

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



NAME /TITLE OF THE PoA: CFL lighting scheme -- “Bachat Lamp Yojana”.



CDM – Executive Board

page 1

<p>CLEAN DEVELOPMENT MECHANISM SMALL-SCALE PROGRAM ACTIVITY DESIGN DOCUMENT FORM (CDM-SSC-CPA- DD) Version 01</p>
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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).

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

Note: This template contains text in blue and black. The black text cannot be edited by SSC-CPAs and is common to all SSC-CPAs. Only the blue text/ table section can be edited by implementer(s). Further, only the blue text need to be checked at the time of new CPA-DD inclusion.

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

>> CFL lighting scheme – “Bachat Lamp Yojana” in <cite in the following sequence SSC-CPA Administrative District name, Circle, Electrical Division, DISCOM Name, State, India>

Version Number: XX

Date: dd/mm/yyyy

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

>> The SSC-CPA project general operating framework and specific details are included as under:

The project is developed under the Small-Scale Programme of Activities (PoA) titled “CFL Lighting Scheme: Bachat Lamp Yojana” (BLY). CFLs will be distributed to those registered, grid connected consumers who freely decide to replace incandescent lamp (ICLs) for CFLs. Under the BLY scheme quality long-life CFLs³ would be distributed by SSC-CPA implementer to grid-connected residential households in exchange of an ICL and INR 15.

The CFLs would deliver atleast the replaced ICL equivalent lumens as derived from the Indian national standard IS 418:2004 for ICLs⁴:

The distribution of CFLs and replacement of previously used ICLs in households in the SSC-CPA area can take place using one or more of the following methods:

- direct installation at each household; and/or
- ICL collection and CFL distribution through dedicated distribution points as advertised by the SSC-CPA owner in the local media e.g. local DISCOM offices, retail outlets, resident association offices, schools etc.

Where direct installation is not done, SSC-CPA shall educate the recipient to install the CFL in high-usage areas, such as outsides, common areas, living room area and kitchen. The SSC-CPA Implementer in cooperation with the DISCOM will do this by virtue of an awareness campaign educating households that only in case the CFLs are placed in high usage areas, maximum energy savings and subsequent cost savings can be achieved. The participating households will need to sign

³ In India IS 15111 standard specifies a minimum 6000 hours rated life time. Long life quality CFLs in BLY context would thus meet IS 15111 requirements and have an average rated life of 6000 hours and above.

⁴ As per AMS IJ ver03, lumen output of replaced ICL shall be determined in accordance with relevant national standard. The national standard for ICLs in India is IS 418:2004. The lumen output values in the table are taken from this standard. The methodology table is optional and applied if the relevant national standards are not available.

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



NAME /TITLE OF THE PoA: CFL lighting scheme -- “Bachat Lamp Yojana”.



CDM – Executive Board

page 3

an agreement with the SSC-CPA Implementer forbidding them to re-sell the CFLs. The replaced ICLs will be destroyed so as to ensure these are not used elsewhere.

The DISCOM allocates a specific service number to its residential customers. To ensure that CFLs are only distributed to residential users, only those DISCOM customers with the specific residential service number will be eligible to receive CFLs. The DISCOM maintains a database of domestic users based on service number and address for billing purposes. The same database would be taken as basis for identification of domestic consumers to ensure that CFLs are distributed only among domestic consumers. To prevent fraudulent activity, consumers will also be required to present their latest electricity bill when they apply for the CFLs. Only those consumers who can present the bill will receive CFLs. Upon giving CFLs to the consumer, the consumer’s electricity bill will be stamped. This is to ensure that the same consumer cannot later come and claim additional CFLs.

To ensure that no more than four CFLs are distributed to each household, the following procedures are in place:

- Training of persons involved in the distribution to emphasize that a maximum of 4 CFLs to be distributed to participating households;
- The hard copy ledger form and the database that must be completed upon distribution of CFLs to each household will only allow entry for a maximum of 4 CFLs. The electronic database will not allow data entry beyond 4 CFLs.
- The spot checks to be performed by the metering personnel of the DISCOM will also provide a cross check to ensure that households have not received more than 4 CFLs. If a household has more than 4 CFLs (which are embossed with the unique logo), then the metering personnel will remove the excess CFLs, which can then be used in other eligible households.

The CPA implementer will ensure the appropriate and environmentally friendly system of disposal/recycling of the CFLs which fuse during the program, and also the ICLs such that they are not reused in the market. The disposal system for fused CFLs will be in line with sustainable practices and available facilities for e-Waste disposal and the Central Pollution Control Board (CPCB).

Recording

All replaced ICLs will be recording during the distribution process in a specially designed database software package programme (Database). The Database will identify the wattage of each replaced ICL.

Storage

The replaced ICLs will be collected and stored in appropriate boxes indicating the wattages of the replaced ICLs. Each box will state the number of ICLs stored in that box. The boxes will be stored at dedicated storage facilities.

Destruction

The CPA Implementer will arrange for destruction and inform the DOE well in advance of the date and time.

Supervision

The Destruction will be closely monitored and supervised by the CPA Implementer, preferably in conjunction with the DOE or any other independent agency to allow for credibility of the process.

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



NAME /TITLE OF THE PoA: CFL lighting scheme -- “Bachat Lamp Yojana”.



CDM – Executive Board

page 4

Reduced energy demand from the households participating in the Project will lead to the reduction in air pollution and greenhouse gas (GHG) emissions resulting from the burning of fossil fuels for electricity production.

The project implementation schedule is as follows:

Event	Planned Date(s)
Supply agreement of CFLs with manufacturer	
Delivery of CFLs	
Distribution of CFLs-Start date	
Distribution of CFLs- Completion date	
Q _{P,i} Survey	

Once distribution of CFLs is completed in the SSC-CPA project area, the implementer shall inform the managing entity that the CFL distribution in project area is completed. This date of declaration, on acceptance by the managing entity after scrutiny, would be treated as the start date of the crediting of GHG reductions for the SSC-CPA area.

