

EEA Core Set of Indicators - CSI 002
Emissions of ozone precursors
May 2005 assessment

working draft

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Key policy question: What progress is being made in reducing emissions of ozone precursors across Europe?

Key message: Emissions of ozone forming gases (ground level ozone precursors) have been reduced by 33% across the EEA32 between 1990 and 2002. The emission reductions are mainly due to introduction of catalysts on new cars.

Total ozone precursor emissions have reduced by 33% across the EEA32 region between 1990 and 2002. For EU15 countries, emissions have been reduced by 35% between 1990 and 2002.

Emission reductions that have occurred within the EU15 region since 1990 are mainly due to the further introduction of catalytic converters for cars and increased penetration of diesel, but also as a result of the implementation of the Solvents Directive in industrial processes.

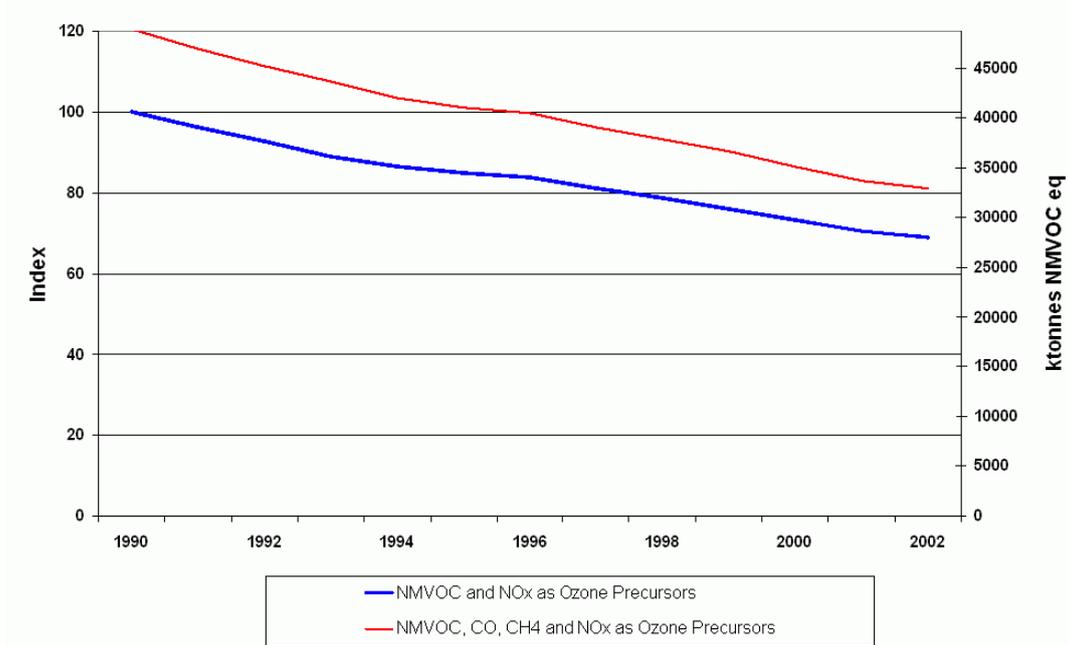
Emissions of non-methane volatile organic compounds (38% of total TOFP-weighted emissions) and nitrogen oxides (48% of total weighted emissions) are the most significant pollutants that contributed to the formation of tropospheric ozone in 2002. Carbon monoxide and methane contributed 13% and 1% in 2002 respectively. The emissions of NO_x and NMVOC reduced significantly between 1990 and 2002, contributing 37% and 44% to the total reduction in precursor emissions respectively. With respect to air quality, although these reductions appear to have reduced peak concentrations of ozone, they have not been enough to limit human health and ecosystem risks significantly.

In the EU10, total ozone precursor emissions have been reduced by 42% between 1990 and 2002 across the EU10 countries (data from Malta not available). Emissions of non-methane volatile organic compounds (32% of total) and nitrogen oxides (51% of total) are the most significant pollutants contributing to the formation of tropospheric ozone in EU10 countries in 2002. Carbon monoxide and methane contributed 16% and 1% respectively.



