

The Netherlands: list of fuels and standard CO₂ emission factors

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Introduction

For national monitoring of greenhouse gas emissions under the framework of the UN Climate Change Agreement (UNFCCC) and monitoring at corporate level for the European CO₂ emissions trade, international agreements state that each country must draw up a national list of defined fuels and standard CO₂ emission factors. This is based on the IPCC list (with default CO₂ emission factors), but should include national values that reflect the specific national situation. This list will also be used by the Netherlands in the (e-)MJV ((electronic) annual environmental report), because these are used for national monitoring, and because the data concerning the CO₂ emissions trade also needs to be entered into the e-MJV.

The Netherlands' list of energy carriers and standard CO₂ emission factors (further referred to as 'the Netherlands' list') is now available in the form of:

1. A table containing the names (in Dutch and English) of the energy carrier and the accompanying standard energy content and CO₂ emissions factor.
2. A fact sheet per energy carrier, substantiating the values given, presenting similar names and possible specifications, and providing an overview of the codes that organisations use for the individual energy carriers.

This document is meant for people using the Netherlands' list. It contains the starting points for this list and indicates how it should be used for various objectives, e.g. national monitoring of greenhouse gas emissions, the European CO₂ emissions trade, and the e-MJV. It also includes background information. The list, plus this document and the background documents for substantiating the specific Netherlands' values can be found on the website:

www.greenhousegases.nl / www.broeikasgassen.nl

Starting points for the Netherlands' list

The following starting points were used to draw up the Netherlands' list:

1. The list contains all the fuels, as included in the IPCC guidelines (Revised 1996 Intergovernmental Panel on Climate Change (IPCC) for national greenhouse gas inventories, further known as the '1996 IPCC guidelines'), Table 1-1 (in Chapter 1 of the Reference Manual, volume 3 of the 1996 IPCC guidelines) and the differentiation thereof in the Workbook Table 1.2 (module 1 of the Workbook, volume 2 of the 1996 IPCC guidelines). The 1996 IPCC guidelines are applicable to the national monitoring of greenhouse gas emissions under the UNFCCC framework.
2. The list contains all fuels, as included in European Commission (EC) Directive 2004/156/EG on reporting CO₂ emissions trading ('... defining guidelines for monitoring and reporting greenhouse gas emissions...'), Appendix 1, Chapter 8.
3. The definition of fuels is based on the definition used by the CBS (Statistics Netherlands) when collating energy statistics.
4. As a result of the 1996 IPCC guidelines and the EC's Directive 2004/156/EG mentioned in 1 and 2 above, the CO₂ emission factors are accurate to one digit after the decimal point.
5. The list assumes the standard CO₂ emission factors as used in the 1996 IPCC guidelines and the EC directive 2004/156/EG but, where the Netherlands' situation deviates from this norm, specific standard values for the Netherlands are used, which are documented and substantiated.

The Netherlands' list

A study was carried out in 2002 with respect to specific Netherlands' CO₂ emission factors¹. This study showed that, for a limited number of Dutch fuels, their situations deviated such that national values needed to be determined. For a number of fuels the previously defined national values² could be updated but, for others, new values were required.

A *specific Netherlands standard CO₂ emissions factor* has been determined for the following fuels, which does not appear in the 1996 IPCC guidelines or in the EC's Directive 2004/156/EG, but has been added as specification for one of the following fuels in:

1. Petrol/gasoline
2. Gas- and diesel oil
3. LPG
4. Coke coals (coke ovens and blast furnaces)
5. (Other bituminous) coal
6. Coke ovens/gas cokes
7. Coke oven gas
8. Blast furnace gas
9. Oxy gas
10. Phosphor oven gas

For industrial gases, chemical waste gas is also split from refinery gas. For the IPCC main group 'other fuels', only the (non-biogenic) waste is differentiated.

The list also includes biomass as a fuel, with accompanying specific Netherlands' CO₂ emission factors. Biomass emissions are reported separately in the national monitoring of greenhouse gas emissions under the UNFCCC framework (as memo element) and are not included in the national emissions figures. For the European CO₂ emissions trading the emissions are not included because an emissions factor of zero is used for biomass.

The CO₂ emissions factor for wood is used for solid biomass, and that of palm oil is used for liquid biomass. A weighed average of three specified biogases is used as the standard factor for gaseous biomass, i.e.

