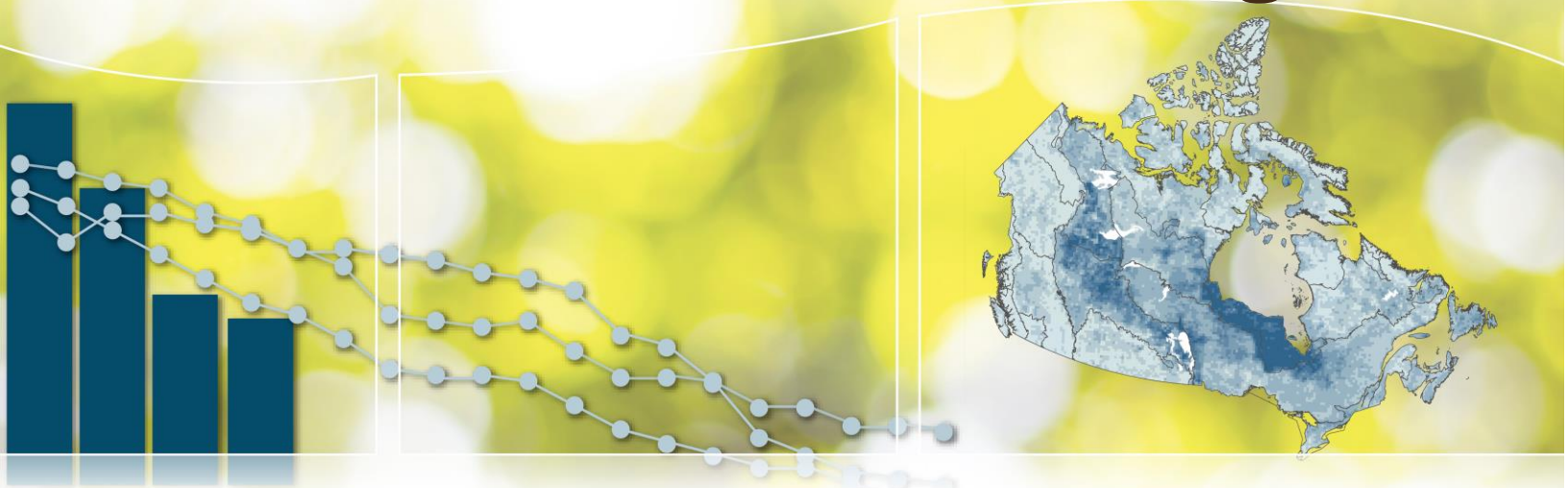




Canadian Environmental Sustainability Indicators

Progress Towards Canada's Greenhouse Gas Emissions Reduction Target



Suggested citation for this document: Environment and Climate Change Canada (2017) Canadian Environmental Sustainability Indicators: Progress Towards Canada's Greenhouse Gas Emissions Reduction Target. Consulted on *Month day, year*. Available at: www.ec.gc.ca/indicateurs-indicators/default.asp?lang=en&n=CCED3397-1.

Cat. No.: En4-144/48-2017E-PDF
ISBN: 978-0-660-07224-1

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**Canadian Environmental
Sustainability Indicators**

