

NITROGEN (FIXED)—AMMONIA

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

Domestic Production and Use: Ammonia was produced by 13 companies at 25 plants in 16 States in the United States during 2012; 3 additional plants were idle for the entire year. Sixty-one 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 2012, 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	2008	2009	2010	2011	2012^e
Production	² 7,870	² 7,700	² 8,290	³ 9,350	⁴ 9,470
Imports for consumption	6,020	4,530	5,540	5,600	5,090
Exports	192	16	35	26	42
Consumption, apparent	13,500	12,300	13,800	14,900	14,400
Stocks, producer, yearend	302	167	165	178	180
Price, dollars per ton, average, f.o.b. Gulf Coast ⁵	590	251	396	531	575
Employment, plant, number ⁸	1,100	1,050	1,050	1,050	1,100
Net import reliance ⁶ as a percentage of apparent consumption	42	38	40	37	35

Recycling: None.

Import Sources (2008–11): Trinidad and Tobago, 60%; Russia, 15%; Canada, 10%; Ukraine, 6%; and other, 9%.

Tariff: Item	Number	Normal Trade Relations 12–31–12
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 \$1.80 and \$3.20 per million British thermal units for most of the year, with an average of about \$2.70 per million British thermal units. Natural gas prices in 2012 were relatively stable; slightly higher prices were a result of increased demand for natural gas owing to hot temperatures and associated increases in demand for power generation. The average Gulf Coast ammonia price gradually increased from \$612 per short ton at the beginning of 2012 to a high of around \$655 per short ton in September. The average ammonia price for the year was estimated to be about \$575 per short ton. The U.S. Department of Energy, Energy Information Administration, projected that Henry Hub natural gas spot prices would average \$3.34 per million British thermal units in 2013.

A long period of stable and low natural gas prices in the United States has made it economical for companies to upgrade existing plants and plan for the construction of new nitrogen projects.

Several companies have announced plans to build new ammonia plants in Azerbaijan, Canada, Egypt, Iraq, Nigeria, Peru, and Trinidad and Tobago, which would add about 6.4 million tons of annual production capacity within the next 2 to 4 years. The largest growth in ammonia production is in Canada because of the low natural gas prices.

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According to the U.S. Department of Agriculture, U.S. corn growers planted 39 million hectares of corn in the 2012 crop year (July 1, 2011, through June 30, 2012), which was 5% higher than the area planted in 2011. Expectations of corn acreage utilization increased in many States because of higher selling prices and expectations of better net returns from corn compared to other commodities. Corn plantings for the 2013 crop year were expected to decrease slightly to 37.2 million hectares. Overall 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 ⁷
	2011	2012 ^e	
United States	9,350	9,470	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	3,900	3,900	
China	41,700	44,000	
Egypt	3,000	3,000	
Germany	2,820	2,800	
India	11,800	12,000	
Indonesia	5,000	5,100	
Iran	2,500	2,500	
Japan	1,200	1,200	
Netherlands	1,800	1,800	
Oman	1,700	1,700	
Pakistan	2,450	2,500	
Poland	1,700	1,700	
Qatar	1,900	1,900	
Romania	1,100	1,100	
Russia	10,500	10,000	
Saudi Arabia	2,600	2,600	
Trinidad and Tobago	5,500	5,500	
Ukraine	4,300	4,300	
United Kingdom	1,100	1,100	
Uzbekistan	1,000	1,000	
Venezuela	1,160	1,200	
Other countries	14,000	14,000	
World total (rounded)	135,000	137,000	

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: U.S. Census Bureau and The Fertilizer Institute; data adjusted by the U.S. Geological Survey.

⁴Source: The Fertilizer Institute as adjusted by the U.S. Geological Survey.

⁵Source: Green Markets.

⁶Defined as imports – exports + adjustments for Government and industry stock changes.

⁷See Appendix C for resource/reserve definitions and information concerning data sources.