

INFORMATION SHEET

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European Community and Member States greenhouse gas emission trends 1990-1999: a summary

This European Environment Agency report analyses greenhouse gas (GHG) emission trends in the European Union and its Member States for the period 1990 to 1999. It explains the underlying causes of the main emission increases, seen in transport, and of the principal decreases, seen in power and heat generation, for the EU and each of its members.

For each EU country, the report contains an analysis of:

- The distance left to reach its emissions target under the Kyoto Protocol on climate change
- Trends in emissions from the main source sectors
- Reasons for these trends, such as socio-economic developments, specific sectoral trends, policies and measures taken.

As announced by the EEA in April 2001, the 15 EU Member States recorded a 4.0% reduction between 1990 and 1999 in their combined emissions of the six greenhouse gases controlled by the Kyoto Protocol (see <http://org.eea.eu.int/documents/newsreleases/newsrelease20010423-en>).

The six controlled gases are carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O) and three fluorinated industrial gases, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF₆).

Two percentage points of the cut recorded between 1990 and 1999 were achieved in the year 1998-1999 alone. The emissions drop in this single year was due to a combination of a relatively mild winter, a continued shift from coal to gas and the one-off introduction of measures to reduce N₂O and HFC emissions from industry.

The reduction since 1990 takes the EU half way towards achieving its Kyoto target of cutting emissions of these gases to 8% below their 1990 level by the years 2008-2012. Emissions of CO₂, which accounts for around 80% of the EU's total greenhouse gas emissions, decreased by 1.6% between 1990 and 1999.

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Nevertheless, the EEA sees no room for complacency and has warned that further big efforts to reduce emissions are needed to achieve the Kyoto targets. A draft report analysing projections for EU GHG emissions, prepared by the EEA, indicates that, unless further action is taken, emissions in 2010 will be unchanged from the 1990 level or 1% higher.

The emissions cuts achieved between 1990 and 1999 signify a certain decoupling from gross domestic product (GDP), which grew by 20% over the period, and energy use, which increased by 10%. As the EU's population grew by 3.2 % over this period, greenhouse gas emissions per capita fell from 11.5 tonnes in 1990 to 10.7 tonnes in 1999.

The favourable picture to date has been determined largely by considerable emissions cuts in Germany and the UK, the EU's two biggest emitters, which together account for around 40% of total EU greenhouse gas emissions. The 1990-1999 reductions amounted to 18.7% in Germany and 14.0% in the UK.

According to a recent study¹, however, about half of the reduction in these two countries was due to one-off factors that, by definition, will not recur.

On present trends, more than half of the other Member States are headed towards substantially exceeding their agreed share of the EU's total allowed emissions under the Kyoto Protocol (see Figure 1). This is the case for Austria, Belgium, Denmark, Greece, Ireland, Italy, the Netherlands, Portugal and Spain.



Figure 1: Greenhouse gas emission trends and Kyoto Protocol targets

This table gives details, for each Member State and the EU overall, of trends in emissions of all greenhouse gases, excluding emissions from and removals by land use change and forestry, up to 1999.

	Change 1998-1999	Change 1990-1999 ¹⁾	Targets 2008-2012 under Kyoto Protocol and EU "burden sharing"	EEA evaluation of progress in 1999 ³⁾
Austria	0,0%	+2,6%	-13,0%	⊗
Belgium	-3,4%	+2,8%	-7,5%	⊗
Denmark ²⁾	-4,6%	+4% (-4,6%)	-21,0%	⊗ (⊗)
Finland	-0,8%	-1,1%	0,0%	☺
France	-2,2%	-0,2%	0,0%	☺
Germany	-3,7%	-18,7%	-21,0%	☺
Greece	-0,7%	+16,9%	+25,0%	⊗
Ireland	+2,5%	+22,1%	+13,0%	⊗
Italy	+0,9%	+4,4%	-6,5%	⊗
Luxembourg	+4,6%	-43,3%	-28,0%	☺
Netherlands	-2,9%	+6,1%	-6,0%	⊗
Portugal	+2,9%	+22,4%	+27,0%	⊗
Spain	+6,1%	+23,2%	+15,0%	⊗
Sweden	-2,6%	+1,5%	+4,0%	☺
United Kingdom	-6,5%	-14,0%	-12,5%	☺
EU Total	-2,0%	-4,0%	-8,0%	☺

¹⁾ For the fluorinated gases some Member States have selected a base year other than 1990, as allowed for under the Protocol.

²⁾ For Denmark, data that reflect adjustments for electricity trade (import and export) in 1990 are given in brackets. This methodology is used by Denmark to monitor progress towards its national target under the EU "burden sharing" agreement. For the EU emissions total the non-adjusted Danish data have been used.

