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1 Introduction

Since 2004 RVO.nl maintains The Netherlands' list of fuels, which contains all fuels used in the Netherlands, including the heating value and the CO₂ emission factor. The previous list (Vreuls and Zijlema, 2013) contained heating values and emission factors that are partly based on Dutch studies. For the remaining emission factors and heating values, default values from the Revised 1996 IPCC Guidelines (IPCC, 1997) or the IPCC Good Practice Guidance (IPCC, 2000) have been used. The list has been used for calculating CO₂ emissions from the combustion of fuels in the National Inventory Report of greenhouse gas emissions for many years (latest version: Coenen, e.a, 2014). In addition, the list has been used by companies for the Annual Environmental Report and for ETS emission report.

Because of the introduction of the 2006 IPCC Guidelines (which hold revised default emission factors and heating values) an update of the Netherlands' list is needed. This update will be used for the CO₂ emission calculations as of the 2015 submission.

This report describes the methodology for establishing the updated Netherlands' list of fuels (chapter 2) and it describes the resulting updated Netherlands' list of fuels and the rationale for each of the choices (chapter 3). The resulting Netherlands' list of fuels is presented in chapter 4.

2 Methodology for establishing the updated Netherlands' list of fuels

The previous Netherlands' list of fuels of February 2013 (Vreuls and Zijlema, 2013) has been used as a starting point for updating the list. This list contains the heating values and the CO₂ emission factors for all of the fuels used in the Netherlands. This information is either available from the Revised 1996 IPCC Guidelines or from other national and international data sources. Depending on the information source, a different methodology for deriving the updated heating values and CO₂ emission factors has been used. This chapter describes the methodology used for deriving the new heating values and emission factors in general. Detailed choices per fuel are described in chapter 3.

The following institutes have been involved in the establishment of the updated Netherlands' list of fuels:

- CBS (Statistics Netherlands) (information on heating values and on biomass)
- Rijkswaterstaat (information on waste incineration)
- NEa (information on ETS companies)
- PBL (information on transport fuels)
- eMJV (information on environmental reports of individual companies)

2.1 Heating value

The heating value in the previous Netherlands' list of fuels of February 2013 (Vreuls and Zijlema, 2013) are from a few different information sources:

- IPCC 1996 default
- Energy statistics (from Statistics Netherlands)
- Other country specific data source (e.g. company specific)
- International data source

Statistics Netherlands calculates the fuel consumption in the energy statistics for the Netherlands in different units (tonnes and m³ and in Gigajoules). The heating values used in the energy statistics are based on national data or on information from international data sources. The heating value from the energy statistics are also to be included in the Netherlands' list of fuels.

Company specific data has been used to derive heating values for several fuels in the previous Netherlands' list of fuels. It is expected that the country specific value will match the Dutch situation better than the 2006 IPCC default heating values and therefore the heating values have not been changed (except when improved information has become available). If there is a difference between the company heating value and the heating value in the energy statistics, then it is investigated in more detail which heating value to use (see chapter 3 for details).

If fuels are not included in the energy statistics, then the heating value in the previous list corresponds to the default value from the 1996 IPCC Guidelines or from an international data source. In the new list, this has been updated to the heating value from the 2006 IPCC Guidelines (unless it is expected that these new heating values are not accurate for the national situation).

2.2 CO2 emission factor

The CO2 emission factor in the previous Netherlands' list of fuels of February 2013 (Vreuls and Zijlema, 2013) are from a few different information sources:

- IPCC 1996 default
- Other country specific data source (e.g. company specific data)
- International data source

Company specific data has been used to derive CO2 emission factors of several fuels in the previous Netherlands' list of fuels. It is expected that the country specific value will match the Dutch situation better than the 2006 IPCC default emission factor and therefore the emission factor has not been changed (except when better information is available).

If no company specific emission factor has been derived, then the previous emission factor corresponds with the default value from the 1996 IPCC Guidelines or from an international data source. In the new list, this has been updated to the CO2 emission factors from the 2006 IPCC Guidelines (unless it is expected that these new emission factors are not accurate for the national situation).

3 Updated Netherlands' list of fuels

The differences in the heating values and CO₂ emission factors between the previous (column 'old') and in the updated (column 'new') Netherlands' list of fuels are presented in Table 1. The table only shows the heating values and emission factors for the year 2013. The reasons behind the choices are described for each fuel in this chapter. The following colour coding is used in the table:



: No changes compared to the previous list



: Changed due to:

1. New IPCC 2006 default value, valid for all years;
2. New country specific value, valid for all years
3. New fuel, valid for all years;



: New value due to:

1. Annual update, valid for 2013, for natural gas (and LNG and CNG), other bituminous coal and waste;
2. New research, valid from 2013 onwards;

Table 1 Differences in the heating values and CO₂ emission factors between the previous ('old') and in the updated ('new') Netherlands' list of fuels.

Main group		Unit	Heating value (MJ/unit)				CO ₂ EF (kg/GJ)			
Dutch	English		Old	Ref	New	Ref	Old	Ref	New	Ref
A. Liquid Fossil, Primary Fuels										
Ruwe aardolie	Crude oil	kg	42,7	IPCC96	42,7	NL	73,3	IPCC96	73,3	IPCC2006
Orimulsion	Orimulsion	kg	27,5	IPCC96	27,5	IPCC2006	80,7	IPCC96	77,0	IPCC2006
Aardgascondensaat	Natural Gas Liquids	kg	44,0	NL	44,0	NL	63,1	IPCC96	64,2	IPCC2006
Fossiele additieven	Fossil fuel additives	kg			44,0	NL			73,3	IPCC2006
Liquid Fossil, Secondary Fuels/ Products										
Motorbenzine	Gasoline	kg	44,0	NL	44,0	NL	72,0	NL	72,0	NL
Vliegtuigbenzine	Aviation gasoline	kg			44,0	NL			72,0	NL
Kerosine luchtvaart	Jet Kerosene	kg	43,5	NL	43,5	NL	71,5	IPCC96	71,5	IPCC2006
Petroleum	Other kerosene	kg	43,1	NL	43,1	NL	71,9	IPCC96	71,9	IPCC2006
Leisteenolie	Shale oil	kg	36,0	IPCC96	38,1	IPCC2006	73,3	IPCC96	73,3	IPCC2006
Gas-/dieselolie	Gas/Diesel oil	kg	42,7	NL	42,7	NL	74,3	NL	74,3	NL
Zware stookolie	Residual Fuel oil	kg	41,0	NL	41,0	NL	77,4	IPCC96	77,4	IPCC2006
LPG	Liquefied Petroleum Gas (LPG)	kg	45,2	NL	45,2	NL	66,7	NL	66,7	NL
Ethaan	Ethane	kg	45,2	NL	45,2	NL	61,6	IPCC96	61,6	IPCC2006
Nafta's	Naphta	kg	44,0	NL	44,0	NL	73,3	IPCC96	73,3	IPCC2006
Bitumen	Bitumen	kg	41,9	NL	41,9	NL	80,7	IPCC96	80,7	IPCC2006
Smeeroliën	Lubricants	kg	41,4	NL	41,4	NL	73,3	IPCC96	73,3	IPCC2006
Petroleumcokes	Petroleum Coke	kg	35,2	NL	35,2	NL	100,8	IPCC96	97,5	IPCC2006
Raffinaderij	Refinery Feedstocks	kg	44,8	IPCC96	43,0	IPCC2006	73,3	IPCC96	73,3	IPCC2006

