working draft

EEA Core Set of Indicators - CSI 010

Greenhouse gas emissions and removals

Jun 2005 assessment

About this document
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European Environment Agency

Key policy question: What is the progress in reducing GHG emissions towards the Kyoto Protocol targets in Europe?

Key message:

- EU-15 total greenhouse gas emissions were 1.7% below base year levels in 2003. Increases in carbon dioxide emissions were offset by reductions of nitrous oxide and methane and F-gas emissions. Carbon dioxide emissions mainly increased from road transport whereas emissions from manufacturing industry decreased.

- Compared to 2002, EU-15 emissions increased in 2003 by 1.3%. The increases mainly occurred from energy industries (+2.1%), mainly due to growing thermal power production and a 5% increase of coal consumption in thermal power stations.

- In the Kyoto Protocol, the EC agreed to reduce its GHG emissions by 8 % by 2008-12, from base year levels. Assuming a linear target path from 1990 to 2010, total EU-15 GHG emissions were 2.4 index points (including flexible Mechanisms) above this target path in 2003.

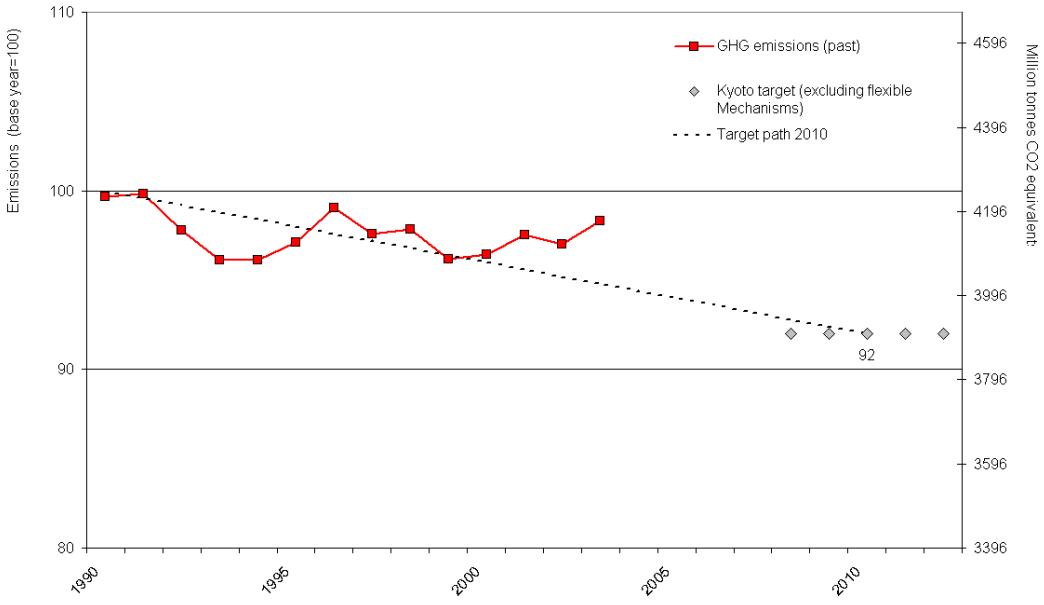
- Total GHG gas emissions in the new Member States have decreased considerably (-32.2%) between the aggregate base year and 2003 primarily due to the economic restructuring transition process towards market economies. Most new Member States are on track to meet their Kyoto target.

- In 2003, four EU-15 Member States (France, Germany, Sweden and the United Kingdom) were below their burden sharing target paths excluding Kyoto Mechanisms. Luxembourg and the Netherlands were below their burden sharing target paths including Kyoto Mechanisms. Nine Member States were above their burden-sharing target paths: Finland, Greece, Italy, Portugal and Spain (excluding Kyoto Mechanisms), Austria, Belgium, Denmark, Ireland and the Netherlands (including Kyoto Mechanisms). Compared to 2002 Austria and Finland departed the most from their target path due to increases in electricity and heat production.

