Environment and Climate Change Canada
Environnement et Changement climatique Canada

# WATER USE IN CANADA

## CANADIAN ENVIRONMENTAL SUSTAINABILITY INDICATORS

Canada

**Suggested citation for this document:** Environment and Climate Change Canada (2025) Canadian Environmental Sustainability Indicators: Water use in Canada. Consulted on *Month day, year*.

Available at: https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/water-use.html

Cat. No.: En4-144/105-2025E-PDF
ISBN: 978-0-660-75308-9
Project code: EC24019



Environment and Climate Change Canada
Public Inquiries Centre
Place Vincent Massey Building
351 Saint-Joseph Boulevard
Gatineau QC K1A 0H3
Toll Free: 1-800-668-6767
Email: enviroinfo@ec.gc.ca



Aussi disponible en français

# CANADIAN ENVIRONMENTAL SUSTAINABILITY INDICATORS

# WATER USE IN CANADA

## February 2025

### Table of contents


Water use in Canada....4
National water withdrawn by sector....4
National water consumed and returned by sector....5
Regional water use....6
Atlantic provinces....7
Water withdrawn by sector....7
Variation in water withdrawals by the most water-intensive sectors....8
Water consumed and returned by the most water-intensive sectors....9
Quebec....10
Water withdrawn by sector....10
Variation in water withdrawals by th most water-intensive sectors....11
Water consumed and returned by the most water-intensive sectors....12
Ontario....13
Water withdrawn by sector....13
Variation in water withdrawals by th most water-intensive sectors....14
Water consumed and returned by the most water-intensive sectors....14
Prairie provinces....16
Water withdrawn by sector....16
Variation in water withdrawals by th most water-intensive sectors....17
Water consumed and returned by the most water-intensive sectors....18
British Columbia and the Territories....19
Water withdrawn by sector....19
Variation in water withdrawals by th most water-intensive sectors....20
Water consumed and returned by the most water-intensive sectors....21
About the indicators....22
What the indicators measure....22
Why these indicators are important....22
Related initiatives....22
Related indicators....22
Data sources and methods....23
Data sources....23
Methods....23
Resources....25
References....25
Related information....25
Annexes....26
Annex A. Data tables for the figures presented in this document....26
Annex B. Industrial sectors used in the water use indicator....31

# List of figures

Figure 1. Water withdrawn by sector, Canada, 2005 to 2021 ..... 4
Figure 2. Water consumed and returned by sector, Canada, 2021 ..... 6
Figure 3. Water withdrawn by sector in Atlantic provinces, 2021 ..... 7
Figure 4. Variation in water withdrawals by the most water-intensive sectors in Atlantic provinces, 2011 to 2021 ..... 8
Figure 5. Water consumed and returned by the most water-intensive sectors in Atlantic provinces, 2021 ..... 9
Figure 6. Water withdrawn by sector in Quebec, 2021 ..... 10
Figure 7. Variation in water withdrawals by the most water-intensive sectors in Quebec, 2011 to 2021 ..... 11
Figure 8. Water consumed and returned by the most water-intensive sectors in Quebec, 2021 ..... 12
Figure 9. Water withdrawn by sector in Ontario, 2021 ..... 13
Figure 10. Variation in water withdrawals by the most water-intensive sectors in Ontario, 2011 to 2021 ..... 14
Figure 11. Water consumed and returned by the most water-intensive sectors in Ontario, 2021 ..... 15
Figure 12. Water withdrawn by sector in Prairie provinces, 2021 ..... 16
Figure 13. Variation in water withdrawals by the most water-intensive sectors in Prairie provinces, 2011 to 2021 ..... 17
Figure 14. Water consumed and returned by the most water-intensive sectors in Prairie provinces, 2021 ..... 18
Figure 15. Water withdrawn by sector in British Columbia and the Territories, 2021 ..... 19
Figure 16. Variation in water withdrawals by the most water-intensive sectors in the British Columbia and the Territories, 2011 to 2021 ..... 20
Figure 17. Water consumed and returned by the most water-intensive sectors in the British Columbia and the Territories, 2021 ..... 21

# List of tables

Table A. 1. Data for Figure 1. Water withdrawn by sector, Canada, 2005 to 2021 ..... 26
Table A. 2. Data for Figure 2. Water consumed and returned by sector, Canada, 2021 ..... 26
Table A. 3. Data for Figure 3. Water withdrawn by sector in Atlantic provinces, 2021 ..... 26
Table A. 4. Data for Figure 4. Variation in water withdrawals by the most water-intensive sectors in Atlantic provinces, 2011 to 2021 ..... 27
Table A. 5. Data for Figure 5. Water consumed and returned by the most water-intensive sectors in Atlantic provinces, 2021 27
Table A. 6. Data for Figure 6. Water withdrawn by sector in Quebec, 2021 ..... 27
Table A. 7. Data for Figure 7. Variation in water withdrawals by the most water-intensive sectors in Quebec, 2011 to 2021 ..... 28
Table A. 8. Data for Figure 8. Water consumed and returned by the most water-intensive sectors in Quebec, 2021 ..... 28
Table A. 9. Data for Figure 9. Water withdrawn by sector in Ontario, 2021 ..... 28
Table A. 10. Data for Figure 10. Variation in water withdrawals by the most water-intensive sectors in Ontario, 2011 to 2021 ..... 28
Table A. 11. Data for Figure 11. Water consumed and returned by the most water-intensive sectors in Ontario, 2021 ..... 29
Table A. 12. Data for Figure 12. Water withdrawn by sector in Prairie provinces, 2021 ..... 29
Table A. 13. Data for Figure 13. Variation in water withdrawals by the most water-intensive sectors in Prairie provinces, 2011 to 2021 ..... 29
Table A. 14. Data for Figure 14. Water consumed and returned by the most water-intensive sectors in Prairie provinces, 2021 ..... 30
Table A. 15. Data for Figure 15. Water withdrawn by sector in British Columbia and the Territories, 2021 ..... 30
Table A. 16. Data for Figure 16 Variation in water withdrawals by the most water-intensive sectors in the British Columbia and the Territories, 2011 to 2021 ..... 30
Table A. 17. Data for Figure 17. Water consumed and returned by the most water-intensive sectors in the British Columbia and the Territories, 2021 ..... 30
Table B.1. Alignment of sectors reported in CESI and IOIC ..... 31

# Water use in Canada

Canada is rich in freshwater, holding 20% of the world's freshwater reserves, and nearly 7% of the world's annually renewable water. Though Canada has large amounts of fresh water, it is unevenly distributed throughout the country. The supply of water is influenced by weather patterns that are increasingly affected by climate change. It is also influenced by human activities such as urban growth, industry, and farming. Understanding how Canada's economic sectors use water is important to ensure that adequate amounts remain available for human use and for the health of nature.

The Water use in Canada indicator provides information on the volume of water withdrawn, consumed, and returned by seven key sectors as a measure of the sustainability of Canada's freshwater supplies. Covering 90 different economic activities (Annex B), these sectors are classified by Statistics Canada as thermal power generation, manufacturing, mining, oil & gas, commercial & institutional, agriculture[1], and residential.

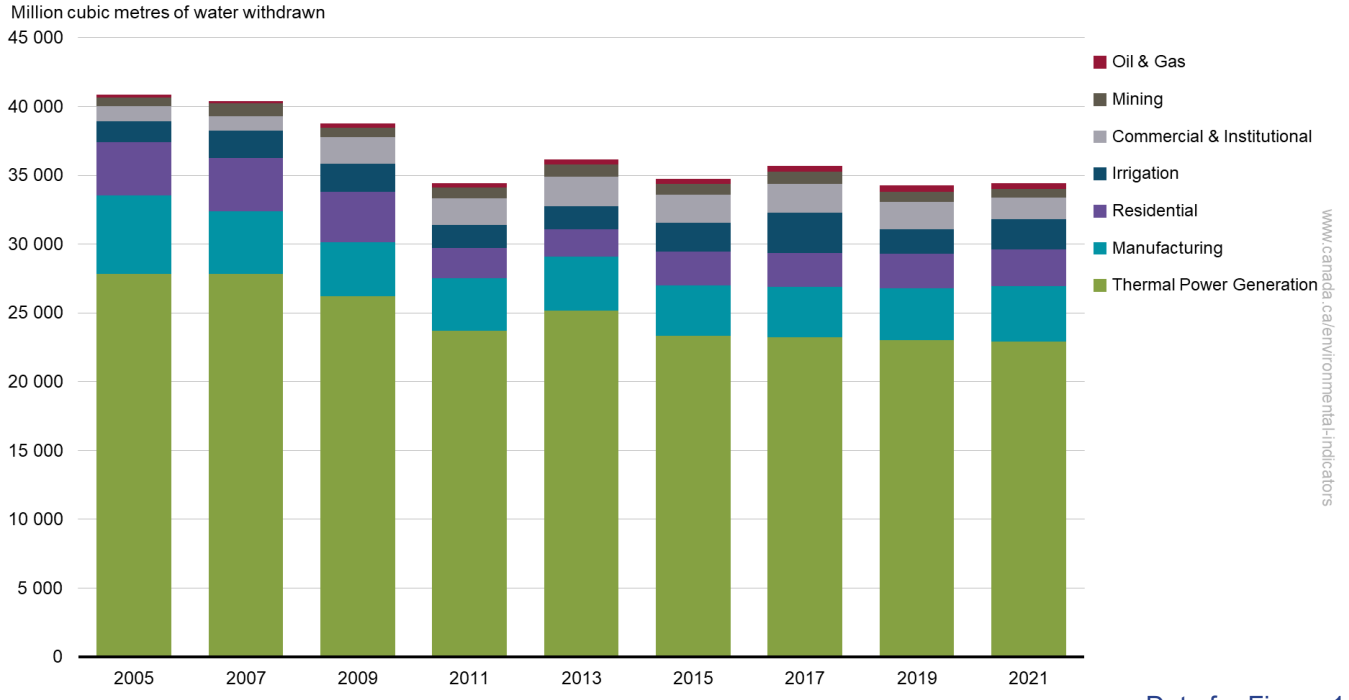
## National water withdrawn by sector

Water withdrawal refers to the volume of freshwater extracted from underground or surface sources such as rivers, lakes and groundwater for human consumption and other uses such as irrigation, chemical processes, cooling and cleaning.

### Key results

- In 2021, over 34 410 million cubic metres ($m^3$) of water was withdrawn from Canada's rivers, lakes and groundwater. 78.3% of the withdrawal came from 2 sectors:
  - thermal power generation (22 903 million $m^3$)
  - manufacturing (4 046 million $m^3$)
- Between 2005 and 2021, total water withdrawal declined by 15.8% from 40 876 million $m^3$ of water in 2005 to 34 410 million $m^3$ in 2021

**Figure 1. Water withdrawn by sector, Canada, 2005 to 2021**




Data for Figure 1

**Note:** Data for the irrigation sector are one year ahead of other sectors from 2006 to 2022. Due to COVID-19, some data were recorded in 2020 instead of 2019. For more information, consult the Data sources and methods section.

[1] For the purpose of the indicator, the agriculture sector refers to water use for irrigation only.

**Source:** Statistics Canada (2024) Water use in Canada. Statistics Canada (2024) Physical flow account for water use. Statistics Canada (2024) Water use parameters in mineral extraction and thermal-electric power generation industries, by region. Statistics Canada (2024) Potable water use by sector and average daily use. Statistics Canada (2024) Water use parameters in manufacturing industries, by industry. Statistics Canada (2024) Irrigation volume by province and drainage region.

Since 2005, the thermal power generation sector has withdrawn the most water. The thermal power generation industry includes nuclear and fossil-fuel power plants. These types of power plants use large quantities of water for cooling and to produce steam that drives the turbines generating electricity. In general, when we compared water use with the electricity produced, coal and nuclear plants use more water than natural gas plants. This sector experienced a 17.7% decrease in water withdrawal, from 27 825 million $m^3$ in 2005 to 22 903 million $m^3$ in 2021. This is explained in part by the transition from coal plants to natural gas plants and mostly by the gradual increase in the share of solar and wind energy which, unlike other energy sources, do not use water.

The manufacturing sector is responsible for the second largest share of water withdrawals. It accounted for between 10% and 14% of the national total during this period. Between 2005 and 2021, national withdrawals fell by 29.3%. This decrease can be explained by market fluctuations for manufactured goods.

From 2005 to 2021, the residential sector ranked third in Canada, fluctuating between 5.5% and 9.5% of the national water withdrawals. Between 2005 and 2021, water withdrawals from this sector decreased by 30.9% despite a population increase of 14.0%. This is probably associated with an improvement in public awareness of water conservation practices such as the widespread implementation of household water meters.

The commercial & institutional sector includes schools, office buildings, hotels, hospitals and restaurants. In 2021, 4.5% of the national water withdrawn was taken by this sector. From 2005 to 2021, water withdrawals showed an overall increasing trend from 1 082 million $m^3$ in 2005 to 1 539 million $m^3$ in 2021, though there was a decrease of 22.4% between 2019 and 2021.

Within the agriculture sector, water is used predominantly (86%)[2] for irrigation. In 2021, irrigation accounted for 6.4% of the total national withdrawals. Between 2005 and 2021[3] the sector showed the second highest proportional rise with a 45.1% increase. This can be attributed to drought, particularly in the Prairies provinces where irrigation compensate the water shortages. In fact, in 2021, southern regions between British Columbia's Lower Mainland and Interior, to the eastern Prairies, where agriculture is prevalent, faced one of their driest summers in 75 years[4].

The oil & gas sector withdrew the lowest water volume in 2021 (1.2%) but has had the largest proportional (111.9%) increase since 2005. In this sector, water is mostly used for hydraulic fracturing, in which high-pressure water is injected into the ground.

## National water consumed and returned by sector

Water that has been withdrawn can be used (consumed or recirculated for reuse) or put back into the water body (returned). Recirculation and reuse occur mainly in the thermal power generation, manufacturing and mining sectors. The water consumption and return by sector indicator considers water to be consumed if it is not returned to its source. The following indicator shows the amount of water consumed and returned by sector in 2021.

