



EU Greenhouse Gas Emission Allowance Trading Scheme

Guidance note to Operators in Ireland on completing the Annual Installation Emissions Report for Emissions Trading

(Issue 2, 16 December 2008)

This document does not purport to be and should not be considered a legal interpretation of the provisions and reporting requirements of the Commission Decision of 18 July 2007 establishing guidelines for the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council.

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Introduction:

This guidance is intended to help Operators in the completion of form IRL ETS 011/04 (Annual Installation Emission Report - AIER), so that they can meet their annual reporting requirements as defined within the M&R Decision 2007, Annex I, Section 5 & Section 14, Schedule 4 of the European Communities (Greenhouse Gas Emissions Trading) Regulations 2004 (S.I. 437 of 2004) and amendments and finally Condition 3 of the GHG Permit.

Please note that a verified Annual Installation Emissions Report must be submitted to the Climate Change Unit of the Environmental Protection Agency no later than **31 March each year, commencing in 2009** for emissions during the preceding year. The EPA **STRONGLY** recommends that Operators submit their verified reports well in advance of this date to avoid any last minute technical problems.

Form IRL ETS 011/04 together with this guidance, is designed to lead Operators stepwise through the EPA's requirements for reporting of annual emissions from permitted installations.

The form and this guidance comprise four parts:

- Part A to provide identification of the installation, a summary of emissions, activities and the monitoring tiers employed;
- Part B to provide information on carbon dioxide emissions from combustion activities;
- Part C to provide information on process related carbon dioxide emissions; and
- Part D to provide supplementary information to that provided in either Parts A or B when a mass balance approach has been used.
- Part E for the use of the Verifier only.

This Guidance Note also includes three Annexes containing information to assist you with completion of your report.

If at anytime you require further guidance or clarification please contact the EPA as soon as possible.

Notes on data entry in the form:

Restricted data entry:

The form is designed with drop down menus and specific data cells. This is to allow for a more standard format and to ease the completion and assessment of the forms. Non-data entry cells are protected to prevent data entry. Every effort has been made in the preparation of the form to accommodate the needs of specific installations. However, if you feel that your installation needs a specifically modified form then please contact the EPA.

Macros:

The form contains a number of Macros or short execution programs for data manipulation. These may trigger a security warning when you open the file. It is recommended that you accept or enable the Macros when prompted.

Tiers:

The tiers to be applied to the monitoring & reporting of emissions are those set out in the installation's current EPA approved M&R Plan. A full explanation of the tiers may be found in Annexes II to XI of the M&R Decision 2007.

Installations that are approved to use country specific factors for combustion activities should refer to the EPA website at <http://www.epa.ie/> and download the latest version of the '*Country Specific Net Calorific Values and CO₂ Emission Factors for use in the Annual Installation Emissions Report*'. In calculating the emissions for a particular year you should only use the emission factors or NCVs approved for that year's report.

Decimal places:

Throughout the form the number of decimal places displayed varies. It is important to note that the final verified emission figure must be rounded to the nearest whole tonne. Installations may use more decimal places for data other than the final emission figure if they wish. This number will be held in the cell for verification, although it may be displayed using fewer decimal places.

Saving, protecting, printing and submission of the form**Saving:**

An Operator with permit IE-GHG999-05 submitting a first 'verified' report to the EPA for 2008 should save the report as follows:

Permit Number, VERIFIEDAIER, report year, version (01 in most cases unless you have to re-submit the report)

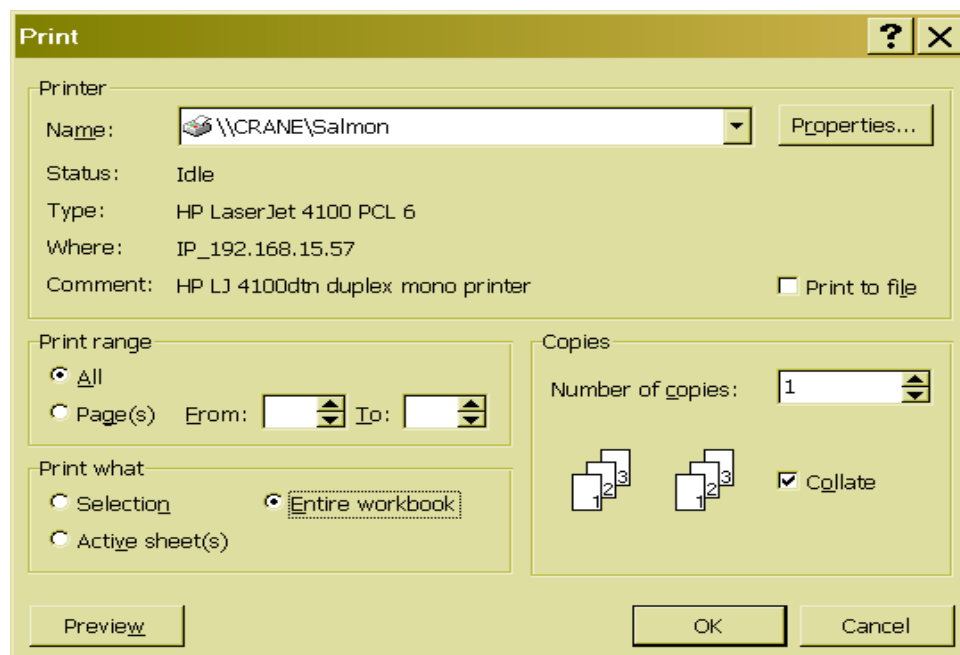
E.g. IE-GHG999-05VERIFIEDAIER2008-01

Protection:

The EPA recommends that you save the file as 'read-only' and record the password somewhere safe. The EPA must be able to open the report to view it.

Printing a hard copy:

A signed **original and two hard copies** and must be sent to the EPA. To print a complete workbook select 'entire workbook' as a print option. See example over.



If you need further advice on how to complete IRL ETS 011/04 or if you have comments on how IRL ETS 011/04 could be improved then please contact the Environmental Protection Agency via GHGpermit@epa.ie

PART A

Part A is to be completed by all Operators reporting emissions from Schedule 1 combustion or process sources within their installation

A1 Identification of installation (M&R Decision 2007 Annex I Section 14.1)

Section A1.1 GHG Permit, installation, E-PRTR and AIER Version numbers.

You are asked to provide your GHG permit number, installation number and your E-PRTR number and the AIER Version number where applicable. The GHG permit and installation numbers are to be found in your current GHG permit. You **must use the numbers exactly** as stated in your GHG permit.

The E-PRTR Number is applicable to Installations which report under the E-PRTR Regulation (EC) No 166/2006 concerning the establishment of a European Pollutant Release and Transfer Register and amending Council Directives 91/689/EEC and 96/61/EC.

Example 1:

An installation has a current permit number of IE-GHG999-05 with an installation number of IE-789 and E-PRTR Number of PO732. They are submitting the first version of their AIER. The section should be completed as follows:

You must use the numbers stated in your GHG permit.

	Number	Version
IE-GHG	999	05
IE-	789	
	PO732	
	Version 1	

Greenhouse Gas Emissions Permit Number
Installation Number
E-PRTR Number (Where applicable)
AIER Version

Section A1.2 Operator name.

You are asked to provide the Operator's name. This should be identical to that stated within your GHG permit.

Section A1.3 Installation name and location of site.

You are asked to provide the installation name and the site name. These must be identical to those given in your GHG permit. Both cells should be completed even if information is the same.

Section A1.4 Contact details for report of annual emissions.

Please identify a person and their job title together with their contact details so that we can contact them directly should we have any questions about this emissions report. If the contact person is an agent (e.g. consultant) acting on behalf of the installation then the name of the Agent's organisation should also be given in the job title box.

Section A1.5 Schedule 1 activities at your installation.

Please select the activity or activities that are carried out at the installation. The majority of installations have a single activity. Single activity installations should only complete 'Activity One' and leave 'Activity Two' as 'select'. If you are unsure which activity is being carried out at the installation you should refer to the current GHG permit.

Section A1.6 Report year.

Select, by clicking on the "select" box, the relevant reporting year from the list provided i.e. the year in which the reported emissions occurred.

A2 Overview of activities and emissions within an installation (M&R Decision 2007 Annex I Section 14.2)

Section A2.1 Summary table of emissions from fossil fuels and/or materials for each type of Schedule 1 activity.

Category of activity:

Please select, the appropriate activity category (e.g. E1.1 Combustion) by clicking on "select" and choosing the appropriate category from those listed. The activities listed here are abbreviated from those in Section A1.5.

IPCC CRF category:

Type the appropriate Common Reporting Format (CRF) category. The CRF categories are listed in Annex I of this guidance. In selecting the appropriate codes, thought must be given to the source of the carbon dioxide emissions i.e. if emissions result from the combustion of fuel (monitoring in accordance with M&R Decision 2007 Annex II) then in general this will be classified as an "Energy" activity. If carbon dioxide is released from a process (monitoring is undertaken in accordance with M&R Decision 2007 Annexes III to XI or in Annex II for FGD equipment) as a result of the use of materials then in general this will be classified as an "Industrial process".