Main group		Unit	Heating value (MJ/unit)				CO2 EF (kg/GJ)			
Dutch	English		Old	Ref	New	Ref	Old	Ref	New	Ref
grondstoffen										
Raffinaderijgas	Refinery Gas	kg	45,2	NL	45,2	NL	66,7	IPCC96	67,0	NL
Chemisch restgas	Chemical Waste Gas	kg	45,2	NL	45,2	NL	66,7	IPCC96	62,4	NL
Overige oliën	Other oil	kg	40,2	IPCC96	40,2	IPCC2006	73,3	IPCC96	73,3	IPCC2006
Paraffine	Paraffin Waxes	kg			42,7	NL			73,3	IPCC2006
Terpentine	White Spirit and SBP	kg			43,6	NL			73,3	IPCC2006
Overige aardolie producten	Other Petroleum Products	kg			42,7	NL			73,3	IPCC2006
B. Solid Fossil, Primary Fuels										
Antraciet	Anthracite	kg	26,6	IPCC GPG	29,3	NL	98,3	IPCC96	98,3	IPCC2006
Cokeskolen	Coking Coal	kg	28,7	NL	28,6	NL	94,0	NL	94,0	NL
Cokeskolen	Coking Coal (used in coke oven)	kg	28,7	NL	28,6	NL	95,4	NL	95,4	NL
Cokeskolen	Coking Coal (used in blast furnaces)	kg	28,7	NL	28,6	NL	89,8	NL	89,8	NL
Overige bitumineuze steenkool	Other Bituminous Coal	kg	24,5	NL	25,0	NL	94,7	NL	94,7	NL
Sub-bitumineuze kool	Sub-Bituminous Coal	kg	20,7	Int	18,9	IPCC2006	96,1	IPCC96	96,1	IPCC2006
Bruinkool	Lignite	kg	20,0	IPCC96	20,0	NL	101,2	IPCC96	101,0	IPCC2006
Bitumineuze Leisteen	Oil Shale	kg	9,4	IPCC96	8,9	IPCC2006	106,7	IPCC96	107,0	IPCC2006
Turf	Peat	kg	10,8	Int	9,76	IPCC2006	106,0	IPCC96	106,0	IPCC2006
Solid Fossil, Secondary Fuels										
Steenkool- en bruinkoolbriketten	BKB & Patent Fuel	kg	23,5	IPCC96	20,7	IPCC2006	94,6	IPCC96	97,5	IPCC2006
Cokesoven/ gascokes	Coke Oven/Gas Coke	kg	28,5	IPCC96	28,5	NL	111,9	NL	106,8	NL
Cokesovengas	Coke Oven gas	MJ	1,0	NL	1,0	NL	41,2	NL	42,8	NL
Hoogovengas	Blast Furnace Gas	MJ	1,0	NL	1,0	NL	247,4	NL	247,4	NL
Oxystaalovengas	Oxy Gas	MJ	1,0	NL	1,0	NL	191,9	NL	191,9	NL
Fosforovengas	Fosfor Gas	Nm3	11,6	NL	11,0	NL	149,5	NL	143,9	NL
Steenkool bitumen	Coal tar	kg			41,9	NL			80,7	IPCC2006
C. Gaseous Fossil Fuels										
Aardgas	Natural Gas (dry)	Nm3 ae	31,65	NL	31,65	NL	56,5	NL	56,5	NL
Compressed natural gas (CNG)	Compressed natural gas (CNG)	Nm3 ae			31,65	NL			56,5	NL
Liquefied natural gas (LNG)	Liquefied natural gas (LNG)	Nm3 ae			31,65	NL			56,5	NL
Koolmonoxide	Carbon Monoxide	Nm3	12,6	NL	12,6	NL	155,2	Int	155,2	Int
Methaan	Methane	Nm3	35,9	NL	35,9	NL	54,9	Int	54,9	Int
Waterstof	Hydrogen	Nm3	10,8	NL	10,8	NL	0	Int	0	Int
Biomass										
Biomassa vast	Solid Biomass	kg	15,1	NL	15,1	NL	109,6	IPCC96	109,6	IPCC96
Houtskool	Charcoal	kg			30,0	NL			112,0	IPCC2006
Biomassa vloeibaar	Liquid Biomass	kg	39,4	NL			71,2	NL		
Biobenzine	Biogasoline	kg			27,0	NL			72,0	NL

Main group		Unit	Heating value (MJ/unit)				CO2 EF (kg/GJ)			
Dutch	English		Old	Ref	New	Ref	Old	Ref	New	Ref
Biodiesel	Biodiesels	kg			37,0	NL			74,3	NL
Overige vloeibare biobrandstoffen	Other liquid biofuels	kg			36,0	NL			79,6	IPCC2006
Biomassa gasvormig	Gas Biomass	Nm3	21,8	NL	21,8	NL	90,8	NL	90,8	NL
RWZI biogas	Wastewater biogas	Nm3	23,3	NL	23,3	NL	84,2	NL	84,2	NL
Stortgas	Landfill gas	Nm3	19,5	NL	19,5	NL	100,7	NL	100,7	NL
Industrieel fermentatiegas	Industrial organic waste gas	Nm3	23,3	NL	23,3	NL	84,2	NL	84,2	NL
	D Other fuels									
Afval	Waste	kg	9,6	NL	9,8	NL	106,3	NL	106,3	NL

Crude oil

In the previous version of the Netherlands' list of fuels (Vreuls and Zijlema, 2013), the heating value was taken from the 1996 IPCC Guidelines. This is equal to the heating value used in the energy statistics and therefore the heating value has not been changed.

In Vreuls and Zijlema (2013), the emission factor was taken from the 1996 IPCC Guidelines. The emission factor in the 2006 IPCC Guidelines is the same and therefore the emission factor has not been changed.

