

**SMALL-SCALE CDM PROGRAMME ACTIVITY DESIGN DOCUMENT FORM
(CDM-SSC-CPA-DD) - Version 01**



NAME /TITLE OF THE PoA: Heat Retention Cookers in South Africa



CDM – Executive Board

page 1

**CLEAN DEVELOPMENT MECHANISM
SMALL-SCALE PROGRAM ACTIVITY DESIGN DOCUMENT FORM (CDM-SSC-CPA-DD)
Version 01**

CONTENTS

- A. General description of CDM programme activity (CPA)
- B. Eligibility of CPA and Estimation of Emission Reductions
- C. Environmental Analysis
- D. Stakeholder comments

Annexes

Annex 1: Contact information on entity/individual responsible for the CPA

Annex 2: Information regarding public funding

Annex 3: Baseline information

Annex 4: Monitoring plan

NOTE:

(i) This form is for submission of CPAs that apply a small scale approved methodology using the provision of the proposed small scale CDM PoA.

(ii) The coordinating/managing entity shall prepare a CDM Small Scale Programme Activity Design Document (CDM-SSC-CPA-DD)^{1,2} that is specified to the proposed PoA by using the provisions stated in the SSC PoA DD. At the time of requesting registration the SSC PoA DD must be accompanied by a CDM-SSC CPA-DD form that has been specified for the proposed SSC PoA, as well as by one completed CDM-SSC CPA-DD (using a real case). After the first CPA, every CPA that is added over time to the SSC PoA must submit a completed CDM-SSC CPA-DD.

¹ The latest version of the template form CDM-CPA-DD is available on the UNFCCC CDM web site in the reference/document section.

² At the time of requesting validation/registration, the coordinating managing entity is required to submit a completed CDM-POA-DD, the PoA specific CDM-CPA-DD, as well as one of such CDM-CPA-DD completed (using a real case).

**SMALL-SCALE CDM PROGRAMME ACTIVITY DESIGN DOCUMENT FORM
(CDM-SSC-CPA-DD) - Version 01**



NAME /TITLE OF THE PoA: Heat Retention Cookers in South Africa



CDM – Executive Board

page 2

SECTION A. General description of small scale CDM programme activity (CPA)

A.1. Title of the small-scale CPA:

>>

Heat Retention Cooking in South Africa-General CPADD

Date and electronic filename of this document: General CPADD HRC SA v10 111112

A.2. Description of the small-scale CPA:

>>

This CDM program activity is a component of the Program Heat Retention Cooking in South Africa. It aims to establish regular use of Heat Retention Cookers, with the trade name Wonderbag, by up to 75,000 families in the CPA area.

The predominant cooking fuels for low-income families in the area are electricity and paraffin. This CPA reduces the amount of fossil fuels used for cooking by low-income families. Through reduction in fossil fuel consumption, the project will decrease both green house gas emissions and cash expenditure on these cooking fuels.

The CPA is managed by a local retail business contracted as a Program Activity Implementer (PAI) also known as a Wonderbag Outreach Team (WOT). Wonderbags (WBs) are supplied from the manufacturer wholesale to the WOT by Natural Balance.

The WOT will sell WBs to domestic householders in the area of Xxxx and throughout South Africa. The market penetration in the Xxxx area is not expected to exceed xxx%, and sales outside this area are expected to be small. At this level of usage of Wonderbags, and given fuel savings as found in the baseline monitoring study, the CPA energy savings do not exceed the threshold for small-scale projects under the CDM; should the usage rate exceed these figures, verification of emission reductions will be limited to the threshold value³. The table presents National Census data⁴.

XXXX

Total number of households	xxxx	Census 2001
Percent electricity	xxx%	Census 2001

³ In the case of WB users cooking on electricity the CPAs will typically not exceed energy savings of 60 GWhr (elec)/year as prescribed for Type II small scale methodologies. In the case of WB users cooking on paraffin the CPAs will typically not exceed energy savings of 180 GWhr (thermal)/year. In order to meet these small-scale thresholds, one of the eligibility criteria has been identified as a limiting size for each CPA of 75,000 Wonderbags.

Future monitoring will update the split of WB users using paraffin and electricity, and also the mean saving achieved by the Wonderbag, so resulting in variations in the total annual energy saving of the project; in case that this causes the threshold to be exceeded, verification will be limited to threshold value just as in the case where usage rates exceed the threshold

⁴ www.statssa.gov.za

**SMALL-SCALE CDM PROGRAMME ACTIVITY DESIGN DOCUMENT FORM
(CDM-SSC-CPA-DD) - Version 01**



NAME /TITLE OF THE PoA: Heat Retention Cookers in South Africa



CDM – Executive Board

page 3

Percent paraffin	xxx%	<i>Census 2001</i>
Percent penetration (of total)	xxx%	
Targeted households	xxxx	

A.3. Entity/individual responsible for the small-scale CPA:

>>

Responsibility for CPA implementation rests with the Wonderbag Outreach Team for Xxxx (WOT-XXX). Contact details are given in Annex 1 below.

A.4. Technical description of the small-scale CPA:

A.4.1. Identification of the small-scale CPA:

A.4.1.1. Host Party:

>>

Name of Party Involved (host) indicates a host Party)	Private and/or public entity(ies) project participants (as applicable)	Kindly indicate if the Party involved wishes to be considered as project participant (Yes/No)
South Africa (host)	Natural Balance (Pty) Ltd.	No
United Kingdom	J.P.Morgan Ventures Energy Corporation	No

A.4.1.2. Geographic reference or other means of identification allowing the unique identification of the small-scale CPA (maximum one page):

The small-scale CPA is managed by the WOT-xxx office in xxx, with co-ordinates xxxx. The unique means of identification for the small-scale CPA is the marking, colour or pattern, or serial number printed onto each Heat Retention Cooker (HRC) disseminated by this CPA. The physical location of the project is the kitchens of the users of the HRCs disseminated by this CPA, which are throughout South Africa and within the national borders of South Africa.

A.4.2. Duration of the small-scale CPA:

A.4.2.1. Starting date of the small-scale CPA:

>>01/06/2009 for specified CPAs (This date marks transition from product performance tests to low-volume low-budget market testing supported by advanced carbon finance agreed between JPMCC and NB in the Term Sheet of 19 Dec 2008. This date has been submitted for a group of CPAs to the CDM

**SMALL-SCALE CDM PROGRAMME ACTIVITY DESIGN DOCUMENT FORM
(CDM-SSC-CPA-DD) - Version 01**



NAME /TITLE OF THE PoA: Heat Retention Cookers in South Africa



CDM – Executive Board

page 4

secretariat by acknowledged letter of 29 January 2010 as the early start date of CPA01 in compliance with para 72 of the EB47 report of May 2009). Start date of other CPAs: xxx

A.4.2.2. Expected operational lifetime of the small-scale CPA:

>>21 Years

A.4.3. Choice of the crediting period and related information:

Renewable crediting period

A.4.3.1. Starting date of the crediting period:

>>xxx

A.4.3.2. Length of the crediting period, first crediting period if the choice is renewable CP:

>>7 years

A.4.4. Estimated amount of emission reductions over the chosen crediting period:

[To be entered for each specific CPA]

A.4.5. Public funding of the CPA:

>>

The CPA is not in receipt of public funding

A.4.6. Information to confirm that the proposed small-scale CPA is not a de-bundled component

>>

The debundling provisions do not apply as the energy saved by each WB is less than 1% of the limit set for the CPAs of small-scale PoAs.