However, in some cases both classifications will apply e.g. where a process requires heat from a combusted fuel and also uses materials that give rise to carbon dioxide emissions. Some examples are given below:

Example 1:

A hospital or university combusting fuel in a range of boilers to provide heat. The appropriate CRF code would be:

1A4a (1. Energy, A. Fuel combustion, 4. Other sectors, a. Commercial/Institutional)

Example 2:

A pulp and paper plant that includes a number of boilers to raise steam for the paper making process and heaters for the process and space heating. The appropriate CRF code would be:

1A2d (1. Energy, A. Fuel combustion, 2. manufacturing, d. Pulp, paper & print)

Example 3:

A fossil fuelled power station fitted with flue gas desulphurisation (FGD) control equipment using limestone (carbonate as the gas scrubbing reagent)

The combustion activities should be listed as:

1A1a (1. Energy, A. Fuel combustion, 1. Energy, a. public electricity)

The use of limestone in the FGD plant however must be listed separately as a “process” accordingly:

2A3 (2. Industrial processes A. Mineral products, 3. limestone and dolomite use)

Example 4:

A cement kiln that combusts fuel to provide heat to calcine the raw materials (e.g. limestone) in the cement kiln and also results in releases of carbon dioxide from carbonates in the raw materials.

The combustion activity should be listed as;

1A2f (1. Energy, A. fuel combustion, 2. Manufacturing, f. other (cement))

The process emissions should be listed under:

2A1 (2. Industrial process, A. Mineral products, 1. Cement production)

Example 5:

A dairy, beverage or food plant combusting fuel in a range of boilers to provide heat. The appropriate CRF code would be:

1A3e (1. Energy, A. Fuel combustion, 3. Manufacturing, e. food processing, beverages and tobacco)

E-PRTR Category:

Please select, the appropriate E-PRTR Category for your installation. A list of activities and their associated E-PRTR Categories is provided in Annex II of this Guidance Note.

If there is no appropriate code for your type of installation then simply select ‘N/A’.

Example 1:

A hospital or university that combusts fuel in a range of boilers that have total thermal input of 35 MW.

E-PRTR Category: N/A

The total thermal input is less than the 50 MW threshold for E-PRTR, so is not covered by E-PRTR.

Example 2:

A fossil fuelled power station that has a thermal input of 650 MW.

E-PRTR Category: 1 (c)

Example 3:

Installations with capacity of over 500 tonnes per day of cement.

E-PRTR Category: 3 (c) (i)

Example 4:

A pharmaceutical plant.

E-PRTR Category: 4 (e)

Approach:

Please select the applied monitoring approach; this should be either 'measurement' or 'calculation'.

Note

'Measurement' means direct measurement of flue gases using a continuous emission monitoring system (CEMS).

'Calculation' means application of the formulae given in Annexes II to XI, as appropriate from the M&R Decision 2007.

Tiers changed:

Please select 'yes' or 'no' as appropriate. If any of the monitoring tiers as specified in the appropriate Annex of the M&R Decision 2007 (Annexes II to XI) and the approved M&R Plan have changed during the reporting period, either temporarily or permanently, then you must select 'yes', **even when the EPA has given approval**. Details of these changes are to be provided in Section A3.

Emissions:

Emissions must be reported as rounded tonnes (i.e. to the nearest whole tonne).

Section A2.2 Biomass use during the reporting year.

Please select 'yes' or 'no' as appropriate. Has biomass been used as a fuel or process material during the reporting year? The biomass must have been used in a Schedule I activity e.g. wood dust used in a boiler at a board plant and not the wood used as raw material in the board production.

If 'yes' then you must complete the following table. If 'no' then please proceed directly to Section A2.3.

Completion of Table A2.2

Category of activity:

Please select, the appropriate activity category (e.g. E1.1 Combustion) by clicking on “select” and choosing the appropriate category from those listed. The activities listed here are abbreviated from those in Section A1.5.

Biomass employed in combustion (TJ):

Please insert the amount of biomass combusted in tera joules (TJ).

Biomass employed in process:

Please insert the amount of biomass employed in your process in terms of tonnes or Nm³, as appropriate.

Emissions of CO₂ (tonnes of CO₂):

Use only if emissions measured by means of direct measurement, e.g. using a continuous emission monitoring system for flue gases.

Section A2.3 Transfer of carbon dioxide from the installation as a pure substance, part of a fuel, feedstock or by-product or product.

In this section you are required to identify, for each appropriate activity, how much CO₂ (in terms of tonnes) was exported from the installation during the reporting period and in what form was the CO₂ exported and not released to the atmosphere. Refer to Annex I, section 5.7 of the M&R Decision 2007 for further details.

Please select ‘yes’ or ‘no’ as appropriate, whether you have transferred CO₂ during the reporting period. If ‘yes’ then you must complete the following table. If no’ then please proceed directly to Section A3.1.

Completion of Table A2.3

Category of activity:

Please select, the appropriate activity category (e.g. E1.1 Combustion) by clicking on “select” and choosing the appropriate category from those listed. The activities listed here are abbreviated from those in section A1.5.

Amount transferred:

Please insert the amount of transferred CO₂ as tonnes.

Type of Transfer:

Please insert the type of transfer, if it is was into or out of the Installation.

Transferred material:

Provide a short description of the nature of the transfer.

A3 Change of tiers and other relevant changes to the installation

Section A3.1 Changes to the approved monitoring tiers in the reporting year.

In this section you are to **select ‘yes’ or ‘no’** as appropriate. You must indicate whether any of the applied monitoring tiers (e.g. for activity data, emission factors etc.) during the reporting period are different to those stated in the approved monitoring and reporting plan. This will include any instances where, in the opinion of the Verifier, an applied tier is different to that stated in the approved M&R plan.

Section A3.2 Description of changes during the reporting year to the approved monitoring tiers.

In this section you are required to describe the changes to monitoring tiers identified in Section A3.1. These changes include any temporary or permanent changes to any tier methodology. **Changes that have been approved by the EPA such as temporary use of lower tiers must also be listed here.**

For each change of tier you are required to provide a succinct description including:

- Identification of the sources, fuel and/or materials concerned;
- Parameters and tiers changed;
- The start and end dates (if appropriate) for the changes;
- The reason for the change(s).

In addition, you should reference any appropriate documents, for example correspondence with the Environmental Protection Agency agreeing to a change.

Section A3.3 Changes to the installation during the reporting year relevant to this emissions report.

In this section you are to **select ‘yes’ or ‘no’ as appropriate**. You must indicate whether any changes to your installation have occurred during the reporting period, other than those notified in Section A3.2, that may be relevant to your emissions report (i.e. have an impact upon the emissions of CO₂ from your installation). Such changes could include unplanned and/or prolonged shutdowns, addition or removal of new plant, meter changes etc.

Section A3.4 Description of changes to the installation during the reporting year and effect on the emissions report.

In this section you are required to describe the changes to your installation identified in Section A3.3.

For each change of tier you are required to provide a succinct description including:

- Identification of the sources, fuel and/or materials affected;
- The start and end dates (if appropriate) for the changes;
- The reason for the change(s).

In addition, you should reference any appropriate documents, for example correspondence with the Environmental Protection Agency agreeing to the change(s).

A 3.5 Declaration

In this section a signature and company stamp is required. It is a confirmation that the information provided by the Operator in the report is a true reflection of the activities and emissions at the installation for the reporting year.

Part B is to be completed by Operators reporting emissions from Schedule 1 combustion sources within their installation.

Process industries should also use this section for the combustion element of the installation's emissions.

PART B Combustion emissions data (M&R Decision 2007 Annex I Section 14.3)

Where carbonate is used for scrubbing emissions from a combustion gas stream, these should be reported as process emissions in Part C together with all relevant process emissions.

If a mass balance approach has been used to calculate carbon dioxide emissions from a combustion activity then in addition to the completion of this Part B, the mass flows of fuels into and out of the installation must be reported in Part D. The net calorific values and emission factors in support of the summary activity figures provided in this section shall be reported in Part D also.

A note on tiers for combustion:

The tier to be applied to the monitoring & reporting of emissions are those set out in your current EPA approved M&R Plan. A full explanation of the tiers may be found in Annex II of the M&R Decision 2007.

Installations that are approved to use country specific factors should refer to the EPA website at <http://www.epa.ie/> and download the latest version of the '*Country Specific Net Calorific Values and CO₂ Emission Factors for use in the Annual Installation Emissions Report*'. You should only use the approved figures for the reporting year for which they are representative.

Section B1.1 Summary table of carbon dioxide emissions from fossil fuel combustion

This table is designed to provide a **summary** of emissions reported for each type of fuel combusted within an installation including minor and *de minimis* fuels.

An installation may have used national figures or site-specific figures for net calorific values, emission factors and oxidation factors. Which were used will depend on the Schedule 1 activity and the approved M&R Plan that your installation operated under in the reporting year.

