THE GOLD STANDARD MICRO-PROGRAMME OF ACTIVITIES DESIGN DOCUMENT TEMPLATE

CONTENTS

Annexes

NOTE: At the time of requesting registration, this form must be accompanied by a VPA-DD applying a real case.

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

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

GS1247 Improved Kitchen Regimes Multi-Country PoA

24/05/2013

Version 3.0

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

1. General operating and implementing framework of PoA

The purpose of this Micro-Scale Programme of Activities (mPoA) is to reduce Green House Gas (GHG) emissions from the burning of non-renewable biomass for cooking and water treatment. This mPoA will distribute energy efficient cook stoves and/or safe water supply and treatment technologies to households/communities across Less Developed Countries (LDCs) and Landlocked Developing Countries (LLDCs).

Biomass, principally firewood and charcoal, holds huge importance in Developing Countries, and is the main source of household energy for some 2-3 billion people in the Developing World, with this demand expected to continue growing.[1] More than 1 billion people worldwide do not have access to safe drinking water and a high percentage of these boil their water to purify it for consumption, taking significant amounts of fuel and time.

High population densities coupled with high population growth rates, is putting increasing pressure on natural resources across the Developing World, which are being overexploited. The resulting situation is high and increasing levels of deforestation and environmental degradation.

In addition to the environmental consequences of such high wood use, there are also serious health implications. Biomass is often the predominant source of energy for cooking and water boiling, especially in rural areas, and is generally carried out on thermally inefficient traditional devices, which produce large amounts of smoke and indoor air pollution. It has been concluded that *'indoor air pollution is a major environmental and public health hazard for many of the world's poorest, most vulnerable people.'*[2]

This mPoA will attempt to address issues such as these through the distribution of several different technologies, which will result in environmental, social and economic benefits, and significant contributions towards achieving Millennium Development Goals[3] (explored later):

[1] 2020 Vision for Food, Agriculture and the Environment
http://www.ifpri.org/sites/default/files/pubs/2020/focus/focus14/focus14_10.pdf
[2] WHO, 2000: http://www.who.int/bulletin/archives/78(9)1078.pdf
[3] United Nations (UN), 2011: http://www.un.org/millenniumgoals/bkgd.shtml

- The distribution of improved cook stoves to households currently cooking on inefficient devices will reduce carbon emissions by allowing families to cook the same amount of food using less non-renewable biomass

- The distribution of household level point of use water treatment technologies to those lacking access to safe water will remove the need to boil water as a form of treatment before consumption, thus reducing carbon emissions.

- The installation and/or repair of community wide safe water supply technologies such as hand-pumped boreholes will also remove the need to treat water by boiling before consumption.

The efficient cook stoves and/or safe water supply and treatment technologies will be distributed to households/installed in communities for a nominal installation fee or through a subsidised sales model. By introducing a small fee, it is anticipated that recipients will experience greater levels of ownership, value the technology more and therefore uptake, usage and continued interest in the project will be greater.

Users will enter into an agreement with co2balance UK Ltd, transferring rights to the VERs generated by the PoA in return for the subsidised technology. The users must also agree to submit to the monitoring programme as described in this PoA Design Document (PoA-DD) and the relevant Voluntary Programme Activity Design Document (VPA-DD).

co2balance UK Ltd will undertake a thorough stakeholder engagement process for each of the proposed VPAs under the PoA, ensuring that users understand the agreement, are trained in the usage of the technology, and are able to give adequate feedback on their usage of the technology.

2. Policy/measure or stated goal of the PoA

The mPoA will distribute efficient cook stoves and/or safe water supply and treatment technologies at a highly subsidised rate to households cooking with non-renewable biomass and/or lacking access to safe water in LDCs and LLDCs. The technologies will reduce carbon emissions by allowing families to cook the same amount of food using less non-renewable biomass, and by removing the need to boil water as a form of treatment before consumption, thus further reducing carbon emissions. Additionally, the programme will yield sustainability benefits, explored under Point 4.

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

There is currently no law or policy which requires the use of fuel-efficient stoves or water treatment technologies across the Developing World. It follows that the mPoA is a voluntary action.

4. Contribution to sustainable development

The proposed mPoA contributes to sustainable development in LDCs and LLDCs in a number of ways:

a. Environmental
   - The PoA will significantly reduce greenhouse gas emissions over its lifetime.
   - The PoA will reduce the use of non-renewable biomass from forests, assisting with the preservation of existing forest stock, protecting natural forest eco-systems and wildlife habitats.

- The protection of standing forests will ensure the maintenance of watersheds that regulate water table levels and prevent flash flooding.
- A reduction in non-renewable biomass consumption will lead to reduced deforestation and therefore reduced erosion of land and nutrient loss.

b. Social

- Considerably less time will be spent collecting wood fuel, thereby reducing the work burden on rural families and presenting alternative opportunities for economic development and a higher standard of living.
- The amount of indoor air pollutants from the burning of biomass in the family home will be reduced. Less Carbon Dioxide (CO_2), Carbon Monoxide (CO), and particulates will be emitted, reducing the likelihood of respiratory diseases and thus impacting positively on the health of the households.
- Incidences of illnesses from consuming unsafe drinking water will be reduced.
- Less time will need to be spent cooking and boiling water before consumption, allowing greater opportunity to focus on other household tasks and the supervision of children.
- Safety in the home will be improved, reducing incidences of injuries and burns, as the efficient cook stoves are safer to cook on, and large vessels of boiling water will not be necessary.

c. Economic

- The PoA will help develop a section of rural economies; in the installation, maintenance and monitoring of the technologies, as well as training and employing community education staff.
- Costs incurred in the purchase of fuel will be reduced through increased thermal efficiency, and reduced need for fuel to treat water, allowing more money to be spent on food, health care, education etc.

The mPoA will deliver long-term, secure and simple contributions to sustainable development in the Developing World, which without carbon finance, would not exist.

A.3. Coordinating/managing entity and participants of PoA:

1. The Coordinating/Managing Entity (CME) of the PoA is co2balance UK Ltd. co2balance UK Ltd is the entity which communicates with Gold Standard
2. Project participants (defined as an entity or person that is responsible for, or who is working closely with the Project Proponent/CME to carry out the project activities) being registered in relation to the PoA are representatives of co2balance Ltd. Specific project participants will be identified at VPA level.

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

A.4.1. Location of the micro-scale programme of activities:

The location of the PoA will be in LDCs and LLDCs across the world, including the following countries: Bangladesh, Benin, Bhutan, Botswana, Burundi, Cambodia, Central African Republic, Democratic Republic of the Congo, Djibouti, Equatorial Guinea, Eritrea, Ethiopia, Gambia, Haiti, Laos, Liberia, Madagascar, Malawi, Maldives, Mali, Mozambique, Myanmar, Nepal, Rwanda, Senegal, Sierra Leone, Somalia, South Sudan, Tanzania, Timor-Leste, Uganda, Zambia, and Zimbabwe. Further countries may be added at later stages in the project.

A.4.1.1. Host Party(ies):

Bangladesh, Benin, Bhutan, Botswana, Burundi, Cambodia, Central African Republic, Democratic Republic of the Congo, Djibouti, Equatorial Guinea, Eritrea, Ethiopia, Gambia, Haiti, Laos, Liberia, Madagascar, Malawi, Maldives, Mali, Mozambique, Myanmar, Nepal, Rwanda, Senegal, Sierra Leone, Somalia, South Sudan, Tanzania, Timor-Leste, Uganda, Zambia, and Zimbabwe

A.4.1.2. Physical/ Geographical boundary:

All micro-scale voluntary project activities (mVPAs) included in the PoA will be implemented within the geographic country borders of Bangladesh, Benin, Bhutan, Botswana, Burundi, Cambodia, Central African Republic, Democratic Republic of the Congo, Djibouti, Equatorial Guinea, Eritrea, Ethiopia, Gambia, Haiti, Laos, Liberia, Madagascar, Malawi, Maldives, Mali, Mozambique, Myanmar, Nepal, Rwanda, Senegal, Sierra Leone, Somalia, South Sudan, Tanzania, Timor-Leste, Uganda, Zambia, and Zimbabwe, taking into consideration the applicable national and/or sectoral policies and regulations of each host country.

