

Helium

Facts and figures



What is helium?¹

Helium (He) is a colorless, odorless, tasteless inert gas.

It is the second most abundant element in the universe after hydrogen. Of all the elements, helium is the most stable; it will not burn or react with other elements.

Today, helium plays a prominent role in medical imaging (magnetic resonance imaging), fiber optics/semiconductor manufacturing, laser welding, leak detection, superconductivity development, aerospace, defense, and energy programs.

Helium occurs with other gasses in reservoirs beneath the earth's surface. When a gas reservoir containing economically recoverable amounts of helium is found, a well is drilled to produce the gas. The gas travels by pipeline to a processing plant where the helium is separated from the other gasses.

World production and demand

Canada has the fifth largest helium resource deposits the world with Qatar having the largest estimated resource. World helium production in 2022 was estimated to be 160 million cubic metres, with Canada producing approximately 2.0 million cubic metres.²

The increasing consumption of helium in the electronics and semiconductor industry and the growing usage in the healthcare industry are the key trends propelling the demand growth for helium. It is anticipated that the special properties of helium, which cannot be replaced by any other element, will increase the helium market share over the foreseeable future.

Helium is part of Canada's 2021 critical minerals list, which was developed to provide greater certainty and predictability to investors, developers, communities and trading partners on national priorities. A mineral is considered "critical" if it is: (i) essential to Canada's economic security and its supply is threatened; (ii) required for Canada's transition to a low-carbon economy; or (iii) a sustainable source of highly strategic critical minerals for Canada's partners and allies.

Top Countries with Helium Resources (in billion cubic meters)

Qatar	10.1
U.S.	8.5
Algeria	8.2
Russia	6.8
Canada	2.0
China	1.1

¹ Primary sources of information for this factsheet include the U.S. Department of the Interior, Bureau of Land Management ([Helium Fast Facts](#) and [About Helium](#)); Alberta Energy Regulator ([Emerging Resources – Helium](#)); and Alberta Geological Survey.

² [Mineral Commodity Summaries 2023](#), U.S. Geological Survey



Helium in Alberta

While the development of the helium industry is in its early stages, the growth potential is high³. Alberta's helium reserves are found in the same regions that have historically been known for oil and gas drilling. Helium can be produced as a by-product of natural gas production or directly from dedicated helium wells in selected geological formations.

Because Alberta produces more than half of Canada's natural gas, the province is well-positioned to become a preferred producer and supplier of helium. The oil and gas industry routinely tests constituent gases in wells. While helium may be found throughout the Western Canadian Sedimentary Basin, data has shown elevated concentration in:

- Cretaceous strata in southern Alberta and east-central Alberta (to a lesser extent),
- Devonian strata in southern and west-central Alberta, and
- Cambrian strata in southern Alberta.

Alberta's other advantages include untapped geological potential, a skilled workforce, well-developed and well-positioned infrastructure, and industry expertise.



Regulations

As helium is considered gas, the primary regulation that applies to the tenure of petroleum and natural gas in Alberta (including helium) is the [Petroleum and Natural Gas Tenure Regulation](#). Enabled by the [Mines and Minerals Act](#), the regulation addresses the issuance and administration of Crown petroleum and natural gas mineral rights, including the obligations of lessees under licenses and leases.

Helium royalty is regulated under the [Natural Gas Royalty Regulation, 2009](#) (AR 221/2008) and [Natural Gas Royalty Regulation, 2017](#) (AR 211/2016). Effective April 1, 2020, operators producing helium are required to report monthly production volumes and monthly average selling prices to Alberta Energy.



Royalty treatment

In May 2020, the Government of Alberta introduced a 4.25 per cent royalty rate for helium.



Production potential

Information on helium production and outlook is available from the Alberta Energy Regulator's annual report, ST98: Alberta Energy Outlook available at www.aer.ca.

Currently, a number of companies are developing helium projects in the province which are in various stages of construction. In addition, several other companies are conducting tests to determine helium concentrations.^{4,5}

³ [Alberta Energy Outlook, ST98 Report 2022](#), Alberta Energy Regulator.

⁴ [Steveville Helium Gas Production Facility](#)

⁵ [Emerging Resources – Helium](#), Alberta Energy Regulator