


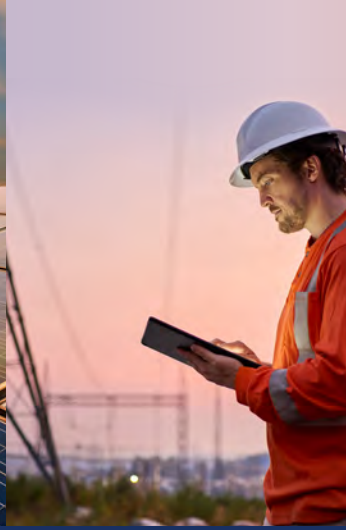

Natural Resources Canada

Ressources naturelles Canada

# Energy Fact Book

## 2025–2026

Canada

Natural Resources Canada | Ressources naturelles Canada

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## 2025–2026

Canada

*Aussi disponible en français sous le titre :* Cahier d'information sur l'énergie, 2025-2026



Cat. No. M136-1E (Print) M136-1E-PDF (online)

ISSN 2370-3105 ISSN 2370-5027

# Preface

The Energy Fact Book provides **reliable, up-to-date statistics and analysis** to support evidence-based dialogue on Canada's energy sector.

Designed for a wide audience—including government, industry, academia, educators, media and the public—**this resource aims to bridge technical depth with broad accessibility**.

The contents of this publication span a wide array of indicators including energy production and consumption, prices and trade; as well as economic contributions, technology trends and environmental impacts – curated to provide a holistic overview of Canada's energy system.

The Energy Fact Book draws on the expertise of Natural Resources Canada, Statistics Canada, the Canada Energy Regulator and Environment and Climate Change Canada, and **benefits from ongoing collaboration across federal and provincial agencies**, under the scope of the **Canadian Centre for Energy Information**.

Refer to the annexes for definitions, methodology, and notes on data availability and consistency. For questions and comments, contact **energyfacts-faitsenergetiques@nrcan-rncan.gc.ca.**

# Contents

# Introduction

Canada is an energy nation. From hydroelectricity to the oil sands to emerging renewables, our vast and varied natural resources have helped build a resilient economy, connect our communities, and support energy security at home and abroad.

Today, the energy landscape is evolving. Canada is innovating in how energy is produced, delivered, and used. Renewable electricity continues to grow, led by wind and solar. Oil and gas remain foundational to the mix, meeting energy needs at home and abroad, supported by efficiency gains and operational advancements in production and use. At the same time, clean fuels are emerging and technologies such as carbon capture, energy storage, and electrification are reshaping industrial processes and transportation.

These changes are part of a global energy transformation—driven by technological change, shifting demand, affordability needs, and the imperative to maintain international competitiveness. With its  geography, skilled workforce, and commitment to research, Canada is positioned to lead in this transformation, —leveraging regional strengths, priorities, energy mixes, and economic pathways.

**Reliable data are essential to understanding these developments and seizing the opportunities they create for innovation, investment, and long-term economic growth. By presenting key facts and indicators on Canada's energy system in a clear and accessible format, the Energy Fact Book has remained a trusted reference for over fifteen years.**

# Section 1:
# Key Energy, Economic and Environmental Indicators

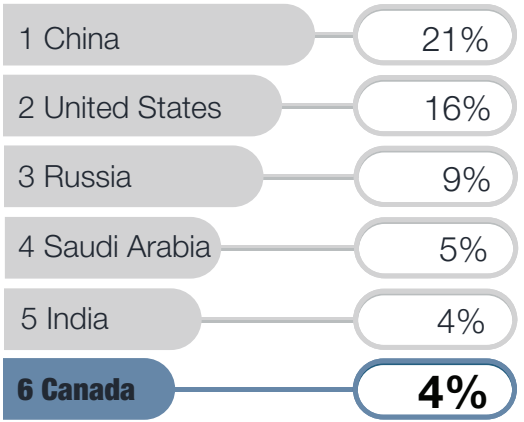
Energy production and supply
Economic contributions
Energy and GHG emissions

# Energy Production and Supply

## CANADA: A GLOBAL ENERGY LEADER

The amount of primary energy produced by Canada in 2023 is **42% more** than in 2005. The world, on average, has increased energy production by **34%** in the same period.

**WORLD TOTAL PRIMARY ENERGY PRODUCTION**
**TOP ENERGY PRODUCERS, 2023**




**GLOBAL ENERGY RANKINGS FOR CANADA**

| | Proved reserve/ capacity | Production | Exports |
|---|---|---|---|
| Crude oil | 4 | 4 | 3 |
| Uranium | 3 | 2 | 2 |
| Hydroelectricity | 4 | 3 | - |
| Electricity | 8 | 7 | 3 |
| Coal | 19 | 14 | 8 |
| Natural gas | 10 | 5 | 6 |

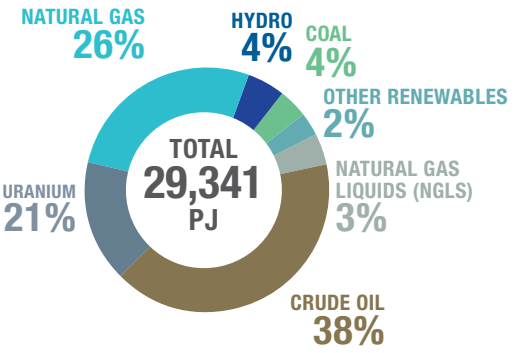
## CANADIAN ENERGY PRODUCTION

Primary energy is energy that is found in nature before any processing or conversion. *The Energy Fact Book* calculates primary energy production by using two methods. The first method treats the energy embodied in uranium as primary energy, thereby capturing the uranium Canada produces and then exports. This method provides a more accurate picture of energy production in Canada.

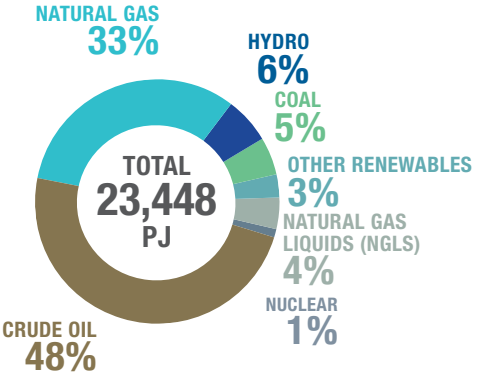
The second method–also employed by the International Energy Agency (IEA), the Energy Information Administration (EIA) and others–treats domestic electricity production from nuclear energy as primary energy, but not uranium itself. Uranium is energy-dense, and Canada exports most of its uranium production, which explains why the two methods produce such different results.

# PRIMARY ENERGY PRODUCTION BY SOURCE (2023)

### PRIMARY ENERGY PRODUCTION, INCLUDING URANIUM



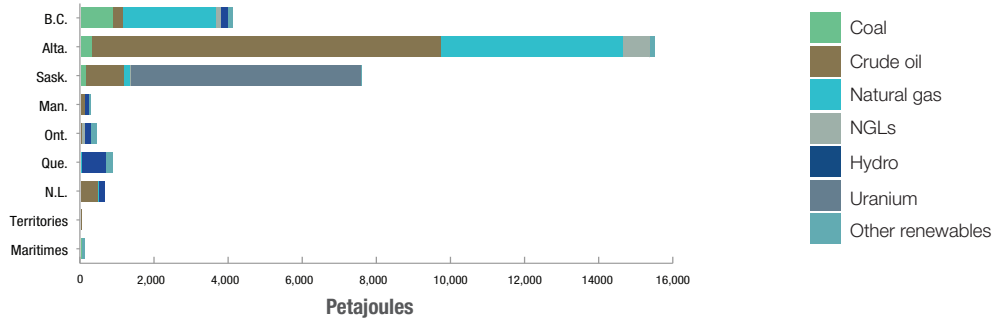

### PRIMARY ENERGY PRODUCTION, EXCLUDING URANIUM



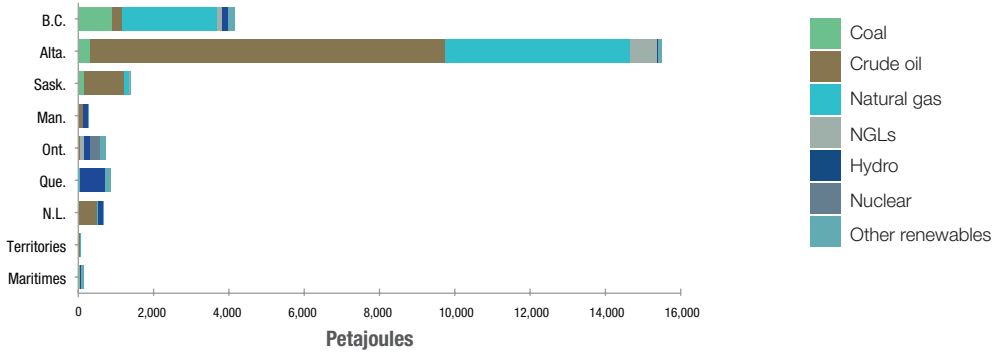

"Other renewables" includes wind, solar, wood/wood waste, biofuels and municipal waste.

# PRIMARY ENERGY PRODUCTION BY REGION AND SOURCE (2023)

## PRIMARY ENERGY PRODUCTION, INCLUDING URANIUM




## PRIMARY ENERGY PRODUCTION, EXCLUDING URANIUM

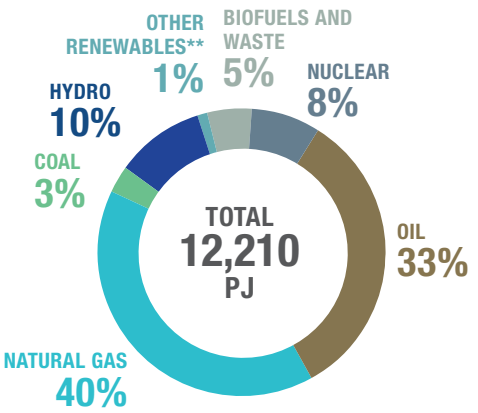


# CANADA'S ENERGY SUPPLY

A look at Canada's total energy supply (TES) helps to better understand the impact of energy sources on GHG emissions. The TES[1] is calculated as:

**TES = PRODUCTION + IMPORTS - EXPORTS + STOCK CHANGES**

**CANADA TOTAL ENERGY SUPPLY,* BY SOURCE, 2023**




- Fossil fuels made up **76%** of Canada's TES in 2023.
- Renewable energy sources made up **16.5%** of Canada's TES in 2023.

Comparatively, the global TES is made up of

**81%** **Fossil fuel**
(oil **30%**, coal **28%**, natural gas **23%**)

**14%** **Renewables**

**5%** **Nuclear**

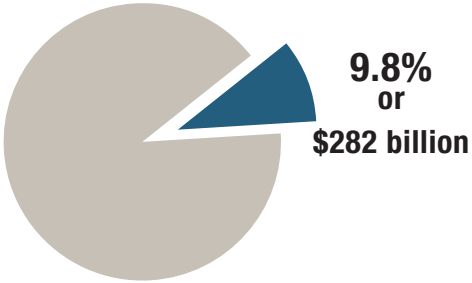
* not including electricity trade
**"Other renewables" includes wind, solar and geothermal.
[1] For the purposes of TES, electricity production is calculated by using the energy content of the electricity (i.e. at a rate of 1 TWh = 0.086 Mtoe), with the exception of nuclear electricity, which is calculated assuming a 33% conversion efficiency factor increase (i.e. 1 TWh = 0.086 ÷ 0.33 Mtoe).

# Economic Contributions

## NOMINAL GROSS DOMESTIC PRODUCT (2024)

### ENERGY'S NOMINAL GDP CONTRIBUTION FOR CANADA

**NOMINAL GDP (% OF CURRENT DOLLARS)**




**CANADIAN GDP**

**ENERGY DIRECT 8.1% ($232 billion)**

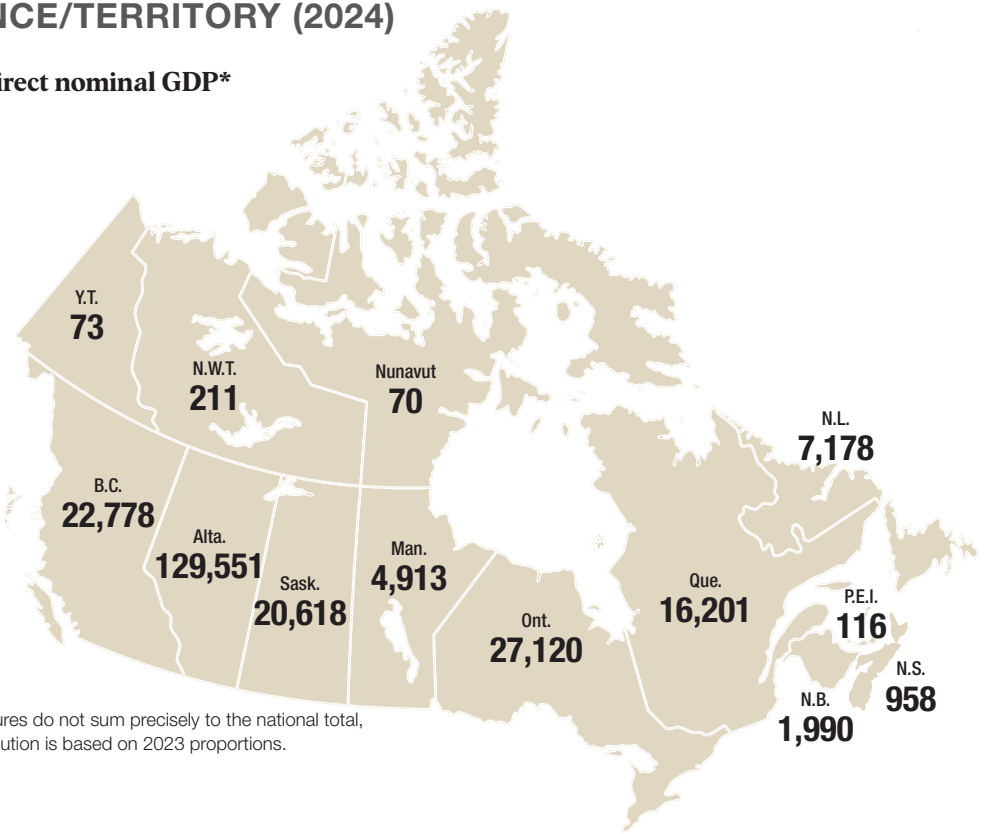
- PETROLEUM 6.0%
- ELECTRICITY 1.8%
- OTHER 0.3%

**ENERGY INDIRECT 1.7% ($50 billion)**

Parts may not sum to total due to rounding. For more information on the methodology used by Statistics Canada to estimate indirect contributions, please contact statcan.iadinfoddci-dciinfoiad.statcan@statcan.gc.ca.

# ENERGY'S NOMINAL GDP CONTRIBUTION BY PROVINCE/TERRITORY (2024)

**Energy sector direct nominal GDP***
**($ millions)**



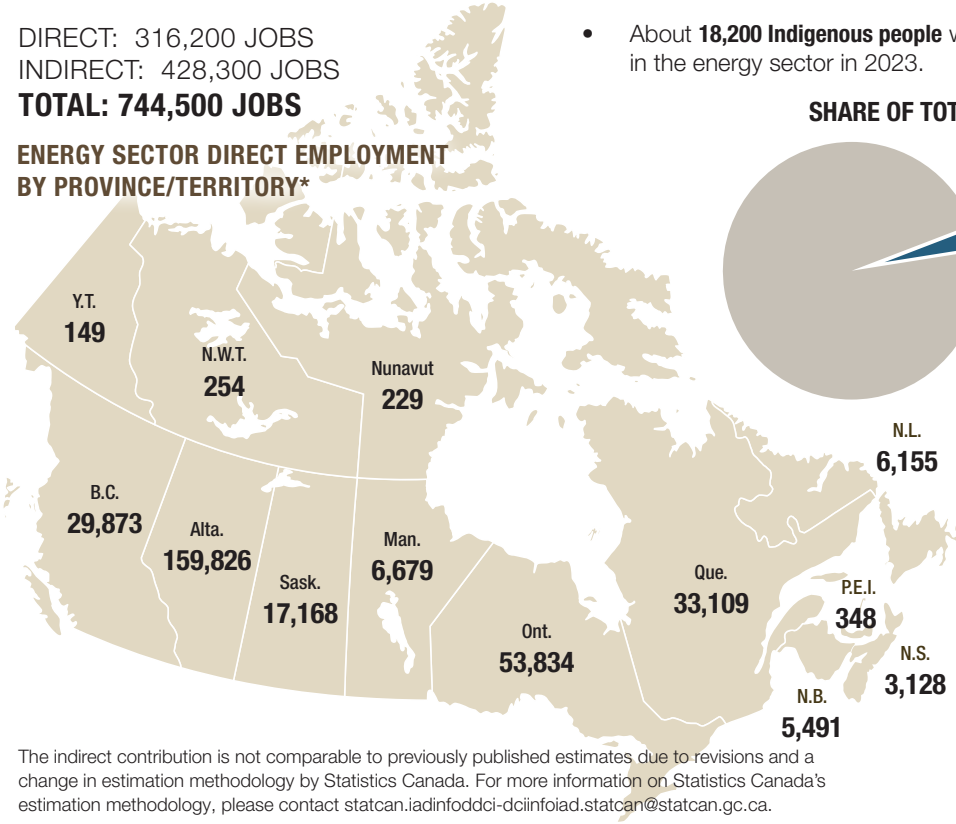

*Provincial/territorial figures do not sum precisely to the national total, due to rounding. Distribution is based on 2023 proportions.

# EMPLOYMENT IN CANADA'S ENERGY SECTOR (2024)

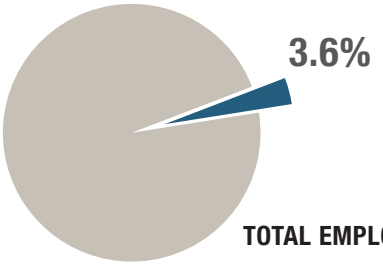
DIRECT: 316,200 JOBS
INDIRECT: 428,300 JOBS
**TOTAL: 744,500 JOBS**

- About **18,200 Indigenous people** were directly employed in the energy sector in 2023.

## ENERGY SECTOR DIRECT EMPLOYMENT BY PROVINCE/TERRITORY*




## SHARE OF TOTAL EMPLOYMENT, 2024



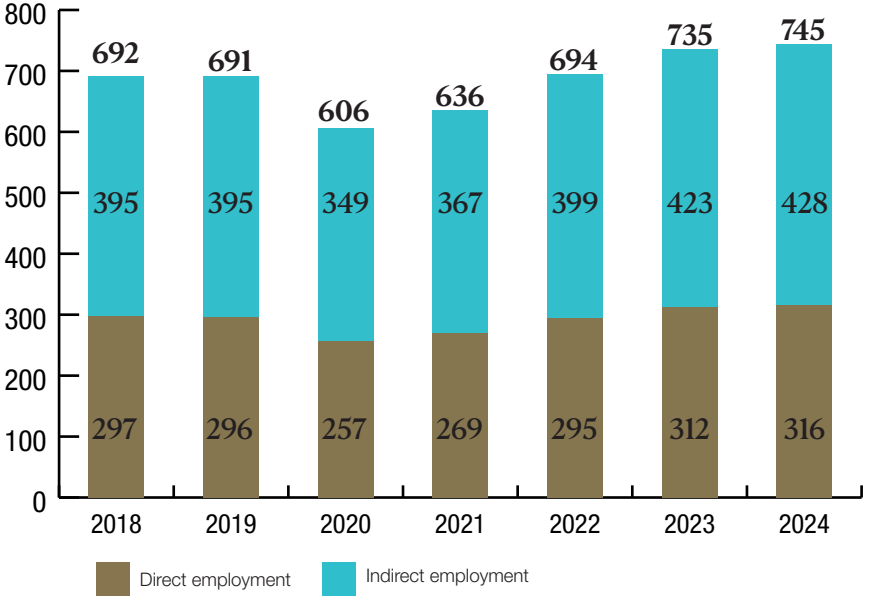

**TOTAL EMPLOYMENT**

**ENERGY DIRECT 1.5%**
PETROLEUM 0.9%
ELECTRICITY 0.5%
OTHER 0.1%

**ENERGY INDIRECT 2.1%**

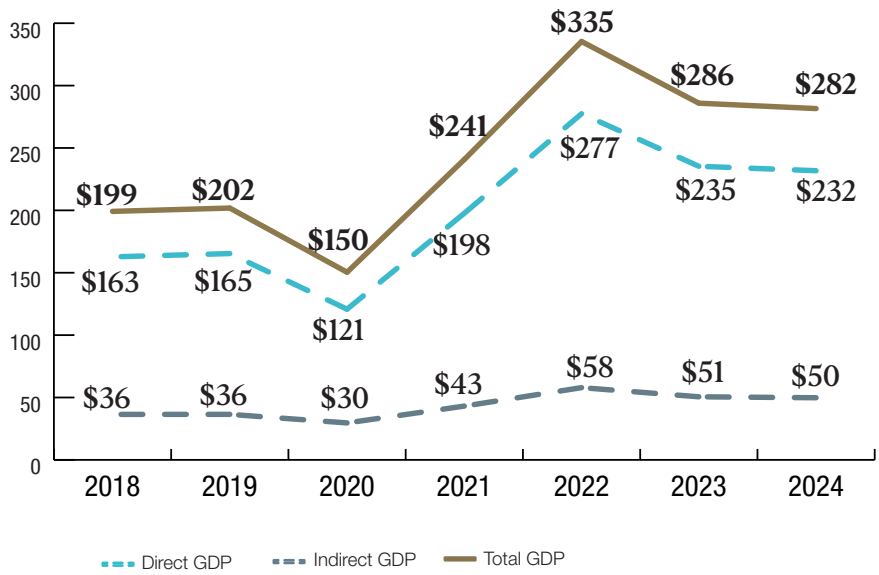
The indirect contribution is not comparable to previously published estimates due to revisions and a change in estimation methodology by Statistics Canada. For more information on Statistics Canada's estimation methodology, please contact statcan.iadinfoddci-dciinfoiad.statcan@statcan.gc.ca.

## ENERGY SECTOR EMPLOYMENT
## (Thousands of jobs)




Parts may not sum to total due to rounding. The indirect contribution is not comparable to previously published estimates due to revisions and a change in estimation methodology by Statistics Canada. For more information on Statistics Canada's estimation methodology, please contact statcan.iadinfoddci-dciinfoiad.statcan@statcan.gc.ca.

## ENERGY SECTOR GDP
## (Billions of dollars)




Parts may not sum to total due to rounding. The indirect contribution is not comparable to previously published estimates due to revisions and a change in estimation methodology by Statistics Canada. For more information on Statistics Canada's estimation methodology, please contact statcan.iadinfoddci-dciinfoiad.statcan@statcan.gc.ca.

## ENERGY TRADE (2024)

### Energy exports

**$208.2 billion**
representing

**29%**
of total Canadian goods exports

Oil and gas domestic exports totalled

**$188 billion**
of which

**94%** were to the U.S.

exported energy products to

**132**
countries

The U.S. accounts for

**89%**
of energy exports by value ($184.3 billion)

### Exports to the U.S.

Crude oil
Natural gas
Electricity
Coal

| % of Canadian exports destined for U.S. | % of Canadian production exported to U.S. | % of U.S. imports coming from Canada | % of U.S. consumption supplied by Canada |
|---|---|---|---|
| 96 | 86 | 62 | 24 |
| 100 | 47 | 99 | 9 |
| 100 | 8 | 85 | 1 |
| 2 | 2 | 40 | 0.2 |

Whereas over 99.9% of Canadian natural gas exports went to the U.S. in 2024, Canada began exporting material volumes of natural gas to countries beyond the U.S. in 2025.

## Energy imports

**$56.1 billion**
representing

**7%**
of total Canadian goods imports

imported energy products from

**122**
countries

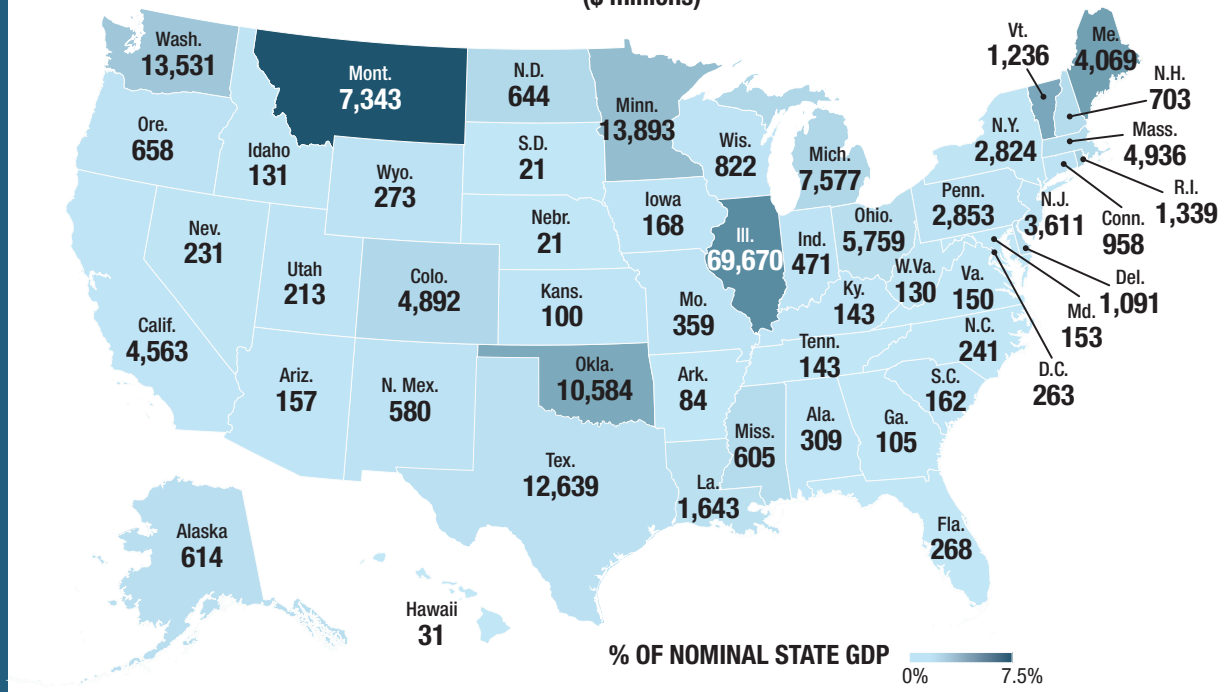
The U.S. accounts for

**79%**
of energy imports by value ($44 billion)

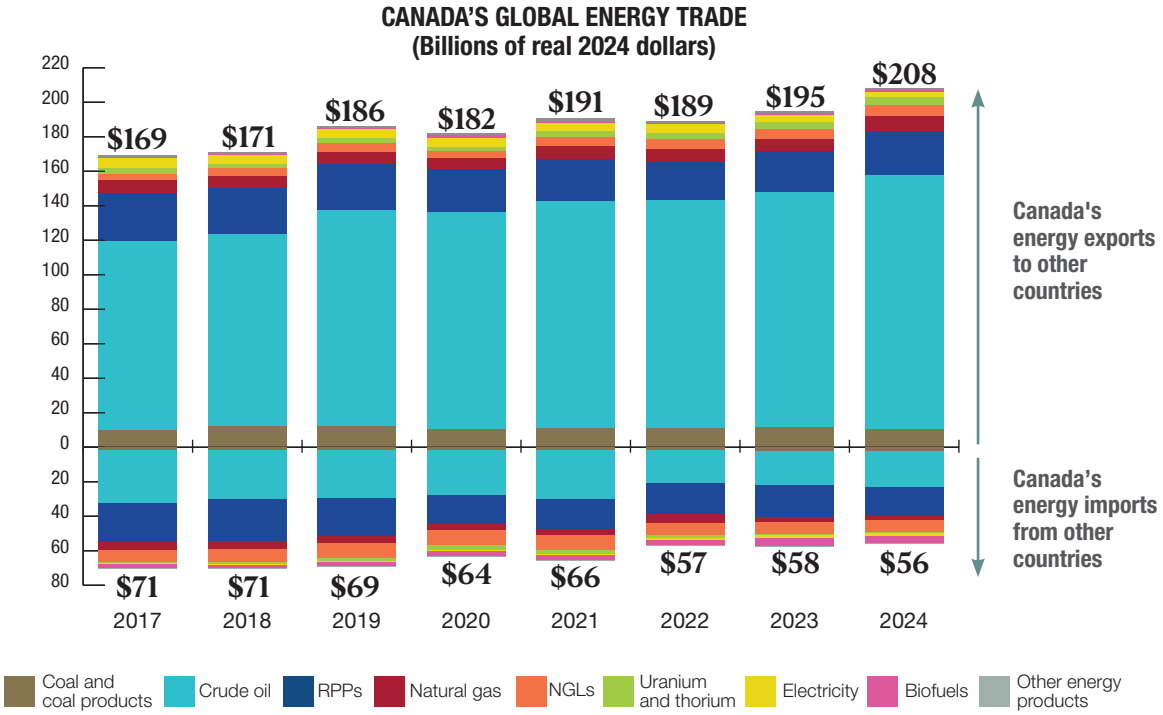
### Imports from the U.S.

| | % of Canadian imports originating from U.S. | % of U.S. exports destined for Canada | % of Canadian consumption supplied by U.S. |
|---|---|---|---|
| Crude oil | 76 | 10 | 23 |
| Natural gas | 98 | 13 | 16 |
| Electricity | 100 | 92 | 4 |
| Coal | 71 | 4 | 23 |

## CANADIAN ENERGY EXPORTS TO THE U.S. BY STATE (2024)
## ($ millions)




* All exports values in Canadian dollars. Values may not sum to U.S. total due to rounding and additional exports to overseas U.S. Territories.

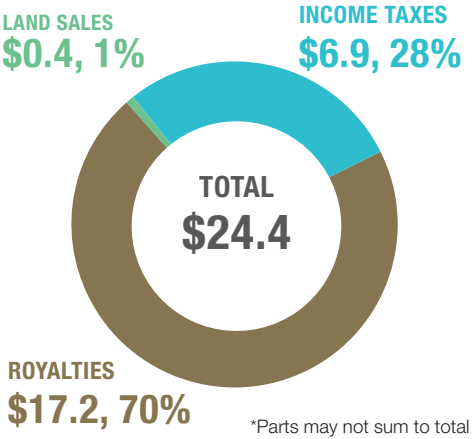



Despite energy price fluctuations, Canada's inflation-adjusted energy trade has remained resilient. From 2017 to 2024 Canada exported nearly **$1.5 trillion** in energy products while importing over **$500 billion**.

# GOVERNMENT REVENUES

Federal and provincial/territorial governments in Canada receive direct revenues from energy industries through corporate income taxes, crown royalties, which are the share of the value of oil and gas extracted that is paid to the Crown as the resource owner, and crown land sales, which are paid to the Crown in order to acquire the resource use for specific properties.

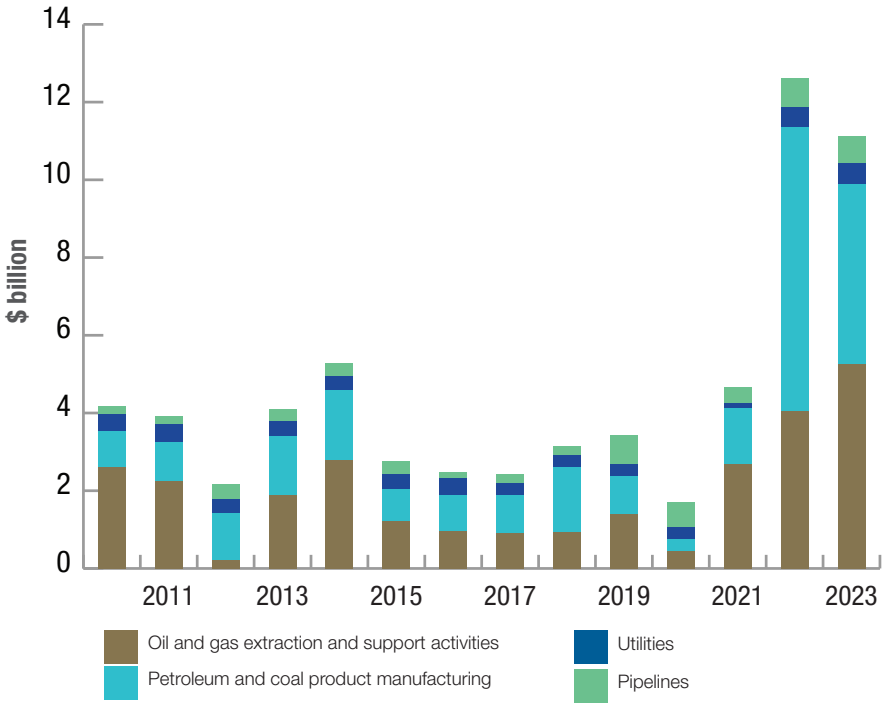
**GOVERNMENT ENERGY REVENUE, 2019-2023 AVERAGE ($ BILLIONS)**



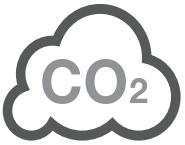

*Parts may not sum to total due to rounding.

