and has not been registered under any other active PoA.
- Leakage from the source must be avoided. Also it should be ensured that no other CPA programme or CDM activity should be trying to save the same non-renewable biomass in the specified boundary.
- **Using the baseline survey method, it should be demonstrated that non-renewable biomass is used since 1989.**

**A.4.3. Description of how the anthropogenic emissions of GHG by sources are reduced by a SSC-CPA below those that would have occurred in the absence of the registered PoA (assessment and demonstration of additionality):**

>>

**Confirmation that the proposed PoA is a voluntary action by the coordinating/managing entity**

The proposed SSC-PoA is a voluntary and coordinated action. There are no mandatory requirements in India stipulating the use of energy efficient thermal appliances. In addition, the PoA requires individual households to take voluntary action to participate in the project activities.

**Justification of additionality of PoA**



Over 80% of the primary energy used in India comes from biomass, of which wood accounts for 56%<sup>5</sup>. The majority use inefficient traditional mud cookstoves. The introduction of modern cookstoves results in substantial wood fuel savings, reducing the amount of wood households must consume for their daily needs. Households must therefore consume less non-renewable biomass, which in turn results in reduced greenhouse gas emissions.

The PoA Procedures require demonstration that in the absence of the CDM

- (i) If the PoA is implementing a voluntary coordinated action, it would not be implemented in the absence of the PoA;
- (ii) If the PoA is implementing a mandatory policy/regulation, this would/is not enforced;
- (iii) If mandatory a policy/regulation is enforced, the PoA will lead to a greater level of enforcement of the existing mandatory policy/regulation.

In the absence of CDM the proposed voluntary scheme would not be implemented. According to the guidance given in attachment A to Appendix B of the “Simplified modalities and procedures for small-scale CDM project activities”, additionality of a small-scale CDM project can be demonstrated by showing that the project would not have occurred anyway due to the existence of one or more of the following barriers: (i) investment barrier, (ii) technological barrier, (iii) barrier due to prevailing practice, and (iv) other barriers. This shall constitute the demonstration of additionality of the PoA as a whole **and to be further validated at each CPA level.**

The PP proposes to demonstrate the project additionality through the investment barrier.

#### 1) Investment Barrier:

The procurement and distribution of the modern cookstoves to households entails costs for the NGO. The minimal costs of around Rs. 100 would be charged from each household. Other cost not accounted in the analysis include the costs incurred towards:

1. Purchase
2. Distribution

Though the costs would be SSC-CPA specific, however a general assessment is made as under.

Assuming that the NGO in the SSC-CPA aims to replace 20,000 traditional cookstoves with modern cookstoves, the only source of revenue is through sales of CERs issued as beneficiaries, given their economic conditions are unable to pay in part or full the price of the modern cookstove. There is no precedent for large-scale private involvement in cookstove promotion and distribution in India without assistance from carbon finance.

A simple cost analysis has been therefore undertaken to demonstrate that earning from the sale of CER is the only way to make project viable.

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<sup>5</sup> IED, India - <http://www.ieindia.org/pdf/86/faxdi85t1.pdf>





Although, the project proponent plans to charge a nominal fee of around INR 100/-, but the revenue generated using this means is insignificant compared to the investment required for the purchase of cookstoves, e.g. considering the bulk purchase for each cookstove the minimum procurement cost is around INR 950, thus with a revenue of around INR 100 per stove, there shall be a loss of around INR 850 per cookstove. Further there are other significant project costs including costs for overhead's plus freight and distribution of the cookstoves in the project area and Project management.

The following table shows the net present value (NPV) of the project activity for the tentative number of cookstoves to be distributed in the project activity i.e., 20,000 (typical CPA). To be most conservative a discount rate of 0 % is used for the calculation. In the table below it can be seen that the resulting NPV of the project without income from CER's i.e. without CDM Revenues is INR – 1.7 crores and thus have a negative cashflow. This excludes the other significant project management cost as explained above. Thus in the absence of CER sale revenue the project is not financially viable at all. The CDM Revenue provides the only financial incentive to implement the Project Activity.

**Net Present Value (NPV) & Simple Cost Analysis for complete project @ around 20,000 stoves**

Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
Cookstove costs	1.9 crores	0	0	0	0	0	0	0	0	0	1.9 crores
Cookstove sales	2.00 lacs	0	0	0	0	0	0	0	0	0	2.00 lacs
Net revenue	-1.7 crores	0	0	0	0	0	0	0	0	0	-1.7 crores

Under each CPA, the above simple cost analysis shall be re-validated, thus taking into account any change in cost over time.

**2) Other Barriers at household level:**

(i) Lack of awareness:

Villagers in rural India do not have adequate information on modern cookstoves<sup>6</sup>. They have been using traditional mud cookstoves for generations<sup>7</sup> and are unwilling to change especially since they are required to pay a high price for efficient cooking devices as opposed to a traditional cookstove which is a “Do It Yourself” device constructed at no cost. They have limited understanding about the disadvantages of the mud cookstoves as well as the health risks involved. They are also wary of spending a substantial part of their income on a new technology. Hence building consumer awareness is difficult.

(ii) High cost of modern cookstove compared to traditional cookstove:

<sup>6</sup> IPCC, Working Group III on Mitigation, <http://www.ipcc.ch/ipccreports/tar/wg3/index.php?idp=206>

<sup>7</sup> P.R. Shukla, Biomass Energy in India: Policies & Prospects, February 2008





The price of a modern and efficient cookstove available in the market today is minimum around 1000 INR (USD 23)<sup>8</sup> which is very high to a villager compared with the cost of making a mud cookstove. The high cost prevents the villagers from buying an efficient cookstove. According to the UNICEF, 42% of India's population lies below the poverty line of USD 1.25 per day<sup>9</sup>.

**Alternatives to the proposed activity:**

1. Mandatory replacement of traditional cookstoves with modern cookstove with greater efficiency without being registered as a CDM project activity.

This alternative is not possible because there is no law regulating the use modern cookstoves by replacing traditional cookstoves.

2. Replacing traditional cookstoves with modern cookstoves voluntarily without registering the activity as a CDM activity.

Although this alternative is possible, it is faced by certain barriers at the household level and also investment barriers as well which will prevent implementation of the project.

3. Continuing the use of traditional mud cookstoves

This alternative is possible since there is no regulation preventing the use of traditional cookstoves in households and it represents the choice in the business as usual scenario in the rural households.

Conclusion:

In order to make this project viable, it needs to overcome barriers such as Investment barrier and requires use of CDM benefit, hence proving that it is additional.

Replacing traditional cookstoves with modern cookstoves will lead to measurable reduction in the use of non renewable biomass for cooking purposes, thus leading to verifiable GHG reductions and improvement in the health conditions of women and children in villages.