A.4.7. Confirmation that small-scale CPA is neither registered as an individual CDM project activity or is part of another Registered PoA:

>>

This small-scale CPA is neither registered as an individual CDM project activity nor as part of another registered PoA. One CDM project using the AMS I.C. methodology is registered in South Africa (efficient housing), and one other PoA (using AMS I.C for distribution of solar water heaters) is under validation; this CPA is not included in either of these projects

SECTION B. Eligibility of small-scale CPA and Estimation of emissions reductions

B.1. Title and reference of the Registered PoA to which small-scale CPA is added:

**SMALL-SCALE CDM PROGRAMME ACTIVITY DESIGN DOCUMENT FORM
(CDM-SSC-CPA-DD) - Version 01**



NAME /TITLE OF THE PoA: Heat Retention Cookers in South Africa



CDM – Executive Board

page 5

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Heat Retention Cookers in South Africa

B.2. Justification of the why the small-scale CPA is eligible to be included in the Registered PoA :

>>

This CPA is eligible for inclusion in the Registered PoA by virtue of the following justifications, in view of the criteria listed below:

1. *The CPA is described appropriately in a CPA-DD document which is approved by the CME and validated by the DOE assigned by the CME.* This CPA-DD is prepared by the CME and formally validated by the DOE assigned by the CME.
2. *This CPA-DD conforms to the POA-DD and to the applied methodology.* The consistency of this CPA-DD with the POA-DD and the methodology, is confirmed through detailed investigation by the validation process. Specifically, this CPA is managed by a Project Activity Implementing team whose place of business is xxxx, as indicated in Annex 1. The team's operational name will be the Wonderbag Outreach team for Xxxx (this being the administrative district of South Africa defined in section A.4.1.2). The contract between the manager of WOT-XXX and Natural Balance requires that the prescriptions of the PoA-DD are followed. The WOT is also permitted to expand sales into any area of South Africa, as specified in section A.4.1.2. An expansion of this sort is in accordance with paragraph 9 of Annex 32 to the EB47 which allows a CPA to be active in the same areas as other CPAs. It is clearly prescribed by the Program of Activities Design Document that the methodology *II.C. Demand-side energy efficiency activities for specific technologies Version 13* will be followed, thus it is confirmed that that the CPA will be applying the correct methodology.
3. *The record-keeping systems follow those of the programme as a whole.* The contractual agreement between the PAI (WOT-XXX) and Natural Balance Ltd has been submitted as a supporting document. It expressly requires the WOT manager to follow the CDM Programme of Activity design Documents, and its Monitoring Plan. Thus the record-keeping systems of this CPA will conform to those of the programme as a whole.
4. *The projected sales imply a total customer base not exceeding 75,000 in one year, in order to remain approximately within the small-scale energy saving limits defined by the CDM.* This CPA has projected sales of 25,000 Wonderbags per year, calculated on the basis that a reasonable capability level is the management of 50 Sales agents, each selling (or distributing in promotional campaigns) 500 WBs per year. An excel spreadsheet containing these details and calculations relevant to the implementation of the CPA has been provided as a supporting document providing this justification. In accordance with paragraph 9 of Annex 32 to the EB47 Report, this CPA is not restricted to operation within this area, and will seek to reach this sales target by operating both within and outside the Xxxx area encompassing all areas of South Africa; equally, other PAIs will be operating within the Xxxx area. The sales target of 25,000 WBs per year results in approximately 73,000 WBs being in use by the third year of the CPA, and assuming a 3-year life for the WB, this figure is maintained through further years. The Wonderbag was found from performance tests to save on average 15.7 KWhr/week of electricity or 1.656 litres/week of kerosene per household, corresponding respectively to 819kWh_{elec}/year and 851 kWh_{thermal}/year (0.0031 TJ_{thermal}/year, kerosene having a density of 0.81 kg/litre density, and specific energy of 43.8TJ/Gg). The most recent census for South Africa records

**SMALL-SCALE CDM PROGRAMME ACTIVITY DESIGN DOCUMENT FORM
(CDM-SSC-CPA-DD) - Version 01**



NAME /TITLE OF THE PoA: Heat Retention Cookers in South Africa



CDM – Executive Board

page 6

that 19% of the population are kerosene users and 77% electricity users; if 25,000 WBs are sold each year in the CPA area, it is therefore reasonable to assume (given that ex-post monitoring will measure actual ratios) that 77% of these will use electricity for cooking and 19% will use kerosene. With respect to the limits of 60 GWh_{elec}/year and 180 GWh_{thermal}/year prescribed by the CDM for small-scale methodologies, the implication is that the number of Wonderbags operational in any one year should not exceed 14,548 associated with kerosene and 58,048 associated with electrical cooking. Assuming a 3-year life for each WB, this implies that the energy savings of electricity users will stabilize at 86% of the small-scale limit in the fourth year of the project and those of kerosene users will stabilize at 7% of the small-scale limit by the fourth year of the project; the total projection of 72, 592 customers (see table B.5.3) comprising 93% of the CPA energy savings limit. Given that this comprises xxxx% of the population of xxxx, and given that the CPA will be active outside the XXX area, it is expected this target will be achieved. As mentioned in the page 30 of CDM Glossary http://cdm.unfccc.int/Reference/Guidclarif/glos_CDM.pdf, if a project activity goes beyond the limit of its type in any year of the crediting period, the emission reductions claimed by the project during this particular year will be capped at the maximum emission reduction level allowed following the above calculation. It is confirmed therefore that this CPA has sales commensurate to a total customer base not exceeding the annual energy saving limits prescribed by the CDM EB for small-scale methodology application.