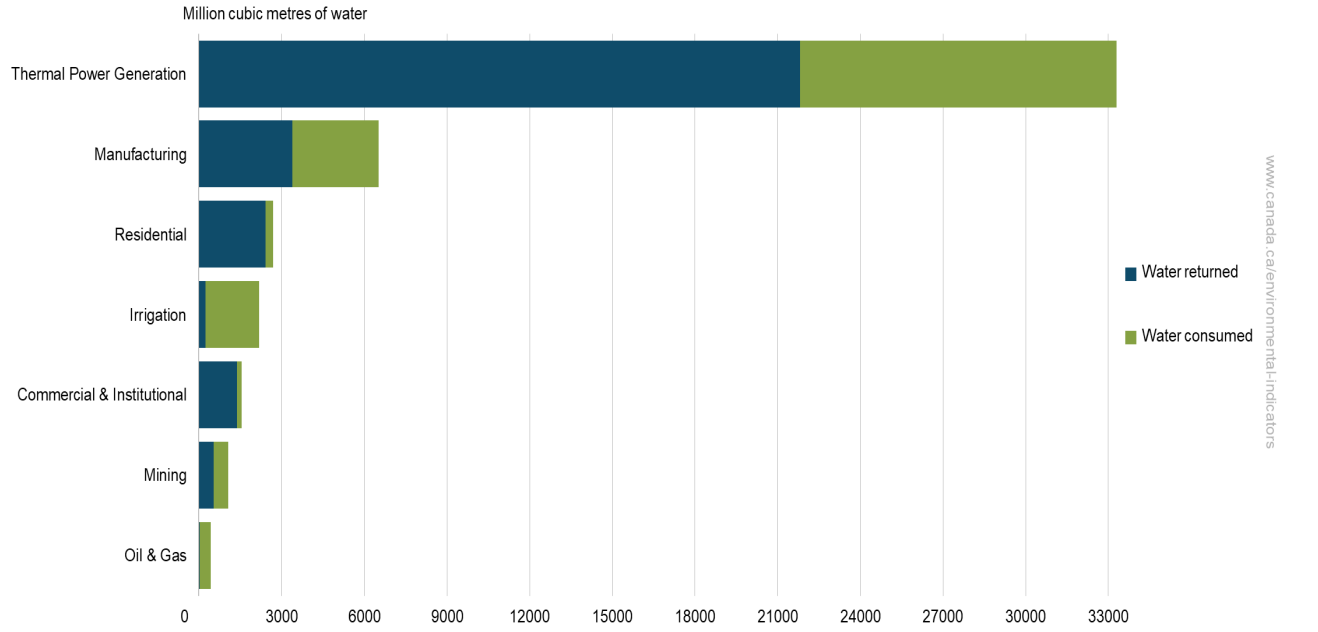
### Key results

In 2021,

- the thermal power generation sector returned more than 65.5% of the water volume used[5]
- the mining and the manufacturing sectors returned each 52.1% of the water volume used[5]
- the irrigation and the oil & gas sector consumed more water than they returned
- the residential and commercial & institutional sectors return an estimated 90% of the water volume withdrawn

[2] Kulshreshtha SN and Grant C (2013) An Estimation of Canadian Agricultural Water Use. Canadian Water Resources Journal 32(2): 137 to 148. Retrieved on November 11, 2024.
[3] Data for irrigation sector are one year ahead of other sectors from 2006 to 2022.
[4] ECCC (2024) Water quantity in Canadian rivers. Retrieved on November 11, 2024.
[5] Includes water intake and water recirculation volume for manufacturing and thermal power generation sectors. The mining sector includes water intake, water recirculation and mine water. For more information, consult Data sources and methods section.

**Figure 2. Water consumed and returned by sector, Canada, 2021**




Data for Figure 2

**Note:** The irrigation data is for the year 2022. Water used (consumed and returned) volumes for mining sector include mine water, intake water and recirculation water. For manufacturing and thermal power generation sectors, water used (consumed and returned) volumes include intake water and recirculation water. For more information, consult Data sources and methods section.
**Source:** Statistics Canada (2024) Water use in Canada. Statistics Canada (2024) Physical flow account for water use. Statistics Canada (2024) Water use parameters in mineral extraction and thermal-electric power generation industries, by region. Statistics Canada (2024) Potable water use by sector and average daily use. Statistics Canada (2024) Water use parameters in manufacturing industries, by industry. Statistics Canada (2024) Irrigation volume by province and drainage region.

In 2021, five sectors returned more water than they consumed. The highest return rates were from the residential and commercial & institutional sectors; it has been estimated that they return 2 410 million $m^3$ and 1 386 million $m^3$ respectively, or 90.0% of the volume withdrawn[6]. The thermal power generation sector, which withdrew the most water, returned 21 807 million $m^3$, followed by manufacturing and mining sectors with respectively 3 396 million $m^3$ and 532 million $m^3$.

By contrast, the oil & gas and irrigation sectors consume more water than they return to the original source and contribute the least to the national water return. They consumed respectively an estimated 398 million $m^3$ or 95.0% and 1 957 million $m^3$ or 89.5% of the total water withdrawn by these sectors.

# Regional water use

Understanding the regional pressures on Canada's water supply is important to ensuring that an adequate amount of water is available for current and future needs. This section reports on the water withdrawn, consumed and returned in 2021 by region: the Atlantic provinces, Quebec, Ontario, the Prairie provinces, and British Columbia and the Territories. This section also looks at the change in withdrawals from 2011 to 2021 focusing on the sectors which use the most of the region’s total water.

[6] Ferguson D. (2011) Environment Canada, personal communication.

## Atlantic provinces

The Atlantic provinces consist of Newfoundland and Labrador, Prince Edward Island, Nova Scotia and New Brunswick. This region is home to approximately 2.3 million people, or 7% of Canada's population.

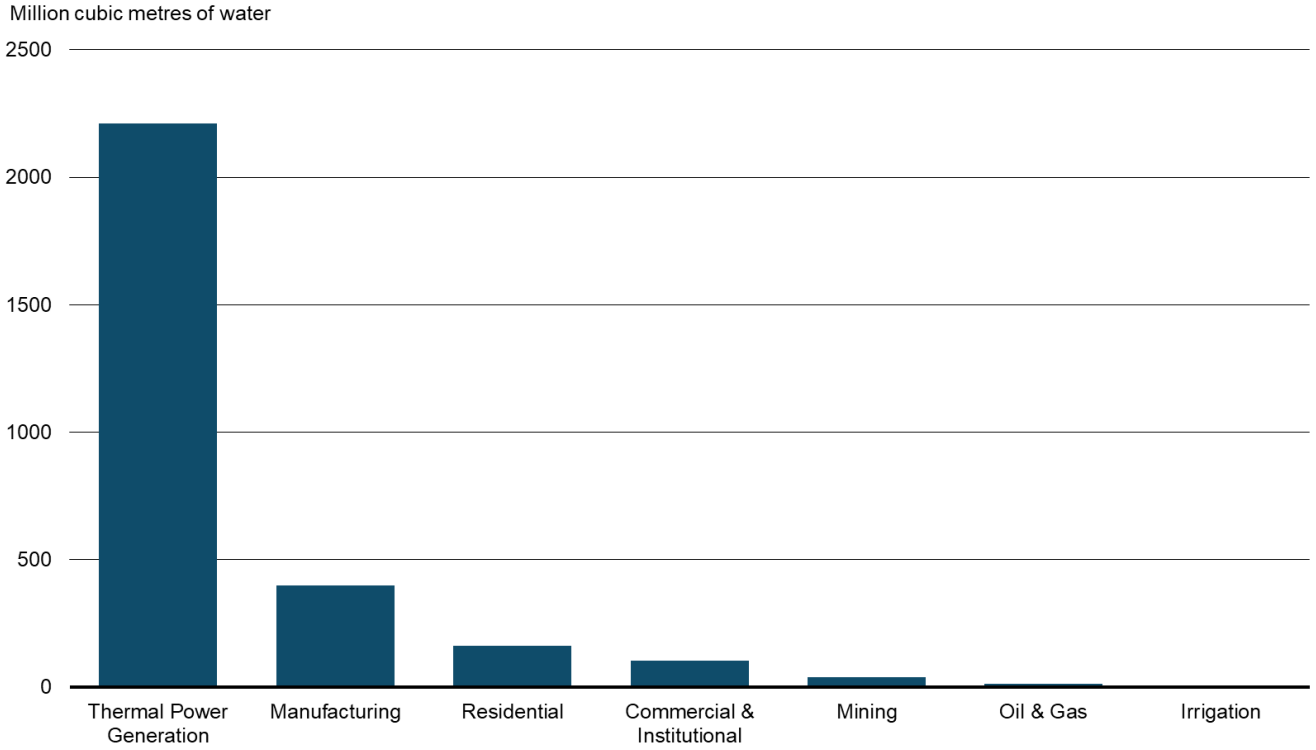
### Water withdrawn by sector

#### Key results

In 2021,

- more than three-quarters (78.2%) of the water volume in this region was withdrawn by the thermal power generation sector with 2 210 million $m^3$
- the manufacturing and residential sectors withdrew respectively 10.5% and 5.7% of the regional water volume
- irrigation used 5.8 million $m^3$, or 0.2% of the regional water volume

**Figure 3. Water withdrawn by sector in Atlantic provinces, 2021**




Data for Figure 3

**Note:** The irrigation data is for the year 2022. For more information, consult Data sources and methods section.
**Source:** Government of Canada (2024) Water use parameters in mineral extraction and thermal-electric power generation industries, by region. Statistics Canada (2024) Potable water use by sector and average daily use. Statistics Canada (2024) Water use parameters in manufacturing industries, by provinces, territories and drainage regions. Statistics Canada (2024) Irrigation volume by province and drainage region. Canada Energy Regulation (2024) Estimated Production of Canadian Crude Oil and Equivalent. Canada Energy Regulation (2024) Marketable Natural Gas Production in Canada.

The thermal power generation sector withdrew the highest volume in the region, 78.2%, with 2 210 million $m^3$ in 2021. The second largest water volume was withdrawn by the manufacturing sector with only 10.5% of the total regional volume (297 million $m^3$). The residential sector is the third largest sector in terms of withdrawing water, with 5.7% of the total regional volume.

Even though mining is one of the region's largest industries in Newfoundland and Labrador as well as in New Brunswick and Nova Scotia, the volume of water withdrawn by this sector was just 1.3% (38.2 million $m^3$) of the total regional volume.

Agriculture is mainly found in Prince Edward Island, Nova Scotia's Annapolis Valley and New Brunswick. However, the volumes withdrawn for irrigation did not exceed 0.2% (5.8 million $m^3$) of the regional volume in 2021, which may be explained by abundant rainfall that characterizes the region.

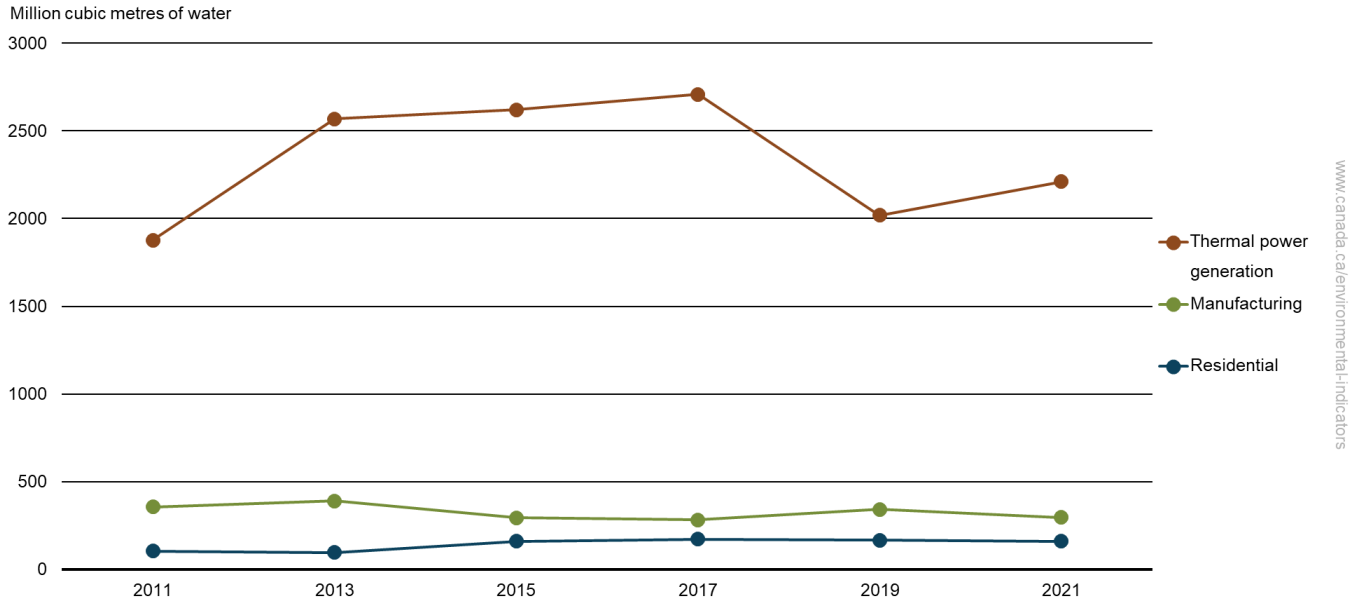
## Variation in water withdrawals by the most water-intensive sectors

### Key results

From 2011 to 2021

- the thermal power generation withdrawn volumes fluctuated with an increase from 1 877 million $m^3$ to 2 708 million $m^3$,
- the volume of water withdrawal by the manufacturing and residential sectors remained relatively stable

**Figure 4. Variation in water withdrawals by the most water-intensive sectors in Atlantic provinces, 2011 to 2021**




Data for Figure 4

**Note:** Due to COVID-19, some data were recorded in 2020 instead of 2019. For more information, consult the Data sources and methods section.
**Source:** Statistics Canada (2024) Water use parameters in mineral extraction and thermal-electric power generation industries, by region. Statistics Canada (2024) Potable water use by sector and average daily use. Statistics Canada (2024) Water use parameters in manufacturing industries, by provinces, territories and drainage regions.

Among the most water-intensive sectors, the proportion of water withdrawn by the thermal power generation sector increased by 17.8% between 2011 and 2021, from 1 877 million $m^3$ to 2 210 million $m^3$. The highest volume withdrawn by this sector (2 708 million $m^3$) was recorded in 2017, 22.5% more than in 2021 and 44.3% more than in 2011.

Over the same time period, the manufacturing sector has withdrawn stable volumes of water, ranging from 390 million $m^3$ in 2013, to 281 million $m^3$, in 2017, and a decrease in water volume of 16.7% between 2011 and 2021. The variation in the volume withdrawn is mostly attributed to the fluctuation in the production of domestic manufactured goods.

Water withdrawal volumes from the residential sector were also relatively stable over the same time period, with a peak of 172 million $m^3$ recorded in 2017, 6.9% more than in 2021. This decrease can be associated with an improvement in public awareness of water conservation practices owing to widespread implementation of household water meters.