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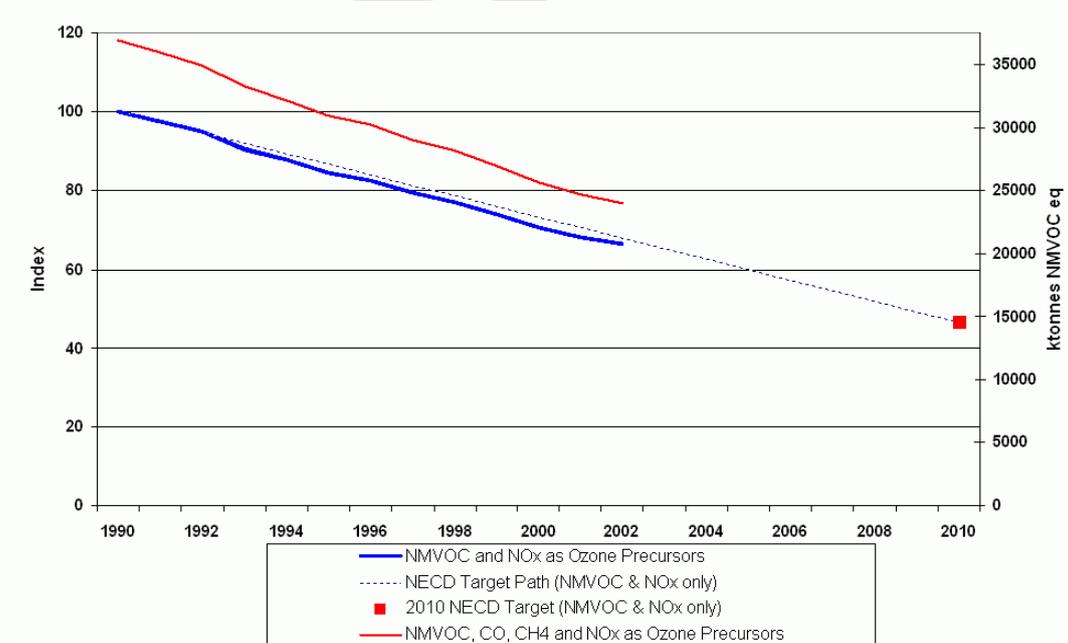
Fig. 1: Emission trends of ozone precursors (ktonnes NMVOC equiv) for EEA32



Data source: Data from 2004 officially reported national total and sectoral emissions to UNECE/EMEP Convention on Long-Range Transboundary Atmospheric Pollution and the UNFCCC.

Note: The EEA32 country grouping includes EEA31 member countries + Croatia. Data from Malta not available.

