Mitsubishi UFJ Securities

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RE: Call for inputs on small-scale energy efficient lighting and solar water heating methodologies

Dear Members of the CDM Executive Board,

We are grateful to the Executive Board for initiating discussion on specific aspects of small-scale energy efficient lighting and solar water heating methodologies, and would like to submit our comment. Please note that our comment is divided into two sections:

1. Input on specific aspects of approved small scale methodologies for energy efficient residential lighting and the draft methodology for energy efficient exterior lighting; and

2. Input on specific aspects of the draft methodology for domestic solar water heating (SDWH) systems.

1. Small-scale energy efficient lighting

In response to the Small Scale Working Group Twenty Fourth Meeting Report, Annex 7: "Updating Small Scale Energy Efficient Lighting Methodologies and New Exterior Lighting Methodology" questions for public comment, we welcome the move by the small-scale working group to simplify the methodological approach to energy efficient lighting by eliminating residential lighting from AMS-II.C and requiring AMS-II.J to be the only methodology for these types of measures. We also welcome the inclusion of LEDs and other energy efficient lighting technologies to be incorporated into the methodology.

The drafting of the new methodology AMS-II.x., "Demand-side activities for outdoor and street efficient lighting technologies", is also welcomed although the details of each clause are suggested to be revised to be more general. For example, while the methodology mentions outdoor application, there is no necessity to specify building outdoor security lighting.

To avoid any confusion or possible future clarifications the crediting period should be brought in line with that currently used in AMS-II.J., that is "*…for the rated lifetime of project lamps/luminaires, not to exceed one crediting period of up to 10 years*" (with CFLs changed to lamps/luminaires to allow for the inclusion of LEDs or other energy efficient lighting technologies).

The methodology is suggested to include new construction lighting projects as one of the technology/measures. The baseline can be constructed from a theoretical baseline that would have been implemented in the absence of the project activity. The theoretical baseline can be determined through studies of similar lighting projects in the local region or on reliable regional or national data. Studies can be undertaken to determine the expected luminescence, number and location of luminaires within the proposed project boundary.

Exterior lighting should comply with all relevant local or national standards and if such standards are non-existent then with pre-determined international standards or acceptable industry practice. Sampling should follow the "General Guidelines for Sampling and Surveys for Small-scale CDM Project Activities" or include a definite clause that these guidelines are not applicable.

2. Solar water heating

In response to the Small Scale Working Group Twenty Fourth Meeting Report, Annex 9: “Solar Water Heating CDM Methodology” questions for public comment, we would like the small-scale working group to take note of the number of solar water heating (SWH) CDM projects submitted for public comment on the UNFCCC website.

These projects involve the installation of solar water heating systems in residential households and commercial buildings. The systems are generally passive, without forced circulation or auxiliary heat sources. The projects, including a number of PoAs, generally apply approved small scale methodology AMS-I.C., “Thermal energy production with or without electricity”.

SWH technology is expected to make a contribution to GHG reductions due to its simple application and accessibility to many households around the world. In fact, a number of projects have already been submitted to the UNFCCC including more than five PoAs. However, none of them have successfully issued CERs. This could be because of the existence of a gap between the methodological (or CDM) requirements and practical application of SWH systems. Most SWH projects which have been submitted to UNFCCC are aiming to install SWH units to a large number of residential households. The units installed under the projects are passive and small sized and therefore affordable to many users.

Although AMS-I.C clearly indicates that the methodology can be applied to SWH projects, the baseline, ER calculation and monitoring methods are not clear and do not suit SWH projects. This is especially the case for projects installing small units to a large number of residential households. Therefore we welcome the introduction of a new Type I methodology dealing specifically with solar water heating systems that will simplify the introduction of dispersion of solar water heating units under the CDM. The new draft methodology, however, is still not sufficient to close the gap between the requirements of the methodology and actual application of SWH technology. It also does not contribute to enhancing the widespread utilization and dispersion of this technology.

Considering our experience with a SWH PoA in Viet Nam and the typical demands involved in the application of SWH technology, we would like to summarize the issues currently facing SWH systems under the CDM and suggest solutions to be considered when drafting the new methodology.