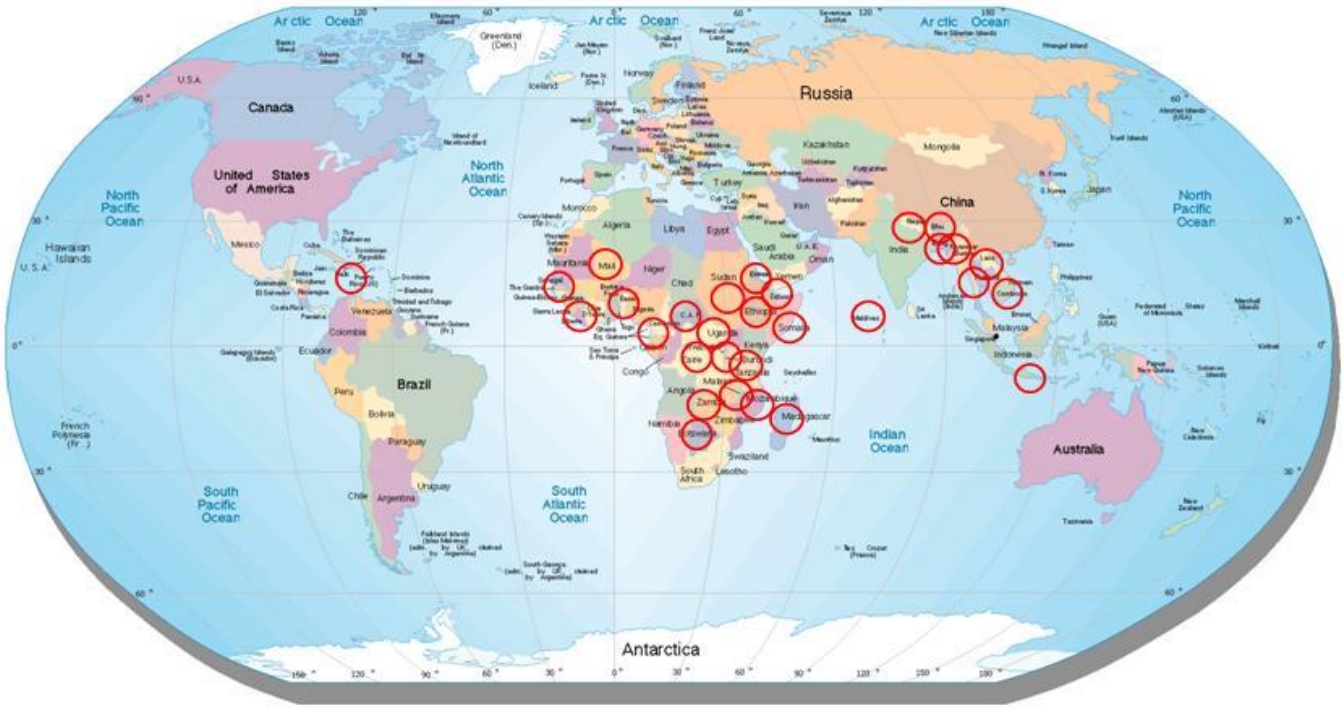

Figure 1: PoA Boundary

A.4.2. Description of typical micro-scale programme activity(ies):

co2balance will act as the Coordinating/Managing Entity (CME) for the PoA but may involve implementation partners or project participants in some project areas; however, this will be decided on a case-by-case basis as projects are implemented.

Projects within the PoA will be designed on an ongoing basis and may incorporate a single technology or a combination of technologies, depending on the conditions in that particular project area. In addition, the approach taken with regards to the distribution model will be influenced by local conditions.

Each VPA will fall within the geographic boundary of one of the countries outlined above, and will involve the installation of efficient cook stoves and/or safe water supply and treatment technologies. The maximum number of technologies per VPA is limited by the 10,000 tCO_2e limit and is dependent on the project baseline which will vary by VPA.

The efficient cook stoves will be manufactured and assembled where possible in the host country, but components or whole stoves may be imported if this is not viable. The Coordinating/Managing Entity of the mPoA is co2balance UK Ltd while in-country co2balance representatives will oversee production, assembly, and distribution of the technologies to the geographical area of each VPA, under the mPoA.

The safe water supply and treatment technology chosen for each VPA will also be manufactured in the host country if this is possible and practical, but may be sourced from other places if necessary.

Each VPA may involve the distribution of just stoves, just water technology, or a combination of both. Where both technologies are implemented in the same VPA, the baseline will be adjusted accordingly. The technology chosen will depend on the local conditions and needs, and is likely to vary by VPA.

co2balance UK Ltd will, where possible, employ local manufacturers to produce the components for each stove to a standardised format. These components will then be distributed to each VPA via a central location, where a regional contractor will be responsible for the assembly of each stove.

Each contractor will be trained to assemble each stove to an exact specification. co2balance UK Ltd will be responsible for ensuring that data is captured at the assembly point to ensure the monitoring of stoves in operation over the VPA crediting period.

The chosen water technology for a specific VPA will, where possible, be manufactured locally in the host country. However, components and/or complete technologies may be sourced from other locations where necessary.

Each technology user will sign a contract between co2balance UK Ltd and themselves, that ensures the transfer of rights to the carbon credits to co2balance UK Ltd. In exchange, the user will receive a highly subsidised stove and/or water technology, training in its use, and maintenance of it during the crediting period of the VPA.

The technologies will be given a unique reference number for monitoring and data capture purposes. The unique identification number is uploaded onto our database and linked to the household details. No ERs can be claimed for technologies without a reference number and household details linked to the database.

A.4.2.1. First technology or practice to be employed in the PoA and the eligibility criteria for inclusion of the technology or practice in the PoA:

The project will provide energy efficient cook stoves to households in the countries included in the PoA, which are currently using non-renewable biomass as fuel (this may include both charcoal and wood). The stove design may vary by VPA as different locations, climates, traditions and improvements in technology demand. Unless otherwise specified, the stove technology for wood fuel users will be based on a design developed by co2balance Ltd. The user-friendly design delivers high thermal efficiency and where possible, is built from locally sourced materials. This simple technology currently performs at 34% thermal efficiency, thereby reducing the amount of biomass required in day-to-day cooking by 71% as compared to the traditional three-stone, open fire method of cooking. The specific stove performance details and third party performance verification will be shown in the technology 'Specification and Builders Manual' document, which will accompany the appropriate VPA-DD.

Figure 2: Carbon Zero Efficient Stove Design

The stove currently consists of a fired clay liner, or combustion chamber, which is encased by a brick-built container. The exact stove construction details will be listed in the 'Specification and Builders Manual' document which will accompany the specific VPA-DD for which that technology is used.

In line with the methodology, if during a VPA roll out a stove with similar design and performance characteristics is introduced it can be included under the same project scenario. Improved cook stoves can be considered similar if they are based on the same fundamental combustion technology and their respective thermal efficiencies do not differ by more than +/-5%. Project technologies with significantly different performance characteristics are treated as independent project scenarios and hence monitored and credited separately (Manufacturing and Design Specifications will be included with the relevant VPA).

Other technologies under consideration include the Envirofit charcoal and portable wood burning stoves, and further improved cook stoves may be considered if deemed more suitable.

A.4.2.2. Second technology or practice to be employed in the PoA and the eligibility criteria for inclusion of the technology or practice in the PoA:

The project will provide safe water *treatment* technologies to households in LDCs and LLDCs currently boiling water as a purification method before consumption. Or alternatively, using the concept of suppressed demand, project developers can also obtain credits by supplying clean water to poorer members of society that are not able to use biomass energy to treat their water (because they cannot afford it, or because the energy is otherwise unavailable to them).

These technologies are likely to treat water at the point of use. The technology chosen may vary by VPA as different locations, climates, traditions and improvements in technology demand. The technology likely to be chosen is a household level water filter, similar to that shown in Figure 3 below.

Figure 3: Household Ceramic Filter

The ceramic filter shown above is made up of a clay filtering element, treated with colloidal silver which acts as a disinfectant. The filter removes odour, colour and turbidity, as well as killing bacteria and parasites from water that has come from an unsafe source. The filter is designed to meet the needs of a family of 5-6 people, with a filtering rate of 1-2.5 litres per hour.

The filter is certified and tested annually, and specifications and testing results for the exact technology will be included with the specific VPA-DD.

A.4.2.1. Third technology or practice to be employed in the PoA and the eligibility criteria for inclusion of the technology or practice in the PoA:

The project will involve the provision of technologies that provide a safe water *source* to communities in LDCs and LLDCs currently boiling water as a purification method before consumption. Or alternatively, using the concept of suppressed demand, project developers can also obtain credits by supplying clean water to poorer members of society that are not able to use biomass energy to treat their water (because they cannot afford it, or because the energy is otherwise unavailable to them).

These technologies will provide a safe water provision to communities, so that it can be consumed from the source without the need for treatment first. The technology chosen may vary by VPA as different locations, climates, traditions and improvements in technology demand. The technology likely to be chosen is a zero emission pumped borehole, with the pump similar to that shown in Figure 4 below. The project activity will involve the installation and/or repair of broken boreholes, and their maintenance over the lifetime of the project.

Figure 4: AfriDev Hand Pump

The pump pictured above draws water from depths of 3-45m, and has a discharge rate of 16.5 litres per minute in 40 strokes. Full details of the exact technology will be included with the specific VPA-DD.

Eligibility Criteria for inclusion of the technologies in the PoA:

Eligibility Criteria	Description	Means of Verification (Checked at VPA Inclusion)
VPA Location and Project Boundary	The geographical boundary within which the technologies are installed will be within the geographical boundary outlined in Section A.4.1.2	The location of each individual VPA is specified in each VPA-DD, in which the CME states that the location is within one of the countries outlined in Section A 4.1.2 above. Each VPA will be uniquely defined by a range of GPS coordinates and current administrative maps to define the project boundary.
Scale of the Activity	Emission reductions achieved by each one of the activities considered under the micro-scale programme are limited to a maximum of 10,000 tonnes of CO_2e in any year of their crediting period.	The total number of technologies to be installed will be calculated to ensure the emission reductions remain within this limit. Calculations will be provided with the individual VPA-DDs.

