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

CONTENTS

Annexes

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).

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

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

>>
LED's kick-off CPA-XXX [indicate number]

Version 7
07-11-2012

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

>>
Key Abbreviations / Terminologies

Abbreviation	Explanation
AMS	Approved small scale baseline and monitoring methodology
CER	Certified Emission Reduction
CFL	Compact Fluorescent Lamp
CPA	CDM Project Activity
GHG	Greenhouse gas
LED	Light Emitting Diode
PoA	Programme of Activities

The "LED's kick-off" Programme of Activities (PoA) comprises the distribution of Light Emitting Diode (LED) lighting devices to public, commercial, residential and industrial users. The end-user will receive a significant discount on the initial LED price in optional combination with an attractive payment plan. The CER related revenue generated by the programme will act as the required collateral to access financing and lower the default risks involved in financing the replacement. Without CERs, financing partners would not be willing to lend to customers in South Africa, who in many cases have track records of above average default rates or extensively delayed repayments.

LED lighting equipment (LED stands for Light Emitting Diodes) under this CPA may include both an LED light source (lamp) as well as an LED luminaire (including lamp and corresponding power conversion electronics, thermal management, fixture etc.).

Under the CPA, LED lighting equipment will be installed in publicly, commercially, industrially or otherwise employed locations. The dissemination and installation of LEDs may involve two types of activities:

- Brownfield; replacement of existing lighting equipment with LED lighting equipment; and
- Greenfield; the installation of LED lighting equipment at new locations where LED equipment is not the common practice

The CPA end-users can obtain the LED lighting equipment at favourable conditions due to CER benefits.

The proposed SSC-CPA will abate greenhouse gas emissions through the increase in energy efficiency of the targeted lighting systems and the corresponding fossil fuel combustion avoided to generate the

electricity. CPA-XXX is expected to reduce XXXXX tonnes of CO_{2e} over the selected ten year crediting period.

The coordinating entity will voluntarily provide LEDs to each end-user participating in the programme. There are no mandatory requirements in South Africa stipulating the use of such devices, and the PoA requires individual users to take voluntary action to participate in the programme activities.

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

>> The entity responsible for the proposed CPA-XXX is XXX [include name of CPA owner], hereafter referred to as CPA owner.

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

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

>>
LED's kick-off CPA-XXX [indicate number]

A.4.1.1. Host Party:

>>
Republic of South Africa

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

>> The physical boundary of CPA-XXX is defined by the LED lighting equipment installed in facilities of the end-users that are participating in the CPA-XXX, i.e. that have installed LED equipment disseminated under CPA-XXX and that have ceded their carbon rights to the CPA owner, <name of CPA owner>.

Accordingly, the geographic boundary of the CPA-XXX coincides with the geographical boundary of the PoA.

Project participants will make sure that all equipment installed can be uniquely identified by means of its geographical location. Exact installation location will be described by a:

- Unique address or description of location (room number, name of terminal, industrial facility etc.
- If necessary, position of equipment in the operator's own record keeping system (based on constructional drawing, building or site design, road kilometre marks etc.)

When LED lighting equipment is installed under the CPA, this is recorded in the CPA data set by the parameter 'exact installation location'. This parameter is a unique address and/or description of the location where LED lighting equipment is installed.

All CPA data sets are aggregated at PoA level in a central database. At verification, the Coordinating or Managing Entity (CME) of the PoA reviews the CPA data sets and checks whether the parameter 'exact installation location' is unique.

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

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

>>
The starting date of CPA-XXX is set as dd/mm/yyyy, the date of the first LED lighting equipment installed under the activity, which is after the date on which the CDM-PoA-DD is first published for global stakeholder consultation: 24/12/2010.

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

>>
10 years

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

Fixed Crediting period

A.4.3.1. Starting date of the crediting period:

>>
The starting date of the crediting period is set as dd/mm/yyyy, the date of the first LED lighting equipment installed or the date of including the CPA-XXX under the registered PoA.

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

>>
10 years

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

>>
Estimated amount of emission reductions is XXX tCO_2-e for a 10 year crediting period. See Table 1 for details.

Table 1: Estimated emission reductions from a typical SSC-CPA

Year	% LED functioning	Annual estimation of emission reductions in tonnes of CO_2-e
1	xxx%	XXX
2	xxx%	XXX
3	xxx%	XXX
4	xxx%	XXX
5	xxx%	XXX
6	xxx%	XXX
7	xxx%	XXX
8	xxx%	XXX
9	xxx%	XXX

10	xxx%	XXX
		XXX
Total estimated emission reductions (tonnes CO_2-e)		XXX
Total number of crediting years		10
Annual average over crediting period of estimated reductions (tonnes CO_2-e)		XXX

A.4.5. Public funding of the CPA:

>>

The SSC-CPA will not involve any public funding.

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

>>

1. For the purposes of registration of a Programme of Activities (PoA)[3] a proposed small-scale CPA of a PoA shall be deemed to be a de-bundled component of a large scale activity if there is already an activity[4], which:

   (a) Has the same activity implementer as the proposed small scale CPA or has a coordinating or managing entity, which also manages a large scale PoA of the same sectoral scope, and;

   (b) The boundary is within 1 km of the boundary of the proposed small-scale CPA, at the closest point.

2. If a proposed small-scale CPA of a PoA is deemed to be a debundled component in accordance with paragraph 2 above, but the total size of such a CPA combined with a registered small-scale CPA of a PoA or a registered CDM project activity does not exceed the limits for small-scale CDM and small-scale A/R project activities as set out in Annex II of the decision 4/CMP.1 and 5/CMP.1 respectively, the CPA of a PoA can qualify to use simplified modalities and procedures for small-scale CDM and small-scale A/R CDM project activities.

If each of the independent subsystems/measures included in the SSC-CPA of the PoA is no greater than 1% of the small-scale thresholds defined by the methodology applied, then that SSC-CPA of POA is exempted from performing a de-bundling check; i.e. considered as not being a de-bundled component of a large scale activity. For the "LED's kick off" programme, where a single unit (1 LED lamp) will not entail more than 1% of the total energy savings, it follows that the lamps can be used collectively in one SSC-CPA, regardless of geographical location. However, the maximum savings of 60 GWh means that only a limited number of lamps can be used per SSC-CPA.

