

Annex 1: Greenhouse gas emission indicators for the EU Member States and the EU as a whole

This annex presents indicators for each EU Member State following the general outline of the analysis of EU GHG trends including: distance-to-target indicators, main driving force indicators, sectoral GHG indicators, and sectoral driving force indicators.

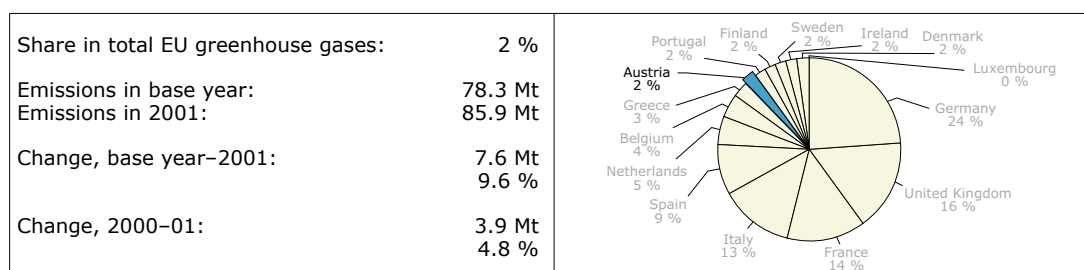
For each Member State, five pages are presented with the following uniform structure:

- description of the main trends of the indicators;
- presentation of the three main figures (total emissions compared with targets, GHG emissions by gas and sector, main driving forces of CO₂ emissions from fossil fuels);
- presentation of the main indicators.

Finally, indicators for the EU as a whole referred to in Chapters 2 and 3 are presented including distance-to-target indicators, main driving force indicators, sectoral GHG indicators and sectoral driving force indicators.

Note: The progress of the Member States towards their Kyoto target is analysed by calculating the distance-to-target indicator. This indicator measures the deviation of actual emissions in 2000 from the (hypothetical) linear target path between 1990 and 2010. This analysis assumes that the Member States meet their target entirely on the basis of domestic measures. See Section 1.2 for an explanation of the DTI.

Austria



Distance-to-target indicator (DTI):

Austria's GHG emissions increased sharply in 2001, compared with 2000. The main reason for this increase was cold weather and low hydro-power production and increases in transport. In 2001, total GHG emissions were 86 Mt (CO₂ equivalents), which was 10 % above the base-year level. In the burden sharing agreement under the Kyoto Protocol, Austria agreed to reduce its GHG emissions by 13 % by 2008–12, from the base-year level. Assuming a linear target path from 1990 to 2010, Austrian GHG emissions were 16.8 index points above this target path in 2001 (Figure A.1).

Greenhouse gas emission trends: CO₂ emissions account for 80 % of total GHG emissions. They increased by 7 % compared with 2000 and were 15 % above 1990 levels in 2001. In 2001, CO₂ emissions increased mainly because of increases in energy industries (partly due to lower hydro-power production), but also transport and households and services. Over the period 1990–2001, the main reason for CO₂ emission increases is growing transport demand. Emissions of CO₂ from transport increased by 48 %, but also emissions from other fuel combustion related sources were above 1990 levels in 2001.

Emissions of CH₄ account for 11 % of total Austrian GHG emissions and decreased by 15 % between 1990 and 2001. Also in 2001, emissions decreased compared with 2000. The main reasons for declining CH₄ emissions were the reductions in solid waste disposal on land, CH₄ recovery from landfills and falling cattle population.

Emissions of N₂O are responsible for 7 % of total GHG emissions and increased by 3 %. The main reason for N₂O emission increases was the introduction of the catalytic converter, whereas emissions were reduced from agricultural soil and from nitric acid production.

Fluorinated gas emissions account for 2 % of total GHG emissions and were at 1995 levels in 2001. Fluorinated gas emissions show opposing trends: HFC emissions increased by 89 % between 1995 and 2001, mainly due to the replacement of ozone depleting substances such as chlorofluorocarbons with HFCs. PFC emissions increased by 61 %. Emissions of SF₆ were reduced by 42 % between 1995 and 2001 mainly in the metal industry.

Transport is the largest sector accounting for 23 % of total Austrian GHG emissions. With a 49 % increase it is also the fastest growing sector in Austria. This is mainly due to fast growing road transport, but partly also to fuel tourism thanks to low petrol and diesel prices.

Industry (processes) is the second largest sector accounting for 18 % of total Austrian GHG emissions. Emissions decreased by 1 % mainly due to a decline of cement production. Note that this sector also includes fuel combustion-related CO₂ emissions from iron and steel and from cement production.

Other (energy) is the third largest sector accounting for 18 % of total Austrian GHG emissions. This sector includes mainly emissions from households and

Figure A.1 Austrian greenhouse gas emissions compared with Kyoto target for 2008–12 (excluding LUCF)

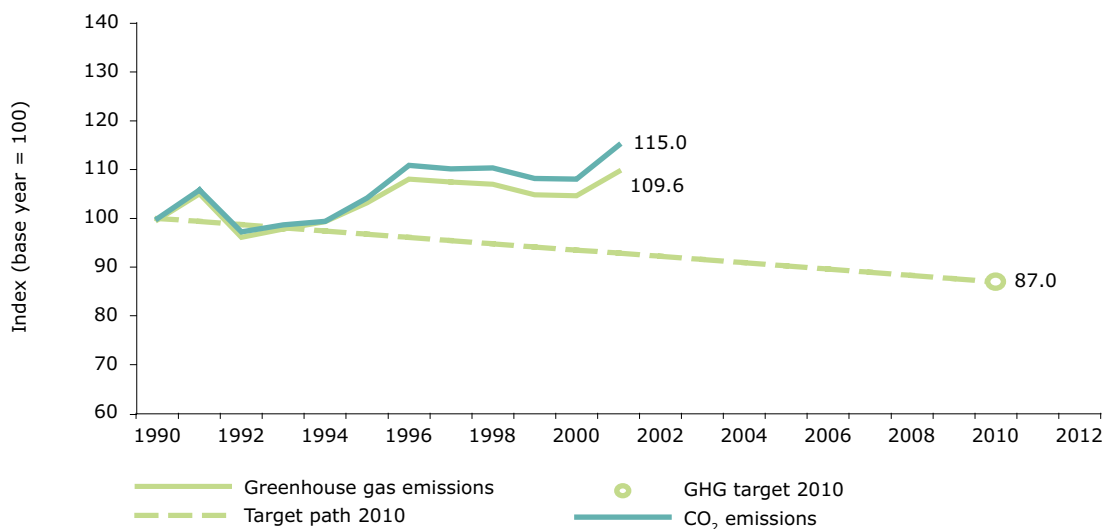
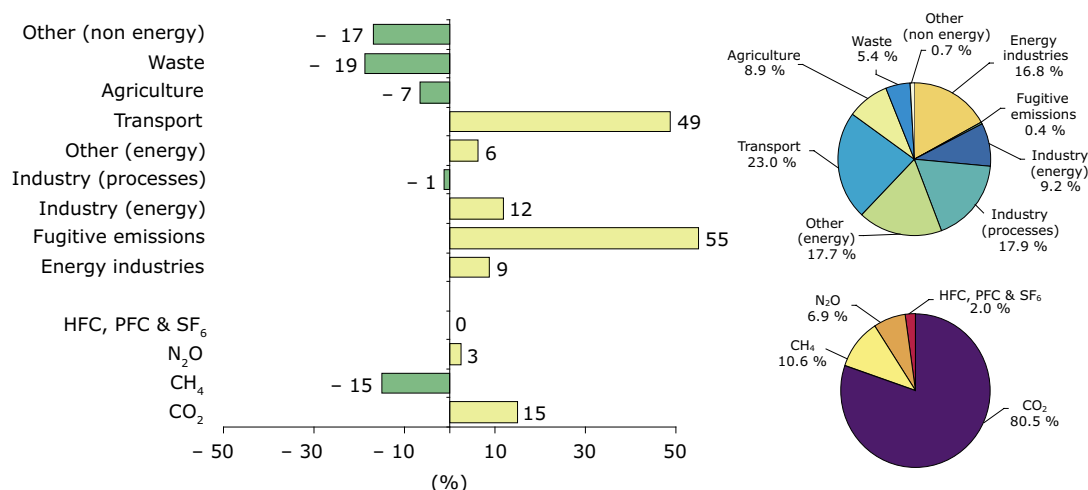


Figure A.2 Change, base year to 2001, of Austrian greenhouse gas emissions by sector and gas and their share in 2001



Note: The left side of the figure shows the percentage change, base year to 2001, of GHG emissions by sector and gas; the right side of the figure shows the share by sector and gas in total Austrian GHG emissions in 2001.

services. Emissions were 6 % above 1990 levels in 2001, but fluctuate to a certain extent according to annual changes in outdoor temperature.

Energy industries is the fourth largest sector accounting for 17 % of total Austrian GHG emissions. The 9 % increase of the sector is largely due to increased power production from fossil fuels. In recent years, the use of coal for power production has increased substantially.

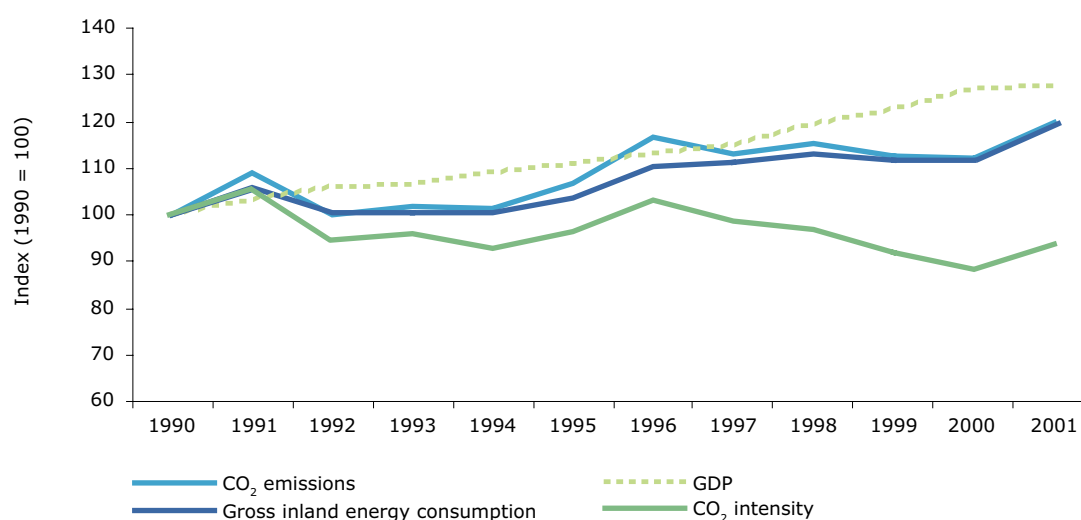
Industry (energy) is the fourth largest sector accounting for 9 % of total

Austrian GHG emissions. Emissions increased by 12 %.

Agriculture accounts for 9 % of total Austrian GHG emissions. Emissions decreased by 7 % mainly due to a decline in cattle population.

Fugitive emissions from fossil fuels increased by 55 % but account for only 0.4 % of total GHG emissions.

Main driving forces: CO₂ emissions from fossil fuel combustion account for 65 % of total Austrian GHG emissions. Figure 3 shows the development of

Figure A.3 GDP, gross inland energy consumption, CO₂ emissions from fossil fuel combustion and CO₂ intensity of GDP (as an index)

Source: Eurostat, Member State inventory submission (CRF tables), EEA (2003a).

Table A.1 Greenhouse gases and distance-to-target indicators for Austria

	Base year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Greenhouse gas emissions (without LUCF)	100.0	99.7	105.0	96.1	97.8	99.3	103.2	108.0	107.4	107.0	104.8	104.6	109.6
DTI 2010	0.0	- 0.3	5.7	- 2.6	- 0.3	1.9	6.4	11.9	12.0	12.2	10.7	11.1	16.8
CO ₂ (without LUCF)	100.0	100.0	105.8	97.2	98.7	99.4	104.2	110.8	110.1	110.3	108.2	108.0	115.0
CH ₄ (without LUCF)	100.0	100.0	98.9	96.3	96.7	95.3	94.4	93.3	90.0	88.5	87.1	85.6	85.0
N ₂ O (without LUCF)	100.0	100.0	110.8	90.4	104.6	116.3	109.6	106.0	111.0	107.7	106.4	106.0	102.5
F-gases	100.0	85.5	95.8	75.4	50.9	63.5	100.0	108.6	108.5	103.2	93.6	99.9	99.9

main driving forces of CO₂ emissions from fossil fuel combustion: real GDP grew by 28 % between 1990 and 2001, energy consumption decoupled from GDP, but increased by 12 % between 1990 and 2000 (no 2001 value available). Emissions of CO₂ from fossil fuels

were 20 % above 1990 levels in 2001. Therefore, CO₂ emissions decoupled from GDP, but not from energy consumption; CO₂ intensity of GDP was 6 % below 1990, but increased in 2001, compared with 2000.

Table A.2 Sectoral emission indicators (key sources) for Austria

Key sources	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
1.A.1. Energy industries (CO ₂)	100	107	83	82	85	94	104	103	97	98	93	109
1.A.2. Manufacturing industries and construction (CO ₂)	100	108	107	117	124	126	129	142	139	127	131	112
1.A.3. Transport (CO ₂)	100	111	111	112	113	113	126	118	135	130	137	148
1.A.3. Transport (N ₂ O)	100	134	153	169	189	194	190	182	194	181	177	176
1.A.4. Other sectors (CO ₂)	100	109	104	103	95	104	114	103	103	104	98	107
1.A.4. Other sectors (CH ₄)	100	108	97	97	88	92	97	58	56	56	52	56
1.A.5. Other (CO ₂)	0	0	0	0	0	0	0	0	0	0	0	0
1.B.1. Fugitive emissions from solid fuels (CH ₄)	100	85	71	69	56	53	45	46	47	46	51	51
1.B.1. Fugitive emissions from solid fuels (CO ₂)	0	0	0	0	0	0	0	0	0	0	0	0
1.B.2. Fugitive emissions from oil and natural gas (CH ₄)	100	106	104	109	113	122	130	126	129	131	127	133
1.B.2. Fugitive emissions from oil and natural gas (CO ₂)	100	108	116	110	123	124	79	119	138	162	156	172
2.A. Mineral products (CO ₂)	100	97	98	94	97	81	81	85	78	78	77	77
2.B. Chemical industry (N ₂ O)	100	102	63	88	91	94	96	95	99	102	105	87
2.B. Chemical industry (CO ₂)	100	102	93	101	96	115	114	112	123	116	114	109
2.C. Metal production (CO ₂)	100	95	82	86	92	101	96	108	99	100	102	109
2.C. Metal production (PFC)	100	100	57	0	0	0	0	0	0	0	0	0
2.E. Production of halocarbons and SF ₆ (HFC)	0	0	0	0	0	0	0	0	0	0	0	0
2.F. Consumption of halocarbons and SF ₆ (HFC)	1	1	2	2	3	100	114	131	149	159	189	189
2.F. Consumption of halocarbons and SF ₆ (SF ₆)	36	55	65	75	90	100	87	109	108	97	91	91
2.G. Other (CO ₂)	0	0	0	0	0	0	0	0	0	0	0	0
4.A. Enteric fermentation (CH ₄)	100	99	94	94	94	94	93	92	92	91	90	89
4.B. Manure management (CH ₄)	100	98	97	114	114	113	111	111	113	107	104	105
4.B. Manure management (N ₂ O)	100	99	95	101	100	101	100	99	99	97	96	95
4.D. Agricultural soils (N ₂ O)	100	114	84	100	119	103	96	107	98	97	96	95
4.D. Agricultural soils (CO ₂)	0	0	0	0	0	0	0	0	0	0	0	0
6.A. Solid waste disposal on land (CH ₄)	100	98	97	94	92	90	88	85	82	81	79	78
6.B. Waste water handling (N ₂ O)	100	102	104	104	105	107	109	108	111	109	109	109
6.D. Other (CO ₂)	0	0	0	0	0	0	0	0	0	0	0	0

Table A.3 Main driving force indicators and sectoral GHG and driving force indicators for Austria

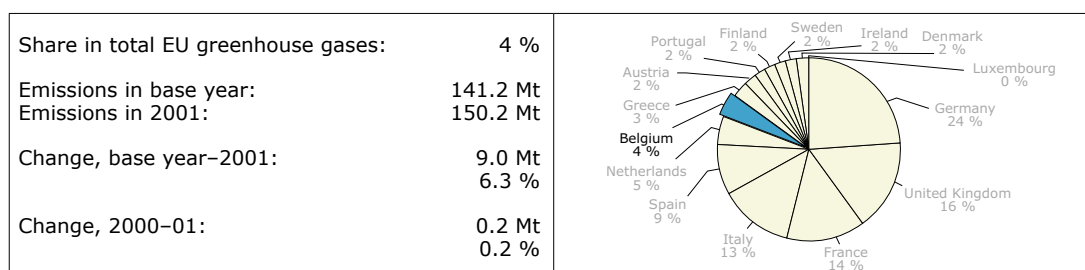
Indicators	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Main driving forces												
CO ₂ from fuel combustion (C)	100	109	100	102	101	107	117	113	115	112	112	120
GDP (E)	100	103	106	106	109	111	113	115	119	122	127	128
Gross inland energy consumption (E)	100	106	101	100	101	104	110	112	113	112	111	:
Energy industries												
CO ₂ from energy industries (C)	100	107	83	82	85	94	104	103	97	98	93	109
Final electricity consumption (E)	100	105	103	104	105	108	111	113	115	118	121	:
Electricity production in public thermal power plants (E)	100	110	86	82	88	102	113	115	114	118	104	:
El. consumption lighting/el. appliances households (E)	100	106	108	110	109	122	122	128	132	135	:	:
Number of dwellings (E)	100	102	103	104	106	107	109	109	110	112	113	:
Electricity consumption in services (E)	100	105	107	111	113	118	122	132	128	107	108	:
Gross value added in services (E)	100	104	108	109	111	112	114	115	120	122	127	:
Transport												
CO ₂ from transport (C)	100	111	111	112	113	113	126	118	135	130	137	148
Passenger transport in cars (pkm) (E)	100	113	111	109	109	109	105	107	110	111	111	:
Freight transport on road (tkm) (E)	100	106	109	114	129	123	131	136	142	148	155	:
CO ₂ from diesel consumption of freight traffic (E)	100	122	133	155	198	163	180	202	220	259	297	:
Households and services												
CO ₂ from other sectors (C)	100	109	104	103	95	104	114	103	103	104	98	107

Indicators	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Heating degree days (E)	100	110	100	105	94	105	114	102	103	101	94	103
CO ₂ from residential (C)	100	110	100	100	93	99	108	102	101	103	98	108
Number of dwellings (E)	100	102	103	104	106	107	109	109	110	112	113	:
CO ₂ from commercial/institutional (C)	100	116	133	133	113	143	168	121	123	112	94	107
Gross value added in services (E)	100	104	108	109	111	112	114	115	120	122	127	:
Manufacturing industries												
CO ₂ from manufacturing industries (C)	100	108	107	117	124	126	129	142	139	127	131	112
Gross value added industry (E)	100	103	104	103	107	111	114	118	123	126	132	:
CO ₂ from iron and steel industry (E)	100	99	86	84	87	97	88	116	118	53	62	:
Gross value added iron and steel industry (E)	:	:	:	:	:	:	:	:	:	:	:	:
Crude steel production (E)	100	98	92	97	103	116	104	121	123	121	:	:
CO ₂ from glass, pottery and building mat. industry (E)	100	95	97	91	88	93	108	103	85	80	93	:
Value added glass, pottery and build. mat. industry (E)	:	:	:	:	:	:	:	:	:	:	:	:
CO ₂ emissions from the chemical industry (E)	100	99	100	95	100	93	97	113	125	102	119	:
Value added chemical industry (E)	:	:	:	:	:	:	:	:	:	:	:	:
CO ₂ from food industry (E)	100	108	101	106	100	105	101	127	124	112	125	:
Gross value added food industry (E)	:	:	:	:	:	:	:	:	:	:	:	:
CO ₂ from paper and printing industry (E)	100	111	109	97	84	83	89	103	110	118	127	:
Gross value added paper and printing industry (E)	:	:	:	:	:	:	:	:	:	:	:	:
CO ₂ from textile industry (E)	100	100	102	88	82	87	82	94	143	66	71	:
Gross value added textile industry (E)	:	:	:	:	:	:	:	:	:	:	:	:
CO ₂ from autoproducer thermal power stations (E)	100	102	116	153	128	138	175	192	162	130	121	:
All output of autoproducer thermal power stations (E)	100	103	107	127	142	165	193	182	179	178	184	:
Agricultural soils												
N ₂ O from agricultural soils (C)	100	114	84	100	119	103	96	107	98	97	96	95
Fertiliser and manure use (C)	100	117	78	96	119	98	91	105	92	91	93	92
Enteric fermentation												
CH ₄ from enteric fermentation (C)	100	99	94	94	94	94	93	92	92	91	90	89
Cattle population (C)	100	98	93	87	90	90	88	85	84	83	83	82
Mineral products												
CO ₂ from mineral products (C)	100	97	98	94	97	81	81	85	78	78	77	77
Cement/clinker production (C)	100	103	103	104	102	82	81	84	78	78	77	77
Solid waste disposal on land												
CH ₄ from solid waste disposal on land (C)	100	98	97	94	92	90	88	85	82	81	79	78
Waste disposal on land (C)	100	97	95	91	87	86	87	87	95	96	96	96

Estimates in italics.

Source: Provided in brackets with C for CRF and E for Eurostat.

Belgium



Distance-to-target indicator: Belgian GHG emissions were almost stable in 2001, compared with 2000. Emission increases from households and services due to cold weather were offset by emission decreases from energy industries, manufacturing industries and from solid waste disposal. In 2001, total GHG emissions were 150 Mt (CO₂ equivalents), which was 6.3 % above the base-year level. In the burden sharing agreement under the Kyoto Protocol, Belgium agreed to reduce its GHG emissions by 7.5 % by 2008–12, from the base-year level. Assuming a linear target path from 1990 to 2010, Belgian GHG emissions were 10.5 index points above this target path in 2001 (Figure A.4).

Greenhouse gas emission trends: CO₂ emissions account for 84 % of total GHG emissions. They increased by 0.4 % compared with 2000 and were 8 % above 1990 level in 2001. The small 2001 increase is mainly due to the fact that emission increases from households and services (+ 5 %) were almost offset by decreases from energy industries and manufacturing industries. Over the period 1990–2001, CO₂ emissions mainly increased from transport (+ 23 %) and from households and services (+ 12 %), whereas emissions from energy industries declined (– 7 %).

Emissions of CH₄ account for 7 % of total Belgian GHG emissions and decreased by 7 % between 1990 and 2001. Also in 2001, emissions decreased compared with 2000. The main reasons for declining CH₄ emissions were the reductions from solid waste disposal on land and falling cattle population.

Emissions of N₂O are responsible for 8 % of total GHG emissions and decreased by 2 %. Emissions mainly decreased from energy use in manufacturing industries and from agricultural soil, whereas emissions from transport and from chemical industry increased.

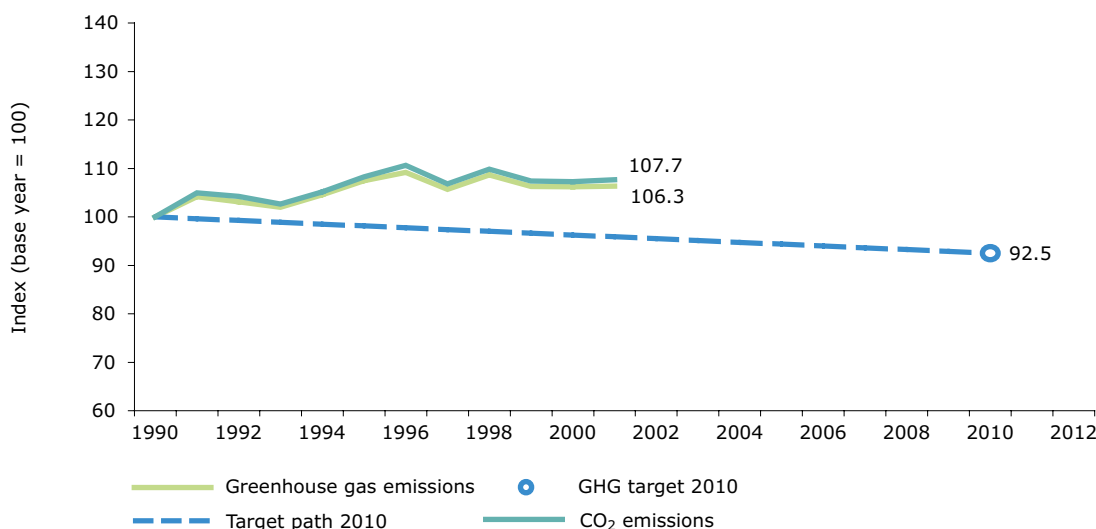
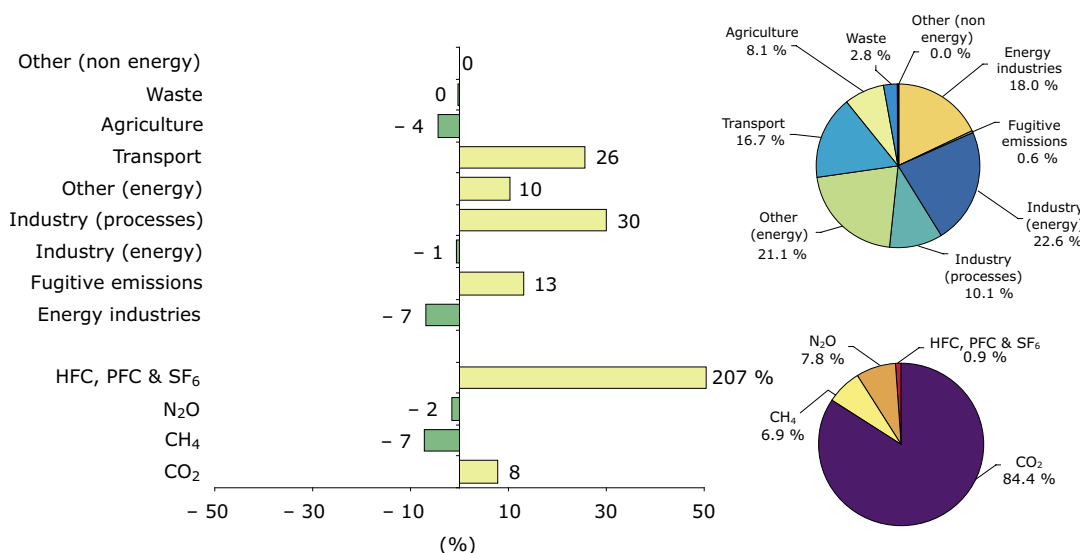
Fluorinated gas emissions account for 1 % of total GHG emissions and were 207 % above the 1995 level in 2001. HFC emissions increased by 262 % between 1995 and 2001, due to the replacement of ozone-depleting substances such as chlorofluorocarbons with HFCs. Emissions of SF₆ increased by 10 % between 1995 and 2001.

Industry (energy) is the largest sector accounting for 23 % of total Belgian GHG emissions. Emissions decreased by 1 %.

Other (energy) is the second largest sector accounting for 21 % of total Belgian GHG emissions. This sector includes mainly emissions from households and services. Emissions were 10 % above 1990 levels in 2001, but fluctuate to a certain extent according to annual changes in outdoor temperature.

Energy industries is the third largest sector accounting for 18 % of total Belgian GHG emissions. Emissions declined by 7 %.

Transport is the fourth largest sector accounting for 17 % of total Belgian GHG emissions. With a 26 % increase it is the second fastest growing sector in Belgium. This is mainly due to fast growing road transport demand.

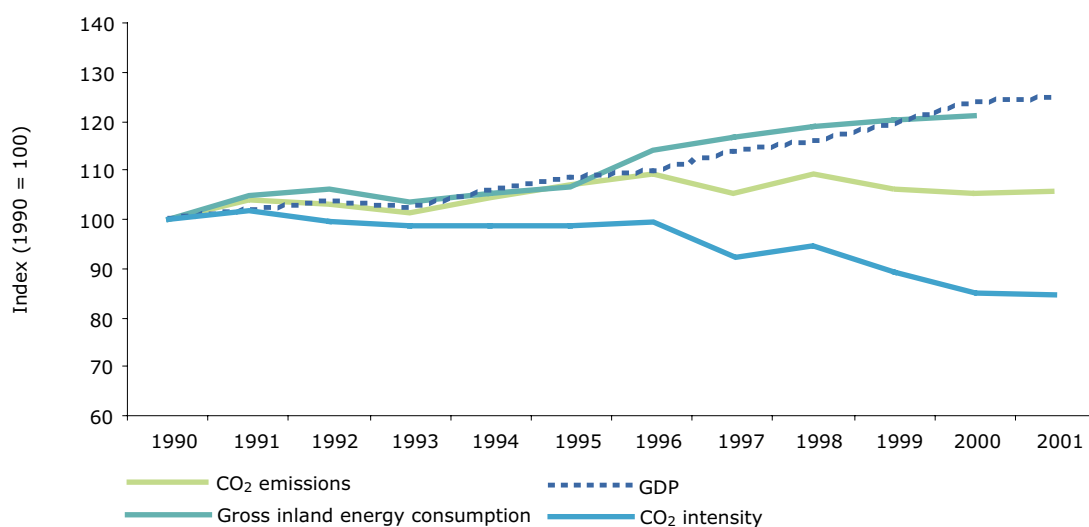
Figure A.4 Belgian GHG emissions compared with Kyoto target for 2008–12 (excluding LUCF)**Figure A.5 Change, base year to 2001, of Belgian GHG emissions by sector and gas and their share in 2001**

Note: The left side of the figure shows the percentage change, base year to 2001, of GHG emissions by sector and gas; the right side of the figure shows the share by sector and gas in total Belgian GHG emissions in 2001.

Industry (processes) accounts for 10 % of total Belgian GHG emissions and is the fastest growing sector (+ 30 %). The increases occurred mainly in CO₂ from mineral products, HFC from consumption of halocarbons and CO₂ and N₂O from chemical industry.

Agriculture accounts for 8 % of total Belgian GHG emissions. Emissions decreased by 4 % mainly due to a decline in cattle population and due to emissions reductions from agricultural soil.

Main driving forces: CO₂ emissions from fossil fuel combustion account for 77 % of total Belgian GHG emissions. Figure 6 shows the development of main driving forces of CO₂ emissions from fossil fuel combustion: real GDP grew by 25 % between 1990 and 2001, energy consumption did not decouple from GDP, and increased by 21 % between 1990 and 2000 (no 2001 value available). Emissions of CO₂ from fossil fuels were 6 % above 1990 levels in 2001. Therefore, CO₂ emissions decoupled from GDP and from energy consumption; CO₂ intensity of GDP was 15 % below 1990.

Figure A.6 GDP, gross inland energy consumption, CO₂ emissions from fossil fuel combustion and CO₂ intensity of GDP (as an index)

Source: Eurostat, Member State inventory submission (CRF tables), EEA (2003a).

Table A.4 Greenhouse gases and distance-to-target indicators for Belgium

	Base year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Greenhouse gas emissions (without LUCF)	100.0	100.0	104.2	103.1	102.0	104.5	107.5	109.2	105.7	108.6	106.3	106.2	106.3
DTI 2010	0.0	0.0	4.5	3.9	3.1	6.0	9.4	11.4	8.3	11.6	9.6	9.9	10.5
CO ₂ (without LUCF)	100.0	100.0	104.9	104.2	102.7	105.1	108.2	110.6	106.8	109.8	107.4	107.3	107.7
CH ₄ (without LUCF)	100.0	100.0	103.5	101.1	100.7	102.0	100.5	99.7	99.1	99.7	97.2	95.5	92.7
N ₂ O (without LUCF)	100.0	100.0	97.3	94.4	96.7	101.2	106.7	102.6	98.8	103.0	100.4	99.6	98.4
F-gases	100.0	100.0	100.0	100.0	100.0	100.0	100.0	145.1	168.7	167.3	185.0	258.3	306.7

Table A.5 Sectoral emission indicators (key sources) for Belgium

Key sources	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
1.A.1. Energy industries (CO ₂)	100	105	105	103	102	106	103	98	105	95	96	93
1.A.2. Manufacturing industries and construction (CO ₂)	100	98	91	87	99	101	94	97	102	103	102	101
1.A.3. Transport (CO ₂)	100	104	111	110	110	111	113	117	119	122	123	123
1.A.3. Transport (N ₂ O)	100	113	127	147	162	175	188	200	210	242	274	278
1.A.4. Other Sectors (CO ₂)	100	110	110	110	110	112	131	114	115	111	106	112
1.A.4. Other Sectors (CH ₄)	100	109	111	108	101	103	117	81	94	72	105	107
1.A.5. Other (CO ₂)	0	0	0	0	0	0	0	0	0	0	NE	NE
1.B.1. Fugitive emissions from solid fuels (CH ₄)	100	68	86	81	79	77	75	61	62	62	62	63
1.B.1. Fugitive emissions from solid fuels (CO ₂)	0	0	0	0	0	0	0	0	0	0	0	0
1.B.2. Fugitive emissions from oil and natural gas (CH ₄)	100	107	109	115	117	92	100	100	112	121	119	116
1.B.2. Fugitive emissions from oil and natural gas (CO ₂)	NE	0	NE	NE	NE	NE	0	NE	0	NE	NE	NE
2.A. Mineral products (CO ₂)	100	108	108	110	114	123	123	115	117	116	129	129
2.B. Chemical industry (N ₂ O)	100	97	88	95	110	120	131	126	132	125	118	113
2.B. Chemical industry (CO ₂)	100	102	136	150	185	202	193	196	190	197	193	201
2.C. Metal production (CO ₂)	100	100	93	92	95	97	96	90	97	97	91	83
2.C. Metal production (PFC)	0	0	0	0	0	0	0	0	0	0	0	0
2.E. Production of halocarbons and SF ₆ (HFC)	0	0	0	0	0	0	0	0	0	0	0	0
2.F. Consumption of halocarbons and SF ₆ (HFC)	100	100	100	100	100	100	123	155	186	237	299	362
2.F. Consumption of halocarbons and SF ₆ (SF ₆)	100	100	100	100	100	100	223	216	100	0	114	110
2.G. Other (CO ₂)	100	298	280	260	128	156	146	209	129	119	133	149
4.A. Enteric fermentation (CH ₄)	100	100	99	100	100	100	99	96	97	96	90	91
4.B. Manure management (CH ₄)	100	97	103	106	106	106	106	107	108	109	112	108
4.B. Manure management (N ₂ O)	100	99	98	100	100	101	99	99	99	100	99	102
4.D. Agricultural soils (N ₂ O)	100	98	97	97	96	98	96	95	96	97	94	93
4.D. Agricultural soils (CO ₂)	0	0	0	0	0	0	0	0	0	0	0	0
6.A. Solid waste disposal on land (CH ₄)	100	114	100	92	97	96	90	90	86	75	70	62
6.B. Waste water handling (N ₂ O)	100	0	0	0	0	0	0	0	145	145	143	143
6.D. Other (CO ₂)	0	0	0	0	0	0	0	0	0	0	100	100

Table A.6 Main driving force indicators and sectoral GHG and driving force indicators for Belgium

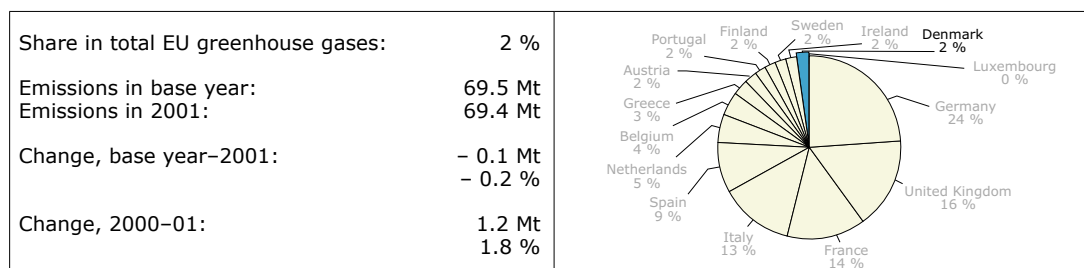
Indicators	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Main driving forces												
CO ₂ from fuel combustion (C)	100	104	103	101	104	107	109	105	109	106	105	106
GDP (E)	100	102	103	102	106	108	109	113	116	119	124	125
Gross inland energy consumption (E)	100	105	106	103	105	107	114	117	119	120	121	:
Energy industries												
CO ₂ from energy industries (C)	100	105	105	103	102	106	103	98	105	95	96	93
Final electricity consumption (E)	100	104	108	109	115	118	120	124	128	128	134	:
Electricity production in public thermal power plants (E)	100	104	102	103	111	117	117	115	134	134	142	:
El. consumption lighting/el. appliances households (E)	:	:	:	:	:	:	:	:	:	:	:	:
Number of dwellings (E)	:	:	:	:	:	:	:	:	:	:	:	:
Electricity consumption in services (E)	100	106	112	123	129	132	139	144	148	151	157	:
Gross value added in services (E)	100	103	105	105	108	111	111	114	116	120	122	:
Transport												
CO ₂ from transport (C)	100	104	111	110	110	111	113	117	119	122	123	123
Passenger transport in cars (pkm) (E)	100	104	105	106	109	109	110	111	115	118	119	:
Freight transport on road (tkm) (E)	100	106	112	119	132	138	126	136	141	147	130	:
CO ₂ from diesel consumption of freight traffic (E)	:	:	:	:	:	:	:	:	:	:	:	:
Households and services												
CO ₂ from other sectors (C)	100	110	110	110	110	112	131	114	115	111	106	112
Heating degree days (E)	100	115	105	107	98	102	125	104	102	98	95	103

Indicators	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
CO ₂ from residential (C)	100	108	108	108	104	110	130	110	112	108	102	108
Number of dwellings (E)	:	:	:	:	:	:	:	:	:	:	:	:
CO ₂ from commercial/institutional (C)	100	126	124	128	140	130	156	141	140	141	141	148
Gross value added in services (E)	:	:	:	:	:	:	:	:	:	:	:	:
Manufacturing industries												
CO ₂ from manufacturing industries (C)	100	98	91	87	99	101	94	97	102	103	102	101
Gross value added industry (E)	100	99	99	95	98	102	104	110	111	113	119	:
CO ₂ from iron and steel industry (E)	100	98	89	78	90	84	81	94	91	91	97	:
Gross value added iron and steel industry (E)	:	:	:	:	:	100	94	90	93	90	94	:
Crude steel production (E)	100	99	90	89	99	101	94	94	100	96	:	:
CO ₂ from glass, pottery and building mat. industry (E)	100	99	114	95	120	107	103	96	92	94	90	:
Value added glass, pottery and build. mat. industry (E)	:	:	:	:	:	100	92	93	87	89	88	:
CO ₂ emissions from the chemical industry (E)	100	96	105	104	99	105	78	84	86	97	98	:
Value added chemical industry (E)	:	:	:	:	:	100	100	99	100	116	122	:
CO ₂ from food industry (E)	100	88	92	87	76	75	82	95	72	70	77	:
Gross value added food industry (E)	:	:	:	:	:	100	90	88	92	94	93	:
CO ₂ from paper and printing industry (E)	100	86	102	84	96	95	91	92	72	78	101	:
Gross value added paper and printing industry (E)	:	:	:	:	:	100	95	93	91	103	98	:
CO ₂ from textile industry (E)	100	95	102	89	87	65	71	67	69	63	56	:
Gross value added textile industry (E)	:	:	:	:	:	100	92	102	104	102	94	:
CO ₂ from autoproducer thermal power stations (E)	100	101	107	88	93	111	98	101	118	132	91	:
All output of autoproducer thermal power stations (E)	100	101	108	103	109	109	110	91	98	97	66	:
Agricultural soils												
N ₂ O from agricultural soils (C)	100	98	97	97	96	98	96	95	96	97	94	93
Fertiliser and manure use (C)	:	:	:	:	:	:	:	:	:	:	:	:
Enteric fermentation												
CH ₄ from enteric fermentation (C)	100	100	99	100	100	100	99	96	97	96	90	91
Cattle population (E)	100	100	99	99	100	101	100	97	95	95	93	94
Mineral products												
CO ₂ from mineral products (C)	100	108	108	110	114	123	123	115	117	116	129	129
Cement/clinker production (C)	:	:	:	:	:	:	:	:	:	:	:	:
Solid waste disposal on land												
CH ₄ from solid waste disposal on land (C)	100	114	100	92	97	96	90	90	86	75	70	62
Waste Disposal on land (C)	:	:	:	:	:	:	:	:	:	:	:	:

Estimates in italics.

