

# 1. ENVIRONMENTAL TRENDS

## Greenhouse gas (GHG) emissions

Emissions of greenhouse gases (GHGs) from human activities disturb the radiative energy balance of the earth-atmosphere system. They exacerbate the natural greenhouse effect, leading to temperature changes and other consequences for the earth's climate. Land use changes and forestry also play a role by altering the amount of greenhouse gases captured or released by carbon sinks.

Climate change is of concern mainly as regards its impact on ecosystems (biodiversity), human settlements and agriculture, and on the frequency and scale of extreme weather events. It could have significant consequences for human well-being and socio-economic activities, which could in turn affect global economic output.

### Definitions

The indicators presented here refer to the sum of emissions of six GHGs that have direct effects on climate change and are considered responsible for a major part of global warming: carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), chlorofluorocarbons (CFCs), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF<sub>6</sub>).

They show gross emissions expressed in CO<sub>2</sub> equivalents as well as emission intensities per unit of GDP and per capita, and related changes. They refer to GHGs emitted within the national territory and exclude CO<sub>2</sub> emissions and removals from land use change and forestry. They do not cover international transactions of emission reduction units or certified emission reductions.

These indicators should be read in conjunction with indicators on CO<sub>2</sub> emissions, energy intensity, and energy prices and taxes. Their interpretation should take into account the structure of countries' energy supply and climatic factors.

### Overview

Global GHG emissions have doubled since the early 1970s, driven by economic growth and increasing fossil energy use in developing countries. Historically, OECD countries emitted the bulk of global GHGs, but the share of the BRIICS in global emissions has been increasing to over 40%. CO<sub>2</sub> determines the overall trend. Together with CH<sub>4</sub> and N<sub>2</sub>O, it accounts for about 98% of GHG emissions.

Emissions have been declining in recent years in almost all OECD countries. They fell by almost 5% since 2008 in the OECD area. This is partly due to a slowdown in economic activity following the 2008 economic crisis, but also to a strengthening of climate policies and changing patterns of energy consumption. As a result, emission intensities per unit of GDP and per capita decreased between 2000 and 2012 in almost all OECD countries, revealing a strong overall decoupling from economic growth.

Reductions in national emissions may also be the result of offshoring domestic production and the associated emissions. Evidence of decoupling based on domestic emissions per unit of GDP or per capita, therefore, may reveal only part of the story.

Individual OECD countries' rates of progress vary significantly. This partly reflects different national circumstances, such as composition and rate of economic growth, population growth, energy resource endowment, and the extent to which the countries have taken steps to reduce emissions from various sources. Today, emissions per capita range from 6 to 24 tonnes per inhabitant, and the related change since 2000 ranges from +32% to -29%.

### Comparability

Data on GHG emissions are reported annually to the Secretariat of the UNFCCC with 1990 as a base year but not by all OECD countries. They display a good level of comparability. The high per-GDP emissions of Estonia result from the use of oil shale for electricity generation. Oil shale has a high carbon emission factor. The high per-capita emissions of Luxembourg result from the lower taxation of road fuels compared to neighbouring countries, which attracts drivers to refuel in the country.

Latest year available: years prior to 2009 were not considered. The OECD totals do not include Israel.

For additional notes, see the Annex.

### Sources

OECD (2014), "Greenhouse gas Emissions by Source", *OECD Environment Statistics* (database), <http://dx.doi.org/10.1787/data-00594-en>.

### Further information

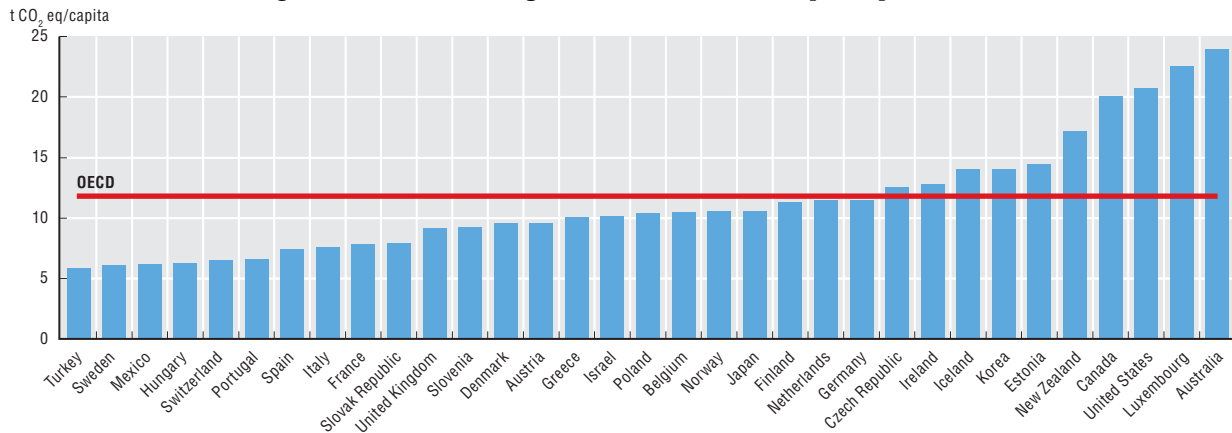
OECD (2015), *Aligning Policies for a Low-Carbon Economy*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264233294-en>.

