IETA
INTERNATIONAL EMISSIONS TRADING ASSOCIATION

PROJECT DEVELOPER FORUM

Chairman and Members of the CDM Executive Board
Mr. Clifford Mahlung
Chairman
UNFCCC Secretariat
Martin-Luther-King-Strasse 8
D 53153 Bonn
Germany

Project Developer Forum Ltd.
100 New Bridge Street
UK London EC4V 6JA
Contact:
Mr. Leo Perkowski
Co-vice Chairman
e: leo.perkowski@pd-forum.net
t: +44 20 3286 2520

International Emissions Trading Association
24, rue Merle d'Aubigné
CH-1207 Geneve
Switzerland
Contact:
Mr Henry Derwent
President and CEO
e: derwent@ieta.org
t: +41 22 737 05 00

To	cdm-info@unfccc.int
From	leo.perkowski@pd-forum.net
Date	12 April 2010
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Subject	**Call for public inputs: Small-scale energy efficient lighting and solar water heating methodologies**

Dear Mr. Mahlung,
Honourable Members of the CDM Executive Board,

The members of the Project Developer Forum and International Emissions Trading Association (IETA) would like to thank the CDM Executive Board for the opportunity to respond to this call for public input, and we provide our comments below in three areas:

1. Draft methodology for energy efficient exterior lighting
2. Approved small scale methodologies for energy efficient residential lighting.
3. Draft methodology for domestic solar water heating (SDWH) system

1. Draft methodology for energy efficient exterior lighting

- **The proposed methodology draws heavily on Version 3 of AMS II.J., but we question this approach for the following reasons:**
  1. The proposed methodology suffers many of the same problems that have been encountered with AMS II.J., which were laid out comprehensively in the submitted clarification request CLA_379.
  2. The concept of rated lifetime is not normally applied to solid-state lighting (such as LEDs), which is one of the reasons that LEDs were not included in AMS II.J. in the first place. Instead, luminous flux at a given time in the life of the LED (expressed as a percentage of the initial luminous flux) is the typical parameter used to ensure a sufficiently long useful life. The other reason is that LED technology has several disadvantages (more expensive than more conventional lighting technologies; difficult to procure; very heat sensitive (can dramatically reduce both light output and lifespan); typically cast light in one direction at a narrow angle compared to incandescent or fluorescent lamps so lenses or reflectors are needed in fixtures to broaden the beam).
  3. The restriction to only luminary retrofits (to the exclusion of new installations and complete lighting systems) discourages proper system design, misses large opportunities to reduce energy demand in the most cost-effective way and does not reflect best practice in many commercial applications, which can often be readily monitored, particularly when control systems are involved. It would be unfortunate if the Executive Board were to issue a top-down methodology that would discourage project proponents from making wise program design choices. There is a real need for simplified methodologies to encourage system optimization. This is true not only for lighting, but also for other large opportunities such as motor systems and buildings.
  4. On a procedural point, the SSC WG did not state why it invested time in developing a top-down methodology for outdoor lighting retrofits, and we question this category as a priority, given that

such project activities (including new installations) can be implemented under AMS II.C. and that it will be very difficult to aggregate sufficient savings under a single outdoor lighting project activity to offset CDM transaction costs and risks. Given the limited resources of the secretariat, SSC WG and CDM EB, we believe the choice of top-down methodologies should reflect market demand, particularly in underrepresented areas. This assessment should take into account CDM potential. In this case, it appears that this methodology development effort and subsequent call for input may have delayed the development of a viable methodology for household CFL programs, for which there is significant market demand. We would welcome the opportunity to work with the EB in the future to help define those areas of greatest market and technical potential.

- **In addition, we offer feedback on selected questions raised:**

  Q1. *Does the methodology represent appropriate emissions calculation and monitoring approaches for small scale-scale methodologies including compliance with CDM modalities and procedures and requirements for determining the amount of real, additional, measurable and verifiable reductions in greenhouse gas emissions associated with solar water heating systems?*

  Q2. *Are the project definition and applicability conditions appropriate? Is it appropriate for the methodology to be applicable to be both single and multifamily residential as well as commercial facilities?*

  Q4. *What changes are suggested to the methodology to make it more accurate and/or more usable?*

