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Climate Change Canada

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INTERNATIONAL COMPARISON: AIR POLLUTANT EMISSIONS IN SELECTED COUNTRIES

CANADIAN ENVIRONMENTAL
SUSTAINABILITY INDICATORS



Canada 

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CANADIAN ENVIRONMENTAL SUSTAINABILITY INDICATORS INTERNATIONAL COMPARISON: AIR POLLUTANT EMISSIONS IN SELECTED COUNTRIES

October 2019

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International comparison: air pollutant emissions in selected countries

Air pollution problems, such as smog and acid rain, result from the release of pollutants into the atmosphere. These indicators compare Canada's emissions of 5 key air pollutants with those of top emitting member countries of the Organisation for Economic Co-operation and Development (OECD).

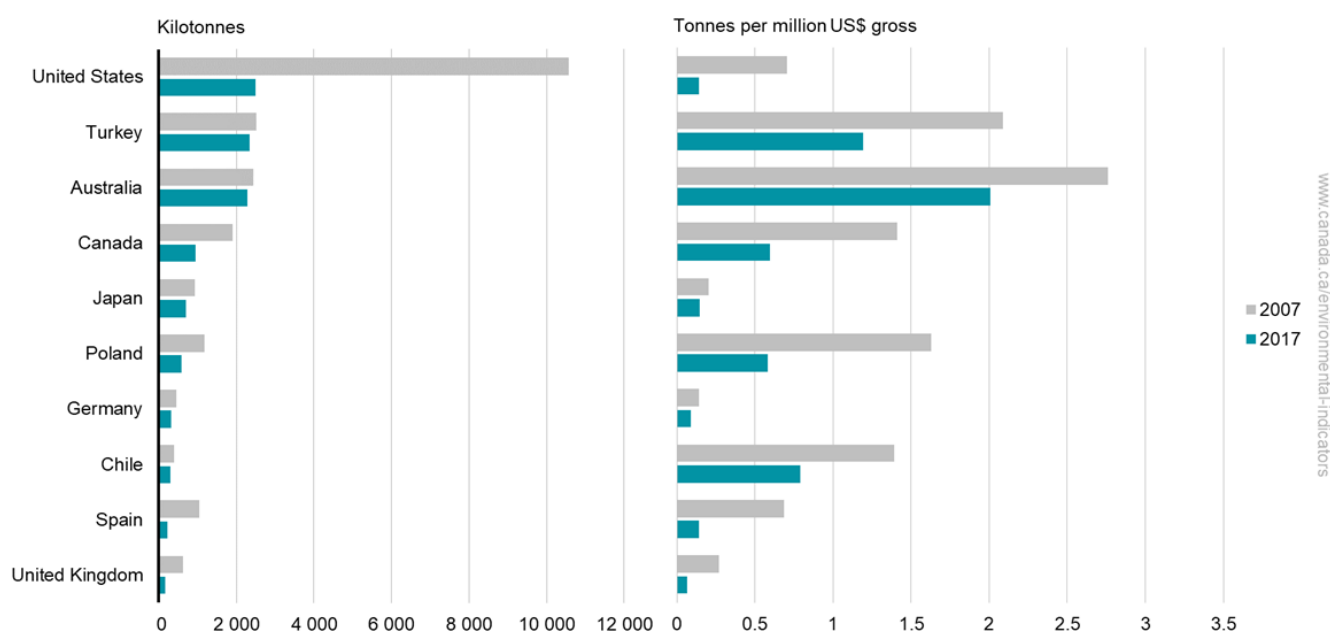
Sulphur oxides

Key results

In 2017, Canada:

- saw a decrease of 50% in sulphur oxides (SO_x) emissions from 2007 levels
- ranked fourth highest in SO_x emissions among OECD member countries
- had the fourth highest ratio of SO_x emissions to gross domestic product among the top 10 emitting OECD member countries

Figure 1. Sulphur oxides emissions and emissions intensity of the top 10 emitting member countries of the Organisation for Economic Co-operation and Development, 2007 and 2017



[Data for Figure 1](#)

Note: Definitions of pollution sources and estimation methods may differ from country to country. Comparisons should be made with caution. Gross domestic product values are in millions of constant United States dollars, constant purchasing power parity, for the base year 2010. The use of purchasing power parity facilitates international comparison of gross domestic product by creating an equivalent purchasing power basis for each country compared.

Source: Organisation for Economic Co-operation and Development (2019) [OECD.Stat](#).

Although Canada's SO_x emissions declined by 951 kilotonnes from 2007 to 2017, Canada ranked as one of the highest emitters among OECD member countries, behind the United States, Turkey and Australia. Of the top 10 emitters, the United States experienced the largest decrease by 8 074 kilotonnes, or 76%.

All of the top 10 emitting member countries experienced declines in emissions between 2007 and 2017.

In terms of the ratio of SO_x emissions to gross domestic product, all top 10 emitting member countries reported declines ranging between 27% and 80% from 2007 to 2017.