Avoiding Double Counting of Emissions Reductions	Each VPA will ensure double counting of emission reductions is avoided, through the unique identification of each technology with an identification number.	The identification system employed is outlined in the VPA-DD. Each technology is linked with a unique identification number. Personal householder information is also gathered. These details are uploaded to our database which is available to view by the DOE.
Technology and Target Group	Each VPA will involve the distribution and installation of efficient cook stoves and/or the installation of water technologies, including boreholes, to households and/or communities currently cooking with non-renewable biomass on a traditional stove and/or currently lacking access to safe water.	Surveys or desk based research will be used to determine those households matching the target group.
Technology Output	The technologies will each have continuous energy outputs of less than 150kW per unit. This will be applied to the baseline technology with regards to the water technology units.	Calculations for the specific technology to show they are within the 150kW limit will be submitted with the individual VPA-DDs.
Baseline	The characteristics and current biomass/water consumption of households in the baseline scenario will be identified for each VPA.	Surveys will be carried out to cover each VPA.
Methodology	Each VPA will be in compliance with *Technologies and Practices to Displace Decentralized Thermal Energy Consumption* Version 1.	The applicability of the methodology is justified in Section D.1.1 and applies to each VPA. The applicability criteria of each methodology will be demonstrated as being met

		as the VPA level.
Additionality	The project activity will be located in a Least Developed Country (LDC), Small Island Developing State (SIDS) or a Land Locked Developing Country (LLDC).	In accordance with the Micro-Programme rules, any Regular Cycle activity meeting one of the criteria outlined in Section D.5 shall be deemed additional. Each VPA will demonstrate that it is within the geographic boundaries of one of the LDCs outlined in Section A 4.1.2. Any Retroactive Projects will demonstrate additionality using an approved UNFCCC or Gold Standard additionality tool.
Carbon Transfer	It will be clearly communicated that co2balance is the entity that is claiming ownership rights of and selling the emission reductions resulting from the project activity.	A Carbon Transfer Form (CTF) will be signed and uploaded to our database stating that the rights to the carbon credits will lie with co2balance.
Non-Diversion of ODA	There will be no diversion of ODA for any of the proposed VPA's.	A declaration confirming that there is no diversion of ODA for each VPA will be attached with the PoA-DD and individual VPA-DDs.
Avoiding Double Counting of Programme Activities	Each VPA will show that it is exclusive to the PoA and not registered as another project activity or VPA under another PoA.	It will be stated in each VPA-DD that the specific VPA is neither registered as a project activity with GS or any other standard or as a VPA of another PoA. The appropriate registries (Gold Standard and CDM) can be accessed to demonstrate this.

Sustainable Development Criteria:

Eligibility Criteria	Description	Means of Verification (Checked at VPA Inclusion)
Air Quality	Both the efficient cook stove and water technologies will result in an improvement in indoor air quality.	The air quality will be measured indirectly through wood consumption as part of the Sustainability Monitoring.

A.4.3. Description of how the anthropogenic emissions of GHG by sources are reduced by the technology or practice below those that would have occurred in the absence of the registered PoA (assessment and demonstration of additionality):

In accordance with the methodology, additionality does not need to be demonstrated for a micro-programme that only plans to include activities that are deemed additional as per criteria listed in the section below:

i. The project activity is located in a Least Developed Country (LDC), Small Island Developing States (SIDS) or a Land Locked Developing Country (LLDC).

ii. The project activity is located in a special underdeveloped zone of the host country identified by the Government before 28 May 2010. CME shall refer to the list published by the host country DNA.

iii. The project activity is located in any host country different from the countries defined above but project participants can demonstrate that project implementation will essentially benefit poor communities. No specific definition of 'poor communities' is pre-established. The Millennium Development Goals-based long term National Development Strategy (NDS) can serve as the basis to assess the eligibility of the targeted communities. Project participants shall seek approval from The Gold Standard Foundation on the basis of a formal request providing detailed arguments as to how the activity will benefit the poor communities.

iv. The project activity generates electricity:

a. As on-site generation, i.e. electricity generated at the point of use and no connection with any grid, OR
b. Feeds into an existing or new local, low voltage isolated grid. It may also feed into the regional or national high voltage grid if convincing evidence can be provided to demonstrate that the implementation of the project activity will significantly improve electricity access for the poor local communities, households or SMEs.

v. The project activity employs specific renewable energy technologies or measures recommended by the host country DNA and approved by the CDM EB (project participants shall refer to the list published by the host country), OR approved by The Gold Standard Foundation.

vi. The project activity is an emission reduction project in which each of the independent subsystems or measures achieve annual emission reductions equal to or less than 600 tCO_2 or annual energy savings equal to or less than 600 MWh or installed capacity is less than 1500 kW for households/SMEs or communities. The limits defined above apply to each subsystem or the measure implemented.

All project activities under this PoA will be implemented in LDCs or LLDCs, thus criterion i. is met and the PoA and associated VPAs can be deemed additional.

In the case of any retroactive projects being included under the PoA, additionality will be demonstrated using an UNFCCC-approved or a Gold Standard-approved additionality tool to demonstrate project additionality.

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

A.4.4.1. Operational and management plan:

co2balance UK Ltd will have overall operational and management responsibility for the implementation and monitoring of the proposed PoA and the VPAs belonging to it; and is therefore the PoA Managing Entity.

co2balance UK Ltd will be responsible for the following operational and management activities related to each mVPA under the PoA as listed below:

1. Manufacturing and Distribution

    a. It is hoped that all components for the improved cook stoves will be manufactured in the host country; however stove parts may be imported if a suitable supplier cannot be found. co2balance UK Ltd will oversee the quality control process for producing the stove liners, fired bricks and other components. The stove technology may be changed if an improved product is developed or if a specific requirement is identified in a specific VPA; in this case stove performance figures will be provided and calculations amended accordingly.
    b. The Carbon Zero stove will be supplied to a central location within each mVPA; to be installed or distributed.
    c. Safe water treatment technologies will be manufactured where possible in the host country, however may be sourced from other locations if necessary. co2balance will work with Community Based Organisations (CBOs) and/or NGOs responsible for borehole installation and maintenance in applicable areas in relation to safe water provision technologies.

2. VPA Household Identification and Sensitisation

    a. For each mVPA a process for identifying households will be managed by co2balance UK Ltd. This will involve working with local community leaders to help identify households suitable for a stove and/or safe water supply and treatment technologies.
    b. In partnership with community leaders, NGOs and other local community organisations, co2balance UK Ltd will initiate a sensitisation procedure to ensure that households

understand the benefits of the technology, cultural issues are addressed, and users are trained in the optimal use of the equipment. A trained Educational Liaison Officer will work within the community to ensure each household supplied with either or both technologies understands how to use it effectively.

3. Construction

   a. Each mVPA will have a designated contractor to install/distribute the stove and/or water technology for each household.
   b. The contractor will coordinate the receipt and distribution of all technologies within the project area.
   c. Each contractor will be responsible for hiring local technicians to install the stoves where applicable and/or water technology within each household; co2balance UK Ltd or a representative of, will oversee the training process of these local technicians.
   d. Regarding safe water provision, co2balance will work with local Community Based Organisations (CBOs) and/or NGOs responsible for borehole installation and maintenance, or other technology types.

4. Data Collection

   a. Upon installation of each stove and/or safe water supply or treatment technology in the mVPA, a representative of co2balance UK Ltd will be responsible for collecting monitoring data. This will include:

   i. A unique serial number for each stove/safe water supply or treatment technology
   ii. The name of a representative of each household
   iii. Mobile number of household representative (where possible)
   iv. ID number of household representative (where possible)
   v. The address of each household (where possible)
   vi. Date of installation/sale
   vii. A signed contract confirming the exchange of the technology in return for rights to the VERs (Carbon Transfer Form)

   b. This data will be collected in a hard copy format by the in-country staff and input into the PoA electronic database.

5. Monitoring and Maintenance

   a. The ongoing monitoring of the performance of the stoves and/or safe water supply or treatment technology in each mVPA will be the responsibility of co2balance UK Ltd.
   b. A sampled group of stoves and/or safe water supply or treatment technologies, as identified in the below monitoring plan, will be assessed in line with the methodology monitoring requirements.
   c. Monitoring reports will be written for each VPA verification period.
   d. A maintenance programme will be developed for each VPA once installation has begun, to ensure the technology remains fully functional throughout the lifetime of the project.

Furthermore, the following items will be addressed by co2balance UK Ltd in the implementation of each VPA under the PoA:

(i) A record keeping system for each technology or practice under the PoA,

Data will be collected for each mVPA according to the attached 'Monitoring Plan.' Initial data in the construction phase will be collected as hard copies. This will then be uploaded into the PoA electronic database managed by co2balance UK Ltd. This will ensure that each technology and its owner is identified and logged for monitoring and verification purposes. Annual monitoring reports and VER calculations will stem from this data. All records will therefore be kept, in electronic and hard copy, centrally by co2balance UK Ltd and will be kept for a minimum of two years from the end of the crediting period.

(ii) A system/procedure to avoid double accounting e.g. to avoid the case of including a new VPA that has been already registered either as a project activity with GS or any other standard or as a VPA of another PoA,

In order to ensure that including a VPA that has already been registered as a project activity with GS or any other standard, or as a VPA of another PoA is avoided, the following procedure will be followed:

Gold Standard and UNFCCC Databases checked for other cook stove and/or water technology projects using *Technologies and Practices to Displace Decentralized Thermal Energy Consumption* in the same country to assess risk that the VPA could already be registered to another PoA or as a Gold Standard or CDM project activity

At time of VPA inclusion

⇩

All cook stoves and water technologies (or borehole log book) to be branded with the co2balance logo to demonstrate their inclusion in the co2balance activity

During manufacture

⇩

All unique identification numbers to be entered into the electronic database, which confirms that IDs are not repeated by highlighting any duplicates and removing them from the system. Confirms that a technology has not already been included in another project activity

At time of installation

⇩

Each VPA will be monitored independently and the status recorded

At every monitoring period

⇩

A status summary for the PoA will be created and continuously updated, which tracks the status of each individual VPA by recording what stage it has reached in a master spreadsheet.

