

II. ENVIRONMENTAL INDICATORS

CLIMATE CHANGE

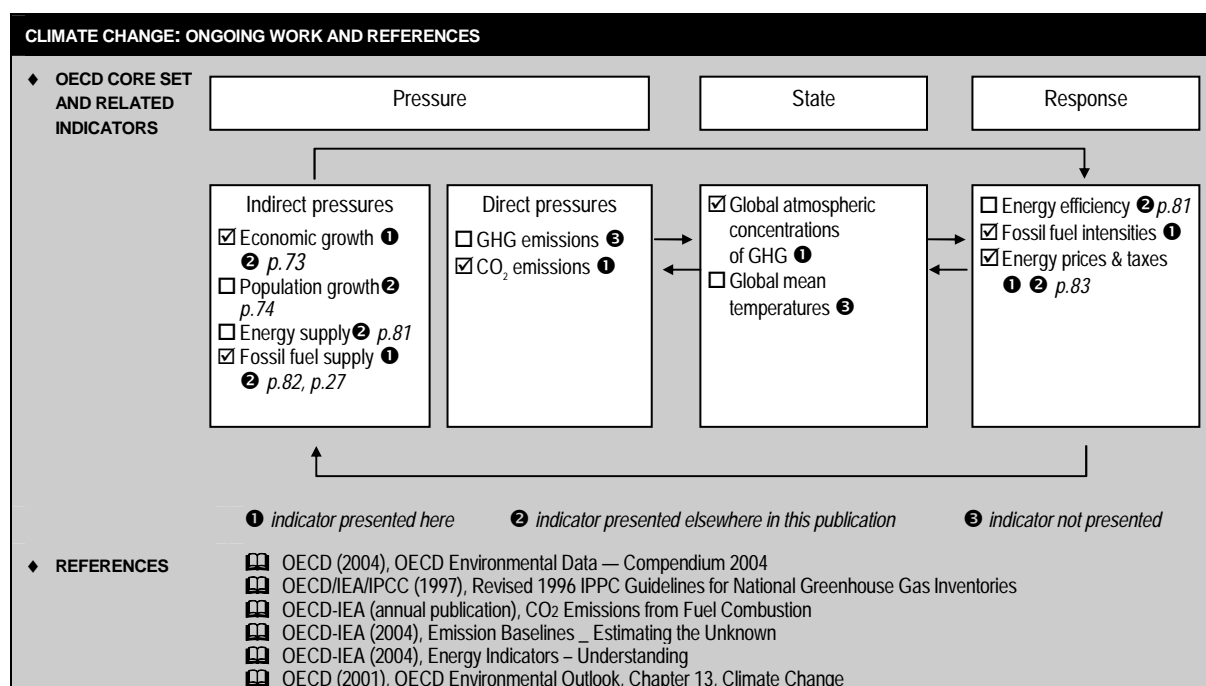
Industrialisation has increased emissions of greenhouses gases (GHG) from human activities, disturbing the radiative energy balance of the earth-atmosphere system. These gases exacerbate the natural greenhouse effect, leading to temperature changes and other potential consequences for the earth's climate. Land use changes and forestry also contribute to the greenhouse effect by altering carbon sinks. Climate change is of concern mainly as relates to its impact on ecosystems (biodiversity), human settlements and agriculture, and possible consequences for other socio-economic activities that could affect global economic output.

