

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)

CHAPTER III

MONITORING OF EMISSIONS FROM STATIONARY INSTALLATIONS

SECTION I

General provisions

Article 19

Categorisation of installations, source streams and emission sources

- 1 For the purpose of monitoring emissions and determining the minimum requirements for tiers, each operator shall determine the category of its installation pursuant to paragraph 2, and, where relevant, of each source stream pursuant to paragraph 3 and of each emission source pursuant to paragraph 4.
- 2 The operator shall classify each installation in one of the following categories:
 - a a category A installation, where the average verified annual emissions in the trading period immediately preceding the current trading period, with the exclusion of CO₂ stemming from biomass and before subtraction of transferred CO₂, are equal to or less than 50 000 tonnes of CO_{2(e)};
 - b a category B installation, where the average verified annual emissions of the trading period immediately preceding the current trading period, with the exclusion of CO₂ stemming from biomass and before subtraction of transferred CO₂, are more than 50 000 tonnes of CO_{2(e)} and equal to or less than 500 000 tonnes of CO_{2(e)};
 - c a category C installation, where the average verified annual emissions of the trading period immediately preceding the current trading period, with the exclusion of CO₂ stemming from biomass and before subtraction of transferred CO₂, are more than 500 000 tonnes of CO_{2(e)}.

By way of derogation from Article 14(2), the competent authority may allow the operator not to modify the monitoring plan where, on the basis of verified emissions, the threshold for the classification of the installation referred to in the first subparagraph is exceeded, but the operator demonstrates to the satisfaction of the competent authority that this threshold has not already been exceeded within the past five reporting periods and will not be exceeded again in subsequent reporting periods.

- 3 The operator shall classify each source stream in one of the following categories, comparing it against the sum of all absolute values of fossil CO₂ and CO_{2(e)} corresponding to all source streams included in calculation-based methodologies and of all emissions of emission sources monitored using measurement-based methodologies, before subtraction of transferred CO₂:

- a minor source streams, where the source streams selected by the operator jointly account for less than 5 000 tonnes of fossil CO₂ per year or less than 10 %, up to a total maximum of 100 000 tonnes of fossil CO₂ per year, whichever is greater in terms of absolute value;
- b *de minimis* source streams, where the source streams selected by the operator jointly account for less than 1 000 tonnes of fossil CO₂ per year or less than 2 %, up to a total maximum of 20 000 tonnes of fossil CO₂ per year, whichever is greater in terms of absolute value;
- c major source streams, where the source streams do not fall within the categories referred to in points (a) and (b).

By way of derogation from Article 14(2), the competent authority may allow the operator not to modify the monitoring plan where, on the basis of verified emissions, the threshold for the classification of a source stream as a minor source stream or a *de minimis* source stream referred to in the first subparagraph is exceeded, but the operator demonstrates to the satisfaction of the competent authority that this threshold has not already been exceeded within the past five reporting periods and will not be exceeded again in subsequent reporting periods.

4 The operator shall classify each emission source for which a measurement-based methodology is applied in one of the following categories:

- a minor emission sources, where the emission source emits less than 5 000 tonnes of fossil CO_{2(e)} per year or less than 10 % of the installation's total fossil emissions, up to a maximum of 100 000 tonnes of fossil CO_{2(e)} per year, whichever is greater in terms of absolute value;
- b major emission sources, where the emission source does not classify as a minor emission source.

By way of derogation from Article 14(2), the competent authority may allow the operator not to modify the monitoring plan where, on the basis of verified emissions, the threshold for the classification of an emission source as a minor emission source referred to in the first subparagraph is exceeded, but the operator demonstrates to the satisfaction of the competent authority that this threshold has not already been exceeded within the past five reporting periods and will not be exceeded again in subsequent reporting periods.

5 Where the average annual verified emissions in the trading period immediately preceding the current trading period for the installation are not available or no longer representative for the purpose of paragraph 2, the operator shall use a conservative estimate of annual average emissions, with the exclusion of CO₂ stemming from biomass and before subtraction of transferred CO₂, to determine the category of the installation.

Article 20

Monitoring boundaries

1 Operators shall define the monitoring boundaries for each installation.

Within those boundaries, the operator shall include all relevant greenhouse gas emissions from all emission sources and source streams belonging to activities carried out at the installation and listed in Annex I to Directive 2003/87/EC, and from activities and greenhouse gases included by the Member State in which the installation is situated, pursuant to Article 24 of that Directive.

The operator shall also include emissions from regular operations and abnormal events, including start-up, shut-down and emergency situations, over the reporting period, with the exception of emissions from mobile machinery for transportation purposes.

2 When determining the monitoring and reporting process, the operator shall include the sector-specific requirements laid down in Annex IV.

3 Where leakages from a storage complex within the meaning of Directive 2009/31/EC are identified and lead to emissions or release of CO₂ to the water column, they shall be considered as emission sources for the installation in question and shall be monitored in accordance with section 23 of Annex IV to this Regulation.

The competent authority may allow the exclusion of a leakage emission source from the monitoring and reporting process, once corrective measures pursuant to Article 16 of Directive 2009/31/EC have been taken and emissions or release into the water column from that leakage can no longer be detected.

Article 21

Choice of the monitoring methodology

1 For the monitoring of the emissions of an installation, the operator shall choose to apply either a calculation-based methodology or a measurement-based methodology, subject to specific provisions of this Regulation.

