

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



NAME /TITLE OF THE PoA: Solar LED Lamp Project in Developing Asia



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: Solar LED Lamp Project in Developing Asia



CDM – Executive Board

page 2

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

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

>> Solar LED Lamp Project in (Insert Region/State and Host Country of the CPA)

Version Number: **XX**

Date: **dd/mm/yyyy**

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

>> The proposed CPA is a part of the PoA, Solar LED Lamp Project in Developing Asia.

The proposed CPA will be located in the state of (Insert Region/State and Host Country of the CPA). The purpose of the CPA is to replace kerosene used for domestic lighting purpose in areas with little or no access to electricity with solar LED lamps. This project will provide families with cost-effective solar LED lamps, replacing carbon-intensive kerosene lamps with a clean, renewable and sustainable source of light. The switch from kerosene based lighting lamps to solar LED lamps offer households significant socio, economic and environmental benefits, including the possibility for increased work hours, enhanced safety at night and lower health from indoor emissions. Many of these benefits are discussed in greater detail below. The switch to clean lighting source like solar LED lamp from kerosene also reduce greenhouse gas (GHG) emissions over the life span of the project.

(Insert overview on access to electricity and kerosene usage in the CPA region)

ToughStuff International will serve as the CME for this CPA.

Contribution to Sustainable Development

Environmental³

• **Saves Energy**

Solar electricity for the poor in developing countries is the most effective energy conservation program because it conserves costly non-renewable power for urban areas, town market centres, and industrial and commercial uses, leaving decentralized PV-generated power to provide the lighting and basic electrical needs of the majority of the developing world's rural populations.

³ <http://www.solarenergysolutions.co.in/benefits-solar-light-lantern.htm>



- **Reduces local air pollution**

Use of solar electric systems decreases the amount of local air pollution. With a decrease in the amount of kerosene used for lighting, there is a corresponding reduction in the amount of local pollution produced.

- **Offsets greenhouse gases**

Photovoltaic systems produce electric power with no carbon dioxide (CO₂) emissions. Carbon emission offset is calculated at approximately 6 tons of CO₂ over the twenty-year life of one PV system.

Economic³

- **Extends the Working day in rural areas**

On an average it is dark by 6:30 year round. Solar Lighting allows rural families to extend their workday into the evening hours. Many villages where solar lights are installed see an increase in their economic activity levels. Installing solar lights in villages allows businesses to operate during the evening. Solar electricity helps promote local enterprises as small shops and village markets can use the systems to provide lighting to operate during the evening.

- **Improves Health issues**

Fumes from kerosene lamps in poorly ventilated houses are a serious health problem in much of the world where electric light is unavailable. The World Bank estimates that 780 million women and children breathing kerosene fumes inhale the equivalent of smoke from 2 packs of cigarettes a day. By the use of Solar Lanterns these issues are resolved.

- **Reduces Maintenance**

Use of a solar light rather than kerosene lamps reduces the time and expense of refuelling and maintenance. Kerosene lamps must be filled several times per day. In rural areas such as Odisha, purchasing and transporting of kerosene fuel is often both difficult and expensive. Diesel generators require periodic maintenance and have a short lifespan.

Social³

- **Increases effectiveness of health programs**

Use of solar electric lighting systems by rural health centres increases the quality of health care provided. Solar electric systems improve patient diagnoses through brighter task lighting. Even today, child birth happens at rural homes having no access to electricity, supplying a regulated amount of light through solar lanterns will improve and make child birth easier.



- **Improves Fire-Reduction**

Kerosene lamps are a serious fire hazard in the developing world, killing and maiming tens of thousands of people each year. Kerosene, diesel fuel and gasoline stored for lamps and small generators are also a safety threat, whereas solar electric light comes as the safest measure for all.

- **Improves Literacy rate**

Solar light improves literacy, because people can read after dark more easily than they can by candle or lamp light. School work improves and eye sight is safeguarded when children study by solar powered light. With the advent of television and radio, people previously cut off from electronic information, education, and entertainment can become part of the modern world without leaving home.

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

>> The CPA implementer is (Insert CPA Implementer Name and PoA Unique Identification).

Statement to confirm status of the CPA implementer as either a project participant or not, under the registered PoA.

Table 1. Parties Involved in the CPA

Name of Party involved ((host indicates a host party)	Public or private entities Project Participants	Parties involved wish to considered as project participant?
(Insert Host Party name)	Host Party	No
(Insert CPA implementer Name)	Private/Public Entity	No

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

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

>> The unique identification number of the CPA is: "Unique CPA Implementer Identification Code-

A.4.1.1. Host Party:

>> (Insert Host Party name)

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

>> Each Solar LED lamp to be distributed under this CPA will be uniquely identified. ToughStuff will maintain records containing information for all the Solar LED lamps sold under the CPA in order to identify the project lamps and allow the unique identification of the CPA:

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



NAME /TITLE OF THE PoA: Solar LED Lamp Project in Developing Asia



CDM – Executive Board

page 5

- Name and address of the owner of the project lamp.
- Distribution date of the project lamp.
- Details of the distributor of the project lamp; which includes the name of the distributor, the unique distributor ID number and the sales region within which they are to operate
- Unique serial number of the project lamp.

The CPA will be implemented within the political boundary of **(Insert Region/State)**
(Inset map of Host Country providing a list of counties/provinces/communities within the target area)

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

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

>> **(Insert CPA Unique Identification)** will be operational from **(Insert date)**.