**A.4.4. Operational, management and monitoring plan for the programme of activities (PoA):**

**A.4.4.1. Operational and management plan:**

>> Description of the operational and management arrangements established by the coordinating/managing entity for the implementation of the PoA, including:

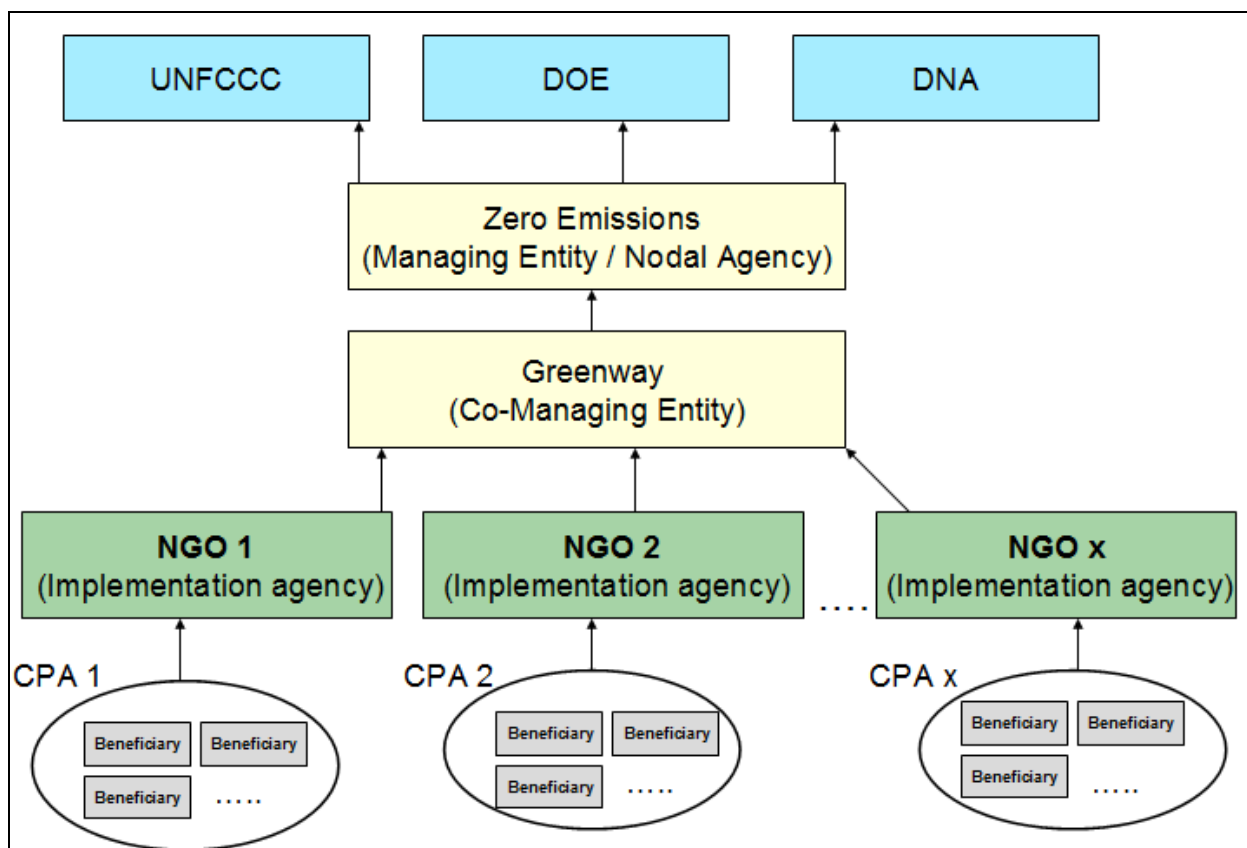
<sup>8</sup> Price quotations and stove MRPs for all major suppliers would be submitted at the time of validation

<sup>9</sup>UNICEF, [http://www.unicef.org/infobycountry/india\\_statistics.html#69](http://www.unicef.org/infobycountry/india_statistics.html#69)



- (i) A record keeping system for each CPA under the PoA,
- (ii) A system/procedure to avoid double accounting e.g. to avoid the case of including a new CPA that has been already registered either as a CDM project activity or as a CPA of another PoA,
- (iii) The SSC-CPA included in the PoA is not a de-bundled component of another CDM programme activity (CPA) or CDM project activity.
- (iv) The provisions to ensure that those operating the CPA are aware of and have agreed that their activity is being subscribed to the PoA;

**Operational and Management Structure:**



*Illustration 5: PoA operational and management structure*

Zeroemissions will be the managing entity and Greenway Ecodevelopment Pvt Ltd (Greenway) will be the co-managing entity. Zeroemissions will act as nodal agency with regard to all communications with UNFCCC, DNA for host country approval and DOE for validation and verification. Greenway will assist ZeroEmissions with all CDM related tasks and be in contact with the NGOs working in each CPA. The NGOs will be the PoA implementers at the CPA level. They will be in charge of sale



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of the modern cookstoves at discounted price and collecting data for monitoring. The general list of all the tasks and the responsible parties are as follows:

<b>S.No</b>	<b>Task Description</b>	<b>Responsible Entity(ies)</b>	<b>Related Documents</b>
1	Technical development of the PoA concept and related documents	Managing Entities (Zeroemissions and Greenway)	Project Implementation Plan and PoA-DD and generic CPA-DD
2	Inclusion of new CPAs	Managing Entities (Zeroemissions and Greenway)	Agreement between NGO and managing entity
3	Validation process	Zeroemissions	Contract with DOE
4	Project Registration process	Zeroemissions and Greenway	Host country approval, Modalities of communication with UNFCCC
5	Sale of modern cookstoves to beneficiary	NGO/participating organization	Beneficiary Contract and details
6	Annual monitoring	NGO/participating organization	Records of data collected with respect to condition of cookstove, quantity of biomass etc.
7	Verification process	Zeroemissions and Greenway	Contract with DOE for verification of individual CPA, Monitoring report for each CPA
8	Issuance of CERs	Zeroemissions	Modalities of Communication, CER Transfer Agreement

**Record keeping system for each CPA under the PoA:**

A standardized data recording formats shall be applied, used and maintained by the SSC-CPA implementer (NGO). The NGO would maintain appropriate records documenting the following variables *inter-alia*:

1. The geographical location of each CPA.
2. The name, address and record of specifications of modern cookstoves
3. The names, addresses and monitoring data of each household involved in sample households for monitoring surveys.
4. Destruction of traditional mud cookstoves as specified by methodology AMS II-G.

For details on how data would be recorded at the PoA level refer Section A.4.4.2.

**Avoidance of double counting:**

Double counting can take place if another CDM project or the CPA of another PoA is registered under this PoA. This will lead to double counting of energy efficient cookstoves and should thus be avoided, The project proponents plan to avoid double counting from taking place in the following ways:



1. Verifying credentials of NGO (Project implementer) at the time of implementation
2. While doing eligibility check for CPA, the project proponents will refer UNFCCC data to see that there is no similar CDM project or CPA registered within the boundary of the proposed CPA.
3. Each beneficiary household to which the modern cookstove has been supplied will be provided with a unique identification number.