Ongoing from time of registration

It will be stated in each VPA-DD that the VPA has not and will not be registered either as a single project activity with GS or any other standard, or as a VPA of another PoA. The unique identification numbers assigned to each technology mean that each can only be assigned to one VPA.

(iii) The provisions to ensure that those operating the VPA are aware of and have agreed that their activity is being subscribed to the PoA;

co2balance UK Ltd is the Coordinating/Managing Entity of the PoA and is therefore responsible for operating each of the mVPAs. Therefore, those operating the VPAs are legally contracted to co2balance UK Ltd and are fully aware of, and have agreed that, their activity is being subscribed to the PoA. Component manufacturers and construction contractors will have specific contracts specifying this. A contract (in English and the local language) between each household and co2balance UK Ltd that confirms the user's involvement in the PoA will also exist.

Potential VPAs will be checked to ensure they meet all requirements and eligibility criteria before inclusion in the registered PoA. Before a VPA can been included in a PoA, it must be reviewed against the Eligibility Criteria outlined in Section A.4.2.2 of the registered PoA-DD, to ensure it meets the criteria stated. If the criteria are met, it is eligible for inclusion. This technical review is a peer review carried out by someone that has not been involved in the development of the PoA.

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

There is currently no public funding for this project activity, and there will be no diversion of ODA. Please see the signed ODA declaration form in Annex 2.

SECTION B. Duration of the micro-scale programme of activities (PoA)

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

01/05/2012

In accordance with the Gold Standard Requirements, the above mentioned start date is the date at which the first real action of the project activity begins. The first two VPAs have been developed simultaneously, and the real action has occurred in VPA 2 first rather than VPA 1. The start date of the PoA is therefore the date that the first project action began- when the first borehole has been repaired to full working order.

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

28 years

SECTION C. Stakeholders' comments

C.1. Summary of stakeholder comments on the PoA design:

Please see the attached PoA Design Consultation Report for a full report on stakeholder comments on the design of the PoA.

C.2. Please indicate the level at which local stakeholder consultation is conducted. Justify the choice:

1. Local stakeholder consultation is done at PoA level ☐
2. Local stakeholder consultation is done at VPA level ✓

Stakeholders in the project will have varied opinions across VPAs, and different VPAs will be made up of differing technologies. Therefore, it is justifiable to conduct the local stakeholder consultation at the mVPA level, in order to include the opinions and comments of those in the immediate project area, and tailor the meetings to the specific area that will be involved in each of the proposed VPA's, and the specific technology being implemented. A single LSC may be organized for multiple VPA's if this can be justified.

C.3. Brief description how comments by local stakeholders have been invited and compiled:

N/A as LSC conducted at VPA level

C.4. Summary of the comments received:

N/A as LSC conducted at VPA level

C.5. Report on how due account was taken of any comments received and on measures taken to address concerns raised:

N/A as LSC conducted at VPA level

C.6. Discussion on continuous input/grievance mechanism:

N/A as LSC and discussion on continuous input/grievance mechanism conducted at VPA level

C.7. Report on stakeholder consultation feedback round at the PoA level:

N/A as LSC and stakeholder feedback round conducted at VPA level

SECTION D. Application of an existing baseline and monitoring methodology or of a new methodology submitted as part of this micro-programme of activities

D.1. Title and reference of an approved baseline and monitoring methodology, or full description of a new methodology, applied to technologies or practices included in the PoA:

The PoA applies the Gold Standard Methodology *Technologies and Practices to Displace Decentralized Thermal Energy Consumption* Version 1.

D.1.1 Justification of the choice of the methodology and why it is applicable to a considered technology or practice (s):

This methodology is applicable to programmes or activities introducing technologies that reduce or displace greenhouse gas (GHG) emissions from the thermal energy consumption of households. Examples of these technologies include the introduction of improved biomass or fossil fuel cook stoves and safe water supply and treatment technologies that displace water boiling by introducing new zero emission technologies.

The following conditions are also met:

Methodology Requirement	**Project**
The project boundary can be clearly identified, and the technologies counted in the project are not included in another voluntary market or CDM project activity	The project boundary is the physical, geographical sites of the project technologies and potentially of the baseline and project fuel collection. The individual households where the project technologies will be installed, and/or communities where the boreholes are situated, are within the target area, which have been clearly demarcated using administrative boundaries. The technologies counted are individually identified by a unique identification number which is stored in the project database. This ensures that the technologies are not accidentally counted in other project activities by the project proponent.
Technologies have a continuous useful energy output of less than 150kW per unit (defined as total energy delivered usefully from start to end of operation of a unit divided by time of operation). For technologies or practices that do not deliver thermal energy in the project scenario but only displace thermal energy supplied in the baseline scenario, the 150kW threshold applies to the displaced baseline technology.	The stove project technology primarily delivers thermal energy, whilst the water technology displaces thermal energy supplied in the baseline. Therefore, the 150kW threshold applies differently to the two technologies. Calculations will be included with each VPA-DD to demonstrate that the applicable technology either has a continuous useful energy output of less than 150kW per unit, or in the case of the water technology, the displaced baseline technology has a continuous useful energy output of less than 150kW.
The use of the baseline technology as a backup or auxiliary technology in parallel with the improved technology introduced by the project activity is permitted as long as a	As referenced in the methodology 'the removal and continued non-use of three stone fires and other easily constructed traditional devices (the baseline technology replaced by

mechanism is put into place to encourage the removal of the old technology and the definitive discontinuity of its use.	this project activity) is in many cases unlikely and impractical to monitor[4]. However, the mechanism introduced to encourage the cessation of use of baseline technology is educating local people on the extensive health and environmental benefits of abandoning inefficient baseline technology entirely, by specifically employed education staff. The same method of educating users about water technology will be adopted, whereby the extensive benefits will be fully explained.
a) The project documentation must provide a clear description of the approach chosen and the monitoring plan must allow for a good understanding of the extent to which the baseline technology is still in use after the introduction of the improved technology, whether the existing baseline technology is not surrendered at the time of the introduction of the improved technology, or whether a new baseline technology is acquired and put to use by targeted end users during the project crediting period.	Overall use of the baseline technology will be monitored in conjunction with that of the project technology, as will the emergence of any other baseline technology by targeted end users.
b) The success of the mechanism put into place must therefore be monitored, and the approach must be adjusted if proven unsuccessful. If an old technology remains in use in parallel with the improved technology, corresponding emissions must of course be accounted for as part of the project emissions.	Parallel baseline technology use (three stone fires or traditional equivalent for either cooking or water boiling) will be revealed during monitoring and its effect on emissions reductions will be captured using Equation 6 of the methodology (for cook stoves) $B_{p,y} = N_{p,y} * ((P_{p,y} * U_{p,y}) + (P_{b,y} * (1 – U_{p,y}))$ and Equation 12 of the methodology (for water technologies) $B_{p,y} = (1-C_j) * N_{p,y} * W_{b,y} * (Q_{p,rawboil,y} + Q_{p,cleanboil,y})$. The uptake rate U will be determined by surveys and hence used to account for parallel baseline and project technology use.
The project proponent must clearly communicate to all project participants the entity that is claiming ownership rights of and selling the emission reductions resulting from the project activity. This must be communicated to the technology producers	A full explanation will be given to all household stove and/or water technology recipients, or end users, that co2balance have provided them with the technology at a subsidised level, on the basis that the emissions reductions will be transferred to

[4] http://www.cdmgoldstandard.org/fileadmin/editors/files/6_GS_technical_docs/manuals_and_methodolgies/110411_TPDDTEC_Methodology.pdf p4

and the retailers of the improved technology or the renewable fuel in use in the project situation by contract or clear written assertions in the transaction paperwork, If the claimants are not the project technology end users, the end users should be notified that they cannot claim for emission reductions from the project.	co2balance. This will be recorded using a Carbon Transfer Form, which stove owners and/or water technology recipients will sign to confirm they understand and voluntarily enter the agreement in which they cannot claim emissions reductions from the project. In the case of boreholes, the Community Water Resource Committees will sign the Carbon Transfer Form on behalf of the community in which the borehole is situated.
Project activities making use of a new biomass feedstock in the project situation (e.g. shift from non-renewable to green charcoal, plant oil or renewable biomass briquettes) must comply with relevant Gold Standard specific requirements for biomass related project activities, as defined in the latest version of the Gold Standard rules.	The emission reductions from this project, for both stove and water technologies, will result from a change in quantity of fuel *consumed*, rather than change of fuel *type,* therefore this condition is not applicable.
a) Adequate evidence is supplied to demonstrate that indoor air pollution (IAP) levels are not worsened compared to the baseline, and greenhouse gases (as listed in section II.1) emitted by the project fuel/stove combination are estimated with adequate precision. The project fuel/stove combination may include instances in which the project stove is a baseline stove.	The fuel used in both the project and baseline scenario is the same, as such there are no additional harmful gases released in the project scenario. The stoves are distributed in households that previously used a traditional inefficient device, as such both the volume of greenhouse gases and volume of harmful gases are reduced in the project scenario. The stove has been proved to reduce the volume of harmful noxious gases by 80% on average.[5] The water technologies will result in reduced boiling of water, hence also a reduction in both the volume of greenhouse gases and volume of harmful gases.
b) Records of renewable fuel sales may not be used as sole parameters for emission reduction calculation, but may be used as data informing the equations in section II of this methodology if correlated to data on distribution and results of field tests and surveys confirming (a) actual use of the renewable fuel and usage patterns such as average fraction of non-renewable fuels used in mixed combustion or seasonal variation of fuel types, (b) GHG emissions, (c) evidence of	The emission reduction calculation will be based on fuel wood usage measurements for both cook stoves and water technologies (Kitchen Performance Tests and Water Boiling Tests). In addition, the Carbon Zero stove has been tested in laboratory settings to ensure that it is of improved efficiency compared to the traditional device. Fuel sales will not be monitored or used in any equations in this project.

