

# AN EVALUATION OF CANADA'S PROGRESS TOWARDS MEETING THE 2026 AND 2030 GHG EMISSION REDUCTION TARGETS

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In its *2023 Emission Reduction Plan* (ERP, ECCC 2023a) the Government of Canada has committed to a target of reducing greenhouse gas (GHG) emissions to at least 40% below 2005 levels by 2030, with an interim target set at 20% below 2005 levels by 2026. Since 2022 emissions were only slightly lower than 2005 emissions the targets equate to 18% below current emissions by 2026 and 38% below by 2030. In this essay I will evaluate Canada's progress towards these targets by breaking down total GHG emissions into the key drivers. It is apparent that the government has not yet come to terms with the major decisions it needs to make in order to meet either of its targets.

## Main drivers of GHG emissions

The economic drivers of GHG emissions can be identified using a simple formula: where *GDP* denotes real Gross Domestic Product and *POP* denotes population. The ratio *GHG/GDP* is emissions per dollar of economic activity, or emissions "intensity", herein simply called GHG Intensity. The second ratio, *GDP/POP*, is real GDP per capita or real per capita income, herein simply called Income. So, another way of expressing this identity is:

$$GHG = \frac{GHG}{GDP} \times \frac{GDP}{POP} \times POP$$

$$Emissions = GHG\ Intensity \times Income \times Population$$

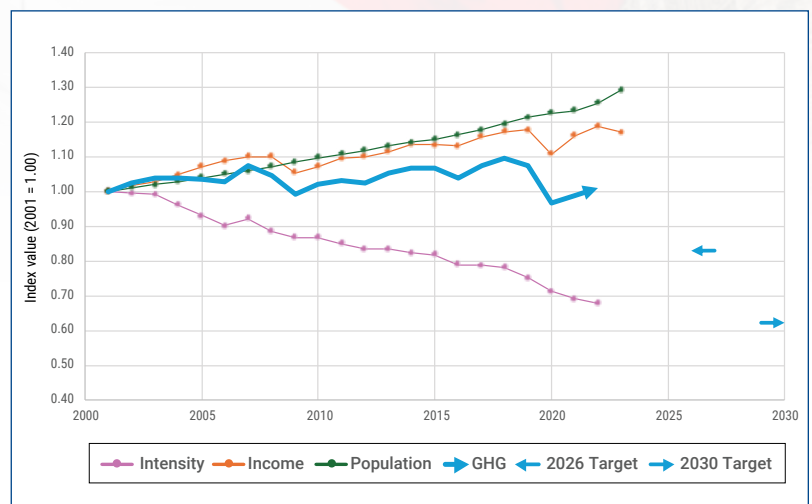
Also, it is approximately true that the annual percent growth in emissions equals the sum of the annual percent growth in each driver. Thus, by looking at how GHG Intensity, Income, and Population change over time we can understand changes in total GHG emissions.

Figure 1 represents each of these measures in the form of indexes set so that the 2001 value equals 1.00. The data series span 2001 to 2023. However, the 2023 GHG emissions level was not available from the source (Energy Institute, 2023), so that series (blue line) and the GHG Intensity series (pink line) end in 2022. The 2026 and 2030 emission targets are shown (blue left arrow and right arrow respectively).

The thick blue line shows Canada's total GHG emissions from fuel use. Up to 2019 they trended up at about 0.4% per year, then during the COVID-19 recession they dropped by 10% but are slowly returning to trend. Over the 2001–2022 interval the trend is 0.0%.

GHG Intensity (pink line) declines approximately linearly over time. The trend rate is -1.4% per year. While the federal and provincial governments have been making increasingly stringent efforts to reduce GHG emissions throughout this interval (note, for instance, that Canada ratified the Kyoto Protocol in 2002 and signed the Paris Agreement in 2016) there are no easy or inexpensive abatement options for carbon dioxide, and given Canada's size and weather we cannot simply stop using fossil fuels. The background trend in GHG Intensity reflects long term global technological progress and improvements in energy efficiency, both of which will continue. But the trend is not likely to bend downward by much in the near future, and indeed Figure 1-2 in the federal government's *2023 Progress Report* (ECCC 2023b) projects GHG Intensity will continue to decline at its historical rate through 2035.

