



**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)

<b>Date of SSC WG meeting:</b>	16–19 August 2010, SSC WG 27
<b>Title/Subject (give a small title or specify the subject of your submission, maximum 200 characters):</b>	Monitoring requirements for the energy delivered by hot oil boilers with fixed flow rates
<b>Indicative methodology to which your submission relates (refer the items of Appendix B of the Simplified Modalities and Procedures), if applicable.</b>	AMS-I.C “Thermal energy production with or without electricity”
<b>Name of the authors of the query:</b>	Patrick Bürgi Institution: South Pole Carbon Asset Management, Ltd. <a href="mailto:p.buergi@southpolecarbon.com">p.buergi@southpolecarbon.com</a> , <a href="mailto:s.tison@southpolecarbon.com">s.tison@southpolecarbon.com</a>

**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 PP:

During recent validations of projects applying AMS.I.C. the text in monitoring methodology was put to question because of multiple interpretation options. This query is in relation to the monitoring requirement of thermal energy supplied by project activity.

**Interpretation of the requirements as per methodology:**

As per text of methodology AMS I.C version 17, for baseline emissions the energy delivered by the project activity in a year y, needs to be monitored directly and is expressed as the difference of the enthalpy between hot water/oil supplied to and returned by the plant. The monitoring parameters would ideally include the flow rate of the hot water/oil, with hourly measurements along with temperature of hot water/oil supplied to and returned by the plant. This would enable the estimation of the enthalpy difference between outgoing and incoming streams of the hot water/oil.

**Project scenario for consideration:**

In biogas projects AMS I.C is often applied in combination with AMS III.H when biogas replaces the historically used fossil fuel for process heat. In such cases, many times hot oil boilers of small industrial capacities are retrofitted. The retrofit allows usage of biogas as a second fuel enabling the replacement of fossil fuel. In case of such small capacity industrial boilers, the boiler specifications and functionality only allows to change the temperature of hot water / oil flowing in the process to regulate the thermal energy supplied to plant. The flow of medium is constant since the boilers don't have the functionality to vary the flow rates. In such cases, installing a flow meter to monitor the flow rate of hot water / oil for calculation of enthalpy of outgoing and incoming flow medium would represent an additional investment without visible benefits since the flow would be constant during the operation.

**Request for clarification:**

Project proponents would like to clarify the monitoring requirement for such specific cases when thermal

boilers operate with fixed flow rates. In particular, project proponents would like to confirm with the SSC WG that in order to estimate the enthalpy of the outgoing and incoming hot water / oil to plant, for such cases, it would be equally appropriate to base the calculation on a fixed flow rate of boiler as per the technical specifications of the boiler.

[Additional query sent to PPs on 30/07/2010:](#)

Elaborate "small capacity boiler applications" with some examples ( also indicate the range of the sizes (kWth) of the boilers) of small scale applications where flow rates are fixed and boilers do not have functionality to vary the flow rates irrespective of the possible system load variation.

PPs response on 05/08/2010:

Small Scale Capacity Boilers: The most common examples for projects under consideration are the hot oil boilers used for starch drying process.

Capacity: typically less than 20 GJ/hour or 5500 kW (attached sample boilers are in range of 3000kW and 4070kW).

Applications: Preheating raw material before manufacturing process. Drying the final products manufactured before making end product (The typical projects under consideration include drying of starch before packaging). In these systems, the boiler medium (the heat transfer medium) is in a closed loop and is not in direct physical contact with any external component of the system. For e.g. hot oil boiler, the hot oil circulates in closed loop and supply and return temperature are regulated to change the amount of heat flowing to the drying process. Therefore, the flow rate is constant.

[Additional query sent to PPs on 30/07/2010:](#)

Please propose conditions that shall comply in order to justify the use of manufacturer's specified fixed flow rate instead of monitoring enthalpy of outgoing and incoming hot oil/water in the small scale boiler application ?

PPs response on 05/08/2010:

Possible Conditions that shall comply in order to justify the use of manufacturer's specified fixed flow rate: In the case of the use of AMS.I.C applied in combination with AMS.III.H, the boilers are installed as packages and circulating pumps are part of package. The variation of the flow rate is not a parameter to be controlled or monitored in such systems. Thereby, the satisfactory continuation of the original equipment (circulating pump) supplied as part of boiler package would ensure that no major differences have occurred in normal operation values. The boiler specification should clearly mention about the circulating pump, which forces the fluid through the system at a constant rate.

In case the boiler specifications provide a range of flow rate values for the circulating pump, the minimum value can be used in case of absence of the flow meter.

#### **Recommendation by the SSC WG:**

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

Please refer to paragraph 26 of the meeting report of the SSC WG 27 ([http://cdm.unfccc.int/Panels/ssc\\_wg](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 to clarify that, as per the current version of AMS-I.C, thermal energy generation is determined as the difference of the enthalpy of the steam or hot fluid and/or gases generated by the heat generation equipment. For example in the case of hot oil boiler application (e.g. thermic fluid heater), thermal energy generation is determined as the sum of the enthalpies of the hot oil and condensate returns. The respective enthalpies are determined based on the mass (or volume) flows, the temperatures and thus, the monitoring parameters include the flow rate of the hot water/oil along with temperature of hot water/oil supplied to and returned by the plant. The SSC WG is thus of the opinion that this monitoring philosophy is hinged on the fact that variability in mass flow and other relevant parameters such as temperature must be captured to ensure emission reduction calculations is accurate. This is also in line with the paragraph 17 (b) of General Guidelines to SSC CDM methodologies that states “Data variables that are most directly related to the emission reductions (e.g. quantity of the fuel inputs, the amount of heat or electricity produced, gas captured) should be measured continuously. Data elements that are generally constant and indirectly related to the emission reductions (e.g. emission factors, calorific value, system efficiencies) should be measured or calculated at least once in an year, unless detailed specifications are provided as part of the indicated methodology.”

The SSC WG was unable to see a convincing justification provided by the query author, to treat the parameters such as flow or temperature as constant parameters set to technical specifications provided by the equipment manufacturer. The request to use manufacturers specification of mass-flow rate of hot oil boiler did not consider the fact that manufacturers specification is usually specified as maximum continuous rating (MCR) which in most cases may not represent the actual operating conditions of the boiler/heater system. Many factors (e.g. wear/tear, clogging, part load operation) may lead to reduced flow rate and hence inaccurate and non conservative estimations of emission reductions.

Considering the above facts, the SSC WG is thus of the opinion that the financial/investment reasons such as described by the query author are not sufficient justification for reducing the quality of monitoring as required by the approved baseline and monitoring methodologies, *inter alia*, ensuring that the emission reductions are real, measurable and verifiable. The SSC WG therefore agreed not to accept the proposal.

Signed by the Chair, Mr. Peer Stiansen

Date: 19/08/2010

Signed by the Vice-Chair, Mr. Hugh Sealy

Date: 19/08/2010

**Information to be completed by the secretariat**

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