- An important share of government revenues is collected from the petroleum sector, which averaged **$24 billion** over the last five years, including **$20 billion** from upstream oil and gas extraction and its support activities.
- Between 2019 and 2023, the energy sector's share of taxes paid by all industries was **8.0%**. Operating revenues of the energy sector represented **9.1%** of all operating revenues earned by industries in Canada.

## CORPORATE INCOME TAXES PAID BY ENERGY INDUSTRIES
## (Federal and Provincial)



# Energy and GHG Emissions




In 2022,

**78%**

of global GHG emissions from human activity were from the production and consumption of energy.

This includes activities such as using gasoline for transportation, fossil fuel-fired electricity generation, oil and gas production, and heating and cooling buildings.

In Canada, **about 81%** of emissions come from energy. Canadians use more energy because of our extreme temperatures, vast landscape and dispersed population.

The challenges of transitioning to a lower-carbon energy system are numerous, but they also present opportunities for Canada to be a global leader by supporting innovative technologies in the energy sector, including promoting our growing renewables and cleantech sectors.

Since 2000, there has been a decoupling between the growth of Canada's economy and GHG emissions, largely because of technological improvements, regulations, and more efficient practices and equipment.

In 2023, emissions increased slightly as economic activity continued to recover from the impacts of the COVID-19 pandemic, with 2023 emissions 53 Mt lower than in 2019 (-7.1%).

**Between 2000 and 2023, Canada's GHG emissions decreased by**

**7%**

**while GDP increased**

**56%**

**GHG emissions decreased**

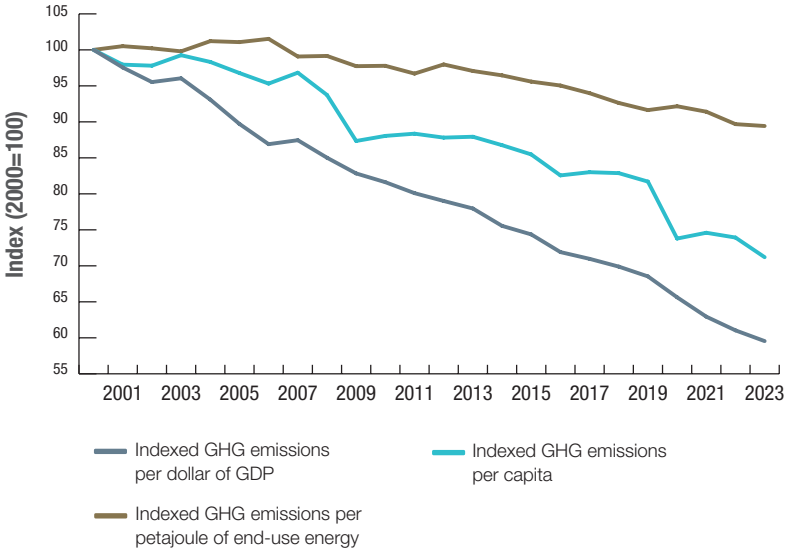
**39%**

**per dollar of GDP and**

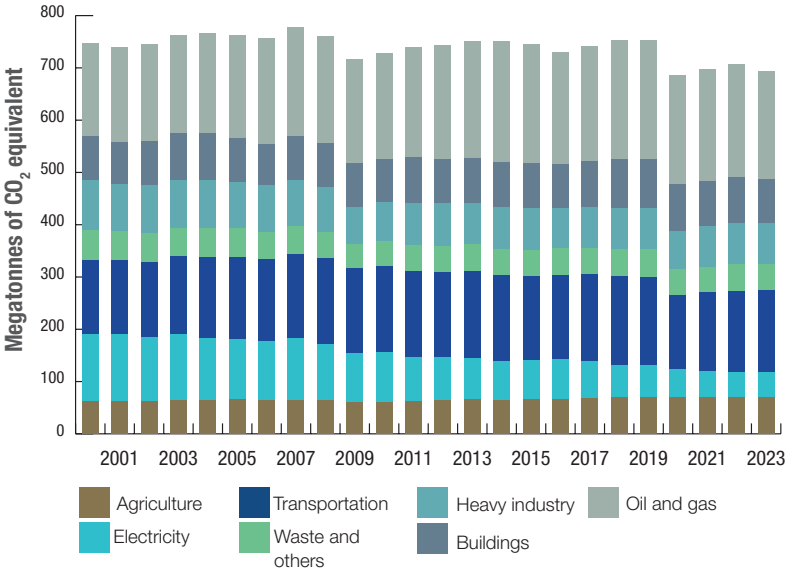
**26.1%**

**per capita.**

**INDEXED TREND IN GHG EMISSIONS PER PERSON, PER UNIT OF GDP AND PER UNIT OF ENERGY CONSUMED, 2000–2023**



## GHG EMISSIONS BY CANADIAN ECONOMIC SECTOR, 2000–2023




- Between 2000 and 2023, **emissions from electricity production decreased 62%**, largely because of Ontario's successful coal phase-out action plan, which started in 2001.
- **Emissions from oil and gas production increased 16%** largely due to an increase of 67% in production.
- **Emissions from heavy industry have decreased by 19%** despite an increase in output of the industrial sector. This is due in part to improvements in energy efficiency and fuel switching.

# CANADA'S ENERGY INFORMATION LANDSCAPE

Canadian energy data is produced by a diverse range of entities. Established in 2020, the **Canadian Centre for Energy Information (CCEI)** works to consolidate and enhance the quality and accessibility of Canadian energy data.

## FEDERAL GOVERNMENT

- Statistics Canada
- Natural Resources Canada
- Canada Energy Regulator
- Environment and Climate Change Canada

## PROVINCES & TERRITORIES

- Provincial and territorial governments
- Energy regulators
- Public utilities and system operators

## INDUSTRY

- Energy producers
- Infrastructure companies
- Industry associations

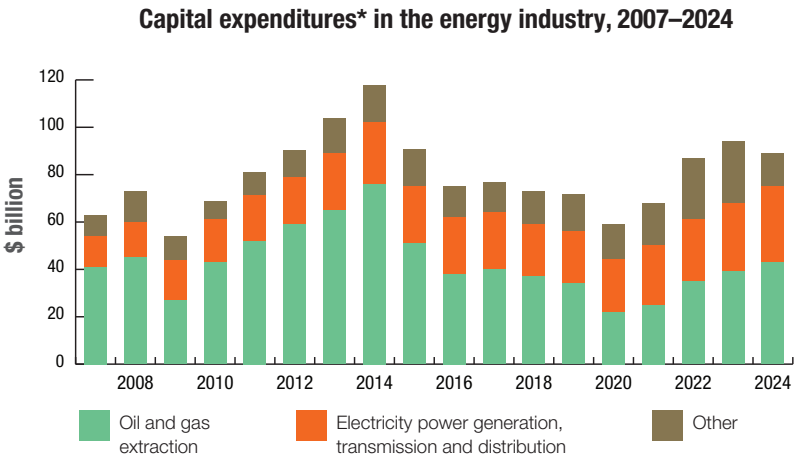
## RESEARCHERS

- Universities and scientific institutions
- Independent research organizations
- Collaborative research networks

# Section 2: **Investment**

Capital expenditures
Energy infrastructure and major projects
FDI and investment abroad
Energy assets
RD&D
Environmental protection expenditures

# Capital Expenditures

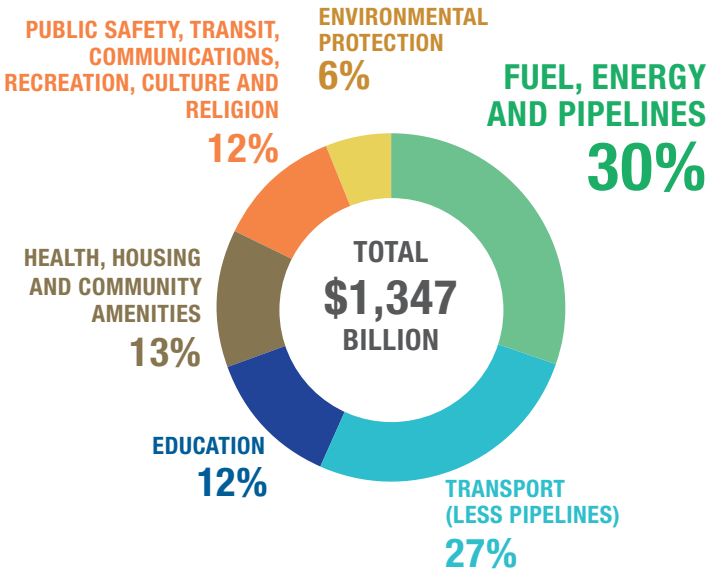



- Capital expenditures in Canada's energy sector totaled **$89 billion** in 2024, a decrease of 24% from a peak in 2014.
- After reaching an eleven year low of **$59 billion** in 2020, investment has rebounded by **51%**.
- Oil and gas extraction was the largest area of energy sector capital expenditure at **$43 billion** in 2024, followed by electrical power generation and distribution ($32 billion).

*Excludes residential expenditures and intellectual property investments such as exploration expenses. Includes investments in renewable electricity, does not capture other forms of renewable energy.

# Canada's Energy Infrastructure

**Fuel, energy and pipeline infrastructure** made up the largest proportion of Canada's infrastructure at **30%** of net stock in 2024.




**Statistics Canada defines infrastructure as:**

> "the physical structures and systems that support the production of goods and services and their delivery to and consumption by governments, businesses and citizens."

Fuel, energy and pipeline infrastructure includes electric power infrastructure like wind and solar, hydro, nuclear, and thermal generation, power transmission and distribution lines and oil and gas pipelines.

## FUEL, ENERGY AND PIPELINE INFRASTRUCTURE INVESTMENT AND OPERATIONS

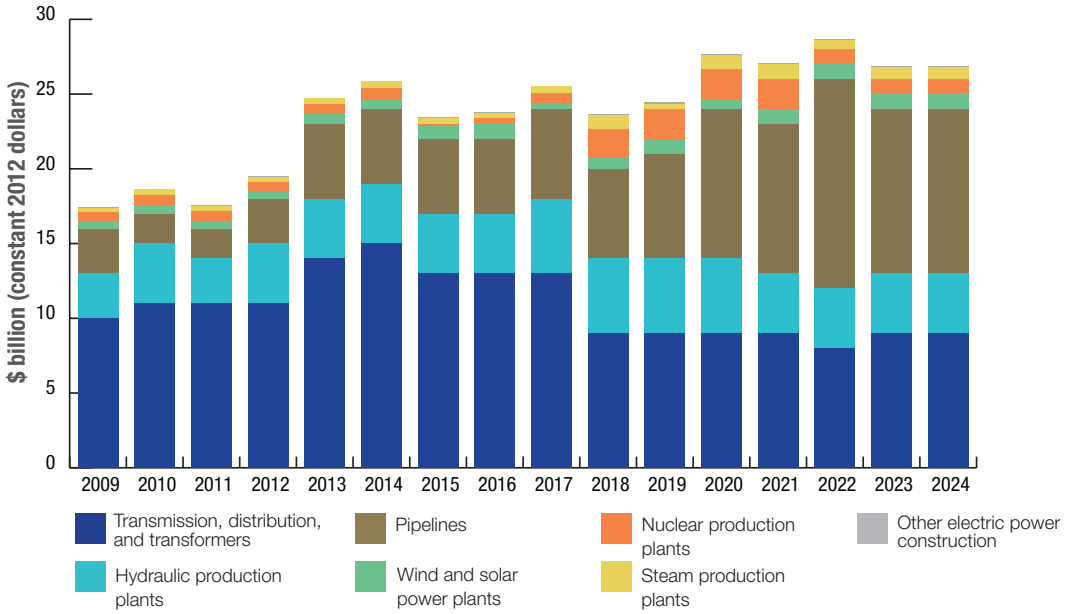
**supported**
**176.1 k jobs**

**generated $15.7 billion**
**in employment income**

and **$28.5 billion**
**in GDP**
**in 2024**
(direct and indirect contributions).

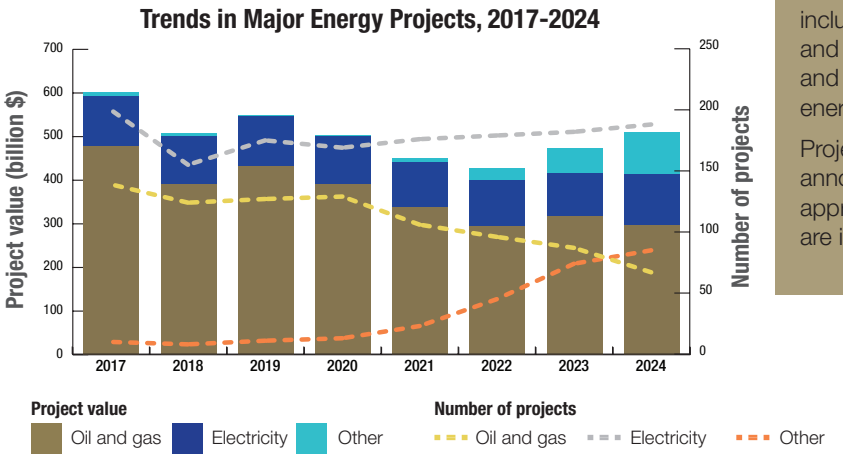
Public and private investment in fuel, energy and pipeline infrastructure in 2024 was **$37.2 billion** (nominal).

## Public and private investment in fuel, energy and pipeline infrastructure, 2009–2024



# Canada's Major Energy Projects

- In 2024, there were 231 planned (announced, under review, or approved) energy projects worth **$351B**, and 109 energy projects under construction worth **$159B**.
- Oil and gas sector projects accounted for the largest portion of project value ($296B), while there were more electricity projects overall (188).
- There were **215 clean technology projects** valued at **$194B**.




Natural Resources Canada's Major Projects Inventory captures information on major natural resource projects in Canada that are either currently under construction or planned in the next 10 years.

Minimum capital thresholds for inclusion are: **$50 million** for oil and gas, **$20 million** for electricity, and **$10 million** for other clean energy or technology projects.

Projects that are either announced, under review, approved and under construction are included.

# CLEAN TECHNOLOGY PROJECT TRENDS 2018-2024

| | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|---|---|
| **Total Clean Technology Projects** | **144 projects ($109.5B)** | **151 projects ($99.3B)** | **159 projects ($99.4B)** | **178 projects ($104B)** | **197 projects ($118B)** | **233 projects ($157.4B)** | **215 projects ($194.2B)** |
| **Hydro** | 65 projects ($48.2B) | 70 projects ($50.0B) | 61 projects ($52.0B) | 58 projects ($39.2B) | 63 projects ($44.8B) | 78 projects ($37.4B) | 58 projects ($30.4B) |
| **Wind** | 27 projects ($9.1B) | 31 projects ($9.4B) | 36 projects ($8.3B) | 41 projects ($14.6B) | 35 projects ($13.4B) | 32 projects ($12.4B) | 33 projects ($26.8B) |
| **Biomass/Biofuels** | 33 projects ($6.4B) | 32 projects ($3.0B) | 29 projects ($4.6B) | 31 projects ($8.0B) | 35 proejcts ($9.4B) | 47 projects ($14.3B) | 41 projects ($12.6B) |
| **Solar** | 7 projects ($0.9B) | 6 projects ($0.7B) | 13 projects ($1.4B) | 22 projects ($2.2B) | 30 projects ($3.0B) | 31 projects ($6.2B) | 36 projects ($8.8B) |
| **Nuclear** | 5 projects ($28.5B) | 5 projects ($28.5B) | 3 projects ($26.1B) | 4 projects ($27.4B) | 3 projects ($26.1B) | 2 projects ($25.8B) | 3 projects ($51.8B) |
| **Carbon Capture and Storage** | 3 projects ($16.3B) | 2 projects ($7.2B) | 1 project ($6.0B) | 2 projects ($11.3B) | 6 projects ($15.5B) | 9 projects ($38.3B) | 8 projects ($38.3B) |
| **Geothermal** | 1 project ($0.0B) | 2 projects ($0.2B) | 3 projects ($0.3B) | 5 projects ($0.4B) | 4 projects ($0.4B) | 4 projects ($0.4B) | 4 projects ($0.4B) |
| **Tidal** | 0 project ($0.0B) | 1 project ($0.1B) | 6 projects ($0.3B) | 6 projects ($0.3B) | 7 projects ($0.4B) | 7 projects ($0.4B) | 4 projects ($0.2B) |
| **Multiple[1]** | 0 project ($0.0B) | 0 project ($0.0B) | 0 project ($0.0B) | 1 project ($0.03B) | 1 project ($0.03B) | 1 project ($0.03B) | 1 project ($0.03B) |
| **Other[2]** | 3 projects ($0.1B) | 2 projects ($0.1B) | 7 projects ($0.4B) | 8 projects ($0.5B) | 13 projects ($5.3B) | 22 projects ($22.1B) | 25 projects ($23.8B) |

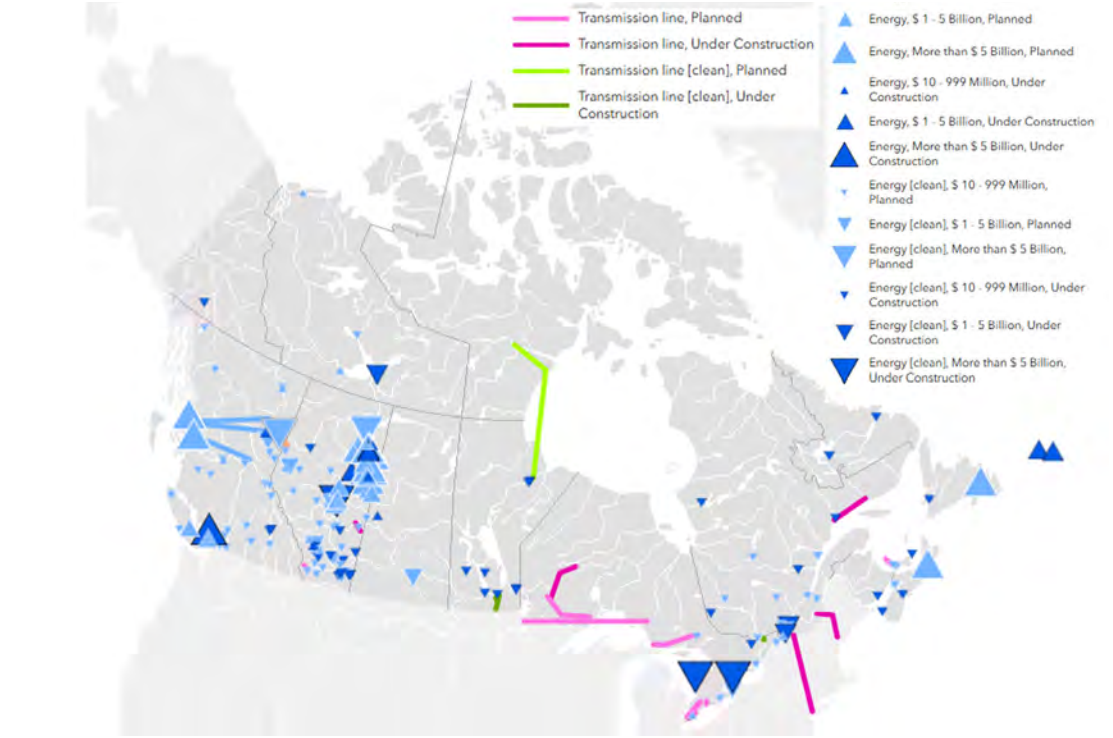
Certain values in 2023 have been revised due to updated data.

[1] The Haida Gwaii Clean Energy Project is a multi-phased project consisting of hydro and solar sites.

[2] "Other" includes novel initiatives such as micro-grid projects, battery storage projects, bioplastics, and a helium purification plant.

# MAJOR ENERGY PROJECTS

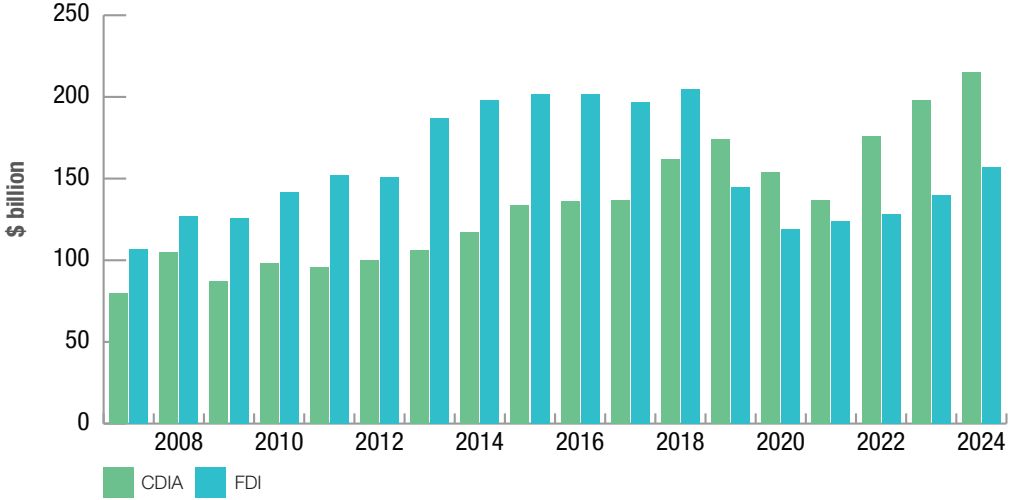
## PLANNED AND UNDER CONSTRUCTION, 2024-2034



# INTERNATIONAL INVESTMENTS AND INVESTORS

Canada's energy industries operate in free markets, where investments by both Canadian and foreign companies ensure an efficient, competitive and innovative energy system.

**Stock of foreign direct investment (FDI)* in Canada and Canadian direct investment abroad (CDIA) in the energy industry**




* Direct investment is defined as a company owning a minimum of 10% of voting equity interest in a foreign enterprise and is measured as the total equity value at the time of acquisition. Excludes residential expenditures and intellectual property investments such as exploration expenses.

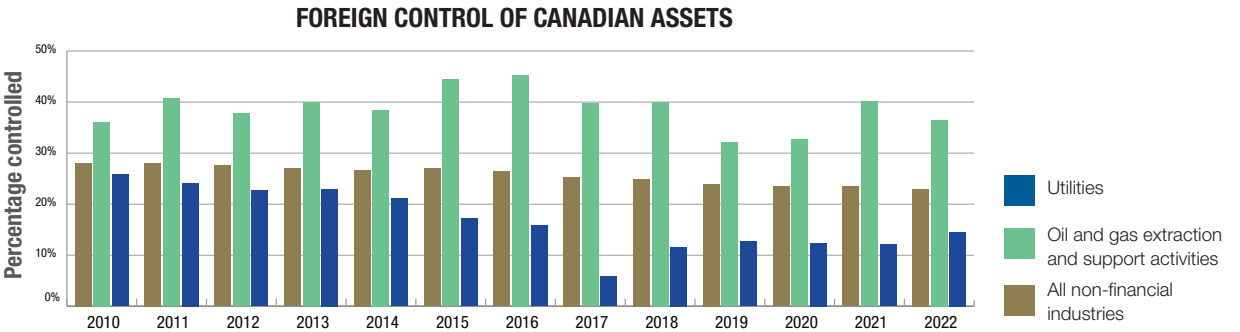
FDI and CDIA include investments in renewable electricity, do not capture other forms of renewable energy.

# Stock of Foreign Direct Investment in Canada and Canadian Direct Investment Abroad

- The stock of **foreign direct investment** (FDI) in the energy sector rose in 2024 to **$157 billion** (+12.4% over the previous year).
- The energy industry's share of overall FDI in Canada was **10%** in 2024, same as in 2023.
- The stock of **Canadian direct investment abroad** (CDIA) was valued at **$215 billion** in 2024, up 8% from 2023.
- Investment in oil and gas extraction accounted for **$36 billion** of the CDIA stock in 2024.

## FOREIGN CONTROL OF CANADIAN ASSETS

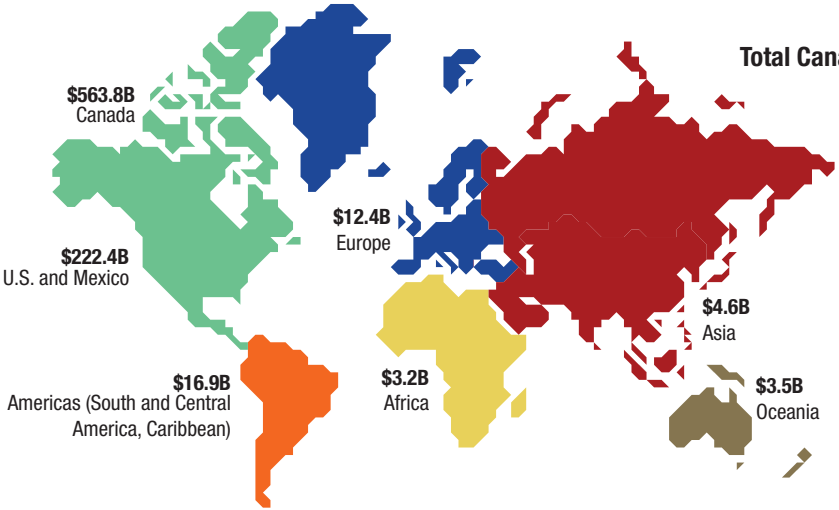
Foreign control is a measure of the extent to which foreign entities operate in Canada. Generally, a corporation is deemed to be foreign-controlled if **more than 50%** of its shares are owned by one or more foreign companies.



# Canadian Energy Assets

The total value of Canadian* energy assets (CEA) went up in 2023 to **$827 billion**, an increase of **9.4%** from **$756 billion** in 2022. In 2023, domestic CEA totaled **$564 billion, up 12.9%** from 2022, while CEA abroad totaled **$263 billion**, up from **$256 billion**.

**CANADIAN ENERGY ASSETS BY REGION, 2023**




**Total Canadian energy assets**

**$827B**

**Total Canadian energy assets abroad**

**$263B**

* A Canadian company is here defined as a publicly traded company headquartered in Canada and not foreign-controlled.

# Research, Development and Demonstration

## CANADIAN TOTAL EXPENDITURES ON ENERGY RD&D

In 2023-24, federal energy RD&D expenditures were $1,464M and provincial and territorial (P&T) government energy RD&D expenditures were $396M, for a combined total of $1,860M.

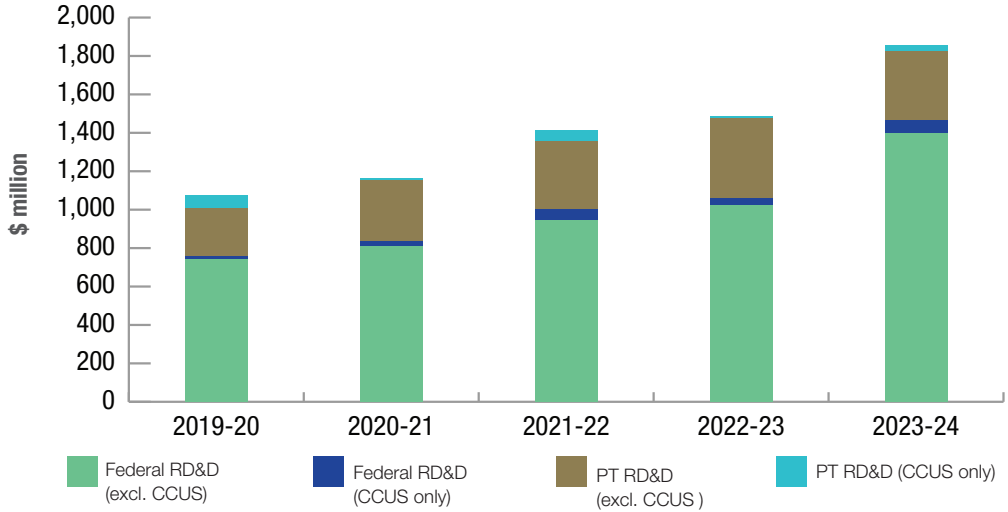
In 2023-24, federal spending increased by **38% ($404M) compared to 2022-23**. Energy efficiency contributed significantly to the total federal spending (46%), doubling its investment in 2023-24 (668M) compared to 2022-23 (385M).

Canada has made international commitments to advance federal energy RD&D expenditures - including through Mission Innovation (MI) and through Canada's 2022 commitment of **$2B** in pre-allocated money to the Clean Energy Technologies Demonstration Challenge, mobilizing public investments internationally for clean energy demonstrations by 2026. Now at the mid-point of this commitment, federal demonstration investments from 2021-22 to 2023-24 have totalled **$1.38B** and remain on track to meet the 2026 commitment.


In 2023-24, P&T spending decreased by **7% (a $29M decrease)** due mostly to fossil fuels (excluding CCUS) and renewables. CCUS had a significant increase by **$22M to $31M** in 2023-24, compared to $9M in 2022-23. Similarly, energy efficiency had an increase by **$22M to $142M** in 2023-24, compared to **$120M** in 2022-23.

Canadian industry spent about **$2.7B** on energy R&D in 2022, an increase from the spending reported in 2021 **($2.3B)**.

## CANADIAN PUBLIC EXPENDITURES ON ENERGY RD&D




* Provincial and territorial (P/T) includes utilities and other publicly owned entities (i.e. State-Owned Entities).

Generally, federal and provincial/territorial energy RD&D spending continues to increase with significant and steady federal contributions. In 2023-24, combined federal, provincial/territorial CCUS spending increased, similar to the combined spending in 2019-20.

## EXPENDITURES ON ENERGY RD&D BY TECHNOLOGY AREA ($ MILLIONS)

| | Federal (2023-24) | Provincial and territorial (2023-24) | Industry (2022) |
|---|---|---|---|
| Hydrocarbons (including CCUS) | 138 | 57 | 998 |
| Renewable and non-emitting energy** | 576 | 138 | 803 |
| Energy end use*** | 751 | 201 | 896 |
| Total* | 1,464 | 396 | 2,697 |

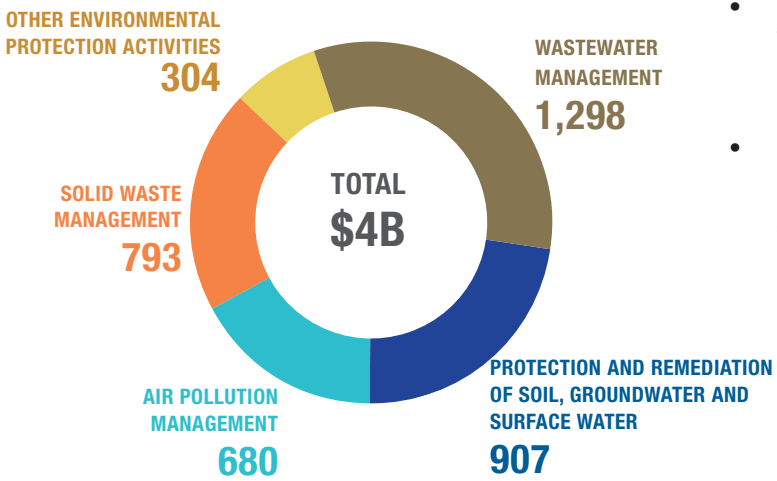
* Totals may not be exact due to rounding.
** Renewable and non-emitting energy includes renewable and nuclear energy.
*** Energy end use includes energy efficiency related to transport, industry and buildings & communities.
Note: Latest data for industry spending was not available at the time of this publication.

# Environmental Protection Expenditures

Environmental protection expenditures (operating and capital spending combined) by the energy sector totalled **$5.1 billion** in 2022, representing **43%** of expenditures made by all industries.

The oil and gas sector ($4 billion) accounts for the largest share of those expenditures, at 34% of total environmental protection expenditures made by all industries.

**OIL AND GAS EXTRACTION EXPENDITURES PER ENVIRONMENTAL ACTIVITY (2022, $ MILLIONS)**




- Electric power generation, transmission and distribution invested **$659 million** on environmental protection measures.
- Petroleum and coal product manufacturing invested **$426 million** in environmental protection activities, with the largest percentage of spending (95%) in pollution abatement and control.

# Section 3:
# **Skills, Diversity and Community**

Energy sector demographics
Energy affordability
Energy reliant communities

# Energy Sector Demographics (2023)

**Women** held **24%** of energy sector jobs.

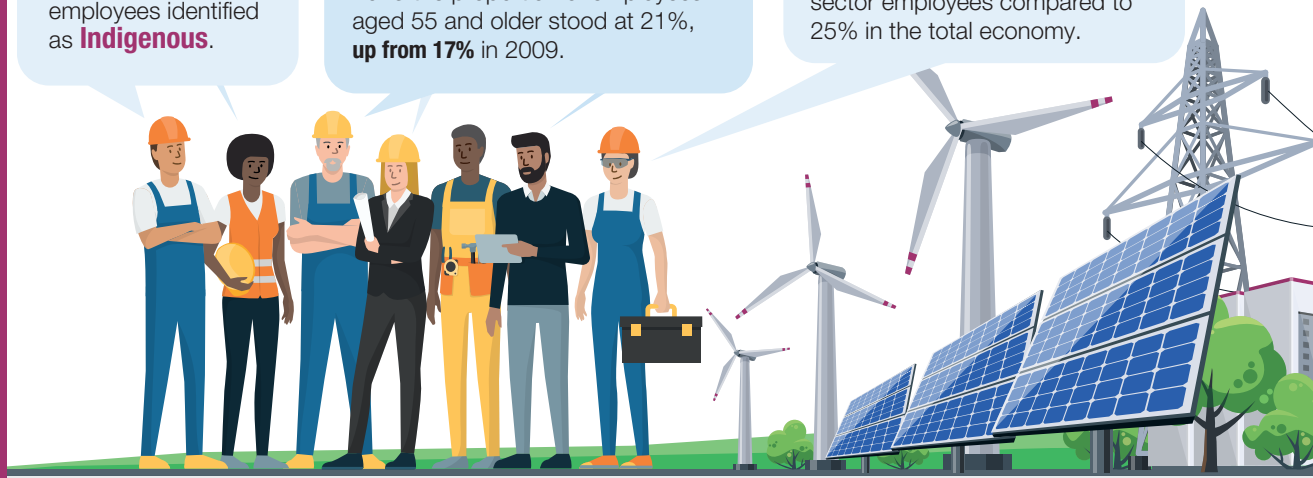
**Nearly three-quarters (75%)** of employees in the energy sector had more than a high school education and **57%** of workers had a **college diploma or university degree**.