Source: Provided in brackets with C for CRF and E for Eurostat.

Denmark



Distance-to-target indicator: Danish GHG emissions increased by 1.8 % in 2001, compared with 2000. In 2001, total GHG emissions were 69 Mt (CO₂ equivalents), which was 0.2 % below the base-year level. In the burden sharing agreement under the Kyoto Protocol, Denmark agreed to reduce its GHG emissions by 21 % by 2008–12, from the base-year level. However, this reduction target refers to electricity trade-adjusted GHG emissions in 1990. The main reason for this adjustment is the specific situation of Denmark as swing producer of electricity in the Nordic electricity pool. Adjusted GHG emissions in 2001 were 9 % below base-year levels. Therefore, for Denmark, two distance-to-target indicators can be calculated: adjusted GHG emissions were 2.6 index points above the linear target path from 1990 to 2010 in 2001; non-adjusted data were 11.4 index points above the linear target path (Figure A.7).

Greenhouse gas emission trends: CO₂ emissions account for 78 % of total GHG emissions. They increased by 3 % compared with 2000 and were 3 % above 1990 level in 2001. In 2001, CO₂ emissions mainly increased due to increases in power production from fossil fuels, in particular from coal. Over the period 1990–2001, CO₂ emissions mainly increased from transport (+ 16 %), whereas emissions from households and services decreased by 14 %.

Emissions of CH₄ account for 8 % of total Danish GHG emissions and decreased by 1 % between 1990 and 2001. In 2001, emissions decreased by 1 % compared with 2000. The decline in

CH₄ emissions from enteric fermentation due to declining cattle numbers was only partly offset by emission increases from gas powered electricity and heat production.

Emissions of N₂O are responsible for 13 % of total GHG emissions and decreased by 19 %. The main reasons for N₂O emission decreases were reductions from agricultural soil (– 24 %) due to falling fertiliser and manure use.

Fluorinated gas emissions account for 1 % of total GHG emissions and doubled between 1995 and 2001. Fluorinated gas emissions show opposing trends: HFC emissions increased by 174 % between 1995 and 2001, mainly due to the replacement of ozone depleting substances such as chlorofluorocarbons with HFCs. PFC emissions increased by a factor of 20. Emissions of SF₆ were reduced by 72 % between 1995 and 2001.

Energy industries is the largest sector accounting for 39 % of total Danish GHG emissions. The 2 % increase of the sector is largely due to increased CH₄ emissions from gaseous fuels in power and heat production.

Transport is the second largest sector accounting for 18 % of total Danish GHG emissions. The 18 % increase is mainly due to fast growing road transport.

Agriculture is the third largest sector accounting for 17 % of total Danish GHG emissions. Emissions decreased by 19 %, which makes it to the fastest decreasing sector in Denmark. The reductions were mainly due to reduced

Figure A.7 Danish GHG emissions compared with Kyoto target for 2008–12 (excluding LUCF)

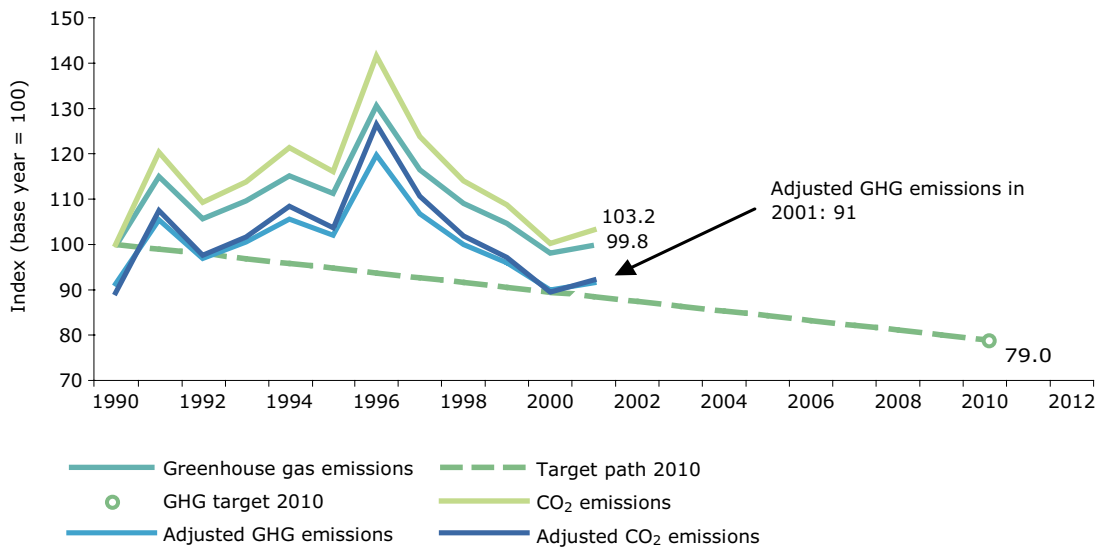
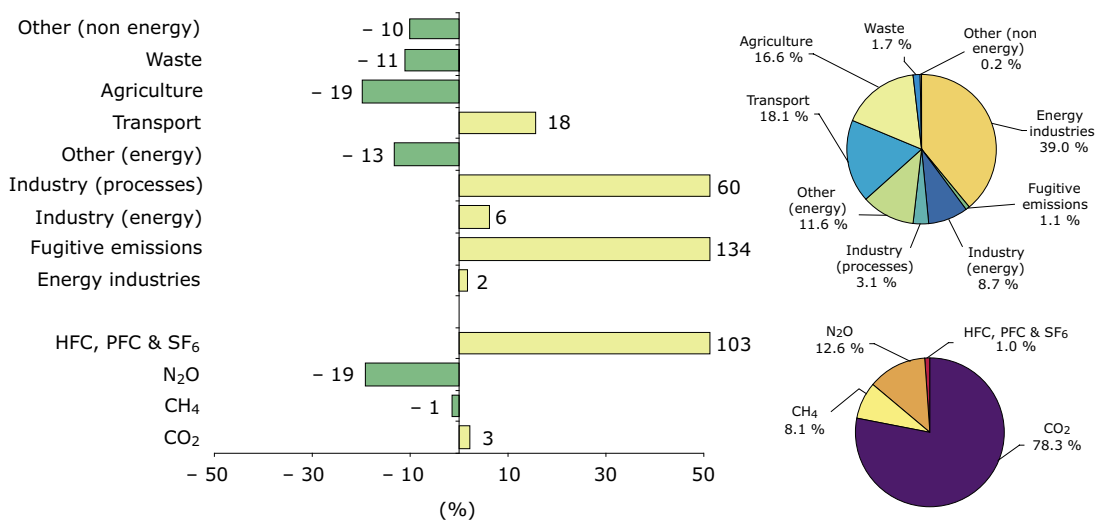


Figure A.8 Change, base year to 2001, of Danish GHG emissions by sector and gas and their share in 2001



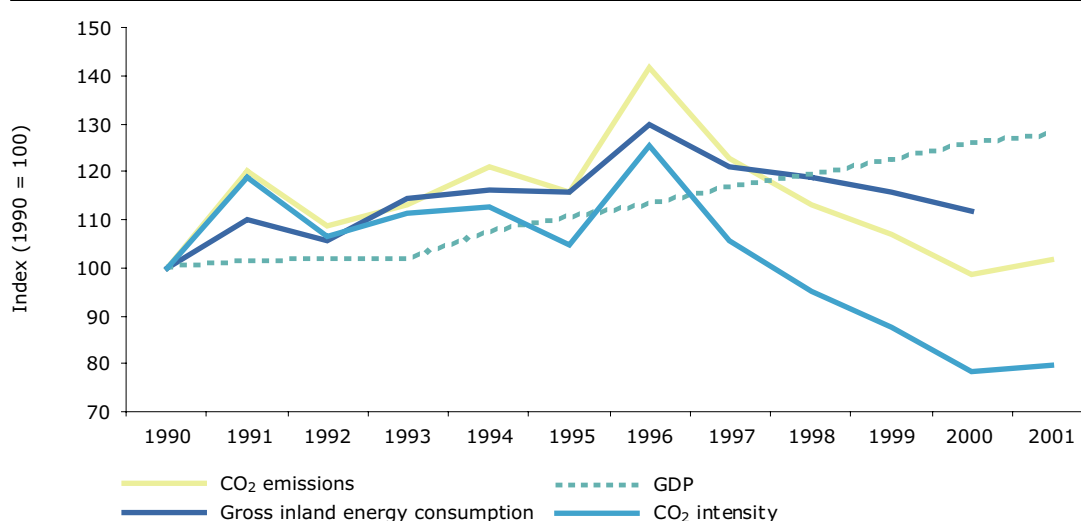
Note: The left side of the figure shows the percentage change, base year to 2001, of GHG emissions by sector and gas; the right side of the figure shows the share by sector and gas in total Danish GHG emissions in 2001.

fertiliser and manure use and to falling cattle numbers.

Other (energy) is the fourth largest sector accounting for 12 % of total Danish GHG emissions. This sector includes mainly emissions from households and services. Emissions were 13 % below 1990 levels in 2001, despite comparatively cold outdoor temperatures. One reason of decoupling emissions from temperature is the increased use of district heating.

Industry (energy) accounts for 9 % of total Danish GHG emissions. Emissions increased by 6 %.

Industry (processes) accounts for 3 % of total Danish GHG emissions, but is one of the fastest growing sectors with an increase of 60 % from the base-year level. The increase was largely due to increased cement production and consumption of HFC.

Figure A.9 GDP, gross inland energy consumption, CO₂ emissions from fossil fuel combustion and CO₂ intensity of GDP (as an index)

Source: Eurostat, Member State inventory submission (CRF tables), EEA (2003a).

Table A.7 Greenhouse gases and distance-to-target indicators for Denmark

	Base year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Greenhouse gas emissions (without LUCF)	100.0	99.6	114.9	105.7	109.6	115.1	111.2	130.6	116.4	109.0	104.6	98.1	99.8
DTI 2010 (non adjusted)	0.0	-0.4	16.0	7.8	12.8	19.3	16.5	36.9	23.8	17.4	14.1	8.6	11.4
CO ₂ (without LUCF)	100.0	100.0	120.4	109.3	113.8	121.4	116.1	141.6	123.8	114.0	108.8	100.2	103.2
CH ₄ (without LUCF)	100.0	100.0	101.0	101.1	103.3	103.7	105.0	106.3	104.4	102.3	96.5	97.6	98.8
N ₂ O (without LUCF)	100.0	100.0	99.0	92.9	94.0	92.0	91.3	90.0	86.2	86.5	85.9	83.8	80.7
F-gases	100.0	12.5	18.0	27.0	66.9	76.5	100.0	126.3	137.3	163.9	198.5	230.3	203.4

Main driving forces: CO₂ emissions from fossil fuel combustion account for 75 % of total Danish GHG emissions. Figure 9 shows the development of main driving forces of CO₂ emissions from fossil fuel combustion: real GDP grew by 28 % between 1990 and 2001, energy consumption decoupled from GDP between 1990 and 2000 and it was

12 % above the 1990 level (no 2001 value available). Emissions of CO₂ from fossil fuels were 3 % above 1990 levels in 2001. Therefore, CO₂ emissions decoupled from GDP, and, to a lesser extent, from energy consumption; CO₂ intensity of GDP was 20 % below 1990 levels, but increased in 2001, compared with 2000.

Table A.8 Sectoral emission indicators (key sources) for Denmark

Key sources	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
1.A.1. Energy industries (CO ₂)	100	134	115	121	135	122	169	135	120	108	96	101
1.A.2. Manufacturing industries and construction (CO ₂)	100	107	105	104	112	120	123	121	108	109	104	105
1.A.3. Transport (CO ₂)	100	105	106	108	112	113	115	116	117	117	116	116
1.A.3. Transport (N ₂ O)	100	116	129	142	167	184	200	223	236	246	259	268
1.A.4. Other sectors (CO ₂)	100	103	95	102	94	95	103	95	91	91	84	86
1.A.4. Other sectors (CH ₄)	100	107	108	111	145	157	176	194	133	172	200	205
1.A.5. Other (CO ₂)	100	241	118	199	211	212	148	144	171	153	93	81
1.B.1. Fugitive emissions from solid fuels (CH ₄)	100	115	113	139	163	183	185	189	101	98	88	95
1.B.1. Fugitive emissions from solid fuels (CO ₂)	0	0	0	0	0	0	0	0	0	0	0	0
1.B.2. Fugitive emissions from oil and natural gas (CH ₄)	100	181	164	155	317	328	307	358	308	449	359	378
1.B.2. Fugitive emissions from oil and natural gas (CO ₂)	100	206	213	185	195	152	167	235	176	376	247	264
2.A. Mineral products (CO ₂)	100	117	129	130	131	130	138	153	143	139	145	146
2.B. Chemical industry (N ₂ O)	0	0	0	0	0	0	0	0	0	0	0	0
2.B. Chemical industry (CO ₂)	0	0	0	0	0	0	0	0	0	0	0	0
2.C. Metal production (CO ₂)	0	0	0	0	0	0	0	0	0	0	0	0
2.C. Metal production (PFC)	0	0	0	0	0	0	0	0	0	0	0	0
2.E. Production of halocarbons and SF ₆ (HFC)	0	0	0	0	0	0	0	0	0	0	0	0
2.F. Consumption of halocarbons and SF ₆ (HFC)	0	0	2	41	60	100	157	166	208	254	299	274
2.F. Consumption of halocarbons and SF ₆ (SF ₆)	17	43	81	122	107	100	72	82	60	68	53	43
2.G. Other (CO ₂)	0	0	0	0	0	0	0	0	0	0	0	0
4.A. Enteric fermentation (CH ₄)	100	99	98	99	95	95	95	92	92	86	85	86
4.B. Manure management (CH ₄)	100	101	103	109	104	104	103	103	106	94	96	98
4.B. Manure management (N ₂ O)	100	102	104	107	107	105	105	97	101	99	95	96
4.D. Agricultural soils (N ₂ O)	100	98	91	92	89	88	85	82	83	82	80	76
4.D. Agricultural soils (CO ₂)	0	0	0	0	0	0	0	0	0	0	0	0
6.A. Solid waste disposal on land (CH ₄)	100	102	104	104	105	100	100	95	89	85	91	89
6.B. Waste water handling (N ₂ O)	0	0	0	0	0	0	0	0	0	0	0	0
6.D. Other (CO ₂)	0	0	0	0	0	0	0	0	0	0	0	0

Table A.9 Main driving force indicators and sectoral GHG and driving force indicators for Denmark

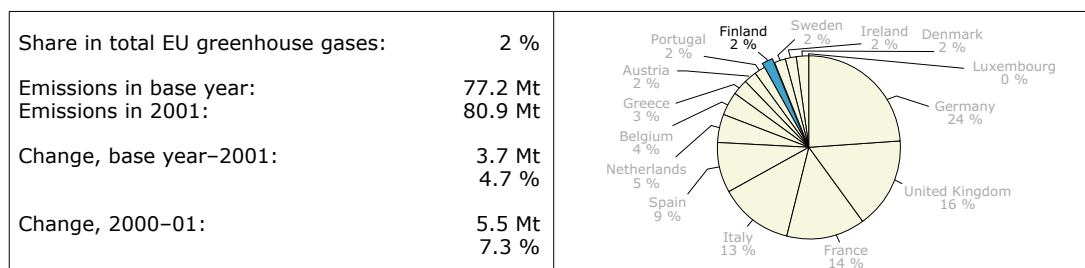
Indicators	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Main driving forces												
CO ₂ from fuel combustion (C)	100	120	108	113	121	116	142	123	113	107	99	102
GDP (E)	100	101	102	102	107	110	113	116	119	122	126	128
Gross inland energy consumption (E)	100	110	105	114	116	116	130	121	119	116	112	:
Energy industries												
CO ₂ from energy industries (C)	100	134	115	121	135	122	169	135	120	108	96	101
Final electricity consumption (E)	100	100	101	106	110	111	113	119	124	126	128	:
Electricity production in public thermal power plants (E)	100	134	121	135	151	148	199	169	159	150	136	:
El. consumption lighting/el. appliances households (E)	100	103	106	106	109	107	109	109	109	111	112	:
Number of dwellings (E)	100	101	101	102	102	103	103	104	104	105	106	:
Electricity consumption in services (E)	100	104	106	107	109	109	114	112	116	117	119	:
Gross value added in services (E)	100	101	101	102	105	107	111	113	116	119	124	:
Transport												
CO ₂ from transport (C)	100	105	106	108	112	113	115	116	117	117	116	116
Passenger transport in cars (pkm) (E)	100	103	105	107	110	114	117	119	122	139	139	:
Freight transport on road (tkm) (E)	100	98	103	97	106	108	106	108	118	124	130	:
CO ₂ from diesel consumption of freight traffic (E)	100	102	100	97	103	103	104	105	107	111	112	:
Households and services												
CO ₂ from other sectors (C)	100	103	95	102	94	95	103	95	91	91	84	86

Indicators	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Heating degree days (E)	100	115	104	118	113	117	133	116	114	105	102	114
CO ₂ from residential (C)	100	105	94	108	98	99	106	95	92	90	80	84
Number of dwellings (E)	100	101	101	102	102	103	103	104	104	105	106	:
CO ₂ from commercial/institutional (C)	100	94	86	94	79	78	88	75	64	68	58	58
Gross value added in services (E)	100	101	101	102	105	107	111	113	116	119	124	:
Manufacturing industries												
CO ₂ from manufacturing industries (C)	100	107	105	104	112	120	123	121	108	109	104	105
Gross value added industry (E)	100	100	100	94	102	108	108	113	115	119	122	:
CO ₂ from iron and steel industry (E)	100	96	98	93	92	91	90	90	92	99	95	:
Gross value added iron and steel industry (E)	100	106	117	116	127	125	112	113	125	130	132	:
Crude steel production (E)	100	104	97	99	118	107	121	129	130	120	:	:
CO ₂ from glass, pottery and building mat. industry (E)	100	124	113	117	129	136	151	150	139	141	138	:
Value added glass, pottery and build. mat. industry (E)	100	99	103	102	112	119	123	120	125	130	113	:
CO ₂ emissions from the chemical industry (E)	100	109	115	93	95	90	99	112	115	107	100	:
Value added chemical industry (E)	100	106	118	125	136	124	134	154	166	185	195	:
CO ₂ from food industry (E)	100	114	107	118	122	120	106	101	101	99	95	:
Gross value added food industry (E)	100	111	115	123	129	121	124	124	:	136	135	:
CO ₂ from paper and printing industry (E)	100	81	66	42	42	52	44	40	44	40	39	:
Gross value added paper and printing industry (E)	100	101	105	104	107	115	126	131	135	141	137	:
CO ₂ from textile industry (E)	100	101	100	91	83	75	74	64	59	63	57	:
Gross value added textile industry (E)	100	106	113	109	110	99	93	87	93	92	91	:
CO ₂ from autoproducer thermal power stations (E)	100	129	156	176	194	226	305	314	373	445	482	:
All output of autoproducer thermal power stations (E)	100	116	262	243	247	302	433	626	857	1 003	1 109	:
Agricultural soils												
N ₂ O from agricultural soils (C)	100	98	91	92	89	88	85	82	83	82	80	76
Fertiliser and manure use (C)	100	100	97	92	91	89	85	82	82	77	74	73
Enteric fermentation												
CH ₄ from enteric fermentation (C)	100	99	98	99	95	95	95	92	92	86	85	86
Cattle population (C)	100	99	98	98	94	93	93	90	88	84	83	85
Mineral products												
CO ₂ from mineral products (C)	100	117	129	130	131	130	138	153	143	139	145	146
Cement/clinker production (C)	100	123	137	139	138	140	149	166	156	150	155	156
Solid waste disposal on land												
CH ₄ from solid waste disposal on land (C)	100	102	104	104	105	100	100	95	89	85	91	89
Waste Disposal on land (C)	100	96	91	87	82	62	79	66	63	46	47	41

Estimates in italics.

Source: Provided in brackets with C for CRF and E for Eurostat.

Finland



Distance-to-target indicator: Finland's GHG emissions increased by 7 % in 2001, compared with 2000. The main reason for this was an increase in power production from fossil fuels. In 2001, total GHG emissions were 80.9 Mt (CO₂ equivalents), which was 4.7 % above the base-year level. In the burden sharing agreement under the Kyoto Protocol, Finland agreed to stabilise its GHG emissions by 2008–12 to the base-year level. Assuming a linear target path from 1990 to 2010, Finnish GHG emissions were 4.7 index points above this target path in 2001 (Figure A.10).

Greenhouse gas emission trends: CO₂ emissions account for 84 % of total GHG emissions. They increased by 9 % compared with 2000 and were 8 % above 1990 levels in 2001. In 2001, CO₂ emissions increased mainly because of increases in energy industries (partly due to decreases in hydro-power production) and in households and services due to cold outdoor temperatures. Over the period 1990–2001, the most important reasons for CO₂ emission increases were increasing fuel combustion of energy industries. Emissions of CO₂ from transport increased only by 1 % and considerable decreases took place in the households and services and agriculture sectors.

Emissions of CH₄ account for 7 % of total Finnish GHG emissions and decreased by 15 % between 1990 and 2001. Also in 2001, emissions decreased compared with 2000. The main reasons for declining CH₄ emissions were the reductions in solid waste disposal on land and falling cattle population.

Emissions of N₂O are responsible for 9 % of total GHG emissions. The emissions decreased by 15 %, due to decreasing use of synthetic fertiliser and a falling nitric acid production.

Fluorinated gas emissions account for 1 % of total GHG emissions and were 647 % above 1995 levels in 2001. Fluorinated gas emissions show opposing trends: HFC emissions increased by a factor of 20 and PFC emissions by a factor of 140 between 1995 and 2001 while the SF₆ emissions were reduced by 20 % within the same period.

Energy industries is the largest sector accounting for 34 % of total Finnish GHG emissions. The 44 % increase of the sector is largely due to increased power and heat production from fossil fuels.

Industry (energy) is the second largest sector accounting for 18 % of total Finnish GHG emissions. Emissions decreased by 3 %, partly due to a decline in solid fuel use and an increase in biomass use (in particular in the pulp and paper industry).

Transport is the third largest sector accounting for 16 % of total Finnish GHG emissions. The emissions increased only by 1 %, which was partly due to an economic downturn in the early 1990s.

Other (energy) is the fourth largest sector accounting for 10 % of total Finnish GHG emissions. This sector includes mainly emissions from households and services. Emissions

Figure A.10 Finnish GHG emissions compared with Kyoto target for 2008–12 (excluding LUCF)

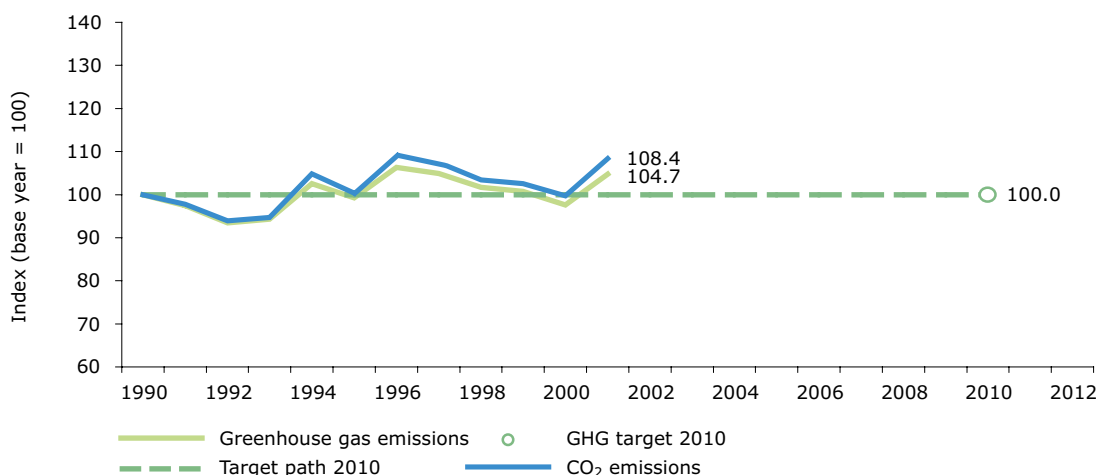
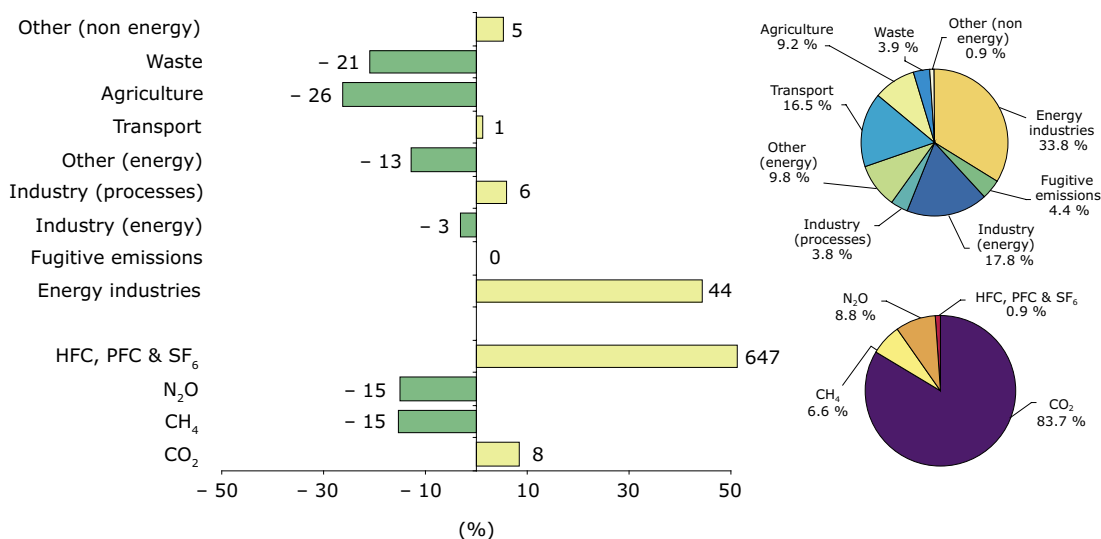


Figure A.11 Change, base year to 2001, of Finnish GHG emissions by sector and gas and their share in 2001



Note: The left side of the figure shows the percentage change, base year to 2001, of GHG emissions by sector and gas; the right side of the figure shows the share by sector and gas in total Finnish GHG emissions in 2001.

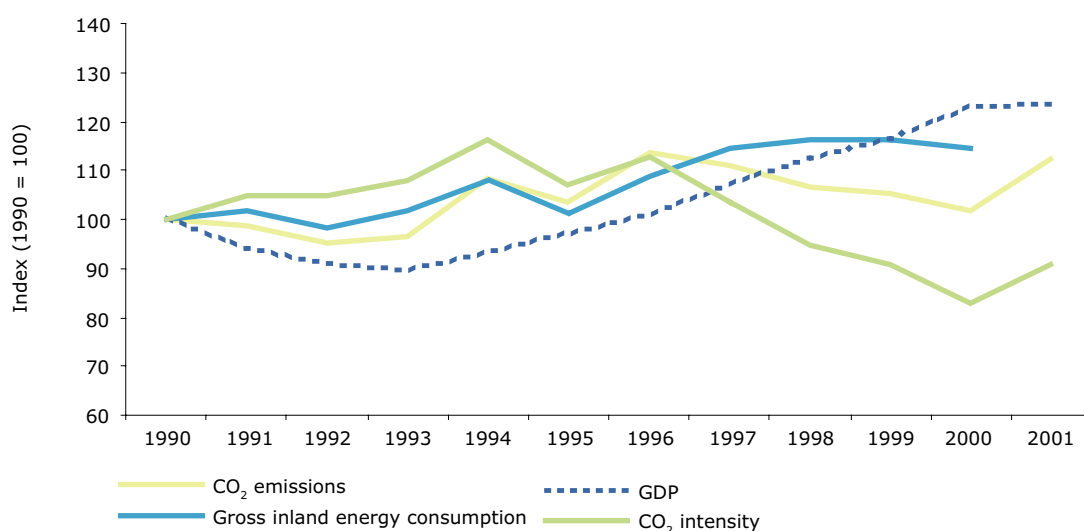
were 13 % below 1990 levels in 2001, despite comparatively cold outdoor temperatures. One reason of decoupling emissions from temperature is the increased use of district heating.

Agriculture accounts for 9 % of total Finnish GHG emissions. Emissions decreased by 26 % mainly due to a decline in emissions from agricultural soil and from enteric fermentation (decline in cattle population). Reduced use of nitrogen fertilisers and improved manure management resulted from the measures taken by the farmers as a part of an agro-environmental programme

aiming at minimising nutrient loading to water courses (Ministry of the Environment, 2003).

Fugitive emissions account for 4 % of total Finnish GHG emissions. These emissions remained stable between 1990 and 2001.

Main driving forces: CO₂ emissions from fossil fuel combustion account for 75 % of total Finnish GHG emissions. Figure 12 shows the development of main driving forces of CO₂ emissions from fossil fuel combustion: real GDP grew by 23 % between 1990 and 2001

Figure A.12 GDP, gross inland energy consumption, CO₂ emissions from fossil fuel combustion and CO₂ intensity of GDP (as an index)

Source: Eurostat, Member State inventory submission (CRF tables), EEA (2003a).

Table A.10 Greenhouse gases and distance-to-target indicators for Finland

	Base year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Greenhouse gas emissions (without LUCF)	100.0	100.0	97.5	93.4	94.3	102.5	99.2	106.3	104.9	101.7	100.8	97.6	104.7
DTI 2010	0.0	0.0	- 2.5	- 6.6	- 5.7	2.5	- 0.8	6.3	4.9	1.7	0.8	- 2.4	4.7
CO ₂ (without LUCF)	100.0	100.0	97.8	93.9	94.7	104.8	100.3	109.1	107.0	103.4	102.6	99.7	108.4
CH ₄ (without LUCF)	100.0	100.0	99.1	97.7	97.5	96.7	96.5	95.5	94.1	90.9	89.2	85.6	84.7
N ₂ O (without LUCF)	100.0	100.0	94.3	87.3	89.3	90.7	93.1	93.5	96.1	94.2	92.5	85.2	85.1
F-gases	100.0	96.4	68.8	37.6	34.5	42.4	100.0	152.7	248.9	304.7	406.7	587.4	746.9

and the energy consumption has steadily increased from 1990 to 2000 (no 2001 value available). Emissions of CO₂ from fossil fuels were 12 % above 1990 levels in 2001. Therefore, CO₂ emissions

decoupled from GDP at the end of the 1990s, but not clearly from energy consumption; CO₂ intensity of GDP was 9 % below 1990, but increased in 2001, compared with 2000.

Table A.11 Sectoral emission indicators (key sources) for Finland

Key sources	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
1.A.1. Energy industries (CO ₂)	100	103	95	108	133	121	149	133	116	114	107	145
1.A.2. Manufacturing industries and construction (CO ₂)	100	96	94	92	97	97	94	106	106	110	111	96
1.A.3. Transport (CO ₂)	100	93	93	88	91	89	88	92	99	102	99	101
1.A.3. Transport (N ₂ O)	100	86	86	90	92	89	95	99	120	113	109	110
1.A.4. Other sectors (CO ₂)	100	95	97	87	91	88	86	87	88	84	77	80
1.A.4. Other sectors (CH ₄)	100	95	72	63	68	112	115	115	117	118	113	120
1.A.5. Other (CO ₂)	100	134	134	135	149	181	278	187	182	83	101	132
1.B.1. Fugitive emissions from solid fuels (CH ₄)	100	100	100	100	100	100	100	100	100	100	100	100
1.B.1. Fugitive emissions from solid fuels (CO ₂)	100	100	100	100	100	100	100	100	100	100	100	100
1.B.2. Fugitive emissions from oil and natural gas (CH ₄)	100	118	118	118	118	118	346	241	355	207	218	534
1.B.2. Fugitive emissions from oil and natural gas (CO ₂)	100	82	111	139	95	94	57	63	58	58	60	54
2.A. Mineral products (CO ₂)	100	88	80	67	71	71	73	75	78	85	91	89
2.B. Chemical industry (N ₂ O)	100	88	79	82	85	87	87	88	83	83	83	79
2.B. Chemical industry (CO ₂)	0	0	0	0	0	0	0	0	0	0	0	0
2.C. Metal production (CO ₂)	0	0	0	0	0	0	0	0	0	0	0	0
2.C. Metal production (PFC)	0	0	0	0	0	0	0	0	0	0	0	0
2.E. Production of halocarbons and SF ₆ (HFC)	0	0	0	0	0	0	0	0	0	0	0	0
2.F. Consumption of halocarbons and SF ₆ (HFC)	0	0	0	0	22	100	264	572	836	1 086	1 711	2 240
2.F. Consumption of halocarbons and SF ₆ (SF ₆)	138	98	53	49	51	100	105	111	78	76	75	80
2.G. Other (CO ₂)	0	0	0	0	0	0	0	0	0	0	0	0
4.A. Enteric fermentation (CH ₄)	100	96	93	93	93	87	88	89	87	85	85	84
4.B. Manure management (CH ₄)	100	95	93	92	93	109	109	113	110	107	107	103
4.B. Manure management (N ₂ O)	100	95	94	94	94	84	83	83	80	76	75	72
4.D. Agricultural soils (N ₂ O)	100	93	85	86	86	88	85	83	81	78	79	78
4.D. Agricultural soils (CO ₂)	100	87	72	69	64	54	57	64	63	63	63	61
6.A. Solid waste disposal on land (CH ₄)	100	102	102	102	100	99	96	93	89	87	82	79
6.B. Waste water handling (N ₂ O)	100	96	93	89	89	90	87	86	82	78	78	78
6.D. Other (CO ₂)	0	0	0	0	0	0	0	0	0	0	0	0

Table A.12 Main driving force indicators and sectoral GHG and driving force indicators for Finland

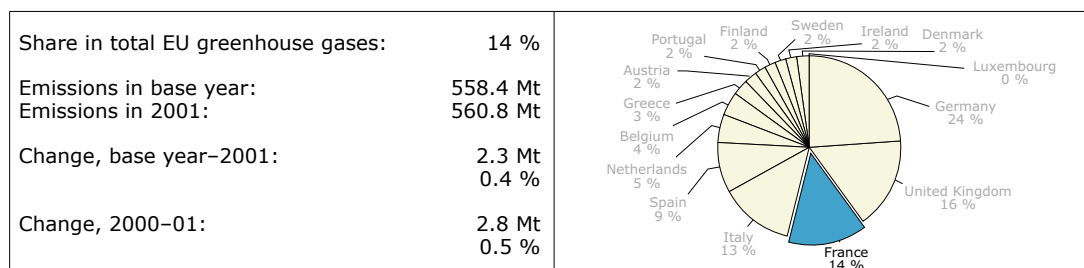
Indicators	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Main driving forces												
CO ₂ from fuel combustion (C)	100	98	95	97	108	104	114	111	107	105	102	112
GDP (E)	100	94	91	90	93	97	101	107	112	116	123	123
Gross inland energy consumption (E)	100	102	98	102	108	101	109	115	117	116	115	:
Energy industries												
CO ₂ from energy industries (C)	100	103	95	108	133	121	149	133	116	114	107	145
Final electricity consumption (E)	100	101	103	105	106	107	110	109	110	110	111	:
Electricity production in public thermal power plants (E)	100	108	101	113	133	129	155	147	127	130	141	:
El. consumption lighting/el. appliances households (E)	100	108	113	115	118	114	119	120	124	128	128	:
Number of dwellings (E)	100	101	103	104	105	107	108	109	110	111	113	:
Electricity consumption in services (E)	100	103	105	106	108	110	114	117	121	124	128	:
Gross value added in services (E)	100	95	90	91	92	96	100	104	109	114	119	:
Transport												
CO ₂ from transport (C)	100	93	93	88	91	89	88	92	99	102	99	101
Passenger transport in cars (pkm) (E)	100	99	99	97	97	98	98	101	104	107	109	:
Freight transport on road (tkm) (E)	100	94	94	95	98	88	92	97	101	101	105	:
CO ₂ from diesel consumption of freight traffic (E)	100	93	92	91	98	97	100	108	112	117	118	:
Households and services												
CO ₂ from other sectors (C)	100	95	97	87	91	88	86	87	88	84	77	80
Heating degree days (E)	100	100	104	108	108	102	110	104	108	101	94	104

Indicators	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
CO ₂ from residential (C)	100	97	100	88	98	94	60	59	61	57	49	51
Number of dwellings (E)	100	101	103	104	105	107	108	109	110	111	113	:
CO ₂ from commercial/institutional (C)	100	144	144	91	94	98	725	791	742	718	654	657
Gross value added in services (E)	100	95	90	91	92	96	100	104	109	114	119	:
Manufacturing industries												
CO ₂ from manufacturing industries (C)	100	96	94	92	97	97	94	106	106	110	111	96
Gross value added industry (E)	100	90	88	90	97	104	108	118	126	131	144	:
CO ₂ from iron and steel industry (E)	100	94	94	98	101	96	102	116	116	120	113	:
Gross value added iron and steel industry (E)	100	100	121	116	121	153	130	133	123	117	:	:
Crude steel production (E)	100	101	108	114	120	111	115	131	138	138	:	:
CO ₂ from glass, pottery and building mat. industry (E)	100	95	82	70	82	76	36	39	46	51	29	:
Value added glass, pottery and build. mat. industry (E)	100	76	53	45	54	52	56	68	71	80	:	:
CO ₂ emissions from the chemical industry (E)	100	101	94	94	94	91	60	69	72	130	61	:
Value added chemical industry (E)	100	79	77	70	83	82	81	87	91	105	:	:
CO ₂ from food industry (E)	100	101	93	84	93	92	71	64	73	74	45	:
Gross value added food industry (E)	100	100	80	72	71	76	79	78	75	74	:	:
CO ₂ from paper and printing industry (E)	100	93	103	93	105	84	95	99	128	110	89	:
Gross value added paper and printing industry (E)	100	90	84	84	98	113	107	117	131	133	:	:
CO ₂ from textile industry (E)	100	100	88	79	94	97	112	85	112	103	9	:
Gross value added textile industry (E)	100	77	59	50	59	58	58	61	62	60	:	:
CO ₂ from autoproducer thermal power stations (E)	100	93	95	102	111	114	96	124	115	135	118	:
All output of autoproducer thermal power stations (E)	100	96	101	114	124	124	166	180	197	203	148	:
Agricultural soils												
N ₂ O from agricultural soils (C)	100	93	85	86	86	88	85	83	81	78	79	78
Fertiliser and manure use (C)	100	90	76	78	78	87	81	77	77	73	74	73
Enteric fermentation												
CH ₄ from enteric fermentation (C)	100	96	93	93	93	87	88	89	87	85	85	84
Cattle population (C)	100	96	94	92	91	84	84	84	82	80	78	76
Mineral products												
CO ₂ from mineral products (C)	100	88	80	67	71	71	73	75	78	85	91	89
Cement/clinker production (C)	100	81	69	51	52	55	59	70	75	79	86	80
Solid waste disposal on land												
CH ₄ from solid waste disposal on land (C)	100	102	102	102	100	99	96	93	89	87	82	79
Waste Disposal on land (C)	100	94	86	78	69	64	57	53	55	69	71	74

Estimates in italics.

