United Nations
Climate Change Secretariat

Training-Workshop on CDM Post-registration Changes (PRCs)
and Programme of Activities (PoAs)
12-14 February 2014 - Pretoria, South Africa

PRC Case Study 3: Permanent changes from the registered monitoring plan or applied methodology

Guidance to carry out the case study

- Read the relevant information on the PoA and the reference regulatory documents provided for the case study.
- After reading the documents, discuss the questions asked within your group and then try to answer them individually.
- A plenary discussion will follow where selected members of your group can present your results.
- The facilitators will comment on your results and compare them with the ones suggested by the UNFCCC secretariat.

Case Study 3a

• Brief description of the project

The project activity involves the installation and operation of a landfill gas capture and flaring system in the ACME Landfill located in Bogota.

The project improves the existing impermeabilization system, the creation of new biogas extraction wells and a conveyance piping system, assisted by suction and pressure pumps, to carry the biogas to a 5,000 m3/h flaring plant.

The registered monitoring plan foresees the monitoring of the parameters relevant to:

1. the LFG extraction and combustion in the enclosed flare
    a. LFG_{flare} – total amount of LFG sent to flare
    b. $F_{CH4,LFG,t}$ – Methane content in the LFG
    c. $F_{CH4,EG,t}$ – Methane content in the exhaust gas of the flare
    d. T_{flare} – Temperature in the exhaust gas of the flare
2. the consumption of electricity
    a. $EG_{EC,y}$ - Amount of electricity consumed
    b. TDL – Transmission losses
    c. $EF_{grid,CM,y}$ – Combined Grid Emission Factor

<u>The post registration change</u>

During the first verification, the DOE observed that:

- A diesel generator has been also installed for emergency purposes; and

- LPG is also used as fuel for flare ignition after shutdowns.

Therefore, the DOE requested the PP to revise the registered monitoring plan to align with current practice at the project site.

The monitoring plan was revised to include the monitoring of the following parameters:

- $FC_{i,j,y}$ - Quantity of fuel type i combusted in process j during the year y
- $NCV_{i,y}$ - Weighted average net calorific value of fuel type i in year y
- $EF_{CO2,i,y}$ - Weighted average CO2 emission factor of fuel type i in year y
- $\rho_{i,y}$ - Weighted average density of fuel type i in year y

The inclusion has been done following the requirement of the "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion" version 2.

Reference regulatory documents

1. *CDM Validation and Verification Standard (VVS) v 5.0 / paragraph 262-268.*
2. *CDM Project Standard (PS) v 5.0 / paragraph 221-223 Appendix I.*
3. *CDM Project Cycle Procedure (PCP) v 5.0 / paragraph 130-157*
4. *Methodology ACM0001 ver. 3, page 7*
5. *Tool to calculate project or leakage CO2 emissions from fossil fuel combustion ver. 2, page 1-3, 5-7*

Questions:

1. Are the proposed changes to the monitoring plan in line with the requirement of the applied monitoring methodology?
2. Does this case of post registration change require prior approval? Why?
3. Does the proposed change lead to a reduction of the accuracy of the calculation of the emission reductions?

Case Study 3b

• Brief description of the project

The project involves the installation and operation of new covered lagoons for the treatment of animal waste from four farms, located in Malaysia. The generated biogas is captured and combusted in an enclosed flare.

The project applies the methodology AMS-III.D version 8.

The emission reductions (ER) from flaring are calculated as follow:

$$ERflare = Biogas_{flared} \times MC_{CH4} \times FE_{\%} \times GWP_{CH4}$$

Where

$Biogas_{flared}$ = Amount of biogas flared
MC_{CH4} = Methane concentration of the biogas
$FE_{\%}$ = Flare efficiency
GWP_{CH4} = Global warming power of methane

The registered monitoring plan states that:

- Methane concentration is determined with a gas analyzer quarterly.
- The equipment and test procedures will provide an accuracy of 0.5%.