Since 2009, the workforce in the energy sector has become **increasingly diverse**. In 2023, **21%** of the workforce identified as members of a visible minority group, up from **17%** in 2009.

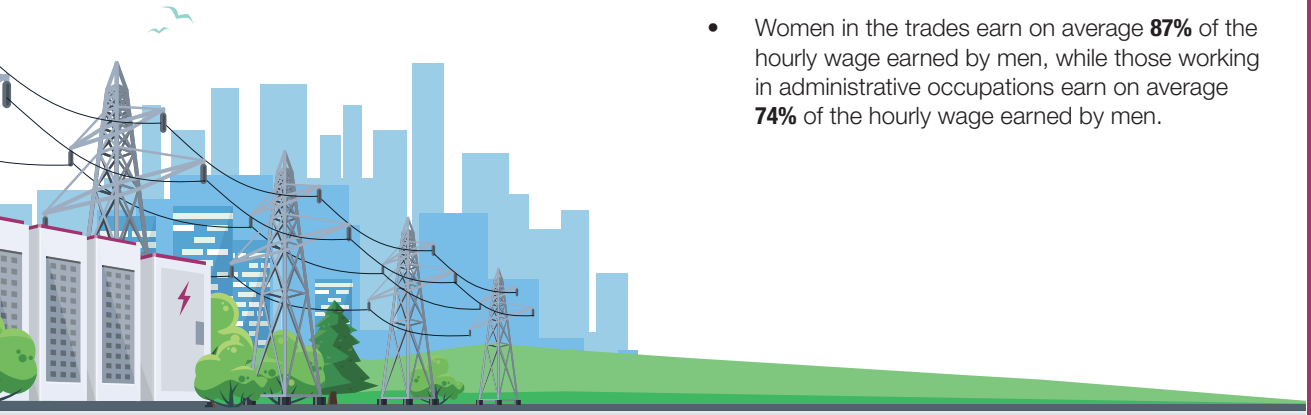
**6%** of energy sector employees identified as **Indigenous**.

The workforce in the energy sector has been **aging over time**. In 2023 the proportion of employees aged 55 and older stood at 21%, **up from 17%** in 2009.

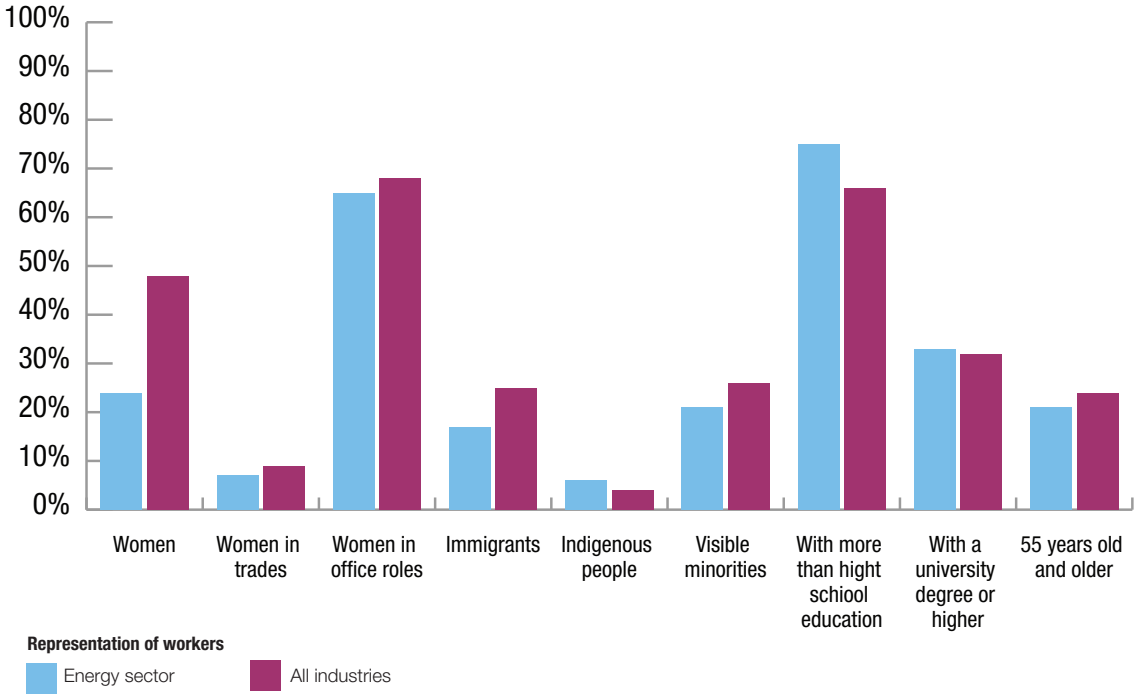
**Immigrant workers** represented **17%** of energy sector employees compared to 25% in the total economy.



- Energy sector jobs paid an average of **$129,498** per year, while the average Canadian job paid **$62,459**.
- The **gender wage gap** closed slightly in the energy sector in 2023, with women earning on average **85%** of the hourly wage earned by men. In contrast, in 2009, women earned on average **75%** of the hourly wages earned by men.
- Jobs requiring a **university degree** had the highest average compensation, reaching **$158,593**.
- Among **occupation types**, women in the energy sector are highly represented in office roles (administrative, general office worker, and auditor accountants and investment professionals) at **65%** of these occupations. Men are highly represented in trades (holding **93%** of these occupations).
- Women in the trades earn on average **87%** of the hourly wage earned by men, while those working in administrative occupations earn on average **74%** of the hourly wage earned by men.



## Representation of demographic groups in the energy sector compared to all industries

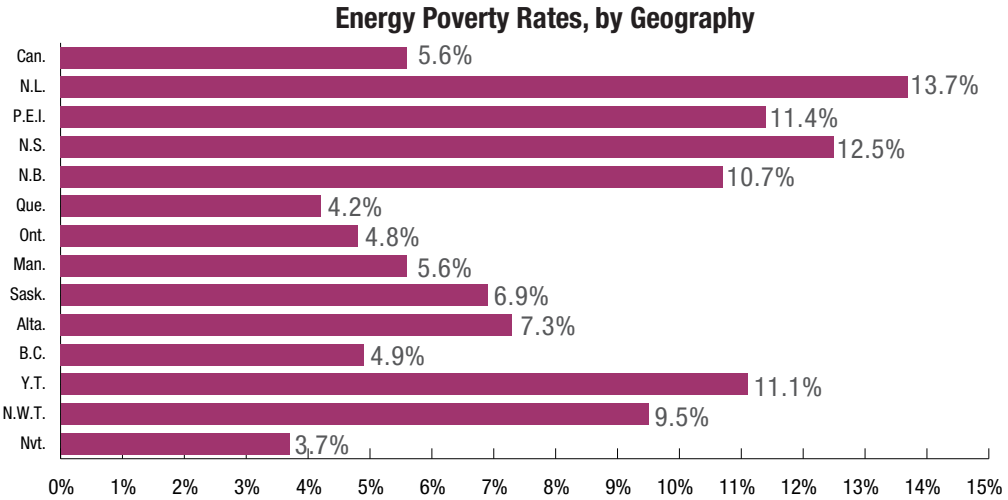


# Energy Affordability

In 2023, in-home energy expenditure by Canadian households averaged **$2,376**. This represented 3% of the average disposable income.

When households spend 10% or more of their income on energy needs, this is referred to as **energy poverty**.

Overall, 5.6% of Canadian households spent 10% or more of their income on energy. This share varies considerably across regions and income levels.




Energy poverty rates are based on the number of energy poor households divided by total households.

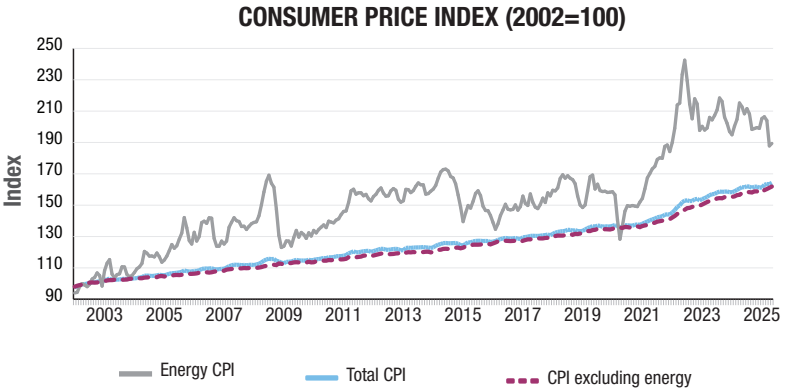
Energy, in this context, includes what is needed inside the home (i.e. space heating, appliances), and excludes transportation.

## HOUSEHOLD EXPENDITURES ON ENERGY

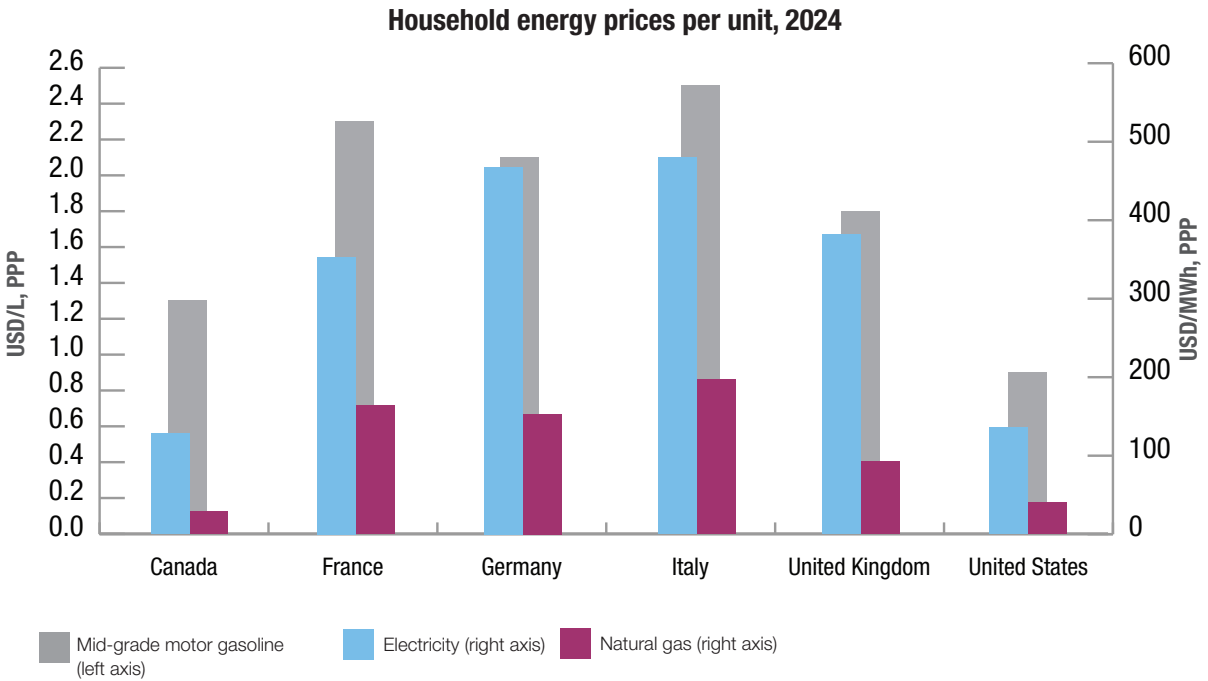
- Canadian households spent **$4,943** on average on energy in 2023.
- Residential expenditures, including for heating/cooling spaces, lighting and operating appliances, averaged **$2,376**.
- Expenditures on fuels for vehicles and tools averaged **$2,567**.
- Energy accounted for **6.4%** of household spending after income taxes, pension contributions, and other deductions. Lower-income households spend a larger share of their disposable income on energy.

## ENERGY RETAIL PRICES

- The “energy” component of the consumer price index (CPI) has been volatile in recent years and has grown much faster than the non-energy component.
- This volatility reflects mostly the variations of upstream oil and gas prices and their impact on consumer products such as gasoline.



## IN COMPARISON WITH OTHER DEVELOPED ECONOMIES, CANADA'S ENERGY PRICES ARE RELATIVELY LOW.

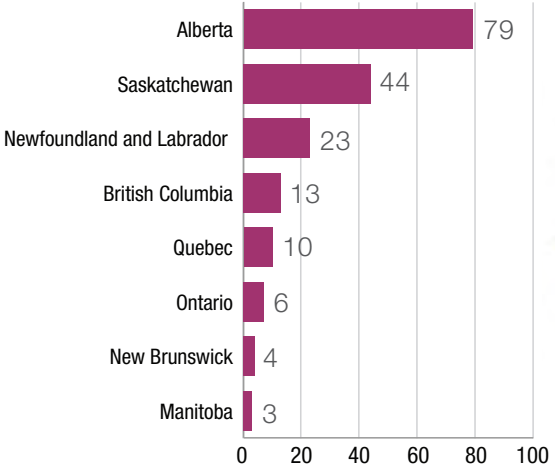


# Energy Reliant Communities

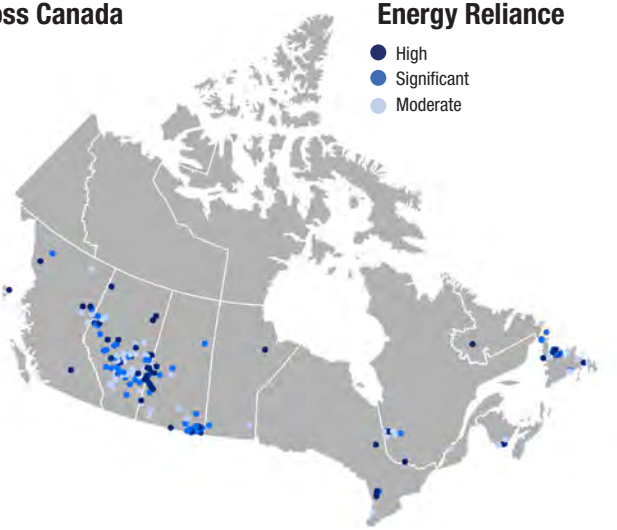
A community that has a higher share of employment from a specific sector, a relatively high share of total income from that sector, and relatively low sectoral diversity in their economy compared to the average Canadian community can be described as reliant on that sector.

There are **182 communities across Canada that are at least moderately reliant** on the energy sector. Of these communities, **80% are rural or remote**.

**Distribution of energy reliant communities across Canada**




**Energy Reliance**




# Section 4:
# **Energy Efficiency**

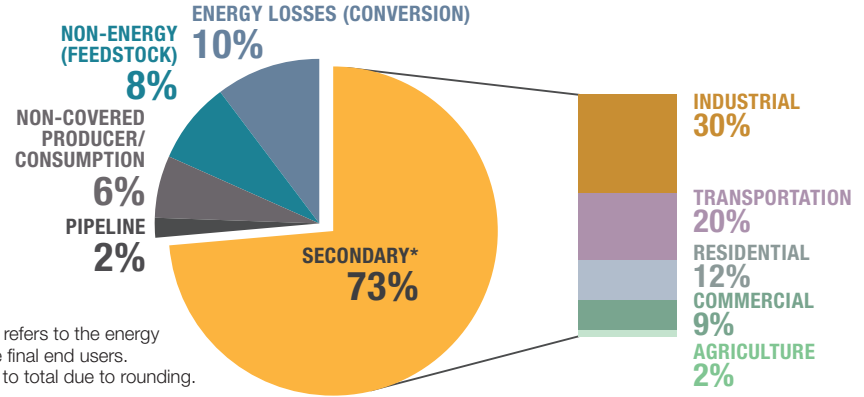
Energy use
Efficiency trends

# Energy use

## PRIMARY AND SECONDARY ENERGY USE BY SECTOR (2022)

- Primary energy use measures the total energy requirements of all energy users.
- Secondary energy use accounts for the energy used by final consumers in the economy.
- Primary energy use includes secondary energy use. Additionally, primary energy use includes the energy required to transform one form of energy into another (e.g. coal to electricity); the energy used to bring energy supplies to the consumer (e.g. pipeline); and the energy used to feed industrial production processes (e.g. the natural gas used as feedstock by the chemical industries).
- Not every fuel is consumed as energy. For example, hydrocarbon gas liquids in Canada are also used as a non-energy feedstock in the petrochemical industry.
- Canada's primary energy consumed was estimated at **12,673 PJ**.

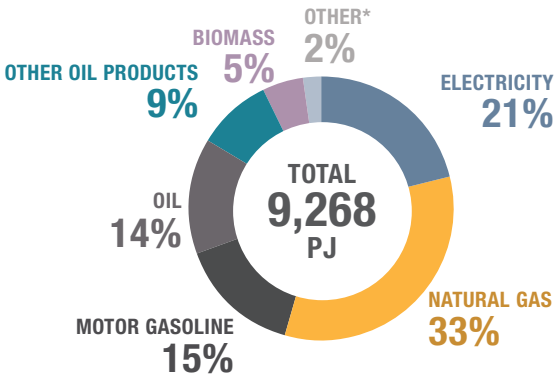
**PRIMARY AND SECONDARY ENERGY USE BY SECTOR, 2022**




*Secondary energy refers to the energy used directly by the final end users.
Parts may not sum to total due to rounding.

- Secondary energy use includes the energy used to run vehicles; the energy used to heat and cool buildings; and the energy required to run machinery.
- Canada's secondary energy use in 2022 was **9,268 PJ**.
- Total secondary energy use **increased 15%** from 2000 to 2022. Natural gas usage grew by **44%** while electricity usage increased 17%, during the same period.

**CANADA'S SECONDARY ENERGY USE BY FUEL TYPE, 2022**

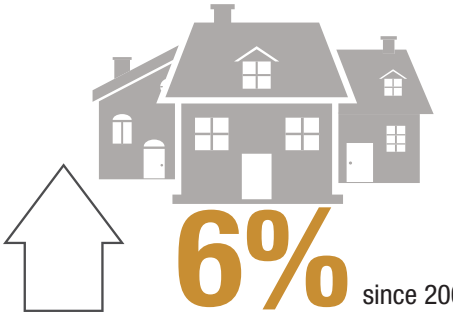



* "Other" includes coal, coke, coke oven gas, NGLs and steam and waste. Parts may not sum to total due to rounding.

## ENERGY IN OUR DAILY LIVES

- Canadian households use energy every day – to power lights and appliances, heat or cool spaces, run personal vehicles, recharge electronics and more.
- **78%** of residential energy consumption is used for space and water heating.
- Residential energy efficiency improved by **35%** between 2000 and 2022, **saving 482 PJ** of energy and **$11.4 billion in energy costs**.

**Residential energy use increased**



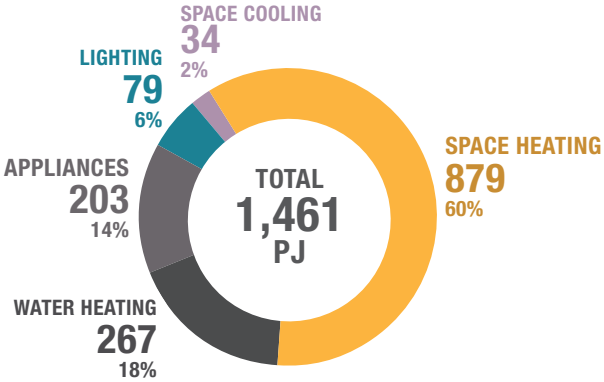
**6%** since 2000,

**but would have increased by**

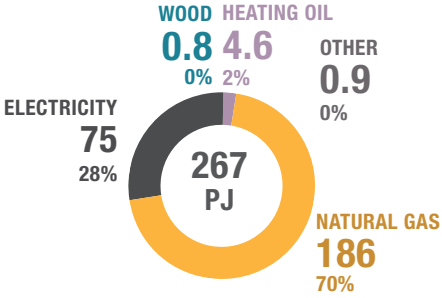
**40%**

without energy efficiency improvements.

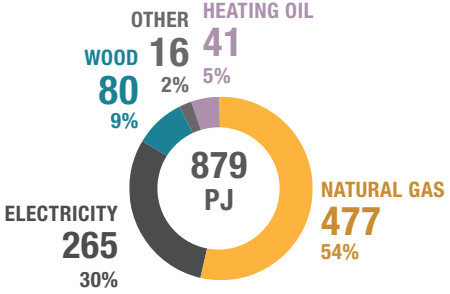
## RESIDENTIAL ENERGY USE, BY TYPE (PJ), 2022




## WATER-HEATING ENERGY USE (PJ), 2022

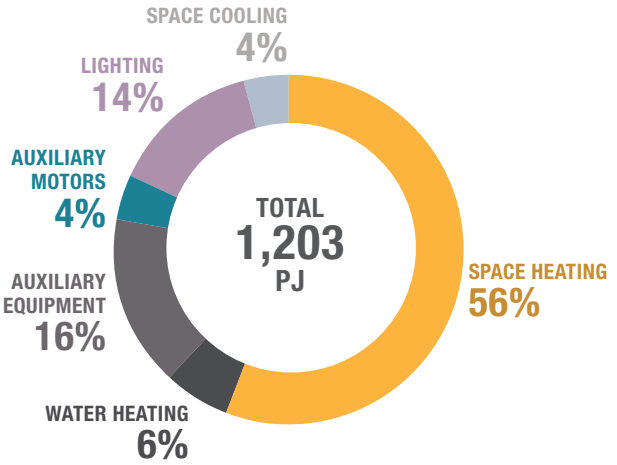



## SPACE-HEATING ENERGY USE (PJ), 2022




Parts may not sum to total due to rounding.

## COMMERCIAL AND INSTITUTIONAL ENERGY USE BY END USE, 2022




**Commercial and institutional energy use increased between 2000 and 2022**

**21%**

**but would have increased**

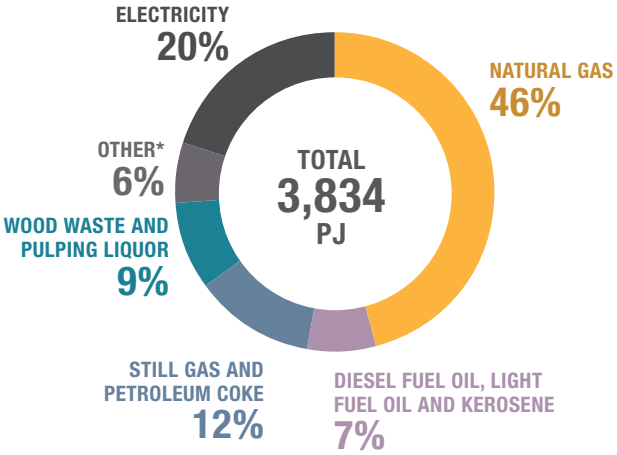
**34%** **without energy efficiency improvements.**

**Energy intensity (GJ/m²) decreased**

**5%**.

Since 2000, energy efficiency in the commercial and institutional sector has **improved 13%**, saving 124 PJ of energy and **$3.3 billion** in energy costs in 2022.

## INDUSTRIAL SECTOR ENERGY USE BY FUEL TYPE, 2022




- The **industrial sector** includes all manufacturing, mining (including oil and gas extraction), forestry and construction activities.
- From 2000 to 2022, **industrial energy use increased 21%**.
- Excluding resource extraction industries, **energy efficiency improvements of 5%** in the industrial sector resulted in **savings of 114 PJ** and **$1.8 billion** in energy costs in 2022.

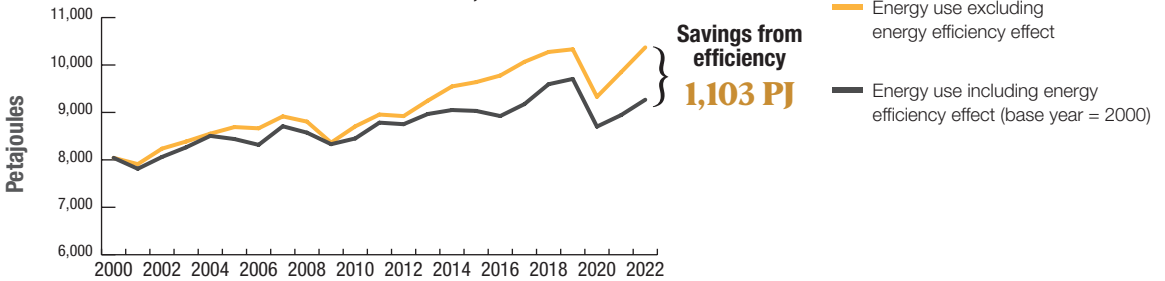
* "Other" includes HFO, coke and coke oven gas, coal, LPGs, NGLs, steam and waste.
Parts may not sum to total due to rounding.

# Efficiency Trends

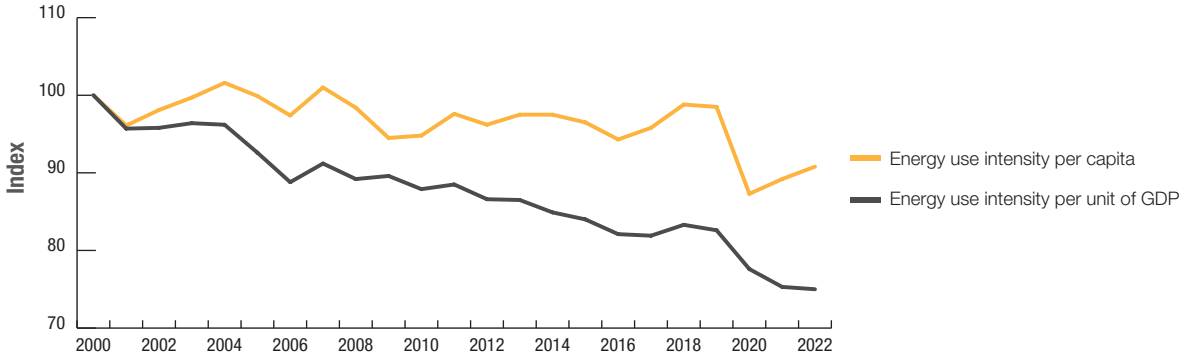
## HISTORICAL ENERGY EFFICIENCY

- **Energy efficiency** is a measure of how effectively energy is used for a given purpose and is an important path toward decarbonization.
- **Energy intensity** is the ratio of energy use per unit of activity (such as floor space and GDP).
- **Efficiency improvements** slow the rate of growth in energy use.
- **Energy efficiency** in Canada **improved by 17%** between 2000 and 2022.
- **Energy use grew by 15%** between 2000 and 2022. Without energy efficiency improvements, energy use would have **grown by 29%**.
- **Energy efficiency savings** of **1,103 PJ** in 2022 were equivalent to end-user savings of **$40 billion**.

**SECONDARY ENERGY USE WITH AND WITHOUT ENERGY EFFICIENCY EFFECT, 2000–2022**



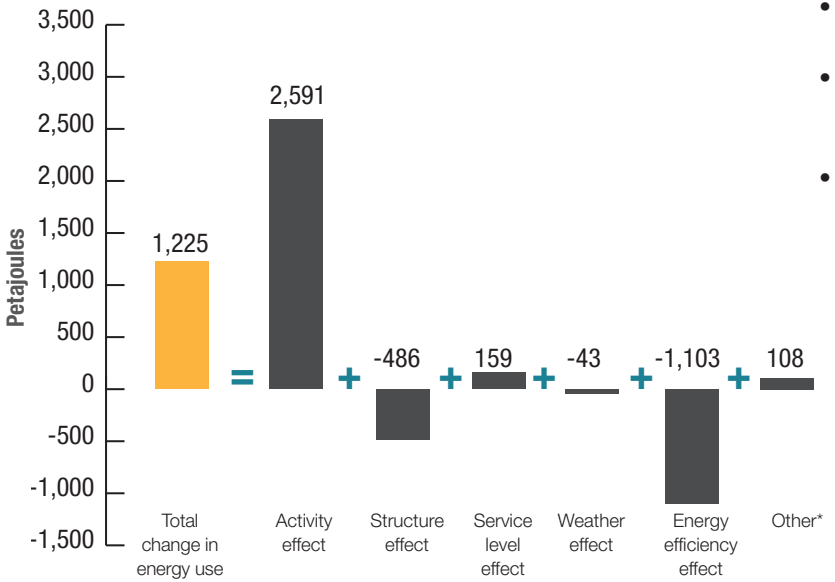
## INDEXED TOTAL SECONDARY ENERGY USE INTENSITY PER CAPITA AND PER UNIT OF GDP, 2000–2022 (2000=100)




**Per capita energy consumption was 9% lower in 2022 than in 2000.**

**Canada used 25% less energy per dollar of GDP in 2022 than in 2000.**

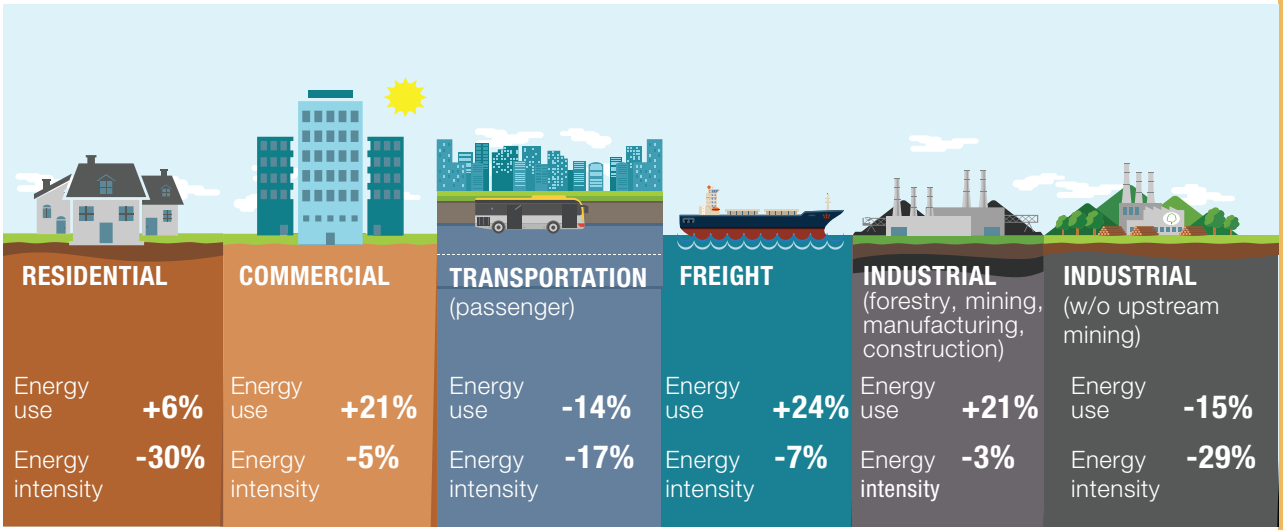
## SUMMARY OF FACTORS INFLUENCING THE CHANGE IN ENERGY USE, 2000–2022




- **Activity**: major drivers of energy use in a sector (e.g. floor space area in the commercial/institutional sector)
- **Structure:** refers to change in the makeup of each sector
- **Service level:** increased penetration of auxiliary equipment in commercial/institutional buildings
- **Energy efficiency:** how effectively energy is being used for a given purpose. For example, providing a similar (or better) level of service with less energy consumption on a per unit basis is considered an improvement in energy efficiency.

* "Other" refers to street lighting, non-commercial airline aviation, off-road transportation and agriculture, which are included in the "Total change in energy use" column but are excluded from the factorization analysis.

