1 Helium

Helium (atomic number 2, atomic weight 4.003) is the lowest atomic weight nobel gas. Although the second most abundant element in the universe, it is relatively rare on earth. It is produced from both natural nuclear fusion reactions and as a byproduct of radioactive decay.

1.1 Uses

Helium is used in cryogenics (25% of total use) especially in medical MRI applications, as a lifting gas (balloons, dirigibles) as a pressurizing and purge gas, in arc welding, and in processes used to grow silicon wafers. Other applications are shown in figure 1

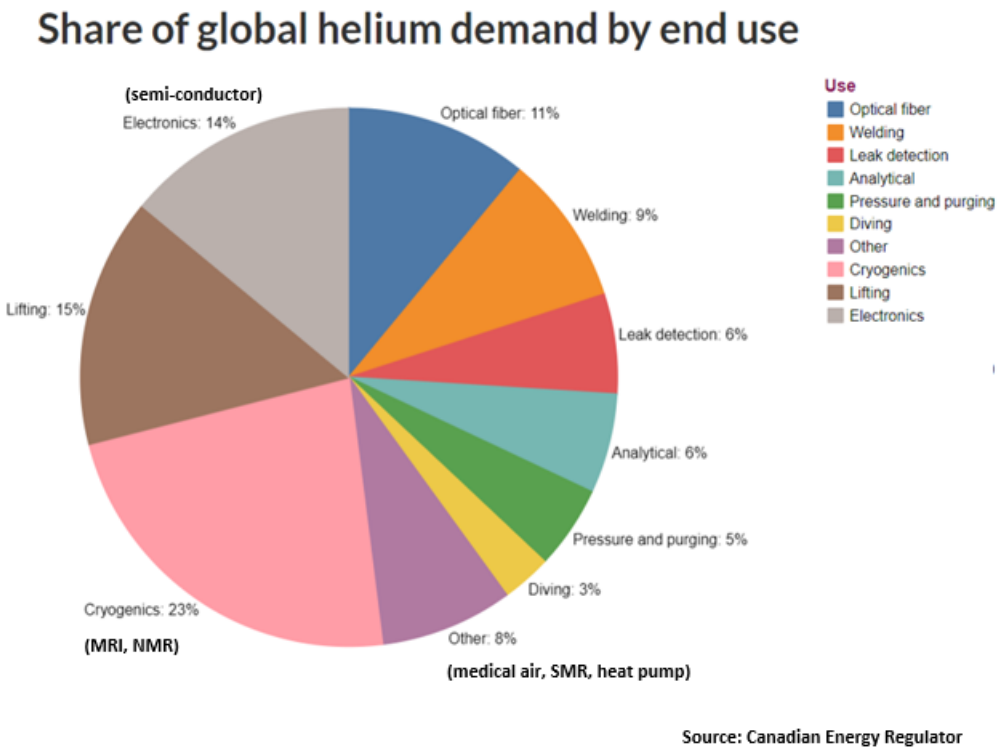

Figure 1: Helium Uses

2 Reserves (source: wikipedia)

Large reserves of the gas exist in natural gas fields in the North America and especially the American plains which is the primary global producer. Its abundance is rare at 5.2ppm in the atmosphere. Most helium on earth is produced by radioactive decay principally of uranium and thorium. The radiogenic helium resources are trapped in NG formations in concentrations up to 7 volume%. The gas is a non-renewable resource and believed to be rapidly depleting.

The rarity compelled the US government to create a national helium reserve in 1925 whose stated purpose was to ensure airships had sufficient fuel sources available. The reserve was expanded in 1950 to ensure it could be used for rocket fuel production during the cold war. During this period a pipeline was constructed that connected Kansas to the depleted Cliffside natural gas field whose formations were used as helium injection storage site. However substantial operating costs caused the US government to shut down the reserve in 1995 and private the asset.

The USA produced 90% of the world's helium up to the 1990s along with Canada, Poland, Russia. In the mid 1990s Algerias helium gas fields came online to address demand from the EU. In the early 2000s helium production costs and demands grew causing helium prices to double. By 2012, the US national helium reserve held 30% of the world reserve with the expectation of complete depletion by 2018. New plants in Qatar, Russia and Wyoming were expected to be insufficient in capacity to address world consumption. However when the Qatar plant came online in 2013 an oversupply situation occured in 2014. However industrial producers of helium say the production is still constrained [1] and a substantial portion is now produced in pontentially politically unstable countries such as Russia, Qatar and Algeria [2]. In recognition of this instability the EU added Helium to its critical elements list in 2023.

2.1 Supply and Demand Outlook

The USA, Qatar and Russia will continue to be principal producers of helium, with small production inputs from Canada and Algeria (figure 2). Production is projected to likely support global demand to 2030, with some potential for over/undersupply.

2.2 Global Producers

Some of the companies that are the largest producers [3]are listed below. APD a company that sells industrial gases and chemicals has been an excellent investment vehicle since its inception in 1985.