#### **Procedure to check for De-bundling:**

Paragraph 10 of EB54, Annex 13 ‘Guidelines on assessment of de bundling for SSC project activities’ states that *“If each of the independent subsystems/measures (e.g., biogas digester, solar home system) included in the CPA of a PoA is no larger than 1% of the small-scale thresholds defined by the methodology applied, then that CPA of PoA is exempted from performing de-bundling check i.e., considering as not being a de-bundled component of a large scale activity”*

The AMS IIG threshold is a maximum energy saving of 180 GWh/ year. The debundling rule does not apply to this SSC-PoA as the efficient modern cookstove (the independent subsystem) being distributed does not exceed 1% of the SSC threshold. Each modern cookstove is in the order of magnitude of 0.01% of the SSC threshold.

#### **Provisions to ensure that those operating the CPA are aware of and have agreed that their activity is being subscribed to the SSC-PoA**

The managing entity will be responsible for identifying, training, registering and managing entities implementing SSC-CPAs, according to the criteria outlined in A.4.2.2. Declaration from the NGO/participating organization shall be taken with regard to the acceptance of their CPA being included in the PoA. These will clearly state that the CPA activities subscribe to this SSC-PoA and their proposed project activity adheres to all rules of qualification as CPA as discussed above in this section.

#### **A.4.4.2. Monitoring plan:**

>> The following information is provided here:

- (i) Description of the proposed statistically sound sampling method/procedure to be used by DOEs for verification of the amount of reductions of anthropogenic emissions by sources or removals by sinks of greenhouse gases achieved by CPAs under the PoA.
- (ii) In case the coordinating/managing entity opts for a verification method that does not use sampling but verifies each CPA (whether in groups or not, with different or identical verification periods) a transparent system is to be defined and described that ensures that no double accounting occurs and that the status of verification can be determined anytime for each CPA;

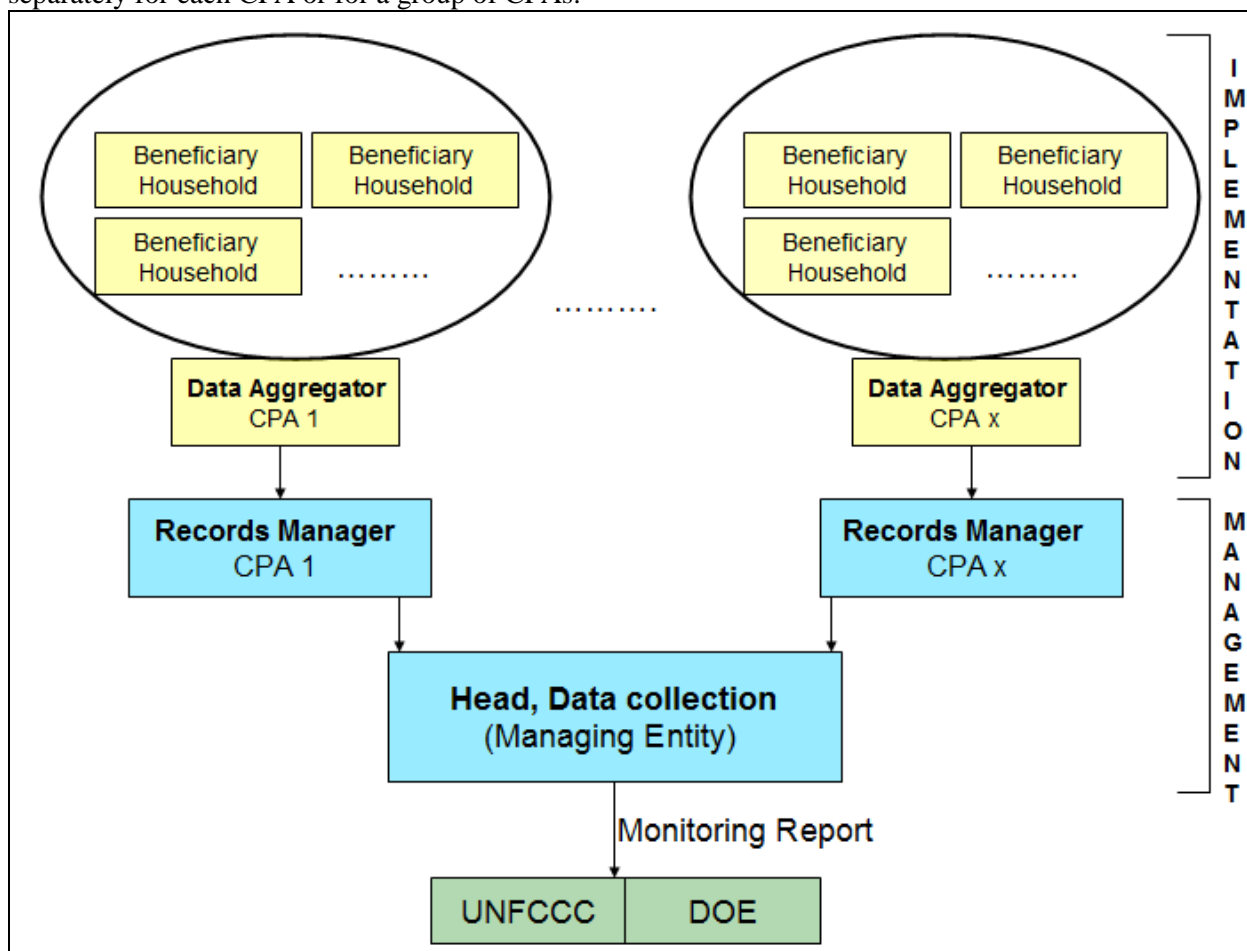
#### **Monitoring option chosen**



The managing entity has opted for a verification method that does not use overall sampling but verifies each CPA independently. Monitoring will be done for parameters as required by the approved methodology, AMS II G and elaborated in sections E.7.1 and E.7.2.

**Verification method**

Zero emissions will keep an electronic database of the data contained in all beneficiary Agreements and stove purchase agreements between stove suppliers and NGOs. Verification will be done either separately for each CPA or for a group of CPAs.



*Illustration 6: Data flow for modern cookstove PoA*

**A.4.5. Public funding of the programme of activities (PoA):**

>>

No public funding is involved in this PoA.



**SECTION B. Duration of the programme of activities (PoA)**

**B.1. Starting date of the programme of activities (PoA):**

>>

The starting date of the PoA is considered as the date of commencement of validation i.e., the date on which the CDM-PoA-DD is first published for global stakeholder consultation.