A calculation-based methodology shall consist in determining emissions from source streams on the basis of activity data obtained by means of measurement systems and additional parameters from laboratory analyses or default values. The calculation-based methodology may be implemented according to the standard methodology set out in Article 24 or the mass-balance methodology set out in Article 25.

A measurement-based methodology shall consist in determining emissions from emission sources by means of continuous measurement of the concentration of the relevant greenhouse gas in the flue gas and of the flue-gas flow, including the monitoring of CO₂ transfers between installations where the CO₂ concentration and the flow of the transferred gas are measured.

Where the calculation-based methodology is applied, the operator shall determine for each source stream, in the monitoring plan, whether the standard methodology or the mass-balance methodology is used, including the relevant tiers in accordance with Annex II.

2 Subject to approval by the competent authority, the operator may combine standard methodology, mass-balance and measurement-based methodologies for different emission sources and source streams belonging to one installation, provided that neither gaps nor double counting concerning emissions occur.

3 Where sector-specific requirements laid down in Annex IV require the use of a specific monitoring methodology, the operator shall use that methodology or a measurement-based methodology. The operator may choose a different methodology only if it provides the competent authority with evidence that the use of the required methodology is technically not feasible or incurs unreasonable costs, or that the alternative methodology leads to a higher overall accuracy of emissions data.

Article 22

Monitoring methodology not based on tiers

By way of derogation from Article 21(1), the operator may use a monitoring methodology that is not based on tiers (hereinafter ‘the fall-back methodology’) for selected source streams or emission sources, provided that all of the following conditions are met:

- (a) applying at least tier 1 under the calculation-based methodology for one or more major source streams or minor source streams and a measurement-based methodology for at least one emission source related to the same source streams is technically not feasible or would incur unreasonable costs;
- (b) the operator assesses and quantifies each year the uncertainties of all parameters used for the determination of the annual emissions in accordance with the *ISO guide to the expression of uncertainty in measurement* (JCGM 100:2008) or another equivalent internationally accepted standard, and includes the results in the annual emissions report;
- (c) the operator demonstrates to the satisfaction of the competent authority that by applying such a fall-back monitoring methodology, the overall uncertainty thresholds for the annual level of greenhouse gas emissions for the whole installation do not exceed 7,5 % for category A installations, 5,0 % for category B installations and 2,5 % for category C installations.

Article 23

Temporary changes to the monitoring methodology

1 Where it is for technical reasons temporarily not feasible to apply the monitoring plan as approved by the competent authority, the operator concerned shall apply the highest achievable tier, or a conservative no-tier approach if application of a tier is not achievable, until the conditions for application of the tier approved in the monitoring plan have been restored.

The operator shall take all necessary measures to allow the prompt resumption of the application of the monitoring plan as approved by the competent authority.

2 The operator concerned shall notify the competent authority of the temporary change referred to in paragraph 1 to the monitoring methodology without undue delay to the competent authority, specifying:

- a the reasons for deviating from the monitoring plan as approved by the competent authority;
- b the details of the interim monitoring methodology that the operator is using to determine the emissions until the conditions for the application of the monitoring plan as approved by the competent authority have been restored;
- c the measures the operator is taking to restore the conditions for the application of the monitoring plan as approved by the competent authority;
- d the anticipated point in time when application of the monitoring plan as approved by the competent authority will be resumed.

SECTION 2

Calculation-based methodology

Subsection 1

General

Article 24

Calculation of emissions under the standard methodology

1 Under the standard methodology, the operator shall calculate combustion emissions source stream by multiplying the activity data related to the amount of fuel combusted, expressed as terajoules based on net calorific value (NCV), by the corresponding emission factor, expressed as tonnes of CO₂ per terajoule (t CO₂/TJ) consistent with the use of NCV, and the corresponding oxidation factor.

The competent authority may allow the use of emission factors for fuels expressed as t CO₂/t or t CO₂/Nm³. In such cases, the operator shall determine combustion emissions by multiplying the activity data related to the amount of fuel combusted, expressed as tonnes or normal cubic metres, by the corresponding emission factor and the corresponding oxidation factor.

2 The operator shall determine process emissions per source stream by multiplying the activity data related to the material consumption, throughput or production output, expressed in tonnes or normal cubic metres, by the corresponding emission factor, expressed in t CO₂/t or t CO₂/Nm³, and the corresponding conversion factor.

3 Where a tier 1 or tier 2 emission factor already includes the effect of incomplete chemical reactions, the oxidation factor or conversion factor shall be set to 1.

Article 25

Calculation of emissions under the mass balance methodology

1 Under the mass balance methodology, the operator shall calculate the quantity of CO₂ corresponding to each source stream included in the mass balance by multiplying the activity data related to the amount of fuel or material entering or leaving the boundaries of the mass balance, with the fuel's or material's carbon content multiplied by 3,664 t CO₂/t C, applying section 3 of Annex II.

2 Notwithstanding Article 49, the emissions of the total process covered by the mass balance shall be the sum of the CO₂ quantities corresponding to all source streams covered by the mass balance. CO emitted to the atmosphere shall be calculated in the mass balance as emission of the molar equivalent amount of CO₂.

Article 26

Applicable tiers

1 When defining the relevant tiers for major and minor source streams in accordance with Article 21(1), to determine the activity data and each calculation factor, each operator shall apply the following:

- a at least the tiers listed in Annex V, in the case of a category A installation, or where a calculation factor is required for a source stream that is a commercial standard fuel;
- b in other cases than those referred to in point (a), the highest tier as defined in Annex II.

