

## **Guide to the Revised Guidelines for Monitoring and Reporting (MRG 2007) in accordance with the EU Emissions Trading Scheme (EU ETS)**

### **INTRODUCTION**

The European Commission's revised Monitoring and Reporting Guidelines (hereafter referred to as MRG 2007) establishes new guidelines for the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC which has established a scheme for greenhouse gas emission allowance trading within the Community. Article 14(1) of Directive 2003/87/EC required the Commission to adopt guidelines for monitoring and reporting (hereafter abbreviated M&R). Articles 14(2) and 14(3) respectively require Member States to ensure that emissions are monitored and reported in accordance with the guidelines. Article 1 of the MRG 2007 Commission Decision confirms that:

*The guidelines for the monitoring and reporting of greenhouse gas emission from the activities listed in Annex I to Directive 2003/87/EC are set out in the Annexes to this Decision.*

The requirements of the MRG 2007 Commission Decision apply from the 1<sup>st</sup> January 2008, replacing the requirements of the original Commission Decision of 29<sup>th</sup> January 2004 (MRG 2004).

This guide summarises the main points arising in MRG 2007 and in particular directs users to information that is especially relevant to them more quickly. Attention is focused on the requirements of Annex I, the General Guidelines. Annex II presents guidelines for combustion emissions and may be of more generic interest, but Annexes III – XI are aimed at activity-specific installations and, therefore, best addressed directly by those concerned with such operations. Annex XII is of specific relevance to determination of greenhouse gas emissions by continuous emission measurement.

The main section of the guide is organised in three columns. The first indicates the location in MRG 2007 to which an issue relates. The second summarises the issue(s) concerned. The third indicates where an issue may be of special relevance either to an Operator (O), the Competent Authority (CA) or a Verifier (V). Verbatim quotes are indicated in *italics* and key words highlighted. O, CA and V in the third column are also highlighted where an issue is especially relevant. The guide is not intended to be all encompassing and many issues are paraphrased instead of quoted in full. Onus remains to address the Guidelines themselves to ascertain an installation's full M&R obligations.

## MAIN IMPLICATIONS UNDER THE NEW COMMISSION DECISION

Further detail on the main changes introduced by MRG 2007 compared to MRG 2004 is available in the document “*Main Changes Proposed in EU ETS MRG2*”. Additional interpretation may also be found in the Commission’s *Answers to Frequently Asked Questions* on EU ETS monitoring, reporting and verification (MRV FAQ).

The main implications of MRG 2007 (especially in relation to it taking effect from 1<sup>st</sup> January 2008) are considered to be:

1. *Section 4.3 (The Monitoring Plan)* changes the required content of EU ETS monitoring plans. Need for an overall description of the calculation/measurement based methodology to be used (Section 4.3 (d)) and evidence demonstrating compliance with uncertainty thresholds (Section 4.3(g)) are the main additions that are now explicitly required. Need to list emission sources and source streams (Section 4.3(c)), and to note links to wider environmental management schemes systems in particular procedures and controls relevant to M&R of greenhouse gas emissions (Section 4.3(n)) are further modifications that are generally required. Another is need to provide a description of data acquisition and handling and control activities in relation to radically restructured control and verification requirements (Section 4.3(m)). Other new requirements may only be applicable to certain installations where use of “non-accredited laboratories” (Section 4.3(j)), a “fall-back approach” (Section 4.3(l)), or CEMs are planned (Section 4.3(k)). **The new requirements under Section 4.3 and the other implications listed below require operators to submit new monitoring plans for Competent Authority approval and reissue of new permits in time for the start of Phase 2, 1<sup>st</sup> January 2008. The new requirements are so substantial to justify submission of complete new monitoring plans rather than supplements. This will serve to consolidate monitoring plans, which should facilitate and lower the cost of verification. MRG 2007 places a stronger emphasis on verifiers assessing material non-conformities with the requirements of the monitoring plan.**
2. The Competent Authorities are issuing a new standard template and guidance to aid completion of appropriate monitoring plans in relation to MRG 2007, and plan stakeholder seminars to provide further explanation of requirements.
3. *Section 5.2 (Tiers of Approaches)*, supported by *Section 2 (Definitions)* introduces various changes which affect the relevance of originally permitted tiers (under MRG 2004):
  - Category A, B and C thresholds are now more explicitly defined (at the head of Table 1) in terms of “fossil” rather than “total” CO<sub>2</sub> emissions (and before subtraction of transferred CO<sub>2</sub>). They are also defined in terms of “average reported annual emissions over the previous trading period (or a conservative estimate or projection if reported emissions are not available or no longer applicable)”.
  - The thresholds for minor and de-minimis source streams are doubled but maximum tonnage caps also introduced. The definitions are also worded in terms of fossil, not total CO<sub>2</sub>, and source streams not sources.

- No-tier methods may be applied in the case of pure biomass fuels and materials.
  - “Subject to Section 16, Member States **shall** ensure that operators apply for all major source streams, as a minimum the tiers set out in table 1 ... unless this is technically not feasible”. This is a change of emphasis from “should” to “shall”, and there remains no provision for derogation due to unreasonable costs.
  - There are various changes to the tiers and activity descriptors specified in Table 1.
4. *Section 5.3 (The Fall-Back Approach)* offers an alternative to Section 5.2 for very specific or complex installations where it is not technically feasible or without unreasonable costs to meet even Tier 1 for all (except de minimis) source streams. Operators wishing to apply the fall-back approach need to gain Competent Authority approval of a customised monitoring methodology for the whole installation and a full uncertainty analysis demonstrating compliance with overall thresholds advised in MRG 2007 Table 2.
  5. *Section 5.5 (Emission Factors)* explicitly clarifies that inherent CO<sub>2</sub> transferred into an installation, as part of a fuel shall be included in the emission factor for that fuel.
  6. *Section 5.7 (Transferred CO<sub>2</sub>)* states “The mass of annually transferred CO<sub>2</sub> or carbonate shall be determined with a maximum uncertainty of less than 1.5%”. Operators are only allowed to subtract (subject to Competent Authority approval) transferred CO<sub>2</sub> originating from fossil fuels and materials (not biomass) from Directive activities.
  7. *Section 7.1 (Uncertainty Assessment - Calculation)* confirms expectation in MRG 2007 for sufficiently thorough uncertainty assessments especially in relation to evaluating compliance with Annex II-XI tier uncertainty thresholds. There is stated requirement for “written proof of the uncertainty level associated with the determination of activity data” (Section 4.3 similarly demands “evidence demonstrating compliance” for monitoring plans). More explicit detail is also provided on the expected approach to uncertainty assessment, including analysis of cumulative components and error propagation. Potential for some dispensation is indicated in relation to installations of low emissions under Section 16 and some circumstances involving use of commercially traded fuels and materials.
  8. *Section 8 (Reporting)* extends the list of items that need to be reported as “memo” items. This is not necessarily an immediate issue regarding the content of the monitoring plan, but it may be regarding need to start collating the data concerned from 1<sup>st</sup> January 2008.
  9. *Section 10 (Control and Verification)* radically modifies the specified requirements on operators to establish, document, implement and maintain effective data acquisition and handling activities, control systems and control activities. In summary, the operator is required to document data flow and control activities in written procedures including:

- the sequence and interaction of data acquisition and handling activities according to Section 10.1, including the methods of calculations or measurement which are used;
- risk assessment of the definition and evaluations of the control system according to Section 10.2;
- management of the necessary competencies for the responsibilities assigned according to Section 10.3.1;
- quality assurance of the measuring equipment and information technology used (if applicable) according to Section 10.3.2;
- internal reviews of reported data according to 10.3.3;
- outsourced processes according to Section 10.3.4;
- corrections and corrective action according to Section 10.3.5;
- records and documentation according to Section 10.3.6.

These are tied into the monitoring plan requirement by Section 4.3(m) and the need to include “*a description of the procedures for data acquisition and handling activities and control activities as well as a description of the activities (see Section 10.1-3)*”.

10. *Section 10.4 (Verification)* introduces some significant changes as regards the requirements for annual emissions verification affecting both verifiers and operators. There is more explicit requirement for verifiers to conclude that an annual emission report is “not verified”, if material non-conformities or material misstatements (with or without material non-conformities) are found. Statement is added (Section 10.4(e)) that: “*Member States shall ensure that the operator addresses non-conformities and misstatements after consultation of the competent authority in a timeframe set by the competent authority*”.
11. *Section 13.5 (Requirements for Determination of Fuel and Material Properties)* confirms preference for operators to use EN ISO 17025 accredited laboratories for various analytical requirements, but introduces the possibility of also making use of additional data from non-EN ISO 17025 accredited laboratories. This is as long as they demonstrate equivalence in terms of quality management and comparability with data derived from periodic proficiency tests involving an EN ISO 17025 accredited laboratory. EN ISO 17025 requirements in connection with use and calibration of on-line gas chromatographs and gas analysers are also confirmed in more explicit terms.
12. *Section 13.6 (Sampling Methods and Frequency of Analysis)* provides more guidance on representative sampling for top tier (installation specific) determinations of emission, oxidation, and conversion factors, NCVs, carbon content, biomass fraction and composition data, which should be accounted for in new monitoring plans.
13. *Section 16 (Exemption from Requirements for Installations with Low Emissions)* includes possible provision for simpler monitoring plan requirements (only seven of the fourteen Section 4.3 listed requirements) which could affect over half of the EU ETS installations in the UK.

14. Although not specifically covered in this document, Annexes II-XI also contain various changes (see the “*Main Changes Proposed in EU ETS MRG2*” paper) with potential implications for the tiers operators can meet.

## **KEY SECTIONS RELATED TO SUBMISSION OF MONITORING PLANS**

Sections of MRG 2007 likely to be of most interest to those concerned with submission of monitoring plans are:

Section 2 (Definitions), including Section 2(1)(f) – “*monitoring plan means a detailed, complete and transparent documentation of the monitoring methodology of a specific installation, including documentation of the data acquisition and data handling activities, and the system to control the trueness thereof*”

Section 4.3 – “*The Monitoring Plan*”, including the required contents which must be approved by the Competent Authority in relation to meeting Article 6(2)(c) of the Directive (permit requirements for monitoring).

Section 5.2 - “*Tiers of approaches*”, introducing the activity-specific guidelines (including tier hierarchies) in Annexes II-XI for determining necessary activity data (fuel/material flow and net calorific value), emission factors, composition data, oxidation and conversion factors, and establishing ground rules for methodology selection.

Section 5.3 – “*Fall-Back Approach*”, available under some circumstances as an alternative to the requirements of Section 5.2.

Section 7.1 - Uncertainty requirements associated with calculation methodologies.

Section 8 – Specifying requirements for reporting. (Section 14 indicating the basis of the reporting form to be adopted).

Section 9 – Indicating need to retain records for at least ten years.

Section 10 – Specifying requirements on operators to establish, document, implement and maintain effective data acquisition and handling activities, control systems and control activities.

Section 13 – Regarding determination of activity-specific data and factors in order to meet highest tier requirements.

Section 16 – Regarding potential eligibility of installations of low emissions for exemption from certain elements of the requirements of Sections 4.3, 5.2, 7.1, 10, and 13.