Orimulsion

In the previous version of the Netherlands' list of fuels (Vreuls and Zijlema, 2013), the heating value was taken from the 1996 IPCC Guidelines. The heating value in the 2006 IPCC Guidelines is the same and therefore the heating value has not been changed.

In Vreuls and Zijlema (2013), the emission factor was taken from the 1996 IPCC Guidelines. The emission factor in the 2006 IPCC Guidelines differs from the emission factor in the 1996 IPCC Guidelines and therefore the emission factor has been updated to match the 2006 IPCC Guidelines for the whole time series.

This fuel is not included in the energy statistics and therefore no country specific heating values and emission factors have been derived.

Natural gas liquids

In the previous version of the Netherlands' list of fuels (Vreuls and Zijlema, 2013), the heating value was a country specific value for the Netherlands (which is also used in the energy statistics). It is expected that the country specific value matches the Dutch situation better than the 2006 IPCC default heating value and therefore the heating value has not been changed.

In Vreuls and Zijlema (2013), the emission factor was taken from the 1996 IPCC Guidelines. The emission factor in the 2006 IPCC Guidelines differs from the emission factor in the 1996 IPCC Guidelines and therefore the emission factor has been updated to match the 2006 IPCC Guidelines for the whole time series.

Fossil fuel additives

This fuel is new in the Netherlands' list of fuels. Within the energy statistics, this fuel is reported separately, and therefore it has been added to the list. The heating value is equal to the heating value in the energy statistics and the CO₂ emission factor is from the 2006 IPCC Guidelines for the whole time series.

Gasoline

In the previous version of the Netherlands' list of fuels (Vreuls and Zijlema, 2013), the heating value was a country specific value for the Netherlands (which is also used in the energy statistics). It is expected that the country specific value matches the Dutch situation better than the 2006 IPCC default heating value and therefore the heating value has not been changed.

In Vreuls and Zijlema (2013), the emission factor was a country specific value for the Netherlands, derived in 2004 (Olivier, 2004). It is expected that the country specific value will match the Dutch situation better than the 2006 IPCC default emission factor and therefore the emission factor has not been changed.

Aviation gasoline

This fuel is new in the Netherlands' list of fuels. Within the energy statistics, this fuel is reported separately, and therefore it has been added to the list. The heating value and the CO₂ emission factor are equal to the heating value and emission factor of gasoline for the whole time series.

Jet kerosene

In the previous version of the Netherlands' list of fuels (Vreuls and Zijlema, 2013), the heating value was a country specific value for the Netherlands (which is also used in the energy statistics). It is expected that the country specific value will match the Dutch situation better than the 2006 IPCC default heating value and therefore the heating value has not been changed.

In Vreuls and Zijlema (2013), the emission factor was taken from the 1996 IPCC Guidelines. The emission factor in the 2006 IPCC Guidelines is the same and therefore the emission factor has not been changed.

Other kerosene

In the previous version of the Netherlands' list of fuels (Vreuls and Zijlema, 2013), the heating value was a country specific value for the Netherlands (which is also used in the energy statistics). It is expected that the country specific value will match the Dutch situation better than the 2006 IPCC default heating value and therefore the heating value has not been changed.

In Vreuls and Zijlema (2013), the emission factor was taken from the 1996 IPCC Guidelines. The emission factor in the 2006 IPCC Guidelines is the same and therefore the emission factor has not been changed.

Shale oil

In the previous version of the Netherlands' list of fuels (Vreuls and Zijlema, 2013), the heating value was taken from the 1996 IPCC Guidelines. The heating value in the 2006 IPCC Guidelines differs from the heating value in the 1996 IPCC Guidelines and therefore the heating value has been updated to match the 2006 IPCC Guidelines for the whole time series.

In Vreuls and Zijlema (2013), the emission factor was taken from the 1996 IPCC Guidelines. The emission factor in the 2006 IPCC Guidelines is the same and therefore the emission factor has not been changed.

This fuel is not included in the energy statistics and therefore no country specific heating values and emission factors have been derived.

Gas/diesel oil

In the previous version of the Netherlands' list of fuels (Vreuls and Zijlema, 2013), the heating value was a country specific value for the Netherlands (which is also used in the energy statistics). It is expected that the country specific value will match the Dutch situation better than the 2006 IPCC default heating value and therefore the heating value has not been changed.

In Vreuls and Zijlema (2013), the emission factor was a country specific value for the Netherlands, derived in 2004 (Olivier, 2004). It is expected that the country specific value will match the Dutch situation better than the 2006 IPCC default emission factor and therefore the emission factor has not been changed.

Residual fuel oil

In the previous version of the Netherlands' list of fuels (Vreuls and Zijlema, 2013), the heating value was a country specific value for the Netherlands (which is also used in the energy statistics). It is expected that the country specific value will match the Dutch situation better than the 2006 IPCC default heating value and therefore the heating value has not been changed.

In Vreuls and Zijlema (2013), the emission factor was taken from the 1996 IPCC Guidelines. The emission factor in the 2006 IPCC Guidelines is the same and therefore the emission factor has not been changed.

Liquefied natural gas (LPG)

In the previous version of the Netherlands' list of fuels (Vreuls and Zijlema, 2013), the heating value was a country specific value for the Netherlands (which is also used in the energy statistics). It is expected that the country specific value will match the Dutch situation better than the 2006 IPCC default heating value and therefore the heating value has not been changed.

In Vreuls and Zijlema (2013), the emission factor was a country specific value for the Netherlands, derived in 2004 (Olivier, 2004). It is expected that the country specific value will match the Dutch situation better than the 2006 IPCC default emission factor and therefore the emission factor has not been changed.

Ethane

In the previous version of the Netherlands' list of fuels (Vreuls and Zijlema, 2013), the heating value was a country specific value for the Netherlands (which is also used in the energy statistics). It is expected that the country specific value will match the Dutch situation better than the 2006 IPCC default heating value and therefore the heating value has not been changed.

In Vreuls and Zijlema (2013), the emission factor was taken from the 1996 IPCC Guidelines. The emission factor in the 2006 IPCC Guidelines is the same and therefore the emission factor has not been changed.

Naphta

In the previous version of the Netherlands' list of fuels (Vreuls and Zijlema, 2013), the heating value was a country specific value for the Netherlands (which is also used in the energy statistics). It is expected that the country specific value will match the Dutch situation better than the 2006 IPCC default heating value and therefore the heating value has not been changed.

In Vreuls and Zijlema (2013), the emission factor was taken from the 1996 IPCC Guidelines. The emission factor in the 2006 IPCC Guidelines is the same and therefore the emission factor has not been changed.