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

>> Project lamps implemented in the CPA **(Insert CPA Unique Identification)** shall have an effective useful life of **(Insert Operational Lifetime)** which qualifies under **(Insert Option 1 or 2 as chosen)** of the baseline and monitoring methodology AMS III AR ver. 02. Therefore the operational lifetime of the CPA is **(Insert Operational Lifetime)**

(The CPA Implementer may choose, from the methodology AMS III AR, either Option 1 and Option 2 for the useful life time of the project lamp. Based on this lifetime the CPA Implementer shall decide the crediting period of the CPA)

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

Renewable Crediting Period

A.4.3.1. Starting date of the crediting period:

>> **(Insert Date in dd/mm/yyyy)** The crediting period shall not start earlier than the date of its inclusion under the “Solar Power Lighting Project in Asia” PoA.

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

>> **(Insert length of Crediting Period)**

NB: The duration of the crediting period of any CPA shall be limited to the end date of the PoA regardless of when the CPA was added.

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

>>

Table 2. Annual Emission Reduction Estimates

Year	Annual estimation of emission reductions in tonnes of tCO ₂ eq
Enter Project start date and Project Year 1	XX
Project Year 2	XX

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



NAME /TITLE OF THE PoA: Solar LED Lamp Project in Developing Asia



CDM – Executive Board

page 6

Insert Rows as necessary	XX
Date of end of the First Crediting Period Project Year 1	XX
Total emission reductions (tCO ₂ eq)	XX
Total number of crediting years	XX years
Annual average emission reductions over the crediting period (tCO ₂ eq)	XX

A.4.5. Public funding of the CPA:

>> The (Insert CPA Unique Identification Number) did not receive any public funding and an undertaking will be provided to DOE at the time of validation.
(If public funding is used please provide information that it does not draw from Official Development Assistance)

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

>> In accordance with the “Guidance For Determining The Occurrence Of Debundling Under A Programme Of Activities (PoA)” EB 54 Annex 13, the test to demonstrate that this CPA is not a debundled project requires the following condition to be met:

There is no activity with the same activity implementer as the proposed small scale CPA, neither is there any activity with the same coordinating or managing entity, which also manages a large scale PoA of same sectorial scope.

This condition is met as there is no other large scale PoA of the same sectorial scope being implemented by ToughStuff International. Therefore, the proposed small scale CPA of a PoA is not deemed to be a debundled component of a large-scale activity and therefore is eligible to use the simplified modalities and procedures for small-scale project activities.

This is illustrated in the flow chart below as extracted from the guidelines on de-bundling wherein all conditions required for the present project activity to qualify as not a de-bundled component of a large scale project activity is met.