5. *The PAI responsible has signed a contract with NB which permits it to participate in the programme. The signed contractual agreement between the PAI (WOT-XXX) and Natural Balance Ltd has been submitted as a supporting document. It confirms that the PAI has signed a contract with NB and is permitted to participate in the programme.*

B.3. Assessment and demonstration of additionality of the small-scale CPA , as per eligibility criteria listed in the Registered PoA:

>>

In compliance with Annex 2 of the CDM board meeting EB 63, this section documents the compliance with the eligibility criteria set in the POADD section E.5.2. Those criteria are set out here in italics, and in connection with each one, explanation is given as to compliance with the relevant guideline/tool in EB 39 Report Annex 10, the “Tool for the demonstration and assessment of additionality” version 05.2:

1. *That this CPA trains and deploys a specialized staff team to overcome a lack of distribution infrastructure in this CPA, to promote awareness, wide acceptance, and enduring utilization of the product.* This CPA complies with the criterion by virtue of recruitment and contracting of the XXX Wonderbag Outreach Team, as evidenced by the contract signed on XXX by the WOT-XXX manager, XXX (see Annex 1 and signed contract). In line with the relevant Tool/Guideline Step 3, this criterion relates to the barrier 3(c) Prevailing Practice detailed in the POADD section E.5.2, which is addressed by “an intense, pervasive, and sustained effort to support customers through pre-sales, sales and after-sales familiarisation activities and the availability of specialised skills and organisational capacity”, only possible with CDM support.
2. *That uncertainty amongst potential lenders or funders as to the viability of distribution of Wonderbags within this CPA, constitutes an impassable investment barrier. Specifically, the evidence submitted for validation of the programme, in the form of refusals by banks and other potential funders to lend or invest, is directly applicable and relevant to this CPA.* The

**SMALL-SCALE CDM PROGRAMME ACTIVITY DESIGN DOCUMENT FORM
(CDM-SSC-CPA-DD) - Version 01**



NAME /TITLE OF THE PoA: Heat Retention Cookers in South Africa



CDM – Executive Board

page 7

approaches made by Natural Balance to a number of financial institutions and organizations for funding were made in respect of this specific CPA (as well as in respect of others) and were refused, as evidenced in the submission for validation, It became clear from numerous detailed discussions with potential lenders and funders, as listed below, that uncertainty as to acceptance of the Wonderbag (combined with appreciation of the significant investment needed to meet the costs of promotion and distribution of the Wonderbag in the informal communities comprising this CPA) was prevalent amongst potential funders. In line with the relevant Tool/Guideline Step 3, this criterion relates to the barrier 3(a) detailed in the POADD section E.5.2, which establishes that without the CDM the cost of promotion and distribution of the Wonderbag cannot be met.

National Empowerment Fund
Industrial Development Corporation
Standard Bank PLC
Nedbank
TFS Green
Department of Trade and Industry (SA)
Gauteng Enterprise Propeller
JP Morgan Philanthropy
Microsoft Foundation
First National Bank

3. *That the prevailing practice and behavioural conditions found in this CPA are challenging and give rise to barriers insurmountable without carbon accreditation, as evidenced specifically for this CPA in relevant literature and reports in reference to energy-saving technologies and prevailing practice.* Supporting documents are referenced⁵ in this regard, demonstrating that prevailing practices and behavioural conditions prohibit introduction of the Wonderbag and indeed alternative energy-saving technologies within this CPA. In line with the relevant Tool/Guideline Step 3, this criterion relates to the barrier 3(c) Prevailing Practice detailed in the POADD section E.5.2, which is addressed by “an intense, pervasive, and sustained effort to support customers through pre-sales, sales and after-sales familiarisation activities and the availability of specialised skills and organisational capacity”, only possible with CDM support.

⁵ For example, <http://www.erc.uct.ac.za/jesa/volume18/18-3jesa-balmer.pdf>, and <http://www.un.org/esa/agenda21/natinfo/countr/safrica/energy.pdf>

**SMALL-SCALE CDM PROGRAMME ACTIVITY DESIGN DOCUMENT FORM
(CDM-SSC-CPA-DD) - Version 01**



NAME /TITLE OF THE PoA: Heat Retention Cookers in South Africa



CDM – Executive Board

page 8

B.4. Description of the sources and gases included in the project boundary and proof that the small-scale CPA is located within the geographical boundary of the registered PoA.

Emissions sources included in or excluded from the project boundary

Source		Gas	Included ?	Justification / Explanation
Baseline	Combustion of fossil fuels such as kerosene in the home; generation of electricity in power stations using fossil fuels	CO ₂	Yes	Major source of emissions
		CH ₄	No	Not included in interest of conservativeness as negligible quantity and difficult to quantify
		N ₂ O	No	Not included in interest of conservativeness as negligible quantity and difficult to quantify
Project activity	Combustion of fossil fuels such as kerosene in the home; generation of electricity in power stations using fossil fuels	CO ₂	Yes	Major source of emissions
		CH ₄	No	Not included in interest of conservativeness as negligible quantity and difficult to quantify
		N ₂ O	No	Not included in interest of conservativeness as negligible quantity and difficult to quantify

The geographical boundary of the registered PoA is the national boundary of South Africa and thus includes this CPA.

B.5. Emission reductions:

B.5.1. Data and parameters that are available at validation:

>>

Data / Parameter:	EF _{CO2,Fossil,i}
Data unit:	kgCO2/TJ
Description:	Emission factor for the fossil fuel displaced
Source of data used:	IPCC default value
Value applied:	For example: Kerosene 71,500; LPG 63,000; Coal 94,600
Justification of the choice of data or description of measurement methods and procedures actually applied :	IPCC default values are used as country or project specific data are not available.
Any comment:	

**SMALL-SCALE CDM PROGRAMME ACTIVITY DESIGN DOCUMENT FORM
(CDM-SSC-CPA-DD) - Version 01**



NAME /TITLE OF THE PoA: Heat Retention Cookers in South Africa



CDM – Executive Board

page 9

Data / Parameter:	NCV_i
Data unit:	TJ/Gg
Description:	Net calorific value of the fossil fuel displaced
Source of data used:	IPCC default value
Value applied:	For example: Kerosene 43.8; LPG 47.3; Coal 18.9
Justification of the choice of data or description of measurement methods and procedures actually applied :	IPCC default values are used as country or project specific data are not available. NCV values are used to calculate the energy consumption values $F_{BL,y,i}$ and $F_{PJ,y,i}$ from the mass values which are obtained by measurement or census data.
Any comment:	

Data / Parameter:	$EF_{CO_2,ELEC,y}$
Data unit:	tCO ₂ /MWh
Description:	Grid emission factor calculated in accordance with the provisions in AMS-I.D
Source of data used:	Data provided in the ESKOM website as referenced in Section E.6.2 above.
Value applied:	1.01
Justification of the choice of data or description of measurement methods and procedures actually applied :	As calculated in Section E.6.2 above following the “Tool for calculation of the emission factor of an electricity system” version 2.
Any comment:	

Data / Parameter:	l_v
Data unit:	fraction
Description:	Average annual technical grid losses (transmission and distribution) during year y for the grid serving the locations where the devices are installed, expressed as a fraction.
Source of data used:	Page 105 of the Eskom Annual Report 2008
Value applied:	0.08
Justification of the choice of data or description of measurement methods and	The Methodology states that “ <i>This value shall not include non-technical losses such as commercial losses (e.g.theft/pilferage). The average annual technical grid losses shall be determined using recent, accurate and reliable data available for the host country. This value can be determined from recent data published either by a national utility or an official</i>