## TRENDS IN ENERGY USE AND INTENSITY BY SECTOR, 2000–2022

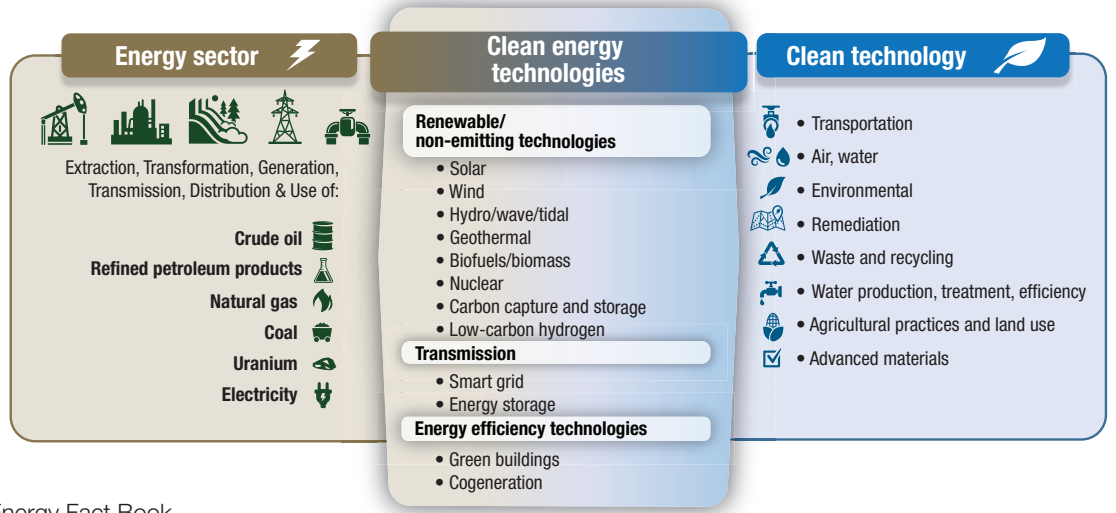


# Section 5:
# **Clean Power and Low Carbon Fuels**

Clean technology and electricity generation mix
Renewable energy
Biofuels and transportation

# Clean Technology and the Economy

- In 2017, the Government of Canada invested in a Clean Technology Data Strategy to provide the foundation for measuring the economic, environmental and social impacts of clean technology in Canada.
- As part of this strategy, Statistics Canada has developed the Environmental and Clean Technology Products Economic Account (ECTPEA), which provides a comprehensive picture of the state of Canada's clean technology economy for the years from 2007 to 2023.
- The ECTPEA includes processes, products and services that reduce environmental impacts through environmental protection and resource management activities and the use of goods that have been adapted to be significantly less energy- or resource-intensive than the industry standard.



**Environmental and clean technology (2023):**

**$80.8 billion** of GDP
(**3.0%** of total GDP)

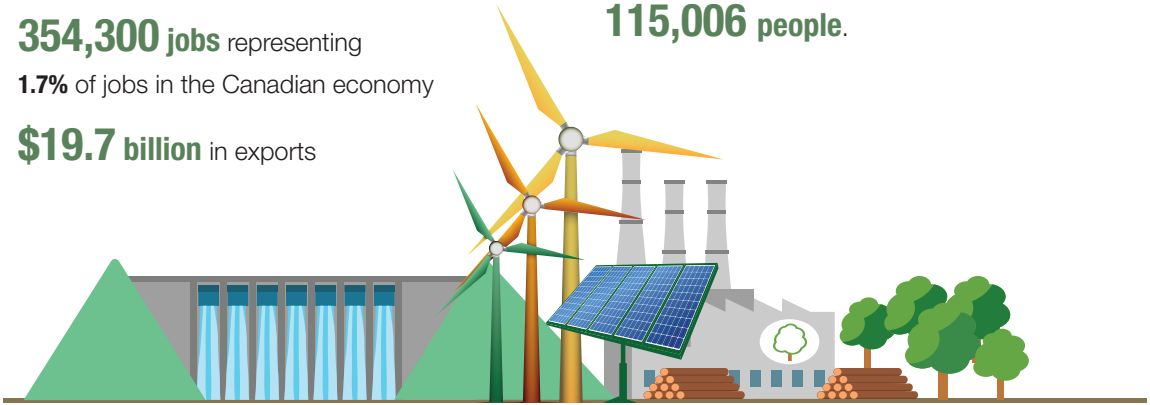
**354,300 jobs** representing
**1.7%** of jobs in the Canadian economy

**$19.7 billion** in exports

**Of this, clean energy alone accounted for**

**1.5%** of Canada's GDP

and employed
**115,006 people**.

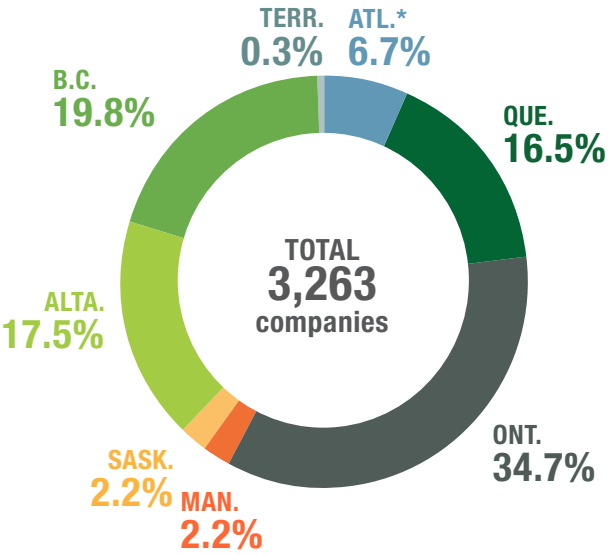


The TSX and TSX-Venture exchanges list **85 companies in the cleantech sector**, with a total market capitalization of **$42.1 billion**. Of these companies, 79 are headquartered in Canada, with a total market capitalization of **$35.9 billion** (as of April 30, 2025).

## CLEANTECH COMPANIES

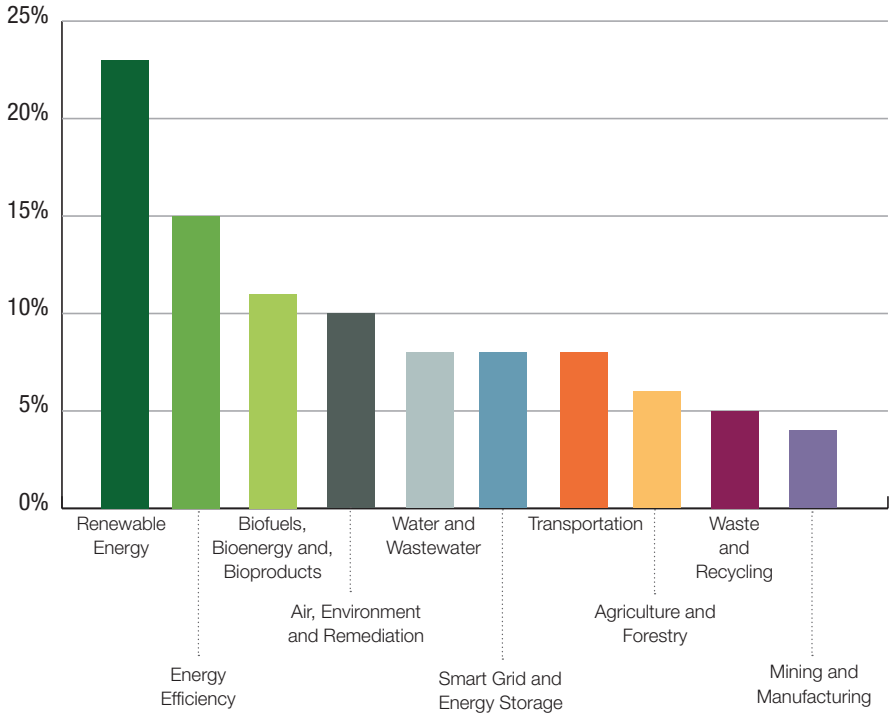
Nearly half of Canada's 3,263 cleantech companies relate to the energy industry, operating in renewables, energy efficiency, and bioeconomy. They are concentrated in Ontario, British Columbia, Alberta, and Quebec.

**CANADIAN CLEANTECH COMPANIES BY PROVINCE, 2025**



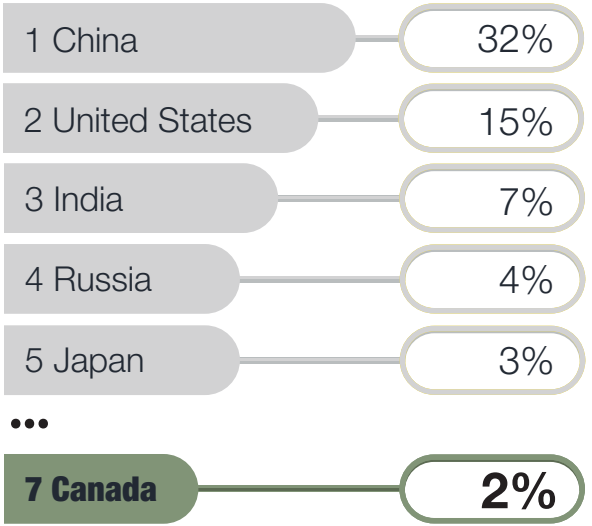

* Atlantic provinces

## CANADIAN CLEANTECH COMPANIES BY INDUSTRY, 2025

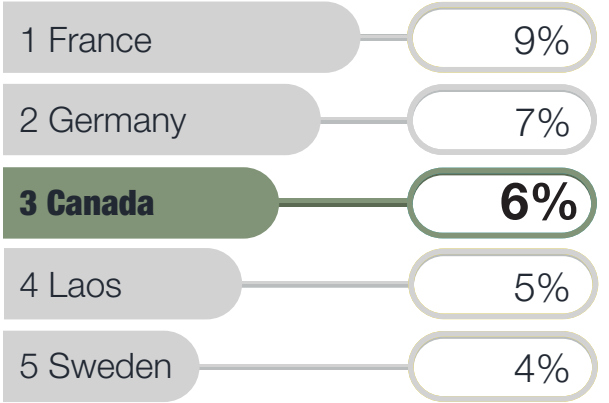


## ELECTRICITY
INTERNATIONAL CONTEXT

**World production – 30,122 TWh** (2023)




**World exports – 820 TWh** (2023)



## TRADE (2024)

All Canadian electricity trade is with the U.S.

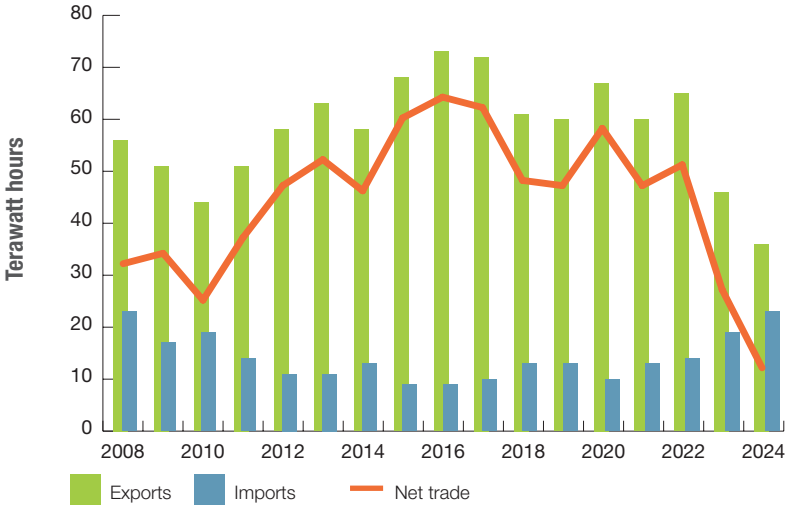
EXPORTS

35.6 TWh

IMPORTS

23.2 TWh

**CANADA'S ELECTRICITY TRADE WITH THE U.S.***

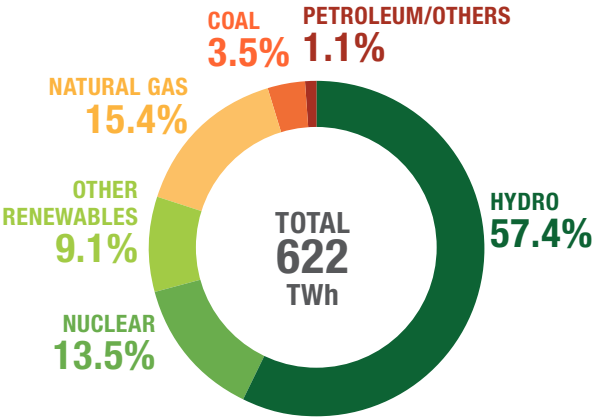


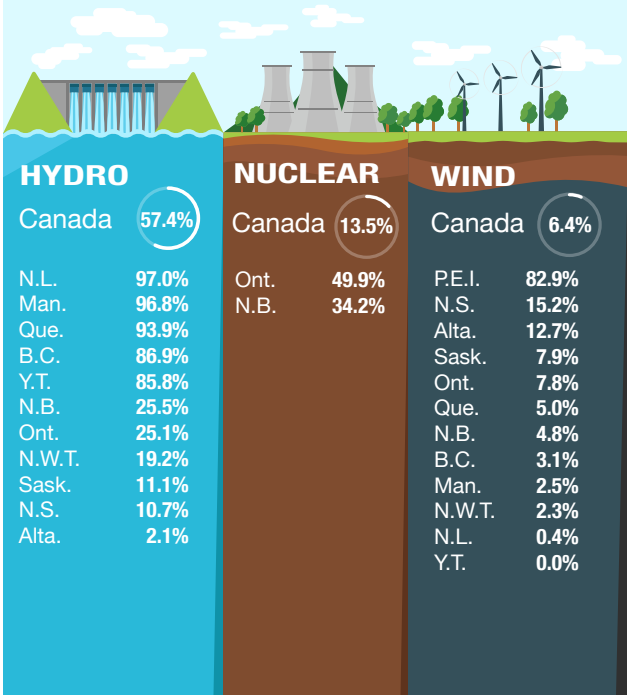

* includes only electricity traded under purchased contracts; excludes electricity transferred under non-financial agreements (e.g. under treaty obligations)

## CANADIAN SUPPLY

### GENERATION IN CANADA – 622 TWh

**GENERATION BY SOURCE, 2023**



**HYDRO**

Canada 57.4%

| | |
|---|---|
| N.L. | 97.0% |
| Man. | 96.8% |
| Que. | 93.9% |
| B.C. | 86.9% |
| Y.T. | 85.8% |
| N.B. | 25.5% |
| Ont. | 25.1% |
| N.W.T. | 19.2% |
| Sask. | 11.1% |
| N.S. | 10.7% |
| Alta. | 2.1% |

**NUCLEAR**

Canada 13.5%

| | |
|---|---|
| Ont. | 49.9% |
| N.B. | 34.2% |

**WIND**

Canada 6.4%

| | |
|---|---|
| P.E.I. | 82.9% |
| N.S. | 15.2% |
| Alta. | 12.7% |
| Sask. | 7.9% |
| Ont. | 7.8% |
| Que. | 5.0% |
| N.B. | 4.8% |
| B.C. | 3.1% |
| Man. | 2.5% |
| N.W.T. | 2.3% |
| N.L. | 0.4% |
| Y.T. | 0.0% |

## PROVINCIAL ELECTRICITY GENERATION BY SOURCE, 2023

### BIOMASS

Canada 1.5%

| | |
|---|---|
| B.C. | 7.1% |
| N.B. | 3.8% |
| N.S. | 3.2% |
| Alta. | 2.1% |
| Ont. | 0.8% |
| Que. | 0.7% |
| P.E.I. | 0.6% |
| Man. | 0.2% |
| Sask. | <0.2% |
| N.L. | <0.1% |

### NATURAL GAS

Canada 15.4%

| | |
|---|---|
| Alta. | 67.1% |
| Sask. | 47.7% |
| N.S. | 21.3% |
| N.B. | 15.2% |
| N.W.T. | 14.7% |
| Ont. | 13.8% |
| Y.T. | 6.4% |
| B.C. | 1.6% |
| N.L. | 0.6% |
| Man. | 0.2% |
| Que. | <0.1% |

### PETROLEUM

Canada 0.9%

| | |
|---|---|
| Nvt. | 99.5% |
| N.W.T. | 63.5% |
| N.S. | 8.3% |
| N.B. | 7.2% |
| Y.T. | 5.6% |
| N.L. | 2.0% |
| Alta. | 1.6% |
| B.C. | 1.0% |
| P.E.I. | 0.8% |
| Que. | 0.2% |
| Man. | <0.1% |
| Ont. | <0.1% |
| Sask. | <0.1% |

### SOLAR

Canada 1.1%

| | |
|---|---|
| P.E.I. | 3.0% |
| Alta. | 3.0% |
| Ont. | 2.5% |
| Y.T. | 2.1% |
| N.S. | 1.1% |
| Nvt. | 0.5% |
| Sask. | 0.5% |
| N.W.T. | 0.2% |
| B.C. | 0.2% |
| Man. | 0.2% |
| N.B. | <0.1% |
| Que. | <0.1% |
| N.L. | <0.1% |

### COAL

Canada 3.5%

| | |
|---|---|
| N.S. | 40.2% |
| Sask. | 31.7% |
| Alta. | 10.7% |
| N.B. | 9.3% |

### OTHER

Canada 0.2%

| | |
|---|---|
| Sask. | 1.0% |
| Alta. | 0.8% |
| Ont. | 0.1% |
| Que. | <0.1% |
| Man. | <0.1% |

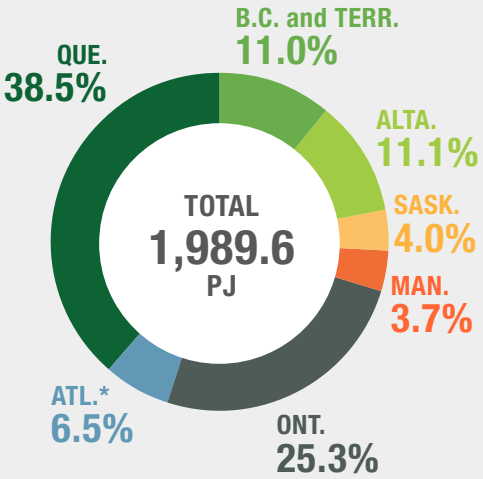
## ELECTRICAL ENERGY USE

### TOTAL ELECTRICAL ENERGY USE* ROSE TO 1,989.6 PJ IN 2022

| Sector | Energy use (PJ) | % of the total |
|---|---|---|
| Residential | 645.0 | 32.4% |
| Commercial | 532.9 | 26.8% |
| Industrial | 769.1 | 38.7% |
| Transportation | 4.5 | 0.2% |
| Agriculture | 38.1 | 1.9% |
| **Total** | **1,989.6** | **100%** |

*secondary energy use

### ELECTRICAL ENERGY USE BY PROVINCE, 2022

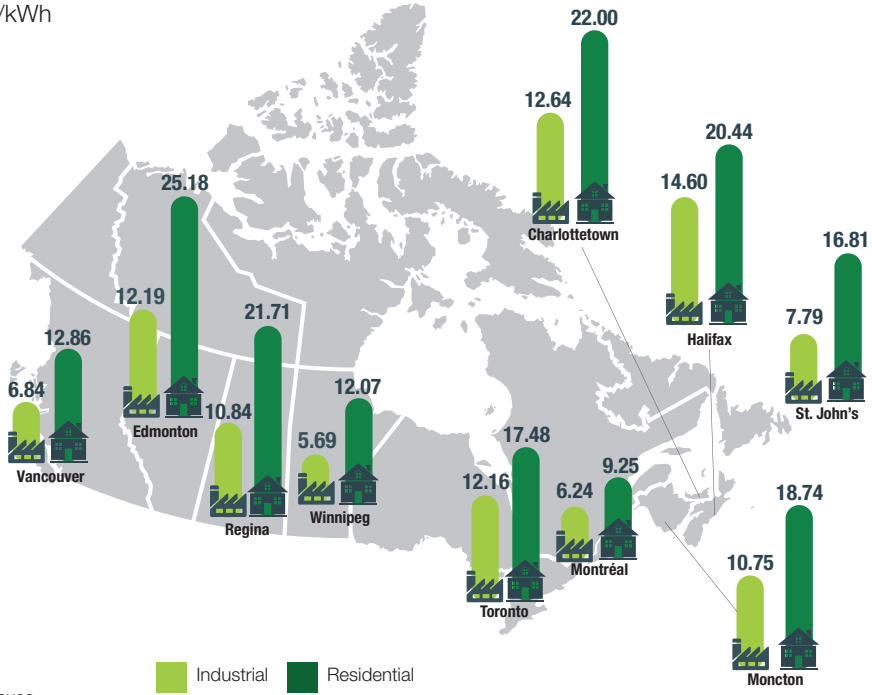



* Atlantic provinces

# ELECTRICITY PRICES

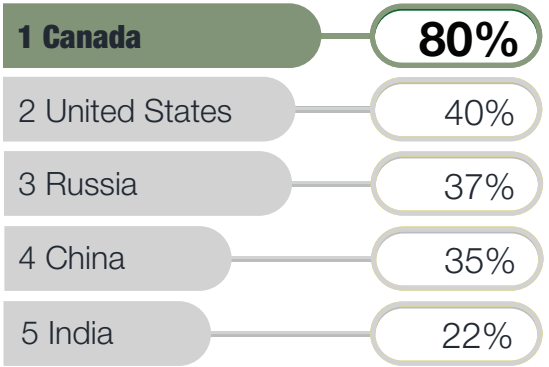
## AVERAGE LARGE INDUSTRIAL AND RESIDENTIAL ELECTRICITY PRICES* (AS OF APRIL 2024)

in cents/kWh




*including taxes

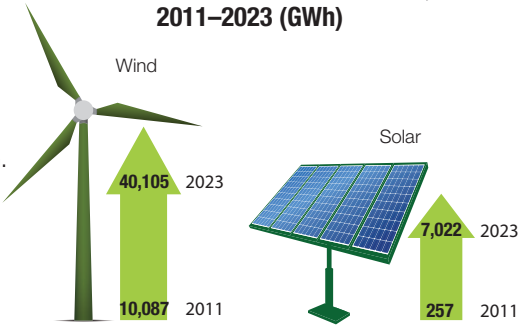
## PERCENTAGE OF TOTAL ELECTRICITY FROM NON-EMITTING SOURCES FOR THE TOP FOUR ELECTRICITY-GENERATING COUNTRIES AND CANADA, 2023




- **Renewable electricity generation** has **increased 6%** between 2011 and 2023, with solar and wind having the largest growth.
- In 2023, **80% of electricity in Canada** came from non-GHG emitting sources. **Hydro** made up **57%**, **nuclear was 14%**, and other renewables were the remaining **9%***.

*Parts may not sum to total due to rounding.

## WIND AND SOLAR NET ELECTRICITY GENERATION GROWTH IN CANADA, 2011–2023 (GWh)

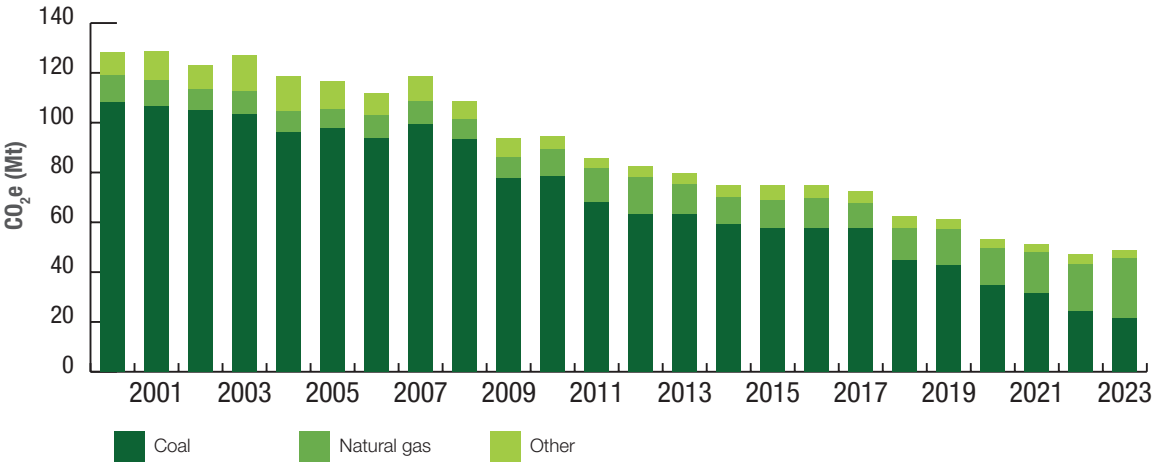


## GHG SPOTLIGHT: ELECTRICITY

Total electricity emissions **decreased by 62%** from 2000 to 2023 because of increased generation from non-emitting sources.

Coal-fired electricity generation accounted for **3% of generation** and **44% of electricity-related** GHG emissions in 2023.

**ELECTRICITY SECTOR GHG EMISSIONS FOR CANADA, 2000–2023**



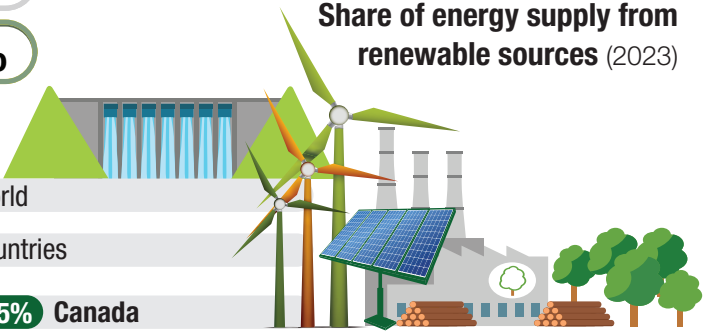
# Renewable Energy

## INTERNATIONAL CONTEXT

**World production – 89,633 PJ or 2,141 MTOE** (2023)

| | |
|---|---|
| 1 China | 19% |
| 2 India | 11% |
| 3 United States | 9% |
| 4 Brazil | 7% |
| 5 Indonesia | 3% |
| **6 Canada** | **2%** |

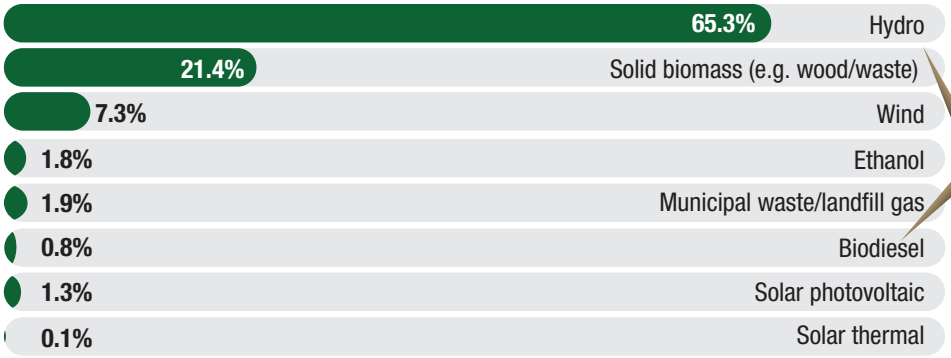
**Share of energy supply from renewable sources** (2023)

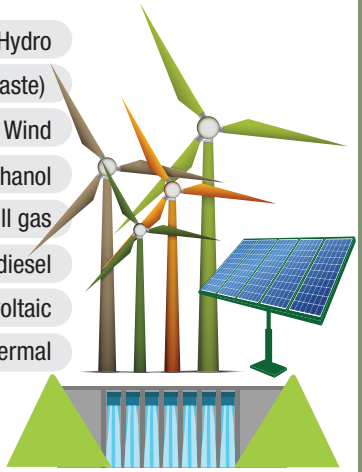


| | |
|---|---|
| 14.1% | World |
| 12.6% | OECD countries |
| 16.5% | Canada |

## CANADIAN PRODUCTION (2023)

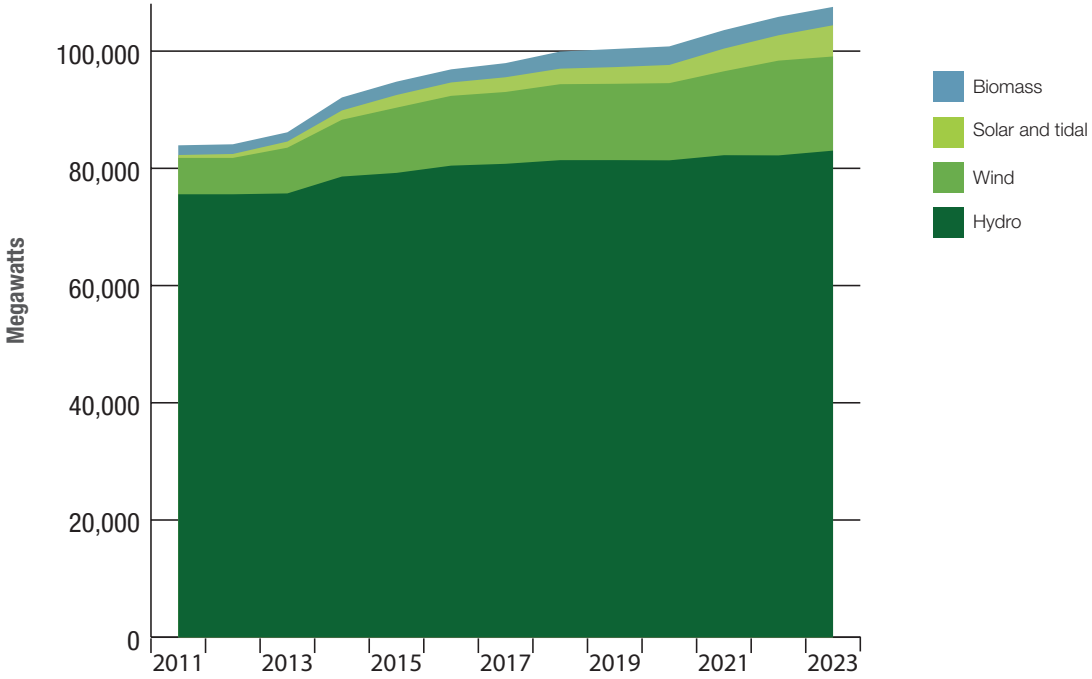
### Total renewable energy* – 1,987 PJ or 47.5 MTOE



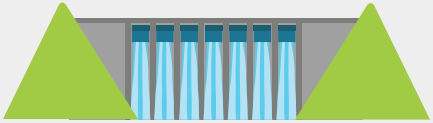



*includes energy consumed for electricity and heat production and for biofuels in the transportation sector

## CANADIAN RENEWABLE ELECTRICITY GENERATING CAPACITY



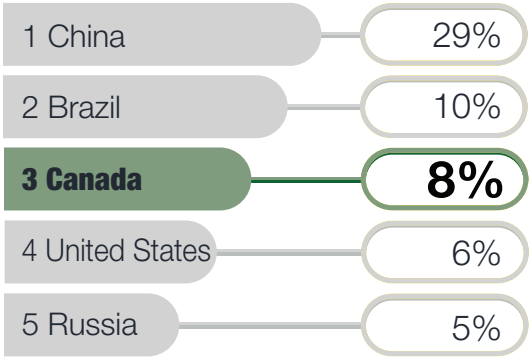
## HYDROELECTRICITY



Moving water is the most important renewable energy source in Canada, providing **57%** of Canada's electricity generation. In fact, in 2023, Canada was the third-largest producer of hydroelectricity in the world.

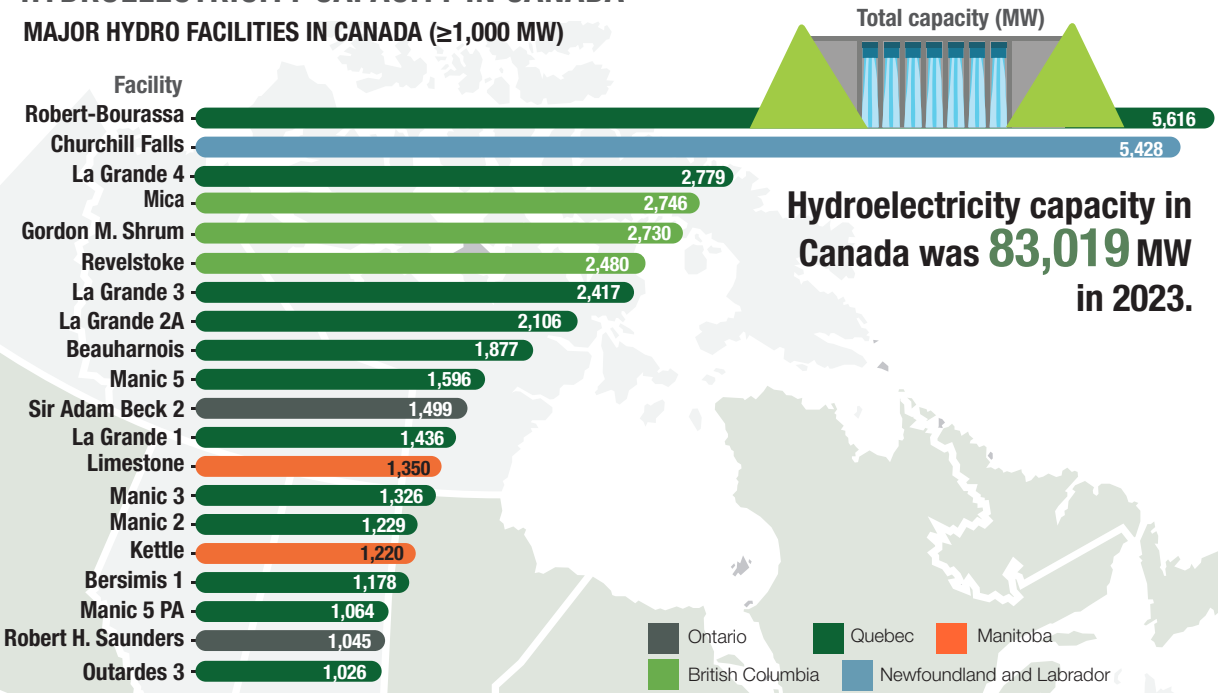
## INTERNATIONAL CONTEXT

**World generation of hydroelectricity – 4,252 TWh**
(2023)



# HYDROELECTRICITY CAPACITY IN CANADA

## MAJOR HYDRO FACILITIES IN CANADA (≥1,000 MW)



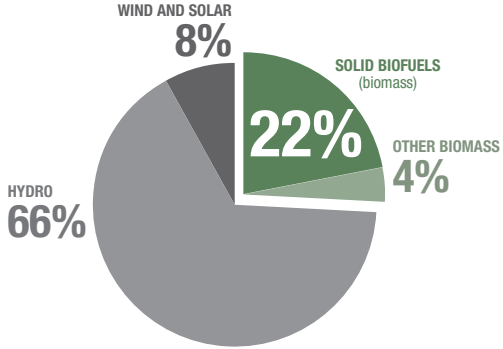

**Hydroelectricity capacity in Canada was 83,019 MW in 2023.**

# BIOMASS

- Biomass is a renewable energy resource derived from living organisms and/or their by-products.
- In 2023 there were **41 operational** co-generation units at pulp and paper mills and **35 Independent Power Providers (IPP)** using biomass.
- Electrical capacity of pulp and paper co-generation was **1,551 MW**, while heat capacity was **10,154 MW**. IPP capacity for electricity and heat was **831 MW** and **701 MW**, respectively.
- In 2023, there were about **640 operational** bioheat systems with installed capacity of **480 MWth**. **83%** of the biomass heating systems are less than **1 MW** in size.

