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TYPE III - OTHER PROJECT ACTIVITIES

Project participants shall take into account the general guidance to the methodologies, information on additionality, abbreviations and general guidance on leakage provided at http://cdm.unfccc.int/methodologies/SSCmethodologies/approved.html.

III.D. Methane recovery in agricultural and agro industrial activities

Technology/measure

1. This project category comprises methane recovery and destruction from manure and wastes from agricultural or agro-industrial activities that would be decaying anaerobically in the absence of the project activity by

(a) installing Installing methane recovery and combustion system to an existing source of methane emissions, or

(b) Changing the management practice of a biogenic waste or raw material in order to achieve the controlled anaerobic digestion equipped with methane recovery and combustion system.

2. The project activity shall satisfy attend to the following conditions:

(a)The sludge must be handled aerobically. In case of soil application of the final sludge the proper conditions and procedures (not resulting in methane emissions) must be ensured.

(b)Technical measures shall be used (e.g. flared, combusted) to ensure that all biogas produced by the digester is used or flared.

3. Projects that recover methane from landfills shall use category III-G and projects for wastewater treatment shall use category III-H.

4. Measures are limited to those that result in emission reductions of less than or equal to 60 kt CO_2 equivalent annually.

Boundary

5. The project boundary is the physical, geographical site of the methane recovery facility.

Project Activity Emissions

6. PTechnical measures shall be used (e.g. flared, combusted) to ensure that all biogas produced by the digester is destroyed. If biogas is released to the atmosphere unburned, these methane emissions shall be considered as the project emissions. Pproject emissionsemissions consist of should be consideredtherefore consist of:(i) Methane not captured by the project and released to the atmosphere; (ii) Methane captured and not flared (e.g. physical leakage, flare inefficiency, flare availability);(iii) CO_2 emissions from combustion of non-biogenic methane;(ICO_2 emissions from use of fossil fuels or electricity for the operation of the facility;

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III.D. Methane recovery in agricultural and agro industrial activities (cont)

(iiv) The aerobic treatment and/or proper soil application of the sludge leaving the digesters in the project activity shall also be ensured and monitored. If the sludge is treated and/or disposed anaerobically, the resulting methane emissions shall be considered as project emissions.

Baseline

7. 4. The emission baseline is the amount of methane that would be emitted to the atmosphere during the crediting period in the absence of the project activity. For each year during the crediting period, emissions are calculated as specified in paragraph a and paragraph b below and lower of the two values is usedActual monitored amount of methane captured and destroyed by the project activity.The baseline scenario is the situation where, in the absence of the project activity, biomass and other organic matter are left to decay anaerobically within the project boundary and methane is emitted to the atmosphere. Baseline emissions (***BE_y***) are calculated ex ante using the amount of the waste or raw material that would decay anaerobically in the absence of the project activity, with the most recent IPCC tier 2 approach (please refer to the chapter 'Emissions from Livestock and Manure Management' under the volume 'Agriculture, Forestry and other Land use' of the 2006 IPCC Guidelines for National Greenhouse Gas Inventories).

8. If the recovered methane is used for heat or electricity generation, the corresponding category of type I project activities can be applied.

Leakage

9. No leakage calculation is required

Monitoring

10. Emission reductions achieved by the project activity in each year will be assessed ex-post through direct measurement of the amount of methane fuelled or flared. The maximal emission reduction in any year is limited to the yearly methane generation potential calculated in the project design document for that year.

11. The amount of methane recovered and fuelled or flared shall be monitored ex-post, using continuous flow meters. The fraction of methane in the biogas should be measured with a continuous analyser or, alternatively, with periodical measurements at a 95% confidence level. Temperature and pressure of the biogas are required to determine the density of methane combusted.

12. Regular maintenance should ensure optimal operation of flares. The flare efficiency, defined as the fraction of time in which the gas is combusted in the flare, multiplied by the efficiency of the flaring process, shall be monitored. One of the two following options shall be used to determine the efficiency of the flaring process in an enclosed flare:

a. to adopt a 90% default value or

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III.D. Methane recovery in agricultural and agro industrial activities (cont)

b. to perform a continuous monitoring of the efficiency.[1]

If option (a) is chosen, continuous check of compliance with the manufacturer's specification of the flare device (temperature, biogas flow rate) should be done. If in any specific hour any of the parameters is out of the range of specifications, 50% of default value should be used for this specific hour. For open flare 50% default value should be used, as it is not possible in this case to monitor the efficiency. If at any given time the temperature of the flare is below 500ºC, 0% default value should be used for this period.

Project activities where a portion of the biogas is destroyed through flaring and the other portion is used for energy may consider to apply the flare efficiency to the portion of the biogas used for energy, if separate measurements are not performed.

13. The emission reduction achieved by the project activity can be estimated ex-ante in the PDD by:

$$ER_{y,estimated} = BE_y - PE_y - Leakage$$

The actual emission reduction achieved by the project during the crediting period will be calculated using the amount of methane recovered and destroyed by the project activity, calculated as:

$$ER_{y,calculated} = MD_y - PE_y - Leakage$$

Where:

PE_y actual project emissions in the year y

MD_y methane captured and destroyed by the project activity in the year "y" (tCO_2 e), that will be measured using the conditions of the flaring process:

$$MD_y = BLFG_{burnt,y} * w_{CH4,y} * D_{CH4,y} * FE * GWP_{CH4}$$

Where:

$BLFG_{burnt,y}$ biogas[2] flared or used as fuel in the year "y" (m^3).

$w_{CH4,y}$ methane content[4] in biogas in the year "y" (mass fraction).

$D_{CH4,y}$ density of methane at the temperature and pressure of the biogas in the year "y" (tonnes/m^3).

FE flare efficiency in the year "y" (fraction)

GWP_{CH4} Methane global warming potential (21)

14. The method for integration of the terms in equation above to obtain the results for one year of measurements within the confidence level, as well as the methods and instruments used for

[1] The procedures described in the Methodological Tool to determine project emissions from flaring gases containing methane shall be used.

[2] BioLandfill gas and methane content measurements shall be on the same basis (wet or dry)

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III.D. Methane recovery in agricultural and agro industrial activities (cont)

metering, recording and processing the data obtained, shall be described in the project design document and monitored during the crediting period.

~~8. The amount of methane used as fuel or combusted shall be monitored, using flow meters and analysing the methane content of the combusted gases either online, or with samples taken at least quarterly, and more frequently if the results show significant deviations from previous values.~~

~~9. Regular maintenance should ensure optimal operation of flares. The flare efficiency, defined as the fraction of time in which the gas is combusted in the flare, multiplied by the efficiency of the flaring process, shall be monitored.~~

15. Flow meters, sampling devices and gas analysers shall be subject to regular maintenance, testing and calibration to ensure accuracy.

16. The proper soil application (not resulting in methane emissions) of the final sludge must be monitored.

17. The monitoring plan should include on site inspections for each individual farm included in the project boundary where the project activity is implemented for each verification period.