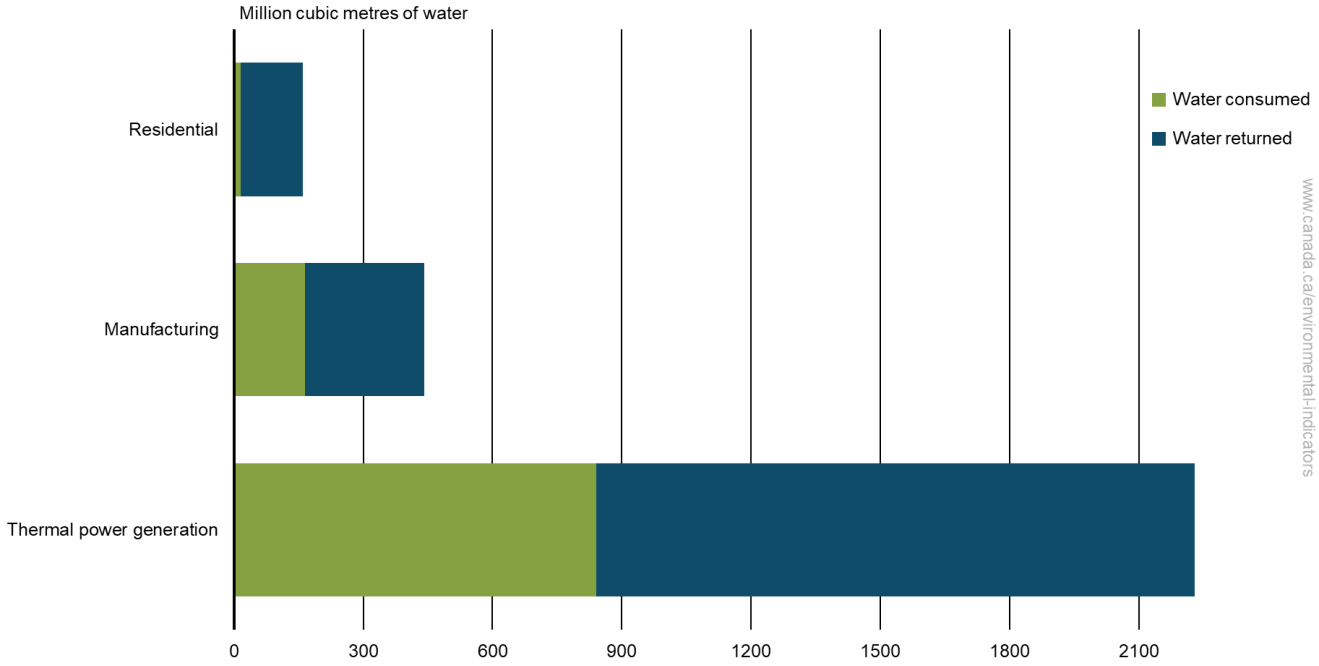
## Water consumed and returned by the most water-intensive sectors

### Key results

In 2021,

- the manufacturing and thermal power generation sectors returned 277 million $m^3$ and 1 389 million $m^3$ of water respectively, representing 62.8% and 62.3% of the water used[7]
- the residential sector returned to the resource an estimated water volume of 90%, or 144 million $m^3$

**Figure 5. Water consumed and returned by the most water-intensive sectors in Atlantic provinces, 2021**




Data for Figure 5

**Note:** Water used (consumed and returned) volumes for the manufacturing and thermal power generation sectors include intake water and recirculation water. For more information, consult the Data sources and methods section.
**Source:** Statistics Canada (2024) Water use parameters in mineral extraction and thermal-electric power generation industries, by region. Statistics Canada (2024) Potable water use by sector and average daily use. Statistics Canada (2024) Water use parameters in manufacturing industries, by provinces, territories and drainage regions.

[7] Includes intake water and recirculation water

# Quebec

Quebec is home to nearly 23% of Canada's population, or close to nine million people. It is also home to the second most populous city in Canada: Montreal, with about four million people.

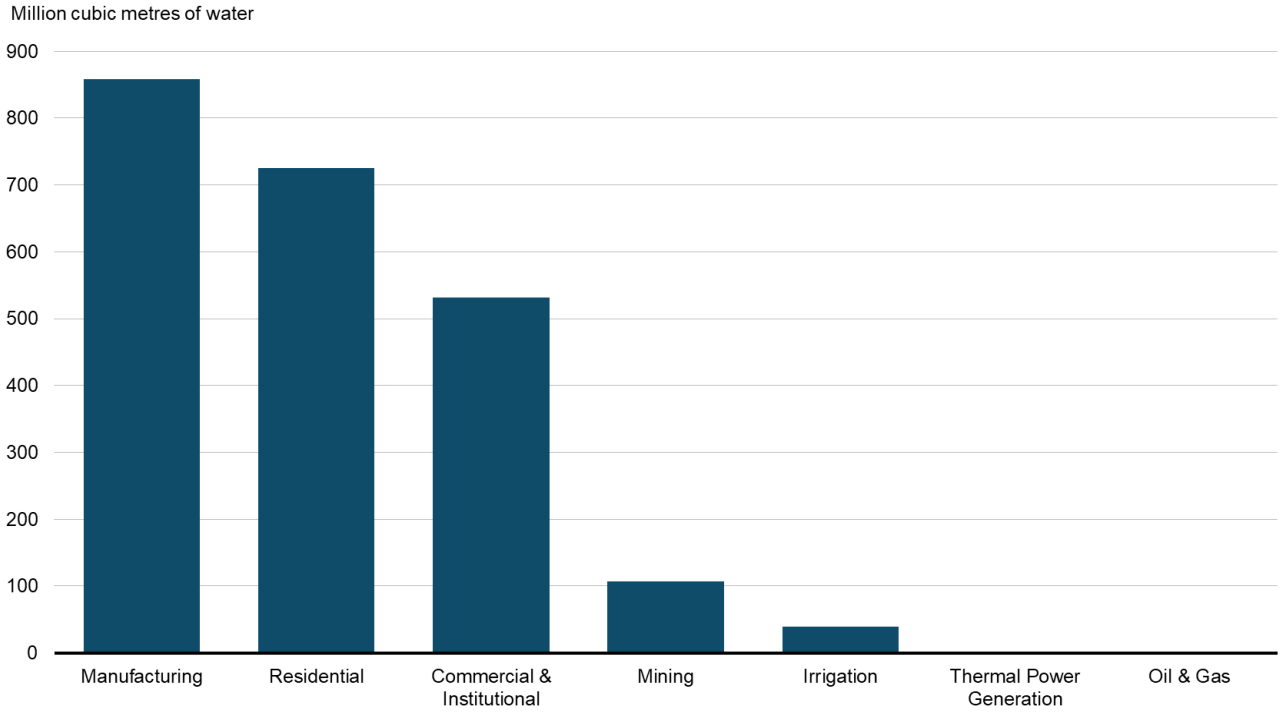
## Water withdrawn by sector

### Key results

In 2021,

- the manufacturing sector withdrew 37.9% of the total water volume of the Quebec region, with 858 million $m^3$
- together the residential and commercial & institutional sectors, which ranked second and third respectively, withdrew 55.5% of the total regional water volume, with 1 257 million $m^3$

**Figure 6. Water withdrawn by sector in Quebec, 2021**




Data for Figure 6

**Note:** The irrigation data is for the year 2022. For more information, consult the Data sources and methods section
**Source:** Statistics Canada (2024) Water use parameters in mineral extraction and thermal-electric power generation industries, by region. Statistics Canada (2024) Potable water use by sector and average daily use. Statistics Canada (2024) Water use parameters in manufacturing industries, by provinces, territories and drainage regions. Statistics Canada (2024) Irrigation volume by province and drainage region. Canada Energy Regulation (2024) Estimated Production of Canadian Crude Oil and Equivalent. Canada Energy Regulation (2024) Marketable Natural Gas Production in Canada.

In 2021, the manufacturing sector withdrew the most water in Quebec with 858 million $m^3$. Within the manufacturing sector, the paper and primary metal industries used and consumed the most water for their processing, cooling and steam generation practices. The residential sector followed with 726 million $m^3$ withdrawn, representing 32.1% of the total regional volume.

The commercial & institutional sector, including schools, office buildings, hotels, hospitals and restaurants, withdrew the third most water in the region with 23.5%, or 531 million $m^3$. This is explained by the high population, and consequently the high concentration of commercial & institutional facilities in this region.

A very low proportion of water was withdrawn for irrigation purposes in 2021, at only 1.8% of the regional volume, with 39.6 million $m^3$.

The thermal power generation sector has decreased its activity since the closure of the province's only nuclear plant in 2012; therefore, the volume of water withdrawn by this sector declined from 634 million $m^3$ in 2011 to 0 $m^3$ in 2021.

There is no oil & gas extraction in Quebec.

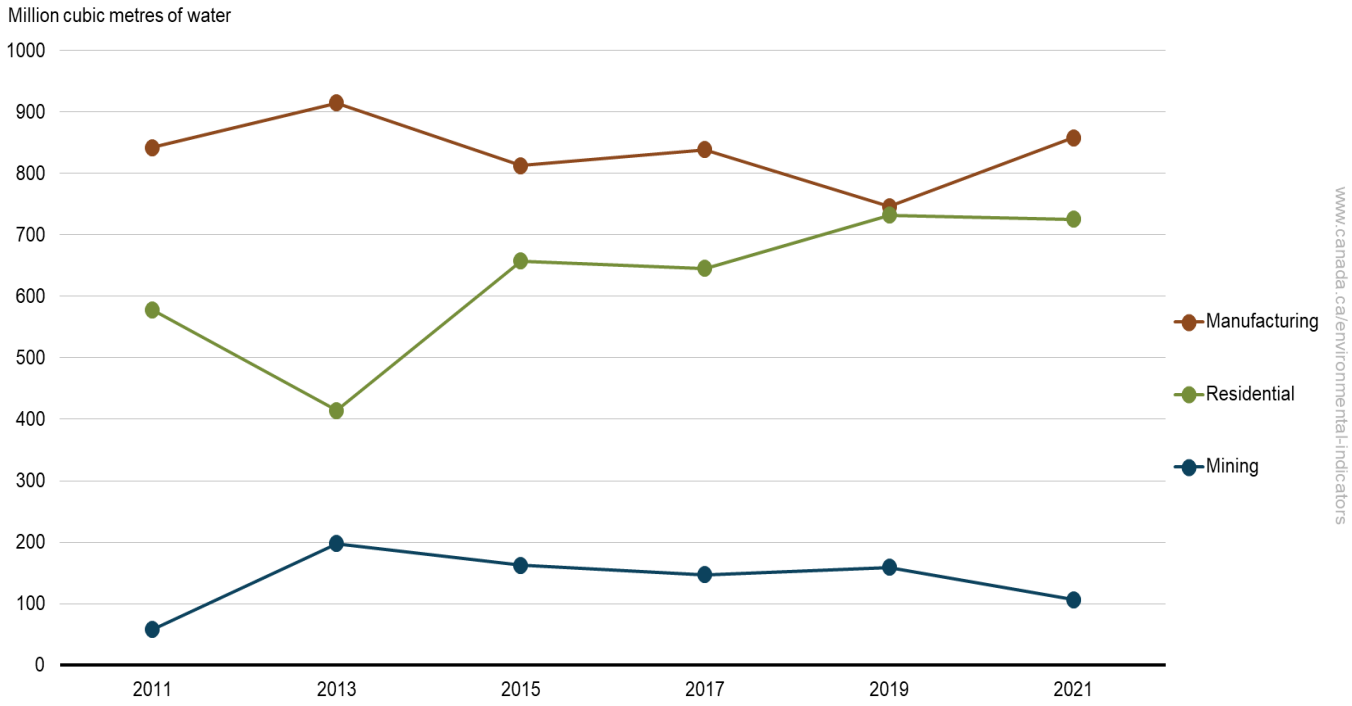
## Variation in water withdrawals by the most water-intensive sectors[8]

### Key results

From 2011 to 2021,

- the volume of water withdrawn by the manufacturing and residential sectors significantly fluctuated
- water withdrawal by the mining sector increased from 58 million $m^3$ to 107 million $m^3$

**Figure 7. Variation in water withdrawals by the most water-intensive sectors in Quebec, 2011 to 2021**




Data for Figure 7

**Note:** Due to COVID-19, some data were recorded in 2020 instead of 2019. For more information, consult the Data sources and methods section.
**Source:** Statistics Canada (2024) Water use parameters in manufacturing industries, by provinces, territories and drainage regions. Statistics Canada (2024) Water use parameters in mineral extraction and thermal-electric power generation industries, by region. Statistics Canada (2024) Potable water use by sector and average daily use.

Among the most water-intensive sectors, the volumes withdrawn by the manufacturing sector have significantly fluctuated from 2011 to 2021, with the highest level recorded in 2013, at 915 million $m^3$. In 2021, manufacturing facilities increased their water usage by 15% when compared to the lowest water volume recorded in 2019. This fluctuation over time may be attributable to changes in market demand for local or international goods.

The water withdrawal volume by the residential sector showed an upward trend over the same time period. In 2021, the sector withdrew 25% more water than in 2011 and recorded a slight decrease of less than 1.0% in its water withdrawal when compared with 2019. The increasing trend is partly associated with population growth.

From 2011 to 2021, the trend in water withdrawals by the mining sector also varied. An increase of 83.8% in water withdrawals was recorded in 2021 compared to 2011, from 58 million $m^3$ to 107 million $m^3$. By contrast, a decrease of 33.0% was recorded in 2021 compared to 2019, from 159 million $m^3$ to 107 million $m^3$.

[8] The commercial & institutional sector is one of the largest consumers of water but is not included in this analysis because of missing details.