[3] Only those PoAs need to be considered in determining de-bundling that are: (i) in the same geographical area; and (ii) use the same methodology; as the POA to which proposed CPA is being added

[4] Which may be a (i) registered small-scale CPA of a PoA, (ii) an application to register another small-scale CPA of a PoA or (iii) another registered CDM project activity

PoA record keeping procedures will prevent double counting across SSC-CPAs. The data-set of each individual SSC-CPA will be mutually exclusive with the data-set of another SSC-CPA under the PoA, as all data will be accumulated at the PoA level. The variable "physical replacement location" is unique and can only be recorded once per lamp type in an SSC-CPA and the general PoA. This physical location can be recorded as room number in a specific building or room description, if necessary supported with GPS coordinates.

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 below:

No	SSC-CPA status	Compulsory answer
1	This project will not be registered as an individual CDM activity and is not part of another registered PoA.	[add assessment result, prerequisite for inclusion is YES]
2	The LED lighting equipment is identified by the parameter: "exact installation location" describing the location where the LED lighting equipment is installed and ensuring that double counting of LED lighting equipment under the CPAs does not occur.	[add assessment result, prerequisite for inclusion is YES]

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:

>>

"LED's kick-off" programme of activities registered under the reference number XXXXX

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

>>

A typical SSC-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 formulated as questions to which the answer needs to be 'yes' in order to be eligible. The criteria/ questions are presented in Table 2.

Table 2: CPA Eligibility Criteria

No	Eligibility Criteria	Compulsory answer
1	Does the CPA regard solely distribution within the programme's geographic boundary as defined in the SSC-PoA-DD?	[add assessment result, prerequisite for inclusion is YES]
2	Shall the end user locations be uniquely identifiable by address and/or unique location description to avoid double counting of emission reductions?	[add assessment result, prerequisite for inclusion is YES]
3	Do the end users of the LED lighting equipment waive all their rights to CERs generated under the CPA to the respective CPA owner(s)?	[add assessment result, prerequisite for inclusion is YES]

4	Does the CPA regard the installation of LED lighting equipment, which may or may not include an LED luminaire (including lamp and corresponding power conversion electronics, thermal management, fixture etc.)?	[add assessment result, prerequisite for inclusion is YES]
5	Will the CPA owner ensure that for each installed LED lighting equipment the rated capacity or output or level of service (e.g., lumen output) is not significantly smaller (maximum - 10%) than the baseline or significantly larger (maximum + 50%) than the baseline?	[add assessment result, prerequisite for inclusion is YES]
6	Has the CPA provided a forecast concerning the CPA start date supported through documentary evidence?	[add assessment result, prerequisite for inclusion is YES]
7	Has the CPA Owner confirmed that the CPA under the PoA is a voluntary action and is neither registered as an individual CDM project activity nor included in another registered CDM PoA?	[add assessment result, prerequisite for inclusion is YES]
8	Does the CPA comply with the applicability criteria of methodology AMS-II.C "Demand-side energy efficiency activities for specific technologies" (version 13) used in the PoA?	[add assessment result, prerequisite for inclusion is YES]
9	Will the CPA meet the requirements pertaining to the demonstration of additionality as specified in EB 63, Annex 24, *Attachment A of Appendix B of the Simplified modalities and procedures for small-scale CDM project activities (Version 08)*?	[add assessment result, prerequisite for inclusion is YES]
10	Does the CPA rule out including facilities that are covered by an enforced government policy that includes mandatory adoption of LED lighting equipment?	[add assessment result, prerequisite for inclusion is YES]
11	Is the market penetration of LED lighting in South Africa below 33% at the time of inclusion of the CPA?	YES
12	Has the owner of the CPA provided an affirmation that funding from Annex I parties, if any, does not result in a diversion of official development assistance?	[add assessment result, prerequisite for inclusion is YES]
13	Does the CPA involve the installation of LED lighting equipment for grid-connected use in publicly, commercially, industrially, otherwise employed locations or residences?	[add assessment result, prerequisite for inclusion is YES]
14	Does the CPA comply with the sampling requirements as per the sampling plan of the PoA, in accordance with the Standard and Guidelines for sampling and surveys for CDM project activities and programme of activities - EB 69, Annex 4 Version (03.0) and Annex 5 Version (02.0)?	[add assessment result, prerequisite for inclusion is YES]
15	Will the ex-ante energy savings per CPA be capped at 60 GWh/per year?	[add assessment result, prerequisite for inclusion is YES]
16	Is the SSC-CPA approved by Lemnis Lighting and the DOE prior to its incorporation into the PoA?	[add assessment result, prerequisite for inclusion is YES]

17	Does the SSC-CPA satisfy de-bundling rules for PoA through the fact that each installation accounts for less than 1% of the total energy savings of the SSC-CPA? (These rules are elaborated on in chapter A.4.4.1.)	[add assessment result, prerequisite for inclusion is YES]

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

>>

Additionality is determined on PoA level. The demonstration of the additionality is outlined in section A.4.2.2. of the SSC-PoA-DD.

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 registered PoA encompasses the entire geographical boundary of South Africa.

Table 3: Emission sources

Source		Gas	Included?	Justification / Explanation
Baseline	Power plants servicing the electricity grid	CO_2	Yes	Main source of emission.
		CH_4	No	Excluded for simplification. Minor source of emission. Conservative.
		N_2O	No	Excluded for simplification. Minor source of emission. Conservative.
Project Activity	Power plants servicing the electricity grid	CO_2	Yes	Main source of emission.
		CH_4	No	Excluded for simplification. Minor source of emission. Consistent with baseline.
		N_2O	No	Excluded for simplification. Minor Source of emission. Consistent with baseline.

