

Environment Fact Sheets

Canada's industrial energy use trends from 2009 to 2022

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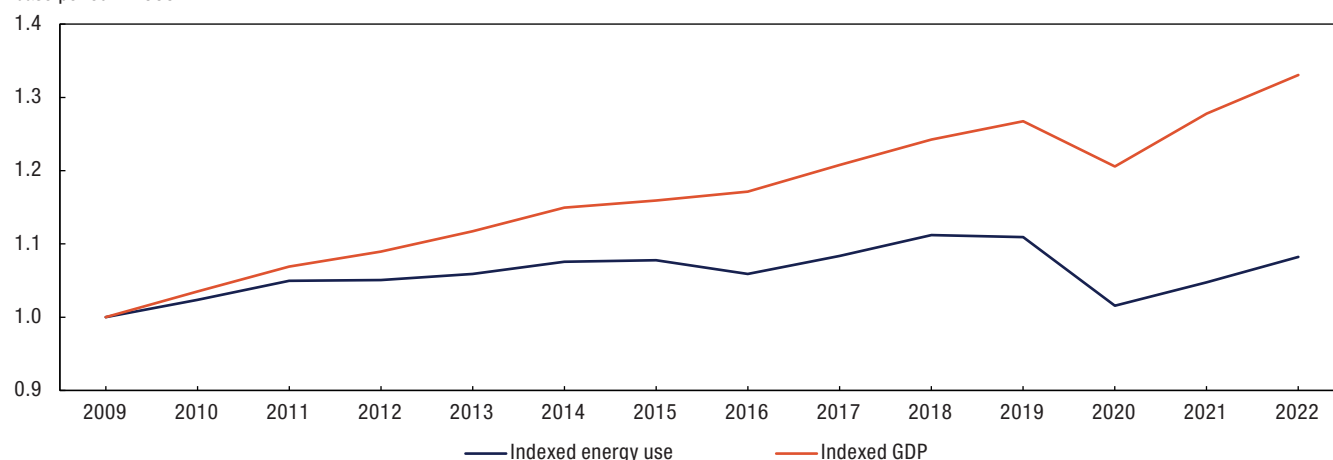
Canada's vast landmass and diverse energy resources play a key role in shaping its energy landscape, as does its economic output. Over time, increases in business production may lead to growth in energy use. However, investments in production efficiencies,¹ technological advances, and socioeconomic or weather-related events can also influence energy use trends.

From 2009 to 2022, the use of energy by Canadian industries increased by 8.2% (from 8,318,039 terajoules in 2009 to 9,002,198 terajoules in 2022), while their real gross domestic product (GDP)² grew by 33.1%. Overall, Canadian industries were less energy intensive over the period because their use of energy grew at a lower rate than their production. In other words, on average, industries now require less energy to produce a unit of production (Chart 1).

Chart 1

Indexed industrial energy use (terajoules) and indexed real gross domestic product (chained [2017] dollars), all industries, Canada, 2009 to 2022

base period = 2009



Sources: Statistics Canada, tables 38-10-0096-01, Physical flow account for energy use, and 36-10-0434-03, Gross domestic product (GDP) at basic prices, by industry, annual average (accessed February 11, 2025).

Following a decline in 2020, due primarily to measures implemented to reduce the impact of the COVID-19 pandemic, energy use continued its upward trend in 2021 and 2022. In 2022, Canadian industries saw their energy use rise 3.3% from the previous year, while the Canadian economy was up 4.1%, continuing to rebound after COVID-19 restrictions were lifted. Before the pandemic, from 2009 to 2019, energy use grew by 10.9%, while the Canadian economy grew by 26.8%. This illustrates that industrial energy use is growing at a slower pace than the economy.

1. Consult the [Annual Environmental Protection Expenditures Survey results](#) for more information on business spending on heat and other energy saving activities, among others.
 2. Real GDP measures the total economic output of goods and services and is adjusted for changes in price (removing inflation and deflation from the total output). In this paper, real GDP is measured in chained (2017) dollars.