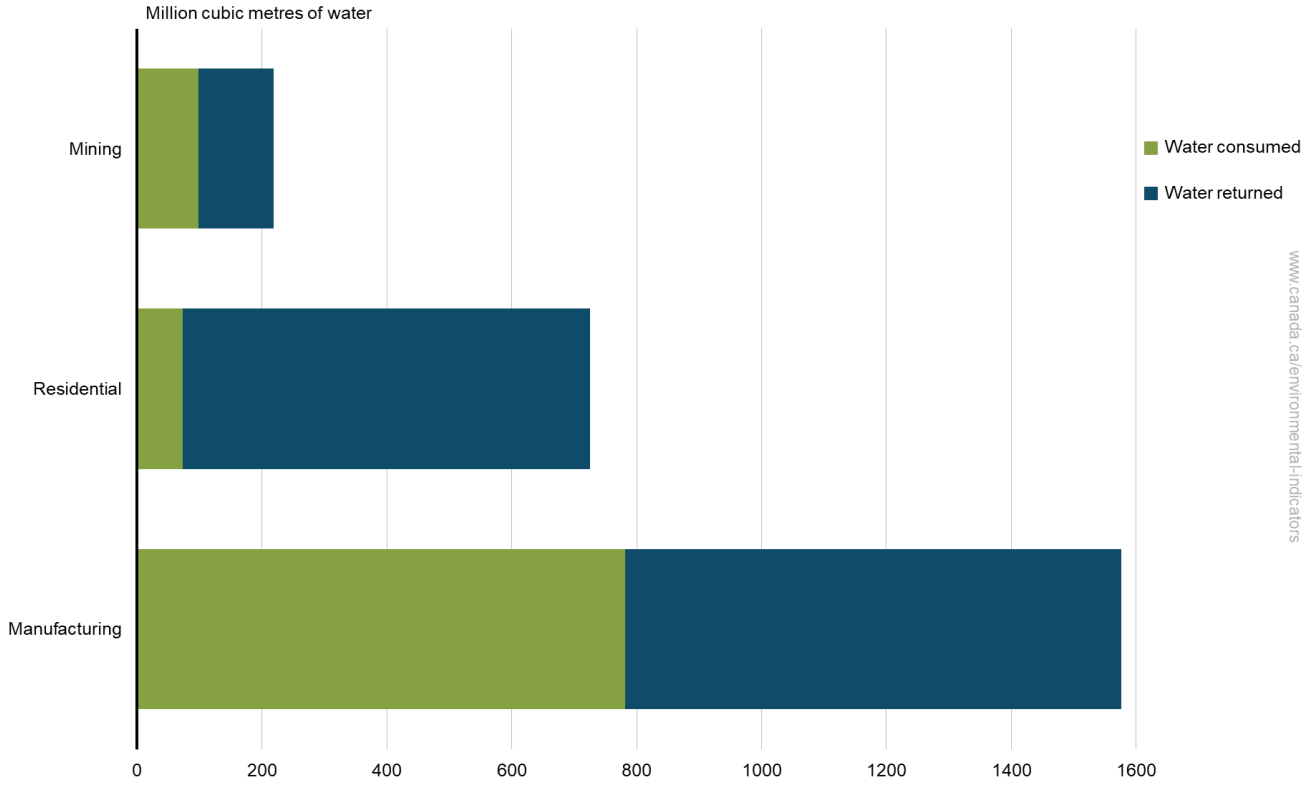
## Water consumed and returned by the most water-intensive sectors

### Key results

In 2021,

- both the mining and manufacturing sectors returned a little more than half of the water used[9], 55.3% (121 million $m^3$) and 50.4% (795 million $m^3$) respectively
- the volume of returned water for the residential sector is estimated at 653 million $m^3$ or 90% of the volume withdrawn

**Figure 8. Water consumed and returned by the most water-intensive sectors in Quebec, 2021**




Data for Figure 8

**Note:** Water used (consumed and returned) volumes for mining sector include mine water, intake water and recirculation water. For manufacturing sector, water used (consumed and returned) volumes include intake water and recirculation water. For more information, consult the Data sources and methods section.
**Source:** Statistics Canada (2024) Water use parameters in mineral extraction and thermal-electric power generation industries, by region. Statistics Canada (2024) Potable water use by sector and average daily use.

[9] Includes water intake and water recirculation for the manufacturing sector. The mining sector includes water intake, water recirculation and mine water. For more information, consult Data sources and methods section.

# Ontario

Ontario is Canada's most populous province with 14.2 million inhabitants, or 38.5% of the Canadian population.

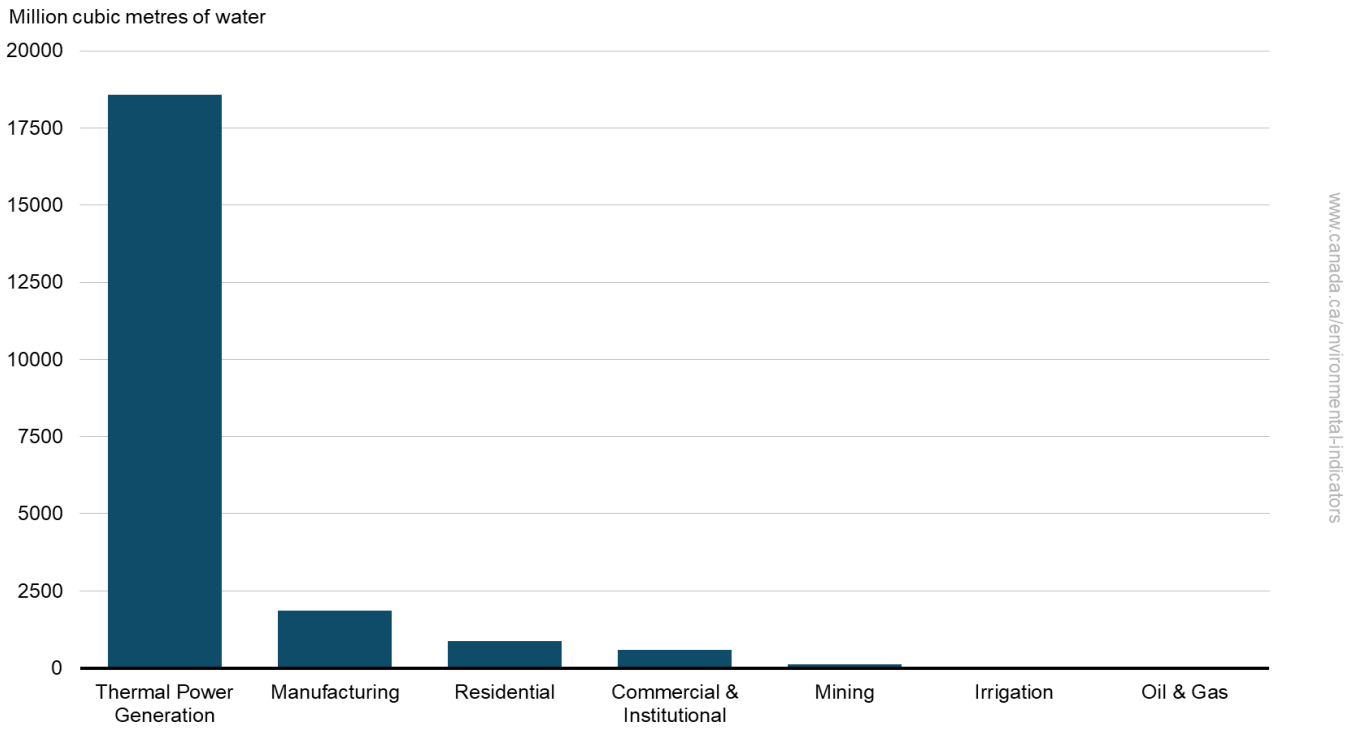
## Water withdrawn by sector

### Key results

In 2021,

- the thermal power generation sector in Ontario withdrew 18 575 million $m^3$ or 84.2% of the volume of water withdrawn by all sectors in this region
- the oil & gas sector withdrew less than one million $m^3$, or 0.001% of the total volume in the region

**Figure 9. Water withdrawn by sector in Ontario, 2021**




Data for Figure 9

**Note:** The irrigation data is for the year 2022. For more information, consult the Data sources and methods section.
**Source:** Statistics Canada (2024) Water use parameters in mineral extraction and thermal-electric power generation industries, by region. Statistics Canada (2024) Potable water use by sector and average daily use. Statistics Canada (2024) Water use parameters in manufacturing industries, by provinces, territories and drainage regions. Statistics Canada (2024) Irrigation volume by province and drainage region. Canada Energy Regulation (2024) Estimated Production of Canadian Crude Oil and Equivalent. Canada Energy Regulation (2024) Marketable Natural Gas Production in Canada.

Although it is not the largest economic sector, the thermal power generation industry, including nuclear and fossil-fuel power plants, is the most important water user in Ontario. In 2021, 84.2% of the water volume withdrawn in Ontario was by this sector. This industry uses large quantities of water to cool and produce steam to drive the turbines that generate electricity. It recycles a large part, up to 48%, of the volume used before returning it.

Manufacturers located in Ontario withdrew 1 862 million $m^3$ in 2021. This volume represented 8.4% of the total water withdrawal of the province, ranking second after the thermal power generation sector.

Only 3.4% of the regional volume was withdrawn by all of the other five sectors in 2021.

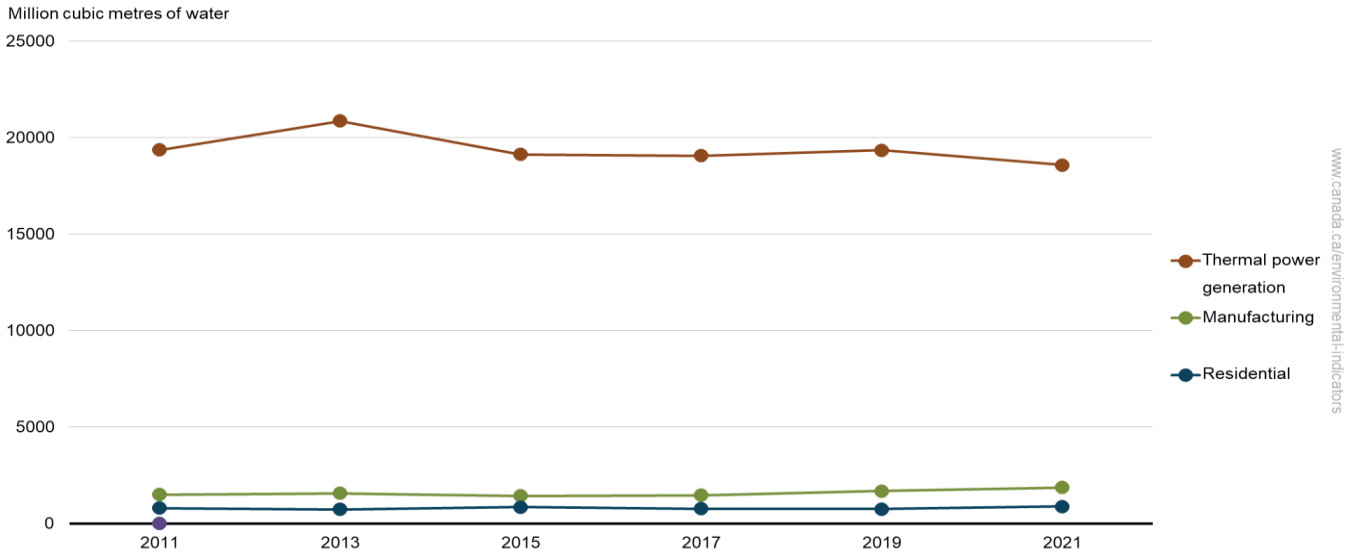
## Variation in water withdrawals by the most water-intensive sectors

### Key results

From 2011 to 2021:

- the volume of water withdrawn by the thermal power generation sector remained relatively stable with a decrease of 1.4%, from 19 344 million $m^3$ to 18 575 $m^3$
- an increase occurred from 1 496 million $m^3$ to 1 862 million $m^3$, or 24.5% of the water withdrawn by the manufacturing sector

**Figure 10. Variation in water withdrawals by the most water-intensive sectors in Ontario, 2011 to 2021**




Data for Figure 10

**Note:** Due to COVID-19, some data were recorded in 2020 instead of 2019. For more information, consult the Data sources and methods section.
**Source:** Statistics Canada (2024) Water use parameters in mineral extraction and thermal-electric power generation industries, by region. Statistics Canada (2024) Potable water use by sector and average daily use. Statistics Canada (2024) Water use parameters in manufacturing industries, by provinces, territories and drainage regions.

Among the most water-intensive sectors, the thermal power generation sector in Ontario consistently accounted for over 84% of the regional water withdrawn from 2011 to 2021. This has remained relatively stable, with a slight reduction of 4% between 2011 and 2021. The largest water volume was withdrawn in 2013, with 20 844 million $m^3$, or 12.2% more than in 2021. This decrease is explained by the closure of Ontario's last coal power plant in December 2013[10] and by the increased use of wind and solar power generation.

From 2011 to 2021, water withdrawals from the manufacturing and residential sectors showed a variable trend with a significant increase in 2021. Water withdrawals by these sectors were respectively 24.5% and 10.6% higher in 2021 compared to 2011, and 10.9% and 16.1% higher in 2021 compared to 2019.

## Water consumed and returned by the most water-intensive sectors

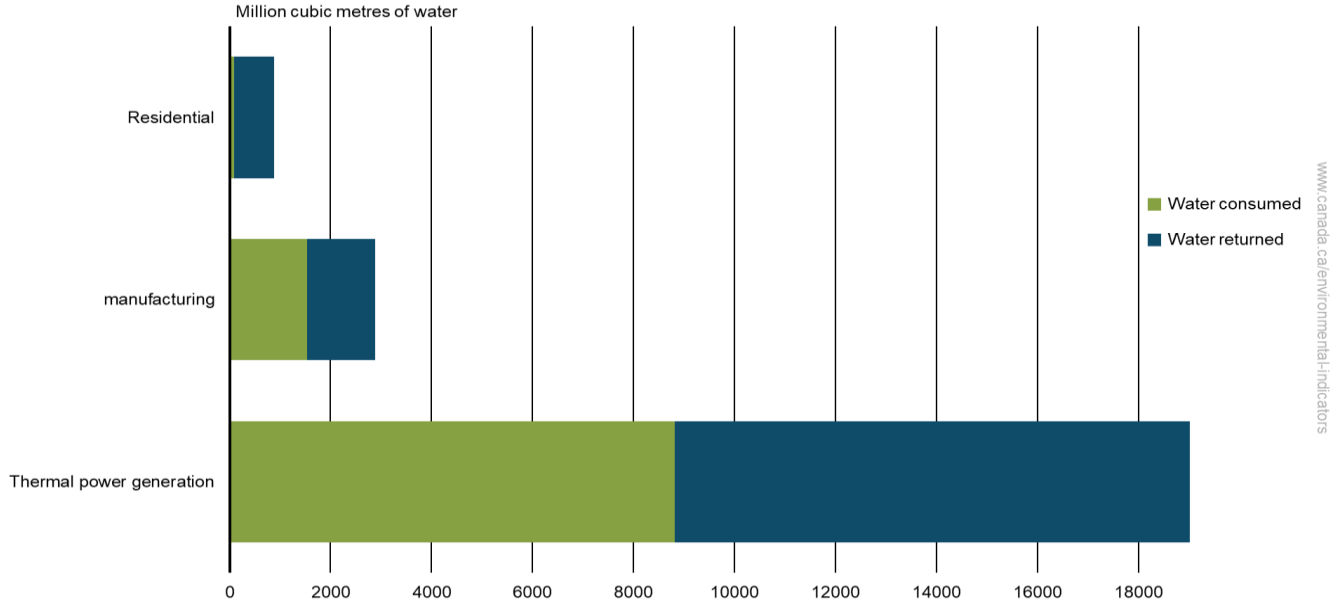
### Key results

In 2021,

- the thermal power generation sector returned 18 408 million $m^3$, or 67.6% of water used[11]
- the manufacturing sector, the second largest user of water, returned 1 350 million $m^3$, or 46.9% of water used[11] for their processes.

[10]Government of Ontario (2020) The End of Coal. Retrieved on November 11, 2024.
[11]Includes water intake and water recirculation. For more information, consult Data sources and methods section.

**Figure 11. Water consumed and returned by the most water-intensive sectors in Ontario, 2021**




Data for Figure 11

**Note:** For the manufacturing and thermal power generation sectors, water used (consumed and returned) volumes include intake water and recirculation water. For more information, consult the Data sources and methods section.
**Source:** Statistics Canada (2024) Water use parameters in mineral extraction and thermal-electric power generation industries, by region. Statistics Canada (2024) Potable water use by sector and average daily use. Statistics Canada (2024) Water use parameters in manufacturing industries, by provinces, territories and drainage regions.