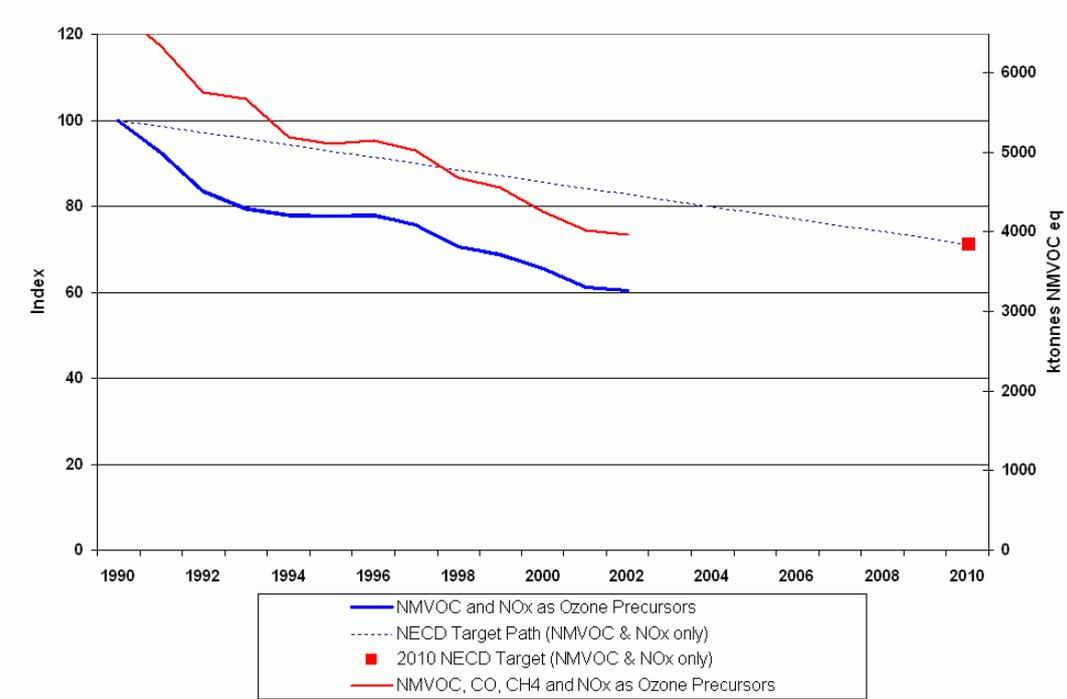
Fig. 2: Emission trends of ozone precursors (ktonnes NMVOC equiv) for EU15



Data source: Data from 2004 officially reported national total and sectoral emissions to UNECE/EMEP Convention on Long-Range Transboundary Atmospheric Pollution and the UNFCCC.



Fig. 3: Emission trends of ozone precursors (ktonnes NMVOC equiv) for EU10

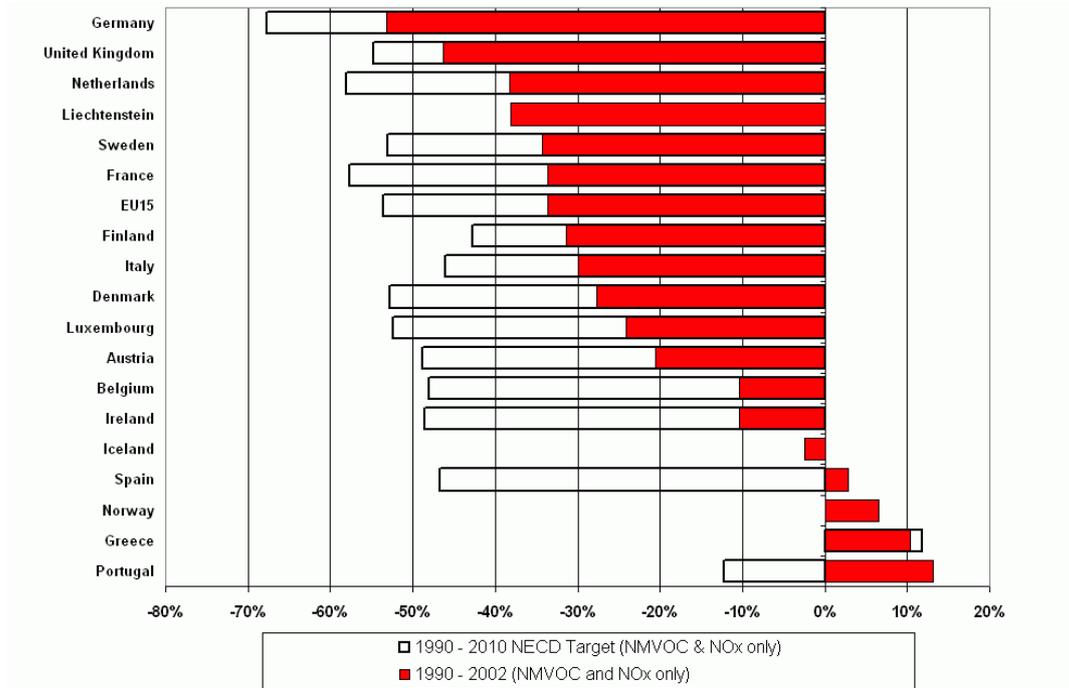


Data source: Data from 2004 officially reported national total and sectoral emissions to UNECE/EMEP Convention on Long-Range Transboundary Atmospheric Pollution and the UNFCCC.

