

**SMALL-SCALE CDM PROGRAMME OF ACTIVITIES DESIGN DOCUMENT FORM  
(CDM SSC-PoA-DD) - Version 01**

CDM – Executive Board

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**CLEAN DEVELOPMENT MECHANISM  
SMALL-SCALE PROGRAMME OF ACTIVITIES DESIGN DOCUMENT FORM  
(CDM-SSC-PoA-DD) Version 01**

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**NOTE:**

- (i) This form is for the submission of a CDM PoA whose CPAs apply a small scale approved methodology.
- (ii) At the time of requesting registration this form must be accompanied by a CDM-SSC-CPA-DD form that has been specified for the proposed PoA, as well as by one completed CDM-SSC-CPA-DD (using a real case).

**SECTION A. General description of small-scale programme of activities (PoA)**

**A.1 Title of the small-scale programme of activities (PoA):**

Demand side energy efficiency measures in building lighting systems.

Version: 1

Date: 3 August, 2010

**A.2. Description of the small-scale programme of activities (PoA):**

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1. General operating and implementing framework of PoA

The PoA is in relation to implementation of energy efficient lighting systems in buildings (including residential, commercial and industrial) across Singapore. The CDM Programme Activities (CPAs) under this PoA will either include (a) installation and operation of more energy efficient lighting luminaires replacing existing luminaires in existing buildings; or (b) installation and operation of more energy efficient lighting luminaires in new buildings. Each CPA will be implemented in a geographically distinct location within Singapore. The PoA and each CPA will be managed by a Managing Entity.

2. Policy/measure or stated goal of the PoA

The goal of the PoA is to significantly contribute towards energy efficiency measures by reducing the consumption of electricity in building lighting systems. By doing so, the programme will assist in reducing greenhouse gas (GHG) emissions in relation to avoided electricity usage. This will also result in lower spending on utility bills in various buildings across Singapore.

With respect to each CPA under this PoA, the Managing Entity/CPA implementer/Contractor may potentially distribute information about the benefits of undertaking such energy efficiency programme including its associated economic, social and environmental benefits. This will help in creating awareness amongst interested stakeholders.

3. Confirmation that the proposed PoA is a voluntary action by the coordinating/managing entity.

There are no mandatory/regulatory requirements in Singapore to (a) install and operate more energy efficient lighting luminaires in replacement to existing luminaires in existing buildings; or (b) installation and operation of more energy efficient lighting luminaires in new buildings. The proposed PoA is a voluntary action by the managing entity. The PoA contributes to sustainable development in Singapore by virtue of the following:

*Environmental Sustainability*

- The PoA would result in reducing electricity consumption, thereby reducing energy demand and avoiding GHG emissions associated with the generation of electricity.

- The PoA is expected to contribute towards resource efficiency in energy sources which is one of the four strategies identified by the Inter-Ministerial Committee on Sustainable Development<sup>1</sup>, Government of Singapore to ensure Singapore’s continued sustainable development.
- The PoA, once registered, will be a long-term initiative with a potential to add CPAs across several years in future, thus, contributing to Singapore’s long term goals (goals up to 2020 and 2030) for improving energy efficiency and reducing carbon intensity.

*Economic Sustainability*

- This will promote Singapore as a regional hub for energy efficiency technologies.
- This will develop industries and services related to energy efficient lighting appliances.
- The energy efficient luminaires would result in lower electricity consumption as compared to the baseline, and thus resulting in lower utility bills.
- Singapore is a resource constrained economy. Therefore, reduced electricity consumption (on account of energy efficiency measures) would result in savings in scarce energy resources (like natural gas) which can be used for other specific requirements.
- Singapore largely depends on imported fuel for electricity generation. Energy efficiency measures would mean lesser stress on import of fuel to generate electricity. Such measures will also increase Singapore’s national resilience to the global uncertainties of energy supplies and prices.

*Social Sustainability*

- The PoA would result in enhancing job opportunities. The implementation of CPAs under the PoA would require involvement of professionals from various fields of specialization including engineering, finance and management. At the same time it would also help in creating job opportunities for who will be engaged in the activity of installing energy efficient luminaires.
- Increasing employment opportunities in engineering services as well as in designing and implementing energy efficient technologies which may also lead to business development in the energy efficiency regime.

**A.3. Coordinating/managing entity and participants of SSC-POA:**

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1. Coordinating or managing entity of the PoA as the entity which communicates with the Board

**United Premas Limited** is the “Managing Entity” for this PoA.

2. Project participants being registered in relation to the PoA. Project participants may or may not be involved in one of the CPAs related to the PoA.

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<sup>1</sup> [http://app.mewr.gov.sg/data/ImgCont/1292/sustainableblueprint\\_forweb.pdf](http://app.mewr.gov.sg/data/ImgCont/1292/sustainableblueprint_forweb.pdf)

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Name of the party involved (host indicates a host party)	Private and/or public entity(ies) project participants (as applicable)	Kindly indicate if the party involved wishes to be considered as project participant (Yes/No)
Singapore	United Premas Limited	No

Other project participants for individual CPAs will be identified in the respective CPA-DDs.

**A.4. Technical description of the small-scale programme of activities:**

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**A.4.1. Location of the programme of activities:**

>> Singapore

**A.4.1.1. Host Party(ies):**

>> Singapore

**A.4.1.2. Physical/ Geographical boundary:**

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The PoA will be implemented within the geographical boundaries of Singapore.



Figure 1- Geographical Map of Singapore

**A.4.2. Description of a typical small-scale CDM programme activity (CPA):**

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**A.4.2.1. Technology or measures to be employed by the SSC-CPA:**

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The luminaires, its associated electronic control gears (driver) and all accessories which will be installed with respect to each CPA, will be designed for reliable operations to light up the locations where they are installed. The luminaires will be able to fully withstand the current and voltage surges of lightning strikes and the frequent switching operation of the power supplies. The power requirement of the project luminaire system will be less than that of the replaced luminaires (in case of existing buildings).