Source: is provided in brackets with C for CRF and E for Eurostat.

France



Distance-to-target indicator: France's GHG emissions increased slightly compared with 2000. In 2001, total GHG emissions were 561 Mt (CO₂ equivalents), which was 0.4 % above the base-year level. In the burden sharing agreement under the Kyoto Protocol, France agreed to stabilise its GHG emissions by 2008–12 to the base-year level. Assuming a linear target path from 1990 to 2010, French GHG emissions were 0.4 index points above this target path in 2001 (Figure A.13).

Greenhouse gas emission trends: CO₂ emissions account for 73 % of total GHG emissions. They increased by 1 % compared with 2000 and were 4 % above 1990 levels in 2001. In 2001, CO₂ emissions increased mainly because of increases in households and services and transport. Over the period 1990–2001, CO₂ emissions increased mainly from transport (+ 18 %) and, to a lesser degree, from households and services (+ 10 %).

Emissions of CH₄ account for 11 % of total French GHG emissions and decreased by 8 % between 1990 and 2001. Also in 2001, emissions decreased compared with 2000. The main reasons for declining CH₄ emissions were declines in coal mining and falling cattle numbers.

Emissions of N₂O are responsible for 13 % of total GHG emissions and decreased by 16 %. The main reason for N₂O emission decreases were reduction measures in the adipic acid production and a decline of fertiliser use.

Fluorinated gas emissions account for 2 % of total GHG emissions and

were 2 % above the base-year level in 2001. Fluorinated gas emissions show opposing trends: HFC emissions increased by 404 % between 1995 and 2001, mainly due to the replacement of ozone depleting substances such as chlorofluorocarbons with HFCs. PFC emissions increased by 5 % and SF₆ emissions decreased by 9 %.

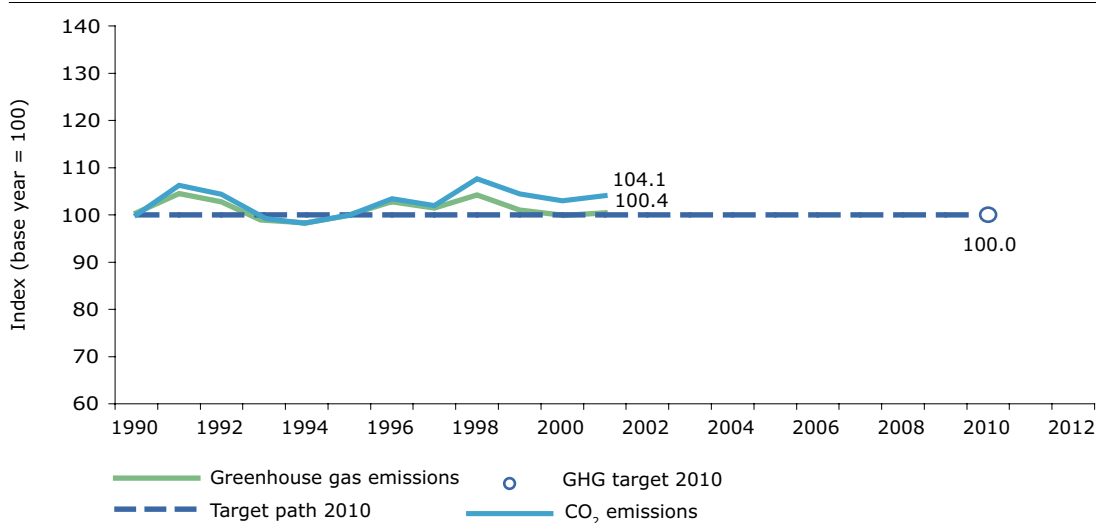
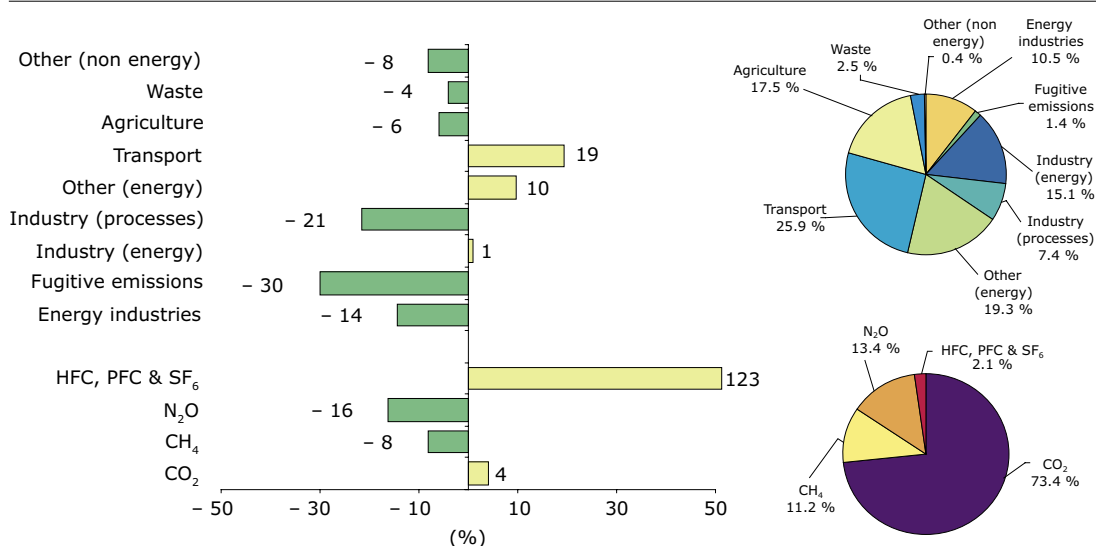
Transport is the largest sector accounting for 26 % of total French GHG emissions. With a 19 % increase it is also the fastest growing sector in France. This is mainly due to fast growing road transport.

Other (energy) is the second largest sector accounting for 19 % of total French GHG emissions. This sector includes mainly emissions from households and services. Emissions were 10 % above 1990 levels in 2001, but fluctuate, to a certain extent, according to annual changes in outdoor temperature.

Agriculture is the third largest sector and accounts for 18 % of total French GHG emissions. Emissions decreased by 6 % mainly due to a decline in fertiliser use and falling cattle population.

Industry (energy) is the fourth largest sector accounting for 15 % of total French GHG emissions. Emissions increased by 1 %.

Energy industries is the fifth largest sector accounting for 11 % of total French GHG emissions. The 14 % decrease of the sector is partly due to an increased fuel shift from solid fuels to gas in power and heat production.

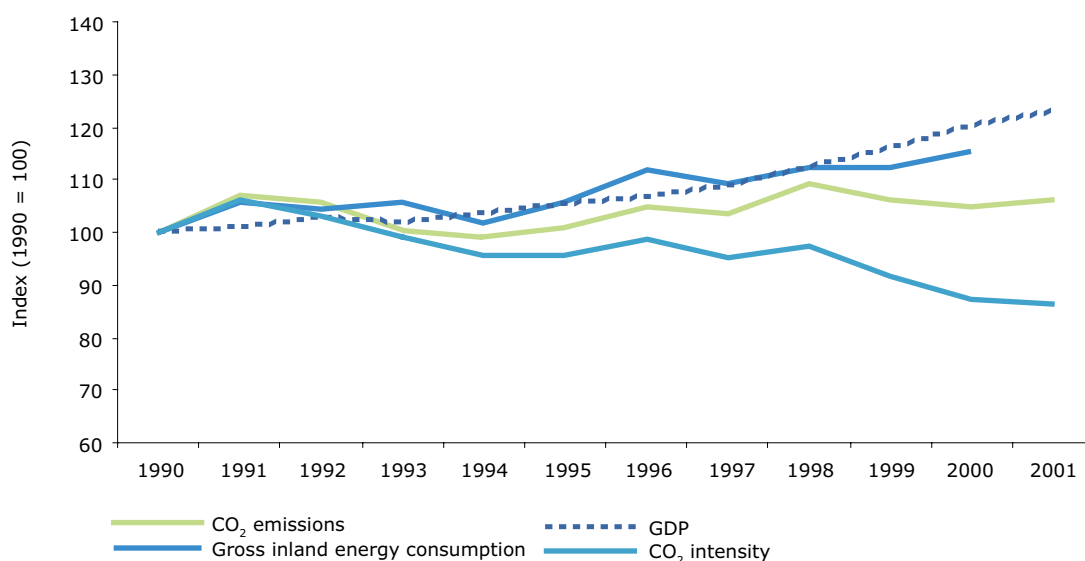
Figure A.13 French GHG emissions compared with Kyoto target for 2008–12 (excluding LUCF)**Figure A.14 Change, base year to 2001, of French GHG emissions by sector and gas and their share in 2001**

Note: The left side of the figure shows the percentage change, base year to 2001, of GHG emissions by sector and gas; the right side of the figure shows the share by sector and gas in total French GHG emissions in 2001.

Industry (processes) is the sixth largest sector accounting for 7 % of total French GHG emissions. Emissions decreased by 21 % mainly due to reduction measures in the adipic acid production.

Main driving forces: CO₂ emissions from fossil fuel combustion account for 69 % of total French GHG emissions. Figure A.15 shows the development of main driving forces of CO₂ emissions

from fossil fuel combustion: real GDP grew by 23 % between 1990 and 2001, energy consumption increased by 15 % between 1990 and 2000 (no 2001 value available). Emissions of CO₂ from fossil fuels were 6 % above 1990 levels in 2001. Therefore, CO₂ emissions decoupled slightly from GDP, and, to a lesser extent, from energy consumption in the late 1990s; CO₂ intensity of GDP was 14 % below 1990 levels.

Figure A.15 GDP, gross inland energy consumption, CO₂ emissions from fossil fuel combustion and CO₂ intensity of GDP (as an index)

Source: Eurostat, Member State inventory submission (CRF tables), EEA (2003a).

Table A.13 Greenhouse gases and distance-to-target indicators for France

	Base year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Greenhouse gas emissions (without LUCF)	100.0	100.4	104.5	102.8	98.9	98.3	99.9	102.8	101.5	104.2	101.0	99.9	100.4
DTI 2010	0.0	0.4	4.5	2.8	- 1.1	- 1.7	- 0.1	2.8	1.5	4.2	1.0	- 0.1	0.4
CO ₂ (without LUCF)	100.0	100.0	106.2	104.3	99.4	98.3	99.9	103.4	102.0	107.6	104.4	103.0	104.1
CH ₄ (without LUCF)	100.0	100.0	100.3	99.8	100.2	100.0	100.7	100.0	95.4	94.8	93.6	93.3	91.9
N ₂ O (without LUCF)	100.0	100.0	99.5	98.1	96.4	97.7	99.5	101.1	101.6	93.7	87.3	84.8	83.6
F-gases	100.0	144.4	117.2	103.0	89.1	85.5	100.0	119.4	137.6	152.0	173.9	209.9	222.9

Table A.14 Sectoral emission indicators (key sources) for France

Key sources	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
1.A.1. Energy industries (CO ₂)	100	118	107	87	82	86	92	87	106	96	94	85
1.A.2. Manufacturing industries and construction (CO ₂)	100	102	100	97	100	100	101	103	108	100	100	101
1.A.3. Transport (CO ₂)	100	102	106	106	107	109	110	112	113	116	116	118
1.A.3. Transport (N ₂ O)	100	107	116	125	141	157	173	188	201	216	226	244
1.A.4. Other sectors (CO ₂)	100	110	110	107	101	103	112	105	108	107	103	110
1.A.4. Other sectors (CH ₄)	100	122	114	112	95	97	104	93	98	95	90	98
1.A.5. Other (CO ₂)	0	0	0	0	0	0	0	0	0	0	0	0
1.B.1. Fugitive emissions from solid fuels (CH ₄)	100	93	97	101	103	102	78	66	65	61	59	39
1.B.1. Fugitive emissions from solid fuels (CO ₂)	0	0	0	0	0	0	0	0	0	0	0	0
1.B.2. Fugitive emissions from oil and natural gas (CH ₄)	100	96	93	89	85	82	78	78	78	77	78	77
1.B.2. Fugitive emissions from oil and natural gas (CO ₂)	100	107	102	107	105	91	93	98	96	93	95	98
2.A. Mineral products (CO ₂)	100	96	87	82	85	82	80	78	83	80	82	82
2.B. Chemical industry (N ₂ O)	100	100	101	101	104	107	108	106	76	53	47	47
2.B. Chemical industry (CO ₂)	100	100	88	93	94	94	99	96	95	91	97	87
2.C. Metal production (CO ₂)	100	77	72	70	86	101	75	87	84	75	66	63
2.C. Metal production (PFC)	347	248	210	144	116	100	98	104	136	177	129	89
2.E. Production of halocarbons and SF ₆ (HFC)	418	279	195	144	115	100	82	82	100	120	47	53
2.F. Consumption of halocarbons and SF ₆ (HFC)	2	2	2	3	19	100	188	270	321	408	637	721
2.F. Consumption of halocarbons and SF ₆ (SF ₆)	90	92	94	96	98	100	101	101	96	83	82	82
2.G. Other (CO ₂)	0	0	0	0	0	0	0	0	0	0	0	0
4.A. Enteric fermentation (CH ₄)	100	98	97	96	96	96	96	95	94	94	95	95
4.B. Manure management (CH ₄)	100	98	97	96	96	96	97	96	95	95	96	97
4.B. Manure management (N ₂ O)	100	98	97	96	96	96	96	96	95	95	95	96
4.D. Agricultural soils (N ₂ O)	100	98	95	93	94	94	96	97	97	97	95	92
4.D. Agricultural soils (CO ₂)	0	0	0	0	0	0	0	0	0	0	0	0
6.A. Solid waste disposal on land (CH ₄)	100	106	111	116	120	124	127	110	108	104	100	96
6.B. Waste water handling (N ₂ O)	100	101	101	102	101	102	101	98	95	95	96	97
6.D. Other (CO ₂)	0	0	0	0	0	0	0	0	0	0	0	0

Table A.15 Main driving force indicators and sectoral GHG and driving force indicators for France

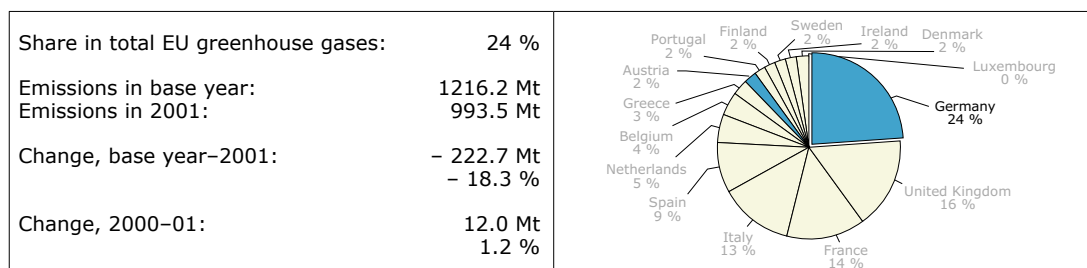
Indicators	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Main driving forces												
CO ₂ from fuel combustion (C)	100	107	106	101	99	101	105	103	109	106	105	106
GDP (E)	100	101	103	102	104	105	107	109	112	116	120	123
Gross inland energy consumption (E)	100	106	104	106	102	106	112	109	112	112	115	:
Energy industries												
CO ₂ from energy industries (C)	100	118	107	87	82	86	92	87	106	96	94	85
Final electricity consumption (E)	100	106	109	110	111	113	118	118	122	124	128	:
Electricity production in public thermal power plants (E)	100	147	120	52	55	72	87	67	118	124	120	:
El. consumption lighting/el. appliances households (E)	100	102	110	110	115	115	120	132	141	156	:	:
Number of dwellings (E)	100	101	102	103	104	106	107	108	110	112	114	:
Electricity consumption in services (E)	100	108	110	112	112	123	122	119	124	128	135	:
Gross value added in services (E)	100	101	103	103	105	105	107	109	112	115	120	:
Transport												
CO ₂ from transport (C)	100	102	106	106	107	109	110	112	113	116	116	118
Passenger transport in cars (pkm) (E)	100	101	104	104	106	109	111	113	116	119	119	:
Freight transport on road (tkm) (E)	100	103	106	104	110	117	119	123	127	134	137	:
CO ₂ from diesel consumption of freight traffic (E)	100	106	112	113	121	125	127	131	136	142	144	:
Households and services												
CO ₂ from other sectors (C)	100	110	110	107	101	103	112	105	108	107	103	110
Heating degree days (E)	100	118	109	110	97	104	117	99	105	100	96	103

Indicators	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
CO ₂ from residential (C)	100	111	108	105	100	102	111	102	109	106	102	110
Number of dwellings (E)	100	101	102	103	104	106	107	108	110	112	114	:
CO ₂ from commercial/institutional (C)	100	112	116	115	107	109	119	113	113	114	108	117
Gross value added in services (E)	100	101	103	103	105	105	107	109	112	115	120	:
Manufacturing industries												
CO ₂ from manufacturing industries (C)	100	102	100	97	100	100	101	103	108	100	100	101
Gross value added industry (E)	100	101	102	97	100	104	103	104	108	111	116	:
CO ₂ from iron and steel industry (E)	100	98	87	81	89	102	97	102	93	84	83	:
Gross value added iron and steel industry (E)	100	93	89	82	97	107	105	:	:	:	:	:
Crude steel production (E)	100	97	95	90	95	95	93	104	106	106	:	:
CO ₂ from glass, pottery and building mat. industry (E)	100	98	98	85	59	57	61	52	61	73	66	:
Value added glass, pottery and build. mat. industry (E)	100	98	95	92	98	99	95	95	100	102	:	:
CO ₂ emissions from the chemical industry (E)	100	80	71	78	72	77	81	60	62	59	73	:
Value added chemical industry (E)	100	100	105	110	122	130	128	132	136	144	:	:
CO ₂ from food industry (E)	100	110	111	111	98	95	100	97	105	95	98	:
Gross value added food industry (E)	100	104	107	112	114	115	114	115	118	:	:	:
CO ₂ from paper and printing industry (E)	100	105	110	106	100	126	130	135	131	134	134	:
Gross value added paper and printing industry (E)	100	105	108	114	117	116	113	112	115	117	:	:
CO ₂ from textile industry (E)	100	106	105	101	82	85	91	84	78	78	79	:
Gross value added textile industry (E)	100	101	100	96	102	97	93	89	91	89	:	:
CO ₂ from autoproducer thermal power stations (E)	100	105	88	96	87	89	89	96	106	103	65	:
All output of autoproducer thermal power stations (E)	100	101	89	101	95	94	98	105	113	87	98	:
Agricultural soils												
N ₂ O from agricultural soils (C)	100	98	95	93	94	94	96	97	97	97	95	92
Fertiliser and manure use (C)	100	101	96	92	94	96	99	100	100	100	95	93
Enteric fermentation												
CH ₄ from enteric fermentation (C)	100	98	97	96	96	96	96	95	94	94	95	95
Cattle population (C)	100	99	96	96	95	96	96	94	94	94	95	96
Mineral products												
CO ₂ from mineral products (C)	100	96	87	82	85	82	80	78	83	80	82	82
Cement/clinker production (C)	100	95	85	79	80	79	77	74	79	77	78	79
Solid waste disposal on land												
CH ₄ from solid waste disposal on land (C)	100	106	111	116	120	124	127	110	108	104	100	96
Waste Disposal on land (C)	100	102	104	106	109	112	114	117	120	123	129	129

Estimates in italics.

Source: Provided in brackets with C for CRF and E for Eurostat.

Germany



Distance-to-target indicator:

Germany's GHG emissions increased by 1.2 % in 2001, compared with 2000. The increase occurred mainly in households and services due to cold outdoor temperature. In 2001, total GHG emissions were 994 Mt (CO₂ equivalents), which was 18 % below the base-year level. In the burden sharing agreement under the Kyoto Protocol, Germany agreed to reduce its GHG emissions by 21 % by 2008–12, from the base-year level. Assuming a linear target path from 1990 to 2010, German GHG emissions were 6.8 index points below this target path in 2001 (Figure A.16).

Greenhouse gas emission trends: CO₂ emissions account for 88 % of total GHG emissions. They increased by 1 % compared with 2000, but were 14 % below 1990 levels in 2001. In 2001, CO₂ emissions increased mainly because of cold outdoor temperature. Over the period 1990–2001, the main reasons for CO₂ emission decreases were efficiency improvements and restructuring of power production and manufacturing industry after the German reunification. Also, emissions from households and services declined mainly due to efficiency improvements and fuels shifts in east German households. Only CO₂ emissions from transport increased between 1990 and 2001.

Emissions of CH₄ account for 5 % of total German GHG emissions and decreased by 49 % between 1990 and 2001. Also in 2001, emissions decreased compared with 2000. Emissions of CH₄ declined in all sectors. The main reasons for this are declines in coal mining,

decreasing waste disposal on land and falling cattle numbers.

Emissions of N₂O are responsible for 6 % of total GHG emissions and decreased by 31 %. The main reasons for N₂O emission decreases were reduction measures in the adipic acid production and the decline of fertiliser and manure use.

Fluorinated gas emissions account for 1 % of total GHG emissions and were 17 % below 1995 levels in 2001. Fluorinated gas emissions show opposing trends: HFC emissions increased by 28 % between 1995 and 2001, mainly due to the replacement of ozone depleting substances such as chlorofluorocarbons with HFCs. PFC emissions decreased by 59 % and SF₆ emissions by 50 %.

Energy industries is the largest sector accounting for 35 % of total German GHG emissions. The 16 % decrease is largely due to efficiency improvements and fuel shifts in German power generation.

Other (energy) is the second largest sector accounting for 19 % of total German GHG emissions. This sector includes mainly emissions from households and services. Emissions were 13 % below 1990 levels in 2001, but fluctuate to a certain extent according to annual changes in outdoor temperature. Emission reductions were mainly achieved in Eastern German households.

Transport is the third largest sector accounting for 19 % of total German GHG emissions. With an 11 % increase

Figure A.16 German GHG emissions compared with Kyoto target for 2008–12 (excluding LUCF)

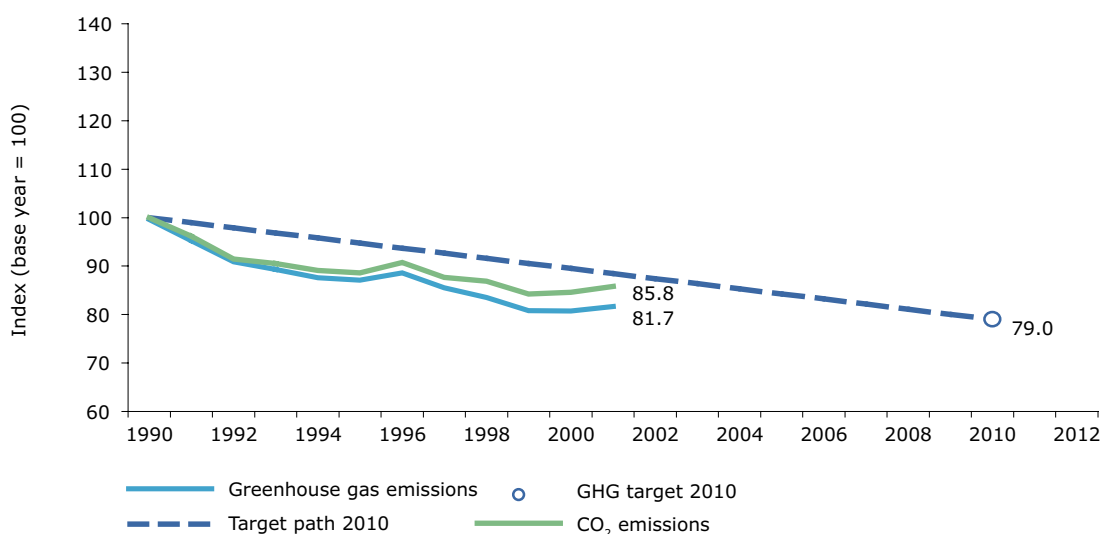
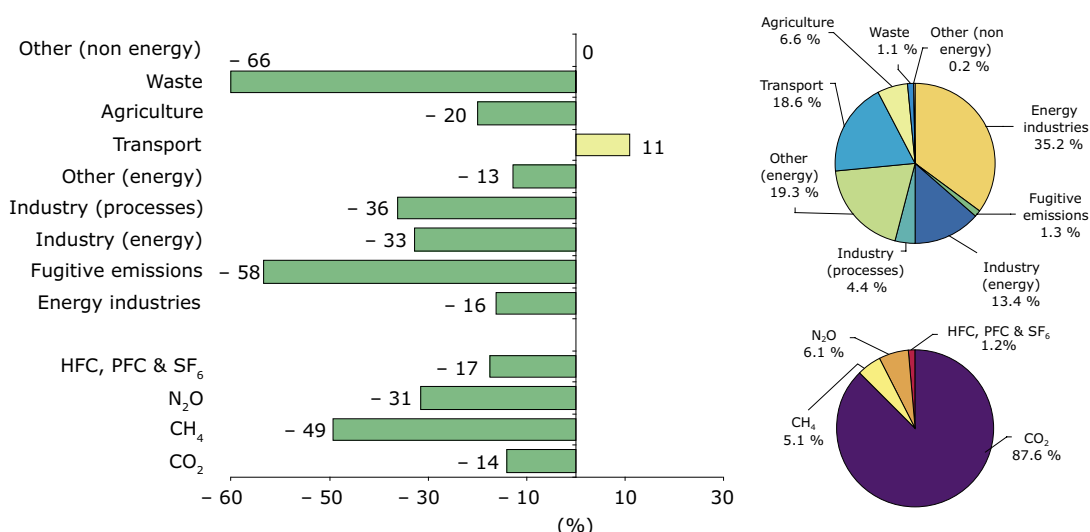


Figure A.17 Change, base year to 2001, of German GHG emissions by sector and gas and their share in 2001



Note: The left side of the figure shows the percentage change, base year to 2001, of GHG emissions by sector and gas; the right side of the figure shows the share by sector and gas in total German GHG emissions in 2001.

it is the only growing sector in Germany. This is mainly due to fast growing road transport.

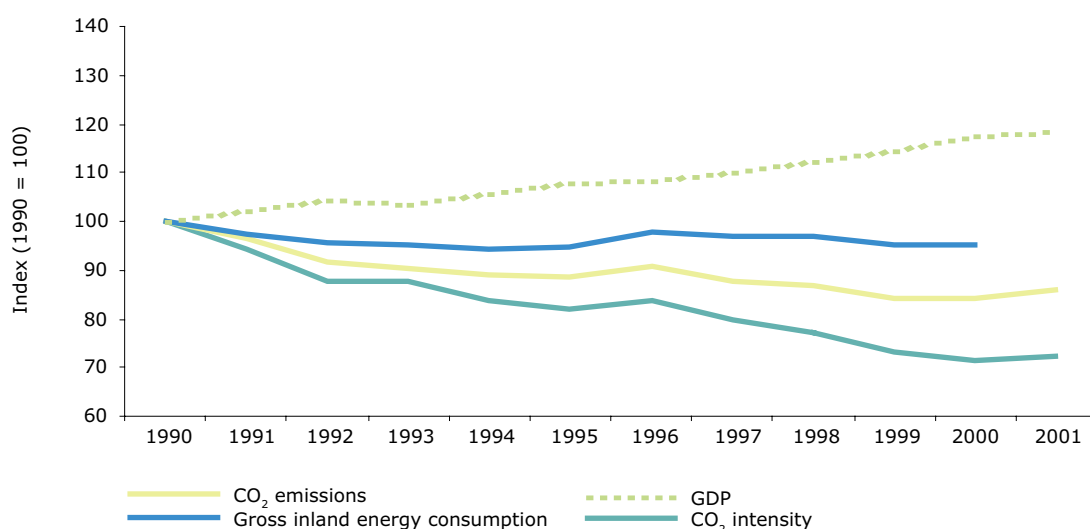
Industry (energy) is the fourth largest sector accounting for 13 % of total German GHG emissions. Emissions decreased by 33 % mainly due to efficiency improvements and restructuring of the industry after reunification.

Agriculture is the fifth largest sector and accounts for 7 % of total German

GHG emissions. Emissions decreased by 20 % mainly due to a decline in cattle population and use of synthetic fertiliser.

Industry (processes) is the sixth largest sector accounting for 4 % of total German GHG emissions. Emissions decreased by 36 % mainly due to reduction measures in adipic acid production.

Main driving forces: CO₂ emissions from fossil fuel combustion account for

Figure A.18 GDP, gross inland energy consumption, CO₂ emissions from fossil fuel combustion and CO₂ intensity of GDP (as an index)

Source: Eurostat, Member State inventory submission (CRF tables), EEA (2003a).

Table A.16 Greenhouse gases and distance-to-target indicators for Germany

	Base year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Greenhouse gas emissions (without LUCF)	100.0	99.6	95.2	90.9	89.3	87.6	87.1	88.6	85.5	83.5	80.8	80.7	81.7
DTI 2010	0.0	- 0.4	- 3.7	- 7.0	- 7.5	- 8.2	- 7.7	- 5.1	- 7.1	- 8.1	- 9.7	- 8.8	- 6.8
CO ₂ (without LUCF)	100.0	100.0	96.2	91.5	90.5	89.1	88.6	90.8	87.7	86.9	84.3	84.6	85.8
CH ₄ (without LUCF)	100.0	100.0	89.9	82.8	76.4	71.9	67.4	63.3	61.3	58.4	56.7	53.2	50.8
N ₂ O (without LUCF)	100.0	100.0	94.6	95.7	91.6	88.3	89.4	91.2	86.1	70.8	67.1	67.5	68.5
F-gases	100.0	68.5	69.5	72.5	83.8	85.5	100.0	93.9	94.9	98.3	87.7	77.5	82.6

85 % of total German GHG emissions. Figure A.18 shows the development of main driving forces of CO₂ emissions from fossil fuel combustion: real GDP grew by 18 % between 1990 and 2001, energy consumption decoupled from GDP and decreased by 5 % between 1990 and 2000 (no 2001 value available).

Emissions of CO₂ from fossil fuels were 14 % below 1990 levels in 2001. Therefore, CO₂ emissions decoupled from GDP and energy consumption; CO₂ intensity of GDP was 28 % below 1990 in 2001.

Table A.17 Sectoral emission indicators (key sources) for Germany

Key sources	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
1.A.1. Energy industries (CO ₂)	100	97	91	89	88	85	87	82	83	79	82	84
1.A.2. Manufacturing industries and construction (CO ₂)	100	88	81	75	76	76	73	73	71	69	69	67
1.A.3. Transport (CO ₂)	100	102	106	109	107	109	109	109	111	115	113	110
1.A.3. Transport (N ₂ O)	100	124	145	161	166	177	183	187	191	199	201	211
1.A.4. Other sectors (CO ₂)	100	101	93	97	92	93	106	99	95	87	84	92
1.A.4. Other sectors (CH ₄)	100	76	62	59	55	29	27	31	26	26	24	24
1.A.5. Other (CO ₂)	100	71	54	43	40	34	27	26	26	22	21	20
1.B.1. Fugitive emissions from solid fuels (CH ₄)	100	91	86	73	64	66	57	54	49	45	35	24
1.B.1. Fugitive emissions from solid fuels (CO ₂)	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
1.B.2. Fugitive emissions from oil and natural gas (CH ₄)	100	107	118	131	126	99	103	100	99	98	96	97
1.B.2. Fugitive emissions from oil and natural gas (CO ₂)	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
2.A. Mineral products (CO ₂)	100	91	93	93	100	97	90	92	94	96	96	89
2.B. Chemical industry (N ₂ O)	100	101	112	102	98	100	106	90	36	20	20	26
2.B. Chemical industry (CO ₂)	100	71	70	67	69	83	82	81	82	79	84	83
2.C. Metal production (CO ₂)	100	93	81	75	68	78	78	77	83	86	87	88
2.C. Metal production (PFC)	160	137	123	114	95	100	95	69	75	56	23	24
2.E. Production of halocarbons and SF ₆ (HFC)	83	83	83	83	83	100	72	70	67	64	29	26
2.F. Consumption of halocarbons and SF ₆ (HFC)	NE	2	8	67	78	100	127	160	193	215	253	328
2.F. Consumption of halocarbons and SF ₆ (SF ₆)	58	66	74	82	88	100	94	92	88	62	55	43
2.G. Other (CO ₂)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
4.A. Enteric fermentation (CH ₄)	100	88	84	82	82	82	81	79	77	77	75	75
4.B. Manure management (CH ₄)	100	87	85	83	82	81	81	83	80	80	78	79
4.B. Manure management (N ₂ O)	100	87	84	83	82	81	81	82	80	80	78	79
4.D. Agricultural soils (N ₂ O)	100	91	88	85	80	84	84	83	84	86	87	84
4.D. Agricultural soils (CO ₂)	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
6.A. Solid waste disposal on land (CH ₄)	100	90	74	62	57	50	43	41	38	37	36	36
6.B. Waste water handling (N ₂ O)	100	41	5	5	6	6	6	7	7	7	7	7
6.D. Other (CO ₂)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO

Table A.18 Main driving force indicators and sectoral GHG and driving force indicators for Germany

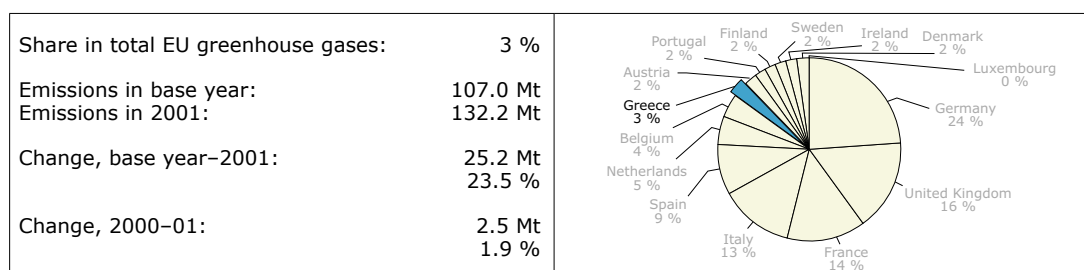
Indicators	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Main driving forces												
CO ₂ from fuel combustion (C)	100	96	91	90	89	88	91	88	87	84	84	86
GDP (E)	100	102	105	103	106	108	109	110	112	114	118	118
Gross inland energy consumption (E)	100	97	96	95	94	95	98	97	97	95	96	:
Energy industries												
CO ₂ from energy industries (C)	100	97	91	89	88	85	87	82	83	79	82	84
Final electricity consumption (E)	100	97	96	95	96	101	103	103	104	105	108	:
Electricity production in public thermal power plants (E)	100	100	96	95	95	124	131	128	133	130	106	:
El. consumption lighting/el. appliances households (E)	100	102	103	105	107	109	111	112	114	116	:	:
Number of dwellings (E)	100	101	102	103	104	106	108	109	111	112	113	:
Electricity consumption in services (E)	100	93	92	93	92	94	98	99	103	106	108	:
Gross value added in services (E)	:	100	104	105	107	111	114	116	120	124	129	:
Transport												
CO ₂ from transport (C)	100	102	106	109	107	109	109	109	111	115	113	110
Passenger transport in cars (pkm) (E)	100	102	105	107	106	107	107	108	108	109	106	:
Freight transport on road (tkm) (E)	100	111	114	113	123	126	127	136	145	154	157	:
CO ₂ from diesel consumption of freight traffic (E)	100	104	112	115	125	131	133	136	145	154	:	:
Households and services												
CO ₂ from other sectors (C)	100	101	93	97	92	93	106	99	95	87	84	92

Indicators	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Heating degree days (E)	100	115	104	111	101	110	129	109	105	100	94	106
CO ₂ from residential (C)	100	102	96	104	100	100	111	108	103	93	91	102
Number of dwellings (E)	100	101	102	103	104	106	108	109	111	112	113	0
CO ₂ from commercial/institutional (C)	100	98	90	87	80	85	103	88	85	79	75	80
Gross value added in services (E)	:	100	104	105	107	111	114	116	120	124	129	:
Manufacturing industries												
CO ₂ from manufacturing industries (C)	100	88	81	75	76	76	73	73	71	69	69	67
Gross value added industry (E)	:	100	99	94	97	97	94	96	97	96	98	:
CO ₂ from iron and steel industry (E)	100	92	85	78	86	85	81	85	85	79	87	:
Gross value added iron and steel industry (E)	100	100	98	94	91	106	87	90	90	85	91	:
Crude steel production (E)	100	110	103	98	106	109	104	117	115	109	:	:
CO ₂ from glass, pottery and building mat. industry (E)	100	88	87	88	90	94	92	86	84	80	78	:
Value added glass, pottery and build. mat. industry (E)	100	106	109	110	117	122	114	107	108	113	111	:
CO ₂ emissions from the chemical industry (E)	100	79	77	73	69	66	53	49	42	42	53	:
Value added chemical industry (E)	100	103	106	108	114	121	120	116	115	120	121	:
CO ₂ from food industry (E)	100	87	84	79	78	73	75	68	67	67	67	:
Gross value added food industry (E)	100	110	111	115	117	118	114	114	114	124	124	:
CO ₂ from paper and printing industry (E)	100	90	83	86	91	99	100	105	101	102	102	:
Gross value added paper and printing industry (E)	100	107	109	108	113	115	118	119	120	127	128	:
CO ₂ from textile industry (E)	100	80	63	48	44	47	46	37	35	30	29	:
Gross value added textile industry (E)	100	101	97	94	89	79	75	71	71	68	69	:
CO ₂ from autoproducer thermal power stations (E)	100	102	96	93	89	74	67	60	56	49	49	:
All output of autoproducer thermal power stations (E)	100	96	90	86	81	87	76	74	71	67	63	:
Agricultural soils												
N ₂ O from agricultural soils (C)	100	91	88	85	80	84	84	83	84	86	87	84
Fertiliser and manure use (C)	100	90	86	83	77	82	82	80	82	84	86	82
Enteric fermentation												
CH ₄ from enteric fermentation (C)	100	88	84	82	82	82	81	79	77	77	75	75
Cattle population (C)	100	88	83	82	82	82	81	78	77	76	75	75
Mineral products												
CO ₂ from mineral products (C)	100	91	93	93	100	97	90	92	94	96	96	89
Cement/clinker production (C)	100	90	94	95	100	98	90	93	96	97	97	86
Solid waste disposal on land												
CH ₄ from solid waste disposal on land (C)	100	90	74	62	57	50	43	41	38	37	36	36
Waste Disposal on land (C)	100	90	74	62	57	50	43	41	39	38	38	38

Estimates in italics.