Note to readers

This article is based on data from the [Physical Flow Account for Energy Use](#). This account describes the annual use of energy products by industries, governments, institutions and households. This article reports solely on industrial energy use (i.e., household energy use amounts are excluded from estimates).

The account includes the following energy sources: coal, natural gas, motor gasoline, diesel, aviation fuel, light fuel oil (including kerosene), heavy fuel oil, refinery fuel gas, coke oven gas, liquefied petroleum gases (including natural gas liquids), electricity, coke, steam, wood and spent pulping liquor.

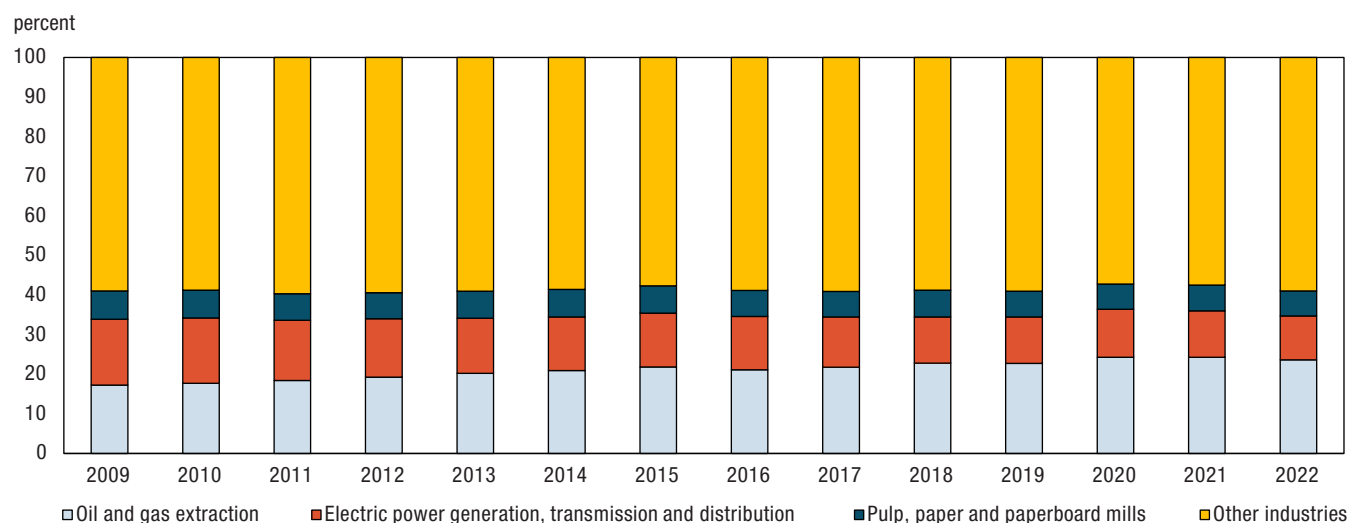
The energy use estimates are reported in terajoules; one terajoule is equal to one trillion joules. Only uses of energy products for their energy content are included in the analysis. The use of energy products as material inputs (e.g., oil products used to make plastics) is not included in the energy use account.

Three industries accounted for nearly two-fifths of national industrial energy use

From 2009 to 2022, the following industries accounted for the highest share of energy use among all Canadian industries: oil and gas extraction; electric power generation, transmission and distribution; and pulp, paper and paperboard mills.³ These three industries were responsible for approximately two-fifths of Canada's total industrial energy use each year (percentage varies from 40.4% to 42.8% depending on the year), while the remaining reported industries were responsible for three-fifths (percentage varies from 57.2% to 59.6%) (Chart 2).

Chart 2

Share of energy use in Canada for the top three energy use industries, 2009 to 2022



Note: The "Other industries" group is composed of the remaining 112 reported industries.

