

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



NAME /TITLE OF THE PoA: *CarbonSoft Open Source PoA, LED lighting distribution:
Emerging Markets*



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: CarbonSoft Open Source PoA, LED lighting distribution:
Emerging Markets



CDM – Executive Board

page 2

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

*The parts of the CPA-DD which will remain constant, irrespective of the CPA region are in black font.
The parts of the document that will vary based on the CPA region are in blue font*

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

Title: CarbonSoft Emerging Markets CPA [XX], [title]

CPA ID: EM [XXX]

Date: XX/XX/20XX

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

The main aim of the CPA is replacement of kerosene used of lighting purposes in [XX] with [LED/CFL] lamps. The [LED/CFL] lamps will lead to abatement of GHG emissions, which would have occurred due to the combustion of kerosene, which is a fossil fuel. Also by replacing kerosene lamps with [LED/CFL] lamps, households are effectively saving money, which would have been spent on the purchase of kerosene. There are many health benefits as well when replacing kerosene lamps with the Project LED lamps. The LED lamps used in the CPA are charged using renewable energy.

[Further information will be provided on use of kerosene for lighting, as baseline scenario in the country the CPA is located]

The project chooses [Option 1 or Option 2] crediting stream for Project Lamps.

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

Name of responsible entity: [Entity name]

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

Name of Company: [Name].

Key product characteristics are:

- Charge time: [X] hours
- Effective light: [X] Lumens
- Minimum total lumen per lamp: 20 or more
- Present power consumption of [X] watts
- Solar panels are effective for up to [X] years
- Type of charger: [active/passive]
- Batteries: [X]

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



NAME /TITLE OF THE PoA: *CarbonSoft Open Source PoA, LED lighting distribution:
Emerging Markets*



page 3

CDM – Executive Board

- Manufacturer certifies each unit for at least [X] hours of useful life
- Each unit has a [X years] guarantee from the manufacturer which is passed on to customers
- [Other relevant parameter]

According to Paragraph 10, of Annex 13 of EB 54, “If each of the independent subsystems/measures (e.g., biogas digester, solar home system) included in the CPA of a PoA is no larger than 1% of the small-scale thresholds defined by the methodology applied, then that CPA of PoA is exempted from performing de-bundling check i.e., considering as not being a de-bundled component of a large scale activity”.

Since the independent subsystem in this case is the LED light and its capacity is much lesser than 1% of 15 MW as specified by the small-scale methodology, this CPA of this PoA need not perform the de-bundling check.

Although the CPA has provided name and technical characteristics of the lamp it plans to distribute under the CarbonSoft PoA, the CPA implementation entity can change the type of lamp initially distributed as long as it meets the criteria of the PoA and the small-scale methodology AMS.III.AR.

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

A.4.1.1. Host Party:

The CPA is located in [country].

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

The actual CPA boundaries have been marked in the map of the region below:
[Add map here]

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

The lifetime of the CPA is 21 years.

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

Starting Date: 10/10/2011

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

Due to the nature of the Project the operational lifetime is challenging to determine; and will be affected by many external factors including economic development of the country, fossil fuel prices and the rollout of energy distribution infrastructure.

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



NAME /TITLE OF THE PoA: *CarbonSoft Open Source PoA, LED lighting distribution:
Emerging Markets*



CDM – Executive Board

page 4

However, it is anticipated that the Project will continue operating for at least as long as the PoA, 28 years.

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

[Renewable crediting period / Fixed Crediting period]

A.4.3.1. Starting date of the crediting period:

Starting Date of crediting period: [XX/XX/20XX]

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

Number of years: [seven / ten]

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

Year	Annual estimation of emission reductions in tonnes of tCO ₂ eq
2012	[xxx]
2013	[xxx]
2014	[xxx]
2015	[xxx]
2016	[xxx]
2017	[xxx]
2018	[xxx]
<i>Total Emission reductions (TCO₂eq)</i>	[xxx]
<i>Total number of crediting years</i>	[7 / 10]
<i>Annual average emission reductions over the crediting period (tCO₂eq)</i>	[xxx]

A.4.5. Public funding of the CPA:

The Project [does/does not] receive public funding.

[In case public funding is available: [Details of public funding]]

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



NAME /TITLE OF THE PoA: *CarbonSoft Open Source PoA, LED lighting distribution: Emerging Markets*



CDM – Executive Board

page 5

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

According to Paragraph 10, of Annex 13 of EB 54, “If each of the independent subsystems/measures (e.g., biogas digester, solar home system) included in the CPA of a PoA is no larger than 1% of the small-scale thresholds defined by the methodology applied, then that CPA of PoA is exempted from performing de-bundling check i.e., considering as not being a de-bundled component of a large scale activity”.

