HELIUM

(Data in million cubic meters of contained helium gas[1] unless otherwise noted)

Domestic Production and Use: The estimated value of Grade-A helium (99.997% or greater) extracted during 2019 by private industry was about $717 million. Fourteen plants (one in Arizona, two in Colorado, five in Kansas, one in Oklahoma, four in Texas, and one in Utah) extracted helium from natural gas and produced crude helium that ranged from 50% to 99% helium. One plant in Colorado and another in Wyoming extracted helium from natural gas and produced Grade-A helium. Three plants in Kansas and one in Oklahoma accepted crude helium from other producers and the Bureau of Land Management (BLM) pipeline and purified it to Grade-A helium. In 2019, estimated domestic consumption of Grade-A helium was 40 million cubic meters (1.4 billion cubic feet), and it was used for magnetic resonance imaging, 30%; lifting gas, 17%; analytical and laboratory applications, 14%; welding, 9%; engineering and scientific applications, 6%; leak detection and semiconductor manufacturing, 5% each; and various other minor applications, 14%.

Salient Statistics—United States:	2015	2016	2017	2018[e]	2019[e]
Helium extracted from natural gas[2]	71	66	63	64	68
Withdrawn from storage[3]	20	23	28	26	21
Grade-A helium sales	91	89	91	90	89
Imports for consumption	16	23	19	8	7
Exports	64	62	74	84	83
Consumption, apparent[4]	43	50	36	40	40
Net import reliance[5] as a percentage of apparent consumption	E	E	E	E	E

In fiscal year (FY) 2019, the price for crude helium to Government users was $3.10 per cubic meter ($86.00 per thousand cubic feet) and to nongovernment users was $4.29 per cubic meter ($119.00 per thousand cubic feet). The price for the Government-owned helium is mandated by the Helium Stewardship Act of 2013 (Public Law 113–40) and determined through public auctions and industry surveys. The last year helium prices were posted by the Federal Government was in 2018. The estimated price for private industry's Grade-A helium was about $7.57 per cubic meter ($210 per thousand cubic feet), with some producers posting surcharges to this price.

Recycling: In the United States, helium used in large-volume applications is seldom recycled. Some low-volume or liquid boil-off recovery systems are used. In the rest of the world, helium recycling is practiced more often.

Import Sources (2015–18): Qatar, 79%; Canada, 8%; Algeria, 5%; Portugal, 4%; and other, 4%.

Tariff: Item	Number	Normal Trade Relations 12–31–19
Helium	2804.29.0010	3.7% ad val.

Depletion Allowance: Allowances are applicable to natural gas from which helium is extracted, but no allowance is granted directly to helium.

Government Stockpile: Under the Helium Stewardship Act of 2013, the BLM manages the Federal Helium Program, which includes all operations of the Cliffside Field helium storage reservoir, in Potter County, TX, and the Government's crude helium pipeline system. Private firms that sell Grade-A helium to Federal agencies are required to purchase a like amount of (in-kind) crude helium from the BLM. The law mandates that the BLM sell at auction Federal Conservation helium stored in Bush Dome at the Cliffside Field. The last auction was completed in the summer of 2018. Because the remaining conservation helium is less than 83.2 million cubic meters (3 billion cubic feet), the law requires that the BLM begin disposal of all helium assets including all operations of the Cliffside Field helium storage reservoir and pipeline system and complete the sale by yearend 2021. In the meantime, the BLM will continue to make in-kind helium available to Federal customers. In FY 2019, privately owned companies purchased about 4.8 million cubic meters (176 million cubic feet) of in-kind crude helium. During FY 2019, the BLM's Amarillo Field Office, Helium Operations, accepted about 3.0 million cubic meters (107 million cubic feet) of private helium for storage and redelivered nearly 24.2 million cubic meters (0.875 billion cubic feet). As of September 30, 2019, about 67.4 million cubic meters (2.43 billion cubic feet) of privately owned helium remained in storage at Cliffside Field.