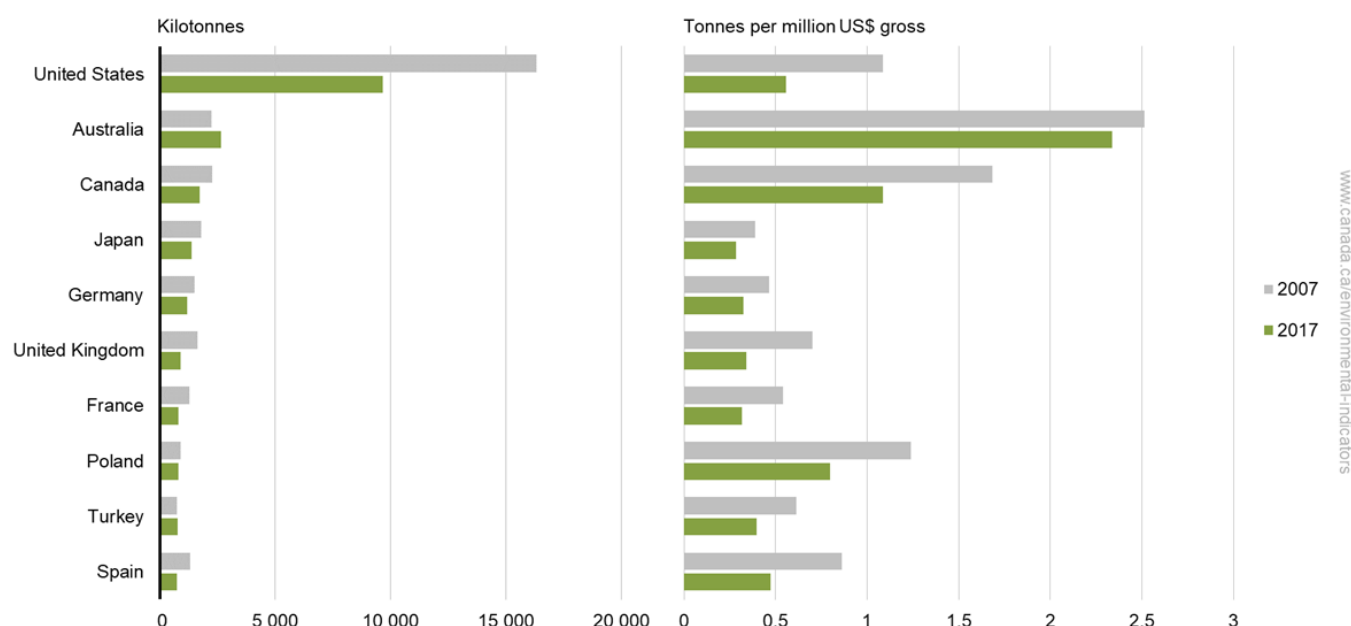
Nitrogen oxides

Key results

In 2017, Canada:

- saw a decrease of 24% in nitrogen oxides (NO_x) emissions from 2007 levels
- ranked third highest in NO_x emissions among OECD member countries
- had the second highest ratio of NO_x emissions to gross domestic product among the top 10 emitting OECD member countries

Figure 2. Nitrogen oxides emissions and emissions intensity of the top 10 emitting member countries of the Organisation for Economic Co-operation and Development, 2007 and 2017



[Data for Figure 2](#)

Note: Definitions of pollution sources and estimation methods may differ from country to country. Comparisons should be made with caution. Gross domestic product values are in millions of constant United States dollars, constant purchasing power parity, for the base year 2010. The use of purchasing power parity facilitates international comparison of gross domestic product by creating an equivalent purchasing power basis for each country compared.

Source: Organisation for Economic Co-operation and Development (2019) [OECD.Stat](#).

In 2017, Canada ranked as one of the highest emitters among OECD member countries, behind the United States and Australia, despite a reduction of 542 kilotonnes in NO_x emissions between 2007 and 2017. Of the top 10 emitting members, the United States experienced the largest reduction over that period (6 667 kilotonnes, or 41%). In 2017, emissions in Australia and Turkey were respectively 20% and 6% higher than in 2007.

Emissions intensity, the ratio of NO_x emissions to gross domestic product, was lower in 2017 than it was in 2007 for all top 10 emitting member countries. The reductions in intensity were between 7% and 51%.

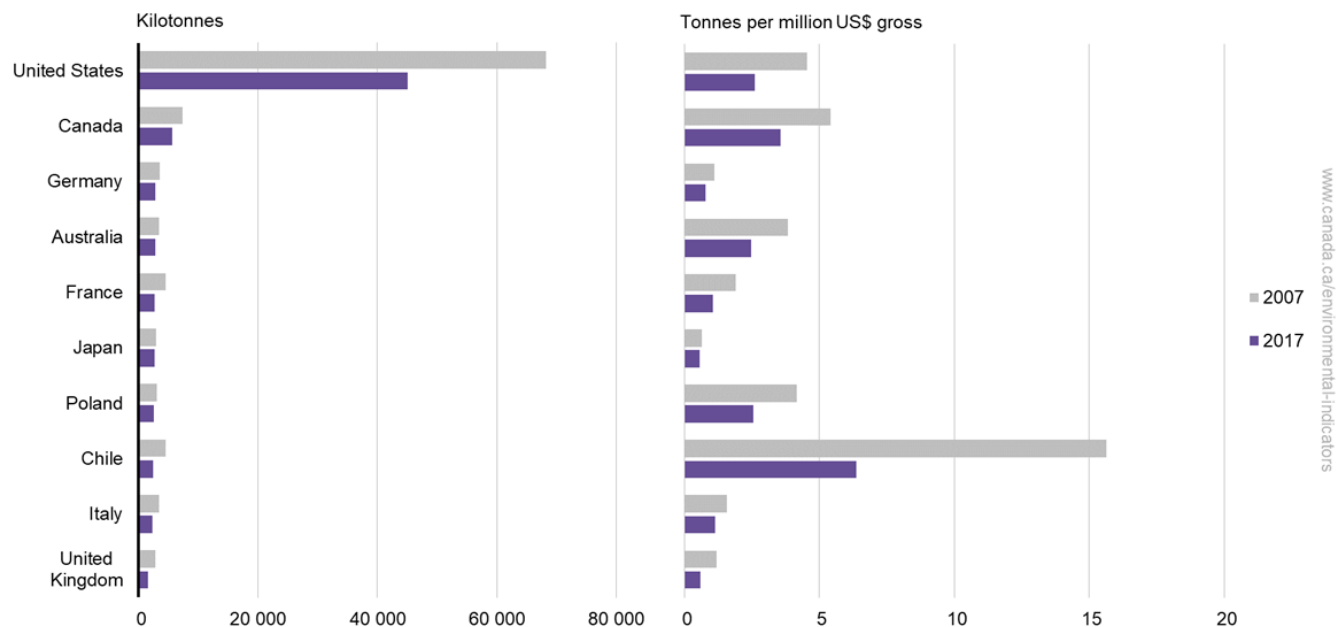
Carbon monoxide

Key results

In 2017, Canada:

- saw a decrease of 22% in carbon monoxide (CO) emissions from 2007 levels
- ranked second highest in CO emissions among OECD member countries
- had the second highest ratio of CO emissions to gross domestic product among the top 10 emitting OECD member countries

Figure 3. Carbon monoxide emissions and emissions intensity of the top 10 emitting member countries of the Organisation for Economic Co-operation and Development, 2007 and 2017



[Data for Figure 3](#)

Note: Definitions of pollution sources and estimation methods may differ from country to country. Comparisons should be made with caution. Gross domestic product values are in millions of constant United States dollars, constant purchasing power parity, for the base year 2010. The use of purchasing power parity facilitates international comparison of gross domestic product by creating an equivalent purchasing power basis for each country compared.

Source: Organisation for Economic Co-operation and Development (2019) [OECD.Stat](#).

In 2017, the United States was the highest CO emitting country, followed by Canada. The top 10 emitting member countries of the OECD experienced declines in emissions between 10% and 45% in 2017 from 2007 levels. Declines were also observed in the ratio of CO emissions to gross domestic product between 2007 and 2017; they ranged from 15% to 59% for the top 10 emitting countries.

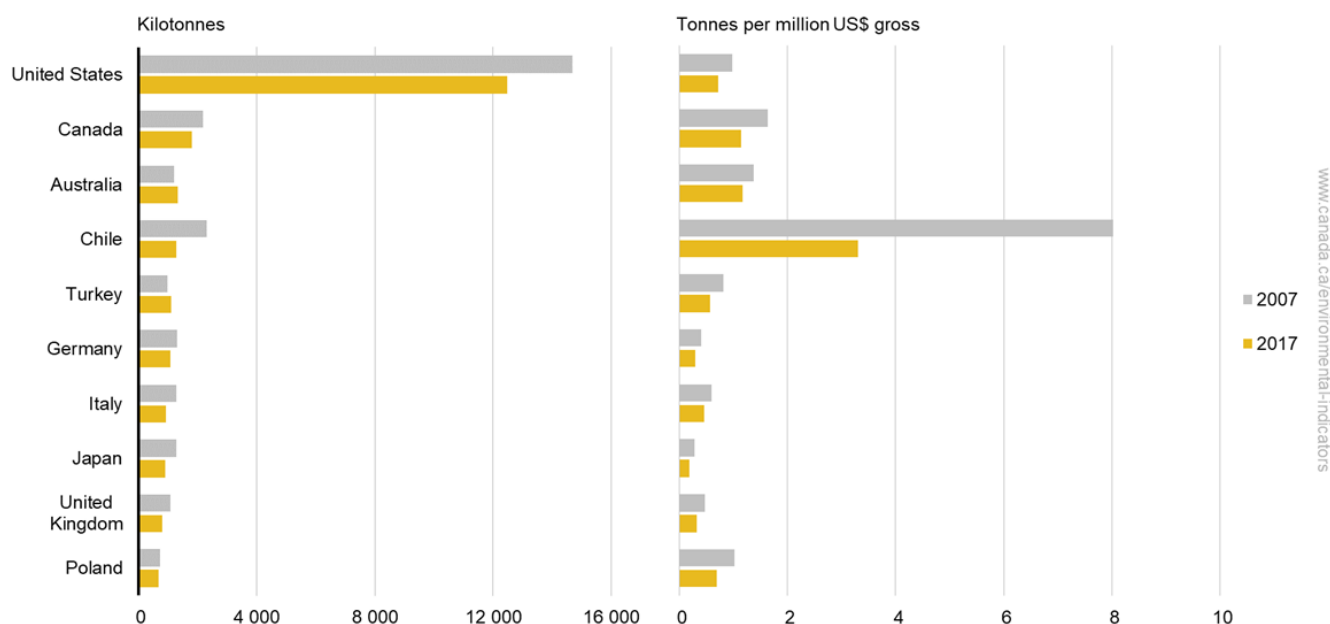
Volatile organic compounds

Key results

In 2017, Canada:

- saw a decrease of 18% in volatile organic compounds (VOC) emissions from 2007 levels
- ranked second highest in VOC emissions among OECD member countries
- had the third highest ratio of VOC emissions to gross domestic product among the top 10 emitting OECD member countries

Figure 4. Volatile organic compound emissions and emissions intensity of the top 10 emitting member countries of the Organisation for Economic Co-operation and Development, 2007 and 2017



[Data for Figure 4](#)

Note: Definitions of pollution sources and estimation methods may differ from country to country. Comparisons should be made with caution. Gross domestic product values are in millions of constant United States dollars, constant purchasing power parity, for the base year 2010. The use of purchasing power parity facilitates international comparison of gross domestic product by creating an equivalent purchasing power basis for each country compared.

Source: Organisation for Economic Co-operation and Development (2019) [OECD.Stat](#).

Although Canada's VOC emissions declined by 385 kilotonnes between 2007 and 2017, Canada ranked as one of the highest emitters among the member countries of the OECD, behind the United States. Most of the top 10 emitting member countries experienced declines in emissions between 2007 and 2017, with the exception of Australia and Turkey whose emissions increased respectively by 10% and 11%.

The reductions in emissions intensity range from 15% to 59% between 2007 and 2017 for the top 10 emitting member countries.