**SMALL-SCALE CDM PROGRAMME ACTIVITY DESIGN DOCUMENT FORM
(CDM-SSC-CPA-DD) - Version 01**



NAME /TITLE OF THE PoA: Heat Retention Cookers in South Africa



CDM – Executive Board

page 10

procedures actually applied :	<i>governmental body. Reliability of the data used (e.g. appropriateness, accuracy/uncertainty, especially exclusion of non technical grid losses) shall be established and documented by the project participant. A default value of 0.1 shall be used for average annual technical grid losses, if no recent data are available or the data cannot be regarded accurate and reliable”.</i>
Any comment:	

B.5.2. Ex-ante calculation of emission reductions:

The following equations will be used to calculate emission reductions:

$$ER_y = (BE_y - PE_y) - LE_y$$

Where:

ER_y Emission reductions in year y (tCO₂e)

LE_y Leakage emissions in year y (tCO₂e)

For electricity using households:

The methodology offers an Option 2 for assessment of electricity-using baseline which is appropriate⁶ in this case as follows:

$$BE_y = E_{BL,y} \cdot EF_{CO_2,ELEC,y}$$

Where

$EF_{CO_2,ELEC,y}$ Grid emission factor in year y calculated in accordance with the provisions in AMS-I.D (tCO₂/MWh). This parameter is calculated ex-ante.

$$E_{BL,y} = EER_{BL,y} \cdot Q_y / (1 - l_y)$$

Where

$EER_{BL,y}$ Specific Energy consumption in the baseline (MWh/unit). *EER* is calculated as total annual electricity consumed in the baseline divided by total quantity of annual output in the baseline. In this programme, the units of $EER_{BL,y}$ are MWh/household and the value of *EER* reflects total electricity consumption by a

⁶ The provision that this option can only be used where comparable conditions for the output in the baseline and project can be established, is satisfied by the adoption in this monitoring plan of baseline energy consumption as an ex-post parameter, which is done specifically to make sure that conditions for project and baseline are similar. Given ex-post tracking of the baseline, the sub-provision in the methodology that historical baseline data of more than 1 year, does not apply (as this is intended to ensure that ex-ante baseline values are accurate and does not apply to ex-post baseline assessment).

**SMALL-SCALE CDM PROGRAMME ACTIVITY DESIGN DOCUMENT FORM
(CDM-SSC-CPA-DD) - Version 01**



NAME /TITLE OF THE PoA: Heat Retention Cookers in South Africa



CDM – Executive Board

page 11

representative Wonderbag user as found from surveying and sampling. This parameter will be measured **ex-post**, each year, as part of the monitoring plan.

Q_y Total quantity of supply in project year 'y' (unit) to users of electricity /usage scenario i. The units are Wonderbag sales and the number of WB sales will be measured **ex-post** as part of the monitoring plan.

l_y Average annual technical grid losses (transmission and distribution) during year y for the grid serving the locations where the devices are installed, expressed as a fraction. This value shall not include non-technical losses such as commercial losses (e.g., theft/pilferage). The average annual technical grid losses shall be determined using recent, accurate and reliable data available for the host country. This value can be determined from recent data published either by a national utility or an official governmental body. Reliability of the data used (e.g., appropriateness, accuracy/uncertainty, especially exclusion of non technical grid losses) shall be established and documented by the project participant. A default value of 0.1 shall be used for average annual technical grid losses, if no recent data are available or the data cannot be regarded accurate and reliable

The energy consumption in the project scenario is measured in the same way as above, since this is exactly equivalent to use of the alternative expression $E_{PJ,y} = \sum_i (n_{i,y} \cdot p_{i,y} \cdot o_{i,y}) / (1 - l_y)$ in the case of cook-stoves where $p_{i,y} \cdot o_{i,y}$ resolves to EER and Q_y is n.

$$PE_y = E_{PJ,y} \cdot EF_{CO2,ELEC,y}$$

Where

$$E_{PJ,y} = EER_{PJ,y} \cdot Q_y / (1 - l_y)$$

$EER_{PJ,y}$ This parameter is the total household electricity consumption of a representative Wonderbag using household, as found from surveying and sampling. This parameter will be measured **ex-post** as part of the monitoring plan. In cases where a usage scenario i is identified which is an alternative to a domestic home (such as use of a large-size Wonderbag in an institutional kitchen) then the expression $E_{PJ,y} = \sum_i EER_{PJ,i,y} \cdot Q_{y,i} / (1 - l_y)$ may be used⁷.

For fossil-fuel using households

Methodology document:

⁷ For projections of emission reductions within each CPA, the assumption is made that each sale of a WB, whatever size and whether it is used in a domestic or non-domestic application, results in emission reductions at domestic scale assuming either electricity or paraffin use. This is conservative since some Wonderbags may be large-size, or may be standard size and used more intensively than in the domestic situation. During project operation two approaches are allowed by the equations: (a) continuation of this approach (b) a count of sales to alternative "usage scenarios" involving non-domestic users i who use a large size WB or use a standard bag more intensively.

**SMALL-SCALE CDM PROGRAMME ACTIVITY DESIGN DOCUMENT FORM
(CDM-SSC-CPA-DD) - Version 01**



NAME /TITLE OF THE PoA: Heat Retention Cookers in South Africa



CDM – Executive Board

page 12

5. If the energy displaced is fossil fuel based, the energy baseline is the existing level of fuel consumption or the amount of fuel that would be used by the technology that would have been implemented otherwise. The emissions baseline is the energy baseline multiplied by an emission factor for the fossil fuel displaced. Reliable local or national data for the emission factor shall be used; IPCC default values should be used only when country or project specific data are not available or difficult to obtain.

Baseline:

$$BE_y = F_{BLi,y} \cdot Q_{Fossil,i,y} \cdot EF_{CO2,Fossil,i}$$

Where

$EF_{CO2,Fossil,i}$ Emission factor for the fossil fuel i displaced
 $F_{BLi,y}$ Energy content of fossil fuel i /usage scenario i ⁸ used in a representative household in a year. This parameter will be measured **ex-post** as part of the monitoring plan.
 $Q_{Fossil,i,y}$ Quantity of Wonderbag sales to users of fossil fuel i /usage scenario i in year y . The number of WB sales will be measured **ex-post** as part of the monitoring plan.

Project:

$$PE_y = E_{PJ,y} \cdot EF_{CO2,Fossil}$$

Where

$E_{PJ,y}$ = Energy consumption in project activity in year y . This shall be determined **ex post** based on monitored values

Therefore:

$$E_{PJ,y} = F_{PJ,i,y} \cdot Q_{Fossil,y}$$

Where

$F_{PJ,i,y}$ Energy content of fossil fuel i /usage scenario i used in a representative household in a year. This parameter will be measured **ex-post** as part of the monitoring plan.