Since the independent subsystem in this case is the LED light and its capacity is [XX] which is much lesser than 1% of 15 KW as specified by the small-scale methodology, this CPA of the PoA need not perform the de-bundling check.

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

The Project is not registered as an individual CDM project and it not part of another PoA, as there is no other PoA or CDM project in the region mentioned in the project boundary carrying out the same project activity of replacing kerosene lamps with [LED/CFL] lamps³.

For other CPAs of the “CarbonSoft Open Source PoA, LED lighting distribution: Emerging Markets” PoA double counting is prevented by assigning unique identification numbers to each individual Project Lamp.

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:

CarbonSoft Open Source PoA, LED lighting distribution: Emerging Markets

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

AMS.III.AR requirement	SSC Qualification / Justification
<i>Replace portable fossil fuel based lamps with LED-based lighting systems in residential and non-residential applications</i>	As demonstrated in “Carbon to Light ⁴ ” the use of portable, cheap kerosene lamps is prevalent across populations across Africa and Asia. [Name of Entity] will replace consumers kerosene lamps with Project Lamps in accordance with AMS.III.AR version 2

³ <http://cdm.unfccc.int/>

⁴ <http://light.lbl.gov/pubs.html>. Accessed November 2010

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



NAME /TITLE OF THE PoA: *CarbonSoft Open Source PoA, LED lighting distribution: Emerging Markets*



CDM – Executive Board

page 6

<i>The project lamps shall use rechargeable batteries charged.</i>	All LED lamps distributed under this CarbonSoft PoA will have rechargeable batteries that will be charged by solar energy.
<i>The manufacture of the Project Lamps shall certify the products has an average rated life of at least 5,000 hours(option 1) or 10,000 hours (option2)</i>	All Project Lamps shall have suitable manufacturer certification that the units have an average life of at least [5,000/10,000] hours.
<i>The manufacture shall certify that the Project Lamps battery charging efficiency is at least 50% at the time of the customer’s purchase</i>	Manufacturer certification shall provide that battery charging efficiency is at least 50% at the time of purchase
<i>Each Project Lamp shall be provided with a one year warranty which specifically covers free replacement or repair of failed lamps, batteries and where applicable solar panels</i>	All Project Lamps shall be distributed with a one year warranty for full repair or full replacement
<i>All Project Lamps carry identification which enables them to be marked as being within the “Project” and avoid double counting</i>	All Project Lamps shall have a unique identification number so that the lamps are marked as being within the CPA.
<i>The disposal of batteries shall be in compliance with the regulations of the host country</i>	[Provide information on how the disposal of batteries will be carried out under the CPA]
<i>Detailed technical specification and supporting documentation of the Project Lamps are made available and in the PDD</i>	Technical specification of the Project Lamps has been included in this CPA in Section A.4. Further Supporting documentation shall be provided to the DOE on request
<i>No more than five Project Lamps per household shall be recognised for generating emission reductions within the Project</i>	A maximum of five Project Lamps per household or business location shall be recognized as Project Lamps within the CPA Project. This will be determined by the CPA project developer’s records. Each LED lamp distributed will have a unique identification mark. It will be ensured that in each household a maximum of 5 lamps will only be distributed.
<i>In the absence of the Project, the burning of kerosene fuel in lanterns would be used as the primary source of light</i>	As demonstrated in “Carbon to Light” and other supporting documents provided ⁵ , the use of portable, cheap kerosene lamps is prevalent across populations of [Name of country, the CPA activity is carried in]. CarbonSoft will replace consumer kerosene lamps with project lamps in accordance with AMS.III.AR version 2. Further information is provided in Section A.2, with regard to the use of kerosene as the baseline fuel.
<i>The project lamps will generate electricity and be used onsite and locally by the user</i>	The project lamps will generate electricity that shall be used onsite and locally be the user

⁵ Supporting documents provided to DOE

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



NAME /TITLE OF THE PoA: *CarbonSoft Open Source PoA, LED lighting distribution:
Emerging Markets*



CDM – Executive Board

page 7

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

Additionality is demonstrated at the PoA level. Refer PoA-DD for details on how the proposed project activity is Additional.

[CPAs will also ensure that the CPA capacity continues to fall within the limits of micro-scale projects]

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.