Note: Data from Malta not available.



Fig. 4: Change in emissions of ozone precursors compared with the 2010 NECD targets (EU15 and EFTA3)

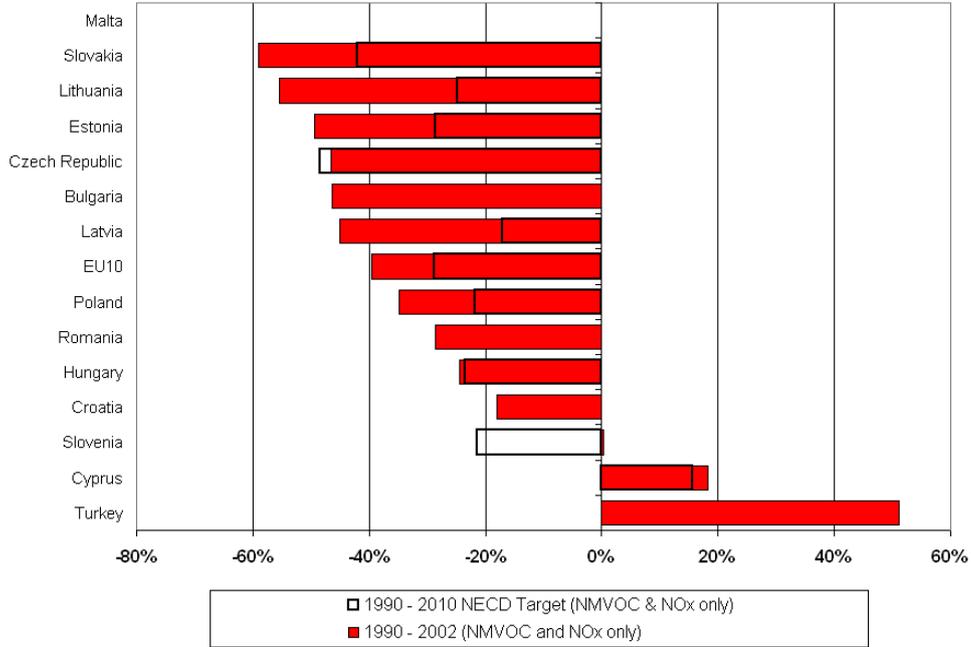


Data source : Data from 2004 officially reported national total and sectoral emissions to UNECE/EMEP Convention on Long-Range Transboundary Atmospheric Pollution and the UNFCCC.

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Fig. 5: Change in emissions of ozone precursors compared with the 2010 NECD targets EU10 and CC4



Data source: Data from 2004 officially reported national total and sectoral emissions to UNECE/EMEP Convention on Long-Range Transboundary Atmospheric Pollution and the UNFCCC.

Note: Data from Malta not available.