- The favourable picture for the EU-15 as a whole has been determined largely by considerable emissions cuts in Germany and the UK, the EU's two biggest emitters, which together account for about 40% of total EU-15 GHG emissions. The 1990 to 2003 reductions amounted to 18.5% in Germany and 13.3% in the UK.

- Italy and France, the third and fourth largest emitters, increased (11.6 %) and decreased (-1.9 %) their emissions between 1990 and 2003. Emissions in Finland, Greece, Ireland, Portugal and Spain have increased by more than 20% since 1990.

Fig. 1: Development of the EU-15 greenhouse gas emissions from base year to 2003 and distance to the (hypothetical) Kyoto target path (excluding flexible Mechanisms)



Data source: ETC/ACC 2005

Fig. 2: Distance to target for the EU-15 in 2003 (EU protocol and EU burden sharing targets)

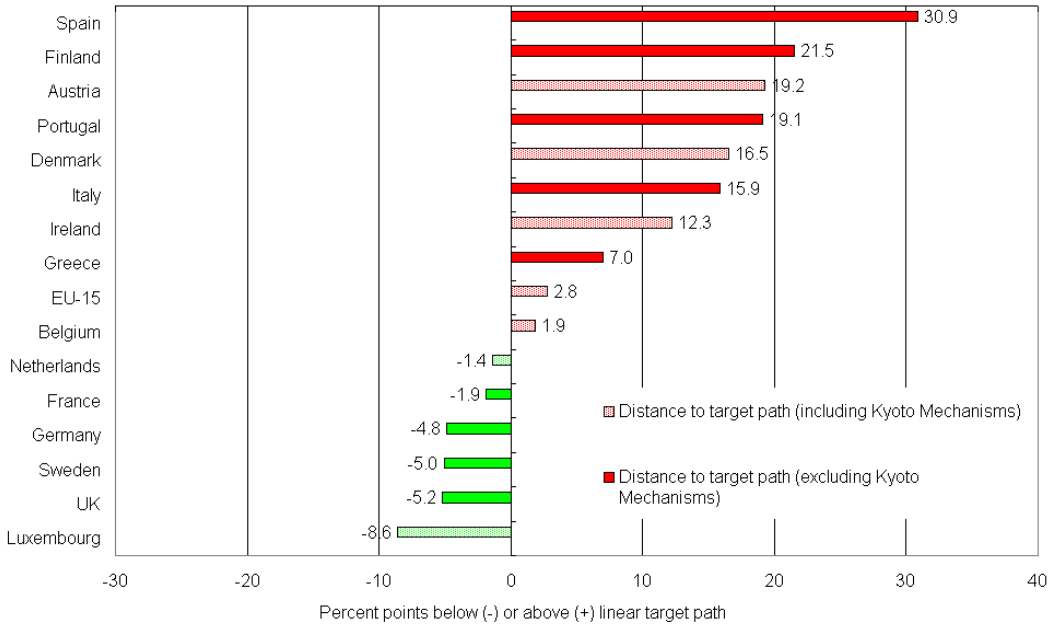
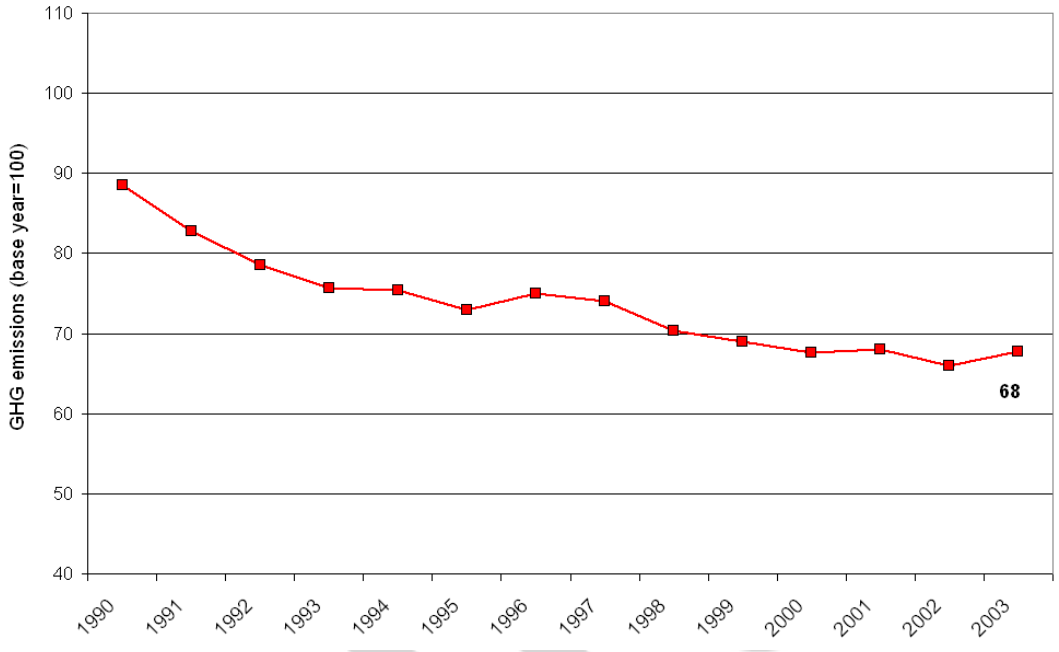


