

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 2011 by private industry was about \$808 million. Nine plants (five in Kansas and four in Texas) extracted helium from natural gas and produced only a crude helium product that varied from 50% to 99% helium. Ten plants (four in Kansas, and one each in Colorado, New Mexico, Oklahoma, Texas, Utah, and Wyoming) extracted helium from natural gas and produced an intermediate process stream of crude helium (about 70% helium and 30% nitrogen) and continued processing the stream to produce a Grade-A helium product. Of these 10 plants, 6 (4 in Kansas, 1 in Oklahoma, and 1 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 2011 domestic consumption of 56 million cubic meters (2.0 billion cubic feet) 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:	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011^e</u>
Helium extracted from natural gas ²	77	80	78	75	83
Withdrawn from storage ³	61	50	40	53	57
Grade-A helium sales	138	130	118	128	140
Imports for consumption	—	—	—	—	—
Exports ⁴	64	70	71	77	84
Consumption, apparent ⁴	74	60	47	51	56
Net import reliance ⁵ as a percentage of apparent consumption	E	E	E	E	E

Price: The Government price for crude helium was \$2.70 per cubic meter (\$75.00 per thousand cubic feet) in fiscal year (FY) 2011. 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 \$5.77 per cubic meter (\$160 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 (2007–10): None.

Tariff: Item	Number	Normal Trade Relations
Helium	2804.29.0010	<u>12-31-11</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 2011, privately owned companies purchased about 4.3 million cubic meters (155 million cubic feet) of in-kind crude helium. In addition to this, privately owned companies also purchased 52.4 million cubic meters (1,889 million cubic feet) of open market sales helium. During FY 2011, the BLM's Amarillo Field Office, Helium Operations (AMFO), accepted about 12.1 million cubic meters (436 million cubic feet) of private helium for storage and redelivered nearly 71 million cubic meters (2,560 million cubic feet). As of September 30, 2011, about 31.8 million cubic meters (1,146 million cubic feet) of privately owned helium remained in storage at Cliffside Field.

Material	Stockpile Status—9-30-11⁶			
	Uncommitted inventory	Authorized for disposal	Disposal plan FY 2011	Disposals FY 2011
Helium	403.2	403.2	63.8	63.2

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Events, Trends, and Issues: In 2011, BLM began using the pricing mechanism defined in the Helium Privatization Act of 1996. During 2011, BLM helium prices increased slightly to \$2.73 per cubic meter (\$75.00 per thousand cubic feet) of gas delivered. In 2012, 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 Amarillo Field Office conducted four open market helium offerings in FY 2011, selling a total of 59.2 million cubic meters (2,130 million cubic feet) of helium. A new helium extraction facility came online near Big Piney, WY, near the Riley Ridge gas field during 2011. Nevertheless, international helium extraction facilities are more likely future sources for world helium resources. Seven international helium plants are in operation and more are planned for the next 3 to 5 years. Most recently, a plant in Darwin, Australia, came online and expansions were planned in Algeria and Qatar. Future production from these facilities is expected to be sufficient to meet worldwide helium demand for the next 5 years; however, to ensure future helium supplies, more exploration will be needed.

World Production and Reserves:

	Production		Reserves ⁸
	<u>2010</u>	<u>2011^e</u>	
United States (extracted from natural gas)	75	83	4,000
United States (from Cliffside Field)	53	57	(⁹)
Algeria	18	20	1,800
Canada	NA	NA	NA
China	NA	NA	NA
Poland	3	3	33
Qatar	13	15	NA
Russia	6	6	1,700
Other countries	<u>NA</u>	<u>NA</u>	<u>NA</u>
World total (rounded)	168	180	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, 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.