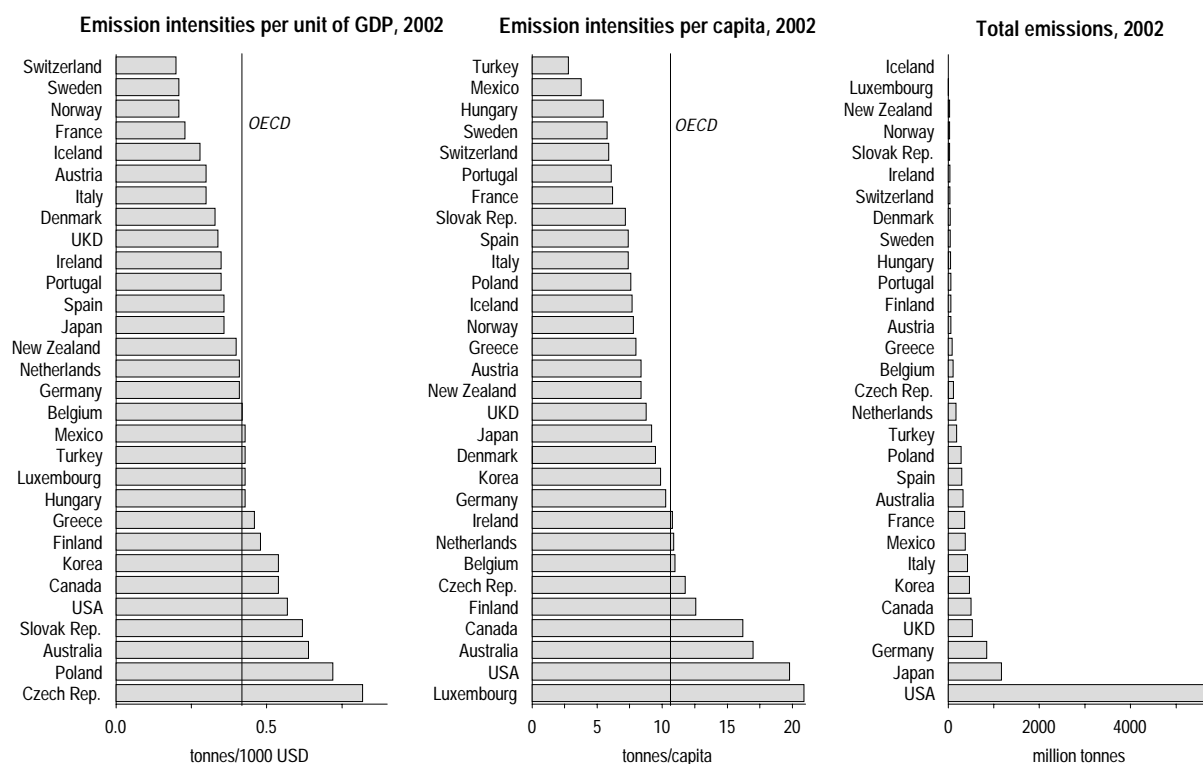
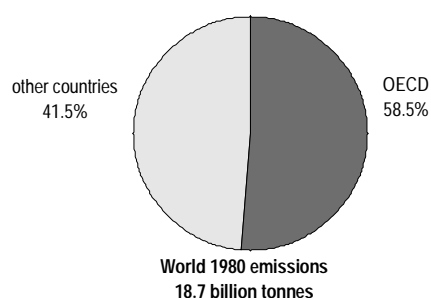
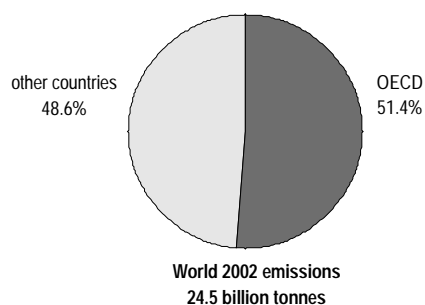
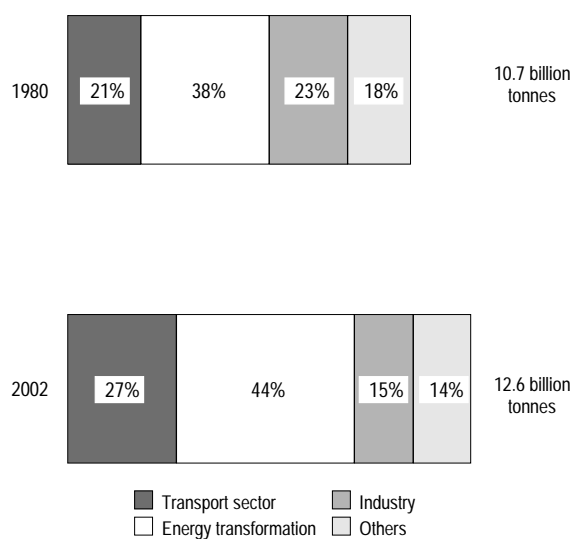
Climate change could have major or significant effects on sustainable development. Performance can be assessed against domestic objectives and international commitments. The main international agreement is the United Nations Framework Convention on Climate Change (FCCC) (Rio de Janeiro, 1992). The FCCC has been ratified by 189 parties. Industrialised countries, including those in transition to market economies, committed to taking measures aimed at stabilising GHG emissions by 2000 at 1990 levels. Its 1997 Kyoto Protocol establishes differentiated national or regional emission reduction or limitation targets for industrialised countries for 2008-12 and for the base year 1990. The Kyoto Protocol that has been ratified by 141 countries, including all but three OECD countries, is in force since 16 February 2005. The targets are comprehensive, covering CO₂, CH₄, N₂O, PFCs, HFCs and SF₆. The main challenge is to stabilise GHG concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system and to further de-couple GHG emissions from economic growth.