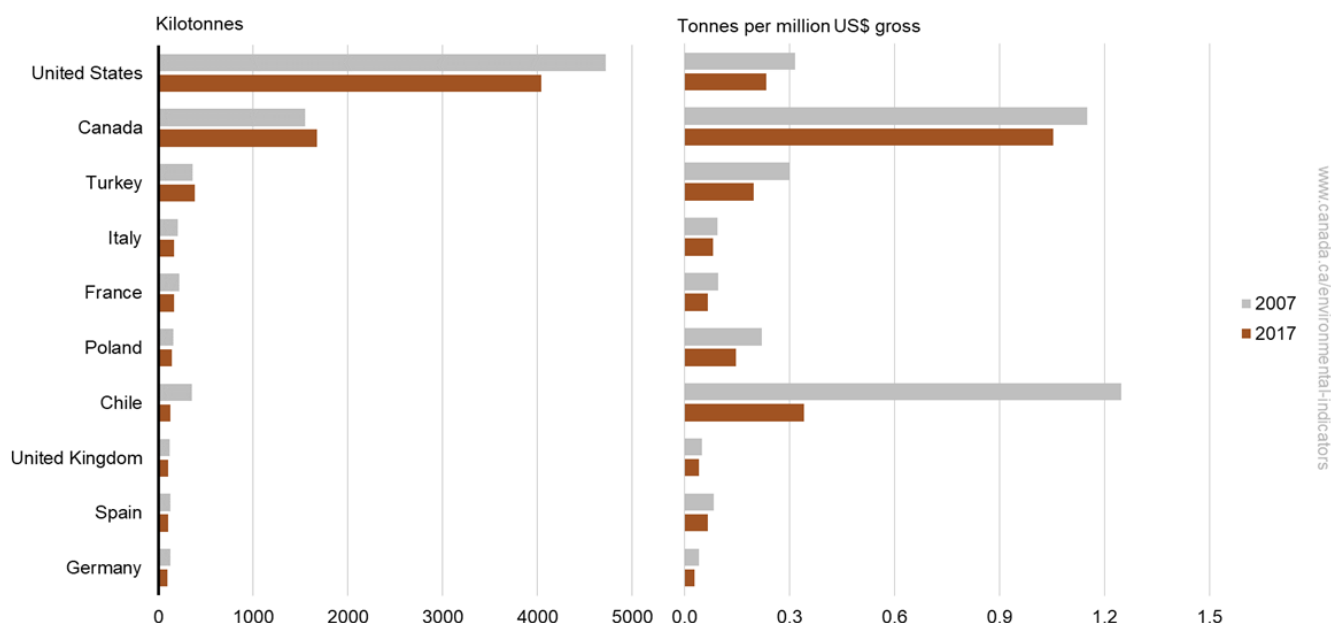
Fine particulate matter

Key results

In 2017, Canada:

- saw an increase of 8% in fine particulate matter (PM_{2.5}) emissions from 2007 levels
- ranked second highest in PM_{2.5} emissions among OECD member countries
- had the highest ratio of PM_{2.5} emissions to gross domestic product among OECD member countries

Figure 5. Fine particulate matter emissions and emissions intensity of the top 10 emitting member countries of the Organisation for Economic Co-operation and Development, 2007 and 2017



[Data for Figure 5](#)

Note: Definitions of pollution sources and estimation methods may differ from country to country. Comparisons should be made with caution. Gross domestic product values are in millions of constant United States dollars, constant purchasing power parity, for the base year 2010. The use of purchasing power parity facilitates international comparison of gross domestic product by creating an equivalent purchasing power basis for each country compared.

Source: Organisation for Economic Co-operation and Development (2019) [OECD.Stat](#).

Canada and Turkey experienced an increase in PM_{2.5} emissions in 2017 from 2007 levels, by 123 and 28 kilotonnes respectively. Despite these increases in emissions, all the top 10 member countries experienced declines in their emissions intensity, which varied between 8% and 73%, from 2007 to 2017.

Canada and the United States include open sources¹ such as dust from roads, prescribed forest burning and agriculture in their PM_{2.5} emissions. These sources are not always reported by other OECD member countries.

¹ In 2017, national emissions from dust, agriculture and controlled fires accounted for 1 385 kilotonnes (83%) of Canada's total of PM_{2.5}.

About the indicators

What the indicators measure

These indicators present total emissions and emissions intensity for member countries of the Organisation for Economic Co-operation and Development (OECD). The emissions of 5 pollutants are reported: sulphur oxides (SO_x), nitrogen oxides (NO_x), carbon monoxide (CO), volatile organic compounds (VOC), and fine particulate matter (PM_{2.5}). The indicators focus on the top 10 emitting member countries of the OECD.

Why these indicators are important

These indicators help to inform Canadians about how Canada's emissions compare to those of other countries. The indicators report on key air pollutants that contribute to smog and acid rain and help the government to identify priorities, track progress, and develop strategies and policies for reducing or controlling air pollution.

Exposure to air pollutants on a daily basis can cause adverse health and environmental effects. Fine particulate matter is a key component of smog along with ground-level ozone (O₃) and has been associated with pulmonary and cardiovascular health issues. While causing effects of their own, NO_x (such as nitrogen dioxide [NO₂]) and VOC are the main contributors to the formation of O₃. Nitrogen oxides, SO_x (such as sulphur dioxide [SO₂]), and VOC also lead to the formation of PM_{2.5} in the air. This is in addition to the PM_{2.5} that is emitted directly from sources such as road dust and prescribed forest burning. Sulphur oxides and NO_x can also lead to the formation of acid deposition that can harm the environment, materials, living organisms and humans.

Irrespective of downward trends observed in emissions, localized air quality issues may still arise when emission sources are spatially concentrated.

Consult [Air pollution: drivers and impacts](#) for more information on the human health, environmental and economic impacts of air pollution.

Related indicators

The [Air pollutant emissions](#) indicators track emissions from human activities of 6 key air pollutants: sulphur oxides (SO_x), nitrogen oxides (NO_x), volatile organic compounds (VOC), ammonia (NH₃), carbon monoxide (CO) and fine particulate matter (PM_{2.5}). Black carbon, which is a component of PM_{2.5}, is also reported. For each air pollutant, data are provided at the national, provincial/territorial and facility level and by major source.

