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CDM Ref 0557	TRIKA	13 December 2007

Validation opinion

Request for revision of monitoring plan for project activity 0557 "Catalytic N2O Abatement Project in the Tail Gas of the Nitric Acid Plant of the Pakarab Fertilizer Ltd (PVT) in Multan, Pakistan".

We refer to the procedure for revising monitoring plans adopted at EB 26. We herewith request a revision of the monitoring plan for project activity 0557 entitled " Project 0557 : Catalytic N2O Abatement Project in the Tail Gas of the Nitric Acid Plant of the Pakarab Fertilizer Ltd (PVT) in Multan, Pakistan".

The project applies the approved consolidated baseline methodology 28 (version 01 of 03 March 2006) – "*Catalytic N2O destruction in the tail gas of Nitric Acid Plants.*"

The revision of the monitoring plan is related to the monitoring of the ammonia used for NOx reduction (counted as project emissions), the electricity used in the N_2O destruction unit (counted as leakage), and the natural gas used to heat the tail gas in order to obtain the required temperature for the N_2O decomposition reaction (counted as leakage). The revisions to the monitoring plan are described below.

Project emissions:
In the registered PDD monitoring plan, the project emissions only comprise N_2O not destroyed ($PE_{ND,y}$). As per AM0028 the emissions related to the production of ammonia used in the $DeNO_x$ reduction shall be included. In this project a Selective Catalytic Reduction (SCR) $DeNO_x$ unit was installed as a part of the project. The project proponent has therefore included these emissions in the revised monitoring plan. According to AM0028 a default GHG emissions factor of 2.14 tCO_2e/tNH_3 has been used. The technology applied is using natural gas for re-heating the tail gas and the emissions from the re-heating are counted as project emissions. The natural gas is used within the project boundary and hence counted as project emissions. The overall equation for project emissions are the as follows:

$$PE_y = PE_{ND,y} + PE_{DF,y}$$

where the project emissions related to the destruction facility ($PE_{DF,y)}$ comprise the emissions from the ammonia used in the $DeNO_x$ reduction and the emissions from the natural gas used for re-heating the tail gas.

The detailed equations for the project emissions are given in the revised monitoring plan.

The natural gas used for re-heating is measured daily and the monitoring device will be subject to regular calibration, maintenance and testing regime to ensure accuracy.

IPCC default values are used for the oxidation factors for natural gas ($OXID_{HC}$ =99.5%) and methane ($OXID_{CH4}$ = 99.5%). The density and methane content of the natural gas is measured and obtained from the natural gas supplier, a default value of 0.000714 t/Nm^3 is applied for the methane density. The carbon emission factor used for the converted natural gas is 2.75 t CO_2/t and in house company data is used to estimate the emission factor for electricity consumption (1.2598 t CO_2e/MW).

Baseline emissions:
No changes have been made to the monitoring or calculation of baseline emissions.

Leakage:
According to AM0028 version 1, the leakage LE_y is given as follows:

$$LE_y = LE_{s,y} + LE_{TGU,y} + LE_{TGH,y}$$

where

LE_y : Leakage emission in year y (tCO_2e/yr)
$LE_{s,y}$: Emissions from net change steam export (tCO_2e/yr)
$LE_{TGU,y}$: Emissions from net change in tail gas utilization (tCO_2e/yr)
$LE_{TGH,y}$: Emissions from net change in tail gas heating (tCO_2e/yr)

In this project activity there is no net change in steam export and no net change in tail gas utilization or net change in tail gas heating as described in the formulas given in AM0028 v.1. However, although not required to be monitored according to AM0028, the electricity required for the operation of the N_2O destruction unit is included as leakage (notation used $LE_{RCS,y}$). The electricity used is minor, however the project proponent are indeed measuring the electricity used and have decided to include the related emissions as leakage.

So, for this project activity, the leakage formula applied is as follows:

$$LE_y = LE_{RCS,}$$

where

$LE_{RCS,y}$: Emissions from electricity demand for N_2O destruction facility

The detailed equations for the leakage are given in the revised monitoring plan.

The electricity used is measured monthly. The monitoring device will be subject to regular calibration, maintenance and testing regime to ensure accuracy.

(a) the proposed revision of the monitoring plan ensures that the level of accuracy or completeness in the monitoring and verification process is not reduced as a result of the revisions
It appears that the project emissions and leakage determined using the calculations, as specified in the revised monitoring plan, is appropriate and is representing a conservative approach compared to the registered monitoring plan by taking into account the emissions related to the production of ammonia, electricity used in the N_2O destruction unit and emissions related to the re-heating of the tail gas.

(b) the proposed revision of the monitoring plan is in accordance with the approved monitoring methodology applicable to the project activity
The proposed revision made for the calculation of project emissions is in accordance with the approved monitoring methodology AM0028. The measurement of electricity used in the N_2O destruction unit is not required by AM0028, but it is counted as leakage for the sake of conservativeness (approx. 0.5% of project emissions). The equations available in AM0028 for determination of leakage related to the net change in heating of the tail gas is not directly applicable to the project activity since natural gas is used for the heating. As the natural gas is used within the project boundary the project proponent has included the emissions from natural gas as project emissions (approx. 0.8% of project emissions) in an appropriate way.

(c) the findings of previous verification reports, if any, have been taken into account
DNV's verification activity for the project revealed inconsistency in the monitoring plan of the registered PDD. The findings will be taken into account in the first revised verification monitoring report.

Yours faithfully
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