B.5. Emission reductions:

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

>>

Data / Parameter:	$EF_{CO2,ELEC,y}$
Data unit:	$kgCO_2/kWh$
Description:	Emissions factor for electricity displaced from the grid relevant to the project boundary.
Source of data used:	Eskom CDM resource data.
Value applied:	1.01
Justification of the choice of data or description of	Project coordinator has obtained latest data from government sources and applied calculation methodology specified in "Tool to calculate the emission factor for an electricity system" version 2.2.0. Details of calculations are

measurement methods and procedures actually applied :	provided in E.6.2. "Equations, including fixed parametric values, to be used for calculation of emission reductions of a SSC-CPA". $EF_{CO2,ELEC,y}$ is fixed for the lifetime of the PoA in principle. If at time of the renewal of a crediting period of a CPA, the fixed $EF_{CO2,ELEC,y}$ is deviating more than 10% of the EF calculated at the start or the renewal of a crediting period, the re-calculated EF needs to be used.
Any comment:	-

Data / Parameter:	l_y
Data unit:	%
Description:	Average annual technical grid losses (transmission and distribution) during year y for the grid serving the locations where the devices are installed.
Source of data used:	Eskom year report 2011
Value applied:	8.3%
Justification of the choice of data or description of measurement methods and procedures actually applied :	A default value of 0.1 shall be used for average annual technical grid losses, if no recent data are available or the data cannot be regarded accurate and reliable. The Eskom year report 2011 reports line losses of 8.3%. This data is considered to be accurate and reliable, and is thus applied. l_y is fixed for the lifetime of the PoA in principle. If at time of the renewal of a crediting period of a CPA, the fixed l_y is deviating more than 10% of the l_y calculated at the start or the renewal of a crediting period, the re-calculated l_y needs to be used.
Any comment:	-

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

>>

STEP 1: BASE LINE EMISSIONS

Because the energy displaced is electricity, the baseline emissions are determined as the product of the baseline electricity consumption and the emission factor for the electricity. The baseline electricity consumption of the equipment replaced in the SSC-CPA is measured during the distribution of LEDs by recording the number and power rating of each device replaced. In addition, the operating hours are measured by monitoring the distributed LEDs ex-post in a representative sample of participants in the PoA.

$$BE_y = E_{BL,y} \times EF_{CO2,ELEC,y}$$

Equation 1

$$E_{BL,y} = \Sigma i \ (n_i \times p_i \times o_i)/(1 - l_y)$$

Equation 2

Where;

BE_y	Baseline emissions in monitoring period *y* (tCO_2e)
$E_{BL,y}$	Energy consumption in the baseline in monitoring period *y* (kWh)
$EF_{CO2,ELEC,y}$	Emission factor in monitoring period *y* calculated in accordance with "Tool to calculate the emission factor for an electricity system". (tCO_2/MWh)
Σi	The sum over the group of "i" replaced (brownfield) and "i" devices avoided installation (greenfield), for which the substituted energy efficient equipment is operating during the monitoring period of the project.
n_i	The number of devices of the group of "i" devices replaced (brownfield) and "i" devices avoided installation (greenfield), for which the substituted energy efficient equipment is operating during the monitoring period.
p_i	The power of the devices of the group of "i" replaced (brownfield) and "i" devices avoided installation (greenfield).
o_i	The average operating hours during the monitoring period of the devices of the group of "i" devices replaced (brownfield) and "i" devices avoided installation (greenfield).
l_y	Average annual technical grid losses (transmission and distribution) during year *y* for the grid serving the locations where the devices are installed, expressed as a fraction. A default value of 0.1 shall be used for average annual technical grid losses, if no recent data are available or the data cannot be regarded accurate and reliable.

The product of the operating hours and the power consumption make it possible to estimate the baseline emissions in combination with the quantity assumption of replaced equipment. For the average annual technical grid losses a value of 0.083 is applied. The methodology states that the average annual technical grid losses (transmission and distribution) during year y for the grid serving the locations where the devices are installed, is expressed as a fraction. A default value of 0.1 shall be used for average annual technical grid losses, if no recent data are available or the data cannot be regarded accurate and reliable. In the Eskom holding annual report 2009 the following statement is made:

"In total the line losses in 2011 are 8.3%".

This data is regarded as accurate and reliable so the default value of 0.083 is applied to the various calculations.

It is necessary to estimate the current lighting mix due to the fact that the different lighting applications have different wattages and thus offer different abatement potentials. Table 4 presents the average wattages of the replaced lighting mix. Furthermore Table 4 presents the estimated operating hours [o_i] per lighting application.

Table 4: Baseline emissions calculation

Existing Equipment	Lamp Type A	Lamp Type B	Lamp Type C	(Lamp Type D
Units replaced/avoided (ni)	XX	XX	XX	XX
Standard wattage existing equipment. (p_i)	XX	XX	XX	XX
Average daily operating	XX	XX	XX	XX

hours (o_i)				

The product of the operating hours and the power consumption make it possible to estimate the baseline emissions in combination with the quantity assumption of replaced equipment. For the average annual technical grid losses a value of 0.083 is applied. The methodology states that the average annual technical grid losses (transmission and distribution) during year y for the grid serving the locations where the devices are installed, is expressed as a fraction. A default value of 0.1 shall be used for average annual technical grid losses, if no recent data are available or the data cannot be regarded accurate and reliable. In the Eskom holding annual report 2011 the following statement is made:

"In total the line losses in 2011 are 8.3%".

This data is regarded as accurate and reliable so the default value of 0.083 is applied to the various calculations. See an example calculated below.

