CDM: Recommendation Form for Small Scale Methodologies (version 01)

(To be used for presenting questions/proposals/amendments to the simplified methodologies for small-scale CDM project activity categories)

Date of SSC WG meeting:	26–29 April 2010, SSC WG 25
Title/Subject (give a small title or specify the subject of your submission, maximum 200 characters):	Applicability of AMS-II.B to a new district heating system displacing individual boilers
Indicative methodology to which your submission relates (refer the items of Appendix B of the Simplified Modalities and Procedures), if applicable.	AMS-II.B "Supply side energy efficiency improvements − generation"
Name of the authors of the query:	Xingyi Gong Institution: Arreon Carbon UK Limited Xingyi.gong@arreon.com

Summary of the query:

Please use the space below to summarize the query related to SSC methodologies/categories SSC Modalities and Procedures provide recommendation/analysis of the SSC WG.

Original text from Stakeholder:

As per paragraph 1 of methodology AMS-II.B (version 09), it is applicable to "technologies or measures to improve the efficiency of fossil fuel generating units that supply an electricity or thermal system by reducing energy or fuel consumption by up to the equivalent of 60 GWhe per year", and it "may be applied to existing stations or be part of a new facility". In addition, the applicable examples may include "efficiency improvements at power stations and district heating plants and co-generation". As per paragraph 3 of methodology AMS-II.B (version 09), "The energy baseline is the technical losses of energy within the project boundary. In the case of retrofit measures, the energy baseline is calculated as the monitored performance of the existing generating unit. In the case of new facilities, the energy baseline is calculated using a standard for the equipment that would otherwise have been installed selected in accordance with relevant paragraphs of 'general guidance'". Thus, it could be concluded that the methodology is applicable to both existing and new generating facilities.

The proposed project aims to replace dozens of 4t/h and 10t/h low efficiency boilers with a new primary district heating system with two much larger boilers as the heat source. Therefore, the energy efficiency of the supply side is expected to be substantially improved as a result of the implementation of the project. And the expected annual reducing energy or fuel consumption is well less than the equivalent of 60 GWhe. As a result, methodology AMS-II.B should be applicable to the project activity in principle.

However, it is not clearly stated in methodology AMS-II.B that whether the introduction of a new district heating system, which definitely involves construction of new district heat plants and replacement of old existing boilers, is applicable to it. Or is the methodology applicable to efficiency improvement at existing facilities, such as existing district heating plants, only? Therefore, further clarification on the applicability of methodology AMS-II.B to introduction of a new primary district heating system is sought here.

Additional queries sent to PP on 26/03/2010:

Please confirm whether our following understanding on your project is correct:

- In the pre-project situation individual/decentralized low efficient boilers are used to supply energy for

space heating.

- Under the project scenario two large boilers with a new district heating system (i.e., involving installation of a new transmission/distribution pipeline network) will be installed.

Please also clarify how energy savings will be measured in the proposed project ensuring that equivalent quantity of the heat supply in the baseline and project.

It is confirmed that in the pre-project situation (i.e., the baseline scenario) individual/decentralized low efficient boilers are used to supply energy for space heating, and under the project scenario two large boilers with a new primary district heating system (i.e. involving installation of a new transmission/distribution pipeline network) will be installed.

PP's response received on 29/03/2010:

As for the measurement of the energy savings, the actual quantity of heat supplied by the proposed project to each building within the project boundary will be measured. So will the actual energy input of the project activity, and thus the energy efficiency as well as the energy losses under the project scenario could be determined. It is hypothesized that the same amount of energy would also be supplied under the baseline scenario since both scenarios must provide the same quantity of service (heat). The baseline energy efficiency of the supply side under the baseline scenario, either the existing or new heat generating systems or both, could be determined as per the guidance provided in the latest version of the "Tool to determine the baseline efficiency of thermal or electric energy generation systems". Then, the energy input that would be required in the baseline situation and the energy losses under the baseline scenario could be identified. With the energy losses under both the baseline and the project scenarios available, the emission reductions achieved by the project activity could be calculated.

Additional queries sent to PP on 29/03/2010:

It is understood that the technical losses in the project is measured by metering the actual total amount of heat supplied in each building and the total energy input in the boilers and taking the difference of the two. On the other hand, the baseline efficiency is determined using "Tool to determine the baseline efficiency of thermal or electric energy generation systems" in which the losses determined might only capture the equipment (e.g., boilers) losses since there is no such pipeline transmission/distribution network system installed in the baseline as compared to the project scenario. Please elaborate further how the proposed approach on computing technical losses in the baseline and in the project is comparable to determine energy savings that corresponds to the equivalent service level (i.e., thermal energy delivered at the users end in the baseline and in the project).