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

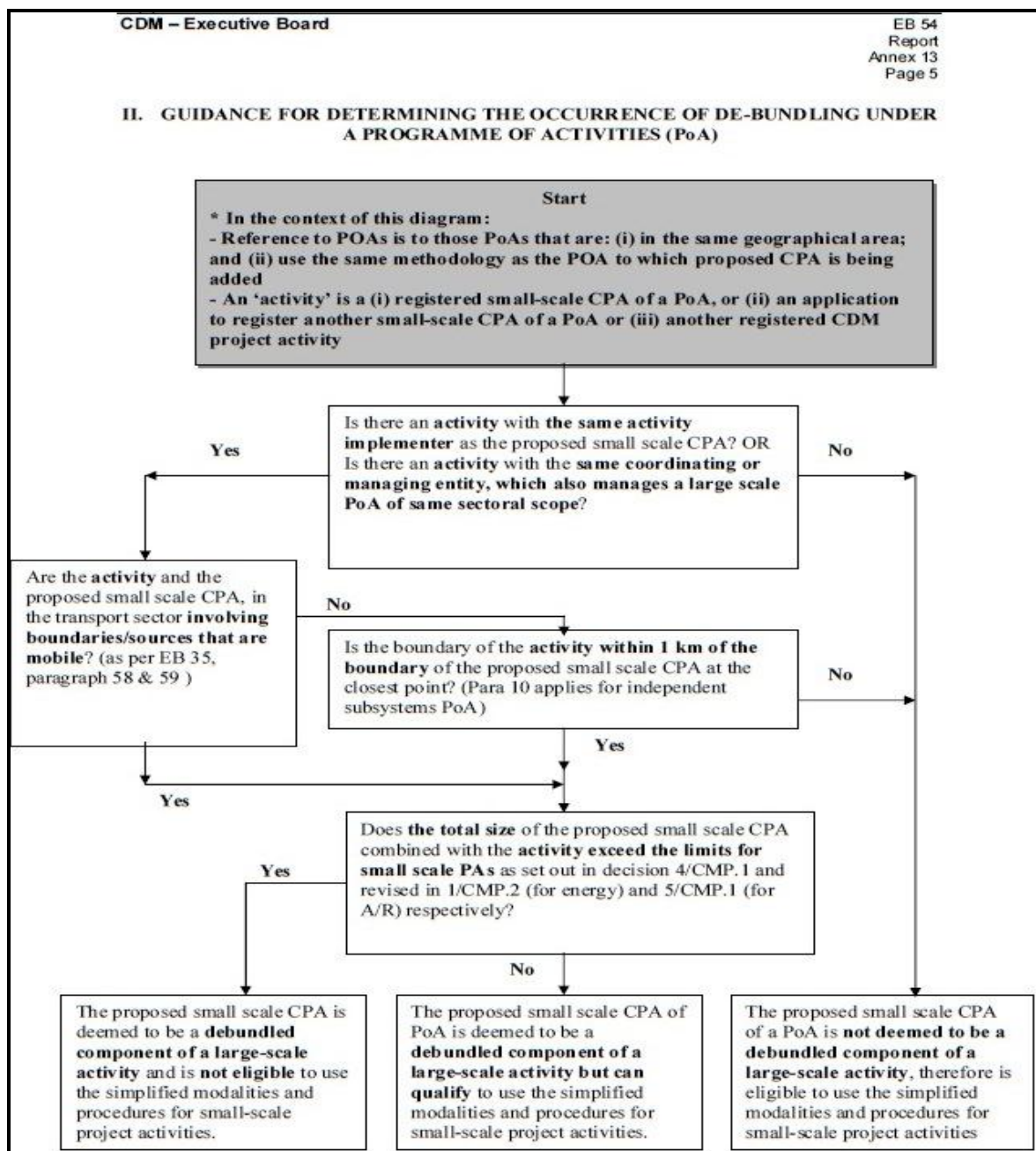


NAME /TITLE OF THE PoA: Solar LED Lamp Project in Developing Asia



CDM – Executive Board

page 7



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 C/ME to the proposed PoA has affirmed that this project activity is neither registered as an individual CDM project activity or is a component of another registered PoA. **Attestation to this fact is provided for in Annex 5 of this CPA DD which is a signed letter of inclusion from the C/ME to (Insert CPA Implementer name).**

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



NAME /TITLE OF THE PoA: Solar LED Lamp Project in Developing Asia



CDM – Executive Board

page 8

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:

>> “Solar LED Lamp Project in Developing Asia”.

Version :< provide version of PoA>

Date: dd/mm/yyyy

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

>>

The present CPA will be eligible for inclusion in the PoA if it meets each of the criteria outlined in section A.4.2.2. of the SSC-PoA-DD. Those criteria are as follows:

SI No	Eligibility Criteria	CPA Compliance
1	The CPA implements LED based lighting in residences with the objective of replacing kerosene lamps. The baseline of kerosene lamps has been adequately proved in the PoA-DD	Yes <input type="radio"/> No <input type="radio"/>
2	The LED based lighting systems has batteries which are charged using photovoltaic systems.	Yes <input type="radio"/> No <input type="radio"/>
3	Based on the option chosen by the CME implementer, either of the option will be chosen by the CME implementer: At a minimum project lamps shall be certified by their manufacturer to have a rated average life of at least: <ul style="list-style-type: none"> • 5,000 hours for Option 1, paragraph 11; • 10,000 hours for Option 2, paragraph 12. 	Yes <input type="radio"/> No <input type="radio"/>
4	All lamps must have one year warranty.	Yes <input type="radio"/> No <input type="radio"/>
5	Individual CPA will not exceed 60,000 tCO ₂ e annually in its emissions reductions	Yes <input type="radio"/> No <input type="radio"/>
6	There are no prevailing legislation that mandates the use of solar lamps in India	Yes <input type="radio"/> No <input type="radio"/>
7	That CPA implementer (Insert name of CPA implementer) will have a contractual engagement with the C/ME which grants the latter exclusive rights to communicate with the EB pertaining to the distribution of all CERs realized from the CPA as well as the right to access all distribution and or monitoring documents required	Yes <input type="radio"/> No <input type="radio"/>
8	(a) Light Output: luminous flux of 20 lumens or luminance of 25 lux over an area ≥0.1 m ² when suspended at a distance of 0.75 meters or self-supported. The light output over a 2,000 hour lumen	Yes <input type="radio"/> No <input type="radio"/>

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



NAME /TITLE OF THE PoA: Solar LED Lamp Project in Developing Asia



CDM – Executive Board

page 9

	maintenance test should not decline by more than 15% for Option 2 (paragraph 12) of the methodology	
9	(b) Run Time and Battery Capacity: Daily Burn Time (DBT) shall meet the following requirements: (i) DBT shall be equal to or greater than 3.5 hours;	Yes <input type="radio"/> No <input type="radio"/>
10	(ii) For charging option 2(a) the Autonomous Time of the Project Lamps shall meet the following requirements: For Option 1, paragraph 11, the Autonomous Time shall be equal to or greater than 150% of the DBT of the Project Lamps For Option 2, paragraph 12, the Autonomous Time shall be equal to or greater than 150% of the DBT of the Project Lamps;	Yes <input type="radio"/> No <input type="radio"/>
11	(iv) For charging with solar PV under option 2(a) the Solar Run Time for the Project Lamp in each month of the year shall be greater than or equal to the DBT;	Yes <input type="radio"/> No <input type="radio"/>
12	The project design document explains the proposed method of distribution of project lamps.	Yes <input type="radio"/> No <input type="radio"/>
13	The project design document includes design specification of project lamps: The CPA implementing party shall describe the following parameters within the CPA DD (a) Lamp wattage (in Watts) and luminous flux output (in lumens); (b) Rated lamp life (in hours); (c) Where applicable, the type and rated capacity of the renewable energy equipment used for battery-charging (in Watts); (d) Type (e.g. NiMH, Lead-Acid, Li-ion), and rated capacity of the batteries (in Ampere Hours); (e) Type of charge controller (e.g. active or passive);	

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



NAME /TITLE OF THE PoA: Solar LED Lamp Project in Developing Asia



CDM – Executive Board

page 10

	<p>(f) Autonomous Time and Daily Burn Time; (g) Solar Run Times(s) (SRT) for products with solar energy charging systems. If regional solar data are available, the maximum, minimum and average estimated SRT values for each month of a typical year shall be provided. If regional solar data are not available the standard solar day (5 kWh/m2) shall be used to estimate SRT; (h) Where applicable, the amount of time to fully charge the product using mechanical means or a centralized charging system (e.g. the national grid); (i) Physical protection against environmental factors (e.g. rain, heat, insect ingress).</p>	
14	<p>The project activity will restrict the number of Project Lamps distributed through the project activity to no more than five per household or per business location (e.g. for commercial applications such as shops).</p>	<p>Yes <input type="radio"/> No <input type="radio"/></p>

Distribution

(Insert Distribution Chart)

(Insert a description on the distribution system which will be utilized for distributing Sola LED lamp in the CPA region)

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

>> The proposed CPA will be implemented under the proposed PoA, “Solar LED Lamp Project in Developing Asia”. Therefore the identified barriers to the project implementation are applicable to the (Insert CPA Title) as demonstrated below.