Source: Provided in brackets with C for CRF and E for Eurostat.

Greece



Distance-to-target indicator: Greece's GHG emissions increased by 1.9 % in 2001, compared with 2000. In 2001, total GHG emissions were 132 Mt (CO₂ equivalents), which was 24 % above the base-year level. In the burden sharing agreement under the Kyoto Protocol, Greece agreed to limit its GHG emissions to 25 % above the base-year level by 2008–12. Assuming a linear target path from 1990 to 2010, Greek GHG emissions were 9.8 index points above this target path in 2001 (Figure A.19).

Greenhouse gas emission trends: CO₂ emissions account for 80 % of total GHG emissions. They increased by 2 % compared with 2000 and were 26 % above 1990 levels in 2001. In 2001, CO₂ emissions increased mainly because of increases from households and services and from transport. Over the period 1990–2001, CO₂ emissions increased in all fuel combusting sectors.

Emissions of CH₄ account for 8 % of total Greek GHG emissions and increased by 28 % between 1990 and 2001. Also in 2001, emissions increased compared with 2000. The main reason for increasing CH₄ emissions was solid waste disposal on land.

Emissions of N₂O are responsible for 8 % of total GHG emissions and increased by 1 %. Emissions increased from energy industries, transport and households and services, whereas reductions were achieved from agricultural soil.

Fluorinated gas emissions account for 3 % of total GHG emissions and were 30 % above 1995 levels in 2001.

Fluorinated gas emissions show opposing trends: HFC emissions increased by 31 % between 1995 and 2001, mainly due to the replacement of ozone depleting substances such as chlorofluorocarbons with HFCs. PFC emissions decreased by 2 % while the SF₆ emissions were not reported by Greece.

Energy industries is the largest sector accounting for 44 % of total Greek GHG emissions. The 28 % increase of the sector is largely due to increased solid fossil fuel use in power and heat production.

Transport is the second largest sector accounting for 18 % of total Greek GHG emissions. The 25 % increase is mainly due to fast growing road transport.

Industry (processes) is the third largest sector accounting for 10 % of total Greek GHG emissions. Emissions increased by 10 % mainly due to increases in HFC consumption due to growing cement production.

Industry (energy) is the fourth largest sector accounting for 8 % of total Greek GHG emissions. Emissions increased by 6 %.

Agriculture is the fifth largest sector and it accounts for 8 % of total Greek GHG emissions. Emissions decreased by 4 % mainly due to the declining use of synthetic fertilisers.

Other (energy) is the sixth largest sector accounting for 8 % of total Greek GHG emissions. This sector includes mainly emissions from households and services.

Figure A.19 Greek GHG emissions compared with Kyoto target for 2008–12 (excluding LUCF)

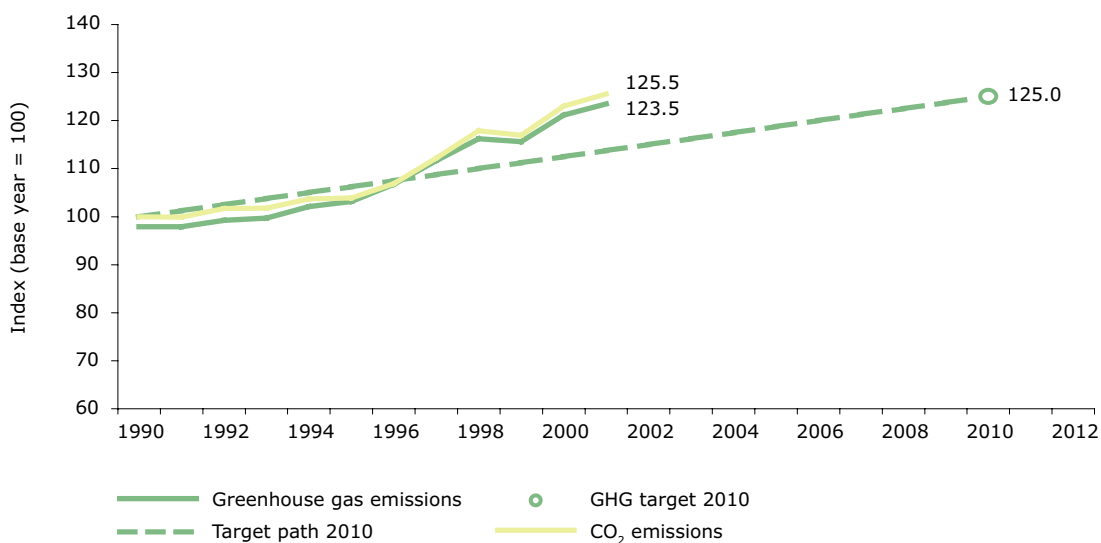
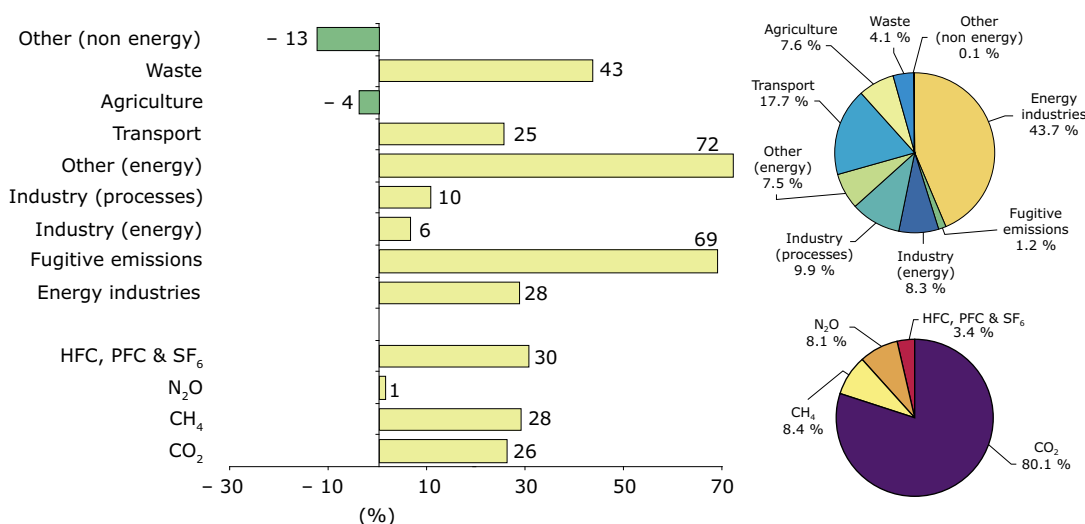


Figure A.20 Change, base year to 2001, of Greek GHG emissions by sector and gas and their share in 2001

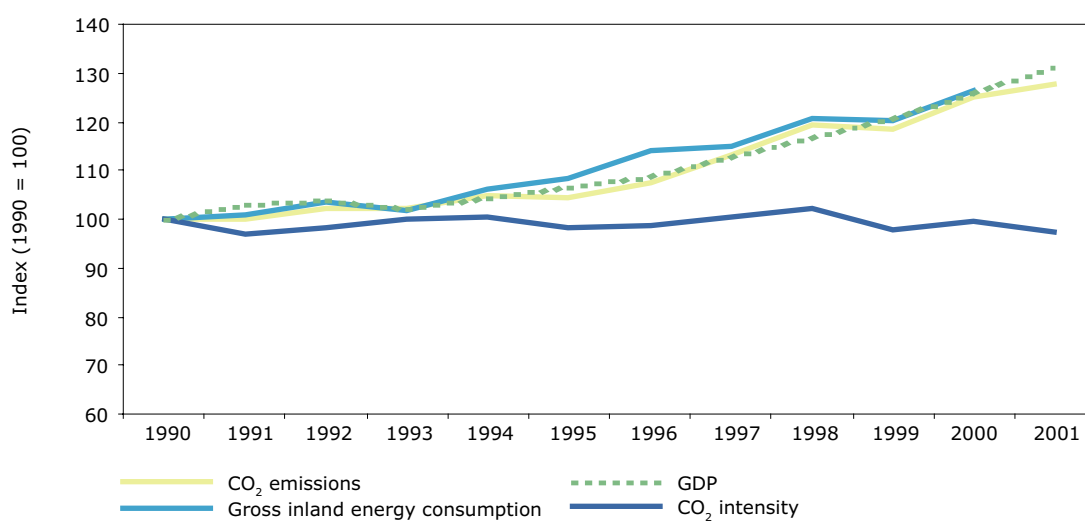


Note: The left side of the figure shows the percentage change, base year to 2001, of GHG emissions by sector and gas; the right side of the figure shows the share by sector and gas in total Greek GHG emissions in 2001.

Emissions were 72 % above 1990 levels in 2001, which was the largest sector increase.

Main driving forces: CO₂ emissions from fossil fuel combustion account for 74 % of total Greek GHG emissions. Figure 21 shows the development of main driving forces of CO₂ emissions from fossil fuel combustion: real GDP

grew by 31 % between 1990 and 2001, energy consumption increased by 26 % between 1990 and 2000 (no 2001 value available). Emissions of CO₂ from fossil fuels were 28 % above 1990 levels in 2001. Therefore emissions did not decouple from GDP and energy use; CO₂ intensity of GDP was 3 % below 1990 in 2001.

Figure A.21 GDP, gross inland energy consumption, CO₂ emissions from fossil fuel combustion and CO₂ intensity of GDP (as an index)

Source: Eurostat, Member State inventory submission (CRF tables), EEA (2003a).

Table A.19 Greenhouse gases and distance-to-target indicators for Greece

	Base year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Greenhouse gas emissions (without LUCF)	100.0	97.9	97.9	99.2	99.7	102.1	103.2	106.7	111.7	116.2	115.6	121.2	123.5
DTI 2010	0.0	- 2.1	- 3.4	- 3.3	- 4.0	- 2.9	- 3.1	- 0.8	2.9	6.2	4.3	8.7	9.8
CO ₂ (without LUCF)	100.0	100.0	99.9	101.7	101.8	103.7	103.9	106.9	112.3	117.9	116.9	123.0	125.5
CH ₄ (without LUCF)	100.0	100.0	100.4	102.1	103.9	107.2	109.5	113.1	114.4	117.3	120.3	122.0	128.4
N ₂ O (without LUCF)	100.0	100.0	99.1	98.4	95.4	96.4	93.3	97.3	100.0	99.5	98.2	103.5	101.3
F-gases	100.0	34.6	39.5	33.6	51.9	66.7	100.0	115.5	126.3	123.3	124.2	128.3	130.1

Table A.20 Sectoral emission indicators (key sources) for Greece

Key sources	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
1.A.1. Energy industries (CO ₂)	100	97	102	102	107	104	102	110	116	116	127	128
1.A.2. Manufacturing industries and construction (CO ₂)	100	99	95	93	91	98	106	108	110	98	106	106
1.A.3. Transport (CO ₂)	100	106	107	108	108	108	110	114	123	127	120	124
1.A.3. Transport (N ₂ O)	100	110	110	113	115	113	117	123	128	130	131	140
1.A.4. Other sectors (CO ₂)	100	104	101	100	101	106	141	145	152	148	160	174
1.A.4. Other sectors (CH ₄)	100	102	102	103	88	88	131	130	130	127	128	127
1.A.5. Other (CO ₂)	0	0	0	0	0	0	0	0	0	0	0	0
1.B.1. Fugitive emissions from solid fuels (CH ₄)	100	102	106	106	109	111	115	113	117	120	123	151
1.B.1. Fugitive emissions from solid fuels (CO ₂)	0	0	0	0	0	0	0	0	0	0	0	0
1.B.2. Fugitive emissions from oil and natural gas (CH ₄)	100	100	87	67	47	42	47	94	312	497	708	3 914
1.B.2. Fugitive emissions from oil and natural gas (CO ₂)	0	0	0	0	0	0	0	0	0	0	0	0
2.A. Mineral products (CO ₂)	100	100	101	104	101	106	109	109	108	109	109	111
2.B. Chemical industry (N ₂ O)	100	82	86	82	80	79	90	80	79	80	80	80
2.B. Chemical industry (CO ₂)	100	82	54	0	0	26	35	32	39	0	0	0
2.C. Metal production (CO ₂)	100	102	102	99	92	87	87	89	98	107	109	108
2.C. Metal production (PFC)	310	310	304	184	113	100	86	199	246	159	179	98
2.E. Production of halocarbons and SF ₆ (HFC)	29	34	28	49	66	100	115	122	115	115	115	115
2.F. Consumption of halocarbons and SF ₆ (HFC)	0	0	0	27	56	100	146	202	267	356	463	574
2.F. Consumption of halocarbons and SF ₆ (SF ₆)	0	0	0	0	0	0	0	0	0	0	0	0
2.G. Other (CO ₂)	0	0	0	0	0	0	0	0	0	0	0	0
4.A. Enteric fermentation (CH ₄)	100	99	98	98	98	99	99	99	99	98	98	101
4.B. Manure management (CH ₄)	100	98	98	98	98	97	97	97	96	95	95	99
4.B. Manure management (N ₂ O)	100	97	96	94	94	94	94	93	91	89	88	97
4.D. Agricultural soils (N ₂ O)	100	100	95	93	94	89	92	95	93	92	98	93
4.D. Agricultural soils (CO ₂)	:	:	:	:	:	:	:	:	:	:	:	:
6.A. Solid waste disposal on land (CH ₄)	100	102	108	114	122	128	134	140	149	160	170	179
6.B. Waste water handling (N ₂ O)	0	0	0	0	0	0	0	0	0	0	0	0
6.D. Other (CO ₂)	0	0	0	0	0	0	0	0	0	0	0	0

Table A.21 Main driving force indicators and sectoral GHG and driving force indicators for Greece

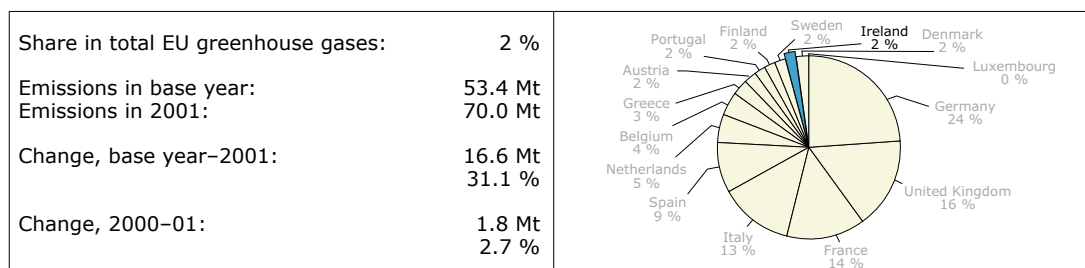
Indicators	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Main driving forces												
CO ₂ from fuel combustion (C)	100	100	102	102	105	104	107	113	119	118	125	128
GDP (E)	100	103	104	102	104	106	109	113	117	121	126	131
Gross inland energy consumption (E)	100	101	104	102	106	109	114	115	121	120	126	:
Energy industries												
CO ₂ from energy industries (C)	100	97	102	102	107	104	102	110	116	116	127	128
Final electricity consumption (E)	100	103	108	110	115	120	125	130	138	144	152	:
Electricity production in public thermal power plants (E)	100	99	106	109	115	115	116	120	129	137	150	:
El. consumption lighting/el. appliances households (E)	100	106	111	113	118	141	172	182	198	212	:	:
Number of dwellings (E)	100	102	104	106	109	111	113	115	115	116	117	:
Electricity consumption in services (E)	100	107	118	128	141	149	157	175	193	210	219	:
Gross value added in services (E)	:	:	:	:	:	:	:	:	:	:	:	:
Transport												
CO ₂ from transport (C)	100	106	107	108	108	108	110	114	123	127	120	124
Passenger transport in cars (pkm) (E)	100	102	104	110	115	121	126	132	139	150	158	:
Freight transport on road (tkm) (E)	100	111	109	119	118	136	146	152	156	163	169	:
CO ₂ from diesel consumption of freight traffic (E)	100	122	125	130	132	135	141	142	143	144	:	:
Households and services												
CO ₂ from other sectors (C)	100	104	101	100	101	106	141	145	152	148	160	174
Heating degree days (E)	100	115	106	104	92	98	104	104	97	90	94	90

Indicators	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
CO ₂ from residential (C)	100	101	99	98	99	104	140	146	154	149	162	174
Number of dwellings (E)	100	102	104	106	109	111	113	115	115	116	117	:
CO ₂ from commercial/institutional (C)	100	128	119	113	117	126	152	147	146	145	148	190
Gross value added in services (E)	:	:	:	:	:	:	:	:	:	:	:	:
Manufacturing industries												
CO ₂ from manufacturing industries (C)	100	99	95	93	91	98	106	108	110	98	106	106
Gross value added industry (E)	:	:	:	:	:	100	102	101	108	111	116	:
CO ₂ from iron and steel industry (E)	100	15	82	79	75	46	24	28	47	60	65	:
Gross value added iron and steel industry (E)	100	70	63	62	51	91	74	150	129	166	:	:
Crude steel production (E)	100	98	92	98	85	94	85	102	111	95	:	:
CO ₂ from glass, pottery and building mat. industry (E)	100	103	103	106	104	108	105	107	104	90	99	:
Value added glass, pottery and build. mat. industry (E)	100	66	109	105	105	101	114	198	193	202	:	:
CO ₂ emissions from the chemical industry (E)	100	63	60	68	66	64	104	121	137	85	88	:
Value added chemical industry (E)	100	83	70	75	77	70	75	99	99	90	:	:
CO ₂ from food industry (E)	100	97	105	107	103	104	112	115	117	104	116	:
Gross value added food industry (E)	100	51	68	66	68	70	72	101	99	94	:	:
CO ₂ from paper and printing industry (E)	100	88	95	90	84	71	97	116	103	106	126	:
Gross value added paper and printing industry (E)	100	91	83	70	65	64	66	101	95	112	:	:
CO ₂ from textile industry (E)	100	77	96	86	81	83	117	112	92	78	92	:
Gross value added textile industry (E)	100	102	103	89	79	70	65	87	82	78	:	:
CO ₂ from autoproducer thermal power stations (E)	100	106	123	119	135	92	80	94	81	25	82	:
All output of autoproducer thermal power stations (E)	100	107	106	97	94	100	101	111	104	106	116	:
Agricultural soils												
N ₂ O from agricultural soils (C)	100	100	95	93	94	89	92	95	93	92	98	93
Fertiliser and manure use (C)	100	96	85	81	81	69	75	83	80	77	89	69
Enteric fermentation												
CH ₄ from enteric fermentation (C)	100	99	98	98	98	99	99	99	99	98	98	101
Cattle population (C)	100	96	94	93	92	92	93	91	90	88	86	95
Mineral products												
CO ₂ from mineral products (C)	100	100	101	104	101	106	109	109	108	109	109	111
Cement/clinker production (C)	100	100	101	104	100	105	108	108	108	108	108	111
Solid waste disposal on land												
CH ₄ from solid waste disposal on land (C)	100	102	108	114	122	128	134	140	149	160	170	179
Waste Disposal on land (C)	100	101	106	110	115	120	124	128	134	139	145	151

Estimates in italics.

Source: is provided in brackets with C for CRF and E for Eurostat.

Ireland



Distance-to-target indicator: Ireland's GHG emissions increased by 2.7 % in 2001, compared with 2000, mainly due to increases in power production from fossil fuels and from growing transport. In 2001, total GHG emissions were 70 Mt (CO₂ equivalents), which was 31 % above the base-year level. In the burden sharing agreement under the Kyoto Protocol, Ireland agreed to limit its GHG emissions to 13 % above the base-year level by 2008–12. Assuming a linear target path from 1990 to 2010, Irish GHG emissions were 23.9 index points above this target path in 2001 (Figure A.22).

Greenhouse gas emission trends: CO₂ emissions account for 66 % of total GHG emissions. They increased by 5 % compared with 2000 and were 46 % above 1990 levels in 2001. In 2001, CO₂ emissions increased mainly from energy industries and from transport. Also over the period 1990–2001, the most important reasons for CO₂ emission increases were fuel combustion in energy industry and in transport. Emissions of CO₂ from transport increased by 120 % mainly due to growth in vehicle fleets, road traffic and fuel tourism (EPA, 2003).

Emissions of CH₄ account for 18 % of total Irish GHG emissions and increased by 6 % between 1990 and 2001. In 2001, emissions decreased compared with 2000. The main reason for increasing CH₄ emissions from 1990 to 2001 was rising cattle population.

Emissions of N₂O are responsible for 15 % of total GHG emissions and increased by 9 %. The main source categories contributing to N₂O emission

increases were agricultural soil and transport.

Fluorinated gas emissions account for 1 % of total GHG emissions and were 232 % above the 1995 level in 2001. Fluorinated gas emissions show opposing trends: HFC emissions increased by 1015 % between 1995 and 2001, due to the replacement of ozone depleting substances such as chlorofluorocarbons with HFCs. PFC emissions increased by 293 % and SF₆ emissions decreased by 20 %.

Agriculture is the largest sector accounting for 27 % of total Irish GHG emissions. Emissions increased by 7 % mainly due to increases in fertiliser and manure use and a growing cattle population.

Energy industries is the second largest sector accounting for 25 % of total Irish GHG emissions. The 55 % increase of the sector is largely due to increased power production from fossil fuels.

Transport is the third largest sector accounting for 17 % of total Irish GHG emissions. With an 124 % increase it is also the fastest growing sector in Ireland. This is mainly due to fast growing road transport.

Other (energy) is the fourth largest sector accounting for 16 % of total Irish GHG emissions. Emissions were 7 % above 1990 levels in 2001, with declining emissions from households (mainly due to a fuel shift from solid fuels to oil and gas) and rapid emission increases from services.

Figure A.22 Irish GHG emissions compared with Kyoto target for 2008–12 (excluding LUCF)

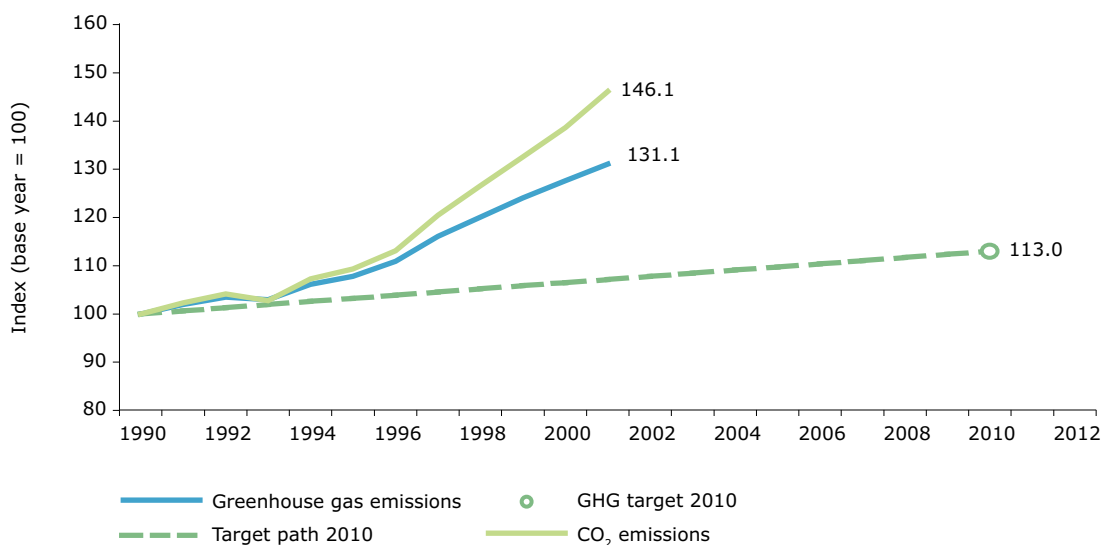
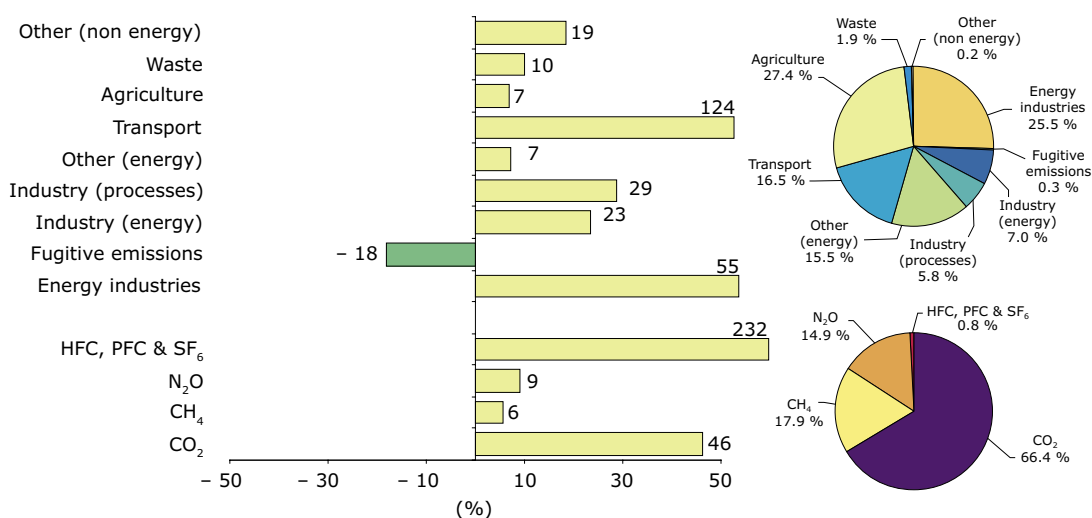


Figure A.23 Change, base year to 2001, of Irish GHG emissions by sector and gas and their share in 2001



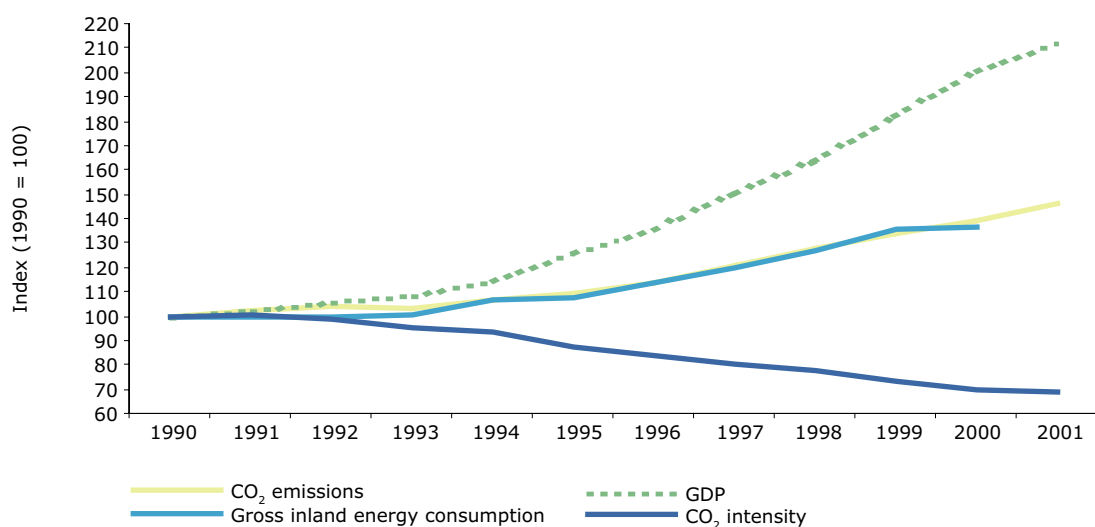
Note: The left side of the figure shows the percentage change, base year to 2001, of GHG emissions by sector and gas; the right side of the figure shows the share by sector and gas in total Irish GHG emissions in 2001.

Industry (energy) is the fifth largest sector accounting for 7 % of total Irish GHG emissions. Emissions increased by 23 %.

Industry (processes) is the sixth largest sector accounting for 6 % of total Irish GHG emissions. Emissions increased by 29 % mainly due to increasing cement production that more than doubled between 1990 and 2001.

Main driving forces: CO₂ emissions from fossil fuel combustion account for 62 % of total Irish GHG emissions.

Figure A.24 shows the development of main driving forces of CO₂ emissions from fossil fuel combustion: real GDP grew by 112 % between 1990 and 2001, energy consumption increased by 37 % between 1990 and 2000 (no 2001 value available). Emissions of CO₂ from fossil fuels followed closely the increase in energy consumption and were 46 % above 1990 levels in 2001. Therefore, CO₂ emissions decoupled from GDP, but not from energy consumption; CO₂ intensity of GDP was 31 % below 1990 in 2001.

Figure A.24 GDP, gross inland energy consumption, CO₂ emissions from fossil fuel combustion and CO₂ intensity of GDP (as an index)

Source: Eurostat, Member State inventory submission (CRF tables), EEA (2003a).

Table A.22 Greenhouse gases and distance-to-target indicators for Ireland

	Base year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Greenhouse gas emissions (without LUCF)	100.0	100.0	101.9	103.5	102.9	106.2	107.8	110.9	116.1	120.0	124.0	127.6	131.1
DTI 2010	0.0	0.0	1.3	2.2	1.0	3.6	4.5	7.0	11.6	14.8	18.2	21.1	23.9
CO ₂ (without LUCF)	100.0	100.0	102.3	104.1	102.8	107.3	109.3	113.1	120.5	126.6	132.5	138.7	146.1
CH ₄ (without LUCF)	100.0	100.0	102.4	103.7	104.5	105.1	105.8	107.3	108.9	109.0	108.3	107.4	105.6
N ₂ O (without LUCF)	100.0	100.0	100.2	101.1	101.5	103.8	105.3	107.5	109.2	111.6	113.4	112.7	109.0
F-gases	100.0	100.0	100.0	100.0	100.0	100.0	100.0	146.3	190.7	143.2	229.5	305.6	331.7

Table A.23 Sectoral emission indicators (key sources) for Ireland

Key sources	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
1.A.1. Energy industries (CO ₂)	100	104	111	111	114	120	126	132	136	142	145	155
1.A.2. Manufacturing industries and construction (CO ₂)	100	100	94	94	97	92	92	104	102	111	124	123
1.A.3. Transport (CO ₂)	100	105	113	113	117	127	142	154	176	196	203	220
1.A.3. Transport (N ₂ O)	100	109	119	160	192	200	254	307	369	450	431	477
1.A.4. Other sectors (CO ₂)	100	100	97	93	98	96	93	97	103	102	107	107
1.A.4. Other sectors (CH ₄)	100	96	85	73	65	61	56	67	68	57	59	57
1.A.5. Other (CO ₂)	NO	0	NO	0	NO	NO	NO	NO	NO	NO	NO	NO
1.B.1. Fugitive emissions from solid fuels (CH ₄)	0	0	0	0	0	0	0	0	0	0	0	0
1.B.1. Fugitive emissions from solid fuels (CO ₂)	NO	NO	NO	0	0	0	0	0	NO	NO	0	0
1.B.2. Fugitive emissions from oil and natural gas (CH ₄)	100	97	93	92	89	86	84	81	72	70	68	69
1.B.2. Fugitive emissions from oil and natural gas (CO ₂)	100	102	101	115	117	120	116	102	78	84	51	96
2.A. Mineral products (CO ₂)	100	98	102	99	115	113	115	126	127	136	180	195
2.B. Chemical industry (N ₂ O)	100	78	78	78	78	78	78	78	78	78	78	56
2.B. Chemical industry (CO ₂)	100	104	101	96	107	98	93	109	107	95	89	105
2.C. Metal production (CO ₂)	0	0	0	0	0	0	0	0	0	0	0	0
2.C. Metal production (PFC)	0	0	0	0	0	0	0	0	0	NE	0	0
2.E. Production of halocarbons and SF ₆ (HFC)	0	0	0	0	0	0	0	0	0	0	0	0
2.F. Consumption of halocarbons and SF ₆ (HFC)	100	100	100	100	100	100	280	380	503	733	918	1.115
2.F. Consumption of halocarbons and SF ₆ (SF ₆)	100	100	100	100	100	100	122	159	109	76	62	80
2.G. Other (CO ₂)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
4.A. Enteric fermentation (CH ₄)	100	103	104	104	105	105	106	108	111	110	108	105
4.B. Manure management (CH ₄)	100	102	104	105	106	108	109	112	115	115	113	111
4.B. Manure management (N ₂ O)	100	102	104	105	107	106	108	111	114	114	112	109
4.D. Agricultural soils (N ₂ O)	100	103	103	104	105	108	110	110	111	112	112	108
4.D. Agricultural soils (CO ₂)	IE	IE	0	IE	0	IE	0	IE	IE	IE	IE	IE
6.A. Solid waste disposal on land (CH ₄)	100	103	106	110	113	118	123	119	100	93	105	110
6.B. Waste water handling (N ₂ O)	100	101	102	102	102	102	103	104	105	106	107	109
6.D. Other (CO ₂)	NO	NO	0	NO	0	0	0	0	NO	NO	0	0

Table A.24 Main driving force indicators and sectoral GHG and driving force indicators for Ireland

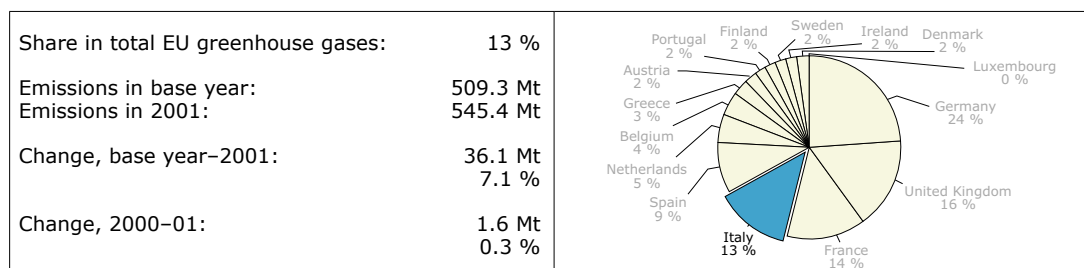
Indicators	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Main driving forces												
CO ₂ from fuel combustion (C)	100	102	104	103	107	110	114	121	128	134	139	146
GDP (E)	100	102	105	108	114	126	136	151	164	182	200	212
Gross inland energy consumption (E)	100	100	99	100	107	108	114	119	127	135	136	:
Energy industries												
CO ₂ from energy industries (C)	100	104	111	111	114	120	126	132	136	142	145	155
Final electricity consumption (E)	100	105	111	114	119	125	134	141	149	158	170	:
Electricity production in public thermal power plants (E)	100	105	111	114	117	125	134	140	145	153	165	:
El. consumption lighting/el. appliances households (E)	:	:	:	:	:	:	:	:	:	:	:	:
Number of dwellings (E)	100	101	103	105	107	109	111	113	115	117	119	:
Electricity consumption in services (E)	100	108	116	119	123	129	140	169	180	178	197	:
Gross value added in services (E)	:	:	:	:	:	:	:	:	:	:	:	:
Transport												
CO ₂ from transport (C)	100	105	113	113	117	127	142	154	176	196	203	220
Passenger transport in cars (pkm) (E)	100	106	109	114	120	128	139	150	157	171	184	:
Freight transport on road (tkm) (E)	100	108	121	105	110	141	146	146	151	156	167	:
CO ₂ from diesel consumption of freight traffic (E)	:	:	:	:	:	:	:	:	:	:	:	:
Households and services												
CO ₂ from other sectors (C)	100	100	97	93	98	96	93	97	103	102	107	107
Heating degree days (E)	100	104	103	104	102	95	104	91	94	95	99	100

Indicators	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
CO ₂ from residential (C)	100	97	93	87	88	87	84	90	95	91	94	96
Number of dwellings (E)	100	101	103	105	107	109	111	113	115	117	119	:
CO ₂ from commercial/institutional (C)	100	105	105	108	123	116	116	115	120	127	136	133
Gross value added in services (E)	:	:	:	:	:	:	:	:	:	:	:	:
Manufacturing industries												
CO ₂ from manufacturing industries (C)	100	100	94	94	97	92	92	104	102	111	124	123
Gross value added industry (E)	:	:	:	:	:	:	:	:	:	:	:	:
CO ₂ from iron and steel industry (E)	100	102	94	81	52	38	24	32	33	33	30	:
Gross value added iron and steel industry (E)	:	:	:	:	:	:	:	:	:	:	:	:
Crude steel production (E)	100	90	79	100	87	95	104	103	110	103	:	:
CO ₂ from glass, pottery and building mat. industry (E)	100	103	67	78	65	75	67	80	77	87	86	:
Value added glass, pottery and build. mat. industry (E)	100	98	89	99	112	113	124	150	154	:	:	:
CO ₂ emissions from the chemical industry (E)	100	100	97	80	91	94	77	120	128	138	149	:
Value added chemical industry (E)	100	110	142	168	184	188	218	331	437	:	:	:
CO ₂ from food industry (E)	100	101	87	94	93	94	95	101	102	99	105	:
Gross value added food industry (E)	100	108	114	116	89	88	94	104	102	120	:	:
CO ₂ from paper and printing industry (E)	100	108	108	69	85	85	69	77	77	85	77	:
Gross value added paper and printing industry (E)	100	100	111	116	123	133	155	193	185	:	:	:
CO ₂ from textile industry (E)	100	92	87	83	90	90	164	143	82	87	95	:
Gross value added textile industry (E)	100	97	92	95	98	87	85	82	84	:	:	:
CO ₂ from autoproducer thermal power stations (E)	100	84	91	150	177	190	120	107	144	141	156	:
All output of autoproducer thermal power stations (E)	100	95	100	105	115	121	136	179	236	181	273	:
Agricultural soils												
N ₂ O from agricultural soils (C)	100	103	103	104	105	108	110	110	111	112	112	108
Fertiliser and manure use (C)	100	95	95	95	98	102	106	104	105	107	108	103
Enteric fermentation												
CH ₄ from enteric fermentation (C)	100	103	104	104	105	105	106	108	111	110	108	105
Cattle population (C)	100	102	104	105	106	107	109	112	115	115	113	110
Mineral products												
CO ₂ from mineral products (C)	100	98	102	99	115	113	115	126	127	136	180	195
Cement/clinker production (C)	100	100	107	100	120	120	120	133	133	150	210	220
Solid waste disposal on land												
CH ₄ from solid waste disposal on land (C)	100	103	106	110	113	118	123	119	100	93	105	110
Waste Disposal on land (C)	100	102	104	106	108	111	113	116	120	124	129	133

Estimates in italics.

