

SULPHUR AND NITROGEN EMISSIONS

Atmospheric pollutants from energy transformation and energy consumption, but also from industrial processes, are the main contributors to regional and local air pollution and raise concerns as to their effects on human health and ecosystems.

In the atmosphere, emissions of sulphur and nitrogen compounds are transformed into acidifying substances. When these substances reach the ground, acidification of soil, water and buildings arises. Soil acidification is one important factor causing forest damage; acidification of the aquatic environment may severely impair the life of plant and animal species.

Nitrogen oxides (NO_x) also contribute to ground-level ozone formation and are responsible for eutrophication, reduction in water quality and species richness. High concentrations of NO_x cause respiratory illnesses.

Definition

Total emissions refer to emissions from human activities of sulphur oxides (SO_x) and nitrogen oxides (NO_x).

It should be kept in mind that SO_x and NO_x emissions provide only a partial view of air pollution problems. They should be supplemented with information on the acidity of rain and snow, and the exceedance of critical loads in soil and water, which reflect the actual acidification of the environment, and with information on population exposure to air pollutants.

Comparability

International data on SO_x and NO_x emissions are available for almost all OECD countries. The details of estimation methods for emissions such as emission factors and reliability, extent of sources and pollutants included in estimation, etc., may differ from one country to another.

Overview

SO_x emissions have continued to decrease since 2000 for the OECD as a whole as a combined result of changes in energy demand through energy savings and fuel substitution, pollution control policies and technical progress.

NO_x emissions have continued to decrease in the OECD overall since 2000, but less than SO_x emissions. This is mainly due to changes in energy demand, pollution control policies and technical progress. In the late 2000s, the slowdown in economic activity following the 2008 economic crisis further contributed to reduce emissions. However, these results have not compensated in all countries for steady growth in road traffic, fossil fuel use and other activities generating NO_x.

The high emission levels of SO_x for Iceland are due to SO_x emissions from geothermal energy which represented 80% of total emissions in 2012.

OECD totals do not include Chile and Mexico.

Sources

- OECD (2014), "Air emissions by source", OECD Environment Statistics (database).
- OECD (2015), *Environment at a Glance*, OECD Publishing.
- United Nations Framework Convention on Climate Change (UNFCCC), "National Inventory Submissions", National Reports.

Further information

Analytical publications

- OECD (2014), *The Cost of Air Pollution: Health Impacts of Road Transport*, OECD Publishing.
- OECD (2012), "Review of the Implementation of the OECD Environmental Strategy for the First Decade of the 21st Century", OECD, Paris.

Online databases

- OECD Environment Statistics.

Websites

- Environmental indicators, modelling and outlooks, www.oecd.org/environment/indicators-modelling-outlooks.



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Sulphur and nitrogen oxides emissions