OECD (2012), *OECD Environmental Outlook to 2050: The Consequences of Inaction*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264122246-en>.

UNFCCC (2014), *Greenhouse Gas Inventory Data*, [http://unfccc.int/ghg\\_data/items/3800.php](http://unfccc.int/ghg_data/items/3800.php).

Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>.

Figure 1.1. Greenhouse gas emission intensities per capita, 2012



Source: OECD (2014), "Greenhouse gas Emissions by Source", OECD Environment Statistics (database); UNFCCC (2014), Greenhouse Gas Inventory Data.

StatLink <http://dx.doi.org/10.1787/888933261683>

Table 1.1. Greenhouse gas emissions and intensities

	Total GHG emissions			Emission intensities				GDP
	Million tonnes CO <sub>2</sub> eq.	% change		Per unit of GDP		Per capita		
		2012	1990-2012	2000-12	t/1 000 USD	% change	t/cap	% change
				2012	2000-12	2012	2000-12	2000-12
Australia	544	31	11	0.62	-23	24	-7	44
Austria	80	3	0	0.25	-17	10	-5	21
Belgium	117	-18	-20	0.31	-32	10	-26	18
Canada	699	18	-3	0.54	-24	20	-15	27
Chile	..	..	..	..	..	..	..	68
Czech Republic	131	-33	-10	0.51	-35	13	-12	38
Denmark	53	-24	-24	0.29	-29	9	-28	8
Estonia	19	-53	12	0.77	-29	14	16	58
Finland	61	-13	-12	0.34	-26	11	-16	20
France	496	-11	-12	0.24	-24	8	-18	16
Germany	939	-25	-10	0.32	-21	11	-9	14
Greece	111	6	-12	0.47	-14	10	-14	1
Hungary	62	-36	-19	0.36	-34	6	-17	22
Iceland	4	26	14	0.38	-15	14	1	35
Ireland	59	6	-14	0.34	-34	13	-29	31
Israel	78	..	8	0.35	-25	10	-12	49
Italy	460	-11	-17	0.28	-17	8	-22	1
Japan	1 343	9	0	0.34	-8	11	0	9
Korea	698	136	36	0.47	-15	14	29	63
Luxembourg	12	-8	21	0.33	-9	23	1	33
Mexico	701	53	24	0.48	3	6	10	30
Netherlands	192	-10	-10	0.29	-21	11	-14	15
New Zealand	76	25	7	0.65	-21	17	-7	35
Norway	53	5	-2	0.22	-19	11	-13	21
Poland	399	-14	1	0.56	-36	10	0	56
Portugal	69	13	-18	0.30	-20	7	-20	2
Slovak Republic	43	-42	-13	0.37	-48	8	-13	67
Slovenia	19	3	0	0.37	-22	9	-4	27
Spain	341	20	-10	0.27	-26	7	-22	21
Sweden	58	-21	-16	0.17	-33	6	-22	26
Switzerland	51	-3	-1	0.15	-20	6	-10	24
Turkey	440	133	48	0.43	-9	6	32	62
United Kingdom	584	-25	-16	0.27	-31	9	-22	21
United States	6 488	4	-8	0.46	-25	21	-18	22
<b>OECD</b>	<b>15 506</b>	<b>5</b>	<b>-4</b>	<b>0.39</b>	<b>-21</b>	<b>12</b>	<b>-11</b>	<b>22</b>
OECD America	8 000	10	-5	0.46	-23	17	-15	24
OECD Asia-Oceania	2 654	30	10	0.41	-11	13	6	24
OECD Europe	4 853	-11	-8	0.31	-23	9	-13	19

Note: See the Annex for country notes.