	Source	Gas	Included?	Justification / Explanation
<i>Baseline Activity</i>	GHG emissions generated from the combustion of kerosene fossil fuel	CO ₂	Included	Main emission source
<i>Project Activity</i>	GHG emissions from emissions due to charging of batteries (if non renewable source of energy is used)	CO ₂	Not Included	No Project emissions will occur since the CarbonSoft PoA will only recognize projects that use renewable lights, which use a renewable source of energy to recharge the battery.

B.5. Emission reductions:

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

Data / Parameter:	<i>FUR (ID 1)</i>
Data unit:	Litres/hour
Description:	Quantity of kerosene used per hour in household by a kerosene lamp
Source of data used:	Default value provided by AMS.III.AR / specific value obtained for CPA region through reports/surveys/studies.
Value applied:	0.025 /specific value obtained for CPA region through reports/surveys/studies etc
Justification of the choice of data or description of measurement methods	The value is the kerosene consumption value for [X]. The methodology provides default value, however it provides provisions for using alternative values based on surveys or reports.

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



NAME /TITLE OF THE PoA: *CarbonSoft Open Source PoA, LED lighting distribution: Emerging Markets*



CDM – Executive Board

page 8

and procedures actually applied:	
Any comment:	

Data / Parameter:	<i>DV (ID 2)</i>
Data unit:	TCO _{2e}
Description:	Emissions factor
Source of data used:	Default value as provided in the small-scale methodology AMS.III.AR / as calculated based on Fuel Use Rate derived from literature review specific to the CPA region.
Value applied:	0.08 / value derived based on Fuel Use Rate derived from literature review specific to the CPA region.
Justification of the choice of data or description of measurement methods and procedures actually applied:	The methodology provides default value, however it provides provisions for using alternative values based on surveys or reports.
Any comment:	

Data / Parameter:	<i>h (ID 3)</i>
Data unit:	Hours/day
Description:	Utilization rate: average operating hours are the average operational hours of kerosene lamps in the baseline
Source of data used:	AMS.III.AR (version 2)
Value applied:	3.5
Justification of the choice of data or description of measurement methods and procedures actually applied:	This value is fixed for the duration of the project; unless observed data further qualifies this value
Any comment:	

Data / Parameter:	<i>d (ID 5)</i>
Data unit:	Days
Description:	The number of days the lamp operates for
Source of data used:	AMS.III.AR (version 2)
Value applied:	365/366 (depending on leap year)
Justification of the	This value is dependent on whether the year is a leap year or not.

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



NAME /TITLE OF THE PoA: *CarbonSoft Open Source PoA, LED lighting distribution:
Emerging Markets*



CDM – Executive Board

page 9

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

Data / Parameter:	<i>EF_{CO2} (ID 5)</i>
Data unit:	KgCO ₂ / litre
Description:	Kerosene fuel CO ₂ emission factor of fuel type
Source of data used:	AMS.III.AR (version 2)
Value applied:	2.4
Justification of the choice of data or description of measurement methods and procedures actually applied:	Default value provided by small scale methodology AMS.III.AR
Any comment:	

Data / Parameter:	<i>L (ID 6)</i>
Data unit:	Value
Description:	Leakage factor
Source of data used:	AMS.III.AR
Value applied:	1.0
Justification of the choice of data or description of measurement methods and procedures actually applied:	Default value provided by small-scale methodology AMS.III.AR.
Any comment:	

Data / Parameter:	<i>N (ID 7)</i>
Data unit:	Value
Description:	Number of fuel-based lamps replaced per Project Lamp
Source of data used:	AMS.III.AR
Value applied:	1.0
Justification of the choice of data or description of measurement methods	Default value provided by small-scale methodology AMS.III.AR.

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



NAME /TITLE OF THE PoA: *CarbonSoft Open Source PoA, LED lighting distribution:
Emerging Markets*



CDM – Executive Board

page 10

and procedures actually applied:	
Any comment:	

Data / Parameter:	<i>N-G (ID 8)</i>
Data unit:	Value
Description:	Net-to-gross factor
Source of data used:	AMS.III.AR
Value applied:	1.0
Justification of the choice of data or description of measurement methods and procedures actually applied:	Default value provided by small-scale methodology AMS.III.AR.
Any comment:	

Data / Parameter:	<i>W_i (ID9)</i>
Data unit:	Watts
Description:	Wattage of project lamps distributed to end users, of type <i>i</i>
Source of data used:	Lamp Manufacturer
Value applied:	[The value will be sourced from the lamp manufacturer and will depend on the lamp type used by the particular Project Activity]
Justification of the choice of data or description of measurement methods and procedures actually applied:	
Any comment:	

