

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 2012 by private industry was about \$830 million. Ten plants (five 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. Six plants, (four in Kansas, one in Oklahoma, and one in Texas) 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 2012 domestic consumption of helium is 50 million cubic meters (1.8 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:	2008	2009	2010	2011	2012^e
Helium extracted from natural gas ²	80	78	75	71	75
Withdrawn from storage ³	50	40	53	59	60
Grade-A helium sales	130	118	128	130	135
Imports for consumption	—	—	—	—	—
Exports ⁴	70	71	77	82	85
Consumption, apparent ⁴	60	47	51	48	50
Net import reliance ⁵ as a percentage of apparent consumption	E	E	E	E	E

Price: In fiscal year (FY) 2012, the price for crude helium to Government users was \$2.36 per cubic meter (\$65.50 per thousand cubic feet) and to nongovernment users was \$2.73 per cubic meter (\$75.75 per thousand cubic feet). The price for the Government-owned helium is mandated by the Helium Privatization Act of 1996 (Public Law 104–273). The estimated price range for private industry's Grade-A gaseous helium was about \$6.13 per cubic meter (\$170 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 boiloff recovery systems are used. In Western Europe and Japan, helium recycling is practiced when economically feasible.

Import Sources (2008–11): None.

Tariff: Item	Number	Normal Trade Relations
Helium	2804.29.0010	<u>12–31–12</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 104–273, 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. The BLM no longer supplies Federal agencies with Grade-A helium. 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 Privatization Act of 1996 mandated that all Federal Conservation helium stored in Bush Dome at the Cliffside Field be offered for sale, except 16.6 million cubic meters (600 million cubic feet).

In FY 2012, privately owned companies purchased about 4.3 million cubic meters (154 million cubic feet) of in-kind crude helium. In addition to this, privately owned companies also purchased 58.2 million cubic meters (2,100 million cubic feet) of open market sales helium. During FY 2012, the BLM's Amarillo Field Office, Helium Operations (AMFO), accepted about 10.1 million cubic meters (363 million cubic feet) of private helium for storage and redelivered nearly 62.2 million cubic meters (2,494 million cubic feet). As of September 30, 2012, about 35.4 million cubic meters (1,277 million cubic feet) of privately owned helium remained in storage at Cliffside Field.

Material	Stockpile Status—9–30–12⁶			
	Uncommitted inventory	Authorized for disposal	Disposal plan FY 2012	Disposals FY 2012
Helium	352.9	352.9	63.8	63.4

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Events, Trends, and Issues: In 2012, BLM continued to use a pricing mechanism based on the requirements of the Helium Privatization Act of 1996. During 2012, BLM helium prices to nongovernment buyers increased to \$2.73 per cubic meter (\$75.50 per thousand cubic feet) of gas delivered. In 2013, increased cost recovery measures are expected to be implemented at various natural gas fields throughout the United States, including the Hugoton and Riley Ridge Fields. The AMFO conducted four open market helium offerings in FY 2012, selling a total of 58.2 million cubic meters (2,100 million cubic feet) of helium. By the end of the decade, international helium extraction facilities are likely to become the main source of supply for world helium uses. Seven international helium plants are in operation and more are planned for the next 3 to 5 years. Expansions to facilities are planned in Algeria and Qatar. Additionally, a new extraction facility associated with LNG production in Qatar is expected to be online within the next 2 years. In 2012, demand exceeded the ability of the BLM's Crude Helium Enrichment Unit to supply its customers along the crude helium pipeline. As a result, the BLM allocated helium to the refiners along the pipeline. The shortage of helium and allocations are expected to continue in 2013 and may become greater as the storage reservoir production declines.

World Production and Reserves:

	Production		Reserves ⁸
	2011	2012 ^e	
United States (extracted from natural gas)	71	75	4,000
United States (from Cliffside Field)	59	60	(°)
Algeria	20	20	1,800
Canada	NA	NA	NA
China	NA	NA	NA
Poland	3	3	30
Qatar	13	15	NA
Russia	6	—	1,700
Other countries	<u>NA</u>	<u>NA</u>	<u>NA</u>
World total (rounded)	172	173	NA

World Resources: 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 (153.2 billion cubic feet) of measured reserves, 5.33 billion cubic meters (192.2 billion cubic feet) of probable resources, 5.93 billion cubic meters (213.8 billion cubic feet) of possible resources, and 5.11 billion cubic meters (184.4 billion cubic feet) of speculative resources. Included in the measured reserves are 0.67 billion cubic meters (24.2 billion cubic feet) of helium stored in the Cliffside Field Government Reserve, and 0.065 billion 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, 2010, the AMFO 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 Mcf 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.

⁶[See Appendix B for definitions.](#)

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

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