NITROGEN (FIXED)—AMMONIA

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

<u>Domestic Production and Use</u>: Ammonia was produced by 13 companies at 28 plants in 15 States in the United States during 2013; 2 additional plants were idle for the entire year. About 60% 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 2013, U.S. producers operated at about 80% 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 84% 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:	² 009 ² 7,700	² 010 28,290	² 011 39,350	<u>2012</u>	<u>2013^e</u>
Production	² 7,700	² 8,290	³ 9,350	⁴ 8,730	8,700
Imports for consumption	4,530	5,540	5,600	5,170	5,000
Exports	16	36	26	31	150
Consumption, apparent	12,300	13,800	14,900	13,900	13,500
Stocks, producer, yearend	167	165	178	180	220
Price, dollars per ton, average, f.o.b. Gulf Coast ⁵	251	396	531	579	540
Employment, plant, number ^e	1,050	1,050	1,050	1,100	1,200
Net import reliance ⁶ as a percentage					
of apparent consumption	38	40	37	37	36

Recycling: None.

Import Sources (2009-12): Trinidad and Tobago, 62%; Canada, 16%; Russia, 7%; Ukraine, 6%; and other, 9%.

Tariff: Item	Number	Normal Trade Relations 12–31–13
Ammonia, anhydrous	2814.10.0000	Free.
Urea	3102.10.0000	Free.
Ammonium sulfate	3102.21.0000	Free.
Ammonium nitrate	3102.30.0000	Free.

<u>Depletion Allowance</u>: Not applicable.

Government Stockpile: None.

Events, Trends, and Issues: The Henry Hub spot natural gas price ranged between \$3.10 and \$4.30 per million British thermal units for most of the year, with an average of about \$3.70 per million British thermal units. Natural gas prices in 2013 were relatively stable; slightly higher prices were a result of increased demand for natural gas owing to high temperatures and associated increased demand for power generation. The average Gulf Coast ammonia price gradually decreased from \$685 per short ton at the beginning of 2013 to a low of around \$440 per short ton in July. The average ammonia price for the year was estimated to be about \$540 per short ton. The U.S. Department of Energy, Energy Information Administration, projected that Henry Hub natural gas spot prices would average \$3.84 per million British thermal units in 2014.

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. During the next 4 years, it is expected that about 3.1 million tons of annual production capacity will be added in the United States.

Several companies announced plans to build new ammonia plants in Azerbaijan, Bolivia, Indonesia, Nigeria, Russia, and Saudi Arabia, which would add about 4.7 million tons of annual global production capacity within the next 2 to 4 years. The largest increase in ammonia production is likely to be in North America because of low natural gas prices.

NITROGEN (FIXED)—AMMONIA

According to the U.S. Department of Agriculture, U.S. corn growers planted 38 million hectares of corn in the 2013 crop year (July 1, 2012, through June 30, 2013), which was slightly lower than the area planted in 2012. Corn acreage utilization was expected to increase in many States in the 2014 crop year because of anticipated higher selling prices and expectations of better net returns from corn compared to other commodities. Overall corn acreage in the United States 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 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. A hypoxic zone happens where water near the bottom of an affected area in a large body of water, such as the Gulf of Mexico, contains less than 2 parts per million of dissolved oxygen. This may cause stress or death in bottom-dwelling organisms that cannot move out of the hypoxic zone. Scientists continued to study the effects of fertilization on the Nation's environmental health.

World Ammonia Production and Reserves:

	Plant production		
	<u>2012</u>	<u>2013^e</u>	
United States	8,730	8,700	
Australia	1,250	1,300	
Bangladesh	1,300	1,300	
Canada	3,940	3,900	
China	45,200	46,000	
Egypt	3,000	3,000	
France	3,500	3,500	
Germany	2,820	2,800	
India	12,000	12,000	
Indonesia	5,100	5,100	
Iran	2,500	2,500	
Japan	1,200	1,200	
Netherlands	1,800	1,800	
Oman	1,700	1,700	
Pakistan	2,500	2,500	
Poland	1,900	1,900	
Qatar	2,100	2,100	
Russia	10,400	10,000	
Saudi Arabia	2,600	2,600	
Trinidad and Tobago	5,250	5,300	
Ukraine	4,200	4,200	
United Kingdom	1,100	1,100	
Uzbekistan	1,300	1,300	
Venezuela	1,200	1,200	
Other countries	<u> 13,000</u>	13,000	
World total (rounded)	140,000	140,000	

Reserves⁷

Available atmospheric nitrogen and sources of natural gas for production of ammonia are considered adequate for all listed countries.

<u>World Resources</u>: 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.

<u>Substitutes</u>: Nitrogen is an essential plant nutrient that has no substitute. No practical substitutes for nitrogen explosives and blasting agents are known.

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.