Interest as far as Annexes II-XI are concerned will be installation specific. If the installation only involves a combustion or other activity as listed in Annex I of the Directive, interest will relate to Annex II covering combustion activities, or the specific Annex assigned to the particular other activity. See Annexes II-XI listed at

the end of the following table. If the installation involves a combustion process as well as another activity which is listed in Annex I of the Directive, interest will relate in both the specific Annex assigned to the particular listed activity and to Annex II as regards the combustion process. For example, a petroleum refinery is likely to be interested in Annex III (Activity-specific Guidelines for Mineral Oil Refineries) regarding its main activities and Annex II regarding any associated combustion plant including its flares.

## GUIDE TO THE EU ETS M&R GUIDELINES (COMMISSION DECISION MRG 2007)

Relevant Section (Annex I unless specified) of the Guidelines	Issue	Special relevance to Operator, Competent Authority, Verifier
<b>Foreword</b>	<p><b><u>Whereas Statements:</u></b> Includes summary of the main revisions that have been introduced in MRG 2007. Confirms intention for further review by 1<sup>st</sup> January 2010</p> <p><b><u>Article 1:</u></b> Confirms the Guidelines are relevant only to greenhouse gas emissions from activities listed in Annex I of the EU ETS Directive (and that they are based on the principles set out in Annex IV to the Directive).</p> <p><b><u>Article 2:</u></b> Repeals MRG 2004 from 1<sup>st</sup> January 2008</p> <p><b><u>Article 3:</u></b> MRG 2007 applies from 1<sup>st</sup> January 2008</p> <p><b><u>Article 4:</u></b> MRG 2007 is addressed to the Member States</p>	
<b>1.</b>	<p><b><u>INTRODUCTION</u></b></p> <p>Annex I contains general guidelines for M&amp;R of GHG emissions from activities listed in Annex I of the EU ETS Directive. Annexes II-XI provide additional activity-specific guidelines. N.B. Annex XII contains guidelines for CEMs</p>	
<b>2.</b>	<p><b><u>DEFINITIONS</u></b></p> <p>The definitions of the EU ETS Directive apply. MRG 2007 sets out further definitions under five headings:</p>	
<b>2(1)</b>	<p><b>Basic Definitions</b>, include:</p>	
(a)	<p><i>“activities” means the activities listed in Annex I to the Directive (the implication is that the Guidelines only apply to M&amp;R of GHG emissions from listed activities, not directly associated activities)</i></p>	
(c)	<p><i>“emission source” means a separately identifiable part (point or process) of an installation from which greenhouse gases are emitted</i></p>	

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(d)	<p><i>“source stream” means a specific fuel type, raw material or product giving rise to emissions of relevant greenhouse gases at one or more emission sources as a result of its consumption or production (MRG2 changes compliance emphasis from consideration of “sources” to “source streams”)</i></p>	
(e)	<p><i>“monitoring methodology” means the sum of approaches used by an operator to determine the emissions of a given installation</i></p>	
(f)	<p><i>“monitoring plan” means a detailed, complete and transparent documentation of the monitoring methodology of a specific installation, including documentation of the data acquisition and data handling activities, and the system to control the trueness thereof</i></p>	
(i)	<p><i>“reporting period” means one calendar year during which emissions have been monitored and reported</i></p> <p>and further definitions are provided for <i>“competent authority”, “tier”, “annual” and “trading period”</i></p>	
<b>2(2)</b>	<p><b>Definitions related to emissions, fuels and materials, include:</b></p>	
(e)	<p><i>“batch” means an amount of fuel or material transferred as one shipment or continuously over a specific period of time (implications for representative sampling and characterisation in respect to average energy , carbon content or other aspect of composition)</i></p>	
(f)	<p><i>“commercially traded fuels” means fuels of specified composition which are frequently and freely traded, if the specific batch has been traded between economically independent parties, including all commercial standard fuels, natural gas, light and heavy fuel oil, coal, petroleum coke</i></p>	
(g)	<p><i>“commercially traded materials” means materials of specified composition which are frequently and freely traded, if the specific batch has been traded between economically independent parties</i></p>	
(h)	<p><i>“commercial standard fuel” means the internationally standardized commercial fuels which exhibit a 95% confidence interval of not more than <math>\pm 1</math> % for their specified calorific value, including gas oil, light fuel oil, gasoline, lamp oil, kerosene, ethane, propane and butane</i></p>	

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2(3)	<p>and further definitions are provided for “<i>combustion emissions</i>”, “<i>process emissions</i>”, “<i>inherent CO<sub>2</sub></i>”, and “<i>conservative</i>”</p> <p><b>Definitions related to measurement</b>, include:</p> <p>(a) “<i>accuracy</i>” means the closeness of the agreement between the result of a measurement and the true value of the particular quantity (or a reference value determined empirically using internationally accepted and traceable calibration materials and standard methods), taking into account both, random and systematic factors</p> <p>(b) “<i>uncertainty</i>” means a parameter, associated with the result of the determination of a quantity, that characterizes the dispersion of the values that could reasonably be attributed to the particular quantity, including the effects of systematic as well as of random factors and expressed in per cent and describes a confidence interval around the mean value comprising 95% of inferred values taking into account any asymmetry of the distribution of values</p> <p>(f) “<i>measurement system</i>” means a complete set of measurement instruments and other equipment, like sampling and data processing equipment, used for the determination of variables like the activity data, the carbon content, the calorific value or the emission factor of the CO<sub>2</sub> emissions (<b>MRG2 places emphasis on the “measurement system” rather than the “measurement instrument”</b>)</p> <p>(g) “<i>calibration</i>” means the set of operations, which establish, under specified conditions, the relations between values indicated by a measuring instrument or measuring system, or values represented by a material measure or a reference material and the corresponding values of a quantity realized by a reference standard</p> <p>(i) “<i>standard conditions</i>” means temperature of 273.15 K (i.e. 0°C) and pressure conditions of 101,325 Pa defining normal cubic meters (Nm<sup>3</sup>)</p> <p>and further definitions are provided for “<i>arithmetic mean</i>”, “<i>measurement</i>”, “<i>measurement instrument</i>”, and “<i>continuous emission measurement</i>”</p>	

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2(4)	<p><b>Definitions related to methodologies, include:</b></p> <p>(a) <i>“Unreasonable costs” means costs of a measure disproportionate to its overall benefits as established by the competent authority. In respect to the choice of tier levels the threshold may be defined as the value of the allowances corresponding to an improvement of the level of accuracy. For measures increasing the quality of reported emissions but without direct impact on accuracy, unreasonable cost may correspond to a fraction exceeding an indicative threshold of 1% of the average value of the available emissions data reported for the previous trading period. For installations without this history, data from representative installations carrying out the same or comparable activities are used as reference and scaled according to their capacity.</i></p> <p>(b) <i>“Technically feasible” means that technical resources capable of meeting the needs of a proposed system can be acquired by the operator in the required time</i></p> <p>(c) <i>“De-minimis source streams” means a group of minor source streams selected by the operator and jointly emitting 1 ktonnes of fossil CO<sub>2</sub> or less per year or that contribute less than 2% (up to a total maximum contribution of 20 ktonnes of fossil CO<sub>2</sub> per year) of total annual emissions of fossil CO<sub>2</sub> of that installation before subtraction of transferred CO<sub>2</sub>, whichever is the highest in terms of absolute emissions (The Commission response to a frequently asked question “What if an operator cannot meet the lowest tier requirements?” confirms that “no specific provisions exist for entire installations falling below the threshold of 1 ktonne”, other than those set out for installations of low emission in Section 16 of MRG2. In other words an entire installation cannot be permitted as de-minimis).</i></p> <p>(d) <i>“Major source streams” means a group of source streams which do not belong to the group of “minor source streams”</i></p> <p>(e) <i>“Minor source streams” means those source streams selected by the operator to jointly emit 5 ktonnes of fossil CO<sub>2</sub> or less per year or to contribute less than 10% (up to a total maximum contribution of 100 ktonnes of fossil CO<sub>2</sub> per year), to the total annual emissions of fossil CO<sub>2</sub> of an installation before subtraction of transferred CO<sub>2</sub>, whichever is the highest in terms of absolute emissions</i></p> <p>(f) <i>“Biomass” means non-fossilised and biodegradable organic material originating from plants, animals and micro-organisms, including products, byproducts, residues and waste from agriculture, forestry and related industries as well as the non-fossilised and biodegradable organic fractions of industrial and municipal wastes, including gases and</i></p>	

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<p>(g)</p> <p>2(5)</p> <p>(e)</p> <p>(f)</p> <p>(g)</p> <p>(h)</p> <p>(i)</p> <p>(j)</p>	<p><i>liquids recovered from the decomposition of non-fossilised and biodegradable organic material</i></p> <p><i>“Pure” relating to a substance means that a material or fuel consists of at least 97% (related to mass) of the specified substance or element - corresponding to the commercial classification of “purum”. For biomass this relates to the fraction of biomass carbon in the total amount of carbon in the fuel or material</i></p> <p>and a further definition is provided for “energy balance method”</p> <p><b>Definitions relating to control and verification, include:</b></p> <p><i>“Reasonable assurance” means a high but not absolute level of assurance, expressed positively in the verification opinion, whether the emissions report subject to verification is free from material misstatement and whether the installation does not have material non-conformities</i></p> <p><i>“Materiality level” means the quantitative threshold or cut-off point to be used to determine the appropriate verification opinion on the emission data reported in the annual emissions report</i></p> <p><i>“Level of assurance” means the degree to which the verifier is confident in the verification conclusions that it has been proved whether or not the information reported in the annual emission report for an installation is free from material misstatement</i></p> <p><i>“Non-conformity” means any act or omission of an act by the installation being under verification, either intentional or unintentional, that is contrary to the requirements in the monitoring plan approved by the competent authority under the installation’s permit</i></p> <p><i>“Material non-conformity” means that a non-conformity to the requirements in the monitoring plan approved by the competent authority under the installation’s permit, could lead to a different treatment of the installation by the competent authority</i></p> <p><i>“Material misstatement” means a misstatement (omissions, misrepresentations and errors, not considering the permissible uncertainty) in the annual emissions report that, to the professional judgement of the verifier, could affect</i></p>	<p>O, V</p>

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(k)  (l)  (m)	<p><i>the treatment of the annual emissions report by the competent authority e.g. when the misstatement exceeds the materiality level</i></p> <p><i>“Accreditation” in the context of verification means the issuing of a statement by an accreditation body based on its decision following a detailed assessment related to a verifier conveying formal demonstration of its competence and independence to carry out verification in accordance with specified requirements</i></p> <p><i>“Verification” means the activities carried out by a verifier to be able to provide a verification opinion as described in Article 15 and Annex V of the Directive 2003/87/EC</i></p> <p><i>“verifier” means a competent, independent, accredited verification body or person with responsibility for performing and reporting on the verification process, in accordance with the detailed requirements established by Member States pursuant to Annex V of the Directive 2003/87/EC</i></p> <p>and further definitions are provided for “control risks”, “detection risk”, “inherent risk”, and “verification risk”</p>	
3.	<p><b><u>PRINCIPLES</u></b></p> <p><b>Obligatory principles</b> to ensure accurate and verifiable M&amp;R:-</p> <p><b>Completeness</b> - covering all process and combustion emissions from all <i>emission sources</i> and <i>source streams</i> belonging to Annex I activities</p> <p><b>Consistency</b> – M&amp;R comparable over time; methodologies can be changed, subject to CA approval, being fully documented and if the accuracy of reported data is improved</p> <p><b>Transparency</b> – data needs to be obtained, recorded, compiled, analysed and documented in a manner that enables reproduction of the determination of emissions by the verifier and the CA</p> <p><b>Trueness</b> – Emission determination is systematically neither over or under the true emissions value. Sources of uncertainties identified and reduced as far as practicable. Due diligence to ensure highest achievable accuracy. <i>The</i></p>	<p>O</p> <p>O, CA</p> <p>O, CA, V</p> <p>O</p>