Also, it would be useful if you could provide us a simplified schematic/single line diagram depicting the baseline and the project scenario to better understand your query.

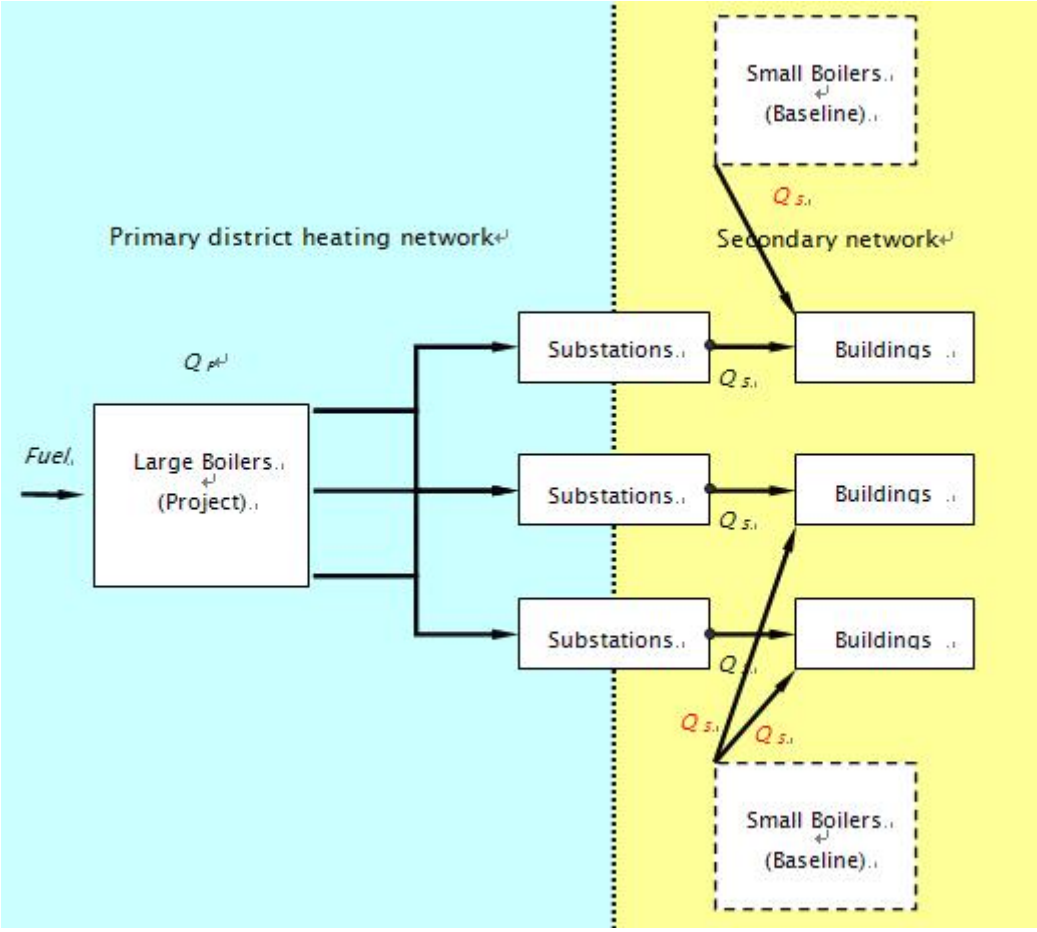
PP's response received on 30/03/2010:

One thing that should be clarified first is that there is also energy loss due to heat transmission/distribution network system in the baseline situation because the small boiler houses are connected with the end-users by (small-scale) isolated heat transmission/distribution networks. In another word, (for existing buildings) the secondary heating network (as shown in the figure attached) does exist prior to the implementation of the proposed project, and the metering points for the service provided (Qs) are located at the output side of the small boiler houses. Thus, the technical losses in the baseline also covers the losses due to heat transmission/distribution in the secondary pipeline network.

The major addition of the project scenario as compared to the baseline scenario, in terms of heat transmission/distribution, is the establishment of a new primary district heating network. Besides, under the project scenario, the small boiler houses will be replaced by the heat sub-stations. However, the metering points for the service provided to the end-users (Qs) will remain unchanged, i.e., still at the output side of the heat sub-stations, which leads to the inclusion of the losses due to heat transmission/distribution in the primary pipeline network. As a result, exactly the same service (Qs) is provided to the end-users in both the baseline and the project scenarios, and thus the proposed approach on computing technical losses in both the baseline and the project scenarios is comparable to determine

energy savings that corresponds to the equivalent service level.