Data / Parameter:	<i>DB (ID10)</i>
Data unit:	Value
Description:	Change in baseline kerosene consumption based on reports from national growth rate of the region where the CPA is located.
Source of data used:	Public reports etc
Value applied:	[The growth rate of the country will be sourced from publicly available date. Conservative change will be considered in case the growth rate of the country where the CPA is located varies over the last few years]
Justification of the choice of data or	The growth rate of the country will have a direct effect on the consumption of kerosene in non-grid connected areas. Hence, growth rate is a perfect measure to

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



NAME /TITLE OF THE PoA: *CarbonSoft Open Source PoA, LED lighting distribution:
Emerging Markets*



CDM – Executive Board

page 11

description of measurement methods and procedures actually applied:	gauge increase in kerosene consumption.
Any comment:	

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

The CPA uses the following calculation approach as stipulated by the methodology AMS.III.AR:

Equation 1, Baseline Emissions:

$$BE_Y = DV * GF_Y * DB_Y$$

Parameter	Unit	Description	Source
<i>DV</i>	tCO2e	Default emissions factor	
<i>GF_Y</i>	Number	Number of consumers supplied with Project Lamps	As defined in AMS.III.AR
<i>DB_Y</i>	%	<p><i>Option 1:</i> = 1.0 in the absence of relevant information</p> <p><i>Option 2:</i> = 1.0 + FFG. FFG is defined as the documented national growth rate of kerosene fuel use in lighting from the preceding 3 or 5 years (depending on the availability of reliable data)</p>	As described in later sections.

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



NAME /TITLE OF THE PoA: *CarbonSoft Open Source PoA, LED lighting distribution:
Emerging Markets*



CDM – Executive Board

page 12

Equation 2, Project Emission:

According to the small scale methodology AMS.III.AR, Project Emissions (PE_y) will depend on the project lamp charging mechanism utilized.

The methodology states that $PE_y = \text{Zero (0)}$ in the case of Project Lamps whose batteries are charged by:

- (a) renewable energy system (e.g., photovoltaic systems or mechanical systems such as wind battery chargers)
- (b) standalone distributed generation system (e.g., a diesel generator set) or a mini-grid, if the mini grid or distributed generation system is entirely powered by renewable energy generation unit(s)

Since all lamps distributed by project developers under CarbonSoft will be exclusively, Solar lamps, which uses a renewable energy system (i.e., photovoltaic), the project emissions will be 0.

Equation 3, Emission Reduction: According to the methodology AMS.III.AR., the annual emissions reductions are calculated as :

$$ER_y = \sum_{i,j} N_{i,j} \times (BE_{y,i} - PE_{y,i,j}) \times (OF_{y,i,j})$$

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



NAME /TITLE OF THE PoA: *CarbonSoft Open Source PoA, LED lighting distribution:
Emerging Markets*



CDM – Executive Board

page 13

Parameter	Unit	Description	Value	Source
N_{ij}	Quantity	Number of Project Lamps distributed to end users of type i , with charging method ' j ' The emissions reductions shall be considered from the date of completion of distribution of the project lamps to end users	Recorded by CPA and the distributor	CPA reporting and monitoring
$OF_{y,ij}$	%	Percentage of Project Lamps distributed to end users that are operating an in service in year, y	Assumed to be 100%	Assumed based guidance from AMS.III.AR

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

Year	Estimation of project activity emissions (tonnes of CO ₂ e)	Estimation of baseline emissions (tonnes of CO ₂ e)	Estimation of leakage (tonnes of CO ₂ e)	Estimation of overall emission reductions (tonnes of CO ₂ e)
Year A				
Year B				
Year C				
Year ...				
Total (tonnes of CO ₂ e)				

B.6. Application of the monitoring methodology and description of the monitoring plan:

B.6.1. Description of the monitoring plan:

The CPA Implementation entity has gone chosen:

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



NAME /TITLE OF THE PoA: *CarbonSoft Open Source PoA, LED lighting distribution: Emerging Markets*



CDM – Executive Board

page 14

[Option 1: Project Lamps are assumed to operate for two years after project lamp distribution to end-users. Therefore, emission reductions can only be claimed for two years / Option 2: Project Lamps are assumed to operate for seven years after project lamp distribution to end-users, and thus emission reductions can be claimed for up to seven years per project lamp]