Bitumen

In the previous version of the Netherlands' list of fuels (Vreuls and Zijlema, 2013), the heating value was a country specific value for the Netherlands (which is also used in the energy statistics). It is expected that the country specific value will match the Dutch situation better than the 2006 IPCC default heating value and therefore the heating value has not been changed.

In Vreuls and Zijlema (2013), the emission factor was taken from the 1996 IPCC Guidelines. The emission factor in the 2006 IPCC Guidelines is the same and therefore the emission factor has not been changed.

Lubricants

In the previous version of the Netherlands' list of fuels (Vreuls and Zijlema, 2013), the heating value was a country specific value for the Netherlands (which is also used in the energy statistics). It is expected that the country specific value will match the Dutch situation better than the 2006 IPCC default heating value and therefore the heating value has not been changed.

In Vreuls and Zijlema (2013), the emission factor was taken from the 1996 IPCC Guidelines. The emission factor in the 2006 IPCC Guidelines is the same and therefore the emission factor has not been changed.

Petroleum coke

In the previous version of the Netherlands' list of fuels (Vreuls and Zijlema, 2013), the heating value was a country specific value for the Netherlands (which is also used in the energy statistics). It is expected that the country specific value will match the Dutch situation better than the 2006 IPCC default heating value and therefore the heating value has not been changed.

In Vreuls and Zijlema (2013), the emission factor was taken from the 1996 IPCC Guidelines. The emission factor in the 2006 IPCC Guidelines differs from the emission factor in the 1996 IPCC Guidelines and therefore the emission factor has been updated to match the 2006 IPCC Guidelines for the whole time series.

Refinery feedstocks

In the previous version of the Netherlands' list of fuels (Vreuls and Zijlema, 2013), the heating value was taken from the 1996 IPCC Guidelines. The heating value in the 2006 IPCC Guidelines differs from the heating value in the 1996 IPCC Guidelines and therefore the heating value has been updated to match the 2006 IPCC Guidelines for the whole time series.

In Vreuls and Zijlema (2013), the emission factor was taken from the 1996 IPCC Guidelines. The emission factor in the 2006 IPCC Guidelines differs from the emission factor in the 1996 IPCC Guidelines and therefore the emission factor has been updated to match the 2006 IPCC Guidelines for the whole time series.

This fuel is not included in the energy statistics and therefore no country specific heating values and emission factors have been derived.

Refinery gas

In the previous version of the Netherlands' list of fuels (Vreuls and Zijlema, 2013), the heating value was a country specific value for the Netherlands (which is also used in the energy statistics). It is expected that the country specific value will match the Dutch situation better than the 2006 IPCC default heating value and therefore the heating value has not been changed.

In Vreuls and Zijlema (2013), the emission factor was taken from the 1996 IPCC Guidelines. In 2011, TNO investigated the emission factors reported by the refineries in the years 2007-2009 (Dröge and Coenen, 2011). Based on this research, the emission factor has been updated to match the reported emission factors from refineries for 2013 onwards.

Chemical waste gas

In the previous version of the Netherlands' list of fuels (Vreuls and Zijlema, 2013), the heating value was a country specific value for the Netherlands (which is also used in the energy statistics). It is expected that the country specific value will match the Dutch situation better than the 2006 IPCC default heating value and therefore the heating value has not been changed.

In Vreuls and Zijlema (2013), the emission factor was taken from the 1996 IPCC Guidelines (emission factor of refinery gas). In 2011, TNO investigated the emission factors reported by the chemical industry in the years 2007-2009 (Dröge and Coenen, 2011). Based on this research, the emission factor has been updated to match the reported emission factors from the chemical industry for 2013 onwards.

Other oil

In the previous version of the Netherlands' list of fuels (Vreuls and Zijlema, 2013), the emission factor was taken from the 1996 IPCC Guidelines. The emission factor in the 2006 IPCC Guidelines is the same and therefore the emission factor has not been changed.

In Vreuls and Zijlema (2013), the emission factor was from the 1996 IPCC Guidelines. The emission factor in the 2006 IPCC Guidelines is the same and therefore the emission factor has not been changed.

This fuel is not reported separately in the energy statistics and therefore no country specific heating values and emission factors have been derived.

Paraffin waxes

This fuel is new in the Netherlands' list of fuels. Within the energy statistics, this fuel is reported separately, and therefore it has been added to the list. The heating value is equal to the heating value in the energy statistics and the CO₂ emission factor is from the 2006 IPCC Guidelines for the whole time series.

White spirit and SBP

This fuel is new in the Netherlands' list of fuels. Within the energy statistics, this fuel is reported separately, and therefore it has been added to the list. The heating value is equal to the heating value in the energy statistics and the CO₂ emission factor is from the 2006 IPCC Guidelines for the whole time series.

Other petroleum products

This fuel is new in the Netherlands' list of fuels. Within the energy statistics, this fuel is reported separately, and therefore it has been added to the list. The heating value is equal to the heating value in the energy statistics and the CO₂ emission factor is from the 2006 IPCC Guidelines for the whole time series.

Anthracite

In the previous version of the Netherlands' list of fuels (Vreuls and Zijlema, 2013), the heating value was taken from the IPCC Good Practice Guidance. This differs from the heating value in the energy statistics and therefore the heating value has been updated to match the heating value in the energy statistics for the whole time series.

In Vreuls and Zijlema (2013), the emission factor was taken from the 1996 IPCC Guidelines. The emission factor in the 2006 IPCC Guidelines is the same and therefore the emission factor has not been changed.

Coking coal

In the previous version of the Netherlands' list of fuels (Vreuls and Zijlema, 2013), the heating value was a country specific value for the Netherlands. This differs from the heating value in the energy statistics and therefore the heating value has been updated to match the heating value in the energy statistics for the whole time series.

In Vreuls and Zijlema (2013), the emission factor was a country specific value for the Netherlands, derived in 2004 (weighted average for coking coal used in coke oven and in blast furnaces). It is expected that the country specific value will match the Dutch situation better than the 2006 IPCC default emission factor and therefore the emission factor has not been changed.

Coking coal (used in coke oven)

In the previous version of the Netherlands' list of fuels (Vreuls and Zijlema, 2013), the heating value was a country specific value for the Netherlands. This differs from the heating value in the energy statistics and therefore the heating value has been updated to match the heating value in the energy statistics for the whole time series.

In Vreuls and Zijlema (2013), the emission factor was a country specific value for the Netherlands, derived in 2004 (average emission factor from individual companies for coking coal used in coke ovens in the period 2000-2002). It is expected that the country specific value will match the Dutch situation better than the 2006 IPCC default emission factor and therefore the emission factor has not been changed.

