

Country	Natural gas (dry)	
	CO ₂ emission factor [tCO ₂ /TJ]	Source
IPCC default	56.1	
Austria	IPCC	CRF 2003
Belgium	IPCC	CRF 2003
Denmark	57.3	CRF 2003
Finland	IPCC	CRF 2003
France	IPCC	CRF 2003 + CRF 2002
Germany	56.0	CRF 2003
Greece	IPCC	CRF 2003
Ireland	54.9	CRF 2003
Italy	55.8	CRF 2003
Netherlands	IPCC	CRF 2003
Portugal	IPCC	CRF 2003
Spain	56.6	CRF 2003
Sweden	56.5	CRF 2003
UK	58.3	CRF 2003
EU-14 average	56.3	
EU average only CS	56.5	
Diff. EU-14 average to IPCC default	0.3%	
Diff. CS average to IPCC default	0.7%	
Czech Republic	IPCC	CRF 2002
Estonia	IPCC	CRF 2002
Hungary	IPCC	CRF 2002
Latvia	63.1	CRF 2002
Poland	55.0	CRF 2003
Romania	IPCC	CRF 2003
Slovakia	58.9	CRF 2002
Slovenia	55.0	NIR 2003
average incl. accession countries	56.6	

Notes: IPCC = IPCC default EF used in CRF reference approach table 1.A.(b), NO = not occurring, IE = included elsewhere, NA = not applicable, blank = no value reported

The comparison shows that the average country-specific emission factor does not deviate much from the IPCC default EF, but that there occur considerable differences between countries. Some accession countries (Latvia and Slovakia) report high emission factors and the reported emission factors range from 54.9 to 63.1 t CO₂/TJ (13 % difference). However, small variations of the emission factors for natural gas can still have a large impact on CO₂ emissions as natural gas accounts for large quantities of emissions from energy and industry sector in some countries.

Gas qualities also vary depending the provenience. E.g. in Germany variations occur for gas from the North Sea, the Netherlands or Russia. For inventory purposes, most countries do not seem to distinguish different types of gas or gas provenience but base estimated on a country-specific average value, even if it is known that different gas types are used and they also use a standard Net Calorific Value.

In the past, it was often sufficient to request information on gas composition and

3.2 Solid fuels

Eight from 14 EU MS report at least some country-specific EF for certain solid fuel types. Table 2 shows the CO₂ emission factors reported by Parties in the CRF reference approach table and the NIR..

Table 2 Comparison of IPCC default CO₂ emission factors and country specific emission factors for solid fuels for Europe [t CO₂/TJ, basis NCV]