SSC-CPA specific Data is as under:

S. No	SSC-CPA Title	Description
1	DISCOM Name	
2	DISCOM Division and Circle	
3	No of grid connected household consumers numbers in project area	<also indicate database date>
4	Average number of CFLs to be distributed per household consumer number (max is four)	
5	Wattages of ICLs to be replaced	40 W 60 W 100 W
6	Wattages of CFLs to be distributed	
7	CFLs would deliver atleast the replaced ICL equivalent lumens as per IS 418:2004	<input type="checkbox"/> Yes <input type="checkbox"/> No
8	CFL distribution method adopted	<input type="checkbox"/> direct installation at each household <input type="checkbox"/> distribution through dedicated distribution points
9	Voluntary relinquishment of rights over the CERs generated from the project CFL use to the SSC-CPA implementer.	<input type="checkbox"/> confirm to enter into agreement with CFL supplier <input type="checkbox"/> confirm to enter into agreement with project households

CDM Consideration by SSC-CPA

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



NAME /TITLE OF THE PoA: CFL lighting scheme -- “Bachat Lamp Yojana”.



The project is being developed under the BLY PoA. Hence by its very design, CDM has been considered right from project inception stage.

The earliest action taken by the CPA implementer(s) is empanelment with the Managing Entity and subsequent signing of the Tri-partite Agreement with the managing entity and the DISCOM. Both the empanelment with the managing entity and the signed TPA indicate the intention to consider CDM.

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

>> The entity/individual responsible of the CPA shall be included, hence forth referred to as CPA implementer(s). CPA implementers can be project participants of the PoA, under which the CPA is submitted, provided their name is included in the registered PoA.

S. No	SSC-CPA Title	Description
1	CPA Implementer(s)	<agency(ies) which implement the SSC-CPA on the ground>

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

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

>>

A.4.1.1. Host Party:

>>India

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

>>Geographic reference or other means of identification⁵, Name/contact details of the entity/individual responsible for the CPA, e.g. in case of stationary CPA geographic reference, in case of mobile CPAs means such as registration number, GPS devices.

S. No	SSC-CPA Title	Description
1	State	
2	District	
3	DISCOM Name	
4	DISCOM Circle	
5	DISCOM Division	
	Subdivision	Section
	< Insert rows as necessary >	< Insert rows as necessary >
6	SSC-CPA Unique Identification Number	<as assigned by BEE>
7	Longitude of Project area	<in standard format>
	Latitude of Project area	<in standard format>

⁵ E.g. in case of stationary CPA geographic reference, in case of mobile CPAs means such as registration number, GPS devices.



The key geographic location of the applied measure (CFLs) is determined using the household consumer number provided by utility and the household physical address. These two parameters together would uniquely identify the household.

This information need not be part of the SSC-CPA-DD but should be maintained under the project database.

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

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

dd/mm/yyyy

For example- date of signing the Tri-partite agreement (TPA) in-between BEE, SSC-CPA Implementer(s) and DISCOM or date of purchasing or distributing the CFLs

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

>>

<The CPA operational life cannot be more than that of the rated life of the distributed CFLs.

For example if CFL rated life is 10,000 hours then taking usage as 3.5 hours per 24 hours, the project operational lifetime is 7.83 years.>

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

Fixed Crediting period: < indicate SSC-CPA choice from amongst the following (whichever is less) viz. project operational lifetime or 10 years fixed or residual BLY PoA lifetime >

A.4.3.1. Starting date of the crediting period:

dd/mm/yyyy;

(The start date would be the planned or the declared end date of the CFL distribution process in SSC-CPA project area by the CPA Implementer and accepted by the Managing Entity)

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

>> Not applicable

NOTE: Please note that the duration of 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:

>> SSC-CPA annual emission reductions are as under:

Year	Estimation of annual emission reductions (tonnes of CO ₂ e)
1	

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



NAME /TITLE OF THE PoA: CFL lighting scheme -- “Bachat Lamp Yojana”.



CDM – Executive Board

page 7

2	
3	
4	
5	
6	
7	
8	
9	
10	
Total estimated reductions	
Total number of crediting years	
Annual average	

A.4.5. Public funding of the CPA:

>>

The source of funding of the SSC-CPA implementer(s) is :

<input type="checkbox"/> Private	SSC-CPA implementer(s) shall provide written confirmation to the managing entity
<input type="checkbox"/> Public	Where public funding is accessed, the SSC-CPA Implementer(s) shall provide written affirmation to the managing entity as below: “Information on sources of public funding for the project activity from Parties included in Annex I which shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of those Parties;”

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

>>As per section A.4.4.1 of the BLY PoA, the SSC-CPA is exempt from performing 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:

>> SSC-CPA status is indicated as under:

This Project will be neither registered as an individual CDM activity or is part of another Registered PoA.

The CPA Implementer is undertaking another similar project activity in the same region, and the households are uniquely identified and are not overlapping.

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:

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



NAME /TITLE OF THE PoA: CFL lighting scheme -- “Bachat Lamp Yojana”.



CDM – Executive Board

page 8

CFL lighting scheme – “Bachat Lamp Yojana”.