The post registration change

The PP draft a monitoring report (MR) covering the monitoring period 1 Jan 2010 – 31 Dec 2010

The MR states that the project is implemented in line with the registered PDD. The new covered lagoons have been installed at the four farms. The recovered biogas has been combusted in an enclosed flare.

The MR describes that the parameter "Methane concentration of the biogas" (MC_{pCH4}) is monitored 2qarterly with a LandTec gas analyzer, which is calibrated against bottled gas samples. The accuracy of the Landtec Biogas Check portable gas analyser according to the specifications of the equipment supplier is 0.5% for methane contents of less than 5%, and 3% for methane contents above 5%.

The MR also states that the ER from flaring are determined as amount of biogas sent to the flare multiplied by the methane content to obtain the volumetric methane flow, then adjusted by the flare efficiency and, finally, multiplied by the Global Warming Power of methane.

**Training-Workshop on CDM Post-registration Changes (PRCs)
and Programme of Activities (PoAs)
12-14 February 2014 - Pretoria, South Africa**

Reference regulatory documents

1. *CDM Validation and Verification Standard (VVS) v 5.0 / paragraph 262-268.*
2. *CDM Project Standard (PS) v 5.0 / paragraph 221-223 Appendix I.*
3. *CDM Project Cycle Procedure (PCP) v 5.0 / paragraph 130-157*
4. *AMS-III.D version 8, para 8*

Questions:

1. Is there any change between the registered monitoring plan and the monitoring practice reported in the MR?
2. Does this case of post registration change require prior approval? Why?
3. How can the PP proceed with this change?

Case Study 3c

• Brief description of the project

The Project Activity is a waste heat recovery power generation project in a cement manufacturing plant in China. The project generates electricity through recovering and utilizing the waste heat from two clinker lines. Two Pre-Heater boilers and two Air Quenching Cooling boilers will be installed, which connect to a turbine-generator of 18 MW.

The electricity generated by the 18MW power plant is consumed for captive use by the cement company, so partially replacing electricity consumption from the grid which is dominated by fossil fuel power plants.

As per the registered monitoring plan, electricity imports from the grid for auxiliary electricity consumption by the project boilers and turbine-generator unit are deducted in order to derive the net electricity supply by the project to the cement plant.
The electricity imports by the turbine-generator unit are monitored by the bidirectional meters 2 (installed at the recipient end) and 1 (generation end); Meter 2 is used for ER calculation. The electricity imported for the consumption of boiler mechanical equipment is measured by meter 3, 4 (auxiliary consumption meters) as shown in Figure 1. Therefore, the project electricity import from the grid is calculated as $EC_{PJ,y}$= $M2_{import}$+M3 +M4

The net electricity supplied by the project to the cement plant is now calculated as $EG_{i,j,y}$= M2export - $EC_{PJ,y}$

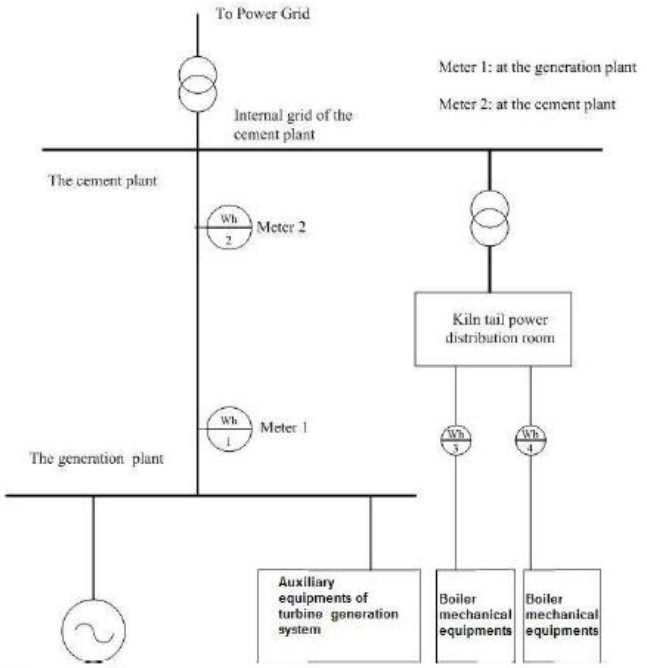


Figure 1. The diagram in the registered monitoring plan

According to the monitoring methodology ACM0012 version 3, the parameter EGi,,j,y needs to be monitored monthly by energy meters.