[5] See attached report compiled by the University of Nairobi

CO levels not deteriorating (d) any further factors effecting emission reductions significantly.	

D.1.2 Justification of the choice of the methodology and why it is applicable to another considered technology or practice:

N/A see above for applicability of the methodology for both cook stove and water technologies.

D.2. Title and reference of another approved baseline and monitoring methodology, or full description of a new methodology, applied to technologies or practices included in the PoA:

N/A

D.2.1 Justification of the choice of the methodology and why it is applicable to a considered technology or practice:

N/A

D.2.2 Justification of the choice of the methodology and why it is applicable to another considered technology or practice:

N/A

D.3. Description of the sources and gases included in the VPA (s) boundary

D.3.1 Description of the sources and gases included in the technology or practice boundary

The project boundary is the physical, geographical sites of the project technologies and potentially of the baseline and project fuel collection. The VPA boundary will be within the geographical boundary of the PoA, as outlined in Section 4.1.2.

Emissions sources to be included in each mVPA boundary in the proposed PoA:

	Source	Gas	Included?	Justification/Explanation
Baseline	Cooking, production of fuel, and transport of fuel	CO_2	Yes	CO_2 is emitted during the combustion of biomass in the baseline and is one of the six greenhouse gases targeted by the IPCC [6]
		CH_4	Yes	CH_4 is emitted during the combustion of biomass in the baseline and is one of the six greenhouse gases targeted by the IPCC *(ibid)*
		N_2O	Yes	N_2O is emitted during the combustion of biomass in the baseline and is one of the six greenhouse gases targeted by the IPCC *(ibid)*

	Source	Gas	Included?	Justification/Explanation
Project	Cooking, production of fuel, and transport of fuel	CO_2	Yes	CO_2 is emitted during the combustion of biomass in the project scenario and is one of the six greenhouse gases targeted by the IPCC *(ibid)*
		CH_4	Yes	CH_4 is emitted during the combustion of biomass in the project scenario and is one of the six greenhouse gases targeted by the IPCC *(ibid)*
		N_2O	Yes	N_2O is emitted during the combustion of biomass in the project scenario and is one of the six greenhouse gases targeted by the IPCC *(ibid)*

D.4. Description of how the baseline scenario is identified and description of the identified baseline scenario for technology(ies) or practice(s):

According to the methodology, a baseline is defined by the typical baseline fuel consumption patterns in a population that is targeted for adoption of the project technology.

The baseline scenario is identified at VPA level using the following baseline studies:

[6] http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_2_Ch2_Stationary_Combustion.pdf

A. Baseline Non-Renewable Biomass Assessment

As woody biomass is a proponent of the baseline scenario, the fractional non-renewability of biomass is identified through an NRB assessment following the guidance in Annex 1 of the methodology. An NRB Report will be completed.

B. Baseline Survey

Personal interviews, or Kitchen Surveys (KS), with a representative sample of targeted end users, will provide information on target population characteristics, baseline technology use, fuel consumption, leakage and sustainable development indicators.

The KS is designed to capture the following demographic, cooking preference and fuel choice variables:

- Their address and telephone number (mobile or landline where possible)
- The number of people served by the baseline technology and typical usage patterns and tasks (e.g. domestic/commercial cooking)
- The types and estimated frequency of baseline technologies used
- The types of fuels used and estimated quantities
- Seasonal variations in baseline technology and fuel use
- Sources of fuels and prices paid (if purchase is the source) or effort made (if collection is the source)
- Renewability and non-renewability indicators as required by Annex 1 of the methodology

The information from the baseline survey was used to choose the most representative households in terms of the above stated variables for the baseline performance test.

C. Baseline Performance Field Test (KPT)

The baseline performance field test follows the guidance in Annex 4 of the methodology – the Kitchen Performance Test (KPT). The KPT measures real, observed technology performance in the field, with a representative sample of end users. The KPTs will be conducted at an appropriate time of year ensuring that no festival or other unusual cooking events were planned during the measurement period.

A Baseline Report will be produced, which gives full details of the baseline studies for each VPA.

D.4.1 Description of how the baseline scenario is identified and description of the identified baseline scenario for each type of technology or practice:

In accordance with the methodology, the baseline scenario is the existing practice of treating water for consumption by boiling using high emission fuels including non-renewable biomass and fossil fuels. Suppressed demand can be applied in instances where inadequate safe water is available or where treatment is not practiced.

Fuel consumption in the baseline scenario is back-calculated by multiplying the safe water consumption of end users observed in the project scenario by the amount of fuel required to boil a specific quantity of water.

A. Baseline Non-Renewable Biomass Assessment

As woody biomass is a proponent of the baseline scenario, the fractional non-renewability of biomass is identified through an NRB assessment following the guidance in Annex 1 of the methodology. An NRB Report will be completed.

B. Baseline Survey

Personal interviews, or Kitchen Surveys (KS), with a representative sample of targeted end users, currently using the safe water project technology will capture the baseline living standard and provide information on target population characteristics, baseline technology use and fuel consumption for water treatment, leakage and sustainable development indicators.

The KS is designed to capture the following demographic, cooking preference and fuel choice variables:

- Their address and telephone number (mobile or landline where possible)
- The number of people served by the baseline technology and typical usage patterns and tasks (e.g. domestic/commercial water treatment)
- The types and estimated frequency of baseline technologies used
- The types of fuels used and estimated quantities
- Seasonal variations in baseline technology and fuel use
- Sources of fuels and prices paid (if purchase is the source) or effort made (if collection is the source)
- Renewability and non-renewability indicators as required by Annex 1 of the methodology

C. Baseline Water Boiling Test (BWBT)

The BWBT is conducted to calculate the quantity of fuel required to purify 1 litre of water by boiling for 10 minutes using technologies and fuels representative of the baseline scenario.

D.5. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the technology(ies) or practice(s) being included as registered PoA (assessment and demonstration of additionality of VPA):

D.5.1. Assessment and demonstration of additionality for a typical technology or practice:

As stated in the methodology; "additionality does not need to be demonstrated for a micro-programme that only plans to include activities that are deemed additional as per criteria listed in the section below [in Section A.4.3]. This can become the inclusion criteria for future activities."

The mPoA meets the first criterion:

i. The project activity is located in a Least Developed Country (LDC), Small Island Developing States (SIDS) or a Land Locked Developing Country (LLDC).

In the case of any retroactive VPAs, additionality will be demonstrated using an UNFCCC-approved or Gold Standard-approved additionality tool.

D.5.2. Key criteria and data for assessing additionality of a technology or practice:

- The project activity is located in a Least Developed Country (LDC), Small Island Developing States (SIDS) or a Land Locked Developing Country (LLDC)

D.6. Estimation of Emission reductions of technology(ies) or practice(s):

D.6.1. Explanation of methodological choices, provided in the baseline and monitoring methodology applied, selected for a technology or practice:

The methodology applied is the Gold Standard Methodology *Technologies and Practices to Displace Decentralized Thermal Energy Consumption* Version 1, applicable as the project involves introducing technologies that reduce or displace greenhouse gas (GHG) emissions from the thermal energy consumption of households.

High efficiency biomass fired cook stoves and/or safe water supply or treatment technologies will be disseminated under the proposed PoA. Emissions reductions for each mVPA will therefore be calculated according to this methodology. Below is an outline of the methodological choices selected from the baseline and monitoring methodology.

Methodological Choices

1. **Project Boundary**

The project boundary, target area and fuel collection area will be defined at VPA level, but all activity will be within the geographical boundaries outlined in Section 4.1.2. The emissions sources included in the project boundary are outlined in Section D.3.1 above.

2. **Selection of Baseline and Project Scenarios**

In accordance with the methodology, as the project activity targets non-industrial applications, the baseline is considered fixed during the crediting period, and therefore does not require continuous monitoring. The baseline is defined by the typical fuel consumption pattern in the target population, and will be identified for the replacement of traditional cooking devices, such as three-stone fires, with improved cook stoves, and the introduction of water technologies to remove the need for treatment by boiling respectively.

The project scenario is the installation of improved cook stoves and/or water treatment and supply technologies. This will alter the fuel consumption observed in the baseline scenario.

3. Additionality

As this is a Micro-Scale PoA, additionality is demonstrated in accordance with The Gold Standard *Micro-Programme Rules and Procedures*.

4. Baseline Emissions

The non-renewable biomass fraction will be calculated according to one of the approaches outlined in Annex 1 of the methodology, and will be determined on a National level for the specific country that each VPA is implemented in. A Baseline Survey at VPA level is used to assess target population characteristics, baseline technology use, fuel consumption, leakage, and sustainable development indicators amongst a randomly selected sample of households currently using traditional cooking devices. The standard approach to a Kitchen Performance Test listed in the methodology is followed for the Baseline Performance Field Test.