**B.2. Length of the programme of activities (PoA):**

>>

28 years (Renewable)

**SECTION C. Environmental Analysis**

>>

**C.1. Please indicate the level at which environmental analysis as per requirements of the CDM modalities and procedures is undertaken. Justify the choice of level at which the environmental analysis is undertaken:**

1. Environmental Analysis is done at PoA level
2. Environmental Analysis is done at SSC-CPA level

The Environmental Analysis is done at the PoA level because the cookstoves distributed by each NGO will have the same environmental impact wherever they are distributed irrespective of the CPA. Also, there exist no legal regulation in the country which regulates the use of household stoves by a user, further no negative environmental impacts are anticipated due to the replacement of traditional mud cookstoves with modern cookstoves in any CPA included under the PoA

**C.2. Documentation on the analysis of the environmental impacts, including transboundary impacts:**

>

The aim of this PoA is to replace traditional mud cookstoves prevalent across rural India with highly efficient modern cookstoves. The environmental impacts of this PoA are as follows:

1. The traditional cookstoves in use are highly inefficient, hence their replacement would lead to reduction in the quantity of biomass used for cooking purposes in the households.
2. Reduction of biomass used for cooking would reduce GHG emissions due to better efficiency.
3. Biomass needs for cooking are met through chopping of firewood and other non renewable biomass. By reducing the quantity the firewood required the PoA will lead to reducing deforestation.
4. The traditional cookstoves are a risk to the health of the women and children present in the kitchen. Thus by replacing these cookstoves health risks due to CO, CO<sub>2</sub> and Particulate Matter can be avoided.
5. Firewood is transported to areas having a shortage. Reduction in consumption would lead to lesser GHG emissions due to transport of firewood.



There are no negative transboundary impacts of the PoA.

**C.3. Please state whether in accordance with the host Party laws/regulations, an environmental impact assessment is required for a typical CPA, included in the programme of activities (PoA):**

>>

The Government of India does not require any documentation of the environmental impacts of the project activity. The project type/category is not included in the “List of projects or activities requiring prior environmental clearance” included in the Environmental Impact Assessment (EIA) notification of the Ministry of Environment and Forest (MOEF), Government of India, 2006<sup>10</sup>

**SECTION D. Stakeholders’ comments**

>>

**D.1. Please indicate the level at which local stakeholder comments are invited. Justify the choice:**

1. Local stakeholder consultation is done at PoA level
2. Local stakeholder consultation is done at SSC-CPA level

Note: If local stakeholder comments are invited at the PoA level, include information on how comments by local stakeholders were invited, a summary of the comments received and how due account was taken of any comments received, as applicable.

The local stakeholder consultation is done at the SSC-CPA level because of the varying nature of the NGOs implementing the project in the CPAs. By holding the stakeholder consultation meeting in each CPA, more comments can be sought from the local population and thus better understanding can be gained of the local issues of the primary stakeholders.

**D.2. Brief description how comments by local stakeholders have been invited and compiled:**

>>

Since stakeholder consultation is done at the SSC-CPA level, this will be provided at the CPA level in the CPA-DD.

**D.3. Summary of the comments received:**

>>

Since stakeholder consultation is done at the SSC-CPA level, this will be provided at the CPA level in the CPA-DD

**D.4. Report on how due account was taken of any comments received:**

>>

Since stakeholder consultation is done at the SSC-CPA level, this will be provided at the CPA level in the CPA-DD

**SECTION E. Application of a baseline and monitoring methodology**

<sup>10</sup> <http://envfor.nic.in/legis/eia/so1533.pdf>



This section shall demonstrate the application of the baseline and monitoring methodology to a typical SSC-CPA. The information defines the PoA specific elements that shall be included in preparing the PoA specific form used to define and include a SSC-CPA in this PoA (PoA specific CDM-SSC-CPA-DD).

**E.1. Title and reference of the approved SSC baseline and monitoring methodology applied to a SSC-CPA included in the PoA:**

>>

NOTE: The approved SSC baseline and monitoring methodology should be approved for use in a PoA by the Board.

Title: AMS II-G “Energy efficiency measures in thermal application of non-renewable biomass”.

Version: 3

**E.2. Justification of the choice of the methodology and why it is applicable to a SSC-CPA:**

>>

NOTE: In the case of CPAs which individually do not exceed the SSC threshold, SSC methodologies may be used once they have first been reviewed and, as needed, revised to account for leakage in the context of a SSC-CPA.

### Methodology

*The AMS II.G methodology is applicable to appliances involving the efficiency improvements in the thermal applications of non-renewable biomass.*

Examples of these technologies and measures include the introduction of high efficiency biomass fired cookstoves or ovens or dryers and/or improvement of energy efficiency of existing biomass fired cookstoves or ovens or dryers.

It has been ensured that there are no other registered CDM project activities in the region that save the same non-renewable biomass as the proposed project activities.

Various survey based studies have shown that biomass is the predominant source of cooking fuel for rural India. For each CPA a survey will be performed to prove that non-renewable biomass has been used for domestic fuel purpose since 31 December 1989.

The project boundary is the physical, geographical site of the efficient systems using biomass.

### PoA Applicability

India has an extensive firewood shortage problem. Per capita consumption of firewood has been steady for the past few decades, while the rate of population explosion has been alarming. A rapid increase in the prices of commercial fuels (kerosene, coal and charcoal), has led the poorer sections of society to use firewood/biomass for their domestic energy requirements.





India depends on firewood to satisfy 24% of the total energy consumption. Indian forests can sustainably provide  $41 \times 10^6 \text{ m}^3$  of firewood per year, even though annual demand for wood remains at  $241 \times 10^6 \text{ m}^3$  per year<sup>11</sup>. In the Indian household sector, the bulk of energy is spent on cooking. According to the 1991 census, 30% of the urban population and 78% of the rural population rely on firewood for domestic energy<sup>12</sup>. According to the NCAER (National Council of applied economic research) survey, conducted in 1978/79 shows that cooking accounts for 85.2% for the total energy consumption of the rural domestic sector. This also shows that non-renewable biomass has been a source of fuel since 31<sup>st</sup> December 1989.

**E.3. Description of the sources and gases included in the SSC-CPA boundary**

>> The following diagram describes the sources of greenhouse gases included within the project boundary.

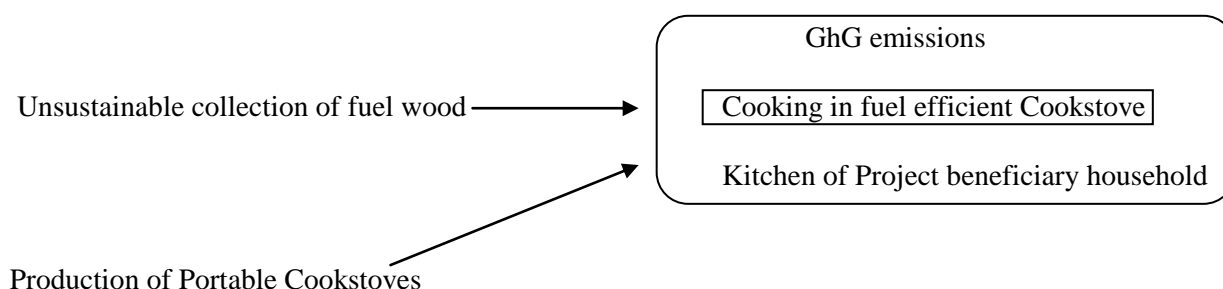


Table 1 below, shows the greenhouse gas emissions included in the SSC-CPAs under this SSC-PoA:

Source baseline	Combustion of non-renewable firewood for cooking.	Gas	Included?	Justification/Explanation
		CO <sub>2</sub>	Yes	The most abundant gas in the emissions.
		CH <sub>4</sub>	NO	The amount of CH <sub>4</sub> is negligible and need not be considered.
		N <sub>2</sub> O	No	The amount of N <sub>2</sub> O is negligible and need not be considered.
Project activity	Combustion of non-renewable firewood for cooking.	CO <sub>2</sub>	Yes	The most abundant gas in the emissions.
		CH <sub>4</sub>	NO	The amount of CH <sub>4</sub> is negligible and need not be considered.
		N <sub>2</sub> O	NO	The amount of N <sub>2</sub> O is negligible and need not

<sup>11</sup> Data obtained from journal titled ‘The Indian stove programme: an insider’s view- the role of society, politics, economics and education.’ By Bhaskar Sinha, National institute of science, technology and development studies (NISTADS), CSIR, New Delhi. Journal dated 6/11/02



				be considered.
--	--	--	--	----------------

**E.4. Description of how the baseline scenario is identified and description of the identified baseline scenario:**

>>

In accordance with Paragraph 5 of the methodology, Type II.G. Energy efficiency measures in thermal applications of non-renewable biomass, Version 3:

*It is assumed that in the absence of the project activity, the baseline scenario would be the use of fossil fuels for meeting similar thermal energy needs.*

According to the general guidelines to SSC CDM methodologies, EB 55, Paragraph 19, the most plausible baseline for the project activity is the baseline provided in the respective type small-scale methodology and which will include the assessment of the alternatives of the project activity. According to Step I and II of the guideline, the various alternatives available that deliver comparable level of service are

- i) continued use of traditional cook stove for cooking ,
- ii) use of different fossil fuels like kerosene, coal/charcoal, LPG, and
- iii) implementation of the project in the absence of CDM revenue,

all of the above are in compliance with mandatory laws and regulations. However, use of Kerosene (Fossil fuel) is most likely to be used to meet the similar thermal energy needs as explained below:

Following figure shows the energy ladder<sup>13</sup> in rural India, and the barriers inhibiting transition to commercial fuels:

The study demonstrates the barriers faced by commercial fuels used for cooking and the figure shows the preference or the likelihood of rural households for different fuels for meeting their cooking needs and choice next after fuelwood is Kerosene.

The preference for kerosene can also be understood considering the fact that kerosene's main advantages is that it is far easier to transport and distribute than gaseous fuels like LPG and, unlike LPG, can be purchased in any quantity. For households with cash constraints, the ability to buy kerosene in small quantities is attractive. Further, the Kerosene stoves, however, typically cheaper than LPG stoves and also its economically cheaper to cook food on Kerosene than on LPG as shown from below analysis, reconstructed from a world bank study<sup>14</sup>.

<sup>13</sup>

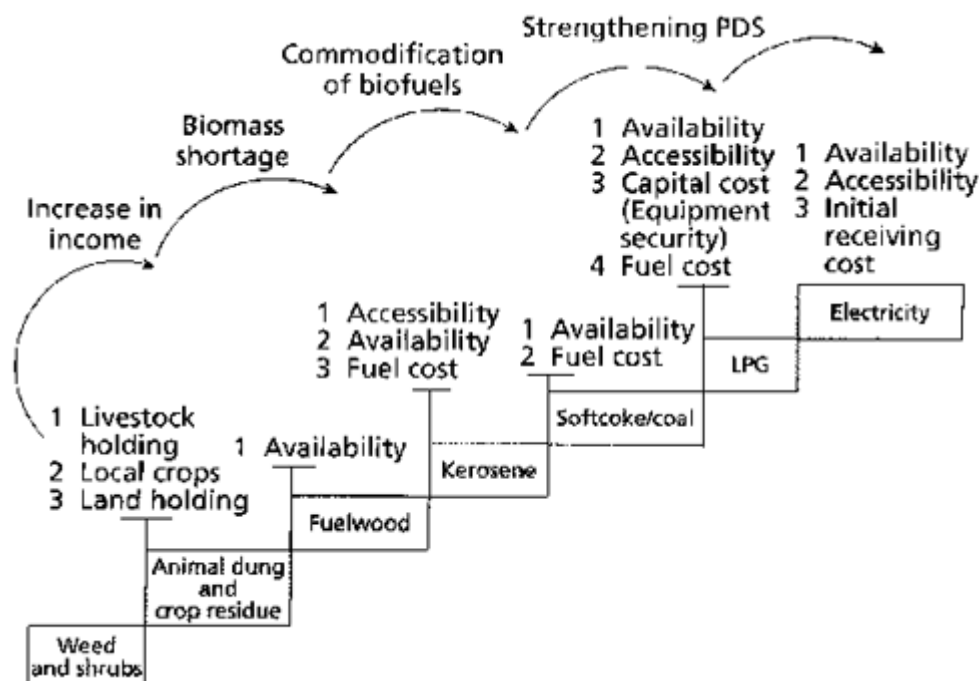
[http://www.hedon.info/BP42\\_EnvironmentalImplicationsOfTheEnergyLadderInRuralIndia&highlight=EnvironmentalImplicationsOfTheEnergyLadderInRuralIndia](http://www.hedon.info/BP42_EnvironmentalImplicationsOfTheEnergyLadderInRuralIndia&highlight=EnvironmentalImplicationsOfTheEnergyLadderInRuralIndia)

<sup>14</sup> <http://siteresources.worldbank.org/INDIAEXTN/Resources/Reports-Publications/Access-Of-Poor/KeroseneLPG.pdf>



Comparison of Subsidized Cost of LPG and Kerosene Cook Stove

(1)	Fuel	(2)	Price (2003)	(3)	Stove Efficiency	(4)	Rs/MJ	(5)	Equivalent Quantity	(6)	Rs/month
(7)	LPG (Subsidized)	(8)	Rs 241/cylinder	(9)	55%	(10)	.67	(11)	14.2	(12)	241
(13)	Kerosene (Subsidized)	(14)	Rs 9/litre	(15)	40%	(16)	.52	(17)	21	(18)	188



Thus, the projected fossil fuel considered for the current PoA is Kerosene.

**E.5. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the SSC-CPA being included as registered PoA (assessment and demonstration of additionality of SSC-CPA): >>**

**E.5.1. Assessment and demonstration of additionality for a typical SSC-CPA:**

>> Here the PPs shall demonstrate, using the procedure provided in the baseline and monitoring methodology applied, additionality of a typical CPA.



The assessment of additionality has been undertaken at SSC-PoA level as the barriers are applicable on the national level as explained under section A.4.3. However, as explained all individual SSC-CPA will further validate the ‘simple cost’ analysis as explained in section A.4.3.

**E.5.2. Key criteria and data for assessing additionality of a SSC-CPA:**

>> Here the PPs shall provide the key criteria for assessing additionality of a CPA when proposed to be included in the registered PoA. The criteria shall be based on additionality assessment undertaken in E.5.1 above. The project participants shall justify the choice of criteria based on analysis in above section.