Fig. 3: Development of the EU-10 greenhouse gas emissions from base year to 2003



Specific policy question: What are the emission changes by sector and by greenhouse gas?

EU-15 GHG emissions have shown a small decrease between base year and 2003 of 1.7%, despite increases in GDP.

Sources and sectors with increasing emissions were

- Transport CO2 emissions (with 20% of total EU-15 GHG emissions) increased by 23% due to road transport growth in almost all EU-15 Member States. Emissions of N2O from transport, increased by more than 100%. The reason is mainly the use of catalytic converters, which reduce cars' exhaust emissions of certain air pollutants but produce N2O as a by-product, have become standard equipment.

- CO2 emissions from energy industries increased by 3.3% due to increasing fossil fuel consumption in public electricity and heat plants. Most Member States had increases between 1990 and 2003, whereas the large Member States Germany and the United Kingdom reduced their emissions by 12% and 10%, respectively. The most important reason for Germany were efficiency improvements in coal-fired power plants and for the United Kingdom it was the fuel switch from coal to gas in power production.

Sources and sectors with decreasing emissions were:

- Reductions were achieved especially in CO2 emissions from manufacturing industries and construction (-11 %), mainly due to efficiency improvements and structural change in Germany after reunification.

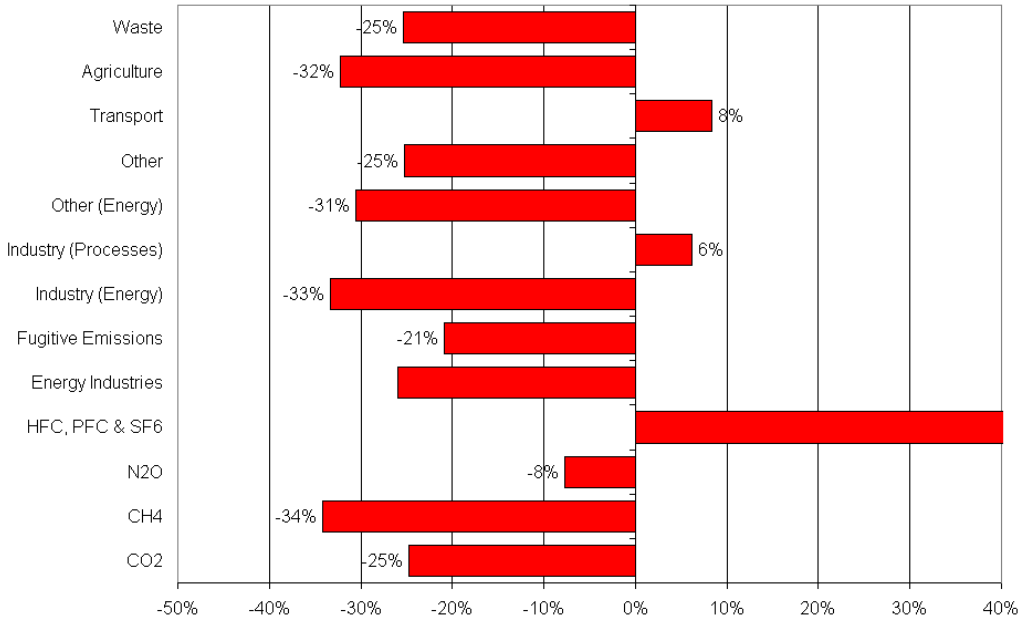
- CH4 emissions from fugitive emissions decreased the most (-52 %, mainly due to the decline of coal mining), followed by the waste sector (-34 %, mainly due to reducing the amount of untreated biodegradable waste in landfills and installing landfill gas recovery).