However, for major source streams the operator may apply a tier one level lower than required in accordance with the first subparagraph for category C installations and up to two levels lower for category A and B installations, with a minimum of tier 1, where it shows to the satisfaction of the competent authority that the tier required in accordance with the first subparagraph is technically not feasible or incurs unreasonable costs.

The competent authority may, for a transitional period agreed with the operator, allow an operator to apply tiers for major source streams that are lower than those referred to in the second subparagraph, with a minimum of tier 1, provided that:

- a the operator shows to the satisfaction of the competent authority that the tier required pursuant to the second subparagraph is technically not feasible or incurs unreasonable costs; and
- b the operator provides an improvement plan indicating how and by when at least the tier required pursuant to the second subparagraph will be reached.

2 For minor source streams, the operator may apply a lower tier than required in accordance with the first subparagraph of paragraph 1, with a minimum of tier 1, where it shows to the satisfaction of the competent authority that the tier required in accordance with the first subparagraph of paragraph 1 is technically not feasible or incurs unreasonable costs.

3 For *de minimis* source streams, the operator may determine activity data and each calculation factor by using conservative estimates instead of using tiers, unless a defined tier is achievable without additional effort.

4 For the oxidation factor and conversion factor, the operator shall, as a minimum, apply the lowest tiers listed in Annex II.

5 Where the competent authority has allowed the use of emission factors expressed as t CO₂/t or t CO₂/Nm³ for fuels, and for fuels used as process input or in mass balances in accordance with Article 25, the net calorific value may be monitored using a conservative estimate instead of using tiers, unless a defined tier is achievable without additional effort.

Subsection 2

Activity data

Article 27

Determination of activity data

1 The operator shall determine the activity data of a source stream in one of the following ways:

- a on the basis of continual metering at the process which causes the emissions;
- b on the basis of aggregation of metering of quantities delivered separately, taking into account relevant stock changes.

2 For the purposes of point (b) of paragraph 1, the quantity of fuel or material processed during the reporting period shall be calculated as the quantity of fuel or material received during the reporting period, minus the quantity of fuel or material moved out of the installation, plus the quantity of fuel or material in stock at the beginning of the reporting period, minus the quantity of fuel or material in stock at the end of the reporting period.

Where it is technically not feasible or would incur unreasonable costs to determine quantities in stock by direct measurement, the operator may estimate those quantities on the basis of one of the following:

- a data from previous years correlated with output for the reporting period;
- b documented procedures and respective data in audited financial statements for the reporting period.

Where it is technically not feasible or would incur unreasonable costs to determine activity data for the entire calendar year, the operator may choose the next most appropriate day to separate one reporting year from the subsequent year, and reconcile accordingly to the calendar year required. The deviations involved for one or more source streams shall be clearly recorded, form the basis of a value representative for the calendar year, and be considered consistently in relation to the next year.

Article 28

Measurement systems under the operator's control

1 To determine activity data in accordance with Article 27, the operator shall use metering results based on measurement systems under its own control at the installation, provided that all of the following conditions are complied with:

- a the operator must carry out an uncertainty assessment and ensures that the uncertainty threshold of the relevant tier level is met;
- b the operator must ensure at least once a year and after each calibration of a measuring instrument that the calibration results multiplied by a conservative adjustment factor are compared with the relevant uncertainty thresholds. The conservative adjustment factor shall be based on an appropriate time series of previous calibrations of that or similar measuring instruments for taking into account the effect of uncertainty in service.

Where tier thresholds approved in accordance with Article 12 are exceeded or equipment found not to conform with other requirements, the operator shall take corrective action without undue delay and notify the competent authority thereof.

2 When notifying a new monitoring plan or when it is relevant for a change to the approved monitoring plan, the operator shall provide the competent authority with the uncertainty assessment referred to in point (a) of paragraph 1.

The assessment shall cover the specified uncertainty of the applied measuring instruments, uncertainty associated with the calibration, and any additional uncertainty connected to how the measuring instruments are used in practice. The uncertainty assessment shall cover uncertainty related to stock changes where the storage facilities are capable of containing at least 5 % of the annual used quantity of the fuel or material considered. When carrying out the assessment, the operator shall take into account the fact that the stated values used to define tier uncertainty thresholds in Annex II refer to the uncertainty over the full reporting period.

The operator may simplify the uncertainty assessment by assuming that the maximum permissible errors specified for the measuring instrument in service or, where lower, the uncertainty obtained by calibration, multiplied by a conservative adjustment factor for taking into account the effect of uncertainty in service, are to be regarded as the uncertainty over the whole reporting period as required by the tier definitions in Annex II, provided that measuring instruments are installed in an environment appropriate for their use specifications.

3 Notwithstanding paragraph 2, the competent authority may allow the operator to use metering results based on measurement systems under its own control at the installation, where the operator provides evidence that the measuring instruments applied are subject to relevant national legal metrological control.

For that purpose, the maximum permissible error in service allowed by the relevant national legislation on legal metrological control for the relevant measuring task may be used as the uncertainty value without providing further evidence.

Article 29

Measurement systems outside the operator's own control

1 Where, based on a simplified uncertainty assessment, the use of measurement systems outside the operator's own control, as compared with the use of those within the operator's own control pursuant to Article 28, allows the operator to comply with at least as high a tier, gives more reliable results and is less prone to control risks, the operator shall determine the activity data from measurement systems outside its own control.