1. Sewage treatment facility (RWZI) biogas.
2. Landfill gas.
3. Industrial organic waste gas.

For coke coals the standard CO₂ emissions factor is also a weighed average, e.g. of coke coals used in coke ovens and in blast furnaces.

The heating values are the same as those used by the CBS for observed fuels in its surveys for collating energy statistics.

¹ TNO 2002 CO₂ emission factors for fuels in the Netherlands, report R2002/174

² Emission registration, Methodological report 37, 1997, update in Methodological report 37b, 2002

Table: Netherlands fuels and standard CO₂ emission factors

Main group (Dutch language)	Main group (English) IPCC (supplemented)	Unit	Heating value (MJ/unit)	CO ₂ EF (kg/GJ)
A. Liquid Fossil, Primary Fuels				
Ruwe aardolie	Crude oil	Kg	42.7	73.3
Orimulsion	Orimulsion	Kg	27.5	80.7
Aardgascondensaat	Natural Gas Liquids	Kg	44.0	63.1
Liquid Fossil, Secondary Fuels/ Products				
Motorbenzine	Petrol/gasoline	Kg	44.0	72.0
Kerosine luchtvaart	Jet Kerosene	Kg	43.5	71.5
Petroleum	Other Kerosene	Kg	43.1	71.9
Leisteenolie	Shale oil	Kg	36.0	73.3
Gas-/dieselolie	Gas/ Diesel oil	Kg	42.7	74.3
Zware stookolie	Residual Fuel oil	Kg	41.0	77.4
LPG	LPG	Kg	45.2	66.7
Ethaan	Ethane	Kg	45.2	61.6
Nafta's	Naphtha	Kg	44.0	73.3
Bitumen	Bitumen	Kg	41.9	80.7
Smeerolieën	Lubricants	Kg	41.4	73.3
Petroleumcokes	Petroleum Coke	Kg	35.2	100.8
Raffinaderij grondstoffen	Refinery Feedstocks	Kg	44.8	73.3
Raffinaderijgas	Refinery Gas	kg	45.2	66.7
Chemisch restgas	Chemical Waste Gas	kg	45.2	66.7
Overige olien	Other Oil	kg	40.2	73.3
B. Solid Fossil, Primary Fuels				
Antraciet	Anthracite	kg	26.6	98.3
Cokeskolen	Coking Coal	kg	28.7	94.0
Cokeskolen (cokeovens)	Coking Coal (used in coke oven)	kg	28.7	95.4
Cokeskolen (basismetaal)	Coking Coal (used in blast furnaces)	kg	28.7	89.8
(Overige bitumineuze) steenkool	Other Bituminous Coal	kg	24.5	94.7
Sub-bitumineuze kool	Sub-bituminous Coal	kg	20.7	96.1
Bruinkool	Lignite	kg	20.0	101.2
Bitumineuze Leisteen	Oil Shale	kg	9.4	106.7
Turf	Peat	kg	10.8	106.0
Solid Fossil, Secondary Fuels				
Steenkool- en bruinkoolbriketten	BKB & Patent Fuel	kg	23.5	94.6
Cokesoven/ gascokes	Coke Oven/Gas Coke	kg	28.5	111.9
Cokesovengas	Coke Oven gas	MJ	1.0	41.2
Hoogovengas	Blast Furnace Gas	MJ	1.0	247.4
Oxystaalovengas	Oxy Gas	MJ	1.0	191.9
Fosforovengas	Phosphor Gas	Nm ³	11.6	149.5
C. Gaseous Fossil Fuels				
Aardgas	Natural Gas (dry)	Nm ³ ae	31.65	56.1
Koolmonoxide	Carbon Monoxide	Nm ³	12.6	155.2
Methaan	Methane	Nm ³	35.9	54.9
Waterstof	Hydrogen	Nm ³	10.8	0.0
Biomass *				
Biomassa vast	Solid Biomass	kg	15.1	109.6
Biomassa vloeibaar	Liquid Biomass	kg	39.4	71.2
Biomassa gasvormig	Gas Biomass	Nm ³	21.8	90.8
RWZI biogas	Wastewater biogas	Nm ³	23.3	84.2
Stortgas	Landfill gas	Nm ³	19.5	100.7
Industrieel fermentatiegas	Industrial organic waste gas	Nm ³	23.3	84.2
D. Other fuels				
Afval (niet biogeen)	Waste (not biogenic)	kg	34.4	73.6

* biomass: the value of the CO₂ emission factor is shown as a memo item in reports for the climate agreement; the value is zero for emissions trading and for the Kyoto Protocol.