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	<p><i>operator shall enable reasonable assurance of the integrity of reported emissions to be determined. <b>Emissions shall be determined using the appropriate monitoring methodologies set out in these Guidelines.</b> All metering or other testing equipment used to report monitoring data shall be appropriately applied, maintained and calibrated, and checked. Spreadsheets and other tools used to store and manipulate monitoring data shall be free from error. Reported emissions and related disclosures shall be free from material misstatement, avoid bias in the selection and presentation of information, and provide a credible and balanced account of an installation's emissions</i></p> <p><b>Cost Effectiveness</b> – M&amp;R shall aim for the highest achievable accuracy subject to technical feasibility and it not leading to unreasonably high costs</p> <p><b>Faithfulness</b> – A verified emissions report represents a faithful account</p> <p><b>Improvement of Performance in M&amp;R Emissions</b> – <i>The process of verifying the emissions reports shall be an effective and reliable tool in its support of quality assurance and quality control procedures, providing information upon which an operator can act to improve its performance in monitoring and reporting emissions (responsibility on a verifier to inform and an operator to act)</i></p>	<p>O</p> <p>V, O</p>
<p>4.</p> <p>4.1</p> <p>Para. 1</p> <p>Para. 2</p>	<p><b><u>MONITORING</u></b></p> <p><b>Boundaries – Section indicates which emissions are included and which ones are excluded from M&amp;R requirement</b></p> <p><i>The monitoring and reporting process for an installation shall include all relevant greenhouse gas emissions from all emission sources and/or source streams belonging to activities carried out at the installation and listed in Annex I to Directive 2003/87/EC, as well as from activities and greenhouse gases included by a Member State pursuant to Article 24 of Directive 2003/87/EC (note relevance to just listed activities, not directly associated ones, and relevance to only greenhouse gases listed in <u>Annex I</u> of the Directive)</i></p> <p><i>...all emission sources and source streams from activities listed in Annex I to Directive 2003/87/EC that are to be monitored and reported shall be listed in the permit.....greenhouse gas emissions permits shall contain monitoring requirements, specifying monitoring methodology and frequency. (expected to be satisfied within the M&amp;R plan)</i></p>	<p>CA, O</p>

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Para. 3  Para. 4  Para. 5  Para. 6  Para. 7	<p><i>Emissions from mobile internal combustion engines for transportation purposes shall be excluded from the emission estimates (note change of emphasis to “mobile” engines being excluded)</i></p> <p><i>The monitoring of emissions shall include emissions from regular operations and abnormal events including start-up and shut-down and emergency situations over the reporting period</i></p> <p>Production capacities or outputs of all activities belonging to the same Annex I activity subheading within the same installation or site are combined before judging whether a respective activity threshold is met. If a threshold is met, emissions from all emission sources and/or source streams of <b>all activities listed in Annex I</b> to the Directive in the installation shall be monitored and reported (<b>note just emissions from Annex I activities, not directly associated ones</b>)</p> <p>Whether an additional combustion installation, such as a CHP, is assigned to the same installation as another Annex I activity or a separate installation <i>depends on local circumstances and shall be established in the installation’s greenhouse gas permit</i></p> <p><i>All emissions from an installation shall be assigned to that installation, regardless of exports of heat or electricity to other installations. Emissions associated with the production of heat or electricity imported from other installations shall not be assigned to the importing installation. (i.e. an installation accounts for actual emissions from its own boundary)</i></p>	
4.2  Para. 1  Para. 2	<p><b>Calculation and Measurement Based Methodologies</b></p> <p>Emissions can be determined by either a calculation based methodology; or a measurement based methodology involving continuous measurement of the concentration of relevant greenhouse gases from emission sources and of flue gas flow</p> <p>Operator can propose to use either methodology, but needs to demonstrate measurement will result in <i>a more accurate value of annual emissions of the installation than an alternative calculation based methodology, while avoiding unreasonable cost</i>, based on comparison of identical emission sources and source streams (<b>note reference to calculation involving highest tiers now dropped</b>)</p>	O

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Para. 3	Measurement based methodology subject to Competent Authority approval and, each reporting period, corroboration of measured emissions with calculation based methodology in accordance with Section 7 of the Guidelines	O, CA
Para. 4	Subject to Competent Authority approval, the operator may combine use of calculation and measurement based methodology. <i>The operator shall ensure and demonstrate that neither gaps nor double counting concerning emissions occur</i>	O, CA
4.3	<p><b>The Monitoring Plan</b></p> <p>Para. 1 Permit to contain monitoring requirements, specifying monitoring methodology and frequency.</p> <p>Para. 2 <i>The monitoring methodology is part of the monitoring plan which shall be approved by the competent authority in accordance with criteria set out in this section and its sub-sections.</i> The applied monitoring methodology must either be specified under conditions of the permit or, where consistent with the Directive, in general binding rules (<b>M&amp;R plans will form part of the permit in the UK</b>)</p> <p>Para. 3 <i>The competent authority shall check and approve the monitoring plan prepared by the operator before the start of the reporting period, and again after any substantial changes to the monitoring methodology applied to an installation</i></p> <p>Para. 4 <i>Subject to Section 16, the monitoring plan shall contain</i> (paraphrasing):  (a) <i>description of the installation and activities;</i>  (b) <i>information on responsibilities for M&amp;R within the installation;</i>  (c) <i>list of emission sources and source streams for each activity;</i> (note emission sources and source streams)  (d) <i>description of the calculation based methodology or measurement based methodology to be used;</i> (note new requirement, requiring indication of the overall methodology that is to be applied inclusive of the proposed mathematical computations, equations and factors)  (e) <i>list and description of tiers to be applied for activity data, emission factors, oxidation and conversion factors related to each source stream;</i> (see Section 5.2 for more information)  (f) <i>description of the measurement systems, and the specification and exact location of the measurement instruments to be used for each of the source streams to be monitored;</i></p>	<p>O, CA</p> <p>CA</p> <p>O, CA</p>

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	<p>(g) <i>evidence demonstrating compliance with the uncertainty thresholds for activity data and other parameters (where applicable) for the applied tiers for each source stream;</i> (note new emphasis for “evidence” concerning compliance with uncertainty threshold requirements)</p> <p>(h) <i>description of the approach to be used for the sampling of fuel and materials for the determination of net calorific value, carbon content, emission factors, oxidation and conversion factor and biomass content for each of the source streams;</i> (“where applicable”)</p> <p>(i) <i>description of the intended sources* or analytical approaches for the determination of the net calorific values, carbon content, emission factor, oxidation factor, conversion factor or biomass fraction for each of the source streams;</i> (* in this context, sources refers to reference sources of factors, analytical services or other data)</p> <p>(j) <i>a list and description of non-accredited laboratories and relevant analytical procedures including a list of all relevant quality assurance measures e.g. inter-laboratory comparisons as described in section 13.5.2;</i> (only if non-EN ISO17025 accredited laboratories are going to be used)</p> <p>(k) <i>description of continuous emission measurement systems to be used for the monitoring of an emission source, i.e. the points of measurement, frequency of measurements, equipment used, calibration procedures, data collection and storage procedures and the approach for corroborating calculation and the reporting of activity data, emission factors and alike;</i> (use of CEMs is not expected to be an option that is commonly adopted for monitoring CO<sub>2</sub> especially in light of the additional Section 4.2 criteria that need to be satisfied)</p> <p>(l) <i>comprehensive description of the approach and the uncertainty analysis where a “fall-back approach” (section 5.3) is applied</i></p> <p>(m) <i>description of the procedures for data acquisition and handling activities and control activities as well as a description of the activities (see section 10.1-3)</i></p> <p>(n) <i>where applicable, information on relevant links with activities undertaken under the Community eco-management and audit scheme (EMAS) and other environmental management systems (e.g. ISO14001:2004); in particular on procedures and controls with relevance to greenhouse gas emissions monitoring and reporting</i></p> <p>The above elements need to form the basis of a new Competent Authority monitoring plan template, which should be followed in producing any exemplar plans and protocols, and in operators submitting plans for their installations</p>	
Para. 5	<p><i>The monitoring methodology shall be changed if this improves the accuracy of the reported data, unless this is not technically feasible or would lead to unreasonably high costs</i></p>	O
Para. 6	<p>A substantial change to the monitoring methodology within a monitoring plan requires Competent Authority approval if it concerns:</p>	O, CA

Relevant Section (Annex I unless specified) of the Guidelines	Issue	Special relevance to Operator, Competent Authority, Verifier
<p>Para. 7</p> <p>Para. 8</p> <p>Para. 9</p> <p>Para. 10</p>	<ul style="list-style-type: none"> <li>- a change of the categorisation of the installation as laid down in table 1</li> <li>- a change between the calculation based or measurement based methodology used to determine emissions</li> <li>- an increase of the uncertainty of the activity data or other parameters (where applicable) which implies a different tier level</li> </ul> <p><i>All changes and proposed changes in monitoring methodology or the underlying data sets shall be notified to the competent authority without undue delay.....unless otherwise specified in the monitoring plan</i></p> <p><i>Changes to the monitoring plan shall be clearly stated, justified and fully documented in internal records of the operator</i> (this is a particularly important requirement as it provides the technical trail to confirming the extant monitoring methodology, and will be subject to periodic inspection and verification)</p> <p>The Competent Authority <b>will</b> require the operator to change its monitoring methodology if the monitoring plan is no longer in conformity with the M&amp;R Guidelines</p> <p>Member States to facilitate an annual QA and evaluation process of MRV in accordance with Article 21 requirements</p>	<p>O</p> <p>O</p> <p>CA</p>
<p>5.</p> <p>5.1</p>	<p><b><u>CALCULATION BASED METHODOLOGIES FOR CO<sub>2</sub>-EMISSIONS</u></b></p> <p><b>Calculation Formulae</b></p> <p>Calculation of CO<sub>2</sub> emissions shall be based on: <i>CO<sub>2</sub> emissions = activity data * emission factor * oxidation factor</i>, or on an alternative approach if defined in the activity-specific guidelines</p> <p>Combustion emissions activity data <i>shall be based on fuel consumption. The quantity of fuel used shall be expressed in terms of energy content as TJ unless otherwise indicated in these Guidelines. The emission factor shall be expressed as tCO<sub>2</sub>/TJ (but see also Section 5.5)</i></p> <p><i>CO<sub>2</sub> emissions = fuel consumption [TJ] * emission factor [tCO<sub>2</sub>/TJ] * oxidation factor</i></p> <p>(See also Annex II)</p> <p>Process emissions shall be based on material consumption, throughput or production output and expressed in t or Nm<sup>3</sup></p>	