To that end, the operator may revert to one of the following data sources:

- a amounts from invoices issued by a trade partner, provided that a commercial transaction between two independent trade partners takes place;
- b direct readings from the measurement systems.

2 The operator shall ensure compliance with the applicable tier pursuant to Article 26.

To that end, the maximum permissible error in service allowed by relevant legislation for national legal metrological control for the relevant commercial transaction may be used as uncertainty without providing further evidence.

Where the applicable requirements under national legal metrological control are less stringent than the applicable tier pursuant to Article 26, the operator shall obtain evidence on the applicable uncertainty from the trade partner responsible for the measurement system.

Subsection 3

Calculation factors

Article 30

Determination of calculation factors

1 The operator shall determine calculation factors either as default values or values based on analysis, depending on the applicable tier.

2 The operator shall determine and report calculation factors consistently with the state used for related activity data, referring to the fuel's or material's state in which the fuel or material is purchased or used in the emission-causing process, before it is dried or otherwise treated for laboratory analysis.

Where such an approach incurs unreasonable costs or where higher accuracy can be achieved, the operator may consistently report activity data and calculation factors referring to the state in which laboratory analyses are carried out.

The operator shall be required to determine the biomass fraction only for mixed fuels or materials. For other fuels or materials the default value of 0 % for the biomass fraction of fossil fuels or materials shall be used, and a default value of 100 % biomass fraction for biomass fuels or materials consisting exclusively of biomass.

Article 31

Default values for calculation factors

1 Where the operator determines calculation factors as default values, it shall use one of the following values, in accordance with the requirement of the applicable tier as set out in Annexes II and VI:

- a standard factors and stoichiometric factors listed in Annex VI;
- b standard factors used by the Member State for its national inventory submission to the Secretariat of the United Nations Framework Convention on Climate Change;
- c literature values agreed with the competent authority, including standard factors published by the competent authority, which are compatible with factors referred to in point (b), but representative of more disaggregated sources of fuel streams;
- d values specified and guaranteed by the supplier of a fuel or material where the operator can demonstrate to the satisfaction of the competent authority that the carbon content exhibits a 95 % confidence interval of not more than 1 %;
- e values based on analyses carried out in the past, where the operator can demonstrate to the satisfaction of the competent authority that those values are representative for future batches of the same fuel or material.

2 The operator shall specify all default values used in the monitoring plan.

Where the default values change on an annual basis, the operator shall specify the authoritative applicable source of that value in the monitoring plan.

3 The competent authority may approve a change of default values for a calculation factor in the monitoring plan pursuant to Article 15(2) only where the operator provides evidence that the new default value leads to a more accurate determination of emissions.

Status: This is the original version (as it was originally adopted).

4 Upon application by the operator, the competent authority may allow that the net calorific value and emission factors of fuels are determined using the same tiers as required for commercial standard fuels provided that the operator submits, at least every three years, evidence that the 1 % interval for the specified calorific value has been met during the last three years.

5 Upon application by the operator, the competent authority may accept that the stoichiometric carbon content of a pure chemical substance be considered as meeting a tier that would otherwise require analyses carried out in accordance with Articles 32 to 35, if the operator can demonstrate to the satisfaction of the competent authority that using analyses would lead to unreasonable costs and that using the stoichiometric value will not lead to under-estimation of the emissions.

Article 32

Calculation factors based on analyses

1 The operator shall ensure that any analyses, sampling, calibrations and validations for the determination of calculation factors are carried out by applying methods based on corresponding EN standards.

Where such standards are not available, the methods shall be based on suitable ISO standards or national standards. Where no applicable published standards exist, suitable draft standards, industry best-practice guidelines or other scientifically proven methodologies shall be used, limiting sampling and measurement bias.

2 Where online gas chromatographs or extractive or non-extractive gas analysers are used to determine emissions, the operator shall obtain the competent authority's approval for the use of such equipment. The equipment shall be used only with regard to composition data of gaseous fuels and materials. As minimum quality assurance measures, the operator shall ensure that an initial validation and annually repeated validations of the instrument are performed.

3 The result of any analysis shall be used only for the delivery period or batch of fuel or material for which the samples have been taken, and for which the samples were intended to be representative.

When determining a specific parameter, the operator shall use the results of all analyses made with regard to that parameter.

Article 33

Sampling plan

1 Where calculation factors are determined by analyses, the operator shall submit to the competent authority for approval, for each fuel or material a sampling plan in the form of a written procedure, which contains information on methodologies for the preparation of samples, including information on responsibilities, locations, frequencies and quantities, and methodologies for the storage and transport of samples.

The operator shall ensure that the derived samples are representative for the relevant batch or delivery period and free of bias. Relevant elements of the sampling plan shall be agreed with the laboratory carrying out the analysis for the respective fuel or material, and evidence of that agreement shall be included in the plan. The operator shall make

the plan available for the purposes of verification pursuant to Implementing Regulation (EU) 2018/2067.

2 The operator shall, in agreement with the laboratory carrying out the analysis for the respective fuel or material and subject to the approval of the competent authority, adapt the elements of the sampling plan where analytical results indicate that the heterogeneity of the fuel or material significantly differs from the information on heterogeneity on which the original sampling plan for that specific fuel or material was based.

Article 34

Use of laboratories

1 The operator shall ensure that laboratories used to carry out analyses for the determination of calculation factors are accredited in accordance with EN ISO/IEC 17025, for the relevant analytical methods.