Source: Provided in brackets with C for CRF and E for Eurostat.

Italy



Distance-to-target indicator: Italy's GHG emissions increased slightly in 2001, compared with 2000. In 2001, total GHG emissions were 545 Mt (CO₂ equivalents), which was 7 % above the base-year level. In the burden sharing agreement under the Kyoto Protocol, Italy agreed to reduce its GHG emissions by 6.5 % by 2008–12, from the base-year level. Assuming a linear target path from 1990 to 2010, Italian GHG emissions were 10.7 index points above this target path in 2001 (Figure A.25).

Greenhouse gas emission trends: CO₂ emissions account for 84 % of total GHG emissions. They remained stable compared with 2000 and were 8 % above 1990 levels in 2001. Over the period 1990–2001, the main reason for CO₂ emission increases was growing fuel consumption in transport (+ 23 %) and in energy industries (+ 12 %).

Emissions of CH₄ account for 7 % of total Italian GHG emissions and decreased by 6 % between 1990 and 2001. In 2001, the emissions remained stable compared with 2000. The main reasons for declining CH₄ emissions were the reductions in fugitive emissions from oil and gas and from enteric fermentation.

Emissions of N₂O are responsible for 8 % of total GHG emissions and increased by 9 %. Emission increases mainly occurred from transport (introduction of the catalytic converter) and from the chemical industry.

Fluorinated gas emissions account for 1 % of total GHG emissions and were 148 % above 1995 levels in 2001.

HFC emissions increased by 307 % between 1995 and 2001, mainly due to the replacement of ozone depleting substances such as chlorofluorocarbons with HFCs. PFC emissions increased by 11 % and SF₆ emissions by 32 %.

Energy industries is the largest sector accounting for 29 % of total Italian GHG emissions. Emissions increased by 12 % between 1990 and 2001.

Transport is the second largest sector accounting for 24 % of total Italian GHG emissions. With a 24 % increase it is also the fastest growing sector in Italy due to rapidly growing road transport.

Other (energy) is the third largest sector accounting for 15 % of total Italian GHG emissions. This sector includes mainly emissions from households and services. Emissions were 2 % above 1990 levels in 2001.

Industry (energy) is the fourth largest sector accounting for 14 % of total Italian GHG emissions. Emissions decreased by 9 %.

Agriculture is the fifth largest sector and accounts for 8 % of total Italian GHG emissions. Emissions decreased by 1 % mainly due to a decline in cattle population.

Industry (processes) is the sixth largest sector accounting for 6 % of total Italian GHG emissions. Emissions increased by 7 % mainly due to emission increases of fluorinated gases and of N₂O from the chemical industry.

Figure A.25 Italian GHG emissions compared with Kyoto target for 2008–12 (excluding LUCF)

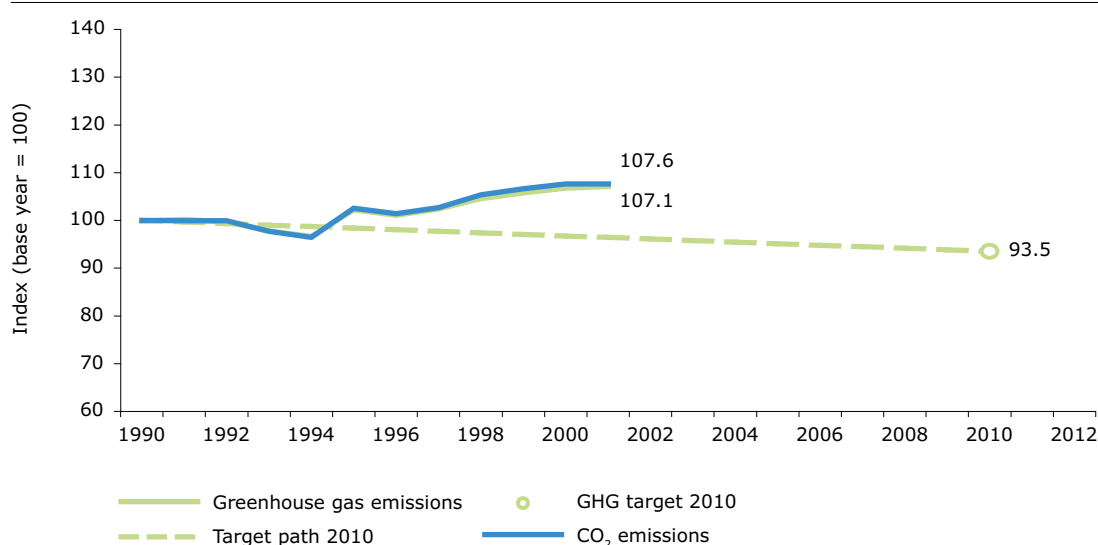
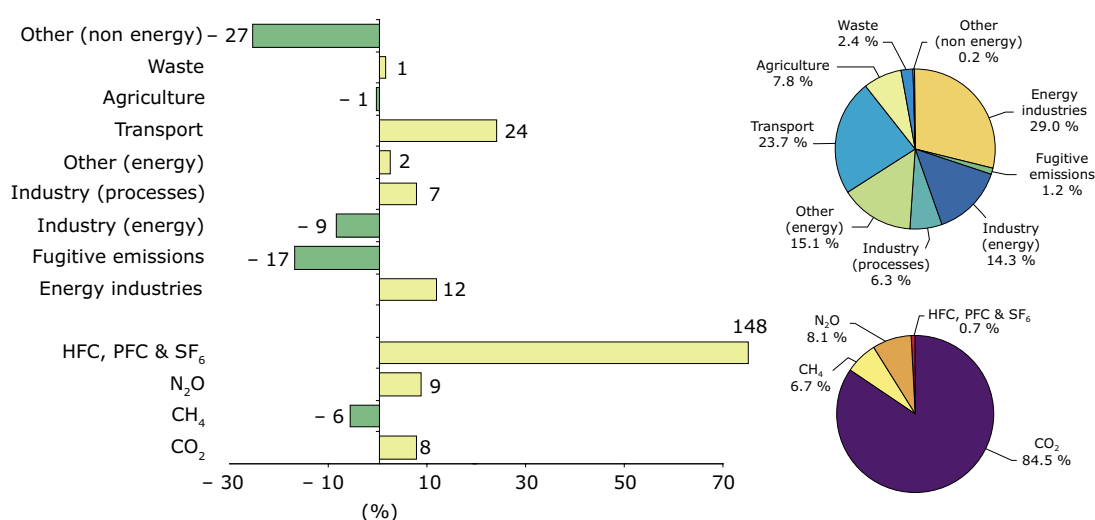


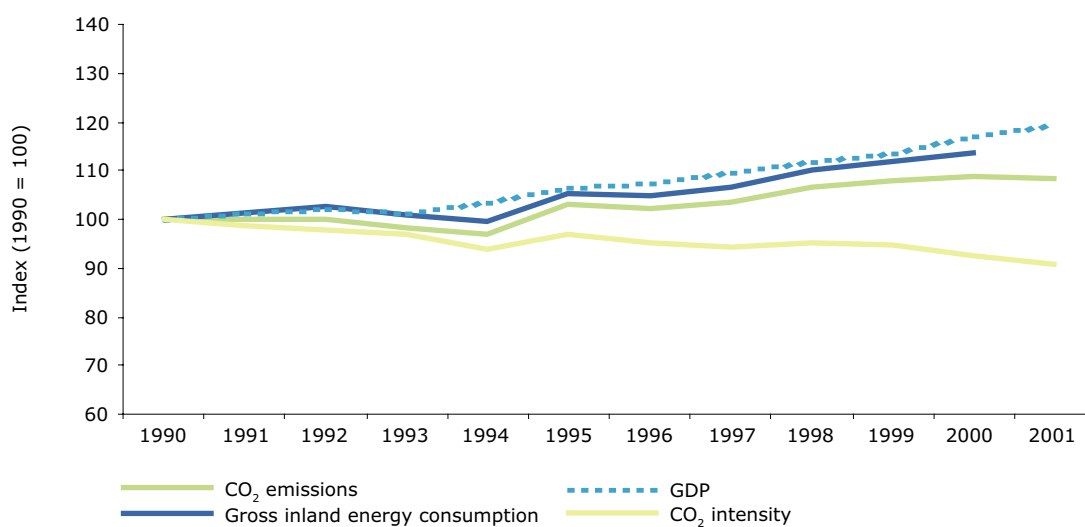
Figure A.26 Change, base year to 2001, of Italian GHG emissions by sector and gas and their share in 2001



Note: The left side of the figure shows the percentage change, base year to 2001, of GHG emissions by sector and gas; the right side of the figure shows the share by sector and gas in total Italian GHG emissions in 2001.

Main driving forces: CO₂ emissions from fossil fuel combustion account for 80 % of total Italian GHG emissions. Figure 27 shows the development of main driving forces of CO₂ emissions from fossil fuel combustion: real GDP grew by 19 % between 1990 and 2001 and energy consumption increased by

14 % between 1990 and 2000 (no 2001 value available). Emissions of CO₂ from fossil fuels were 9 % above 1990 levels in 2001. Therefore, CO₂ emissions decoupled slightly from GDP and energy consumption; CO₂ intensity of GDP was 9 % below 1990 in 2001.

Figure A.27 GDP, gross inland energy consumption, CO₂ emissions from fossil fuel combustion and CO₂ intensity of GDP (as an index)

Source: Eurostat, Member State inventory submission (CRF tables), EEA (2003a).

Table A.25 Greenhouse gases and distance-to-target indicators for Italy

	Base year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Greenhouse gas emissions (without LUCF)	100.0	99.9	100.2	99.6	97.8	96.6	102.2	101.1	102.4	104.6	105.8	106.8	107.1
DTI 2010	0.0	- 0.1	0.5	0.3	- 1.2	- 2.1	3.8	3.0	4.7	7.2	8.7	10.0	10.7
CO ₂ (without LUCF)	100.0	100.0	100.0	99.9	97.7	96.4	102.5	101.4	102.6	105.4	106.6	107.7	107.6
CH ₄ (without LUCF)	100.0	100.0	101.1	96.5	95.5	96.5	97.9	97.6	97.5	96.0	95.0	94.5	94.2
N ₂ O (without LUCF)	100.0	100.0	103.3	101.3	101.9	99.8	102.8	101.6	104.6	103.8	105.9	106.5	108.5
F-gases	100.0	59.6	61.0	59.7	60.1	71.8	100.0	84.6	107.7	127.9	131.4	175.4	247.7

Table A.26 Sectoral emission indicators (key sources) for Italy

Key sources	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
1.A.1. Energy industries (CO ₂)	100	97	97	91	93	103	100	102	108	108	114	112
1.A.2. Manufacturing industries and construction (CO ₂)	100	96	95	96	96	99	96	100	95	96	95	92
1.A.3. Transport (CO ₂)	100	102	107	108	108	110	111	113	117	118	118	123
1.A.3. Transport (N ₂ O)	100	101	104	108	116	126	136	146	164	178	184	200
1.A.4. Other sectors (CO ₂)	100	107	101	101	90	99	101	98	102	108	102	103
1.A.4. Other sectors (CH ₄)	100	111	115	109	119	123	122	133	135	152	158	173
1.A.5. Other (CO ₂)	100	114	123	139	140	138	113	147	100	106	77	34
1.B.1. Fugitive emissions from solid fuels (CH ₄)	100	94	88	69	61	55	52	51	47	45	55	55
1.B.1. Fugitive emissions from solid fuels (CO ₂)	:	:	:	:	:	:	:	:	:	:	:	0
1.B.2. Fugitive emissions from oil and natural gas (CH ₄)	100	98	95	92	90	86	85	84	84	83	82	76
1.B.2. Fugitive emissions from oil and natural gas (CO ₂)	100	75	80	93	106	105	106	111	120	120	129	129
2.A. Mineral products (CO ₂)	100	100	104	91	90	98	89	91	92	96	99	101
2.B. Chemical industry (N ₂ O)	100	106	98	99	94	108	104	105	107	110	118	122
2.B. Chemical industry (CO ₂)	100	95	95	61	43	42	29	32	30	26	30	31
2.C. Metal production (CO ₂)	100	93	83	85	85	92	92	92	90	82	88	88
2.C. Metal production (PFC)	:	:	:	:	:	:	:	:	:	:	:	100
2.E. Production of halocarbons and SF ₆ (HFC)	:	:	:	:	:	:	:	:	:	:	:	101
2.F. Consumption of halocarbons and SF ₆ (HFC)	:	:	:	:	:	:	:	:	:	:	:	102
2.F. Consumption of halocarbons and SF ₆ (SF ₆)	:	:	:	:	:	:	:	:	:	:	:	103
2.G. Other (CO ₂)	:	:	:	:	:	:	:	:	:	:	:	0
4.A. Enteric fermentation (CH ₄)	100	102	97	96	97	98	97	97	95	94	93	94
4.B. Manure management (CH ₄)	100	99	96	96	93	96	97	97	98	96	96	98
4.B. Manure management (N ₂ O)	100	104	100	97	100	104	105	106	107	107	103	110
4.D. Agricultural soils (N ₂ O)	100	104	105	106	104	102	100	105	102	102	101	101
4.D. Agricultural soils (CO ₂)	:	:	:	:	:	:	:	:	:	:	:	0
6.A. Solid waste disposal on land (CH ₄)	100	102	92	92	96	100	101	102	100	98	99	100
6.B. Waste water handling (N ₂ O)	100	100	101	101	101	101	102	102	102	102	102	102
6.D. Other (CO ₂)	:	:	:	:	:	:	:	:	:	:	:	0

Table A.27 Main driving force indicators and sectoral GHG and driving force indicators for Italy

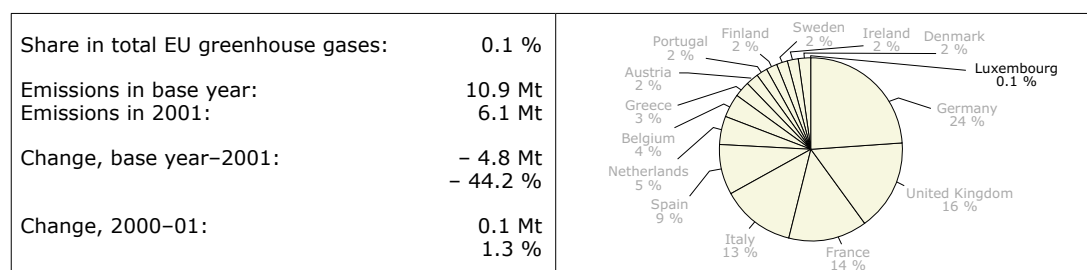
Indicators	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Main driving forces												
CO ₂ from fuel combustion (C)	100	100	100	98	97	103	102	104	107	108	109	109
GDP (E)	100	101	102	101	103	107	108	110	112	114	117	119
Gross inland energy consumption (E)	100	101	103	101	100	105	105	107	110	112	114	:
Energy industries												
CO ₂ from energy industries (C)	100	97	97	91	93	103	100	102	108	108	114	112
Final electricity consumption (E)	100	102	104	105	108	111	112	116	119	122	127	:
Electricity production in public thermal power plants (E)	100	96	97	94	95	103	100	99	100	98	117	:
El. consumption lighting/el. appliances households (E)	100	104	108	110	112	109	110	111	113	120	:	:
Number of dwellings (E)	100	101	101	102	103	104	106	107	109	110	111	:
Electricity consumption in services (E)	100	106	112	116	120	124	128	134	140	135	141	:
Gross value added in services (E)	100	101	102	103	105	107	109	111	113	115	119	:
Transport												
CO ₂ from transport (C)	100	102	107	108	108	110	111	113	117	118	118	123
Passenger transport in cars (pkm) (E)	100	103	115	115	115	118	120	122	127	127	127	:
Freight transport on road (tkm) (E)	100	101	105	102	107	112	114	113	121	128	136	:
CO ₂ from diesel consumption of freight traffic (E)	100	98	99	98	99	98	98	98	99	100	:	:
Households and services												
CO ₂ from other sectors (C)	100	107	101	101	90	99	101	98	102	108	102	103
Heating degree days (E)	100	116	99	104	94	102	103	95	100	98	89	92

Indicators	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
CO ₂ from residential (C)	:	:	:	:	:	:	:	:	:	:	:	100
Number of dwellings (E)	100	101	101	102	103	104	106	107	109	110	111	:
CO ₂ from commercial/institutional (C)	:	:	:	:	:	:	:	:	:	:	:	100
Gross value added in services (E)	100	101	102	103	105	107	109	111	113	115	119	:
Manufacturing industries												
CO ₂ from manufacturing industries (C)	100	96	95	96	96	99	96	100	95	96	95	92
Gross value added industry (E)	100	100	101	97	101	105	104	106	108	108	111	:
CO ₂ from iron and steel industry (E)	100	98	99	97	101	104	92	98	92	84	90	:
Gross value added iron and steel industry (E)	100	97	88	64	89	102	90	98	91	85	:	:
Crude steel production (E)	100	99	98	101	102	109	95	101	101	97	:	:
CO ₂ from glass, pottery and building mat. industry (E)	100	98	96	87	85	85	84	86	70	101	96	:
Value added glass, pottery and build. mat. industry (E)	100	98	98	80	79	74	79	76	78	83	:	:
CO ₂ emissions from the chemical industry (E)	100	95	89	90	84	93	87	87	54	73	66	:
Value added chemical industry (E)	100	98	100	91	92	88	99	91	91	88	:	:
CO ₂ from food industry (E)	100	121	130	115	124	129	130	126	153	169	167	:
Gross value added food industry (E)	100	107	109	138	129	79	87	82	90	88	:	:
CO ₂ from paper and printing industry (E)	100	115	118	117	130	133	138	143	119	134	137	:
Gross value added paper and printing industry (E)	100	101	92	80	78	71	80	78	83	75	:	:
CO ₂ from textile industry (E)	100	110	115	117	125	127	116	115	126	132	138	:
Gross value added textile industry (E)	100	105	102	92	94	90	96	88	89	86	:	:
CO ₂ from autoproducer thermal power stations (E)	100	112	114	129	135	151	166	204	231	249	185	:
All output of autoproducer thermal power stations (E)	100	108	118	132	148	162	176	221	243	266	179	:
Agricultural soils												
N ₂ O from agricultural soils (C)	100	104	105	106	104	102	100	105	102	102	101	101
Fertiliser and manure use (C)	:	:	:	:	:	:	:	:	100	101	96	89
Enteric fermentation												
CH ₄ from enteric fermentation (C)	100	102	97	96	97	98	97	97	95	94	93	94
Cattle population (E)	100	95	92	87	87	84	85	84	85	84	81	81
Mineral products												
CO ₂ from mineral products (C)	100	100	104	91	90	98	89	91	92	96	99	101
Cement/clinker production (C)	:	:	:	:	:	:	:	:	100	104	108	86
Solid waste disposal on land												
CH ₄ from solid waste disposal on land (C)	100	102	92	92	96	100	101	102	100	98	99	100
Waste Disposal on land (C)	:	:	:	:	:	:	:	:	100	104	105	97

Estimates in italics.

Source: Provided in brackets with C for CRF and E for Eurostat.

Luxembourg



Distance-to-target indicator:

Luxembourg's GHG emissions increased by 1.3 % in 2001, compared with 2000. In 2001, total GHG emissions were 6 Mt (CO₂ equivalents), which was 44 % below the base-year level. In the burden sharing agreement under the Kyoto Protocol, Luxembourg agreed to reduce its GHG emissions by 28 % by 2008–12, from the base-year level. Assuming a linear target path from 1990 to 2010, Luxembourg's GHG emissions were 28.8 index points below this target path in 2001 (Figure A.28).

Greenhouse gas emission trends:

CO₂ emissions account for 90 % of total GHG emissions. They increased by 2 % compared with 2000, but were 46 % below 1990 levels in 2001. In 2001, CO₂ emissions increased mainly from households and services due to cold outdoor temperature. Over the period 1990–2001, the main sectors with CO₂ emission decreases were manufacturing industries and energy industries. In contrast to this, CO₂ emissions from transport increased by 73 %, but also emissions from households and services were above 1990 levels in 2001.

Emissions of CH₄ account for 8 % of Luxembourg's total GHG emissions and decreased by 5 % between 1990 and 2001. Also in 2001, emissions decreased compared with 2000. Emissions of CH₄ mainly declined from enteric fermentation and from solid waste disposal on land.

Emissions of N₂O are responsible for 1 % of total GHG emissions and decreased by 60 %. These figures have to be interpreted with care because the

time series for N₂O from agricultural soil seems to be inconsistent.

Fluorinated gas emissions account for 1 % of total GHG emissions. They have been reported for 2001 only.

Industry (energy) is the largest sector accounting for 27 % of Luxembourg's total GHG emissions. The emissions decreased by 69 % mainly due to a sharp decrease in coke consumption after the conversion of the steel industry to electric arc furnaces.

Transport is the second largest sector accounting for 26 % of Luxembourg's total GHG emissions. With a 76 % increase it is also the fastest growing sector in Luxembourg. This is mainly due to fast growing road transport.

Other (energy) is the third largest sector accounting for 24 % of Luxembourg's total GHG emissions. This sector includes mainly emissions from households and services. Emissions were 11 % above 1990 levels in 2001, and fluctuate, to a certain extent, according to annual changes in outdoor temperature.

Industry (processes) is the fourth largest sector accounting for 11 % of Luxembourg's total GHG emissions. Emissions decreased by 55 % mainly due to a decline from metal production and from cement production.

Agriculture accounts for 6 % of Luxembourg's GHG emissions. Emissions decreased by 32 %. These figures have to be interpreted with care because the time series for N₂O

Figure A.28 Luxembourg's GHG emissions compared with Kyoto target for 2008–12 (excluding LUCF)

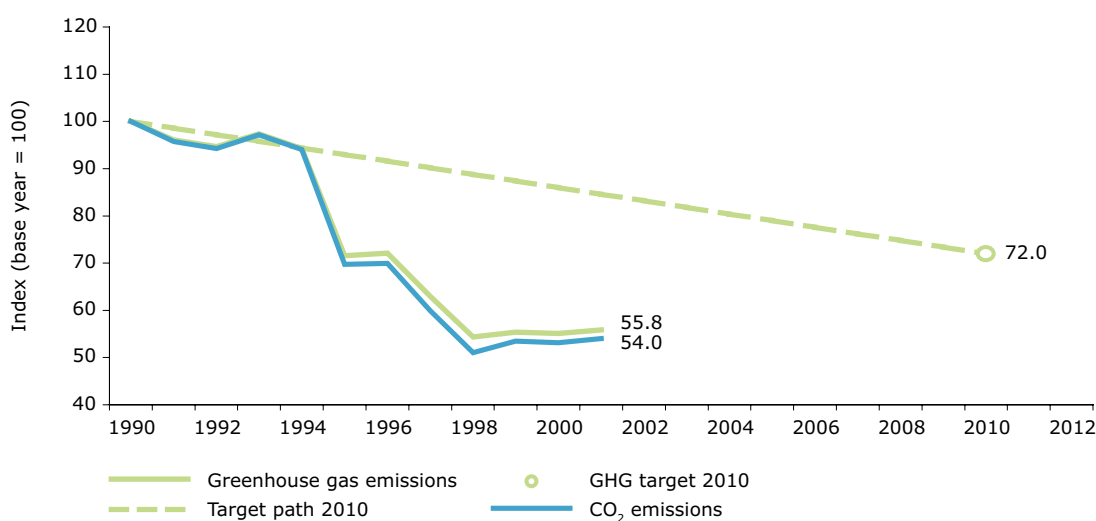
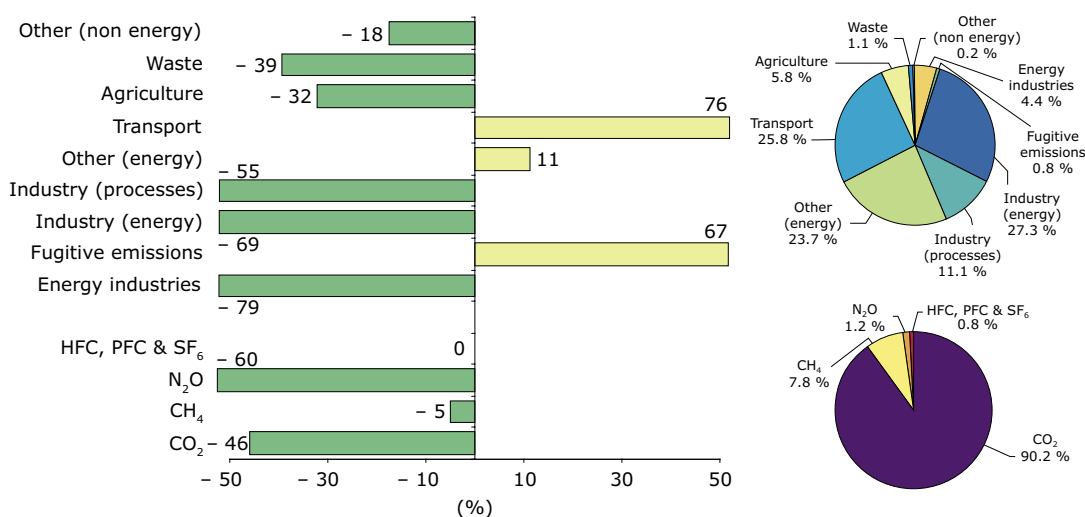


Figure A.29 Change, base year to 2001, of Luxembourg's GHG emissions by sector and gas and their share in 2001



Note: The left side of the figure shows the percentage change, base year to 2001, of GHG emissions by sector and gas; the right side shows the share by sector and gas in total Luxembourg's GHG emissions in 2001.

from agricultural soil seems to be inconsistent.

Energy industries is the sixth largest sector accounting for 4 % of Luxembourg's total GHG emissions. The sector includes emissions from electricity and heat production, oil refineries and manufacturing of solid fuels. The emissions from this sector decreased by 79 % mainly because of reductions in thermal power production and increases in electricity imports and hydro-power production.

Main driving forces: CO₂ emissions from fossil fuel combustion account

for 80 % of Luxembourg's total GHG emissions. Figure 30 shows the development of main driving forces of CO₂ emissions from fossil fuel combustion: real GDP grew by 74 % between 1990 and 2001, energy consumption decoupled from GDP, but increased by 22 % between 1990 and 2000 (no 2001 value available). Emissions of CO₂ from fossil fuels were 44 % below 1990 levels in 2001. Therefore, CO₂ emissions decoupled significantly from GDP and also from energy consumption; CO₂ intensity of GDP was 68 % below 1990 in 2001.

Table A.29 Sectoral emission indicators (key sources) for Luxembourg

Key sources	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
1.A.1. Energy industries (CO ₂)	100	97	95	98	83	64	58	32	5	8	20	21
1.A.2. Manufacturing industries and construction (CO ₂)	100	97	95	98	104	66	65	45	32	34	33	31
1.A.3. Transport (CO ₂)	100	97	95	98	142	136	143	142	146	154	167	173
1.A.3. Transport (N ₂ O)	100	100	100	100	243	268	275	325	350	350	411	425
1.A.4. Other sectors (CO ₂)	100	97	95	98	101	97	108	111	129	119	99	112
1.A.4. Other sectors (CH ₄)	100	100	100	100	90	83	85	84	84	81	74	77
1.A.5. Other (CO ₂)	0	0	0	0	:	100	96	0	0	0	0	0
1.B.1. Fugitive emissions from solid fuels (CH ₄)	0	0	0	0	0	0	0	0	0	0	0	0
1.B.1. Fugitive emissions from solid fuels (CO ₂)	0	:	:	:	0	0	0	0	0	0	0	0
1.B.2. Fugitive emissions from oil and natural gas (CH ₄)	100	100	100	100	117	134	142	146	147	157	161	167
1.B.2. Fugitive emissions from oil and natural gas (CO ₂)	0	:	:	:	0	0	0	0	0	0	0	0
2.A. Mineral products (CO ₂)	100	91	91	92	IE	:	:	62	62	89	94	83
2.B. Chemical industry (N ₂ O)	0	0	0	0	0	0	0	0	0	0	0	0
2.B. Chemical industry (CO ₂)	0	0	0	0	IE	0	0	0	0	0	0	0
2.C. Metal production (CO ₂)	100	91	91	92	IE	31	27	31	16	17	15	16
2.C. Metal production (PFC)	:	:	:	:	:	:	:	:	:	:	:	:
2.E. Production of halocarbons and SF ₆ (HFC)	:	:	:	:	:	:	:	:	:	:	:	:
2.F. Consumption of halocarbons and SF ₆ (HFC)	:	:	:	:	:	:	:	:	:	:	:	:
2.F. Consumption of halocarbons and SF ₆ (SF ₆)	:	:	:	:	:	:	:	:	:	:	:	:
2.G. Other (CO ₂)	0	0	0	0	100	1	1	1	1	0	0	0
4.A. Enteric fermentation (CH ₄)	100	100	100	100	96	96	100	100	96	96	95	95
4.B. Manure management (CH ₄)	100	100	100	100	94	94	97	97	94	95	93	93
4.B. Manure management (N ₂ O)	0	0	0	0	0	0	0	0	0	0	0	0
4.D. Agricultural soils (N ₂ O)	100	100	100	100	101	101	102	102	102	0	0	0
4.D. Agricultural soils (CO ₂)	0	0	0	0	0	0	0	0	0	:	:	0
6.A. Solid waste disposal on land (CH ₄)	100	100	100	100	73	73	107	107	87	87	87	74
6.B. Waste water handling (N ₂ O)	100	100	100	100	80	85	85	85	85	100	88	89
6.D. Other (CO ₂)	0	0	0	0	0	100	0	0	0	0	0	0

Table A.30 Main driving force indicators and sectoral GHG and driving force indicators for Luxembourg

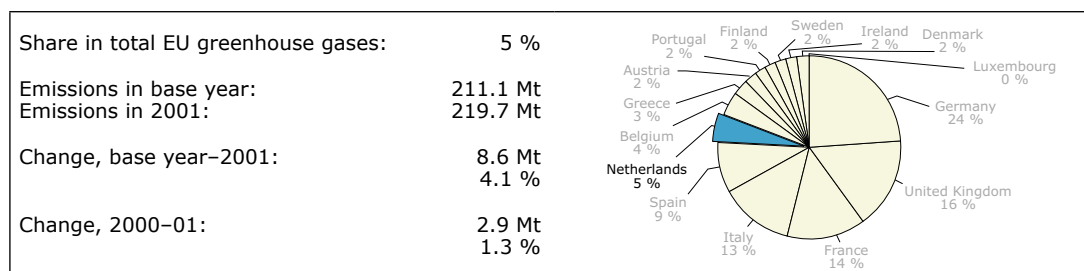
Indicators	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Main driving forces												
CO ₂ from fuel combustion (C)	100	97	95	98	104	78	79	62	53	55	54	56
GDP (E)	100	109	111	115	120	121	125	136	145	158	172	174
Gross inland energy consumption (E)	100	106	107	108	106	94	96	94	92	97	102	:
Energy industries												
CO ₂ from energy industries (C)	100	97	95	98	83	64	58	32	5	8	20	21
Final electricity consumption (E)	100	102	103	107	113	121	119	124	128	134	139	:
Electricity production in public thermal power plants (E)	:	100	84	105	87	95	111	121	118	132	137	:
El. consumption lighting/el. appliances households (E)	:	:	:	:	:	:	:	:	:	:	:	:
Number of dwellings (E)	:	:	:	:	:	:	:	:	:	:	:	:
Electricity consumption in services (E)	100	108	112	123	125	129	136	144	150	123	129	:
Gross value added in services (E)	100	110	115	121	127	131	135	145	158	166	180	:
Transport												
CO ₂ from transport (C)	100	97	95	98	142	136	143	142	146	154	167	173
Passenger transport in cars (pkm) (E)	100	104	108	113	115	118	120	123	125	125	127	:
Freight transport on road (tkm) (E)	100	112	129	141	135	147	148	157	164	168	184	:
CO ₂ from diesel consumption of freight traffic (E)	:	:	:	:	:	:	:	:	:	:	:	:
Households and services												
CO ₂ from other sectors (C)	100	97	95	98	101	97	108	111	129	119	99	112
Heating degree days (E)	100	113	103	107	98	104	121	103	103	97	91	100

Indicators	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
CO ₂ from residential (C)	100	110	100	100	93	99	108	102	101	103	98	108
Number of dwellings (E)	:	:	:	:	:	:	:	:	:	:	:	:
CO ₂ from commercial/institutional (C)	100	116	133	133	113	143	168	121	123	112	94	107
Gross value added in services (E)	100	110	115	121	127	131	135	145	158	166	180	:
Manufacturing industries												
CO ₂ from manufacturing industries (C)	100	97	95	98	104	66	65	45	32	34	33	31
Gross value added industry (E)	100	103	104	109	113	115	118	124	127	131	138	:
CO ₂ from iron and steel industry (E)	100	95	86	90	76	44	40	26	10	11	10	:
Gross value added iron and steel industry (E)	100	85	78	81	83	83	82	86	86	91	:	:
Crude steel production (E)	100	95	86	93	86	73	70	72	70	73	:	:
CO ₂ from glass, pottery and building mat. industry (E)	100	82	94	78	105	83	92	81	75	77	88	:
Value added glass, pottery and build. mat. industry (E)	100	104	90	95	109	114	121	130	117	104	:	:
CO ₂ emissions from the chemical industry (E)	100	137	100	111	105	61	74	42	21	18	13	:
Value added chemical industry (E)	100	120	180	201	193	148	225	234	248	262	:	:
CO ₂ from food industry (E)	100	150	125	75	125	125	100	126	101	126	101	:
Gross value added food industry (E)	100	111	124	127	132	129	141	135	144	139	:	:
CO ₂ from paper and printing industry (E)	0	0	0	0	0	0	0	0	0	0	0	:
Gross value added paper and printing industry (E)	100	97	112	122	121	130	130	147	165	204	:	:
CO ₂ from textile industry (E)	0	0	0	0	0	0	0	0	0	0	0	:
Gross value added textile industry (E)	100	113	130	146	168	163	196	203	217	229	:	:
CO ₂ from autoproducer thermal power stations (E)	100	103	103	104	86	53	47	33	13	14	15	:
All output of autoproducer thermal power stations (E)	100	104	100	101	84	68	70	78	86	86	98	:
Agricultural soils												
N ₂ O from agricultural soils (C)	100	100	100	100	101	101	102	102	102	0	0	0
Fertiliser and manure use (C)	:	:	:	:	:	:	:	:	:	:	:	:
Enteric fermentation												
CH ₄ from enteric fermentation (C)	100	100	100	100	96	96	100	100	96	96	95	95
Cattle population (E)	100	101	96	96	96	98	100	97	96	96	94	94
Mineral products												
CO ₂ from mineral products (C)	100	91	91	92	IE	:	:	62	62	89	94	83
Cement/clinker production (C)	:	:	:	:	:	:	:	:	:	:	:	:
Solid waste disposal on land												
CH ₄ from solid waste disposal on land (C)	100	100	100	100	73	73	107	107	87	87	87	74
Waste Disposal on land (C)	:	:	:	:	:	:	:	:	:	:	:	:

Estimates in italics.

Source: Provided in brackets with C for CRF and E for Eurostat.

Netherlands



Distance-to-target indicator: Dutch GHG emissions increased by 1.3 % in 2001, compared with 2000. In 2001, total GHG emissions were 220 Mt (CO₂ equivalents), which was 4.1 % above the base-year level. In the burden sharing agreement under the Kyoto Protocol, the Netherlands agreed to reduce its GHG emissions by 6 % by 2008–12, from the base-year level. Assuming a linear target path from 1990 to 2010, Dutch GHG emissions were 7.4 index points above this target path in 2001 (Figure A.31).

Greenhouse gas emission trends:

CO₂ emissions account for 82 % of total GHG emissions. They increased by 3 % compared with 2000 and were 13 % above 1990 levels in 2001. In 2001, CO₂ emissions increased mainly from energy industries (partly due to lower electricity imports) and from households and services (partly due to cold outdoor temperature). Over the period 1990–2001, the reasons for CO₂ emission increases were growing fossil fuel use in thermal power plants and increasing transport demand. Emissions of CO₂ from energy industries increased by 26 %, CO₂ from transport by 22 %.

Emissions of CH₄ account for 9 % of total Dutch GHG emissions and decreased by 25 % between 1990 and 2001. Also in 2001, emissions decreased compared with 2000. The main reason for declining CH₄ emissions were reductions in solid waste disposal, increased CH₄ recovery and declining cattle numbers.

Emissions of N₂O are responsible for 7 % of total GHG emissions and decreased

by 3 %. Emissions mainly declined from nitric acid production.

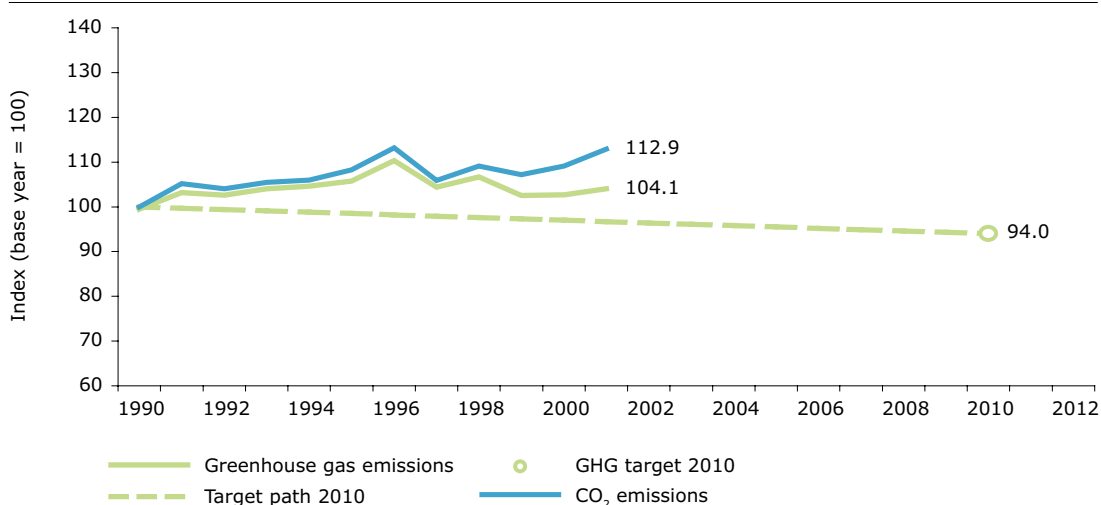
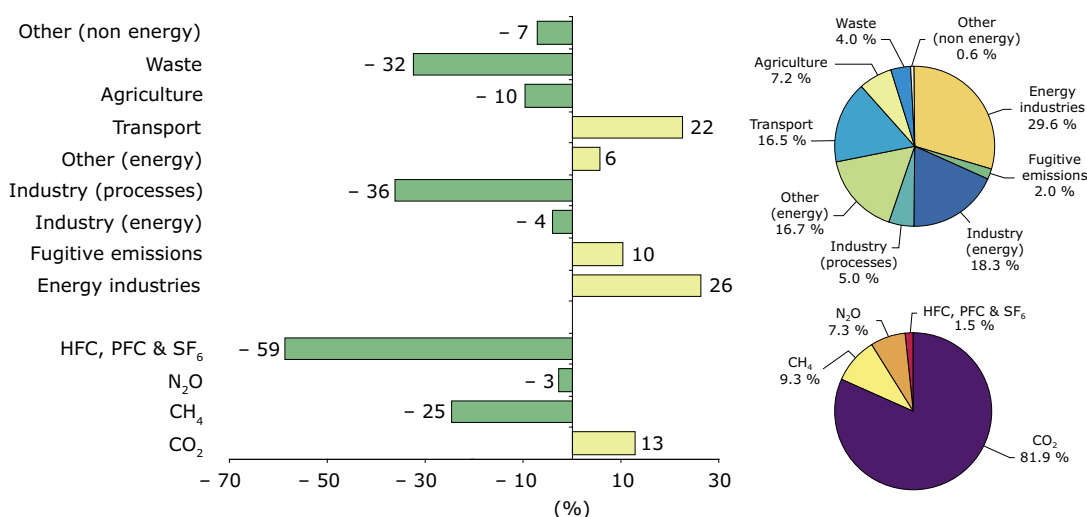
Fluorinated gas emissions account for 2 % of total GHG emissions and were 59 % below 1995 levels in 2001. Fluorinated gas emissions show opposing trends: HFC emissions decreased by 74 % between 1995 and 2001, mainly due to the installation of a thermal afterburner in HCFC-22 production (Olivier *et al.*, 2002). PFC emissions decreased by 22 % and SF₆ emissions increased by 8 %.