The [Air quality](#) indicators track ambient concentrations of fine particulate matter (PM_{2.5}), ground-level ozone (O₃), sulphur dioxide (SO₂), nitrogen dioxide (NO₂), and volatile organic compounds (VOC) at the national, regional and urban level and at local monitoring-stations.

The [International comparison of urban air quality](#) indicators present and compare the air quality in selected Canadian urban areas with a population greater than one million to the air quality in selected international urban areas having comparable data.

Data sources and methods

Data sources

Air pollutant emissions data for the indicators come from the Organisation for Economic Co-operation and Development [OECD.Stat](#) database, specifically the Air emissions by source table under the Environment (Air and Climate) grouping.

The gross domestic product data were obtained from the Main aggregate tables of the National accounts (Annual national accounts) in the same database.

More information

At the time of this update the OECD.Stat database contained emissions data up to the end of 2017, reflecting delays in the collection and aggregation of international data. Data are collected for each member country from the following sources:

- the [Centre on Emission Inventories and Projections database](#) (as of July 2019) of the Convention on Long-Range Transboundary Air Pollution
- the [National Inventory Submissions 2019](#) (as of July 2019) of the United Nations Framework Convention on Climate Change
- the replies to the 2018 OECD Questionnaire on the State of the Environment and comments from member countries received before late August 2019
- national data from specific countries

The OECD.Stat database indicates the source used to report emissions for each country, pollutant and year.

Methods

Two (2) years of data are used to compare the emissions from 36 member countries of the Organisation for Economic Co-operation and Development (OECD): 2017, which is the latest year with available information, and 2007, 10 years prior.

For each air pollutant, 2007 and 2017 emissions are compiled and ranked in relation to total emissions in 2017. While the focus is on the top 10 emitting OECD member countries, emissions for all 36 member countries are provided.

The emission intensity indicators are calculated by dividing a country's emissions by its gross domestic product value for that year.

More information

Air pollutant emissions indicators

Emissions for each member country are estimated or measured using one or several of the following methods:

- continuous emission monitoring systems
- predictive emission monitoring
- source testing
- mass balance
- site-specific emission factors
- published emission factors
- engineering estimates
- special studies

Generally, each country compiles and estimates its air pollutant emissions combining facility-level emissions (aka point sources) with sector-level emissions (or area sources).

Canada's data are derived from the annual Convention on Long-Range Transboundary Air Pollution submission to the Centre on Emission Inventories and Projections database. The submitted air pollutant emission data are based on Canada's [Air Pollutant Emission Inventory](#). This includes information reported by facilities to the National Pollutant Release Inventory as well as emission estimates compiled for non-reporting facilities, non-reporting sources such as motor vehicles or non-reported pollutants (in-house emissions estimates).

Air pollution emissions per unit of gross domestic product

The emissions intensity indicators are expressed in tonnes of pollutants emitted per million United States dollars using constant gross domestic product at purchasing power parity for the base year 2010. Purchasing power parity is a weighted average of the relative prices, quoted in national currency, of comparable items between countries. Using purchasing power parity facilitates international comparison of gross domestic product by creating an equivalent purchasing power basis for each country compared.

Countries included in the comparison

The indicators include all member countries of the OECD as of September 2019. The data presented in the indicator reflect data completeness in the OECD.Stat database at the time of reporting.

Caveats and limitations

Air pollutant emission inventories from different countries are estimated with the best data, measurements and methodologies available. While national emission inventories follow a common reporting structure, emissions estimation methodologies and coverage among countries may differ. Users should be cautious when comparing the data.

The indicators generally exclude non-anthropogenic (natural sources) emissions and emissions from international aviation and maritime transport. However, estimation methodologies used by Canada currently includes emissions from international maritime navigation.

Emissions from sources such as dust from roads, prescribed forest fires and agriculture are also included in Canada's values. These sources are not always reported by other countries.

Emissions reported for Canada in this indicator may be slightly different from the emissions reported in the Canadian Environmental Sustainability Indicators' [Air pollutant emissions](#). Those indicators are based on data from Canada's Air Pollutant Emission Inventory.

Adjustments may be made to Canada's national totals after the final submission to the database OECD.Stat, which may result in slight differences in the values reported.

Resources

References

Centre on Emission Inventories and Projections, European Monitoring and Evaluation Programme (2019) [Submissions 2019](#). Retrieved on September 4, 2019.

Environment and Climate Change Canada (2019) Canada's Air Pollutant Emissions Inventory Report. [Chapter 2.1 Particulate matter less than or equal to 2.5 microns in diameter \(PM_{2.5}\)](#). Retrieved on September 10, 2019.

Environment and Climate Change Canada (2019) Canada's Air Pollutant Emissions Inventory Report. [Executive summary](#). Retrieved on September 10, 2019.

Organisation for Economic Co-operation and Development (2019) [OECD.Stat](#). Retrieved on September 4, 2019.

United Nations Framework Convention on Climate Change (2019) [National Inventory Submissions 2019](#). Retrieved on September 4, 2019.

Related information

[Air pollution: Drivers and impacts](#)

Annex

Annex A. Data tables for the figures presented in this document

Table A.1A. Data for Figure 1. Sulphur oxides emissions and emissions intensity of the top 10 emitting member countries of the Organisation for Economic Co-operation and Development, 2007 and 2017

Country	2007 sulphur oxides emissions (kilotonnes)	2017 sulphur oxides emissions (kilotonnes)	2007 sulphur oxides emissions intensity (tonnes per million United States dollars of gross domestic product)	2017 sulphur oxides emissions intensity (tonnes per million United States dollars of gross domestic product)
United States	10 563	2 489	0.70	0.14
Turkey	2 523	2 350	2.09	1.19
Australia	2 445	2 288	2.76	2.01
Canada	1 900	949	1.41	0.60
Japan	927	696	0.20	0.14
Poland	1 174	583	1.63	0.58
Germany	455	315	0.14	0.09
Chile	400	306	1.39	0.79
Spain	1 045	221	0.69	0.14
United Kingdom	632	172	0.27	0.07

Note: Definitions of pollution sources and estimation methods may differ from country to country. Comparisons should be made with caution. Gross domestic product values are in millions of constant United States dollars, constant purchasing power parity, for the base year 2010. The use of purchasing power parity facilitates international comparison of gross domestic product by creating an equivalent purchasing power basis for each country compared.