Since the CPA is going with Option 1 of the methodology the Project Activity will record the following data:

- Number of lamps distributed to end users under the project activity, identified by the type of project lamps (lamp wattage, battery type, charging method, the date of supply).*

The following database will be operated and maintained to ensure completeness and accuracy of monitoring information:

- **Sales record (SR):** Project Lamp systems deployed sales records
- **Sample database (DB i,a):** sample database for deployed LED lights
- **Periodic check A (SG i,v):** regular review of sample group for monitoring of deployed LED Lamps

Each Project Lamp distributed will only be eligible to generate CERs for a period of two years from the date of sale. Monitoring will be ongoing throughout the Project; and will take account of verification periods.

The table below shows the main characteristics of each database: parties involved, periodicity and format.

	LED lights deployed sales records (SR)
<i>Parties involved</i>	Primary data collection: project developer Database maintenance: project developer
<i>Periodicity</i>	Continuous
<i>Format</i>	Paper or electronic for primary data Electronic database
<i>Data saving</i>	All data shall be saved for the whole crediting period, plus an additional two years

The Sale Record (SR)

The Sales Record (SR) database has been established and shall contain the following information:

- Lamps distributed
- Serial number of lamp
- Date of Sale LED Light
- Lamp wattage for each lamp
- Battery type for each lamp
- Charging method for each lamp

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



NAME /TITLE OF THE PoA: *CarbonSoft Open Source PoA, LED lighting distribution:
Emerging Markets*



CDM – Executive Board

page 15

The purpose of the SR database is to provide enough information to enable full monitoring for each monitoring period.

Since the CPA chooses Option 2 crediting of the methodology the Project Activity will record the following data:

1. *Number of lamps distributed to end users under the project activity, identified by the type of project lamps (lamp wattage, battery type, charging method, the date of supply).*
2. *Number of lamps in use and operational within the CPA boundary*

The following database will be operated and maintained to ensure completeness and accuracy of monitoring information:

- **Sales record (SR):** LED light systems deployed sales records
- **Sample database (DB i,a):** sample database for deployed LED lights
- **Periodic check A (SG i,v):** *regular review of sample group for monitoring of deployed LED Lamps*

A sales record will be kept similar to the one described above (for CPAs using Option 1).

In addition to this since the project proponents are going with Option 2 and the lamps will generate CERs for a period of 7 years, monitoring surveys will be conducted at the CPA level to determine the percentage of Project Lamps distributed to end users that are operating and in service during the third year of the crediting period.

The following are the principles that need to be met during periodic monitoring for lamps distributed under option 2 and the ways CarbonSoft will go about meeting them:

1. Only Project Lamps with an original unique marking can be counted as operating and in service.

CarbonSoft will ensure that each lamp distributed under the CPA will have a Unique Identification Number, which will be placed on the lamp by means of a sticker. Following sampling, only those lamps with the number will be counted as operating and in service.

2. While project lamps replaced as part of a regular maintenance or warranty program can be counted as operating, project lamps cannot be replaced as part of the survey process and counted as operating

The monitoring and replacement groups will be kept separate. At the time of monitoring, no replacement will take place to ensure such lamps are not counted.

3. The sampling size is determined by minimum 90% confidence interval and the 10% maximum error margin; the size of the sample shall be no less than 100.

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



NAME /TITLE OF THE PoA: *CarbonSoft Open Source PoA, LED lighting distribution:
Emerging Markets*



CDM – Executive Board

page 16

A detailed sampling plan has been described at the end of this section to ensure minimum of 90% confidence level and 10% error margin.

4. The survey will be conducted by site visits

A survey form is being created for the process and will be used to gather information from the end users at the time of monitoring by carrying out door-to-door site visits.

5. Only persons over age 12 will be interviewed

At the time of monitoring, the head of the household, on whose name the lamp was distributed, will be interviewed. In case this is not possible, other adults in the household will be interviewed. In no scenario, will any person under 12 be interviewed.

6. The CPA design document will describe in detail the survey design for gathering the above information.

The CPA-DD will describe the survey design for gathering the information required for monitoring.

7. The survey has a random distribution and is representative of target population (e.g., size, location)

A detailed sampling plan has been described at the end of this section to ensure random distribution.

8. The method to select respondents for interview is random

A detailed sampling plan has been described at the end of this section to ensure random sampling.