Energy industries is the largest sector accounting for 30 % of total Dutch GHG emissions. The 26 % increase of the sector makes it the fastest growing sector in the Netherlands. The increase is largely due to increased power and heat production from fossil fuels.

Industry (energy) is the second largest sector accounting for 18 % of total Dutch GHG emissions. Emissions decreased by 4 % mainly due to decreases in the chemical industry.

Transport is the third largest sector accounting for 17 % of total Dutch GHG emissions. The 22 % increase is mainly due to fast growing road transport.

Other (energy) is the fourth largest sector accounting for 17 % of total Dutch GHG emissions. This sector includes mainly emissions from households and services. Emissions were 6 % above 1990 levels in 2001, and fluctuate to a certain extent according to annual changes in outdoor temperature.

Figure A.31 Dutch GHG emissions compared with Kyoto target for 2008–12 (excluding LUCF)**Figure A.32 Change, base year to 2001, of Dutch GHG emissions by sector and gas and their share in 2001**

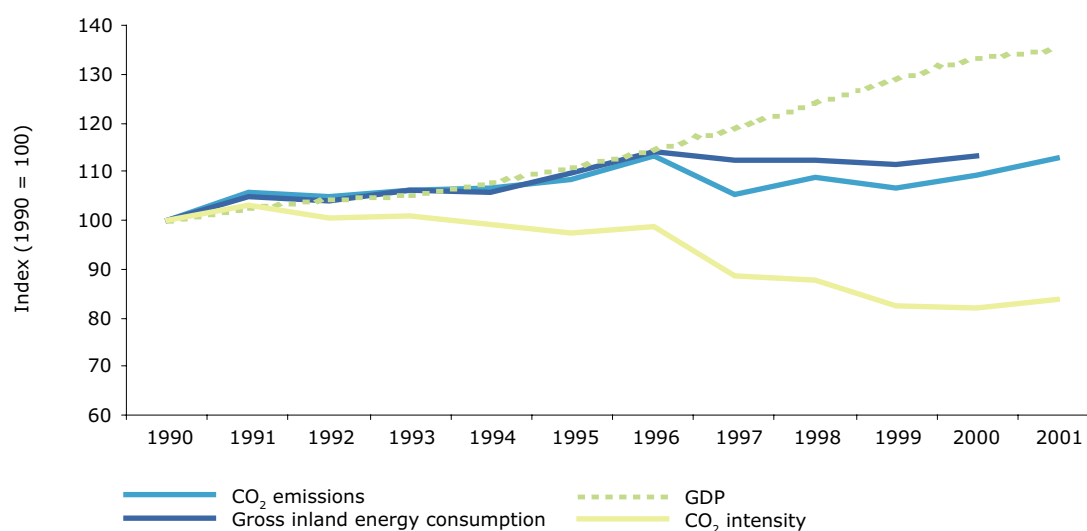
Note: The left side of the figure shows the percentage change, base year to 2001, of GHG emissions by sector and gas; the right side of the figure shows the share by sector and gas in total Dutch GHG emissions in 2001.

Agriculture is the fifth largest sector and accounts for 7 % of total Dutch GHG emissions. Emissions decreased by 10 % mainly due to a decline in cattle numbers.

Industry (processes) is the sixth largest sector accounting for 5 % of total Dutch GHG emissions. Emissions decreased by 36 % mainly due to HFC reductions in HCFC-22 production.

Main driving forces: CO₂ emissions from fossil fuel combustion account for 80 % of total Dutch GHG emissions. Figure 33 shows the development of

main driving forces of CO₂ emissions from fossil fuel combustion: real GDP grew by 35 % between 1990 and 2001, energy consumption decoupled from GDP in the late 1990s and was 13 % above 1990 levels in 2000. Also, CO₂ emissions from fossil fuels grew by 13 % between 1990 and 2001. Therefore, CO₂ emissions decoupled from GDP, but not from energy consumption. GDP CO₂ intensity was 16 % below that in 1990.

Figure A.33 GDP, gross inland energy consumption, CO₂ emissions from fossil fuel combustion and CO₂ intensity of GDP (as an index)

Source: Eurostat, Member State inventory submission (CRF tables), EEA (2003a).

Table A.31 Greenhouse gases and distance-to-target indicators for the Netherlands

	Base year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Greenhouse gas emissions (without LUCF)	100.0	99.5	103.2	102.6	104.0	104.6	105.8	110.3	104.4	106.7	102.5	102.7	104.1
DTI 2010	0.0	-0.5	3.5	3.2	4.9	5.8	7.3	12.1	6.5	9.1	5.2	5.7	7.4
CO ₂ (without LUCF)	100.0	100.0	105.2	104.1	105.4	106.0	108.2	113.2	105.9	109.1	107.2	109.1	112.9
CH ₄ (without LUCF)	100.0	100.0	101.3	97.0	94.9	93.1	90.5	90.8	85.1	82.4	80.3	76.1	75.3
N ₂ O (without LUCF)	100.0	100.0	101.6	108.5	112.8	110.7	109.9	108.5	107.5	106.6	105.0	100.7	97.1
F-gases	100.0	86.4	73.4	81.5	88.6	104.5	100.0	122.6	132.0	139.5	81.0	69.5	40.9

Table A.32 Sectoral emission indicators (key sources) for the Netherlands

Key sources	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
1.A.1. Energy industries (CO ₂)	100	102	106	105	109	110	114	111	117	110	119	126
1.A.2. Manufacturing industries and construction (CO ₂)	100	102	101	95	98	102	103	93	101	101	95	96
1.A.3. Transport (CO ₂)	100	100	104	106	107	110	112	114	116	119	121	122
1.A.3. Transport (N ₂ O)	100	113	130	142	150	162	165	167	168	170	167	165
1.A.4. Other sectors (CO ₂)	100	118	109	117	113	111	125	105	100	97	101	106
1.A.4. Other sectors (CH ₄)	100	109	101	106	105	101	117	99	96	94	98	101
1.A.5. Other (CO ₂)	100	141 161	- 48 813	217 678	73 879	520	18 166	0	1 444	5	0	0
1.B.1. Fugitive emissions from solid fuels (CH ₄)	0	0	0	0	0	0	0	0	0	0	0	0
1.B.1. Fugitive emissions from solid fuels (CO ₂)	0	0	0	0	0	0	0	0	0	0	0	0
1.B.2. Fugitive emissions from oil and natural gas (CH ₄)	100	105	91	88	94	95	105	88	82	81	73	75
1.B.2. Fugitive emissions from oil and natural gas (CO ₂)	100	149	120	114	62	263	325	330	504	492	516	541
2.A. Mineral products (CO ₂)	100	62	67	93	93	99	80	96	91	87	76	72
2.B. Chemical industry (N ₂ O)	100	101	102	110	105	99	99	99	99	95	94	87
2.B. Chemical industry (CO ₂)	0	0	0	0	0	0	0	0	0	0	0	0
2.C. Metal production (CO ₂)	0	0	0	0	0	100	0	0	0	0	0	0
2.C. Metal production (PFC)	133	133	114	115	102	100	109	115	90	74	77	73
2.E. Production of halocarbons and SF ₆ (HFC)	77	60	77	87	111	100	123	129	144	66	49	11
2.F. Consumption of halocarbons and SF ₆ (HFC)	0	0	0	0	32	100	228	360	424	433	419	381
2.F. Consumption of halocarbons and SF ₆ (SF ₆)	68	36	39	40	54	100	103	113	107	96	98	108
2.G. Other (CO ₂)	100	175	114	35	85	68	107	75	64	75	83	70
4.A. Enteric fermentation (CH ₄)	100	102	100	98	95	94	91	88	85	83	79	80
4.B. Manure management (CH ₄)	100	102	101	102	98	97	94	90	90	88	88	85
4.B. Manure management (N ₂ O)	100	106	106	121	121	112	110	105	102	99	94	92
4.D. Agricultural soils (N ₂ O)	100	102	117	118	117	121	119	117	114	114	105	105
4.D. Agricultural soils (CO ₂)	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
6.A. Solid waste disposal on land (CH ₄)	100	99	96	93	90	85	85	82	79	76	72	69
6.B. Waste water handling (N ₂ O)	100	100	111	117	116	122	118	142	132	140	155	154
6.D. Other (CO ₂)	100	0	0	0	0	103	120	141	52	116	40	40

Table A.33 Main driving force indicators and sectoral GHG and driving force indicators for the Netherlands

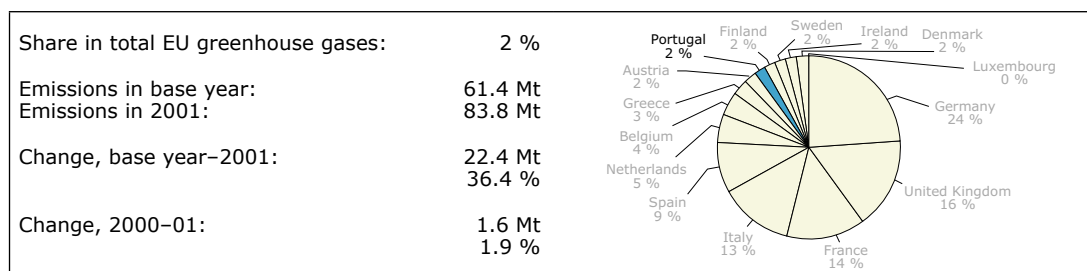
Indicators	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Main driving forces												
CO ₂ from fuel combustion (C)	100	106	105	106	107	108	113	105	109	107	109	113
GDP (E)	100	102	104	105	108	111	114	119	124	129	133	135
Gross inland energy consumption (E)	100	105	104	106	106	110	114	112	112	111	113	:
Energy industries												
CO ₂ from energy industries (C)	100	102	106	105	109	110	114	111	117	110	119	126
Final electricity consumption (E)	100	103	106	107	111	113	117	122	126	129	133	:
Electricity production in public thermal power plants (E)	100	105	110	107	129	141	154	160	169	166	172	:
El. consumption lighting/el. appliances households (E)	100	104	106	108	112	119	121	124	126	129	132	:
Number of dwellings (E)	100	101	103	104	105	107	108	109	110	111	113	:
Electricity consumption in services (E)	100	107	114	110	114	106	117	124	134	137	146	:
Gross value added in services (E)	100	103	105	107	108	112	116	122	128	134	138	:
Transport												
CO ₂ from transport (C)	100	100	104	106	107	110	112	114	116	119	121	122
Passenger transport in cars (pkm) (E)	100	98	100	101	101	103	103	105	105	108	109	:
Freight transport on road (tkm) (E)	100	102	125	124	128	133	138	142	146	153	144	:
CO ₂ from diesel consumption of freight traffic (E)	100	107	114	114	116	125	119	122	132	142	149	:
Households and services												
CO ₂ from other sectors (C)	100	118	109	117	113	111	125	105	100	97	101	106
Heating degree days (E)	100	117	104	114	105	108	132	110	102	98	96	105

Indicators	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
CO ₂ from residential (C)	100	109	98	104	99	107	125	105	95	97	99	103
Number of dwellings (E)	100	101	103	104	105	107	108	109	110	111	113	:
CO ₂ from commercial/institutional (C)	100	173	158	179	171	146	153	128	129	113	133	149
Gross value added in services (E)	100	103	105	107	108	112	116	122	128	134	138	:
Manufacturing industries												
CO ₂ from manufacturing industries (C)	100	102	101	95	98	102	103	93	101	101	95	96
Gross value added industry (E)	100	102	101	100	104	107	108	109	112	114	119	:
CO ₂ from iron and steel industry (E)	100	92	94	101	84	107	105	111	106	99	94	:
Gross value added iron and steel industry (E)	:	:	:	:	:	:	:	100	:	:	:	:
Crude steel production (E)	100	96	100	111	114	118	117	123	118	112	:	:
CO ₂ from glass, pottery and building mat. industry (E)	100	94	94	90	85	78	84	82	76	78	76	:
Value added glass, pottery and build. mat. industry (E)	100	104	107	109	121	124	120	121	123	:	:	:
CO ₂ emissions from the chemical industry (E)	100	86	88	94	86	71	70	68	68	57	78	:
Value added chemical industry (E)	100	92	93	90	125	140	123	124	115	:	:	:
CO ₂ from food industry (E)	100	99	104	113	109	104	108	103	104	110	101	:
Gross value added food industry (E)	100	112	116	123	128	129	129	130	130	:	:	:
CO ₂ from paper and printing industry (E)	100	105	95	107	96	85	94	95	88	88	92	:
Gross value added paper and printing industry (E)	100	111	115	121	129	125	124	130	139	:	:	:
CO ₂ from textile industry (E)	100	141	134	140	137	149	155	154	159	127	141	:
Gross value added textile industry (E)	100	103	100	100	96	91	86	83	86	:	:	:
CO ₂ from autoproducer thermal power stations (E)	100	103	108	115	107	101	117	126	131	129	128	:
All output of autoproducer thermal power stations (E)	100	103	111	120	104	98	103	107	112	108	112	:
Agricultural soils												
N ₂ O from agricultural soils (C)	100	102	117	118	117	121	119	117	114	114	105	105
Fertiliser and manure use (C)	100	100	103	103	100	103	100	99	97	97	87	86
Enteric fermentation												
CH ₄ from enteric fermentation (C)	100	102	100	98	95	94	91	88	85	83	79	80
Cattle population (C)	100	103	100	97	96	94	92	90	87	85	83	82
Mineral products												
CO ₂ from mineral products (C)	100	62	67	93	93	99	80	96	91	87	76	72
Cement/clinker production (C)	100	95	88	90	91	84	62	74	85	102	95	94
Solid waste disposal on land												
CH ₄ from solid waste disposal on land (C)	100	99	96	93	90	85	85	82	79	76	72	69
Waste Disposal on land (C)	100	86	82	81	65	61	49	42	38	39	37	34

Estimates in italics.

Source: Provided in brackets with C for CRF and E for Eurostat.

Portugal



Distance-to-target indicator: Portugal's GHG emissions increased by 1.9 % in 2001, compared with 2000. In 2001, total GHG emissions were 84 Mt (CO₂ equivalents), which was 36 % above the base-year level. In the burden sharing agreement under the Kyoto Protocol, Portugal agreed to limit its GHG emissions to 27 % above the base-year level by 2008–12. Assuming a linear target path from 1990 to 2010, Portuguese GHG emissions were 21.6 index points above this target path in 2001 (Figure A.34).

Greenhouse gas emission trends: CO₂ emissions account for 77 % of total GHG emissions. They increased by 2 % compared with 2000 and were 48 % above 1990 level in 2001. In 2001, CO₂ emissions increased mainly from fuel combustion in manufacturing and energy industries. Over the period 1990–2001, emission increases from transport were largest (+ 78 %), but also all other fuel combustion-related sectors increased emissions.

Emissions of CH₄ account for 13 % of total Portuguese GHG emissions and increased by 7 % between 1990 and 2001. Also in 2001, emissions increased compared with 2000. The main reasons for growing CH₄ emissions were increases in solid waste disposal on land.

Emissions of N₂O are responsible for 10 % of total GHG emissions and increased by 8 %. Emissions mainly increased from transport due to the introduction of the catalytic converter.

Fluorinated gas emissions account for 0.1 % of total GHG emissions and they

were 1 376 % above 1995 levels in 2001. Both HFC and SF₆ emissions have been increasing since 1995, PFC emissions were not reported by Portugal.

Energy industries is the largest sector accounting for 26 % of total Portuguese GHG emissions. The 36 % increase of the sector is largely due to increased power production from fossil fuels, in particular coal and gas.

Transport is the second largest sector accounting for 23 % of total Portuguese GHG emissions. The 81 % increase is mainly due to growing road transport demand.

Agriculture is the third largest sector and accounts for 14 % of total Portuguese GHG emissions. Emissions decreased by 4 % mainly from manure management (CH₄).

Industry (energy) is the fourth largest sector accounting for 14 % of total Portuguese GHG emissions. Emissions increased by 39 % with strong growth rates in almost all industrial branches.

Other (energy) is the fifth largest sector accounting for 9 % of total Portuguese GHG emissions. This sector includes mainly emissions from households and services. Emissions were 50 % above 1990 levels in 2001, with a larger increase in services than in households.

Industry (processes) is the sixth largest sector accounting for 7 % of total Portuguese GHG emissions. Emissions increased by 19 % mainly due to increasing emissions from cement production.

Figure A.34 Portuguese GHG emissions compared with Kyoto target for 2008–12 (excluding LUCF)

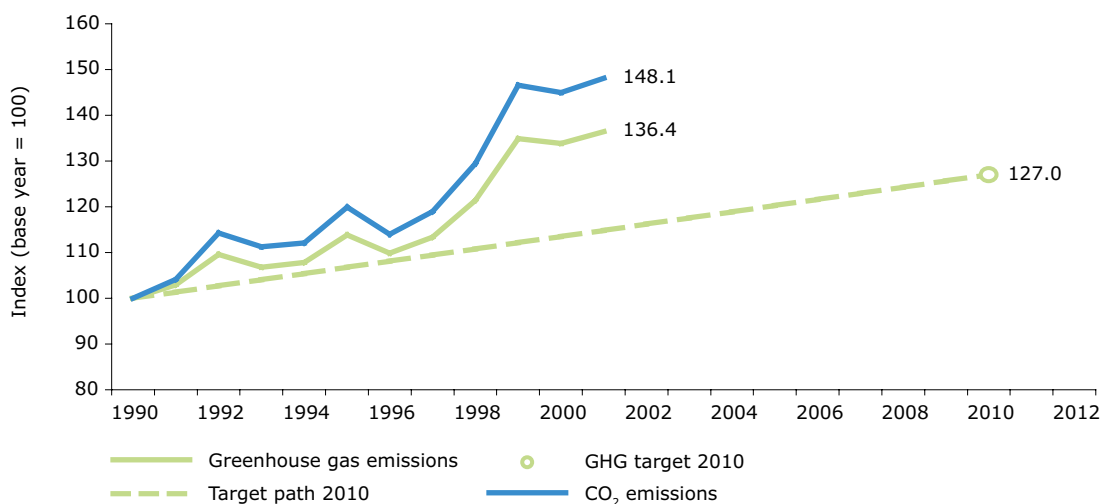
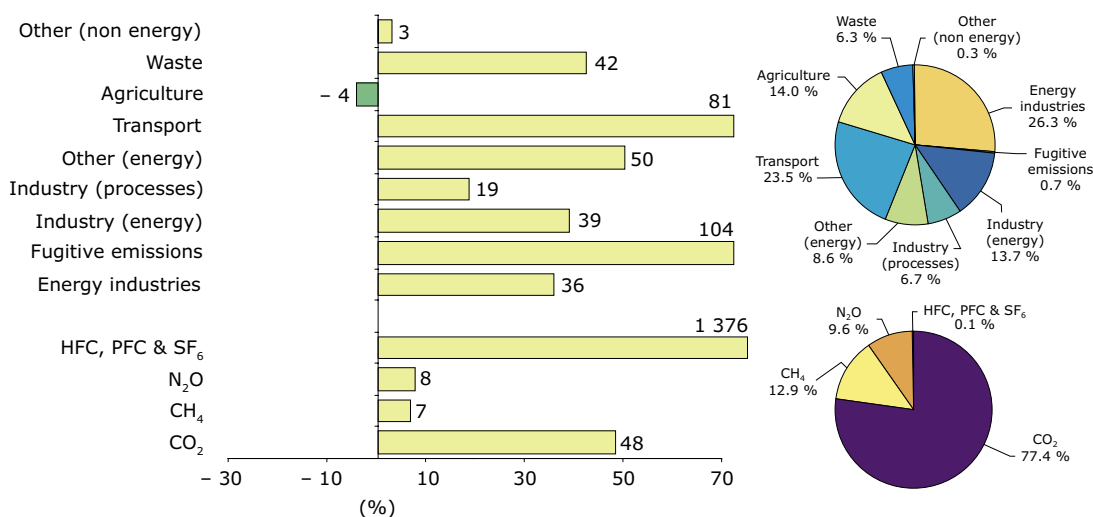


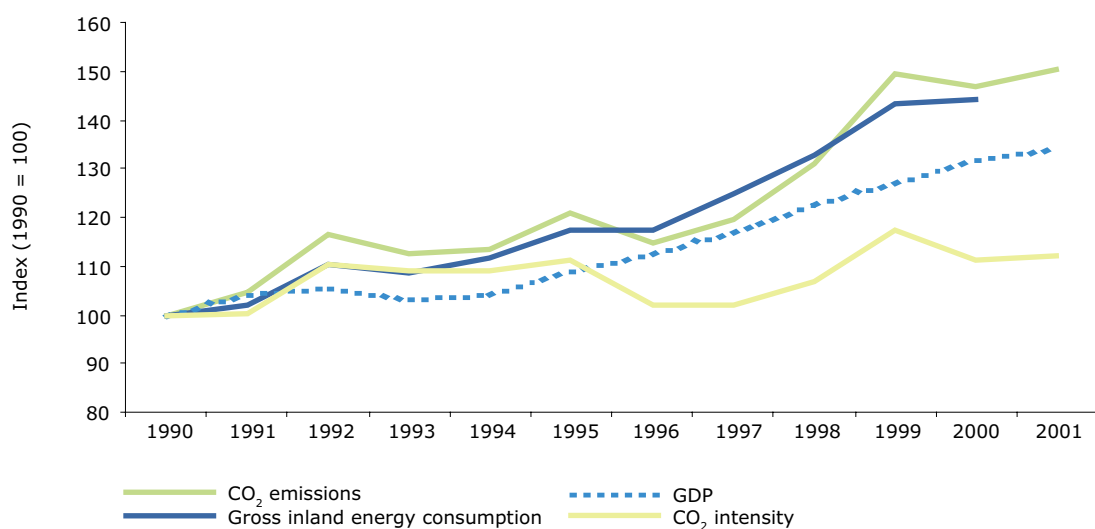
Figure A.35 Change, base year to 2001, of Portuguese GHG emissions by sector and gas and their share in 2001



Note: The left side of the figure shows the percentage change, base year to 2001, of GHG emissions by sector and gas; the right side of the figure shows the share by sector and gas in total Portuguese GHG emissions in 2001.

Main driving forces: CO₂ emissions from fossil fuel combustion account for 70 % of total Portuguese GHG emissions. Figure A.36 shows the development of main driving forces of CO₂ emissions from fossil fuel combustion: real GDP grew by 34 % between 1990 and 2001, energy

consumption increased by 44 % between 1990 and 2000 (no 2001 value available). Emissions of CO₂ from fossil fuels were 50 % above 1990 levels in 2001. Therefore, CO₂ from fossil fuel increased more rapidly than GDP and energy consumption; CO₂ intensity of GDP was 12 % above 1990 in 2001.

Figure A.36 GDP, gross inland energy consumption, CO₂ emissions from fossil fuel combustion and CO₂ intensity of GDP (as an index)

Source: Eurostat, Member State inventory submission (CRF tables), EEA (2003a).

Table A.34 Greenhouse gases and distance-to-target indicators for Portugal

	Base year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Greenhouse gas emissions (without LUCF)	100.0	100.0	102.9	109.6	106.8	107.8	113.9	109.8	113.4	121.4	134.9	133.9	136.4
DTI 2010	0.0	0.0	1.6	6.9	2.7	2.4	7.1	1.7	3.9	10.6	22.7	20.4	21.6
CO ₂ (without LUCF)	100.0	100.0	104.1	114.3	111.2	112.1	119.9	114.0	118.9	129.4	146.5	144.9	148.1
CH ₄ (without LUCF)	100.0	100.0	100.0	98.6	95.8	98.4	98.7	99.1	100.1	100.8	105.2	105.6	106.6
N ₂ O (without LUCF)	100.0	100.0	100.0	97.0	95.8	95.6	98.9	100.2	98.9	102.0	106.6	107.0	107.5
F-gases	100.0	0.0	0.0	0.0	0.0	0.0	100.0	110.0	141.8	246.8	525.9	923.2	1475.8

Table A.35 Sectoral emission indicators (key sources) for Portugal

Key sources	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
1.A.1. Energy industries (CO ₂)	100	104	123	110	105	121	98	101	116	153	131	136
1.A.2. Manufacturing industries and construction (CO ₂)	100	104	109	110	116	112	116	123	124	122	130	139
1.A.3. Transport (CO ₂)	100	106	114	118	123	129	136	142	156	165	179	178
1.A.3. Transport (N ₂ O)	100	106	114	141	170	197	228	257	300	335	382	414
1.A.4. Other sectors (CO ₂)	100	106	109	113	119	116	125	127	137	147	156	158
1.A.4. Other sectors (CH ₄)	100	96	93	91	90	90	90	90	90	89	88	87
1.A.5. Other (CO ₂)	100	71	68	35	5	0	0	0	0	0	0	0
1.B.1. Fugitive emissions from solid fuels (CH ₄)	100	97	90	84	63	0	0	0	0	0	0	0
1.B.1. Fugitive emissions from solid fuels (CO ₂)	100	97	90	84	63	0	0	0	0	0	0	0
1.B.2. Fugitive emissions from oil and natural gas (CH ₄)	100	93	107	105	129	124	115	137	276	652	555	520
1.B.2. Fugitive emissions from oil and natural gas (CO ₂)	100	94	110	106	147	145	139	147	160	176	187	224
2.A. Mineral products (CO ₂)	100	103	101	106	108	114	111	121	122	126	127	126
2.B. Chemical industry (N ₂ O)	100	100	101	84	63	101	101	101	101	101	101	101
2.B. Chemical industry (CO ₂)	100	80	63	55	42	101	75	75	79	78	79	80
2.C. Metal production (CO ₂)	100	95	128	132	129	130	127	149	151	161	173	178
2.C. Metal production (PFC)	0	0	0	0	0	0	0	0	0	0	0	0
2.E. Production of halocarbons and SF ₆ (HFC)	0	0	0	0	0	0	0	0	0	0	0	0
2.F. Consumption of halocarbons and SF ₆ (HFC)	0	0	0	0	0	0	100	522	2.027	6 007	11 734	19 758
2.F. Consumption of halocarbons and SF ₆ (SF ₆)	0	0	0	0	0	100	103	107	110	120	130	140
2.G. Other (CO ₂)	0	0	0	0	0	0	0	0	0	0	0	0
4.A. Enteric fermentation (CH ₄)	100	102	98	96	95	96	95	94	94	100	99	99
4.B. Manure management (CH ₄)	100	97	96	88	92	91	89	90	89	90	89	89
4.B. Manure management (N ₂ O)	100	101	99	97	98	98	97	98	99	110	108	108
4.D. Agricultural soils (N ₂ O)	100	99	94	93	94	94	95	92	95	98	97	97
4.D. Agricultural soils (CO ₂)	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
6.A. Solid waste disposal on land (CH ₄)	100	103	107	110	114	117	121	125	129	135	140	145
6.B. Waste water handling (N ₂ O)	100	104	108	113	115	115	117	116	120	123	124	126
6.D. Other (CO ₂)	0	0	0	0	0	0	0	0	0	0	0	0

Table A.36 Main driving force indicators and sectoral GHG and driving force indicators for Portugal

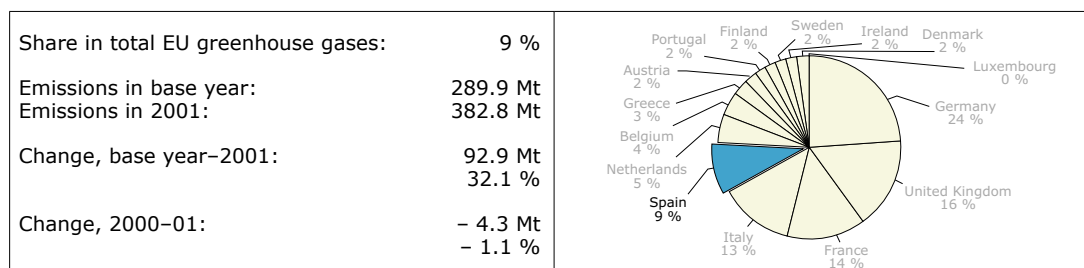
Indicators	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Main driving forces												
CO ₂ from fuel combustion (C)	100	105	116	113	114	121	115	119	131	149	147	150
GDP (E)	100	104	106	103	104	109	113	117	123	127	132	134
Gross inland energy consumption (E)	100	102	110	109	112	117	117	125	133	143	144	:
Energy industries												
CO ₂ from energy industries (C)	100	104	123	110	105	121	98	101	116	153	131	136
Final electricity consumption (E)	100	106	109	110	114	122	128	136	144	153	163	:
Electricity production in public thermal power plants (E)	100	107	130	114	102	122	93	98	124	173	154	:
El. consumption lighting/el. appliances households (E)	:	:	:	:	:	:	:	:	:	:	:	:
Number of dwellings (E)	100	101	102	103	104	105	108	110	111	113	115	:
Electricity consumption in services (E)	100	107	113	119	127	143	153	180	197	216	234	:
Gross value added in services (E)	100	108	111	111	108	112	114	119	126	132	139	:
Transport												
CO ₂ from transport (C)	100	106	114	118	123	129	136	142	156	165	179	178
Passenger transport in cars (pkm) (E)	100	107	120	131	142	152	163	175	187	201	214	:
Freight transport on road (tkm) (E)	100	107	100	94	105	105	107	115	122	128	130	:
CO ₂ from diesel consumption of freight traffic (E)	:	:	:	:	:	:	:	:	:	:	:	:
Households and services												
CO ₂ from other sectors (C)	100	106	109	113	119	116	125	127	137	147	156	158
Heating degree days (E)	100	118	101	110	87	71	97	67	90	101	99	99

Indicators	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
CO ₂ from residential (C)	100	105	111	117	118	118	127	124	132	143	147	154
Number of dwellings (E)	100	101	102	103	104	105	108	110	111	113	115	:
CO ₂ from commercial/institutional (C)	100	112	120	126	145	142	155	191	241	259	252	277
Gross value added in services (E)	100	108	111	111	108	112	114	119	126	132	139	:
Manufacturing industries												
CO ₂ from manufacturing industries (C)	100	104	109	110	116	112	116	123	124	122	130	139
Gross value added industry (E)	100	98	96	93	97	103	109	116	120	121	125	:
CO ₂ from iron and steel industry (E)	100	93	95	97	98	100	102	99	101	100	96	:
Gross value added iron and steel industry (E)	:	:	:	:	:	:	100	125	109	143	:	:
Crude steel production (E)	100	76	109	110	106	117	123	128	128	147	:	:
CO ₂ from glass, pottery and building mat. industry (E)	100	107	103	102	108	108	122	125	148	165	168	:
Value added glass, pottery and build. mat. industry (E)	:	:	:	:	:	:	100	114	121	131	:	:
CO ₂ emissions from the chemical industry (E)	100	101	99	73	123	122	65	180	174	58	63	:
Value added chemical industry (E)	:	:	:	:	:	:	100	109	100	99	:	:
CO ₂ from food industry (E)	100	107	110	102	112	97	112	124	120	110	115	:
Gross value added food industry (E)	:	:	:	:	:	:	100	97	99	110	:	:
CO ₂ from paper and printing industry (E)	100	106	116	119	132	100	126	150	149	153	142	:
Gross value added paper and printing industry (E)	:	:	:	:	:	:	100	111	110	113	:	:
CO ₂ from textile industry (E)	100	99	67	64	71	62	83	98	96	98	107	:
Gross value added textile industry (E)	:	:	:	:	:	:	100	100	99	99	:	:
CO ₂ from autoproducer thermal power stations (E)	100	119	108	137	145	185	182	219	220	225	271	:
All output of autoproducer thermal power stations (E)	100	114	127	151	187	221	236	285	305	362	392	:
Agricultural soils												
N ₂ O from agricultural soils (C)	100	99	94	93	94	94	95	92	95	98	97	97
Fertiliser and manure use (C)	100	97	90	91	90	89	92	88	92	96	95	95
Enteric fermentation												
CH ₄ from enteric fermentation (C)	100	102	98	96	95	96	95	94	94	100	99	99
Cattle population (C)	100	103	98	96	96	96	95	93	92	103	103	103
Mineral products												
CO ₂ from mineral products (C)	100	103	101	106	108	114	111	121	122	126	127	126
Cement/clinker production (C)	100	104	101	107	108	112	117	130	127	130	133	93
Solid waste disposal on land												
CH ₄ from solid waste disposal on land (C)	100	103	107	110	114	117	121	125	129	135	140	145
Waste Disposal on land (C)	100	106	110	114	117	122	128	134	140	139	126	129

Estimates in italics.

Source: Provided in brackets with C for CRF and E for Eurostat.

Spain



Distance-to-target indicator: Spain's GHG emissions decreased by 1.1 % in 2001, compared with 2000, mainly because of decreases in thermal power production, and HFC emission reductions. In 2001, total GHG emissions were 383 Mt (CO₂ equivalents), which was 32 % above the base-year level. In the burden sharing agreement under the Kyoto Protocol, Spain agreed to limit its GHG emissions to 15 % above the base-year level by 2008–12. Assuming a linear target path from 1990 to 2010, Spanish GHG emissions were 23.8 index points above this target path in 2001 (Figure A.37).

Greenhouse gas emission trends:

CO₂ emissions account for 80 % of total GHG emissions. They remained stable compared with 2000 and were 35 % above 1990 levels in 2001. In 2001, CO₂ emissions mainly decreased due to reduced coal use in thermal power production and increased hydro-power production. The decrease was almost offset by emission increases from transport. Over the period 1990–2001, CO₂ emissions increased from all fuel combustion-related sectors, above all, transport (+ 55 %).

Emissions of CH₄ account for 11 % of total Spanish GHG emissions and increased by 33 % between 1990 and 2001. Also in 2001, emissions increased compared with 2000. The main reasons for increasing CH₄ emissions were increases from solid waste disposal on land, manure management and enteric fermentation.

Emissions of N₂O are responsible for 8 % of total GHG emissions and increased

by 11 %. The main reason for N₂O emission increases was the introduction of the catalytic converter and increases in fertiliser and manure use.

Fluorinated gas emissions account for 1 % of total GHG emissions and were 4 % above 1995 levels in 2001. Fluorinated gas emissions show opposing trends: HFC emissions increased by 14 % between 1995 and 2001, due to the replacement of ozone depleting substances such as chlorofluorocarbons with HFCs. PFC emissions decreased by 71 %. Emissions of SF₆ increased by 127 % between 1995 and 2001.

Energy industries is the largest sector accounting for 26 % of total Spanish GHG emissions. The 28 % increase of the sector is largely due to increased power production from fossil fuels, especially from coal.

Transport is the second largest sector accounting for 24 % of total Spanish GHG emissions. The 57 % increase is due to fast growing road transport.

Industry (energy) is the third largest sector accounting for 16 % of total Spanish GHG emissions. Emissions increased by 34 %.

Agriculture is the fourth largest sector and accounts for 11 % of total Spanish GHG emissions. Emissions increased by 15 % due to increasing cattle numbers and use of fertiliser and manure.