It shall be demonstrated how these criteria would be applied to assess the additionality of a typical CPA at the time of inclusion.

NOTE: Information provided here shall be incorporated into the PoA specific CDM-SSC-CPA-DD that shall be included in documentation submitted by project participants at registration of PoA.

Proposed SSC-CPAs shall meet the following criteria in order to demonstrate additionality and be included in this SSC-PoA:

- *Demonstrate that the proposed activities are a voluntary coordinated action, and that it is in compliance with mandatory regulations*

Before the inclusion of any CPA, the CPA will have to demonstrate that no regulation has come into place which mandates the use of modern cookstoves by replacing traditional mud cookstoves.

- *Demonstrate that alternative scenarios for delivering the activities in the SSC-CPA may not be implemented due to barriers which may be overcome only with CDM funding.*

The NGO for each CPA will demonstrate that for beneficiaries the cost of the modern cookstove is a significant amount and that it can only be affordable at highly reduced costs. This shall be analysed using simple cost analysis as explained under section A.4.3.

**E.6. Estimation of Emission reductions of a CPA:**

**E.6.1. Explanation of methodological choices, provided in the approved baseline and monitoring methodology applied, selected for a typical SSC-CPA:**

>>

The choice of methodology that will be used for SSC-CPAS is AMS II.G version 3. By distributing, installing and maintaining the improved cook stoves, an increase of thermal efficiency can be obtained..



The project involves replacement of inefficient traditional cookstoves with modern cookstoves which are efficient than the traditional stoves used in rural India. For all the individual CPAs, it shall be checked and ensured that the project does not save any non-renewable biomass already accounted by some other project as per section A.4.2.2. Further, baseline surveys shall be used to establish the use of non-renewable biomass.

**E.6.2. Equations, including fixed parametric values, to be used for calculation of emission reductions of a SSC-CPA:**

>>

To calculate the emission reduction of each SSC-CPA the following formulas are used:

$$ER_y = B_{y,savings} \cdot f_{NRB,y} \cdot NCV_{biomass} \cdot EF_{projected\ fossil\ fuel}$$

Where,

**ER<sub>y</sub>** emission during the year y in tCO<sub>2</sub>e

**B<sub>y,savings</sub>** quantity of woody biomass that is saved in tonnes.

**f<sub>NRB,y</sub>** fraction of the woody biomass saved by the project activity in the year y that can be established as non-renewable biomass

**NCV<sub>biomass</sub>** Net calorific value of the non-renewable woody biomass that is substituted (IPCC default value for wood fuel, 0.015 TJ/tonne)

**EF<sub>projected fossil fuel</sub>** emission factor for the substitution of non-renewable woody biomass by similar consumers. The substitution fuel likely to be used by similar consumers is taken: 71.5tCO<sub>2</sub>/TJ for kerosene, 63.0 tCO<sub>2</sub>/TJ liquefied petroleum gas (LPG) or the IPCC default value of other relevant fuel.

$$B_{y,savings} = \sum B_{y,i} \cdot (1 - \eta_{old} / \eta_{new,i})$$

Where:

**B<sub>y,i</sub>** quantity of woody biomass used in the absence of the i<sup>th</sup> type of cookstove used in the project activity in tonnes.

**η<sub>old</sub>** efficiency of the baseline system/s being replaced, measured using representative sampling methods or based on referenced literature values (fraction), use weighted average values if more than one type of systems is encountered. 0.1 default value may optionally be used if the replaced system is a three stone fire or a conventional system lacking improved combustion air supply mechanism and flu



gas ventilation system i.e., without a grate as well as a chimney; for the rest of the systems 0.2 default value may be optionally used

$\eta_{new,i}$  efficiency of the  $i^{th}$  system being deployed part of the project activity(fraction)

$B_y$  is calculated by using one of the two options:

- (a) Calculated as the product of the number of appliances multiplied by the estimate of average annual consumption of woody biomass as per appliance (tonnes/year). This can be obtained from historical data or survey of local usage, OR
- (b) Calculated from the thermal energy generated in the project activity as:

$$B_y = HG_{p,y} / NCV_{biomass} \cdot \eta_{old}$$

Where,

$HG_{p,y}$  amount of thermal energy generated by the new technology in the project in the year  $y$  (TJ)

**E.6.3. Data and parameters that are to be reported in CDM-SSC-CPA-DD form:**

*(Copy this table for each data and parameter)*

<b>Data / Parameter:</b>	$B_{v,appliance}$
Data unit:	Tonnes/year
Description:	Quantity of non-renewable biomass used in the absence of the activity in the geographic boundary of the CPA.
Source of data used:	This value is calculated as per the survey data collected for each CPA
Value applied:	
Justification of the choice of data or description of measurement methods and procedures actually applied :	The survey is done as per AMS II G using latest available guidelines issued by EB on survey and sampling methods for small scale projects.
Any comment:	

<b>Data / Parameter:</b>	$f_{NRB,y}$
Data unit:	Fraction
Description:	The fraction of biomass that is derived as non-renewable in the region where the CPA is implemented.
Source of data used:	Survey results
Value applied:	
Justification of the	Survey conducted by third parties



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**NAME /TITLE OF THE PoA: Programme for replacement of traditional cookstoves  
with modern cookstoves in India**

choice of data or description of measurement methods and procedures actually applied :	
Any comment:	

<b>Data / Parameter:</b>	$\eta_{new,i}$
Data unit:	Fraction
Description:	The efficiency of the $i^{th}$ type of modern cookstove that is deployed in the project activity
Source of data used:	Manufacturer’s specifications as approved by third party tests according to national or international standards
Value applied:	
Justification of the choice of data or description of measurement methods and procedures actually applied :	The tests performed by third party agencies will be repeatable as per required calibration levels of the standards.
Any comment:	

<b>Data / Parameter:</b>	$NCV_{biomass}$
Data unit:	TJ/Tonne
Description:	According to the Intergovernmental Panel on Climate Change (IPCC), the net caloric value of woody biomass is given as 0.0015TJ/tonne
Source of data used:	IPCC
Value applied:	0.0015
Justification of the choice of data or description of measurement methods and procedures actually applied :	Default value to be used as per AMS II G in absence of more accurate data available for local wood types.
Any comment:	

<b>Data / Parameter:</b>	$\eta_{old}$
Data unit:	Fraction
Description:	According to the AMS II.G methodology, efficiency of tradition or conventional cooking stoves which do not have improved combustion techniques can be assumed as 0.1
Source of data used:	Latest version of approved methodology AMS II G
Value applied:	0.1
Justification of the choice of data or description of	Default value as per AMS II G



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measurement methods and procedures actually applied :	
Any comment:	

<b>Data / Parameter:</b>	<b>EF<sub>projected fossil fuel</sub></b>
Data unit:	tCO <sub>2</sub> /TJ
Description:	Emission factor for the substitution of non-renewable woody biomass by similar consumers.
Source of data to be used:	Default for Kerosene
Value of data applied for the purpose of calculating expected emission reductions in section B.5	71.5
Description of measurement methods and procedures to be applied:	NA
QA/QC procedures to be applied:	Sourced from public data
Any comment:	Fixed for the PoA

