

NITROGEN (FIXED)—AMMONIA

(Data in thousand metric tons of nitrogen unless otherwise noted)

Domestic Production and Use: Ammonia was produced by 14 companies at 24 plants in 16 States in the United States during 2007; 3 additional plants were idle for the entire year. Fifty-seven percent of total U.S. ammonia production capacity was centered in Louisiana, Oklahoma, and Texas because of their large reserves of natural gas, the dominant domestic feedstock. In 2007, U.S. producers operated at about 86% of their rated capacity. The United States was one of the world's leading producers and consumers of ammonia. Urea, ammonium nitrate, ammonium phosphates, nitric acid, and ammonium sulfate were the major derivatives of ammonia in the United States, in descending order of importance.

Approximately 90% of apparent domestic ammonia consumption was for fertilizer use, including anhydrous ammonia for direct application, urea, ammonium nitrates, ammonium phosphates, and other nitrogen compounds. Ammonia also was used to produce plastics, synthetic fibers and resins, explosives, and numerous other chemical compounds.

Salient Statistics—United States: ¹	2003	2004	2005	2006	2007^e
Production ²	8,450	8,990	8,340	8,180	8,300
Imports for consumption	5,720	5,900	6,520	5,920	6,500
Exports	400	381	525	194	100
Consumption, apparent	13,900	14,400	14,400	14,000	14,700
Stocks, producer, yearend	195	298	254	201	200
Price, dollars per ton, average, f.o.b. Gulf Coast ³	245	274	314	302	300
Employment, plant, number ^e	1,550	1,300	1,150	1,150	1,050
Net import reliance ⁴ as a percentage of apparent consumption	39	38	42	41	44

Recycling: None.

Import Sources (2003-06): Trinidad and Tobago, 55%; Canada, 16%; Russia, 12%; Ukraine, 9%; and other, 8%.

Tariff: Item	Number	Normal Trade Relations 12-31-07
Ammonia, anhydrous	2814.10.0000	Free.
Urea	3102.10.0000	Free.
Ammonium sulfate	3102.21.0000	Free.
Ammonium nitrate	3102.30.0000	Free.

Depletion Allowance: Not applicable.

Government Stockpile: None.

Events, Trends, and Issues: Natural gas prices stabilized somewhat during 2007. Except for a brief spike in February, the Henry Hub spot natural gas price fluctuated between \$5 and \$8 per million British thermal units for most of the year. The average Gulf Coast ammonia price also fell from \$345 per short ton at the beginning of 2007 to its low for the year of \$265 per short ton at the beginning of August before beginning to increase. The U.S. Department of Energy, Energy Information Administration, projected that Henry Hub natural gas spot prices would average \$7.62 per million British thermal units in 2008.

Despite sustained high natural gas prices in the United States, a new 1.2-million-ton-per-year ammonia plant was scheduled to be constructed in Faustina, LA, by 2010. The new plant was expected to be fed by a proposed synthetic gas facility to be constructed concurrently. Two current ammonia producers signed agreements to market the ammonia produced at the plant. The 231,000-ton-per-year Beaumont, TX, ammonia plant that has been closed since 2004 was purchased by a chemical company that planned to integrate the facility into a \$1.6 billion industrial gasification project that it was developing at Beaumont. The project was scheduled to be operational by 2011.

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In September, the Kenai, AK, ammonia plant was closed because of a shortage of supply of natural gas from Alaska's Cook Inlet. The plant had been operating at reduced capacity for several years because of the natural gas shortage. Much of the plant's output was exported to the Republic of Korea. The company that owned the plant, however, continued to investigate the feasibility of a coal gasification project. The gas produced would replace natural gas as the plant's feedstock, but the earliest the coal gasification facility could be operational is 2012.

Two ammonia plants outside the United States were opened in 2007—a 677,000-ton-per-year plant in Iran and a 1.1-million-ton-per-year plant in Saudi Arabia. Several companies announced plans to build new ammonia plants in Algeria, Egypt, Pakistan, Qatar, and Saudi Arabia, which, if completed on time, would add 6 million tons of annual capacity by the end of 2010. Two plants in Spain, with a total capacity of 600,000 tons per year, and a plant in the United Kingdom, with a capacity of 265,000 tons per year, were closed in 2007.

According to the U.S. Department of Agriculture, U.S. corn growers planted 37.8 million hectares of corn in the 2007 crop year (July 1, 2006, to June 30, 2007), which was the largest area planted in corn in more than 60 years. The increase in plantings was principally in response to the expected increase in consumption of corn for ethanol production. Corn plantings for the 2008 crop year, however, were expected to decrease to 35.2 million hectares. Although this would be less than that planted in the 2007 crop year, it still would be 8% to 12% above the 1997-2006 average. The decrease was attributed to an increase in prices for competing crops, such as soybeans and wheat, and a 50% increase in corn stocks at the end of the 2007 crop year compared with those at the end of 2006.

Nitrogen compounds also are an environmental concern. Overfertilization and the subsequent runoff of excess fertilizer may contribute to nitrogen accumulation in watersheds. Nitrogen in excess fertilizer runoff is suspected to be a cause of the hypoxic zone that occurs in the Gulf of Mexico during the summer. Scientists continue to study the effects of fertilization on the Nation's environmental health.

World Ammonia Production, Reserves, and Reserve Base:

	Plant production		Reserves and reserve base ⁵
	2006	2007 ^e	
United States	8,180	8,300	Available atmospheric nitrogen and sources of natural gas for production of ammonia are considered adequate for all listed countries.
Canada	4,000	3,700	
China	39,000	39,500	
Egypt	1,800	2,500	
Germany	2,300	2,200	
India	10,900	9,200	
Indonesia	4,300	4,400	
Netherlands	1,800	1,750	
Pakistan	2,200	2,200	
Poland	2,100	2,100	
Qatar	1,750	1,850	
Russia	10,500	11,000	
Saudi Arabia	2,000	2,600	
Trinidad and Tobago	5,190	5,200	
Ukraine	4,200	4,200	
Other countries	<u>23,400</u>	<u>24,000</u>	
World total (rounded)	124,000	125,000	

World Resources: The availability of nitrogen from the atmosphere for fixed nitrogen production is unlimited. Mineralized occurrences of sodium and potassium nitrates, found in the Atacama Desert of Chile, contribute minimally to global nitrogen supply.

Substitutes: Nitrogen is an essential plant nutrient that has no substitute. Also, there are no known practical substitutes for nitrogen explosives and blasting agents.

^eEstimated.

¹U.S. Department of Commerce (DOC) data unless otherwise noted.

²Annual and preliminary data as reported in Current Industrial Reports MQ325B (DOC).

³Source: Green Markets.

⁴Defined as imports – exports + adjustments for Government and industry stock changes.

⁵See Appendix C for definitions.