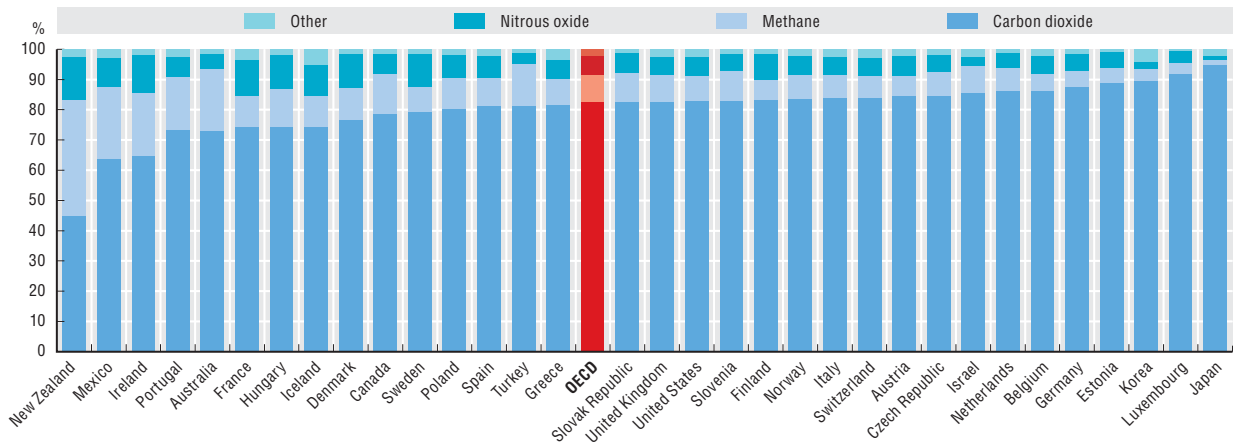
Source: OECD (2014), "Greenhouse Gas Emissions by Source", OECD Environment Statistics (database); UNFCCC (2014), Greenhouse Gas Inventory Data.

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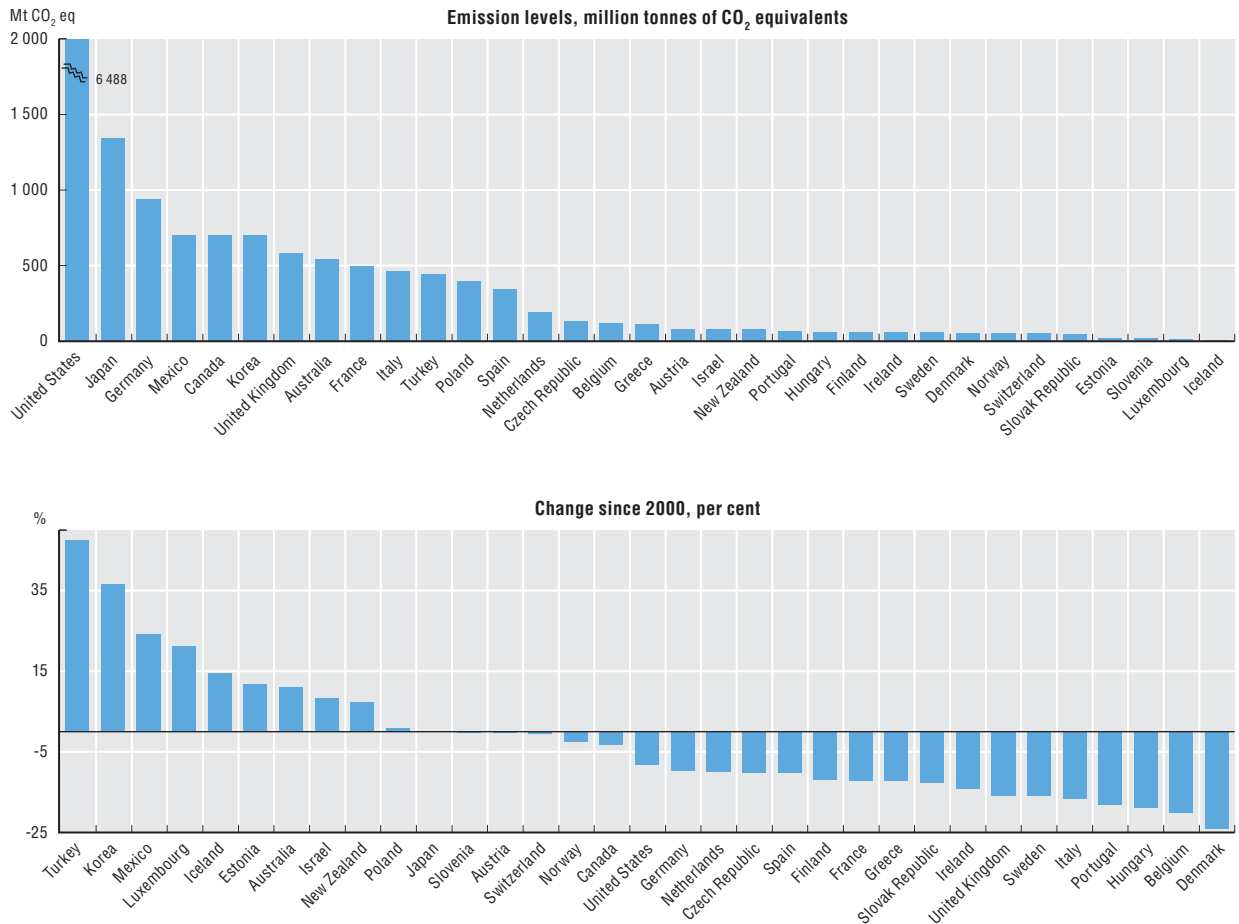
## Greenhouse gas (GHG) emissions