<b>Data / Parameter:</b>	<b>HG<sub>D,y</sub></b>
Data unit:	TJ
Description:	It is the total amount of heat generated by the modern cookstoves deployed in the project activity in the year y.
Source of data used:	
Value applied:	XXX
Justification of the choice of data or description of measurement methods and procedures actually applied :	This value is not used as the project participant's use method (a) as per section E.6.2 for calculating B <sub>y</sub> .
Any comment:	

<b>E.7. Application of the monitoring methodology and description of the monitoring plan:</b>
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**SMALL-SCALE CDM PROGRAMME OF ACTIVITIES DESIGN DOCUMENT FORM  
(CDM SSC-PoA-DD) - Version 01**



**NAME /TITLE OF THE PoA: Programme for replacement of traditional cookstoves  
with modern cookstoves in India**

**D.7.1. Data and parameters to be monitored by each SSC-CPA:**

*(Copy this table for each data and parameter)*

<b>Data / Parameter:</b>	<b>N_cookstoves</b>
Data unit:	Integer
Description:	No of cookstoves in working condition in each CPA
Source of data to be used:	No. of cookstove would be verified by purchase records of cookstoves placed by NGOs
Value of data applied for the purpose of calculating expected emission reductions in section B.5	
Description of measurement methods and procedures to be applied:	Third party survey
QA/QC procedures to be applied:	
Any comment:	The actual number of stoves will depend on the number of stoves falling within the 180 Gwh SSC limit.

<b>Data / Parameter:</b>	<b>N_cookstoves_operating_i</b>
Data unit:	Number
Description:	Number of cookstoves of type i operational in the CPA
Source of data to be used:	Calculated
Value of data applied for the purpose of calculating expected emission reductions in section B.5	20000
Description of measurement methods and procedures to be applied:	The number of modern cookstoves operational at specified efficiency or above is calculated using data from the sample survey for efficiency check for the distributed stoves.
QA/QC procedures to be applied:	Sample survey efficiency check shall be undertaken by a 3 <sup>rd</sup> party.
Any comment:	

<b>Data / Parameter:</b>	<b>L<sub>y</sub></b>
Data unit:	N/A
Description:	Leakage adjustment factor for period y
Source of data to be	Primary data collection: dedicated monitoring team; database maintenance:



used:	managing entity
Value of data applied for the purpose of calculating expected emission reductions in section B.5	0
Description of measurement methods and procedures to be applied:	The leakage adjustment factor is calculated based on a survey amongst non-project users that previously used renewable sources (e.g. dung) and live in the same area as project households/users. The survey shall satisfy 90/30 precision.
QA/QC procedures to be applied:	Data will be collected using the standard procedures and will be stored for the CPA crediting period and an additional two years.
Any comment:	

#### E.7.2. Description of the monitoring plan for a SSC-CPA:

>>

The monitoring plan for each SSC-CPA will be based on AMS II-G methodology. Monitoring shall be done annually. Data from the monitoring procedures will be recorded in the electronic project database and summarized in the monitoring report. The data collection will follow the "General guidelines for sampling and surveys for small-scale CDM project activities", will comply with the requirements for the verification stated in A.4.4.2 of transparency and double-counting avoidance, and will check the required parameters in the methodology AMS II.G in an unbiased and reliable way.

The following parameters would be checked and verified during monitoring:

- Efficiency check of appliances (modern cookstoves disseminated)
- Assessing the percentage of beneficiaries using the modern cookstoves due to stove functionality and beneficiary choice
- Verifying non-usage of traditional cookstove
- Assessing leakage due to project activity

The following parameters would be recorded in the project database during implementation of each CPA:

- Details of all beneficiaries as detailed in the beneficiary contracts
- Sales agreements with modern stove suppliers
- Photographic evidence of destruction of traditional stoves in beneficiary households
- Evidence on demonstration of modern stove usage instructions

#### 1. Efficiency Check of appliances

According to the methodology AMS II-G, "Monitoring shall consist of an annual check of efficiency of all appliances or a representative sample thereof to ensure that they are still operating at the specified efficiency ( $\eta_{new}$ ) or replaced by an equivalent in service appliance. Where replacements are made,



*monitoring shall also ensure that the efficiency of the new appliances is similar to the appliances being replaced.”*

The efficiency of the modern cookstoves will be monitored annually, one year after the registration of the PoA. The efficiency checks will be undertaken by the NGO implementing the project in the CPA. To confirm efficiency, well established methods such as water boiling tests or controlled cooking tests will be used. The performance of the stoves is likely to be related to the condition and dimensions of combustion chambers and pot and pot supports. Therefore, as an alternative to the above, stove condition may be used as a proxy indicator of efficiency. In this instance, the relationship between stove degradation and stove efficiency would be established in a laboratory. Monitoring would thus involve field-based inspections and measurements of critical components of a representative sample of stoves required to achieve 90/10.

In case the efficiency of the stove falls below specified efficiency ( $\eta_{new}$ ), emission reductions from that fraction of cookstoves won't be claimed unless these are replaced. Measures will be taken by the managing entities and implementation agency to replace the stove in such a scenario as soon as possible.

## 2. Leakage

According to the methodology, leakage from the following sources will be considered:

- *Use/diversion of non-renewable woody biomass saved under the project activity by non-project households/users who previously used renewable energy sources. If this leakage assessment quantifies an increase in the use of non-renewable woody biomass used by the non-project households/users attributable to the project activity then By is adjusted to account for the quantified leakage.*

Baseline surveys from the CPA areas reveal the fraction of non renewable biomass used by the beneficiaries. Hence, leakage from their use of non-renewable biomass saved under the project activity however ex post surveys conducted as a part of monitoring would determine if non renewable biomass saved due to the project activity is diverted to other uses.

- *If equipment currently being utilised is transferred from outside the boundary to the project activity, leakage is to be considered.*

There is no transfer of equipment from outside the boundary of the PoA, hence leakage is not considered.

## 3. Demonstration that the traditional mud cookstoves have been replaced

According to the methodology:

*“Monitoring shall ensure that:*

- (a) Either the replaced low efficiency appliances are disposed off and not used within the boundary or within the region; or*



*(b) If the baseline stoves usage continues, monitoring shall ensure that the wood fuel consumption of those stoves is excluded from By in equation 2.*

The NGOs which will be the project implementers in the CPA will ensure that the traditional mud cookstove is destroyed so that the beneficiary may not continue using it for cooking purpose. In order to confirm this photographic evidence will be taken of breaking of the traditional mud cookstove in each household at the time of sale of the modern cookstove. Also the contract that has been signed with the beneficiary states that the beneficiary will have to contact the NGO incase the household does not use the modern cookstove and reverts back to using the traditional cookstove.

Through annual monitoring it will be checked whether the beneficiary family has been using the modern cookstove. This will ensure that actual replacement of mud cookstoves have taken place.