Fact sheets

A fact sheet (consisting of at least two sections) has been drawn up for each energy carrier:

- 1) General information
 - a. Name of the energy carrier, in Dutch and English
 - b. Other names used (Dutch and English)
 - c. Description
 - d. Codes (in Dutch) used to specify the energy carrier
 - e. Unit
- 2) Specific values and substantiation
 - a. Heating value
 - b. Carbon content
 - c. CO₂ emissions factor
 - d. Density (if relevant), converting from weight to volume or converting from gases to m³ standard natural gas equivalents
 - e. Substantiating the choices, plus accurate referral to references and/or specific text sections within the reference
 - f. Year and/or period for which the specific values apply

If a standard Dutch value for an energy carrier already exists, then this has been added to the fact sheet (as a third section containing the same information as that described under 1) and 2) above).

Using the Netherlands list in national monitoring, European CO₂ emissions trade and in the e-MJV

National monitoring

The 1996 IPCC guidelines are among those valid for national monitoring under the UNFCCC framework, which is reported annually in the NIR (National Inventory Report). This includes the default CO₂ emission factors shown in Table 1-1 (Chapter 1 of the Reference Manual, volume 3 of the 1996 IPCC guidelines) and Table 1-2 (Module 1 of the Workbook, volume 2 of the 1996 IPCC guidelines). With respect to the specification at national level: ‘...default assumptions and data should be used only when national assumptions and data are not available.’ (Overview of the Reporting Instructions, volume 1 of the 1996 IPCC guidelines) and ‘...because fuel qualities and emission factors may differ markedly between countries, sometimes by as much as 10% for nominally similar fuels, national inventories should be prepared using local emission factors and energy data where possible.’ (Chapter 1, Section 1.1 of the Reference Manual, volume 3 of the 1996 IPCC guidelines).

With respect to documentation: ‘When countries use local values for the carbon emission factors they should note the differences from the default values and provide documentation supporting the values used in the national inventory calculations’ (Chapter 1, Section 1.4.1.1 of the Reference Manual, volume 3 of the 1996 IPCC guidelines). Exactly when and how the Netherlands list should be used in the national monitoring process is further described in the 1996 IPCC guidelines. The Netherlands list is included in the country’s national report to the UNFCCC on greenhouse gas emissions.

Monitoring European CO₂ emissions trade

The EC Directive 2004/156/EG covers the monitoring under the framework of the European CO₂ emissions trade. This directive serves as a starting point for the Netherlands monitoring system for trading in emission rights. With respect to the CO₂ emission factors and the calculations of CO₂ emissions at level 2a, the directive states: 'The operator should use the relevant fuel caloric values that apply in that country, e.g. as indicated in the relevant Member State's latest national inventory, which has been submitted to the secretariat of the UNFCCC (EC Directive 2004/156/EG, Appendix II, Section 2.1.1.1).

With respect to the reports, this states that: 'Fuels, and the resulting emissions must be reported in accordance with the IPCC standard format for fuels.... this is based on the definitions set out by the IEA (International Energy Agency). If the Member State (relevant to the operator) has already published a list of fuel categories, including definitions and emission factors, which is consistent with the latest national inventory such as submitted to the UNFCCC secretariat, these categories and the accompanying emission factors should be used, if these have been approved within the framework of the relevant monitoring methodology.' (EC Directive 2004/156/EG, Appendix I, Section 5).

Exactly when and how the Netherlands list should be used in the monitoring process under the framework of the EU CO₂ emissions trading is further explained in EC Directive 2004/156/EG and the Netherlands system for monitoring the trade in emission rights.

The Netherlands scheme for monitoring the trade in emission rights indicates that, in the first trading period (2005 through 2007) by Dutch companies, monitoring under the framework of the EU CO₂ emissions trade shows a deviation (for a number of fuels) to the values given on the Netherlands list. This is due to the fact that the allocation of CO₂ emission rights for this period assumes other values because, at that point in time, the Netherlands list was not yet defined. It was decided to leave these differing values for the first trading period as they are, so that the allocation to Dutch companies need not be changed. These differences are shown in the following table. Exactly when and how figures may deviate is indicated in the Netherlands system for monitoring the trade in emission rights.

