

Annex 8

Response to the public comment on SSC-II.L “Demand-side activities for outdoor and street efficient lighting technologies”

I. Background

1. The SSC WG (hereinafter referred to as the group), at its twenty-ninth meeting, agreed to continue considering a small-scale methodology for demand-side activities for outdoor and street efficient lighting technologies, taking into account public comments received, expert inputs and inputs from potential project proponents. During this process, the group received 28 comments in total from stakeholders.

II. Summary of comments and the responses by the group

2. **[Comment on applicability].** The methodology should clarify if it can be applicable to cases where number of lamps/luminaires have been reduced due to improved design practices of the lighting. This involves maintaining design based spacing between two lamp poles and/or reducing number of lamps to avoid excess lighting/glaring etc.

[Response from the group] The footnote 1 clearly states that the number of project lamps/luminaires can be less (or more) numerous. This is also explicitly stated in the explanation of variable Q in paragraph 11.

3. **[Comment on applicability].** Para 1 states that the methodology is only applicable if failed project equipment will continuously be replaced, during the crediting period, by equipment of equivalent or better lighting and energy performance specification. The maximum time allowed for replacement needs to be specified.

[Response from the group] The group agreed to specify the maximum allowable time (i.e. within a year after the failure) in the methodology.

4. **[Comment on applicability]** The methodology need to clarify if any measures implemented as part of better O&M practices are allowed to use the methodology. This include 'manual' switch off of alternate lamps during off-peak hours say between 2-5 AM or total removal of alternate lamps etc.

[Response from the group] The group is concerned that projects that turn off or remove baseline luminaires, but do not involve new equipment may be reducing lighting services to achieve CERs rather than improving energy efficiency to achieve CERs. Also, the group feels that it will be hard to monitor and verify.

5. **[Comment on applicable street lighting standard].** The methodology has considered a number of issues that are associated with good practice in street lighting. Contrary to other methodologies, instead of giving only a reference to a standard or document, this time, the methodology has given actual text which is very useful. However, in the process, the document has given a number of references and hence, too many details can some time lead to confusion and contradiction. It may be good practice to indicate clearly what is the preferred document or procedure.

[Response from the group] See next comment

6. **[Comment on applicable street lighting standard]**. Regarding the applicable street lighting standard, there is a need to know which is preferred in case all area available.

[Response from the group] The preferred standard would be the local standard if there is one, in absence of a local standard the national standard if there is one, or the CIE standards detailed in Annex III if there is no local or national standard.

7. **[Comment on measuring illuminance]**. The methodology falls short of recognizing the practical difficulties with measuring illuminance on roads considering varying factors that effect the accurate measurement of the illuminance. This includes mainly the lighting from surrounding installations. These requirements can be minimized if the lab tests on the illuminance levels can be accepted.

[Response from the group] As paragraph 4 and Annex II state, quantifying illuminance can either be done through computer modeling of illuminance or actual field measurements.

8. **[Comment on equivalence to existing baseline luminaires]**. There is a requirement in the methodology that project participant shall prove that project luminaires provide equivalent or improved total useful illumination (lx), compared to the baseline luminaires being replaced, at each Representative Location. Does this also cover colour rendering?

[Response from the group] CRI is typically not specified in roadway lighting standards. Some roadway lighting technology, such as sodium vapor lamps, have extremely low CRI, while metal halide and LEDs CRI is much higher.

9. **[Comment on compliance with applicable street lighting standard]** Though countries have lighting standards for street lighting, it is very hard to identify cities that use them during bidding process to specify the requirements and even if it specifies, it is difficult to identify if it is enforced fully considering budget constraints to procure high efficient lamps. Considering this, the meth should propose alternative and practical ways to address this issue without being referred to national/international standards.

[Response from the group] There is an alternative to national standards listed within this methodology - use the “equivalence to existing baseline luminaires option” above. If a city doesn't design street lighting to a standard, the baseline illuminance will simply be the illuminance provided by current practice. This also applies to the Greenfield projects, where illuminance is characterized at Reference Locations - those locations may or may not be designed to a standard.

10. **[Comment on identification of baseline technology for green field projects]**. At present the methodology suggests to document and use the data from the region (locations within 500 km) for identification of baseline technology for green field projects. It is not clear if the technology used in 'other parts' of the 'same location i.e. city/town' can be used as a baseline technology. This will minimize the costs of data collection for the implementing agencies also considering difficulties with collecting such data from other places.

[Response from the group] Within the same city or town is acceptable to fulfill the “same region” requirement. See paragraph 6 for a revised definition of the region.