**Progress Towards
Canada's Greenhouse
Gas Emissions Reduction
Target**

February 2017

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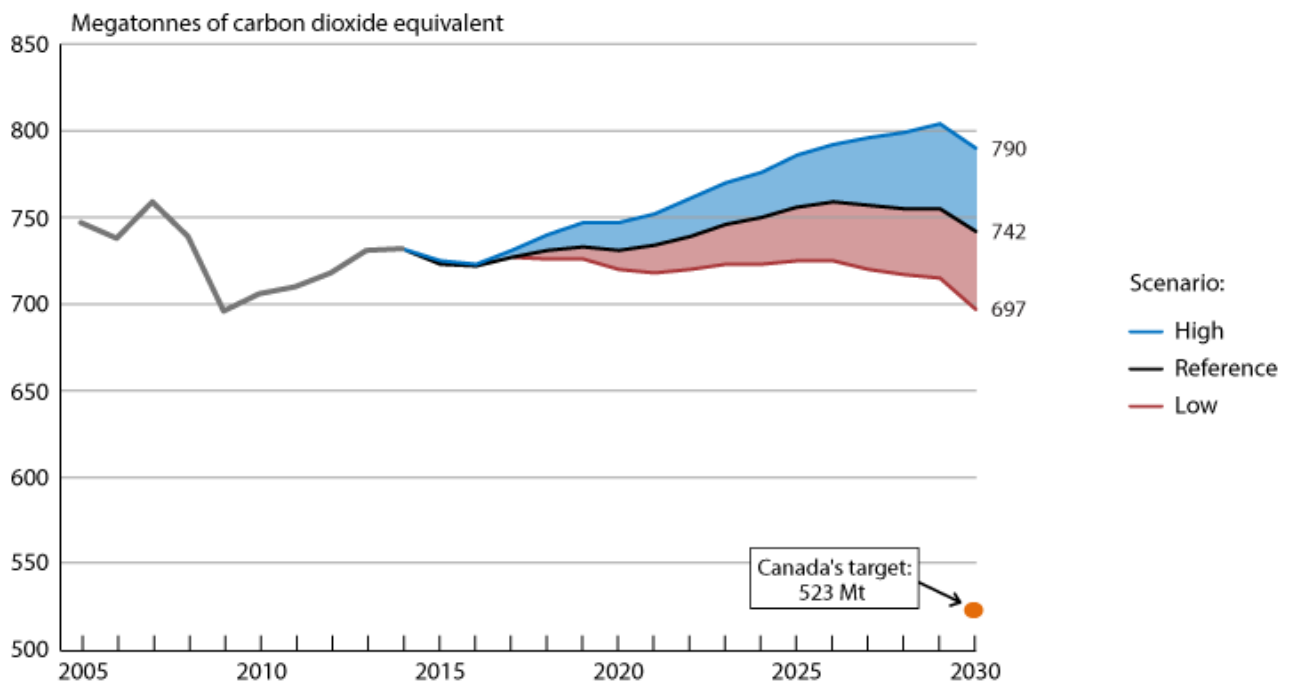
Part 1. Progress Towards Canada's Greenhouse Gas Emissions Reduction Target Indicator

Canada's annual greenhouse gas (GHG) emissions are expected to be between 697 and 790 megatonnes of carbon dioxide equivalent (Mt CO₂ eq) in 2030, without taking into account the contribution of the land use, land-use change and forestry sector.

According to [Canada's 2016 Greenhouse Gas Emissions Reference Case](#), GHG emissions are projected to be 742 Mt CO₂ eq in 2030. These projections are based on historical data and actions taken by governments, consumers and businesses up to 2014, as well as the future impacts of policies and measures put in place as of November 1, 2016.

Oil and gas prices and economic growth are key drivers of GHG emissions trends in Canada. Because these drivers can be quite volatile, sensitivity analysis is presented through alternative scenarios (Low and High), reflecting different assumptions about oil and natural gas prices and production as well as different rates of economic growth.

Figure 1. Historical greenhouse gas emissions and projections to 2030 with policies and measures as of November 1, 2016, Canada, 2005 to 2030



[Data for Figure 1](#)

Source: Environment and Climate Change Canada (2016) [Canada's 2016 Greenhouse Gas Emissions Reference Case](#). Environment and Climate Change Canada (2016) [National Inventory Report 1990–2014: Greenhouse Gas Sources and Sinks in Canada](#).

The future level of GHG emissions in Canada depends on a number of factors, including the pace of expected economic and population growth, the development of energy markets and their influence on prices, technological change, consumer behaviour, and policies aimed at emissions reductions.



Effective action on climate change

This indicator supports the measurement of progress towards the long-term goal of the [2016–2019 Federal Sustainable Development Strategy](#): A low-carbon economy contributes to limiting global average temperature rise to well below two degrees Celsius and supports efforts to limit the increase to 1.5 degrees Celsius.

