

NITROGEN (FIXED)—AMMONIA

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

Domestic Production and Use: Ammonia was produced by 12 companies at 24 plants in 16 States in the United States during 2010; 4 additional plants were idle for the entire year. Sixty 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 2010, U.S. producers operated at about 85% 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 87% 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	2006	2007	2008	2009	2010^e
Production ²	8,190	8,540	7,870	7,700	8,300
Imports for consumption	5,920	6,530	6,020	4,530	6,400
Exports	194	145	192	16	8
Consumption, apparent	14,000	15,000	13,600	12,300	14,700
Stocks, producer, yearend	201	157	302	167	151
Price, dollars per ton, average, f.o.b. Gulf Coast ³	302	307	590	251	390
Employment, plant, number ⁴	1,150	1,050	1,100	1,050	1,050
Net import reliance ⁴ as a percentage of apparent consumption	41	43	42	38	43

Recycling: None.

Import Sources (2006–09): Trinidad and Tobago, 57%; Russia, 15%; Canada, 13%; Ukraine, 7%; and other, 8%.

Tariff: Item	Number	Normal Trade Relations 12-31-10
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: The Henry Hub spot natural gas price ranged between \$3.7 and \$7.5 per million British thermal units for most of the year, with an average of around \$4.5 per million British thermal units. Natural gas prices in 2010 were relatively stable; slightly higher prices were a result of increased demand for natural gas owing to colder temperatures. The average Gulf Coast ammonia price gradually increased from \$275 per short ton at the beginning of 2010 to a high of around \$420 per short ton in October. The average ammonia price for the year was estimated to be about \$400 per short ton. The U.S. Department of Energy, Energy Information Administration, projected that Henry Hub natural gas spot prices would average \$4.76 per million British thermal units in 2011.

In Minnesota, researchers began work on a \$4 million project that uses wind power to produce anhydrous ammonia. However, industry analysts estimate that it is unlikely that commercial use of renewable energy to produce fertilizer can compete in the global market unless fertilizer prices are twice the current price.

Several companies have announced plans to build new ammonia plants in Argentina, Brazil, China, Cuba, Egypt, and India, which would add about 7.7 million tons of annual production capacity within the next 2 to 3 years. The largest growth in ammonia production is in China.

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According to the U.S. Department of Agriculture, U.S. corn growers planted 35.6 million hectares of corn in the 2010 crop year (July 1, 2009, through June 30, 2010), which was 2% higher than the area planted in 2009. Favorable planting conditions occurred through early May, but below average temperatures and wet conditions dominated much of the Midwest and portions of the Plains in the middle part of May, hampering the planting of the remaining acreage. Corn plantings for the 2011 crop year, however, were expected to increase to 36.0 million hectares. Corn acreage was expected to remain high owing in part to continued U.S. ethanol production and U.S. corn exports in response to a strong global demand for feed grains.

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

World Ammonia Production and Reserves:

	Plant production		Reserves ⁵
	2009	2010 ^e	
United States	7,700	8,300	Available atmospheric nitrogen and sources of natural gas for production of ammonia are considered adequate for all listed countries.
Australia	1,200	1,200	
Bangladesh	1,300	1,300	
Canada	4,000	4,000	
China	42,300	42,000	
Egypt	2,000	2,300	
Germany	2,360	2,500	
India	11,200	11,700	
Indonesia	4,600	4,600	
Iran	2,000	2,000	
Japan	1,100	1,000	
Netherlands	1,800	1,800	
Pakistan	2,300	2,300	
Poland	1,990	1,900	
Qatar	1,800	1,800	
Romania	1,300	1,300	
Russia	10,400	10,400	
Saudi Arabia	2,600	2,600	
Trinidad and Tobago	5,100	5,500	
Ukraine	4,200	3,300	
Uzbekistan	1,000	1,000	
Venezuela	1,160	1,160	
Other countries	<u>17,000</u>	<u>17,000</u>	
World total (rounded)	<u>130,000</u>	<u>131,000</u>	

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.

⁵[See Appendix C for resource/reserve definitions and information concerning data sources.](#)