The following barriers have been identified in Section A.4.3 of the PoA DD for the demonstration of additionality:

The assessment on additionality has been developed as per Attachment of Appendix B (EB 63, Annex 24, Version 8). Project participants can demonstrate additionality by providing an explanation to show that the project activity would not have occurred anyway due to at least one of the following barriers:

(a) **Investment barrier:** a financially more viable alternative to the project activity would have led to higher emissions;

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



NAME /TITLE OF THE PoA: Solar LED Lamp Project in Developing Asia



CDM – Executive Board

page 11

- (b) **Technological barrier:** a less technologically advanced alternative to the project activity involves lower risks due to the performance uncertainty or low market share of the new technology adopted for the project activity and so would have led to higher emissions;
- (c) **Barrier due to prevailing practice:** prevailing practice or existing regulatory or policy requirements would have led to implementation of a technology with higher emissions;
- (d) **Other barriers:** without the project activity, for another specific reason identified by the project participant, such as institutional barriers or limited information, managerial resources, organizational capacity, financial resources, or capacity to absorb new technologies, emissions would have been higher.

For small scale projects, additionality is demonstrated by establishing the existence of the (1) Other barriers, and (2) Barrier due to prevailing practice.

However there shall be exceptions to SSC CPA which can demonstrate additionality as per Paragraph 4 of Guidelines for demonstrating additionality of microscale project activities (EB 63 annex 23 Version 3) For a microscale project, project participants have to demonstrate the additionality by satisfying one of the following condition:

- (a) The geographic location of the project activity is an LDC/SIDS or special underdeveloped zone of the host country as identified by the government before 28 May 2010;
- (b) The project activity is an emission reduction activity with both conditions (i) and (ii) below satisfied:
 - i) Each of the independent subsystems/measures in the project activity achieves an estimated annual emission reduction equal to or less than 600 tCO₂e per year; and
 - ii) End users of the subsystems or measures are households/communities/SMEs.

Conclusion

The **(Insert CPA Title)** affirms the following:

Table 5. Barrier Assessment

Barrier	Compliance
There are no mandatory statutory or policy requirements in the Host Country regarding the use of Solar Lamps	√ <input type="checkbox"/> Yes/ <input type="checkbox"/> No
Barrier due to prevailing practice: prevailing practice or existing regulatory or policy requirements would have led to implementation of a technology with higher emissions;	√ <input type="checkbox"/> Yes/ <input type="checkbox"/> No
Other barriers: without the project activity, for another specific reason identified by the project participant, such as institutional barriers or limited information, managerial resources, organizational capacity, financial resources, or capacity to absorb new technologies, emissions would have been higher.	√ <input type="checkbox"/> Yes/ <input type="checkbox"/> No
Microscale Additionality	√ <input type="checkbox"/> Yes/ <input type="checkbox"/> No

The assessment of additionality has been conducted at PoA level and therefore the CPA implementer is only required to affirm the barrier analysis in the table above. **However CPA implementers are**

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



NAME /TITLE OF THE PoA: Solar LED Lamp Project in Developing Asia



CDM – Executive Board

page 12

encouraged to provide additional information, third party testing or sufficient literature review, analysis or reporting to further demonstrate additionality.

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.

>> The baseline and monitoring methodology AMS III AR version 02 defines the project boundary as the physical, geographical site where each project lamp is utilized. In addition paragraph 9 (a) further dictates that if the project lamps are charged by a renewable energy system then the project boundary includes the physical, geographical site of the renewable energy system. In this case, the project boundary includes the solar panel, the connector to the LED lamp and the LED lamp. The kit, comprising of the solar panel, the connector and LED lamp, constitutes the boundary.

The sources and gases included in the defined project boundary are described in the table below:

Table 6. Sources and Gases Included in Project Boundary

Baseline	Source	Gas	Included?	Justification
	Traditional Fuel based lighting systems	CO ₂	Yes	Main Source of emissions
		CH ₄	No	Excluded to maintain conservativeness
		N ₂ O	No	Excluded to maintain conservativeness
Project	LED Lighting System (Project Lamp)	CO ₂	No	No attributable emissions from project activity
		CH ₄	No	No attributable emissions from project activity
		N ₂ O	No	No attributable emissions from project activity

The geographical boundary of the CPA is the (Insert Province, Region or Host Country in which the CPA will be implemented) as provided in the map in section A.4.1.2. of this PDD. (Insert Province, Region) is a state within (Insert Host Country), which is clearly within the Developing Asia boundary of the PoA.