Source: Organisation for Economic Co-operation and Development (2019) [OECD.Stat](#).

Table A.1B. Sulphur oxides emissions and emissions intensity of the other member countries of the Organisation for Economic Co-operation and Development, 2007 and 2017

Country	2007 sulphur oxides emissions (kilotonnes)	2017 sulphur oxides emissions (kilotonnes)	2007 sulphur oxides emissions intensity (tonnes per million United States dollars of gross domestic product)	2017 sulphur oxides emissions intensity (tonnes per million United States dollars of gross domestic product)
France	414	144	0.18	0.06
Italy	345	115	0.16	0.06
Czech Republic	212	110	0.73	0.33
New Zealand	82	74	0.61	0.44
Greece	491	69	1.41	0.27
Iceland	61	50	4.42	3.09
Portugal	159	49	0.55	0.17

Country	2007 sulphur oxides emissions (kilotonnes)	2017 sulphur oxides emissions (kilotonnes)	2007 sulphur oxides emissions intensity (tonnes per million United States dollars of gross domestic product)	2017 sulphur oxides emissions intensity (tonnes per million United States dollars of gross domestic product)
Estonia	88	39	2.53	1.03
Belgium	123	37	0.29	0.08
Finland	83	35	0.38	0.16
Hungary	36	28	0.16	0.11
Slovak Republic	69	27	0.54	0.17
Netherlands	62	27	0.08	0.03
Sweden	31	18	0.08	0.04
Norway	19	15	0.07	0.05
Ireland	55	13	0.26	0.04
Lithuania	22	13	0.31	0.16
Austria	23	13	0.07	0.03
Denmark	27	10	0.11	0.04
Switzerland	11	5	0.03	0.01
Slovenia	16	5	0.27	0.08
Latvia	8	4	0.17	0.09
Luxembourg	2	1	0.05	0.02
Israel	186	n/a	0.94	n/a
Korea	403	n/a	0.30	n/a
Mexico	n/a	n/a	n/a	n/a

Note: n/a = not available. Definitions of pollution sources and estimation methods may differ from country to country. Comparisons should be made with caution. Gross domestic product values are in millions of constant United States dollars, constant purchasing power parity, for the base year 2010. The use of purchasing power parity facilitates international comparison of gross domestic product by creating an equivalent purchasing power basis for each country compared.

Source: Organisation for Economic Co-operation and Development (2019) [OECD.Stat](https://data.oecd.org).

Table A.2A. Data for Figure 2. Nitrogen oxides emissions and emissions intensity of the top 10 emitting member countries of the Organisation for Economic Co-operation and Development, 2007 and 2017

Country	2007 nitrogen oxides emissions (kilotonnes)	2017 nitrogen oxides emissions (kilotonnes)	2007 nitrogen oxides emissions intensity (tonnes per million United States dollars of gross domestic product)	2017 nitrogen oxides emissions intensity (tonnes per million United States dollars of gross domestic product)
United States	16 335	9 668	1.09	0.56
Australia	2 224	2 665	2.51	2.34
Canada	2 270	1 728	1.69	1.09
Japan	1 780	1 378	0.39	0.29
Germany	1 504	1 184	0.47	0.33
United Kingdom	1 634	888	0.70	0.34
France	1 272	805	0.54	0.32
Poland	892	803	1.24	0.80
Turkey	741	783	0.61	0.40
Spain	1 313	741	0.86	0.47

Note: Definitions of pollution sources and estimation methods may differ from country to country. Comparisons should be made with caution. Gross domestic product values are in millions of constant United States dollars, constant purchasing power parity, for the base year 2010. The use of purchasing power parity facilitates international comparison of gross domestic product by creating an equivalent purchasing power basis for each country compared.

Source: Organisation for Economic Co-operation and Development (2019) [OECD.Stat](https://data.oecd.org/).

Table A.2B. Nitrogen oxides emissions and emissions intensity of the other member countries of the Organisation for Economic Co-operation and Development, 2007 and 2017

Country	2007 nitrogen oxides emissions (kilotonnes)	2017 nitrogen oxides emissions (kilotonnes)	2007 nitrogen oxides emissions intensity (tonnes per million United States dollars of gross domestic product)	2017 nitrogen oxides emissions intensity (tonnes per million United States dollars of gross domestic product)
Italy	1 160	712	0.53	0.34
Greece	484	270	1.39	1.04
Netherlands	363	234	0.48	0.29
Chile	164	180	0.57	0.47
Belgium	291	172	0.67	0.36
Portugal	255	168	0.88	0.58
New Zealand	162	168	1.20	1.00
Czech Republic	269	163	0.93	0.48
Norway	217	162	0.76	0.51
Austria	213	143	0.60	0.37
Finland	205	125	0.94	0.57

Country	2007 nitrogen oxides emissions (kilotonnes)	2017 nitrogen oxides emissions (kilotonnes)	2007 nitrogen oxides emissions intensity (tonnes per million United States dollars of gross domestic product)	2017 nitrogen oxides emissions intensity (tonnes per million United States dollars of gross domestic product)
Sweden	174	125	0.44	0.27
Hungary	164	119	0.72	0.47
Denmark	190	111	0.77	0.42
Ireland	161	109	0.75	0.34
Slovak Republic	96	65	0.75	0.40
Switzerland	85	60	0.21	0.13
Lithuania	61	52	0.87	0.65
Latvia	44	37	0.95	0.80
Slovenia	53	34	0.91	0.55
Estonia	45	33	1.29	0.89
Iceland	31	22	2.26	1.36
Luxembourg	43	18	0.98	0.35
Israel	196	n/a	0.99	n/a
Korea	1 188	n/a	0.87	n/a
Mexico	n/a	n/a	n/a	n/a

Note: n/a = not available. Definitions of pollution sources and estimation methods may differ from country to country. Comparisons should be made with caution. Gross domestic product values are in millions of constant United States dollars, constant purchasing power parity, for the base year 2010. The use of purchasing power parity facilitates international comparison of gross domestic product by creating an equivalent purchasing power basis for each country compared.