2 Laboratories not accredited in accordance with EN ISO/IEC 17025 may be used for the determination of calculation factors only where the operator can demonstrate to the satisfaction of the competent authority that access to laboratories referred to in paragraph 1 is technically not feasible or would incur unreasonable costs, and that the non-accredited laboratory meets requirements equivalent to EN ISO/IEC 17025.

3 The competent authority shall deem a laboratory to meet requirements equivalent to EN ISO/IEC 17025 within the meaning of paragraph 2 where the operator provides, to the extent feasible, in the form and to a similar level of detail required for procedures pursuant to Article 12(2), evidence in accordance with the second and the third subparagraph of this paragraph.

With respect to quality management, the operator shall produce an accredited certification of the laboratory in conformity with EN ISO/IEC 9001, or other certified quality management systems that cover the laboratory. In the absence of such certified quality management systems, the operator shall provide other appropriate evidence that the laboratory is capable of managing its personnel, procedures, documents and tasks in a reliable manner.

With respect to technical competence, the operator shall provide evidence that the laboratory is competent and able to generate technically valid results using the relevant analytical procedures. Such evidence shall cover at least the following elements:

- a management of the personnel's competence for the specific tasks assigned;
- b suitability of accommodation and environmental conditions;
- c selection of analytical methods and relevant standards;
- d where applicable, management of sampling and sample preparation, including control of sample integrity;
- e where applicable, development and validation of new analytical methods or application of methods not covered by international or national standards;
- f uncertainty estimation;
- g management of equipment, including procedures for calibration, adjustment, maintenance and repair of equipment, and record keeping thereof;
- h management and control of data, documents and software;
- i management of calibration items and reference materials;

Status: This is the original version (as it was originally adopted).

- j quality assurance for calibration and test results, including regular participation in proficiency testing schemes, applying analytical methods to certified reference materials, or inter-comparison with an accredited laboratory;
- k management of outsourced processes;
- l management of assignments, customer complaints, and ensuring timely corrective action.

Article 35

Frequencies for analyses

1 The operator shall apply the minimum frequencies for analyses for relevant fuels and materials listed in Annex VII.

2 The competent authority may allow the operator to use a frequency that differs from those referred to in paragraph 1, where minimum frequencies are not available or where the operator demonstrates one of the following:

- a based on historical data, including analytical values for the respective fuels or materials in the reporting period immediately preceding the current reporting period, any variation in the analytical values for the respective fuel or material does not exceed 1/3 of the uncertainty value to which the operator has to adhere with regard to the activity data determination of the relevant fuel or material;
- b using the required frequency would incur unreasonable costs.

Where an installation operates for part of the year only, or where fuels or materials are delivered in batches that are consumed over more than one calendar year, the competent authority may agree with the operator a more appropriate schedule for analyses, provided that it results in a comparable uncertainty as under point (a) of the first subparagraph.

Subsection 4

Specific calculation factors

Article 36

Emission factors for CO₂

1 The operator shall determine activity-specific emission factors for CO₂ emissions.

2 Emission factors of fuels, including those used as process input, shall be expressed as t CO₂/TJ.

The competent authority may allow the operator to use an emission factor for a fuel expressed as t CO₂/t or t CO₂/Nm³ for combustion emissions, where the use of an emission factor expressed as t CO₂/TJ incurs unreasonable costs or where at least equivalent accuracy of the calculated emissions can be achieved by using such an emission factor.

3 For the conversion of the carbon content into the respective value of a CO₂ related emission factor or *vice versa*, the operator shall use the factor 3,664 t CO₂/t C.

Article 37

Oxidation and conversion factors

1 The operator shall use tier 1 as a minimum to determine oxidation or conversion factors. The operator shall use a value of 1 for oxidation or for a conversion factor where the emission factor includes the effect of incomplete oxidation or conversion.

However, the competent authority may require operators to always use tier 1.

2 Where several fuels are used within an installation and tier 3 is to be used for the specific oxidation factor, the operator may ask for the approval of the competent authority for one or both of the following:

- a the determination of one aggregate oxidation factor for the whole combustion process and to apply it to all fuels;
- b the attribution of the incomplete oxidation to one major source stream and use of a value of 1 for the oxidation factor of the other source streams.

Where biomass or mixed fuels are used, the operator shall provide evidence that application of points (a) or (b) of the first subparagraph does not lead to an under-estimation of emissions.

Subsection 5

Treatment of biomass

Article 38

Biomass source streams

1 The operator may determine the activity data of a biomass source stream without using tiers and providing analytical evidence regarding the biomass content, where that source stream consists exclusively of biomass and the operator can ensure that it is not contaminated with other materials or fuels.

2 The emission factor of biomass shall be zero.

The emission factor of each fuel or material shall be calculated and reported as the preliminary emission factor, determined in accordance with Article 30, multiplied by the fossil fraction of the fuel or material.

3 Peat, xylite and fossil fractions of mixed fuels or materials shall not be considered biomass.

4 Where the biomass fraction of mixed fuels or materials is equal or higher than 97 %, or where, due to the amount of the emissions associated with the fossil fraction of the fuel or material, it qualifies as a *de minimis* source stream, the competent authority may allow the operator to apply no-tier methodologies, including the energy balance method, for determining activity data and relevant calculation factors.

Article 39

Determination of biomass and fossil fraction

1 For mixed fuels or materials, the operator may either assume the absence of biomass and apply a default fossil fraction of 100 %, or determine a biomass fraction in accordance with paragraph 2, applying tiers as defined in section 2.4 of Annex II.