Indicators presented here relate to:

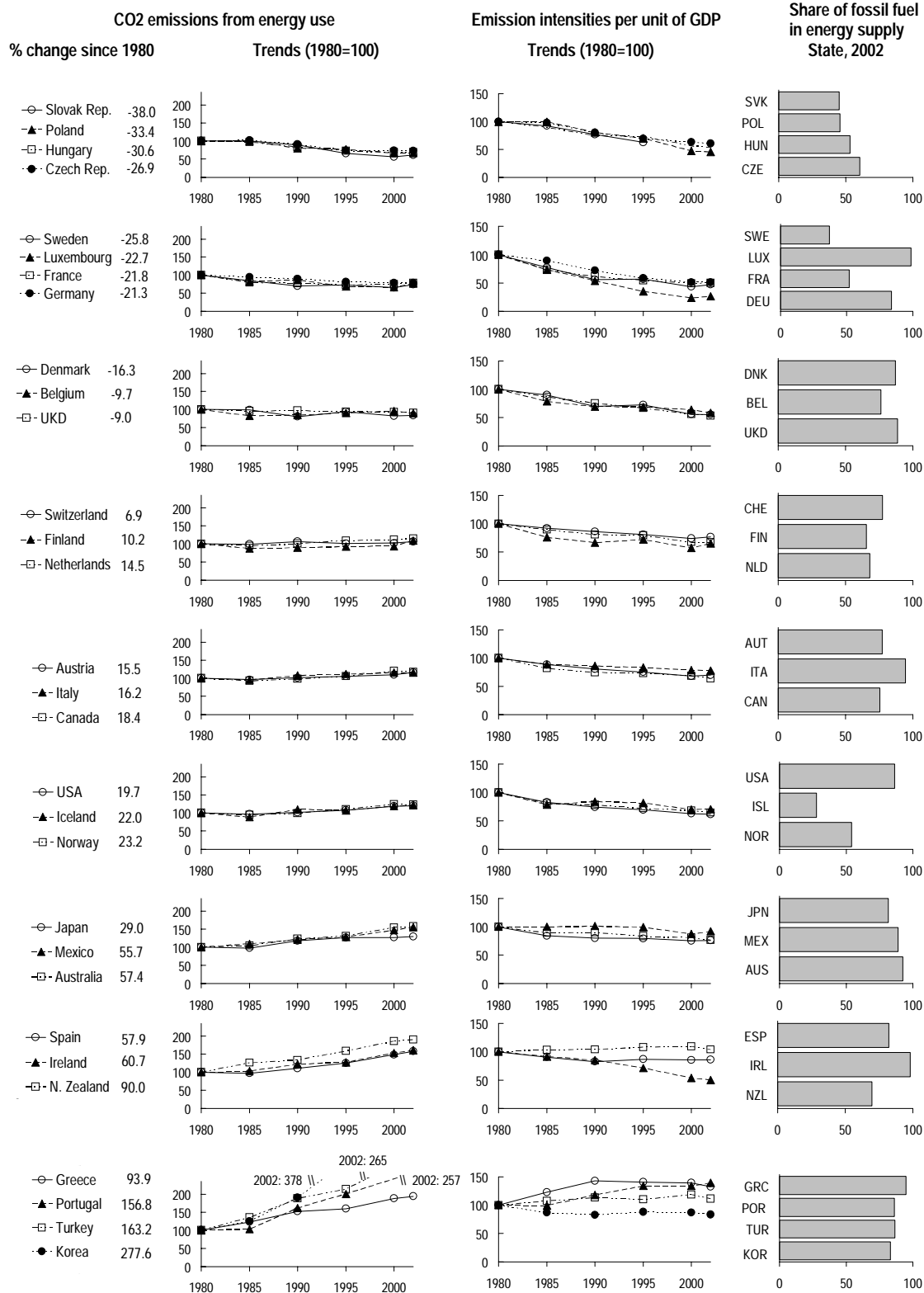
- ♦ *CO₂ emissions from energy use, showing total emissions as well as emission intensities per unit of GDP and per capita, and related changes since 1980. CO₂ from combustion of fossil fuels and biomass is a major contributor to the greenhouse effect and a key factor in countries' ability to deal with climate change. Information on fossil fuel share and intensity is given to reflect, at least partly, changes in energy efficiency and energy mix, which are key in efforts to reduce atmospheric CO₂ emissions.*
- ♦ *total greenhouse gas emissions, i.e. the sum of the six greenhouse gases of the Kyoto Protocol expressed in CO₂ equivalents, as well as emissions intensities per unit of GDP and per capita, and related changes since 1990.*
- ♦ *atmospheric concentrations of the greenhouse gases covered by the FCCC (CO₂, CH₄, N₂O) and of selected ozone depleting substances controlled by the Montreal Protocol (page 19) that also play a role in the greenhouse effect (CFC-11, CFC-12, total gaseous chlorine). Data are from various monitoring sites that provide an indication of global concentrations and trends.*