Summary of calculation		
Electricity saving/week	15.7	KWhrs/week in household
EF grid	1.01	tCO2/MWh
Transmission loss	8%	
CO2 savings/year Elec	0.90	tCO2/WB/year
Kerosene saving per week	1.656	litres per week
EF kerosene	71.5	tCO2/TJ
CO2 savings/year Kerosene	0.22	tCO2/WB/year
Averaged CO2 saving	0.74	tCO2/WB/year

⁸ During project operation, the fossil fuels used by Wonderbag customers will be monitored and $F_{BL,y}$ will be evaluated according to the specific fuel i or by application of a conservative value. In addition to variation in fuel type, non-domestic usage scenarios i , may occur amongst fossil fuel users as well as amongst electricity users, and these may be distinguished during project operation.

**SMALL-SCALE CDM PROGRAMME ACTIVITY DESIGN DOCUMENT FORM
(CDM-SSC-CPA-DD) - Version 01**



NAME /TITLE OF THE PoA: Heat Retention Cookers in South Africa



CDM – Executive Board

page 13

B.5.3. Summary of the ex-ante estimation of emission reductions:

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The ex-ante estimation of ERs accumulated each year during the crediting period, is summarised in Table B.5.3. The WB is assumed to have a 3-year life, and this assumption is used to calculate the number of users of Wonderbags, and the number of WBs operating each year. The difference between the CO₂ emitted in the baseline, and that emitted in the project scenario, in each case multiplied by the number of Wonderbags operational in a given year, gives the emission reduction result for each year, as specified in the equations required by the methodology and set out above.

Table B.5.3 Expected schedule of emission reductions									
	Year	1	2	3	4	5	6	7	TOTAL
Expected sales of WB per retailer		500	500	500	500	500	500	500	Total
Total sales of WB		25,000	25,000	25,000	25,000	25,000	25,000	25,000	175,000
ELECTRICITY USERS									
		77%	of target population						
CO ₂ savings		0.90	tCO ₂ /WB/year (Source: KT 2009)						
Operational years limit		67,614	beyond which energy saved exceeds small-scale limit						
Sales of Wonderbags		19,349	19,349	19,349	19,349	19,349	19,349	19,349	135,445
Expiries (assuming 3 year life of WB)					-19,349	-19,349	-19,349	-19,349	
Number of users by year end		19,349	38,699	58,048	58,048	58,048	58,048	58,048	
Baseline emissions		26,897	80,691	134,484	161,381	161,381	161,381	161,381	
Project emissions		18,226	54,677	91,129	109,355	109,355	109,355	109,355	
Emission reductions ERs		8,671	26,013	43,355	52,026	52,026	52,026	52,026	286,145
Operational WB-years		9,675	29,024	48,373	58,048	58,048	58,048	58,048	319,264
Number of CPAs		0.14	0.43	0.72	0.86	0.86	0.86	0.86	
PARAFFIN USERS									
		19%	of target population						
CO ₂ savings		0.22	tCO ₂ /WB/year (source: KT 2009)						
Operational years limit		211,525	beyond which energy saved exceeds small-scale limit						
Sales of Wonderbags		4,849	4,849	4,849	4,849	4,849	4,849	4,849	33,945
Expiries (assuming 3 year life of WB)					-4,849	-4,849	-4,849	-4,849	
Number of users by year end		4,849	9,698	14,548	14,548	14,548	14,548	14,548	
Baseline emissions		1,279	3,838	6,396	7,676	7,676	7,676	7,676	
Project emissions		736	2,207	3,678	4,414	4,414	4,414	4,414	
Emission reductions ERs		544	1,631	2,719	3,262	3,262	3,262	3,262	17,942
Operational WB-years		2,425	7,274	12,123	14,548	14,548	14,548	14,548	80,012
Number of CPAs		0.01	0.03	0.06	0.07	0.07	0.07	0.07	
COMBINED									
Total number of users by year end		25,000	50,000	75,000	75,000	75,000	75,000	75,000	
Total number of users generating ERs		24,199	48,397	72,596	72,596	72,596	72,596	72,596	
Baseline emissions		28,176	84,529	140,881	169,057	169,057	169,057	169,057	
Project emissions		18,961	56,884	94,807	113,768	113,768	113,768	113,768	
Total emission reductions of the CPA		9,215	27,644	46,074	55,289	55,289	55,289	55,289	304,087
Fraction of limiting CPA size		0.15	0.46	0.77	0.93	0.93	0.93	0.93	

**SMALL-SCALE CDM PROGRAMME ACTIVITY DESIGN DOCUMENT FORM
(CDM-SSC-CPA-DD) - Version 01**



NAME /TITLE OF THE PoA: Heat Retention Cookers in South Africa



CDM – Executive Board

page 14

B.6.1. Description of the monitoring plan:

>>

Description of the Monitoring Plan for a SSC-CPA

Each CPA is subject to monitoring by way of a survey which determines national values for the following parameters:

- Household energy consumption (both baseline and project values), both electricity and fossil fuels
- Relative numbers of electricity-using and fossil-fuel-using Wonderbag users
- Fraction of Wonderbags sold, which have dropped out of use (the “Drop-off Fraction”) with respect both to fossil users and electricity users

The monitoring survey shall determine these parameter values for application to all active CPAs with respect to a specific monitoring and verification period which is identical for all CPAs. The sampling procedure may either consist of a single-stage process which randomly samples households across all the CPAs, or it may consist of a two-stage process whereby a sample of CPAs are randomly selected and within these, a random selection is made of households. Both procedures are statistically sound and either one may be adopted by the CME depending on practical feasibility and costs.

For a detailed description, see Annex 4.

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:

X Please tick if this information is provided at the PoA level. In this case sections C.2. and C.3. need not be completed in this form.

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

>>Not required as per provisions of C.1.

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

>> Not required as per provisions of C.1.

SECTION D. Stakeholders' comments

>>

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

X Please tick if this information is provided at the PoA level. In this case sections D.2. to D.4. need not be completed in this form.

**SMALL-SCALE CDM PROGRAMME ACTIVITY DESIGN DOCUMENT FORM
(CDM-SSC-CPA-DD) - Version 01**



NAME /TITLE OF THE PoA: Heat Retention Cookers in South Africa



CDM – Executive Board

page 15

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

>> Not required as per provisions of D.1.

D.3. Summary of the comments received:

>> Not required as per provisions of D.1.

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

>> Not required as per provisions of D.1.