Where site-specific factors have been used, a weighted average figure for the net calorific values, emission factors and oxidation factors of each fuel group are to be used

in Section B1.1 along with the total of the actual CO₂ emissions generated by the fuel type. The specific details of the fuel usage per batch will be provided in Section B1.3.

Type of Schedule 1 activity:

This should be as given in Table A2.1. If more than one Schedule 1 type of combustion activity is carried out at your installation you will need to contact the EPA for a modified workbook.

Description of activity:

Please provide a succinct description of the activity. *For example, a hospital site with a number of boilers may be described as:*

Type of Schedule 1 activity:	E1.1 Combustion
Description of activity:	Various boilers providing heating, hot water and steam to the hospital site

Fuel type:

Select the appropriate fuel types from the drop down list. This list has been devised using the range of fuels identified in the approved monitoring and reporting plans. If there is not a suitable fuel description for the installation than please contact the EPA for a revised list.

If wastes are used as fuels then the waste types must be reported using the classification of the 'European List of Wastes' (Commission Decision 2000/532/EC). The list of classifications can be found at <http://eur-lex.europa.eu/>

You must complete one row for each type of fuel used. For the purpose of this summary table a number of batches of similar fuels can be grouped together and weighted average factors used.

Fuels with carbon contents only:

Where the carbon content of fuels are being used for the calculation of CO₂ as per Section 5.5 of the Annex I of the M&R Decision 2007, then select N/A for units in the NCV column and enter the weighted average carbon content as a fraction in the emissions factor column and select 'tC/t' from the units column. **Carbon content may only be used when approved by the EPA in the M&R Plan.**

Activity data:

Please input the actual amount of fuel used in the activity data box and the appropriate units for your activity data by clicking on "select" and choose from the list in the adjacent unit box.

NCV:

Please insert the appropriate NCV value and select the appropriate units for the net calorific value of your fuel in the adjacent box. For the purpose of this summary table only a **weighted average NCV** should be used.

Emission factor:

Please insert the **weighted average emission factor** for the purpose of this summary table only. Then select the appropriate units for your emission factor by clicking on "select" and choose from the list in the adjacent box. Please note that if an emission factor of tCO₂/TJ is used then this should be in terms of **net** energy content.

Oxidation factor:

Please insert the numerical value of the oxidation factor to be applied. The oxidation factor will be determined in accordance with your permitted tier methodology i.e. based on a given factor within the M&R Decision 2007, determined by an ISO 17025 accredited analytical facility or similar.

Emissions:

Please insert your calculated emissions for the fuel as a whole for the year. This figure must be the total of individual batch calculations for the specified fuel type from section B1.3 and **not calculated** from the weighted factors in this summary table.

Section B1.2 - Summary table of biomass used in combustion

Operators need only complete this section if biomass or fuels containing biomass are combusted in a Schedule 1 process within their installation.

This table is designed to provide a **summary** of emissions reported for each type of biomass fuel combusted within an installation including minor and *de minimis* biomass fuels.

Type of Schedule 1 activity:

This should be as given in Table A2.1. If more than one type of Schedule 1 activity is carried out at your installation you will need to contact the EPA for a modified workbook.

Description of activity:

Please provide a succinct description of the activity.

Biomass type:

Please select the best description of the fuel used (e.g. *dry wood fines*). You must complete one row for each type of fuel used. If the installation's biomass fuel is not listed please contact the EPA for a revised list.

Activity data:

Please insert the total amount of biomass fuel used. Then in the adjacent box select the appropriate units for your activity data (the amount of biomass used) by clicking on "select" and choose from the list.

NCV:

Please insert the appropriate NCV for the biomass fraction of the fuel. Then select the appropriate units for the net calorific value of your fuel in the adjacent box. This information must be provided for all biomass fuels.

Total Energy in TJ:

Please insert your total energy derived from biomass.

Section B1.3 Individual fuel data information.

In this section, the activity data, emission factors, oxidation factors and emissions are to be reported for each type of fuel combusted within an installation. Data may only be reported in an aggregate manner where the fuel is used in a number of sources and provided the oxidation, NCV and emission factors are identical. Where batch specific

analysis data is required then a table must be filled out for each batch. If you require more tables please contact the EPA with the number you require.

Example one:

An installation, which is Category B, has six shipments of coal sourced from 5 different batches in the reporting year, therefore the annual reporting involves 5 different NCV etc. The operator must fill out five tables in section B1.3, one for each of the five batches.

Example two:

An installation, which is Category A, has five deliveries of gas oil in the year and must apply tier 2a for NCV and tier 2a for the emissions factor. As all deliveries are from the same batch, only one table need be completed for the total amount.

Category A Natural Gas Users:

Most Category Installations receive monthly gas bills which detail the volume of gas consumed in m³ and kWh of gas consumed based on gross calorific value and at 288.15K.

The M&R Decision 2007 requires that the annual reporting of natural gas Activity Data at standardised or 'Normalised' conditions (corrected to 273.15K) in addition to the reporting of the net calorific value of the fuel as TJ/Nm³. The following note is to help Operators report natural gas consumption correctly.

Calculation of CO₂

On an annual basis the monthly kWh data is summed to give total kWh for the year based on gross calorific value. This is first converted from Gross to Net calorific value by multiplying by the current factor 0.9028 (for 2008) and then into TJ by multiplying by 3.6 X 10⁻⁶. The total TJ value is then multiplied by the current country specific emission factor (56.832 t CO₂/TJ in 2008) to give total tonnes CO₂ for the reporting year.

Reporting of Activity Data (Quantity of Natural Gas Consumed)

The M&R Decision 2007 requires that the annual reporting of natural gas Activity Data at standardised or 'Normalised' conditions (corrected to 273.15K) in addition to the reporting of the net calorific value of the fuel as TJ/Nm³.

Therefore on an annual basis the monthly gas volume, which is billed as m³ at 288.15K must be normalised to m³ at 273.15K to give Nm³.

The annual gas volume as billed can be converted to standardised gas volume as follows:

$$V_s (\text{Nm}^3) = (V_a * 273.15)/288.15.$$

Where V_s is the standardised gas volume (corrected to 273.15K) and V_a is the actual gas volume reported on the gas bills.

Finally, to determine and report the net calorific value of the fuel as TJ/Nm³. The annual total TJ (as calculated above) is divided by the annual standardised gas volume (as calculated above) as follows:

$$\text{TJ/Nm}^3 = \text{Annual TJ} / \text{Annual Nm}^3$$

Sample Calculation for Category A Natural Gas Users

Operator A sums up the monthly kWhs from the gas bills to give an annual figure of 235,248,72 kWh.

To calculate CO₂ in tonnes

1. 235,248,72 kWh X 0.9028 X 3.6 X 10⁻⁶ = 76.457716 TJ
2. 76.457716 TJ X 56.832 t CO₂/TJ = **4,345 tonnes CO₂**

To report Activity Data and NCV as TJ/Nm³

Operator A now sums up the monthly volume data (m³ at 288.15K) from the gas bills to give a total annual figure of 2,107,500 m³.

The annual gas volume is then converted to standardised gas volume as follows:

1. Vs (Nm³) = (2,107,500 X 273.15)/288.15 = 1,997,791.514 Nm³

Operator A finally calculates the net calorific value of the fuel as follows:

2. TJ/Nm³ = 76.457716/1,997,791.514 = 0.000038271 TJ/Nm³.
-

Type of fuel:

Select the appropriate fuel types from the drop down menu. This list has been devised using the range of fuels identified in the scheme's monitoring and reporting plans. If there is not a suitable fuel description for the installation than please contact the EPA for a revised list.

IEA Category:

The International Energy Authority has a standardised list describing the fuels used in the scheme. Select the appropriate fuel short name or category from the drop down list. This list has been devised using the International Energy Authority's list and full definitions may be viewed in Annex III of this Guidance Note.

Waste Catalogue Number:

If wastes are used as fuels then the waste types must be reported using the classification of the 'European List of Wastes' (Commission Decision 2000/532/EC). The list of classifications can be found at <http://eur-lex.europa.eu/>. You must complete one table for **each batch** of fuel used.

Emission point reference:

Please identify all the emission point reference(s) that use the fuel that you have identified above. You should use the same descriptors given within your GHG permit e.g. A1-1, A2-2, S1, S2 etc.

More than one emission point may be associated with a single fuel and these sources must be aggregated into a single box and table, provided that the emission factor and oxidation factors are identical for each of the aggregated sources.

Activity data (mass/volume):

Please select the appropriate units for your activity data by clicking on “select” and choosing from the list and then insert in the adjacent boxes the amount of fuel used and select the tier used.

NCV:

Please select the appropriate units for the net calorific value of your fuel and then in the adjacent boxes insert the appropriate NCV and select the tier used. This information must be provided for all fuels regardless of whether the data is used in your subsequent calculation of emissions.