These indicators should be read in conjunction with other indicators from the OECD Core Set and in particular with indicators on energy efficiency and on energy prices and taxes. Their interpretation should take into account the structure of countries' energy supply, the relative importance of fossil fuels and of renewable energy, as well as climatic factors.



CO₂ EMISSION INTENSITIES 1**Contribution of OECD countries to world emissions****Structure of OECD emissions**

1 CO₂ EMISSION INTENSITIES



CO₂ EMISSION INTENSITIES 1

	CO2 emissions from energy use							Fossil fuel supply		Real end-use energy prices	GDP
	Total		Emission intensities					Share of total supply	Intensity per unit of GDP		
	million tonnes 2002	% change since 1980	% change since 1990	per unit of GDP		per capita					
				t/1 000 USD 2002	% change since1980	tonnes/cap. 2002	% change since1980				
Canada	507	18	20	0.54	-36	16.2	-7	76	0.24	19	84
Mexico	380	56	28	0.43	-8	3.8	7	89	0.17	67	69
USA	5705	20	18	0.57	-39	19.8	-5	86	0.22	-35	95
Japan	1178	29	10	0.36	-24	9.2	18	82	0.13	-36	70
Korea	472	278	99	0.55	-16	9.9	202	83	0.26	-8	352
Australia	334	57	28	0.64	-23	17.0	18	92	0.23	-4	105
New Zealand	33	90	42	0.39	4	8.4	52	70	0.17	-23	83
Austria	67	15	14	0.29	-30	8.4	8	77	0.11	-26	65
Belgium	113	-10	7	0.42	-41	11.0	-14	76	0.17	-18	54
Czech Rep.	121	-27	-20	0.78	-40	11.8	-26	86	0.26	2	21
Denmark	51	-16	3	0.33	-45	9.5	-20	87	0.12	-1	51
Finland	65	10	22	0.48	-35	12.6	1	60	0.17	-8	68
France	369	-22	1	0.23	-50	6.2	-29	52	0.10	-14	57
Germany	848	-21	-13	0.41	-49	10.3	-25	84	0.15	-9	53
Greece	88	94	27	0.46	33	8.0	70	95	0.17	-31	46
Hungary	56	-31	-17	0.43	-47	5.5	-27	83	0.19	88	30
Iceland	2	22	11	0.28	-29	7.7	-3	28	0.13	..	73
Ireland	42	61	32	0.35	-50	10.8	40	98	0.17	-24	221
Italy	430	16	8	0.30	-22	7.4	13	94	0.12	16	50
Luxembourg	9	-23	-11	0.42	-73	20.9	-36	99	0.20	0	188
Netherlands	177	15	13	0.40	-32	10.9	0	97	0.19	9	70
Norway	36	23	25	0.21	-35	7.8	11	54	0.10	1	91
Poland	292	-33	-17	0.73	-54	7.6	-38	95	0.23	53	45
Portugal	63	157	58	0.35	39	6.1	143	86	0.14	-27	85
Slovak Rep.	39	-38	-30	0.62	-55	7.2	-43	71	0.24	19	37
Spain	303	58	43	0.35	-14	7.4	44	82	0.14	-8	83
Sweden	51	-26	7	0.21	-53	5.8	-31	37	0.09	17	56
Switzerland	43	7	0	0.20	-24	5.9	-7	57	0.08	-31	40
Turkey	193	163	40	0.43	12	2.8	68	87	0.15	37	136
UKD	532	-9	-7	0.34	-47	8.8	-15	89	0.14	-16	72
OECD	12600	15	13	0.45	-36	11.0	-3	83	0.18	-22	81
World	24528	31	15	3.9	-6	80

♦ See Technical Annex for data sources, notes and comments.