Table 5: Baseline emissions estimation

Type	Lamp Type A	Lamp Type B	Lamp Type C	Lamp Type D	Total
Units replaced/avoided (ni)	XX	XX	XX	XX	XX
Standard Wattage (average) (p_i)	XX	XX	XX	XX	XX
Operating Hours/Day (o_i)	XX	XX	XX	XX	XX
Average annual technical grid losses (l_y)	0.083	0.083	0.083	0.083	
E_{BL} (MWh)	XX	XX	XX	XX	XX
EF (t CO2e/MWh)	1,01	1,01	1,01	1,01	1,01
BE (t CO2e)	XX	XX	XX	XX	XX

BE_y = XXX t CO2e

STEP 2: PROJECT EMISSIONS

Because the energy displaced is electricity, the project emissions are determined as the product of the project electricity consumption and the emission factor for the electricity. The project electricity consumption of the equipment installed in the SSC-CPA is measured during the distribution of LEDs by recording the number and power rating of each LED placed under the SSC-CPA. In addition, the operating hours are measured by monitoring the distributed LEDs ex-post in a representative sample of participants in the PoA.

$$PE_y = E_{p,y} \times EF_{CO2,ELEC,y}$$

Equation 3

$$E_{P,y} = \Sigma k \ (n_k \times p_k \times o_k)/(1 - l_y)$$

Equation 4

Where;

PE_y	Project emissions in monitoring period *y* (tCO_2e)
$E_{P,y}$	Energy consumption due to the project in monitoring period y (kWh)
$EF_{CO2,ELEC,y}$	Emission factor in monitoring period *y* calculated in accordance with "Tool to calculate the emission factor for an electricity system". (tCO_2/MWh)
Σk	The sum over the group of "k" energy efficient equipment that is operating during the monitoring period of the project.
n_k	The number of devices of the group of "k" energy efficient equipment that is operating during the monitoring period. This parameter will be corrected with the monitoring data on failure of devices throughout the monitoring period.
p_k	The power of the devices of the group of "k" energy efficient equipment that is operating during the monitoring period.
o_k	The average operating hours during the monitoring period of the devices of the group of "k" energy efficient equipment.
l_y	Average annual technical grid losses (transmission and distribution) during year *y* for the grid serving the locations where the devices are installed, expressed as a fraction. A default value of 0.1 shall be used for average annual technical grid losses, if no recent data are available or the data cannot be regarded accurate and reliable.

The name plate power use (wattage) p_k of the LEDs installed is an important variable in determining the project emissions. Because each lighting application has a specific LED replacement, the current lighting mix estimation in **Error! Reference source not found.** can be used to calculate the number of LED types installed, and consequently the project emissions.

Table 6: Project emissions estimation

Type	LED Type A	LED Type B	LED Type C	LED Type D	Total
Units installed (n_k)	XX	XX	XX	XX	XX
Retrofit Wattage (LED) (p_k)	XX	XX	XX	XX	XX
Operating Hours/Day (o_k)	XX	XX	XX	XX	XX
Average annual technical grid losses (l_y)	0.083	0.083	0.083	0.083	
E_P (MWh)	XX	XX	XX	XX	XX
EF (t CO2e/MWh)	1,01	1,01	1,01	1,01	1,01

PE (t CO2e)	XX	XX	XX	XX	XX

PE_y = XXX t CO_2e

STEP 3: EMISSION REDUCTIONS

The emission reduction achieved by the project activity shall be determined as the difference between the baseline emissions and the project emissions and leakage.

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

Equation 5

Where;

ER_y Emission reductions from avoided electricity consumption in year *y* (tCO_2/y)
BE_y Baseline emissions from electricity consumption in year *y* (tCO_2/y)
PE_y Project emissions from electricity consumption in year *y* (tCO_2/y)
LE_y Leakage emissions in year *y* (tCO_2/y). The leakage effect of the use of the replaced equipment in another activity can be neglected if the replaced equipment is scrapped[5].

Note that because all replaced equipment will be destroyed, leakage is assumed to be zero.

By combining Table 5 and Table 6, total emission reductions are illustrated in Table 7.

Table 7: Total emission reductions

Type	LED Type A	LED Type B	LED Type C	LED Type D	Total
Units installed (n_k)	XX	XX	XX	XX	XX
E_{BL} (MWh)	XX	XX	XX	XX	XX
E_P (MWh)	XX	XX	XX	XX	XX
E_S (MWh)	XX	XX	XX	XX	XX
BE (t CO2e)	XX	XX	XX	XX	XX
PE (t CO2e)	XX	XX	XX	XX	XX
ER (t CO2e)	XX	XX	XX	XX	XX

ER_y = XXX t CO_2e

[5] As described in the monitoring section, if equipment is not scrapped, there will be deemed to be no emission reductions for the equipment not destroyed

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)
20xx	xxxx	xxxx	xxxx	xxxx
20xx	xxxx	xxxx	xxxx	xxxx
20xx	xxxx	xxxx	xxxx	xxxx
20xx	xxxx	xxxx	xxxx	xxxx
20xx	xxxx	xxxx	xxxx	xxxx
20xx	xxxx	xxxx	xxxx	xxxx
20xx	xxxx	xxxx	xxxx	xxxx
20xx	xxxx	xxxx	xxxx	xxxx
20xx	xxxx	xxxx	xxxx	xxxx
20xx	xxxx	xxxx	xxxx	xxxx
Total (tonnes of CO2 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:

>>

The following paragraphs will describe the proposed monitoring and sampling method/procedure to be used for verification of the amount of emission reductions achieved under this CPA-XXX.

The following parameters will be monitored for this CPA-XXX.

Data / Parameter:	**n_i**
Data unit:	Number
Description:	Number of replaced equipment collected (brownfield) and number of avoided equipment installed (greenfield) in the baseline. The SSC-CPA implementer will make a distinction between brownfield and greenfield in the database entry which allows for allocation in a later stage. For the calculation of the emission reduction both brownfield and greenfield are placed under the same parameter for simplicity.
Source of data to be used:	SSC-CPA implementer
Value of data applied for the purpose of calculating expected emission reductions in section B.5	To be determined for CPA-XXX
Description of measurement methods and procedures to be	At the time of the exchange/installation a record will be kept of the number of replaced equipment (brownfield) and the avoided equipment installed (greenfield). The SSC-CPA implementer will make a distinction between