Annex 1

**CONTACT INFORMATION ON ENTITY/INDIVIDUAL RESPONSIBLE
FOR THE small-scale CPA**

Organization:	WOT-XXX
Street/P.O.Box:	xxx
City:	xxx
Postfix/ZIP:	xxx
Country:	xxx
Telephone:	xxx
Salutation:	xxx
Last Name:	xxx
First Name:	xxx
Mobile:	xxx

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

The program is not in receipt of any public funding

ANNEX 3

BASELINE INFORMATION

The baseline information is detailed in the consultant's report which is submitted as a supporting document: Wonderbag Kitchen Survey & Tests Report 30 March 2009, Scott Burnett, Molara Consulting, 10 First Street, Melville, 2092, South Africa



Annex 4

MONITORING INFORMATION

Application of the Monitoring Methodology

Methodology document:

15. If the devices have variable current (ampere) characteristics, monitoring shall consist of metering the “energy use” of an appropriate sample of the devices installed. Monitoring shall also include annual checks of a sample of non-metered systems to ensure that they are still operating.

To apply this methodology, measurements will be taken of energy consumption in a sample of households which have purchased the Wonderbag, and a count will be made of the number of the sampled homes found not using the device; the portion of such homes is referred to as the Drop-Off Fraction of DOF. The households in the sample will be selected randomly from the pool of Wonderbag customers for which an address is recorded; this pool of registered customers will not represent less than 20% of the full sales volume, by virtue of distribution of warranty cards and maintenance of customer registration sheets by PAIs.

For conservativeness, emission reductions assume that a drop-off has made no use of the Wonderbag throughout the period monitored, such that no claim is made for emission reductions achieved prior to actual drop-off date.

In addition to sampling of energy consumption amongst users, energy consumption amongst equivalent non-users will also be measured periodically, in order to make sure of accurate assessment of emission reductions in a context where the baseline conditions may change.

Accordingly the following equations will be applied for emission reduction calculation:

For Electricity users:

$$ER_{Elec,y} = \sum_i (E_{BL,y} - E_{PJ,y}) \cdot Q_{SalesElec,y,i} \cdot (1-DOF_{Elec,i}) \cdot EF_{CO2,Elec}$$

Where

$Q_{SalesElec,y,i}$

Quantity of Wonderbags sold to electricity users with usage scenario i

$DOF_{Elec,i}$

Drop Off Fraction. The portion of electricity using purchasers no longer using the Wonderbag (in usage group i).

For fossil fuel users:

$$ER_{Fossil,y} = \sum_i (F_{BL,y} - F_{PJ,y}) \cdot Q_{SalesFossil,y,i} \cdot (1-DOF_{Fossil,i}) \cdot EF_{CO2,Fossil,i}$$

Where

$Q_{SalesFossil,i,y}$

Quantity of Wonderbags sold to fossil fuel i /usage scenario i customers

$DOF_{Fossil,i}$

Drop Off Fraction. The portion of fossil fuel i /usage scenario i customers no longer using the Wonderbag.

**SMALL-SCALE CDM PROGRAMME ACTIVITY DESIGN DOCUMENT FORM
(CDM-SSC-CPA-DD) - Version 01**



NAME /TITLE OF THE PoA: Heat Retention Cookers in South Africa



CDM – Executive Board

page 17

In order to distinguish the relative values of $Q_{SalesFossil,i,y}$ and $Q_{SalesElec,i,y}$ the monitoring procedure will count the number of fossil fuel users (types i / usage scenarios i) and electricity users (usage scenarios i) in the random sample of Wonderbag customers, and calculate the fraction of each in comparison to total sample size. These fractions will be applied both:

- to the total sales count of all CPAs to derive the total programme emission reduction for the monitored period following the equation above
- to the total sales count of each CPA to derive the sub-counts ($Q_{SalesFossil,i,y} (CPAn)$ and $Q_{SalesElec,i,y} (CPAn)$) for each CPA(n).

The relative quantities of energy types (and usage scenario types) will be compared with the result of the same analysis of the baseline sample. If the two results differ by more than +/- 20% then an investigation will be conducted and an explanation provided.

Calculation of emission reductions in monitored period

Each CPA is responsible to keep an accurate record of the date of each sale of a Wonderbag, together with an informed and justified estimate of the date it is first used in a kitchen. In the case of bulk sales, the CPA is responsible equally to make informed and justified estimates of dates of individual sales and dates of first use, and include these on its sales record.

The parameter values $E_{B,i,y}$ $E_{PJ,i,y}$ $F_{BL,i,y}$ $F_{PJ,i,y}$ are the annual energy consumed in a household. To derive these values in practice during the sampling procedure, energy consumption is measured in each sampled home over a week. The week in question is chosen to be a conservative representation of the household consumption pattern over the whole year. The annual consumption value is divided by 365 days to generate a daily energy consumption figure, so that it is possible to calculate the emission reduction of each Wonderbag sold individually. This done by multiplying by the number of days which have elapsed between the date of first use of the individual Wonderbag and the date representing the end of the monitored period. The total emission reduction is therefore calculated as the sum of the emission reductions of each Wonderbag sold.

$$ER_{\text{monitoring period}} = \sum_x (F_{BL,\text{day}} - F_{PJ,\text{day}}) \cdot D_x \cdot Q_{SalesFossil,\text{day}} \cdot (1-DOF_{Fossil}) \cdot EF_{Fossil, CO2} + \sum_x (E_{BL,\text{day}} - E_{PJ,\text{day}}) \cdot D_x \cdot Q_{SalesElec,\text{day}} \cdot (1-DOF_{Elec}) \cdot EF_{Elec, CO2}$$

Where

F_{day} and E_{day}

D_x

$Q_{SalesElec,\text{day}}$

$Q_{SalesFossil,\text{day}}$

x

Energy consumed per day (annual energy divided by 365)

number of days elapsing between first use of Wonderbag x and the end of the monitoring period.

The Quantity of Wonderbags starting used with electricity on Day x

The Quantity of Wonderbags starting used with fossil fuel on Day x

Sale date adjusted for delay between sale and start of use

**SMALL-SCALE CDM PROGRAMME ACTIVITY DESIGN DOCUMENT FORM
(CDM-SSC-CPA-DD) - Version 01**



NAME /TITLE OF THE PoA: Heat Retention Cookers in South Africa



CDM – Executive Board

page 18

Sampling protocol

Wherever reasonably possible, sample sizes will be sufficient to ensure that the precision of the sample means are 90/10 or better, in which cases the sample means will be used to estimate emissions reductions. If such samples sizes are difficult to achieve in practice, a conservative 90% lower bound on emissions reductions will be used. This is the value for which there is 90% confidence that the true mean emission reduction is at least as large. To ensure a conservative result when converting energy measurement to annual energy values, the monitoring surveys will be carried out in weeks not containing holidays or feasts nor in unusually cold weather. Energy measurement will take place over a period of seven days in sampled households. Baseline measurements will take place in homes randomly picked from homes of equivalent socio-economic to neighbouring sampled project households.