**A.4.2.2. Eligibility criteria for inclusion of a SSC-CPA in the PoA:**

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The eligibility criteria for inclusion of a CPA under this PoA are as follows:

1. Each CPA under this PoA will involve installation and operation of: either (a) more energy efficient lighting luminaires replacing existing luminaires in existing buildings; or (b) more energy efficient lighting luminaires in new buildings.
2. Each CPA will implement the Baseline and Monitoring Methodology AMS II.E/version10 “Energy Efficiency and Fuel Switching Measures for Buildings” hereinafter referred to as the “Baseline and Monitoring Methodology”.
3. Each CPA shall be uniquely identified by providing geographical information of the CPA.
4. Each CPA must be approved by the managing entity and DOE prior to its incorporation into the PoA.
5. Each CPA must satisfy de-bundling rules applicable to small scale project activities.
6. Each CPA is to subscribe to the PoA.
7. In case the energy efficiency measures result in increase in capacity as compared to the baseline, the baseline emissions calculations will be restricted to the existing capacity existing in the baseline. This is applicable in the case of replacement of luminaires in existing buildings.
8. The aggregate energy savings from a single CPA may not exceed the equivalent 60 GWh per year.
9. It should be possible to directly measure and record the energy consumption within the project boundary.

**A.4.3. Description of how the anthropogenic emissions of GHG by sources are reduced by a SSC-CPA below those that would have occurred in the absence of the registered PoA (assessment and demonstration of additionality):**

The proposed PoA is a voluntary coordinated action by the Managing Entity. In Singapore, it is not mandatory to (a) install and operate more energy efficient lighting luminaires in replacement to existing luminaires in existing buildings; or (b) install and operate more energy efficient lighting luminaires in new buildings. The implementation of the PoA and associated CPAs needed commercial incentives to

encourage coordinated voluntary participation from various project participants. In general, the commercial incentives for the CPA are expected to be in the form of electricity cost savings and potential CDM revenues. The cost of developing a project as a CDM are also reduced for individual project participants if they participate in the PoA.

It is also important to note that programmes relating to (a) installation and operation of more energy efficient lighting luminaires in replacement to existing luminaires in existing buildings; or (b) installation and operation of more energy efficient lighting luminaires in new buildings of similar scale and nature are not at all common in Singapore. It is unlikely that a voluntary programme or individual CPAs would have been implemented in the absence of the incentives mentioned above.

Hence, there are significant barriers to undertaking such programmes given that the technology for the new luminaries (given its higher efficiency), is expected to be more expensive. Availability of skill sets and equipment components with respect to these technologies is also expected to be limited. Hence, implementation of this PoA and avoidance of anthropogenic GHG emissions are additional to those that would have occurred in absence of this PoA.

Similar barriers to implementation of the respective CPAs are expected to be faced by the individual project participants. The demonstration of additionality for each CPA will be provided in the individual CPA-DD.

Also refer to (a) section E.5.1 “Assessment and Demonstration of additionality for a typical SSC-CPA” which lay down the guidelines to be followed by each CPA proposed to be registered under this PoA in demonstrating its additionality; and (b) section E.5.2 “Key Criteria and data for assessing additionality of a SSC-CPA” which lay down the key criterion to assess the additionality of a CPA under this PoA.

The PoA as a whole, once implemented, will encourage development of policies to aid similar programmes and greater implementation of electricity saving projects.

<b>A.4.4. Operational, management and monitoring plan for the <u>programme of activities</u> (PoA):</b>
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<b>A.4.4.1. Operational and management plan:</b>
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Description of the operational and management arrangements established by the coordinating/managing entity for the implementation of the PoA, including:

**(i) A record keeping system for each CPA under the PoA**

Each CPA will follow the record keeping and monitoring requirements stipulated in applied Baseline and Monitoring Methodology and detailed in Section E below. In summary, the managing entity will ensure that each CPA will maintain appropriate records documenting relevant variables including:

- Distinct geographical location of the CPA. This will contain the block number of the building and may also include the Street name in which such building is located.
- In relation to removal of existing luminaries - date of such removal.
- In relation to installation of new energy efficient luminaires- date of such installation.

- Location from where the luminaires have been removed (if applicable). For example, luminaires may be removed from corridors, staircase, etc.
- Number of luminaires replaced.
- Number of newly installed energy efficient luminaires.
- Power of the replaced luminaires (determined through sampling process in case of large population size)
- Operating hours of the newly installed energy efficient luminaires (determined through sampling process for a large population size)
- Energy consumption of the newly installed energy efficient luminaires (determined through sampling process for a large population size)
- Details pertaining to the project sample group (PGS)
- Details pertaining to the cross check project sample group (CCPGS)
- In case of installing more energy efficient lighting luminaires in new buildings the baseline technology will be determined in accordance with Clause 14 of the indicative simplified baseline and monitoring methodologies for selected small scale CDM project activity categories – “Type II and III Greenfield Projects (new facilities)”. Necessary information in relation to the baseline technology will be maintained in compliance with the aforesaid guidelines.

The CPA implementer will make available copies of the aforesaid documents to the managing entity, so that the latter could ascertain that the aforesaid record keeping requirements are being met by the CPA implementer.

**(ii) A system/procedure to avoid double accounting e.g. to avoid the case of including a new CPA that has been already registered either as a CDM project activity or as a CPA of another PoA**

Prior to registering a new CPA within the proposed PoA, the managing entity will check the CPA and PoA database (available on UNFCCC website) to ensure whether there exist a similar CPA which has been submitted for validation and registration as another CDM project or a CPA under a PoA within similar locations of a building (for e.g. staircases, corridor) in the similar distinct geographical location.

In case the managing entity concludes that there already exists a similar CDM project activity or a CPA of another PoA (in the CDM cycle) implemented in the similar building location (for e.g. staircase, corridor) within the similar distinct geographical location, then it will not proceed with the registration of the particular CPA under this PoA. Thus, the managing entity shall avoid double counting of carbon credits.

**(iii) The SSC-CPA included in the PoA is not a de-bundled component of another CDM programme activity (CPA) or CDM project activity**

The managing entity will follow the latest version of guidance provided by the Executive Board on “Occurrence of De-bundling Under Programme of Activity” to identify whether a proposed CPA is a de-bundled component of a large scale activity.

**(iv) The provisions to ensure that those operating the CPA are aware of and have agreed that their activity is being subscribed to the PoA**

The managing entity will obtain an authorisation letter from each of the CPA implementers intending to participate under this PoA and to act collectively for the purpose of the PoA.