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 :

>> With reference to BLY-PoA section A.4.2.2. The eligibility criteria stated under the SSC-PoA are confirmed by the SSC-CPA implementer(s) as under:

S. No	Eligibility Criteria	Status
1	SSC-CPA follows the baseline and monitoring methodology AMS IIJ ver03	<input type="checkbox"/> Yes / <input type="checkbox"/> No
2	The geographical boundary of the SSC-CPA area is uniquely defined by SSC-CPA implementer(s) at own cost e.g. using DISCOM Circle, Division maps	<input type="checkbox"/> Yes / <input type="checkbox"/> No
3	CFLs distributed under the scheme: <ul style="list-style-type: none"> - are distributed only to grid-connected households - independent rated lifetime testing as per international / national standards. - conform to the IS : 15111:2002 requirements and provide atleast the lumen equivalent of replaced ICLs as per IS 418:2004 - INR 15 is collected from households, along with ICL 	<input type="checkbox"/> Yes / <input type="checkbox"/> No <input type="checkbox"/> Yes / <input type="checkbox"/> No <input type="checkbox"/> Yes / <input type="checkbox"/> No <input type="checkbox"/> Yes / <input type="checkbox"/> No
4	Confirm to have signed PoA liability indemnity agreement with BEE	<input type="checkbox"/> Yes / <input type="checkbox"/> No
5	Valid and signed tripartite agreement with DISCOM and BEE, specifying the duties and responsibilities under a SSC-CPA.	<input type="checkbox"/> Yes / <input type="checkbox"/> No
6	Confirm to apply CFL daily operational hours as 3.5 hours per 24 hour period.	<input type="checkbox"/> Yes / <input type="checkbox"/> No
7	Commitment towards collection and destruction of the ICLs generated out of SSC-CPA project; and CFL disposal as per the applicable directions of MoEF / State Pollution Control Board.	<input type="checkbox"/> Yes / <input type="checkbox"/> No
8	Confirmation that this SSC-CPA is not registered or being registered, as a stand-alone CDM project outside of BLY SSC-PoA.	<input type="checkbox"/> Yes / <input type="checkbox"/> No
9	Confirmation that SSC-CPA is not a de-bundled component of another large-scale CPA or CDM project activity as per the latest guidance given in CDM EB. (refer PoA DD Section A.4.4.1).	<input type="checkbox"/> Yes / <input type="checkbox"/> No

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



NAME /TITLE OF THE PoA: CFL lighting scheme -- “Bachat Lamp Yojana”.



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

Additionality Demonstration

Description of the barriers at PoA level is provided in PoA-DD section A.4.3. The barrier analysis description presented therein is also prevalent in the SSC-CPA project area.

From the project implementer(s) perspective, the key barrier to the project is the investment barrier. The SSC-CPA implementer(s) has adapted the PoA financial spread-sheet template using the SSC-CPA project information and the key results of the financial analysis to support SSC-CPA additionality are as under:

Title	NPV Value
NPV without CDM consideration	
NPV with CDM consideration	

As can be assessed, the CPA project NPV is negative without CDM revenues and thus the SSC-CPA is additional.

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 project boundary is the physical, geographical location of each measure (i.e. each CFL) installed. The CFL installed is energy efficient in comparison to the comparable conventional incandescent lamp (ICL) and by virtue of installation in grid-connected households, reduces the need for electricity.

The electricity is supplied by the grid which is pre-dominantly fossil fuel based. Therefore, indirectly GHG emissions (CO₂) from grid-connected power plants are reduced. Other sources/ gases are deemed negligible.

	Source	Gas	Included?	Justification / Explanation
Baseline	Power plants serving the electricity grid	CO ₂	Included	Main emission source.
		CH ₄	Excluded	Excluded for simplification. This emission source is assumed to be very small.
		N ₂ O	Excluded	Excluded for simplification. This emission source is assumed to be very small.
Project Activity	Power plants serving the electricity grid	CO ₂	Included	Main emission source.
		CH ₄	Excluded	Excluded for simplification. This emission source is assumed to be very small.
		N ₂ O	Excluded	Excluded for simplification. This emission source is assumed to be very small.

B.5. Emission reductions:

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



NAME /TITLE OF THE PoA: CFL lighting scheme -- “Bachat Lamp Yojana”.



CDM – Executive Board

page 10

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

>> The BLY-PoA section E.6.3 is adapted for the SSC-CPA project area as under:

Data / Parameter:	$EF_{CO_2.ELEC,y}$
Data unit:	tCO ₂ /MWh
Description:	CO ₂ emission factor for displacement of electricity in the <indicate grid> serving the household consumers that participate in the SSC-CPA project area during the monitoring interval y, calculated according to the latest approved version of AMS-I.D (tCO ₂ /MWh)
Source of data used:	The <indicate version, date> of CDM baseline CO ₂ emission database by Central Electricity Authority (CEA), India
Value applied:	<SSC-CPA to apply value >
Justification of the choice of data or description of measurement methods and procedures actually applied :	The SSC-CPA applies the latest grid emission factor database available on the CEA website. The value is fixed ex-ante.
Any comment:	Data to be reported to BEE for record

Data / Parameter:	O_i
Data unit:	Hours / day
Description:	Average daily operating hours of the baseline ICLs of the group of “i”,
Source of data used:	AMS IIJ default value
Value applied:	3.5 hours per 24 hours period
Justification of the choice of data or description of measurement methods and procedures actually applied :	The SSC-CPA shall use fixed 3.5 hours per 24 hrs period.
Any comment:	--

Data / Parameter:	X_i
Data unit:	Hours / year
Description:	Operating hours per year for CFL type i
Source of data used:	Calculated value
Value applied:	1277.5 hours per 365 day year; 1281 hours for leap year
Justification of the choice of data or description of measurement methods and procedures actually applied :	The SSC-CPA shall use fixed 3.5 hours per 24 hrs period. Hence for the yearly value the estimate is fixed.
Any comment:	Data to be reported to BEE for record

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



NAME /TITLE OF THE PoA: CFL lighting scheme -- “Bachat Lamp Yojana”.