Relevant Section (Annex I unless specified) of the Guidelines	Issue	Special relevance to Operator, Competent Authority, Verifier
	<p><i>CO<sub>2</sub> emissions = activity data [t or Nm<sup>3</sup>] * emission factor [tCO<sub>2</sub>/t or Nm<sup>3</sup>] * conversion factor</i>            (See Annexes II-XI for further detail. N.B. Conversion factors are not always applied)</p>	
<p><b>5.2</b></p> <p>Para. 1</p> <p>Para. 2</p> <p>Para. 3</p> <p><b>Para. 4</b></p> <p>Para. 5</p>	<p><b>Tiers of approaches</b></p> <p>Annexes II-XI contain specific methodologies, referred to as tiers, for determining activity data (fuel/material flow/NCV), emission factors, composition data, oxidation and conversion factors</p> <p>The higher the number of the tier, the higher the associated level of accuracy, <i>with the highest numbered tier as the preferred tier</i></p> <p>Different tiers can be applied to the different variables within a methodology. Choice of tiers shall be subject to competent authority approval</p> <p>Equivalent tiers have the same number and an alphabet letter (e.g. Tier 2a and 2b); an operator can only change from one method to the other subject to Competent Authority satisfaction that it will lead to more accurate M&amp;R of relevant emissions.</p> <p><i>The highest tier approach shall be used by all operators to determine all variables for all source streams for all category B and C installations. Only if it is shown to the satisfaction of the competent authority that the highest tier approach is technically not feasible or will lead to unreasonably high costs, may a next lower tier be used for that variable</i></p> <p>Duty on Member State to notify the Commission in accordance with Article 21 of the Directive of Category C installations (emissions of more than 500 ktonnes of fossil CO<sub>2</sub> annually) that are not applying a combination of highest tier approaches for all major source streams</p> <p><b>Except as regards Section 16, the tiers set out in Table 1 of the Guidelines shall be applied as a minimum for all major source streams, unless this is technically not feasible</b> (See Commission FAQ No. 10 for confirmation that major source streams cannot be derogated below Table 1 minimum tier requirements purely on grounds of “unreasonable cost”)</p>	<p>O, CA</p> <p>O, CA</p> <p>O, CA</p> <p>O, CA</p> <p>CA</p> <p>O, CA</p>

Relevant Section (Annex I unless specified) of the Guidelines	Issue	Special relevance to Operator, Competent Authority, Verifier
Para 6	<p><b><u>Derogation for Minor and De-minimis Source Streams:</u></b> Subject to approval by the competent authority, the operator may select as a minimum the Tier 1 level for the variables used to calculate emissions from minor source streams (as defined under Section 2(4)(e)) and apply approaches for monitoring and reporting using their own no-tier estimation method for de-minimis source streams (as defined under Section 2(4)(c))</p>	O, CA
Para. 7	<p><i>The operator shall without undue delay propose changes to the tiers applied when:</i></p> <ul style="list-style-type: none"> <li>- <i>accessible data has changed, allowing for higher accuracy in the determination of emissions;</i></li> <li>- <i>previously non-existent emission has started;</i></li> <li>- <i>the range of fuels or raw materials has substantially changed;</i></li> <li>- <i>errors were detected in data resulting from the monitoring methodology;</i></li> <li>- <i>the competent authority has requested a change</i></li> </ul> <p>(Note the expectation for action “without undue delay”)</p>	O, CA
Para. 8	<p><b><u>No-tier Derogation allowed for Pure Biomass:</u></b> <i>For biomass fuel and materials qualifying as pure, no-tier approaches may be applied for installations, or technically identifiable parts thereof, unless the respective value to be used for the subtraction of biomass derived CO<sub>2</sub> from emissions determined by means of continuous emission measurement. Emission of CO<sub>2</sub> from fossil contaminants within pure biomass may also be determined according to no-tier methodology. (See Section 2(4)(g) regarding definition of “pure”)</i></p>	O, CA
Para. 9	<p><b><u>Provision for temporary derogation from agreed tiers:</u></b> In the event of agreed tiers being temporarily unachievable for technical reasons, the next highest tiers may be applied until former conditions can be restored. <i>The operator shall without undue delay provide proof of the necessity for a change of tiers to the competent authority and details of the interim monitoring methodology. The operator shall take all necessary action to allow prompt restoration of the original tier for monitoring and reporting purposes</i></p>	O, CA
Para. 10	<p><b><u>Measurement System Downtimes:</u></b> <i>Changes of tiers shall be fully documented. The treatment of minor data gaps from measurement system downtimes shall follow good professional practice ensuring a conservative estimation of emissions (see Section 2(2)(d) for definition of “conservative”). When tiers are changed within a reporting period the results for the affected activity shall be calculated and reported as separate sections of the annual report to the competent authority for the respective parts of the reporting period</i></p>	O, CA



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5.5	<p><b>Emission factors</b></p> <p>Para. 1 Initial statement is made that <i>emission factors are based on the carbon content of fuels or input materials and expressed as tCO<sub>2</sub>/TJ (combustion emissions), or tCO<sub>2</sub>/t or tCO<sub>2</sub>/Nm<sup>3</sup> (process emissions).</i></p> <p>Para. 2 Subsequent statement is then made that <i>in order to achieve highest transparency and widest possible consistency with national greenhouse gas inventories, the use of emission factors for a fuel expressed as tCO<sub>2</sub>/t rather than tCO<sub>2</sub>/TJ for combustion emissions is restricted to cases where unreasonable costs would otherwise be incurred by the operator.</i>  <b>This provides at least some flexibility contrary to the suggestion of Sections 5.1 and 5.4 for an operator to calculate combustion emissions of CO<sub>2</sub> from either the energy content of the fuel or its carbon content even though obligation still remains to report fuel CV values however emissions are calculated</b></p> <p>Para. 3 A factor of 3.664 [tCO<sub>2</sub>/tC] shall be used for conversion of carbon to CO<sub>2</sub></p> <p>Para. 4 Attention is drawn to Section 11 concerning reference emission factors and Section 13 as regards provisions set out for determination of activity-specific factors</p> <p><b>Para. 5 Biomass is considered CO<sub>2</sub> neutral, emission factor 0 (zero) tCO<sub>2</sub>/TJ or t or Nm<sup>3</sup></b></p> <p>Para. 6 A weighted emission factor shall be applied in the case of fuels and materials containing both fossil and biomass carbon (calculation in accordance with Section 13)</p> <p><b>Para. 7 <i>Inherent CO<sub>2</sub> which is transferred into an installation under the EU-ETS as part of a fuel (e.g. blast furnace gas, coke oven gas or natural gas) shall be included in the emission factor for that fuel.</i></b> (“Inherent” is defined in Section 2(2)(c))</p> <p><b>Para. 8 <i>Subject to approval by the competent authority, inherent CO<sub>2</sub> originating from a source stream but subsequently being transferred out of an installation as part of a fuel may be deducted from the emissions of that installation - independently of whether it is supplied to another EU-ETS installation or not. In any case, it shall be reported as a memo-item. Installations concerned are to be notified by Member States to the Commission under the obligations of Article 21 of Directive 2003/87/EC.</i></b> (N.B. Amongst other things, Competent Authorities should be satisfied that such transfers involve genuinely used fuels of reasonable CV)</p>	<p>O, CA</p> <p>O,CA, V</p> <p>O, CA, V</p> <p>O, CA, V</p>

Relevant Section (Annex I unless specified) of the Guidelines	Issue	Special relevance to Operator, Competent Authority, Verifier
5.6	<p><b>Oxidation and Conversion Factors</b></p> <p>Oxidation factors for combustion emissions and conversion factors for process emissions shall be used to reflect the proportion of carbon that is not oxidised or converted in the process. For oxidation factors, previous requirement for highest tier default is waived. Where different fuels are used and activity-specific oxidation factors calculated, the operator may subject to CA approval apply one aggregate oxidation factor for the activity to all fuels, or unless biomass is used, attribute incomplete oxidation to one major fuel stream and use a value of 1 for the others</p>	O
5.7	<p><b>Transferred CO<sub>2</sub></b></p> <p>Subject to CA approval, CO<sub>2</sub> may be subtracted from the calculated emissions that is not emitted from the installation but <b>transferred</b> out as a pure substance, or directly used and bound in products or as a feedstock, provided subtraction corresponds to equivalent national inventory adjustments. The respective amount of CO<sub>2</sub> shall be reported a memo item, and respective installations also notified under Article 21 obligations. The mass of annually transferred CO<sub>2</sub> or carbonate is to be determined with a maximum uncertainty of less than 1.5%. The operator shall subtract only the respective fractions of transferred CO<sub>2</sub> originating from fossil fuels and materials in activities covered by the Directive</p>	O, CA
6. 6.1	<p><b><u>MEASUREMENT BASED METHODOLOGIES</u></b></p> <p>Greenhouse gas emissions may be determined by a measurement based methodology using continuous emission measurement systems (CEMS) instead of calculation, either from all or selected sources. This is subject to Competent Authority approval that the CEMS approach will deliver greater accuracy than calculation involving the most accurate tier approach. The CEN, ISO, National Standards, draft standards, industry best practice guidelines hierarchy applies. Biomass contribution needs to be deduced and subtracted and reported as a memo item</p>	O, CA
6.2	<p>Annex XII of the Guidelines covers specific approaches for measurement based methodologies including a tier hierarchy. The highest tier default approach applies subject to technical feasibility and not leading to unreasonable costs. Tier 2 is specified as a minimum for 2008-2012 reporting periods unless technically not feasible</p>	O
6.3	<p>Sampling requirements including rates, substitution of missing data and calculation of arithmetic means and standard deviations for presentation to the verifier are discussed, as well as requirements for corroborating calculations of emissions</p>	O, CA,V

Relevant Section (Annex I unless specified) of the Guidelines	Issue	Special relevance to Operator, Competent Authority, Verifier
	<i>Respective approaches as well as the chosen method for the corroborating calculation shall be laid down in the monitoring plan and be approved by the competent authority</i>	O, CA
7  7.1  Para. 1  Para. 2  Para. 3  Para. 4	<p><b><u>UNCERTAINTY ASSESSMENT</u></b></p> <p><b>Calculation</b></p> <p>Subject to Section 16, <i>The operator shall have an understanding of main sources of uncertainty when calculating emissions.</i></p> <p><i>Under the calculation based methodology following the provisions of section 5.2, the competent authority will have approved the combination of tiers for each source stream in an installation plus approved all other details of the monitoring methodology for that installation as contained within the installation's permit. In doing so, the competent authority has authorised the uncertainty directly resulting from correct application of the approved monitoring methodology, and the evidence of that approval is the content of the permit. Stating the combination of tiers in the emissions report shall constitute reporting uncertainty for the purposes of Directive 2003/87/EC. Hence there is no further requirement to report on uncertainty if the calculation based methodology is applied</i></p> <p><i>The uncertainty determined for the measurement system within the tier system shall comprise the specified uncertainty of the applied measurement instruments, uncertainty associated with the calibration and any additional uncertainty connected to how the measurement instruments are used in practice. The stated threshold values within the tier system refer to the uncertainty associated to the value for one reporting period</i></p> <p><b>Dispensation for “commercially traded fuels” and “commercially traded materials” (see Section 2(2)(f) and 2(2)(g) definitions):</b> <i>As regards commercially traded fuels or materials, competent authorities may permit the determination of the annual fuel/material flow by the operator based solely on the invoiced amount of fuel or material without further individual proof of associated uncertainties, provided that national legislation or the demonstrated application of relevant national or international standards ensures that respective uncertainty requirements for activity data are met for commercial transactions</i></p>	<p>O</p> <p>CA</p> <p>O, V</p> <p>O, CA</p> <p>O, CA</p>