Coking coal (used in blast furnaces)

In the previous version of the Netherlands' list of fuels (Vreuls and Zijlema, 2013), the heating value was a country specific value for the Netherlands. This differs from the heating value in the energy statistics and therefore the heating value has been updated to match the heating value in the energy statistics for the whole time series.

In Vreuls and Zijlema (2013), the emission factor was a country specific value for the Netherlands, derived in 2004 (average emission factor from individual companies for coking coal used in blast furnaces in the period 2000-2002).

It is expected that the country specific value will match the Dutch situation better than the 2006 IPCC default emission factor and therefore the emission factor has not been changed.

Other bituminous coal

In the previous version of the Netherlands' list of fuels (Vreuls and Zijlema, 2013), the heating value was a country specific value for the Netherlands. This differs from the heating value in the energy statistics and therefore the heating value has been updated to match the heating value in the energy statistics. The heating value varies yearly and will also be updated yearly with data from Statistics Netherlands (see link in the footnote of Table 1). The heating value is presented in Table 2. In Vreuls and Zijlema (2013), the emission factor was a country specific value for the Netherlands, derived in 2002 (van Harmelen and Koch, 2002). In 2011, TNO investigated the emission factors reported by the energy sector in the years 2007-2009 (Dröge and Coenen, 2011). The emission factor reported by the energy sector matches the old emission factor and therefore the emission factor has not been changed.

Table 2 Heating value of other bituminous coal*.

Year	Heating value (MJ/kg)
1995	26,1
1996	25,7
1997	24,5
1998	24,3
1999	24,9
2000	24,4
2001	24,5
2002	24,8
2003	25,0
2004	25,1
2005	25,1
2006	24,9
2007	24,7
2008	24,7
2009	24,8
2010	24,8
2011	24,6
2012	24,7
2013	25,0

* Heating value is annually updated. The heating value is calculated from the data available on <http://statline.cbs.nl/StatWeb/publication/?VW=T&DM=SLNL&PA=70846NED&D1=2,40&D2=9&D3=5&D4=a&HD=131212-1551&HDR=G2,G1,T&STB=G3>

Sub-bituminous coal

In the previous version of the Netherlands' list of fuels (Vreuls and Zijlema, 2013), the heating value was an average value from the IEA statistics. This heating value differs from the heating value in the 2006 IPCC Guidelines and both heating values are not country specific. Therefore the heating value has been updated to match the 2006 IPCC Guidelines for the whole time series.

In Vreuls and Zijlema (2013), the emission factor was taken from the 1996 IPCC Guidelines. The emission factor in the 2006 IPCC Guidelines is the same and therefore the emission factor has not been changed.

This fuel is not included in the energy statistics and therefore no country specific heating values and emission factors have been derived.

Lignite

In the previous version of the Netherlands' list of fuels (Vreuls and Zijlema, 2013), the heating value was taken from the 1996 IPCC Guidelines. This is equal to the heating value used in the energy statistics and therefore the heating value has not been changed.

In Vreuls and Zijlema (2013), the emission factor was taken from the 1996 IPCC Guidelines. The emission factor in the 2006 IPCC Guidelines differs from the emission factor on the 1996 IPCC Guidelines and therefore the emission factor has been updated to match the 2006 IPCC Guidelines for the whole time series.

Oil shale

In the previous version of the Netherlands' list of fuels (Vreuls and Zijlema, 2013), the heating value was taken from the 1996 IPCC Guidelines. The heating value in the 2006 IPCC Guidelines differs from the heating value in the 1996 IPCC Guidelines and therefore the heating value has been updated to match the 2006 IPCC Guidelines for the whole time series.

In Vreuls and Zijlema (2013), the emission factor was taken from the 1996 IPCC Guidelines. The emission factor in the 2006 IPCC Guidelines differs from the emission factor on the 1996 IPCC Guidelines and therefore the emission factor has been updated to match the 2006 IPCC Guidelines for the whole time series.

This fuel is not included in the energy statistics and therefore no country specific heating values and emission factors have been derived.

Peat

In the previous version of the Netherlands' list of fuels (Vreuls and Zijlema, 2013), the heating value was taken an average value from Eurostat. This heating value differs from the heating value in the 2006 IPCC Guidelines and both heating values are not country specific. Therefore the heating value has been updated to match the 2006 IPCC Guidelines for the whole time series.

In Vreuls and Zijlema (2013), the emission factor was taken from the 1996 IPCC Guidelines. The emission factor in the 2006 IPCC Guidelines is the same and therefore the emission factor has not been changed.

This fuel is not included in the energy statistics and therefore no country specific heating values and emission factors have been derived.

BKB & patent fuel

In the previous version of the Netherlands' list of fuels (Vreuls and Zijlema, 2013), the heating value was taken from the 1996 IPCC Guidelines. The heating value in the 2006 IPCC Guidelines differs from the heating value in the 1996 IPCC Guidelines and therefore the heating value has been updated to match the 2006 IPCC Guidelines for the whole time series.

In Vreuls and Zijlema (2013), the emission factor was taken from the 1996 IPCC Guidelines. The emission factor in the 2006 IPCC Guidelines differs from the emission factor on the 1996 IPCC Guidelines and therefore the emission factor has been updated to match the 2006 IPCC Guidelines for the whole time series.

This fuel is not reported separately in the energy statistics and therefore no country specific heating values and emission factors have been derived.

Coke oven/gas coke

In the previous version of the Netherlands' list of fuels (Vreuls and Zijlema, 2013), the heating value was taken from the 1996 IPCC Guidelines. This is equal to the heating value used in the energy statistics and therefore the heating value has not been changed.

In Vreuls and Zijlema (2013), the emission factor was taken from the 1996 IPCC Guidelines (emission factor of refinery gas). In 2011, TNO investigated the emission factors reported by the iron and steel industry in the years 2007-2009 (Dröge and Coenen, 2011). Based on this research, the emission factor has been updated to match the reported emission factors from the iron and steel industry for 2013 onwards.

Coke oven gas

In the previous version of the Netherlands' list of fuels (Vreuls and Zijlema, 2013), the heating value was expressed in MJ/MJ, since the amount of coke oven gas is not monitored in kg or m³. This is equal to the heating value used in the energy statistics and therefore the heating value has not been changed.