Current difficulties faced by developers of solar water heating projects include lack of direction in determining the baseline, especially for green field scenarios and difficulty in meeting the monitoring requirements of the current methodologies. Most solar water heating projects involve the installation of single units or systems in a residential setting. The units are simple, passive systems with no means to monitor the temperature and flow of water. The CDM requirement to monitor these parameters within strict confidence levels involves the installation of expensive monitoring equipment, often more expensive than the solar water heating system itself.

Baseline definition

It is difficult to determine the baseline for greenfield or retrofit projects. Some users install SWH systems to replace electric water heaters but others do not have electric water heaters in the baseline although they would install them if they were not to install SWHs.

ER calculation

It is not clear whether the baseline should be calculated based on baseline electric/fossil fuel hot water consumption or consumption of hot water generated by the SWH system in the project scenario. The issue of suppressed demand is also currently not clear.

The new draft methodology, AMS-I.x, "Solar thermal domestic water heating systems" does not give clear direction on which method, either energy consumption by baseline equipment or energy generation by the SWH system, should be used to calculate baseline emissions.

Monitoring

Unlike solar electricity generation, it is difficult to meter thermal energy generation by SWH systems. In addition, most projects involve the installation of a large number of very simple, small, passive units. The cost of monitoring a large number of units, even via sampling, would be significantly expensive and unrealistic considering the price of a SWH system itself and the expected emission reductions per unit.

As long as monitoring requires the temperature and water consumption to be metered, it is not a realistic or feasible monitoring method for projects aiming to install a large number of small, passive units.

The draft methodology proposed by the small-scale working group attempts to address the issue of baseline selection however does not adequately address the issue of monitoring suitability. The draft methodology categorizes solar thermal water heating systems into two classes, residential and commercial and then proceeds to outline four methods to determine the baseline and project emissions followed by directions for monitoring and sampling. In doing so the draft methodology ignores the differences in size, technology and cost between residential and commercial solar water heating systems and is not appropriate for small residential systems or PoAs.

Suggestions to new methodology

We would like to suggest some ways in which we believe the draft methodology could be improved to better support the development of all potential solar water heating projects, including PoAs. These changes will allow the rapid installation of residential solar water heating systems under PoAs in developing countries where the technology and cost of monitoring equipment is not readily available to the project developers.

It is suggested that small sized, passive units should be treated separately from large sized units for commercial facilities or collective housing projects with backup water

heating systems, auxiliary and pumping equipment. For small, passive units, the followings points should be taken into consideration:

1. The data required for calculating baseline emissions should be based on system specification but not user demographics or residence occupancy;

2. There should be an option to select an *ex-ante* value to calculate baseline emissions per unit;

3. Monitoring should be feasible and realistic without requiring the installation of meters.

Methodology title

We question the use of the word "domestic" in the title of the methodology if the methodology is also going to be applicable to commercial facilities.

Emission reductions

Wording can be simplified to eliminate redundant phrases already mentioned in both the baseline and project emissions sections.

Of the four methods detailed in the draft methodology both the Computer Simulation Method and the System Metering Method involve measuring a number of parameters which is not feasible for project activities involving the installation of very small solar water heating systems. The draft methodology indicates that the Control Group Method and the Deemed Savings Value Method are more appropriate in the case of small residential systems and PoAs. We would, therefore, like to make our suggestions focusing on these two methods.

Control Group Method

First, the definition of SWH systems applying this method should be defined by the specifications of the equipment not by residential demographics. For instance, the criteria definition should be defined by system specifications such as panel size, tank size and the existence of any backup heating and pumping systems.

It is expected that the project owner will face difficulty in identifying the control group of similar residences with similar occupancy and occupant demographics. The project owner will also face difficulty in continuously monitoring the energy use by a control group during the crediting period. The cooperation of a potential control group is questionable, if by their very nature, the control group will not be participating in the project. Further, especially in the case of PoAs, the possibility exists that the control group would participate in new CPAs in the future.