Density:

If a density factor has been used to convert the fuel volume to mass, please enter the appropriate figures.

Energy as tera joules:

The net energy as TJ must be entered here for **all fuels**.

Emission factor:

Please select, the appropriate units for your emission factor by clicking on “select” and choosing from the list and then in the adjacent boxes; insert the numerical value of the emission factor used and select the tier. Please note that if an emission factor of tCO₂/TJ is used then this should be in terms of **net** energy content, i.e based on NCV.

Oxidation factor:

Please insert the numerical value of the oxidation factor to be applied. The oxidation factor will be determined in accordance with your permitted tier methodology, i.e. based on a given factor within the M&R Decision 2007, or determined by an ISO 17025 accredited analytical facility or similar.

Emissions:

Please insert your calculated emissions. This should be the product of the relevant activity data, emission factor and oxidation factors listed above and as follows:

$$CO_2 \text{ emissions} = \text{activity data} \times \text{emission factor} \times \text{oxidation factor}$$

B1.4 Calculation of carbon dioxide emissions from biomass and mixed fuel combustion.

Operators need only complete this section if biomass or fuels containing biomass are combusted in a Schedule 1 activity within their installation. If the installation burns pure biomass then the emission factor is zero. Further details on what is defined as biomass under the trading scheme can be found in Annex I Sections 12 and 13.4 of the M&R Decision 2007.

Type of biomass/mixed fuel:

Please select the best description of the fuel used (e.g. *dry wood fines*). You must complete one table for each type of fuel used. If the installation's biomass fuel is not listed please contact the EPA for a revised list.

IEA Category:

The International Energy Authority has a standardised list describing the fuels used in the scheme. Select the appropriate fuel short name or category from the drop down list. This list has been devised using the International Energy Authority's list and full definitions may be viewed in Annex III of this Guidance Note.

Emission point reference:

Please identify the emission point reference(s) that use the fuel that you have identified above. You should use the same descriptors given within your GHG permit e.g. S1, S2 etc.

More than one emission point may be associated with a single fuel and these sources may be aggregated into a table, provided the emission factor and oxidation factors are identical for each of the aggregated sources.

Waste Catalogue Number:

If wastes are used as fuels then the waste types must be reported using the classification of the 'European List of Wastes' (Commission Decision 2000/532/EC). The list of classifications can be found at <http://eur-lex.europa.eu/>. You must complete one table for **each batch** of fuel used.

Fraction of biomass:

Please type in the percentage of biomass derived carbon content of the fuel identified above.

Activity data (mass/volume):

Please select the appropriate units for your activity data (the amount of fuel used) by clicking on "select" and choose from the list; then in the adjacent boxes insert the total amount of fuel used (i.e. including both the biomass and non-biomass fractions) and select the tier used.

NCV:

Please select for the non-biomass fraction of the fuel, the appropriate units for the net calorific value of your fuel, including both biomass and non-biomass components, (i.e. tera joules per tonne or tera joules per Nm³), in the adjacent boxes insert the appropriate NCV value. This information must be provided for all fuels.

Density:

If a density factor has been used to convert the fuel volume to mass, please enter the appropriate figures.

Emission factor:

Please select, for the non-biomass fraction of the fuel, the appropriate units for your emission factor by clicking on "select" and choosing from tCO₂/TJ, tCO₂/t or tCO₂/m³ from the list. In the adjacent boxes insert the numerical value of the emission factor used and select the tier.

The emission factor used should be a weighted emission factor based on the proportion of fossil carbon in the fuels overall carbon content. Please note that if an emission factor of tCO₂/TJ is used then this should be in terms of **net energy** content.

For pure biomass fuels and biomass fractions of fuels the emission factor will be zero.

Oxidation factor:

Please insert the numerical value of the oxidation factor to be applied to the whole fuel. The oxidation factor will be determined in accordance with your permitted tier methodology i.e. based on a given factor within the M&R Decision 2007 or determined by ISO 17025 accredited analyses.

Emissions:

Please insert your calculated emissions. This should be the product of the relevant activity data, emission factor and oxidation factor i.e.

Emissions = activity data x emission factor x oxidation factor

PART C

Part C is to be completed by Operators reporting process CO₂ emissions from Schedule 1 activities within their installation. This form should also be used for reporting carbon dioxide emissions resulting from the use of carbonate to scrub sulphur dioxide from combustion gas.

C1 Process Emissions Data (M&R Decision 2007 Section 14.4)

If a mass balance approach has been used to calculate carbon dioxide emissions from a process then in addition to completion of this section, the mass flows of relevant materials into and out of the installation must also be reported in Part D.

Section C1.1 Summary table of the calculation of carbon dioxide emissions from processes using only fossil input material (for M&R Decision 2007 ANNEX III to XI processes)

This table is designed to provide a **summary** of activity data, emission factors, conversion factors and emissions that are being reported for each type of material used in processes within an installation, including minor and *de minimis* materials. Data may be reported in an aggregated manner where a certain material is used at a number of emission points with identical conversion and emission factors.

The installation may have used standard or site-specific figures for emission factors and conversion factors. Which are used will have depended on the schedule 1 activity class and the approved M&R plan for your installation in the reporting year.

Where site-specific factors have been used, a **weighted average figure** for the emission factors and conversion factors of each material group are to be used in Section C1.1 along with the actual CO₂ emission generated by the material. The specific details of the material usage per batch will be provided in Section C1.3.

Type of Schedule 1 activity:

This should be as given in Table A2.1.

Description of activity:

Please provide a succinct description of the activity e.g. 'clinker manufacture'.

Material type:

Please select the materials to which your activity data relates as per the approved M&R plan. If there is no suitable material on the list please contact the EPA to have a revised list prepared.

Activity data (mass/volume):

Please enter the amount of material used and in the adjacent box select the appropriate units for your activity data by clicking on "select" and choosing from the list.

Emission factor:

Please insert the numerical value of the emission factor used and in the adjacent box select the appropriate units for your emission factor by clicking on "select" and choosing from the list.

Conversion factor:

Please insert the numerical value of the conversion factor to be applied. The conversion factor will be determined in accordance with your approved tier methodology i.e. based on a given factor within the M&R Decision 2007 or determined by an ISO 17025 accredited analytical facility or similar.

Emissions:

Please insert your actual calculated emissions. This should be the product of the relevant activity data, emission factor and conversion factors from Section C1.3

CO₂ emissions = activity data x emission factor x conversion factor

Section C1.2 Summary table of biomass used in process

Operators need only complete this section if biomass or materials containing biomass are converted to carbon dioxide in a Schedule 1 process activity within their installation.

Type of Schedule 1 activity:

This should be as given in Table A2.1.

Description of activity:

Please provide a succinct description of the activity e.g. 'clinker manufacture'.

Biomass type:

Please select the description of the material used. You must complete one row for each type of biomass material used. If the installation's biomass material is not listed please contact the EPA for a revised list.

Activity data (mass/volume):

Please insert the total amount of biomass material used and in the adjacent box select the appropriate units for your activity data (the amount of material used) by clicking on "select" and choosing from the list.

Emission factor:

Please insert the numerical value of the emission factor used for the non-biomass fraction of the material in the adjacent box select the appropriate units for your emission factor by clicking on “select” and choosing from the list.

The emission factor used should be a weighted average emission factor based on the proportion of fossil carbon in the materials overall carbon content. ***For pure biomass materials and biomass fractions of materials the emission factor will be zero.***

Conversion factor:

Please insert the numerical value of the conversion factor to be applied to the whole material. The conversion factor will be determined in accordance with your permitted tier methodology, i.e. based on a given factor within the M&R Decision 2007 or determined by an ISO 17025 accredited analytical facility or similar.

Section C1.3 Detailed Calculation of carbon dioxide emissions from processes using only fossil input material (for M&R Decision 2007 ANNEX III to XI processes)

In this section the activity data, emission factors, conversion factors and emissions are to be reported for each type of material used in processes within an installation. Data may be reported in an aggregated manner where a specific material is used in a number of sources with identical conversion and emission factors.

Type of Schedule 1 activity:

This should be as given in Table A2.1.

Description of activity:

Please provide a succinct description of the activity e.g. ‘clinker manufacture or lime production’.

Type of Process:

Please provide a succinct description of the type of process employed e.g. cement kiln – dry process.

Emission point reference:

Please identify the emission point reference(s) arising from the use of the material that you have identified above. You should use the same descriptors given within your GHG permit e.g. S1, S2 etc.

More than one emission point may be associated with a single material and these sources may be aggregated into a single table, provided that the emission factor and oxidation factors are identical for each of the aggregated sources.

Description of input material:

Please select the materials to which your activity data relates. e.g. limestone.

Waste Catalogue Number:

If wastes are used as input materials then the waste types must be reported using the classification of the ‘European List of Wastes’ (Commission Decision 2000/532/EC). The list of classifications can be found at <http://eur-lex.europa.eu/> . You must complete one table for **each batch** of material used.

