

SULFUR

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

Domestic Production and Use: In 2005, elemental sulfur and byproduct sulfuric acid were produced at 115 operations in 29 States and the U.S. Virgin Islands. Total shipments were valued at about \$400 million. Elemental sulfur production was 8.8 million tons; Louisiana and Texas accounted for about 45% of domestic production. Elemental sulfur was recovered at petroleum refineries, natural-gas-processing plants, and coking plants by 38 companies at 109 plants in 26 States and the U.S. Virgin Islands. Byproduct sulfuric acid, representing about 8% of production of sulfur in all forms, was recovered at six nonferrous smelters in five States by six companies. Domestic elemental sulfur provided 66% of domestic consumption, and byproduct acid accounted for 6%. The remaining 28% of sulfur consumed was provided by imported sulfur and sulfuric acid. About 90% of sulfur was consumed in the form of sulfuric acid. Agricultural chemicals (primarily fertilizers) composed 62% of reported sulfur demand; petroleum refining, 29%; and metal mining, 3%. Other uses, accounting for 6% of demand, were widespread because a multitude of industrial products required sulfur in one form or another during some stage of their manufacture.

Salient Statistics—United States:	2001	2002	2003	2004	2005^e
Production:					
Recovered elemental	8,490	8,500	8,920	9,380	8,840
Other forms	982	772	683	739	750
Total (may be rounded)	9,470	9,270	9,600	10,100	9,600
Shipments, all forms	9,450	9,260	9,600	10,100	9,600
Imports for consumption:					
Recovered, elemental ^e	1,730	2,560	2,870	2,850	2,800
Sulfuric acid, sulfur content	462	346	297	784	700
Exports:					
Recovered, elemental	711	709	840	949	650
Sulfuric acid, sulfur content	69	48	67	67	20
Consumption, apparent, all forms	10,900	11,400	12,000	12,800	12,400
Price, reported average value, dollars per ton of elemental sulfur, f.o.b., mine and/or plant	10.01	11.84	28.71	32.50	35.00
Stocks, producer, yearend	232	181	206	185	170
Employment, mine and/or plant, number	2,700	2,700	2,700	2,700	2,700
Net import reliance ¹ as a percentage of apparent consumption	13	19	20	21	23

Recycling: Between 3 million and 5 million tons of spent sulfuric acid was reclaimed from petroleum refining and chemical processes.

Import Sources (2001-04): Elemental: Canada, 72%; Mexico, 19%; Venezuela, 7%; and other, 2%. Sulfuric acid: Canada, 52%; Mexico, 19%; Germany, 6%; and other, 23%. Total sulfur imports: Canada, 70%; Mexico, 19%; Venezuela, 7%; and other, 4%.

Tariff: Item	Number	Normal Trade Relations 12-31-05
Sulfur, crude or unrefined	2503.00.0010	Free.
Sulfur, all kinds, other	2503.00.0090	Free.
Sulfur, sublimed or precipitated	2802.00.0000	Free.
Sulfuric acid	2807.00.0000	Free.

Depletion Allowance: 22% (Domestic and foreign).

Government Stockpile: None.

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Events, Trends, and Issues: Total U.S. sulfur production was 5% lower in 2005 than it was in 2004 because two hurricanes hit the Gulf Coast region, causing major shutdowns of refining capacity in the region. Because most domestic sulfur production comes from refineries, sulfur production was curtailed at some refineries for an extended period of time. In addition, reinjection of acid gases at a major natural-gas-processing plant in Wyoming resulted in decreased sulfur production from natural gas operations. Decreased production of elemental sulfur from petroleum refineries is not expected to establish a new trend, but rather a temporary downturn. Recovery from refineries is expected to return to normal early in 2006 and to resume its upward trend, supported by new facilities being installed to increase refining capacity and the capability of current operations to handle higher sulfur crude oil. Recovered sulfur from domestic natural gas processing is expected to decline as a result of the natural depletion of some large natural gas deposits and projects to reinject acid gas. Byproduct sulfuric acid production is expected to remain relatively stable unless one or more of the remaining nonferrous smelters closes. World sulfur production did not change because the decreased production in the United States countered increases in other parts of the world.

Domestic phosphate rock consumption was slightly higher in 2005 than in 2004, with a slight increase in demand for sulfur to process the phosphate rock into phosphate fertilizers, although the severe weather negatively affected the sulfur industry around the Gulf of Mexico. Increased worldwide sulfur demand drove prices higher, which encouraged expansion in world trade. Canadian sulfur stocks were remelted to meet increased demand for overseas trade.

World Production, Reserves, and Reserve Base:

	Production—All forms		Reserves and reserve base ²
	2004	2005 ^e	
United States	10,100	9,600	Previously published reserve and reserve base data are outdated and inadequate for this tabulation because of changes in the world sulfur industry. For this reason, specific country data have been omitted from this report. Reserves of sulfur in crude oil, natural gas, and sulfide ores are large. Because most sulfur production is a result of the processing of fossil fuels, supplies should be adequate for the foreseeable future. Because petroleum and sulfide ores can be processed long distances from where they are produced, actual sulfur production may not be in the country for which the reserves were attributed. For instance, sulfur reserves from Saudi Arabia actually may be recovered at oil refineries in the United States.
Australia	925	950	
Canada	8,890	8,900	
Chile	1,510	1,500	
China	6,630	6,700	
Finland	702	720	
France	961	900	
Germany	2,150	2,100	
India	1,070	1,100	
Iran	1,460	1,500	
Italy	688	650	
Japan	3,150	3,200	
Kazakhstan	1,980	2,000	
Korea, Republic of	1,680	1,700	
Kuwait	682	700	
Mexico	1,820	1,800	
Netherlands	547	550	
Poland	1,180	1,300	
Russia	6,920	7,100	
Saudi Arabia	2,230	2,200	
Spain	634	630	
United Arab Emirates	1,930	1,900	
Other countries	<u>6,290</u>	<u>6,300</u>	
World total (rounded)	64,100	64,000	

World Resources: Resources of elemental sulfur in evaporite and volcanic deposits and sulfur associated with natural gas, petroleum, tar sands, and metal sulfides amount to about 5 billion tons. The sulfur in gypsum and anhydrite is almost limitless, and some 600 billion tons is contained in coal, oil shale, and shale rich in organic matter, but low-cost methods have not been developed to recover sulfur from these sources. The domestic resource is about one-fifth of the world total.

Substitutes: Substitutes for sulfur at present or anticipated price levels are not satisfactory; some acids, in certain applications, may be substituted for sulfuric acid.

^eEstimated. — Zero.

¹Defined as imports – exports + adjustments for Government and industry stock changes.

²See Appendix C for definitions.