  As mentioned, we do not know why the SSC WG chose to prepare a methodology for outdoor lighting retrofits, which may have quite limited potential (under current CDM modalities and procedures) and, in any case, could be implemented under AMS II.C. (covers not only retrofits, but also new installations) or AMS II.J. (households only, at present). We therefore do not consider this to be the highest priority. Secondly, we find it unfortunate to only address luminaries, rather than lighting systems (see above) – and the methodology is contradictory on this point, as the category explicitly excludes lighting controls that reduce the lighting operating hours, yet default hours of operation are proposed to be determined based on such controls. Another point is that the methodology is apparently intended to be applicable to a wide range of technologies, but it is not suitable for solid-state lighting (SSL) or for typical street lighting applications, because it is based on the concept of "rated lifetime." In the case of SSL, which has fundamentally different characteristics than ICLs and CFLs, manufacturers do not declare a "rated lifetime" for a bulb (because they can have very long lifetimes and do not catastrophically fail like a CFL or ICL), but rather give guidance on useful life in terms of lumen maintenance. In the case of street lighting, lamps are typically replaced on a regular maintenance schedule (planned replacement), which is more cost-effective than replacing individual lamps at failure, so even for technologies that have a "rated life," this concept does not reflect how bulbs are actually used. So, the fundamental structure of the methodology, which was based on residential lighting, is not well-suited to either outdoor retrofit or SSL applications. If the main objective of the methodology is to address SSL technology, a methodology dedicated to solid-state lighting (SSL) applications should cover: (i) the retrofit and new installation markets; (ii) both residential and commercial applications; (iii) both indoor and outdoor applications; and (iv) SSL systems powered by grid (and micro-grid) electricity or by solar PV. However, a higher priority for efficient lighting would be to arrive at a viable version of AMS II.J. and expand its applicability to include (i) new installations and (ii) commercial applications (exterior lighting is not excluded from AMS II.J., so does not require special provisions).

  Q3. *Will the methodology be applicable to and support the development of both projects and POAs?*

  Yes, the methodology would be applicable to both projects and POAs.

  Q5. *Should there be a limit to the number of years allowed for crediting?*

  No, there should not be any *a priori* limit to the number of years allowed for crediting. The CDM modalities and procedures define crediting period as either maximum fixed 10-year period or 3 times 7-year renewable, and this choice should be left to the discretion of the PPs. The choice can depend

on a number of factors, including how the project is financed and which technology is used. As long as certified emissions reductions are achieved in accordance with the quantification algorithms, CERs should be issued.

Q6. *For new construction facilities (e.g., homes) are there suggestions for more detailed language on determining baseline systems for domestic water heating?*

Yes, in general, every attempt should be made to make SSC methodologies applicable to both retrofit and new installations. On the question of determining baseline systems, this will depend on the specific project case and should be left up to the project proponents to define.

Q7. *Are all four methods described for calculating CERs appropriate? Should the method to be selected be prescriptive based on specific project conditions or discretionary to be selected by the PP and/or DOE?*

As mentioned, we do not believe the proposed methodological approach is the best way to proceed. It does not reflect how large outdoor lighting systems are managed and maintained. Street lights are typically controlled by timers or sensors, and these data are used by cities to manage and maintain their systems. They typically replace lamps on a regular maintenance schedule, so these data can be used directly, without coming up with default values. If this methodology is revised, we highly recommend direct consultations with city officials, ESCOs and lighting system technology providers.

Q8. *For all four methods described, how often (every year, every three years, etc.) should the savings determination be updated with field verification of system operation and/or analyses of savings? Are there different criteria, then what is specified, appropriate for field verification?*

In what context is the concept of “measure life” raised? We do not see an obvious need to determine a “measure life”. But this will depend on the ultimate design of the methodology.

Q9. *For the calibrated simulation model method: (a) what specific criteria should be established for any specific computer simulation model to be considered .approved. and who should provide this approval? (b) What specific criteria should be established for a model to be considered calibrated? (c) What parameters should be required as project specific inputs to the model? (d) For large numbers of project SDHW systems, does each individual system have to be modeled?*

As a general principle, CDM methodologies should focus on requirements needed to quantify emissions reductions – and leave maximum flexibility to PPs to design project activities suited to local circumstances. As another general principle, project activities should be required to meet any quality, safety, energy, environmental or other relevant standards that would apply to the technology or project activity as required by the host country (or local authorities, if applicable).