Biomass* accounts for the **largest share of renewable energy production** in the OECD**, at

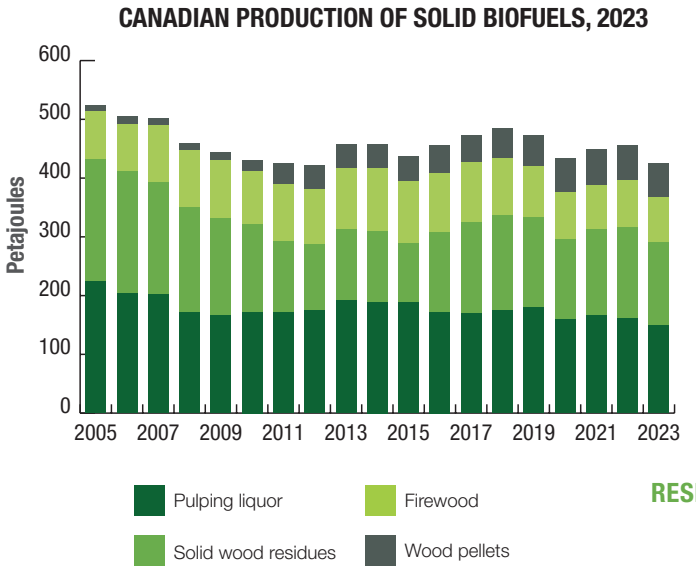

**In Canada, that share is 26%.**

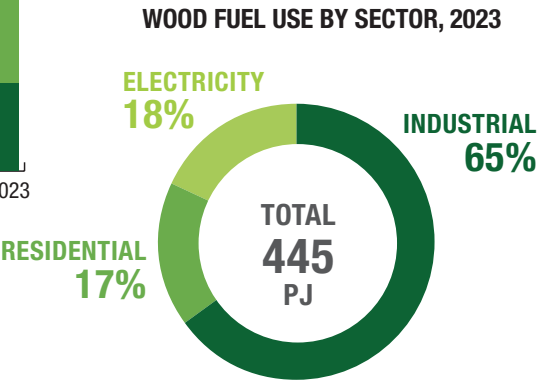



*Includes solid biofuels, liquid biofuels, biogases and renewable municipal waste

**Organization for Economic Cooperation and Development

# CANADIAN PRODUCTION OF SOLID BIOFUELS



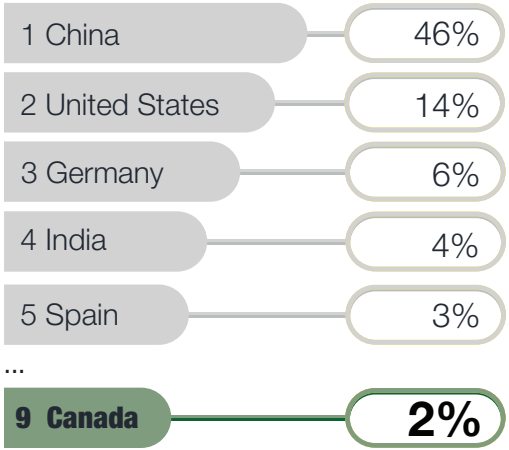



## WIND POWER

- Electricity from wind energy is one of the **fastest growing sources** of electricity in the world and in Canada.
- Wind accounted for **6.4%** of electricity generation in Canada in 2023.

## INTERNATIONAL CONTEXT

**World capacity of wind power – 1,136 GW** (2024)

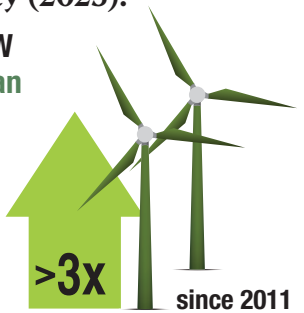


## WIND POWER IN CANADA

**Capacity (2023):**

**16.1 GW**

more than tripled

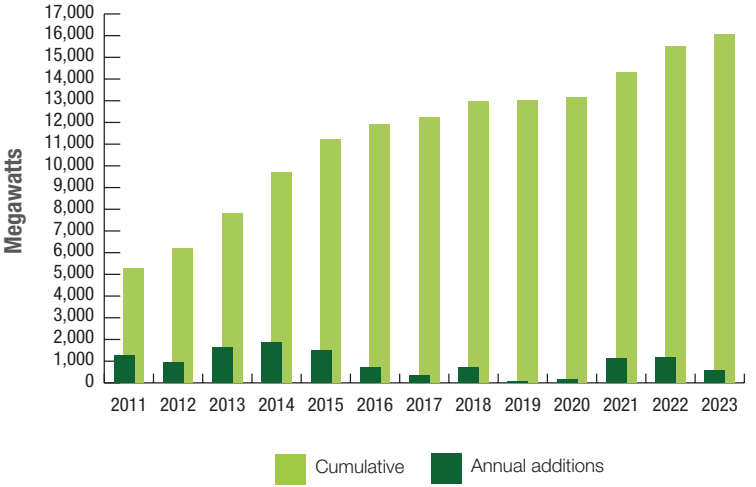



**Generation (2023):**

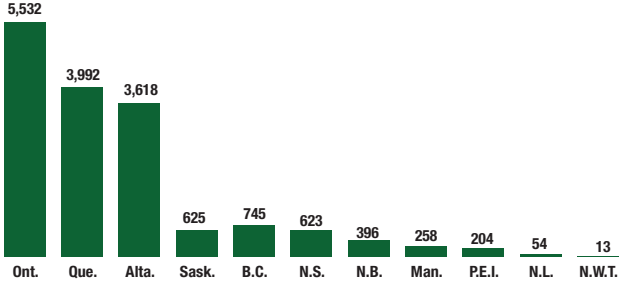
**40.1 TWh**

nearly quadrupled

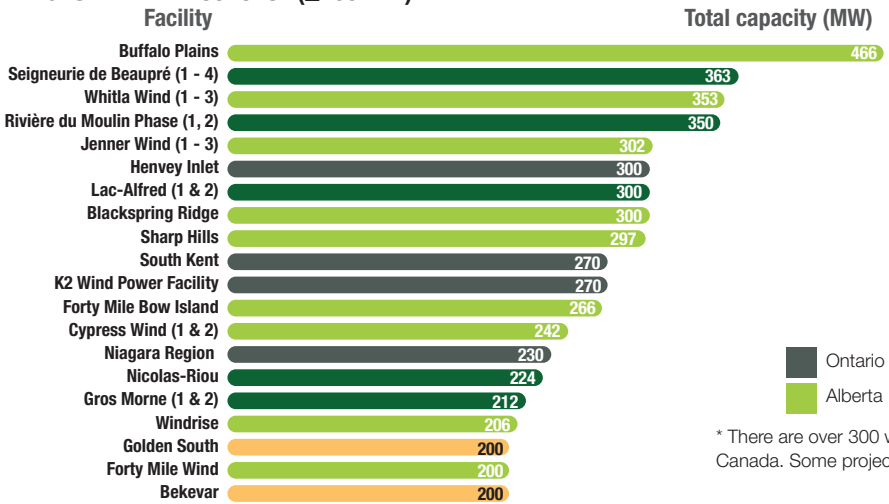

**INSTALLED CAPACITY**



## CAPACITY BY PROVINCE (MW)




## LARGEST WIND PROJECTS* (≥200 MW)



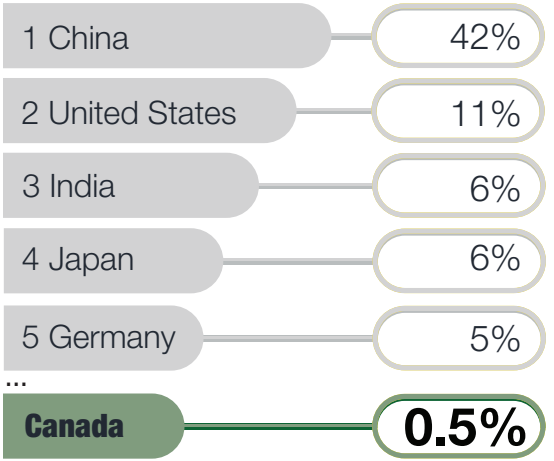

* There are over 300 wind energy projects across Canada. Some projects are part of a larger wind farm.

## SOLAR PHOTOVOLTAIC

- Solar power is the conversion of energy from sunlight into electricity. Solar PV is rapidly becoming an economical, renewable technology to harness renewable energy from the sun.

### INTERNATIONAL CONTEXT

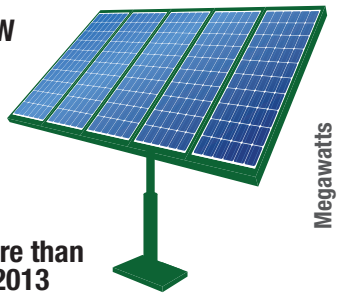
**World capacity of solar PV – 1,581 GW** (2023)



## SOLAR PV IN CANADA

**Capacity (2023):**

**5,328 MW**



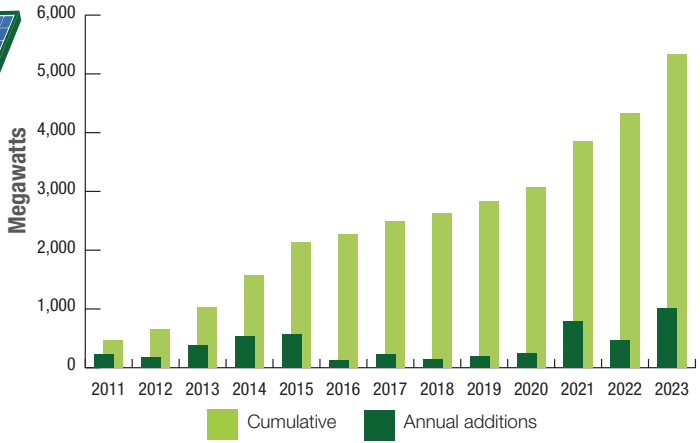
**5.2x** more than in 2013

**Generation (2023):**

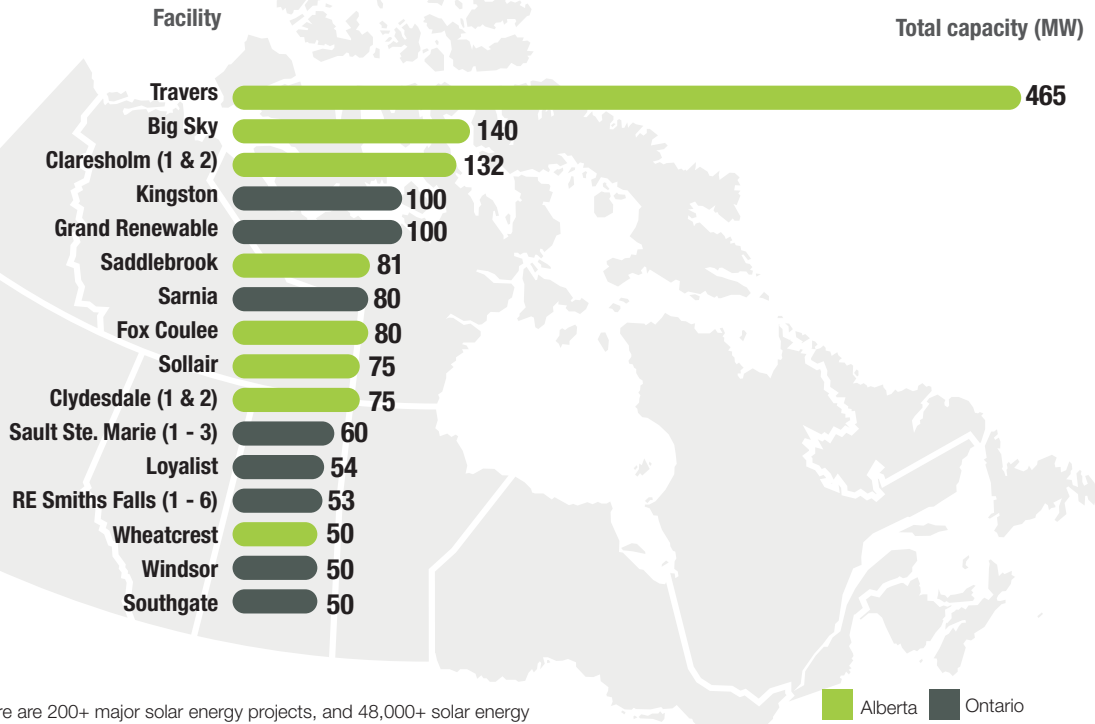
**7 TWh**

**6.2x** more than in 2013

**INSTALLED CAPACITY**



## LARGEST SOLAR PROJECTS* (≥50 MW)



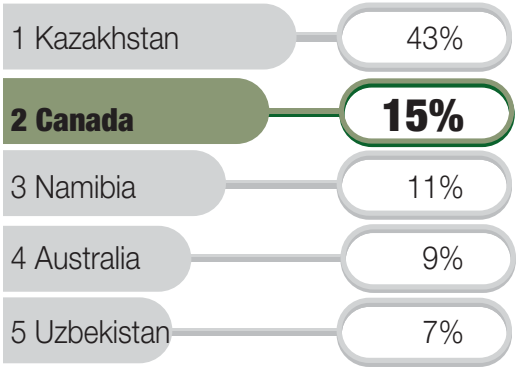

*There are 200+ major solar energy projects, and 48,000+ solar energy installations across Canada.

## URANIUM

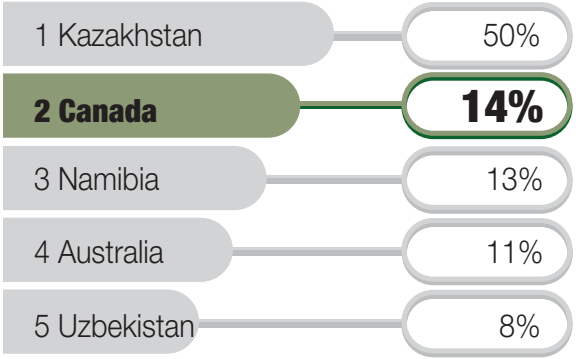
- Uranium is a silvery-white metal and a primary energy source. After raw uranium is mined and milled, it is **processed to make fuel for nuclear reactors** to generate electricity.

## INTERNATIONAL CONTEXT

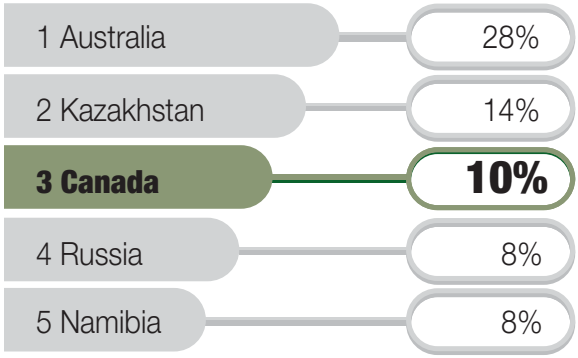
**World production – 49.4 kt** (2022)




**World exports – 42.6 kt** (2022)




**World known recoverable resources – 5.9 Mt** (2023)

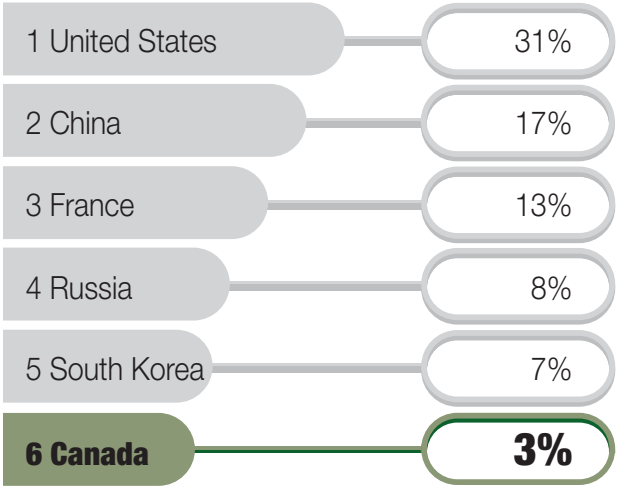


## NUCLEAR POWER

- Nuclear energy is the second largest contributor of non-emitting electricity in Canada. In 2023, nuclear energy provided approximately **14% of Canada's total electricity needs** (50% in Ontario).

## INTERNATIONAL CONTEXT

**World generation – 2,552 TWh** (2023)



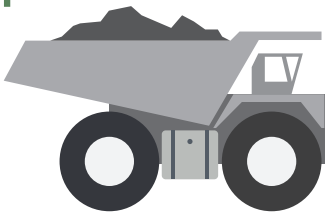
## CANADIAN SUPPLY AND DEMAND (2024)

### URANIUM

Canadian production **14.3 ktU**
All uranium comes from mines in Saskatchewan.

**VALUED AT**
about

**$3 billion**



**About 90% of production**
was available for export.

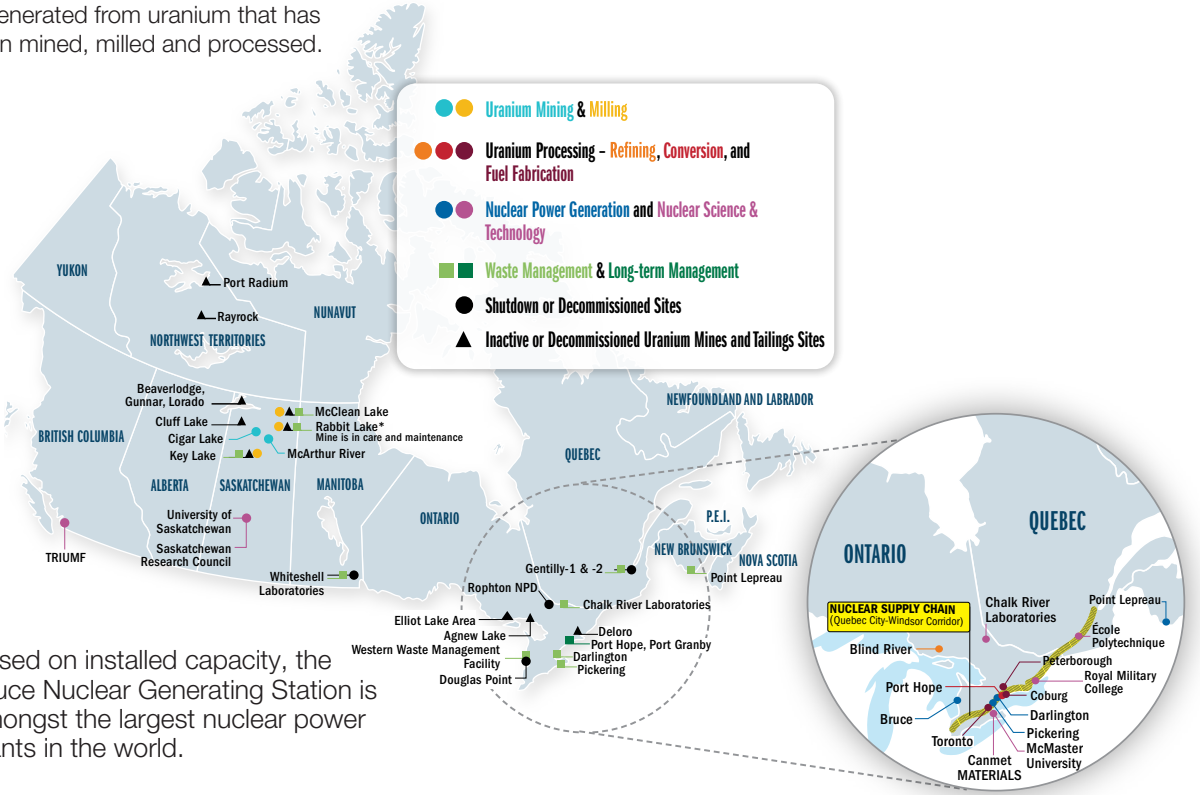
**33%** of uranium purchased by U.S. nuclear reactors in 2024 came from Canada, making Canada the largest foreign supplier of uranium to the U.S.

**DOMESTIC USE:**

**About 10% of production**

Used in Canada's CANDU reactors (Ontario and New Brunswick), including the Bruce Generating Station, amongst the world's largest operating nuclear facilities.

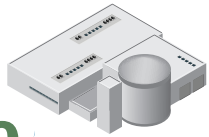
Across the country, nuclear power is generated from uranium that has been mined, milled and processed.




Based on installed capacity, the Bruce Nuclear Generating Station is amongst the largest nuclear power plants in the world.

## CANDU NUCLEAR REACTORS

- **Canada has developed a unique nuclear reactor technology called CANDU**, for CANada Deuterium Uranium. Canada is one of roughly half a dozen countries that offer domestically designed reactors to the open commercial market.
- The CANDU reactor is a pressurized heavy water reactor (PHWR) that uses heavy water (deuterium oxide) as a moderator and coolant and natural uranium for fuel. The majority of power reactors in use in the world are light water reactors (LWR), which use normal water as the moderator and coolant and enriched uranium for fuel.
- There are 17 CANDU reactors operating in Canada, and nine operating in five other countries. These 26 reactors represent nearly 7% of global reactors and 5% of global nuclear electricity capacity (17.9 GWe).
- CANDU reactor refurbishment in Ontario is one of the largest infrastructure projects in Canada and will extend the life of Ontario's nuclear fleet past mid-century.



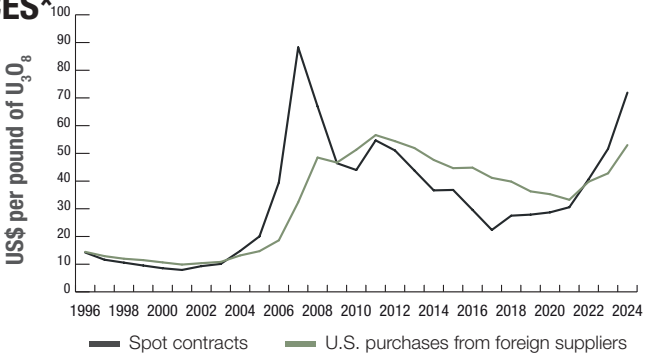
**9 CANDU reactors**

are in operation outside of Canada.

## GROSS ELECTRICAL OUTPUT OF NUCLEAR POWER PLANTS IN CANADA

| Facility | Province | Gross Electrical Output (MW) | Units |
|---|---|---|---|
| Darlington | Ontario | 3,736 | 4 |
| Bruce B | Ontario | 3,507 | 4 |
| Bruce A | Ontario | 3,437 | 4 |
| Pickering B | Ontario | 2,160 | 4 |
| Point Lepreau | New Brunswick | 705 | 1 |

## URANIUM - PRICES*




* The majority of Canadian uranium production is sold by long-term contract, as opposed to the spot market.

# Biofuels and transportation

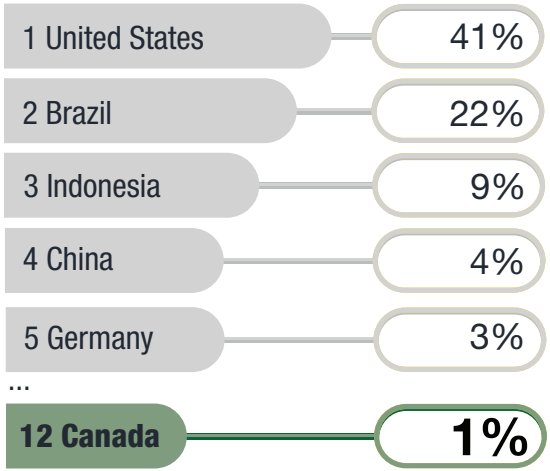
## LIQUID BIOFUELS

- Liquid biofuels are enhanced biomass-derived fuels that can take the form of a liquid such as ethanol or renewable diesel fuels. The liquid biofuels are mixed with traditional gasoline and diesel to reduce the overall GHG emissions associated with the blended fuel.
- The federal *Renewable Fuels Regulations* require fuel producers and importers to have an average renewable content of **at least 5%** based on the **volume of gasoline** that they produce or import and **at least 2%** of the **volume of diesel fuel** that they produce and import.*

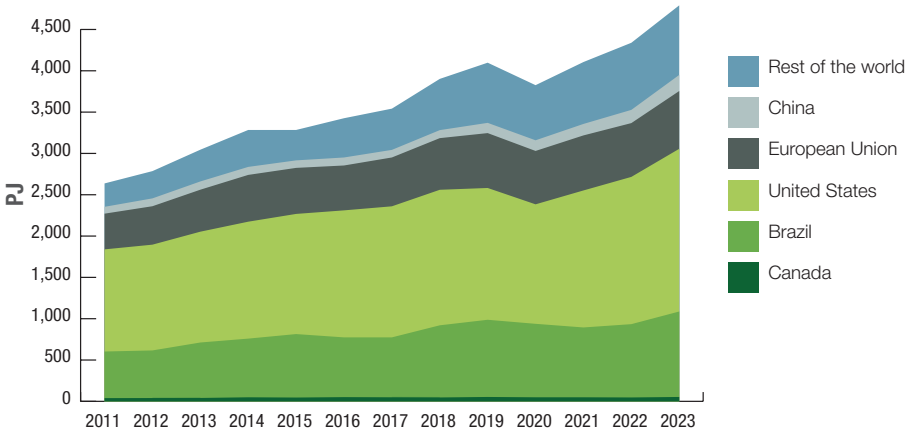
* Heating distillate oil volumes for space-heating purposes are excluded from the diesel regulations.

### INTERNATIONAL CONTEXT

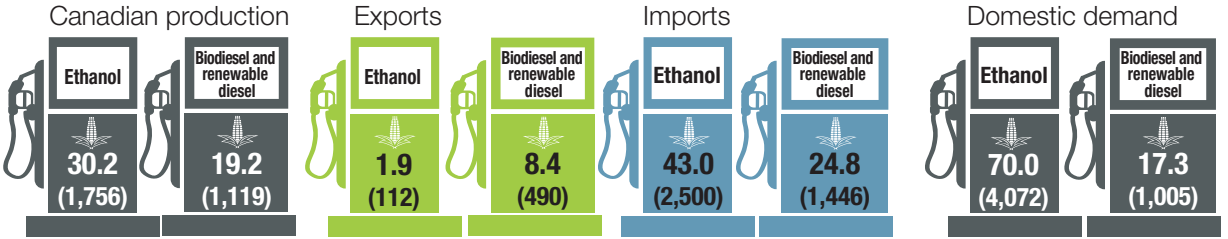
**World production of biofuels – 4,791 PJ** (2023)



## WORLD BIOFUELS PRODUCTION



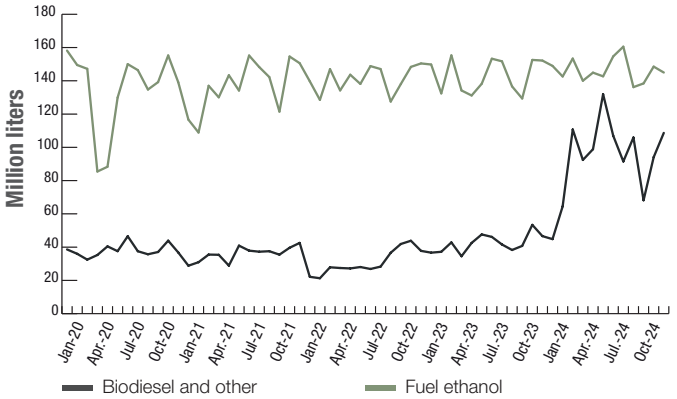

## CANADIAN SUPPLY AND DEMAND (2024) - MB/D (MILLION LITRES)



## CANADIAN BIOFUEL PRODUCTION

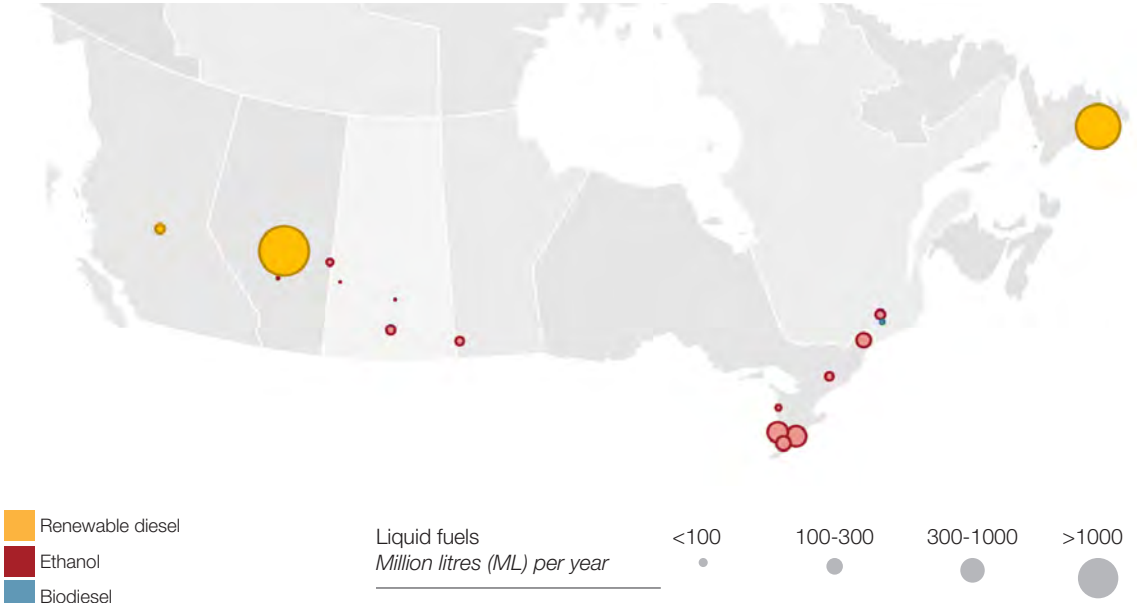
- Liquid biofuels are made of **feedstocks such as cereal grains and vegetable oils**.
- In 2024, **4.2 million tonnes** of cereal grain, and **1.06 million tonnes** of vegetable oil were used in domestic production of biofuels.
- Canada produced **1.8 billion liters of fuel ethanol** and **1.12 billion liters of biodiesel and other products** in 2024.
- Co-products are secondary goods that are generated during the biofuel manufacturing process and can be sold or reused. Biofuel production generated **1.5 million tonnes of co-products in 2024**, primary distillers grains which can be used as animal feed.

**MONTHLY PRODUCTION OF LIQUID BIOFUELS, 2020–2024**

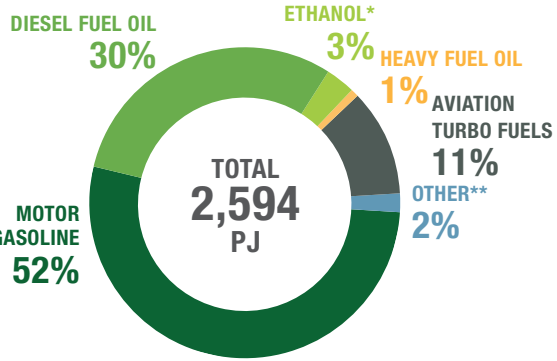


Currently the **majority of liquid biofuel facilities** in Canada are **located in southern Ontario and Saskatchewan**. The largest facility is located in Alberta.