**A.4.4.2. Monitoring plan:**

The managing entity proposes to have all the CPAs under this PoA to be independently verified and therefore no sampling procedures are proposed for the use by DOE. Independent verification of each of the CPA will enhance the accuracy and reliability of the amount of GHG emission reductions achieved by each CPA under the PoA. Independent verification of each CPA will entail additional costs, but the managing entity will still continue to persist on independent verification of each CPA to ensure highest level of accuracy and reliability of the emission reductions calculated for each of the CPA.

Monitoring plan for each CPA will be developed in accordance with the applied baseline and monitoring methodology. Data parameters will be identified and monitored in accordance with the requirement of the baseline and monitoring methodology.

Thus, the status of monitoring and verification can be determined anytime for each CPA as the same will be consistent with the requirements of the baseline and monitoring methodology.

The general details on monitoring of parameters are included in section E. Each CPA-DD will include specific information on the associated monitoring plan.

**A.4.5. Public funding of the programme of activities (PoA):**

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The PoA does not depend on any public funding. In case any CPA under this PoA avails of public funding, it will be required to provide in its CPA-DD that no official development assistance is diverted to the public funding.

**SECTION B. Duration of the programme of activities (PoA)**

**B.1. Starting date of the programme of activities (PoA):**

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December, 2010

Aforesaid date is provided because it is assumed that the project will be registered by this date. CPA's can be implemented under the PoA only after the PoA has been registered. Therefore the start date of the PoA will be the date when it is registered with the CDM EB.

If the actual date of registration of PoA is other than the date provided aforesaid, then the actual date of registration of the PoA to be regarded as the start date..

**B.2. Length of the programme of activities (PoA):**

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The length of the PoA will be 28 years.



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**SECTION C. Environmental Analysis**

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

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

Individual CPAs under this PoA will be implemented at different geographical locations involving uniquely identified separate building blocks. Environmental impacts, if any, associated with the implementation of each CPA is, therefore, expected to occur at individual CPA level. The potential environmental impacts that could be associated with these CPAs relate to safe disposal of replaced luminaires, as per applicable guidelines for disposal from the National Environment Agency (NEA). Hence, the environmental analysis will be conducted at individual CPA levels as and when a new CPA is intended to be added to this PoA.

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

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In case where the CPA is in relation to replacement of existing luminaires with more energy efficient luminaires in existing buildings, the CPA owner will maintain evidence that the replaced luminaires have been managed and disposed as per permissible procedures and guidelines applicable to Singapore and/or provided by the NEA. No trans-boundary movement of any replaced equipment is expected and hence there will not be any trans-boundary impacts.

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

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In accordance with the environmental regulations, an environmental assessment is not required to be conducted for lighting system installation or replacement activity in Singapore.

**SECTION D. Stakeholders' comments**

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

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

The CPAs under this PoA are expected to be implemented by different entities independent of each other. Therefore the stakeholder's concerns on individual CPAs are expected to be specific to the respective CPA and not common across several CPAs.

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

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This will be addressed at the individual CPA-DD.

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**D.3. Summary of the comments received:**

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This will be addressed at the individual CPA-DD.

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

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This will be addressed at the individual CPA-DD.

**SECTION E. Application of a baseline and monitoring methodology**

**E.1. Title and reference of the approved SSC baseline and monitoring methodology applied to a SSC-CPA included in the PoA:**

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**Name of the Approved baseline and monitoring methodology:** AMS II.E. (Version 10) “Energy Efficiency and Fuel Switching Measures for Buildings”

The managing entity will follow the guidelines (as updated from time to time) given under Annex 29 of EB 47 which lays down the “Procedure for Registration of a Programme of Activities as a Single CDM Project Activity and Issuance of Certified Emission Reductions for a Programme of Activities”. These include the procedure dealing with “Implications of an Approved methodology being put on hold or withdrawn”.

**E.2. Justification of the choice of the methodology and why it is applicable to a SSC-CPA:**

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Sr. No.	Requirement for applicability of the methodology	Whether the SSC-CPA complies with the given requirement
1.	This methodology comprises any energy efficiency and fuel switching measure implemented at a single building, such as a commercial, institutional or residential building, or group of similar buildings, such as a school, district or university.	The CPAs to be implemented under this PoA will involve installation and operation of: either (a) more energy efficient lighting luminaires replacing existing luminaires in existing buildings; or (b) more energy efficient lighting luminaires in new buildings, within distinct geographical locations across Singapore creating demand-side energy savings and reductions in greenhouse gas emissions.
2.	This methodology covers project activities aimed primarily at energy efficiency, a project activity that involves primarily fuel switching falls into category III.B	All CPAs to be implemented under this PoA will be aimed primarily to energy efficiency.
3.	The aggregate energy savings of a single project may not exceed the equivalent of 60 GWh per year	The managing entity will ascertain/obtain confirmation that each CPA under this PoA complies with this methodological requirement on aggregate energy savings equivalent of 60 GWh per year.
4.	This category is applicable to project	The managing entity will ascertain from the individual

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Sr. No.	Requirement for applicability of the methodology	Whether the SSC-CPA complies with the given requirement
	activities where it is possible to directly measure and record the energy use within the project boundary (e.g. electricity and/or fossil fuel consumption).	CPA implementors that appropriate mechanism (including installation of energy meters in project sample groups of electricity consuming lighting equipment) will be implemented for each CPA under this PoA to measure and record the energy used in the project system.
5.	This category is applicable to project activities where the impact of the measures implemented (improvements in energy efficiency) by the project activity can be clearly distinguished from changes in energy use due to other variables not influenced by the project activity (signal to noise ratio).	<p>The impact of the measures implemented (improvements in energy efficient) by each CPA will be clearly distinguished from changes in the energy use due to other variables not influenced by the project activity.</p> <p>Each CPA will involve installation of energy efficient luminaires (either as replacement or new installations). The power (wattage) of the project luminaires is expected to be lower compared to the luminaires in the baseline. Thus, the electricity savings under each CPA on account of the lower wattage of the project luminaires can be clearly distinguished from electricity savings due to other changes in energy use.</p>

Leakage associated with each CPA, if any, will be accounted for in accordance with the requirements of the baseline and monitoring methodology.