Figure 1.2. Greenhouse gas emissions, by gas, 2012



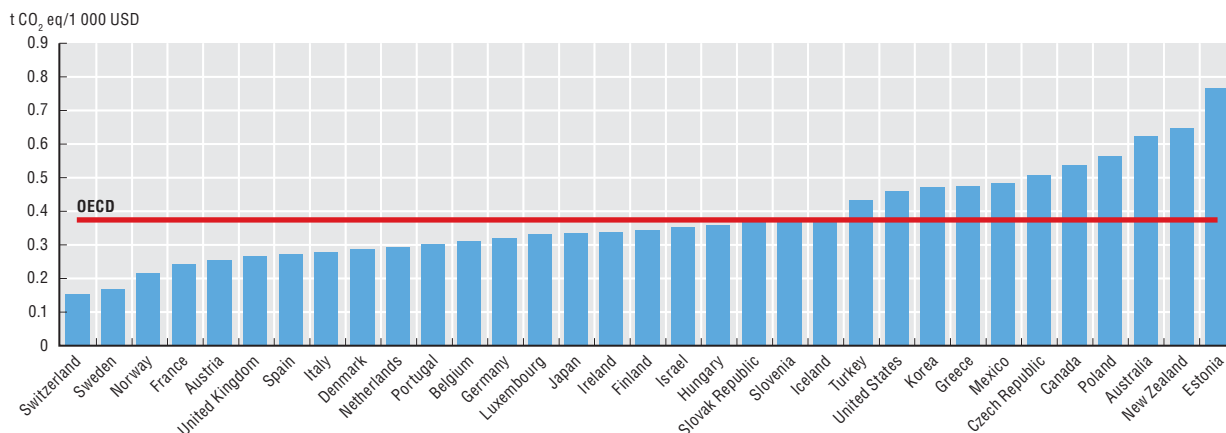
Source: OECD (2014), "Greenhouse Gas Emissions by Source", OECD Environment Statistics (database); UNFCCC (2014), Greenhouse Gas Inventory Data. StatLink <http://dx.doi.org/10.1787/888933261690>