Country	CO ₂ emission factor [tCO ₂ /TJ]											Source
	Primary fuels				Sec. Fuels/ Products							
	Anthracite	Coking Coal	Other Bit. Coal	Sub-bit. Coal	Lignite	Oil Shale	Peat	BKB & Patent Fuel	Coke Oven / Gas Coke	coke oven gas	blast furnace gas	
IPCC default	98.3	94.6	94.6	96.1	101.2	106.7	106.0	94.6	108.2	47.7	242.0	
Austria	IE	IPCC	IPCC		IPCC	NO	IPCC	IPCC	IPCC			CRF 2003
Belgium		IPCC	IPCC	IPCC	IPCC			IPCC				CRF 2003
Denmark	NO	NO	95.0	NO	IPCC	NO	NO	NO	IPCC			CRF 2003
Finland			IPCC	NO	NO	NO	IPCC	IPCC	IPCC	40.5		CRF + NIR 2003
France	IE	IPCC	IPCC	NO	IPCC	NO	NO	IPCC	IPCC			CRF 2003 + 2002
Germany	IE	87.6	86.7	NO	111.1	NO	IE	93.3	108.3	44.0		CRF 2003, UBA 2003
Greece		IPCC	IPCC		124.7							CRF 2003
Ireland			IPCC				108.4	98.9				CRF 2003
Italy	NO	IPCC	97.5	94.6	IPCC	NO	NO	NO	IPCC			CRF 2003
Netherlands			96.7					94.0	103.0	44.0	200.0	CRF 2003
Portugal			IPCC					IPCC				CRF 2003
Spain	IE	96.4	99.8	99.6	117.4	NO		NO	106.5			CRF 2003
Sweden	NO	90.7	NO	NO	90.7	NO	107.0	NO	103.0			CRF 2003
UK	98.7	89.6	IPCC					111.6	106.2			CRF 2003
EU-14 average	98.7	93.0	94.8	96.7	105.5	NO	106.8	97.0	106.8			
EU average only CS	98.7	91.1	95.1	97.1	111.0		107.7	99.4	105.4	42.8		
Diff. EU-14 average to IPCC default	0.4%	-1.7%	0.2%	0.7%	4.3%		0.8%	2.6%	-1.3%			
Diff. CS average to IPCC default	0.4%	-3.7%	0.6%	1.0%	9.7%		1.7%	5.1%	-2.6%			
Czech Republic		IPCC	IPCC		IPCC				IPCC			CRF 2002
Estonia	IPCC					106.7	IPCC	IPCC	IPCC			CRF 2002
Hungary		IPCC	IPCC	IPCC	IPCC				IPCC			CRF 2002
Latvia			IPCC				IPCC		IPCC			CRF 2002
Poland		89.9	95.2		111.2				111.6			CRF 2003
Romania		IPCC	IPCC	IPCC	IPCC				IPCC			CRF 2003
Slovakia		94.8	93.8		100.4				106.8			CRF 2002
Slovenia	96.3		92.7	99.2	99.2				106.0			NIR 2003
Average incl. access. countries	97.7	93.3	94.6	96.9	104.3	106.7	106.6	96.5	107.4			

Notes: IPCC = IPCC default EF used in CRF reference approach table 1.A.(b), NO = not occurring, IE = included elsewhere, NA = not applicable, blank = no value reported
 Fuel categories based on IPCC nomenclature, national energy balances may assign coke oven gas and blast furnace gas to gaseous fuels.

Lignite is the solid fuel where the country-specific EF in the EU vary most widely from 90.7 t CO₂/TJ to 124.7 t C/TJ (27% difference) and where the difference between country-specific emission factors and IPCC default is considerable (about 10 %).

For **BKB and patent fuel**, the average country-specific EF from the reporting

Table 1 Comparison of IPCC default CO₂ emission factors and country specific emission factors for liquid fuels for Europe [t CO₂/TJ, basis NCV]