Calculation method applied:

Please identify the calculation method applied if more than one method is specified in the appropriate Annex of the M&R Decision 2007. For example, for the production of cement clinker either 'Calculation Method A' or 'Calculation Method B' could be applied.

Activity data (mass/volume):

Please insert the amount of material used and in the adjacent box select the appropriate units for your activity data by clicking on "select" and choosing from the list and selecting the tier used.

Emission factor:

Please insert the numerical value of the emission factor used and in the adjacent boxes select the appropriate units for your emission factor by clicking on "select" and choosing from the list and select the tier applied.

Conversion factor:

Please insert the numerical value of the conversion factor to be applied. The conversion factor will be determined in accordance with your permitted tier methodology i.e. based on a given factor within the M&R Decision 2007 or determined by an ISO 17025 accredited analytical facility or similar. Select the tier applied in the adjacent box.

Emissions:

Please insert your calculated emissions. This should be the product of the relevant activity data, emission factor and conversion factors listed above and as follows:

$$CO_2 \text{ emissions} = \text{activity data} \times \text{emission factor} \times \text{conversion factor}$$

Section C1.4 Calculation of carbon dioxide emissions from processes using biomass/mixed input material

Operators need only complete this section if biomass or materials containing biomass are converted to carbon dioxide in a Schedule 1 process within their installation.

Type of process:

Please provide a succinct description of the type of process employed e.g. cement kiln – dry process.

Description of process:

Please provide a succinct description of the activity e.g. 'clinker manufacture in a rotary kiln'.

Description of input material:

Please select a description of the material used. You must complete one table for each type of material used.

Emission point reference:

Please identify the emission point reference(s) arising from the use of the material that you have identified above. You should use the same descriptors given within your GHG permit e.g. S1, S2 etc.

More than one emission point may be associated with a single material and these sources may be aggregated into a single table, provided that the emission factor and oxidation factors are identical for each of the aggregated sources.

Fraction of biomass:

Please type in the percentage carbon content of the material identified above derived from biomass.

Waste Catalogue Number:

If wastes are used as input materials then the waste types must be reported using the classification of the 'European List of Wastes' (Commission Decision 2000/532/EC). The list of classifications can be found at <http://eur-lex.europa.eu/>. You must complete one table for **each batch** of material used.

Calculation method applied:

Please provide a short description of the calculation method use only if specified in the M&R decision 2007.

Activity data (mass/volume):

Please insert the amount of material used (including both the biomass and non-biomass fractions). In the adjacent boxes select the appropriate units for your activity data (the amount of material used) by clicking on "select" and choosing from the list and select the tier used.

Emission factor:

Please insert the numerical value of the emission factor used for the non-biomass fraction of the material. In the adjacent boxes; select the appropriate units for your emission factor by clicking on "select" and choosing from the list and select the tier used.

The emission factor used should be a weighted emission factor based on the proportion of fossil carbon in the materials overall carbon content. ***For pure biomass materials and biomass fractions of materials the emission factor will be zero.***

Conversion factor:

Please insert the numerical value of the conversion factor to be applied to the whole material. The conversion factor will be determined in accordance with your permitted tier methodology, i.e. based on a given factor within the M&R Decision 2007 or determined by an ISO 17025 accredited analytical facility or similar.

Emissions:

Please insert your calculated emissions. This should be the product of the relevant activity data, emission factor and conversion factor i.e.

Emissions = activity data x emission factor x conversion factor

Part D

D1 Supplementary data for mass balance approaches (M&R Decision 2007 Section 5)

Part D is to be completed by Operators that have applied a mass balance approach to the calculation of their installation's emissions. This section should be completed in addition to completion of Part B and/or Part C of this form.

D1.1 Fossil fuel stock information.

Fuel:

Please list the fuels to which a mass balance approach has been applied for determining carbon dioxide emissions. Each fuel batch must be listed on a separate line and described as given in Part B, e.g. if an installation has two separated batches of coal in stock with different NCV etc., then two rows must be completed for each batch.

Stock

In this section of the table you are asked to specify the amount of fuel stocks at the beginning and end of the reporting period together with the amounts of fuel imported and exported out of the installation during the reporting period. All fuels should be listed here including any that are classed as '*de minimis*'.

Batch ID:

Please enter the Batch ID of the fuel.

Opening stock:

Please enter the amount of fuel held in stock at the beginning of the reporting period (e.g. as of 01-01-08).

Closing stock:

Please enter the amount of fuel held in stock at the end of the reporting period (e.g. as of 31-12-08).

Imported:

Please enter the amount of fuel purchased or imported in to the permitted installation over the year.

Exported:

Please enter the amount of fuel sold, transferred or exported out of the permitted installation over the year e.g. imported fuel subsequently transferred to non permitted sites.

Net Use:

Enter the net amount of fuel consumed per batch listed above. This figure is made up of the following:

Fuel C = Fuel P + (Fuel S – Fuel E) – Fuel O; *where:*

Fuel C: Fuel processed during the reporting period

Fuel P: Fuel purchased (imported) during the reporting period

Fuel S: Fuel stock at the beginning of the reporting period

Fuel E: Fuel stock at the end of the reporting period

Fuel O: Fuel used for other purposes (transportation, exported or re-sold)

Units:

Please enter the appropriate units for the data presented in the preceding columns e.g. tonnes.

Net Calorific Value / Carbon content:

Please report the NCV or Carbon content of each fuel and units.

*Where the carbon content of fuels are being used for the calculation of CO₂ as per Section 5.5 of Annex I of the M&R Decision 2007, then enter the weighted average carbon content as fraction in the NCV/C content column and select 'tC/t' from the units column. **Carbon content may only be used when it has been approved by the EPA in the M&R Plan.***

D1.2 Fossil material stock information.
Material:

Please list the materials to which a mass balance approach has been applied for determining carbon dioxide emissions. Each batch of material in stock must be listed on a separate line and described as given in Part C, e.g. an installation has two separated batches of limestone in stock with different emission factors etc. Therefore two rows must be completed for each batch.

Stock

In this section of the table you are asked to specify the amount of fossil material in stock at the beginning and end of the reporting period together with the amounts of material exported out of the installation during the reporting period.

Opening stock:

Please enter the amount of material held in stock at the beginning of the reporting period (e.g. as of 01-01-08).

Closing stock:

Please enter the amount of material held in stock at the end of the reporting period (e.g. as of 31-12-08).

Imported:

Please enter the amount of material purchased or imported into the permitted installation over the year.

Exported:

Please enter the amount of material sold, transferred or exported out of the permitted installation over the year e.g. imported material subsequently transferred to non permitted sites.

Net Use:

Enter the net amount of material consumed per batch listed above. This figure is made up of the following:

$$\text{Material C} = \text{Material P} + (\text{Material S} - \text{Material E}) - \text{Material O}$$

where:

Material C: Material processed during the reporting period
Material P: Material purchased during the reporting period
Material S: Material stock at the beginning of the reporting period
Material E: Material stock at the end of the reporting period
Material O: Material used for other purposes (transportation or re-sold)

Units:

Please enter the appropriate units for the data presented in the preceding columns e.g. tonnes.

Emission Factor:

Please report the emission factor of each material and units.

Annex I - Extract from the common reporting format (CRF)**1. Sectoral report for energy****A. Fuel combustion activities (Sectoral approach)**

1. Energy industries
 - a. Public electricity and heat production
 - b. Petroleum refining
 - c. Manufacture of solid fuels and other energy industries
2. Manufacturing industries and construction
 - a. Iron and steel
 - b. Non-ferrous metals
 - c. Chemicals
 - d. Pulp, paper and print
 - e. Food processing, beverages and tobacco
 - f. Other (please specify)
4. Other sectors
 - a. Commercial/institutional
 - b. Residential
 - c. Agriculture/forestry/fisheries
5. Other (please specify)
 - a. Stationary
 - b. Mobile

2. Sectoral report for industrial processes**A. Mineral products**

1. Cement production
2. Lime production
3. Limestone and dolomite use
4. Soda ash production and use
5. Asphalt roofing
6. Road paving with asphalt
7. Other (please specify)

B. Chemical industry

1. Ammonia production
2. Nitric acid production
3. Adipic acid production
4. Carbide production
5. Other (please specify)

C. Metal production

1. Iron and steel production
2. Ferroalloys production
3. Aluminium production
4. SF6 used in aluminium and magnesium foundries
5. Other (please specify)

B. Fugitive emissions from fuels

1. Solid fuels
 - a. Coal mining
 - b. Solid fuel transformation
 - c. Other (please specify)
2. Oil and natural gas
 - a. Oil
 - b. Natural gas
 - c. Venting and flaring
Venting
Flaring
 - d. Other (please specify)