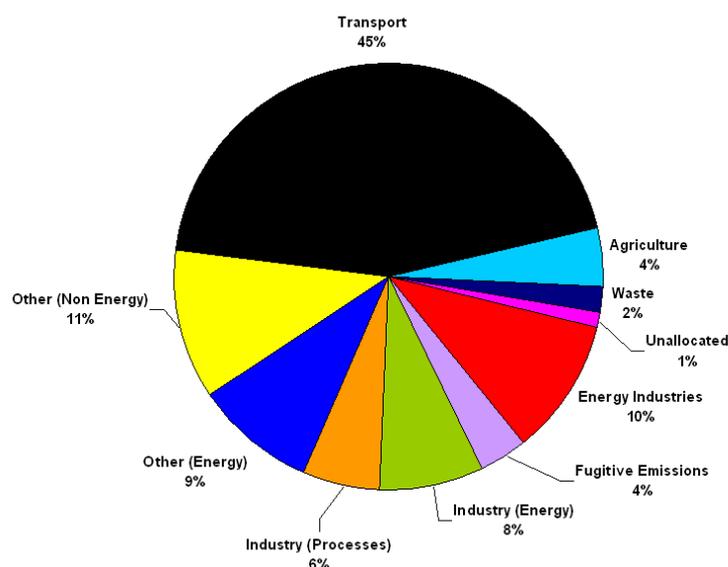


Specific policy question: How do different sectors and processes contribute to emissions of ozone precursors?

In both the EU15 and EU10, transport is the dominant source of ozone precursors. In 2002, transport contributed to 48% of total EU15 emissions, with emissions from this sector contributing 65% of the total reduction of ozone precursor emissions between 1990 and 2002. Other important EU15 emission sources in 2002 included commercial and domestic combustion and use of solvents in paint, glue and printing. After the transport sector, the sector responsible for the second largest absolute reduction was the energy industries sector, contributing 10% of the total reduction of ozone precursor emissions. Emission reductions that have occurred within the EU15 region since 1990 are mainly due to the further introduction of catalytic converters for cars and increased penetration of diesel, but also as a result of the implementation of the Solvents Directive in industrial processes.

In the EU10, transport is again the dominant source of ozone precursors and contributed 40% of total TOFP-weighted emissions in 2002. Other significant emission sources in the EU10 include commercial and domestic combustion processes (13% of total emissions), other non-energy (8%) and energy industries (13%). As observed across the EU15, the emission reductions observed are mainly due to further introduction of catalytic converters for cars and increased penetration of diesel, but also through the implementation of the Solvents Directive in industrial processes and reduction of fuel consumption. Emissions in the industry (processes), energy industry and transport sectors have all been significantly reduced, and contributed to 14%, 25% and 26% of total reduction of ozone precursor emissions respectively.

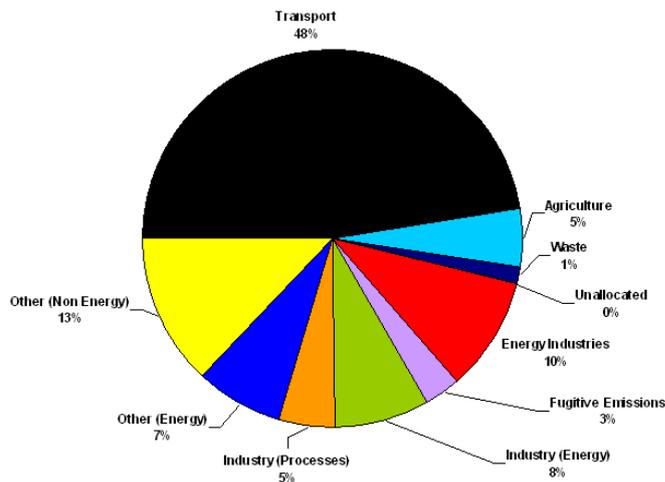
Fig. 7: Sector split for emissions of ozone precursors (EEA32)



Data source: Data from 2004 officially reported national total and sectoral emissions to UNECE/EMEP Convention on Long-Range Transboundary Atmospheric Pollution and the UNFCCC.

Note: Data from EEA sectors "road transport", and "other transport" are aggregated into sector "transport". The EEA32 country grouping includes EEA31 member countries + Croatia. Data not available for Malta.