# Prairie provinces

The Prairies include Alberta, Saskatchewan and Manitoba and have a population of 6.74 million, representing 18.2% of the Canadian population, mostly living in the five major cities (Calgary, Edmonton, Winnipeg, Saskatoon and Regina).

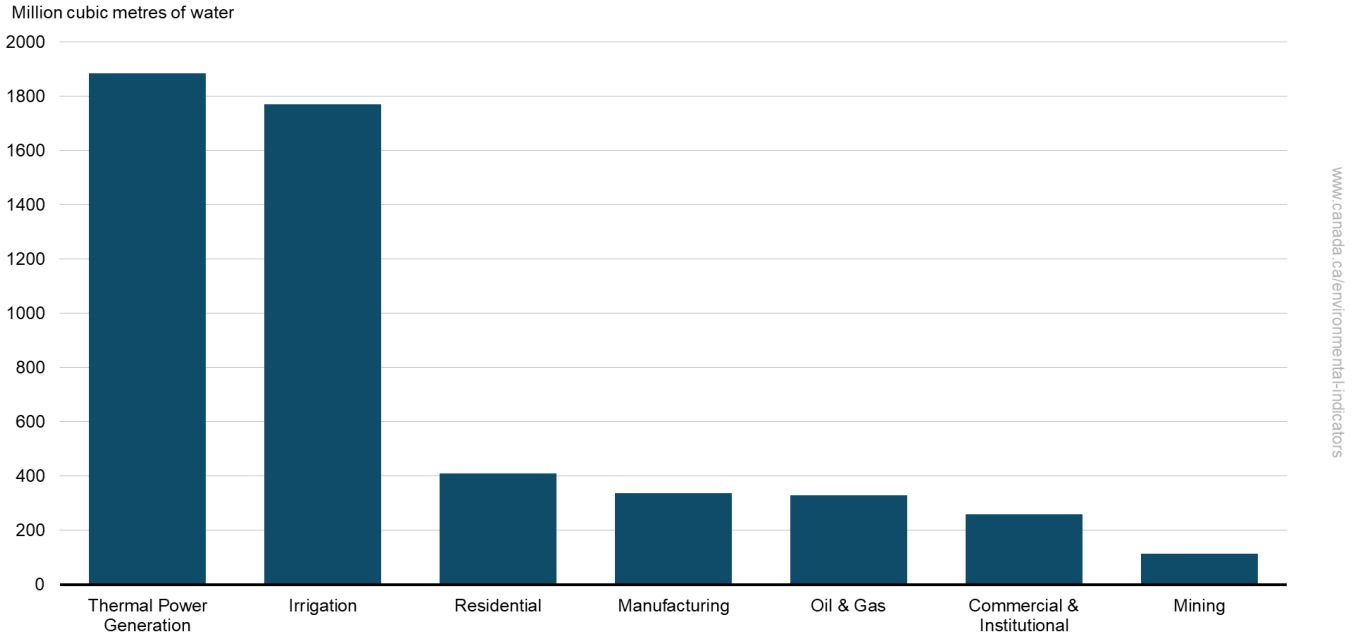
## Water withdrawn by sector

### Key results

In 2021,

- the thermal power generation and irrigation sectors withdrew the most water in the region with 71.6%, or 3 656 million $m^3$ combined
- the oil & gas sector, the most important economic sector in this region, withdrew 328 million $m^3$, or 6.4% of the total regional volume

**Figure 12. Water withdrawn by sector in Prairie provinces, 2021**




Data for Figure 12

**Note:** The irrigation data is for the year 2022. For more information, consult the Data sources and methods section.
**Source:** Statistics Canada (2024) Water use parameters in mineral extraction and thermal-electric power generation industries, by region. Statistics Canada (2024) Potable water use by sector and average daily use. Statistics Canada (2024) Water use parameters in manufacturing industries, by provinces, territories and drainage regions. Statistics Canada (2024) Irrigation volume by province and drainage region. Canada Energy Regulation (2024) Estimated Production of Canadian Crude Oil and Equivalent. Canada Energy Regulation (2024) Marketable Natural Gas Production in Canada.

In 2021, the Prairies region withdrew the largest amount of water in Canada for irrigation purposes with 1 771 million $m^3$. This reflects the importance of agriculture in the region.

The thermal power generation sector recorded 1 885 million $m^3$ of water withdrawn, 36.9% of the total regional volume while irrigation, the second most important economic sector of this region, recorded 34.7% of the total regional withdrawals.

The residential and manufacturing sectors followed with 408 million $m^3$ (8.0%) and 338 million $m^3$ (6.6%) respectively of the total regional withdrawals. The oil & gas sector, which is the most important economic sector in Alberta, withdrew 328 million $m^3$ in 2021, representing 6.4% of the total volume of water withdrawn in the region.

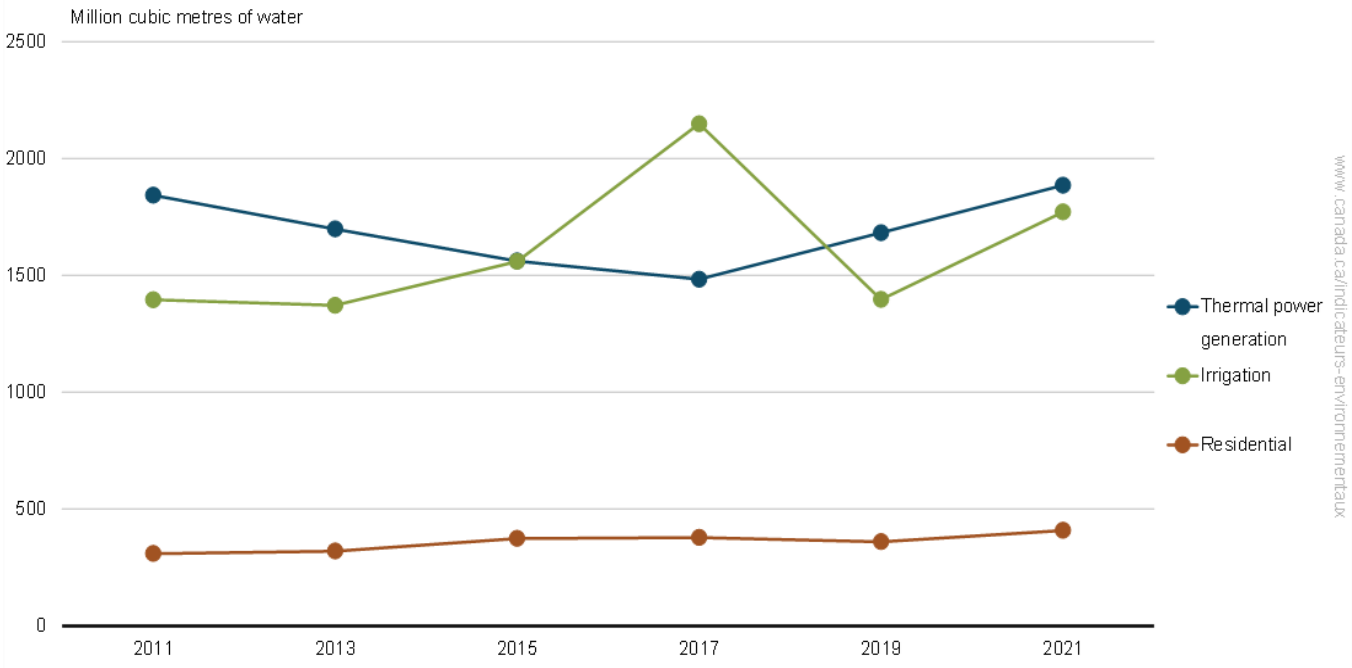
## Variation in water withdrawals by the most water-intensive sectors

### Key results

From 2011 to 2021,

- the thermal power generation, irrigation and residential sectors increased their water withdrawal by 2.3%, 26.9% and 32.1% respectively
- the thermal power generation and irrigation sector remained the most important users of water in this region

**Figure 13. Variation in water withdrawals by the most water-intensive sectors in Prairie provinces, 2011 to 2021**




Data for Figure 13

**Note:** Data for irrigation sector are one year ahead of other sectors from 2012 to 2022. Due to COVID-19, some data were recorded in 2020 instead of 2019. For more information, consult the Data sources and methods section.
**Source:** Statistics Canada (2024) Water use parameters in mineral extraction and thermal-electric power generation industries, by region. Statistics Canada (2024) Potable water use by sector and average daily use. Statistics Canada (2024) Irrigation volume by province and drainage region.

Between 2011 and 2021, the volume of water withdrawn by the thermal power generation sector increased by 2.3%, partly explained by the increase in natural gas power generation despite the decrease in coal power generation which both use water in their process.

From 2011 to 2021, irrigation water withdrawals have tended to increase. The highest amount was recorded in 2017 with 2 148 million $m^3$, 21.3% more than in 2021 (1 771 million $m^3$), and 54.0% more than in 2011 (1 395 million $m^3$). Irrigation water use is linked to annual changes in weather and precipitation that are impacted by climate change, so more water will be used and consumed in a drier summer compared to a summer with more rain.

For the same time period, the residential sector withdrew a volume of water accounting for between 6.9% (in 2011) and 8.0% (in 2021) of the total water withdrawn in the region.

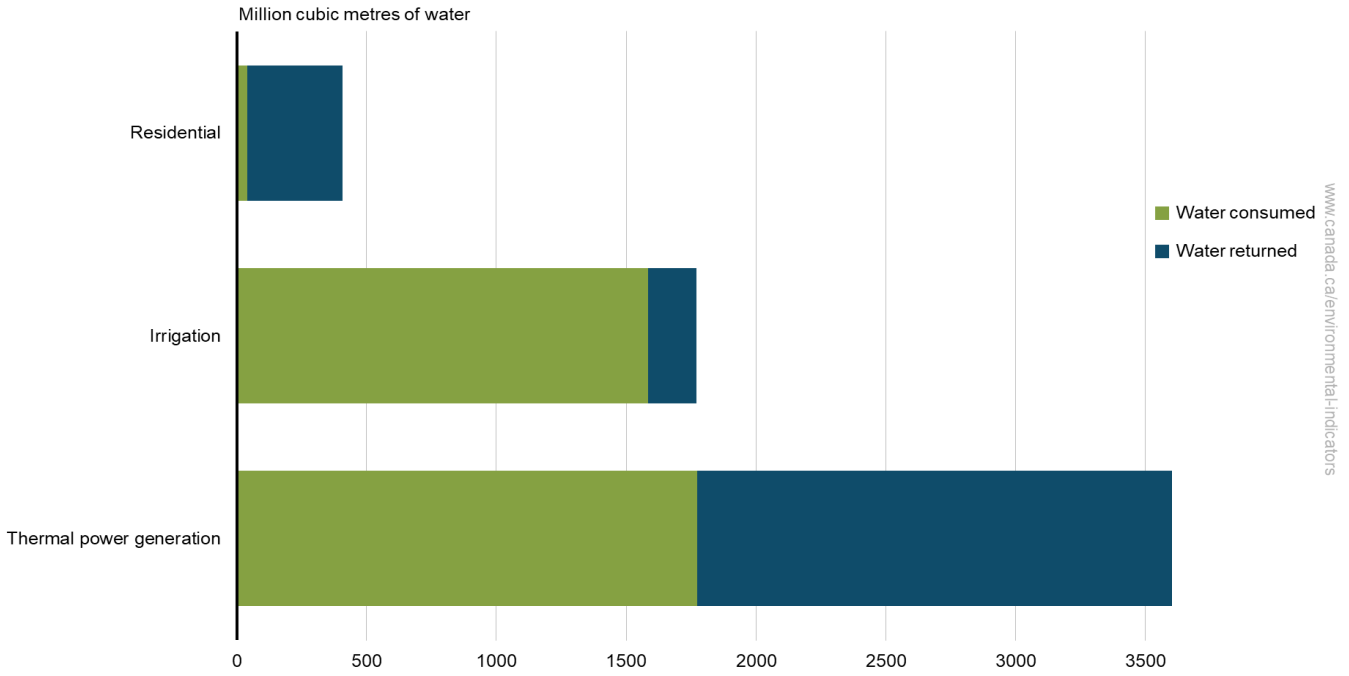
## Water consumed and returned by the most water-intensive sectors

### Key results

In 2021,

- the thermal power generation sector returned 1 832 million $m^3$, or 50.8% of water used[12]
- the water volumes returned by the irrigation and residential sectors were estimated to be respectively 186 million $m^3$ (10.5%) and 368 million $m^3$ (90%)

**Figure 14. Water consumed and returned by the most water-intensive sectors in Prairie provinces, 2021**




Data for Figure 14

**Note:** The irrigation data is for the year 2022. For the thermal power generation sector, water used (consumed and returned) volumes include intake water and recirculation water. For more information, consult the Data sources and methods section.
**Source:** Statistics Canada (2024) Water use parameters in mineral extraction and thermal-electric power generation industries, by region. Statistics Canada (2024) Potable water use by sector and average daily use. Statistics Canada (2024) Irrigation volume by province and drainage region.

[12] Includes water intake and water recirculation. For more information, consult Data sources and methods section.

# British Columbia and the Territories

This region includes British Columbia, Yukon, Nunavut and Northwest Territories. It is home to approximately 5.1 million people, or 13.8% of Canada's population. 97.7% of this population lives in British Columbia, which is the third largest Canadian province by population.

