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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 (<http://ec.gc.ca/indicateurs-indicators/default.asp?lang=en&n=54C061B5-1>) is part of the Canadian Environmental Sustainability Indicators (CESI) program (<http://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 (CO₂) emissions from fuel combustion in 2011. CO₂ emissions from non-energy-related sources (processes), gas flaring, and emissions of other greenhouse gases (GHGs), including methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF₆), are not included in the indicator.

2.2 Rationale

The indicator provides a global perspective on Canada's share of CO₂ emissions from fuel combustion. This represents a subset of countries' total emissions which is normally the largest proportion of their total emissions. This subset is used because many countries do not submit an official inventory to the United Nations Framework Convention on Climate Change (UNFCCC) and global GHGs total emissions data are not available.

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, CO₂ emissions data for 2011 come from the International Energy Agency (IEA) CO₂ Emissions from Fuel Combustion 2013 – Highlights report (<http://www.iea.org/publications/freepublications/publication/name,43840,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 CO₂ emissions data from fuel combustion from 1971 to 2011 for more than 140 countries and regions. The CO₂ emissions from a sectoral approach were used in this indicator.¹

¹ Sectoral Approach contains total CO₂ emissions from fuel combustion as calculated using the Intergovernmental Panel on Climate Change (IPCC) Tier 1 Sectoral Approach and corresponds to IPCC Source/Sink Category 1 A (<http://www.ipcc.ch/>). Emissions calculated using a Sectoral Approach include emissions only when the fuel is actually combusted.

3.2 Spatial coverage

The indicator provides global coverage.

3.3 Temporal coverage

The indicator uses the latest available year of global data (2011).

3.4 Data completeness

The analysis of global energy-related CO₂ emissions from fuel combustion includes: developed countries/regions (Canada, United States, European Union-27 [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 2011.

4 Methods

The estimates of global CO₂ emissions from fuel combustion were calculated by the 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 Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories (<http://www.ipcc.ch/>). This global indicator represents total emissions from fuel combustion, expressed in megatonnes of carbon dioxide (Mt CO₂).

5 Caveats and limitations

IEA emission estimates only include energy-related² CO₂ 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 CO₂ 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 CO₂ emissions from fossil fuel combustion were 530 megatonnes (Mt) in 2011,³ approximately 75% of Canada's total emissions (701 Mt) submitted to the UNFCCC for 2012.⁴

² CO₂ 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 (2013) CO₂ Emissions from Fuel Combustion 2013 - Highlights. Available from: <http://www.iea.org/publications/freepublications/publication/name,43840,en.html>.

³ International Energy Agency (2013) CO₂ Emissions from Fuel Combustion 2013 - Highlights. Retrieved on 9 January, 2014. Available from: <http://www.iea.org/publications/freepublications/publication/name,43840,en.html>.

⁴ Environment Canada (2013) National Inventory Report 1990-2011: Greenhouse Gas Sources and Sinks in Canada. Retrieved on 9 January, 2014. Available from: <http://www.ec.gc.ca/ges-ghg/Default.asp?lang=En&nav=1357A041-1>.

6 References and further reading

6.1 References

Canada's Action on Climate Change (2010) Copenhagen Accord. Retrieved on 9 January, 2014. Available from: <http://www.ec.gc.ca/default.asp?lang=En&n=714D9AAE-1&news=EAF552A3-D287-4AC0-ACB8-A6FEA697ACD6>.

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6.2 Further reading

International Energy Agency (2013) Key World Energy Statistics. Available from: <http://www.iea.org/publications/freepublications/publication/name,31287,en.html>.

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