CDM – Executive Board

page 11

Data / Parameter:	NTG
Data unit:	--
Description:	Net-to-gross adjustment factor
Source of data used:	Default AMS IIJ value
Value applied:	0.95
Justification of the choice of data or description of measurement methods and procedures actually applied :	The SSC-CPA shall use a default value of 0.95 under the BLY PoA.
Any comment:	--

Data / Parameter:	L_i
Data unit:	hours
Description:	rated average operating hours for CFL type <i>i</i>
Source of data used:	Life test report of CFLs
Value applied:	<As per SSC-CPA CFL>
Justification of the choice of data or description of measurement methods and procedures actually applied :	Determined as per the independent life-tests of the CFLs as per national / international standard (refer Annex 4 of PoA-DD). The value is fixed ex-ante.
Any comment:	Data to be reported to BEE for record

Data / Parameter:	High PF CFL life test report and test curves
Data unit:	--
Description:	Life test reports of CFLs
Source of data used:	Obtained from accredited manufacturer or laboratory
Value applied:	<As per SSC-CPA CFL test data>
Justification of the choice of data or description of measurement methods and procedures actually applied :	<p>Determined as per the independent life-tests of the CFLs as per national / international standard. The value is to be furnished ex-ante.</p> <p>However, due to the special situation in India requiring high PF CFLs the life-test data may not be readily available ex-ante.</p> <p>Where such information is not available ex-ante, the life-test curves of low PF CFLs would be obtained in lieu of the high PF CFLs as the LFR in both lamps is similar. (refer PoA-DD Annex 4)</p> <p>The high PF CFL test curves shall be provided before the 1st CPA Verification by a DOE.</p>
Any comment:	Data to be reported to BEE for record

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

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>>The equations under the BLY-PoA section E.6.2 are applied as per project values

Ex ante emission reductions are calculated as below.

Net Energy Savings (NES_y)

The net energy saved is derived using the equation (1) below:

$$NES_y = \sum_i Q_{PJ,i} * (1-LFR_{i,y}) * ES_i * [1 / (1 - TD_y)] * NTG \tag{1}$$

Where:

$$ES_i = (P_{i,BL} - P_{i,PJ}) * O_i * 365 / 1000 \tag{2}$$

Where:

$P_{i,BL}$ <Project value> Watt

$P_{i,PJ}$ <Project value> Watt

O_i 3.5 hours per day

ES_i ($P_{i,BL}$ Watts – $P_{i,PJ}$ Watts) * 3.5 hours/day * 365 / 1000 = <Project value> kWh per year

$Q_{PJ,i}$ <Project value> bulbs

TD_y <Project value> %⁶

NTG 0.95

The maximum NES_y would be in the first year post-CFL distribution. This is calculated to be <Project value> GWhr for the 1st year.

The CPA Implementer(s) confirm based on the calculation demonstrated above for the Net Energy Savings (NES_y), that the CPA project aggregate energy savings do not exceed the equivalent of 60 GWh per year.

Lamp Failure Rate ($LFR_{i,y}$)

In the context of the SSC-CPA, the project lamp (CFL) failure rate was calculated *ex-ante* and then measured *ex-post* till the end of the crediting period as follows:

<input type="checkbox"/> Once every 3 years	Choice of the minimum frequency of carrying out the ex-post survey. (note: The SSC-CPA implementer is free to choose a monitoring periodicity more frequent than the one chosen during the SSC-CPA crediting period.)
<input type="checkbox"/> Once for every 30% of the elapsed rated lifetime of the lamp	

⁶ <provide the reference source here for T&D>

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



NAME /TITLE OF THE PoA: CFL lighting scheme -- “Bachat Lamp Yojana”.



CDM – Executive Board

page 13

If $y * X_i < L_i$, then $LFR_{i,y} = y * X_i * (100 - R_i) / (100 * L_i)$ (3)
 If $y * X_i > \text{or} = L_i$, then $LFR_{i,y} = 1$

Where:

- L_i <Project value> hours
- R_i 50%
- X_i 1,277.5 or 1281 hours

Based on these numbers, yearly LFR and NES are as shown below:

Year →	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>
Till date cumulative CFL Operating Hours in project (hours)										
Lamp Failure Rate (LFR, %)										
Net Energy Saved (NES, MWh)										

Emissions Reduction (ER_y)

Emission reduction (ER_y) is net electricity savings (NES_y) times an emission factor ($EF_{CO2,ELEC,y}$)

$ER_y = NES_y \times EF_{CO2,ELEC,y}$ (4)

Where:

$EF_{CO2,ELEC,y}$ <apply project value> t_{CO2}/MWh

Thus, *ex ante* calculations of emission reductions over crediting period is as follows:

Year →	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>
Emission Reductions (ER, t _{CO2e})										

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)
1				
2				
3				
Year ...				

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



NAME /TITLE OF THE PoA: CFL lighting scheme -- “Bachat Lamp Yojana”.



CDM – Executive Board

page 14

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:

>>

SSC-CPA implementer(s) confirm to follow the monitoring plan as described in BLY-PoA section E.7.2

SSC-CPA implementer(s) confirm to develop and submit to managing entity project implementation handbook covering all requirements as stated in BLY-PoA section E.7.2

A list of parameters to be measured during the implementation of project activity is adapted from PoA-DD section E.7.2 for the SSC-CPA project area as under:

Data / Parameter:	N																																											
Data unit:	--																																											
Description:	Sample size of Monitoring Survey																																											
Source of data to be used:	Calculated value as per statistical analysis provided in PoA-DD and SSC-CPA-DD Annex 4																																											
Value of data applied for the purpose of calculating expected emission reductions in section B.5	<p><To be filled by SSC-CPA></p> <table border="1"> <thead> <tr> <th rowspan="2"></th> <th colspan="10">Ex-post Monitoring Year over crediting period</th> </tr> <tr> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> <th>6</th> <th>7</th> <th>8</th> <th>9</th> <th>10</th> </tr> </thead> <tbody> <tr> <td>Sample Size (n)</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>Actual households</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> </tbody> </table>		Ex-post Monitoring Year over crediting period										1	2	3	4	5	6	7	8	9	10	Sample Size (n)											Actual households										
	Ex-post Monitoring Year over crediting period																																											
	1	2	3	4	5	6	7	8	9	10																																		
Sample Size (n)																																												
Actual households																																												
Description of measurement methods and procedures to be applied:	<p>Sampling shall be statistically sound and random.</p> <p>Calculations to follow PoA-DD Annex 4.</p>																																											
QA/QC procedures to be applied:	<p>The SSC-CPA shall determine the representative sample size with minimum 90% confidence interval and 10% maximum error margin. The actual number of households to be surveyed can be arrived at by dividing the value of ‘n’ in table above with the average number of CFLs distributed per household.</p> <p>To be conservative the minimum number of households surveyed should be hundred. The SSC-CPA implementer(s) may choose a sample size higher than the one calculated above.</p>																																											
Any comment:	Data to be reported to BEE for record																																											

Data / Parameter:	LFR _{i,y}
--------------------------	--------------------

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



NAME /TITLE OF THE PoA: CFL lighting scheme -- “Bachat Lamp Yojana”.



CDM – Executive Board

page 15

Data unit:	%
Description:	Lamp Failure Rate for CFL type <i>i</i> in year <i>y</i> (fraction)
Source of data to be used:	Ex-post Monitoring survey
Value of data applied for the purpose of calculating expected emission reductions in section B.5	< To be filled by SSC-CPA.>
Description of measurement methods and procedures to be applied:	Determined as per monitoring surveys of the installed CFLs. The ex-ante LFR estimate is corrected as per the ex-post monitoring survey.
QA/QC procedures to be applied:	The survey will consist of identifying CFLs, with unique SSC-CPA markings that are installed and operating. Under the survey, only CFLs with an original marking can be counted as installed. While CFLs replaced as part of a regular maintenance or warranty program can be counted as operating, CFLs cannot be replaced as part of the survey process and counted as operating.
Any comment:	--

Data / Parameter:	<i>Lamp distribution data</i>					
Data unit:	--					
Description:	The start and completion date of CFL distribution, Utility consumer number of CFL recipient households under the SSC-CPA will be entered into the SSC-CPA database.					
Source of data to be used:	SSC-CPA database					
Value of data applied for the purpose of calculating expected emission reductions in section B.5	<table border="1"> <tr> <td>Distribution of CFLs-Start date</td> <td>dd/mm/yyyy</td> </tr> <tr> <td>Distribution of CFLs- Completion date</td> <td>dd/mm/yyyy</td> </tr> </table> <p>Utility household consumer data would be provided in SSC-CPA database.</p>		Distribution of CFLs-Start date	dd/mm/yyyy	Distribution of CFLs- Completion date	dd/mm/yyyy
Distribution of CFLs-Start date	dd/mm/yyyy					
Distribution of CFLs- Completion date	dd/mm/yyyy					
Description of measurement methods and procedures to be applied:	The data should be documented and verifiable by Managing Entity and DOE at random.					
QA/QC procedures to be applied:	--					
Any comment:	Data to be reported to BEE for record					

Data / Parameter:	$N_{Destroyed}$
Data unit:	Number
Description:	Number of ICLs collected and destroyed

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



NAME /TITLE OF THE PoA: CFL lighting scheme -- “Bachat Lamp Yojana”.



CDM – Executive Board

page 16

Source of data to be used:	SSC-CPA database
Value of data applied for the purpose of calculating expected emission reductions in section B.5	<To be filled by SSC-CPA.>
Description of measurement methods and procedures to be applied:	The destroyed ICLs data will be entered into the SSC-CPA database. The value is fixed for the entire project crediting period.
QA/QC procedures to be applied:	The destruction of baseline ICLs should be documented and verifiable by DOE at random.
Any comment:	Data to be reported to BEE for record

Data / Parameter:	Q_{PJ}								
Data unit:	Number								
Description:	Number of CFLs of the group of “i” CFLs (e.g. 20W CFL) in operation during the first 12 months of distribution.								
Source of data to be used:	SSC-CPA database								
Value of data applied for the purpose of calculating expected emission reductions in section B.5	<table border="1"> <tr> <td colspan="2"><To be filled by SSC-CPA></td> </tr> <tr> <td>No of grid connected household consumers numbers in project area</td> <td></td> </tr> <tr> <td>Average number of CFLs to be distributed per household consumer number (max is four)</td> <td></td> </tr> <tr> <td>Q_{PJ}</td> <td></td> </tr> </table>	<To be filled by SSC-CPA>		No of grid connected household consumers numbers in project area		Average number of CFLs to be distributed per household consumer number (max is four)		Q_{PJ}	
<To be filled by SSC-CPA>									
No of grid connected household consumers numbers in project area									
Average number of CFLs to be distributed per household consumer number (max is four)									
Q_{PJ}									
Description of measurement methods and procedures to be applied:	The SSC-CPA will determine Q_{PJ} , using ex-post survey and the data will be entered into the SSC-CPA database.								
QA/QC procedures to be applied:	Use of standardized data forms and compliance protocols of SSC-CPA.								
Any comment:	Data to be reported to BEE for record								

Data / Parameter:	$P_{i, BL}$
Data unit:	W
Description:	Rated power of the baseline ICLs of the group of “i”
Source of data to be used:	Weighted average calculated using rated power of the baseline ICLs as recorded in SSC-CPA database
Value of data applied for the purpose of calculating expected emission reductions in	< to be filled by SSC-CPA >

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



NAME /TITLE OF THE PoA: CFL lighting scheme -- “Bachat Lamp Yojana”.