Source: Organisation for Economic Co-operation and Development (2019) [OECD.Stat](https://data.oecd.org/).

Table A.3A. Data for Figure 3. Carbon monoxide emissions and emissions intensity of the top 10 emitting member countries of the Organisation for Economic Co-operation and Development, 2007 and 2017

Country	2007 carbon monoxide emissions (kilotonnes)	2017 carbon monoxide emissions (kilotonnes)	2007 carbon monoxide emissions intensity (tonnes per million United States dollars of gross domestic product)	2017 carbon monoxide emissions intensity (tonnes per million United States dollars of gross domestic product)
United States	68 247	45 017	4.54	2.60
Canada	7 297	5 655	5.42	3.56
Germany	3 540	2 828	1.10	0.78
Australia	3 383	2 815	3.82	2.47
France	4 491	2 690	1.91	1.06
Japan	2 954	2 656	0.64	0.55
Poland	3 000	2 548	4.16	2.54
Chile	4 496	2 460	15.65	6.38
Italy	3 423	2 330	1.57	1.13
United Kingdom	2 748	1 550	1.18	0.60

Note: Definitions of pollution sources and estimation methods may differ from country to country. Comparisons should be made with caution. Gross domestic product values are in millions of constant United States dollars, constant purchasing power parity, for the base year 2010. The use of purchasing power parity facilitates international comparison of gross domestic product by creating an equivalent purchasing power basis for each country compared.

Source: Organisation for Economic Co-operation and Development (2019) [OECD.Stat](https://data.oecd.org/).

Table A.3B. Carbon monoxide emissions and emissions intensity of the other member countries of the Organisation for Economic Co-operation and Development, 2007 and 2017

Country	2007 carbon monoxide emissions (kilotonnes)	2017 carbon monoxide emissions (kilotonnes)	2007 carbon monoxide emissions intensity (tonnes per million United States dollars of gross domestic product)	2017 carbon monoxide emissions intensity (tonnes per million United States dollars of gross domestic product)
Spain	1 611	1 310	1.06	0.84
Czech Republic	939	819	3.24	2.43
New Zealand	747	746	5.57	4.44
Netherlands	726	556	0.97	0.68
Austria	577	527	1.63	1.36
Norway	570	436	2.00	1.37
Hungary	539	422	2.37	1.67
Sweden	498	385	1.27	0.85
Greece	673	366	1.94	1.41
Slovak Republic	506	365	3.95	2.24
Portugal	475	352	1.63	1.22

Country	2007 carbon monoxide emissions (kilotonnes)	2017 carbon monoxide emissions (kilotonnes)	2007 carbon monoxide emissions intensity (tonnes per million United States dollars of gross domestic product)	2017 carbon monoxide emissions intensity (tonnes per million United States dollars of gross domestic product)
Finland	437	326	2.00	1.49
Belgium	652	292	1.51	0.62
Denmark	408	241	1.65	0.90
Switzerland	264	154	0.65	0.33
Lithuania	192	139	2.74	1.74
Estonia	157	138	4.52	3.69
Latvia	201	128	4.34	2.74
Iceland	79	121	5.75	7.53
Slovenia	147	105	2.49	1.67
Ireland	184	87	0.86	0.27
Luxembourg	39	22	0.89	0.42
Israel	225	n/a	1.13	n/a
Korea	802	n/a	0.59	n/a
Mexico	n/a	n/a	n/a	n/a
Turkey	2 400	n/a	1.99	n/a

Note: n/a = not available. Definitions of pollution sources and estimation methods may differ from country to country. Comparisons should be made with caution. Gross domestic product values are in millions of constant United States dollars, constant purchasing power parity, for the base year 2010. The use of purchasing power parity facilitates international comparison of gross domestic product by creating an equivalent purchasing power basis for each country compared.

Source: Organisation for Economic Co-operation and Development (2019) [OECD.Stat](https://data.oecd.org/).

Table A.4A. Data for Figure 4. Volatile organic compound emissions and emissions intensity of the top 10 emitting member countries of the Organisation for Economic Co-operation and Development, 2007 and 2017

Country	2007 volatile organic compound emissions (kilotonnes)	2017 volatile organic compound emissions (kilotonnes)	2007 volatile organic compound emissions intensity (tonnes per million United States dollars of gross domestic product)	2017 volatile organic compound emissions intensity (tonnes per million United States dollars of gross domestic product)
United States	14 681	12 488	0.98	0.72
Canada	2 194	1 809	1.63	1.14
Australia	1 217	1 334	1.37	1.17
Chile	2 306	1 272	8.03	3.30
Turkey	987	1 098	0.82	0.56
Germany	1 301	1 068	0.40	0.29
Italy	1 294	935	0.59	0.45
Japan	1 273	899	0.28	0.19
United Kingdom	1 090	810	0.47	0.31
Poland	733	691	1.02	0.69

Note: Definitions of pollution sources and estimation methods may differ from country to country. Comparisons should be made with caution. Gross domestic product values are in millions of constant United States dollars, constant purchasing power parity, for the base year 2010. The use of purchasing power parity facilitates international comparison of gross domestic product by creating an equivalent purchasing power basis for each country compared.

Source: Organisation for Economic Co-operation and Development (2019) [OECD.Stat](#).