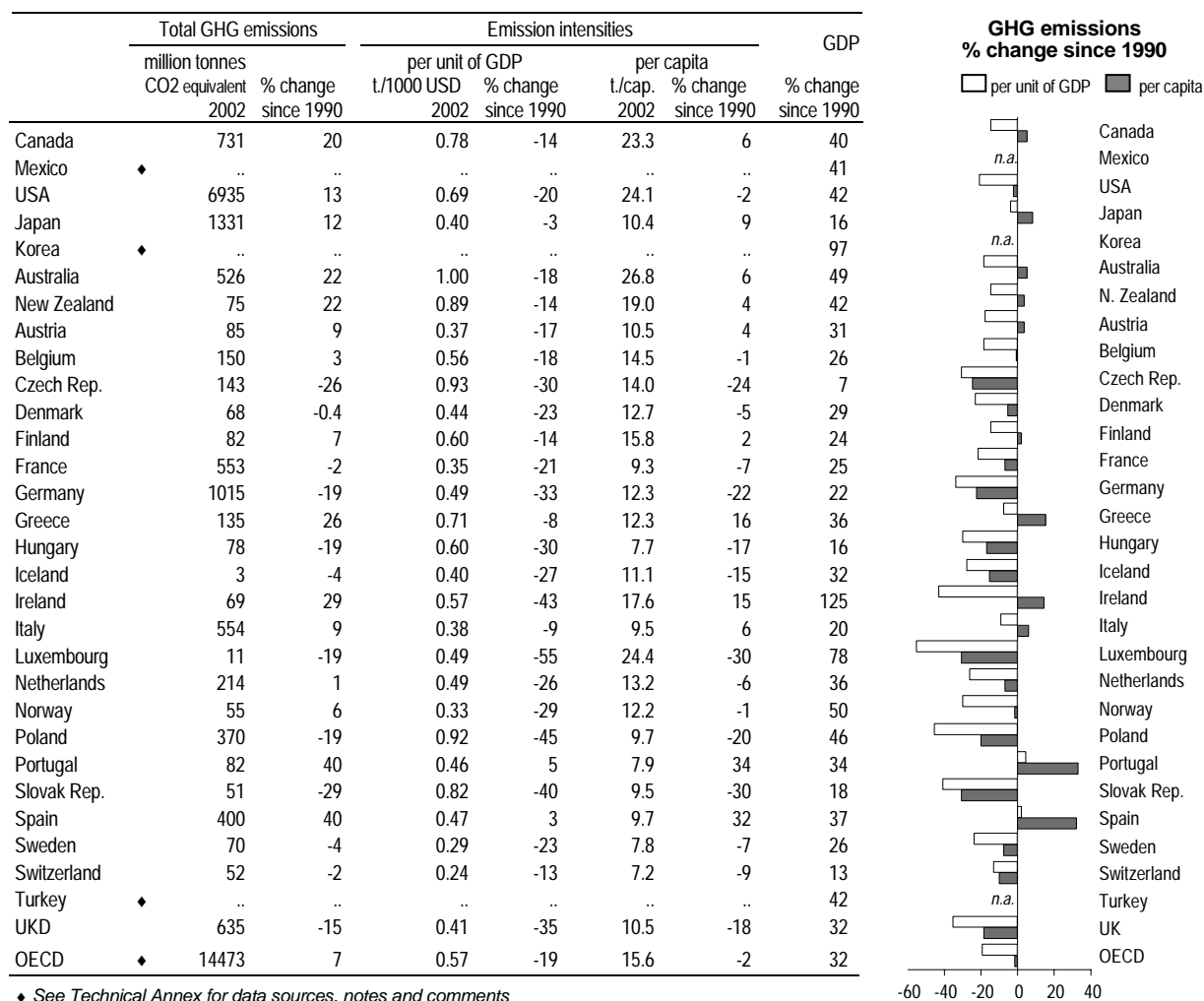
STATE AND TRENDS SUMMARY

CO₂ emissions from energy use are still growing in many countries and overall. Since 1980, they have grown more slowly in OECD countries as a group than they have worldwide. But recent data suggest that OECD growth rates are now on par with those world-wide. Individual OECD countries' rates of progress vary significantly.

A number of OECD countries have de-coupled their CO₂ emissions from GDP growth through structural changes in industry and in energy supply and the gradual improvement of energy efficiency in production processes. Most countries, however, have not succeeded in meeting their own national commitments.

CO₂ emissions from energy use continue to grow, particularly in the OECD Asia-Pacific region and in North America. This can be partly attributed to energy production and consumption patterns and trends, often combined with overall low energy prices. In OECD Europe CO₂ emissions from energy use decreased by almost 5% between 1980 and 2002, as a result of changes in economic structures and energy supply mix, energy savings and, in some countries, decreases in economic activity over the considered period.