11. **[Comment on identification of baseline technology for green field projects]**. The design of street lighting systems vary between different cities/locations as they do not follow any standards or norms, but mostly based on their experience and estimation skills. Considering these practices in developing countries, it will be difficult to standardize the requirements for a given type of road and illuminance requirements especially pole height, number of lamps, pole to pole spacing etc. Instead, it may be better to check these details with recommendations of any standard,

if available or else specify the requirements in the method itself for a given type of road and illuminance requirements.

[Response from the group] Street lighting standards normally do not specify dimensions of streets, poles, number of lights, etc either – they merely require levels of illuminance or luminance and are neutral as to number of luminaires and poles required to meet them. The group agrees that coming up with a standard pole spacing and height and lamp type that is consistent in all locations is impossible, as these are very “localized” decisions. The point of the representative locations is to require the project sponsor to establish and justify a reasonable hypothetical baseline for a Greenfield project, since none exists in the project boundary.

12. **[Comment on determination of representative locations]** The methodology states that Roadway lighting classes and Representative Locations should be documented and labeled in the Project Design Document in a consistent way and shown to include any major variations within the project boundary in type of location (urban, semi-urban, rural), road dimensions, pole spacing, mounting height, etc. Perhaps legal, taxation, environmental considerations may be added here.

[Response from the group] The group agreed not to add these variables. The group feels that the type of location (urban, semi-urban, rural) and the type of roadway lighting class (see Annex III) should be sufficient, so as to reduce the total number of representative locations required.

13. **[Comment on quality of the lamps/luminaries procured].** In most of cities in the developing countries, lamps (especially tube lights) and ballasts are procured from secondary markets mainly due to their low cost and other vested interests. In these cases, it is very difficult to meet the requirements specified under paragraph 6 and might eliminate projects implemented in such locations.

[Response from the group] The group decided to remove requirements on the quality of the project lighting equipment.

14. **[Comment on rated lifetime]** The rated lifetime of the measure lamps and/or luminaries may be defined more explicitly.

[Response from the group] The requirement on the rated lifetime has been deleted.

15. **[Comment on requirement of use of professional lighting design practices]:** paragraph 7(c) calls for PDDs to explain “how the project design utilizes professional lighting design practices”, without offering any guidance on what such practices are. Such ambiguous provisions create major problems in the validation process – but will not have any impact on the environmental integrity of the projects in terms of estimating CERs conservatively.

[Response from the group] The intent of this requirement is that project design address light levels that will be delivered by project equipment. Since lighting performance is not monitored over time per the methodology, the group feels that an up-front guarantee that a properly designed system (from lighting services perspective) is installed would be necessary.

16. **[Comment on destroying baseline lamps/luminaries].** This is far from happening in cities in developing countries. If the lamps are working and luminaries are in good condition, it is highly likely that they will be used elsewhere in the city. Hence, this requirement should be removed and instead, it only request to document properly where they are utilized. Please note that inefficient lamps located in one place can become an efficient one elsewhere, for example, if the project involves replacement of HPSV lamps with LED lamps and these HPSV will become efficient if they replace HPMV lamps and so on or even when a particular wattage of lamp is replacing another wattage of similar lamp to maintain/avoid excess lighting.

[Response from the group] The group agreed to eliminate this requirement.

17. **[Comment on use of wattage of lamps].** As it is known that most of the street lighting systems have ballasts and total power consumed per luminaire includes the consumption of ballasts as well. In cases where a replacement of existing lamp/luminaire system involves installation of a low loss ballast compared to the baseline one, the methodology should allow accounting of those loss reductions also in to the calculations.

[Response from the group] The methodology addresses luminaire wattage, which includes wattage from ballast or driver losses. See paragraph 1.

18. **[Comment on use of wattage of lamps].** The methodology should also provide an option for measurement of sample lamp systems to ascertain the wattage consumption of lamps both in baseline and project scenario in real terms and use the same for calculations. It will also be useful if an option is provided to establish an average hourly/daily consumption of a lamp system in baseline and project case and use the same for calculation of emission reductions.

[Response from the group] The group decided not to include this option to keep the methodology simple.

19. **[Comment on lamp systems in baseline and project scenario].** The methodology should clarify how energy savings will be accounted if non-operating baseline lamps (either due to fusing or damage to the luminaire/lamp or any other reason) are replaced with new lamps in the project scenario.

[Response from the group] The System Outage Factor (SOF) accounts for this and the baseline SOF and project SOF are now set to be equal at the value as monitored in the project. If the new system has a lower SOF, the baseline SOF is also assumed to be lower.

20. **[Comment on time-integrated average power]** Paragraph 10 (c) states that if patterns of variation in parameters such as traffic volume are well known, such as from records of traffic counts, such records shall be used to estimate time-integrated average power based on controls settings. More definitive approach will help. There can be a guidance on how to conduct traffic survey for the purpose or some transport methodology/tool may be referred to.

[Response from the group] The group feels that the methodology should be kept as simple as possible since it only relates to *ex ante* calculation.