applied:	brownfield and greenfield in the database entry, which allows for allocation in a later stage. For the calculation of the emission reduction both brownfield and greenfield are placed under the same parameter for simplicity. Each employee involved in the project will work with an electronic handheld device (PDA) that updates this database automatically ensuring an accurate record keeping. Industry standard software, databases, infrastructure and backup procedures will allow full auditability with the aim of ensuring long-term data integrity and security so that data is not misreported, overwritten or lost. Data entry occurs decentralised at point of replacement, with the full database stored at a central location. Data is verified in a timely manner at point of data entry to ensure valid and non-duplicate names and addresses, and a valid and accurate number of replaced equipment. As per AMS.II.C. an independent auditor will be required to verify the collection and subsequent destruction of the replaced equipment. All data will be stored in the project database for at least two years after the crediting period or the last issuance of CERs, for this programme, whichever occurs later.
QA/QC procedures to be applied:	A CME representative will perform spot-checks on data entries by the CPA-owner in order to minimise data entry errors.
Any comment:	All data will be stored in the project database for at least two years after the crediting period or the last issuance of CERs, for this programme, whichever occurs later. As per paragraph 12 of AMS II.C. Demand-side energy efficiency activities for specific technologies (v13) a representative sample of the replaced devices (including the number and "power") will be recorded to allow for physical verification by the DOE. The number and "power" of the replaced equipment to be recorded for physical verification is based on the identified samples within the metered sampling survey ($\mathbf{S_{metered,k}}$). That means, if a meter is installed the replaced lamp is collected and stored for verification.

Data / Parameter:	$\mathbf{n_{scrapped}}$
Data unit:	Number
Description:	Number of replaced equipment collected (brownfield) that is scrapped under the SSC-CPA-XXX
Source of data to be used:	Database SSC- CPA-XXX
Value of data applied for the purpose of calculating expected emission reductions in section B.5	N/A; available only *ex-post*.
Description of measurement methods and procedures to be applied:	As per the methodology AMS-II.C Demand-side energy efficiency programmes for specific technologies (version 13) replaced equipment (old lamps) must be scrapped, in order to prevent leakage and ensure correct disposal. The contracted scrapping entity will provide independently verified data on the scrapped equipment. This allows for a check whether the number of project activity equipment distributed by the SSC-CPA and the number of scrapped equipment correspond with each other. The scrapping of replaced equipment will be documented and independently verified

QA/QC procedures to be applied:	A CME representative will perform spot-checks on data entries by the CPA-owner in order to minimise data entry errors.
Any comment:	-

Data / Parameter:	n_k
Data unit:	Number
Description:	Number of operational LED equipment in the project
Source of data used:	SSC-CPA implementer
Value of data applied for the purpose of calculating expected emission reductions in section B.5:	To be determined for CPA-XXX
Description of measurement methods and procedures to be applied:	At the time of the exchange a record will be kept of the number of LED equipment. This information will be stored in the project database. Each employee involved in the project will work with a PDA that updates this database automatically ensuring an accurate record keeping. Industry standard software, databases, infrastructure and backup procedures will allow full auditability with the aim of ensuring long-term data integrity and security so that data is not misreported, overwritten or lost. Data entry occurs decentralised at point of replacement, with the full database stored at a central location. Data is verified in a timely manner at point of data entry to ensure valid and non-duplicate names and addresses, and a valid and accurate number of installed LED equipment. When installed the monitoring of the sample group will provide the information regarding failure rate back to the centralised database. This information will then be extrapolated throughout the total installed LED population.
QA/QC procedures to be applied:	All data will be stored in the project database for at least two years after the crediting period or the last issuance of CERs, for this programme, whichever occurs later.
Any comment:	All data will be stored in the project database for at least two years after the crediting period or the last issuance of CERs, for this programme, whichever occurs later.

Data / Parameter:	p_i
Data unit:	Watts
Description:	The power of the replaced equipment (brownfield) or the most conservative common practice power of the avoided equipment installed (greenfield) in the baseline.
Source of data to be used:	Nameplate data
Value of data applied for the purpose of calculating expected	To be determined for CPA-XXX

emission reductions in section B.5	
Description of measurement methods and procedures to be applied:	At the time of the exchange a record will be kept of the wattage of replaced equipment (brownfield) or the most conservative common practice power of the avoided equipment installed (greenfield). This information will be stored in the project database. Each employee involved in the project will work with a PDA that updates this database automatically ensuring an accurate record keeping. Industry standard software, databases, infrastructure and backup procedures will allow full auditability with the aim of ensuring long-term data integrity and security so that data is not misreported, overwritten or lost. Data entry occurs decentralised at point of replacement, with the full database stored at a central location. Data is verified in a timely manner at point of data entry to ensure valid and non-duplicate names and addresses, and a valid and accurate wattage of replaced equipment.
QA/QC procedures to be applied:	A CME representative will perform spot-checks on data entries by the CPA-owner in order to minimise data entry errors.
Any comment:	All data will be stored in the project database for at least two years after the crediting period or the last issuance of CERs, for this programme, whichever occurs later. As per paragraph 12 of AMS II.C. Demand-side energy efficiency activities for specific technologies (v13) a representative sample of the replaced devices (including the number and "power") will be recorded to allow for physical verification by the DOE. The number and "power" of the replaced equipment to be recorded for physical verification is based on the identified samples within the metered sampling survey ($\mathbf{S_{metered,k}}$). That means, if a meter is installed the replaced lamp is collected and stored for verification.

Data / Parameter:	$\mathbf{p_k}$
Data unit:	Watts
Description:	The power of the installed LED equipment in the project.
Source of data to be used:	Nameplate data
Value of data applied for the purpose of calculating expected emission reductions in section B.5	To be determined for CPA-XXX
Description of measurement methods and procedures to be applied:	At the time of the exchange a record will be kept of the wattage of installed LED equipment. This information will be stored in the project database. Each employee involved in the project will work with a PDA that updates this database automatically ensuring an accurate record keeping. Industry standard software, databases, infrastructure and backup procedures will allow full auditability with the aim of ensuring long-term data integrity and security so that data is not misreported, overwritten or lost. Data entry occurs decentralised at point of replacement, with the full database stored at a central location. Data is verified in a timely manner at point of data entry to ensure valid and non-duplicate names and addresses, and a valid and accurate wattage of installed LED equipment.
QA/QC procedures to	All data will be stored in the project database for at least two years after the

be applied:	crediting period or the last issuance of CERs, for this programme, whichever occurs later. A CME representative will perform spot-checks on data entries by the CPA-owner in order to minimise data entry errors.
Any comment:	-