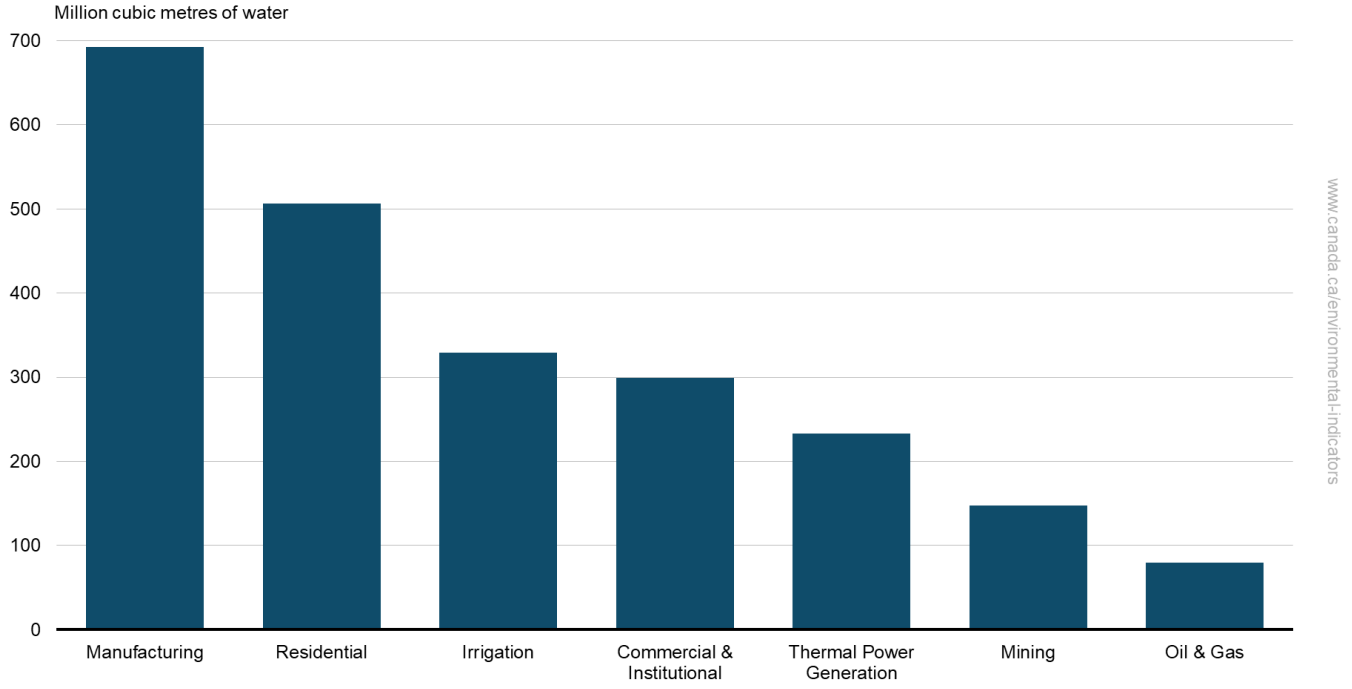
## Water withdrawn by sector

### Key results

In 2021,

- the manufacturing sector withdrew the largest amount of water, 692 million $m^3$, or 30.3% of the total regional water withdrawn
- the residential sector is ranked second in the total volume withdrawn with 507 million $m^3$, 98% of this by British Columbia and 2% by the Yukon, Nunavut and Northwest Territories combined

**Figure 15. Water withdrawn by sector in British Columbia and the Territories, 2021**




Data for Figure 15

**Note:** The irrigation data is for the year 2022. For more information, consult the Data sources and methods section.
**Source:** Statistics Canada (2024) Water use parameters in mineral extraction and thermal-electric power generation industries, by region. Statistics Canada (2024) Potable water use by sector and average daily use. Statistics Canada (2024) Water use parameters in manufacturing industries, by provinces, territories and drainage regions. Statistics Canada (2024) Irrigation volume by province and drainage region. Canada Energy Regulation (2024) Estimated Production of Canadian Crude Oil and Equivalent. Canada Energy Regulation (2024) Marketable Natural Gas Production in Canada.

In 2021, the manufacturing sector withdrew 692 million $m^3$. This volume accounted for 30.3% of the total volume withdrawal in this region. It is the most water-intensive sector, but not the largest in economic terms. The residential sector ranked a close second with 507 million $m^3$ of water withdrawn, at 22.2%. This is consistent with the distribution of the population of the region, however, 98% was withdrawn by British Columbia and only 2% by the territories.

Water withdrawal for irrigation purposes[13] accounted 329 million $m^3$, 14.4% of total water withdrawals in the region. That compensated the low precipitation in the interior of British Columbia.

[13] The irrigation data is for the year 2022. For more information, consult the Data sources and methods section.

Even though commercial & institutional is the most important economic sector in the region, the volume of water withdrawn by this sector was ranked fourth, estimated at 299 million $m^3$, or 13.1% of the total regional volume.

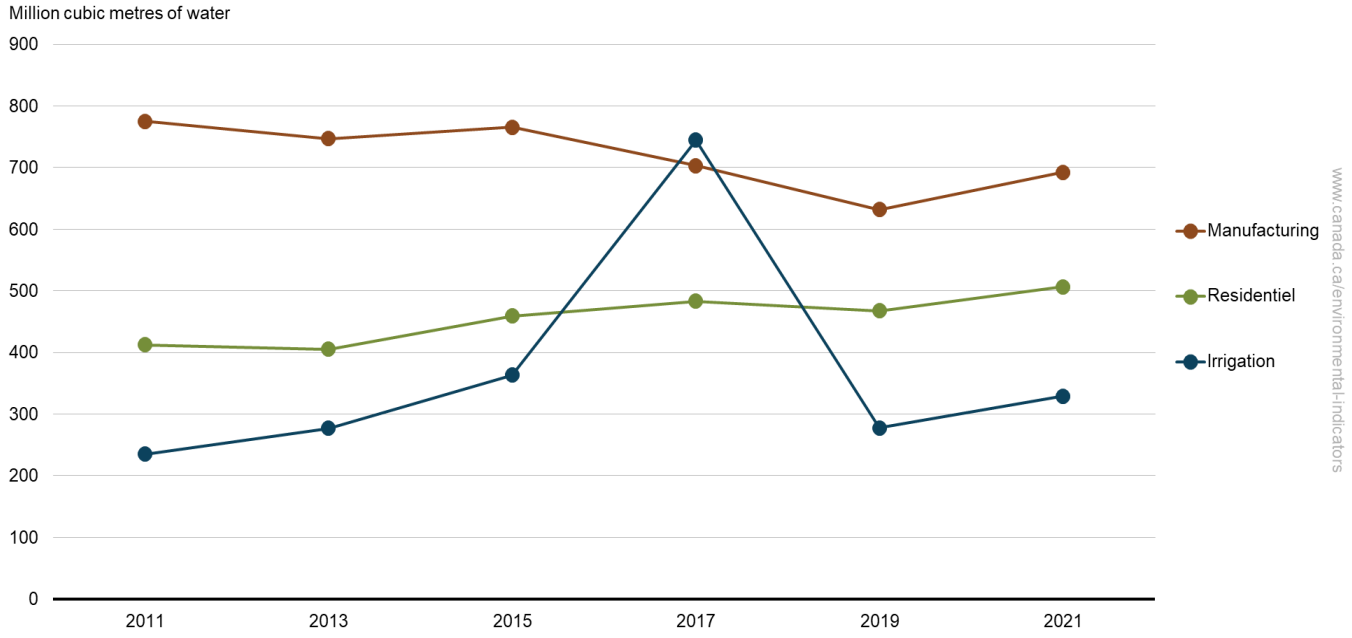
## Variation in water withdrawals by the most water-intensive sectors

### Key results

From 2011 to 2021,

- the manufacturing sector had a downward trend of water volume withdrawn from 775 million $m^3$ to 692 million $m^3$
- the residential and irrigation sectors had an upward trend of water volume withdrawn, from 412 million $m^3$ to 507 million $m^3$ and from 235 million $m^3$ to 329 million $m^3$, respectively

**Figure 16. Variation in water withdrawals by the most water-intensive sectors in the British Columbia and the Territories, 2011 to 2021**




Data for Figure 16

**Note:** Data for irrigation sector are one year ahead of other sectors from 2012 to 2022. Due to COVID-19, some data were recorded in 2020 instead of 2019. For more information, consult the Data sources and methods section.
**Source:** Statistics Canada (2024) Potable water use by sector and average daily use. Statistics Canada (2024) Water use parameters in manufacturing industries, by provinces, territories and drainage regions. Statistics Canada (2024) Irrigation volume by province and drainage region.

From 2011 to 2021, the manufacturing sector has shown a slight downward trend of water volume withdrawn from 775 million $m^3$ in 2011 to 692 million $m^3$ in 2021. The decrease of 10.6% between 2011 and 2021 can be explained by decrease in demand for manufactured goods from domestic markets.

The volume of water withdrawn in the residential sector has shown an upward trend over the same time period, with an increase of 23.0% in 2021 compared to 2011. This increase is mostly associated with population growth.

Irrigation recorded a marked fluctuation in the volume of water withdrawn over this period. Water withdrawals continued to rise from 2011 to 2017, reaching a peak volume of 745 million $m^3$, after which, volumes fell to 329 million $m^3$ in 2021. As in all regions, more water will be withdrawn in a drier summer compared to a summer with more rain.

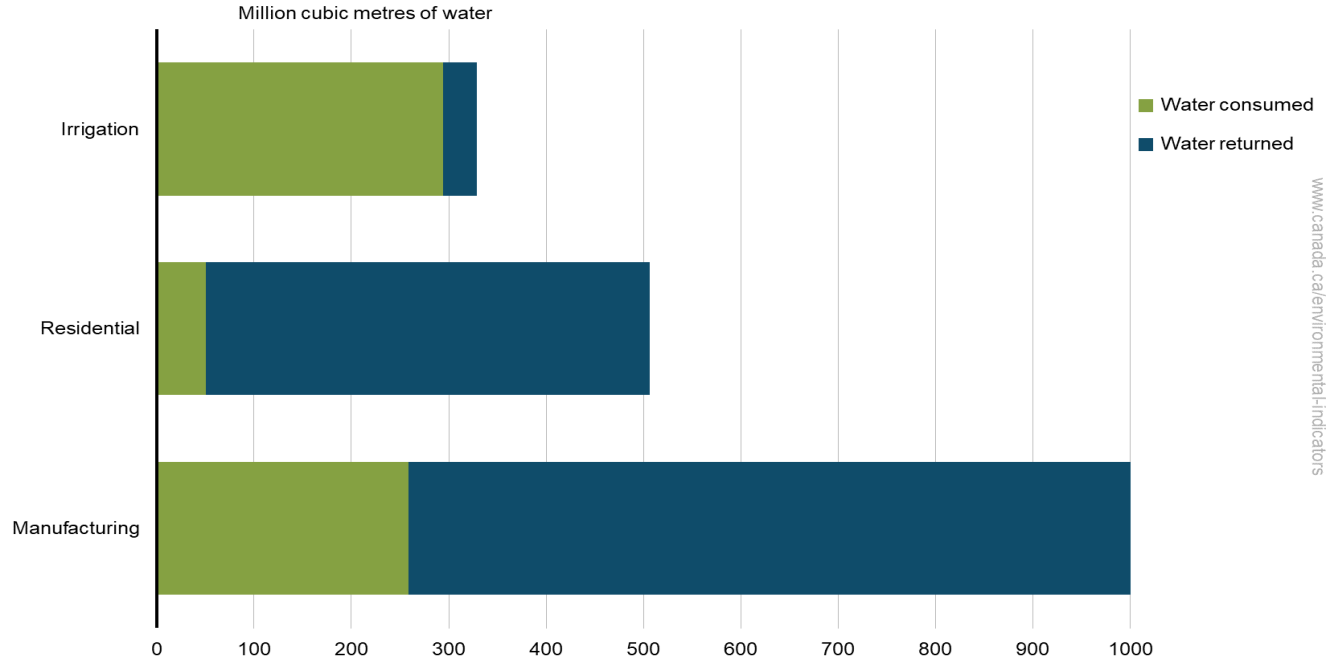
## Water consumed and returned by the most water-intensive sectors

### Key results

In 2021,

- the manufacturing sector returned 742 million $m^3$, representing more than 74.0% of water used[14] in British Columbia and the Territories
- the volume of returned water from the residential sector and for irrigation is estimated at 456 million $m^3$ and 34.6 million $m^3$ respectively

**Figure 17. Water consumed and returned by the most water-intensive sectors in the British Columbia and the Territories, 2021**




Data for Figure 17

**Note:** The irrigation data is for the year 2022. For the manufacturing sector, water used (consumed and returned) volumes include intake water and recirculation water. For more information, consult the Data sources and methods section.
**Source:** Statistics Canada (2024) Potable water use by sector and average daily use. Statistics Canada (2024) Water use parameters in manufacturing industries, by provinces, territories and drainage regions. Statistics Canada (2024) Irrigation volume by province and drainage region.

[14] Includes water withdrawn and recirculation. For more information, consult Data sources and methods section.

# About the indicators

## What the indicators measure

The water use indicator provides information about the volumes and proportions of water that are withdrawn, consumed and returned for all of Canada and divided by its five regions. It reports the volume of water withdrawn between 2005 and 2021 for seven of Canada's key economic sectors: thermal power generation, manufacturing, residential, commercial & institutional, irrigation (agriculture), mining and oil & gas. For the five regions, it reports the volume withdrawn by sector, and the proportions of water returned by the largest water users for each region in 2021, as well as their variation over time from 2011 to 2021.

## Why these indicators are important

Water is a vital resource and an important economic driver in Canada. Water is used for irrigation, cleaning, chemical processes, electricity generation, and many other purposes. Municipalities distribute water for residential, commercial & institutional use, including drinking, cooking and cleaning.

Climate change is affecting the water cycle and water availability. The following observed changes have an impact on the use of water: melting ice, thawing permafrost and shorter duration of snow cover, increasing precipitation and a transition from snow to rain, changes in the timing of water availability, and changes in the nature of extreme events.

Moreover, one of the largest water-using sectors in Canada is thermal power generation. Water use in this sector is expected to grow with the expected electrification of the transportation sector, especially if fossil-fuel electricity generation remains substantial in Canada. Understanding the amount of water withdrawn and consumed by each sector in different regions of the country is important for the sustainable management of Canada’s long-term water supply.

## Related initiatives

These indicators support the measurement of progress towards the following 2022 to 2026 Federal Sustainable Development Strategy Goal 6: Ensure clean and safe water for all Canadians.

In addition, the indicator contributes to the Sustainable Development Goals of the 2030 Agenda for Sustainable Development. It is linked to the 2030 Agenda's Goal 6: Clean water and sanitation and Target 6.4: "By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity."

## Related indicators

The Water quantity in Canadian rivers indicator provides a summary of trends and the status of water quantity in rivers at the national, regional and local levels.

Municipal wastewater treatment measures the level of wastewater treatment provided to the Canadian population and tracks the compliance of the treated water discharged with the national effluent quality standards.

Precipitation change in Canada measures the annual average precipitation and the seasonal average precipitation at the national and regional levels.

# Data sources and methods

## Data sources

Data for national and regional water withdrawal are taken mainly from Statistics Canada Water Surveys tables, more specifically from the Biennial Industrial Water Survey (IWS), the Biennial Agricultural Water Survey (AWS), the Biennial Drinking Water Plants Survey (DKWP), the Canadian Wastewater Survey (CWS).

**More information**

The following list provides all the sources of data used for the water use indicators:

- Water use parameters in mineral extraction and thermal-electric power generation industries, by region used for national and regional data on water withdrawals, returned and consumed by the mining and thermal power generation sectors from 2005 to 2021
- Water use parameters in manufacturing industries, by industry used for national data on water withdrawals, return and consumption by manufacturing sector from 2005 to 2021.
- Water use parameters in manufacturing industries, by provinces, territories and drainage regions used for regional data on water withdrawals, return and consumption by manufacturing sector from 2011 to 2021
- Irrigation volume by province and drainage region used for national and regional data on water withdrawals by the irrigation sector from 2010 to 2022
- Water use in Canada used for national data on water withdrawals by oil & gas, residential, and Commercial & Institutional sectors from 2005 to 2009
- Physical flow account for water used for national data on water withdrawals by oil & gas and Commercial & Institutional sectors from 2011 to 2021
- Potable water use by sector and average daily used for national and regional data on water withdrawals by Residential and Commercial & institutional sectors from 2011 to 2021
- Census Profile, 2021 Census of Population used for population
- Estimated Production of Canadian Crude Oil and Equivalent and Marketable Natural Gas Production in Canada tables by the Canada Energy Regulator program used for regional data on water withdrawals by oil & gas sector

## Methods

The values used for the seven economic sectors (thermal power generation, manufacturing, residential, commercial & institutional, mining and oil & gas) that are reported in the indicators summarize data from 90 economic activities classified by Statistics Canada (listed in Annex B).