**E.3. Description of the sources and gases included in the SSC-CPA boundary**

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	Source	Gas	Include?	Justification
Baseline Emissions	Power Plants serving the grid	CO <sub>2</sub>	Yes	Major Source
		CH <sub>4</sub>	No	Minor Source
		N <sub>2</sub> O	No	Minor Source
Project Activity	Power Plants serving the grid	CO <sub>2</sub>	Yes	Major Source
		CH <sub>4</sub>	No	Minor Source
		N <sub>2</sub> O	No	Minor Source

**E.4. Description of how the baseline scenario is identified and description of the identified baseline scenario:**

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As per the methodology AMS I.I.E./version 10, the determination of energy baseline depends on whether the energy displaced is fossil fuel or electricity. The CPAs under this PoA will either involve (a) installation and operation of more energy efficient lighting luminaires in replacement to existing luminaires in existing buildings; or (b) installation and operation of more energy efficient lighting luminaires in new buildings; located in distinct geographical locations across Singapore. The

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geographical location of each CPA implemented under this PoA will be unambiguously identifiable and verifiable. The energy displaced in the baseline will be electricity and not fossil fuel.

In case a CPA involves installation and operation of more energy efficient lighting luminaires in replacement to existing luminaires in existing buildings, the baseline scenario will be the electricity consumption of the existing luminaire technology installed in such buildings. The baseline electricity consumption will be determined using the following equation:

$$E_{BL,y} = \sum_i (n_i * p_i * o_i) / (1 - l_y)$$

$E_{BL,y}$	Energy consumption in the baseline in year y (kWh)
$\sum_i$	Sum over the group of “i” devices (e.g., 40W incandescent bulb, 5hp motor) replaced, for which the project energy efficient equipment is operating during the year, implemented as part of the project activity
$n_i$	Number of devices of the group of “i” devices replaced, for which the project energy efficient equipment is operating during the year
$p_i$	Power of the devices of the group of “i” baseline devices.
$o_i$	Average annual operating hours of the devices of the group of “i” baseline devices
$l_y$	Average annual technical grid losses (transmission and distribution) during year y for the grid serving the locations where the devices are installed, expressed as a fraction. This value shall not include non-technical losses such as commercial losses (e.g., theft/pilferage). The average annual technical grid losses shall be determined using recent, accurate and reliable data available for the host country. This value can be determined from recent data published either by a national utility or an official governmental body. Reliability of the data used (e.g., appropriateness, accuracy/uncertainty, especially exclusion of non technical grid losses) shall be established and documented by the project participant. A default value of 0.1 shall be used for average annual technical grid losses, if no recent data are available or the data cannot be regarded accurate and reliable

Reference for the aforesaid equation is taken from equation number (2) of AMS.II.C/Version 13.

In case a CPA involves installation and operation of more energy efficient lighting luminaires in new buildings, the baseline scenario will be determined in accordance with Clause 14 of the Indicative Simplified Baseline and Monitoring Methodologies for Selected Small Scale CDM Project Activity Categories – “Type II and III Greenfield Projects (new facilities)”.

Once the most likely baseline scenario is identified using the guidelines provided under Clause 14, baseline electricity consumption will be calculated using the same equation as aforesaid.

**E.5. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the SSC-CPA being included as registered PoA (assessment and demonstration of additionality of SSC-CPA): >>**

**E.5.1. Assessment and demonstration of additionality for a typical SSC-CPA:**

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(A) Demonstrating additionality for CPAs on energy efficiency projects with energy savings =<20 GWh per year<sup>2</sup>

Such CPAs will be additional if it is an energy efficiency measure fulfilling both of the following conditions:

- Each of the independent subsystem/measure in the CPA achieves an estimated annual electrical energy savings of equal to smaller than 600 megawatt hours; and
- End users of the subsystem or measure are households/communities/SME.

(B) Demonstrating additionality for small scale CPAs

The additionality of each CPA will be demonstrated in accordance with Attachment A to Appendix B of the simplified modalities and procedures for small scale CDM project activities. The managing entity will use one or more of the barriers (listed below) in demonstrating the additionality of a given CPA.

**Investment barrier:** The CPA may demonstrate investment barrier by employing one or more of the following:

- By providing an explanation to show that a more financially viable alternative to the CPA would lead to higher emissions.
- Demonstrate that similar activities have only been implemented with grants or other non commercial finance terms.
- The institution providing financing for the CPA had considered CDM benefits into consideration for financing the CPA.

**Technological barriers:** The CPA may demonstrate technology barrier by employing one or more of the following:

- By providing an explanation to show that a less technological advance alternative to the project involves low risk (on account of performance uncertainty) or the project technology has a low market share and therefore ultimately leading to higher emissions
- Skilled and/or properly trained labour to operate and maintain the technology is not available in the relevant country/region, which leads to an unacceptably high risk of equipment disrepair and malfunctioning or other underperformance;
- Lack of infrastructure for implementation and logistics for maintenance of the technology;
- Risk of technological failure: the process/technology failure risk in the local circumstances is significantly greater than for other technologies that provide services or outputs comparable to those of the proposed CDM project activity, as demonstrated by relevant scientific literature or technology manufacturer information;
- The particular technology used in the proposed project activity is not available in the relevant region.

**Barriers due to Prevailing practices:** The CPA may prove “Barriers due to prevailing practices” by employing one or more of the following:

- By providing explanation to show that prevailing practices or existing regulatory or policy requirement would have led to implementation of technology with higher emissions.
- The CPA is one of the first of its kind in the region.

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<sup>2</sup> Annex 15 to EB 54 “Guidelines for demonstrating additionality of renewable energy projects =<5 MW and energy efficiency projects with energy savings =<20 GWh per year”

- The technology implemented for the CPA is not a common practice

**Other barriers:** The CPA may prove “Other Barriers” by employing one or more of the following:

- By providing explanation to show that due to other barriers such as institutional barriers or limited information, managerial resources, organisational capacity, financial resource, or capacity to absorb new technologies, emissions would have been higher if the CPA were not implemented.

**E.5.2. Key criteria and data for assessing additionality of a SSC-CPA:**

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The criteria for assessing the additionality of any CPA include the following:

(A) Criteria in relation to CPAs on energy efficiency projects with energy savings =<20 GWh per year

- The CPA to demonstrate compliance with the applicability conditions listed under Annex-15 to EB 54, as may be updated from time to time

(B) Criteria in relation to small scale CPAs

- Managing entity to demonstrate that the proposed CPA is not the only alternative that is in compliance with the applicable national and/or sectoral policies and regulations in Singapore; and
- Individual CPA should be able to demonstrate successfully at least one of the barriers as described in sub section B of section E.5.1 above, which could have prevented implementation of the CPA.