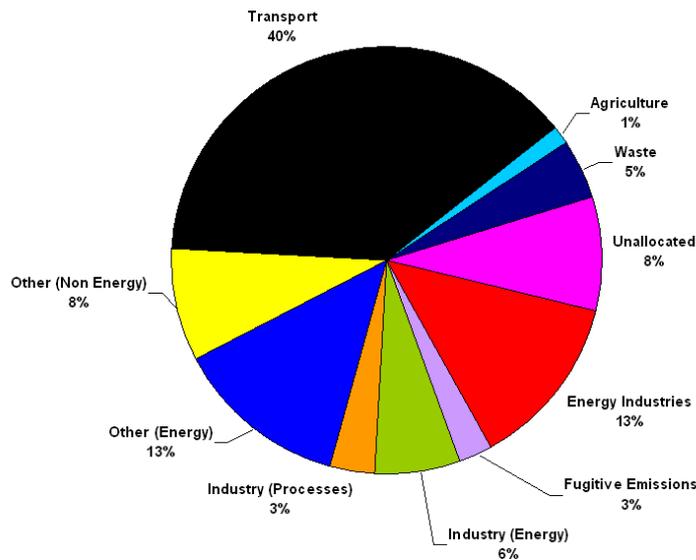
Fig. 8: Sector split for emissions of ozone precursors (EU15)



Data source: Data from 2004 officially reported national total and sectoral emissions to UNECE/EMEP Convention on Long-Range Transboundary Atmospheric Pollution and the UNFCCC.

Note: Data from EEA sectors "road transport", and "other transport" are aggregated into sector "transport".

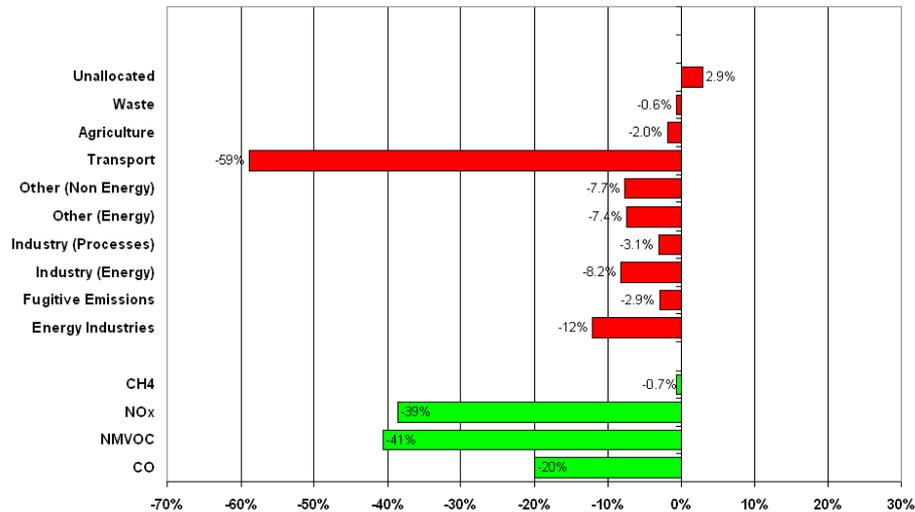
Fig. 9: Sector split for emissions of ozone precursors (EU10)



Data source: Data from 2004 officially reported national total and sectoral emissions to UNECE/EMEP Convention on Long-Range Transboundary Atmospheric Pollution and the UNFCCC.

Note: Data from EEA sectors "road transport", and "other transport" are aggregated into sector "transport". Data from Malta not available.