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	<p><i>b) For uncertainty of a product (e.g. of different parameters used to convert a meter reading into mass flow data):</i></p> <p><i>For uncorrelated uncertainties</i></p> $U_{total} = \sqrt{U_1^2 + U_2^2 + \dots + U_n^2}$ <p><i>For interdependent uncertainties:</i></p> $U_{total} = U_1 + U_2 + \dots + U_n$ <p><i>Where:</i></p> <p><i><math>U_{total}</math> is the uncertainty of the product, expressed as a percentage</i>  <i><math>U_i</math> are the percentage uncertainties associated with each of the quantities</i></p> <p><i>The operator, via the quality assurance and control process, shall manage and reduce the remaining uncertainties of the emissions data in his emissions report. During the verification process, the verifier shall check the correct application of the approved monitoring methodology, and shall assess the management and reduction of remaining uncertainties via the operator's quality assurance and control procedures.</i></p>	<p>O V</p>
<p>7.2</p> <p>Para. 1</p>	<p><b>Measurement</b> - Uncertainty requirements associated with measurement based (CEM) methodologies</p> <p>Under Section 4.2, operators need to demonstrate a measurement based methodology will result in lower uncertainty than a relevant calculation based methodology. In order to provide this justification <i>the operator shall report the quantitative results of a more comprehensive uncertainty analysis considering the following sources of uncertainty taking into account EN 14181.</i></p> <ul style="list-style-type: none"> <li>- <i>the specified uncertainty of continuous measurement equipment;</i></li> <li>- <i>uncertainties associated to the calibration;</i></li> <li>- <i>additional uncertainty connected to how the monitoring equipment is used in practice.</i></li> </ul>	<p>O</p>

Relevant Section (Annex I unless specified) of the Guidelines	Issue	Special relevance to Operator, Competent Authority, Verifier
<p>Para. 2</p> <p>Para. 3</p> <p>Para. 4</p>	<p>Based on such justification, <i>the competent authority may approve the operator's use of a continuous emission measurement system for selected or all emission sources.</i> This authorises the uncertainty assuming correct application of the approved methodology</p> <p><i>The operator shall state the uncertainty figure from this initial comprehensive uncertainty analysis in his annual emissions report for the relevant emission sources and source streams, until such point that the competent authority reviews the choice of measurement over calculation and requests that the uncertainty figure be re-calculated. Stating this uncertainty figure in the emissions report shall constitute reporting uncertainty for the purposes of Directive 2003/87/EC</i></p> <p>Identical to Section 7.1, <i>the operator, via the quality assurance and control process, shall manage and reduce the remaining uncertainties of the emissions data in his emissions report. During the verification process, the verifier shall check the correct application of the approved monitoring methodology, and shall assess the management and reduction of remaining uncertainties via the operator's quality assurance and control procedures</i></p>	<p>CA</p> <p>O, CA, V</p> <p>O,V</p>
<p>8.</p> <p>Para. 1</p> <p>Para. 3</p> <p>Para. 4</p>	<p><b>REPORTING</b> – Reporting Requirements</p> <p><i>The reporting format set out in section 14 of this Annex and the information required therein shall be used as a basis for reporting of the quantitative data unless an equivalent electronic standards protocol for annual reporting has been published by the EU Commission</i></p> <p><i>The report shall be verified in accordance with the detailed requirements established by the Member State pursuant to Annex V to Directive 2003/87/EC.</i></p> <p><i>The operator shall submit the verified report to the competent authority by 31 March each year for emissions during the preceding year</i></p> <p><i>Emission reports held by the competent authority shall be made available to the public by that authority subject to the rules laid down in Directive 2003/4/EC..... operators may indicate in their report which information they consider commercially sensitive</i></p>	<p>O</p> <p>O, V</p> <p>O, CA, V</p> <p>CA, O</p>

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Para. 5	<p><b>Each operator shall include the following information in the report for an installation:</b></p> <ol style="list-style-type: none"> <li>(1) <i>Data identifying the installation, as specified in Annex IV to Directive 2003/87/EC, and its unique permit number;</i></li> <li>(2) <b>For all emission sources and/or source streams the emission totals, chosen approach (measurement or calculation), chosen tiers and method (if applicable), activity data, emission factors, and oxidation/conversion factors. The following items, which are not accounted for in terms of emissions, shall be reported as memo items: amounts of biomass combusted [TJ] or employed in processes [t or Nm<sup>3</sup>] (see also Section 5.5, Para. 5); CO<sub>2</sub> emissions [t CO<sub>2</sub>] from biomass where measurement is used to determine emissions (see also Section 5.2, Para. 8); CO<sub>2</sub> transferred from an installation [t CO<sub>2</sub>] (see also Section 5.7, Para. 1); inherent CO<sub>2</sub> leaving the installation as part of a fuel (see also Section 5.5, Para. 8);</b></li> <li>(3) <i>If emission factors and activity data for fuels are related to mass instead of energy, the operator shall report supplementary proxy-data for the annual average net calorific value and emission factor for each fuel “Proxy data” means annual values - substantiated empirically or by accepted sources - used to substitute data for variables (i.e. fuel/material flow, net calorific value or emission, oxidation or conversion factors) required in the default calculation approaches according to Annexes I-XI in order to ensure complete reporting when the monitoring methodology does not generate all required variables;</i></li> <li>(4) <i>If a mass balance approach is applied operators shall report the mass flow, carbon and energy content for each fuel and material stream into and out of the installation and their stocks;</i></li> <li>(5) <i>If continuous emissions monitoring (Annex XII) is applied, the operator shall report the annual fossil CO<sub>2</sub>-emissions as well the CO<sub>2</sub>-emissions from biomass use. In addition, the operator shall report supplementary proxy-data for the annual average net calorific value and emission factor for each fuel or respective other relevant parameters for materials and products as derived by means of the corroborating calculation;</i></li> <li>(6) <i>If a fall-back approach according to section 5.3 is applied, the operator shall report supplementary proxy-data for every parameter for which the approach does not produce the required data according to Annexes I to XI;</i></li> <li>(7) <i>Where fuel use occurs, but emissions are calculated as process emissions, the operator shall report supplementary proxy-data for the respective variables of the default emission calculation for combustion emissions for these fuels;</i></li> <li>(8) <b>Temporal or permanent changes of tiers, reasons for these changes, starting date for changes, and starting and ending dates of temporal changes;</b></li> <li>(9) <b>Any other changes in the installation during the reporting period that may be relevant for the emissions report</b></li> </ol> <p>Annex IV defines data identifying the installation as name of the installation; its address including postcode and country; type and number of Annex I activities carried out in the installation; address, telephone, fax and email details for a contact person; and name of the owner of the installation and of any parent company</p>	O

Relevant Section (Annex I unless specified) of the Guidelines	Issue	Special relevance to Operator, Competent Authority, Verifier
Para. 6	<p><i>Activity data for combustion activities shall be reported as energy (net calorific value) and mass. Biomass fuels or input materials also have to be reported as activity data</i></p> <p><i>Emission factors for combustion activities shall be reported as CO<sub>2</sub> emission per energy content (see also Sections 5.5 and 14)</i></p> <p><i>Conversion and oxidation factors shall be reported as dimensionless fractions</i></p> <p><i>Information to be provided under (8) and (9) and supplementary information to be provided under (2) is not suitable for presentation in the tabulated form of the reporting format and shall therefore be included in the annual emission report as plain text</i></p>	O
Para. 7	<p><i>Fuels and resulting emissions shall be reported using IPCC fuel categories (see Section 11), subject to a list of categories and factors published by the Member State in accordance with the latest UNFCCC submission being approved</i></p>	O
Para. 8	<p><i>Waste types and emissions resulting from their use as fuels or input materials shall be reported using the classification of the Community list of wastes specified in Commission Decision 2000/532/EC... The respective six digit codes shall be added to the names of the relevant waste types used in the installation</i></p>	O
Para. 9	<p><i>Emissions occurring from different emission sources or source streams of the same type of a single installation belonging to the same type of activity may be reported in an aggregate manner for the type of activity (note: may be)</i></p>	O, CA
Para. 10	<p><i>Emissions shall be reported as rounded tonnes of CO<sub>2</sub> (for example 1,245,978 tons). Activity data, emission factors and oxidation or conversion factors shall be rounded to include only significant digits both for emission calculations and reporting purposes</i></p>	O
Para. 11	<p><b>Each activity carried out by an installation shall also be labelled with the appropriate codes related to the UNFCCC CRF and IPPC (EPRTR) reporting codes (see Sections 15.1 and 15.2 respectively)</b></p>	O

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9.  Para. 1  Para. 2  Para. 3  Para. 4  Para. 5	<p><b><u>RETENTION OF INFORMATION</u></b> - Requirements for Retention of Information</p> <p><i>An operator of an installation shall document and archive monitoring data for the installation's emissions <b>from all emission sources and/or source streams belonging to activities listed in Annex I to Directive 2003/87/EC of greenhouse gases specified in relation to those activities. (note: just concerns emissions from Annex I activities, not directly associated ones, and greenhouse gases listed in Annex I)</b></i></p> <p><i>The documented and archived monitoring data shall be sufficient to allow for the verification of the annual emissions report of an installation's emissions ... in accordance with the criteria set out in Annex V (of the Directive)</i></p> <p><i>Data that are not part of the annual emissions report shall not be required to be reported or made public otherwise</i></p> <p><i>To allow reproducibility of the determination of emissions by the verifier or another third party, <b>an operator of an installation shall retain the following information for at least ten years after the submission of the report pursuant to Article 14(3) of Directive 2003/87/EC for each reporting year:</b></i></p> <p><b>For calculation based methodologies</b> (paraphrasing):</p> <ul style="list-style-type: none"> <li>– list of source streams monitored;</li> <li>– activity data used in <b>any</b> calculation of emissions for each source stream, <i>categorised by process and fuel or material type</i>;</li> <li>– documents justifying selection of monitoring methodology and temporal or non-temporal derogation and tiers approved by the Competent Authority;</li> <li>– documentation of the monitoring methodology and results from development of activity-specific emissions factors, biomass fractions, oxidation and conversion factors, and respective proofs of Competent Authority approval;</li> <li>– documentation of the process of collection of activity data for the installation and its source streams;</li> <li>– <b>activity data, emission, oxidation/conversion factors submitted for NAP purposes</b>;</li> <li>– documentation of responsibilities in connection with emissions monitoring;</li> <li>– the annual emissions report;</li> <li>– any other information identified as required for verification purposes</li> </ul>	<p>O</p> <p>O, V</p> <p>O</p> <p>O</p>