B.5. Emission reductions:

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

>>

Data / Parameter:	GF
Data unit:	Fraction
Description:	Grid time available to target households and communities
Source of data used:	Baseline and monitoring methodology AMS III AR
Value applied:	1.0
Justification of the choice of data or description of measurement methods and procedures actually applied :	Solar Led lamps included in this CPA will be charged by a photovoltaic solar panel. Therefore satisfying the condition that the LED lamps are charged by a renewable energy source as described in paragraph 2a.
Any comment:	

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



NAME /TITLE OF THE PoA: Solar LED Lamp Project in Developing Asia



CDM – Executive Board

page 13

Data / Parameter:	O
Data unit:	Hours/Day
Description:	Amount of kerosene used for lighting in the domestic/non-residential setting daily
Source of data used:	Baseline and monitoring methodology AMS III AR
Value applied:	3.5
Justification of the choice of data or description of measurement methods and procedures actually applied :	The figure provided by the baseline and monitoring methodology is conservative and will be used by each CPA throughout the crediting period.
Any comment:	

Data / Parameter:	EF_{i,CO2}/litre
Data unit:	kgCO ₂ /litre
Description:	Fuel Emission Factor of CO ₂ emissions realized from the combustion of 1 litre of fuel <i>i</i> (kerosene)
Source of data used:	Baseline and monitoring methodology AMS III AR
Value applied:	2.4
Justification of the choice of data or description of measurement methods and procedures actually applied :	Default value provided by the baseline and monitoring methodology.
Any comment:	

Data / Parameter:	U_v
Data unit:	Days/year
Description:	Number of days in calendar year in which the baseline lamps are used
Source of data used:	Baseline and monitoring methodology AMS III AR
Value applied:	365
Justification of the choice of data or description of measurement methods and procedures actually applied :	Default value provided by the baseline and monitoring methodology.
Any comment:	

Data / Parameter:	LF_v
Data unit:	Figure
Description:	Leakage Factor
Source of data used:	Baseline and monitoring methodology AMS III AR

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



NAME /TITLE OF THE PoA: Solar LED Lamp Project in Developing Asia



CDM – Executive Board

page 14

Value applied:	1.0
Justification of the choice of data or description of measurement methods and procedures actually applied :	Default value provided by the baseline and monitoring methodology.
Any comment:	

Data / Parameter:	<i>n</i>
Data unit:	Figure
Description:	Number of Kerosene Lamps replaced per Solar LED Lamp
Source of data used:	Baseline and monitoring methodology 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 the baseline and monitoring methodology.
Any comment:	

Data / Parameter:	FUR <i>l/hr</i>
Data unit:	(litres/hour)
Description:	Quantity of kerosene fuel used per hour for domestic/non-residential setting
Source of data used:	Default value provided or Value quantified based on baseline surveys or literature review
Value applied:	Default Value of 0.025 or figure derived from baseline surveys or literature review of the respective host country.
Justification of the choice of data or description of measurement methods and procedures actually applied :	The baseline and monitoring methodology provides a default value for Fuel Use Rate. However the methodology AMS III AR has a provision in paragraph 14 that allows CPA implementers to use alternative values based on strategic surveys and research conducted by national or local organizations, initiatives by international organizations or non-governmental organizations or the project proponent to collect reliable and comprehensive data.
Any comment:	Default value provided or Value quantified based on baseline surveys or literature review

Data / Parameter:	DV
Data unit:	tCO _{2e}
Description:	Default Emissions Factor
Source of data used:	Default value as provided in the baseline and monitoring methodology or as calculated based on Fuel Use Rate derived from baseline surveys/literature review.
Value applied:	Default value of 0.08 or value derived from baseline surveys/literature review

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



NAME /TITLE OF THE PoA: Solar LED Lamp Project in Developing Asia



CDM – Executive Board

page 15

Justification of the choice of data or description of measurement methods and procedures actually applied :	The values provided above are in accordance with the baseline and monitoring methodology with dual scenarios of default or alternative values.
Any comment:	

Data / Parameter:	DB_v
Data unit:	Dynamic Baseline Factor
Description:	Change in baseline fuel, fuel use rate, and/or utilization during crediting period) in year y.
Source of data used:	AMS III AR and literature review of documented national growth rate of kerosene fuel use in lighting from the preceding years.
Value applied:	1 + (FFG)Fraction derived from national kerosene fuel growth rate
Justification of the choice of data or description of measurement methods and procedures actually applied :	This parameter accounts for increased fuel use for lighting as it affects the baseline fuel consumption throughout the crediting period. If national statistics on documented increase in kerosene consumption are unavailable, the CPA DD may reference real GDP Growth rates and derive a correlation in increased per capita expenditure on fossil fuel with GDP growth.
Any comment:	If the CPA DD does document real GDP growth studies should be referenced per year.

Data / Parameter:	N_{ij}
Data unit:	Figure
Description:	Number of project lamps distributed to end users
Source of data used:	CPA Implementer sales database
Value applied:	A figure describing the number of lamps/sold or projected to be sold within the CPA crediting period.
Justification of the choice of data or description of measurement methods and procedures actually applied :	A sales record will be established per CPA which shall highlight the number of project lamps distributed, the lamp wattage, battery type, charging method and date of sale and unique serial number of each lamp sold for lamps that will be credited for up to 7 years.
Any comment:	

Data / Parameter:	OF_{v,ij}
Data unit:	Percentage
Description:	Percentage of distributed lamps which are in service and operational in year.
Source of data used:	Monitoring surveys past year 3 of the CPA crediting period.
Value applied:	A percentage of the total sales based on the monitoring survey which will prove operational lamps within the third year from the CPA start date.
Justification of the choice of data or	Only project lamps with an original unique marking will be counted as operating and in service. While project lamps replaced as part of a regular

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



NAME /TITLE OF THE PoA: Solar LED Lamp Project in Developing Asia



CDM – Executive Board

page 16

description of measurement methods and procedures actually applied :	maintenance or warranty program will be counted as operating, project lamps cannot be replaced as part of the survey process and counted as operating.
Any comment:	

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

>> **Baseline Emissions:**

Calculation of Lamp Emission Factor:

$$DV = FUR \times O \times EF / 1000 \times LF \times n \times NTG$$

where

- FUR = (Insert Value)
- O = 3.5 hours per day
- U = 365 days /year
- EF = (Insert Value)
- LF = 1.0
- n = 1.0
- NTG = 1.0

$$DV = (Insert Value) \text{ tCO}_2\text{e per project lamp}$$

Baseline Calculation:

$$BE_y = DV \times GF_y \times DB_y \tag{1}$$

Where:

- DV = (Insert Value)
- GF_y = 1.0
- DB_y = (Insert Value)
- BE_y = (Insert Value)

$$BE_y = (Insert Value) \text{ tCO}_2\text{e}$$

Project Emissions:

There are no project emissions ($Pr_{ey} = 0$) if the project lamp charging mechanism utilized is as defined in paragraph 2(a) of the baseline methodology AMS.III.AR which defines the charging mechanism as project lamps charged using renewable energy systems such as the photovoltaic systems as envisioned for the project activity.

$$PE_y = 0$$



CDM – Executive Board

Leakage Emission:

Leakage is not to be considered as per the methodology AMS III AR version 02

Emission Reductions:

$$ER_y = \sum_{i,j} N_{i,j} \times (BE_{y,i} - PE_{y,i,j}) \times (OF_{y,i,j}) \quad (3)$$

Where:

ER_y Emission reductions in year y (tCO₂e)

N_{i,j} Number of project lamps distributed to end users of type *i* with charging method *j*

OF_{y,i,j} Percentage of project lamps distributed to end users that are operating and in service in year y for each lamp type *i* and charging method *j*.

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

>>

Table 8. Ex-ante emission reduction calculations

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	xxxx	xxxx	xxxx	xxxx
Year B	xxxx	xxxx	xxxx	xxxx
Year C	xxxx	xxxx	xxxx	xxxx
Year ...	xxxx	xxxx	xxxx	xxxx
Total (tonnes of CO ₂ e)	xxxx	xxxx	xxxx	xxxx

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

B.6.1. Description of the monitoring plan:

>>

In accordance with the methodology, monitoring needs to be conducted in two ways:

1. *During project activity implementation, the following data are to be recorded:*

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



NAME /TITLE OF THE PoA: Solar LED Lamp Project in Developing Asia



CDM – Executive Board

page 18

- a) *Number of Project 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 distribution);*
- b) *Data to unambiguously identify each recipient of a Project Lamp, for all the Project Lamps distributed that will claim emission reductions for up to seven years, as per option 2 paragraph 12.*
2. *For Project Lamps that will claim emission reductions for up to seven years, ex post monitoring surveys to determine percentage of Project Lamps¹⁰ distributed to end users that are operating and in service will be conducted during the third year of the crediting period. Only Project Lamps with a unique project marking (per paragraphs 12(e) or 25) can be counted as operating and in service. 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 then counted as operating.*

In accordance with the methodology, our proposed monitoring approach is divided into two parts.

Monitoring during Project Activity Implementation

The following types of data will be gathered by the **(Insert name of CPA Implementer)**, the agency that will be implementing this CPA during the implementation of the CPA.

1. Name and unique ID number of the CPA
2. Name and unique Identification number of the CPA Implementing Party
3. Date of Registration of the CPA
4. Unique serial number sequence for lamps sold under the CPA, and the following details for each of the project lamp sold
 - a) Lamp wattage
 - b) Battery type
 - c) Charging method
 - d) Date of distribution
 - e) Name and unique identification of distributor
 - f) Date of sale
 - g) Location of sale
 - h) Customer contact detail (name, address and mobile number, if available)
5. Total number of Project Lamps distributed to end users under the project activity

Data will be gathered continuously during the implementation of the CPA as the sales are made. Data collection and management will occur in several steps.

Step 1: The distributor collects the initial data as sale is completed. The data is collected through a warranty card that end-users and distributors must complete. A completed warranty card, when received by the CPA implementer is necessary to activating the warranty. Consequently, there is an inbuilt incentive for the distributor to ensure that the data is collected. The CPA implementer **(Insert name of CPA Implementer)** may also be a distributor.

Step 2: The distributor sends the data collected during the sale to the CPA implementer. This data flow occurs at the same time as the distributor stock is being replenished and is likely to vary with each distributor.

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



NAME /TITLE OF THE PoA: Solar LED Lamp Project in Developing Asia



CDM – Executive Board

page 19

Step 3: The CPA implementer (**Insert name of CPA Implementer**) will maintain the data collected in an electronic database. It will conduct QAQC to verify that data appears to be accurate and attempt to fill in any gaps that may have arisen. The QAQC will be based on a true-up, i.e., verification against units supplied by the CPA implementer to the distributor. The CPA implementer will conduct the true-up and QAQC on a monthly basis (or in a frequency as established by its own sales planning and management process). The CPA implementer maintains the paper records of the data (i.e., the warranty card) for a period of up to 2 years following the completion of the CPA.

Step 4: The CPA implementer (**Insert name of CPA Implementer**) will send the electronic data on a quarterly basis to CME (ToughStuff). Upon receiving the data, the CME will conduct a QAQC to verify that consistency between serial number of lamps supplied and those reported to identify any potential errors. CME will maintain the data electronically in a central database for a period of up to 2 years following the completion of the CPA.

The information contained in this database is updated regularly as defined in the schedule of Step 1 – 4 above and has redundancy of information at three levels. Level 1, each data contains a paper record. Level 2, the data is stored with the CPA implementer. Level 3, the data is stored with the CME.

Ex-post monitoring survey

If the CPA selects Option 2, the CPA implementer (**Insert name of CPA Implementer**) will distribute lamps with a seven years effective useful life to end-users. In accordance with the methodology, an ex-post monitoring survey is required in the third year from the project start date. Results of the ex-post survey will then be used for the crediting period of each lamp in accordance with paragraph 22 of the baseline and monitoring methodology AMS III AR.