**E.6. Estimation of Emission reductions of a CPA:**

**E.6.1. Explanation of methodological choices, provided in the approved baseline and monitoring methodology applied, selected for a typical SSC-CPA:**

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Following are the methodological choices which will be applied in relation to each of the CPA to be developed under this PoA.

Determination of Baseline Emissions

Energy displaced in the baseline is electricity. Therefore, energy baseline will be the level of electricity consumption by the baseline lighting systems. Baseline emissions will be calculated by multiplying the electricity consumption by the baseline lighting systems with the grid emission factor for electricity.

Grid emission factor for the electricity displaced will be determined in accordance with the applied baseline and monitoring methodology. The baseline emissions will be adjusted for average annual technical grid losses (transmission and distribution) during year y for the grid serving the location where the devices are installed, expressed as a fraction.

In case the project activity results in increase in capacity of the lighting systems, calculation of baseline emissions will be restricted to the capacity existing in the baseline scenario. Thus, to be conservative, baseline emissions in relation to increased capacity will not be calculated. This is applicable to CPAs involving replacement of lighting systems in existing buildings.

Determination of Project Emissions

Energy consumed in the project is electricity therefore electricity consumption in the project will be multiplied with the grid emission factor for electricity to determine project emissions. Grid emission

factor for electricity will be determined in accordance with the applied baseline and monitoring methodology.

Electricity consumption in the project activity will be determined based on monitoring meter records recorded by the electricity meters installed in the project sample group. The project emissions will be adjusted for average annual technical grid losses (transmission and distribution) during year  $y$  for the grid serving the location where the devices are installed, expressed as a fraction.

Leakages

Leakages will be neglected because the replaced equipments will be scrapped and an independent monitoring of the scrapping of replaced equipments will be implemented in relation of each CPA in compliance with the requirements of the applied baseline and monitoring methodology.

Calculation of Emission Reductions

Emission Reductions will be calculated by subtracting project emissions from baseline emissions.

Project Sample Group

In case value for certain parameters used for calculating project emissions and/or baseline emissions is determined through sampling process, the size of the project sample group used for arriving at the value of such data parameter will be determined taking into consideration the latest version of the “General Guidelines for Sampling and Surveys for SSC project activities”.

Cross Check Sample Group

A cross check sample group of non-metered buildings will be identified and will be subject to annual check to ensure that the luminaires installed in such buildings are still operating. The results of such annual check will be documented and will be made available to the DOE during verification.

<b>E.6.2. Equations, including fixed parametric values, to be used for calculation of emission reductions of a SSC-CPA:</b>
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Calculation of Baseline Emissions

**(A) In case of replacement of existing luminaires with more energy efficient luminaires in existing buildings.**

Energy baseline will be determined based on the following equation:

$$E_{BL,y} = \sum_i (n_i * p_i * o_i) / (1-l_y)$$

where,

$E_{BL,y}$  Energy consumption in the baseline in year  $y$  (kWh).

$\sum_i$  Sum over the group of “ $i$ ” devices (e.g., 40W incandescent bulb, 5hp motor) replaced, for which the project energy efficient equipment is operating during the year, implemented as part of the project activity.

$n_i$  Number of devices of the group of “ $i$ ” devices (e.g., 40W incandescent bulb, 5hp motor) replaced, for which the project energy efficient equipment is operating during the year.

$p_i$  Power of the devices of the group of “ $i$ ” baseline devices (e.g., 40W incandescent bulb, 5hp motor). In the case of a retrofit activity, “power” is the weighted average of the devices replaced. Power of a representative sample of the replaced devices to be determined.

$o_i$  Average annual operating hours. Operating hours of a representative sample of project devices to be determined.

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

Reference for the aforesaid equation is taken from equation number (2) of AMS.II.C/Version 13.

**(B) In case of installation of more energy efficient luminaires in new buildings.**

Energy baseline in case of electricity displacement to be determined based on the following equation:

$$E_{BL,y} = \sum_i (n_i * p_i * o_i) / (1-l_y)$$

where,

$E_{BL,y}$  Energy consumption in the baseline in year  $y$  (kWh)

$\sum_i$  Sum over the group of “ $i$ ” devices (e.g., 40W incandescent bulb, 5hp motor) which could have otherwise be implemented in the baseline scenario, for which the project energy efficient equipment is operating during the year, implemented as part of the project activity

$n_i$  number of newly installed energy efficient luminaires. Ratio of 1:1 will be considered for newly installed energy efficient luminaires and probable baseline luminaires. This is conservative as the baseline technology will be such luminaire technology (having such wattage) which will be capable of providing the same level of output and service (lux) as the project technology.

$p_i$  Power of the luminaires which would otherwise would have been implemented in the baseline scenario. To be measured in *watt*. Power of the baseline luminaires to be such that it is capable of providing the same level of output and service (lux) compared to the project luminaires.

$o_i$  Average annual operating hours. Operating hours of a representative sample of project devices to be determined.

$l_y$  Average annual technical grid losses (transmission and distribution) during year  $y$  for the grid serving the locations where the devices are installed, expressed as a fraction. This value shall not include non-



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

Reference for the aforesaid equation is taken from equation number (2) of AMS.II.C/Version 13.

**(C) Baseline emissions will be calculated by multiplying the energy baseline (kWh) with the baseline electricity emission factor (tCO<sub>2</sub>/kWh)**

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

where,

$BE_y$  Baseline emissions in year  $y$  (tCO<sub>2e</sub>)

$E_{BL,y}$  Energy consumption in the baseline in year  $y$  (kWh)

$EF_{CO_2,ELEC,y}$  Emission factor in year  $y$  calculated in accordance with the provisions in AMS-I.D (tCO<sub>2</sub>/kWh)

Reference for the aforesaid equation is taken from equation number (1) of AMS.II.C/Version 13.