Data / Parameter:	$S_{metered}$
Data unit:	Number
Description:	Total sample size of metered equipment used for monitoring operating hours failure rates of project devices. Whenever a meter is installed, the replaced lamp is collected and stored for verification. This is in line with the requirements of paragraph 12 of AMS-II.C. The increase in sample size for the PoA will be identified and documented before the start date of crediting period of each SSC-CPA.
Source of data to be used:	Sample size will be determined based on the; • Population Size • Confidence • Precision • Variability Confidence-Precision ratio of 90-10 is in line with the requirement of Standard and Guidelines for sampling and surveys for CDM project activities and programme of activities EB 69, Annex 4 Version (03.0) and Annex 5 Version (02.0).
Value of data applied for the purpose of calculating expected emission reductions in section B.5	To be determined for CPA-XXX (mimum of 30)
Description of measurement methods and procedures to be applied:	Sample size is determined with a confidence precision ratio of 90/10. This is in line with the requirements listed in the Standard and Guidelines for sampling and surveys for CDM project activities and programme of activities EB 69, Annex 4 Version (03.0) and Annex 5 Version (02.0). The PoA uses a stratified sampling procedure, the population is first partitioned into disjoint classes (the strata) which together are exhaustive. Thus each population element should be within one and only one stratum. Then a simple random sample is taken from each stratum. For the LED's kick-off PoA the following strata are identifed in the table below:

Indoor		**Outdoor**	
Low power	High power	Low power	High power
<40 Watt	≥ 40 Watt	<20 Watt	≥ 20 Watt
IL (Indoor Low)	IH (Indoor High)	OL (Outdoor Low)	OH (Outdoor High)

$S_{metered}$ is defined per stratum. If $\mathbf{n_k}$ does not include LEDs in one or more of the strata, these strata are logically not used to select a sample group from.

The sample size is to be calculated for every stratum of each CPA using equation

	provided in Annex 4.
QA/QC procedures to be applied:	The CPA owner has to hire a by the CME approved monitoring entity for the operating hours. This to ensure there are proper QA/QC in places for the monitoring.
Any comment:	See Annex 4 for details.

Data / Parameter:	$S_{non\text{-}metered}$
Data unit:	Number
Description:	The managing entity will identify and document a sample group of non-metered equipment which will be subject to annual checks to ensure that the LEDs installed are still operating.
Source of data to be used:	Sample size will be determined based on the; • Population Size • Confidence • Precision • Variability Confidence-Precision ratio of 90-10 is in line with the requirement of Standard and Guidelines for sampling and surveys for CDM project activities and programme of activities EB 69, Annex 4 Version (03.0) and Annex 5 Version (02.0)..
Value of data applied for the purpose of calculating expected emission reductions in section B.5	To be determined for CPA-XXX (mimum of 30)
Description of measurement methods and procedures to be applied:	Sample size is determined with a confidence precision ratio of 90/10. This is in line with the requirements listed in the 'Standard and Guidelines for sampling and surveys for CDM project activities and programme of activities EB 69, Annex 4 Version (03.0) and Annex 5 Version (02.0). The PoA uses a stratified sampling procedure, the population is first partitioned into disjoint classes (the strata) which together are exhaustive. Thus each population element should be within one and only one stratum. Then a simple random sample is taken from each stratum. For the LED's kick-off PoA the following strata are identifed in the table below:

Indoor		Outdoor	
Low power	High power	Low power	High power
<40 Watt	≥ 40 Watt	<20 Watt	≥ 20 Watt
IL (Indoor Low)	IH (Indoor High)	OL (Outdoor Low)	OH (Outdoor High)

	$S_{non\text{-},metered}$ is defined per stratum. If $\mathbf{n_k}$ does not include LEDs in one or more of the strata, these strata are logically not used to select a sample group from. The sample size is to be calculated for every stratum of each CPA using equation provided in Annex 4.
QA/QC procedures to	The CPA owner has to hire a by the CME approved monitoring entity for

be applied:	execution of the non-metered sampling survey. This to ensure there are proper QA/QC in places for the monitoring.
Any comment:	See Annex 4 for details.

Data / Parameter:	o_k
Data unit:	Hours
Description:	The average annual operating hours of LED equipment distributed.
Source of data to be used:	Periodic readings of monitoring equipment.
Value of data applied for the purpose of calculating expected emission reductions in section B.5	Product type dependent.
Description of measurement methods and procedures to be applied:	Electronic metering equipment installed in monitoring sample group. This equipment will feed monitoring information/operating hours back to a centralised database.
QA/QC procedures to be applied:	No additional QA/QC procedures need to be planned.
Any comment:	All data will be stored in the project database for at least two years after the crediting period or the last issuance of CERs for this programme, whichever occurs later.

Data / Parameter:	$r_{failure}$
Data unit:	%
Description:	Mean annual failure rate of the installed LED equipment.
Source of data used:	Periodic non-metered sampling survey(s).
Value of data applied for the purpose of calculating expected emission reductions in section B.5	N/A; available only *ex-post*.
Description of measurement methods and procedures to be applied:	Annual survey of non-metered sampling group for each stratum. Data will be aggregated and stored in the central database.
QA/QC procedures to be applied:	The survey will consist of identifying LED lighting equipment, based on their 'exact installation location' that are installed and operating. The exact installation location is the entry in the database that allows for an unique identification. While LED lighting equipment replaced as part of a regular maintenance or warranty program can be counted as operating, LED lighting equipment cannot be replaced as part of the survey process and counted as operating.
Any comment:	The number of LEDs to be included under the survey, per stratum is defined under $S_{non\text{-}metered,k}$

Industry standard software, databases, infrastructure and backup procedures will allow full auditability with the aim of ensuring long-term data integrity and security so that data is not misreported, overwritten or lost. Data entry occurs decentralised at the point of LED lighting equipment installation. The full database is stored centrally.

Aggregated data will be stored in the central data base for at least two years after the crediting period or the last issuance of CERs to the programme, whichever occurs last.

Monitoring Procedures

Monitoring is performed at CPA level.