Energy carrier	Unit	Allocation		National list	
		Heating value (GJ/unit)	CO ₂ emission factor (kg/GJ)	Heating value (GJ/unit)	CO ₂ emission factor (kg/GJ)
LPG	ton	46.00	63.00	45.2	66.7 ¹⁾
Heavy oil	ton	41.00	77.30	41.0	77.4 ²⁾
Light oil	ton	42.50	73.00	42.7	74.3 ¹⁾
Coal	ton	29.30	94.50	24.5	94.7 ³⁾

¹⁾ Country-specific factor, substantiated in MNP Memorandum on Netherlands CO₂ emission factors for petrol, diesel and LPG), M/773201/01/NI, December 2004

²⁾ IPCC standard value

³⁾ Country-specific factor, substantiated in TNO report 2002/174

It has been decided to leave these differences for the first trading period, so that the allocation to these companies need not be modified. How these exceptions should be treated is further defined under the framework of the EU CO₂ emissions trading in the Netherlands.

(e-)MJV

Within the UNFCCC framework, the national monitoring of greenhouse gases is partly based on the information provided in the MJVs (annual environmental reports). Information on CO₂ emissions trading is (also) reported in the MJV, which is why the Netherlands list is also used in the (e-)MJV. Since the monitoring of the energy covenant known as MJA (long-term energy agreement) can be carried out via the e-MJV, the Netherlands list is also used to compile these reports. Exactly how the Netherlands list should be used in the (e-)MJV is further described in the (e-)MJV itself.

Use of the Netherlands list by other stakeholders in the Netherlands

The Netherlands list can also be used for other purposes (e.g. monitoring energy covenants, predicting future CO₂ emissions etc.). Selections can be taken from the list, depending on the application. This usage is not defined in the legislation, but offers the advantage of harmonising the national monitoring under the UNFCCC framework. Whenever CO₂ emissions are defined for the government, the Netherlands list will be used wherever possible.

Defining and maintaining the Netherlands list

The Ministry of VROM (Spatial Planning, Housing and the Environment) initiated the compilation of the Netherlands list, as it is responsible for the national monitoring of greenhouse gas emissions under the UNFCCC framework. This list has been prepared in consultation with those national institutes that are involved in the national monitoring activities, i.e. RIVM, CBS, SenterNovem, plus other relevant organisations, such as the (e-)MJV, CO₂ emissions trade and ECN. The EMSG (Emissions Registration Steering Group, the collaborative agencies implementing the national monitoring) compiled the list during its meeting held in October 2004.

The list will be maintained within the National System, the organisational structure that coordinates national greenhouse gas monitoring under the UNFCCC framework. The Netherlands list, this document and the background documents are all publicly accessible from the Dutch website (www.broeikasgassen.nl) or the English version, (www.greenhousegases.nl). As part of the quality monitoring system for national monitoring of greenhouse gases, this list will be evaluated every three years. The values currently included are valid for (at least) the period from 1990 through 2007.

Appendix 1: Fact sheet for petrol as a transport fuel

Version: 4

Date: 17 October 2005

General information

Name of energy carrier	Nederlands: Motorbenzine English: Petrol/gasoline (US)
Energysource-ID:	
Fuels understood to be included under this energy carrier	<p>Unleaded petrol (30900)</p> <ul style="list-style-type: none"> • Petrol standard • Euro, unleaded • Superplus, unleaded • Super with lead replacement • (Petrol) Other <p>Leaded petrol (30900)</p> <ul style="list-style-type: none"> • Petrol standard, leaded • Euro, leaded • (Petrol) Other, leaded <p>Aviation fuel (30600)</p>
Description (using GN standards)	<p>Unleaded petrol (30900):</p> <p>Petrol, standard</p> <ul style="list-style-type: none"> • 27101141 Petrol (Motor spirit) with a lead content of ≤ 0.013 g/l and a research-octane level "RON" of ≤ 95 <p>Euro, unleaded:</p> <ul style="list-style-type: none"> • 27101145 Petrol (Motor spirit) with a lead content of ≤ 0.013 g/l and a research-octane level "RON" of > 95 or < 98 <p>Superplus, unleaded:</p> <ul style="list-style-type: none"> • 27101149 Petrol (Motor spirit) with a lead content of ≤ 0.013 g/l and a research-octane level "RON" of ≥ 98 <p>Super, with lead replacement:</p> <ul style="list-style-type: none"> • 27101149 Petrol (Motor spirit) with a lead content of ≤ 0.013 g/l and a research-octane level "RON" of ≥ 98 <p>(Petrol) Other:</p> <ul style="list-style-type: none"> • 27101145 Petrol (Motor spirit) with a lead content of ≤ 0.013 g/l and a research-octane level "RON" of > 95 or < 98 <p>Leaded petrol (30900)</p> <p>Petrol standard, leaded:</p> <ul style="list-style-type: none"> • 27101151 Petrol (Motor spirit) with a lead content of > 0.013 g/l and a research-octane level "RON" of < 98 (except aviation fuel) <p>Euro, leaded:</p> <ul style="list-style-type: none"> • 27101159 Petrol (Motor spirit) with a lead content of > 0.013 g/l and a research-octane level "RON" of ≥ 98 (except aviation fuel) • (Petrol) Other, leaded: • 27101145 Petrol (Motor spirit) with a lead content of ≤ 0.013 g/l and a research-octane level "RON" of > 95 or < 98.