Source: Statistics Canada, Table 38-10-0096-01, Physical flow account for energy use (accessed February 11, 2025).

3. This text uses the industry classification of the supply and use tables, the [Input-Output Industry Classification](#), which is based on the [North American Industry Classification System](#). The three industries referenced in this report are the oil and gas extraction industry (BS21100); the electric power generation, transmission and distribution industry (BS22110); and the pulp, paper and paperboard mills industry (BS32210).

Although the share of the top three ranked industries was relatively stable from 2009 to 2022, the oil and gas extraction industry (Canada's top energy use industry) experienced a gradual increase over this period. Oil and gas extraction represented less than one-fifth (17.3%) of national industrial energy use in 2009, compared with almost one-quarter (23.7%) in 2022. Over the same period, the share of the electric power generation, transmission and distribution industry (Canada's second-highest energy use industry) dropped from 16.6% to 11.1%.

Oil and gas extraction industry is becoming less energy intensive

From 2009 to 2022, oil and gas extraction experienced a notable increase in energy use (+47.9%), while its GDP (or value-added) rose even more (+56.9%). However, the trend differs when observing the early years.

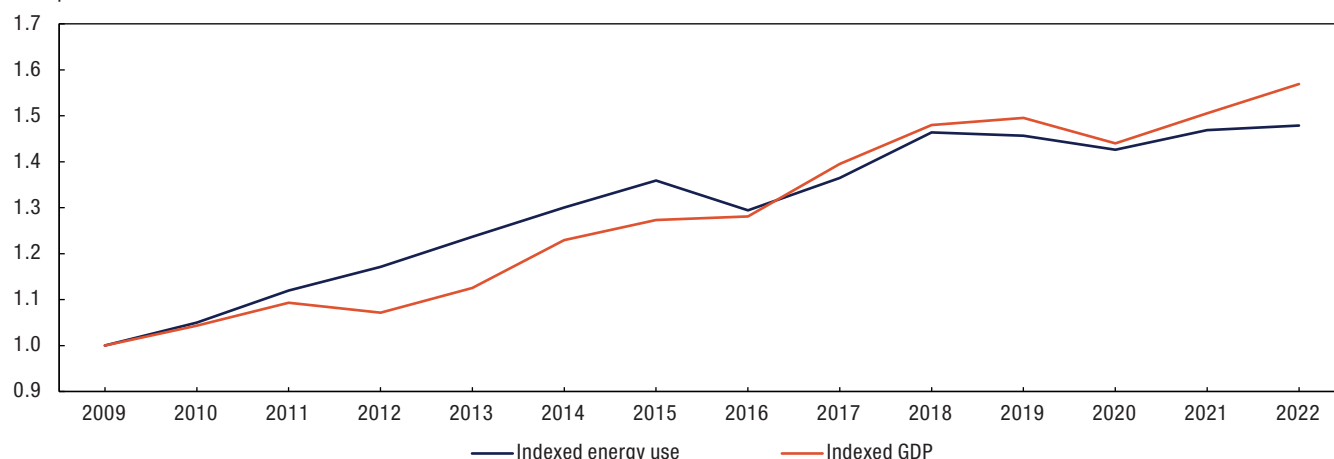
As shown in Chart 3, from 2009 to 2015, energy use for this industry grew at a faster rate (+35.9%) than real GDP (+27.3%). However, from 2016 to 2022, energy use grew at a slower rate (+14.3%) than real GDP (+22.5%). This shows that, over time, the industry is becoming less energy intensive.

The oil price plunge, which began in 2014, may have contributed to the reduction in energy use. The drop was brought on by weakening global demand and rapid expansion of oil supply by unconventional sources (World Bank Group, 2015). Investments made by this industry in energy efficiency, primarily heat or energy savings and management activities, may also have contributed to the reduction in energy use. For example, from 2019 to 2022, investments reached \$135 million to \$207 million annually, accounting for about one-quarter (23.7% to 26.9%) of all industrial⁴ spending on this activity each year (Statistics Canada, 2025).