**BIOFUEL PRODUCTION CAPACITY (2025)**

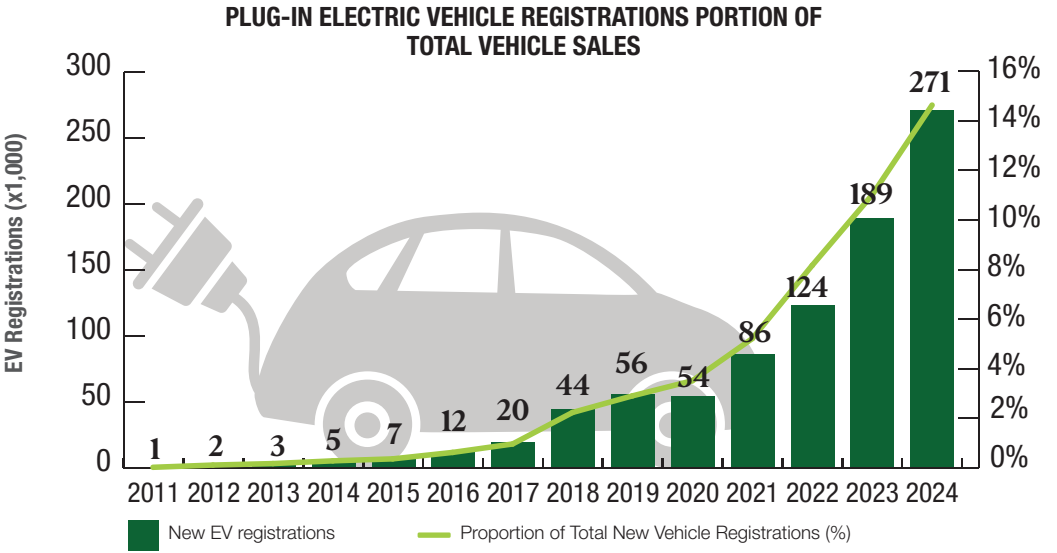


## FUEL MIX OF THE TRANSPORTATION SECTOR, 2022



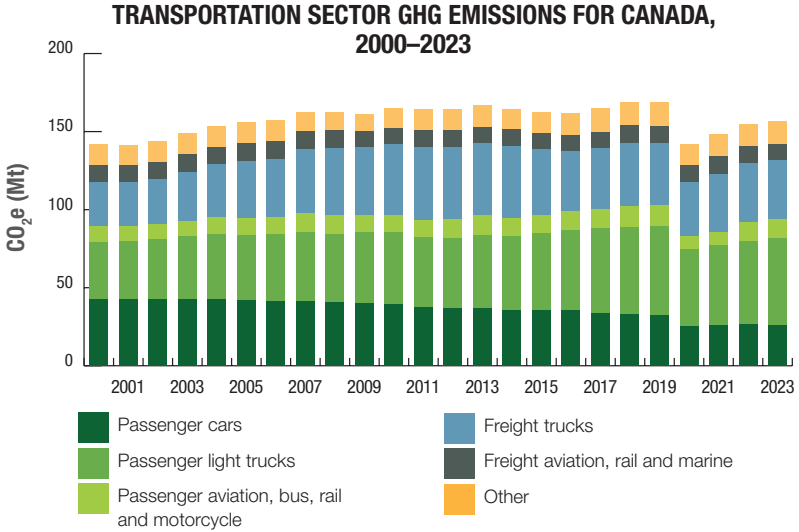

- Total transportation energy use **increased 14%** from 2000 to 2022.
- Energy efficiency improvements in the transportation sector saved Canadians **594 PJ** of energy and over **$27 billion** in energy costs in 2022.
- Passenger transportation contributes **49%** to the total emissions, freight emissions are **46%**, and off-road emissions are **5%**.

* The ethanol proportion is estimated based on production data.
** The category "Other" includes electricity, natural gas, biodiesel fuel oil, light fuel oil, aviation gasoline and propane
Parts may not sum to total due to rounding.




- In 2024, electric vehicle (EV) registrations made up **14.6% of total vehicle registrations**.
- **271,000 plug-in EVs** were **registered** in 2024, over fourteen times the number of registrations as in 2017. Sales are highest in the provinces of Quebec, British Columbia and Ontario.

## GHG SPOTLIGHT: TRANSPORTATION




- **Transportation GHG emissions** (from passenger, freight, and other forms of transport) **increased** 6% from 2021 to 2023, reflecting a gradual rebound from the pandemic. Despite the increase, transportation emissions were 7% below their pre-pandemic level in 2019.

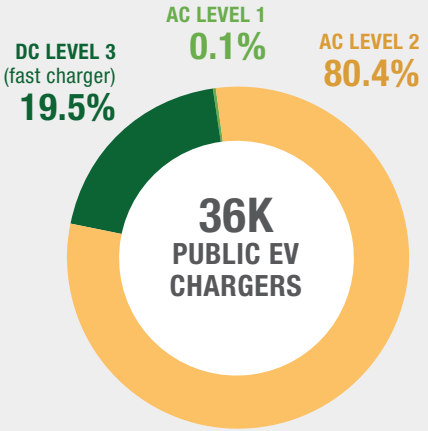
## ELECTRIC VEHICLE CHARGING

EV chargers deliver electricity to the on-board batteries of both **battery electric vehicles (BEV)** and **plug-in hybrid electric vehicles (PHEVs)**. There are two main types of EV chargers: **alternating current (AC) chargers** provide electricity to the vehicle via Level 1 and Level 2 chargers. **Direct current (DC) chargers**, also known as **Level 3 fast chargers**, provide electricity much more rapidly.

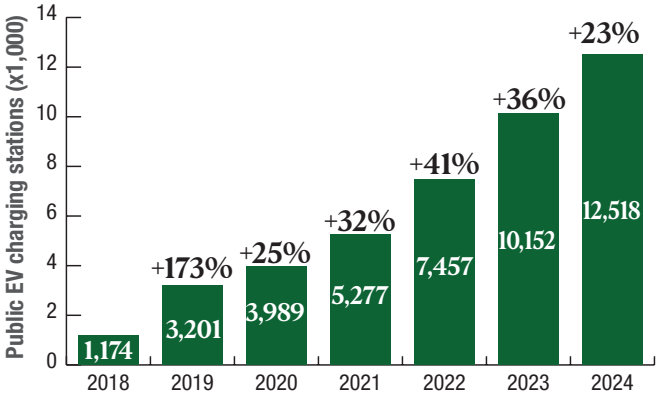
| Charger | Input | Outlet type | Estimated charging time* | Estimated range per hour of charging* | Typical uses |
|---|---|---|---|---|---|
| **AC Level 1** | 120 V | Standard electrical outlet (for example, phone charger) | 8–50+ hours | 3-8 km | Home charging and back-up situations |
| **AC Level 2** | 208/240 V | Special electrical outlet (for example, stove or dryer plug) | 4–10 hours | 16-50 km | Home charging, charging at businesses and public spaces |
| **DC Level 3** (fast charger) | 480 V | DC outlet (not found in homes) | 25–30 minutes | Up to maximum driving range of vehicle | Charging at dedicated stations, public spaces, and highway corridors |

*Estimates assume 80% charging level limit. Time to full charge and range per hour of charging will vary depending on the vehicle, battery, and charger, as well as fluctuating temperatures, battery state, and tire pressure.

## TYPES OF EV CHARGERS AT PUBLIC CHARGING STATIONS IN CANADA (2025)*




## PUBLIC EV CHARGING STATIONS IN CANADA*




Canada's network of public charging facilities for EVs has expanded rapidly in recent years. In 2025, roughly **18%** of publicly accessible EV charging facilities nationwide supported at least one DC fast charger.

*Total includes publicly accessible stations reserved for patrons of businesses

## HYDROGEN

Hydrogen is a versatile energy carrier that can be produced from a variety of feedstocks.

Hydrogen can be converted to electricity through a fuel-cell in electric vehicles and power generation equipment, combusted to produce heat, or used as a feedstock in a range of chemical and industrial processes.

Hydrogen produced via low-carbon production pathways such as electrolysis or natural gas using carbon abatement can be ideal for decarbonizing hard-to-abate sectors such as heavy industry, truck freight or bus transit.

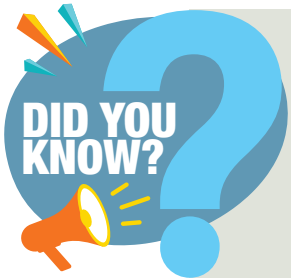
**Versatile energy carrier**

**Carbon free at point of use**

**Can be produced from variety of feedstocks**

**Can be transported long distances**

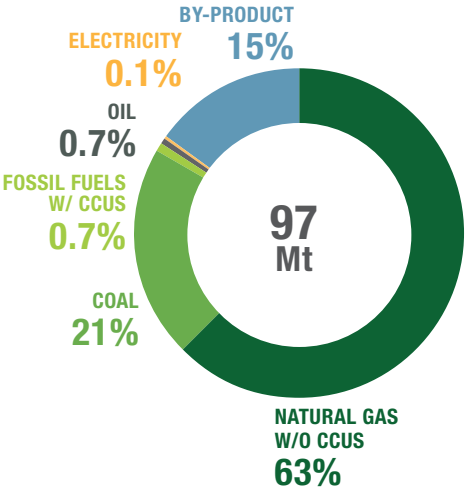
**Highest energy per mass of any fuel**



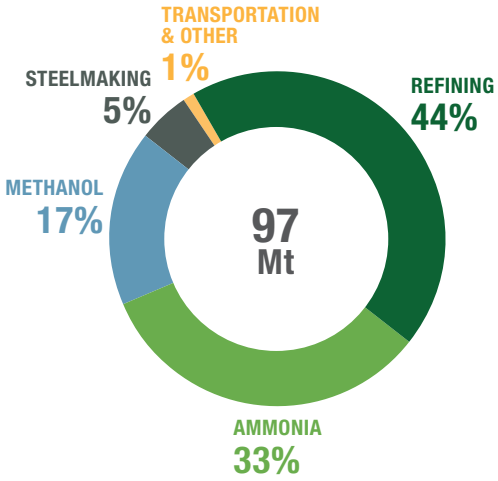

The energy in **1 kg** of hydrogen is the same as approximately **2.8 kg** of gasoline.

- The total global production of hydrogen in 2023 was **97 million tonnes (Mt)**, in which **85%** of production was deliberate, and **15%** was produced as a by-product to industrial processes.
- Global demand for hydrogen in 2023 was **97 Mt**. Hydrogen for oil refining and ammonia production were the most common end-uses, accounting for approximately **44%** and **33%** of total demand, respectively.

**GLOBAL HYDROGEN PRODUCTION BY ENERGY SOURCE, 2023**




**GLOBAL HYDROGEN DEMAND BY END-USE, 2023**



- Canada is **one of the top 10 hydrogen producers in the world today, with an estimated 4 M**t of hydrogen produced per year (low-carbon and carbon-intensive).
- Most hydrogen in Canada is produced from natural gas and used by the chemical industry and the oil and gas sector. Some of this hydrogen is now being produced using carbon abatement technologies, with several facilities already producing low-carbon hydrogen and others coming online soon.
- Air Liquide's **20 MW** electrolyser is **Canada's largest electrolysis** facility, producing low-carbon hydrogen using electricity to split water. Canada's total deployed low-carbon hydrogen production capacity is currently **over 12,000 tonnes** per year.
- There are more than **100 established hydrogen and fuel cell companies** spanning the full value chain, **employing almost 4,300 people** in direct jobs within Canada, and generating **revenues in excess of $525 million** and **investing $125 million in research, development and demonstration**.

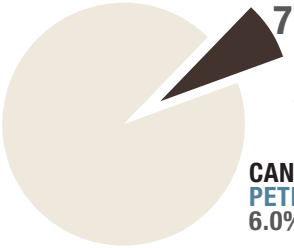
# Section 6:
# **Oil, Natural Gas and Coal**

Crude oil
Natural gas
Hydrocarbon gas liquids (HGLs)
Refined petroleum products (RPPs)
Coal
GHG emissions from petroleum

# Petroleum and the Economy

**NOMINAL GDP CONTRIBUTION FOR CANADA, 2024**

NOMINAL GDP (% OF CURRENT DOLLARS)




**CANADIAN GDP**
**PETROLEUM DIRECT**
**6.0% ($172.0 BILLION)**

**PETROLEUM INDIRECT**
**1.4% ($39.0 BILLION)**

**EMPLOYMENT, 2024**

**DIRECT: 189,700 JOBS**

| | |
|---|---|
| Oil and gas extraction: | 78,100 |
| Support activities: | 57,600 |
| Exploration: | 3,200 |
| Natural gas transmission and distribution: | 20,100 |
| Crude oil and other pipeline transportation: | 5,800 |
| Other: | 24,800 |

**INDIRECT: 313,400 JOBS**

**TOTAL: 503,100 JOBS**

Approximately **11,300 Indigenous people** are employed in the oil and gas sector.

- Capital Expenditures (2024): **$57 billion**
- Canada's oil and gas sector represents about **30%** of the country's GHG emissions.
- Exports (2024): **$188 billion** (26% of total exports)

**4TH Largest** oil producer globally

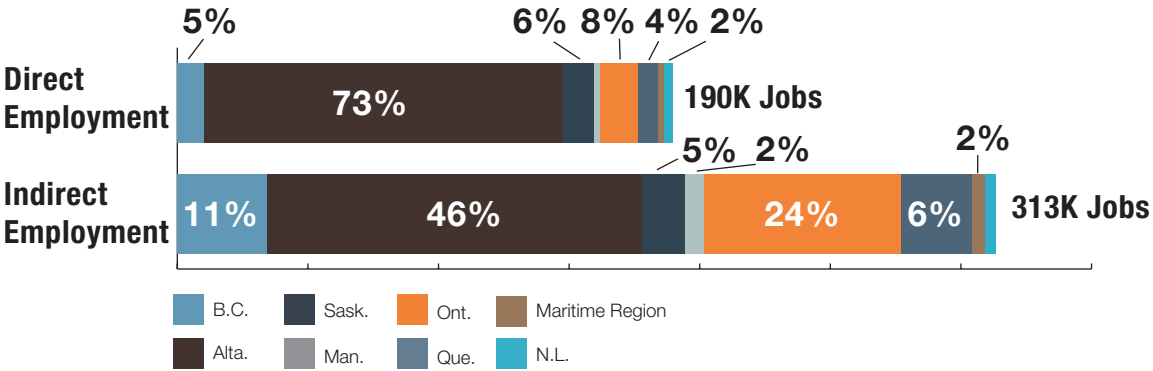
**5TH Largest** gas producer globally

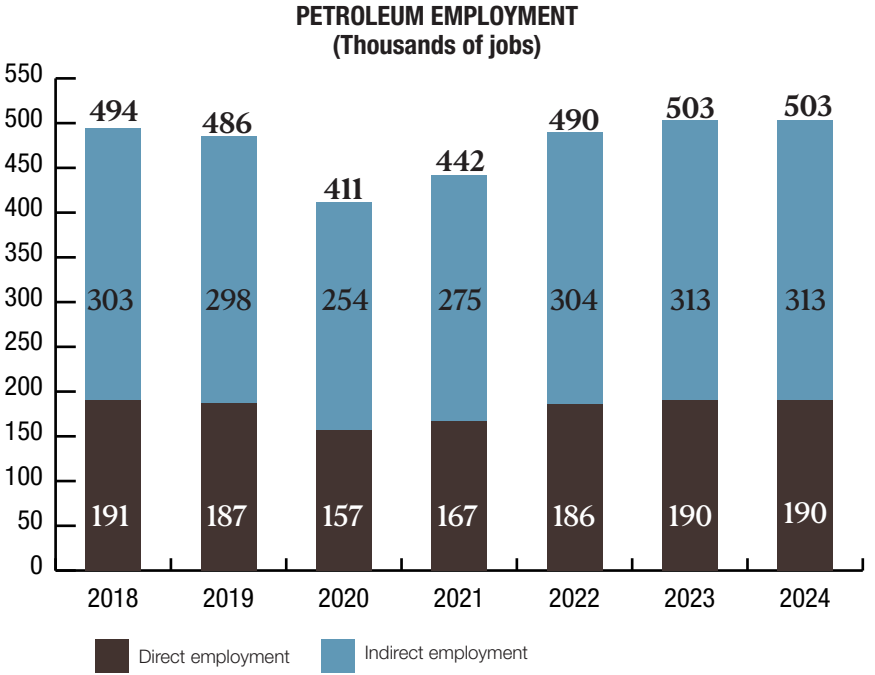
Parts may not sum to total due to rounding. The indirect contribution is not comparable to previously published estimates due to revisions and a change in estimation methodology by Statistics Canada. For more information on Statistics Canada's estimation methodology, please contact statcan.iadinfoddci-dciinfoiad.statcan@statcan.gc.ca.

While Canada's petroleum sector **directly employed 190K people** in 2024, the sector's use of inputs from other industries created an additional

# 313K indirect jobs in the supply chain.

**Alberta employed the largest share (46%) of the supply chain** workers followed by Ontario (24%). BC (11%), Quebec (8%), and Saskatchewan (5%) also accounted for sizeable shares of supply chain jobs.



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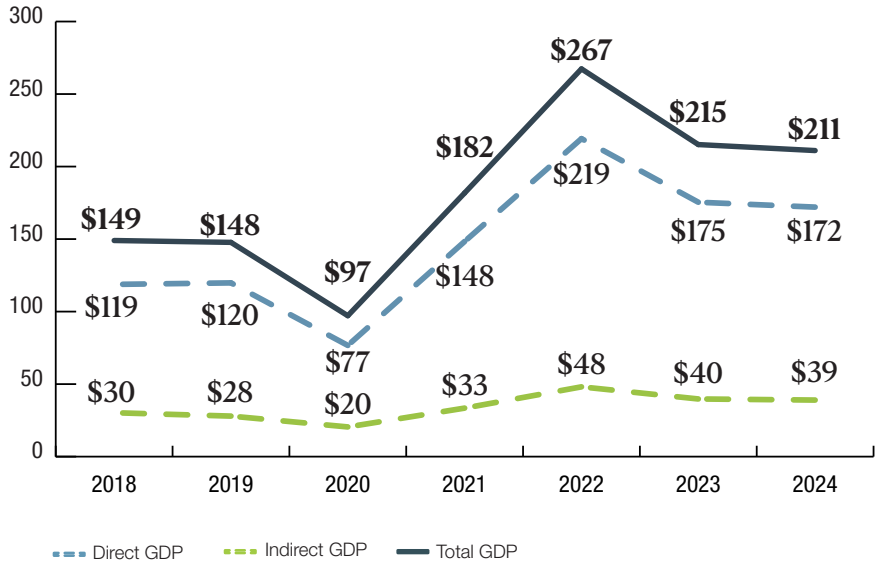
## PETROLEUM GDP
## (Billions of Canadian Dollars)

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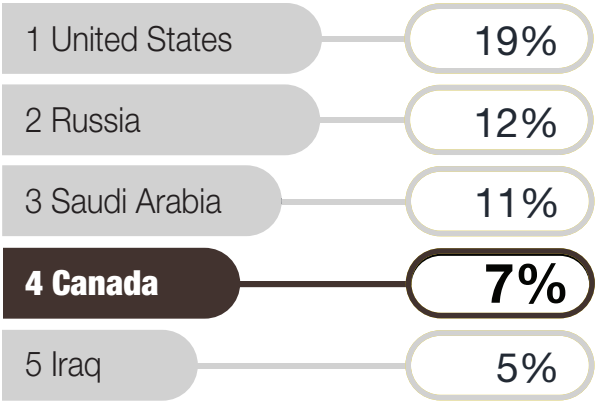
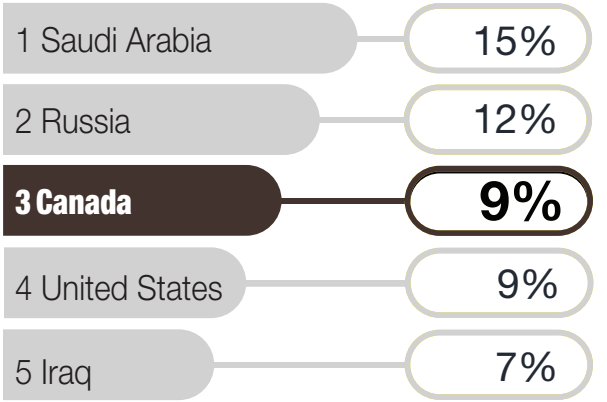
# Crude Oil

## INTERNATIONAL CONTEXT

**World production* – 89.2 MMb/d** (2024)




**World exports* – 45.3 MMb/d** (2023)

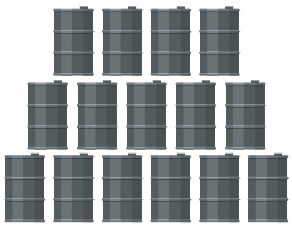



* includes crude oil, NGLs, additives and other hydrocarbons (including the receipts of additives).

**World proved reserves**

# 1,768 billion barrels

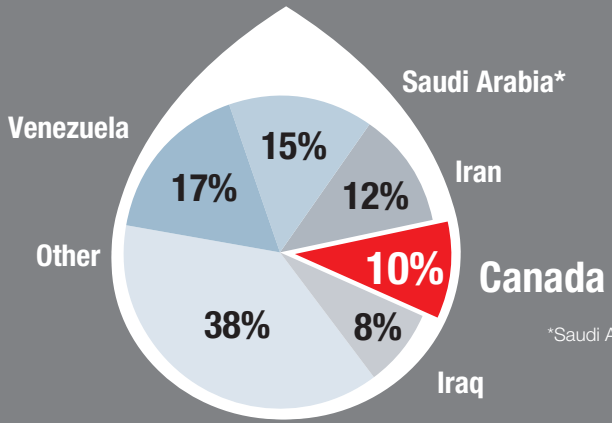
(at the end of 2023)



**Proved reserves are those reserves expected to be recoverable with a high degree of certainty.**

# 97%

## of Canada's proven oil reserves are located in the oil sands.




*Saudi Arabia and Kuwait reserves include the Saudi-Kuwaiti "neutral zone," with total proved reserves of 5 billion barrels.

## CANADIAN RESOURCES

### REMAINING ESTABLISHED RESERVES*

(billion barrels, as of December 2023)


Conventional**

5

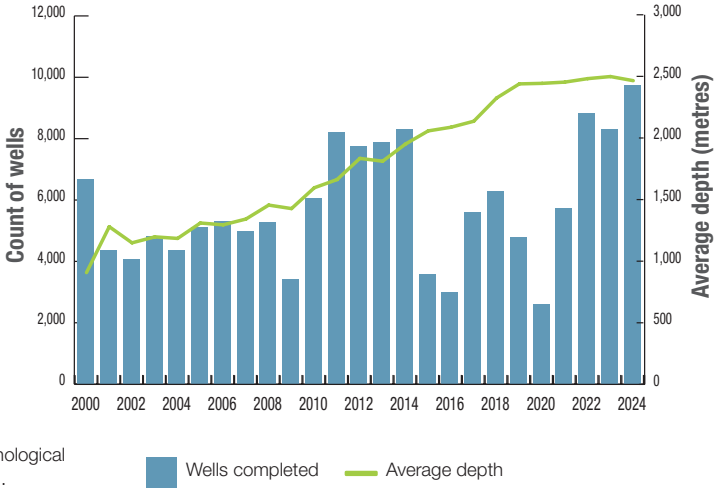
Oil sands

165

mining 33

in situ 132

### COUNT AND AVERAGE DEPTH OF OIL WELLS COMPLETED IN WESTERN CANADA




* Reserves known to exist and recoverable under current technological and economic conditions. Totals may not sum due to rounding.

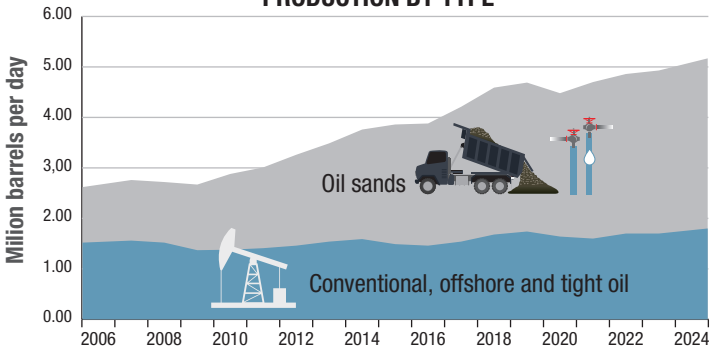
** Reserves also include proved reserves of pentanes plus (a crude-oil equivalent that is associated with oil production).

# CANADIAN PRODUCTION

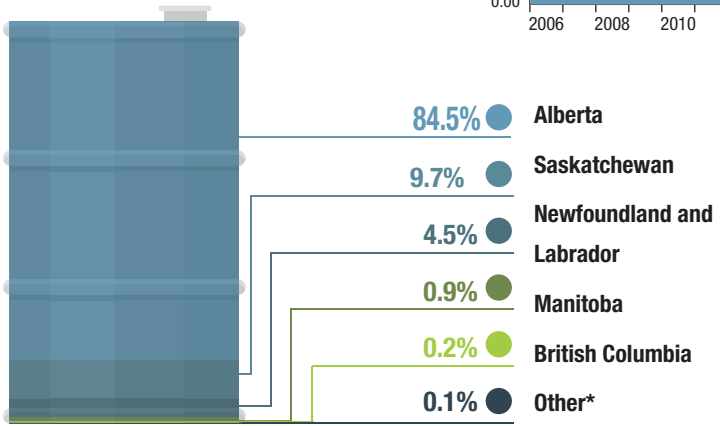
Oil sands production has exceeded conventional production since 2010.

In 2024, oil sands production was **3.4 MMb/d** compared with **1.8 MMb/d** of other oil production.

## PRODUCTION BY TYPE

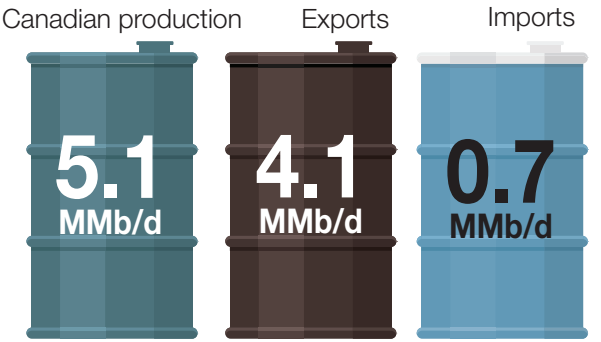



## PRODUCTION BY PROVINCE, 2024

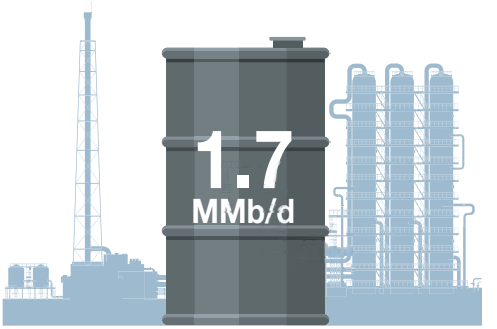



*Other: Nova Scotia, Ontario and the Northwest Territories.

## CANADIAN SUPPLY AND DEMAND* (2024)

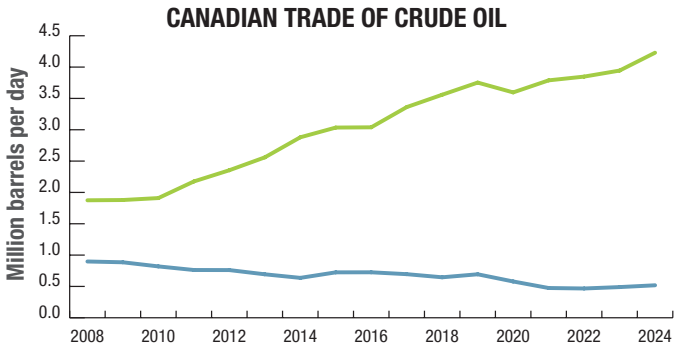



* includes condensates and pentanes plus.




**CRUDE OIL INPUT TO DOMESTIC REFINERIES**

## TRADE



## OIL SANDS

An estimated **$379 billion** of capital investment to date, including **$13.3 billion** in 2024


**OF CANADA'S PROVED RESERVES**


**OF CANADA'S OIL PRODUCTION IN 2024 OR 3.4 MMb/d**

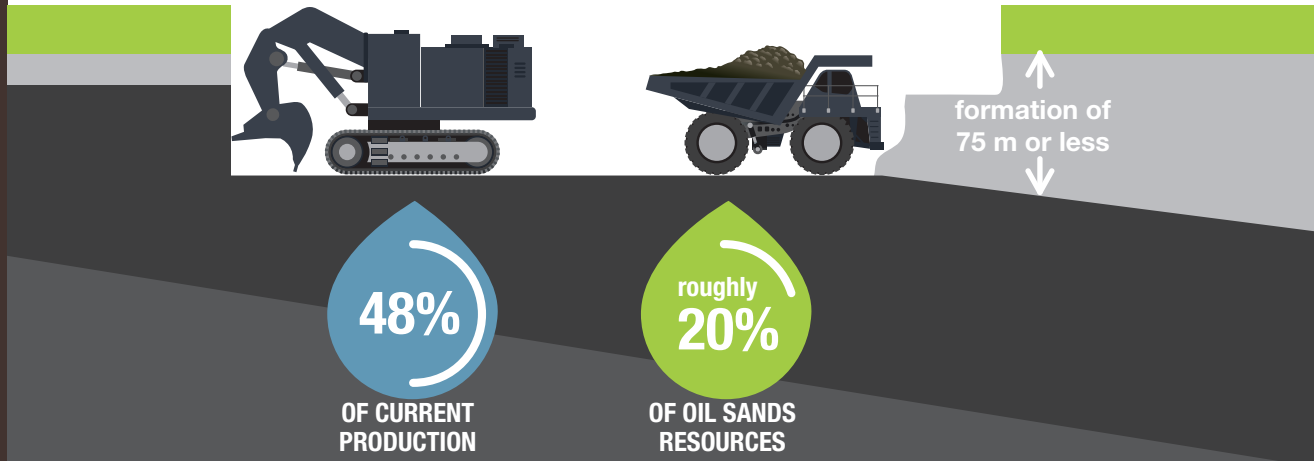
## BITUMEN UPGRADING

- Crude bitumen from oil sands may be transported to upgraders for processing to make it lighter – "synthetic crude oil."
- In 2024, **41%** of the raw bitumen produced was sent for upgrading in Alberta.
- Major companies with upgrading capacity include Syncrude, Suncor, Shell, Canadian Natural Resources, Husky and Nexen-CNOOC.
- The total upgrading capacity in Canada is **1.3 MMb/d**
- Bitumen may also be blended with diluent (e.g. condensates) and sold directly to refineries capable of processing heavier oils.

## MINING METHOD

**Process:** Companies use trucks and shovels to scoop oil sands from the ground. The oil sands are then transported to extraction plants where bitumen is separated from the sand by using steam. Tailings are then pumped into settling basins.

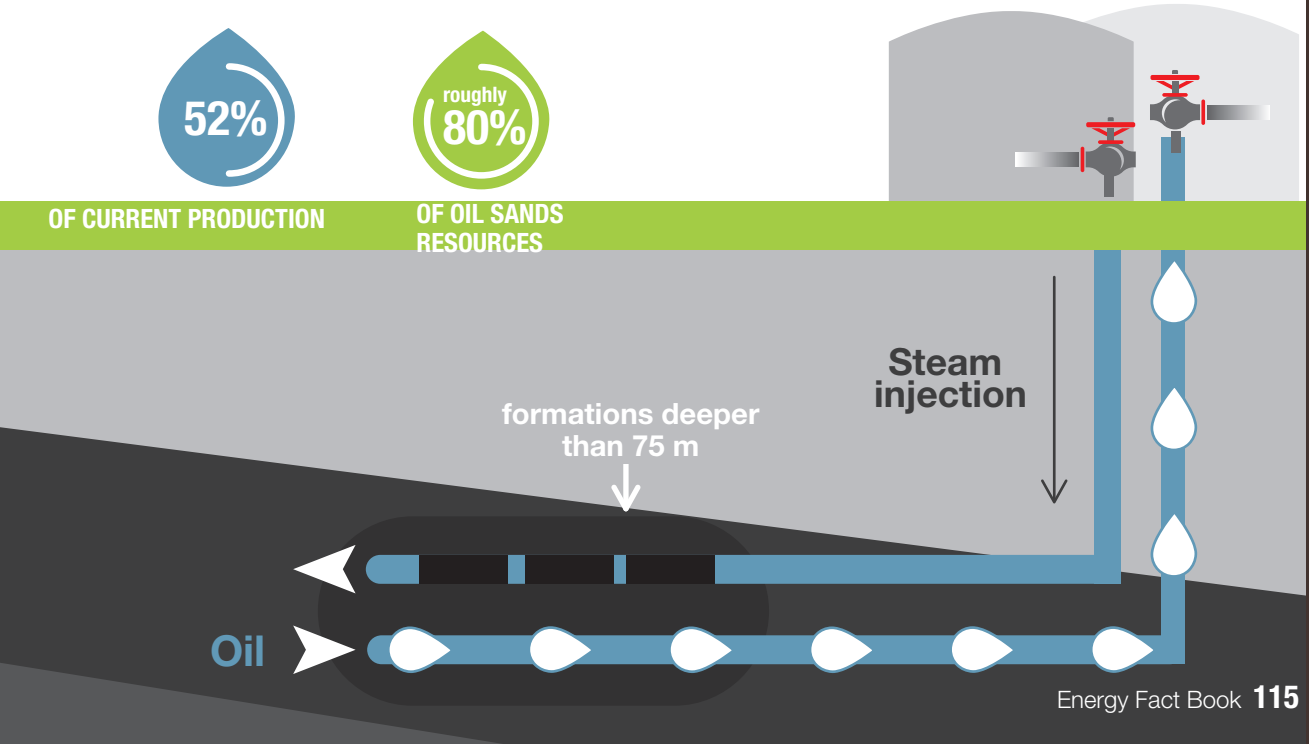
In 2024, **seven projects in Alberta** produced **1,715 Mb/d**: Syncrude Mining Project **(365 Mb/d)**, Suncor Base Mine **(262 Mb/d)**, CNRL Horizon Mine **(282 Mb/d)**, Athabasca Oil Sands Project – Muskeg River (**188 Mb/d**), Jackpine Mine (**142 Mb/d**), Imperial's Kearl Mine **(300 Mb/d)** and Fort Hills **(176 Mb/d)**.