The Sales Record (SR) database has been established and shall contain the following information:

- Quantity of Lamps lamps sold
- Serial number of lamps delivered to distribution point
- Date of sale provided by distributor
- Lamp wattage for each lamp
- Battery type for each lamp
- Charging method for each lamp

Sampling Plan and Procedure

The SSC-CPA implementation entities utilizing Option 2 and claiming CERs for a period of 7 years will follow the guidelines stipulated by the latest version of the “*Standard for Sampling and Surveys for CDM*”

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



NAME /TITLE OF THE PoA: *CarbonSoft Open Source PoA, LED lighting distribution:
Emerging Markets*



CDM – Executive Board

page 17

Project Activities and Programme of Activities” (EB 65, Annex2). The SSC-CPA will provide how the CPA conforms to the following in the CPA-DD.

Objectives of the Plan:

The following will be the outline of the sampling and monitoring plan prepared by a SSC-CPA utilizing **Option 2** defined in paragraph 2 of the methodology AMS-III.A.R. The goal of this plan is to determine number of project lamps in service and operating under the project in a given year. The lamps distributed will have a unique marking, and only those lamps with the marking will be counted to ensure lamps from other projects are not counted.

Since the project activity is spread out over a large area, monitoring each and every lamp is not a feasible option and hence a sample size is considered. According to the methodology, *the sampling size is determined by minimum 90% confidence interval and the 10% maximum error margin and the size of the sample shall be no less than 100.*

Hence the sampling plan provided by the SSC-CPA aims at counting the number of LED lamps in use during the crediting period across the CPA, using a 90/10 confidence precision.

Target Population:

The target population will be all the households across a given CPA, that have been distributed LED lamps to replace use of kerosene lamps for lighting.

Parameters of the Sampling Plan:

A multi stage procedure will be followed. According to guidelines,

“Multistage sampling is a complex form of cluster sampling. Using all the sample elements in all the selected clusters may be prohibitively expensive or not necessary. Under these circumstances, multistage cluster sampling becomes useful. Instead of using all the elements contained in the selected clusters, the researcher randomly selects elements from each cluster. Constructing the clusters is the first stage. Deciding what elements within the cluster to use is the second stage.”

The model adopted will be a two-stage model:

Stage I: This would involve dividing the entire project area into clusters, which typically would be sales points and then, selecting a sample of clusters for survey. Product-type distribution would also be taken into consideration while forming clusters.

Stage II: This would involve selection of a sample of lamps from each selected sample cluster for monitoring.

The aim of the plan is to check continued operation of sampled lamps and identification of user and checking with customer database. The sample survey will be carried out through direct household interviews or user feedback forms.

Sample Size:

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



NAME /TITLE OF THE PoA: *CarbonSoft Open Source PoA, LED lighting distribution:
Emerging Markets*



CDM – Executive Board

The sampling size will be calculated using Cochran’s formula as follows:⁶

$$1. \quad SS = (Z^2 * p * (1-p)) / (c^2)$$

where,

SS = Sample Size

Z = Z value (e.g. 1.645 for 90% confidence level)

p = estimated percentage of the population possessing attribute of interest =0.5

c = acceptable margin of error = 0.1

Correction is done for a finite population based on the following formula:

$$\text{New SS} = SS / (1+(SS/P))$$

where,

SS = Sample Size

P = Population

After the sample size has been determined for the CPA using Option 2, the actual survey will be carried out by the CPA implementation agency.

Data Measured:

The objective of the monitoring for option 2 will be to check number of lamps operational during the crediting period. The number of sample households that will be visited will be calculated by the CPA implementation agency as described above. The following will the parameter monitored:

Parameter	Unit	Description
n_0	Quantity	Number of units in operation and in service

Quality Assurances:

⁶ <http://www.surveysystem.com/sample-size-formula.htm>

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



NAME /TITLE OF THE PoA: *CarbonSoft Open Source PoA, LED lighting distribution:
Emerging Markets*



CDM – Executive Board

page 19

The SSC-CPA implementation agency in its monitoring and sampling plan provided with the CPA-DD will ensure proper quality control methods are prescribed to ensure that data gathered is error free. An overall quality control and assurance strategy shall be documented in the plan. This shall include a procedure for defining outliers and under what circumstances outlier data/measurements may be excluded and/or replaced.

The implementation agency will also provide information on each of the following in the CPA-DD:

- 1) Training of field personnel,
- 2) provisions for maximizing response rates
- 3) Documenting out-of-population cases
- 4) Refusals
- 5) Other sources of non-response, and related issues.