The national Wonderbag sales record will be used as a basis for random selection of the project sample. If a home visit indicates that the Wonderbag purchased is in use at another known address, the sample can be taken at the address in which the bag is used.

The required sample size is determined by the following factors: the coefficient of variation (*cv*) of the quantity being estimated, the expected level of non-compliance in the sample and the desired precision. To achieve 90/10 precision, assuming perfect compliance, the use of simple random sampling, a coefficient of variation *cv* and a population size of *N*, the minimum required sample size will be equal to

$$n = N \cdot (16.7 \cdot cv)^2 / (N + (16.7 \cdot cv)^2)$$

The coefficient of variation and expected rate of non-compliance will be estimated from the most recent previous monitoring data (or 2009 data in the case of the first monitoring period). The final sample size will be at least 10% larger than calculated from the above formula, to allow for error in the estimate of *cv* and expected levels of non-compliance. For estimates of baseline, the population size will be assumed infinite (this is a conservative adjustment), in which case the above formula simplifies to $n = (16.7 \cdot cv)^2$. For the purpose of monitoring project emissions, the population size is equal to the number of WBs on the sales record.

An indication of sample sizes for 90/10 precision can be obtained from the *cv* values observed during the 2009 surveys. These indicated that a sample size of approximately 300 project and 300 baseline test will be needed to obtain 100 to 150 protocol-compliant results which satisfy 90-10 precision.

The sampling procedure may either consist of a single-stage process which randomly samples households across all the CPAs, or it may consist of a two-stage process whereby a sample of CPAs are randomly selected and within these, a random selection is made of households.

If and when the single-stage approach is adopted, the statistical procedure is as described above. If the two-stage process is followed, then the first step is to randomly select a group of CPAs. This approach ensures that every CPA has an equal probability of selection, so the sample is representative of the entire population of CPAs.

The size of the CPA sample is determined by the requirement to achieve 90/10 precision for the estimate of mean value of the parameter investigated. This can be achieved through different combinations of across-CPA sample size and within-CPA household sample sizes; if less CPAs are surveyed, more

**SMALL-SCALE CDM PROGRAMME ACTIVITY DESIGN DOCUMENT FORM
(CDM-SSC-CPA-DD) - Version 01**



NAME /TITLE OF THE PoA: Heat Retention Cookers in South Africa



CDM – Executive Board

page 19

houses within the CPAs will need to be surveyed to achieve the required precision, and vice versa. The relative costs and practicalities of surveying across several CPAs will be balanced against the relative costs and practicalities of household surveys and a decision taken as to the most efficient balance between across-CPA surveying and within-CPA surveying, always adhering to the equation presented here to ensure statistically valid results.

At the second stage, a representative sample of appliances is sampled from every CPA which was selected in the first stage sample. Every sampled appliance is then checked for the ex-post parameters listed. This sample will also test for false records (non-existence of the installation as opposed to the installation not being operative). Sample size shall be chosen for a 90/10 precision (90% confidence interval and 10% margin of error) wherever reasonably possible. When 90/10 precision is not feasible, the lower bound of the 90% confidence interval will be adopted, as this will be a conservative approach and may in some cases be the only feasible approach in practical terms.

To start the process, the size of the sample of CPAs (labelled m in the equations below) and of the within-CPA samples (n_i) will be determined by estimates of the within-CPA and between-CPA variances obtained from the most recent survey undertaken. This is likely to be the survey of the previous year, and in the case of the first monitoring period, will be the results of the 2009 survey. Once these sample sizes are known, they may be increased by 10% to ensure adequacy and applied to the survey under preparation.

The variance of the estimate of the population mean for each parameter is given by this equation:

$$\text{Var}(Y) = \frac{1}{(N_1 + \dots + N_M)^2} \left(\frac{M^2}{m} \left(1 - \frac{m}{M}\right) S_1^2 + \frac{M}{m} \sum_{i \in C_1} \frac{N_i^2}{n_i} \left(1 - \frac{n_i}{N_i}\right) S_i^2 \right)$$

Where

Var(Y) Variance of the estimated mean value of the parameter investigated

M The population of CPAs within the programme of activities

N_i The population of Wonderbag users within the i -th CPA sampled

m The number of CPAs in the sample

n_i The number of Wonderbag users in the i -th CPA sampled

S_1 Between-CPA variance

S_i Within-CPA variance

C_1 Set of all CPAs

The precision of the estimated mean is:

$$\alpha = 1.67 \cdot \sqrt{\text{var}(Y) / Y} \cdot 100$$

Where

α The precision achieved at 90% confidence as in 90/ α

Y The estimated population mean for the parameter investigated

**SMALL-SCALE CDM PROGRAMME ACTIVITY DESIGN DOCUMENT FORM
(CDM-SSC-CPA-DD) - Version 01**



NAME /TITLE OF THE PoA: Heat Retention Cookers in South Africa



CDM – Executive Board

page 20

Quality assurance and check on double-counting

A credible third party consultant will be hired to carry out the sampling survey.

Furthermore, operational and management procedures are established to ensure that there is no risk that the count of Wonderbags will be incorrect through double-counting.

The principal method of ensuring is the maintenance of a unique sales records by the PAI, and its correlation against other records, principally purchase contracts between the PAI and NB, manufacturing records, shipping records, and stock records kept by NB and the manufacturers/shippers. All such data will be presented in the monitoring report presented to the verifier, with detail as to how it can be verified. It will be possible therefore for a verifier to confirm the accuracy of the sales record.

The WBs sold by the PAI will distinctive to each PAI, so that there is no danger that WBs sold by another company are included in the sample. As far as feasible in practice, each WB will have a distinctive colour code, serial number, or equivalent permanent marking to distinguish both:

- its age
- the PAI responsible for its sales and monitoring

Parameters monitored:

I. Ex-post (monitored) parameters applying to electricity users:

Data / Parameter:	$EER_{BL,i,y}$
Data unit:	MWh/household/year
Description:	Specific Energy consumption in the baseline
Source of data used:	Survey of sample of Wonderbag users. Expected emission reductions are calculated from the value measured by March 2009 Baseline Study.
Value of data applied for the purpose of calculating expected emission reductions	0.049
Description of measurement methods and procedures to be applied:	Electrical energy consumption measured during annual monitoring survey, by virtue of readings of household KWhr meters.
QA/QC procedures to be applied:	The monitoring survey will be conducted by a credible independent consultant, and will follow the statistical method outline in section E.7. Expert 3rd party input will be sought on statistical validity of the survey.