CDM – Executive Board

page 17

section B.5	
Description of measurement methods and procedures to be applied:	The SSC-CPA will monitor $P_{i, BL}$ during the ICL replacement. The data will be entered into the SSC-CPA database and fixed for crediting period duration. Normally the nameplate data would be used, however where there is no wattage labelling visible on the ICL, then using a multi-meter, the resistance in ohms of the ICL to be replaced shall be compared against the resistance for the known ICL wattage.
QA/QC procedures to be applied:	Use of standardized data forms and compliance protocols of SSC-CPA.
Any comment:	Data to be reported to BEE for record. The baseline ICLs rated power should be verified during ICL destruction.

Data / Parameter:	$P_{i,PJ}$
Data unit:	W
Description:	Rated power of the CFLs of the group of “i” lighting devices (Watts)
Source of data to be used:	Weighted average calculated using rated power of the CFLs as recorded in SSC-CPA database
Value of data applied for the purpose of calculating expected emission reductions in section B.5	< To be filled by SSC-CPA >
Description of measurement methods and procedures to be applied:	The SSC-CPA will monitor $P_{i,PJ}$ during the CFL distribution. The data will be entered into the SSC-CPA database and fixed for crediting period duration.
QA/QC procedures to be applied:	Use of standardized data forms and compliance protocols of SSC-CPA.
Any comment:	Data to be reported to BEE for record

Data / Parameter:	TD_y
Data unit:	%
Description:	Average annual technical grid losses
Source of data to be used:	Published DISCOM data by an official governmental body or 10 % Default AMS IIJ option
Value of data applied for the purpose of calculating expected emission reductions in section B.5	Justification to be provided by SSC-CPA
Description of measurement methods and procedures to be applied:	The transmission and distribution losses for the SSC-CPA area would be updated and determined from recent audited data published either by the DISCOM or an official governmental body. Else the SSC-CPA should apply the default value of 10%.
QA/QC procedures to	This value does not include non-technical losses such as commercial losses

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



NAME /TITLE OF THE PoA: CFL lighting scheme -- "Bachat Lamp Yojana"



CDM – Executive Board

page 18

be applied:	(e.g., theft/pilferage)
Any comment:	Data to be reported to BEE for record

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:

- This information is provided at the PoA level.
SSC-CPA need not complete sections C.2. and C.3 of this form.

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

>> Not applicable

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

>> Not applicable

SECTION D. Stakeholders' comments

>>

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

- This information is provided at the PoA level.
SSC-CPA need not complete sections D.2. to D.4 of this form.

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

>> Not applicable

D.3. Summary of the comments received:

>> Not applicable

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

>> Not applicable

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



NAME /TITLE OF THE PoA: CFL lighting scheme -- "Bachat Lamp Yojana"



CDM – Executive Board

page 19

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:	

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



NAME /TITLE OF THE PoA: CFL lighting scheme -- “Bachat Lamp Yojana”.



CDM – Executive Board

page 20

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

<SSC-CPA to fill if public funding is planned for this Project. Else write ‘not applicable’>



Annex 3

BASELINE INFORMATION

<SSC-CPA to adapt as necessary the text below>

Calculations of Baseline Electricity Emission from Grid

As per paragraph 10, AMS I D ver 14, the baseline grid emission factor can be calculated using a combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM).

The data used to calculate the combined margin is obtained from the latest published studies by the Central Electricity Authority (CEA) of India which are the “CO2 Baseline Database for the Indian Power Sector: User Guide Version 4.0” and “Baseline Carbon Dioxide Emission Database Version 4”

These two studies are available on the CEA website as below:

<http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm>

The combined margin is calculated according to the procedure as described in the “Tool to calculate the emission factor for an electricity system” (Version 1.1) and the following six steps are applied.

STEP 1. Identify the relevant electric power system

The Indian electricity system is now divided into two grids (See Table 1), the new Integrated Northern, Eastern, Western, and North-Eastern regional grids (NEWNE) and the Southern Grid. The project activity is located at Andhra Pradesh and the electricity supply is obtained from Southern Grid.

Table 1: Geographical scope of the two electricity grids.

NEWNE Grid				Southern Grid
Northern	Eastern	Western	North-Eastern	Southern
Chandigarh	Bihar	Chhattisgarh	Arunachal Pradesh	Andhra Pradesh
Delhi	Jharkhand	Gujarat	Assam	Karnataka
Haryana	Orissa	Daman & Diu	Manipur	Kerala
Himachal Pradesh	West Bengal	Dadar & Nagar Haveli	Meghalaya	Tamil Nadu
Jammu & Kashmir	Sikkim	Madhya Pradesh	Mizoram	Pondicherry
Punjab	Andaman-Nicobar	Maharashtra	Nagaland	Lakshadweep
Rajasthan		Goa	Tripura	
Uttar Pradesh				
Uttarakhand				



STEP 2. Select an operating margin (OM) method

The calculation of the operating margin emission factor ($EF_{grid,OM,y}$) is based on Simple OM method because the low-cost/must-run resources constitute less than 50% of Southern Grid generation in the average of the five most recent years. In India, hydro and nuclear stations qualify as low-cost / must-run sources.

Table 2; Share of Must-Run (Hydro/Nuclear) (% of Net Generation)

Grid	2003-2004	2004-2005	2005-06	2006-07	2007-08
NEWNE	NA	NA	18.0%	18.5%	19.0%
South	16.2%	21.6%	27.0%	28.3%	27.1%
India	17.1%	18.0%	20.1%	20.9%	21.0%

STEP 3. Calculate the operating margin emission factor according to the selected method

The simple OM emission factor is calculated as the generation-weighted average CO₂ emissions per unit net electricity generation (tCO₂/MWh) of all generating power plants serving the system in Southern Grid, excluding low-cost / must-run power plants / units.