Annex II E-PRTR Category

No	Activity	Capacity threshold
1.	Energy sector	
(a)	Mineral oil and gas refineries	* ⁽¹⁾
(b)	Installations for gasification and liquefaction	*
(c)	Thermal power stations and other combustion installations	With a heat input of 50 megawatts (MW)
(d)	Coke ovens	*
(e)	Coal rolling mills	With a capacity of 1 tonne per hour
(f)	Installations for the manufacture of coal products and solid smokeless fuel	*
2.	Production and processing of metals	
(a)	Metal ore (including sulphide ore) roasting or sintering installations	*
(b)	Installations for the production of pig iron or steel (primary or secondary melting) including continuous casting	With a capacity of 2,5 tonnes per hour
(c)	Installations for the processing of ferrous metals: (i) Hot-rolling mills (ii) Smitheries with hammers (iii) Application of protective fused metal coats	With a capacity of 20 tonnes of crude steel per hour With an energy of 50 kilojoules per hammer, where the calorific power use exceeds 20 MW With an input of 2 tonnes of crude steel per
(d)	Ferrous metal foundries	With a production capacity of 20 tonnes per day
(e)	Installations: (i) For the production of non-ferrous crude metals from ore, concentrates or secondary raw materials by metallurgical, chemical or electrolytic processes (ii) For the smelting, including the alloying, of non-ferrous metals, including recovered products (refining, foundry casting, etc.)	* With a melting capacity of 4 tonnes per day for lead and cadmium or 20 tonnes per day for all other metals
(f)	Installations for surface treatment of metals and plastic materials using an electrolytic or chemical process	Where the volume of the treatment vats equals 30 m ³
3.	Mineral industry	
(a)	Underground mining and related operations	*
(b)	Opencast mining and quarrying	Where the surface of the area effectively under extractive operation equals 25 hectares
(c)	Installations for the production of: (i) Cement clinker in rotary kilns (ii) Lime in rotary kilns (iii) Cement clinker or lime in other furnaces	With a production capacity of 500 tonnes per day With a production capacity of 50 tonnes per day With a production capacity of 50 tonnes per day
(d)	Installations for the production of asbestos and the manufacture of asbestos-based products	*

No	Activity	Capacity threshold
(e)	Installations for the manufacture of glass, including glass fibre	With a melting capacity of 20 tonnes per day
(f)	Installations for melting mineral substances, including the production of mineral fibres	With a melting capacity of 20 tonnes per day
(g)	Installations for the manufacture of ceramic products by firing, in particular roofing tiles, bricks, refractory bricks, tiles, stoneware or porcelain	With a production capacity of 75 tonnes per day, or with a kiln capacity of 4 m ³ and with a setting density per kiln of 300 kg/m ³
4.	Chemical industry	
(a)	<p>Chemical installations for the production on an industrial scale of basic organic chemicals, such as:</p> <ul style="list-style-type: none"> (i) Simple hydrocarbons (linear or cyclic, saturated or unsaturated, aliphatic or aromatic) (ii) Oxygen-containing hydrocarbons such as alcohols, aldehydes, ketones, carboxylic acids, esters, acetates, ethers, peroxides, epoxy resins (iii) Sulphurous hydrocarbons (iv) Nitrogenous hydrocarbons such as amines, amides, nitrous compounds, nitro compounds or nitrate compounds, nitriles, cyanates, isocyanates (v) Phosphorus-containing hydrocarbons (vi) Halogenic hydrocarbons (vii) Organometallic compounds (viii) Basic plastic materials (polymers, synthetic fibres and cellulose-based fibres) (ix) Synthetic rubbers (x) Dyes and pigments (xi) Surface-active agents and surfactants 	*
(b)	<p>Chemical installations for the production on an industrial scale of basic inorganic chemicals, such as:</p> <ul style="list-style-type: none"> (i) Gases, such as ammonia, chlorine or hydrogen chloride, fluorine or hydrogen fluoride, carbon oxides, sulphur compounds, nitrogen oxides, hydrogen, sulphur dioxide, carbonyl chloride (ii) Acids, such as chromic acid, hydrofluoric acid, phosphoric acid, nitric acid, hydrochloric acid, sulphuric acid, oleum, sulphurous acids (iii) Bases, such as ammonium hydroxide, potassium hydroxide, sodium hydroxide (iv) Salts, such as ammonium chloride, potassium chlorate, potassium carbonate, sodium carbonate, perborate, silver nitrate (v) Non-metals, metal oxides or other inorganic compounds such as calcium carbide, silicon, silicon carbide 	*

No	Activity	Capacity threshold
(c)	Chemical installations for the production on an industrial scale of phosphorous-, nitrogen- or potassium-based fertilisers (simple or compound fertilisers)	*
(d)	Chemical installations for the production on an industrial scale of basic plant health products and of biocides	*
(e)	Installations using a chemical or biological process for the production on an industrial scale of basic pharmaceutical products	*
(f)	Installations for the production on an industrial scale of explosives and pyrotechnic products	*
5.	Waste and wastewater management	
(a)	Installations for the recovery or disposal of hazardous waste	Receiving 10 tonnes per day
(b)	Installations for the incineration of non-hazardous waste in the scope of Directive 2000/76/EC of the European Parliament and of the Council of 4 December 2000 on the incineration of waste ⁽²⁾	With capacity of 3 tonnes per hour
(c)	Installations for the disposal of non-hazardous waste	With a capacity of 50 tonnes per day
(d)	Landfills (excluding landfills of inert waste and landfills, which were definitely closed before 16.7.2001 or for which the after-care phase required by the competent authorities according to Article 13 of Council Directive 1999/31/EC of 26 April 1999 on the landfill of waste ⁽³⁾ has expired)	Receiving 10 tonnes per day or with a total capacity of 25 000 tonnes
(e)	Installations for the disposal or recycling of animal carcasses and animal waste	With a treatment capacity of 10 tonnes per day
(f)	Urban waste-water treatment plants	With a capacity of 100 000 population equivalents
(g)	Independently operated industrial waste-water treatment plants which serve one or more activities of this annex	With a capacity of 10 000 m ³ per day ⁽⁴⁾
6.	Paper and wood production and processing	
(a)	Industrial plants for the production of pulp from timber or similar fibrous materials	*
(b)	Industrial plants for the production of paper and board and other primary wood products (such as chipboard, fibreboard and plywood)	With a production capacity of 20 tonnes per day
(c)	Industrial plants for the preservation of wood and wood products with chemicals	With a production capacity of 50 m ³ per day
7.	Intensive livestock production and aquaculture	
(a)	Installations for the intensive rearing of poultry or pigs	(i) With 40 000 places for poultry (ii) With 2 000 places for production pigs (over 30 kg) (iii) With 750 places for sows
(b)	Intensive aquaculture	With a production capacity of 1 000 tonnes of fish or shellfish per year

No	Activity	Capacity threshold
8.	Animal and vegetable products from the food and beverage sector	
(a)	Slaughterhouses	With a carcass production capacity of 50 tonnes per day
(b)	Treatment and processing intended for the production of food and beverage products from: (i) Animal raw materials (other than milk) (ii) Vegetable raw materials	With a finished product production capacity of 75 tonnes per day With a finished product production capacity of 300 tonnes per day (average value on a quarterly basis)
(c)	Treatment and processing of milk	With a capacity to receive 200 tonnes of milk per day (average value on an annual basis)
9.	Other activities	
(a)	Plants for the pre-treatment (operations such as washing, bleaching, mercerisation) or dyeing of fibres or textiles	With a treatment capacity of 10 tonnes per day
(b)	Plants for the tanning of hides and skins	With a treatment capacity of 12 tonnes of finished product per day
(c)	Installations for the surface treatment of substances, objects or products using organic solvents, in particular for dressing, printing, coating, degreasing, waterproofing, sizing, painting, cleaning or impregnating	With a consumption capacity of 150 kg per hour or 200 tonnes per year
(d)	Installations for the production of carbon (hard-burnt coal) or electro-graphite by means of incineration or graphitisation	*
(e)	Installations for the building of, and painting or removal of paint from ships	With a capacity for ships 100 m long

(¹) An asterisk (*) indicates that no capacity threshold is applicable (all facilities are subject to reporting).

(²) OJ L 332, 28.12.2000, p. 91.

(³) OJ L 182, 16.7.1999, p. 1. Directive as amended by Regulation (EC) No 1882/2003.