Table A.4B. Volatile organic compound emissions and emissions intensity of the other member countries of the Organisation for Economic Co-operation and Development, 2007 and 2017

Country	2007 volatile organic compound emissions (kilotonnes)	2017 volatile organic compound emissions (kilotonnes)	2007 volatile organic compound emissions intensity (tonnes per million United States dollars of gross domestic product)	2017 volatile organic compound emissions intensity (tonnes per million United States dollars of gross domestic product)
Spain	765	618	0.50	0.39
France	965	611	0.41	0.24
Netherlands	262	251	0.35	0.31
Czech Republic	247	207	0.85	0.62
New Zealand	183	192	1.36	1.15
Portugal	198	167	0.68	0.58
Norway	210	152	0.74	0.48
Greece	280	152	0.81	0.59

Country	2007 volatile organic compound emissions (kilotonnes)	2017 volatile organic compound emissions (kilotonnes)	2007 volatile organic compound emissions intensity (tonnes per million United States dollars of gross domestic product)	2017 volatile organic compound emissions intensity (tonnes per million United States dollars of gross domestic product)
Sweden	199	147	0.51	0.32
Hungary	155	141	0.68	0.56
Austria	154	120	0.44	0.31
Ireland	120	113	0.56	0.36
Belgium	158	109	0.37	0.23
Denmark	137	102	0.55	0.38
Finland	148	101	0.68	0.46
Slovak Republic	145	89	1.13	0.55
Switzerland	101	78	0.25	0.17
Lithuania	60	46	0.86	0.57
Latvia	47	38	1.02	0.81
Slovenia	43	30	0.73	0.47
Estonia	28	22	0.81	0.59
Luxembourg	12	12	0.28	0.23
Iceland	7	7	0.53	0.42
Israel	248	n/a	1.25	n/a
Korea	844	n/a	0.62	n/a
Mexico	n/a	n/a	n/a	n/a

Note: n/a = not available. Definitions of pollution sources and estimation methods may differ from country to country. Comparisons should be made with caution. Gross domestic product values are in millions of constant United States dollars, constant purchasing power parity, for the base year 2010. The use of purchasing power parity facilitates international comparison of gross domestic product by creating an equivalent purchasing power basis for each country compared.

Source: Organisation for Economic Co-operation and Development (2019) [OECD.Stat](https://data.oecd.org/).

Table A.5A. Data for Figure 5. Fine particulate matter emissions and emissions intensity of the top 10 emitting member countries of the Organisation for Economic Co-operation and Development, 2007 and 2017

Country	2007 fine particulate matter emissions (kilotonnes)	2017 fine particulate matter emissions (kilotonnes)	2007 fine particulate matter emissions intensity (tonnes per million United States dollars of gross domestic product)	2017 fine particulate matter emissions intensity (tonnes per million United States dollars of gross domestic product)
United States	4 725	4 043	0.32	0.23
Canada	1 550	1 674	1.15	1.05
Turkey	360	388	0.30	0.20
Italy	203	165	0.09	0.08
France	222	165	0.10	0.07
Poland	158	147	0.22	0.15
Chile	358	132	1.25	0.34
United Kingdom	118	107	0.05	0.04
Spain	128	105	0.08	0.07
Germany	129	99	0.04	0.03

Note: Definitions of pollution sources and estimation methods may differ from country to country. Comparisons should be made with caution. Gross domestic product values are in millions of constant United States dollars, constant purchasing power parity, for the base year 2010. The use of purchasing power parity facilitates international comparison of gross domestic product by creating an equivalent purchasing power basis for each country compared.

Source: Organisation for Economic Co-operation and Development (2019) [OECD.Stat](https://data.oecd.org).

Table A.5B. Fine particulate matter emissions and emissions intensity of the other member countries of the Organisation for Economic Co-operation and Development, 2007 and 2017

Country	2007 fine particulate matter emissions (kilotonnes)	2017 fine particulate matter emissions (kilotonnes)	2007 fine particulate matter emissions intensity (tonnes per million United States dollars of gross domestic product)	2017 fine particulate matter emissions intensity (tonnes per million United States dollars of gross domestic product)
Portugal	61	50	0.21	0.17
Hungary	40	48	0.18	0.19
Czech Republic	42	40	0.15	0.12
Norway	37	28	0.13	0.09
Greece	47	27	0.13	0.11
Belgium	34	23	0.08	0.05
Sweden	29	20	0.07	0.04
Denmark	29	20	0.12	0.08

Country	2007 fine particulate matter emissions (kilotonnes)	2017 fine particulate matter emissions (kilotonnes)	2007 fine particulate matter emissions intensity (tonnes per million United States dollars of gross domestic product)	2017 fine particulate matter emissions intensity (tonnes per million United States dollars of gross domestic product)
Latvia	23	18	0.49	0.39
Slovak Republic	27	18	0.21	0.11
Finland	24	18	0.11	0.08
Austria	20	15	0.06	0.04
Netherlands	22	14	0.03	0.02
Ireland	18	12	0.09	0.04
Slovenia	13	11	0.22	0.18
Estonia	13	9	0.37	0.25
Lithuania	10	9	0.15	0.11
Switzerland	9	7	0.02	0.01
Luxembourg	2	1	0.05	0.03
Iceland	2	1	0.14	0.08
Australia	n/a	n/a	n/a	n/a
Israel	n/a	n/a	n/a	n/a
Japan	n/a	n/a	n/a	n/a
Korea	n/a	n/a	n/a	n/a
Mexico	n/a	n/a	n/a	n/a
New Zealand	n/a	n/a	n/a	n/a

Note: n/a = not available. Definitions of pollution sources and estimation methods may differ from country to country. Canada and the United States include open sources such as dust from roads, prescribed forest burning and agriculture in their PM_{2.5} emissions. These sources are not always reported by other OECD member countries. Comparisons should be made with caution. Gross domestic product values are in millions of constant United States dollars, constant purchasing power parity, for the base year 2010. The use of purchasing power parity facilitates international comparison of gross domestic product by creating an equivalent purchasing power basis for each country compared.

Source: Organisation for Economic Co-operation and Development (2019) [OECD.Stat](#).

Additional information can be obtained at:

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