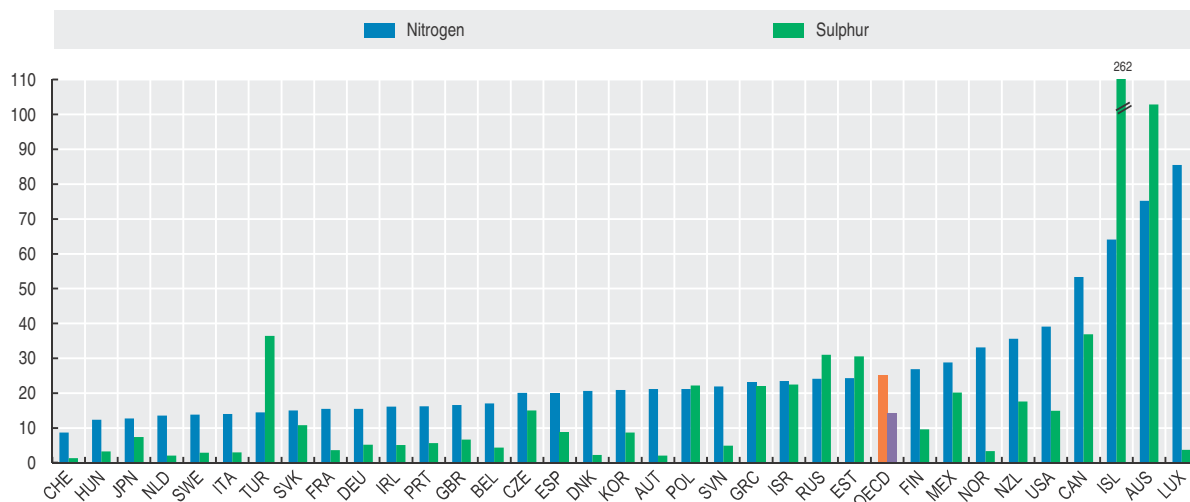
Thousand tonnes

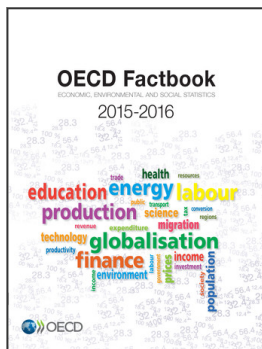
	Sulphur oxides						Nitrogen oxides					
	2007	2008	2009	2010	2011	2012	2007	2008	2009	2010	2011	2012
Australia	2 440.2	2 618.1	2 594.6	2 381.0	2 356.4	2 333.9	1 659.9	1 667.9	1 657.8	1 669.8	1 678.0	1 706.7
Austria	24.7	22.4	17.0	18.6	18.0	17.2	217.4	204.8	189.0	193.1	182.5	178.3
Belgium	123.8	96.1	74.5	59.9	52.7	48.0	261.2	230.5	204.9	212.2	198.2	189.7
Canada	1 968.2	1 789.9	1 538.3	1 375.2	1 286.9	1 287.7	2 273.4	2 183.9	2 075.9	2 061.7	1 964.2	1 861.7
Chile	..	..	..	..	..	..	..	..	..	..	..	..
Czech Republic	216.5	174.3	173.5	170.3	169.0	157.9	283.2	261.1	251.4	239.1	225.9	210.6
Denmark	25.5	20.0	14.9	14.9	14.0	12.5	172.0	154.3	136.1	131.8	124.6	115.4
Estonia	88.0	69.4	54.8	83.2	72.7	40.6	38.5	35.7	30.2	36.7	35.8	32.3
Finland	82.0	68.3	58.7	66.6	60.7	52.0	182.7	167.7	153.5	165.5	155.2	145.6
France	424.2	359.3	311.2	287.8	246.3	232.4	1 269.4	1 168.3	1 086.5	1 065.9	999.7	981.5
Germany	453.9	454.2	406.6	430.4	423.8	427.1	1 476.7	1 402.1	1 303.3	1 324.9	1 289.1	1 269.3
Greece	537.9	445.2	425.6	265.4	262.2	244.9	414.1	392.2	379.5	319.4	296.0	258.6
Hungary	36.4	36.6	30.9	32.3	35.3	31.8	163.0	160.2	153.6	151.5	137.3	122.4
Iceland	58.0	74.2	68.7	73.4	80.2	83.9	26.3	24.4	24.8	22.4	20.9	20.5
Ireland	54.5	45.2	32.4	26.3	24.7	23.2	120.9	108.8	87.0	80.1	71.8	73.8
Israel	198.9	183.8	167.8	164.0	174.2	..	201.4	196.3	183.9	186.1	182.0	..
Italy	339.8	284.6	232.8	214.2	193.9	177.7	1 112.5	1 042.0	970.3	951.6	927.8	849.2
Japan	1 031.8	990.0	957.0	951.2	942.2	936.8	1 957.3	1 870.4	1 778.3	1 730.2	1 675.2	1 626.9
Korea	402.5	418.0	387.7	401.7	434.0	..	1 187.8	1 044.9	1 014.1	1 061.1	1 040.0	..
Luxembourg	2.4	2.2	2.2	2.2	1.7	2.0	51.6	49.7	43.3	45.6	47.6	45.4
Mexico	..	2 241.2	..	..	..	..	..	3 206.9	..	..	..	..
Netherlands	59.3	50.0	36.7	33.5	33.5	33.8	287.9	279.0	254.7	253.5	237.7	227.3
New Zealand	82.2	86.4	74.3	73.5	74.2	78.2	160.5	161.9	151.8	150.6	152.8	157.9
Norway	20.1	20.0	15.4	19.5	18.4	16.7	201.6	190.4	179.8	182.0	174.2	166.2
Poland	1 229.2	1 007.3	868.2	935.6	897.5	853.3	860.3	829.9	809.4	862.1	845.9	817.3
Portugal	162.9	114.1	79.0	70.2	64.5	59.2	241.6	215.6	204.4	189.1	179.0	170.1
Slovak Republic	70.6	69.4	64.1	69.4	68.5	58.5	95.6	93.6	84.2	88.6	85.2	81.0
Slovenia	14.6	12.8	10.5	9.8	10.9	10.2	49.3	54.1	46.9	46.1	46.2	45.1
Spain	1 135.9	512.8	459.9	424.9	459.5	407.9	1 368.7	1 179.5	1 043.9	965.7	958.9	928.0
Sweden	32.4	30.2	29.5	32.0	29.2	27.8	164.4	155.9	147.1	148.7	139.5	131.8
Switzerland	13.2	13.7	11.8	12.5	10.6	10.8	84.7	81.6	76.8	75.3	70.5	69.3
Turkey	2 646.2	2 560.2	2 663.8	2 558.8	2 652.7	2 739.1	1 038.6	989.5	967.5	938.1	1 115.7	1 087.7
United Kingdom	588.0	490.3	397.3	415.0	385.4	426.4	1 467.7	1 317.6	1 147.0	1 113.1	1 040.4	1 057.0
United States	10 562.9	9 302.1	8 223.8	7 016.9	5 853.1	4 694.5	16 334.5	15 252.7	14 316.1	13 497.2	13 045.1	12 257.9
EU 28	..	..	..	..	..	..	..	..	..	..	..	..
OECD	25 126.7	22 421.3	20 483.5	18 690.4	17 406.8	16 052.8	35 424.5	33 166.3	31 152.8	30 158.8	29 342.9	28 108.0
Brazil	..	..	..	..	..	..	..	..	..	..	..	..
China	..	..	..	..	..	..	..	..	..	..	..	..
India	..	..	..	..	..	..	..	..	..	..	..	..
Indonesia	..	..	..	..	..	..	..	..	..	..	..	..
Russian Federation	4 709.0	4 675.0	4 512.0	4 512.0	4 462.0	4 431.0	3 764.0	3 809.0	3 669.0	3 735.0	3 649.0	3 452.0
South Africa	..	..	..	..	..	..	..	..	..	..	..	..

 1 2 <http://dx.doi.org/10.1787/888933336620>

Sulphur and nitrogen oxides emissions

Kilograms per capita, 2012 or latest available year


 1 2 <http://dx.doi.org/10.1787/888933335546>



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