A simplified diagram illustrating the baseline and the project scenarios is attached, and hopefully it would help.



Additional questions sent to PPs:

It is noted from your response that the energy efficiency of the supply side under the baseline scenario for existing or new heat generating systems would be determined as per the guidance provided in the latest version of the "Tool to determine the baseline efficiency of thermal or electric energy generation systems".

It is however not clear how the baseline energy use would be determined for your project.

Is our understanding correct that the baseline energy use is determined using a calibrated algorithm that correlates baseline energy use to heating load of the buildings? And, that heating load of the buildings is measured during the crediting period with the assumption that is the same amount of heat that would have been supplied in the baseline? If so please describe how the algorithm would be determined, how it would be calibrated to baseline heating system performance and how, and how often, crediting period heating loads would be measured. Also, please indicate how the baseline energy use would be determined if the baseline algorithm applicability limits were exceeded during the crediting period; for example if the baseline model is applicable for outside air temperatures between -10 and 20 oC, but there is a period of time when the temperature is -15 oC what would you do?

PPs response:

It is confirmed that the key assumption is that the same amount of heat supplied in the project activity would have also been provided in the baseline scenario. Briefly speaking, the energy consumption in the baseline scenario could be determined by the following equation:

E = Q/ (Baseline energy efficiency)

Where the baseline energy efficiency is determined as per the"Tool to determine the baseline efficiency of thermal or electric energy generation systems", and Q is expected to be continuously monitored in the project activity.

Thus far, no detailed algorithm has been established to adjust to the load-related performance of the baseline boilers or the applicability limits of the baseline boilers. However, as per the"Tool to determine the baseline efficiency of thermal or electric energy generation systems", the impact of the heating load on the efficiency of the baseline boilers could be measured by establishing a load-efficiency relationship based on measurements of a given baseline boiler and, if no such relationship is available, a quite conservative default value will be applied. As for the issue of the applicability limits of the baseline boilers, at least one quick solution is available, by which the heat quantity Q of any given existing baseline boiler could be capped by the product of its nameplate capacity and the annual operational hours. The annual operational hours could be assigned with a conservative value to avoid the leakage, if necessary. For more details, please refer to equations (4) and (4.a) at page 10 of the large-scale CDM methodology AM0058 (version 03).

Recommendation by the SSC WG:

Please use the space below to provide amendments/change (in your expert view, if necessary).

Please refer to paragraph 30 of the meeting report of the SSC WG 25 (http://cdm.unfccc.int/Panels/ssc_wg).

Answer to authors of query by the SSC WG:

Please use the space below to provide answer to the authors of the above query.

The small-scale working group of the CDM Executive Board would like to thank the author for the submission.

The SSC WG agreed that, in principle, AMS-II.B is applicable to the introduction of a new centralized district heating system replacing small distributed heating boilers. However, the SSC WG noted that AMS-II.B is a generic methodology and it has a very simple definition of baseline energy consumption: *"The energy baseline is the technical losses of energy within the project boundary. In the case of retrofit measures, the energy baseline is calculated as the monitored performance of the existing generating unit. In the case of new facilities, the energy baseline is calculated using a standard for the equipment that would otherwise have been installed selected in accordance with relevant paragraphs of 'general guidance'.* This definition is not sufficient for conservatively defining how baseline energy use will be calculated for the described situation. Furthermore, under the current provisions of AMS-II.B, it will be difficult to ensure for the underlying project that the service levels of the energy supplied to the consumer(s) in the baseline and project are equivalent.

In order to ensure for such project activities that the baseline energy consumption is appropriately and conservatively estimated , the SSC WG agreed to suggest that the project proponent submit a request for revision of AMS-II.B (including modification in applicability condition, project boundary and monitoring procedures where appropriate) and or submit a new SSC methodology to cover the underlying project , taking into account:

- The provisions of AM0058 to estimate baseline energy consumption to ensure the service (e.g., heat provided to load) provided is the same/equivalent quantity (e.g., kJ per year) in the baseline and in the project cases .
- The methods to calculate baseline energy use should involve algorithms that (a) indicate baseline energy use as a function of heating load as measured in the project case at the buildings and (b) are calibrated with actual baseline system performance data if the service (e.g., heat provided to load) are different in the baseline and project cases. Such methods shall perhaps refer to the "Tool to determine the baseline efficiency of thermal or electric energy generation systems".

Signed by the Chair, Mr. Peer Stiansen
Date: 29/04/2010

Signed by the Vice-Chair, Mr. Hugh Sealy
Date: 29/04/2010

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