Other (energy) is the fifth largest sector accounting for 9 % of total Spanish GHG emissions. Emissions were 29 % above

Figure A.37 Spanish GHG emissions compared with Kyoto target for 2008–12 (excluding LUCF)

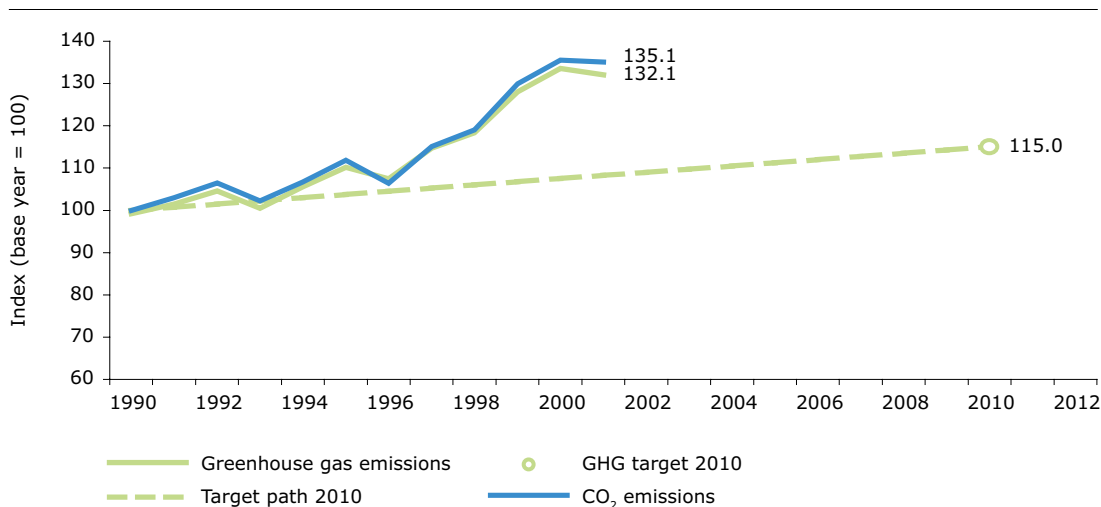
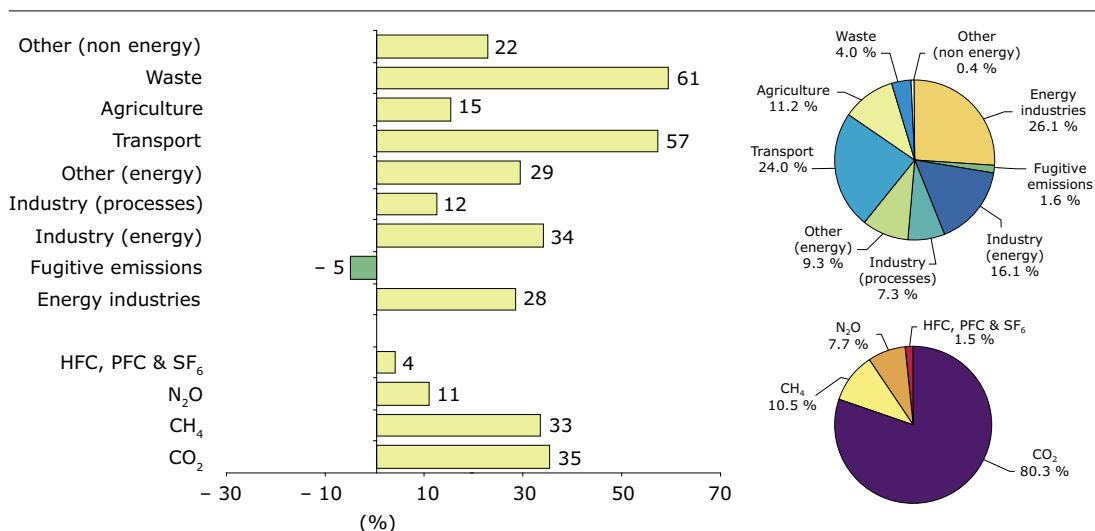


Figure A.38 Change, base year to 2001, of Spanish GHG emissions by sector and gas and their share in 2001



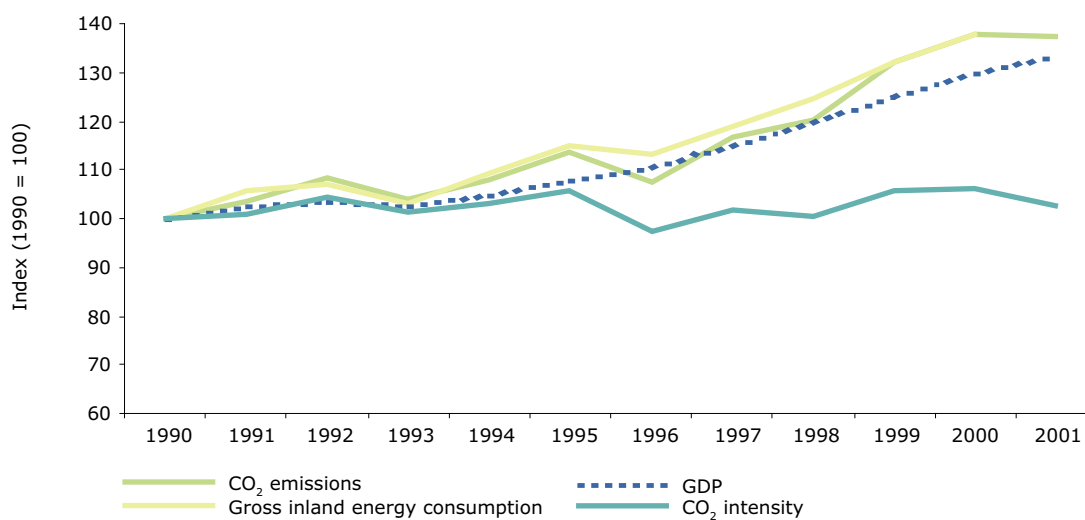
Note: The left side of the figure shows the percentage change, base year to 2001, of GHG emissions by sector and gas; the right side of the figure shows the share by sector and gas in total Spanish GHG emissions in 2001.

1990 levels in 2001. Emissions from the services sector (+ 80 %) increased more than emissions from households (+ 27 %).

Industry (processes) is the sixth largest sector accounting for 7 % of total Spanish GHG emissions. Emissions increased by 12 % mainly due to increasing cement production.

Main driving forces: CO₂ emissions from fossil fuel combustion account for

74 % of total Spanish GHG emissions. Figure A.39 shows the development of main driving forces of CO₂ emissions from fossil fuel combustion: real GDP grew by 34 % between 1990 and 2001, energy consumption increased by 38 % between 1990 and 2000 (no 2001 value available). Emissions of CO₂ from fossil fuels were 37 % above 1990 levels in 2001. Therefore, CO₂ emissions grew more rapidly than GDP; CO₂ intensity of GDP was 3 % above 1990 in 2001.

Figure A.39 GDP, gross inland energy consumption, CO₂ emissions from fossil fuel combustion and CO₂ intensity of GDP (as an index)

Source: Eurostat, Member State inventory submission (CRF tables), EEA (2003a).

Table A.37 Greenhouse gases and distance-to-target indicators for Spain

	Base year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Greenhouse gas emissions (without LUCF)	100.0	99.2	101.5	104.6	100.5	105.6	110.2	107.4	114.7	118.4	128.0	133.6	132.1
DTI 2010	0.0	- 0.8	0.8	3.1	- 1.7	2.6	6.4	2.9	9.5	12.4	21.3	26.1	23.8
CO ₂ (without LUCF)	100.0	100.0	103.0	106.5	102.2	106.7	111.9	106.4	115.1	119.0	130.0	135.5	135.1
CH ₄ (without LUCF)	100.0	100.0	100.9	104.4	105.7	109.2	111.5	117.0	120.4	124.5	125.8	129.8	133.2
N ₂ O (without LUCF)	100.0	100.0	99.1	96.3	89.1	97.5	96.5	105.1	102.7	105.4	110.4	115.6	110.7
F-gases	100.0	59.5	54.8	65.3	56.4	78.1	100.0	109.5	127.2	121.2	145.5	158.9	103.6

Table A.38 Sectoral emission indicators (key sources) for Spain

Key sources	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
1.A.1. Energy industries (CO ₂)	100	101	111	103	103	111	95	110	109	129	135	128
1.A.2. Manufacturing industries and construction (CO ₂)	100	103	101	98	107	119	106	119	121	126	134	134
1.A.3. Transport (CO ₂)	100	103	109	108	112	114	122	123	135	144	148	155
1.A.3. Transport (N ₂ O)	100	104	112	121	138	151	170	186	215	240	256	278
1.A.4. Other sectors (CO ₂)	100	114	112	109	114	112	117	117	120	126	131	131
1.A.4. Other sectors (CH ₄)	100	105	107	100	96	90	89	89	88	84	79	78
1.A.5. Other (CO ₂)	0	0	0	0	0	0	0	0	0	0	0	0
1.B.1. Fugitive emissions from solid fuels (CH ₄)	100	88	89	86	80	80	81	80	72	67	67	59
1.B.1. Fugitive emissions from solid fuels (CO ₂)	100	99	98	80	63	52	60	77	85	72	80	82
1.B.2. Fugitive emissions from oil and natural gas (CH ₄)	100	106	104	101	119	125	129	152	162	124	142	170
1.B.2. Fugitive emissions from oil and natural gas (CO ₂)	100	98	104	113	122	108	107	111	115	111	126	123
2.A. Mineral products (CO ₂)	100	96	87	82	97	103	101	106	114	119	121	124
2.B. Chemical industry (N ₂ O)	100	90	76	63	75	83	85	80	75	81	80	71
2.B. Chemical industry (CO ₂)	100	108	94	71	91	93	95	98	93	90	90	90
2.C. Metal production (CO ₂)	100	96	86	94	99	102	100	108	113	114	118	123
2.C. Metal production (PFC)	105	100	99	100	99	100	95	98	92	84	46	22
2.E. Production of halocarbons and SF ₆ (HFC)	52	47	60	49	75	100	110	126	110	128	138	65
2.F. Consumption of halocarbons and SF ₆ (HFC)	0	0	0	4	11	100	1 566	3 986	9 074	16 213	23 518	30 375
2.F. Consumption of halocarbons and SF ₆ (SF ₆)	60	66	68	72	81	100	108	130	150	198	225	227
2.G. Other (CO ₂)	0	0	0	0	0	0	0	0	0	0	0	0
4.A. Enteric fermentation (CH ₄)	100	101	100	100	100	102	109	108	111	112	113	115
4.B. Manure management (CH ₄)	100	97	105	107	113	114	112	118	126	128	136	138
4.B. Manure management (N ₂ O)	100	100	99	97	97	96	97	97	99	99	98	99
4.D. Agricultural soils (N ₂ O)	100	99	95	88	96	91	106	100	104	108	115	108
4.D. Agricultural soils (CO ₂)	0	0	0	0	0	0	0	0	0	0	0	0
6.A. Solid waste disposal on land (CH ₄)	100	107	118	126	135	145	154	165	172	178	187	194
6.B. Waste water handling (N ₂ O)	100	102	103	105	105	105	105	105	106	107	108	108
6.D. Other (CO ₂)	0	0	0	0	0	0	0	0	0	0	0	0

Table A.39 Main driving force indicators and sectoral GHG and driving force indicators for Spain

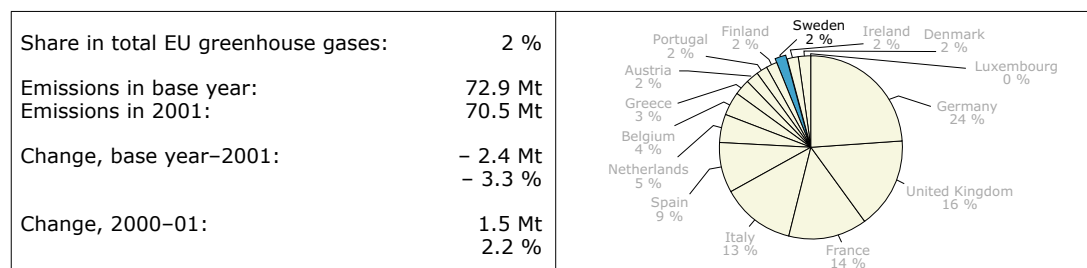
Indicators	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Main driving forces												
CO ₂ from fuel combustion (C)	100	104	108	104	108	114	108	117	120	132	138	137
GDP (E)	100	103	103	102	105	108	110	115	120	125	130	134
Gross inland energy consumption (E)	100	106	107	103	109	115	113	119	125	132	138	:
Energy industries												
CO ₂ from energy industries (C)	100	101	111	103	103	111	95	110	109	129	135	128
Final electricity consumption (E)	100	102	104	104	109	112	117	126	132	141	150	:
Electricity production in public thermal power plants (E)	100	101	115	103	102	113	93	116	112	135	144	:
El. consumption lighting/el. appliances households (E)	100	103	104	103	106	115	117	121	128	128	:	:
Number of dwellings (E)	100	101	103	104	105	107	108	110	111	112	114	:
Electricity consumption in services (E)	100	102	106	109	131	141	150	169	179	188	199	:
Gross value added in services (E)	100	102	103	103	105	107	109	112	116	121	126	:
Transport												
CO ₂ from transport (C)	100	103	109	108	112	114	122	123	135	144	148	155
Passenger transport in cars (pkm) (E)	100	105	110	113	117	119	124	129	135	148	151	:
Freight transport on road (tkm) (E)	100	105	109	111	117	120	117	122	146	156	169	:
CO ₂ from diesel consumption of freight traffic (E)	100	96	92	90	106	117	123	125	146	149	:	:
Households and services												
CO ₂ from other sectors (C)	100	114	112	109	114	112	117	117	120	126	131	131
Heating degree days (E)	100	115	108	112	93	83	98	81	98	103	100	98

Indicators	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
CO ₂ from residential (C)	100	119	112	111	115	108	117	116	119	126	128	127
Number of dwellings (E)	100	101	103	104	105	107	108	110	111	112	114	:
CO ₂ from commercial/institutional (C)	100	121	132	115	125	141	139	144	146	155	182	180
Gross value added in services (E)	100	102	103	103	105	107	109	112	116	121	126	:
Manufacturing industries												
CO ₂ from manufacturing industries (C)	100	103	101	98	107	119	106	119	121	126	134	134
Gross value added industry (E)	100	102	100	96	97	101	102	107	113	118	124	:
CO ₂ from iron and steel industry (E)	100	99	90	90	93	90	78	90	86	80	83	:
Gross value added iron and steel industry (E)	100	87	76	64	69	88	70	79	78	86	101	:
Crude steel production (E)	100	103	101	103	107	110	97	109	118	118	:	:
CO ₂ from glass, pottery and building mat. industry (E)	100	113	111	91	95	94	98	115	116	111	131	:
Value added glass, pottery and build. mat. industry (E)	100	102	100	81	86	88	85	92	102	115	119	:
CO ₂ emissions from the chemical industry (E)	100	104	110	101	120	134	111	119	114	105	119	:
Value added chemical industry (E)	100	102	100	91	95	92	93	97	104	112	112	:
CO ₂ from food industry (E)	100	103	103	103	116	126	107	110	105	101	114	:
Gross value added food industry (E)	100	106	105	93	87	82	83	83	86	91	90	:
CO ₂ from paper and printing industry (E)	100	100	99	108	115	119	108	123	132	129	148	:
Gross value added paper and printing industry (E)	100	105	102	90	91	88	94	100	104	110	123	:
CO ₂ from textile industry (E)	100	89	86	97	101	112	104	118	116	111	130	:
Gross value added textile industry (E)	100	102	93	74	72	70	74	77	82	85	87	:
CO ₂ from autoproducer thermal power stations (E)	100	110	219	232	327	495	374	487	484	734	632	:
All output of autoproducer thermal power stations (E)	100	93	116	136	252	321	445	660	766	974	925	:
Agricultural soils												
N ₂ O from agricultural soils (C)	100	99	95	88	96	91	106	100	104	108	115	108
Fertiliser and manure use (C)	100	99	93	81	95	88	106	98	102	108	116	104
Enteric fermentation												
CH ₄ from enteric fermentation (C)	100	101	100	100	100	102	109	108	111	112	113	115
Cattle population (C)	100	102	99	99	103	111	117	117	120	123	120	126
Mineral products												
CO ₂ from mineral products (C)	100	96	87	82	97	103	101	106	114	119	121	124
Cement/clinker production (C)	100	95	85	81	94	101	99	104	112	118	120	122
Solid waste disposal on land												
CH ₄ from solid waste disposal on land (C)	100	107	118	126	135	145	154	165	172	178	187	194
Waste Disposal on land (C)	100	110	125	129	127	129	125	134	134	140	135	145

Estimates in italics.

Source: Provided in brackets with C for CRF and E for Eurostat.

Sweden



Distance-to-target indicator: Sweden's GHG emissions increased by 2.2 % in 2001, compared with 2000, mainly due to increases in thermal power production. In 2001, total GHG emissions were 71 Mt (CO₂ equivalents), which was 3 % below the base-year level. In the burden sharing agreement under the Kyoto Protocol, Sweden agreed to reduce its GHG emissions by 4 % by 2008–12, from the base-year level. Assuming a linear target path from 1990 to 2010, Swedish GHG emissions were 5.5 index points below this target path in 2001 (Figure A.40).

Greenhouse gas emission trends: CO₂ emissions account for 78 % of total GHG emissions. They increased by 3 % compared with 2000 and were 2 % below 1990 levels in 2001. In 2001, CO₂ emissions increased mainly because of increases in thermal power production. Over the period 1990–2001, CO₂ emissions mainly declined from households and services (– 27 %) partly due to increases in district heating.

Emissions of CH₄ account for 8 % of total Swedish GHG emissions and decreased by 12 % between 1990 and 2001. In 2001, the emissions remained stable. The main reasons for declining CH₄ emissions were the reductions in solid waste disposal on land and CH₄ recovery.

Emissions of N₂O are responsible for 12 % of total GHG emissions and decreased by 5 %. The main reasons for N₂O emission decreases was a decline in fertiliser and manure use, and falling nitric acid production.

Fluorinated gas emissions account for 1 % of total GHG emissions and were 16 % above 1995 levels in 2001. Fluorinated gas emissions show opposing trends: HFC emissions increased by 193 % between 1995 and 2001, mainly due to the replacement of ozone depleting substances such as chlorofluorocarbons with HFCs. PFC emissions decreased by 32 % (mainly from metal production) and SF₆ emissions by 17 %.

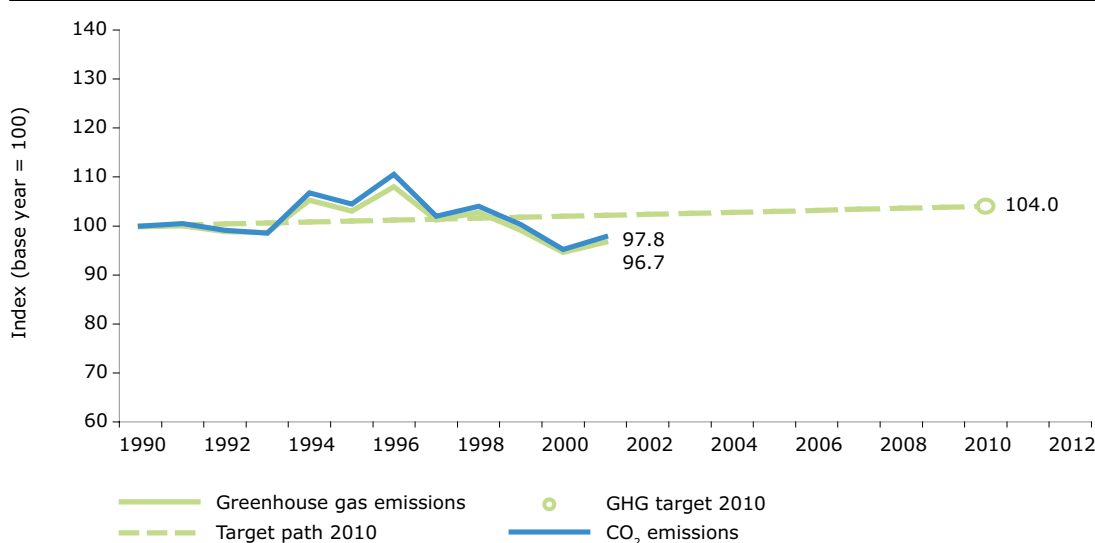
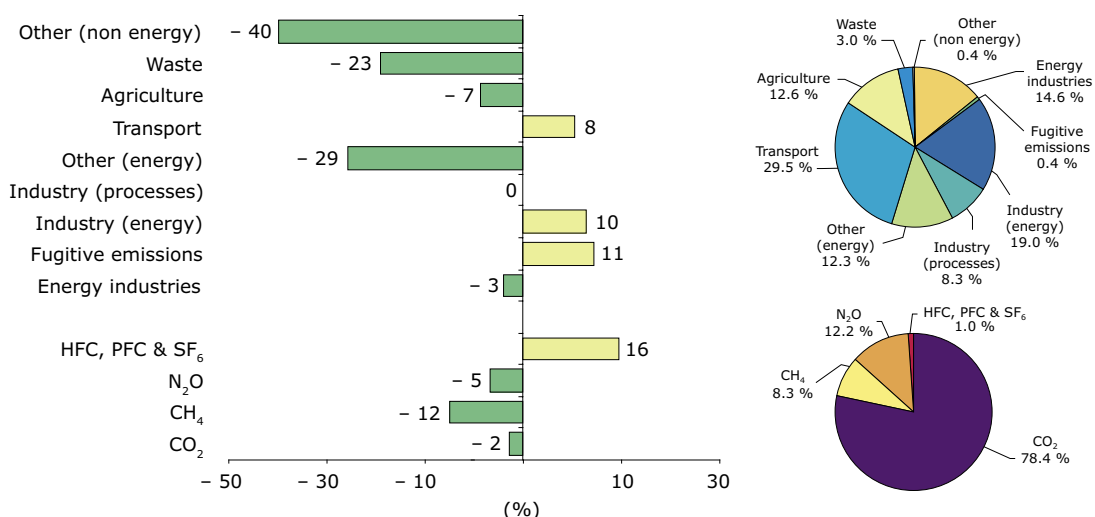
Transport is the largest sector, accounting for 30 % of total Swedish GHG emissions. The 8 % increase is mainly due to growing road transport.

Industry (energy) is the second largest sector accounting for 19 % of total Swedish GHG emissions. Emissions increased by 10 %. A main contributor is the iron and steel industry with a 44 % increase in CO₂ emissions.

Energy industries is the third largest sector accounting for 15 % of total Swedish GHG emissions. The emissions from this sector decreased by 3 %, despite a substantial increase in thermal power and heat production mainly due to a shift from solid fuels to biomass.

Agriculture accounts for 13 % of total Swedish GHG emissions. Emissions decreased by 7 % mainly due to a decline in fertiliser and manure use.

Other (energy) is the fifth largest sector accounting for 12 % of total Swedish GHG emissions. This sector includes mainly emissions from households and services. Emissions were 29 % below

Figure A.40 Swedish GHG emissions compared with Kyoto target for 2008–12 (excluding LUCF)**Figure A.41 Change, base year to 2001, of Swedish GHG emissions by sector and gas and their share in 2001**

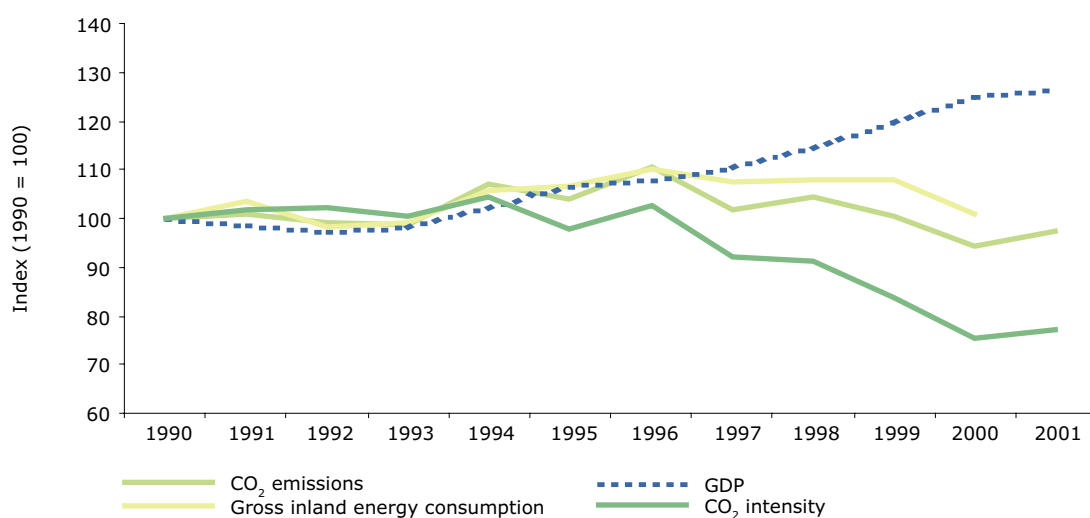
Note: The left side of the figure shows the percentage change, base year to 2001, of GHG emissions by sector and gas; the right side of the figure shows the share by sector and gas in total Swedish GHG emissions in 2001.

1990 levels in 2001, which was partly due to increases in district heating.

Industry (processes) is the sixth largest sector accounting for 8 % of total Swedish GHG emissions. Emissions remained stable compared with 1990.

Main driving forces: CO₂ emissions from fossil fuel combustion account for 71 % of total Swedish GHG emissions. Figure 42 shows the development of

main driving forces of CO₂ emissions from fossil fuel combustion: real GDP grew by 26 % between 1990 and 2001, energy consumption decoupled from GDP and was 1 % above 1990 levels in 2000 (no 2001 value available). Emissions of CO₂ from fossil fuels were 3 % below 1990 levels in 2001. Therefore, CO₂ emissions decoupled from GDP, but not from energy consumption; CO₂ intensity of GDP was 23 % below 1990 in 2001.

Figure A.42 GDP, gross inland energy consumption, CO₂ emissions from fossil fuel combustion and CO₂ intensity of GDP (as an index)

Source: Eurostat, Member State inventory submission (CRF tables), EEA (2003a).

Table A.40 Greenhouse gases and distance-to-target indicators for Sweden

	Base year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Greenhouse gas emissions (without LUCF)	100.0	99.8	100.0	98.9	98.6	105.2	103.0	108.0	101.2	102.8	99.1	94.6	96.7
DTI 2010	0.0	- 0.2	- 0.2	- 1.5	- 2.0	4.4	2.0	6.8	- 0.2	1.2	- 2.7	- 7.4	-5.5
CO ₂ (without LUCF)	100.0	100.0	100.5	99.1	98.6	106.8	104.5	110.6	102.0	104.0	100.3	95.2	97.8
CH ₄ (without LUCF)	100.0	100.0	99.6	101.2	101.9	100.7	99.4	98.8	97.4	95.2	92.2	88.4	88.2
N ₂ O (without LUCF)	100.0	100.0	98.6	96.9	98.0	100.3	96.9	99.1	98.1	100.1	95.6	94.4	94.7
F-gases	100.0	82.4	81.2	79.5	82.0	88.0	100.0	99.8	117.2	109.6	120.7	112.7	115.6

Table A.41 Sectoral emission indicators (key sources) for Sweden

Key sources	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
1.A.1. Energy industries (CO ₂)	100	111	111	106	129	114	155	113	125	109	82	95
1.A.2. Manufacturing industries and construction (CO ₂)	100	96	86	96	109	113	108	110	108	102	109	110
1.A.3. Transport (CO ₂)	100	99	104	100	103	103	102	104	107	108	107	108
1.A.3. Transport (N ₂ O)	100	105	113	115	120	122	131	136	135	146	157	165
1.A.4. Other sectors (CO ₂)	100	98	92	92	93	89	89	81	81	82	72	73
1.A.4. Other sectors (CH ₄)	100	100	100	101	95	101	104	98	96	102	95	108
1.A.5. Other (CO ₂)	100	117	123	96	85	77	71	64	52	45	43	30
1.B.1. Fugitive emissions from solid fuels (CH ₄)	100	99	79	92	144	131	116	94	109	118	114	114
1.B.1. Fugitive emissions from solid fuels (CO ₂)	100	98	77	93	146	131	115	92	110	119	115	115
1.B.2. Fugitive emissions from oil and natural gas (CH ₄)	100	83	95	84	53	53	146	159	0	0	12	92
1.B.2. Fugitive emissions from oil and natural gas (CO ₂)	100	80	91	77	50	50	116	122	86	NO	12	70
2.A. Mineral products (CO ₂)	100	92	86	87	92	102	97	93	93	90	90	92
2.B. Chemical industry (N ₂ O)	100	105	101	98	95	87	84	83	93	83	78	60
2.B. Chemical industry (CO ₂)	100	101	77	80	83	84	86	85	79	78	69	68
2.C. Metal production (CO ₂)	100	102	108	109	111	119	125	119	112	111	122	115
2.C. Metal production (PFC)	116	112	109	105	101	100	87	79	77	85	69	68
2.E. Production of halocarbons and SF ₆ (HFC)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0
2.F. Consumption of halocarbons and SF ₆ (HFC)	3	5	8	25	56	100	140	213	237	276	293	293
2.F. Consumption of halocarbons and SF ₆ (SF ₆)	82	84	83	72	74	100	77	112	59	59	37	52
2.G. Other (CO ₂)	0	0	0	0	0	0	0	0	0	0	0	0
4.A. Enteric fermentation (CH ₄)	100	98	101	105	106	103	102	102	99	98	96	95
4.B. Manure management (CH ₄)	100	98	102	114	117	118	120	116	115	113	108	123
4.B. Manure management (N ₂ O)	100	98	100	91	91	83	83	87	87	81	79	75
4.D. Agricultural soils (N ₂ O)	100	97	95	98	99	98	98	99	98	93	92	93
4.D. Agricultural soils (CO ₂)	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE
6.A. Solid waste disposal on land (CH ₄)	100	102	102	98	94	94	93	91	89	84	80	77
6.B. Waste water handling (N ₂ O)	100	100	93	93	92	95	95	94	82	81	75	75
6.D. Other (CO ₂)	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE

Table A.42 Main driving force indicators and sectoral GHG and driving force indicators for Sweden

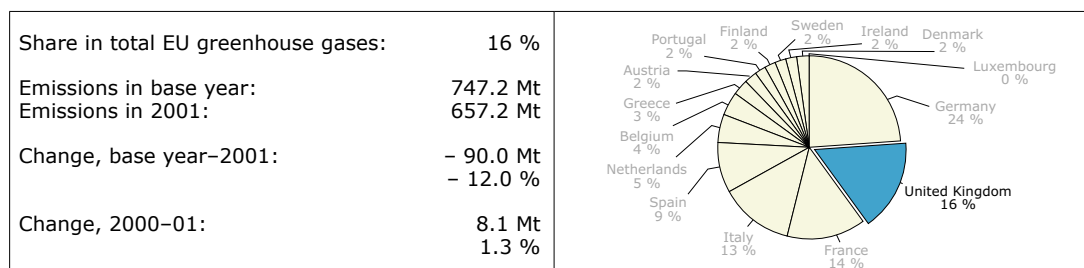
Indicators	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Main driving forces												
CO ₂ from fuel combustion (C)	100	101	99	99	107	104	111	102	104	100	94	97
GDP (E)	100	99	97	98	102	107	108	111	115	120	125	126
Gross inland energy consumption (E)	100	103	98	99	106	107	109	106	107	107	101	:
Energy industries												
CO ₂ from energy industries (C)	100	111	111	106	129	114	155	113	125	109	82	95
Final electricity consumption (E)	100	101	100	101	102	104	105	104	105	105	107	:
Electricity production in public thermal power plants (E)	100	138	149	171	187	202	249	194	200	195	178	:
El. consumption lighting/el. appliances households (E)	100	101	102	104	105	108	111	106	106	99	102	:
Number of dwellings (E)	100	104	105	105	105	106	105	105	104	105	106	:
Electricity consumption in services (E)	100	104	105	104	106	107	107	101	103	107	104	:
Gross value added in services (E)	100	101	99	98	101	104	105	108	110	115	118	:
Transport												
CO ₂ from transport (C)	100	99	104	100	103	103	102	104	107	108	107	108
Passenger transport in cars (pkm) (E)	100	101	102	100	101	103	104	104	104	107	108	:
Freight transport on road (tkm) (E)	100	96	92	98	103	111	118	126	124	124	119	:
CO ₂ from diesel consumption of freight traffic (E)	100	92	89	89	95	88	93	99	98	98	94	:
Households and services												
CO ₂ from other sectors (C)	100	98	92	92	93	89	89	81	81	82	72	73
Heating degree days (E)	100	109	100	109	86	111	118	106	112	106	99	110

Indicators	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
CO ₂ from residential (C)	100	99	95	93	97	94	94	84	84	86	73	73
Number of dwellings (E)	100	104	105	105	105	106	105	105	104	105	106	:
CO ₂ from commercial/institutional (C)	100	98	79	81	73	64	66	60	58	62	56	58
Gross value added in services (E)	100	101	99	98	101	104	105	108	110	115	118	:
Manufacturing industries												
CO ₂ from manufacturing industries (C)	100	96	86	96	109	113	108	110	108	102	109	110
Gross value added industry (E)	100	96	92	91	100	110	113	118	125	135	146	:
CO ₂ from iron and steel industry (E)	100	93	99	102	127	130	116	113	110	107	109	:
Gross value added iron and steel industry (E)	100	63	62	61	71	62	65	71	66	97	:	:
Crude steel production (E)	100	95	98	103	112	111	110	116	116	114	:	:
CO ₂ from glass, pottery and building mat. industry (E)	100	88	70	78	73	74	73	70	70	65	77	:
Value added glass, pottery and build. mat. industry (E)	100	88	74	59	55	57	57	57	56	56	:	:
CO ₂ emissions from the chemical industry (E)	100	119	90	111	106	80	93	65	106	88	93	:
Value added chemical industry (E)	100	110	119	115	125	108	95	121	126	140	:	:
CO ₂ from food industry (E)	100	85	88	85	97	99	106	96	90	96	78	:
Gross value added food industry (E)	100	105	109	88	89	83	103	104	101	107	:	:
CO ₂ from paper and printing industry (E)	100	90	82	99	123	119	138	124	111	113	111	:
Gross value added paper and printing industry (E)	100	92	88	82	85	86	77	86	85	89	:	:
CO ₂ from textile industry (E)	100	81	83	102	92	109	111	99	94	98	48	:
Gross value added textile industry (E)	100	89	85	64	67	57	67	69	67	64	:	:
CO ₂ from autoproducer thermal power stations (E)	100	111	199	256	300	348	267	243	293	338	325	:
All output of autoproducer thermal power stations (E)	100	109	114	136	148	148	283	287	290	334	337	:
Agricultural soils												
N ₂ O from agricultural soils (C)	100	97	95	98	99	98	98	99	98	93	92	93
Fertiliser and manure use (C)	100	94	84	94	98	90	87	91	91	82	84	88
Enteric fermentation												
CH ₄ from enteric fermentation (C)	100	98	101	105	106	103	102	102	99	98	96	95
Cattle population (C)	100	99	103	105	106	103	104	104	101	100	98	96
Mineral products												
CO ₂ from mineral products (C)	100	92	86	87	92	102	97	93	93	90	90	92
Cement/clinker production (C)	100	89	86	86	87	102	96	87	90	90	89	87
Solid waste disposal on land												
CH ₄ from solid waste disposal on land (C)	100	102	102	98	94	94	93	91	89	84	80	77
Waste Disposal on land (C)	100	95	92	89	81	74	72	76	62	55	46	47

Estimates in italics.

Source: Provided in brackets with C for CRF and E for Eurostat.

United Kingdom



Distance-to-target indicator: the United Kingdom's GHG emissions increased by 1.3 % in 2001, compared with 2000, mainly due to increased use of solid fuels in power production. In 2001, total GHG emissions were 657 Mt (CO₂ equivalents), which was 12 % below the base-year level. In the burden sharing agreement under the Kyoto Protocol, the United Kingdom agreed to reduce its GHG emissions by 12.5 % by 2008–12, from the base-year level. Assuming a linear target path from 1990 to 2010, the United Kingdom's GHG emissions were 5.2 index points below this target path in 2001 (Figure A.43).

Greenhouse gas emission trends: CO₂ emissions account for 85 % of total GHG emissions. They increased by 2 % compared with 2000, but were 5 % below 1990 levels in 2001. In 2001, CO₂ emissions increased mainly because of increases in fuel combustion (in particular coal) in power and heat production. Also, emissions from households and services increased due to cold outdoor temperatures. Over the period 1990–2001, the main reason for CO₂ emission decreases was the shift from coal and oil to gas in power and heat production.

Emissions of CH₄ account for 7 % of the United Kingdom's total GHG emissions and decreased by 40 % between 1990 and 2001. Also in 2001, emissions decreased compared with 2000. The main reasons for declining CH₄ emissions were reductions in solid waste disposal on land, increased CH₄ recovery in landfills and the decline of coal mining.

Emissions of N₂O are responsible for 6 % of total GHG emissions and decreased by 38 %. The main reasons for N₂O emission decreases were reduction measures in the adipic acid production.

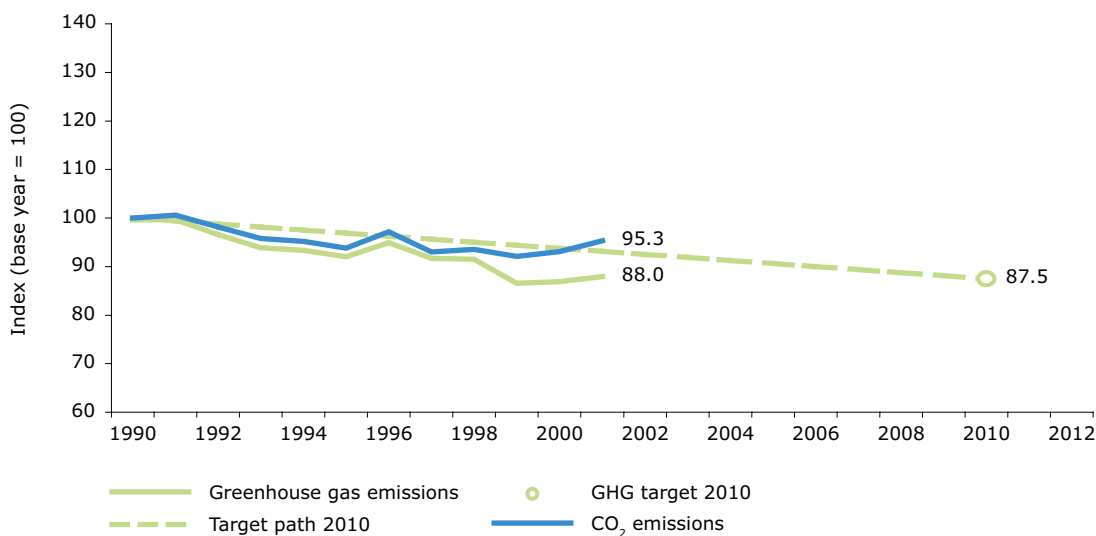
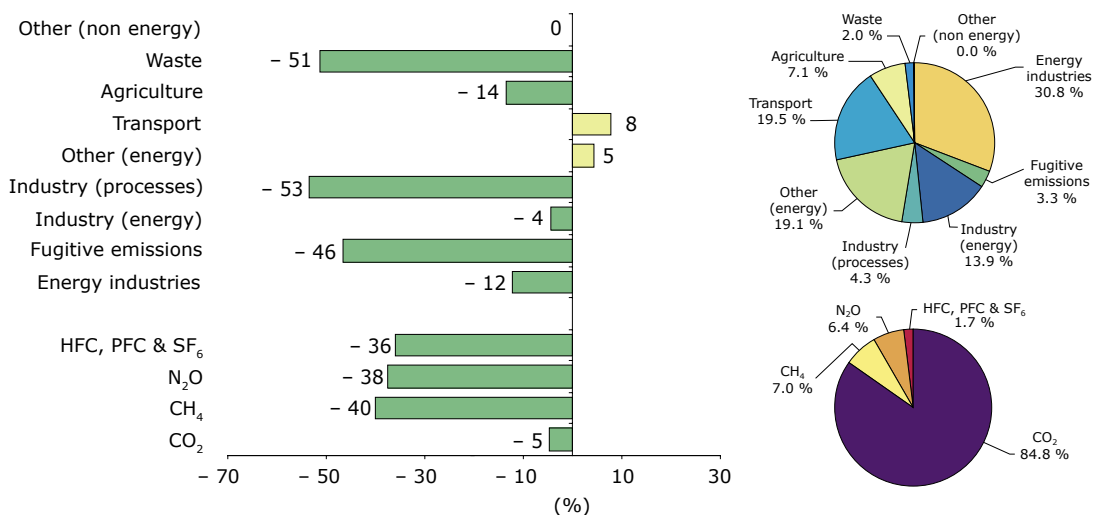
Fluorinated gas emissions account for 2 % of total GHG emissions and were 36 % below 1995 levels in 2001. Fluorinated gas emissions show opposing trends: HFC emissions decreased by 43 % mainly from HCFC production. PFC emissions decreased by 35 % and SF₆ emissions increased by 55 % between.