21. **[Comment on operating hours].** In addition to default options suggested in the methodology (paragraph 10 b), it is also better to provide a standard default value, say 8 or 10 hours, if user chooses to use over the options suggested or in cases where such controls are not available.

[Response from the group] The group believes that a default value would make sense in AMS-II.J “Demand-side activities for efficient lighting technologies” when lights are inside peoples home, but feels that it would be hard to establish such a default value for street lighting, and that monitoring of operating hours is relatively easy for street lighting.

22. **[Comment on pperating hours]** Paragrpah 10 (b) (i) states that when luminaires are controlled with a standard timer, default value for daily hours of operation of luminaires is assumed to be equal to the number of hours that the timer will be set during the crediting period for operating hours during an average day. Can it be ‘representative day?

[Response from the group] The group believes that average day is more clear.

23. **[Comment on operating hours]** Paragraph 10 (b) (iv) states that when luminaires are controlled by advanced controls that allow scheduling options other than light sensing or time clock,

default value for daily hours of operation of luminaires is assumed to be equal to the operating hours that will be programmed into the controls system. We suggest that programs should be temper proof and validator should be able to verify the program settings. The validator should also have an assurance that the program is temper proof. A certificate from the supplier (on an international security standard will be helpful) on this aspect can be of help.

[Response from the group] Agreed.

24. **[Comment on direct monitoring as an option]** Paragraph 11 uses a quantification methodology that does not allow lighting systems to be directly monitored as a basis for quantifying energy use and energy savings. Thus it treats each luminary individually, rather than the system as a whole. In most applications, direct monitoring of lighting system energy use would be far simpler, more automated/robust and less costly than the approach presented. The paragraph also introduces the concept of system outage factor, and requires baseline data that may often not be available.

[Response from the group] The group feels that direct monitoring of the entire system would be ideal. However, the group recognizes that monitoring power for an entire streetlight system is often not done and isn't typically practical (It involves installation of reliable and technologically advanced communication equipment. Even in the US it is rare for streetlight power to be metered). Thus, the group agreed not to include this option.

25. **[Comment on operating hours].** The methodology should specify how the operating hours will be 'measured' - is it using a timer controls installed or through manual recording of power supply hours or any other.

[Response from the group]. For measurement of average annual operating hours, a simple recorder of on/off time or direct monitoring over time of power or even light intensity may be used.

26. **[Comment on outage hours].** In the absence of accurate recording of outage hours in the maintenance records, it is better that methodology suggests some default value for the same instead of specifying a requirement to maintain the log book to record outage hours.

[Response from the group] While a default value could be helpful, the group is afraid that it could vary widely from region to region, and technology to technology. Thus it feels that using maintenance records to determine OF would be preferable. The group welcomes any suggestion on such a default value.

27. **[General comment]**

- (a) We request that top-down methodologies prepared under the auspices of the CDM Executive Board (the Board) be accompanied by background information justifying the proposed new methodology. We suggest that this could be accomplished by adapting the existing submission forms for new methodologies for use by the Board and its panels and working groups (F-CDM-SSC-Subm for SSC methodologies and CDM-NM for regular methodologies), as appropriate. For example, Sections B and D of CDM-NM are needed to document the rationale for a proposed NM, as well as important explanations and justifications, such as for the choice of default values. This would help the public understand the methodologies proposed by the Board and better comment on them;
- (b) The resulting methodology is complex and far from easy to understand and thus apply to a project. Given the potential high use for this methodology in the developing world this is a disappointing result. We believe the proposed

methodology could be streamlined and vastly improved, increasing the prospect that it will be viable and widely used;

- (c) We strongly recommend that the methodology be redrafted following consultation with lighting system operators in developing countries with the specific aim of making it more robust and easier to understand and apply. Only if this is achieved will this methodology be widely usable for the small scale projects in developing country contexts that this methodology is intended to support.

[Response from the group]

When developing a methodology top down the group is often faced with many competing demands pulling in different directions e.g. high usability, environmental integrity, broad applicability, market transformation, short development time. In striking a balance, group strives to meet to most expectations but recognizes that not all expectations will be met. For example one of the key request from a project proponent was to cover new construction (Greenfield) installations in the new methodology inclusion of which leads to specification of more requirements applicable to those cases. Experts and Lighting system operators in developing countries have been consulted to the extent possible, however as with any new methodology there is always scope and need for further work to suit specific situations of a particular project activity or group of project activities. The group is thankful to many specific substantive inputs already received (and those that will be received in future by those who actually implement the project). General calls for increased robustness and increased understandability, reduced complexity, streamlining/need for improvements are useful reminders for vast amount work that remains to be done, experience shows specific inputs on specific methodological issues tend to produce useful results in shorter timeframe.