

SULFUR

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

Domestic Production and Use: In 2007, elemental sulfur and byproduct sulfuric acid were produced at 113 operations in 29 States and the U.S. Virgin Islands. Total shipments were valued at about \$400 million. Elemental sulfur production was 8.2 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 43 companies at 107 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 63% of domestic consumption, and byproduct acid accounted for 5%. The remaining 32% 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 about 60% of reported sulfur demand; petroleum refining, 25%; and metal mining, 3%. Other uses, accounting for 12% of demand, were widespread because a multitude of industrial products required sulfur in one form or another during some stage of their manufacture.

<u>Salient Statistics—United States:</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007^e</u>
Production:					
Recovered elemental	8,970	9,420	8,790	8,380	8,150
Other forms	683	739	711	674	670
Total (may be rounded)	<u>9,650</u>	<u>10,200</u>	<u>9,500</u>	<u>9,060</u>	<u>8,820</u>
Shipments, all forms	9,690	10,100	9,480	8,960	8,860
Imports for consumption:					
Recovered, elemental ^e	2,870	2,850	2,820	2,950	2,800
Sulfuric acid, sulfur content	297	784	877	793	860
Exports:					
Recovered, elemental	840	949	684	635	810
Sulfuric acid, sulfur content	67	67	110	79	100
Consumption, apparent, all forms	11,900	12,800	12,400	12,000	11,600
Price, reported average value, dollars per ton					
of elemental sulfur, f.o.b., mine and/or plant	28.70	32.62	30.88	32.85	40.00
Stocks, producer, yearend	206	185	160	221	180
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	19	21	24	25	24

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

Import Sources (2003-06): Elemental: Canada, 71%; Mexico, 17%; Venezuela, 9%; and other, 3%. Sulfuric acid: Canada, 76%; Mexico, 12%; Germany, 3%; and other, 9%. Total sulfur imports: Canada, 72%; Mexico, 16%; Venezuela, 7%; and other, 5%.

<u>Tariff: Item</u>	<u>Number</u>	<u>Normal Trade Relations</u>
		<u>12-31-07</u>
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.

SULFUR

Events, Trends, and Issues: Total U.S. sulfur production declined for the third consecutive year. Decreases in 2005 and 2006 were a result of slow recovery from the two hurricanes that hit the Gulf Coast region in 2005 and complete implementation of an acid-gas reinjection project at a major natural-gas-processing plant in Wyoming, but decreases in 2007 were harder to pinpoint. Several oil refineries experienced temporary, unplanned shutdowns, but capacity utilization was relatively high. The average sulfur content of crude petroleum processed during the year was lower than expected, resulting in less sulfur to recover. Decreased production of elemental sulfur from petroleum refineries is not expected to establish a new trend, but rather a temporary downturn. Sulfur recovery from refineries is expected to return to normal and to resume its upward trend, supported by new facilities being installed that will 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 continue to decline. Byproduct sulfuric acid production is expected to remain relatively stable unless one or more of the remaining nonferrous smelters closes. World sulfur production was relatively stable, with Canada surpassing the United States as the leading global producer.

Domestic phosphate rock consumption was 4% higher in 2007 than in 2006, which resulted in increased demand for sulfur to process the phosphate rock into phosphate fertilizers. Worldwide sulfur prices increased throughout the year because of high demand in China and India. Some Canadian sulfur stocks were remelted to meet increased demand for overseas trade, while material in areas less accessible to markets was stockpiled.

World Production, Reserves, and Reserve Base:

	Production—All forms		Reserves and reserve base ²
	2006	2007 ^e	
United States	9,060	8,820	Previously published reserves 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 from Saudi Arabian oil actually may be recovered at refineries in the United States.
Australia	941	950	
Canada	9,047	9,000	
Chile	1,000	1,000	
China	8,020	8,500	
Finland	615	600	
France	945	950	
Germany	2,290	2,300	
India	1,170	1,200	
Iran	1,465	1,500	
Italy	650	750	
Japan	3,330	3,300	
Kazakhstan	2,000	2,000	
Korea, Republic of	1,690	1,700	
Kuwait	650	650	
Mexico	1,774	1,800	
Netherlands	530	530	
Poland	1,240	1,200	
Russia	7,000	7,000	
Saudi Arabia	2,800	3,000	
South Africa	643	650	
Spain	651	600	
United Arab Emirates	1,950	2,000	
Uzbekistan	520	520	
Venezuela	800	800	
Other countries	<u>4,920</u>	<u>5,000</u>	
World total (rounded)	65,700	66,000	

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 of sulfur 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 sulfur 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.

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

²See Appendix C for definitions.