	Aviation fuel (30600) • 27101131 Aviation spirit.	
Names currently in use	Netherlands Statistics (CBS):	Fuels in questionnaire form for crude oil statistics: 10+11+14 Fuels in NEH under table numbers 4.3.6 4.3.9
	ER/TNO	
	MJA	
	CO ₂ trade	
Names used in previous lists	EMJV	Petrol/motorbenzine
	ER/TNO	Petrol
	MJA	Petrol
	Benchmark	
Unit	Kg	

Specific values and substantiation

Heating value (MJ/[unit])	44.0
Substantiation of heating value	NEH
Carbon content (ton C/TJ)	19.6
Substantiation of carbon content	Calculated based on the C-content % mass and energy conversion factor
CO ₂ emissions factor (ton CO ₂ /TJ)	72.0
<i>CEF IPCC default</i>	69.3
Substantiation of CO ₂ emissions factor	The Netherlands deviates here from the IPCC default. The basis for this is the report 'Netherlands' CO ₂ emission factors for petrol, diesel and LPG' MNP Memorandum on the Netherlands CO ₂ emission factors, Olivier 2004. At the request of the Ministry of VROM, in 2004 ITS Caleb Brett analysed a number of petrol and diesel samples (winter and summer qualities) for both carbon and energy contents. This resulted in the following values: <ul style="list-style-type: none"> • C-content (% mass): 86.4 • Conversion factor (GJ/1000kg; LHV) 44.0 • Emissions factor (kg CO₂/GJ) 72.0 This emissions factor can be used for all years from 1990 onwards
Validity of CO ₂ emissions factor	From 1990 onwards
Density (kg/l)	Gasoline 0.745 kg/l
Substantiation of density	NEH (Netherlands Energy Statistics) 1996

Appendix 2: IPCC Fuel lists

Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories: Reference Manual (Volume 3), Page 1.13

TABLE 1-1 (CONTINUED)							
IPCC REFERENCE APPROACH							
ENTRIES AND CALCULATIONS FOR STEPS (3) TO (6)							
Fuel	(8) Apparent Consumption (TJ)	(9) Carbon Emission Factor ^(f) (t C/TJ)	(10) Carbon Content (Gg C)	(11) Carbon Stored (Gg C)	(12) Net Carbon Emissions (Gg C)	(13) Actual Carbon Emissions (Gg C)	(14) Actual CO ₂ Emissions (Gg CO ₂)
A) Liquid Fossil	sum		sum	sum	sum	sum	sum
Primary Fuels							
1) Crude Oil	calc	20.0	calc		calc	calc	calc
2) Orimulsion	calc	22.0	calc		calc	calc	calc
3) N. Gas Liquids	calc	17.2	calc		calc	calc	calc
Secondary Fuels / Products							
4) Gasoline	calc	18.9	calc		calc	calc	calc
5) Jet Kerosene	calc	19.5	calc		calc	calc	calc
6) Other Kerosene	calc	19.6	calc		calc	calc	calc
7) Shale Oil	calc	20.0	calc		calc	calc	calc
8) Gas / Diesel Oil	calc	20.2	calc	Table 1-5	calc	calc	calc
9) Residual Fuel Oil	calc	21.1	calc		calc	calc	calc
10) LPG	calc	17.2	calc	Table 1-5	calc	calc	calc
11) Ethane	calc	16.8	calc	Table 1-5	calc	calc	calc
12) Naphtha	calc	(20.0)	calc	Table 1-5	calc	calc	calc
13) Bitumen	calc	22.0	calc	Table 1-5	calc	calc	calc
14) Lubricants	calc	(20.0)	calc	Table 1-5	calc	calc	calc
15) Petroleum Coke	calc	27.5	calc		calc	calc	calc
16) Refinery Feedstocks	calc	(20.0)	calc		calc	calc	calc
17) Other Oil	calc	(20.0)	calc		calc	calc	calc
B) Solid Fossil	sum		sum	sum	sum	sum	sum
Primary Fuels							
18) Anthracite ^(c)	calc	26.8	calc		calc	calc	calc
19) Coking Coal	calc	25.8	calc	Table 1-5	calc	calc	calc
20) Other Bit. Coal	calc	25.8	calc		calc	calc	calc
21) Sub-bit. Coal	calc	26.2	calc		calc	calc	calc
22) Lignite	calc	27.6	calc		calc	calc	calc
23) Oil Shale	calc	29.1	calc		calc	calc	calc
24) Peat	calc	28.9	calc		calc	calc	calc
Secondary Fuels							
25) BKB & Patent Fuel	calc	(25.8)	calc		calc	calc	calc
26) Coke Oven Gas/Coke	calc	29.5	calc		calc	calc	calc
C) Gaseous Fossil	sum		sum	sum	sum	sum	sum
27) Natural Gas (Dry)	calc	15.3	calc	Table 1-5	calc	calc	calc
Total^(e)	sum		sum	sum	sum	sum	sum
Information Entries							
Biomass Total	sum		sum		sum	sum	sum
28) Solid Biomass	calc	29.9	calc		calc	calc	calc
29) Liquid Biomass	calc	(20.0)	calc		calc	calc	calc
30) Gas Biomass	calc	(30.6) ^(g)	calc		calc	calc	calc