- N2O emissions from the industrial processes decreased by 56 % mainly due to specific measures at adipic acid production plants in the UK, Germany and France. Also N2O emissions from agricultural soils reduced by 11% between 1990 and 2003, due to a decline in fertiliser and manure use.

- HFC, PFC and SF6 emissions from industrial processes, which account for 1.6% of GHG emissions, decreased by 4 %. Large increases mainly are the result of the expanding use of HFCs as substitute for ozone-depleting CFCs that were gradually phased out in the 1990s were offset by decreases of emissions from the production of halocarbons and SF6.

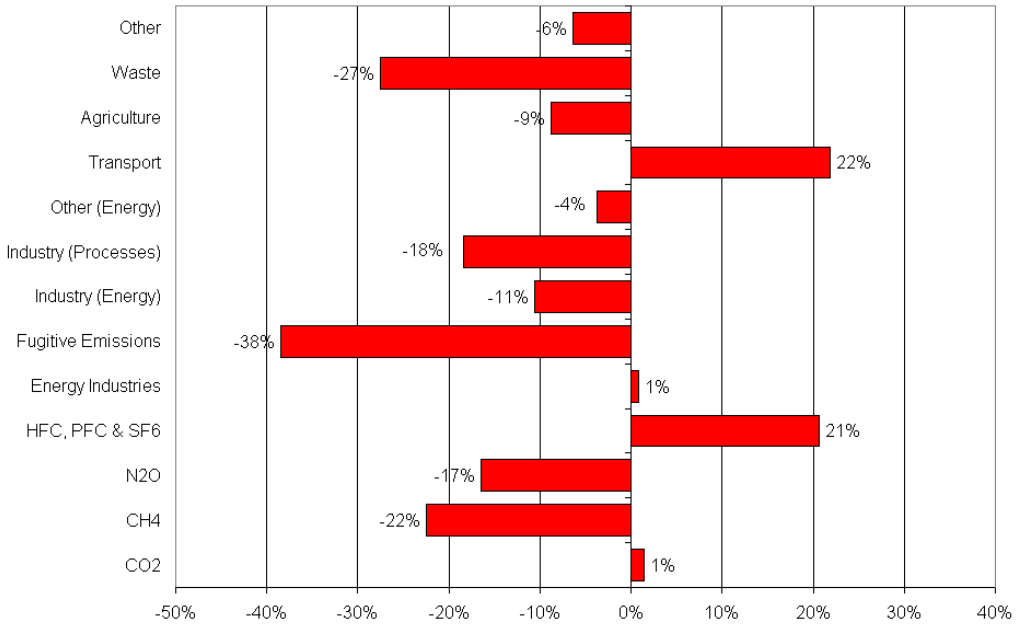
In new Member States, CO2 is the most important GHG (82.7% of total emissions) and it was reduced by 31.7 % between 1990 and 2003. Second is CH4 (share 9.8 %, decrease 40 %) and third is N2O (share 7.1 %, decrease 28 %). Compared to the base year, all of these gases reduced significantly. The share of F-gases is 0.4 % and these emissions have been increasing since 1990 (+74 %), but there are still countries which do not report F-gases.

Fig. 4: Change in EU-10 emissions of greenhouse gases by sector and gas 1990-2003



Data source: ETC/ACC 2005

Fig. 5: Change in EU-15 emissions of greenhouse gases by sector and gas 1990-2003



Data source: ETC/ACC 2005