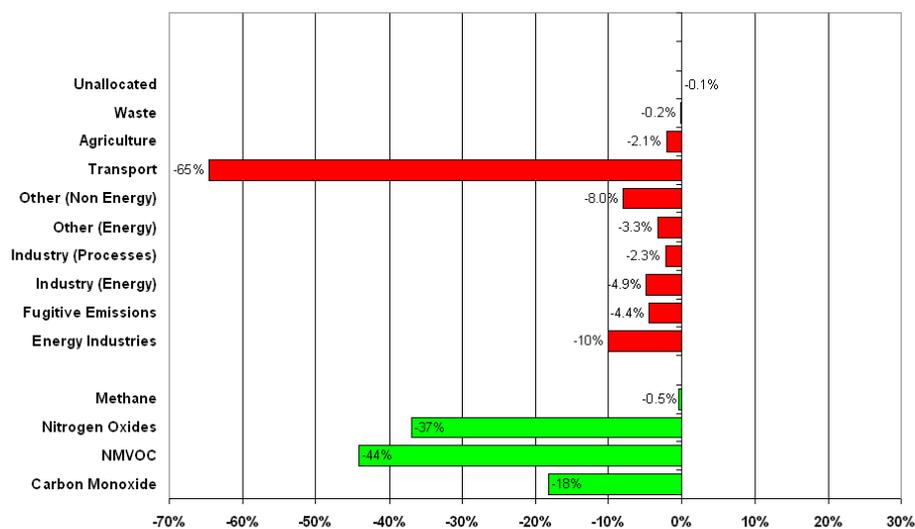
Fig. 10: Contribution to change in ozone precursors emissions for each sector and pollutant (EEA32)



Data source: Data from 2004 officially reported national total and sectoral emissions to UNECE/EMEP Convention on Long-Range Transboundary Atmospheric Pollution and the UNFCCC.

Note: 'Contribution to change' plots show the contribution to the total emission change between 1990-2002 made by a specified sector/ pollutant. Data from EEA sectors "road transport", and "other transport" are aggregated into sector "transport". The EEA32 country grouping includes EEA31 member countries + Croatia. Data not available for Malta.

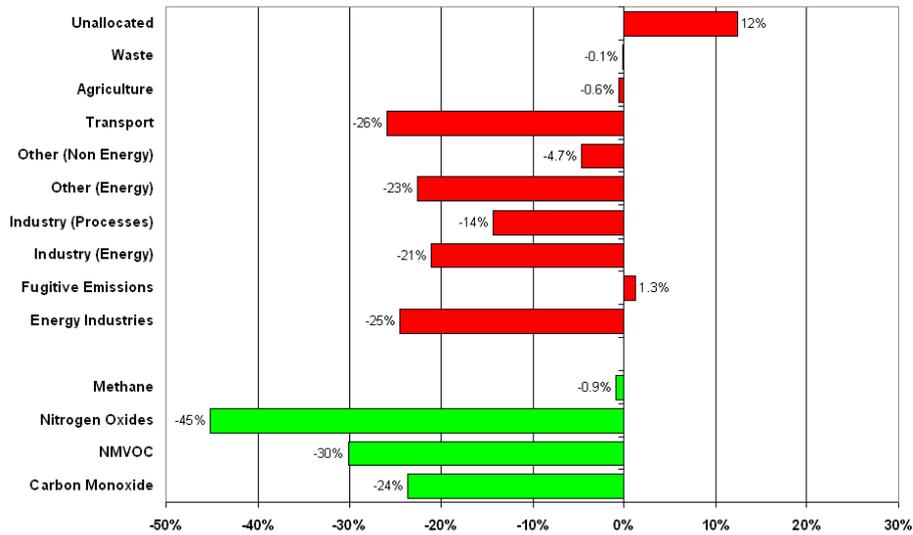
Fig. 11: Contribution to change in ozone precursors emissions for each sector and pollutant (EU15)



Data source: Data from 2004 officially reported national total and sectoral emissions to UNECE/EMEP Convention on Long-Range Transboundary Atmospheric Pollution and the UNFCCC.

Note: 'Contribution to change' plots show the contribution to the total emission change between 1990-2002 made by a specified sector/ pollutant. Data from EEA sectors "road transport", and "other transport" are aggregated into sector "transport".

Fig. 12: Contribution to change in ozone precursors emissions for each sector and pollutant (EU10)



Data source : Data from 2004 officially reported national total and sectoral emissions to UNECE/EMEP Convention on Long-Range Transboundary Atmospheric Pollution and the UNFCCC.

Note: 'Contribution to change' plots show the contribution to the total emission change between 1990-2002 made by a specified sector/ pollutant. Data from EEA sectors "road transport ", and "other transport " are aggregated into sector "transport ". Data from Malta not available.