In Vreuls and Zijlema (2013), the emission factor was a country specific value for the Netherlands, derived in 2004 (average emission factor from individual companies for coke oven gas in the period 2000-2002). In 2011, TNO investigated the emission factors reported by the energy sector in the years 2007-2009 (Dröge and Coenen, 2011). Based on this research, the emission factor has been updated to match the reported emission factors from the chemical industry for 2013 onwards.

Blast furnace gas

In the previous version of the Netherlands' list of fuels (Vreuls and Zijlema, 2013), the heating value was expressed in MJ/MJ, since the amount of coke oven gas is not monitored in kg or m³. This is equal to the heating value used in the energy statistics and therefore the heating value has not been changed.

In Vreuls and Zijlema (2013), the emission factor was a country specific value for the Netherlands, derived in 2004 (average emission factor from individual companies for blast furnace gas in the period 2000-2002). It is expected that the country specific value will match the Dutch situation better than the 2006 IPCC default emission factor and therefore the emission factor has not been changed.

Oxy gas

In the previous version of the Netherlands' list of fuels (Vreuls and Zijlema, 2013), the heating value was expressed in MJ/MJ, since the amount of coke oven gas is not monitored in kg or m³. This is equal to the heating value used in the energy statistics and therefore the heating value has not been changed.

In Vreuls and Zijlema (2013), the emission factor was a country specific value for the Netherlands, derived in 2004 (average emission factor from individual companies for oxy gas in the period 2000-2002). It is expected that the country specific value will match the Dutch situation better than the 2006 IPCC default emission factor and therefore the emission factor has not been changed.

Fosfor gas

In the previous version of the Netherlands' list of fuels (Vreuls and Zijlema, 2013), the heating value was a country specific value for the Netherlands.

In 2011, TNO investigated the emission factors reported by the individual companies in the years 2007-2009 (Dröge and Coenen, 2011). Based on this research, the heating value has been updated to match the reported emission factors from the individual companies for 2013 onwards.

In Vreuls and Zijlema (2013), the emission factor was a country specific value for the Netherlands, derived in (average emission factor from individual companies for fosfor gas in the period 2000-2002). In 2011, TNO investigated the emission factors reported by the individual companies in the years 2007-2009 (Dröge and Coenen, 2011). Based on this research, the emission factor has been updated to match the reported emission factors from the chemical industry for 2013 onwards.

Coal tar

This fuel is new in the Netherlands' list of fuels. Within the energy statistics, this fuel is reported separately, and therefore it has been added to the list. The heating value is equal to the heating value in the energy statistics and the CO₂ emission factor is from the 2006 IPCC Guidelines for the whole time series.

Natural gas (dry)

In the previous version of the Netherlands' list of fuels (Vreuls and Zijlema, 2013), the heating value was a country specific value for the Netherlands (which is also used in the energy statistics). It is expected that the country specific value will match the Dutch situation better than the 2006 IPCC default heating value and therefore the heating value has not been changed.

In Vreuls and Zijlema (2013), the emission factor was a country specific value for the Netherlands, derived in 2012 (Zijlema, 2012). Since 2006 the emission factor is updated yearly. The emission factor for 2012 and 2013 (calculated in Zijlema, 2012) are the same.

Compressed natural gas (CNG)

This fuel is new in the Netherlands' list of fuels. Within the energy statistics, this fuel is reported separately, and therefore it has been added to the list. The heating value is equal to the heating value in the energy statistics and the CO₂ emission factor is equal to the CO₂ emission factor of natural gas.

Liquefied natural gas (LNG)

This fuel is new in the Netherlands' list of fuels. Within the energy statistics, this fuel is reported separately, and therefore it has been added to the list. The heating value is equal to the heating value in the energy statistics and the CO₂ emission factor is equal to the CO₂ emission factor of natural gas.

Carbon monoxide

In the previous version of the Netherlands' list of fuels (Vreuls and Zijlema, 2013), the heating value was a country specific value for the Netherlands (which is also used in the energy statistics). It is expected that the country specific value will match the Dutch situation better than the 2006 IPCC default heating value and therefore the heating value has not been changed.

In Vreuls and Zijlema (2013), the emission factor was taken from the EU directive 2004/156/EC, table 4. The 2006 IPCC Guidelines do not provide an emission factor for this fuel and therefore the heating value has not been updated.

Methane

In the previous version of the Netherlands' list of fuels (Vreuls and Zijlema, 2013), the heating value was a country specific value for the Netherlands (which is also used in the energy statistics). It is expected that the country specific value will match the Dutch situation better than the 2006 IPCC default heating value and therefore the heating value has not been changed.

In Vreuls and Zijlema (2013), the emission factor was taken from the EU directive 2004/156/EC, table 4. The 2006 IPCC Guidelines do not provide an emission factor for this fuel and therefore the heating value has not been updated.

Hydrogen

In the previous version of the Netherlands' list of fuels (Vreuls and Zijlema, 2013), the heating value was a country specific value for the Netherlands (which is also used in the energy statistics). It is expected that the country specific value will match the Dutch situation better than the 2006 IPCC default heating value and therefore the heating value has not been changed.

In Vreuls and Zijlema (2013), the emission factor was taken from the EU directive 2004/156/EC, table 4. The 2006 IPCC Guidelines do not provide an emission factor for this fuel and therefore the heating value has not been updated.

Solid biomass

In the previous version of the Netherlands' list of fuels (Vreuls and Zijlema, 2013), the heating value was a country specific value for the Netherlands (which is also used in the energy statistics). It is expected that the country specific value will match the Dutch situation better than the 2006 IPCC default heating value and therefore the heating value has not been changed.

In Vreuls and Zijlema (2013), the emission factor was taken from the 1996 IPCC Guidelines. The emission factor in the 2006 IPCC Guidelines has been differentiated for several types of biomass (wood/wood waste, sulphite lyes, other primary solid biomass and charcoal). The energy statistics do not contain detailed information about the several types of biomass and it is therefore not possible to use the individual emission factors from the 2006 IPCC Guidelines. The emission factor from the 1996 IPCC Guidelines is an averaged value of several emission factors of the IPCC 2006 Guidelines. Since the energy statistics do not contain detailed information about the several types of biomass, it is preferred to use the general emission factor from the 1996 IPCC Guidelines for the whole time series.

Charcoal

This fuel is new in the Netherlands' list of fuels. Within the energy statistics, this fuel is reported separately, and therefore it has been added to the list. The heating value is equal to the heating value in the energy statistics and the CO₂ emission factor is from the 2006 IPCC Guidelines for the whole time series.

Liquid biomass

This fuel has been split up in several types of fuels in the 2006 IPCC Guidelines (biogasoline, biodiesel and other liquid biofuels). It has been decided to include the new fuels in the Netherlands' list of fuels and to remove this fuel.