National and regional water withdrawal, consumption and return values for some sectors are taken directly from the Statistics Canada tables (consult Data sources section above). For other values, calculation, estimation and assumptions were applied on the data.

**More information**

For the national data:

- The volumes of water withdrawn by all sectors were taken directly from the Statistics Canada tables (consult Data sources section above)
- The volumes of water returned by the thermal power generation and manufacturing sectors were taken directly from the Statistics Canada tables (consult Data sources section above) referred to as water discharged in the tables while water consumption for these sectors was calculated by subtracting the volume returned from the sum of recirculation and intake (withdrawal) volumes
- The volumes of water returned by the mining sector were taken directly from the Statistics Canada tables (consult Data sources section above) referred to as water discharged in the tables. Water consumption was calculated by subtracting the volume returned from the sum of recirculation, intake and mine water

volumes. Mine water is water removed from mines through dewatering. The IWS reports mine water and water intake separately.

- Water consumption of the oil & gas sector is estimated using the upper limit of 95% range of the total water withdrawn by the oil sands industry being recycled and not returned to groundwater and surface water sources[15]. The volume returned is therefore estimated at 5% of the total water withdrawn
- Water consumption of the residential and commercial & institutional sectors is assumed to be 10% of total water withdrawal, based on consumption rates from Environment Canada's MWWS[16]. The volume returned is therefore estimated at 90% of the total water withdrawn
- Water consumption of the irrigation sector is assumed to be 89.5% of the total water withdrawn. National consumption is calculated using annual water use return rates for irrigation in Alberta[17]. The volume returned is calculated as the difference between the volume withdrawn and the volume consumed. We assumed that the Alberta rate is applicable to the rest of the country

For the regional data:

- The analysis of volumes consumed-returned and the variation in water withdrawals from 2011 to 2021 concerned only the sectors that consume the most water, called the most water-intensive sectors, since they use much larger volumes than the other sectors. For Quebec, the commercial & institutional sector is one of the largest consumers of water but it was not included in the analysis of the withdrawal volume variation from 2011 to 2021 nor in the analysis of the consumed and returned volumes due to a lack of data.
- The Atlantic provinces data resulted from the sum of the data for Prince Edward Island, New Brunswick, Newfoundland and Labrador and Nova Scotia
- The Prairie provinces data resulted from the sum of the data of Alberta, Manitoba and Saskatchewan
- British Columbia and the Territories data resulted from the sum of the data of British Columbia, Yukon, Northwest Territories and Nunavut
- The volumes of water withdrawn, consumed and returned for the thermal power generation, manufacturing, mining, residential and irrigation sectors were calculated in the same way as for national volumes
- The volumes of water withdrawn by the commercial & institutional sector were estimated to be 36% of total potable water volume data of the Potable water use by sector and average daily table. This percentage represents the proportion of water used by this sector at national level. It was applied at regional level due to the lack of regional data. Consumed and returned volumes were calculated in the same way as for national volumes
- The volumes of water withdrawn by oil & gas sector were estimated from the Estimated Production of Canadian Crude Oil and Equivalent and the Marketable Natural Gas Production in Canada tables. For each region, the volume of water withdrawn by the oil & gas sector represents a proportion of the national volume of water withdrawn by this sector. To estimate the regional volume proportion for this sector, we used the regional oil & gas production as a comparison with the national production. We have assumed that water withdrawals follow the same pattern as production. Consumed and returned volumes were calculated in the same way as for national volumes

Because of the staggered times between different water surveys by Statistics Canada, data for the irrigation sector are one year ahead of the other sectors. In order to simplify the editing of irrigation-related indicators, the values for even-numbered years from 2006 to 2022 have been assigned to the previous odd-numbered years from 2005 to 2021.

Due to COVID-19, no surveys were carried out for the thermal power generation and manufacturing sectors in 2019; they were postponed until 2020. It should be noted that all 2019 data for these sectors used in the indicators are actually for 2020.

[15] Government of Alberta (2024) Oil Sands Facts and Statistics. Retrieved on November 11, 2024.
[16] Ferguson D (2011) Environment Canada, personal communication.
[17] Government of Alberta (2024) Alberta Irrigation Information. Retrieved on November 11, 2024.

**Caveats and limitations**

While water is withdrawn from both surface water and groundwater sources, most water is returned to surface water. The Water consumption and return by sector indicator considers water to be consumed if it is not returned to its source.

The possible depletion of groundwater resources due to certain practices, such as mine dewatering or municipalities using groundwater for drinking, has been captured in the indicator.

Although efforts were made by Statistics Canada to reduce errors in their surveys through data validation, errors are unavoidable and may have been introduced during the data production process. Imputation was used by the IWS and AWS on partial-response records.

In the cases of the residential, commercial & institutional, and oil & gas sectors, the regional estimates of the proportion of water consumed and returned is constantly being improved.

# Resources

## References


Government of Alberta (2024) Alberta Irrigation Information. Retrieved on November 11, 2024.

Government of Alberta (2024) Oil Sands Facts and Statistics. Retrieved on November 11, 2024.

Government of Canada (2024) Water use parameters in mineral extraction and thermal-electric power generation industries, by region. Retrieved November 11, 2024.

Kulshreshtha SN and Grant C (2007) An Estimation of Canadian Agricultural Water Use. Canadian Water Resources Journal 32(2): 137 to 148. Retrieved November 11, 2024.

Statistics Canada (2024) Biennial Agricultural Water Survey (IWS). Retrieved on November 11, 2024.

Statistics Canada (2024) Biennial Industrial Water Survey (IWS). Retrieved on November 11, 2024.

Statistics Canada (2024) Potable water use by sector and average daily use. Retrieved on November 11, 2024.

Statistics Canada (2024) Physical flow account for water use. Retrieved on November 11, 2024.

Statistics Canada (2024) Water use parameters in manufacturing industries, by provinces, territories and drainage regions. Retrieved on November 11, 2024.

Statistics Canada (2024) Water use in Canada. Retrieved November 11, 2024.


## Related information

Agriculture and Irrigation | Alberta.ca

Water and the environment - Canada.ca

# Annexes

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

**Table A. 1. Data for Figure 1. Water withdrawn by sector, Canada, 2005 to 2021**

| Year | Thermal power generation (million $m^3$) | Manufacturing (million $m^3$) | Residential (million $m^3$) | Irrigation (million $m^3$) | Commercial & institutional (million $m^3$) | Mining (million $m^3$) | Oil & gas (million $m^3$) |
|---|---|---|---|---|---|---|---|
| 2005 | 27 825.1 | 5 719.5 | 3 875.2 | 1 507.3 | 1 082.1 | 668.9 | 198.0 |
| 2007 | 27 834.4 | 4 573.1 | 3 827.4 | 2 015.4 | 1 055.7 | 906.0 | 190.0 |
| 2009 | 26 213.6 | 3 929.8 | 3 639.2 | 2 043.7 | 1 957.3 | 675.2 | 289.1 |
| 2011 | 23 715.9 | 3 789.3 | 2 195.8 | 1 692.4 | 1 931.2 | 776.3 | 343.0 |
| 2013 | 25 145.5 | 3 967.6 | 1 971.4 | 1 679.0 | 2 112.3 | 924.7 | 365.8 |
| 2015 | 23 318.3 | 3 661.9 | 2 497.7 | 2 054.1 | 2 055.5 | 797.7 | 374.8 |
| 2017 | 23 249.0 | 3 647.5 | 2 450.2 | 2 950.9 | 2 073.3 | 888.8 | 419.0 |
| 2019 | 23 041.9 | 3 752.7 | 2 480.1 | 1 780.8 | 1 984.2 | 775.5 | 446.2 |
| 2021 | 22 903.3 | 4 046.3 | 2 678.0 | 2 186.5 | 1 539.9 | 636.5 | 419.6 |

**Note:** Data for irrigation sector are one year ahead of other sectors from 2006 to 2022. Due to COVID-19, some data were recorded in 2020 instead of 2019. For more information, consult Data sources and methods section.
**Source:** Statistics Canada (2024) Water use in Canada. Statistics Canada (2024) Physical flow account for water use. Statistics Canada (2024) Water use parameters in mineral extraction and thermal-electric power generation industries, by region. Statistics Canada (2024) Potable water use by sector and average daily use. Statistics Canada (2024) Water use parameters in manufacturing industries, by industry. Statistics Canada (2024) Irrigation volume by province and drainage region.

**Table A. 2. Data for Figure 2. Water consumed and returned by sector, Canada, 2021**

| Sector | Water consumed (million $m^3$) | Water returned (million $m^3$) |
|---|---|---|
| Thermal power generation | 11 488.4 | 21 806.7 |
| Manufacturing | 3 125.9 | 3 395.5 |
| Residential | 267.8 | 2 410.2 |
| Irrigation | 1 956.9 | 229.6 |
| Commercial & institutional | 153.9 | 1 385.9 |
| Mining | 517.4 | 532.4 |
| Oil & gas | 398.6 | 21.0 |

**Note:** The irrigation data is for the year 2022. Water used (consumed and returned) volumes for the mining sector include mine water, intake water and recirculation water. For the manufacturing and thermal power generation water used (consumed and returned) volumes include intake water and recirculation water. For more information, consult Data sources and methods section.
**Source:** Statistics Canada (2024) Water use in Canada. Statistics Canada (2024) Physical flow account for water use. Statistics Canada (2024) Water use parameters in mineral extraction and thermal-electric power generation industries, by region. Statistics Canada (2024) Potable water use by sector and average daily use. Statistics Canada (2024) Water use parameters in manufacturing industries, by industry. Statistics Canada (2024) Irrigation volume by province and drainage region.

**Table A. 3. Data for Figure 3. Water withdrawn by sector in Atlantic provinces, 2021**

| Sector | 2021 (million $m^3$) |
|---|---|
| Thermal power generation | 2 210.4 |
| Manufacturing | 296.8 |
| Residential | 160.5 |
| Commercial & institutional | 103.6 |
| Mining | 38.2 |
| Oil & gas | 11.5 |
| Irrigation | 5.8 |

**Note:** The irrigation data is for the year 2022. For more information, consult Data sources and methods section.
**Source:** Statistics Canada (2024) Water use parameters in mineral extraction and thermal-electric power generation industries, by region. Statistics Canada (2024) Potable water use by sector and average daily use. Statistics Canada (2024) Water use parameters in manufacturing industries, by provinces, territories and drainage regions. Statistics Canada (2024) Irrigation volume by province and drainage region. Canada

Energy Regulation (2024) Estimated Production of Canadian Crude Oil and Equivalent. Canada Energy Regulation (2024) Marketable Natural Gas Production in Canada.

### Table A. 4. Data for Figure 4. Variation in water withdrawals by the most water-intensive sectors in Atlantic provinces, 2011 to 2021

| Year | Thermal power generation (million $m^3$) | Manufacturing (million $m^3$) | Residential (million $m^3$) |
|---|---|---|---|
| 2011 | 1 877.1 | 356.3 | 103.1 |
| 2013 | 2 567.5 | 389.8 | 95.5 |
| 2015 | 2 620.7 | 293.1 | 160.6 |
| 2017 | 2 707.8 | 280.9 | 172.4 |
| 2019 | 2 019.0 | 342.6 | 166.0 |
| 2021 | 2 210.4 | 296.8 | 160.5 |

**Note:** Due to COVID-19, some data were recorded in 2020 instead of 2019. For more information, consult the Data sources and methods section.
**Source:** Statistics Canada (2024) Water use parameters in mineral extraction and thermal-electric power generation industries, by region. Statistics Canada (2024) Potable water use by sector and average daily use. Statistics Canada (2024) Water use parameters in manufacturing industries, by provinces, territories and drainage regions.

### Table A. 5. Data for Figure 5. Water consumed and returned by the most water-intensive sectors in Atlantic provinces, 2021

| Sector | Water consumed (million $m^3$) | Water returned (million $m^3$) |
|---|---|---|
| Thermal power generation | 841.3 | 1 389.1 |
| Manufacturing | 164.3 | 277.0 |
| Residential | 16.0 | 144.5 |

**Note:** For the manufacturing and thermal power generation water used (consumed and returned) volumes include intake water and recirculation water. For more information, consult the Data sources and methods section.
**Source:** Statistics Canada (2024) Water use parameters in mineral extraction and thermal-electric power generation industries, by region. Statistics Canada (2024) Potable water use by sector and average daily use. Statistics Canada (2024) Water use parameters in manufacturing industries, by provinces, territories and drainage regions.

### Table A. 6. Data for Figure 6. Water withdrawn by sector in Quebec, 2021

| Sector | 2021 (million $m^3$) |
|---|---|
| Manufacturing | 857.8 |
| Residential | 725.7 |
| Commercial & institutional | 530.7 |
| Mining | 106.8 |
| Irrigation | 39.6 |
| Thermal power generation | 0.0 |
| Oil & gas | 0.0 |

**Note:** The irrigation data is for the year 2022. For more information, consult the Data sources and methods section.
**Source:** Statistics Canada (2024) Water use parameters in mineral extraction and thermal-electric power generation industries, by region. Statistics Canada (2024) Potable water use by sector and average daily use. Statistics Canada (2024) Water use parameters in manufacturing industries, by provinces, territories and drainage regions. Statistics Canada (2024) Irrigation volume by province and drainage region. Canada Energy Regulation (2024) Estimated Production of Canadian Crude Oil and Equivalent. Canada Energy Regulation (2024) Marketable Natural Gas Production in Canada.

**Table A. 7. Data for Figure 7. Variation in water withdrawals by the most water-intensive sectors in Quebec, 2011 to 2021**

| Year | Mining (million $m^3$) | Manufacturing (million $m^3$) | Residential (million $m^3$) |
|---|---|---|---|
| 2011 | 58.1 | 842.1 | 578.4 |
| 2013 | 197.9 | 914.5 | 414.0 |
| 2015 | 162.2 | 812.5 | 657.7 |
| 2017 | 147.0 | 838.4 | 645.6 |
| 2019 | 159.4 | 745.7 | 731.8 |
| 2021 | 106.8 | 857.8 | 725.7 |

**Note:** Due to COVID-19, some data were recorded in 2020 instead of 2019. For more information, consult the Data sources and methods section.
**Source:** Statistics Canada (2024) Water use parameters in manufacturing industries, by provinces, territories and drainage regions. Statistics Canada (2024) Water use parameters in mineral extraction and thermal-electric power generation industries, by region. Statistics Canada (2024) Potable water use by sector and average daily use.