³⁾ The EEA's evaluation of progress to 1999 awards "smileys" if the trend from the base year to 1999 is in line with a linear target path in 1999. The following rating system is used:

- ☺ more than 2 index points *below* linear target path (positive contribution to EU trend)
- ⊗ more than 2 index points *above* linear target path (negative contribution to EU trend)
- ☹ in a range of plus/minus 2 index points of linear target path (limited positive or negative contribution to EU trend)

Eighteen main source categories account for 96% of the EU's total GHG emissions (see Figure 2).

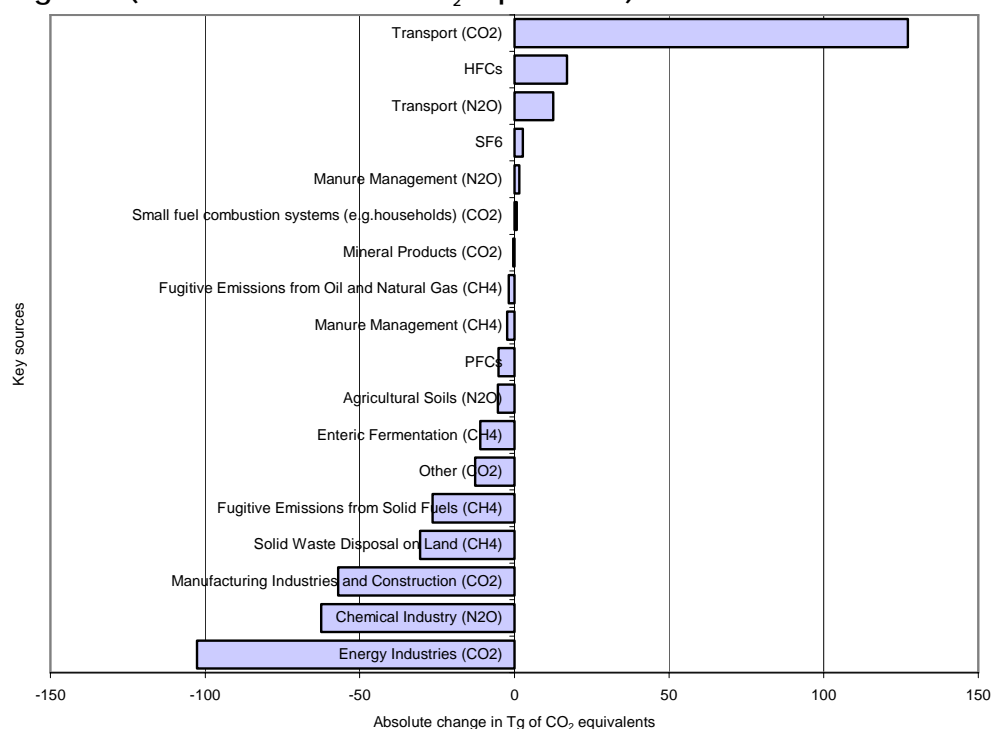
Sources and sectors with emission increases between 1990 and 1999:

- Transport, which is responsible for 21% of total EU GHG emissions, saw its CO₂ emissions increase by 18% due to road transport growth in almost all Member States (see box *CO₂ emissions from transport*, below). N₂O

emissions from transport, which are responsible for 0.6% of total GHG emissions, grew by 100% as catalytic converters, which reduce cars' exhaust emissions of certain air pollutants but produce N₂O as a by-product, became standard equipment.

- HFC emissions from industrial processes, which account for 1% of GHG emissions, increased by 66% as a result of the expanding use of these chemicals as substitutes for ozone-depleting CFCs, which were gradually phased out in the 1990s.

Figure 2: Trends in GHG emissions 1990-1999 in the key EU source categories (in million tonnes of CO₂ equivalents)



Source: Submissions by the EU Member States (EEA Technical Report 60, 2001)

Sources and sectors with emission decreases between 1990 and 1999:

- CO₂ emissions from the energy sector (electricity and heat production) fell by 9%. The energy sector is the largest single source of overall EU GHG emissions, accounting for 26% of the total. The drop was due to fuel shifts from coal to gas in the UK as well as efficiency improvements and increased use of combined heat and power (CHP) generation in several Member States, most importantly Germany. CO₂ emissions from the electricity supply industry fell by more than 20%. An increase in wind power generation in Germany, Denmark and Spain was a contributing factor.
- N₂O emissions from the chemical industry, which are responsible for 1.2% of total GHG emissions, decreased by 57% mainly due to specific

measures at adipic acid production plants in the UK, Germany and France.