Figure 1: Drivers of emissions in Canada, 2001–2023



The Income line (orange) tends to go up, reflecting government and public priorities to attain a rising standard of living. The trend is +0.7% per year.

The Population line (green) also continues to trend upward, with a noticeable acceleration recently. The underlying trend is +1.2% per year, but in 2022 it grew by 1.8% and in 2023 it grew by 3.0%. Even if population growth returns to its historical average rate after the 2022–23 surge, this line represents a constant upward force on total GHG emissions. The two trends together contribute an upward force of +1.9% per year on total GHG emissions.

Thus, taking the three components together we have upward drivers (Income and Population growth) adding about 1.9% annually to emissions, and the downward Intensity driver reducing emissions by about 1.4% per year, leading to a base case increase of about 0.5% per year.<sup>1</sup>

### The challenge

The challenge facing the Canadian government is that the blue line, representing total GHG emissions, needs to get down first to the 2026 target (18% below 2022) and thereafter to the 2030 target (38% below 2022). Where will these reductions come from, and at what cost to the economy?

Reducing emissions by 2026 has been made more difficult by the large population growth (3.0%) in 2023. However, this was offset by a 1.5% reduction in real per-capita income the same year. If GHG Intensity falls by 1.5% then total emissions in 2023 will be about the same as in 2022. Hitting the 2026 target will require percent changes in Population, Income, and GHG Intensity to add up to -18% across 2023 to 2025. Even if Population doesn't grow in 2024 and 2025, and even if GHG Intensity falls by 15% across those three years, which is a much larger decrease than over any three-year period in the record, real per-capita income would have to fall by 6% to meet the target (3%-6%-15%=-18%).

Looking further to 2030, if, for instance, population returns to its historical trajectory and grows by about 10% between 2022 and 2030, and GHG Intensity begins falling at double its historical rate thus declining by 33% over the same interval, real per-capita income would have to decline by 15% from 2022 to 2030 for emissions to reach the 2030 target.

On a compound basis, if population grows on average by 1.2% per year and real per-capita income grows by 0.7% per year, over the nine years from 2022 to 2030 they will contribute an increase of about 19% to Canada's GHG emissions.<sup>2</sup> Hitting the 2030 target of -38% compared to current emissions will require emissions intensity to fall by 57% over nine years. Since it only fell by 32% over the entire 2001–2022 interval this is an unprecedented undertaking and is contradicted by the projection in the federal government's *2023 Progress Report* that Intensity will continue to decline at its historical rate. A decline of 57% over nine years requires a compound annual average decline of 9.0%, more than six times faster than the rate achieved since 2001. It will be apparent over the next two years if an acceleration of this magnitude can be achieved by the federal plan.

### Course correction

Taking account of historical constraints on our ability to reduce GHG Intensity and Canada's ongoing desire to avoid both depopulation and collapsing real incomes, a realistic option would be for the government to modify its target so that it is stated in terms of GHG Intensity rather than total emissions. For instance, the target might be to have GHG Intensity decline on average by 2.0% annually, which is higher than the long-term rate of decline (1.4%) but in line with the trend since 2018 and may be feasible to sustain. This will allow population and income to continue to grow while shifting focus to a more attainable target. If over the coming six years Population and Income return to their historical trend growth rates while Intensity declines by 2.0% annually, total GHG emissions will end up at about 16% below 2005 levels by 2030, which is approximately the 2026 target.

Given the limited scope for reducing the emissions intensity of the economy faster than technology allows, we can predict that Canada will not meet either the 2026 or 2030 GHG targets as stated. We also believe that any attempt to do so will cause such a large drop in living standards that the government will not be able to remain committed to the policy. We have already seen evidence of this in the recent decision by the government to exempt heating oil from the carbon tax for three years. However, a revised target stated in terms of the average annual decline in GHG Intensity would provide a tangible and feasible benchmark for the government to follow. ❖