Biogasoline

This fuel is new in the Netherlands' list of fuels. Within the energy statistics, this fuel is reported separately, and therefore it has been added to the list. The heating value is equal to the heating value in the energy statistics and the CO2 emission factor is equal to the CO2 emission factor of gasoline for the whole time series.

Biodiesel

This fuel is new in the Netherlands' list of fuels. Within the energy statistics, this fuel is reported separately, and therefore it has been added to the list. The heating value is equal to the heating value in the energy statistics and the CO2 emission factor is equal to the CO2 emission factor of diesel for the whole time series.

Other liquid biofuels

This fuel is new in the Netherlands' list of fuels. Within the energy statistics, this fuel is reported separately, and therefore it has been added to the list. The heating value is equal to the heating value in the energy statistics and the CO2 emission factor is from the 2006 IPCC Guidelines for the whole time series.

Gas biomass

In the previous version of the Netherlands' list of fuels (Vreuls and Zijlema, 2013), the heating value was a country specific value for the Netherlands (which is also used in the energy statistics). It is expected that the country specific value will match the Dutch situation better than the 2006 IPCC default heating value and therefore the heating value has not been changed.

In Vreuls and Zijlema (2013), the emission factor was a country specific value for the Netherlands. It is expected that the country specific value will match the Dutch situation better than the 2006 IPCC default emission factor and therefore the emission factor has not been changed.

Wastewater biogas

In the previous version of the Netherlands' list of fuels (Vreuls and Zijlema, 2013), the heating value was a country specific value for the Netherlands (which is also used in the energy statistics). It is expected that the country specific value will match the Dutch situation better than the 2006 IPCC default heating value and therefore the heating value has not been changed.

In Vreuls and Zijlema (2013), the emission factor was a country specific value for the Netherlands. It is expected that the country specific value will match the Dutch situation better than the 2006 IPCC default emission factor and therefore the emission factor has not been changed.

Landfill gas

In the previous version of the Netherlands' list of fuels (Vreuls and Zijlema, 2013), the heating value was a country specific value for the Netherlands (which is also used in the energy statistics). It is expected that the country specific value will match the Dutch situation better than the 2006 IPCC default heating value and therefore the heating value has not been changed.

In Vreuls and Zijlema (2013), the emission factor was a country specific value for the Netherlands. It is expected that the country specific value will match the Dutch situation better than the 2006 IPCC default emission factor and therefore the emission factor has not been changed.

Industrial organic waste gas

In the previous version of the Netherlands' list of fuels (Vreuls and Zijlema, 2013), the heating value was a country specific value for the Netherlands (which is also used in the energy statistics). It is expected that the country specific value will match the Dutch situation better than the 2006 IPCC default heating value and therefore the heating value has not been changed.

In Vreuls and Zijlema (2013), the emission factor was a country specific value for the Netherlands. It is expected that the country specific value will match the Dutch situation better than the 2006 IPCC default emission factor and therefore the emission factor has not been changed.

Waste

In the previous version of the Netherlands' list of fuels (Vreuls and Zijlema, 2013), the heating value was a country specific value for the Netherlands (which is also used in the energy statistics). The heating value is updated yearly and for 2013 it is slightly higher than the one used for 2012.

In Vreuls and Zijlema (2013), the emission factor is a country specific value for the Netherlands, derived in 2012 (based on data from the individual waste incinerators in 2011). The emission factor is updated yearly and the emission factor for 2013 is equal to the emission factor for 2012.

4 Conclusion

Because of the introduction of the 2006 IPCC Guidelines (which hold revised default emission factors and heating values) an update of the Netherlands' list is needed. This update will be used for the CO₂ emission calculations as of the 2015 submission.

The newly derived heating values and emission factors will be used for the years 2013, 2014 and 2015. It will be used for:

- Reporting the CO₂ emissions from combustion processes in the NIR
- Reporting the CO₂ emissions from combustion processes by individual companies in their environmental report
- Reporting the CO₂ emissions from combustion processes by ETS companies for their ETS emission report, if the companies are allowed to report (part of) their emissions according to a Tier 2 methodology.

For ETS, it is important that the default heating value and CO₂ emission factor are available before the year starts. Therefore, the Netherlands' list of fuels contains the heating values and the emission factors for 2013, 2014 and 2015.

The heating value and emission factor for waste in 2014 and 2015 will be a preliminary value, which could be used by companies in the environmental report and their emissions trading scheme. Since the waste incinerators in the Netherlands use company specific data for calculating the emissions, the preliminary values will probably not be used. The preliminary values will be replaced by a definite value in December 2015 and December 2016 respectively.

The heating values and emission factors in 2013, 2014 and 2015 are presented in Table 3. Heating values and emission factors for other years will be presented in the updated version of the Netherlands' list of fuels (expected in February 2015).

Table 3 Updated heating values and emission factors for the years 2013, 2014 and 2015.

Main group (Dutch language)	Main group (English) IPCC (supplemented)	Unit	Heating value (MJ/unit)				CO ₂ EF (kg/GJ)			
			2013	2014	2015	Ref	2013	2014	2015	Ref
A. Liquid Fossil, Primary Fuels										
Ruwe aardolie	Crude oil	kg	42,7	42,7	42,7	CS	73,3	73,3	73,3	IPCC
Orimulsion	Orimulsion	kg	27,5	27,5	27,5	IPCC	77,0	77,0	77,0	IPCC
Aardgascondensaat	Natural Gas Liquids	kg	44,0	44,0	44,0	CS	64,2	64,2	64,2	IPCC
Fossiele additieven	Fossil fuel additives	kg	44,0	44,0	44,0	CS	73,3	73,3	73,3	IPCC
Liquid Fossil, Secondary Fuels/ Products										
Motorbenzine	Gasoline	kg	44,0	44,0	44,0	CS	72,0	72,0	72,0	CS
Vliegtuigbenzine	Aviation gasoline	kg	44,0	44,0	44,0	CS	72,0	72,0	72,0	CS
Kerosine luchtvaart	Jet Kerosene	kg	43,5	43,5	43,5	CS	71,5	71,5	71,5	IPCC
Petroleum	Other kerosene	kg	43,1	43,1	43,1	CS	71,9	71,9	71,9	IPCC
Leisteenolie	Shale oil	kg	38,1	38,1	38,1	IPCC	73,3	73,3	73,3	IPCC
Gas-/dieselolie	Gas/Diesel oil	kg	42,7	42,7	42,7	CS	74,3	74,3	74,3	CS