The calculations used to determine baseline emissions are shown in Section D.6.2.

5. Project Emissions

The project proponent has opted to carry out a single sample test of baseline fuel use and use an independently verified assessment of the thermal efficiency of the improved project stove in estimating the project scenario and hence emission reductions. The procedures used are described below:

An independent laboratory test of the thermal efficiency of the project technology was used to estimate the project fuel use in relation to the baseline technology. A default efficiency of 10% for the baseline technology was applied in accordance with the rules of the methodology. Measured baseline fuel use from the statistically representative KPT studies (shown in the prior section) was used to predict savings as a result of the improvement in efficiency of the project technology. These calculations were carried out by an independent consultant and are made available for validation.

The proponent will carry out KPTs for the project scenario in time for verification; project tests will be independent of the baseline tests. This option allows a proper development of the project and hence accurate assessment of emissions reductions - this process is fully described in the monitoring plan.

6. Leakage

The potential sources of leakage listed in the methodology are investigated and addressed below:

a) The displaced baseline technologies are reused outside the project boundary in place of lower emitting technology or in a manner suggesting more usage than would have occurred in the absence of the project.

In the case of wood stoves, the traditional stoves replaced are three rocks (threes-stone fires); these have no market value and are not a product as such. There is nothing limiting the use of three-stone cooking across the country (technology is lowest, price is zero), which is why this cooking method is so widespread. Regarding charcoal stoves, the baseline technology would be disposed of and replaced with the improved efficiency charcoal stove, removing the possibility of it continuing to be used outside the project boundary. This leakage source can therefore be discounted.

b) The non-renewable biomass or fossil fuels saved under the project activity are used by non-project users who previously used lower emitting energy sources.

There is no evidence to suggest significant (if any) use of renewable energy for cooking in the project regions. As solar ovens are not available, renewable energy use for cooking would likely be use of animal dung or crop residues which will be used due to ease of availability/proximity to the home rather than due to a shortage of wood fuel, therefore being an independent factor. This leakage source can therefore be discounted.

c) The project significantly impacts the NRB fraction within an area where other CDM or VER project activities account for NRB fraction in their baseline scenario.

The NRB fraction will be monitored every 2 years. However, as the majority of participants collect wood from within the project boundary, it is not expected that the NRB in other areas will be affected.

d) The project population compensates for loss of the space heating effect of inefficient technology by adopting some other form of heating or by retaining some use of inefficient technology.

This is possible in some areas covered by the project. Any compensation will however be covered in the results of the monitoring KPT (which encompasses all wood-fuel use) and the monitoring KS (which will pick up on any use of other fuels for space heating) and so this need not be separately assessed.

e) By virtue of promotion and marketing of new technology with high efficiency, the project stimulates substitution within households who commonly used a technology with relatively lower emissions, in cases where such a trend is not eligible as an evolving baseline.

The majority of stove recipients cook on three-stone fires, in which case the only scenario producing this leakage would be a recipient reducing use of renewable fuels such as crop residues. This will be captured through monitoring KS and KPTs.

In accordance with the methodology, leakage risks deemed very low can be ignored. As explored above, leakage in this project is expected to be 0, but leakage will be investigated every two years as part of monitoring.

7. Calculation of Emission Reductions

The methodology provides three choices for calculating emissions reductions. Equation 3 was considered most appropriate as it is relevant for cases of a single sample test.

The equations used in the calculations are outlined in Section D.6.2 below.

D.6.2. Equations, including fixed parametric values, to be used for calculation of emission reductions of a technology or practice:

Estimation of Emissions Reductions: Cook Stoves Calculations

Parameter	Value	Unit	Description
BE_{by}	VPA Specific	tco_2e	Emissions for baseline scenario b during the year y
B_{by}	VPA Specific	tons/yr	Quantity of fuel consumed in baseline scenario b during year y
fNRBy	VPA Specific	Fraction	Fraction of non-renewable biomass
NCV_{bfuel}	0.015	TJ/ton	Net calorific value of fuel (wood) reduced
$EF_{bfuelCO2}$	112	tco_2/TJ	CO_2 emission factor of wood reduced
$EF_{bfuelnonCO2}$	8.692	tco_2/TJ	Non-CO_2 emission factor of wood reduced
N_{py}	VPA Specific		Project technology-days
P_{by}	VPA Specific	tons/day	Specific fuel consumption for an individual technology in baseline scenario b during year y
PE_{py}	VPA Specific	tco_2e	Emissions for project scenario p during the year y
B_{py}	VPA Specific	tons/yr	Quantity of fuel consumed in project scenario p during year y
P_{py}	VPA Specific	tons/day	Specific fuel consumption for an individual technology in project scenario p during year y
U_{py}	0.99	Percentage	Usage rate
n_{new}	VPA Specific	Percentage	Thermal efficiency of efficient cook stove
n_{old}	0.10	Percentage	Thermal efficiency of three-stone baseline stove
LE_{py}	0	tco_2e	Leakage
ER_y	VPA Specific	tco_2e	Emission Reductions

Baseline Emissions

$$BE_{b,y} = B_{b,y} * \left(\left(fNRB_y * EF_{b,fuel,co2} \right) + EF_{b,fuel,nonco2} \right) * NCV_{b,fuel}$$

Where:

$$B_{b,y} = N_{b,y} * P_{b,y}$$

Project Emissions

$$PE_{p,y} = B_{p,y} * \left(\left(fNRB_y * EF_{p,fuel,co2} \right) + EF_{p,fuel,nonco2} \right) * NCV_{p,fuel}$$

Where:

$B_{p,y} = N_{p,y} * ((P_{p,y} * U_{p,y}) + (P_{b,y} * (1- U_{p,y})))$

And:

$P_{p,y} = n_{old}/n_{new}$

Overall Emission Reductions

$$ER_y = \Sigma BE_{b,y} - \Sigma PE_{p,y} - \Sigma LE_{p,y}$$

Estimation of Emissions Reductions: Water Technology Calculations

Parameter	Value	Unit	Description
BE_{by}	VPA Specific	tco_2e	Emissions for baseline scenario b during the year y
B_{by}	VPA Specific	tons/yr	Quantity of fuel consumed in baseline scenario b during year y
fNRBy	VPA Specific	Fraction	Fraction of non-renewable biomass
NCV_{bfuel}	0.015	TJ/ton	Net calorific value of fuel (wood) reduced
$EF_{bfuelCO2}$	112	tco_2/TJ	CO_2 emission factor of wood reduced
$EF_{bfuelnonCO2}$	8.692	tco_2/TJ	Non-CO_2 emission factor of wood reduced
PE_{py}	VPA Specific	tco_2e	Emissions for project scenario b during the year y
B_{py}	VPA Specific	tons/yr	Quantity of fuel consumed in project scenario p during year y
P_{py}	VPA Specific	tons/day	Specific fuel consumption for an individual technology in project scenario p during year y
C_j	VPA Specific	Percentage	Portion of users of the project technology j who in the baseline were already consuming safe water without boiling it
Q_{py}	VPA Specific	litres/person/day	Quantity of safe water in litres consumed in the project scenario p and supplied by project technology per person per day
$Q_{p,rawboil,y}$	VPA Specific	litres/person/day	Quantity of raw water boiled in the project scenario p per person per day

$Q_{p,cleanboil,y}$	VPA Specific	litres/person/day	Quantity of safe water boiled in the project scenario p per person per day
W_{by}	VPA Specific	tons	Quantity of fuel in tons required to treat 1 litre of water using technologies representative of baseline scenario b during project year y, as per Baseline WBT
W_{py}	VPA Specific	tons	Quantity of wood fuel or fossil fuel in tons required to treat 1 litre of water using technologies representative of the project scenario p during project year y
U_{py}	0.99	Percentage	Usage rate
n_{new}	VPA Specific	Percentage	Thermal efficieny of efficient cook stove
n_{old}	0.10	Percentage	Thermal efficiency of three-stone baseline stove
LE_{py}	0	tco_2e	Leakage
ER_y	VPA Specific	tco_2e	Emission Reductions

Baseline Fuel Consumption

$B_{b,y} = (1- C_j) * N_{p,y} * W_{b,y} * (Q_{p,y} + Q_{p,rawboil,y})$

Project Fuel Consumption

$B_{p,y} = (1- C_j) * N_{p,y} * W_{b,y} * (Q_{p,rawboil,y} + Q_{p,cleanboil,y})$

Baseline Emissions

$$BE_{b,y} = B_{b,y} * \left((fNRB_y * EF_{b,fuel,co2}) + EF_{b,fuel,nonco2} \right) * NCV_{b,fuel}$$

Where:

$$B_{b,y} = N_{b,y} * P_{b,y}$$

Project Emissions

$$PE_{p,y} = B_{p,y} * \left((fNRB_y * EF_{p,fuel,co2}) + EF_{p,fuel,nonco2} \right) * NCV_{p,fuel}$$

Overall Emission Reductions

$$ER_y = \Sigma BE_{b,y} - \Sigma PE_{p,y} - \Sigma LE_{p,y}$$

For full calculations please see accompanying 'Ex-Ante Calculations Spreadsheet' for specific VPA-DD.