Stockpile Status—9–30–19[6]

Material	Inventory	Authorized for disposal	Disposal plan FY 2019	Disposals FY 2019
Helium	68.0	51.4	4.8	4.8

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Events, Trends, and Issues: In 2019, the BLM continued implementation of the Helium Stewardship Act of 2013 by supplying helium to Federal agencies through the in-kind helium program from Federal helium storage at the Cliffside Field near Amarillo. The Bush Dome at the Cliffside Field is the only geologic structure in the United States that is used to store of helium. The Federal Government has stored helium in the Bush Dome since 1962. By about 2025, international helium extraction facilities are likely to become the main sources of supply for world helium users.

World Production and Reserves:[8]

	Production		Reserves[9]
	2018	2019[e]	
United States (extracted from natural gas)	64	68	3,900
United States (from Cliffside Field)	26	21	([10])
Algeria	14	14	1,800
Australia	4	4	NA
Canada	<1	<1	NA
China	NA	NA	NA
Poland	2	2	25
Qatar	45	51	NA
Russia	3	2	1,700
World total (rounded)	158	160	NA

World Resources: Section 16 of Public Law 113-40 requires the U.S. Geological Survey (USGS) to complete a national helium gas assessment. The USGS and the BLM coordinated efforts to complete this assessment. The USGS expects results to be published in 2020. The BLM plans to publish an update to its report of the Helium Resources of the United States by midyear 2020. Until then, the following estimates are still the best available.

As of December 31, 2006, the total helium reserves and resources of the United States were estimated to be 20.6 billion cubic meters (744 billion cubic feet). This includes 4.25 billion cubic meters (153 billion cubic feet) of measured reserves, 5.33 billion cubic meters (192 billion cubic feet) of probable resources, 5.93 billion cubic meters (214 billion cubic feet) of possible resources, and 5.11 billion cubic meters (184 billion cubic feet) of speculative resources. Included in the measured reserves are 670 million cubic meters (24.2 billion cubic feet) of helium stored in the Cliffside Field Government Reserve, and 65 million cubic meters (2.3 billion cubic feet) of helium contained in Cliffside Field native gas. The Hugoton (Kansas, Oklahoma, and Texas), Panhandle West, Panoma, Riley Ridge in Wyoming, and Cliffside Fields are the depleting fields from which most U.S.-produced helium is extracted. These fields contained an estimated 3.9 billion cubic meters (140 billion cubic feet) of helium.

Helium resources of the world, exclusive of the United States, were estimated to be about 31.3 billion cubic meters (1.13 trillion cubic feet). The locations and volumes of the major deposits, in billion cubic meters, are Qatar, 10.1; Algeria, 8.2; Russia, 6.8; Canada, 2.0; and China, 1.1. As of December 31, 2018, the BLM had analyzed about 22,300 gas samples from 26 countries and the United States, in a program to identify world helium resources.

Substitutes: There is no substitute for helium in cryogenic applications if temperatures below –429 °F are required. Argon can be substituted for helium in welding, and hydrogen can be substituted for helium in some lighter-than-air applications in which the flammable nature of hydrogen is not objectionable. Hydrogen is also being investigated as a substitute for helium in deep-sea diving applications below 1,000 feet.

[e]Estimated. E Net exporter. NA Not available.

[1]Measured at 101.325 kilopascals absolute (14.696 psia) and 15 °C; 27.737 cubic meters of helium = 1,000 cubic feet of helium at 70 °F and 14.7 psia.

[2]Both Grade-A and crude helium.

[3]Extracted from natural gas in prior years.

[4]Grade-A helium. Defined as Grade-A helium sales + imports – exports. However, substantial increases in exports reported in 2018 and 2019 suggest that domestic consumption declined, although no significant decline in U.S. helium consumption is thought to have taken place. For that reason, apparent consumption for 2018 and 2019 was estimated to have remained at about 40 million cubic meters.

[5]Defined as imports – exports.

[6]See Appendix B for definitions.

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[8]Production and reserves outside of the United States are estimated.

[9]See Appendix C for resource and reserve definitions and information concerning data sources.

[10]Included in United States (extracted from natural gas) reserves.