TABLE 1-2 CARBON EMISSION FACTORS (CEF)	
Fuel	Carbon Emission Factor (t C/TJ)
LIQUID FOSSIL	
<i>Primary fuels</i>	
Crude oil	20.0
Orimulsion	22.0
Natural Gas Liquids	17.2
<i>Secondary fuels/products</i>	
Gasoline	18.9
Jet Kerosene	19.5
Other Kerosene	19.6
Shale Oil	20.0
Gas/Diesel Oil	20.2
Residual Fuel Oil	21.1
LPG	17.2
Ethane	16.8
Naphtha	(20.0) (a)
Bitumen	22.0
Lubricants	(20.0) (a)
Petroleum Coke	27.5
Refinery Feedstocks	(20.0) (a)
Refinery Gas	18.2 (b)
Other Oil	(20.0) (a)
SOLID FOSSIL	
<i>Primary Fuels</i>	
Anthracite	26.8
Coking Coal	25.8
Other Bituminous Coal	25.8
Sub-bituminous Coal	26.2
Lignite	27.6
Oil Shale	29.1
Peat	28.9
<i>Secondary Fuels/Products</i>	
BKB & Patent Fuel	(25.8) (a)
Coke Oven / Gas Coke	29.5
Coke Oven Gas	13.0 (b)
Blast Furnace Gas	66.0 (b)
GASEOUS FOSSIL	
Natural Gas (Dry)	15.3
BIOMASS	
Solid Biomass	29.9
Liquid Biomass	(20.0) (a)
Gas Biomass	(30.6) (a)
(a) This value is a default value until a fuel specific CEF is determined. For Gas biomass, the CEF is based on the assumption that 50% of the carbon in the biomass is converted to methane and 50% is emitted as CO ₂ . The CO ₂ emissions from biogas should not be included in national inventories. If biogas is released and not combusted 50% of the carbon content should be included as methane.	
(b) For use in the sectoral calculations.	

TABLE 1-3 SELECTED NET CALORIFIC VALUES	
	Factors (TJ/10 ³ tonnes)
Refined Petroleum Products	
Gasoline	44.80
Jet Kerosene	44.59
Other Kerosene	44.75
Shale Oil	36.00
Gas/Diesel Oil	43.33
Residual Fuel Oil	40.19
LPG	47.31
Ethane	47.49
Naphtha	45.01
Bitumen	40.19
Lubricants	40.19
Petroleum Coke	31.00
Refinery Feedstocks	44.80
Refinery Gas	48.15
Other Oil Products	40.19
Other Products	
Coal Oils and Tars derived from Coking Coals	28.00
Oil Shale	9.40
Orimulsion	27.50
See the <i>Greenhouse Gas Inventory Reference Manual</i> for sources.	