**(D) Project emissions will be calculated as:**

$$PE_y = (EP_{PJ,y} * EF_{CO_2,y}) / (1-l_y)$$

where,

$PE_y$  Project emissions in year  $y$  (tCO<sub>2e</sub>)

$EP_{PJ,y}$  Energy consumption in project activity in year  $y$  (based on data collected from energy meters installed for the project sample group). This shall be determined *ex post* based on monitored values (kWh)

$EF_{CO_2,y}$  Emission factor for electricity. The emissions associated with grid electricity consumption should be calculated in accordance with the procedures of AMS-I.D. (tCO<sub>2</sub>/kWh)

$l_y$  Average annual technical grid losses (transmission and distribution) during year  $y$  for the grid serving the locations where the devices are installed, expressed as a fraction. This value shall not include non-technical losses such as commercial losses (e.g., theft/pilferage). The average annual technical grid losses shall be determined using recent, accurate and reliable data available for the host country. This value can be determined from recent data published either by a national utility or an official governmental body. Reliability of the data used (e.g., appropriateness, accuracy/uncertainty, especially exclusion of non technical grid losses) shall be established and documented by the project participant. A default value of

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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.

Reference for the aforesaid equation is taken from equation number (5) of AMS.II.C/Version 13.

**(E) Emission Reductions will be calculated as:**

$$ER_y = BE_y - PE_y$$

where,

ER<sub>y</sub> Emissions Reductions in year y (tCO<sub>2e</sub>)

BE<sub>y</sub> Baseline Emissions in year y (tCO<sub>2e</sub>)

PE<sub>y</sub> Project Emissions in year y (tCO<sub>2e</sub>)

Reference for the aforesaid equation is taken from equation number (7) of AMS.II.C/Version 13.

Leakages

Leakages will be neglected because the replaced equipments will be scrapped and an independent monitoring of the scrapping of replaced equipments will be implemented in relation of each CPA in compliance with the requirements of the applied baseline and monitoring methodology.

**E.6.3. Data and parameters that are to be reported in CDM-SSC-CPA-DD form:**

E.6.3.1

<b>Data / Parameter:</b>	<b>EF<sub>CO2,ELEC,y</sub> ; EF<sub>CO2,y</sub></b>
Data unit:	tCO <sub>2</sub> /MWh
Description:	Combined margin emission factor in year y calculated in accordance with the provisions under equations (1) and (5) in AMS-II.C/Version 13
Source of data used:	National Climate Change Committee, Ministry of Environment, Government of Singapore.
Value applied:	0.456 tCO <sub>2</sub> /MWh
Justification of the choice of data or description of measurement methods and procedures actually applied :	The National Climate Change Committee operating under the Ministry of Environment, Government of Singapore has calculated the Operating Margin Emission Factor and the Build Margin Emission Factor for the Singapore Power Grid. These factors have been calculated using the “Tool to calculate the emission factor for an electricity system” (provided by the CDM EB of the UNFCCC) based on most recently available data. The managing entity has calculated the Combined Margin Emission Factor by applying 0.5 weights to be operating margin emission factor and build margin emission factor. Calculation pertaining to combined margin emission factor is available under Annex-3 “Baseline Information”.
Any comment:	Combined Margin Emission Factor so determined is on ex-ante basis and will remain constant for the entire crediting period.

E.6.3.2

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<b>Data / Parameter:</b>	$l_v$
Data unit:	Percentage
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:	Data is collected from SP Services Limited, a member of the Singapore Power Group. SP Services Limited has determined transmission loss factors for respective loads derived using the methodology approved by the EMA (Energy Market Authority), Government of Singapore.
Value applied:	to be determined for each CPA
Justification of the choice of data or description of measurement methods and procedures actually applied :	This is in line with the methodology AMS II.C./version13
Any comment:	This factor is determined on ex-ante basis and will remain constant for the entire crediting period.

E.6.3.3

<b>Data / Parameter:</b>	Project Sample group (PSG) for monitoring average operating hours and electricity consumption of the project devices.
Data unit:	Number
Description:	Total sample size of buildings used for monitoring operating hours and electricity consumption of project devices. The Project Sample Group for a given CPA will be identified and documented before the start date of crediting period of that CPA.
Source of data used:	<p>Sample size will be determined based on the (a) Population Size - i.e. number of buildings participating in a given CPA, (b) Confidence- 90%, (c) Precision-10%, (d) variability (error rate)- unless the managing entity is able to justify any other error rate the default error rate to be used for calculating the size of the project sample group will be 50%.</p> <p>Confidence-Precision ratio of 90-10 is in line with the requirement of “General Guidelines For Sampling and Surveys for Small Scale CDM Project Activity” (Annex-30, EB 50). Error rate of 50% is conservative because at any error rate above or below 50%, the sample size determined will be comparatively lower.</p>
Value applied:	To be determined for each CPA
Justification of the choice of data or description of measurement methods and procedures actually applied :	The population size will be identified and documented before the start date of crediting period of a given CPA. The population size is to be determined based on data collected from reliable sources of data including tender documents submitted by the main contractor to the CPA implementer for evaluating its proposal of either (a) replacing existing luminaires with more efficient luminaires in existing buildings or (b) installing energy efficient luminaires in new buildings; located in a distinct geographical location.
Any comment:	The project sample size so determined (based on the population size and other parameters) will remain constant for the entire crediting period for a given CPA.

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E.6.3.4

Data / Parameter:	Sample group of non-metered buildings
Data unit:	Number
Description:	The managing entity will identify and document a sample group of non metered buildings (forming part of a given CPA) which will be subject to annual checks to ensure that the energy efficient luminaires installed in such buildings are still operating. The sample group of non metered buildings will be identified and documented before the start date of crediting period of that CPA.
Source of data used:	Sample size will be determined based on the (a) Population Size- i.e. number of buildings participating in a CPA, (b) Confidence- 90%, (c) Precision-10%, (d) variability (error rate)- unless the managing entity is able to justify any other error rate the default error rate to be used for calculating the sample size will be 50%
Value applied:	To be determined for each CPA
Justification of the choice of data or description of measurement methods and procedures actually applied :	The population size will be identified and documented before the start date of crediting period of a given CPA. The population size is to be determined based on data collected from authentic and reliable sources of data including tender documents submitted by the main contractor to the CPA implementer for either (a) replacing existing luminaires with more efficient luminaires in existing buildings or (b) installing energy efficient luminaires in new buildings; located in a distinct geographical location.
Any comment:	The project sample so size determined (based on the population size and other parameters) will remain constant for the entire crediting period for a given CPA.