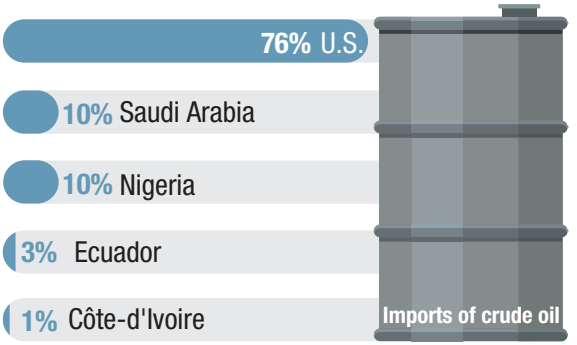
## IN SITU METHOD

**Process:** Companies drill vertical and/or horizontal wells to inject steam to facilitate the flow of oil.

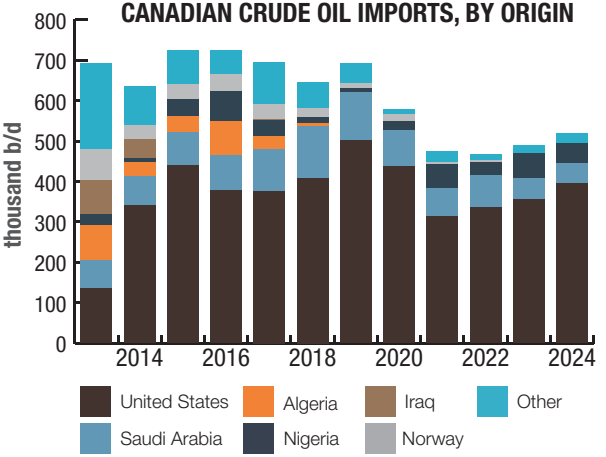
**More than 20 projects in Alberta** – The largest projects in 2024 were Firebag and MacKay River (Suncor) at **266 Mb/d**, Christina Lake (Cenovus) at **234 Mb/d**, Foster Creek (Cenovus) at **194 Mb/d** and Cold Lake (Imperial Oil) at **150 Mb/d**.



In 2024, imports of crude oil into Canada came from a range of countries including:



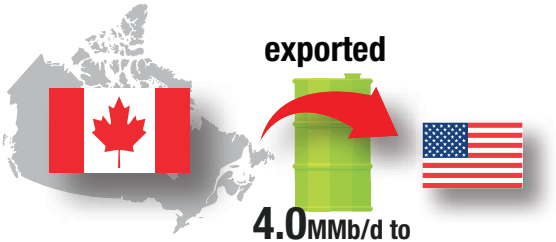

Over recent years, the U.S. has become Canada's primary supplier of imported crude oil.




In 2024, Canada was the **largest foreign supplier of crude oil** to the U.S., accounting for

**62%**
**of total U.S. crude oil imports**

**24%**
**of U.S. refinery crude oil intake**



**exported**
**4.0MMb/d to**

**representing**
**96%**
**of all Canadian crude oil exports**

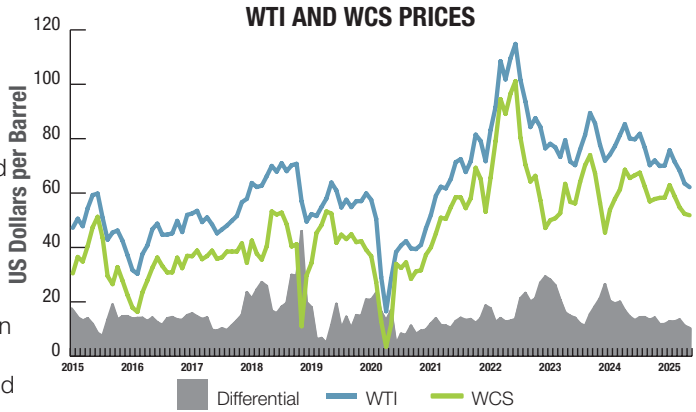
# PRICES

## WEST TEXAS INTERMIEDATE (WTI) AND WESTERN CANADIAN SELECT (WCS)

- WTI is a reference price for light crude oil delivered at Cushing, Oklahoma (a major pipeline hub) and is used as the benchmark price for North American crudes. WTI underlies oil futures contracts on the NYMEX.
- WCS is the main benchmark price for Canadian heavy crude, specifies delivery at Hardisty, Alberta and is representative of the price of oil from the oil sands.

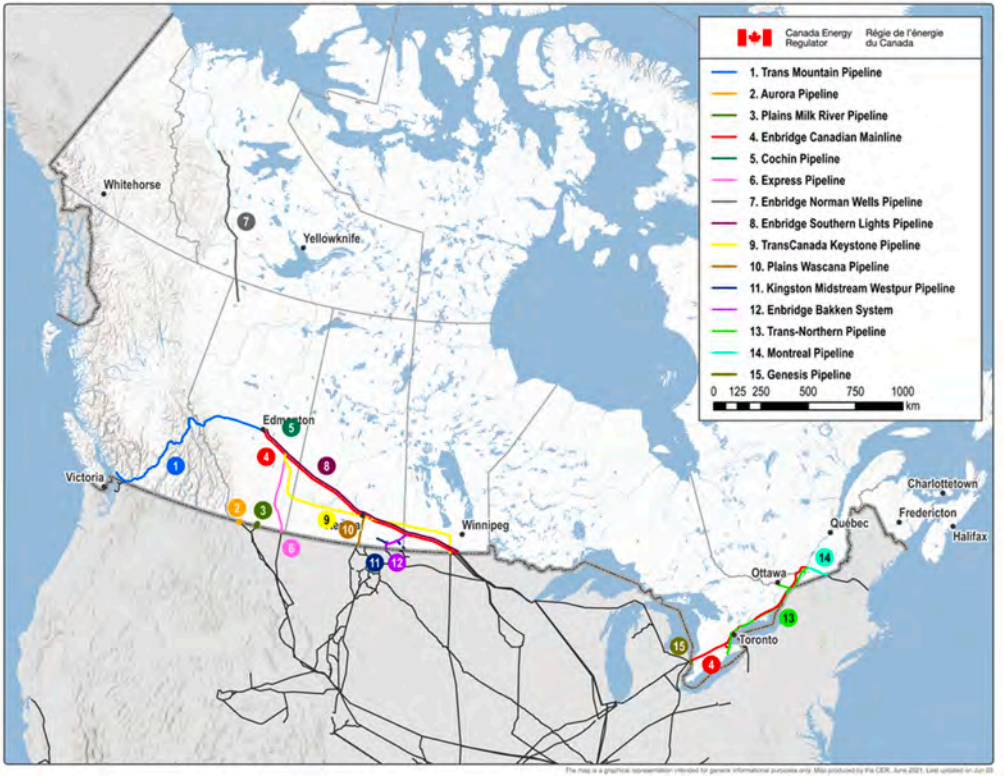
## WTI-WCS DIFFERENTIAL

- WCS is typically sold at a discount to WTI due to differences in quality and transportation costs. Heavy crude is more difficult to process and requires specialized equipment at refineries.
- The WCS-WTI differential has historically averaged between US$10-$15 per barrel. However, during the fall of 2018, the differential reached a record high of over US$50 per barrel due to insufficient pipeline capacity.
- In Q2 2020, oil prices collapsed due to the drop in demand resulting from the global pandemic. US refineries drastically reduced their refinery runs and purchases of Canadian heavy crude.




- Starting in Q3 2020, easing lockdown measures led to a demand recovery and a price rebound that lasted through 2021, accelerating in the first half of 2022 following the Russian invasion of Ukraine. After peaking in June 2022, prices trended downward due to increasing global inventories and concerns over slowing demand amid rising interest rates.

# MAJOR CER REGULATED OIL PIPELINES

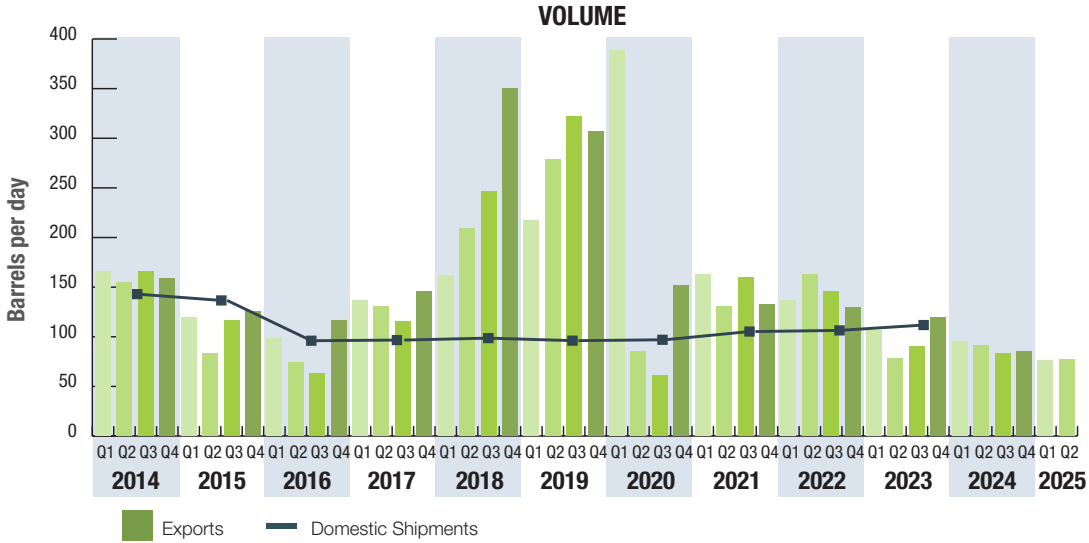


# OIL BY RAIL

Oil shipments by rail have varied considerably over the past decade, driven by shifts in global oil prices and transportation capacity. Exports fell sharply in 2015-2016 amid declining prices, then surged in 2018 as pipeline constraints in Western Canada increased reliance on rail.

Exports reached a high of 412 Mb/d in February 2020, just before a pandemic-related price downturn triggered a steep decline. Although volumes briefly rebounded, they have since levelled off below prior peaks.

By contrast, domestic shipments of fuel oils and crude have remained relatively stable since 2016.

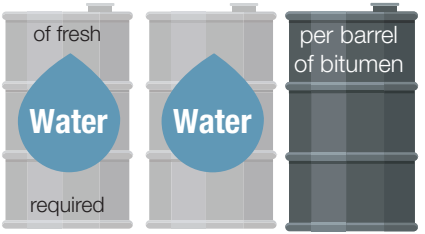


# OIL SANDS: ENVIRONMENTAL CONSIDERATIONS

## WATER

**Mining method:**

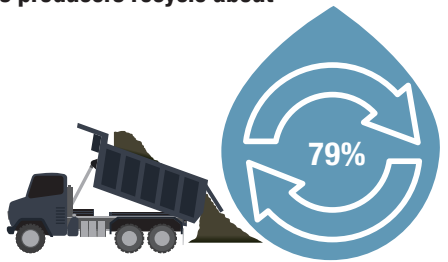
**2.1 barrels**



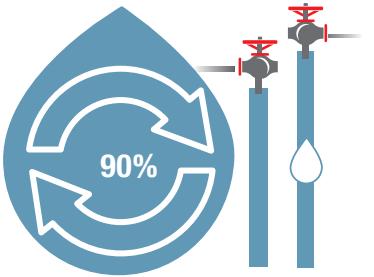

**In situ method:** an average of

**0.15 barrels**


**Oil sands producers recycle about**




**OF THE WATER USED FOR ESTABLISHED MINES**

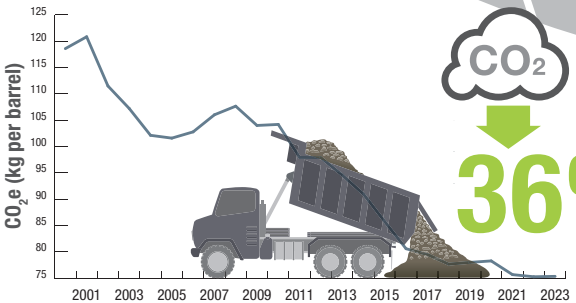



**OF THE WATER USED FOR IN SITU PRODUCTION**

## GREENHOUSE GASES

**13%** of Canada's total **GHG emissions** in 2023 and **0.18%** of **global emissions in 2022**

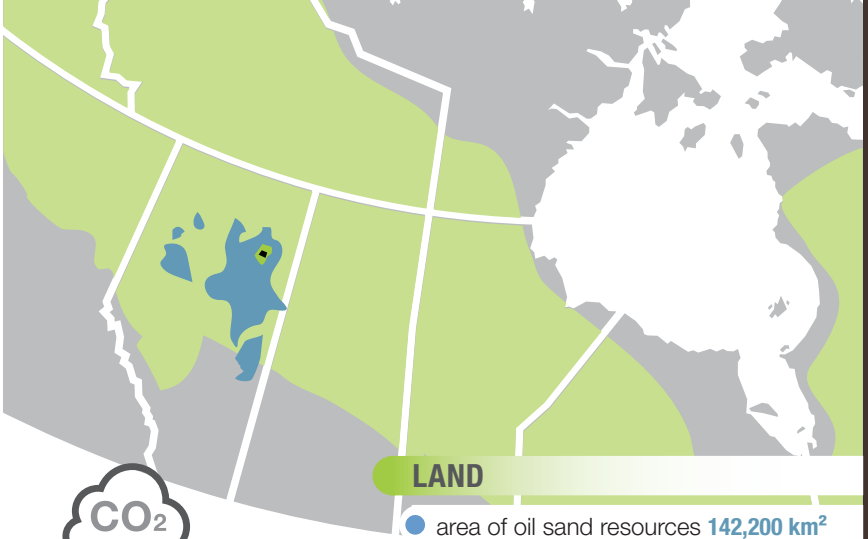
From 2000 to 2023, emissions intensity per barrel decreased by





**36%**

as a result of **technological and efficiency improvements**, fewer venting emissions and reductions in the percentage of crude bitumen being upgraded to synthetic crude oil.



### LAND

- area of oil sand resources **142,200 km²**
- total mineable area **4,800 km²**
- total area being mined **953 km²**
  tailings ponds **257 km²**

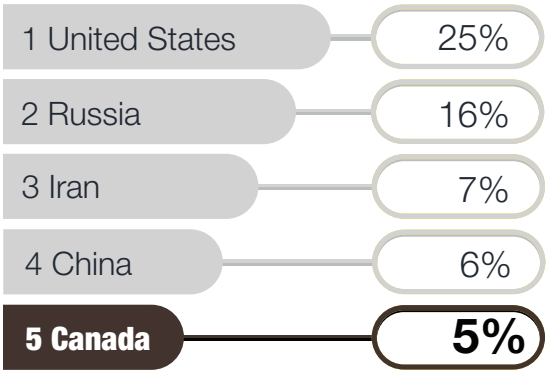
For comparison:

- Canada's area **10,000,000 km²**
- Canada's boreal forest **2,700,000 km²**

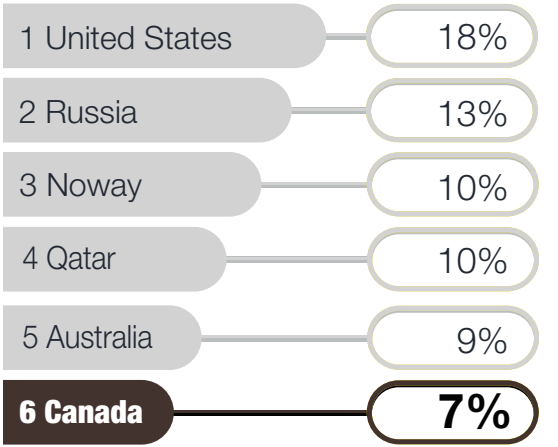
# Natural gas

## INTERNATIONAL CONTEXT

**World production – 413 Bcf/d (11.7 Bcm/d)**
(2024, PRELIMINARY)

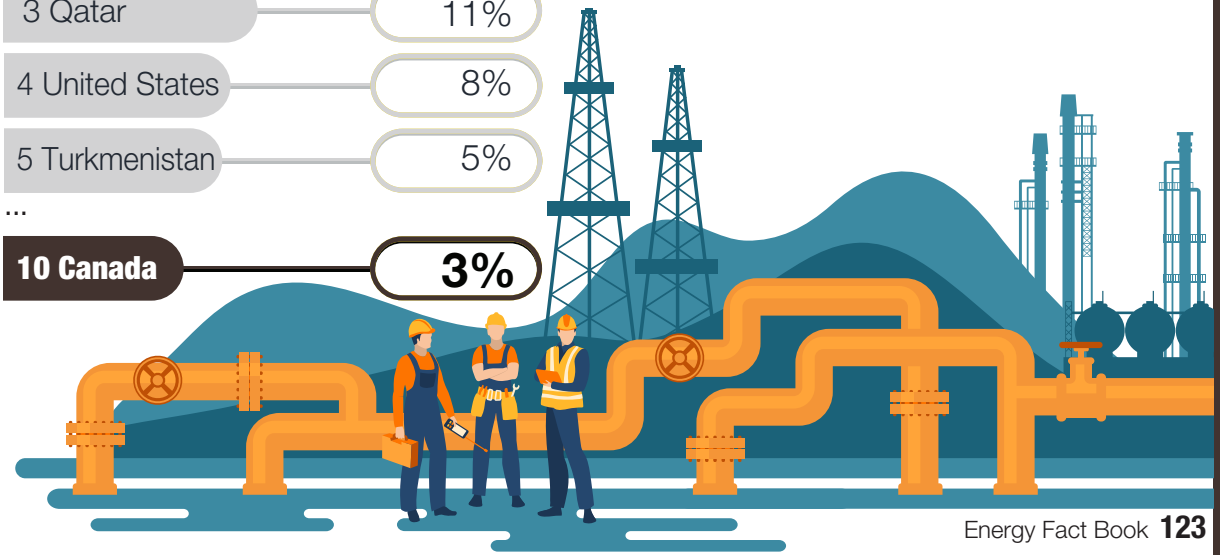



**World exports – 119 Bcf/d (3.4 Bcm/d)**
(2024, PRELIMINARY)



**World proved reserves – 7,604 Tcf (215 Tcm)**
(BEGINNING OF 2024)

| | |
|---|---|
| 1 Russia | 22% |
| 2 Iran | 16% |
| 3 Qatar | 11% |
| 4 United States | 8% |
| 5 Turkmenistan | 5% |
| ... | |
| **10 Canada** | **3%** |



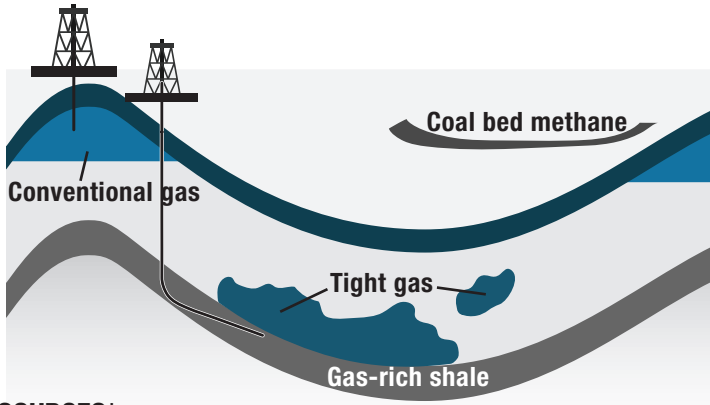
# CANADA-U.S. RESOURCES

**PROVED RESERVES*** (Beginning of 2024)

**196**** Tcf

**604** Tcf

TOTAL **800** Tcf




## MARKETABLE/TECHNICALLY RECOVERABLE RESOURCES*

**Canada total, year-end 2023** **1,368** Tcf

conventional **380** Tcf

unconventional **988** Tcf

(coal-bed methane, shale and tight gas)

**U.S. total, year-end 2020** **2,973** Tcf

portion that is shale and tight gas **2,172** Tcf

portion that is other **801** Tcf

**World total** (year-end 2022) **28,358** Tcf

conventional **14,867** Tcf

unconventional **13,490** Tcf

* Please see *Annex 2: Units and conversion factors* for definitions of proved reserves and recoverable resources.

** NRCan approximation based on data publicly available as of August 2025.

## CANADA-U.S. MARKET (2024)

Canada's natural gas market is heavily integrated with that of the U.S. largely because of the location of supply basins, demand centres, and the availability of transportation infrastructure, as well as existing Canada-U.S. trade agreements. These factors allow for consumers and distributors on either side of the border to freely access natural gas from the lowest cost supplier.

**Canadian average marketable production**

**18.8** Bcf/d (0.53 Bcm/d)

**10%** conventional

**90%** unconventional*

**U.S. average marketable production**

**103.2** Bcf/d (2.92 Bcm/d)

**6%** conventional

**94%** unconventional*

**Canada-U.S. production**

**122.0** Bcf/d (3.46 Bcm/d)

**LNG imports**

**39** MMcf/d

**45** MMcf/d

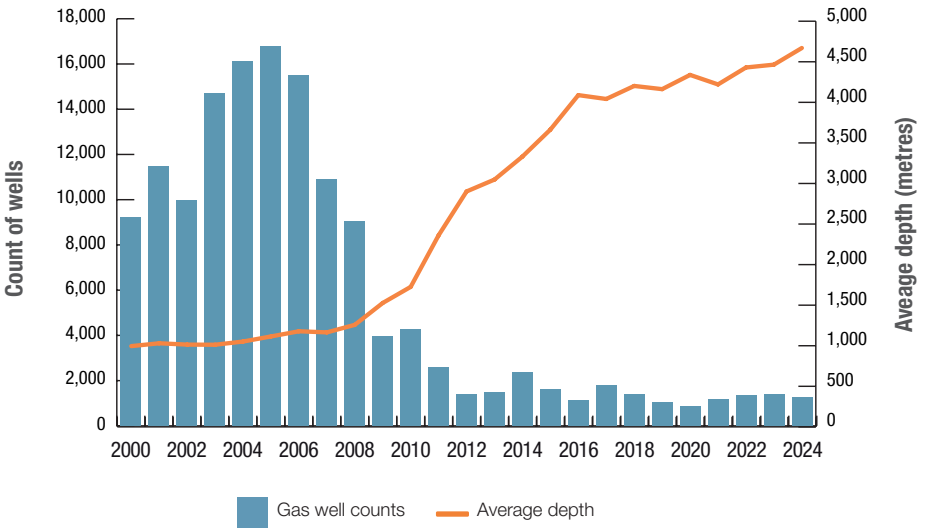
**LNG exports**

**3** MMcf/d

**11,932** MMcf/d

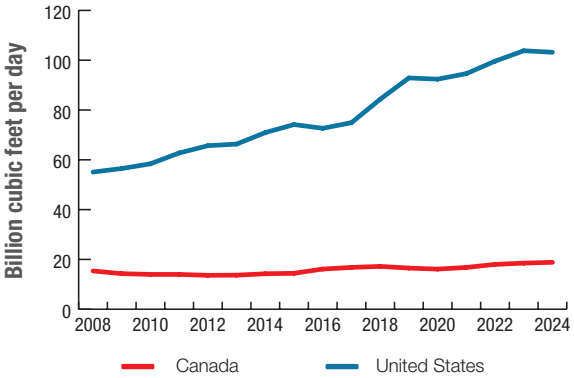
* Unconventional gas includes tight gas, coal bed methane and shale gas.

## COUNT AND AVERAGE DEPTH OF NATURAL GAS WELLS COMPLETED IN WESTERN CANADA

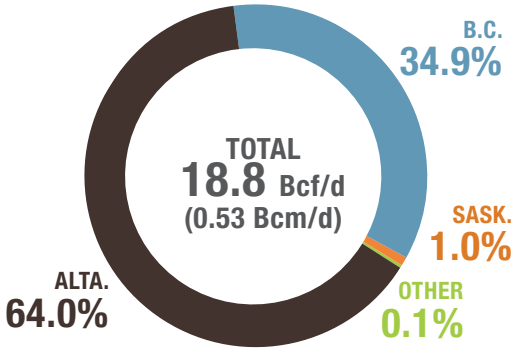



While Canadian natural gas production remained relatively flat and the number of wells drilled declined, the well productivity has increased over time. This reflects the increased use of horizontal drilling and increased well length.

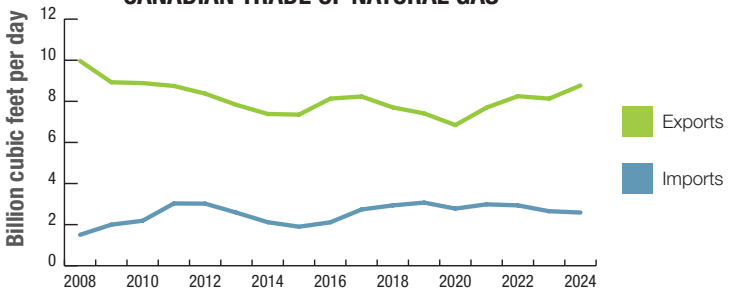
## CANADIAN AND U.S. MARKETABLE PRODUCTION OF NATURAL GAS




## MARKETABLE PRODUCTION BY PROVINCE, 2024




## CANADIAN TRADE OF NATURAL GAS




Canadian exports to the U.S.

**8.8** Bcf/d (0.25 Bcm/d)

Canadian imports from the U.S.

**2.6** Bcf/d (0.07 Bcm/d)

- Natural gas imports from the U.S. into Eastern Canada are on the rise because of higher supplies in the U.S. Northeast and shorter transportation distances from these U.S. natural gas basins.
- Canadian natural gas exports to the western U.S. and U.S. Midwest remain significant.
- Since 2009, Canada has imported liquefied natural gas (LNG) from other countries via the Canaport LNG terminal in Saint John, N.B.
- Since 2017, Canada has also exported small quantities of LNG to other countries via the Port of Vancouver, B.C.

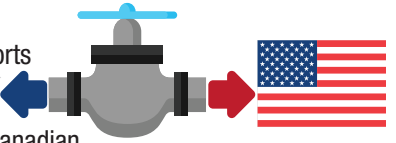
**34%** of Canadian production is exported.

**Canadian exports are largely destined for the U.S.**

**99% of U.S. imports and 9% of U.S. consumption comes from Canada.**

**The value of Canadian net exports** (exports minus imports) was **$6.3 billion** in 2024.

**98%** of Canada's imports and **16%** of Canadian consumption comes from the U.S.

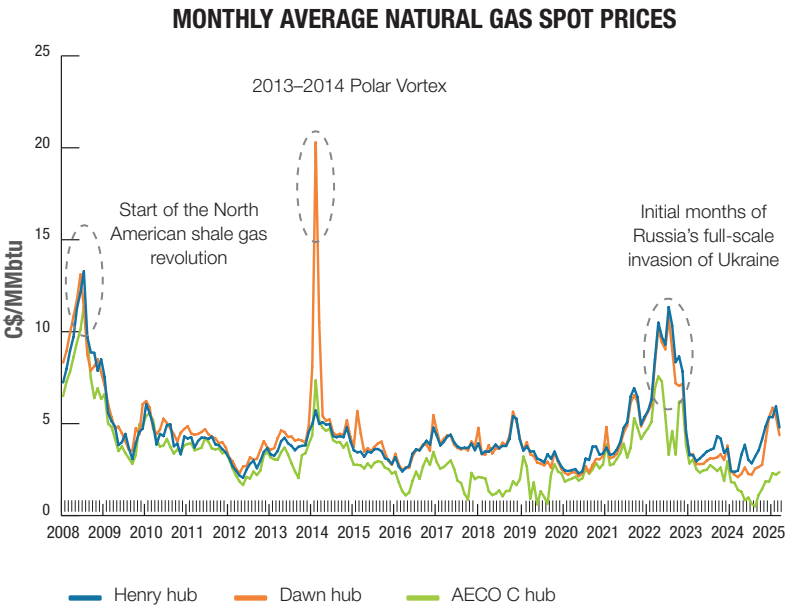


# UPSTREAM PRICES

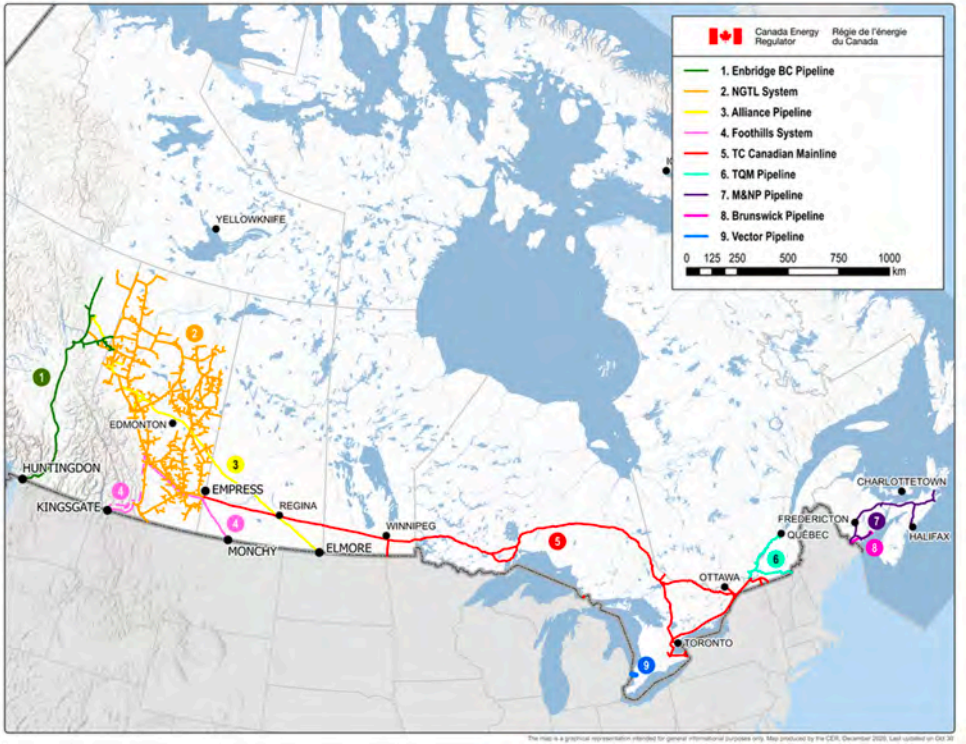
The AECO hub is Canada's largest natural gas trading hub, and the AECO price serves as a benchmark for Alberta wholesale natural gas transactions.

## AECO PRICE

| | |
|---|---|
| Average: 2009–2016 | **$3.38**/MMbtu |
| Average: 2017 | **$2.20**/MMbtu |
| Average: 2018 | **$1.53**/MMbtu |
| Average: 2019 | **$1.80**/MMbtu |
| Average: 2020 | **$2.24**/MMbtu |
| Average: 2021 | **$3.64**/MMbtu |
| Average: 2022 | **$5.43**/MMbtu |
| Average: 2023 | **$2.64**/MMbtu |
| Average: 2024 | **$1.39**/MMbtu |



# TRANSPORTATION
## CER REGULATED GAS PIPELINES

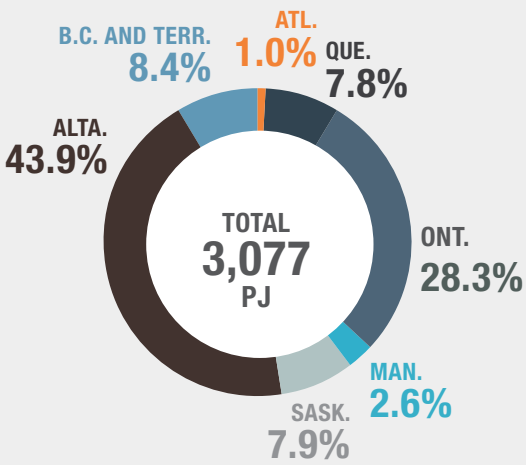


# NATURAL GAS ENERGY USE

### NATURAL GAS END USE BY SECTOR, 2022

| Sector | Energy use (PJ) | Energy use (Bcf/d) | % of the total |
|---|---|---|---|
| Residential | 673.3 | 1.75 | 21.9% |
| Commercial | 608.6 | 1.58 | 19.8% |
| Industrial | 1,740.6 | 4.52 | 56.6% |
| Transportation | 4.8 | 0.01 | 0.2% |
| Agriculture | 49.8 | 0.13 | 1.6% |
| **Total** | **3,077.1** | **7.99** | **100%** |

### NATURAL GAS ENERGY USE BY PROVINCE, 2022

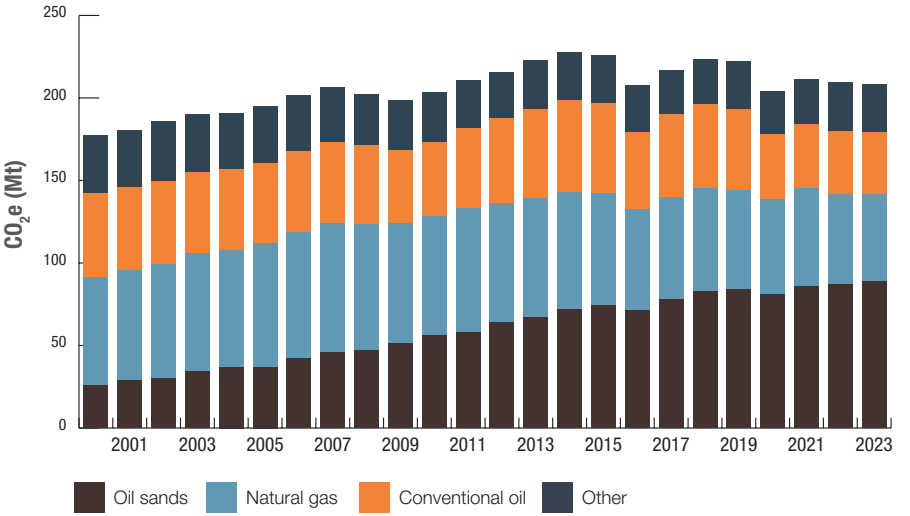


## GHG SPOTLIGHT: OIL AND GAS

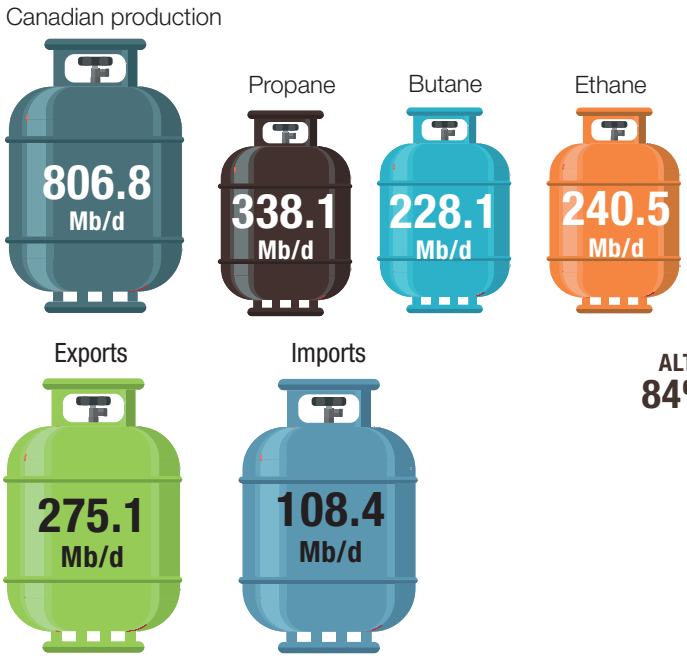
GHG emissions from oil and gas production **have gone up 17% between 2000 and 2023,** largely from increased oil sands production, particularly in situ extraction.