(⁴) The capacity threshold shall be reviewed by 2010 at the latest in the light of the results

Annex III IEA Fuel Category and Definitions

Coal The fuels in this section are expressed in thousand tonnes.		
Product	Short Name	Definition
Hard Coal (if no detail)	HARDCOAL	This item is only used if the detailed breakdown is not available. It includes anthracite, coking coal, other bituminous coal and (depending on the country) also may include sub-bituminous coal.
Brown Coal (if no detail)	BROWN	This item is only used if the detailed breakdown is not available. It includes lignite and (depending on the country) also may include sub bituminous coal.
Anthracite	ANTCOAL	Anthracite is a high rank coal used for industrial and residential applications. It is generally less than 10% volatile matter and a high carbon content (about 90% fixed carbon). Its gross calorific value is greater than 23 865 kJ/kg (5 700 kcal/kg) on an ash-free but moist basis.
Coking Coal	COKCOAL	Coking coal refers to coal with a quality that allows the production of a coke suitable to support a blast furnace charge. Its gross calorific value is greater than 23 865 kJ/kg (5 700 kcal/kg) on an ash-free but moist basis.
Other Bituminous Coal	BITCOAL	Other bituminous coal is used for steam raising and space heating purposes and includes all bituminous coal that is not included under coking coal. It is usually more than 10% volatile matter and a relatively high carbon content (less than 90% fixed carbon). Its gross calorific value is greater than 23 865 kJ/kg (5 700 kcal/kg) on an ashfree but moist basis.
Sub-Bituminous Coal	SUBCOAL	Non-agglomerating coals with a gross calorific value between 17 435 kJ/kg (4 165 kcal/kg) and 23 865 kJ/kg (5 700 kcal/kg) containing more than 31% volatile matter on a dry mineral matter free basis.
Lignite/Brown Coal	LIGNITE	Lignite/brown coal is a non-agglomerating coal with a gross calorific value of less than 17 435 kJ/kg (4 165 kcal/kg), and greater than 31% volatile matter on a dry mineral matter free basis. Oil shale and tar sands produced and combusted directly are included in this category. Oil shale and tar sands used as inputs for other transformation processes are also included here (this includes the portion consumed in the transformation process). Shale oil and other products derived from liquefaction are included in from other sources under crude oil (other hydrocarbons).

Peat	PEAT	Peat is a combustible soft, porous or compressed, fossil sedimentary deposit of plant origin with high water content (up to 90% in the raw state), easily cut, of light to dark brown colour. Peat used for non-energy purposes is not included.
Patent Fuel	PATFUEL	Patent fuel is a composition fuel manufactured from hard coal fines with the addition of a binding agent. The amount of patent fuel produced is, therefore, slightly higher than the actual amount of coal consumed in the transformation process. Consumption of patent fuels during the patent fuel manufacturing process is included under other energy sector.
Coke Oven Coke and Lignite Coke	OVENCOKE	Coke oven coke is the solid product obtained from the carbonisation of coal, principally coking coal, at high temperature. It is low in moisture content and volatile matter. Coke oven coke is used mainly in the iron and steel industry, acting as energy source and chemical agent. Also included are semi-coke (a solid product obtained from the carbonisation of coal at a low temperature), lignite coke (a semi-coke made from lignite/brown coal), coke breeze and foundry coke. The heading other energy sector includes the consumption at the coking plants themselves. Consumption in the iron and steel industry does not include coke converted into blast furnace gas. To obtain the total consumption of coke oven coke in the iron and steel industry, the quantities converted into blast furnace gas have to be added (these are included in blast furnaces/gas works).
Gas Coke	GASCOKE	Gas coke is a by-product of hard coal used for the production of town gas in gas works. Gas coke is used for heating purposes. Other energy sector includes the consumption of gas coke at gas works.
Coal Tar	COALTAR	Coal tar is a result of the destructive distillation of bituminous coal. Coal tar is the liquid by product of the distillation of coal to make coke in the coke oven process. Coal tar can be further distilled into different organic products (e.g. benzene, toluene, naphthalene), which normally would be reported as a feedstock to the petrochemical industry.
BKB/Peat Briquettes	BKB	BKB are composition fuels manufactured from lignite/brown coal, produced by briquetting under high pressure. These figures include peat briquettes, dried lignite fines and dust. The heading other energy sector includes consumption by briquetting plants.

Crude, NGL, Refinery Feedstocks

The fuels in this section are expressed in thousand tonnes.

Product	Short Name	Definition
Crude/NGL/Feedstocks (if no detail)	CRNGFEED	This item is only used if the detailed breakdown is not available. It includes crude oil, natural gas liquids, refinery feed stocks, additives/blending components and other hydrocarbons.
Crude Oil	CRUDEOIL	Crude oil is a mineral oil consisting of a mixture of hydrocarbons of natural origin and associated impurities, such as sulphur. It exists in the liquid phase under normal surface temperatures and pressure and its physical characteristics (density, viscosity, etc.) are highly variable. It includes field or lease condensates (separator liquids) which are recovered from associated and non-associated gas where it is commingled with the commercial crude oil stream.
Natural Gas Liquids	NGL	NGLs are the liquid or liquefied hydrocarbons produced in the manufacture, purification and stabilisation of natural gas. These are those portions of natural gas which are recovered as liquids in separators, field facilities, or gas processing plants. NGLs include but are not limited to ethane, propane, butane, pentane, natural gasoline and condensate.
Refinery Feedstocks	REFFEEDS	A refinery feedstock is a processed oil destined for further processing (e.g. straight run fuel oil or vacuum gas oil) other than blending in the refining industry. It is transformed into one or more components and/or finished products. This definition covers those finished products imported for refinery intake and those returned from the petrochemical industry to the refining industry.
Additives/Blending Components	ADDITIVE	Additives are non-hydrocarbon substances added to or blended with a product to modify its properties, for example, to improve its combustion characteristics. Alcohols and ethers (MTBE, methyl tertiary-butyl ether) and chemical alloys such as tetraethyl lead are included here. The biomass fractions of bio-gasoline, bio-diesel and ethanol are not included here, but under liquid biomass. This differs from the presentation of additives in the Oil Information publication.
Other Hydrocarbons	NONCRUDE	Other hydrocarbons, including emulsified oils (e.g. orimulsion), synthetic crude oil, mineral oils extracted from bituminous minerals such as oil shale, bituminous sand, etc. and liquids from coal liquefaction, are included here.

Petroleum Products

The fuels in this section are expressed in thousand tonnes. Petroleum products are any oil-based products which can be obtained by distillation and are normally used outside the refining industry. The exceptions to this are those finished products which are classified as refinery feed stocks. *Production* of petroleum products shows gross refinery output for each product. Refinery fuel (row *petroleum refineries*, under *energy sector*) represents consumption of petroleum products, both intermediate and finished, within refineries, e.g. for heating, lighting, traction, etc.

Product	Short Name	Definition
Refinery Gas	REFINGAS	Refinery gas is defined as non-condensable gas obtained during distillation of crude oil or treatment of oil products (e.g. cracking) in refineries. It consists mainly of hydrogen, methane, ethane and olefins. It also includes gases which are returned from the petrochemical industry. Refinery gas production refers to gross production. Own consumption is shown separately under petroleum refineries in the energy sector.
Ethane	ETHANE	Ethane is a naturally gaseous straight-chain hydrocarbon (C ₂ H ₆). It is a colourless paraffinic gas which is extracted from natural gas and refinery gas streams.
Liquefied Petroleum Gases	LPG	Liquefied petroleum gases are the light hydrocarbon fraction of the paraffin series, derived from refinery processes, crude oil stabilisation plants and natural gas processing plants, comprising propane (C ₃ H ₈) and butane (C ₄ H ₁₀) or a combination of the two. They could also include propylene, butylene, isobutene and isobutylene. LPG are normally liquefied under pressure for transportation and storage.
Motor Gasoline	MOTORGAS	Motor gasoline is light hydrocarbon oil for use in internal combustion engines such as motor vehicles, excluding aircraft. Motor gasoline is distilled between 35°C and 215°C and is used as a fuel for land based spark ignition engines. Motor gasoline may include additives, oxygenates and octane enhancers, including lead compounds such as TEL (tetraethyl lead) and TML (tetramethyl lead). Motor gasoline does not include the liquid bio-fuel or ethanol blended with gasoline - see liquid biomass. This differs from the presentation of motor gasoline in the Oil Information publication.
Aviation Gasoline	AVGAS	Aviation gasoline is motor spirit prepared especially for aviation piston engines, with an octane number suited to the engine, a freezing point of -60°C, and a distillation range usually within the limits of 30°C and 180°C.
Gasoline Type Jet Fuel	JETGAS	Gasoline type jet fuel includes all light hydrocarbon oils for use in aviation turbine power units, which distil between 100°C and 250°C. This fuel is obtained by blending kerosenes and gasoline or naphthas in such a way that the aromatic content does not exceed 25% in volume, and the vapour pressure is between 13.7 kPa and 20.6 kPa. Additives can be included to improve fuel stability and combustibility.