E.6.3.5

Data / Parameter:	$n_i$ (in case of replacement of luminaires in existing buildings)
Data unit:	Number
Description:	Number of devices of the group of “ <i>i</i> ” devices (e.g., 40W incandescent bulb, 5hp motor) replaced, for which the project energy efficient equipment is operating during the year.
Source of data used:	Data is collected at the time of replacing the existing luminaires with the more energy efficient luminaires. The collected data will be recorded and archived.
Value applied:	To be determined for each CPA
Justification of the choice of data or description of measurement methods and procedures actually applied :	Data pertaining to replaced luminaires will be collected and recorded in special data logs developed for this purpose. These data logs will be signed by (a) The CPA implementer, (b) The main contractor who has been appointed to perform the replacement. Therefore this source of data is regarded as the most reliable source of data.
Any comment:	Value of this parameter under a given CPA will remain constant for the entire

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	crediting period.
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E.6.3.6

Data / Parameter:	$n_i$ (in case of luminaires installed in new buildings)
Data unit:	Number
Description:	Number of newly installed energy efficient luminaires
Source of data used:	Data is collected at the time of installing energy efficient luminaires. The collected data will be recorded and archived. As provided under section E.6.2 above, a one to one ratio is considered for the number of baseline luminaires to project luminaires, this is because the baseline technology (i.e. the nameplate wattage of baseline luminaires) identified for the project will be such that it is capable to provide same level of output and service (lux) similar to the project technology.
Value applied:	To be determined for each CPA
Justification of the choice of data or description of measurement methods and procedures actually applied :	Data will be collected and recorded in special data logs developed for this purpose. This data logs will be signed by (a) The CPA implementer, (b) The main contractor. Therefore this source of data is regarded as the most authenticate and reliable source of data.
Any comment:	Value of this parameter under a given CPA will remain constant for the entire crediting period.

E.6.3.7

Data / Parameter:	$p_i$ (in case of replacement of luminaires in existing buildings)
Data unit:	Watt
Description:	Power of the devices of the group of “ <i>i</i> ” baseline devices (e.g., 40W incandescent bulb, 5hp motor). In the case of a retrofit activity, “power” is the weighted average of the devices replaced. Power of a representative sample of the replaced devices to be determined.
Source of data used:	Data is collected at the time of replacing the existing luminaires with the more energy efficient luminaires. The collected data will be recorded and archived.
Value applied:	To be determined for each CPA
Justification of the choice of data or description of measurement methods and procedures actually applied :	Data collected for this parameter will be recorded in a special data logs developed for this purpose. These data logs will be signed by (a) The CPA implementer, (b) The main contractor who has been appointed to perform the replacement. Therefore this source of data is regarded as the most reliable source of data.
Any comment:	Value for this parameter under each CPA will remain constant for the entire crediting period.

E.6.3.8

Data / Parameter:	$p_i$ (in case of luminaires installed in new buildings)
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Data unit:	Watt
Description:	Power of the luminaires which would otherwise would have been implemented in the baseline scenario.
Source of data used:	The baseline scenario will be determined in accordance with Clause 14 of the Indicative Simplified Baseline and Monitoring Methodologies for Selected Small Scale CDM Project Activity Categories – “Type II and III Greenfield Projects (new facilities)”.
Value applied:	To be determined for each CPA
Justification of the choice of data or description of measurement methods and procedures actually applied :	This data is collected in line with the methodological requirement and also the Indicative Simplified Baseline and Monitoring Methodologies for Selected Small Scale CDM Project Activity Categories. Therefore this source of data is regarded as the most reliable source of data.
Any comment:	Value for this parameter under each CPA will remain constant for the entire crediting period.

**E.7. Application of the monitoring methodology and description of the monitoring plan:**

**D.7.1. Data and parameters to be monitored by each SSC-CPA:**

Parameters to be monitored for calculating baseline emissions

E.7.1

<b>Data / Parameter:</b>	$o_i$
Data unit:	Hours
Description:	Average annual operating hours. Operating hours of a representative sample of project devices to be determined.
Source of data to be used:	Data will be recorded using timers or any other appropriate measuring instrument which will be installed in the project sample group of buildings used for monitoring operating hours.
Value of data applied for the purpose of calculating expected emission reductions in section B.5	To be determined for each CPA
Description of measurement methods and procedures to be applied:	As large number of buildings is expected to be participating in each CPA, it will be practically not possible to employ resources to monitor the operating hours of luminaires in each of such buildings. Instead each CPA will involve implementation of measurement equipments in sample group of buildings. Data will be collected for the sample group of buildings at least on monthly basis. This data will be recorded in special data logs and countersigned by CPA implementer.
QA/QC procedures to be applied:	No additional QA/QC procedures need to be planned.
Any comment:	All data will be electronically archived as part of the monitoring for a period of

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	two years from the end of crediting period for the CPA.
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Parameters to be monitored for calculating project emissions

E.7.2

<b>Data / Parameter:</b>	EP <sub>PJ,y</sub>
Data unit:	kWh
Description:	Electricity consumption in project activity in year y (based on data collected from energy meters installed for the project sample group)
Source of data to be used:	Data will be recorded using energy meters which will be installed in the project sample group of buildings used for monitoring of electricity consumption.
Value of data applied for the purpose of calculating expected emission reductions in section B.5	To be determined for each CPA
Description of measurement methods and procedures to be applied:	Energy meters will be installed in each of the building forming part of the sample group used for monitoring electricity consumption of the project devices. Data will be collected at least on monthly basis. Special data logs will be developed to record the monthly meter readings for each of the building forming part of the sample group. Logs will be counter signed by the CPA implementer.
QA/QC procedures to be applied:	The meters will be certified to national or IEC standards and calibrated according to the national standards and reference points or IEC standards and recalibrated at appropriate time interval according to manufacturer's specifications, but at least once in 3 years.
Any comment:	All data will be electronically archived as part of the monitoring for a period of two years from the end of crediting period for the CPA.