2 Where, subject to the tier level required, the operator has to carry out analyses to determine the biomass fraction, it shall do so on the basis of a relevant standard and the analytical methods therein, provided that the use of that standard and analytical method are approved by the competent authority.

Where, subject to the tier level required, the operator has to carry out analyses to determine the biomass fraction, but the application of the first subparagraph is technically not feasible or would incur unreasonable costs, the operator shall submit an alternative estimation method to determine the biomass fraction to the competent authority for approval. For fuels or materials originating from a production process with defined and traceable input streams, the operator may base the estimation on a mass balance of fossil and biomass carbon entering and leaving the process.

The Commission may provide guidelines on further applicable estimation methods.

3 By way of derogation from paragraphs 1 and 2 and Article 30, where the guarantee of origin has been established in accordance with Articles 2(j) and 15 of Directive 2009/28/EC for biogas injected into and subsequently removed from a gas network, the operator shall not use analyses to determine the biomass fraction.

SECTION 3

Measurement-based methodology

Article 40

Use of the measurement-based monitoring methodology

The operator shall use measurement-based methodologies for all emissions of nitrous oxide (N₂O) as laid down in Annex IV, and to quantify CO₂ transferred pursuant to Article 49.

In addition, the operator may use measurement-based methodologies for CO₂ emission sources where it can provide evidence that for each emission source the tiers required in accordance with Article 41 are complied with.

Article 41

Tier requirements

- 1 For each major emission source, the operator shall apply the following:
 - a in the case of a category A installation, at least the tiers listed in section 2 of Annex VIII;
 - b in other cases, the highest tier listed in section 1 of Annex VIII.

However, the operator may apply a tier one level lower than required in accordance with the first subparagraph for category C installations and up to two levels lower for category A and B installations, with a minimum of tier 1, where it shows to the satisfaction of the competent authority that the tier required in accordance with the first subparagraph is technically not feasible or incurs unreasonable costs.

2 For emissions from minor emission sources, the operator may apply a lower tier than required in accordance with the first subparagraph of paragraph 1, with a minimum of tier 1, where it shows to the satisfaction of the competent authority that the tier required in accordance with the first subparagraph of paragraph 1 is technically not feasible or incurs unreasonable costs.

Article 42

Measurement standards and laboratories

- 1 All measurements shall be carried out applying methods based on:
- a EN 14181 (Stationary source emissions — Quality assurance of automated measuring systems);
 - b EN 15259 (Air quality — Measurement of stationary source emissions — Requirements for measurement sections and sites and for the measurement objective, plan and report);
 - c other relevant EN standards, in particular EN ISO 16911-2 (Stationary source emissions — Manual and automatic determination of velocity and volume flow rate in ducts).

Where such standards are not available, the methods shall be based on suitable ISO standards, standards published by the Commission or national standards. Where no applicable published standards exist, suitable draft standards, industry best practice guidelines or other scientifically proven methodologies shall be used, limiting sampling and measurement bias.

The operator shall consider all relevant aspects of the continuous measurement system, including the location of the equipment, calibration, measurement, quality assurance and quality control.

2 The operator shall ensure that laboratories carrying out measurements, calibrations and relevant equipment assessments for CEMS are accredited in accordance with EN ISO/IEC 17025 for the relevant analytical methods or calibration activities.

Where the laboratory does not have such accreditation, the operator shall ensure that equivalent requirements of Article 34(2) and (3) are met.

Article 43

Determination of emissions

1 The operator shall determine the annual emissions from an emission source over the reporting period by summing up over the reporting period all hourly values of the measured greenhouse gas concentration multiplied by the hourly values of the flue gas flow, where the hourly values shall be averages over all individual measurement results of the respective operating hour.

Status: This is the original version (as it was originally adopted).

In the case of CO₂ emissions, the operator shall determine annual emissions on the basis of equation 1 in Annex VIII. CO emitted to the atmosphere shall be treated as the molar equivalent amount of CO₂.

In the case of nitrous oxide (N₂O), the operator shall determine annual emissions on the basis of the equation in subsection B.1 of section 16 of Annex IV.

2 Where several emission sources exist in one installation and cannot be measured as one emission source, the operator shall measure emissions from those sources separately and add the results to obtain the total emissions of the gas in question over the reporting period.

3 The operator shall determine the greenhouse gas concentration in the flue gas by continuous measurement at a representative point through one of the following:

- a direct measurement;
- b in the case of high concentration in the flue gas, calculation of the concentration using an indirect concentration measurement applying equation 3 in Annex VIII and taking into account the measured concentration values of all other components of the gas stream as laid down in the operator's monitoring plan.

4 Where relevant, the operator shall determine separately any CO₂ amount stemming from biomass and subtract it from the total measured CO₂ emissions. For this purpose the operator may use:

- a a calculation based approach, including approaches using analyses and sampling based on EN ISO 13833 (Stationary source emissions — Determination of the ratio of biomass (biogenic) and fossil-derived carbon dioxide — Radiocarbon sampling and determination);
- b another method based on a relevant standard, including ISO 18466 (Stationary source emissions — Determination of the biogenic fraction in CO₂ in stack gas using the balance method);
- c an estimation method published by the Commission.

Where the method proposed by the operator involves continuous sampling from the flue gas stream, EN 15259 (Air quality — Measurement of stationary source emissions — Requirements for measurement sections and sites and for the measurement objective, plan and report) shall be applied.