The following principles as explained in paragraph 23 of the methodology AMS III.AR and as per the guidelines of EB 65 Annex 02, the sampling plan will be adopted for the present project activity as follows:

- (a) The sampling size is determined by minimum 90% confidence interval and the 10% maximum error margin; the size of the sample will be no less than 150;
- (b) Sampling is statistically robust and relevant, i.e. the survey is conducted on those households which are selected on the basis of random number generated from the database of the solar lamp users
- (c) The method to select respondents for interviews will be random;
- (d) The survey will be conducted by site visits;
- (e) Only persons over age 12 are interviewed;
- (f) The PoA-DD contains the design details of the survey.

Objective

Specifically, the ex-post survey will be used to determine the following:

1. Number of solar lamps placed in service and operating
2. Solar lamp failure rate

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



NAME /TITLE OF THE PoA: Solar LED Lamp Project in Developing Asia



CDM – Executive Board

page 20

The proposed sampling plan described below has been developed in accordance to the principles outlined above as based on “Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities” Version 02 EB 65 Annex 2.

Broadly, the key elements for the monitoring survey are outlined below.

1. Obtain the CPA database for which distribution is completed, as declared by CPA implementer. This database is frozen and used for the survey.
2. To satisfy a 90% confidence interval and 10% precision for a population size where the no of solar lamps distributed is more than 40,000 in the first three years, the number of households sampled must be a minimum of 68. In order to accommodate non-responsive errors and non-sampling measurement errors that could crop up inadvertently during the course of sampling, a sample of 150 is chosen.
3. If consumer distribution records⁴ are in order, the declared date is accepted by CME.
4. Any discrepancies observed by the CME would be reported to the CPA for correction, and the database will be accepted only after all the corrections are made. Where necessary this may also imply a change in the declared date.

Sampling Objective

The objective of the sampling is to accurately determine the number of project lamps which are in service and are operational in the third year of crediting of the CPA. The target population are the project lamp owners.

Field Measurement Objectives and Data to be collected

Monitoring surveys shall seek to establish the following parameters:

1. Unique Identification of the CPA
2. Unique Identification of the Solar Lantern (spot check by the CPA implementer/party conducting monitoring survey)
3. Proper usage and maintenance of the project lamp (spot check by the CPA implementer/ party conducting the monitoring survey)
4. Date of survey
5. Number of lamps installed per household
6. Physical location of domestic/non-residential setting of project lamp owner
7. Date of sale/distribution of the project lamp

For the random selection of households in the proposed CPA area, the database listing all residential households eligible under the CPA will be randomly selected under the monitoring survey. The sampling will as per the following criteria:

Sampling Criteria

1. The survey should cover the CPA area,

⁴ The distribution records include name of the customer, location, type and unique identifier of lamp, date of sale

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



NAME /TITLE OF THE PoA: Solar LED Lamp Project in Developing Asia



CDM – Executive Board

page 21

2. Random sample group be determined using statistical tools as representing the households falling under the CPA area. Survey sample size shall be determined to have at-least 90% confidence level with 10 % maximum margin of error i.e., in a sample of 150 samples at least 135 samples will show the result that lamps are operational.

The specific methodology for determining the sample size for the present CPA is outlined in the table below.

S.No	Information head	Coverage
1	Sampling Objectives	Sampling objective is to obtain a reliable estimate of the key variables used in the estimation of GHG reductions viz.: Number of solar lamps placed in service and operating (<i>ex-post, survey</i>) solar lamp failure rate (<i>ex-post monitoring surveys</i>)
2	Target Population.	The present project activities employ technology which survive the harsh environments of the regions in which it is distributed viz., Asia and Africa
	Data to be collected.	Number of Solar lamps placed in service and operating (<i>ex-post survey</i>) Only Solar lamps bearing an original manufacturer's logo can be counted as replaces. While solar lamps replaced as part of a regular maintenance or warranty program can be counted as operating, solar lamps cannot be replaced as part of the survey process and will be counted as operating. Solar failure rate (<i>ex-post monitoring surveys</i>) The present CPA will carry out subsequent surveys as per the outline provided for the ex-post, survey above.
3	Sampling Frame.	Sampling frame refers to all the information sources on the basis of which the CPA project database is developed. For the present CPA, the sample frame is developed from the panchayat records or adopting the government enumerated survey numbers viz., UIDAI, BPL fair price shop number, Voter ID (any one of them) on the regions which lack electricity or where the reliability of power is very low. The frame includes information relevant to conducting sampling out of the total CPA information database as stated in section E.7.2 of PoA-DD. Where information mis-match is observed, conservative assumptions would be made and applied.
4	Sample Method.	Considering that from a solar lamp manufacturer's point of view, each of the households holds an equal probability of being identified, hence simple random sampling will be used.
5	Desired Precision/Expected Variance and Sample Size	AMS IIIAR ver02 requires a minimum 90% confidence interval and the 10% maximum error margin. ex-post survey to determine the quantity of solar lamps installed and operating to estimate the proportion, p, of solar lamps utilized under the project activity in household population with a 10% margin of error at desired confidence level of 90%, the optimal sample size