Part 2. Data Sources and Methods for the Progress Towards Canada's Greenhouse Gas Emissions Reduction Target Indicator

Introduction

The [Progress Towards Canada's Greenhouse Gas Emissions Reduction Target](#) indicator is part of the [Canadian Environmental Sustainability Indicators](#) (CESI) program, which provides data and information to track Canada's performance on key environmental sustainability issues. This indicator is also used to report and measure progress towards the goals of the [2016–2019 Federal Sustainable Development Strategy](#).

Description and rationale of the Progress Towards Canada's Greenhouse Gas Emissions Reduction Target indicator

Description

The Progress Towards Canada's Greenhouse Gas Emissions Reduction Target indicator provides an overview of the projected greenhouse gas (GHG) emissions in Canada until the year 2030. This indicator was developed using historical emissions data from 1990 to 2014. The reference scenario represents a "with current measures" scenario that takes into account actions taken by governments, consumers and businesses up to 2014 as well as the future impacts of federal and provincial policies and measures put in place as of November 1, 2016. Key drivers of GHG emissions in Canada are oil and gas price and production projections (from the National Energy Board's [Canada's Energy Future](#) report), which are subject to external commodity market pricing, and economic growth (aligned with Finance Canada's macroeconomic projections). Because these drivers can be quite volatile and have a critical impact on GHG projections, alternative scenarios that reflect different assumptions about oil and gas prices and production (from Canada's National Energy Board) as well as different rates of economic growth have been developed.

- The highest emissions scenario uses high oil and gas price projections (driving increased oil and gas production) and a higher annual growth in gross domestic product than in the reference scenario between 2014 and 2030.
- The lowest emissions scenario uses low world oil and gas price projections (leading to lower oil and gas production) and slower gross domestic product growth than in the reference scenario.

These scenarios are reported in [Canada's 2016 Greenhouse Gas Emissions Reference Case](#).

Rationale

This indicator allows the public and policy-makers to view Canada's progress towards meeting its GHG emissions target.

Recent changes to the indicator

This release of the indicator uses the GHG projections reported in [Canada's 2016 Greenhouse Gas Emissions Reference Case](#). The previous versions of the indicator used projections from [Canada's Second Biennial Report on Climate Change](#) (PDF; 2.55 MB) to the United Nations Framework Convention on Climate Change. The calculation of this indicator reflects methodological revisions that were applied to the 2016 edition of Environment and Climate

Change Canada's annual [National Inventory Report](#), as well as improvements to the Energy, Emissions and Economy Model for Canada that are listed in the "Methodology and Modeling Assumptions" section in Annex 1 of Canada's 2016 Greenhouse Gas Emissions Reference Case.

Data

Data source

The data source of this indicator is the Environment and Climate Change Canada's greenhouse gas (GHG) emissions projections used to inform [Canada's 2016 Greenhouse Gas Emissions Reference Case](#). Annex 1 of Canada's 2016 Greenhouse Gas Emissions Reference Case report provides a quantitative description of the sources and assumptions used to develop the reference and alternative scenarios.

Spatial coverage

Coverage is national.

Temporal coverage

Historical GHG data presented cover the years from 2005 to 2014. The GHG projections cover the years 2015 to 2030.

Data completeness

The indicator is based on analysis that incorporates the most up-to-date statistics on GHG emissions, economic and population growth and energy price and production projections available at the time the technical modelling was completed for the report. Data and information on policies and measures up to November 1, 2016 were included in Canada's 2016 Greenhouse Gas Emissions Reference Case.

Data timeliness

The indicator reflects the latest GHG emissions projections published by Environment and Climate Change Canada at time of production.

Methods

The emissions projections have been developed in line with generally recognized best practices, including:

- Incorporating Intergovernmental Panel on Climate Change standards for estimating greenhouse gas emissions (GHG) across different fuels and processes.
- Relying on outside expert reviews and the most up-to-date data available for key drivers such as economic and population growth, energy prices, and energy demand and supply.
- Applying an internationally recognized energy and macroeconomic modelling framework for estimating emissions and economic interactions.
- Using a methodology to develop the projections and underlying assumptions that has been subject to peer review by leading external experts on economic modelling and GHG emissions projections, and that has been vetted with key stakeholders.
- Using the most up-to-date statistics on GHG emissions and energy use, and using key assumptions from the best available public and private expert sources.
- Developing emissions projections scenarios using the detailed and proven Energy, Emissions and Economy Model for Canada, also known as E3MC.