Air Liquide (France)	Air Products and Chemical (USA) NYSE APD
Exxon Mobil (USA)	Messer SE & Co (Germany)
Iwatani (Japan)	Linde PLC (England)
Gazprom (Russia)	Gulf Cryo (UAE)
Acail Group (Portugal)	HeliumOne (Tanzania)

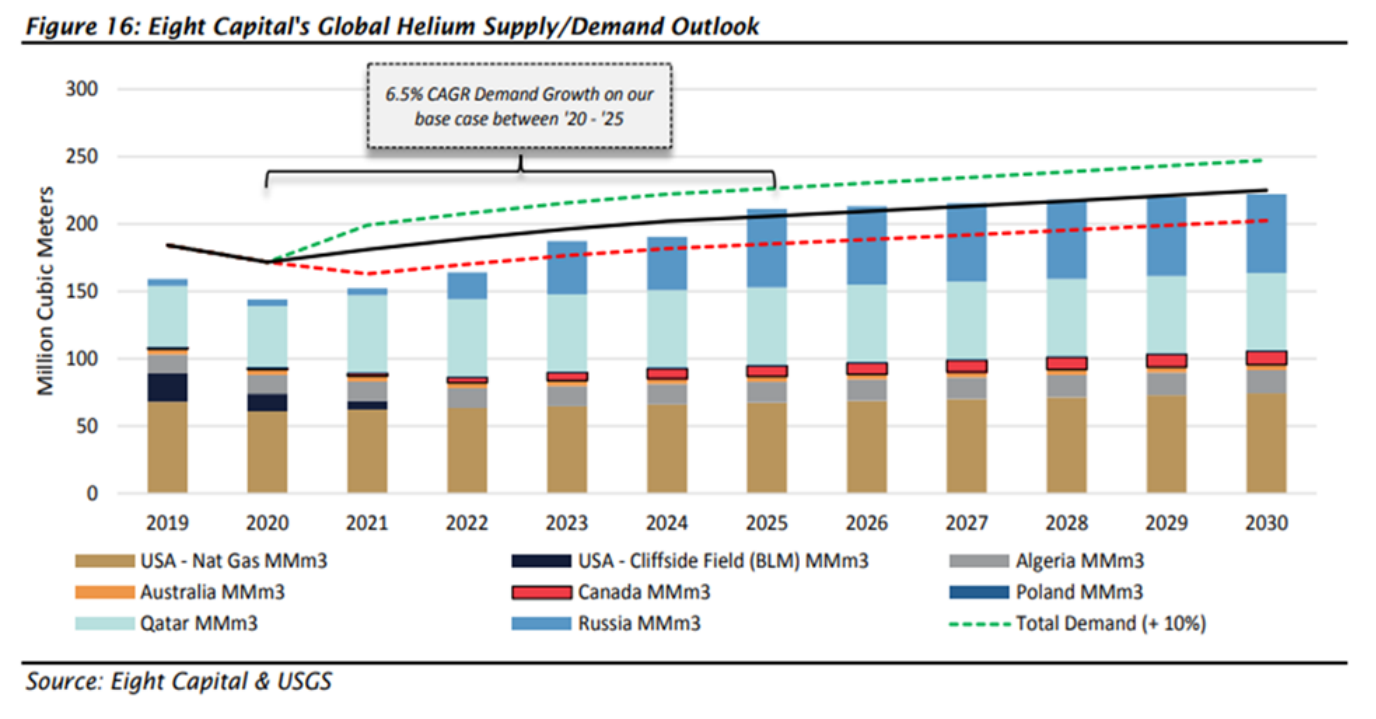

Figure 2: Helium Supply and Demand

2.3 Canadian Listed Producers

Several publically traded companies are involved in helium production. Some Canadian listed producers are shown below. Most have endured significant or near-total stock price collapses. The best performer in this group below appears to be HEVI which has managed to hold onto 30% of its share value from 2022. The other companies appear to have had long had their capital disappear into thin air. No investigation into whether the primary cause was mismanagement, debt structuring, capex blowouts, or oversupply was conducted.

Notably, Canada has historically exported its raw product to purification facilities in the USA. However Royal Helium built the first helium purification plant in Canada in 2023. This momentous event may have been the reason why the company is now bankrupt as of Feb 10, 2025 in spite of the positive press it received Dec 16, 2023 at the launch of its Stevensville Helium Purification facility.

Symbol	PLSR.V	HEVI.V	HELI.V	HECO.CN
Name	Pulsar Helium	Helium Evolution	First Helium	Global Helium
Market Cap MCAD	65	22	4	0.5
Symbol	DME.V	AVN.V	RHC-H.V	TOH.V/ALTU.V
Name	Desert Mountain Energy	Avanti Helium	Royal Helium	Total Helium
Market Cap MCAD	18	10	bankrupt	2

Success or failure of these companies going forward will likely hinge on good management focused on capex control and whether or not global production deficits will be a permanent fixture of the helium market.

References

[1] https://en.wikipedia.org/wiki/Helium

[2] https://hedac.ca/resources-events/

[3] https://greenstocknews.com/stocks/critical-element-stocks/helium-stocks

[4] https://www.expertmarketresearch.com/blogs/top-helium-companies#