Implementation Plan:

The implementation plan will be provided in the CPA-DD for those CPAs utilizing Option 2 wherein the actual timelines of the sampling effort will be described. It will also contain a general description of qualifications and experience of personnel who will be engaged and if possible listing specific names, qualification and experience.

The CPA implementation agencies will ensure that all recommendations provided in the Annex 4 of the Guidelines for unbiased estimates of sampled parameters will be followed.

The following variables will be monitored during the Project:

Data / Parameter:	n_j (ID11)
Data unit:	Quantity
Description:	Number of units distributed
Source of data to be used:	CPA Project
Value of data applied for the purpose of calculating expected emission reductions in section B.5	Project developer database
Description of measurement methods and procedures to be applied:	The sales date is defined as the date of completion of distribution of the Project Lamps to the customers.
QA/QC procedures to be applied:	Data will be collected by the project developer. CarbonSoft will be responsible to store the data for the crediting period and an additional two years.
Any comment:	

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



NAME /TITLE OF THE PoA: *CarbonSoft Open Source PoA, LED lighting distribution:
Emerging Markets*



CDM – Executive Board

page 20

Data / Parameter:	<i>D_{intro}</i> (ID 12)
Data unit:	Date
Description:	To be conservative, the date that the Project Lamp was purchased, rounded to the 1 st of the month following. This number is required to conservatively calculate the emission reductions for a verification period.
Source of data to be used:	Sale records available with CPA project implementer, where each Lamp with its Unique Identification Number has been provided the date of sale.
Value of data applied for the purpose of calculating expected emission reductions in section B.5	E.g., 01/03/2011
Description of measurement methods and procedures to be applied:	Based on the exact date of sale being input to the database, data will be automatically rounded up to the 1 st of the following month.
QA/QC procedures to be applied:	Data will be collected by the project developer. CarbonSoft will be responsible to store the data for the crediting period and an additional two years.
Any comment:	

Data / Parameter:	<i>Customer Information</i> (ID 13)
Data unit:	Not applicable
Description:	Details of the final end point user will be maintained. This will include complete name and if available address. This will be beneficial in monitoring the following: 1) Not more than 5 lamps are replaced per household. 2) Carrying out sample surveys for monitoring in case the CPA has gone with Option 2.
Source of data to be used:	Project Developer Database.
Value of data applied for the purpose of calculating expected emission reductions in section B.5	Various
Description of measurement methods and procedures to be applied:	All information will be collected locally by the project developer in provided in CarbonSoft templates.
QA/QC procedures to be applied:	Data will be collected by the project developer. CarbonSoft will be responsible to store the data for the crediting period and an additional two years.
Any comment:	

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



NAME /TITLE OF THE PoA: *CarbonSoft Open Source PoA, LED lighting distribution:
Emerging Markets*



CDM – Executive Board

page 21

Data / Parameter:	UI (ID 14)
Data unit:	Not applicable
Description:	Unique identification number of lamp distributed
Source of data to be used:	Project Developer Database.
Value of data applied for the purpose of calculating expected emission reductions in section B.5	Various
Description of measurement methods and procedures to be applied:	The Unique Identification for a particular lamp will be based on a number which will be put on the lamp by means of a sticker. Data will be collected by the project developer. CarbonSoft will be responsible to store the data for the crediting period and an additional two years.
QA/QC procedures to be applied:	
Any comment:	This sales data, in its detailed form, is considered by project developers to be commercially sensitive information. The information will be provided to the DOE, and as required aggregated data can be made available. CarbonSoft will treat detailed sales data as commercially confidential information.

[In case the CPA uses option 2 the following, along with the above the following will be monitored:]

Data / Parameter:	n_o (ID 15)
Data unit:	Quantity
Description:	Number of units in operation and in service
Source of data to be used:	Survey to determine number of Project Lamps in year 3 of lamp being used. Sampling survey results shall be utilised as the operating assumptions for years 4,5,6 and 7 for Project Lamps in the CPA.
Value of data applied for the purpose of calculating expected emission reductions in section B.5	Project developer database
Description of measurement methods and procedures to be applied:	The number of units in operation and in service is found through monitoring and shall be presented as a percentage (%). Only project lamps with Unique Identification numbers provided by the CPA will be included.
QA/QC procedures to be applied:	Data will be collected by the project developer. CarbonSoft will be responsible to store the data for the crediting period and an additional two years.