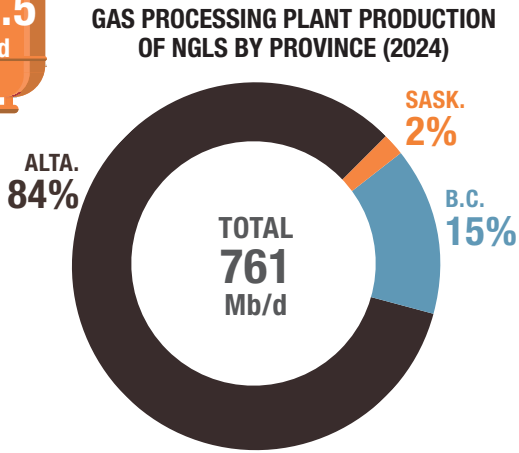
During this period, oil sands production emissions **more than tripled** while conventional oil and natural gas emissions **decreased by 23%**.

**OIL AND GAS SECTOR GHG EMISSIONS FOR CANADA, 2000–2023**



# HYDROCARBON GAS LIQUIDS (HGLs)
## SUPPLY AND DEMAND* (2024)




* excludes condensates and pentanes plus, which are induded as part of crude oil, and includes refinery-produced LPGs.

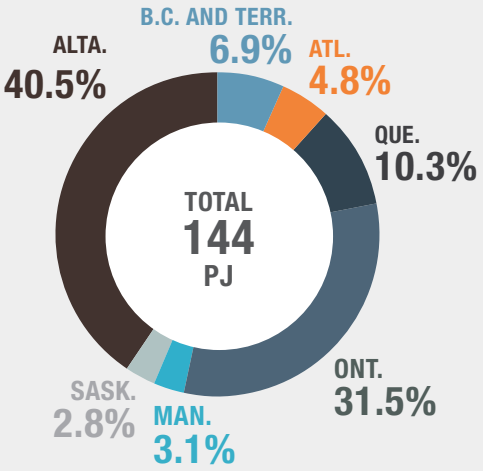
# NATURAL GAS LIQUIDS ENERGY USE

**TOTAL NATURAL GAS LIQUIDS ENERGY USE WAS 144 PJ IN 2022.**

| Sector | Energy use* (PJ) | % of the total |
|---|---|---|
| Residential | 16.7 | 11.6% |
| Commercial | 38.0 | 26.4% |
| Industrial | 67.4 | 46.9% |
| Transportation | 11.9 | 8.3% |
| Agriculture | 9.8 | 6.8% |
| **Total** | **143.8** | **100%** |

*secondary energy use

**NATURAL GAS LIQUIDS ENERGY USE BY PROVINCE, 2022**



# REFINED PETROLEUM PRODUCTS (RPPs)

## PETROLEUM REFINERIES

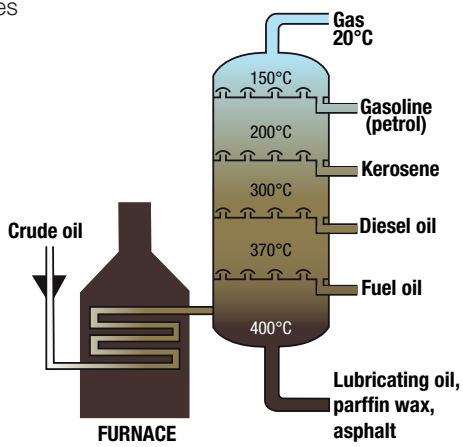
Petroleum refineries transform crude oil into a wide range of refined petroleum products (RPPs, e.g. gasoline, diesel). Other facilities such as asphalt plants, lubricant plants, upgraders and some petrochemical plants also process crude oil to produce a limited range of products.

### REFINERY ACTIVITIES

- **crude oil distillation:** separating products from crude oil by heating
- **additional processing:** e.g. catalytic cracking, reforming, coking
- **product blending:** end-use RPPs are usually blended with additives or renewable fuels

### REFINERY OUTPUTS

- transportation fuels: gasoline, diesel, aviation fuels, heavy fuel oil
- heating oil
- liquid petroleum gases: propane and butane from refineries
- petrochemical feedstock
- other products: e.g. kerosene, lubricating oils, greases, waxes, asphalt



## SUPPLY AND DEMAND* (2024)

Canadian net production

**2.0**
**MMb/d**
(115 billion L)

Exports

**0.3**
**MMb/d**
(20 billion L)

Imports

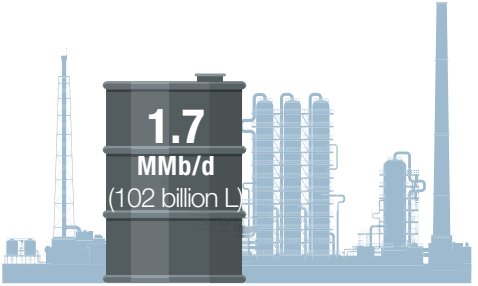
**0.1**
**MMb/d**
(9 billion L)

**Domestic Consumption**

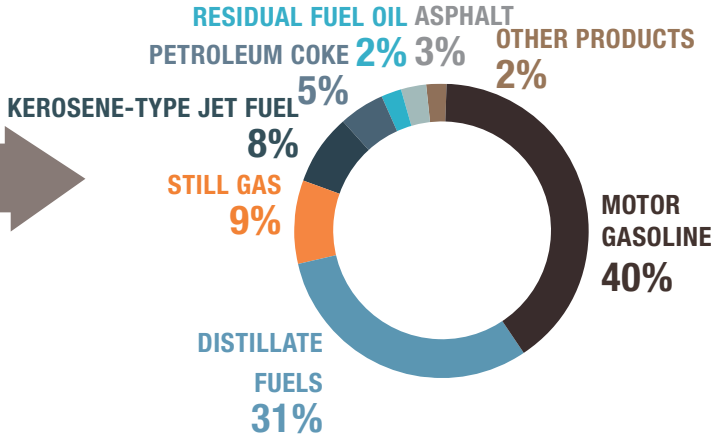
**1.8**
**MMb/d**
(104 billion L)

*Some product shares are based on estimates from Natural Resources Canada.

### CRUDE OIL SHIPPED TO DOMESTIC REFINERIES

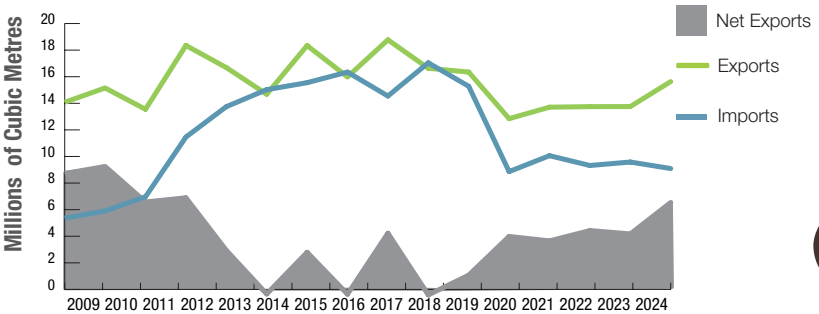



### DOMESTIC CONSUMPTION BY PRODUCT, 2024*

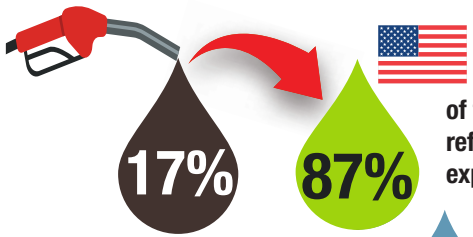


# TRADE

## CANADIAN TRADE OF MAJOR REFINED PETROLEUM PRODUCTS



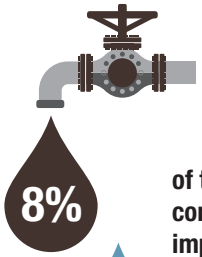

*Primarily motor gasoline, diesel, jet fuel, fuel oil, and kerosene*




**of Canadian production of refined petroleum products is exported**

**of the dollar value of Canadian refined petroleum products exports are to the United States.**


**of United States imports come from Canada.**




**of total Canadian consumption is imported.**
**In value terms:**

**71%**
**United States**

**8%**
**Netherlands**

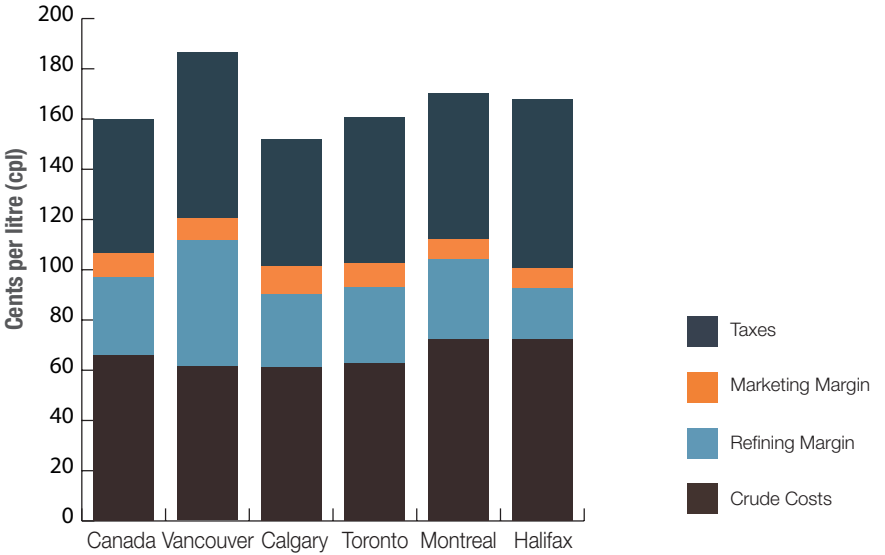
**4%**
**United Kingdom**

**3%**
**Belgium**

**3%**
**South Korea**

# RETAIL PRICES

## AVERAGE CANADIAN REGULAR GASOLINE PRICES, 2024



# REFINERY CAPACITY

**CANADIAN PETROLEUM REFINERIES BY COUNT AND CAPACITY*, 2024**

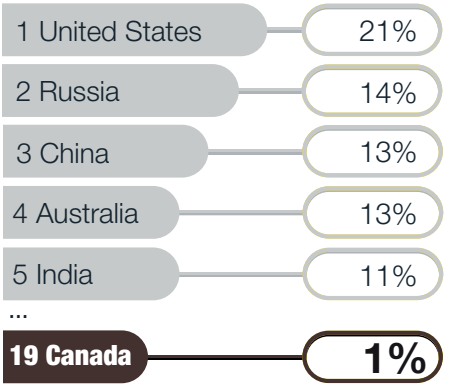
| Province | Petroleum refinery | | Asphalt plants | | Lubricant plants (using crude oil as feedstock) | | Total | |
|---|---|---|---|---|---|---|---|---|
| | Count | Capacity | Count | Capacity | Count | Capacity | Count | Capacity |
| Alberta | 4 | 530 | - | - | - | - | 4 | 530 |
| British Columbia | 2 | 67 | - | - | - | - | 2 | 67 |
| New Brunswick | 1 | 320 | - | - | - | - | 1 | 320 |
| Ontario | 4 | 393 | - | - | 1 | 16 | 5 | 409 |
| Quebec | 2 | 372 | - | - | - | - | 2 | 372 |
| Saskatchewan | 1 | 135 | 2 | 52 | - | - | 3 | 187 |
| **Total** | **14** | **1,817** | **2** | **52** | **1** | **16** | **17** | **1,885** |

*Capacities are in Mb/d. The Come by Chance Refinery in Newfoundland and Labrador is being converted into a biofuel refinery.

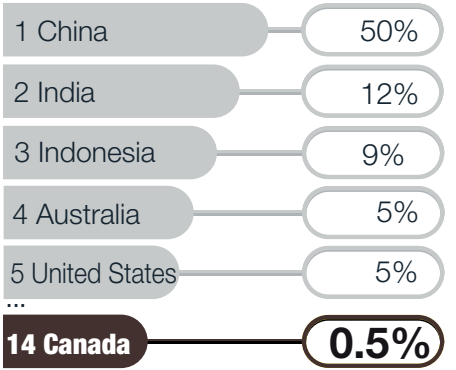
# Coal

## INTERNATIONAL CONTEXT

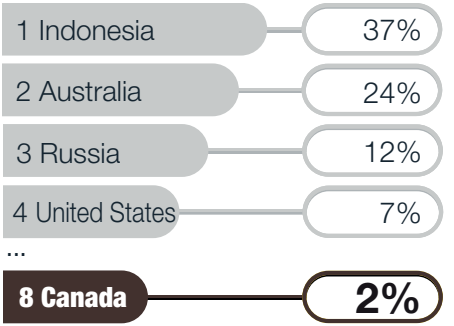
**World proved reserves – 1,166 BILLION TONNES** (2023)




**World production – 8.8 BILLION TONNES** (2024)

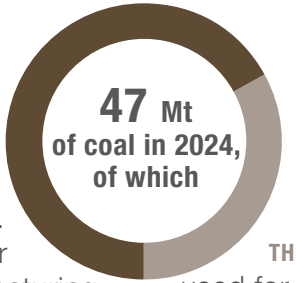



**World exports – 1.5 BILLION TONNES** (2024)



## PRODUCTION AND USE

### Canada produced




**67%** is **METALLURGICAL COAL** used for steel manufacturing

**33%** is **THERMAL COAL** used for electricity

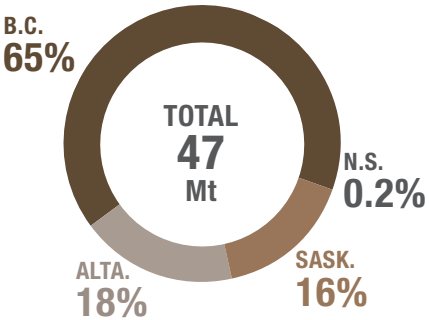
### Electricity generation consumed


of coal in **2023**, a

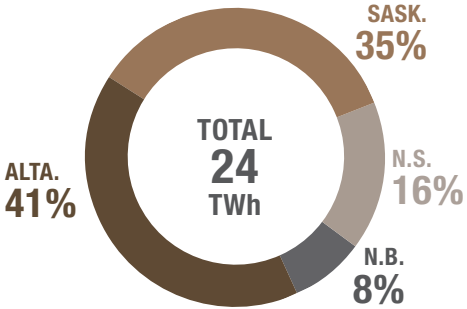
**70%** decrease from


in **2010**.

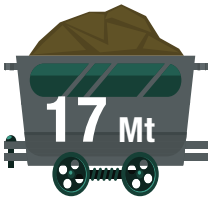
### COAL PRODUCTION BY PROVINCE, 2024



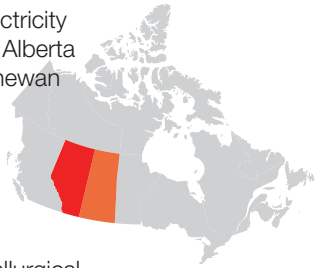

### COAL-FIRED ELECTRICITY GENERATION BY PROVINCE, 2022



## DOMESTIC DEMAND (2024)




Mostly for electricity generation in Alberta and Saskatchewan



Also for metallurgical applications

## TRADE

### CANADIAN TRADE OF COAL


Canada's exports are primarily metallurgical coal (**81%** in 2024).

## TRADE (2024)

EXPORTS


**$9.7 billion in coal exports**

(by volume)

**major export destinations**

**28% South Korea**

**27% China**

**25% Japan**

**2%** of Canadian exports are to the U.S.,

representing **19%** of **U.S. coal imports**.

IMPORTS


**$1.1 billion in coal imports**

**71%** of Canadian imports are from the U.S.

# ANNEXES

## Annex 1: Notes on methodology

In this publication, energy industries are generally considered to include oil and gas extraction; coal mining; uranium mining; electric power generation, transmission and distribution; pipeline transportation; natural gas distribution; biofuels production; petroleum refineries; and support activities for oil and gas extraction. The petroleum sector is a subset of these industries, and in this publication consists of oil and gas extraction and support activities, pipeline transportation and distribution of oil and gas, and petroleum refineries.

Clean energy industries such as renewable and nuclear electricity generation, biofuels production and carbon capture and storage facilities are contained within the definition of energy industries. Some energy-related industries (e.g. petroleum product wholesaler-distributors and coal product manufacturing) are excluded because of a lack of data.

This publication represents data availability at the time of its preparation. All data is subject to revisions by statistical sources. In some instances, more than one source may be available and discrepancies in numbers may occur because of conceptual or methodological differences. In addition, some numbers may not add up precisely due to rounding.

## Annex 2: Units and conversion factors

### PREFIXES AND EQUIVALENTS

| Prefix | | | | |
|---|---|---|---|---|
| SI/Metric | | Imperial | Equivalent | |
| k | kilo | M | thousand | $10^3$ |
| M | mega | MM | million | $10^6$ |
| G | giga | B | billion | $10^9$ |
| T | tera | T | trillion | $10^{12}$ |
| P | peta | - | quadrillion | $10^{15}$ |

Notes

- Tonne may be abbreviated to “t” and is not to be confused with “T” for tera or trillion.
- Roman numerals are sometimes used with imperial units (this can create confusion with the metric “M”).

## CRUDE OIL

### Upstream

- reserves usually in barrels or multiples (million barrels)
- production/capacity often in barrels per day or multiples (thousand barrels/day or Mb/d, million barrels/day or MMb/d)
- metric: 1 cubic metre = 6.2898 barrels
- International Energy Agency: uses weight (tonnes) rather than volume

### Downstream (petroleum products)

- volumes of refined products usually in litres
- 1,000 litres = 1 cubic metre
- U.S.: 1 U.S. gallon = 3.785 litres

## NATURAL GAS

### Volume

- reserves/production usually in cubic feet or multiples (billion cubic feet or Bcf, trillion cubic feet or Tcf)
- production/capacity often in cubic feet per day or multiples (Bcf/d, Tcf/d)
- metric: 1 cubic metre = 35.3147 cubic feet

### Density

- 1 million t LNG = 48.0279 billion cubic feet

### Pricing

Volume-based:

- cents per cubic metre (¢/$m^3$) (customer level in Canada)
- $ per hundred cubic feet ($/CCF) (customer level in the U.S.)

Energy content-based:

- $ per gigajoule ($/GJ) (company level in Canada)
- $ per million British thermal units ($/MMbtu) (company level in the U.S., LNG)

## URANIUM

- 1 metric tonne = 1,000 kilograms of uranium metal (U)
- U.S.: in pounds of uranium oxide ($U_3O_8$)
- 1 lb. $U_3O_8$ = 0.84802 lb. U = 0.38465 kg U

## COAL

- 1 metric tonne = 1,000 kilograms
- U.S.: 1 short ton = 2,000 pounds
- 1 metric tonne = 1.10231 short tons

## ELECTRICITY

### Capacity

- maximum rated output that can be supplied at an instant, commonly expressed in megawatts (MW)

### Total capacity

- installed generator nameplate capacity

### Generation/sales

- flow of electricity over time, expressed in watt-hours or multiples:
  - kilowatt-hours or kWh (e.g. customer level)
  - megawatt-hours or MWh (e.g. plant level)
  - gigawatt-hours or GWh (e.g. utility level)
  - terawatt-hours or TWh (e.g. country level)

### From capacity to generation

- A 1-MW unit operating at full capacity over one hour generates 1 MWh of electricity
- Over one year, this unit could generate up to 8,760 MWh (1 MW × 24 hr × 365 days)
- Units are rarely used at full capacity over time because of factors such as maintenance requirements, resource limitations and low demand
- "Capacity factor" is the ratio of actual generation to full capacity potential

## ENERGY CONTENT

Rather than using "natural" units (e.g. volume, weight), energy sources can be measured according to their energy content – this allows comparison between energy sources

- metric: joules or multiples (gigajoules or GJ, terajoules or TJ, petajoules or PJ)
- U.S.: 1 British thermal unit (BTU) = 1,055.06 joules
- IEA: energy balances expressed in oil equivalent: :
  - thousand tonnes of oil equivalent (ktoe)
  - million tonnes of oil equivalent (Mtoe)

### Typical values

- 1 $m^3$ of crude oil = 39.0 GJ
- 1,000 $m^3$ of natural gas = 38.3 GJ
- 1 MWh of electricity = 3.6 GJ
- 1 metric tonne of coal = 29.3 GJ
- 1 metric tonne of wood waste = 18.0 GJ
- 1 metric tonne of uranium = 420,000 GJ to 672,000 GJ

## NATURAL GAS RESOURCES AND RESERVES

### Proved reserves

Volumes of natural gas from known accumulations, of marketable quality, demonstrated with reasonable certainty to be recoverable, as of the estimate date, under current economic, technological, regulatory, and operating conditions, and suitable for delivery to market within a reasonable time frame.

### Marketable/technically recoverable resources

Estimated volumes of natural gas – discovered or undiscovered – that exist in subsurface accumulations. Discovered resources are estimated quantities of gas in known drilled reservoirs, which are too remote to be connected to existing pipelines and markets. If pipelines were built, gas volumes would be recoverable under existing technological and economic conditions.

Undiscovered resources are an estimate, inferred from geological data, of gas volumes thought to be recoverable under current or anticipated economic and technological conditions, but not yet discovered by drilling. These resources may be near or remote from pipelines.

# Annex 3: Abbreviations

| | |
|---|---|
| AC | alternating current |
| AECO | Alberta Energy Company |
| AESO | Alberta Electric System Operator |
| AER | Alberta Energy Regulator |
| B | billion |
| b/d | barrels per day |
| Bcf/d | billion cubic feet per day |
| Bcm/d | billion cubic metres per day |
| BEV | battery electric vehicle |
| CANDU | Canada deuterium uranium |
| CAPP | Canadian Association of Petroleum Producers |
| CanREA | Canadian Renewable Energy Association |
| CCEI | Canadian Centre for Energy Information |
| CCS | carbon capture and storage |
| CCUS | carbon capture, utilization and storage |
| CDIA | Canadian direct investment abroad |
| CEA | Canadian energy assets |
| CER | Canada Energy Regulator |
| CFS | Canadian Forest Service |
| $CO_2$ equivalent | carbon dioxide equivalent |
| CPI | consumer price index |
| CPL | cents per litre |
| DC | direct current |
| ECCC | Environment and Climate Change Canada |
| ECTPEA | Environmental and Clean Technology Products Economic Account |
| EGS | enhanced geothermal system |
| EIA | Energy Information Administration (U.S.) |
| EU | European Union |
| EV | electric vehicle |
| FDI | foreign direct investment |
| G7 | seven wealthiest major developed nations: Canada, France, Germany, Italy, Japan, U.K. and U.S. |
| GDP | gross domestic product |
| GHG | greenhouse gas |
| GJ | gigajoule |
| GST | Goods and Services tax |
| GWh | gigawatt hours |
| HGL | hydrocarbon gas liquids |
| HST | Harmonized sales tax |
| IEA | International Energy Agency |
| IHA | International Hydropower Association |
| kg | kilogram |
| km | kilometre |
| $km^2$ | square kilometre |
| kt | kilotonne |
| kWh | kilowatt hour |
| lb. | pound |
| L | litre |
| LCOE | levelized cost of electricity |

| | |
|---|---|
| LNG | liquefied natural gas |
| LPG | liquefied petroleum gases |
| LWR | light water reactor |
| m | metre |
| $m^2$ | square metre |
| $m^3$ | cubic metre |
| Mb/d | thousand barrels per day |
| MJ | megajoule |
| MMb/d | million barrels per day |
| MMcf/d | million cubic feet per day |
| MMbtu | million British thermal units |
| Mt | million tonnes; megatonne |
| Mtoe | million tons of oil equivalent |
| MW | megawatt |
| NGCC | natural gas combined cycle |
| NGL | natural gas liquids |
| NRCan | Natural Resources Canada |
| OEE | NRCan Office of Energy Efficiency |
| NRSA | Natural Resources Satellite Account |
| NSERC | National Science and Engineering Research Council of Canada |
| NYMEX | New York Mercantile Exchange |
| OECD | Organisation for Economic Co-operation and Development |
| PHEV | plug-in hybrid electric vehicle |
| PHWR | pressurized heavy water reactor |
| PJ | petajoule |
| Pkm | passenger-kilometre |
| Provinces and territories | |
| | Alta. – Alberta |
| | B.C. – British Columbia |
| | Man. – Manitoba |
| | N.B. – New Brunswick |
| | N.L. – Newfoundland and Labrador |
| | N.S. – Nova Scotia |
| | N.W.T. – Northwest Territories |
| | Ont. – Ontario |
| | P.E.I. – Prince Edward Island |
| | Que. – Quebec |
| | Sask. – Saskatchewan |
| | Y.T. – Yukon |
| | Atl. – Atlantic provinces |
| | Terr. – Territories |
| P/T | provincial/territorial |
| PV | photovoltaic |
| RD&D | research, development and demonstration |
| R&D | research and development |
| RPP | refined petroleum products |
| SDTC | Sustainable Development Technology Canada |
| StatCan | Statistics Canada |
| States | |
| | Ala.– Alabama |
| | Ariz. – Arizona |

Ark.– Arkansas
Calif. – California
Colo. – Colorado
Conn. – Connecticut
Del. – Delaware
D.C. – District of Columbia
Fla. – Florida
Ga. – Georgia
Ill. – Illinois
Ind. – Indiana
Kans. – Kansas
Ky. – Kentucky
La. – Louisiana
Me. – Maine
Md. – Maryland
Mass. – Massachusetts
Mich. – Michigan
Minn. – Minnesota
Miss. – Mississippi
Mo. – Missouri
Mont. – Montana
Nebr.– Nebraska
Nev. – Nevada
N.H. – New Hampshire
N.J. – New Jersey
N.Mex. – New Mexico
N.Y.– New York
N.C.– North Carolina
N.D. – North Dakota
Okla.– Oklahoma
Ore. – Oregon
Penn. – Pennsylvania
R.I. – Rhode Island
S.C. – South Carolina
S.D. – South Dakota
Tenn. – Tennessee
Tex. – Texas
Vt.– Vermont
Va. – Virginia
Wash. – Washington
W.Va. – West Virginia
Wis. – Wisconsin
Wyo. – Wyoming

| | |
|---|---|
| Tcf | trillion cubic feet |
| Tcm | trillion cubic metres |
| Tkm | tonne-kilometre |
| t | tonnes |
| TPES | total primary energy supply |
| TWh | terawatt-hour |
| TSX | Toronto Stock Exchange |
| U.K. | United Kingdom |
| U.S. | United States |
| US$ | United States dollars |
| V | volt |
| WCS | Western Canadian Select |
| WTI | West Texas Intermediate |

# Annex 4: Sources

## SECTION 1: KEY ENERGY, ECONOMIC AND ENVIRONMENTAL INDICATORS

- **ENERGY PRODUCTION AND SUPPLY**
  - **Global Primary Energy Production:** IEA. *Annual Database*
  - **Global Energy Rankings:** IEA. *Annual Database*; IHA. *World Hydropower Outlook*
  - **Primary Energy Production by Region & Source:** StatCan. Tables *25-10-0020-01, 25-10-0029-01, 25-10-0030-01, 25-10-0031-01,* and *25-10-0082-01*; NRCan OEE. *National Energy Use Database*; ECCC. *Special tabulations*
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  - **Employment:** StatCan. Tables *38-10-0285-01, 36-10-0480-01* and *14-10-0023-01*; StatCan. *Custom tabulations*; NRCan estimates
  - **Energy Trade:** StatCan. *International Merchandise Trade Database*; IEA. *Annual Database*; U.S. EIA. *U.S. Imports by Country of Origin*
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- **Capital expenditures:** StatCan. *Tables 34-10-0035-01, 34-10-0036-01* and *34-10-0040-01*
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- **Foreign Direct Investment and Canadian Direct Investment Abroad:** StatCan. Table *36-10-0009-01*
- **Foreign Control of Canadian Assets:** StatCan. Tables *33-10-0033-01, 33-10-0005-01* and *33-10-0006-01*
- **Canadian Energy Assets:** Compiled by NRCan from S&P Global Market Intelligence and annual financial statements from publicly traded Canadian energy companies
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## SECTION 3: SKILLS, DIVERSITY AND COMMUNITY

- **Energy Sector Demographics:** StatCan. *NRSA Human Resources Module* custom tables
- **Energy Affordability:** StatCan. Estimation of Energy Poverty Rates Using the 2021 Census of Population; StatCan. Table *11-10-0222-01*
- **Household Expenditures on Energy:** StatCan. Table *11-10-0222-01*
- **Energy Retail Prices:** StatCan. Table *18-10-0004-01* and *18-10-0001-01*; IEA. *Annual Database*
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- **CLEAN TECHNOLOGY AND THE ECONOMY**
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- **RENEWABLES**
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- **Wind – wind farms:** AESO. *Current Supply Demand Report*; CanREA. *By the Numbers*; Government of Ontario. *Renewable Energy Projects Listing*; Hydro Québec. *Electricity supply contracts in force in Québec*; SaskPower. *System Map*
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- **Solar PV – capacity in Canada:** NRCan and CanREA. *National Survey Report of PV Power Applications in Canada - 2022*
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  - **Canada and U.S. – Proved reserves:** U.S. EIA. *U.S. Crude Oil and Natural Gas Proved Reserves, Year-end 2023*; Oil and Gas Journal. *Worldwide look at reserves and production*; AER. *Alberta Energy Outlook (ST98)*; Government of Alberta. News release: "*New gas reserves take Canada into global top 10*" (March 12, 2025); BC Energy Regulator. *2023 Gas Reserves Report*; Saskatchewan Ministry of Energy and Resources. *Five-Year Gas Reserve Summary Report*; Headwater Exploration Inc. *Annual Information Form*; CER. *Provincial and Territorial Energy Profiles*; Consultations with provincial and territorial governments and energy regulators, the CER, CAPP, and the Canada–Newfoundland and Labrador Offshore Energy Regulator (formerly Offshore Petroleum Board), and the Canada–Nova Scotia Offshore Energy Regulator (formerly Offshore Petroleum Board); *NRCan estimates*
  - **Canada and U.S. – Marketable and technically recoverable resources:** CER. *Canada's Energy Future 2023, Macro Indicators*; U.S. EIA. *Annual Energy Outlook 2025*; U.S. EIA. *Shale Gas, Proved Reserves as of Dec. 31*; NRCan analysis
  - **Canadian average marketable production:** CER. *Canada's Energy Future 2023*, *Figure Data (Excel)*; StatCan. Table *25-10-0055-01*
  - **U.S. average marketable production:** U.S. EIA. *Annual Energy Outlook 2023*; U.S. EIA. *Dry Natural Gas Production, Annual*
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  - **Exports:** CER. *Commodity Tracking System*
  - **Imports:** StatCan. *International Merchandise Trade Database*
- **RPPs**
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