5 The operator shall determine the flue gas flow for the calculation in accordance with paragraph 1 by one of the following methods:

- a calculation by means of a suitable mass balance, taking into account all significant parameters on the input side, including for CO₂ emissions at least input material loads, input airflow and process efficiency, and on the output side, including at least the product output and the concentration of oxygen (O₂), sulphur dioxide (SO₂) and nitrogen oxides (NO_x);
- b determination by continuous flow measurement at a representative point.

Article 44

Data aggregation

1 The operator shall calculate hourly averages for each parameter, including concentrations and flue gas flow, relevant for determining emissions using a measurement-based methodology by using all data points available for that specific hour.

Where an operator can generate data for shorter reference periods without additional cost, the operator shall use those periods for the determination of the annual emissions in accordance with Article 43(1).

2 Where the continuous measurement equipment for a parameter is out of control, out of range or out of operation for part of the hour or reference period referred to in paragraph 1, the operator shall calculate the related hourly average *pro rata* to the remaining data points for that specific hour or shorter reference period, provided that at least 80 % of the maximum number of data points for a parameter are available.

Article 45(2) to (4) shall apply where fewer than 80 % of the maximum number of data points for a parameter are available.

Article 45

Missing data

1 Where a piece of measurement equipment within a CEMS is out of operation for more than five consecutive days in any calendar year, the operator shall inform the competent authority without undue delay and propose adequate measures to improve the quality of the CEMS in question.

2 Where a valid hour or shorter reference period in accordance with Article 44(1) of data cannot be provided for one or more parameters of the measurement-based methodology due to the equipment being out of control, out of range or out of operation, the operator shall determine values for substituting each missing hour of data.

3 Where a valid hour or shorter reference period of data cannot be provided for a parameter directly measured as concentration, the operator shall calculate a substitution value as the sum of an average concentration and twice the standard deviation associated with that average, using equation 4 in Annex VIII.

Where the reporting period is not applicable for determining such substitution values due to significant technical changes at the installation, the operator shall agree with the competent authority a representative timeframe for determining the average and standard deviation, where possible with a duration of one year.

4 Where a valid hour of data cannot be provided for a parameter other than concentration, the operator shall obtain substitute values of that parameter through a suitable mass balance model or an energy balance of the process. The operator shall validate the results by using the remaining measured parameters of the measurement-based methodology and data at regular working conditions, considering a time period of the same duration as the data gap.

Article 46

Corroborating with calculation of emissions

The operator shall corroborate emissions determined by a measurement-based methodology, with the exception of N₂O emissions from nitric acid production and greenhouse gases transferred to a transport network or a storage site, by calculating the annual emissions of each greenhouse gas in question for the same emission sources and source streams.

The use of tier methodologies shall not be required.

SECTION 4

Special provisions

Article 47

Installations with low emissions

1 The competent authority may allow the operator to submit a simplified monitoring plan in accordance with Article 13, provided that it operates an installation with low emissions.

The first subparagraph shall not apply to installations carrying out activities for which N₂O is included pursuant to Annex I to Directive 2003/87/EC.

2 For the purposes of the first subparagraph of paragraph 1, an installation shall be considered an installation with low emissions where at least one of the following conditions is met:

- a the average annual emissions of that installation reported in the verified emissions reports during the trading period immediately preceding the current trading period, with the exclusion of CO₂ stemming from biomass and before subtraction of transferred CO₂, were less than 25 000 tonnes of CO_{2(e)} per year;
- b the average annual emissions referred to in point (a) are not available or are no longer applicable because of changes to the installation's boundaries or changes to the operating conditions of the installation, but the annual emissions of that installation for the next five years, with the exclusion of CO₂ stemming from biomass and before subtraction of transferred CO₂, will be, based on a conservative estimation method, less than 25 000 tonnes of CO_{2(e)} per year.

3 The operator of an installation with low emissions shall not be required to submit the supporting documents referred to in the third subparagraph of Article 12(1), and shall be exempt from the requirement of submitting an improvement report as referred to in Article 69(4) in response to recommendations for improvement reported by the verifier in the verification report.

4 By way of derogation from Article 27, the operator of an installation with low emissions may determine the amount of fuel or material by using available and documented purchasing records and estimated stock changes. The operator shall also be exempt from the requirement to provide the uncertainty assessment referred to in Article 28(2) to the competent authority.

5 The operator of an installation with low emissions shall be exempt from the requirement in Article 28(2) to include uncertainty related to stock changes in an uncertainty assessment.

6 By way of derogation from Articles 26(1) and 41(1), the operator of an installation with low emissions may apply as a minimum tier 1 for the purposes of determining activity data and calculation factors for all source streams and for determining emissions by measurement-based methodologies, unless higher accuracy is achievable without additional effort for the operator, without providing evidence that applying higher tiers is technically not feasible or would incur unreasonable costs.

7 For the purpose of determining calculation factors on the basis of analyses in accordance with Article 32, the operator of an installation with low emissions may use any laboratory that is technically competent and able to generate technically valid results using the

relevant analytical procedures, and provides evidence for quality assurance measures as referred to in Article 34(3).

8 Where an installation with low emissions subject to simplified monitoring exceeds the threshold referred to in paragraph 2 in any calendar year, its operator shall notify the competent authority thereof without undue delay.

The operator shall, without undue delay, submit a significant modification of the monitoring plan within the meaning of point (b) of Article 15(3), to the competent authority for approval.