D.6.3. Data and parameters that are to be reported in VPA-DD form for a technology or practice:

Technology 1: Cook Stoves

Parameters Fixed for All VPAs under this PoA:

Data / Parameter:	$EF_{b,co2}$
Data unit:	tco_2/TJ
Description:	co_2 emission factor arising from use of fuels in baseline scenario
Source of data used:	IPCC default value
Value applied:	112
Justification of the choice of data or description of measurement methods and procedures actually applied:	Deemed valid by Methodology
Any comment:	-

Data / Parameter:	$EF_{b,CH4}$
Data unit:	tco_2/TJ
Description:	Non-co_2 emission factor arising from use of fuels in baseline scenario
Source of data used:	IPCC default value
Value applied:	7.5
Justification of the choice of data or description of measurement methods and procedures actually applied:	Deemed valid by Methodology
Any comment:	-

Data / Parameter:	$EF_{b,N2O}$
Data unit:	tco_2/TJ
Description:	Non-co_2 emission factor arising from use of fuels in baseline scenario
Source of data used:	IPCC default value

Value applied:	1.192
Justification of the choice of data or description of measurement methods and procedures actually applied:	Deemed valid by Methodology
Any comment:	-

Data / Parameter:	$EF_{p,co2}$
Data unit:	tco_2/TJ
Description:	co_2 emission factor arising from use of fuels in project scenario
Source of data used:	IPCC default value
Value applied:	112
Justification of the choice of data or description of measurement methods and procedures actually applied:	Deemed valid by Methodology
Any comment:	-

Data / Parameter:	$EF_{p,CH4}$
Data unit:	tco_2/TJ
Description:	Non-co_2 emission factor arising from use of fuels in project scenario
Source of data used:	IPCC default value
Value applied:	7.5
Justification of the choice of data or description of measurement methods and procedures actually applied:	Deemed valid by Methodology
Any comment:	-

Data / Parameter:	$EF_{p,N2O}$
Data unit:	tco_2/TJ
Description:	Non-co_2 emission factor arising from use of fuels in project scenario
Source of data used:	IPCC default value
Value applied:	1.192
Justification of the choice of data or description of measurement	Deemed valid by Methodology

methods and procedures actually applied:	
Any comment:	-

Data / Parameter:	NCV_b
Data unit:	TJ/ton
Description:	Net calorific value of the fuels used in the baseline
Source of data used:	IPCC default value
Value applied:	0.0156
Justification of the choice of data or description of measurement methods and procedures actually applied:	Deemed valid by Methodology
Any comment:	-

Data / Parameter:	NCV_p
Data unit:	TJ/ton
Description:	Net calorific value of the fuels used in the project
Source of data used:	IPCC default value
Value applied:	0.0156
Justification of the choice of data or description of measurement methods and procedures actually applied:	Deemed valid by Methodology
Any comment:	-

Parameters Fixed at VPA Inclusion:

Data / Parameter:	$f_{NRB,i,y}$
Data unit:	Fractional non-renewability
Description:	Non-renewability status of woody biomass fuel in scenario i during year y
Source of data used:	Applicable NRB assessment
Value applied:	-
Justification of the choice of data or description of measurement methods and procedures actually	The NRB will be assessed in accordance with one of the approaches given in the methodology, and will be detailed in each VPA-DD.

applied:	
Any comment:	-

Technology 2: Safe water supply and treatment technology

Parameters Fixed for All VPAs under this PoA:

Same as fixed parameters above

Parameters Fixed at VPA Inclusion:

Data / Parameter:	C
Data unit:	Percentage
Description:	Portion of users of project safe water supply who were already using a non-boiling safe water supply in the baseline
Source of data used:	Baseline study
Value applied:	-
Justification of the choice of data or description of measurement methods and procedures actually applied:	Deemed valid by Methodology
Any comment:	-

Data / Parameter:	$W_{b,y}$
Data unit:	Kg/Litre
Description:	Quantity of wood fuel required to boil 1 litre of water using technologies representative of baseline scenario b during project year y
Source of data used:	Baseline water boiling test BWBT
Value applied:	-
Justification of the choice of data or description of measurement methods and procedures actually applied:	Deemed valid by Methodology
Any comment:	-

Data / Parameter:	$W_{p,y}$
Data unit:	Kg/Litre
Description:	Quantity of wood fuel required to boil 1 litre of water using technologies representative of the project scenario p during project year y
Source of data used:	Baseline water boiling test BWBT
Value applied:	-

Justification of the choice of data or description of measurement methods and procedures actually applied:	Deemed valid by Methodology
Any comment:	-

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

D.7.1. Data and parameters to be monitored by each technology or practice:

Cook Stoves:	
Data / Parameter:	$P_{p,y}$
Data unit:	kg/household-day
Description:	Quantity of fuel that is consumed in project scenario p during year y
Source of data to be used:	Total sales record, project FT, project FT updates, and any applicable adjustment factors
Value of data applied for the purpose of calculating expected emission reductions	See VPA-DD
Description of measurement methods and procedures to be applied:	
QA/QC procedures to be applied:	Work is carried out by experienced field staff; all data is checked by co2balance UK.
Any comment:	-

Data / Parameter:	$U_{p,y}$
Data unit:	Percentage
Description:	Usage rate for project scenario p in year y
Source of data to be used:	Annual Usage Survey
Value of data applied for the purpose of calculating expected emission reductions	Assumed to be 0.99 in the absence of any data for validation.
Description of measurement methods and procedures to be	Annual usage survey completed for each crediting year.

applied:	
QA/QC procedures to be applied:	Random selection will be controlled by a computer using unique IDs.
Any comment:	Value will be determined by survey in time for first verification.

Data / Parameter:	$N_{p,y}$
Data unit:	Project technologies credited (units)
Description:	Technologies in the project database for project scenario p through year y
Source of data to be used:	Total sales record
Value of data applied for the purpose of calculating expected emission reductions	See VPA-DD
Description of measurement methods and procedures to be applied:	Project technologies will be monitored continuously using an electronic database derived from the installation record.
QA/QC procedures to be applied:	Quality of data uploaded will be assured by a computer using unique IDs to ensure no duplication of records resulting from human error.
Any comment:	-

Data / Parameter:	$LE_{p,y}$
Data unit:	t_CO_2e per year
Description:	Leakage in project scenario p during year y
Source of data to be used:	Baseline and monitoring surveys
Value of data applied for the purpose of calculating expected emission reductions	See VPA-DD
Description of measurement methods and procedures to be applied:	Monitoring Kitchen Surveys supported by desk-based research – a biennial assessment will be made as per the methodology.
QA/QC procedures to be applied:	Monitoring surveys are randomly selected to represent the wider population. Work carried out by experienced field staff; all data is checked by co2balance UK .
Any comment:	-

Water:	
Data / Parameter:	$Q_{p,y}$
Data unit:	Litres per person per day
Description:	Quantity of safe water supplied in the project scenario p during the year y, using the zero or low emissions clean water supply technology
Source of data to be used:	Water consumption field test WCFT
Value of data applied for the purpose of calculating expected emission reductions	See VPA-DD
Description of measurement methods and procedures to be applied:	Water Consumption Field Test survey
QA/QC procedures to be applied:	Surveys are randomly selected to represent the wider population. Work carried out by experienced field staff; all data is checked by co2balance UK .
Any comment:	-

Data / Parameter:	$Q_{p,rawboil,y}$
Data unit:	Litres per person per day
Description:	The raw or unsafe water that is still boiled after installation of the water treatment technology
Source of data to be used:	Water consumption field test WCFT
Value of data applied for the purpose of calculating expected emission reductions	See VPA-DD
Description of measurement methods and procedures to be applied:	Water Consumption Field Test survey
QA/QC procedures to be applied:	Surveys are randomly selected to represent the wider population. Work carried out by experienced field staff; all data is checked by co2balance UK .
Any comment:	-

Data / Parameter:	$Q_{p,cleanboil,y}$
Data unit:	Litres per person per day
Description:	Quantity of safe (treated, or from safe supply) water boiled in the project scenario p, after installation of the water treatment technology
Source of data to be used:	Water consumption field test WCFT
Value of data applied	See VPA-DD

for the purpose of calculating expected emission reductions	
Description of measurement methods and procedures to be applied:	Water Consumption Field Test survey
QA/QC procedures to be applied:	Surveys are randomly selected to represent the wider population. Work carried out by experienced field staff; all data is checked by co2balance UK .
Any comment:	-

Data / Parameter:	Quality of the treated water
Data unit:	As appropriate in alignment with QA/QC procedures
Description:	Performance of the treatment technology
Source of data to be used:	FT updates
Value of data applied for the purpose of calculating expected emission reductions	See VPA-DD
Description of measurement methods and procedures to be applied:	One of the options below will be chosen, in line with the specific country's standards. The chosen option will be detailed in the Monitoring Plan and Report.
QA/QC procedures to be applied:	Water quality testing may be conducted either in the field or by transportation to laboratories; the testing approach will be fully described in the monitoring reports. In cases where the effectiveness of project technologies may be indicated reliably through proxies, such as reliable evidence that they are being maintained and used correctly in accordance with manufacturers' or installers', then the FTs may capture such evidence in pace of chemical and biological indicator tests. The approach will be described in the Monitoring Plan for the specific VPA.
Any comment:	-

Data / Parameter:	$U_{p,y}$
Data unit:	Percentage
Description:	Usage rate for project scenario p in year y
Source of data to be used:	Annual Usage Survey
Value of data applied for the purpose of calculating expected emission reductions	Assumed to be 0.99 in the absence of any data for validation.
Description of measurement	Annual usage survey completed for each crediting year.

methods and procedures to be applied:	
QA/QC procedures to be applied:	Random selection will be controlled by a computer using unique IDs.
Any comment:	Value will be determined by survey in time for first verification.