Four data streams can be distinguished with respect to the data collected during implementation and execution of the individual CPAs. These are:

1. Installation data including the details of lamp installation in particular the number and wattage of replaced (brownfield) or avoided (greenfield) equipment and the number and wattage of newly installed LED lighting equipment.
2. Scrapping data including the record on replaced and subsequently scrapped old lamp equipment.
3. Sampling data including the mean operating hours (metered samples) of the newly installed lamps and non-metered survey on failure rates.
4. If the devices installed replace existing devices (brownfield locations), the number and power of a representative sample of the replaced devices shall be recorded in a way to allow for a physical verification by DOE.

Both installation data and scrapping data are point measurements that are recorded once during the installation of new LED lighting equipment and the scrapping of replaced equipment, respectively. A dedicated scrapping entity that has been appointed by the CME is responsible for the disposal of the replaced lamps generated out of the CPA-XXX. The scrapping entity will ensure that the replaced lamps will be disposed according to effective (enforced) applicable waste disposal regulations that exist in the project host country or region. The scrapping entity will also compile the necessary scrapping data and make it available for monitoring. Installation data is provided by the CPA owner who is responsible for the installation of LED equipment under their CPA. Sampling data is a continuous measurement. The CPA owner purchases monitoring services from a dedicated entity responsible for monitoring appointed by the CME. The monitoring entity is responsible for collecting the installation data from the CPA owner, the scrapping data from the scrapping entity and for sampling operating hours failure rate of the installed LED equipment as well as number and wattage of replaced equipment (brownfield). The monitoring entity subsequently sends the aggregated monitoring data (installation, scrapping and sampling data) of CPA-XXX to the CME who compiles a respective monitoring report which is sent to the DOE for verification and stored in the central database.

An overview of the monitoring set-up is provided in Table 8.

Roles under the programme	Name of entity fulfilling the role	Responsibilities
Coordinating and Managing Entity	Lemnis Lighting B.V.	• Operates and supervises central monitoring database • Checks aggregated CPA monitoring datasets to prevent double counting • Compiles monitoring reports per CPA and sends these to DOE for verification • Selects and proposes eligible entities to fulfil the monitoring and scrapping roles under the PoA
CPA Owner	XXX	• Delivers installation data to the entities fulfilling the monitoring role (parameters: n_i, n_k, p_i, p_k) • Must enter into a contract with monitoring and scrapping entities appointed by the CME to monitor according to the PoA monitoring plan
Monitoring Entity	XXX Qualified entity entered into agreement with CME	• Implements metered sampling to measure the mean operation time of installed LED lighting equipment (parameter: $S_{metered,i}$) • Whenever a meter is installed, the monitoring entity collects the replaced lamp. Collected lamps are stored for verification. • Implements non-metered sampling survey to determine the mean failure rate of installed LED lighting equipment (parameter: $S_{non\text{-}metered,i}$) • Collects all monitoring data: sampling data, installation data and scrapping data. Deliver the aggregated monitoring data to the CME
Scrapping Entity	XXX Qualified entity entered into agreement with CME	• Delivers scrapping data to monitoring entity fulfilling this role (parameter: r_i)

Table 8 Overview of monitoring roles and responsibilities

Sampling plan

See PoA-DD A.4.4.2. Sampling plan for a detailed description of the sampling plan.

Stratification of lamps used under CPA-001

Under the CPA-XXX LED lighting equipment is broadly divided into two categories: indoor and outdoor. Further these can be divided - as per the power mentioned on the nameplate data of the LED lighting equipment - into high power and low power.

Table 9: Lamp classification

Indoor		Outdoor	
Low power	High power	Low power	High power
<40 Watt	≥ 40 Watt	<20 Watt	≥ 20 Watt
IL (Indoor Low)	IH (Indoor High)	OL (Outdoor Low)	OH (Outdoor High)

Hence, all LED lighting equipment under the CPA-XXX will fall into one of the four strata: IL, IH, OL, OH identified above. These strata (classifications) are to be applied for the metered and non-metered sample groups.

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

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

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

>>

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:

>>

SECTION D. Stakeholders' comments

>>

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

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

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

>>

D.3. Summary of the comments received:

>>

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

>>

Annex 1

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

Organization:	Lemnis Lighting B.V.
Street/P.O.Box:	Gildeweg 18
Building:	
City:	Barneveld
State/Region:	
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Country:	Netherlands
Telephone:	+31 342 760 760
FAX:	+31 342 760 761
E-Mail:	info@lemnislighting.com
URL:	www.lemnislighting.com
Represented by:	Francois van Tonder
Title:	VP Business Development & Strategy/ Managing Director - Lemnis Lighting Africa
Salutation:	Mr
Last Name:	van Tonder
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First Name:	Francois
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Annex 2

INFORMATION REGARDING PUBLIC FUNDING
(intentionally left blank)

Annex 3

BASELINE INFORMATION
(intentionally left blank)

Annex 4

MONITORING INFORMATION

Confidence/precision
As per EB 69, Standard and Guidelines for sampling and surveys for CDM project activities and programme of activities EB 69, Annex 4 Version (03.0) and Annex 5 Version (02.0) -as there is no specific guidance in the applicable methodology (*AMS -II.C. Demand-side energy efficiency activities for specific technologies*) *version 13* - project proponents shall use 90/10 confidence/precision as the criteria for reliability of sampling efforts for small-scale project activities.

Sample frame
The sampling approach chosen is Stratified Random Sampling (II B in EB 69 Annex 5 page 3[6]), within the strata Simple Random Sampling is applied (II A in EB 69 Annex 5 page 3[7]). Strata are presented in Table 10.

Table 10: Overview of strata

Stratum	IL	IH	OL	OH
Location	Indoor	Indoor	Outdoor	Outdoor
Power	Low power (<40 Watt)	High power (≥ 40 Watt)	Low power (<20 Watt)	High power (≥ 20 Watt)

All equipment in $\mathbf{n_k}$ is allocated to a stratum and within the stratum sample groups $S_{metered}$ and $S_{non\text{-}metered}$ are selected randomly. If one or more of the strata remain empty, these strata are logically not used to select sample groups from.