Chart 3

Indexed industrial energy use (terajoules) and indexed real gross domestic product (chained [2017] dollars) for the oil and gas extraction industry, Canada, 2009 to 2022

base period = 2009



Sources: Statistics Canada, tables 38-10-0096-01, Physical flow account for energy use, and 36-10-0434-03, Gross domestic product (GDP) at basic prices, by industry, annual average (accessed February 11, 2025).

4. The target population of the [Annual Environmental Protection Expenditures Survey](#) includes establishments engaged in primary industries (resource extraction); manufacturing industries; the electric power generation, transmission and distribution industry; the natural gas distribution industry; and the pipeline transportation industry.

Energy use in electric power generation, transmission and distribution industry on a declining trend

Energy use associated with electric power generation, transmission and distribution decreased by 27.5% from 2009 to 2022. Conversely, real GDP for the industry increased by 18.4%, demonstrating that this industry is becoming less energy intensive over time (Chart 4).

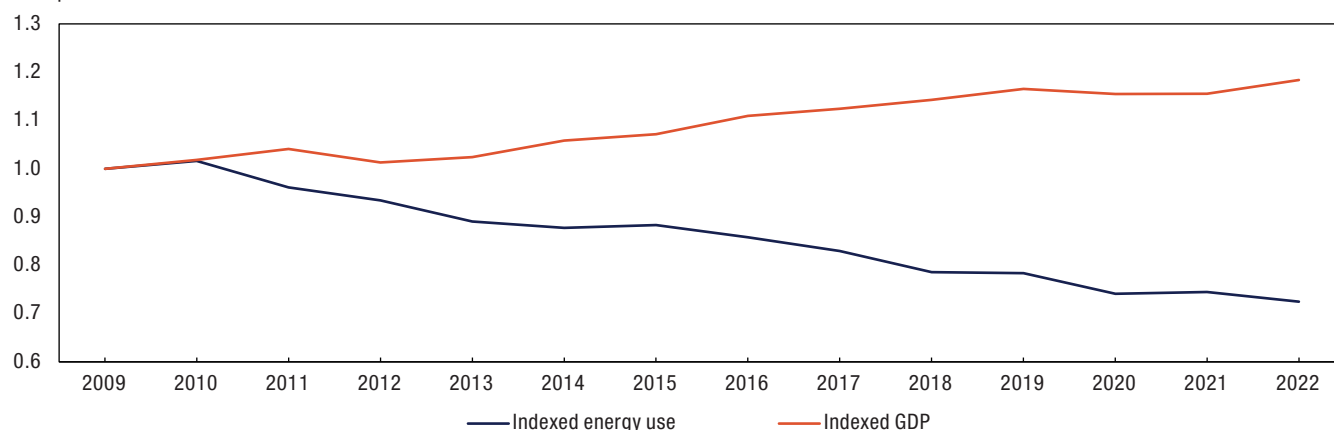
One factor that may have contributed to the decrease in energy use within this industry is Canada's commitment to phase out coal by 2030. This saw some provinces phase out coal-fired generation, replacing it with lower or zero-emission alternatives such as natural gas or non-hydro renewable alternatives such as wind, solar, nuclear and biomass (some of these energy sources, such as wind, solar and nuclear, are not included in our study). From 2005 to 2021, coal-fired power generation decreased by two-thirds nationally (Canada Energy Regulator, 2024).

This industry also reported investments in energy efficiency, primarily heat or energy savings and management activities. Amounts varied from \$23 million to \$76 million annually from 2019 to 2022 (Statistics Canada, 2025).

Chart 4

Indexed industrial energy use (terajoules) and indexed real gross domestic product (chained [2017] dollars) for the electric power generation, transmission and distribution industry, Canada, 2009 to 2022

base period = 2009



Sources: Statistics Canada, tables 38-10-0096-01, Physical flow account for energy use, and 36-10-0434-03, Gross domestic product (GDP) at basic prices, by industry, annual average (accessed February 11, 2025).