Parameters for calculation of leakages

E.7.3

<b>Data / Parameter:</b>	Monitoring of scrapping of replaced luminaires
Data unit:	NA
Description:	Scrapping of replaced luminaires to be subject to independent monitoring.
Source of data to be used:	Report submitted by the CPA to the DOE.
Value of data applied for the purpose of calculating expected emission reductions in section B.5	NA
Description of measurement methods and procedures to be applied:	Scrapping of replaced luminaires to be subject to independent monitoring and reporting. A copy of this report will be made available to the DOE.
QA/QC procedures to be applied:	NA

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Any comment:	All data will be electronically archived as part of the monitoring for a period of two years from the end of crediting period for the CPA.
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**E.7.2. Description of the monitoring plan for a SSC-CPA:**

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The key considerations for developing monitoring plans in individual SSC-CPAs are discussed below.

**1. Introduction**

The Monitoring Plan (MP) would present a plan to meet the requirements for the collection, processing and reporting of data. It will describe the management systems and procedures to be implemented by managing entity upon implementation of each CPA in order to ensure consistency between the project operation as well as monitoring, processing and reporting of data required for the calculation of emission reductions (ERs) taking into account AMS.II.E/version 10 and the guidance presented in the Validation and Verification Manual.

**2. Obligations of managing entity**

It will be the responsibility of the managing entity to develop and implement a management and operational system for a CPA that will meet the requirements of the MP.

**3. Description of data required to be monitored**

The monitoring plan will identify the various data parameters to be monitored in order to calculate the emission reductions. Data parameters which need to be monitored will be recorded in the following format.

<b>Parameter ID</b>	<b>Name of the Data Parameter</b>	<b>Primary source of data for the parameter</b>	<b>Data unit of the parameter</b>

**4. Recommendations for improvisation in the monitoring plan**

During the course of monitoring and verification; if the project proponent is of the opinion that there exist potential to improve the monitoring process which would eventually result in improving the quality of monitoring and reporting of emission reductions, then such quality enhancement measures may be implemented in the monitoring process.

**5. Detailed description on monitoring of each of the data parameters**

This section will contain a detailed description of the data collection and recording measures to be implemented for each of the data parameter which is monitored under the CPA. This section will address to the following monitoring criteria for each of the monitoring data parameter;

- *Description of the primary source of data from where the information pertaining to the data parameter will be collected.*
- *Description of the data collection process*
- *Description of the data recording process*
- *Description of the measurement instruments, in case a given parameter is to be measured ( for e.g. meters used for measuring energy consumption, operating hours)*
- *Calibration requirement of the measurement instrument.*



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6. Independent monitoring of scrapping of replaced luminaires to be implemented:

As is required by the methodology AMS I.I.E./version 10, the managing entity will be required to engage the services of an independent third party to conduct monitoring of the scrapping of replaced luminaires in relation to the CPA implemented under this PoA. The scrapping of replaced luminaires will be documented and verified independently.

7. Sampling Plan Documentation

As per clause (e) of paragraph 12 of the “Indicative Simplified Baseline and Monitoring Methodologies for Selected Small Scale CDM Project Activities Categories”, wherever a statistical sample is proposed for monitoring a data parameter the “general guidelines for sampling and survey for SSC project activities” shall be referred to. Therefore a CPA which proposes to use statistical samples for monitoring any data parameter will be required to refer to and comply with the aforesaid sampling guidelines.

Presently Annex 30 to EB 50 provides the latest version of the aforesaid guidelines. These guidelines may be updated by the EB from time to time. Each CPA will be required to use the latest version of the aforesaid guidelines for the purpose of developing their respective monitoring plan.

As per the current guidelines, the DD of a CPA is to include a “Sampling Plan Documentation”. Further, the EB has also provided the necessary clarification as to the information to be included in the “Sampling Plan Documentation”. Therefore each CPA which implements statistical sampling for monitoring any data parameter will be required to include the “Sampling Plan Documentation” in their DD and also comply with all requirements as to all the relevant information which is to be documented in such “Sampling Plan Documentation”.

Tool for calculating a representative sample size

Sample size for the relevant data parameter (which is to be monitored using sampling mechanism) will be determined in accordance with the guidelines available under the “General guidelines for sampling and survey for SSC project activities”. As per these guidelines, sample size may be determined using sampling software. The Executive Board in the “General Guidelines for Sampling and Surveys for Small Scale CDM Project Activity” has provided links to <http://www.freestatistics.info/stat.php>, for estimating the representative sample size. The managing entity has downloaded software named “Easy Sample” which can be used for calculation of the representative sample size. Each CPA under this PoA will use this statistical software to determine the sample size for those parameters which are monitored for the purpose of the “Sampling Plan Documentation”.

8. Annual Check of sample group of non metered systems within a given CPA

The managing entity will make sure that an annual check is performed in relation to the sample group of non metered buildings within a given CPA so as to ensure that the energy efficient luminaires installed in such buildings are still operating. The outcomes of these annual checks will be documented separately and shall be made available to the DOE for verification.

<b>E.8 Date of completion of the application of the baseline study and monitoring methodology and the name of the responsible person(s)/entity(ies)</b>
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The baseline study and monitoring methodology was completed by the managing entity whose contact details are included in Annex 1. Date of completion of application of baseline study and monitoring methodology is 3 August, 2010.

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**Annex 1**

**CONTACT INFORMATION ON COORDINATING/MANAGING ENTITY and  
PARTICIPANTS IN THE PROGRAMME of ACTIVITIES**

Organization:	United Premas Limited
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Represented by:	NG Yun Shen Kevin
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Direct tel:	+65- 6876 6496
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**Annex 2**

**INFORMATION REGARDING PUBLIC FUNDING**

**Annex 3**

**BASELINE INFORMATION**

<b>Particulars</b>	<b>tCO2/MWh</b>
Operating Margin emission factor <sup>3</sup>	0.5016
Build Margin emission factor <sup>4</sup>	0.4111
Combined Margin emission factor <sup>5</sup>	0.456

<sup>3</sup> <http://www.nccc.gov.sg/cdm/InformationOnEmissionFactors.pdf>

<sup>4</sup> <http://www.nccc.gov.sg/cdm/InformationOnEmissionFactors.pdf>

**Annex 4**

**MONITORING INFORMATION**

As per sections E.6 and E.7.

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<sup>5</sup> Combined Margin emission factor has been calculated by applying 0.5 weights to each of operating margin and build margin emission factor. This is in line with the “Tool to calculate the emission factor for an electricity system” provided by the CDM EB of the UNFCCC.