**Table A. 8. Data for Figure 8. Water consumed and returned by the most water-intensive sectors in Quebec, 2021**

| Sector | Water consumed (million $m^3$) | Water returned (million $m^3$) |
|---|---|---|
| Mining | 97.8 | 121.1 |
| Manufacturing | 781.8 | 794.7 |
| Residential | 72.6 | 653.1 |

**Note:** Water used (consumed and returned) volumes for the mining sector include mine water, intake water and recirculation water. For the manufacturing sector, water used (consumed and returned) volumes include intake water and recirculation water. For more information, consult the Data sources and methods section.
**Source:** Statistics Canada (2024) Water use parameters in mineral extraction and thermal-electric power generation industries, by region. Statistics Canada (2024) Potable water use by sector and average daily use.

**Table A. 9. Data for Figure 9. Water withdrawn by sector in Ontario, 2021**

| Sector | 2021 (million $m^3$) |
|---|---|
| Thermal power generation | 18 575.0 |
| Manufacturing | 1 861.6 |
| Residential | 876.7 |
| Commercial & institutional | 580.7 |
| Mining | 128.0 |
| Irrigation | 41.2 |
| Oil & gas | 0.13 |

**Note:** The irrigation data is for the year 2022. For more information, consult the Data sources and methods section.
**Source:** Statistics Canada (2024) Water use parameters in mineral extraction and thermal-electric power generation industries, by region. Statistics Canada (2024) Potable water use by sector and average daily use. Statistics Canada (2024) Water use parameters in manufacturing industries, by provinces, territories and drainage regions. Statistics Canada (2024) Irrigation volume by province and drainage region. Canada Energy Regulation (2024) Estimated Production of Canadian Crude Oil and Equivalent. Canada Energy Regulation (2024) Marketable Natural Gas Production in Canada.

**Table A. 10. Data for Figure 10. Variation in water withdrawals by the most water-intensive sectors in Ontario, 2011 to 2021**

| Year | Thermal power generation (million $m^3$) | Residential (million $m^3$) | Manufacturing (million $m^3$) |
|---|---|---|---|
| 2011 | 19 344.0 | 793.0 | 1 495.7 |
| 2013 | 20 844.3 | 737.1 | 1 564.8 |
| 2015 | 19 124.0 | 846.5 | 1 431.0 |
| 2017 | 19 053.9 | 771.4 | 1 462.2 |
| 2019 | 19 339.5 | 754.8 | 1 679.3 |
| 2021 | 18 575.0 | 876.7 | 1 861.6 |

**Note:** Due to COVID-19, some data were recorded in 2020 instead of 2019. For more information, consult the Data sources and methods section.

**Source:** Statistics Canada (2024) Water use parameters in mineral extraction and thermal-electric power generation industries, by region. Statistics Canada (2024) Potable water use by sector and average daily use. Statistics Canada (2024) Water use parameters in manufacturing industries, by provinces, territories and drainage regions.

### Table A. 11. Data for Figure 11. Water consumed and returned by the most water-intensive sectors in Ontario, 2021

| Sector | Water consumed (million $m^3$) | Water returned (million $m^3$) |
|---|---|---|
| Thermal power generation | 8 814.7 | 18 408.3 |
| Manufacturing | 1 530.1 | 1 350.2 |
| Residential | 87.7 | 789.0 |

**Note:** For the manufacturing and thermal power generation sectors, water used (consumed and returned) volumes include intake water and recirculation water. For more information, consult the Data sources and methods section.
**Source:** Statistics Canada (2024) Water use parameters in mineral extraction and thermal-electric power generation industries, by region. Statistics Canada (2024) Potable water use by sector and average daily use. Statistics Canada (2024) Water use parameters in manufacturing industries, by provinces, territories and drainage regions.

### Table A. 12. Data for Figure 12. Water withdrawn by sector in Prairie provinces, 2021

| Sector | 2021 (million $m^3$) |
|---|---|
| Thermal power generation | 1 885.0 |
| Irrigation | 1 770.9 |
| Residential | 408.4 |
| Manufacturing | 337.8 |
| Oil & gas | 328.3 |
| Commercial & institutional | 258.0 |
| Mining | 113.3 |

**Note:** The irrigation data is for the year 2022. For more information, consult the Data sources and methods section.
**Source:** Statistics Canada (2024) Water use parameters in mineral extraction and thermal-electric power generation industries, by region. Statistics Canada (2024) Potable water use by sector and average daily use. Statistics Canada (2024) Water use parameters in manufacturing industries, by provinces, territories and drainage regions. Statistics Canada (2024) Irrigation volume by province and drainage region. Canada Energy Regulation (2024) Estimated Production of Canadian Crude Oil and Equivalent. Canada Energy Regulation (2024) Marketable Natural Gas Production in Canada.

### Table A. 13. Data for Figure 13. Variation in water withdrawals by the most water-intensive sectors in Prairie provinces, 2011 to 2021

| Year | Thermal power generation (million $m^3$) | Irrigation (million $m^3$) | Residential (million $m^3$) |
|---|---|---|---|
| 2011 | 1 842.4 | 1 395.3 | 309.2 |
| 2013 | 1 697.8 | 1 371.5 | 319.8 |
| 2015 | 1 561.0 | 1 559.3 | 373.7 |
| 2017 | 1 482.9 | 2 147.9 | 377.9 |
| 2019 | 1 681.9 | 1 396.5 | 360.1 |
| 2021 | 1 885.0 | 1 770.9 | 408.4 |

**Note:** Data for irrigation sector are one year ahead of other sectors from 2012 to 2022. Due to COVID-19, some data were recorded in 2020 instead of 2019. For more information, consult the Data sources and methods section.
**Source:** Statistics Canada (2024) Water use parameters in mineral extraction and thermal-electric power generation industries, by region. Statistics Canada (2024) Potable water use by sector and average daily use. Statistics Canada (2024) Irrigation volume by province and drainage region.

**Table A. 14. Data for Figure 14. Water consumed and returned by the most water-intensive sectors in Prairie provinces, 2021**

| Sector | Water consumed (million $m^3$) | Water returned (million $m^3$) |
|---|---|---|
| Thermal power generation | 1 774.2 | 1 832.7 |
| Irrigation | 1 584.9 | 185.9 |
| Residential | 40.8 | 367.6 |

**Note:** The irrigation data is for the year 2022. For the thermal power generation sector, water used (consumed and returned) volumes include intake water and recirculation water. For more information, consult the Data sources and methods section.
**Source:** Statistics Canada (2024) Water use parameters in mineral extraction and thermal-electric power generation industries, by region. Statistics Canada (2024) Potable water use by sector and average daily use. Statistics Canada (2024) Irrigation volume by province and drainage region.

**Table A. 15. Data for Figure 15. Water withdrawn by sector in British Columbia and the Territories, 2021**

| Sector | 2021 (million $m^3$) |
|---|---|
| Manufacturing | 692.3 |
| Residential | 506.7 |
| Irrigation | 329.1 |
| Commercial & institutional | 299.3 |
| Thermal power generation | 232.8 |
| Mining | 147.4 |
| Oil & gas | 79.8 |

**Note:** The irrigation data is for the year 2022. For more information, consult the Data sources and methods section.
**Source:** Statistics Canada (2024) Water use parameters in mineral extraction and thermal-electric power generation industries, by region. Statistics Canada (2024) Potable water use by sector and average daily use. Statistics Canada (2024) Water use parameters in manufacturing industries, by provinces, territories and drainage regions. Statistics Canada (2024) Irrigation volume by province and drainage region. Canada Energy Regulation (2024) Estimated Production of Canadian Crude Oil and Equivalent. Canada Energy Regulation (2024) Marketable Natural Gas Production in Canada.

**Table A. 16. Data for Figure 16. Variation in water withdrawals by the most water-intensive sectors in the British Columbia and the Territories, 2011 to 2021**

| Year | Manufacturing (million $m^3$) | Residential (million $m^3$) | Irrigation (million $m^3$) |
|---|---|---|---|
| 2011 | 775.1 | 412.1 | 234.8 |
| 2013 | 747.2 | 404.9 | 276.9 |
| 2015 | 765.2 | 459.1 | 363.4 |
| 2017 | 703.1 | 483.0 | 744.8 |
| 2019 | 631.9 | 467.4 | 277.6 |
| 2021 | 692.3 | 506.7 | 329.1 |

**Note:** Data for irrigation sector are one year ahead of other sectors from 2012 to 2022. Due to COVID-19, some data were recorded in 2020 instead of 2019. For more information, consult the Data sources and methods section.
**Source:** Statistics Canada (2024) Potable water use by sector and average daily use. Statistics Canada (2024) Water use parameters in manufacturing industries, by provinces, territories and drainage regions. Statistics Canada (2024) Irrigation volume by province and drainage region.

**Table A. 17. Data for Figure 17. Water consumed and returned by the most water-intensive sectors in the British Columbia and the Territories, 2021**

| Sector | Water Consumed (million $m^3$) | Water Returned (million $m^3$) |
|---|---|---|
| Manufacturing | 258.6 | 742.5 |
| Residential | 50.7 | 456.0 |
| Irrigation | 294.5 | 34.6 |

**Note:** The irrigation data is for the year 2022. For the manufacturing sector, water used (consumed and returned) volumes include intake water and recirculation water. For more information, consult the Data sources and methods section.
**Source:** Statistics Canada (2024) Potable water use by sector and average daily use. Statistics Canada (2024) Water use parameters in manufacturing industries, by provinces, territories and drainage regions. Statistics Canada (2024) Irrigation volume by province and drainage region.

## Annex B. Industrial sectors used in the water use indicator

The Statistics Canada Water use by industries and households and Physical flow account for water use tables report sectors according to the Input-Output Industry Codes from Canada's System of macroeconomic accounts: input-output accounts. The following table outlines the IOIC assigned to each sector included in this indicator.

**Table B.1. Alignment of sectors reported in CESI and IOIC**

| Canadian Environmental Sustainability Indicator Sector | Input-Output Industry Code Sector |
|---|---|
| **Thermal power generation** | Electric power generation, transmission and distribution [BS22110] |
| **Manufacturing** | Food manufacturing [BS311] |
| | Beverage and tobacco product manufacturing [BS312] |
| | Textile and textile product mills [BS31A] |
| | Clothing and leather and allied product manufacturing [BS31B] |
| | Wood product manufacturing [BS321] |
| | Paper manufacturing [BS322] |
| | Printing and related support activities [BS323] |
| | Petroleum and coal product manufacturing [BS324] |
| | Chemical manufacturing [BS325] |
| | Plastic and rubber products manufacturing [BS326] |
| | Non-metallic mineral product manufacturing [BS327] |
| | Primary metal manufacturing [BS331] |
| | Fabricated metal product manufacturing [BS332] |
| | Machinery manufacturing [BS333] |
| | Computer and electronic product manufacturing [BS334] |
| | Electrical equipment and component manufacturing [BS335] |
| | Transportation equipment manufacturing [BS336] |
| | Furniture and related product manufacturing [BS337] |
| | Miscellaneous manufacturing [BS339] |
| **Residential** | Residential |
| **Commercial & institutional** | Natural gas distribution, water, sewage and other systems [BS221A0] |
| | Forestry and logging [BS11300] |
| | Fishing, hunting and trapping [BS11400] |
| | Support activities for agriculture and forestry [BS11500] |
| | Support activities for mining and oil and gas extraction [BS21300] |
| | Residential building construction [BS23A00] |
| | Non-residential building construction [BS23B00] |
| | Transportation engineering construction [BS23C10] |
| | Oil and gas engineering construction [BS23C20] |
| | Electric power engineering construction [BS23C30] |
| | Communication engineering construction [BS23C40] |
| | Other engineering construction [BS23C50] |
| | Repair construction [BS23D00] |
| | Other activities of the construction industry [BS23E00] |
| | Wholesale trade [BS41000] |
| | Retail trade [BS4A000] |
| | Air transportation [BS48100] |
| | Rail transportation [BS48200] |
| | Water transportation [BS48300] |
| | Truck transportation [BS48400] |
| | Transit, ground passenger and scenic and sightseeing transportation, taxi and limousine service and support activities for transportation [BS48B00] |
| | Pipeline transportation [BS48600] |
| | Postal service and couriers and messengers [BS49A00] |

| Canadian Environmental Sustainability Indicator Sector | Input-Output Industry Code Sector |
|---|---|
| | Warehousing and storage [BS49300] |
| | Motion picture and sound recording industries [BS51200] |
| | Radio and television broadcasting [BS51510] |
| | Publishing, pay and specialty services, telecommunications and other information services [BS51B00] |
| | Depository credit intermediation and monetary authorities [BS52B00] |
| | Insurance carriers [BS52410] |
| | Lessors of real estate [BS53110] |
| | Owner-occupied dwellings [BS5311A] |
| | Rental and leasing services and lessors of non-financial intangible assets (except copyrighted works) [BS53B00] |
| | Other finance, insurance and real estate services and management of companies and enterprises [BS5A000] |
| | Legal, accounting and architectural, engineering and related services [BS541C0] |
| | Computer systems design and other professional, scientific and technical services [BS541D0] |
| | Advertising, public relations and related services [BS54180] |
| | Administrative and support services [BS56100] |
| | Waste management and remediation services [BS56200] |
| | Educational services [BS61000] |
| | Health care and social assistance [BS62000] |
| | Arts, entertainment, and recreation [BS71000] |
| | Accommodation and food services [BS72000] |
| | Repair and maintenance [BS81100] |
| | Personal services and private households [BS81A00] |
| | Professional and similar organizations [BS81300] |
| | Repair and maintenance [FC11000] |
| | Operating supplies [FC12000] |
| | Office supplies [FC13000] |
| | Advertising, promotion, meals, entertainment, and travel [FC20000] |
| | Transportation margins [FC30000] |
| | Non-profit education services [NP61000] |
| | Non-profit social assistance [NP62400] |
| | Non-profit arts, entertainment, and recreation [NP71000] |
| | Religious organizations [NP81310] |
| | Miscellaneous non-profit institutions serving households [NPA0000] |
| | Educational services (except universities) [GS611B0] |
| | Universities [GS61130] |
| | Hospitals [GS62200] |
| | Nursing and residential care facilities [GS62300] |
| | Other federal government services [GS91100] |
| | Other provincial and territorial government services [GS91200] |
| | Other municipal government services [GS91300] |
| | Other aboriginal government services [GS91400] |
| **Irrigation** | Crop production [BS111] |
| **Mining** | Coal mining [BS21210] |
| | Metal ore mining [BS21220] |
| | Non-metallic mineral mining and quarrying [BS21230] |
| | Mine water |
| **Oil & gas** | Oil and gas extraction [BS21100] |

**Source:** Statistics Canada (2019) Input-output industry classification IOIC. Retrieved on November 11, 2024.

Additional information can be obtained at:

Environment and Climate Change Canada
Public Inquiries Centre
Place Vincent Massey Building
351 Saint-Joseph Boulevard
Gatineau QC K1A 0H3
Telephone: 1-800-668-6767 (in Canada only) or 819-938-3860
Email: enviroinfo@ec.gc.ca