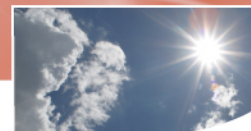




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Data Sources and Methods for the International Air Pollutant Emissions Indicators.

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1 Introduction

The international air pollutant emissions indicators are part of the Canadian Environmental Sustainability Indicators (CESI) program, which provides data and information to track Canada's performance on key environmental sustainability issues.

The international air pollutant emissions indicators track criteria air contaminant (CAC) emissions from Canada and 9 other countries. These indicators help to inform Canadians about how Canada's emissions compare to those from other countries. The indicators report on key air pollutants that contribute to smog and acid rain and help the government to identify priorities and track/develop progress on strategies and policies put in place to reduce or control air pollution. The emissions data used for these indicators are also used to fulfill Canada's international and domestic commitment on reporting obligations.

2 Description and rationale of the Air Pollutant Emissions indicators

2.1 Description

The international air pollutant emissions indicators track criteria air contaminant (CAC) emissions for Canada and for nine other leading economies (G8 countries plus Australia and Sweden). Four CAC were selected for these indicators. They are: sulphur oxides (SO_x), nitrogen oxides (NO_x), volatile organic compounds (VOC) and ammonia (NH₃). Emissions are reported in kilotonnes (kt).

A country's air pollutant emissions for the same four CAC are also provided in terms of total emissions (tonnes) per unit of gross domestic product (GDP in Millions US\$). The GDP used is in American (US) \$, at constant prices, and constant purchasing power parity (PPP), and uses as a base the year 2000.

2.2 Changes since last report

Two countries (Australia and Sweden) were added to the analysis for this year due to their similarity to Canada in economy and population size for Australia and climate for Sweden.

3 Data

3.1 Data source

The criteria air contaminant (CAC) emissions data used to calculate the international air pollutant emissions indicators are directly retrieved from the Centre on Emission Inventories and Projections database of the Convention on Long-Range Transboundary Air Pollution (CLRTAP), available from: <http://www.ceip.at/emission-data-webdab/>. For Japan and Australia, the emissions were taken from the National Inventory Submission 2011 of the United Nations Framework Convention on Climate Change (UNFCCC). Available from: http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/5270.php

Gross Domestic Product (GDP) statistics were obtained through the National Accounts of the Organization for Economic Co-operation and Development (OECD) Stat Extracts, accessed June 2011. Available from: http://stats.oecd.org/Index.aspx?DataSetCode=SNA_TABLE1.

3.2 Spatial coverage

The following countries are included in the international air emissions indicators; Canada, United States, Germany, United Kingdom, France, Italy, Sweden, Russia, Australia and Japan.

3.3 Temporal coverage

Two years are used to compare these countries: 2009 which is the latest available year, and 1999 (10 year in the past).

3.4 Data completeness

NH₃ emissions were not available for Japan and Australia. These two cases were excluded from the comparisons.

3.5 Data timeliness

The data is current up to the end of 2009. The international air pollutant emissions indicators are reported two years after data collection, because of the time needed to validate, calculate and interpret the data.

4 Methods

International air pollutant emissions indicator

Emissions data used to calculate the international air emissions indicators are directly taken from the Centre on Emission Inventories and Projections (CEIP) database, available from: <http://www.ceip.at/emission-data-webdab/>. This database contains all the information on emissions for the countries that have signed the Convention on Long-Range Transboundary Air Pollution (CLRTAP). It provides time-series emissions by pollutant and by source (sectors). Each country is required to report their emissions by February 15 of each year. Canada's annual CLRTAP submission for air pollutant emission data is based on Canada's National Pollutant Release Inventory (NPRI) air pollutant emission summaries and trends, available from: <http://www.ec.gc.ca/inrp-npri/Default.asp?lang=En&n=4A577BB9-1>. This includes information reported by facilities to the NPRI as well as emission estimates that are compiled from other sources such as motor vehicles. For Japan and Australia, the emissions used were directly taken from the National Inventory Submission 2011 of the United Nations Framework Convention on Climate Change (UNFCCC). Available from: http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/5270.php

Each country compiles and estimates their emissions, generally using a combination of top-down and bottom-up approaches. Top-down approaches involve multiplication of sector activity levels by emissions factors. Bottom-up approaches compile facility emissions. The emissions are collated, verified, validated and grouped into the format required by the international organizations (CEIP and UNFCCC) and reported.

The emissions calculations are based on one of the following methods:

- Continuous Emission Monitoring Systems (CEMS)
- Predictive Emission Monitoring (PEM)
- Source testing
- Mass balance
- Site-specific emission factor
- Published emission factor
- Engineering estimates
- Special studies

International air pollutant emissions per unit gross domestic product (GDP)

The emissions are divided by the gross domestic product (GDP) data from the Organization of Economic Co-operation and Development (OECD) Stat Extracts to give the emissions per GDP in tonnes/Million US\$ (GDP)

5 Caveats and Limitations

Air pollutant emissions inventories from different countries are being estimated with the best data, measurements and methodologies available. Even though the national emissions inventories used for these comparisons follow the same Centre on Emission Inventories and Projections database (CEIP) structure, the user needs to be cautious when comparing the data. Emissions estimation methodologies among countries may differ so comparisons should be made with caution. Available from: <http://www.ceip.at/emission-data-webdab/>

Comparison with past international air emissions reporting

The emissions in CEIP or in the National inventory submissions of the United Nations Framework Convention on Climate Change (UNFCCC) for a given year may be different from those previously published by those organizations. Caution is advised when comparing data released in different years.

6 References and further reading

6.1 References

CEIP (2011) European Monitoring and Evaluation Programme, Centre on Emission Inventories and Projections 2011 submission. Retrieved in June 2011. Available from: <http://www.ceip.at/submissions-under-clrtap/2011-submissions/>

OECD (2011) OECD Statistical Library - GDP. Retrieved in June 2011. Available from: http://stats.oecd.org/Index.aspx?DataSetCode=SNA_TABLE1

UNFCCC (2011) GHG Emissions Inventory - National Inventory Submissions 2011. Retrieved in June 2011. Available from: http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/5888.php