However, the competent authority shall allow that the operator continues simplified monitoring provided that that operator demonstrates to the satisfaction of the competent authority that the threshold referred to in paragraph 2 has not already been exceeded within the past five reporting periods and will not be exceeded again from the following reporting period onwards.

Article 48

Inherent CO₂

1 Inherent CO₂ that is transferred into an installation, including that contained in natural gas, a waste gas (including blast furnace or coke oven gas) or in process inputs (including synthesis gas), shall be included in the emission factor for that source stream.

2 Where inherent CO₂ originates from activities covered by Annex I to Directive 2003/87/EC or included pursuant to Article 24 of that Directive and is subsequently transferred out of the installation as part of a source stream to another installation and activity covered by that Directive, it shall not be counted as emissions of the installation where it originates.

However, where inherent CO₂ is emitted, or transferred out of the installation to entities not covered by that Directive, it shall be counted as emissions of the installation where it originates.

3 The operators may determine quantities of inherent CO₂ transferred out of the installation both at the transferring and at the receiving installation. In that case, the quantities of respectively transferred and received inherent CO₂ shall be identical.

Where the quantities of transferred and received inherent CO₂ are not identical, the arithmetical average of both determined values shall be used in both the transferring and receiving installations' emissions reports, where the deviation between the values can be explained by the uncertainty of the measurement systems or the determination method. In such cases, the emissions report shall refer to the alignment of that value.

Where the deviation between the values cannot be explained by the approved uncertainty range of the measurement systems or the determination method, the operators of the transferring and receiving installations shall align the values by applying conservative adjustments approved by the competent authority.

Article 49

Transferred CO₂

1 The operator shall subtract from the emissions of the installation any amount of CO₂ originating from fossil carbon in activities covered by Annex I to Directive 2003/87/EC that is not emitted from the installation, but:

- a transferred out of the installation to any of the following:
 - (i) a capture installation for the purpose of transport and long-term geological storage in a storage site permitted under Directive 2009/31/EC;
 - (ii) a transport network with the purpose of long-term geological storage in a storage site permitted under Directive 2009/31/EC;
 - (iii) a storage site permitted under Directive 2009/31/EC for the purpose of long-term geological storage;
- b transferred out of the installation and used to produce precipitated calcium carbonate, in which the used CO₂ is chemically bound.

2 In its annual emissions report, the operator of the transferring installation shall provide the receiving installation's installation identification code recognised in accordance with the acts adopted pursuant to Article 19(3) of Directive 2003/87/EC, if the receiving installation is covered by that Directive. In all other cases, the operator of the transferring installation shall provide the name, address and contact information of a contact person for the receiving installation.

The first subparagraph shall also apply to the receiving installation with respect to the transferring installation's installation identification code.

3 For the determination of the quantity of CO₂ transferred from one installation to another, the operator shall apply a measurement-based methodology, including in accordance with Articles 43, 44 and 45. The emission source shall correspond to the measurement point and the emissions shall be expressed as the quantity of CO₂ transferred.

For the purpose of point (b) of paragraph 1, the operator shall apply a calculation-based methodology.

4 For determining the quantity of CO₂ transferred from one installation to another, the operator shall apply the highest tier as defined in section 1 of Annex VIII.

However, the operator may apply the next lower tier provided that it establishes that applying the highest tier as defined in section 1 of Annex VIII is technically not feasible or incurs unreasonable costs.

For determining the quantity of CO₂ chemically bound in precipitated calcium carbonate, the operator shall use data sources representing highest achievable accuracy.

5 The operators may determine quantities of CO₂ transferred out of the installation both at the transferring and at the receiving installation. In such cases, Article 48(3) shall apply.

Article 50

Use or transfer of N₂O

1 Where N₂O originates from activities covered by Annex I to Directive 2003/87/EC for which that Annex specifies N₂O as relevant and an installation does not emit the N₂O but transfers it to another installation that monitors and reports emissions in accordance with this Regulation, it shall not be counted as emissions of the installation where it originates.

An installation that receives N₂O from an installation and activity in accordance with the first subparagraph shall monitor the relevant gas streams using the same methodologies, as required by this Regulation, as if the N₂O were generated within the receiving installation itself.

However, where N₂O is bottled or used as a gas in products so that it is emitted outside the installation, or where it is transferred out of the installation to entities not covered by Directive 2003/87/EC, it shall be counted as emissions of the installation where it originates, except for quantities of N₂O in respect of which the operator of the installation where the N₂O originates can demonstrate to the competent authority that the N₂O is destroyed using suitable emissions abatement equipment.

2 In its annual emissions report, the operator of the transferring installation shall provide the receiving installation's installation identification code recognised in accordance with the acts adopted pursuant to Article 19(3) of Directive 2003/87/EC, if relevant.

The first subparagraph shall also apply to the receiving installation with respect to the transferring installation's installation identification code.

3 To determine the quantity of N₂O transferred from one installation to another, the operator shall apply a measurement-based methodology, including in accordance with Articles 43, 44 and 45. The emission source shall correspond to the measurement point and the emissions shall be expressed as the quantity of N₂O transferred.

4 To determine the quantity of N₂O transferred from one installation to another, the operator shall apply the highest tier as defined in section 1 of Annex VIII for emissions of N₂O.

However, the operator may apply the next lower tier provided that it establishes that applying the highest tier as defined in section 1 of Annex VIII is technically not feasible or incurs unreasonable costs.

5 The operators may determine quantities of N₂O transferred out of the installation both at the transferring and at the receiving installation. In such cases, Article 48(3) shall apply *mutatis mutandis*.