That said, it would be helpful for project developers to have good program design guidance. The best source for such guidance is likely not the CDM authorities, but rather technology experts and implementation practitioners. The Executive Board might explore means to make such technology selection and program design guidance readily available to the CDM community. For example, the Energy Sector Management Assistance Program recently issued an online “CDM Toolkit” (http://www.esmap.org/news/news.asp?id=126) containing good-practice operational models and templates to help scale up the replication of large-scale, energy-efficient lighting programs. Guidance is also available on the design of street lighting systems, and considerations in the selection and procurement of various types of efficient lighting technologies. Even adding a simple link to “external resources” under each approved SSC methodology and inviting third parties to supply URLs to their relevant tools on this page could be a helpful starting point.

Q10. For metering approach method and other field data collection requirements: (a) what parameters should be metered? (b) what time period and time interval metering requirements should be established? (c) what metering accuracy and calibration requirements should be established?

The first option is wide open for abuse. The second option discourages best practice that can reduce energy demand by 20 to 35% (e.g., reducing light output to 50% between 11 pm and 6 am or completely shutting off lights between 1 and 5 am). No justification is provided at all for the third

default option, and wide variations are to be expected when using motion sensors. With many commercial and outdoor lighting applications large enough to be viable under the CDM, direct monitoring of energy use and/or hours of operation, reflected in maintenance records, would be the preferred approach and reflects how these systems are typically managed (this is also mentioned in several responses above).

- **To summarize, we do not think the proposed new methodology is well-suited for the intended applications, and we question whether it is a top priority. If it is pursued, a fundamentally different approach is needed and should be based on guidance from practitioners.**

- **Going forward, we request that top-down methodologies prepared under the auspices of the CDM Executive Board be accompanied by background information justifying the proposed new methodology.**

  This could be accomplished by adapting the existing submission forms for new methodologies for use by the CDM Executive 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.

2. Approved small scale methodologies for energy efficient residential lighting

- **We fully support the need for and the content of the proposed revisions included in CLA_379 with respect to AMS II.C. and AMS II.J.**

- A number of our members have in-depth experience trying to apply these methodologies to residential lighting programs, and the proposed changes are urgently needed. Furthermore, our membership has been involved in drafting the original AMS II.J., and there has been collaboration and consultation among PDF and IETA members on previous revisions, in addition to CLA_379.

- **Responses to specific question on AMS II.C.**
  Q1. *Should AMS-II.C be modified so to eliminate residential CFLs as an applicable measure, and thus require the use of only AMS-II.J for this type of measure?*
  No, AMS-II.C should not be modified to eliminate residential CFLs as an applicable measure. At present, this is the only methodology under which efficient lighting activities have achieved registration. On the contrary, we support the request in CLA_379 to revise AMS II.C. to allow use of default hours of operation. In general, we question why the SSC WG is considering limiting its scope of AMS II.C. by suggesting the elimination of a single technology. Narrowing the applicability of approved methodologies seems to run counter to what the COP has requested the CDM Executive Board to do and takes time away from its priority work.

- **Responses to specific questions on AMS II.J.**
  Q1. *Should AMS-II.J be modified to eliminate the net to gross (NTG) ratio?*
  We do not advocate eliminating NTG, all other things held constant. The NTG ratio is intended to capture changes in gross energy demand (other than T&D losses, which are treated as an independent parameter) caused by the project activity and not quantified at the level of the project, one of which is permanence, and it represents an element of conservativeness. So, it serves a function in a case where a pure deemed savings approach is taken. Unfortunately, NTG in Version 3 of the methodology represents a double discount on lamp persistence, because the methodology does not take a pure deemed savings approach, but requires monitoring of *in situ* lamp persistence. Instead of just eliminating NTG, we would prefer to see an integrated, rational compromise, consistent with a deemed savings approach, which would consist of the following:

- Keep NTG as is in Version 3 (a default 5% deduction in CERs), which is intended to account for lamp persistence and other issues (refer to all of the documentation and discussion on this point from previous rounds)
- Keep the initial *ex post* survey requirement (to catch and correct any incidences of early failure)
- Drop the subsequent *ex post* survey requirements and do not correct LFR *ex post* at all, but use the linear failure rate assumption (which is conservative, because the *ex ante* LFR calculation is a straight line, whereas products do not behave this way, even under test conditions. In fact, failure rates for CFLs are known to be very low initially, accelerating over time).
- Allow for a fixed 10-year or renewable crediting period, and crediting up to the time at which LFR = 100% (rather than 50%), based on a linear *ex ante* failure rate calculation. Refer to our response to Q5 on outdoor lighting for justification.
- Only require use of rated life as in Version 3 to determine LFR, which is defined in IEC 60969 as a manufacturer-declared value, acknowledging the demonstrated effectiveness of market self-policing in ensuring CFL quality (note that CLA_354 added in the third party testing requirement, which was not included in Version 3). This point is elaborated on below in our comments on questions 5 and 6.
- Remove the option to use a T&D rate other than the default (but only if the *ex post* surveys to determine LFR are eliminated). Countries that have unstable electric grids – and which may therefore see CFLs demonstrate an actual LFR in the field higher than expected based on *ex ante* rated life claims and assuming a linear lamp failure rate – would also be expected to have higher technical grid losses than the default value of 10% (however, it should be noted that the tolerance of the highest-quality bulbs being used in CDM projects to voltage fluctuations has improved significantly over the early generation and current low-price bulbs). Therefore, using the default 10% TD factor would be overly conservative for these countries and tend to underestimate actual emissions reductions, offsetting the opposite effect of higher failure rates. The significance of this is important to grasp: When CER issuance is based on default TD losses and *ex post* surveys to correct LFR, the poorest countries with the most unstable electricity grids will be disadvantaged, because only the downside (higher LFR) would be taken into account in quantifying CERs and not the upside (greater reductions in T&D losses than the default). On the other hand, if we accept that volatile grids go hand-in-hand with high T&D losses, then taking permanence into account in the NTG (as it already is) is a fairer solution. Otherwise project developers will have to focus on countries with stable grids.

This integrated set of solutions can be justified on rational grounds, would give a conservative result, while overcoming problems with Version 3 and making the meth straightforward to implement. Should the SSC WG nonetheless wish to maintain the *ex post* monitoring requirements as contained in Version 3, the default value for NTG should be adjusted upwards by 2% to 0.97 (see justification document provided with original NM submission for an explanation of this 2% correction value).

Q2. *What language should be added and/or modified so that AMS-II.J can be used for replacement of incandescent lamps with LEDs or other efficient lighting technologies?*

As mentioned on page 2, there were several reasons why LEDs were not included in AMS II.J. Although we think it might be possible to address this type of technology in AMS II.J., this might not be the best approach (maybe a separate methodology that takes into account the characteristics of SSL technology might be a better approach), and more deliberation is required than we can offer in the short time available. For example, LEDs are not typically assigned “rated life” values, so substantive changes would be required. As project developers with a lot of up-front investment at stake, we believe the priority should be on making AMS II.J. become viable for CFLs, so as not to

jeopardize the existing CFL pipeline, which is already shrinking as host countries and investors turn away from CDM as a result of uncertainty, delay and risk.

Q3. *Are there recent credible documentation on the residential operating hours of lamps in non annex I country households? Such information could be used to confirm the conservativeness of the default value used in AMS-II.J or be used to update the value.*

Further to the previous question, before the SSC WG considers updating default hours of operation, we first need to get a viable version of AMS II.J. approved, see some projects registered and gain experience. During the methodology approval process, there was an extensive dialog on an appropriate and conservative default value (and results of program evaluations provided) and we believe this is still legitimate. Our members did not provide any new data, and most are hoping to rely on the default approach, although projects registered under AMS II.C. should deliver such information. The secretariat might wish to consult with organizations outside of the CDM which have been involved in such activities.

Q4. *Are there recent credible documentation on the validity of the table in paragraph 2 for use in establishing minimum service levels for both CFL and LED replacements?*

The values in the table in paragraph 2 for ICLs are only optional, and the SSC WG did not indicate why it might want to revise it, so we do not see a compelling need to revise the table. In fact, the widely used performance standard IEC 60064 for tungsten filament lamps establishes minimum rated luminous flux values for both nominal and high luminous flux and for different voltages. PPs are free to use this standard or any other.

