

HELIUM

(Data in million cubic meters of contained helium gas¹ unless otherwise noted)

Domestic Production and Use: The estimated value of Grade-A helium (99.997% or better) extracted domestically during 2015 by private industry was about \$900 million. Nine plants (four in Kansas, four in Texas, and one in Wyoming) extracted helium from natural gas and produced only a crude helium product that varied from 50% to 99% helium. Two plants (one in Colorado and one in Wyoming) extracted helium from natural gas and produced a Grade-A helium product. Four plants (three in Kansas and one in Oklahoma) accepted a crude helium product from other producers and the Bureau of Land Management (BLM) pipeline and purified it to a Grade-A helium product. Estimated 2015 domestic consumption of helium is 43 million cubic meters (1.5 billion cubic feet) and was used for cryogenic applications, 32%; for pressurizing and purging, 18%; for controlled atmospheres, 18%; for welding cover gas, 13%; leak detection, 4%; breathing mixtures, 2%; and other, 13%.

Salient Statistics—United States:	2011	2012	2013	2014	2015^e
Helium extracted from natural gas ²	71	*73	*69	75	76
Withdrawn from storage ³	*59	*60	*49	*27	24
Grade-A helium sales	*130	133	*118	*102	100
Imports for consumption	—	—	2	7	10
Exports ⁴	82	85	81	67	67
Consumption, apparent ⁴	48	48	39	*42	43
Net import reliance ⁵ as a percentage of apparent consumption	E	E	E	E	E

Price: In fiscal year (FY) 2015, the price for crude helium to Government users was \$3.06 per cubic meter (\$85.00 per thousand cubic feet) and to non-Government users was \$3.75 per cubic meter (\$104.00 per thousand cubic feet). The price for the Government-owned helium is mandated by the Helium Stewardship Act of 2013 (Public Law 113–46) and determined through public auctions and industry surveys. The estimated price for private industry's Grade-A helium was about \$7.21 per cubic meter (\$200 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 (2011–14): Qatar, 100%.

Tariff: Item	Number	Normal Trade Relations
Helium	2804.29.0010	<u>12–31–15</u> 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 Public Law 113–46, 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 Helium Stewardship Act of 2013 mandated that the BLM sell Federal Conservation helium stored in Bush Dome at the Cliffside Field annually at sale or auction. The amounts sold are approximately equal to the amount that the Federal helium system can produce each year. The Federal Government will dispose of all helium-related assets when the remaining Conservation helium falls below 83 million cubic meters or not later than 2021.

In FY 2015, privately owned companies purchased about 4.5 million cubic meters (162 million cubic feet) of in-kind crude helium. Privately owned companies also purchased 27 million cubic meters (1.0 billion cubic feet) of open market sales helium. During FY 2015, the BLM's Amarillo Field Office, Helium Operations, accepted about 9.8 million cubic meters (354 million cubic feet) of private helium for storage and redelivered nearly 32.1 million cubic meters (1.16 billion cubic feet). As of September 30, 2015, about 62.4 million cubic meters (2.25 billion cubic feet) of privately owned helium remained in storage at Cliffside Field.

Material	Stockpile Status—9–30–15⁶			
	Uncommitted inventory	Authorized for disposal	Disposal plan FY 2015	Disposals FY 2015
Helium	227.2	227.2	27.0	24.0

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Events, Trends, and Issues: In 2015, the BLM continued implementation of the Helium Stewardship Act of 2013 by conducting its second auction of helium from Federal helium storage at the Cliffside Field near Amarillo. The average price of helium sold to private buyers as a result of this process was \$3.75 per cubic meter (\$104.00 per thousand cubic feet). By the end of the decade, international helium extraction facilities are likely to become the main source of supply for world helium users. Seven international helium plants are in operation and more are planned during the next 3 to 5 years. Expansions to facilities have been completed in Algeria and Qatar. In 2015, demand for helium both domestically and worldwide increased. Additionally in 2015, a new helium recovery facility began operation in southwest Colorado. As a result, demand for helium stored in the U.S. Government's helium facilities has decreased by more than 50% during the past 2 years.

World Production and Reserves:

	Production		Reserves ⁸
	2014	2015 ^e	
United States (extracted from natural gas)	75	76	3,900
United States (from Cliffside Field)	26	24	(⁹)
Algeria	16	16	1,800
Australia	5	5	NA
Canada	NA	NA	NA
China	NA	NA	NA
Poland	3	3	25
Qatar	35	40	NA
Russia	4	4	1,700
Other countries	NA	NA	NA
World total (rounded)	164	168	NA

World Resources: Section 16 of Public Law 113-40 requires the U.S. Geological Survey (USGS) to complete a national helium gas assessment along with a global helium gas assessment. Over the past 2 years, the USGS and the BLM have been coordinating efforts to complete this assessment. However, it may be several years before a project of this magnitude will be completed. 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 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 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. Cliffside Field, Hugoton (Kansas, Oklahoma, and Texas), Panhandle West, Panoma, and Riley Ridge in Wyoming 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, 2010, the BLM had analyzed about 22,000 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.

^eEstimated. E Net exporter. NA Not available. — Zero.

¹Measured 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.

²Both Grade-A and crude helium.

³Extracted from natural gas in prior years.

⁴Grade-A helium.

⁵Defined as imports – exports + adjustments for Government and industry stock changes.

⁶See [Appendix B](#) for definitions.

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⁸See [Appendix C](#) for resource/reserve definitions and information concerning data sources.

⁹Included in United States (extracted from natural gas) reserves.

*Corrections posted on February 17, 2016.