Data / Parameter:	$N_{p,y}$
Data unit:	Person.days
Description:	Number of persons consuming water supplied by project scenario p through year y
Source of data to be used:	Water consumption field test WCFT
Value of data applied for the purpose of calculating expected emission reductions	See VPA-DD
Description of measurement methods and procedures to be applied:	The number of people served by project technologies will be monitored continuously using an electronic database derived from the installation record.
QA/QC procedures to be applied:	Quality of data uploaded will be assured by a computer using unique IDs to ensure no duplication of records resulting from human error.
Any comment:	-

Data / Parameter:	$LE_{p,y}$
Data unit:	t_CO_2e per year
Description:	Leakage in project scenario p during year y
Source of data to be used:	Water consumption field test WCFT
Value of data applied for the purpose of calculating expected emission reductions	See VPA-DD
Description of measurement methods and procedures to be applied:	WCFT supported by desk-based research – a biennial assessment will be made as per the methodology.
QA/QC procedures to be applied:	Work carried out by experienced field staff; all data is checked by co2balance UK .
Any comment:	-

D.7.2. Description of the monitoring plan for a technology(ies) or practice(s):

Cook Stoves:

For further details and the full Monitoring Plan, see the 'Monitoring Plan' document for the specific VPA-DD.

A. Installation Record

A comprehensive installation record will record the following information:

- Date of installation
- Geographic location of the installed stove
- Model of the stove
- Unique Stove ID
- Quantity of stoves installed
- Name, address and telephone number of all stove end users where possible
- Mode of use: commercial/domestic

The installation record will be backed up electronically, with original documentation being stored in the Carbon Zero Kenya office or appropriate office for the respective VPAs.

B. Project Database

The project database will be derived from the Installation Record, with project technologies differentiated by different project scenarios. The project proponent expects that any improvements to the current design will not involve significant changes in combustion technology or changes in thermal efficiency of +/- 5%, and hence will not entail a new project scenario. Any such changes to the current design will however be recorded in the project database. The useful life of the stove technology is estimated to be at least 7 years and therefore extends the chosen crediting period.

All data collected in relation to the project will be held in the local office and/or on the Project Database for the entire life cycle of the project and a period of 2 years afterwards. The data may be archived during the project in order to maintain clarity and security.

a. Ongoing Monitoring Studies

The following ongoing monitoring studies are conducted for each project scenario following verification of the associated initial project studies.

a) *Monitoring Survey*- Completed annually, beginning 1 year after project registration

The monitoring survey investigates changes over time in a project scenario by surveying end users with project technologies on an annual basis.

b) Usage Survey- Completed annually, on time for any request of issuance

The usage survey provides a single usage parameter that is weighted based on drop off rates that are representative of the age distribution for project technologies in the installation record.

c) *Project KPT (FT) Update*- Completed at least every other year

The FT Update will provide a fuel consumption assessment representative of the project technologies currently in use. As the stove remains materially the same each year, an Age Test may be chosen to be applied instead of a PFT.

d) *Leakage Assessment*- Completed every other year

The potential sources of leakage will be investigated. If the assessment quantifies an increase in fuel consumption by the non-project households attributable to the project activity, then calculations will be adjusted to account for this.

e) *Non-renewable Biomass Assessment Update*- Reassessed at renewal of crediting period

In accordance with the methodology, the NRB assessment will remain fixed for the entire crediting period, although the project proponent may choose to reexamine the assessment at any time.

D.7.2.1	Description of the monitoring plan for a technology or practice:

Water Technologies:

For further details and the full Monitoring Plan, see the 'Monitoring Plan' document for the specific VPA-DD.

A. Installation Record

A comprehensive installation record will record the following information:

- Date of installation
- Geographic location of the installed water technology
- Model of the treatment device
- Serial Number
- Quantity of water technologies installed
- Name, address and telephone number of all water technology end users where possible
- Mode of use: commercial/domestic

The installation record will be backed up electronically, with original documentation being stored in the Carbon Zero Kenya office or appropriate office for the respective VPAs.

B. Project Database

The project database will be derived from the Installation Record, with project technologies differentiated by different project scenarios.

C. Ongoing Monitoring Studies

The following ongoing monitoring studies are conducted for each project scenario following verification of the associated initial project studies.

a) Monitoring Survey- Completed annually, beginning 1 year after project registration

The monitoring survey investigates changes over time in a project scenario by surveying end users with project technologies on an annual basis.

b) *Usage Survey*- Completed annually, on time for any request of issuance

The usage survey provides a single usage parameter that is weighted based on drop off rates that are representative of the age distribution for project technologies in the installation record.

c) Water Consumption Field Test (WCFT) Update- Completed at least every other year

The WCFT Update will provide a water consumption volumes and boiling assessment representative of the project technologies currently in use.

d) Leakage Assessment- Completed every other year

The potential sources of leakage will be investigated. If the assessment quantifies an increase in fuel consumption by the non-project households attributable to the project activity, then calculations will be adjusted to account for this.

e) Non-renewable Biomass Assessment Update- Reassessed at renewal of crediting period

In accordance with the methodology, the NRB assessment will remain fixed for the entire crediting period, although the project proponent may choose to reexamine the assessment at any time.

Verification Sampling

As is outlined in Annex F; "different monitoring periods for activities requesting issuance that may lead to sampling verification not being compatible (any period for which Emission Reductions are claimed must be covered by verification). For instance, for a set of activities requesting issuance but having different monitoring periods, it may not be possible to choose a sample and all activities may need to be systematically verified."

This PoA will contain numerous VPAs covering different technologies and having different monitoring periods, therefore co2balance UK Ltd has opted for a verification method which verifies each VPA individually.

During each verification period, a sampled group of stove users within each VPA will be identified to be monitored. This sample group will alter during every verification period, according to a random selection process. The Monitoring Plan is described in detail in the attached 'Project Monitoring Plan.'

Each VPA-DD will contain a Sampling Plan. In accordance with the *Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities Version 02,* the complete Sampling Plan will include the following:

1. Sampling Design:
   2. Objectives and Reliability Requirements
   3. Target Population
   4. Sampling Method
   5. Sample Size
   6. Sampling Frame

2. Data:
   (i) Field Measurements

   (ii) Quality Assurance/Quality Control

   (iii) Analysis

3. Implementation
   (i) Implementation Plan

D.8 Date of completion of the application of the baseline study and monitoring methodology and the name of the responsible person(s)/entity(ies)

The baseline studies are carried out at VPA level and will be completed in time for inclusion under the registered PoA. The monitoring methodology was completed on 24/08/2012 by co2balance UK Ltd.

Annex 1

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

Organization:	co2balance
Street/P.O.Box:	Cook Way
Building:	1 Discovery House
City:	Taunton
State/Region:	Somerset
Postfix/ZIP:	TA2 6BJ
Country:	UK
Telephone:	01823 332233
FAX:	
E-Mail:	ellie.kowalski@co2balance.com
URL:	
Represented by:	Ellie Kowalski; Richard Iliffe
Title:	Carbon Project Developer
Salutation:	Miss
Last Name:	Kowalski
Middle Name:	
First Name:	Eleanor
Department:	Carbon Projects
Mobile:	
Direct FAX:	
Direct tel:	+44 (0)1823 332233
Personal E-Mail:	ellie.kowalski@co2balance.com; richard.iliffe@co2balance.com

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

OFFICIAL DEVELOPMENT ASSISTANCE DECLARATION

Date: 20/07/2012

The Gold Standard Foundation
79 Avenue Louis Casai
Geneva Cointrin, CH-1216
Switzerland

RE: Declaration of Non-Use of Official Development Assistance by Project Owner of GS1247

As Project Owner of the above-referenced project, and acting on behalf of all Project Participants, I now make the following representations:

I. The Gold Standard Documentation

I am familiar with the provisions of The Gold Standard Documentation relevant to Official Development Assistance (ODA). I understand that the above-referenced project is not eligible for Gold Standard registration if the project receives or benefits from Official Development Assistance with the condition that some, or all, of the carbon credits [CERs, ERUs, or VERs] coming out of the project are transferred to the ODA donor country. I hereby expressly declare that no financing provided in connection with the above-referenced project has come from or will come from ODA that has been or will be provided under the condition, whether express of implied, that any or all of the carbon credits issued as a result of the project's operation will be transferred directly or indirectly to the country of origin of the ODA.

II. Duty to Notify Upon Discovery

If I learn or if I am given any reason to believe at any stage of project design or implementation that ODA has been used to support the development or implementation of the project, or that an entity providing ODA to the host country may at some point in the future benefit directly or indirectly from the carbon credits generated from the project as a condition of investment, I will notify The Gold Standard immediately using the Amended ODA Declaration Form provided below.

III. Investigation

The Gold Standard reserves the right to conduct an investigation into any project it reasonably believes may be receiving ODA with the condition that some or all of the carbon credits from the project will be transferred to the ODA donor country.

IV. Sanctions

I am fully aware that the sanctions identified in The Gold Standard Terms and Conditions may be applied to me or the above-referenced project in the event that any of the information provided above is false or I fail to notify The Gold Standard of any changes to ODA in a timely manner.

I swear that all of the statements contained herein are true to the best of my knowledge.

Signed: 

Name: Suzanne Longworth

Title: Director

On behalf of: co2balance

Place: Taunton, UK