Zware stookolie	Residual Fuel oil	kg	41,0	41,0	41,0	CS	77,4	77,4	77,4	IPCC
LPG	Liquefied Petroleum Gas (LPG)	kg	45,2	45,2	45,2	CS	66,7	66,7	66,7	CS
Ethaan	Ethane	kg	45,2	45,2	45,2	CS	61,6	61,6	61,6	IPCC
Nafta's	Naphta	kg	44,0	44,0	44,0	CS	73,3	73,3	73,3	IPCC
Bitumen	Bitumen	kg	41,9	41,9	41,9	CS	80,7	80,7	80,7	IPCC
Smeeroliën	Lubricants	kg	41,4	41,4	41,4	CS	73,3	73,3	73,3	IPCC
Petroleumcokes	Petroleum Coke	kg	35,2	35,2	35,2	CS	97,5	97,5	97,5	IPCC
Raffinaderij grondstoffen	Refinery Feedstocks	kg	43,0	43,0	43,0	IPCC	73,3	73,3	73,3	IPCC
Raffinaderijgas	Refinery Gas	kg	45,2	45,2	45,2	CS	67,0	67,0	67,0	CS
Chemisch restgas	Chemical Waste Gas	kg	45,2	45,2	45,2	CS	62,4	62,4	62,4	CS
Overige oliën	Other oil	kg	40,2	40,2	40,2	IPCC	73,3	73,3	73,3	IPCC
Paraffine	Paraffin Waxes	kg	42,7	42,7	42,7	CS	73,3	73,3	73,3	IPCC
Terpentine	White Spirit and SBP	kg	43,6	43,6	43,6	CS	73,3	73,3	73,3	IPCC
Overige aardolie producten	Other Petroleum Products	kg	42,7	42,7	42,7	CS	73,3	73,3	73,3	IPCC
B. Solid Fossil, Primary Fuels										
Antraciet	Anthracite	kg	29,3	29,3	29,3	CS	98,3	98,3	98,3	IPCC
Cokeskolen	Coking Coal	kg	28,6	28,6	28,6	CS	94,0	94,0	94,0	CS
Cokeskolen	Coking Coal (used in coke oven)	kg	28,6	28,6	28,6	CS	95,4	95,4	95,4	CS
Cokeskolen	Coking Coal (used in blast furnaces)	kg	28,6	28,6	28,6	CS	89,8	89,8	89,8	CS
Overige bitumineuze steenkool	Other Bituminous Coal	kg	25,0	25,0 ¹⁾	25,0 ¹⁾	CS	94,7	94,7	94,7	CS
Sub-bitumineuze kool	Sub-Bituminous Coal	kg	18,9	18,9	18,9	IPCC	96,1	96,1	96,1	IPCC
Bruinkool	Lignite	kg	20,0	20,0	20,0	CS	101,0	101,0	101,0	IPCC
Bitumineuze Leisteen	Oil Shale	kg	8,9	8,9	8,9	IPCC	107,0	107,0	107,0	IPCC
Turf	Peat	kg	9,76	9,76	9,76	IPCC	106,0	106,0	106,0	IPCC
Solid Fossil, Secondary Fuels										
Steenkool- en bruinkoolbriketten	BKB & Patent Fuel	kg	20,7	20,7	20,7	IPCC	97,5	97,5	97,5	IPCC
Cokesoven/ gascokes	Coke Oven/Gas Coke	kg	28,5	28,5	28,5	CS	106,8	106,8	106,8	CS
Cokesovengas	Coke Oven gas	MJ	1,0	1,0	1,0	CS	42,8	42,8	42,8	CS
Hoogovengas	Blast Furnace Gas	MJ	1,0	1,0	1,0	CS	247,4	247,4	247,4	CS
Oxystaalovengas	Oxy Gas	MJ	1,0	1,0	1,0	CS	191,9	191,9	191,9	CS
Fosforovengas	Fosfor Gas	Nm3	11,0	11,0	11,0	CS	143,9	143,9	143,9	CS
Steenkool bitumen	Coal tar	kg	41,9	41,9	41,9	CS	80,7	80,7	80,7	IPCC
C. Gaseous Fossil Fuels										
Aardgas	Natural Gas (dry)	Nm3 ae	31,65	31,65	31,65	CS	56,5	56,4	56,5	CS
Compressed natural gas (CNG)	Compressed natural gas (CNG)	Nm3 ae	31,65	31,65	31,65	CS	56,5	56,5	56,5	CS
Liquified natural gas (LNG)	Liquified natural gas (LNG)	Nm3 ae	31,65	31,65	31,65	CS	56,5	56,5	56,5	CS
Koolmonoxide	Carbon Monoxide	Nm3	12,6	12,6	12,6	CS	155,2	155,2	155,2	CS
Methaan	Methane	Nm3	35,9	35,9	35,9	CS	54,9	54,9	54,9	CS
Waterstof	Hydrogen	Nm3	10,8	10,8	10,8	CS	0	0	0	CS
Biomass										

Biomassa vast	Solid Biomass	kg	15,1	15,1	15,1	CS	109,6	109,6	109,6	IPCC
Houtskool	Charcoal	kg	30,0	30,0	30,0	CS	112,0	112,0	112,0	IPCC
Biobenzine	Biogasoline	kg	27,0	27,0	27,0	CS	72,0	72,0	72,0	CS
Biodiesel	Biodiesels	kg	37,0	37,0	37,0	CS	74,3	74,3	74,3	CS
Overige vloeibare biobrandstoffen	Other liquid biofuels	kg	36,0	36,0	36,0	CS	79,6	79,6	79,6	IPCC
Biomassa gasvormig	Gas Biomass	Nm3	21,8	21,8	21,8	CS	90,8	90,8	90,8	CS
RWZI biogas	Wastewater biogas	Nm3	23,3	23,3	23,3	CS	84,2	84,2	84,2	CS
Stortgas	Landfill gas	Nm3	19,5	19,5	19,5	CS	100,7	100,7	100,7	CS
Industrieel fermentatiegas	Industrial organic waste gas	Nm3	23,3	23,3	23,3	CS	84,2	84,2	84,2	CS
D Other fuels										
Afval	Waste	Kg	9,8	9,8 ²⁾	9,8 ²⁾	CS	106,2	106,2 ²⁾	106,2 ²⁾	CS

- 1) The heating value for other bituminous coal in 2014 and 2015 are preliminary values (equal to 2013). The values for 2014 and 2015 will be updated in 2015 and 2016 as soon as new data is available for this fuel.
- 2) The heating values and emission factors for waste in 2014 and 2015 are preliminary values (equal to 2013). The values for 2014 and 2015 will be updated in 2015 and 2016 as soon as new data is available for this fuel.

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