Q5. *Is there language that can be used in AMS-II.J to ensure CFLs are of a high quality when used in CDM projects? Should the methodology prescribe minimum level of power factor and rated lifetime for the CFLs?*

Q6. *How can rated lifetime (50% failure) be reliably documented? Such language should be conservative, applicable to lamp operation and grid characteristics in non annex I countries, and able to be verified by a DOE. Such language should be based on credible documentation of current standards, practices, costs, etc. What procedures should be defined for constructing a mortality curve? Should more time built in for lifetime tests by manufactures or testing labs? Should such tests be done by independent labs? Such information could possibly be used for updating AMS-II.J paragraph 5.*

Rated lifetime is typically defined as a manufacturer-declared value (refer, for example, to the most widely used standard for testing lamp performance, IEC 60969). We therefore see no justification for this value to be further documented. Rated life claims are not test results *per se*, but in the case of reputable manufacturers represent conservative claims that include a comfortable buffer over test values, based on experience and typically assigned before full life testing is completed. It should be left to the PPs to procure lamps with performance characteristics and warranties suitable for their project activity. There is no evidence that relying on rated life claims of manufacturers is a problem in the context of the CDM; on the contrary, as demonstrated in CLA_379, the market has been self-policing – all of the CFLs that have been supplied to the projects in the pipeline so far have been either 10000- or 15000-hour lamps of the highest quality from leading manufacturers (which are not even available in many developing country markets, because they are too expensive), because the financial viability of CFL projects is so dependent on lamp persistence to generate CERs. As project developers, we have no incentive to procure poor quality lamps, and we know how to procure the quality lamps that we need (without relying on restrictive independent, third-party testing). We therefore recommend that the revision as proposed in CLA_379 be adopted, namely that the requirement that the rated life claim of manufacturers be certified by an independent, third-party lab be dropped. It adds no value in terms of environmental integrity, yet creates implementation bottlenecks and raises transaction costs.

Q8. *Are the existing criteria for debundling check adequate for the purpose for which it was developed in the context of distributed lighting energy efficiency activities or more in general*

distributed renewable energy generation or energy efficiency activities? If a modification is deemed necessary what would be criteria that may be revised or additionally applied?

We fully support the point made in SSC_391 that the same exemption from the debundling test that applies to CPAs under a PoA is needed and should apply to individual SSC project activities, namely if each of the independent subsystems/measures included in the CPA of a PoA (or in an SSC project activity) is no greater than 1% of the small scale thresholds defined by the methodology applied, then that CPA of PoA (SSC project activity) is exempted from performing de-bundling check. There are still significant barriers to PoA, so we need to be able to rely on SSC project activities as the mode of implementing many project types important for sustainable development that are dependent on this ruling.

3. Draft methodology for domestic solar water heating (SDWH) system

The PD-Forum and IETA would like to thank the SSC WG and the EB for drafting a metholodgy for solar water heating projects, which have a significant potential to reduce emissions and provide sustainable development benefits.

However, due to the limited timeframe to submit inputs only generic comments on the draft methodology are provided in this document, but we urge the SSC WG and the EB to continue work in this area and to explore other avenues for involving stakeholders in this work, such as workshops, in which project participants would be happy to take part.

All five solar water heating PoAs submitted for validation so far involve the installation of various types of solar water heating systems. As such, options *c* (Control Group Method) and *d* (Deemed Savings Value Method) of the draft methodology could not be used for the calculation of emission reductions generated by these PoAs - only option *a* (Computer Simulation Method) or *b* (System Metering Method) could be. The application of either of these two options as they are in the draft methodology would result in significantly high transaction costs due to the amount of data required first to establish the baseline and then to monitor emission reductions. These high transaction costs, associated with the low CER volume per system, are one of the main obstacles to investment in solar water hearing projects and programmes. The PD Forum and IETA therefore believe that the key aim of this new methodology should be to reduce transaction costs for such projects, and we encourage the SSC WG and the EB to keep this issue in mind while finalising this methodology, especially in the consideration of options a and b relevant for most projects.

Again, the members of the Project Developer Forum and IETA thank you for the opportunity to comment on small-scale energy efficient lighting and domestic SDWH methodologies. We are available to provide further comments or clarifications at any time during your deliberations. Please feel free to contact us at any time.

Yours sincerely,

Henry Derwent
President and CEO, IETA

Leo S. Perkowski
Co-vice Chairman,
Project Developer Forum