Data on fuel consumption and net electricity generation of each power plant / unit (Option A) is used.

The simple OM emission factor is calculated as follows:

$$EF_{grid,OMsimple,y} = \frac{\sum_{i,m} FC_{i,m,y} \cdot NCV_{i,y} \cdot EF_{CO_2,i,y}}{\sum_m EG_{m,y}}$$

Where:

- $EF_{grid,OMsimple,y}$ Simple operating margin CO₂ emission factor in year y (tCO₂/MWh)
- $FC_{i,m,y}$ Amount of fossil fuel type *i* consumed by power plant / unit *m* in year y (mass or volume unit)
- $NCV_{i,y}$ Net calorific value (energy content) of fossil fuel type *i* in year y (GJ / mass or volume unit)
- $EF_{CO_2,i,y}$ CO₂ emission factor of fossil fuel type *i* in year y (tCO₂/GJ)
- $EG_{m,y}$ Net electricity generated and delivered to the grid by power plant / unit *m* in year y (MWh)
- m* All power plants / units serving the grid in year y except low-cost / must-run power plants / units
- i* All fossil fuel types combusted in power plant / unit *m* in year y
- y* Either the three most recent years for which data is available

The simple OM is calculated using ex-post option, and latest data available is for year 2007 to 2008.

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



NAME /TITLE OF THE PoA: CFL lighting scheme -- “Bachat Lamp Yojana”.



CDM – Executive Board

page 23

Table 3: Simple Operating Margin for Southern grid

Year	Simple Operating Margin (OM)
2007-2008	0.99

STEP 4. Identify the cohort of power units to be included in the build margin (BM)

The sample group of power units m used to calculate the build margin consists of the set of power capacity additions in the electricity system that comprise 20% of the system generation (in MWh) and that have been built most recently. The build margin will cover units commissioned in the last five to ten years. Using the available data in the Southern Regional Grid from the CEA *Baseline Carbon Dioxide Emission Database Version 4*, the most recent 20% of additional units is referred as this would represent a larger, more representative of annual generation. The total output of this 20% of the system generation is as below:

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



NAME /TITLE OF THE PoA: CFL lighting scheme -- “Bachat Lamp Yojana”



CDM – Executive Board

page 24

Net 20% Generation (GWh)

	2007-08
NEWNE	100,707
South	31,613
India	132,320

Absolute Emissions from net 20% generation (tCO₂)

	2007-08
NEWNE	60,193,616
South	22,550,310
India	82,743,926

Total Net Generation in the grid (GWh)

	2007-08
NEWNE	496,119
South	157,315
India	653,434



STEP 5. Calculate the build margin emission factor

The build margin emissions factor is the generation-weighted average emission factor (tCO₂/MWh) of all power units *m* during the most recent year *y* for which power generation data is available, calculated as follows:

$$EF_{\text{grid,BM},y} = \frac{\sum_m EG_{m,y} \times EF_{\text{EL},m,y}}{\sum_m EG_{m,y}}$$

Where:

- EF_{grid,BM,y} Build margin CO₂ emission factor in year *y* (tCO₂/MWh)
- EG_{m,y} Net quantity of electricity generated and delivered to the grid by power unit *m* in year *y* (MWh)
- EF_{EL,m,y} CO₂ emission factor of power unit *m* in year *y* (tCO₂/MWh)
- m* Power units included in the build margin
- y* Most recent historical year for which power generation data is available

The calculation of Build Margin is performed based on the net generation of the 20% most recent capacity additions in the grid. The total power output of this 20% generation is 31,613 GWh, while the total net generation in Southern Grid is 157,315 GWh.

Therefore, the build Margin for Southern Grid
 = 22,550,310 tCO₂ / 31,613,000 MWh
 = 0.71 tCO₂/MWh.

STEP 6. Calculate the combined margin (CM) emissions factor

The combined margin emissions factor is calculated as follows:

$$EF_{\text{grid,CM},y} = EF_{\text{grid,OM},y} \times W_{\text{OM}} + EF_{\text{grid,BM},y} \times W_{\text{BM}}$$

Where:

- EF_{grid,CM,y} Combined margin CO₂ emission factor in year *y* (tCO₂/MWh)
- EF_{grid,OM,y} Operating margin CO₂ emission factor in year *y* (tCO₂/MWh)
- EF_{grid,BM,y} Build margin CO₂ emission factor in year *y* (tCO₂/MWh)
- W_{OM} Weighting of operating margin emissions factor (%)
- W_{BM} Weighting of build margin emissions factor (%)

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



NAME /TITLE OF THE PoA: CFL lighting scheme -- “Bachat Lamp Yojana”.



CDM – Executive Board

page 26

The recommended default value by the tool for W_{OM} and W_{BM} is both at 0.5.
Therefore, the Combined Margin is calculated as below:

$$\begin{aligned} EF_{\text{grid,CM,y}} &= 0.99 \times 0.5 + 0.71 \times 0.5 \\ &= 0.856 \text{ tCO}_2/\text{MWh} \end{aligned}$$

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



NAME /TITLE OF THE PoA: CFL lighting scheme -- "Bachat Lamp Yojana".



CDM – Executive Board

page 27

Annex 4

MONITORING INFORMATION

1. Life Test Curves of Project CFLs

low power factor Life test reports available and furnished to managing entity *in lieu* for those of the *high power factor* project CFLs. *High power factor* project CFL life test reports would be furnished to verifying DOE, when this information is required to determine the ex-post CFL failure rate against the laboratory tests, and adjust the failure rate (if found necessary)

high power factor project CFL life test reports available and furnished to managing entity

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



NAME /TITLE OF THE PoA: CFL lighting scheme -- “Bachat Lamp Yojana”.