Caveats and limitations

A series of plausible assumptions regarding, among others, the level of continuing population and economic growth, prices, demand and supply of energy, and the evolution of energy efficiency technologies were employed to make the projections. The projections assume no further government actions to address greenhouse gas emissions beyond those in place as of November 1, 2016.

The emissions projections presented in the indicator cannot be viewed as a forecast or prediction of emissions at a future date. They do not attempt to account for the inevitable, or as yet unknown changes that will occur in government policy; energy supply, demand and technology; or domestic and international economic and political events.

Emissions projections are subject to uncertainty and are most appropriately viewed as a range of plausible outcomes. Many of the events that shape emissions and energy markets cannot be anticipated. In addition, future developments in technologies, demographics and resources cannot be foreseen with certainty.

Part 3. Annexes

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

Table A.1. Data for Figure 1. Historical greenhouse gas emissions and projections to 2030 with policies and measures as of November 1, 2016, Canada, 2005 to 2030

Year	Historical emissions (megatonnes of carbon dioxide equivalent) ^[A]	Reference scenario (megatonnes of carbon dioxide equivalent)	High emissions scenario (megatonnes of carbon dioxide equivalent)	Low emissions scenario (megatonnes of carbon dioxide equivalent)	Canada's target (megatonnes of carbon dioxide equivalent)
2005	747	-	-	-	-
2006	738	-	-	-	-
2007	758	-	-	-	-
2008	739	-	-	-	-
2009	696	-	-	-	-
2010	706	-	-	-	-
2011	710	-	-	-	-
2012	718	-	-	-	-
2013	731	-	-	-	-
2014	732	-	-	-	-
2015	-	723	725	725	-
2016	-	722	723	722	-
2017	-	727	731	727	-
2018	-	731	740	726	-
2019	-	733	747	726	-
2020	-	731	747	720	-
2021	-	734	752	718	-
2022	-	739	761	720	-
2023	-	746	770	723	-
2024	-	750	776	723	-

Year	Historical emissions (megatonnes of carbon dioxide equivalent) ^[A]	Reference scenario (megatonnes of carbon dioxide equivalent)	High emissions scenario (megatonnes of carbon dioxide equivalent)	Low emissions scenario (megatonnes of carbon dioxide equivalent)	Canada's target (megatonnes of carbon dioxide equivalent)
2025	–	756	786	725	–
2026	–	759	792	725	–
2027	–	757	796	720	–
2028	–	755	799	717	–
2029	–	755	804	715	–
2030	–	742	790	697	523

Note: ^[A] Historical emissions were taken from the [National Inventory Report 1990–2014: Greenhouse Gas Sources and Sinks in Canada](#).

Source: Environment and Climate Change Canada (2016) [Canada's 2016 Greenhouse Gas Emissions Reference Case](#). Environment and Climate Change Canada (2016) [National Inventory Report 1990–2014: Greenhouse Gas Sources and Sinks in Canada](#).

Annex B. References and additional information

References and further reading

Environment and Climate Change Canada (2016) [Canada's 2016 Greenhouse Gas Emissions Reference Case](#). Retrieved on December 28, 2016.

Environment and Climate Change Canada (2016) [National Inventory Report 1990–2014: Greenhouse Gas Sources and Sinks in Canada](#). Retrieved on December 12, 2016.

Related information

[Carbon Dioxide Emissions from a Consumption Perspective](#)

[Drivers and Impacts of Greenhouse Gas Emissions](#)

[Global Greenhouse Gas Emissions](#)

[Greenhouse Gas Emissions by Economic Sector](#)

[Greenhouse Gas Emissions by Province and Territory](#)

[Greenhouse Gas Emissions from Large Facilities](#)

[Greenhouse Gas Emissions per Person and per Unit Gross Domestic Product](#)

[National Greenhouse Gas Emissions](#)

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