# 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)***

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| *Date of SSC WG meeting:* | 19–22 October 2010, SSC WG 28 |
| *Title/Subject (give a small title or specify the subject of your submission, maximum 200 characters):* | Clarification on the applicability of AMS-III.P to Petrochemical Industry |
| *Indicative methodology to which your submission relates (refer the items of Appendix B of the Simplified Modalities and Procedures), if applicable.* | AMS-III.P<br>"Recovery and utilization of waste gas in refinery facilities" |
| *Name of the authors of the query:* | Tulika Biswas<br>Institution: Carbonmcgroup<br>tulikabiswas.cmc@gmail.com,<br>tulika.biswas@carbonmcgroup.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:

**Project Activity:** A flare gas recovery project at a Petrochemical complex, developed by one of our PPs in Pata, Auraiya district, Uttar Pradesh, India, reduces the emission of greenhouse gases (GHG) from lean gas used for process heating by replacing them with recovered waste gases that are normally burned in flares.

The average amount of waste gas sent to the flares at the petrochemical process is 2727 $Nm^3$/hr and the fossil fuel consumed in the flaring purpose amounts to 224 $Nm^3$/hr. Waste gas is characterized by low pressure for which no useful application is found in the absence of the project. In the project scenario this waste gas is recovered in order to make it useful as a fuel for its own use.

It is proposed to recover the flare gases from the Flare Knockout Drum (KOD) of Main Flare system using ejector system. Lean gas compressor discharge will be used as motive fluid to the ejector and flare knock out drum will be connected to the suction of ejector. Final discharge shall go to boiler KOD, from where it will be used in Utility Boilers (UB) as fuel. To facilitate on line hook up of the system, tap off connections are already provided at the outlet of the flare KOD discharge, LGC outlet and also at the inlet of UB KOD.

The proposed CDM project activity aims to reduce GHG emissions by recovering waste gases before flaring and partly replacing lean gas, used in process heating (Utility Boiler), with the recovered waste gas. It will also reduce emissions by decreasing the amount of fossil fuel (Rich gas) necessary for flaring.

**Methodology :** Approved small scale methodology AMS III.P (version 01) is for "Recovery and utilisation of waste gas in refinery facilities". Definition section of this methodology on page 2/6 says that :

"For the purpose of this category the following definitions apply :

Waste gas : Waste gas is a by-product generated in several of the **processing units of the refinery and in normal operational processes is directed to the flares**. The principal constituents of this gas are the same as in refinery gas (methane, ethane, ethylene, normal butane, butylene, propane, propylene, etc).

However, waste gas is characterized by a low pressure for which no useful application is found in the absence of the project, because recovering waste gas for energy use is not feasible in the baseline scenario (eg. because of low pressure, heating value or quantity available). In the project scenario, this waste gas is recovered in order to make it useful as a fuel.

Waste gas composition of both refinery and petrochemical industry is given in the following table.

| Sl. No. | Parameters | Unit | Petrochemical Complex | Industrial Complex of La Plata Project (refinery) (Methodology AM0055 approved based on this PDD) | Low Pressure Gas Recovery Project of Shandong Changyi Petrochemical Co., Ltd., China | Low Pressure Gas Recovery Project of Shandong Weifang Hongrun Petrochemical Auxiliary Co., Ltd., China | Recovery and utilization of flare waste gases at the Industrial Complex of Luján de Cuyo |
|---|---|---|---|---|---|---|---|
| 1 | Methane | Vol % | 34 | 39.51 | 32.07 | 19.07 | 25.05 |
| 2 | Ethane | Vol % | 1.6 | 7.58 | 10.43 | 10.43 | 8.09 |
| 3 | Propane | Vol % | 0.3 | 5.60 | 0.04 | 0.04 | 9.84 |
| 4 | Butanes | Vol % | 0.2 | 3.17 | - | - | - |
| 5 | Pentanes | Vol % | 0.04 | 1.15 | - | - | - |
| 6 | Hydrogen | Vol % | 39.98 | 15.82 | 24.31 | 37.31 | 23.85 |
| 7 | Ethylene | Vol % | 1.1 | 2.92 | 13.51 | 13.51 | 1.07 |
| 8 | Propylene | Vol % | 0.14 | 6.84 | 0.5 | 0.5 | 1.56 |
| 9 | CO2 | Vol % | 0.1 | 1.49 | 2.39 | 2.39 | 0.26 |
| 10 | Nitrogen | Vol % | 22.54 | 9.68 | 13.48 | 13.48 | 0.89 |
| Source | | - | From PP source | UNFCCC website | UNFCCC website (under validation) | UNFCCC website (under validation) | UNFCCC website (under validation) |

**Clarification Request 1 :**

Clarification is requested about whether recovery and utilization of waste gas (methane, ethane, ethylene, normal butane, butylene, propane, propylene, etc. – with little variation) in petrochemical complex can use this methodology. The project activity complies with all the requirements of the methodology including the definition of waste gas, but the only thing that is not in compliance with the methodology is the title of the methodology referring to "refinery". So we request the SSC-WG to clarify whether, if all the other requirements of the methodology are met, a petrochemical industry can use this methodology AMS III P.

**Recommendation by the SSC WG:**

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

Please refer to paragraph 27 of the meeting report of the SSC WG 28 <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 AMS-III.P can in principle be applicable to waste heat recovery project implemented in petrochemical industries where in the baseline the waste gas produced is flared. However the group is of the opinion that mostly editorial (and may be some substantial) revision will be needed to the existing AMS-III.P to ensure proper coverage of petrochemical facilities and to ensure that any necessary details of petrochemical processes differentiating it from petroleum refineries, for which the current version of the methodology is focused, if any, is taken into consideration in the revision. The group thus invite the author of the query to submit a request for revision of AMS-III.P taking into account the following important issues inherent in the current version of AMS-III.P and some suggestions for the

proposed revision:

1. In the current version of AMS-III.P, it is assumed that waste gas is flared (without supplemental fuel) in the absence of the project. In the project case, supplemental fuel is utilized in the use of the recovered waste gas as a fuel;
2. Energy needs in some elemental processes in the refinery is met by the combustion of fossil fuels in the pre-project situation while in the project, recovered waste gas/heat is utilized to meet these energy needs;
3. In the project, the waste gas is collected and as such flaring is discontinued;
4. Baseline emissions are calculated as: $BEy = Qwg,y * LHVwg * EFff,y * F$;

   where it must be noted the factor F has been introduced to account for the difference in the efficiency of firing the pre-project fuel compared to firing the recovered waste gas.

In the proposed revision of the methodology the following among other things should be addressed:

a. Flaring in the case described by the submission author include the use of booster fuel for the flaring of the petrochemical waste gas. While this may not be the general situation at all petrochemical plants, revision of the equation must cover this situation;

b. All references to "refinery" processes and facilities in the current version of the methodology should be expanded to cover "petrochemical" in the revised version of the methodology;

c. Care must be taken to ensure that any critical characteristics of the petrochemical plant that will impact reasonable and transparent estimation of emission reductions by the revised methodology are covered.

Signed by the Chair, Mr. Peer Stiansen

Date: 22/10/2010

Signed by the Vice-Chair, Mr. Hugh Sealy

Date: 22/10/2010

| **Information to be completed by the secretariat** | |
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