Sample size determination
To determine the sample size of $S_{metered}$ and $S_{non\text{-}metered}$ for each stratum under a CPA is to be determined following the formulas presented under EB 69, Annex 5 Version (02.0) page 22 (18)[8].

$$n \geq \frac{1.645^2 \times NV}{(N-1)\times 0.1^2 + 1.645^2 V}$$

[6] Guidelines for sampling and surveys for CDM project activities and programme of activities EB 69, Annex 5 Version (02.0).

[7] See footnote 6

[8] See footnote 6

Where:

$$V = \left(\frac{SD}{mean}\right)^2$$

equation 18 of EB 69, Annex 5

n	Sample size
N	Total number of LEDs installed within a stratum
1.645	Represents the 90% confidence required
0.1	Represents the 10% relative precision
SD	Is the overall Standard Deviation
mean	Is the overall mean

Following EB 69 Annex 5 (version 2.0) Appendix A - Best practice examples for sample size calculations article 41[9] if SD and mean are not known these parameters can be can be estimated using different ways:

a) We may refer to the result of previous studies and use these results;
b) In a situation where we do not have any information from previous studies, we could take a preliminary sample as a pilot and use that sample to provide our estimates;
c) We could use 'best guesses' based on the researcher's own experiences.

Note that following EB 69 Annex 5 (version 2.0) Appendix A - Best practice examples for sample size calculations article 42[10] if the standard deviation is unknown but the range (maximum - minimum) is known then a rough 'rule of thumb' is that the standard deviation can be estimated as the range divided by 4.

With the estimates from SD and mean equations 18 can subsequently filled out. A sample size calculator has been built to determine the sample size of $S_{metered}$ and $S_{non\text{-}metered}$ for each stratum under a CPA [11].

According to EB 69 Annex 4 (version 3.0) page 15 Section IV Sampling Requirements article 12 a minimum sample size of 30 shall be chosen if the sample size calculation returns a value of less than 30 samples[12]

Calculation of sample group for the CPA
In the calculator it is marked which strata are relevant for the CPA and what the sample size is and the way it was calculated.

[9] Guidelines for sampling and surveys for CDM project activities and programme of activities EB 69, Annex 5 Version (02.0).

[10] See footnote 9

[11] Submitted to validator

[12] Standard for sampling and surveys for CDM project activities and programme of activities EB 69, Annex 4 Version (03.0).

Table 11: Sample group size

Stratum	IL	IH	OL	OH
Relevant: Y/N				
N: 3/ unknown				
SD: (study, estimated)				
Mean: (study/ estimated)				
Way to calculate sample size: (equation 7 and 8/ software)				
Resulting sample size:	(minimum 30)	(minimum 30)	(minimum 30)	(minimum 30)

Meter

The operation time of the LED lighting equipment in the metered sample will be measured. The meter can be installed at the last point of control. For each monitoring period a mean value is calculated; this value is used for the operating hours of all LED lighting equipment within the respective stratum.

The meter to be used is designed to measure electrical parameters of LED lighting equipment. The measured data is stored and relayed to Central Server digitally. It is possible to download data on a computer using an interface cable.

In the schematic below an example schematic of such a meter is presented.

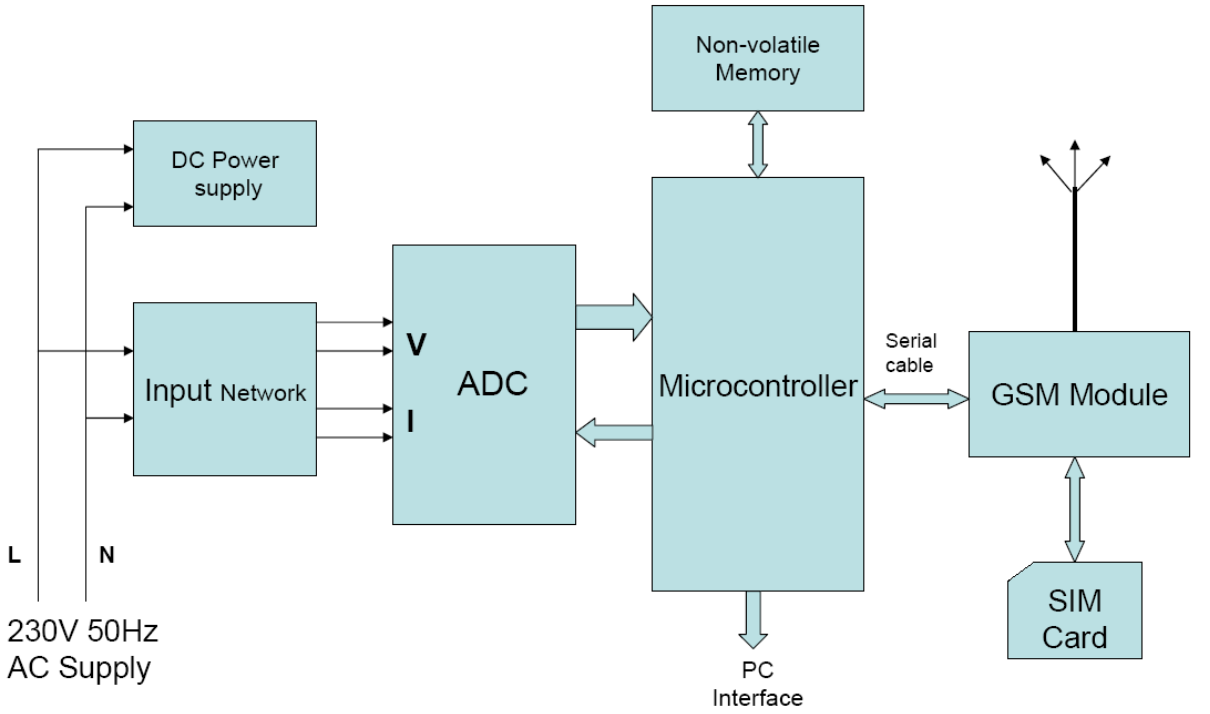

Figure 1: Example: schematic monitoring meter

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