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Data Sources and Methods for the Global Carbon Dioxide Emissions from Fuel Combustion Indicator

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1 Introduction

The Global Carbon Dioxide Emissions from Fuel Combustion indicator is part of the Canadian Environmental Sustainability Indicators (CESI) program (http://www.ec.gc.ca/indicateurs-indicators/default.asp?lang=En&n=47F48106-1), which provides data and information to track Canada's performance on key environmental sustainability issues.

2 Description and rationale of the global carbon dioxide emissions from fuel combustion indicator

2.1 Description

The indicator reports Canada's share of global energy-related carbon dioxide (CO_2) emissions from fuel combustion in 2010 (absolute emissions) to worldwide emissions.

CO_2 emissions from non-energy-related sources, gas flaring, and emissions of other greenhouse gases (GHGs), including methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF_6), are not included in the indicator.

2.2 Rationale

The indicator provides a global perspective on Canada's share of CO_2 emissions from fuel combustion. This represents a subset of countries' total emissions but many countries do not submit an official inventory to the United Nations Framework Convention on Climate Change (UNFCCC) and total emissions data are not available. Emissions from fossil fuel combustion normally represent the largest proportion of countries emissions, however, and the picture provided is still relevant to the international discussions around GHG emissions.

In December 2009, Canada signed the Copenhagen Accord committing to reduce its GHG emissions to 17% below 2005 levels by 2020. The Accord includes emission reduction commitments from all major emitters, including the United States, China, India and Brazil, and provides for international review of both developed and developing countries' targets and actions.

3 Data

3.1 Data source

For each country, carbon dioxide (CO_2) emissions data for 2010 come from the International Energy Agency (IEA) CO_2 Emissions from Fuel Combustion 2012 – Highlights (http://www.iea.org/publications/freepublications/publication/name,32870,en.html). The IEA is an autonomous body (within the Organisation for Economic Co-operation and Development [OECD]) that has gained recognition over the years as one of the world's most authoritative sources for energy statistics. The IEA provides CO_2 emissions data from fuel combustion from1971 to 2010 for more than 140 countries and regions.

3.2 Spatial coverage

The indicator provides global coverage.

3.3 Temporal coverage

The indicator uses the latest available year of global data (2010).

3.4 Data completeness

The analysis of global energy-related CO_2 emissions from fuel combustion includes: developed countries (Canada, United States, EU-27, Japan); developing countries (BRIC: Brazil, Russian Federation, India and China) and the rest of the world.

3.5 Data timeliness

The data are current up to 2010.

4 Methods

The estimates of global CO_2 emissions from fuel combustion were calculated by the International Energy Agency (IEA) using the IEA energy balances (http://www.iea.org/stats/prodresult.asp?PRODUCT=Balances) along with default methods and emission factors from the 1996 IPCC Guidelines for National Greenhouse Gas Inventories (http://www.ipcc-nggip.iges.or.jp/public/gl/invs1.html). This global indicator represents total emissions from fuel combustion, expressed in megatonnes of carbon dioxide equivalent (Mt CO_2 eq).

5 Caveats and limitations

International Energy Agency (IEA) emission estimates only include energy-related[1] carbon dioxide (CO_2) emissions from fossil fuel combustion. This represents a subset of countries' total emissions, and differs from the official emissions inventory submissions to the United Nations Framework Convention on Climate Change (UNFCCC); many countries do not submit an official inventory to the UNFCCC. In addition, the estimates of CO_2 from fuel combustion developed by the IEA may not be identical to the emission estimates that a country submits to the UNFCCC, due to differences between the calculation methodologies prescribed by the two approaches.

Emissions from fossil fuel combustion normally represent the largest proportion of countries' emissions. For example, the IEA reports that Canada's CO_2 emissions from fossil fuel combustion were 537 megatonnes (Mt) in 2010,[2] approximately 78% of Canada's total emissions (692 Mt) submitted to the UNFCCC for 2010.[3] The value of Canada's total emissions that was understood at the time the IEA report was published is used in the proportion calculation. The IEA report was written before recent updates to source data, which have resulted in revision of Canada's total emissions for 2010 from 692 to 701 Mt of CO_2 eq.[4]

[1] CO_2 emissions produced from the combustion of coal/peat, oil or natural gas from the following sources: the generation of electricity and heat, transport, industry, residential and other commercial/public services, agriculture/forestry, energy industries other than electricity and heat generation, and other emissions not specified elsewhere. International Energy Agency (2012) CO_2 Emissions from Fuel Combustion 2012 – Highlights. Retrieved on 7 January, 2013. Available from: http://www.iea.org/publications/freepublications/publication/name,32870,en.html

[2] International Energy Agency (2012) CO_2 Emissions from Fuel Combustion 2012 – Highlights. Retrieved on 7 January, 2013. Available from: http://www.iea.org/publications/freepublications/publication/name,32870,en.html

[3] Environment Canada (2012) National Inventory Report 1990–2010: Greenhouse Gas Sources and Sinks in Canada. Retrieved on 7 January, 2013. Available from: http://greenlanedev2.ncr.ec.gc.ca/ges-ghg/default.asp?lang=En&n=83A34A7A-1

[4] Environment Canada (2013) National Inventory Report 1990–2011: Greenhouse Gas Sources and Sinks in Canada. Available from: http://greenlanedev2.ncr.ec.gc.ca/ges-ghg/default.asp?lang=En&n=83A34A7A-1

6 References and further reading

6.1 References

International Energy Agency (2012) CO_2 Emissions from Fuel Combustion 2012 – Highlights. Retrieved on 7 January, 2013. Available from: http://www.iea.org/publications/freepublications/publication/name,32870,en.html

Canada's Action on Climate Change (2010) Copenhagen Accord. Retrieved on 7 January, 2013. Available from: http://www.climatechange.gc.ca/cdp15-cop15/default.asp?lang=En&n=970E8B07-1

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Environment Canada (2013) National Inventory Report 1990–2011: Greenhouse Gas Sources and Sinks in Canada. Available from: http://ec.gc.ca/ges-ghg/default.asp?lang=En&n=83A34A7A-1

6.2 Further reading

International Energy Agency (2012) CO_2 Emissions from Fossil Fuel Combustion 2012 Edition. Retrieved on 7 January, 2013. Available from: http://www.iea.org/w/bookshop/add.aspx?id=618

International Energy Agency (2012) Key World Energy Statistics. Retrieved on 7 January, 2013. Available from: http://www.iea.org/publications/freepublications/publication/name,31287,en.html

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