The monitoring report will use the current CDM Monitoring Report Form and follow the current "Guidelines for completing the Monitoring Report Form (CDM-MR)

<b>E.8 Date of completion of the application of the baseline study and monitoring methodology and the name of the responsible person(s)/entity(ies)</b>
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Baseline surveys would be done for each CPA independently by credible third parties details of which would be provided in each CPA-DD.



**SMALL-SCALE CDM PROGRAMME OF ACTIVITIES DESIGN DOCUMENT FORM  
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**NAME /TITLE OF THE PoA: Programme for replacement of traditional cookstoves  
with modern cookstoves in India**

**Annex 1**

**CONTACT INFORMATION ON COORDINATING/MANAGING ENTITY and  
PARTICIPANTS IN THE PROGRAMME of ACTIVITIES**

Organization:	<b>Zero Emissions Technologies SA</b>
Street/P.O.Box:	Campus Palmas Altas
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State/Region:	Seville, Spain
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E-Mail:	<a href="mailto:zeroemissions@abengoa.com">zeroemissions@abengoa.com</a>
URL:	<a href="http://www.zeroemissions.com">http://www.zeroemissions.com</a>
Represented by:	Antonio Marín Écija
Title:	Head of CDM/JI Projects
Salutation:	Mr
Last Name:	Marín
Middle Name:	
First Name:	Antonio
Department:	
Mobile:	
Direct FAX:	
Direct tel:	
Personal E-Mail:	<a href="mailto:zeroemissions@abengoa.com">zeroemissions@abengoa.com</a>

Organization:	<b>Greenway Ecodevelopment Pvt Ltd</b>
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State/Region:	Maharashtra
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Country:	India
Telephone:	(+91) 22 27572430
FAX:	(+91) 22 27574916
E-Mail:	<a href="mailto:info@thinkcarbon.in">info@thinkcarbon.in</a>
URL:	<a href="http://www.thinkcarbon.in">http://www.thinkcarbon.in</a>
Represented by:	Ankit Mathur
Title:	Director
Salutation:	Mr
Last Name:	Mathur



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Middle Name:	
First Name:	Ankit
Department:	
Mobile:	
Direct FAX:	
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**Annex 2**

**INFORMATION REGARDING PUBLIC FUNDING**

**Annex 3**

**BASELINE INFORMATION**



**Annex 4**

**MONITORING INFORMATION**

**Monitoring Plan**

Programmes in India and elsewhere were not prove to be inoperative due to absence of monitoring plan. Experience has shown that cookstoves are distributed under governmental schemes but are not able to replace traditional chulhas in the long run.

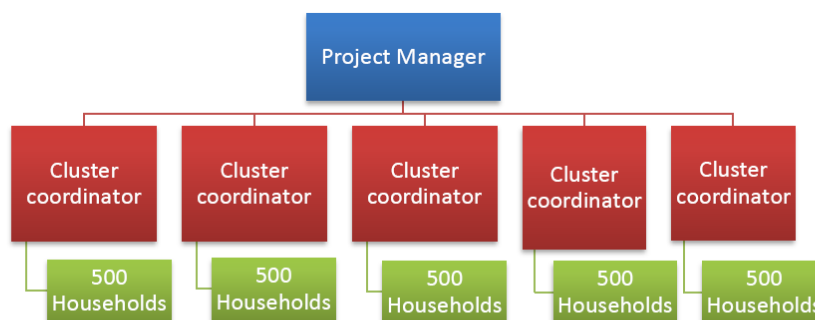


Figure 8: Monitoring Plan for the programme

Figure 8: Monitoring Plan for the programme

Monitoring shall consist of checking the efficiency of all cookstove sample thereof, at least once every two years (biennial) to ensure that they are still operating at the specified efficiency ( new  $\eta$  ) or replaced by an equivalent in service appliance. Where replacements are made, monitoring shall also ensure that the efficiency of the new cookstove is similar to the cookstove being replaced.

Monitoring shall also consist of checking of cookstoves sample thereof, at least once every two years (biennial) to determine if they are still operating or are replaced by an equivalent in service appliance.

If the quantity of fuel saved is determined using the Kitchen Performance Test (i.e. paragraph 6, Option 1), monitoring shall ensure that fuel consumption during the period of the project activity is monitored annually.

KPT:

Option 1:

$$B_{y,savings} = B_{old} - B_{y,new}$$

Where:

$B_{old}$  = Quantity of woody biomass used in the absence of the project activity in tonnes



$B_{y_{new}}$  = Annual quantity of woody biomass used during the project activity in tonnes, measured as per the Kitchen Performance Test (KPT) protocol. The KPT should be carried out in accordance with national standards (if available) or international standards or guidelines (e.g. the KPT procedures specified by the Partnership for Clean Indoor Air (PCIA))

If option (b) in paragraph 7 is chosen for determining old B, monitoring shall include the amount of thermal energy generated by the project technology t in year y.

In order to assess the leakage described above, monitoring shall include data on the amount of woody biomass saved under the project activity that is used by non-project households/users (who previously used renewable energy sources). Other data on non-renewable woody biomass use required for leakage assessment shall also be collected.

Monitoring shall ensure that:

- (a) Either the replaced low efficiency appliances are disposed of and not used within the boundary or within the region; or
- (b) If baseline stoves continue to be used, monitoring shall ensure that the fuel-wood consumption of those stoves is excluded from  $B_{old}$ .

### Sampling Method

A statistically valid sample of the locations where the systems are deployed, with consideration, in the sampling design, of occupancy and demographics differences can be used to determine parameter values used to determine emission reductions, as per the relevant requirements for sampling in the .General guidelines for sampling and surveys for small-scale CDM project activities. When biennial inspection is chosen a 95% confidence interval and a 5% margin of error requirement shall be achieved for the sampling parameter. On the other hand when the project proponent chooses to inspect annually, a 90% confidence interval and a 10% margin of error requirement shall be achieved for the sampled parameters. In cases where survey results indicate that 90/10 precision or 95/5 precision is not achieved, the lower bound of a 90% or 95% confidence interval of the parameter value may be chosen as an alternative to repeating the survey efforts to achieve the 90/10 or 95/5 precision.

To counter this, a structured monitoring plan will be executed over by the project proponents. To ensure smooth and continued monitoring the project proponents have developed an organization structure wherein 20,000 households will be divided into 40 clusters with approximately 500 households in each cluster. Three monitoring programmes will be undertaken at regular interval of 3 months and each cluster coordinator will be responsible to undertake the programme for its cluster. First monitoring programme will also include a water boiling test wherein the efficiency of the cook-stove will be tested with 95% confidence interval and feedback from the users will be collected. In following two programmes, only user feedback will be collected wherein following points will be addressed while taking the feedback:

- Cookstove daily usage time
- Daily Wood requirement
- Other fuels usage





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- Money saved on fuel
- Change in air quality/smoke released (qualitative, opinion based survey)
- Problems in usage
- Other comments

A complaint number would be provided for all registration of complaints and function as a helpline.  
*Proposal for pilot demonstration of commercial propagation of improved cookstoves*