Relevant Section (Annex I unless specified) of the Guidelines	Issue	Special relevance to Operator, Competent Authority, Verifier
Para. 6	<p><b>In addition, for measurement based methodologies:</b></p> <ul style="list-style-type: none"> <li>– list of emission sources monitored</li> <li>– documentation justifying selection of a measurement based methodology;</li> <li>– data used for the uncertainty analysis of emissions from each emission source, categorised by process;</li> <li>– data used for corroborating calculations;</li> <li>– detailed description of the CEM system including documented Competent Authority approval;</li> <li>– raw and aggregated data from the CEM system, including documented changes over time, the log book on tests, down-times, calibrations, servicing and maintenance;</li> <li>– documentation on any changes of the CEM system</li> </ul>	O
10.  10.1	<p><b><u>CONTROL AND VERIFICATION</u></b></p> <p><b>Data Acquisition and Handling</b></p> <p><i>The operator shall establish, document, implement and maintain an effective data acquisition and handling activities (... data flow activities) for the monitoring and reporting of greenhouse gas emissions in accordance with the approved monitoring plan, the permit and these guidelines</i></p> <p><i>These data flow activities include measuring, monitoring, analyzing, recording, processing, and calculating parameters in order to be able to report on greenhouse gas emissions</i></p>	O
10.2	<p><b>Control System</b></p> <p><i>The operator shall establish, document, implement and maintain an effective control system to ensure that the annual emissions report, resulting from the data flow activities does not contain misstatements and is in conformance with the approved monitoring plan, the permit and these guidelines</i></p> <p>The operator's control system needs to consist of:</p> <p>(a) <i>the operator's own assessment process of inherent (see Section 2(5)(c)) and control (see Section 2(5)(a)) risks to errors, misrepresentations or omissions (misstatements) in the annual emissions report, and non conformities against the approved monitoring plan, the permit and these guidelines;</i></p>	O  O

Relevant Section (Annex I unless specified) of the Guidelines	Issue	Special relevance to Operator, Competent Authority, Verifier
	<p>(b) <i>control activities(see Section 10.3) that help mitigate the identified risks</i></p> <p><b><i>The operator shall evaluate and improve his control system to ensure that the annual emissions report is not materially misstated or contains a material non-conformity. The evaluations shall include internal audits of the control system and the data reported.</i></b> The audit may also refer to other procedures and documents including in management systems (EMAS, ISO 14001, ISO 9001) and financial control systems. <i>When such a reference has been made, the operator shall ensure that the requirements in the approved monitoring plan, the permit and these guidelines are arranged for in the respective applicable system (overtly and specifically covered – direct as opposed to indirect or tenuous coverage)</i></p>	O
10.3  10.3.1	<p><b>Control Activities</b></p> <p>To control and mitigate the inherent and control risks identified under Section 10.2, <b><i>the operator shall identify and implement control activities in accordance with sections 10.3.1 to 10.3.6</i></b></p> <p><i>Procedures and Responsibilities</i></p> <p><b>The operator must assign responsibilities to all data flow activities and to all control activities, and resolve conflicting interests</b></p> <p><b><i>The operator shall document the data flow activities pursuant to section 10.1 and the control activities pursuant to sections 10.3.2 to 10.3.6 in written procedures, including:</i></b></p> <ul style="list-style-type: none"> <li>– <i>the sequence and interaction of data acquisition and handling activities according to 10.1, including the methods of calculations or measurement which are used;</i></li> <li>– <i>risk assessment of the definition and evaluations of the control system according to 10.2;</i></li> <li>– <i>management of the necessary competences for the responsibilities assigned according to 10.3.1;</i></li> <li>– <i>quality assurance of the measuring equipment and information technology used (if applicable) according to 10.3.2;</i></li> <li>– <i>internal reviews of reported data according to 10.3.3;</i></li> <li>– <i>outsourced processes according to 10.3.4;</i></li> <li>– <i>corrections and corrective action according to 10.3.5;</i></li> <li>– <i>records and documentation according to 10.3.6.</i></li> </ul>	O  O  O

Relevant Section (Annex I unless specified) of the Guidelines	Issue	Special relevance to Operator, Competent Authority, Verifier
10.3.2	<p>Each procedure shall address as appropriate responsibilities, records, information systems, inputs/outputs/linkages with previous and next activities, frequency</p> <p><b><i>The procedures shall be suitable to mitigate the identified risks</i></b></p> <p><i>Quality Assurance</i></p> <p><b><i>The operator shall ensure that relevant measuring equipment is calibrated, adjusted and checked at regular intervals including prior to use, and checked against measurement standards traceable to international measurement standards where available in accordance with the risks identified according to 10.2. The operator shall identify in the monitoring plan if components of the measurement instrument cannot be calibrated, and propose alternative control activities, which need approval of the competent authority. When the equipment is found not to conform to requirements, the operator shall promptly take necessary remedial action. Records of the results of calibration and authentication shall be retained for the period of 10 years</i></b></p>	<p>O</p> <p>O</p> <p>O</p>
10.3.3	<p>Additional requirements on the operator are stated where IT is used including for process control (see Section 10.3.2 for full details)</p> <p><i>Reviews and Evaluation of Data</i></p> <p><b><i>For managing the data flow, the operator shall design and implement reviews and validation of data in accordance with the risks identified according to 10.2. These validations may be conducted either manually or electronically. They shall be designed such that boundaries for rejecting the data are clear upfront where possible.</i></b></p> <p><i>Simple data reviews may be performed at the operational level by vertical and horizontal checks:</i></p> <p>A vertical approach compares emission data monitored for the installation in different years. Monitoring error is probable if differences between annual data cannot be explained by changes in activity levels, changes concerning fuels or input materials, changes in process (e.g. improvement energy efficiency)</p> <p>A horizontal approach compares values resulting from different operational data collection systems, including comparison of stock change against purchase data, comparison of differently derived emission factors (calculated,</p>	<p>O</p> <p>O</p>

Relevant Section (Annex I unless specified) of the Guidelines	Issue	Special relevance to Operator, Competent Authority, Verifier
10.3.4	<p>obtained from the fuel supplier, national or international references concerning comparable fuels), comparison of measured and calculated emissions</p> <p><i>Out-sourced Processes</i></p> <p><b>Where an operator chooses to out-source any process in the data flow, the operator shall control the quality of these processes in accordance with the risks identified according to 10.2. The operator shall define appropriate requirements for outputs and methods and review the quality delivered.</b></p>	O
10.3.5	<p><i>Corrections and Corrective Action</i></p> <p><b>When any part of the data flow activities or control activities (device, equipment, staff member, supplier, procedure or other) is found not to function effectively or to function outside set boundaries, the operator shall promptly take appropriate corrections and the rejected data shall be corrected. The operator shall assess the validity of the outputs of the applicable steps, determine the root cause of the malfunctioning or error and take appropriate corrective action</b></p> <p><i>The activities in this section shall be performed in accordance with 10.2 (risk based approach)</i></p>	O
10.3.6	<p><i>Records and Documentation</i></p> <p><b>To be able to show and ensure compliance and to be able to reconstruct emissions data reported, the operator shall keep records of all control activities (including Quality Assurance/Quality Control of equipment and Information Technology, review and validation of data and corrections) and all information listed under section 9 of this annex for at least 10 years.</b></p> <p><b>The operator shall ensure that relevant documents are available when and where they are needed to perform the data flow activities as well as the control activities. The operator shall have a procedure to identify, produce, distribute and control the version of these documents</b></p> <p><i>The activities in this section shall be performed in accordance with the risk based approach according to 10.2</i></p>	O

Relevant Section (Annex I unless specified) of the Guidelines	Issue	Special relevance to Operator, Competent Authority, Verifier
<p>10.4</p> <p>10.4.1</p> <p>10.4.2</p>	<p><b>Verification - section of principal interest concerning verification and verifier duties</b></p> <p><i>General Principles</i></p> <p><b><i>The objective of the verification is to ensure that emissions have been monitored in accordance with the guidelines and that reliable and correct emissions data will be reported pursuant to Article 14(3) of Directive 2003/87/EC. Member States shall consider respective guidance issued by the European Cooperation for Accreditation (EA) – the UK requires EU ETS verification to be carried out by bodies appropriately accredited by a member of the EA (e.g. UKAS) according to relevant EA guidance (e.g. EA-6/03)</i></b></p> <p><i>Subject to Chapter 10.4.2 e) a verification body shall come to a verification opinion that states with <b>reasonable assurance</b> (see Section 2(5)(e) definition) whether the data in the emissions report is free from material misstatements and whether there are no material non-conformities (see Section 2(5)(j) and Section 2(5)(i) definitions respectively)</i></p> <p><i>The operator shall submit the emissions report, <b>a copy of its approved monitoring plan</b> for each of its installations, and any other relevant information to the verifier</i></p> <p><i>Verification Methodology</i></p> <p><b><i>As part of the verification process, the verifier shall carry out the following steps:</i></b></p> <p><b><i>(a) Strategic Analysis</i></b></p> <p><i>The verifier shall:</i></p> <ul style="list-style-type: none"> <li>– <b><i>verify whether the monitoring plan has been approved by the competent authority and whether it is the right version. If this is not the case, the verifier should not continue the verification except for elements that are obviously not affected by the non-approval;</i></b></li> <li>– <b><i>understand each activity undertaken by the installation, the sources, source streams within the installation, the metering equipment used to monitor or measure activity data, the origin and application of emission factors and oxidation/conversion factors, any other data used to calculate or measure the emissions, and the environment in which the installation operates;</i></b></li> </ul>	<p>V</p> <p>V</p> <p>O</p> <p>V</p> <p>V</p>

Relevant Section (Annex I unless specified) of the Guidelines	Issue	Special relevance to Operator, Competent Authority, Verifier
	<ul style="list-style-type: none"> <li>– <i>understand the operator's monitoring plan, data flow, as well as its control system, including the overall organisation with respect to monitoring and reporting;</i></li> <li>– <i>apply the materiality level defined in Table 3</i></li> </ul> <p><b>MRG 2007 Table 3 sets the materiality level requirement for Category A and B installations at 5% and for Category C installations at 2%. Note that these are set rather than suggested materiality level requirements</b></p> <p><i>The verifier shall perform the strategic analysis in such a way that the verifier is able to conduct the risk analysis as set out below. When necessary this shall include a site visit</i></p> <p><b>(b) Risk Analysis</b></p> <p><i>The verifier shall:</i></p> <ul style="list-style-type: none"> <li>– <i>analyse the inherent risks (see Section 2(5)(c) definition) and control risks (see Section 2(5)(a) definition) related to the scope and complexity of the operator's activities and emission sources and source streams, and which could lead to a material misstatements (see Section 2(5)(j) definition) and non-conformities (see Section 2(5)(i) definition);</i></li> <li>– <i>draw up a verification plan which is commensurate with this risk analysis. The verification plan describes the way in which the verification activities are to be carried out. It contains a verification programme and a data sampling plan. The verification programme describes the nature of the activities, at what times they must be carried out and their scope in order for the verification plan to be completed. The data sampling plan sets out what data is to be tested in order to reach a verification opinion</i></li> </ul> <p><b>(c) Verification</b></p> <p><i>In carrying out the verification, the verifier shall conduct a site visit, when appropriate, to inspect the operation of meters and monitoring systems, conduct interviews, and collect sufficient information and evidence (note suggested reasons and need for a site visit to be carried out as part of the verification process)</i></p> <p><i>The verifier shall:</i></p> <ul style="list-style-type: none"> <li>– <i>carry out the verification plan by gathering data in accordance with the defined sampling methods, walkthrough tests, document reviews, analytical procedures and data review procedures, including any relevant additional</i></li> </ul>	<p>O, V</p> <p>V</p> <p>V</p> <p>V</p> <p>V</p> <p>V</p>