CDM – Executive Board

page 28

2. SAMPLING INFORMATION

Outline of the Sampling Plan Design in SSC-CPA DD⁷

The details of the sampling plan design are adapted from Annex-4 of PoA-DD for use as under:

S.No	Information head	Coverage
1	Sampling Objectives	<p>Sampling Objective is to obtain a reliable estimate of the key variables used in the estimation of GHG reductions viz.:</p> <ul style="list-style-type: none"> • Number of CFLs placed in service and operating (<i>ex-post Q_{PJ} survey</i>) • CFL failure rate (<i>ex-post monitoring surveys</i>)
2	Target Population.	<p>The target population is the household consumer base connected to the <indicate SSC-CPA Administrative District name, Circle, Electrical Division, DISCOM Name, State, India > where the SSC-CPA project is being implemented.</p>
	Data to be collected.	<p>Number of CFLs placed in service and operating (<i>ex-post Q_{PJ} survey</i>)</p> <ul style="list-style-type: none"> • Within 12 months of the start of CFL distribution in SSC-CPA project area, an on-site visual survey of sample households shall be done to identify CFLs that are installed and operating. • Only CFLs bearing an original BLY logo can be counted as installed. While CFLs replaced as part of a regular maintenance or warranty program can be counted as operating, CFLs cannot be replaced as part of the survey process and counted as operating. <p>CFL failure rate (<i>ex-post monitoring surveys</i>)</p> <ul style="list-style-type: none"> • SSC-CPA shall carry out subsequent survey's as per the outline provided for the ex-post Q_{PJ} survey above.
3	Sampling Frame.	<p>Sampling frame refers to all the information sources on the basis of which the SSC-CPA project database is developed.</p> <p>For a BLY SSC-CPA, the sample frame is developed from the DISCOMs customer account records. The frame consists of currently active accounts with a unique residential service code.</p>

⁷ Adapted for the BLY PoA from the UNFCCC General guidance on sampling and surveys for SSC projects, version 01, Annex 30, EB 50

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



NAME /TITLE OF THE PoA: CFL lighting scheme -- “Bachat Lamp Yojana”.



CDM – Executive Board

page 29

		<input type="checkbox"/> The SSC-CPA implementer(s) confirm that the sampling frame includes information relevant to conducting sampling out of the total SSC-CPA information database as required in section E.7.2 of PoA-DD. Where information mis-match is observed, conservative assumptions have been made and applied.
4	Sample Method.	Considering that from a BLY scheme point of view, each of the households holds an equal probability of being identified from a DISCOMs active residential household customer base, hence simple random sampling is used.
5	Desired Precision/Expected Variance and Sample Size.	<p>AMS IJ requires a minimum 90% confidence interval and the 10% maximum error margin.</p> <p><u>ex-post Q_{PI} Survey to determine the quantity of CFLs installed and operating</u></p> <p>To estimate the proportion, p, of CFLs placed in service and operating under the project activity in household population with a 10% margin of error at desired confidence level of 90%, the optimal sample size n of CFLs is given by:</p> $n = 270.6025 \frac{1-p}{p}$ <p>The value of p i.e. proportion of CFLs installed and working as assumed for the SSC-CPA project area is <put value in %> and the estimated household sample size is <put value not less than 100>. The SSC-CPA implementer(s) may choose a sample size higher than the one calculated above.</p> <p><u>Ex-post CFL Monitoring Survey to assess failure rate</u></p> <p>To estimate the proportion, p, of CFL failure rate in the installed CFLs in household population with a 10% margin of error at desired confidence level of 90%, the optimal sample size n of CFLs is given by:</p> $n = 270.6025 \frac{1-p}{p}$ <p>The value of p i.e. proportion of CFLs installed and not working as assumed for the SSC-CPA project area and the corresponding estimated CFL sample size ‘n’ over crediting period is calculated, then the actual number of households to be surveyed can be arrived at by dividing the value of ‘n’ with the average number of CFLs distributed per household. To be conservative the minimum number of households surveyed should be hundred.</p>

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



NAME /TITLE OF THE PoA: CFL lighting scheme -- “Bachat Lamp Yojana”.



CDM – Executive Board

page 30

		<p>The results for the SSC-CPA are tabulated below:</p> <table border="1" data-bbox="662 416 1482 629"> <thead> <tr> <th rowspan="2"></th> <th colspan="10">Ex-post Monitoring Year over crediting period</th> </tr> <tr> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> <th>6</th> <th>7</th> <th>8</th> <th>9</th> <th>10</th> </tr> </thead> <tbody> <tr> <td>p</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>n</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>Actual households</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> </tbody> </table> <p>The SSC-CPA implementer(s) may choose a sample size higher than the one calculated above.</p> <p><u>Determining Random Selection of Household</u></p> <p>To ensure random selection, random number generators shall be applied.</p> <ol style="list-style-type: none"> 1. Each household is allotted a unique SSC-CPA serial number starting at 1 and upto the total number of households in SSC-CPA area. 2. Using random number generators, the households are randomly chosen. 3. The random number thus obtained is correlated with the utility provided residential customer code. 		Ex-post Monitoring Year over crediting period										1	2	3	4	5	6	7	8	9	10	p											n											Actual households										
	Ex-post Monitoring Year over crediting period																																																							
	1	2	3	4	5	6	7	8	9	10																																														
p																																																								
n																																																								
Actual households																																																								
6	<p>Procedures for Administering Data Collection and Minimizing Non-Sampling Errors.</p>	<p><input type="checkbox"/> SSC-CPA implementers confirm to develop the SSC-CPA Implementation manual as per the PoA-DD section E.7.2 requirements.</p>																																																						