Pulp, paper and paperboard mills industry remained Canada's top manufacturing industrial energy user

The pulp, paper and paperboard mills industry (third-highest energy use industry) remained the largest energy user among Canada's manufacturing industries. In 2022, this industry accounted for nearly one-quarter (24.2%) of energy use among all manufacturing industries. The primary metal manufacturing industry (21.5%) and the petroleum and coal product manufacturing industry (15.2%) followed in the manufacturing sector top three.

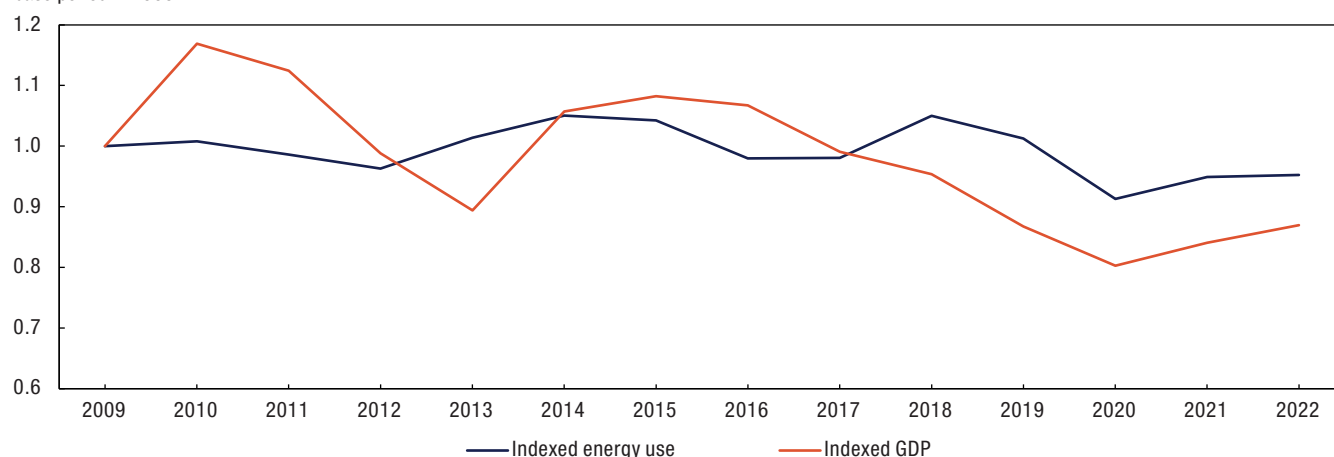
The pulp, paper and paperboard mills industry has experienced irregular patterns of energy use from 2009 to 2022 (Chart 5). The industry's energy use decreased by 4.8% over the period, while its real GDP contracted even further (-13.0%). On average, this industry's energy use decreased at a lower rate than its GDP.

The decreases observed over time can be linked to a reduction in demand and production for printing and writing paper, and increased competition from other parts of the world, which in turn has resulted in lower economic output for the industry (Canada Energy Regulator, 2019). Additionally, many papermills are experiencing closures, but they may still use energy for maintenance while idling (Paper Advance, 2023). The paper manufacturing industry (which includes the pulp, paper and paperboard mills industry) also reported investments in heat or energy savings and management activities over the years. From 2019 to 2022, those investments reached \$60 million to \$77 million annually (Statistics Canada, 2025).

Chart 5

Indexed industrial energy use (terajoules) and indexed real gross domestic product (chained [2017] dollars) for the pulp, paper and paperboard mills industry, Canada, 2009 to 2022

base period = 2009



Sources: Statistics Canada, tables 38-10-0096-01, Physical flow account for energy use, and 36-10-0434-03, Gross domestic product (GDP) at basic prices, by industry, annual average (accessed February 11, 2025).

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