Relevant Section (Annex I unless specified) of the Guidelines	Issue	Special relevance to Operator, Competent Authority, Verifier
	<p><i>evidence, upon which the verifier's verification opinion will be based;</i></p> <ul style="list-style-type: none"> <li>– <i>confirm the validity of the information used to calculate the uncertainty level as set in the approved monitoring plan;</i></li> <li>– <i>verify that the approved monitoring plan is implemented and seek understanding whether the monitoring plan is up to date;</i></li> <li>– <i>request the operator to provide any missing data or complete missing sections of audit trails, explain variations in the emissions data, or revise calculations, or adjust reported data, before reaching a final verification opinion. <b>The verifier should, in any form, report all non-conformities and misstatements identified to the operator</b></i></li> </ul> <p><b><i>The operator shall correct any reported misstatements. The entire population from which a sample was taken shall be corrected</i></b></p> <p><i>Throughout the verification process, the verifier shall determine misstatements and non-conformities by assessing whether:</i></p> <ul style="list-style-type: none"> <li>– <i>the monitoring plan has been implemented to support the determination of non-conformities;</i></li> <li>– <i>there is clear and objective evidence obtained through the gathering of data to support the determination of misstatements</i></li> </ul> <p><b><i>(d) Internal Verification Report</i></b></p> <p><i>At the end of the verification process, <b>the verifier shall prepare an internal verification report.</b> The verification report shall record evidence showing that the strategic analysis, the risk analysis and the verification plan has been performed in full, and provide sufficient information to support verification opinions. <b>The internal verification report should as well facilitate a potential evaluation of the audit by the competent authority, and accreditation body</b></i></p> <p><b><i>Based on the findings contained in the internal verification report, the verifier shall make a judgement with respect to whether the annual emissions report contains any material misstatement as compared to the materiality threshold, and whether there are material non-conformities or other issues relevant for the verification opinion</i></b></p>	<p>V, O</p> <p>O</p> <p>V</p> <p>V</p> <p>V</p>

Relevant Section (Annex I unless specified) of the Guidelines	Issue	Special relevance to Operator, Competent Authority, Verifier
	<p><i>(e) Verification Report</i></p> <p><i>The verifier shall present the verification methodology, his findings and verification opinion in a verification report, addressed to the operator, to be submitted by the operator with the annual emission report to the competent authority. An annual emissions report is verified as satisfactory if the total emissions are not materially misstated, and if, in the opinion of the verifier, there are no material non-conformities. In the case of non-material non-conformities or non-material misstatements, the verifier may include these in the verification report ("verified as satisfactory with non-material non-conformities or non-material misstatements"). The verifier may also report these in a separate management letter (the UK annual verification guidance accommodates report of non-material issues as comments in a "verified with comments" verification opinion)</i></p> <p><i>The verifier may conclude an annual emission report is not verified as satisfactory, if the verifier finds material non-conformities or material misstatements (with or without material non-conformities). The verifier may conclude an annual emissions report is not verified when there was a limitation of scope (when circumstances prevent, or a restriction was imposed that prevents, the verifier from obtaining evidence required to reduce the verification risk to the reasonable level) and/or material uncertainties</i></p> <p><i>Member States shall ensure that the operator addresses non-conformities and misstatements after consultation of the competent authority in a timeframe set by the competent authority. In addition, all divergences of opinion between operators, verifiers and competent authorities shall not affect proper reporting and shall be settled in accordance with Directive 2003/87/EC, these guidelines, and the requirements established by the Member States pursuant to Annex V to that Directive, and relevant national procedures</i></p>	<p>V</p> <p>V</p> <p>CA, O</p>
11.	<p><b><u>EMISSION FACTORS</u></b></p> <p><b>Table 4: Fuel emission factors related to net calorific value (NCV) and net calorific values per mass of fuel (aligned with 2006 IPCC Guidelines)</b></p> <p>Tier 1 allows use of non-activity specific emission factors for combustion of fuel.</p> <p><i>If a fuel does not belong to an existing fuel category (listed in Table 4) the operator shall use his expert judgement to</i></p>	<p>O, CA</p>

Relevant Section (Annex I unless specified) of the Guidelines	Issue	Special relevance to Operator, Competent Authority, Verifier
	<p><i>assign the fuel used to a related fuel category, subject to the approval of the competent authority</i></p> <p><b>N.B. A list of UK country-specific factors currently updated annually and published on the DEFRA EU ETS website are generally considered superior and allow Tier 2 compliance. They should be used in preference to values from Table 4 (assuming comparable fuel type concerned).</b></p>	
12.	<p><b><u>LIST OF CO<sub>2</sub>-NEUTRAL BIOMASS</u></b></p> <p><b>Exemplary but not exhaustive list of materials considered biomass for the application MRG 2007 - to be weighted with an emission factor of zero. Peat and fossil fractions of the materials listed shall not be considered biomass. Unless a contamination with other materials or fuels is apparent ..., no analytical procedures need to be applied to demonstrate the purity of members of Group 1 and 2 (Group 1: Plants and parts of plants; Group 2: Biomass wastes, products and by-products; see Section 11 for specific materials)</b></p>	
13.  13.1  Para. 1  Para. 2	<p><b><u>DETERMINATION OF ACTIVITY SPECIFIC DATA AND FACTORS</u></b></p> <p>The section is mandatory only for those parts of MRG 2007 making explicit reference to “section 13” of Annex 1 (e.g. top tiers in the activity-specific Annexes II-XI)</p> <p><b><i>Determination of Net Calorific Values and Emission Factors for Fuels</i></b></p> <p><i>The specific procedure to determine the activity specific emission factor including the sampling procedure for a specific fuel type shall be agreed with the competent authority before the start of respective reporting period in which it will be applied</i></p> <p><i>The procedures applied to sample the fuel and to determine its net calorific value, carbon content and emission factor shall, where available, be according to a standardized method that limits sampling and measurement bias and has a known measurement uncertainty. CEN standards shall be used if available. If CEN standards are not available, suitable ISO standards or national standards shall apply. Where no applicable standards exist, procedures can be carried out where possible in accordance with suitable draft standards or industry best practice guidelines</i></p>	O, CA

Relevant Section (Annex I unless specified) of the Guidelines	Issue	Special relevance to Operator, Competent Authority, Verifier
<p>Paras. 3-5</p> <p><b>Para. 6</b></p> <p><b>Para. 7</b></p> <p>Para. 8</p>	<p>(Examples of possibly relevant standards provided)</p> <p><i>The laboratory used to determine the emission factor, carbon content and net calorific value shall comply with requirements laid down in section 13.5</i></p> <p>Emphasis on the importance of sampling frequency, procedure and preparation, and homogeneity of fuel/material. The required number of samples will be larger for very heterogeneous materials</p> <p><i>The sampling procedure and frequency of analyses for the determination of the carbon content, net calorific values and emission factors shall comply with the requirements of section 13.6</i></p> <p><i>The full documentation of the procedures used in the respective laboratory for the determination of the emission factor and the full set of results shall be retained and made available to the verifier of the emissions report.</i></p>	<p>O</p> <p>O</p> <p>O, V</p>
<p><b>13.2</b></p> <p>Para. 1</p> <p><b>Paras. 2 &amp; 3</b></p> <p>Para. 4</p>	<p><b><i>Determination of Activity Specific Oxidation Factors</i></b></p> <p><i>The specific procedure to determine the activity specific oxidation factor including the sampling procedure for a specific fuel type and installation shall be agreed with the competent authority before the start of respective reporting period in which it will be applied.</i></p> <p>Equivalent requirements to the contents of Para. 2 (use of CEN standards etc.), Para. 6 (<b>laboratories according to section 13.5</b>) and Para. 7 (<b>sampling procedure and frequency according to section 13.6</b>) of Section 13.1 above</p> <p><i>The full documentation of the procedures used by the organisation for the determination of the oxidation factor and the full set of results shall be retained and made available to the verifier of the emissions report</i></p>	<p>O, CA</p> <p>O</p> <p>O, V</p>

Relevant Section (Annex I unless specified) of the Guidelines	Issue	Special relevance to Operator, Competent Authority, Verifier
<p><b>13.3</b></p> <p>Para. 1</p> <p><b>Paras. 2 &amp; 3</b></p> <p>Para. 4</p>	<p><b><i>Determination of Process Emission Factors, Conversion Factors and Composition Data</i></b></p> <p><i>The specific procedure to determine the activity specific emission factor, conversion factor or composition data including the sampling procedure for a specific material shall be agreed with the competent authority before the start of respective reporting period in which it will be applied</i></p> <p>Equivalent requirements to the contents of Para. 2 (use of CEN standards etc.), Para. 6 (<b>laboratories according to section 13.5</b>) and Para. 7 (<b>sampling procedure and frequency according to section 13.6</b>) of Section 13.1 above</p> <p><i>The full documentation of the procedures used by the organisation and the full set of results shall be retained and made available to the verifier of the emissions report</i></p>	<p>O, CA</p> <p><b>O</b></p> <p>O, V</p>
<p><b>13.4</b></p> <p>Para. 1</p> <p>Para. 2</p> <p>Para. 3</p> <p>Paras. 4</p> <p><b>Para. 5</b></p>	<p><b><i>Determination of a Biomass Fraction</i></b></p> <p>The term “biomass fraction” for the purpose of the Guidelines refers to the mass percentage of biomass carbon according to the biomass definition (see Sections 2(4)(f) and 12) out of the total mass of carbon in a sample</p> <p><i>Fuel or material shall qualify as pure biomass with simplified provisions for the monitoring and reporting as set out in section 5.2, if the non-biomass content accounts to no more than 3 % of the total quantity of the fuel or material concerned</i></p> <p><i>The specific procedure to determine the biomass fraction of a specific fuel or material including the sampling procedure shall be agreed with the competent authority before the start of the reporting period in which it will be applied</i></p> <p>Equivalent requirements to Para. 2 (use of CEN standards etc.) of Section 10.1 above</p> <p><i>Methods applicable to determine the biomass fraction in a fuel or material could range from the manual sorting of components of mixed materials, to differential methods determining heating values of a binary mixture and its two pure components to an isotopic analysis of carbon-14 – depending on the specific nature of the respective fuel mixture. For fuels or materials originating from a production process with defined and traceable input streams, the operator may alternatively base the determination of the biomass fraction on a mass-balance of fossil and biomass carbon entering</i></p>	<p>O, CA</p> <p>O</p> <p><b>O, CA</b></p>