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



NAME /TITLE OF THE PoA: Solar LED Lamp Project in Developing Asia



CDM – Executive Board

page 22

		<p>n of solar lamps are given by:</p> $\frac{z^2}{r^2} \frac{[p(1-p)]}{p}$ <p>Here, r denotes the relative error allowed i.e. 10% and equals 0.1; denotes the abscissa of the normal curve that cuts off an area of 0.1 at the tails to give the desired confidence level of 0.9 so that $z = 1.645$, the value being read off from the normal tables. Thus, the sample size</p> $n = \frac{(1.645)^2}{(0.1)^2} \frac{[p(1-p)]}{p} = 270.6025 \frac{[p(1-p)]}{p}$ <p>The above equation has two unknowns- n and p. However if we can get an advance value for the solar lamps in operation, using information from similar sample surveys elsewhere or if some past experience suggests a possible value of p, the knowledge can be utilized to estimate n as above. From the test results for certification it was found that the failure rate of the solar lamps is 1 in 1000. In order to be conservative and also to determine a higher sampling number, the failure is assumed to be 1 in 100. Then the number of samples that needs to be taken is given as below:</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <thead> <tr> <th colspan="8" style="text-align: center;">Ex-Post Monitoring Year over crediting period</th> </tr> <tr> <th></th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> <th>6</th> <th>7</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">p</td> <td style="text-align: center;">0.01</td> <td style="text-align: center;">0.02</td> <td style="text-align: center;">0.03</td> <td style="text-align: center;">0.04</td> <td style="text-align: center;">0.05</td> <td style="text-align: center;">0.06</td> <td style="text-align: center;">0.07</td> </tr> <tr> <td style="text-align: center;">n</td> <td style="text-align: center;">3</td> <td style="text-align: center;">5</td> <td style="text-align: center;">8</td> <td style="text-align: center;">10</td> <td style="text-align: center;">13</td> <td style="text-align: center;">15</td> <td style="text-align: center;">18</td> </tr> </tbody> </table> <p>The CPA is however free to choose a household sample size higher than the one calculated. So accordingly the PP has chosen to adopt a sample size of 150 for the present activity</p> <p>To ensure random selection, random number generators will be applied.</p> <ol style="list-style-type: none"> 1. Each household is allotted a unique CPA serial number starting at 1 and up to the total number of households in CPA area. 2. Using random number generators, the households are randomly chosen. 3. The random number thus obtained is correlated with the unique identification number for locating the household at the time of distribution 	Ex-Post Monitoring Year over crediting period									1	2	3	4	5	6	7	p	0.01	0.02	0.03	0.04	0.05	0.06	0.07	n	3	5	8	10	13	15	18
Ex-Post Monitoring Year over crediting period																																		
	1	2	3	4	5	6	7																											
p	0.01	0.02	0.03	0.04	0.05	0.06	0.07																											
n	3	5	8	10	13	15	18																											

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



NAME /TITLE OF THE PoA: Solar LED Lamp Project in Developing Asia



CDM – Executive Board

page 23

		of the solar lamps.
6	Procedures for Administering Data Collection and Minimizing Non-Sampling Errors.	Refer section E.7.2 for description

The following key questions will be raised with the households as part of survey during ex post monitoring:

- a. Does the solar lamp used carry the lamp’s unique identification number: Yes / No
- b. Is the Solar lamp operating: Yes / No

Survey data collection arrangement

The survey will be conducted by the CPA implementer data, who in turn may use external third-party assistance. The survey data and results will be first maintained by the CPA implementer (**Insert name of CPA Implementer**) and provided to the CME for integration into the central database management system.

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

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

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

>> **The CPA DD shall describe any anticipated environmental impacts from the use of the project lamps.**

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 CPA shall reference national laws that require or exempt the project activity from compulsory EIA.**

SECTION D. Stakeholders’ comments

>>

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



NAME /TITLE OF THE PoA: Solar LED Lamp Project in Developing Asia



CDM – Executive Board

page 24

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

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:

>>

Please compile the results of the local stakeholder's consultation in this section

D.3. Summary of the comments received:

>>

Please fill this section according to the outcome of the comments received

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

>>

Please fill in this section based on the replies given to the queries raised by the stakeholder's in the meeting

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



NAME /TITLE OF THE PoA: Solar LED Lamp Project in Developing Asia



CDM – Executive Board

page 25

Annex 1

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

Organization:	
Street/P.O.Box:	
Building:	
City:	
State/Region:	
Postfix/ZIP:	
Country:	
Telephone:	
FAX:	
E-Mail:	
URL:	
Represented by:	
Title:	
Salutation:	
Last Name:	
Middle Name:	
First Name:	
Department:	
Mobile:	
Direct FAX:	
Direct tel:	
Personal E-Mail:	

Organization:	<i>(Provide contact Details of the CPA Implementer)</i>
Street/P.O.Box:	
Building:	
City:	
State/Region:	
Postfix/ZIP:	
Country:	
Telephone:	
FAX:	
E-Mail:	
URL:	
Represented by:	
Title:	
Salutation:	
Last Name:	
Middle Name:	
First Name:	

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



NAME /TITLE OF THE PoA: Solar LED Lamp Project in Developing Asia



CDM – Executive Board

page 26

Department:	
Mobile:	
Direct FAX:	
Direct tel:	
Personal E-Mail:	

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



NAME /TITLE OF THE PoA: Solar LED Lamp Project in Developing Asia

CDM – Executive Board



page 27

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

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



NAME /TITLE OF THE PoA: Solar LED Lamp Project in Developing Asia

CDM – Executive Board



page 28

Annex 3

BASELINE INFORMATION

(Insert Study(ies), Official data or Peer Reviewed Literature for the Region to demonstrate the baseline scenario)



Annex 4

MONITORING INFORMATION

Details of monitoring equipment, data management system are described in section B.6.1.

The following information shall be collected during the sampling:

- I. the date of solar lamp purchase
- II. serial number of each solar lamp
- III. Address of each solar lamp

Sl No	Date of Solar Lamp Purchase	Serial No of Each Solar Lamp	Address of Each Solar Lamp	Working Yes/No	Remarks