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Commission Implementing Regulation (EU) 2018/2066 of 19 December 2018 on the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council and amending Commission Regulation (EU) No 601/2012 (Text with EEA relevance)

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ANNEX IV

Activity-specific monitoring methodologies related to installations (Article 20(2))

22. DETERMINATION OF GREENHOUSE GAS EMISSIONS FROM THE TRANSPORT OF CO_2 BY PIPELINES FOR GEOLOGICAL STORAGE IN A STORAGE SITE PERMITTED UNDER DIRECTIVE 2009/31/EC

A. Scope

The boundaries for monitoring and reporting emissions from CO_2 transport by pipeline shall be laid down in the transport network's greenhouse gas emissions permit, including all ancillary plant functionally connected to the transport network, including booster stations and heaters. Each transport network shall have a minimum of one start point and one end point, each connected to other installations carrying out one or more of the activities: capture, transport or geological storage of CO_2. Start and end points may include bifurcations of the transport network and cross national borders. Start and end points as well as the installations they are connecting to, shall be laid down in the greenhouse gas emissions permit.

Each operator shall consider at least the following potential emission sources for CO_2 emissions: combustion and other processes at installations functionally connected to the transport network including booster stations; fugitive emissions from the transport network; vented emissions from the transport network; and emissions from leakage incidents in the transport network.

B. Quantification Methodologies for CO_2

The operator of transport networks shall determine emissions using one of the following methods:

(a) Method A (overall mass balance of all input and output streams) set out in subsection B.1;

(b) Method B (monitoring of emission sources individually) set out in subsection B.2.

In choosing either Method A or Method B, each operator shall demonstrate to the competent authority that the chosen methodology will lead to more reliable results with lower uncertainty of the overall emissions, using best available technology and knowledge at the time of the application for the greenhouse gas emissions permit and approval of the monitoring plan, without incurring unreasonable costs. Where Method B is chosen each operator shall demonstrate to the satisfaction of the competent authority that the overall uncertainty for the annual level of greenhouse gas emissions for the operator's transport network does not exceed 7,5 %.

The operator of a transport network using Method B shall not add CO_2 received from another installation permitted in accordance with Directive 2003/87/EC to its calculated level of emissions, and shall not subtract from its calculated level of emissions any CO_2 transferred to another installation permitted in accordance with Directive 2003/87/EC.

Each operator of a transport network shall use Method A for the validation of the results of Method B at least once annually. For that validation, the operator may use lower tiers for the application of Method A.

B.1. Method A

Each operator shall determine emissions in accordance with the following formula:

$$Emissions[t\ CO_2] = E_{own\ activity} + \sum_i T_{IN,i} - \sum_i T_{OUT,i}$$

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Where:

Emissions	=	Total CO_2 emissions of the transport network [t CO_2];
$E_{own\ activity}$	=	Emissions from the transport network's own activity, meaning not emissions stemming from the CO_2 transported, but including emissions from fuel used in booster stations, monitored in accordance with the relevant sections of Annex IV;
$T_{IN,i}$	=	Amount of CO_2 transferred to the transport network at entry point *i*, determined in accordance with Articles 40 to 46 and Article 49.
$T_{OUT,i}$	=	Amount of CO_2 transferred out of the transport network at exit point *i*, determined in accordance with Articles 40 to 46 and Article 49.

B.2. **Method B**

Each operator shall determine emissions considering all processes relevant to emissions at the installation as well as the amount of CO_2 captured and transferred to the transport facility using the following formula:

Emissions [t CO_2]= $CO_{2\ fugitive} + CO_{2\ vented} + CO_{2\ leakage\ events} + CO_{2\ installations}$

Where:

Emissions	=	Total CO_2 emissions of the transport network [t CO_2];
$CO_{2\ fugitive}$	=	Amount of fugitive emissions [t CO_2] from CO_2 transported in the transport network, including from seals, valves, intermediate compressor stations and intermediate storage facilities;
$CO_{2\ vented}$	=	Amount of vented emissions [t CO_2] from CO_2 transported in the transport network;
$CO_{2\ leakage\ events}$	=	Amount of CO_2 [t CO_2] transported in the transport network, which is emitted as the result of the failure of one or more components of the transport network;
$CO_{2\ installations}$	=	Amount of CO_2 [t CO_2] being emitted from combustion or other processes functionally connected to the pipeline transport in the transport network, monitored in accordance with the relevant sections of Annex IV.

B.2.1. *Fugitive emissions from the transport network*

The operator shall consider fugitive emissions from any of the following types of equipment:

(a) seals;

(b) measurement devices;

(c) valves;

(d) intermediate compressor stations;

(e) intermediate storage facilities.

The operator shall determine average emission factors *EF* (expressed in g CO_2/unit time) per piece of equipment per occurrence where fugitive emissions can be anticipated at the beginning of operation, and by the end of the first reporting year in which the transport network is in operation at the latest. The operator shall review those factors at least every 5 years in the light of the best available techniques and knowledge.

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The operator shall calculate fugitive emissions by multiplying the number of pieces of equipment in each category by the emission factor and adding up the results for the single categories as shown in the following equation:

$$Fugitive\ Em[t\ CO_2] = \left(\sum_{Category} EF[g\ CO_2\ /\ occurr] \times N_{occurr}\right) \Big/ 10^6$$

The number of occurrences (N_{occurr}) shall be the number of pieces of the given equipment per category, multiplied by the number of time units per year.

B.2.2. *Emissions from leakage events*

The operator of a transport network shall provide evidence of the network integrity by using representative (spatial and time-related) temperature and pressure data. Where the data indicates that a leakage has occurred, the operator shall calculate the amount of CO_2 leaked with a suitable methodology documented in the monitoring plan, based on industry best practice guidelines, including by use of the differences in temperature and pressure data compared to integrity related average pressure and temperature values.

B.2.3. *Vented emissions*

Each operator shall provide in the monitoring plan an analysis regarding potential situations of venting emissions, including for maintenance or emergency reasons, and provide a suitable documented methodology for calculating the amount of CO_2 vented, based on industry best practice guidelines.

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