Relevant Section (Annex I unless specified) of the Guidelines	Issue	Special relevance to Operator, Competent Authority, Verifier
<p>Para. 6 &amp; 7</p> <p>Para. 8</p> <p>Para. 9</p>	<p><i>and leaving the process. The respective methods are to be approved by the competent authority</i></p> <p>Equivalent requirements to the contents of Para. 6 (<b>laboratories according to section 13.5</b>) and Para. 7 (<b>sampling procedure and frequency according to section 13.6</b>) of Section 13.1 above</p> <p><i>The full documentation of the procedures used in the respective laboratory for the determination of the biomass fraction and the full set of results shall be retained and made available to the verifier of the emissions report</i></p> <p><i>If the determination of the biomass fraction in a mixed fuel is technically not feasible or would lead to unreasonably high costs the operator shall either assume a 0% biomass share (i.e. complete fossil origin of all carbon in that particular fuel) or propose an estimation method for approval by the competent authority</i></p>	<p>O</p> <p>O, V</p> <p>O, CA</p>
<p>13.5</p> <p>13.5.1</p> <p>13.5.2</p>	<p><b>Requirements for Determination of Fuel and Material Properties</b></p> <p><i>Use of Accredited Laboratories</i></p> <p><i>The laboratory used to determine the emission factor, net calorific value, oxidation factor, carbon content, the biomass fraction or composition data should be accredited according to EN ISO 17025:2005 (“General requirements for the competence of testing and calibration laboratories”)</i></p> <p><i>Use of Non-Accredited Laboratories</i></p> <p><i>Preference is for use of laboratories accredited according to EN ISO 17025:2005. The use of non-accredited laboratories shall be limited to situations in which the operator can demonstrate to the competent authority that the laboratory meets equivalent requirements to those laid out in EN ISO 17025:2005. The respective laboratories and relevant analytical procedures shall be listed in the monitoring plan for the installation. Equivalence in respect to quality management could be demonstrated by an accredited certification of the laboratory against EN ISO 9001:2000. Additional evidence shall be provided that the laboratory is technically competent and able to generate technically valid results using the relevant analytical procedures</i></p>	<p>O, CA</p>

Relevant Section (Annex I unless specified) of the Guidelines	Issue	Special relevance to Operator, Competent Authority, Verifier
13.5.3	<p><i>Under the responsibility of the operator, each non-accredited laboratory used by the operator to determine results used for the calculation of emissions shall take the following measures:</i></p> <p><i>a) Validation - of each relevant analytical method against a reference method carried out by a laboratory accredited according to EN ISO 17025:2005, before or at the beginning of contracting the non-accredited laboratory. Inclusive of a sufficient number of repetitions of the analysis of a set of at least five samples Representative for the expected value range including a blank sample for each relevant parameter and fuel or material in order to characterise the repeatability of the method and to derive the calibration curve of the instrument;</i></p> <p><i>b) Inter-comparison – An inter-comparison of the results of analytical methods shall be executed once a year by a laboratory accredited according to EN ISO 17025: 2005 involving at least a fivefold repetition of the analysis of a representative sample using the reference method for each relevant parameter and fuel or material</i></p> <p><i>The operator shall apply conservative adjustments (i.e. avoiding under-estimation of emissions) to all relevant data of the respective year in cases in which a difference is observed between the results derived by the non-accredited and the accredited laboratory which might lead to an under-estimation of emissions. Any statistically significant (<math>2\sigma</math>) differences between the end results (e.g. the composition data) derived by the non-accredited and the accredited laboratory shall be notified to the competent authority and be immediately resolved under supervision of a laboratory accredited according to EN ISO 17025: 2005</i></p> <p><i>Online Gas Analysers and Gas Chromatographs</i></p> <p><i>The use of online gas chromatographs and extractive or non-extractive gas analysers for emission determination under these Guidelines is subject to approval by the competent authority. The use of these systems is limited to the determination of composition data of gaseous fuels and materials. The operator operating the systems shall meet the requirements of EN ISO 9001:2000. Evidence that the system is meeting those requirements can be demonstrated by an accredited certification of the system. Calibration services and the suppliers of calibration gases shall be accredited against EN ISO 17025:2005</i></p> <p><i>Where applicable an initial and annually repeated validation of the instrument shall be carried out by a laboratory accredited against EN ISO 17025:2005 using EN ISO 10723:1995 “Natural gas - Performance evaluation for on-line</i></p>	<p>O</p> <p>O, CA</p> <p>O, CA</p> <p>O</p>

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	<p><i>analytical systems". In all other cases, the operator shall commission an initial validation and annual inter-comparison:</i></p> <p>a) <b>Initial validation</b> – <i>The validation shall be carried out before 31<sup>st</sup> January 2008 or as part of the commissioning of a new system. It includes an appropriate number of repetitions of the analysis of a set of at least five samples representative for the expected value range including a blank sample for each relevant parameter and fuel or material in order to characterise the repeatability of the method and to derive the calibration curve of the instrument;</i></p> <p>b) <b>Annual inter-comparison</b> – <i>The inter comparison of the results of analytical methods shall be executed once a year by a laboratory accredited according to EN ISO 17025: 2005 involving an appropriate number of repetitions of the analysis of a representative sample using the reference method for each relevant parameter and fuel or material</i></p> <p><i>The operator shall apply conservative adjustments (i.e. avoiding under-estimation of emissions) to all relevant data of the respective year in cases in which a difference is observed between the results derived by the non-accredited and the accredited laboratory which might lead to an under-estimation of emissions. Any statistically significant (2σ) differences between the end results (e.g. the composition data) derived by the non-accredited and the accredited laboratory shall be notified to the competent authority and be immediately resolved under supervision of a laboratory accredited according to EN ISO 17025: 2005</i></p>	O, CA
<p>13.6</p> <p>Para. 1</p> <p>Para. 2</p>	<p><b>Sampling Methods and Frequency of Analysis</b></p> <p><i>The determination of the relevant emission factor, net calorific value, oxidation factor, conversion factor, carbon content, biomass fraction or composition data shall follow generally accepted practice for representative sampling. The operator shall provide evidence that the derived samples are representative and free of bias. The respective value shall be used only for the delivery period or batch of fuel or material for which it was intended to be representative</i></p> <p><i>Generally, the analysis will be carried out on a sample which is the mixture of a larger number (e.g. 10-100) of samples collected over a period of time (e.g. from a day to several months) provided that the sampled fuel or material can be stored without changes of its composition</i></p>	O

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Para. 3  Para. 4  Table 5	<p><i>The sampling procedure and frequency of analyses shall be designed to ensure that the annual average of the relevant parameter is determined with a maximum uncertainty of less than 1/3 of the maximum uncertainty which is required by the approved tier level for the activity data for the same source stream</i></p> <p><i>If the operator is not able to meet the allowed maximum uncertainty for the annual value or unable to demonstrate compliance with the thresholds, he shall apply the frequency of analyses as laid down in table 5 as a minimum, if applicable. In all other cases the competent authority shall define the frequency of analyses.</i></p> <p>Table of Indicative Minimum Frequency of Analyses (for a number of different fuels and materials)</p>	O  O
14.	<p><b><u>REPORTING FORMAT</u></b> (Further to Section 8)</p> <p>Tables that shall be used as a basis for reporting and may be adapted according to the number of activities, type of installation, fuels and processes monitored</p>	
15.	<p><b><u>REPORTING CATEGORIES</u></b></p> <p>Tables presenting the IPCC and IPPC source category codes against which EU ETS annual emissions must be reported (also see Sections 8 and 14)</p> <p>Where an activity could be classified under two or more categories the selected classification shall reflect the primary purpose of the activity</p>	
16.	<p><b><u>REQUIREMENTS FOR INSTALLATIONS WITH LOW EMISSIONS</u></b></p> <p>Possible exemptions are listed in relation to Sections 4.3 (The Monitoring Plan), 5.2 (Tiers of Approaches), 7.1 (Uncertainty Assessment Calculation), 10 (Control and Verification) and 13 (Determination of Activity Specific Data and Factors). This is specifically for <i>installations with average verified reported emissions of less than 25,000 tonnes of CO<sub>2</sub> per year during the previous trading period. If the reported emission data are no longer applicable ... or if a history of verified emissions is missing, the exemptions apply if the competent authority has approved a conservative projection of emissions for the next five years with less than 25,000 tonnes of fossil CO<sub>2</sub> for each year</i></p>	O, CA

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	<p>The possible exemptions that are listed are:</p> <ul style="list-style-type: none"> <li>• <i>Member States may waive the mandatory need for annual site visits by the verifier in the verification process and let the verifier take the decision based on the results of his risk analysis</i></li> <li>• <i>Where necessary, the operator may use information as specified by the supplier of relevant measurement instruments irrespective of specific use conditions to estimate the uncertainty of activity data</i></li> <li>• <i>Member States may waive the need of proof of compliance with the requirements regarding calibration in section 10.3.2 of this Annex</i></li> <li>• <i>Member States may permit the use of lower tier approaches (with tier 1 as minimum level) for all source streams and relevant variables</i></li> <li>• <i>Member States may permit the use of simplified monitoring plans which contains at least the elements listed under items a), b), c), e), f), k) and l) as listed in section 4.3 of this Annex</i></li> <li>• <i>Member States may waive requirements regarding the accreditation against EN ISO 17025:2005 if the laboratory in question:</i> <ul style="list-style-type: none"> <li>– <i>provides conclusive evidence that it is technically competent and is able to generate technically valid results using the relevant analytical procedures and</i></li> <li>– <i>participates annually in inter-laboratory comparisons and subsequently undertakes corrective measures if necessary</i></li> </ul> </li> <li>• <i>The uses of fuels or materials can be determined based on purchasing records and estimated stock changes without further consideration of uncertainties</i></li> </ul>	

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Annex II	<p><b>Guidelines for Combustion Emissions from Activities as listed in Annex I to Directive 2003/87/EC</b></p> <p>Note applicability to all activities listed in Annex I of the Directive, not just combustion installations</p>	
Annex III  Section 2.1b&c	<p><b>Activity-Specific Guidelines for Mineral Oil Refineries as listed in Annex I to Directive 2003/87/EC</b></p> <p>Provision to use additional mass balance approach if the operator can demonstrate that it is more accurate for the installation as a whole than for each fuel type or process (or the equivalent demonstrated for using the mass balance approach on a well defined sub-set of fuel types or processes)</p>	
Annex IV	<p><b>Activity-Specific Guidelines for Coke Ovens as listed in Annex I to Directive 2003/87/EC</b></p>	
Annex V	<p><b>Activity-Specific Guidelines for Metal Ore Roasting and Sintering Installations as listed in Annex I to Directive 2003/87/EC</b></p>	
Annex VI	<p><b>Activity-Specific Guidelines for Installations for the Production of Pig Iron and Steel including Continuous Casting as listed in Annex I to Directive 2003/87/EC</b></p>	
Annex VII	<p><b>Activity-Specific Guidelines for Installations for the Production of Cement Clinker as listed in Annex I to Directive 2003/87/EC</b></p>	
Annex VIII	<p><b>Activity-Specific Guidelines for Installations for the Production of Lime as listed in Annex I to Directive 2003/87/EC</b></p>	

<b>Relevant Section (Annex I unless specified) of the Guidelines</b>	<b>Issue</b>	<b>Special relevance to Operator, Competent Authority, Verifier</b>
<b>Annex IX</b>	<b>Activity-Specific Guidelines for Installations for the Manufacture of Glass as listed in Annex I to Directive 2003/87/EC</b>	
<b>Annex X</b>	<b>Activity-Specific Guidelines for Installations for the Manufacture of Ceramic Products as listed in Annex I to Directive 2003/87/EC</b>	
<b>Annex XI</b>	<b>Activity-Specific Guidelines for Pulp and Paper Producing Installations as listed in Annex I to Directive 2003/87/EC</b>	
<b>Annex XII</b>	<b>Guidelines for Determination of Greenhouse Gas Emissions by Continuous Emission Measurement Systems</b>	

**RJ Gemmill  
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28<sup>th</sup> June 2007**