According to the monitoring methodology, project emissions include emissions due to (1) combustion of maintenance fuel to supplement waste gas/heat and (2) electricity emissions due to consumption of electricity for cleaning of gas before being used for generation of energy or other supplementary electricity consumption; and (3) emissions due to consumption of imported electricity that in the absence of project activity would have been supplied by captive electricity generated (only for Type-2 project activities).

The post registration change

During the first verification, the DOE observes on-site that:

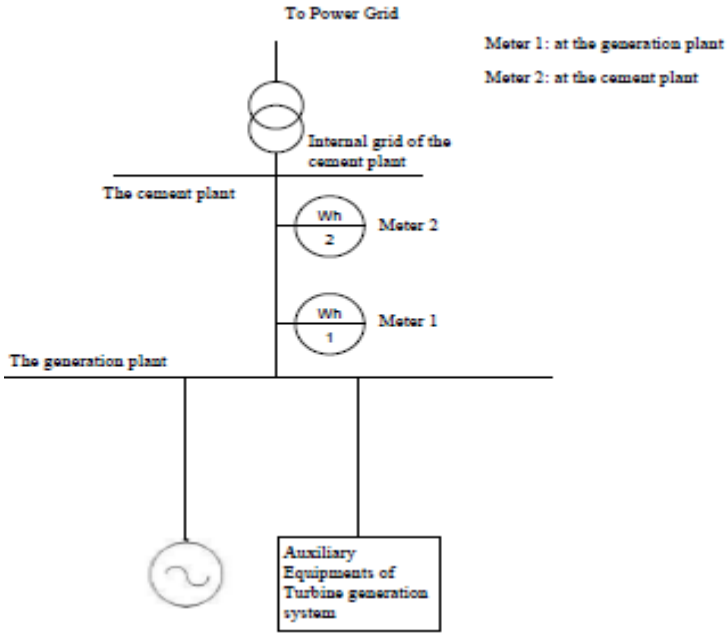
- Boilers and turbine-generator unit are installed as per description in the registered PDD;
- Meter 3 and Meter 4 have not been installed, as the electricity consumption for the boiler mechanical equipment during maintenance periods is supplied by the project instead of the grid.

- The electricity imported to the proposed project from the grid for maintenance consumption has been monitored monthly by Meter 1 and Meter 2 (reverse direction) and deducted from the quantity of electricity supplied to the recipient by generator (as shown in Figure 2).

The above changes are reflected into a revised monitoring plan as follow:

- The parameter $EC_{PJ,y}$ and corresponding equation ($EC_{PJ,y}$= $M2_{import}$+M3 +M4) are excluded from the PDD;

- The net electricity supplied by the project to the cement plant is now calculated as $EG_{i,j,y}$= M2,export - M2,import



• Reference regulatory documents

1. *CDM Validation and Verification Standard (VVS) v 5.0 / paragraph 262-268.*
2. *CDM Project Standard (PS) v 5.0 / paragraph 221-223 Appendix I.*
3. *CDM Project Cycle Procedure (PCP) v 5.0 / paragraph 130-157*
4. *Methodology ACM0012 version 3, page 40*

- **Questions:**

1. Are the proposed changes to the monitoring plan in line with the requirement of the applied monitoring methodology?
2. Does this case of post registration change require prior approval? Why?
3. Does the proposed change lead to a reduction of the accuracy of the calculation of the emission reductions?

End