2 GREENHOUSE GAS EMISSIONS



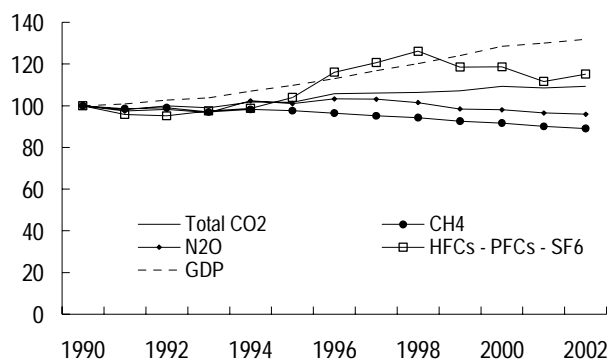
STATE AND TRENDS SUMMARY

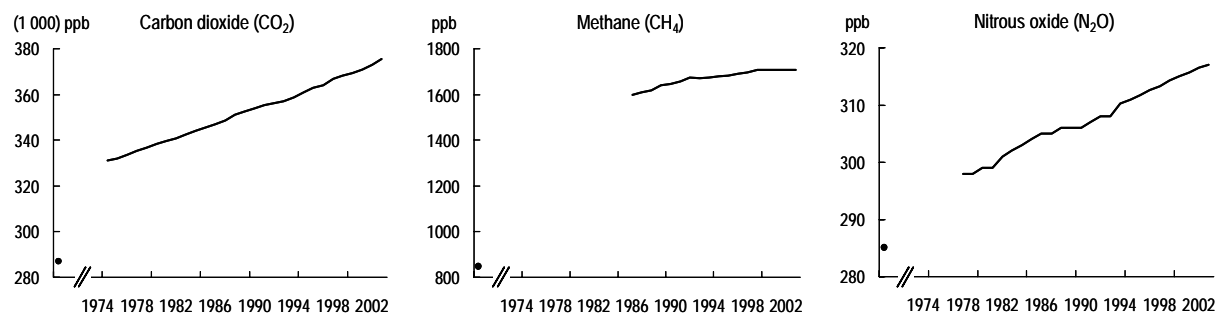
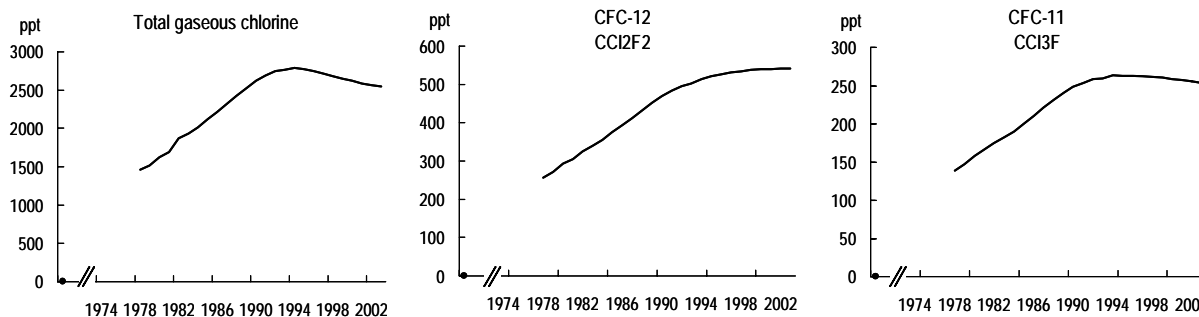
GHG emissions are still growing in many countries and overall. Individual OECD countries' contributions to the greenhouse effect, and rates of progress, however, vary significantly. These differences partly reflect different national circumstances like economic growth, population growth and the extent to which the countries have taken steps to reduce emissions from different sources.

Emission intensities per unit of GDP and per capita are decreasing in most OECD countries.

The predominant greenhouse gas is carbon dioxide and it largely determines the overall trend. However, methane (CH₄) and nitrous oxide (N₂O) represent a sizeable share so reductions in emissions of these gases also make an important contribution.

OECD greenhouse gas emissions Index 1990=100



GREENHOUSE GAS CONCENTRATIONS 3**Gases controlled under the Framework Convention on Climate Change****Gases controlled under the Montreal Protocol (subst. depleting the ozone layer)**

• - Preindustrial level

**STATE AND TRENDS
SUMMARY**

Since the beginning of industrialisation, human activity has substantially raised atmospheric concentrations of GHG. Global CO₂ concentrations have increased along with world population. According to the IPCC (2001), global mean surface air temperature has increased by between 0.4 and 0.8 degree Celsius over the 20th century and is expected to rise 1.4° to 5.8°C by 2100 relative to 1990.

Trends also show large increases in concentrations of ozone depleting substances (ODS) in the atmosphere. A number of ODS play a role in the greenhouse effect. However, growth rates of CFC concentrations have decreased since 1989 as a result of the Montreal Protocol and its amendments. (see also page 19).