Country	CO ₂ emission factor [tCO ₂ /TJ]																	
	Primary fuels			Secondary Fuels / Products														
	Crude Oil	Orimulsion	Natural Gas Liquids	Gasoline	Jet Kerosene	Other Kerosene	Shale Oil	Gas / Diesel Oil	Residual Fuel Oil	LPG	Ethane	Naphtha	Bitumen	Lubricants	Petroleum Coke	Refinery Feed-stocks	refinery gas	Other oil
IPCC default	73.3	80.7	63.1	69.3	71.5	71.9	73.3	74.1	77.4	63.1	61.6	73.3	80.7	73.3	100.8	73.3	66.7	73.3
Austria	IPCC	NO	IPCC	IPCC	IPCC	IPCC	NO	IPCC	IPCC	IPCC	IE	IE	IPCC	IPCC	IE	IPCC	IPCC	IPCC
Belgium	IPCC	NO	IPCC	IPCC	IPCC	IPCC	NO	IPCC	IPCC	IPCC	IPCC	IPCC	IPCC	IPCC	IPCC	IPCC	IPCC	IPCC
Denmark	IPCC	80.0	NO	IPCC	72.0	NO	NO	74.0	78.0	65.0	NO	IPCC	IPCC	IPCC	92.0	IPCC	57.1	NO
Finland	IPCC	NO	IPCC	72.7	IPCC	71.5	NO	73.6	IPCC	IPCC	IE	72.7	IPCC	IPCC	IPCC	IPCC	65.0	IPCC
France	IPCC	NO	IPCC	IPCC	IPCC	IPCC	NO	IPCC	IPCC	IPCC	NO	74.4	IPCC	IPCC	IPCC	IPCC	IPCC	IPCC
Germany	73.4	NO	NA	74.7	74.8	IE	NO	74.5	78.8	63.8	NO	74.4	IPCC	IPCC	119.0	NA	60.0	IPCC
Greece	IPCC	IPCC	IPCC	IPCC	IPCC	IPCC	IPCC	IPCC	IPCC	IPCC	IPCC	IPCC	IPCC	IPCC	IPCC	IPCC	IPCC	IPCC
Ireland	IPCC	IPCC	65.0	72.6	IPCC	71.4	73.3	76.0	63.7	IPCC	IPCC	IPCC	IPCC	IPCC	IPCC	IPCC	IPCC	IPCC
Italy	IPCC	IPCC	NO	IPCC	IPCC	71.5	NO	IPCC	77.6	65.6	NA	IPCC	NA	NA	IPCC	IPCC	65.0	IPCC
Netherlands	73.0	IPCC	66.0	73.0	73.0	73.0	73.0	73.0	77.0	66.0	IPCC	IPCC	IPCC	IPCC	IPCC	IPCC	85.3	IPCC
Portugal	IPCC	IPCC	IPCC	IPCC	IPCC	IPCC	IPCC	IPCC	IPCC	IPCC	IPCC	IPCC	IPCC	IPCC	IPCC	IPCC	46.0	IPCC
Spain	IPCC	NO	NO	72.0	73.7	73.7	NO	73.6	76.7	66.2	IE	72.4	IPCC	IPCC	97.5	IPCC	IPCC	IPCC
Sweden	77.0	NO	NO	72.6	73.1	NO	NO	73.6	76.2	65.1	NO	72.6	103.0	NO	103.0	75.3	75.3	IPCC
UK	IPCC	78.4	IPCC	70.9	72.5	72.5	73.6	76.7	65.0	IPCC	IPCC	IPCC	IPCC	IPCC	IPCC	IPCC	IPCC	IPCC
EU-14 average	73.6	79.9	63.8	71.0	72.2	72.1	73.9	77.2	64.2	61.6	73.2	82.2	73.3	99.7	73.5	73.5	74.5	74.5
EU average only CS	74.5	79.2	66.0	72.6	73.2	72.3	73.9	77.1	65.0	IPCC	73.0	90.0	73.0	73.0	98.3	75.3	58.6	77.8
Diff. EU-14 average to IPCC default	0.3%	-0.9%	1.1%	2.4%	1.0%	0.3%	-0.2%	-0.2%	-0.2%	1.8%	-0.2%	1.9%	0.0%	-1.2%	0.3%	1.5%	-12.2%	6.1%
Diff. CS average to IPCC default	1.6%	-1.8%	4.7%	4.8%	2.3%	0.6%	-0.3%	-0.3%	-0.3%	3.1%	-0.4%	11.6%	-2.6%	-2.6%	-2.6%	-12.2%	6.1%	6.1%
IPCC default																		
Czech Republic	IPCC		IPCC	IPCC	IPCC	IPCC	IPCC	IPCC	IPCC	IPCC	IPCC	74.1	IPCC	IPCC			IPCC	IPCC
Estonia			IPCC	IPCC	IPCC	IPCC	IPCC	IPCC	IPCC	IPCC							IPCC	IPCC
Hungary	IPCC		IPCC	IPCC	IPCC												IPCC	IPCC
Latvia				IPCC	IPCC	IPCC											IPCC	IPCC
Poland				IPCC	IPCC	IPCC												
Romania				IPCC	IPCC	IPCC												
Slovakia	IPCC		IPCC	IPCC	IPCC	IPCC											IPCC	IPCC
Slovenia	75.1			72.3	73.4												IPCC	IPCC
Average incl. access. countries	74.1		63.6	70.5	71.8	72.0	71.4	73.9	77.2	64.0	61.6	73.3	81.8	73.3	98.3	73.9	74.4	74.4

Notes: IPCC = IPCC default EF used in CRF reference approach table 1.A.(b), NO = not occurring, IE = included elsewhere, NA = not applicable, blank = no value reported

Fuel categories shaded in grey: relevant in industry and energy sector in European countries, fuel categories highlighted in green: relevant in refineries
Emission factors highlighted in yellow: difference of more than 5% to IPCC default