Kerosene Type Jet Fuel	JETKERO	Kerosene type jet fuel is a medium distillate used for aviation turbine power units. It has the same distillation characteristics and flash point as kerosene (between 150°C and 300°C but not generally above 250°C). In addition, it has particular specifications (such as freezing point) which are established by the International Air Transport Association (IATA). It includes kerosene blending components.
Kerosene	OTHKERO	Kerosene (other than kerosene used for aircraft transport which is included with aviation fuels) comprises refined petroleum distillate intermediate in volatility between gasoline and gas/diesel oil. It is a medium oil distilling between 150°C and 300°C.
Gas/Diesel Oil	GASDIES	Gas/diesel oil includes heavy gas oils. Gas oils are obtained from the lowest fraction from atmospheric distillation of crude oil, while heavy gas oils are obtained by vacuum redistillation of the residual from atmospheric distillation. Gas/diesel oil distils between 180°C and 380°C. Several grades are available depending on uses: diesel oil for diesel compression ignition (cars, trucks, marine, etc.), light heating oil for industrial and commercial uses, and other gas oil including heavy gas oils which distil between 380°C and 540°C and which are used as petrochemical feedstocks. Gas/diesel oil does not include the liquid biofuel blended with gas/diesel oil – see liquid biomass. This differs from the presentation of gas/diesel oil in the Oil Information publication.
Heavy Fuel Oil	RESFUEL	Heavy fuel oil defines oils that make up the distillation residue. It comprises all residual fuel oils, including those obtained by blending. Its kinematic viscosity is above 10 cSt at 80°C. The flash point is always above 50°C and the density is always higher than 0.90 kg/l.
Naphtha	NAPHTHA	Naphtha is a feedstock destined either for the petrochemical industry (e.g. ethylene manufacture or aromatics production) or for gasoline production by reforming or isomerisation within the refinery. Naphtha comprises material that distils between 30°C and 210°C. Naphtha imported for blending is shown as an import of naphtha, and then shown in the transfers row as a negative entry for naphtha and a positive entry for the corresponding finished product (e.g. gasoline).
White Spirit & SBP	WHITESP	White spirit and SBP are refined distillate intermediates with a distillation in the naphtha/kerosene range. White Spirit has a flash point above 30°C and a distillation range of 135°C to 200°C. Industrial Spirit (SBP) comprises light oils distilling between 30°C and 200°C, with a temperature difference between 5% volume and 90% volume distillation points, including losses, of not more than 60°C. In other words, SBP is a light oil of narrower cut than motor spirit. There are seven or eight grades of industrial spirit, depending on the position of the cut in the distillation range defined above.
Lubricants	LUBRIC	Lubricants are hydrocarbons produced from distillate or residue; they are mainly used to reduce friction between bearing surfaces. This category includes all finished grades of lubricating oil, from spindle oil to cylinder oil, and those used in greases, including motor oils and all grades of lubricating oil base stocks.

Bitumen	BITUMEN	Bitumen is a solid, semi-solid or viscous hydrocarbon with a colloidal structure that is brown to black in colour. It is obtained by vacuum distillation of oil residues from atmospheric distillation of crude oil. Bitumen is often referred to as asphalt and is primarily used for surfacing of roads and for roofing material. This category includes fluidised and cut back bitumen.
Paraffin Waxes	PARWAX	Paraffin waxes are saturated aliphatic hydrocarbons. These waxes are residues extracted when dewaxing lubricant oils, and they have a crystalline structure which is more or less fine according to the grade. Their main characteristics are that they are colourless, odourless and translucent, with a melting point above 45°C.
Petroleum Coke	PETCOKE	Petroleum coke is defined as a black solid residue, obtained mainly by cracking and carbonising of petroleum derived feedstocks, vacuum bottoms, tar and pitches in processes such as delayed coking or fluid coking. It consists mainly of carbon (90 to 95%) and has a low ash content. It is used as a feedstock in coke ovens for the steel industry, for heating purposes, for electrode manufacture and for production of chemicals. The two most important qualities are "green coke" and "calcinated coke". This category also includes "catalyst coke" deposited on the catalyst during refining processes: this coke is not recoverable and is usually burned as refinery fuel.
Non-specified Petroleum Products	ONONSPEC	Other petroleum products not classified above (e.g. tar, sulphur and grease) are included here. This category also includes aromatics (e.g. BTX or benzene, toluene and xylene) and olefins (e.g. propylene) produced within refineries.

Gases

The gases in this section are expressed in terajoules on a **gross calorific value** basis.

Product	Short Name	Definition
Natural Gas	NATGAS	Natural gas comprises gases, occurring in underground deposits, whether liquefied or gaseous, consisting mainly of methane. It includes both "non-associated" gas originating from fields producing only hydrocarbons in gaseous form, and "associated" gas produced in association with crude oil as well as methane recovered from coal mines (colliery gas) or from coal seams (coal seam gas). Production represents dry marketable production within national boundaries, including offshore production and is measured after purification and extraction of NGL and sulphur. It includes gas consumed by gas processing plants and gas transported by pipeline. Quantities of gas that are re-injected, vented or flared are excluded.
Gas Works Gas	GASWKSGS	Gas works gas covers all types of gas produced in public utility or private plants, whose main purpose is the manufacture, transport and distribution of gas. It includes gas produced by carbonisation (including gas produced by coke ovens and transferred to gas works), by total gasification (with or without enrichment with oil products) and by reforming and simple mixing of gases and/or air.
Coke Oven Gas	COKEOVGS	Coke oven gas is obtained as a by-product of the manufacture of coke oven coke for the production of iron and steel.
Blast Furnace Gas	BLFURGS	Blast furnace gas is produced during the combustion of coke in blast furnaces in the iron and steel industry. It is recovered and used as a fuel, partly within the plant and partly in other steel industry processes or in power stations equipped to burn it.
Oxygen Steel Furnace Gas	OXYSTGS	Oxygen steel furnace gas is obtained as a by-product of the production of steel in an oxygen furnace and is recovered on leaving the furnace. Oxygen steel furnace gas is also known as converter gas, LD gas or BOS gas.

Combustible Renewables and Wastes

The fuels in this section are expressed in terajoules on a **net calorific value** basis, with the exception of liquid biomass which is in thousand tonnes.

Product	Short Name	Definition
Industrial Waste	INDWASTE	Industrial waste of non-renewable origin consists of solid and liquid products (e.g. tyres) combusted directly, usually in specialised plants, to produce heat and/or power. Renewable industrial waste is not included here, but with solid biomass, biogas or liquid biomass.
Municipal Waste (Renewable)	MUNWASTER	Municipal waste consists of products that are combusted directly to produce heat and/or power and comprises wastes produced by households, industry, hospitals and the tertiary sector that are collected by local authorities for incineration at specific installations. Municipal waste is split into renewable and non-renewable.
Municipal Waste (Non-Renewable)	MUNWASTEN	Municipal waste consists of products that are combusted directly to produce heat and/or power and comprises wastes produced by households, industry, hospitals and the tertiary sector that are collected by local authorities for incineration at specific installations. Municipal waste is split into renewable and non-renewable.
Primary Solid Biomass	SBIOMASS	Primary solid biomass is defined as any plant matter used directly as fuel or converted into other forms before combustion. This covers a multitude of woody materials generated by industrial process or provided directly by forestry and agriculture (firewood, wood chips, bark, sawdust, shavings, chips, sulphite lyes also known as black liquor, animal materials/wastes and other solid biomass).
Biogas	GBIOMASS	Biogas is derived principally from the anaerobic fermentation of biomass and solid wastes and combusted to produce heat and/or power. Included in this category are landfill gas, sludge gas and other biogas such as biogas produced from the anaerobic fermentation of animal slurries and of wastes in abattoirs, breweries and other agro-food industries.
Biogasoline	BIOGASOL	Biogasoline includes bio-ethanol (ethanol produced from biomass and/or the biodegradable fraction of waste), bio-methanol (methanol produced from biomass and/or the biodegradable fraction of waste), bio-ETBE (ethyl-tertio-butyl-ether produced on the basis of bio-ethanol; the percentage by volume of bio-ETBE that is calculated as bio-fuel is 47%) and bio-MTBE (methyl-tertio-butyl-ether produced on the basis of bio-methanol: the percentage by volume of bio-MTBE that is calculated as bio-fuel is 36%). Biogasoline includes the amounts that are blended into the gasoline - it does not include the total volume of gasoline into which the bio-gasoline is blended.

Biodiesels	BIODIESEL	Biodiesels includes bio-diesel (a methyl-ester produced from vegetable or animal oil, of diesel quality), bio-dimethylether (dimethylether produced from biomass), Fischer Tropsh (Fischer Tropsh produced from biomass), cold pressed bio-oil (oil produced from oil seed through mechanical processing only) and all other liquid bio-fuels which are added to, blended with or used straight as transport diesel. Biodiesels includes the amounts that are blended into the diesel - it does not include the total volume of diesel into which the bio-diesel is blended.
Other Liquid Biofuels	OBIOLIQ	Other liquid bio-fuels includes liquid bio-fuels not reported in either bio-gasoline or bio-diesels.
Non-specified Primary Biomass and Wastes	RENEWNS	This item is used when the detailed breakdown for primary combustible renewables and wastes is not available.
Charcoal	CHARCOAL	Charcoal produced from solid biomass is also included here. Since charcoal is a secondary product, its treatment is slightly different than that of the other primary biomass. Production of charcoal (an output in the transformation process) is offset by the inputs of primary biomass into the charcoal production process. The losses from this process are included in the row other transformation sector. Other supply (e.g. trade and stock changes) as well as consumption are aggregated directly with the primary biomass. In most countries, only the primary biomass is reported.