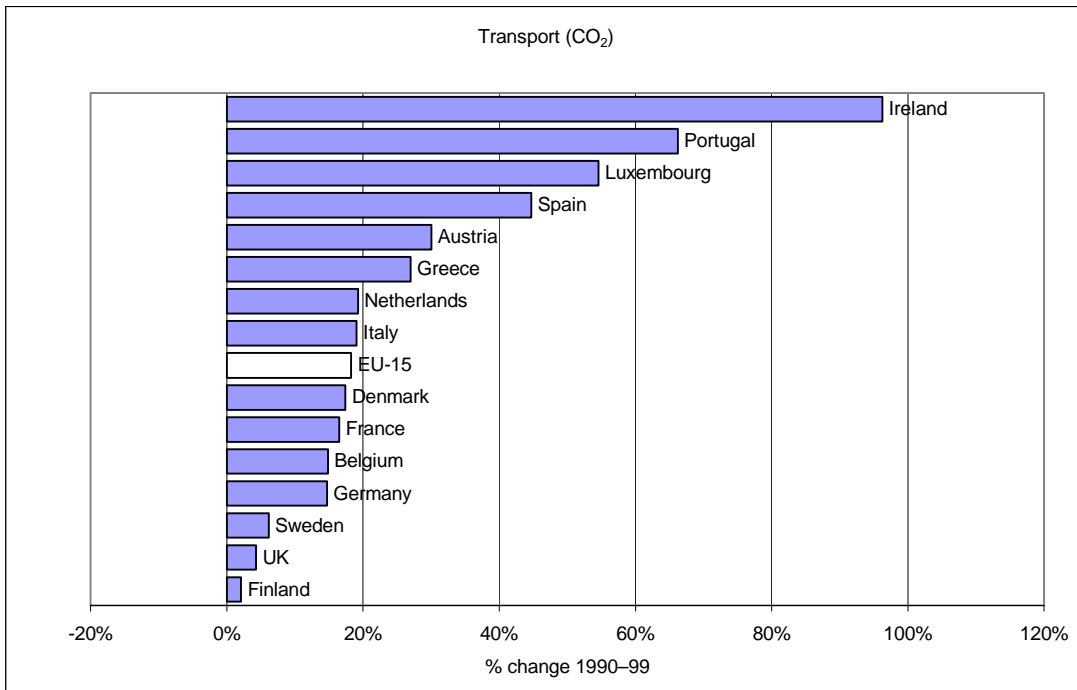
- CO₂ emissions from fossil fuel combustion in manufacturing industry, which account for 14% of total GHG emissions, decreased by 9%. This was mainly due to efficiency improvements in several Member States and economic restructuring in Germany's manufacturing industry after unification.
- Methane emissions from solid waste disposal in landfills, which are responsible for 2.6% of total emissions, decreased by 22% as public authorities and the waste sector prepared for implementation of the EU landfill directive and related legislation.
- Methane emissions from solid fuels fell by 52%, reducing their share of total emissions to 0.6%. This was mainly due to the decline of coal mining, particularly in the UK but also in France and Germany.

CO₂ emissions from transport

Accounting for 21% of all EU GHG emissions, CO₂ emissions from transport are the second largest single emissions source after the energy sector. The calculation of transport emissions covers emissions from fossil fuel combustion in road transportation, national civil aviation, railways, national navigation, and other transportation. The Kyoto Protocol target does not include emissions from international aviation and shipping, emissions of which increased by 37% from 1990 to 1999 to account for 6% of total EU GHG emissions.

The main causes of the strong growth in CO₂ emissions from transport are increases in road transport volumes and rising road fuel consumption. In the EU, passenger car and road freight transport increased by 15% and 29% respectively between 1990 and 1997. Almost all Member States saw increases in both types of transport, and generally freight transport increased more rapidly than passenger transport. Finland, Sweden and the UK show the lowest CO₂ emissions growth in the EU. One reason for this is high or rapidly rising fuel prices. Factors behind the large emission increases in Ireland, Portugal, Luxembourg and Spain are high economic growth, low car-ownership ratios and low road fuel prices.

Figure 3: CO₂ emissions from transport in EU Member States. % growth 1990-1999



Note: Excludes emissions from international aviation and navigation (in accordance with UNFCCC).

Source: Submissions by EU Member States (EEA Technical Report 60, 2001)

The report was prepared by EEA's European Topic Centre on Air and Climate Change. The project was led by the Umweltbundesamt (UBA Vienna) in Austria.

Notes

¹*Greenhouse gas reductions in Germany and the UK — Coincidence or policy induced? An analysis for international climate policy.* Eichhammer, W et al, 2001. Study for the German Federal Ministry of the Environment (BMU) and the German Federal Environmental Agency (UBA) by the Fraunhofer-Institute Systems and Innovation Research (ISI, Germany), Deutsches Institut für Wirtschaftsforschung (DIW, Germany) and Science Policy and Technology Policy Research (SPRU, UK), June 2001.

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