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



NAME /TITLE OF THE PoA: *CarbonSoft Open Source PoA, LED lighting distribution:
Emerging Markets*



CDM – Executive Board

page 22

Any comment:

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:

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:

[The environmental assessment (if required by host country where CPA is located) will be provided in the individual actual CPA-DDs and will vary from CPA to CPA. An environmental analysis will be conducted only in the first CPA project of each host country. This is because the LED lighting projects are not site specific.]

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:

[The environmental assessment (if required by host country where CPA is located) will be provided in the individual actual CPA-DDs and will vary from CPA to CPA, An environmental analysis will be conducted only in the first CPA project of each host country. This is because the LED lighting projects are not site specific.]

SECTION D. Stakeholders' comments

The stakeholder consultation was undertaken starting in [date] when a product distribution trial was established in the [region/city] area of the CPA. [Entity] was responsible for distributing the lights in the trial and hosting of the stakeholder consultation. The initial public meeting drew attendants.

As LED lamps are still a new technology for consumers in the region an initial public meeting was held to:

- demonstrate the product
- explain the benefit of LED lamps
- the goals of the Project
- answer question raised by participants

The following images were taken at the stakeholder consultation:

[Photographic evidence of the stakeholder consultation]

[Questions asked]

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



NAME /TITLE OF THE PoA: *CarbonSoft Open Source PoA, LED lighting distribution: Emerging Markets*



CDM – Executive Board

page 23

[How these questions were considered]

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

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.

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

A stakeholder meeting was held on [XX/XX/20XX] in [XX] to provide stakeholders with an overview of the Project Activity and to get their comments and feedback on the Project Activity. Along with the stakeholder meeting, the stakeholders were also invited to submit their comments through the following mediums:

S.No	Method used	Types of stakeholders targeted by the method	Description
1	News paper advertisement	Local Population, Villagers of villages included in CPA,	[XX]
2	Stakeholder Meeting	Local Population. Local government representatives	[XX]
3	Email	Government representatives, Local NGOs	[XX]
4	Private Invitations	Government representatives, Local NGOs	[XX]
5	Phone Calls	Government representatives, Local NGOs, Village/District heads	[XX]
.....	[XX]	[XX]	[XX]

D.3. Summary of the comments received:

S.No	Comments
1	[XX]

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



NAME /TITLE OF THE PoA: *CarbonSoft Open Source PoA, LED lighting distribution:
Emerging Markets*



CDM – Executive Board

page 24

2	[XX]
3	[XX]
....	

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

S.No	Comments	Name and Designation of person commentating	Response to comment and if any action required
1	[XX]	[XX]	[XX]
2	[XX]	[XX]	[XX]
3	[XX]	[XX]	[XX]
....			

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



NAME /TITLE OF THE PoA: *CarbonSoft Open Source PoA, LED lighting distribution:
Emerging Markets*



CDM – Executive Board

page 25

Annex 1

CONTACT INFORMATION ON ENTITY/INDIVIDUAL RESPONSIBLE FOR THE SMALL-SCALE CPA

Organization:	Carbon Sustainable Resources Pte Ltd
Street/P.O.Box:	20 Cecil Street
Building:	#14-01, Equity Plaza
City:	
State/Region:	Singapore
Postfix/ZIP:	049705
Country:	Singapore
Telephone:	
FAX:	
E-Mail:	Co2@carbonsoft.net
URL:	www.carbonsoft.net
Represented by:	Sebastian Foot
Title:	Managing Director
Salutation:	Mr.
Last Name:	Foot
Middle Name:	
First Name:	Sebastian
Department:	
Mobile:	
Direct FAX:	
Direct tel:	
Personal E-Mail:	Sebastian@carbonsoft.net

Organization:	[XXX]
Street/P.O.Box:	[XXX]
Building:	[XXX]
City:	[XXX]
State/Region:	[XXX]
Postfix/ZIP:	[XXX]
Country:	[XXX]
Telephone:	[XXX]
FAX:	[XXX]
E-Mail:	[XXX]
URL:	[XXX]
Represented by:	[XXX]
Title:	[XXX]
Salutation:	[XXX]

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



NAME /TITLE OF THE PoA: *CarbonSoft Open Source PoA, LED lighting distribution:
Emerging Markets*



CDM – Executive Board

page 26

Last Name:	[XXX]
Middle Name:	[XXX]
First Name:	[XXX]
Department:	[XXX]
Mobile:	[XXX]
Direct FAX:	[XXX]
Direct tel:	[XXX]
Personal E-Mail:	[XXX]

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

Annex 3

BASELINE INFORMATION

Annex 4

MONITORING INFORMATION