Data / Parameter:	$EER_{PJ,i,y}$
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**SMALL-SCALE CDM PROGRAMME ACTIVITY DESIGN DOCUMENT FORM
(CDM-SSC-CPA-DD) - Version 01**



NAME /TITLE OF THE PoA: Heat Retention Cookers in South Africa



CDM – Executive Board

page 21

Data unit:	MWh/household/year
Description:	Specific Energy consumption in the project
Source of data used:	Survey of sample of Wonderbag users. Expected emission reductions are calculated from the value measured by March 2009 Baseline Study.
Value of data applied for the purpose of calculating expected emission reductions	0.033
Description of measurement methods and procedures to be applied:	Electrical energy consumption measured during annual monitoring survey, by virtue of readings of household KWhr meters.
QA/QC procedures to be applied:	The monitoring survey will be conducted by a credible independent consultant, and will follow the statistical method outline in section E.7. Expert 3rd party input will be sought on statistical validity of the survey each year.
Any comment:	

Data / Parameter:	$DOF_{Elec,i}$
Data unit:	fraction
Description:	The portion of households which purchased a Wonderbag and are estimated to be no longer using it
Source of data used:	Survey of sample of Wonderbag users.
Value of data applied for the purpose of calculating expected emission reductions	Zero, since the expected emission reductions are calculated on the basis of an estimated volume of sales.
Description of measurement methods and procedures to be applied:	Each home selected for sampling from the sales record will be visited and the number of homes in which the Wonderbag is not used will be counted. If the purchased Wonderbag has been moved to another address, this will be recorded in the interest of conservativeness as a Drop-Off, unless a further visit is made to the new address and the use of the Wonderbag is confirmed.
QA/QC procedures to be applied:	The monitoring survey will be conducted by a credible independent consultant, and will follow the statistical method outline in section E.7. Expert 3rd party input will be sought on statistical validity of the survey each year.
Any comment:	

Data / Parameter:	$Q_{SalesElec,i,y}$
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**SMALL-SCALE CDM PROGRAMME ACTIVITY DESIGN DOCUMENT FORM
(CDM-SSC-CPA-DD) - Version 01**



NAME /TITLE OF THE PoA: Heat Retention Cookers in South Africa



CDM – Executive Board

page 22

Data unit:	Number
Description:	The quantity of Wonderbag sales to users of electricity under usage scenario <i>i</i>
Source of data used:	Survey of sample of Wonderbag users
Value of data applied for the purpose of calculating expected emission reductions in the first CPA	60,000
Description of measurement methods and procedures to be applied:	Each home selected for sampling from the sales record will be visited and the number of homes in which the Wonderbag is used with electricity under usage scenario <i>i</i> , will be counted. The fraction of these homes in comparison to the total sample population will be calculated and applied to the total sales volume to derive the appropriate value of this parameter.
QA/QC procedures to be applied:	The monitoring survey will be conducted by a credible independent consultant, and will follow the statistical method outline in section E.7. Expert 3rd party input will be sought on statistical validity of the survey each year.
Any comment:	

II. Ex-post (monitored) parameters applying to fossil fuel users:

Data / Parameter:	$F_{BL,i,y}$
Data unit:	TJ/household/year
Description:	Specific Fossil Fuel Energy consumption in the baseline
Source of data used:	Survey of sample of Wonderbag users. Expected emission reductions are calculated from the value measured by March 2009 Baseline Study.
Value of data applied for the purpose of calculating expected emission reductions	2.3 kg of kerosene multiplied by NCV of kerosene
Description of measurement methods and procedures to be applied:	Fossil fuel energy consumption measured during annual monitoring survey, by virtue of weighing of household fuel supply or of tracking of depletion of fuel supply in containers of known volumetric characteristics
QA/QC procedures to be applied:	The annual monitoring survey will be conducted by a credible independent consultant, and will follow the statistical method outline in section E.7. Expert 3rd party input will be sought on statistical validity of the survey each year.

**SMALL-SCALE CDM PROGRAMME ACTIVITY DESIGN DOCUMENT FORM
(CDM-SSC-CPA-DD) - Version 01**



NAME /TITLE OF THE PoA: Heat Retention Cookers in South Africa



CDM – Executive Board

page 23

Data / Parameter:	$F_{PJ,i,y}$
Data unit:	TJ/household/year
Description:	Specific Fossil Fuel Energy consumption in the baseline
Source of data used:	Survey of sample of Wonderbag users. Expected emission reductions are calculated from the value measured by March 2009 Baseline Study.
Value of data applied for the purpose of calculating expected emission reductions	1.4 kg of kerosene multiplied by NCV of kerosene
Description of measurement methods and procedures to be applied:	Fossil fuel energy consumption measured during annual monitoring survey, by virtue of weighing of household fuel supply or of tracking of depletion of fuel supply in containers of known volumetric characteristics
QA/QC procedures to be applied:	The monitoring survey will be conducted by a credible independent consultant, and will follow the statistical method outline in section E.7. Expert 3rd party input will be sought on statistical validity of the survey each year.
Any comment:	

Data / Parameter:	$DOF_{Fossil,i}$
Data unit:	fraction
Description:	The portion of households which purchased a Wonderbag and are using Fossil fuel, and are estimated to be no longer using it
Source of data used:	Annual survey of sample of Wonderbag users.
Value of data applied for the purpose of calculating expected emission reductions	Zero, since the expected emission reductions are calculated on the basis of an estimated volume of sales.
Description of measurement methods and procedures to be applied:	Each home selected for sampling from the sales record will be visited and the number of homes in which the Wonderbag is not used will be counted. If the purchased Wonderbag has been moved to another address, this will be recorded in the interest of conservativeness as a Drop-Off, unless a further visit is made to the new address and the use of the Wonderbag is confirmed.
QA/QC procedures to be applied:	The monitoring survey will be conducted by a credible independent consultant, and will follow the statistical method outline in section E.7. Expert 3rd party input will be sought on statistical validity of the survey each year.
Any comment:	

**SMALL-SCALE CDM PROGRAMME ACTIVITY DESIGN DOCUMENT FORM
(CDM-SSC-CPA-DD) - Version 01**



NAME /TITLE OF THE PoA: Heat Retention Cookers in South Africa



CDM – Executive Board

page 24

Data / Parameter:	$Q_{SalesFossil,i,y}$
Data unit:	Number
Description:	The quantity of Wonderbag sales to users of fossil fuels of type i under usage scenario i
Source of data used:	Survey of sample of Wonderbag users
Value of data applied for the purpose of calculating expected emission reductions in the first CPA	10,000
Description of measurement methods and procedures to be applied:	Each home selected for sampling from the sales record will be visited and the number of homes in which the Wonderbag is used with fossil fuel type i under usage scenario i , will be counted. The fraction of these homes in comparison to the total sample population will be calculated and applied to the total sales volume to derive the appropriate value of this parameter.
QA/QC procedures to be applied:	The monitoring survey will be conducted by a credible independent consultant, and will follow the statistical method outline in section E.7. Expert 3rd party input will be sought on statistical validity of the survey each year.
Any comment:	