Energy industries is the largest sector accounting for 31 % of the United Kingdom's total GHG emissions. The emissions from this sector decreased by 12 % mainly due to fuel shifts from coal and oil to gas in power production.

Transport is the second largest sector accounting for 20 % of the United Kingdom's GHG emissions. With an 8 % increase it is also the fastest growing sector in the United Kingdom. This is mainly due to growing road transport demand.

Other (energy) is the third largest sector accounting for 19 % of the United Kingdom's total GHG emissions. This sector includes mainly emissions from households and services. Emissions were 5 % above 1990 levels in 2001, but fluctuate to a certain extent according to annual changes in outdoor temperatures.

Industry (energy) is the fourth largest sector accounting for 14 % of the United Kingdom's GHG emissions. Emissions

Figure A.43 UK GHG emissions compared with Kyoto target for 2008–12 (excluding LUCF)**Figure A.44 Change, base year to 2001, of UK GHG emissions by sector and gas and their share in 2001**

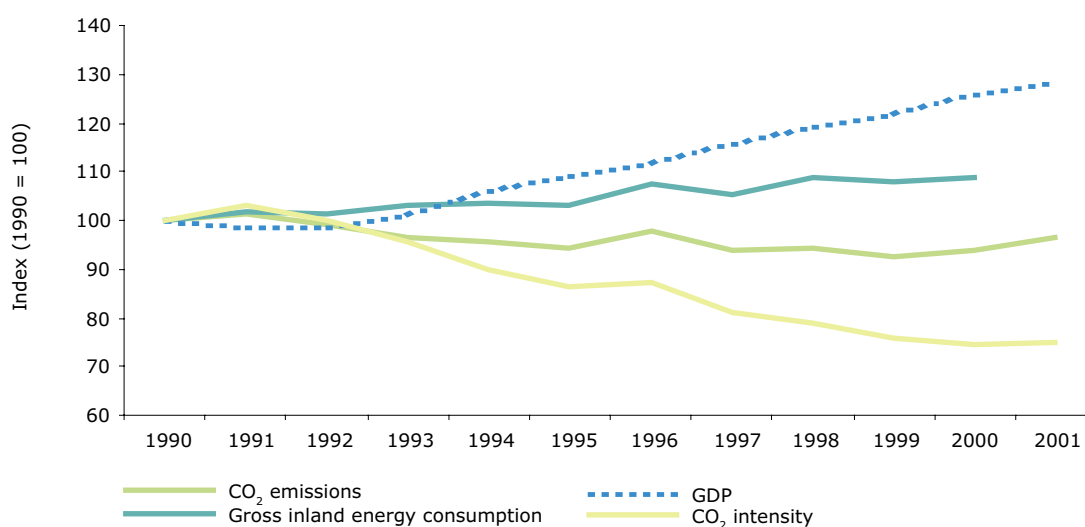
Note: The left side of the figure shows the percentage change, base year to 2001, of GHG emissions by sector and gas; the right side of the figure shows the share by sector and gas in total UK GHG emissions in 2001.

decreased by 4 %, partly due to fuel shifts from coal and oil to gas.

Agriculture accounts for 7 % of the United Kingdom's total GHG emissions. Emissions decreased by 14 % mainly due to declining use of fertiliser and manure and a smaller cattle population.

Industry (processes) is the sixth largest sector accounting for 4 % of total GHG emissions. Emissions decreased by 53 % mainly due to reduction measures in adipic acid production emission reductions from HCFC production.

Main driving forces: CO₂ emissions from fossil fuel combustion account for 83 % of the United Kingdom's GHG emissions. Figure 45 shows the development of main driving forces of CO₂ emissions from fossil fuel combustion: real GDP grew by 28 % between 1990 and 2001, energy consumption decoupled from GDP but increased by 9 % between 1990 and 2000 (no 2001 value available). Emissions of CO₂ from fossil fuels were 4 % below 1990 levels in 2001. Therefore, CO₂ emissions decoupled from GDP and from energy consumption; CO₂ intensity of GDP was 25 % below 1990 in 2001.

Figure A.45 GDP, gross inland energy consumption, CO₂ emissions from fossil fuel combustion and CO₂ intensity of GDP (as an index)

Source: Eurostat, Member State inventory submission (CRF tables), EEA (2003a).

Table A.43 Greenhouse gases and distance-to-target indicators for the United Kingdom

	Base year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Greenhouse gas emissions (without LUCF)	100.0	99.6	99.7	96.6	93.9	93.4	92.0	94.9	91.7	91.5	86.5	86.9	88.0
DTI 2010	0.0	- 0.4	0.3	- 2.2	- 4.2	- 4.1	- 4.9	- 1.4	- 4.0	- 3.5	- 7.8	- 6.9	- 5.2
CO ₂ (without LUCF)	100.0	100.0	100.6	98.1	95.8	95.2	93.8	97.2	93.0	93.5	92.1	93.1	95.3
CH ₄ (without LUCF)	100.0	100.0	98.7	96.6	92.8	84.4	83.6	81.6	77.5	73.4	68.4	63.4	60.0
N ₂ O (without LUCF)	100.0	100.0	97.2	87.1	81.6	88.1	84.1	87.1	89.6	85.5	66.2	65.9	62.4
F-gases	100.0	82.5	82.7	81.1	83.8	90.9	100.0	107.1	116.7	126.6	59.3	64.5	63.9

Table A.44 Sectoral emission indicators (key sources) for the United Kingdom

Key sources	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
1.A.1. Energy industries (CO ₂)	100	99	95	87	86	87	87	80	83	79	83	87
1.A.2. Manufacturing industries and construction (CO ₂)	100	101	99	98	100	97	99	99	97	96	93	96
1.A.3. Transport (CO ₂)	100	100	101	102	102	101	105	106	105	106	106	105
1.A.3. Transport (N ₂ O)	100	104	112	132	160	186	217	243	269	293	312	331
1.A.4. Other sectors (CO ₂)	100	110	107	110	105	101	113	104	106	105	105	108
1.A.4. Other sectors (CH ₄)	100	105	96	94	75	57	61	56	58	62	48	57
1.A.5. Other (CO ₂)	100	81	77	78	75	74	72	69	60	60	55	57
1.B.1. Fugitive emissions from solid fuels (CH ₄)	100	102	98	88	56	62	58	54	46	38	32	30
1.B.1. Fugitive emissions from solid fuels (CO ₂)	100	77	73	65	60	66	68	80	68	80	66	74
1.B.2. Fugitive emissions from oil and natural gas (CH ₄)	100	97	96	94	94	93	90	86	84	81	77	79
1.B.2. Fugitive emissions from oil and natural gas (CO ₂)	100	81	81	78	104	79	81	69	69	64	60	62
2.A. Mineral products (CO ₂)	100	85	80	80	88	89	91	100	100	94	88	80
2.B. Chemical industry (N ₂ O)	100	94	76	65	76	65	69	71	63	19	21	18
2.B. Chemical industry (CO ₂)	100	100	102	102	102	102	102	65	82	82	96	101
2.C. Metal production (CO ₂)	100	69	66	70	82	80	99	66	51	93	101	87
2.C. Metal production (PFC)	545	418	200	127	109	100	80	64	60	51	71	60
2.E. Production of halocarbons and SF ₆ (HFC)	81	85	88	92	95	100	102	112	118	31	27	23
2.F. Consumption of halocarbons and SF ₆ (HFC)	0	1	3	10	45	100	168	219	275	310	410	442
2.F. Consumption of halocarbons and SF ₆ (SF ₆)	46	56	66	77	87	100	103	102	166	169	177	186
2.G. Other (CO ₂)	0	0	0	0	0	0	0	0	0	0	0	0
4.A. Enteric fermentation (CH ₄)	100	99	99	99	100	99	100	98	98	98	95	89
4.B. Manure management (CH ₄)	100	99	99	100	101	99	100	100	101	99	95	91
4.B. Manure management (N ₂ O)	100	100	98	99	100	99	100	100	100	101	95	91
4.D. Agricultural soils (N ₂ O)	100	100	94	93	95	96	96	99	96	94	91	85
4.D. Agricultural soils (CO ₂)	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE
6.A. Solid waste disposal on land (CH ₄)	100	97	94	90	87	83	79	71	64	55	49	43
6.B. Waste water handling (N ₂ O)	100	99	100	100	100	102	105	105	105	104	109	107
6.D. Other (CO ₂)	0	0	0	0	0	0	0	0	0	0	0	0

Table A.45 Main driving force indicators and sectoral GHG and driving force indicators for the United Kingdom

Indicators	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Main driving forces												
CO ₂ from fuel combustion (C)	100	102	99	97	95	94	98	94	94	93	94	96
GDP (E)	100	99	99	101	106	109	112	116	119	122	126	128
Gross inland energy consumption (E)	100	102	101	103	104	103	108	105	109	108	109	:
Energy industries												
CO ₂ from energy industries (C)	100	99	95	87	86	87	87	80	83	79	83	87
Final electricity consumption (E)	100	102	103	104	104	107	111	113	115	118	120	:
Electricity production in public thermal power plants (E)	100	99	93	89	90	93	96	94	97	99	104	:
El. consumption lighting/el. appliances households (E)	100	101	103	104	105	106	106	107	113	114	116	:
Number of dwellings (E)	100	101	102	103	104	105	106	107	108	109	110	:
Electricity consumption in services (E)	100	105	109	109	109	114	118	125	125	126	128	:
Gross value added in services (E)	100	100	100	103	108	111	115	120	126	130	135	:
Transport												
CO ₂ from transport (C)	100	100	101	102	102	101	105	106	105	106	106	105
Passenger transport in cars (pkm) (E)	100	99	99	99	101	101	103	105	105	104	104	:
Freight transport on road (tkm) (E)	100	95	93	99	105	110	113	115	117	115	116	:
CO ₂ from diesel consumption of freight traffic (E)	100	98	101	106	117	121	130	136	138	142	144	:
Households and services												
CO ₂ from other sectors (C)	100	110	107	110	105	101	113	104	106	105	105	108
Heating degree days (E)	100	113	109	114	106	104	118	101	101	100	104	108

CO ₂ from residential (C)	100	111	108	112	107	101	115	106	108	108	109	113
Number of dwellings (E)	100	101	102	103	104	105	106	107	108	109	110	:
CO ₂ from commercial/institutional (C)	100	109	105	103	101	102	109	101	100	100	97	97
Gross value added in services (E)	100	100	100	103	108	111	115	120	126	130	135	:
Manufacturing industries												
CO ₂ from manufacturing industries (C)	100	101	99	98	100	97	99	99	97	96	93	96
Gross value added industry (E)	100	96	95	97	102	103	105	106	107	108	110	:
CO ₂ from iron and steel industry (E)	100	96	90	88	106	110	108	110	92	92	85	:
Gross value added iron and steel industry (E)	100	89	77	73	81	82	68	84	:	:	:	:
Crude steel production (E)	100	92	91	93	97	99	101	104	97	91	:	:
CO ₂ from glass, pottery and building mat. industry (E)	100	88	76	71	80	73	72	66	62	56	47	:
Value added glass, pottery and build. mat. industry (E)	100	82	72	0	81	77	76	88	:	:	:	:
CO ₂ emissions from the chemical industry (E)	100	99	166	110	153	115	151	139	138	157	153	:
Value added chemical industry (E)	100	110	110	108	114	114	115	134	:	:	:	:
CO ₂ from food industry (E)	100	97	97	96	106	105	105	96	93	97	97	:
Gross value added food industry (E)	100	118	113	:	109	97	105	127	:	:	:	:
CO ₂ from paper and printing industry (E)	100	98	112	117	137	130	98	88	79	91	89	:
Gross value added paper and printing industry (E)	100	105	102	97	104	92	94	115	:	:	:	:
CO ₂ from textile industry (E)	100	98	94	117	127	93	84	72	72	76	81	:
Gross value added textile industry (E)	100	92	87	:	89	79	77	95	:	:	:	:
CO ₂ from autoproducer thermal power stations (E)	100	100	105	114	87	91	105	117	150	139	165	:
All output of autoproducer thermal power stations (E)	100	108	107	109	112	123	131	129	164	205	246	:
Agricultural soils												
N ₂ O from agricultural soils (C)	100	100	94	93	95	96	96	99	96	94	91	85
Fertiliser and manure use (C)	100	100	91	88	92	92	91	97	92	89	84	80
Enteric fermentation												
CH ₄ from enteric fermentation (C)	100	99	99	99	100	99	100	98	98	98	95	89
Cattle population (C)	100	98	99	98	99	98	100	96	95	95	92	88
Mineral products												
CO ₂ from mineral products (C)	100	85	80	80	88	89	91	100	100	94	88	80
Cement/clinker production (C)	100	82	75	76	87	86	88	92	94	90	87	80
Solid waste disposal on land												
CH ₄ from solid waste disposal on land (C)	100	97	94	90	87	83	79	71	64	55	49	43
Waste Disposal on land (C)	100	101	102	104	105	109	98	89	80	74	75	75

Estimates in italics.

Source: Provided in brackets with C for CRF and E for Eurostat.

European Union

Table A.46 Greenhouse gases and distance-to-target indicators for the EU

	Base year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Greenhouse gas emissions (without LUCF)	100.0	99.7	99.9	97.7	95.8	96.0	96.9	98.9	97.4	98.0	96.4	96.7	97.7
DTI 2010	0.0	- 0.3	0.3	- 1.5	- 3.0	- 2.4	- 1.1	1.3	0.2	1.2	0.0	0.7	2.1
CO ₂ (without LUCF)	100.0	100.0	100.8	98.6	96.8	96.9	98.0	100.3	98.5	100.0	99.4	100.0	101.6
CH ₄ (without LUCF)	100.0	100.0	97.8	95.1	92.7	90.4	89.4	88.4	86.2	84.6	82.8	80.8	79.5
N ₂ O (without LUCF)	100.0	100.0	98.5	95.8	93.6	95.0	95.2	96.9	96.4	90.8	85.6	85.2	84.0
F-gases	100.0	79.4	75.7	75.8	78.9	87.0	100.0	107.7	117.3	122.9	97.6	102.2	98.0

Table A.47 Sectoral emission indicators (key sources) for the EU

Key sources	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
1.A.1. Energy industries (CO ₂)	100	101	98	93	93	94	96	92	95	94	96	98
1.A.2. Manufacturing industries and construction (CO ₂)	100	96	93	90	93	94	92	94	93	92	92	91
1.A.3. Transport (CO ₂)	100	102	105	106	107	108	111	112	115	118	119	120
1.A.3. Transport (N ₂ O)	100	111	122	133	145	157	169	180	194	206	213	226
1.A.4. Other Sectors (CO ₂)	100	107	102	104	99	100	110	102	102	100	98	103
1.A.4. Other Sectors (CH ₄)	100	102	94	91	82	74	78	74	73	73	69	74
1.A.5. Other (CO ₂)	100	88	69	74	66	60	59	54	48	41	38	36
1.B.1. Fugitive emissions from solid fuels (CH ₄)	100	95	92	82	66	69	61	58	51	46	39	31
1.B.1. Fugitive emissions from solid fuels (CO ₂)	100	92	90	83	78	77	79	87	86	86	84	87
1.B.2. Fugitive emissions from oil and natural gas (CH ₄)	100	101	101	102	101	93	94	90	89	88	85	86
1.B.2. Fugitive emissions from oil and natural gas (CO ₂)	100	93	92	93	107	92	94	91	94	93	92	95
2.A. Mineral products (CO ₂)	100	95	94	91	95	97	93	96	98	99	101	99
2.B. Chemical industry (N ₂ O)	100	98	95	90	92	92	95	91	69	48	47	46
2.B. Chemical industry (CO ₂)	100	94	90	81	82	89	86	83	84	80	84	84
2.C. Metal production (CO ₂)	100	90	82	84	88	96	92	94	89	92	93	93
2.C. Metal production (PFC)	207	180	143	117	102	100	98	94	91	83	65	55
2.E. Production of halocarbons and SF ₆ (HFC)	77	73	77	80	91	100	104	112	115	65	56	37
2.F. Consumption of halocarbons and SF ₆ (HFC)	6	7	10	35	52	100	154	207	256	305	402	509
2.F. Consumption of halocarbons and SF ₆ (SF ₆)	61	68	75	82	88	100	97	98	95	75	71	68
2.G. Other (CO ₂)	100	248	212	167	151	120	130	155	103	101	113	117
4.A. Enteric fermentation (CH ₄)	100	98	96	95	95	95	95	94	93	93	92	91
4.B. Manure management (CH ₄)	100	97	97	97	98	98	98	99	99	99	100	100
4.B. Manure management (N ₂ O)	100	96	94	93	93	92	93	93	93	93	91	92
4.D. Agricultural soils (N ₂ O)	100	98	95	93	94	94	95	96	95	95	95	92
4.D. Agricultural soils (CO ₂)	100	87	72	69	64	54	57	64	63	63	63	61
6.A. Solid waste disposal on land (CH ₄)	100	98	93	90	89	87	85	81	79	76	74	72
6.B. Waste water handling (N ₂ O)	100	88	81	82	82	83	83	83	84	84	86	86
6.D. Other (CO ₂)	100	0	0	0	0	103	120	141	52	116	48	48

Table A.48 Main driving force indicators and sectoral GHG and driving force indicators for the EU

Indicators	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Main driving forces												
CO ₂ from fuel combustion (C)	100	101	99	97	97	98	101	99	100	100	100	102
GDP (E)	100	101	103	102	105	108	109	112	115	118	123	125
Gross inland energy consumption (E)	100	102	101	101	101	103	107	107	109	109	110	:
Energy industries												
CO ₂ from energy industries (C)	100	101	98	93	93	94	96	92	95	94	96	98
Final electricity consumption (E)	100	102	103	103	105	109	111	114	117	119	123	:
Electricity production in public thermal power plants (E)	100	103	101	98	101	114	119	117	121	123	121	:
El. consumption lighting/el. appliances households (E) ¹⁾	100	103	106	107	109	111	114	117	122	126	:	:
Number of dwellings (E) ¹⁾	100	101	102	103	104	106	107	108	110	111	112	:
Electricity consumption in services (E)	100	103	105	107	109	114	118	121	126	128	132	:
Gross value added in services (E)	100	102	104	105	107	109	112	115	119	123	128	:
Transport												
CO ₂ from transport (C)	100	102	105	106	107	108	111	112	115	118	119	120
Passenger transport in cars (pkm) (E)	100	102	106	107	108	110	111	113	116	118	118	:
Freight transport on road (tkm) (E)	100	103	106	106	113	118	119	124	131	137	140	:
Freight transport on road (tkm) (E) ¹⁾	100	103	106	106	113	117	119	123	131	137	141	:
CO ₂ from diesel consumption of freight traffic (E) ¹⁾	100	102	106	107	115	118	122	125	131	136	:	:
Households and services												
CO ₂ from other sectors (C)	100	107	102	104	99	100	110	102	102	100	98	103
Heating degree days (E)	100	111	104	109	99	103	116	102	104	100	96	104
CO ₂ from residential (C) ²⁾	100	110	100	100	93	99	108	102	101	103	98	108
Number of dwellings (E)	100	101	102	103	104	106	107	108	110	111	112	:
CO ₂ from commercial/institutional (C) ²⁾	100	116	133	133	113	143	168	121	123	112	94	107
Gross value added in services (E)	100	102	104	105	107	109	112	115	119	123	128	:
Manufacturing industries												
CO ₂ from manufacturing industries (C)	100	96	93	90	93	94	92	94	93	92	92	91
Gross value added industry (E)	100	100	100	96	100	102	102	104	107	109	113	:
CO ₂ from iron and steel industry (E)	100	95	89	85	92	94	89	95	90	83	86	:
Gross value added iron and steel industry (E)	100	94	88	78	88	86	84	88	90	88	96	:
Crude steel production (E)	100	101	97	97	102	105	99	108	108	105	:	:
CO ₂ from glass, pottery and building mat. industry (E)	100	97	95	87	86	86	86	85	82	88	88	:
Value added glass, pottery and build. mat. industry (E)	100	98	97	90	96	96	96	97	100	105	107	:
CO ₂ emissions from the chemical industry (E)	100	87	91	86	86	83	78	75	67	69	77	:
Value added chemical industry (E)	100	100	104	104	110	112	114	119	122	130	132	:
CO ₂ from food industry (E)	100	100	99	97	98	97	97	94	95	95	96	:
Gross value added food industry (E)	100	109	110	113	113	106	108	112	114	120	120	:
CO ₂ from paper and printing industry (E)	100	99	101	101	108	109	109	112	110	112	111	:
Gross value added paper and printing industry (E)	100	103	102	99	104	101	104	110	115	121	126	:
CO ₂ from textile industry (E)	100	95	89	87	88	85	84	80	81	79	82	:
Gross value added textile industry (E)	100	100	97	90	90	82	86	87	85	83	83	:
CO ₂ from autoproducer thermal power stations (E)	100	103	101	105	101	98	96	101	105	105	95	:
All output of autoproducer thermal power stations (E)	100	100	99	103	104	112	117	127	137	143	133	:
Agricultural soils												
N ₂ O from agricultural soils (C)	100	98	95	93	94	94	95	96	95	95	95	92
Fertiliser and manure use (C) ³⁾	100	97	92	88	89	90	92	92	92	92	91	87
Enteric fermentation												
CH ₄ from enteric fermentation (C)	100	98	96	95	95	95	95	94	93	93	92	91
Cattle population (C) ⁴⁾	100	97	95	93	93	93	94	92	92	91	90	90

Indicators	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Mineral products												
CO ₂ from mineral products (C)	100	95	94	91	95	97	93	96	98	99	101	99
Cement/clinker production (E)	100	97	93	88	93	92	90	93	97	101	:	:
Solid waste disposal on land												
CH ₄ from solid waste disposal on land (C)	100	98	93	90	89	87	85	81	79	76	74	72
Waste Disposal on land (C) ³⁾	100	98	95	92	90	90	83	79	75	73	74	74

¹⁾ EU11 (does not include BE, IE, LU, PT)

²⁾ EU 13 (does not include IT, LU)

³⁾ EU12 (does not include BE, LU, IT)

⁴⁾ Includes Eurostat data for BE, IT, LU

Estimates in italics.

Source: Provided in brackets with C for CRF and E for Eurostat.

Denmark

	Base year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	CO ₂ equivalent (Tg = million tons)												
CO ₂ (without LUCF)	60.8	52.7	63.4	57.6	59.9	63.9	61.1	74.6	65.2	60.1	57.3	52.8	54.4
CH ₄ (without LUCF)	5.7	5.7	5.7	5.7	5.9	5.9	6.0	6.0	5.9	5.8	5.5	5.5	5.6
N ₂ O (without LUCF)	10.8	10.8	10.7	10.1	10.2	10.0	9.9	9.8	9.3	9.4	9.3	9.1	8.7
HFCs	0.2	0.0	0.0	0.0	0.1	0.1	0.2	0.4	0.4	0.5	0.6	0.7	0.6
PFCs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SF ₆	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
Total (without LUCF)	77.7	69.2	79.9	73.5	76.2	80.0	77.3	90.8	80.9	75.8	72.7	68.2	69.4
Energy industries	34.7	26.5	35.6	30.5	32.1	35.9	32.7	45.2	36.1	32.2	28.9	25.7	27.0
Fugitive emissions	0.3	0.3	0.6	0.6	0.6	0.7	0.6	0.6	0.8	0.6	1.1	0.7	0.8
Industry (energy)	5.7	5.7	6.1	5.9	5.9	6.4	6.8	7.0	6.9	6.2	6.2	5.9	6.0
Industry (processes)	1.3	1.0	1.2	1.4	1.5	1.6	1.7	1.8	2.0	2.0	2.1	2.2	2.2
Other (energy)	9.3	9.3	9.7	8.8	9.6	8.9	9.0	9.6	8.9	8.6	8.5	7.9	8.0
Transport	10.6	10.6	11.1	11.3	11.5	12.0	12.1	12.4	12.5	12.5	12.6	12.5	12.5
Agriculture	14.3	14.3	14.1	13.4	13.6	13.2	13.1	12.8	12.4	12.5	12.1	11.9	11.6
Waste	1.3	1.3	1.3	1.4	1.4	1.4	1.3	1.3	1.2	1.2	1.1	1.2	1.2
Other (non energy)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

Note: Base year emissions are adjusted for electricity trade and temperature corrections. All adjustments are allocated to energy industries.

Finland

	Base year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	CO ₂ equivalent (Tg = million tons)												
CO ₂ (without LUCF)	62.5	62.5	61.1	58.7	59.2	65.5	62.7	68.1	66.8	64.6	64.1	62.3	67.7
CH ₄ (without LUCF)	6.3	6.3	6.3	6.2	6.2	6.1	6.1	6.1	6.0	5.8	5.7	5.4	5.4
N ₂ O (without LUCF)	8.3	8.3	7.9	7.3	7.4	7.6	7.8	7.8	8.0	7.9	7.7	7.1	7.1
HFCs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.3	0.5	0.7
PFCs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SF ₆	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total (without LUCF)	77.2	77.2	75.3	72.2	72.8	79.2	76.7	82.1	81.1	78.5	77.8	75.4	80.9
Energy industries	18.9	18.9	19.5	17.9	20.4	25.2	23.0	28.2	25.3	22.0	21.6	20.2	27.3
Fugitive emissions	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Industry (energy)	14.8	14.8	14.3	14.0	13.7	14.5	14.5	14.1	16.1	16.2	16.8	16.5	14.4
Industry (processes)	2.9	2.9	2.5	2.2	2.1	2.2	2.3	2.4	2.5	2.6	2.7	3.0	3.0
Other (energy)	9.1	9.1	9.1	9.2	8.4	8.8	9.1	9.9	9.1	9.0	7.7	7.4	7.9
Transport	13.2	13.2	12.2	12.2	11.6	12.0	11.7	11.7	12.2	13.1	13.5	13.1	13.3
Agriculture	10.1	10.1	9.3	8.4	8.4	8.2	7.8	7.7	7.9	7.7	7.6	7.6	7.5
Waste	4.0	4.0	4.0	4.0	4.0	4.0	3.9	3.8	3.7	3.5	3.4	3.3	3.1
Other (non energy)	0.7	0.7	0.7	0.7	0.6	0.8	0.8	0.8	0.6	0.8	0.8	0.8	0.7

Netherlands

	Base year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	CO ₂ equivalent (Tg = million tons)												
CO ₂ (without LUCF)	159.3	159.3	167.5	165.7	167.9	168.8	172.4	180.3	168.7	173.8	170.7	173.8	179.9
CH ₄ (without LUCF)	27.1	27.1	27.5	26.3	25.7	25.3	24.6	24.6	23.1	22.4	21.8	20.6	20.4
N ₂ O (without LUCF)	16.5	16.5	16.8	17.9	18.7	18.3	18.2	17.9	17.8	17.6	17.4	16.7	16.1
HFCs	6.0	4.4	3.5	4.4	5.0	6.5	6.0	7.7	8.3	9.4	4.9	3.9	1.6
PFCs	1.9	2.4	2.4	2.1	2.1	1.9	1.9	2.0	2.2	1.7	1.4	1.5	1.5
SF ₆	0.3	0.2	0.1	0.1	0.1	0.1	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Total (without LUCF)	211.1	210.0	217.8	216.7	219.6	220.9	223.3	232.9	220.3	225.2	216.4	216.8	219.7
Energy industries	51.5	51.5	52.4	54.4	54.0	56.1	56.8	58.5	57.2	60.4	56.9	61.5	65.1
Fugitive emissions	4.1	4.1	4.4	3.8	3.7	3.9	4.4	5.0	4.3	4.6	4.5	4.3	4.5
Industry (energy)	42.0	42.0	42.8	42.6	40.0	41.0	42.7	43.1	39.0	42.5	42.4	39.8	40.3
Industry (processes)	17.4	16.3	15.2	15.7	16.8	18.0	17.2	19.0	19.7	20.2	15.2	14.1	11.1
Other (energy)	34.6	34.6	42.0	37.4	42.2	39.5	38.4	43.4	36.3	34.5	33.5	35.0	36.6
Transport	29.7	29.7	29.7	31.0	31.6	31.9	32.9	33.4	33.8	34.5	35.5	35.9	36.3
Agriculture	17.5	17.5	17.9	18.7	18.6	18.2	18.3	17.9	17.4	17.0	16.7	15.8	15.8
Waste	12.9	12.9	11.9	11.5	11.3	10.9	11.2	11.2	11.2	10.0	10.2	9.0	8.7
Other (non energy)	1.4	1.4	1.5	1.5	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.3

Portugal

	Base year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	CO ₂ equivalent (Tg = million tons)												
CO ₂ (without LUCF)	43.8	43.8	45.6	50.1	48.7	49.1	52.5	49.9	52.1	56.7	64.2	63.5	64.9
CH ₄ (without LUCF)	10.1	10.1	10.1	10.0	9.7	10.0	10.0	10.0	10.1	10.2	10.7	10.7	10.8
N ₂ O (without LUCF)	7.5	7.5	7.5	7.3	7.2	7.2	7.4	7.5	7.4	7.7	8.0	8.0	8.1
HFCs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
PFCs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SF ₆	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total (without LUCF)	61.4	61.4	63.3	67.3	65.6	66.3	70.0	67.5	69.7	74.6	82.9	82.3	83.8
Energy industries	16.3	16.3	16.9	20.0	18.0	17.1	19.6	16.0	16.4	18.9	25.0	21.4	22.1
Fugitive emissions	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.5	0.5
Industry (energy)	8.3	8.3	8.6	9.0	9.1	9.5	9.3	9.5	10.2	10.2	10.1	10.8	11.5
Industry (processes)	4.7	4.7	4.7	4.5	4.5	4.4	5.2	4.9	5.3	5.4	5.5	5.6	5.6
Other (energy)	4.8	4.8	5.0	5.1	5.3	5.6	5.4	5.8	5.9	6.3	6.7	7.1	7.2
Transport	10.9	10.9	11.5	12.4	12.9	13.4	14.2	14.9	15.6	17.2	18.2	19.8	19.7
Agriculture	12.3	12.3	12.2	11.7	11.3	11.5	11.5	11.5	11.4	11.5	11.9	11.8	11.8
Waste	3.7	3.7	3.8	3.9	4.0	4.1	4.2	4.3	4.4	4.5	4.8	5.1	5.3
Other (non energy)	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3

Spain

	Base year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	CO ₂ equivalent (Tg = million tons)												
CO ₂ (without LUCF)	227.4	227.4	234.2	242.2	232.5	242.7	254.4	241.9	261.7	270.6	295.5	308.2	307.2
CH ₄ (without LUCF)	30.3	30.3	30.6	31.6	32.0	33.1	33.8	35.4	36.5	37.7	38.1	39.3	40.3
N ₂ O (without LUCF)	26.6	26.6	26.4	25.6	23.7	26.0	25.7	28.0	27.4	28.1	29.4	30.8	29.5
HFCs	4.6	2.4	2.2	2.8	2.3	3.5	4.6	5.2	6.1	5.8	7.2	8.2	5.3
PFCs	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.4	0.2
SF ₆	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2
Total (without LUCF)	289.9	287.6	294.2	303.1	291.3	306.1	319.4	311.4	332.5	343.1	371.1	387.1	382.8
Energy industries	78.0	78.0	78.8	86.5	80.3	80.6	86.5	73.9	85.9	84.9	100.9	105.5	99.8
Fugitive emissions	6.7	6.7	6.4	6.5	6.1	5.9	5.4	5.6	6.2	6.4	5.7	6.3	6.3
Industry (energy)	46.2	46.2	47.6	46.4	45.1	49.6	55.1	49.2	55.0	55.8	58.3	61.8	61.8
Industry (processes)	24.8	22.6	21.4	20.1	18.6	22.3	24.7	25.0	26.7	27.4	29.6	30.7	27.8
Other (energy)	27.5	27.5	31.2	30.8	30.0	31.1	30.8	31.9	32.0	32.7	34.3	35.6	35.5
Transport	58.5	58.5	60.4	63.7	63.0	66.0	67.0	71.7	72.5	79.7	84.8	87.3	91.7
Agriculture	37.4	37.4	37.2	36.9	35.6	37.5	36.8	40.3	39.6	40.9	41.9	43.6	43.0
Waste	9.4	9.4	9.9	10.6	11.3	11.7	11.7	12.4	13.1	13.6	14.0	14.5	15.1
Other (non energy)	1.3	1.3	1.3	1.3	1.3	1.3	1.4	1.4	1.5	1.6	1.7	1.7	1.6

Sweden

	Base year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	CO ₂ equivalent (Tg = million tons)												
CO ₂ (without LUCF)	56.5	56.5	56.8	56.0	55.7	60.3	59.0	62.5	57.6	58.8	56.6	53.8	55.3
CH ₄ (without LUCF)	6.6	6.6	6.6	6.7	6.8	6.7	6.6	6.6	6.5	6.3	6.1	5.9	5.8
N ₂ O (without LUCF)	9.1	9.1	9.0	8.8	8.9	9.1	8.8	9.0	8.9	9.1	8.7	8.6	8.6
HFCs	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.3	0.4	0.4	0.4
PFCs	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3
SF ₆	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1
Total (without LUCF)	72.9	72.8	72.9	72.0	71.9	76.7	75.1	78.7	73.8	74.9	72.2	68.9	70.5
Energy industries	10.6	10.6	11.7	11.8	11.3	13.7	12.1	16.4	12.0	13.2	11.7	8.8	10.3
Fugitive emissions	0.3	0.3	0.3	0.2	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Industry (energy)	12.2	12.2	11.7	10.6	11.7	13.3	13.6	13.1	13.4	13.2	12.4	13.3	13.4
Industry (processes)	5.8	5.7	5.7	5.6	5.7	5.8	6.2	6.2	6.1	6.0	5.9	6.1	5.8
Other (energy)	12.1	12.1	12.0	11.5	11.2	11.2	10.6	10.6	9.8	9.6	9.8	8.7	8.7
Transport	19.2	19.2	19.0	19.9	19.1	19.7	19.8	19.7	19.9	20.5	20.6	20.5	20.8
Agriculture	9.5	9.5	9.3	9.3	9.5	9.7	9.4	9.4	9.5	9.3	9.0	8.9	8.9
Waste	2.7	2.7	2.8	2.8	2.7	2.6	2.6	2.6	2.5	2.4	2.3	2.2	2.1
Other (non energy)	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2

United Kingdom

	Base year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	CO ₂ equivalent (Tg = million tons)												
CO ₂ (without LUCF)	585.0	585.0	588.6	574.1	560.3	557.1	548.6	568.5	544.3	547.1	538.7	544.4	557.6
CH ₄ (without LUCF)	76.9	76.9	75.9	74.3	71.3	64.9	64.3	62.7	59.6	56.4	52.6	48.8	46.1
N ₂ O (without LUCF)	67.9	67.9	65.9	59.1	55.4	59.8	57.1	59.1	60.8	58.0	44.9	44.7	42.4
HFCs	15.2	11.4	11.9	12.3	12.9	13.8	15.2	16.4	18.4	20.0	8.2	8.9	8.7
PFCs	1.1	2.3	1.8	1.0	0.8	1.0	1.1	1.0	0.7	0.6	0.7	0.7	0.7
SF ₆	1.1	0.7	0.8	0.8	0.9	1.1	1.1	1.3	1.3	1.5	1.5	1.6	1.8
Total (without LUCF)	747.2	744.1	744.9	721.7	701.6	697.6	687.4	709.1	685.0	683.5	646.5	649.1	657.2
Energy industries	230.5	230.5	228.5	218.4	201.6	199.0	200.4	200.4	186.2	192.0	183.9	193.6	202.8
Fugitive emissions	40.2	40.2	37.8	36.9	34.5	31.1	29.9	29.2	27.4	25.4	23.6	21.4	21.5
Industry (energy)	95.6	95.6	96.3	95.2	94.0	95.2	93.0	94.2	94.8	92.3	91.5	88.6	91.4
Industry (processes)	61.0	58.0	53.8	47.7	45.0	50.7	49.1	52.5	53.9	53.0	29.2	30.6	28.4
Other (energy)	120.0	120.0	130.3	126.3	129.5	123.9	119.1	132.4	122.3	123.3	122.7	121.9	125.4
Transport	118.7	118.7	118.2	119.7	121.2	121.8	121.1	126.2	127.6	127.0	128.1	128.8	127.9
Agriculture	53.7	53.7	53.2	51.5	50.9	51.8	51.7	52.1	52.7	51.9	51.3	49.4	46.4
Waste	27.5	27.5	26.7	26.0	25.0	24.1	23.1	22.2	20.1	18.6	16.4	14.9	13.4
Other (non energy)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

European Union

	Base year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	CO ₂ equivalent (Tg = million tons)												
CO ₂ (without LUCF)	3 329.1	3 329.1	3 354.5	3 282.3	3 222.2	3 227.4	3 263.0	3 339.6	3 279.6	3 329.9	3 308.9	3 329.3	3 383.6
CH ₄ (without LUCF)	411.9	411.9	402.7	391.6	382.0	372.5	368.4	364.3	355.1	348.3	341.0	332.7	327.4
N ₂ O (without LUCF)	403.3	403.3	397.0	386.3	377.7	383.0	383.8	390.6	388.6	366.3	345.4	343.7	338.8
HFCs	39.3	25.7	24.4	26.0	28.5	33.1	39.3	43.7	49.8	54.1	41.4	45.0	43.4
PFCs	7.7	13.4	11.8	9.6	8.3	7.5	7.7	7.7	7.4	7.1	6.9	6.2	5.5
SF ₆	12.7	8.3	8.9	9.6	10.4	11.3	12.7	12.8	12.8	12.2	9.9	9.8	9.5
Total (without LUCF)	4 204.0	4 191.7	4 199.4	4 105.4	4 028.9	4 034.7	4 074.8	4 158.7	4 093.3	4 117.9	4 053.5	4 066.7	4 108.3
Energy industries	1 160.1	1 160.1	1 166.7	1 131.9	1 076.7	1 085.0	1 095.9	1 109.9	1 074.6	1 105.5	1 087.1	1 119.9	1 137.4
Fugitive emissions	108.1	108.1	104.0	102.2	97.2	91.2	87.3	84.6	81.6	78.7	75.4	70.8	68.1
Industry (energy)	653.2	653.2	630.0	607.5	587.5	607.3	614.7	601.3	612.6	608.8	600.2	600.5	594.4
Industry (processes)	314.3	302.0	290.4	282.8	274.9	287.7	299.7	302.5	307.3	287.8	251.5	255.9	251.1
Other (energy)	676.7	676.7	716.5	680.6	692.8	658.5	663.3	727.1	677.9	677.7	662.2	645.6	680.5
Transport	711.4	711.4	725.9	751.5	759.7	764.3	775.3	793.0	803.1	828.8	849.7	851.7	863.3
Agriculture	433.8	433.8	423.3	412.8	407.9	409.3	409.0	412.3	412.4	410.5	410.1	406.8	400.2
Waste	135.0	135.0	131.3	125.1	121.6	120.5	118.7	117.2	113.1	109.2	106.5	104.4	102.5
Other (non energy)	11.4	11.4	11.3	11.1	10.6	10.7	10.8	10.8	10.7	10.9	10.9	11.0	10.7