Figure 1.3. Greenhouse gas emission levels



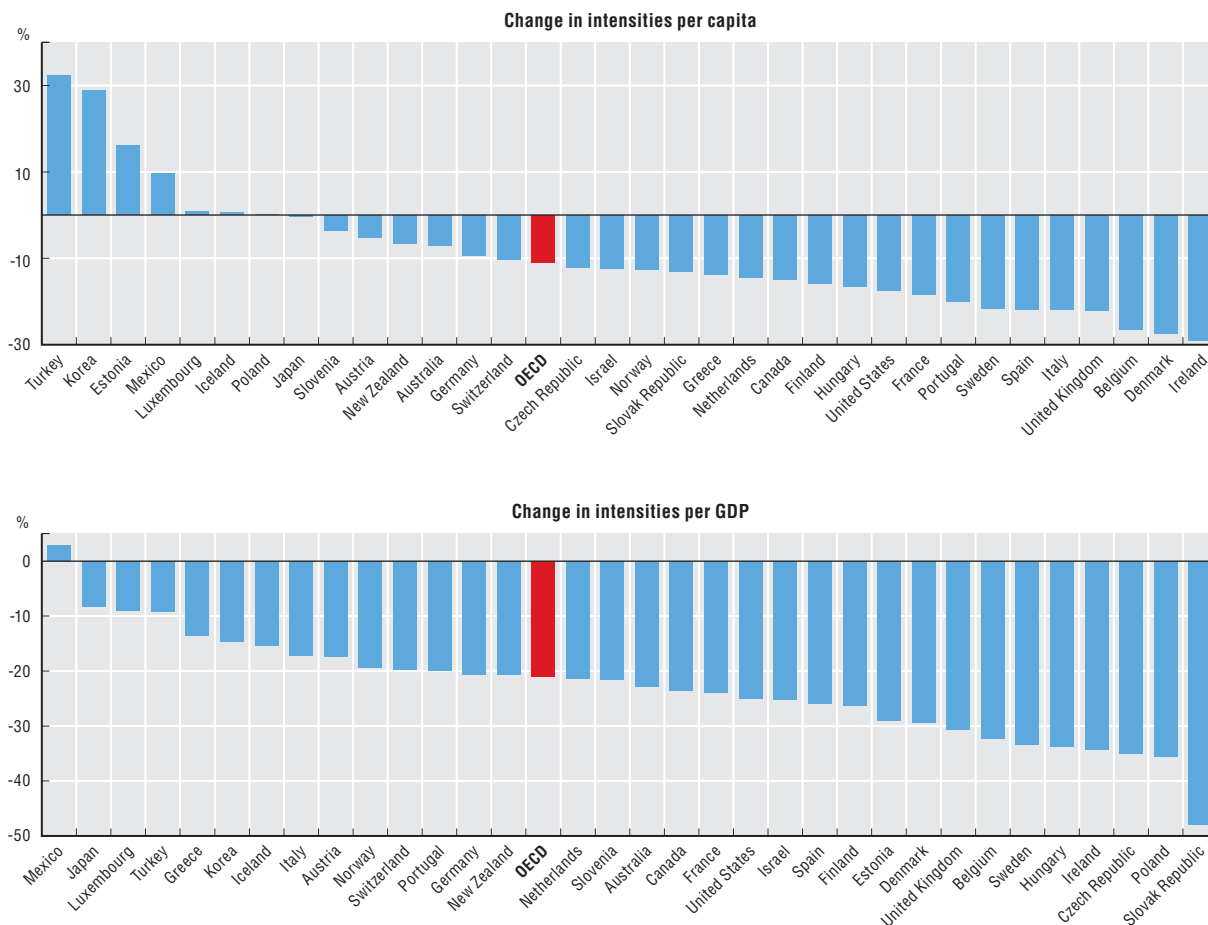
Source: OECD (2014), "Greenhouse Gas Emissions by Source", OECD Environment Statistics (database); UNFCCC (2014), Greenhouse Gas Inventory Data. StatLink <http://dx.doi.org/10.1787/888933261700>

Figure 1.4. Greenhouse gas emission intensities per GDP, 2012



Source: OECD (2014), "Greenhouse Gas Emissions by Source", OECD Environment Statistics (database); UNFCCC (2014), Greenhouse Gas Inventory Data. StatLink <http://dx.doi.org/10.1787/888933261713>

Figure 1.5. Change in greenhouse gas emission intensities, since 2000



Source: OECD (2014), "Greenhouse Gas Emissions by Source", OECD Environment Statistics (database); UNFCCC (2014), Greenhouse Gas Inventory Data. StatLink <http://dx.doi.org/10.1787/888933261723>



**From:**  
**Environment at a Glance 2015**  
OECD Indicators

**Access the complete publication at:**  
<https://doi.org/10.1787/9789264235199-en>

**Please cite this chapter as:**

OECD (2015), "Greenhouse gas (GHG) emissions", in *Environment at a Glance 2015: OECD Indicators*, OECD Publishing, Paris.

DOI: <https://doi.org/10.1787/9789264235199-4-en>

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