In order to eliminate this issue, it is suggested to provide an option to set the baseline energy consumption *ex-ante* by conducting a survey. The survey is to study the average energy used for hot water consumption per person in the baseline case. The baseline energy use per SWH installation can be estimated by multiplying the energy use

per person by the average number of family members per household from the survey or official statistical data.

The necessity to record the fossil fuel or electricity use on an hourly basis for passive systems is also questioned. It is also not feasible for baseline monitoring to be undertaken for the duration of the crediting period. The monitoring period should be specified and the result set *ex-ante* as mentioned above. For the case of passive systems with no auxiliary equipment, project emissions should be set as zero and monitoring should consist only of ensuring the number of systems installed and that they are operational and in compliance with manufacturers specifications.

Deemed Savings Value Method

We strongly agree to the application of this method to demonstrate the deemed savings per system although it is not clear from the draft methodology how to adequately demonstrate the deemed savings and define the criteria of the SWH systems.

We would like to suggest that the deemed savings should be calculated based on the equipment specifications but not based on the parameters which are affected by users' behaviour. Average values can be supplied by reliable local or national data or official UN statistics. Our suggestion is to calculate the deemed savings based on the following parameters:

- Average daily solar radiation (kWh/m^2/day);
- Operating days (days);
- Panel size (m^2);
- Panel heat collection efficiency (%);
- A discount factor set by the EB in order to maintain a conservative result.

Criteria could include:

- Panel size;
- Tank size;
- Panel heat collection efficiency (%);
- The existence of any backup heating and pumping systems.

Even if the value given by the Deemed Savings Value Method is more conservative compared to other methods, it is more important for a project developer to have a feasible option in which to undertake their project. Without allowing this practical approach with a predetermined value, it is considered difficult to encourage the implementation of SWH projects on a large scale.

Monitoring and Sampling

As previously mentioned, the requirement that all data for metering and sub-metering is collected and recorded on an hourly basis to within a small margin of error, is not feasible due to the costs involved with installing monitoring equipment.

The monitoring of small sized, passive units without energy consumption by backup heating and pumping systems should be treated separately from large sized, forced circulation systems. Under application of the current methodology, AMS-I.C., if the emissions reduction per system is less than 5 tonnes of CO_2e a year, then only the number of systems and hours of operation of an average system need to be monitored on an annual basis. A clause similar to that in AMS-I.C. limiting the monitoring requirements for systems with less than 5 tonnes of emissions reductions per year is suggested to be included, limited to passive systems.

For monitoring small sized, passive units under the two emission reduction calculation methods, the Control Group Method and the Deemed Savings Value Method, in accordance with our suggestions above, monitoring should be limited to the following:

1. All SWH systems shall be inspected for proper operation in compliance with manufacturer specifications at the time of installation;

2. The number of systems installed should be recorded annually;

3. Bi-annual (every other year) inspections shall be made of a sample of systems to confirm their continued operation.

To prevent future potential clarification requests, it is further suggested that the clause concerning sampling is re-worded to include mention of the latest version of the "General Guidelines for Sampling and Surveys for Small-scale CDM Project Activities" or a definite clause that these guidelines are not applicable.

Project Activity Under a Programme of Activities

It is suggested that specific reference to one guideline (ASHRAE) in the Computer Simulation Model is removed and that a clause is included requiring models to meet certain general calibration guidelines, preferably recognized at an international level.

For the Control Group Method and Deemed Savings Value Method, the criteria for sampling for CPAs within a PoA may differ from that in a regular CDM project and reference should be made to this. Reference should also be made to the potential scrapping of equipment in the case of retrofit or modified equipment replacement.

Specific questions for public comment

There should be no limit to the number of years allowed for crediting and the methodology should follow the regular format of 7 years renewable and 10 years fixed (28 years for PoA).

The baseline emissions should be determined ex-ante for the Control Group Method and Deemed Savings Values Method and the savings determination updated bi-annually during the crediting period. For the Computer Simulation Method, once the parameters are set, the savings determined should be updated bi-annually. For the System Metering Method, where data is metered regularly, the savings determined could be updated annually.

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We thank the small-scale working group for its consideration of our suggestions concerning the specific aspects of small-scale energy efficient lighting and solar water heating methodologies.

Sincerely yours,

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