

SULFUR

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

Domestic Production and Use: In 2020, recovered elemental sulfur and byproduct sulfuric acid were produced at 95 operations in 27 States. Total shipments were valued at about \$320 million. Elemental sulfur production was estimated to be 7.6 million tons; Louisiana and Texas accounted for about 50% of domestic production. Elemental sulfur was recovered, in descending order of tonnage, at petroleum refineries, natural-gas-processing plants, and coking plants by 35 companies at 90 plants in 26 States. Byproduct sulfuric acid, representing about 6% of production of sulfur in all forms, was recovered at five nonferrous-metal smelters in four States by four companies. Domestic elemental sulfur provided 62% of domestic consumption, and byproduct sulfuric acid accounted for about 5%. The remaining 33% of sulfur consumed was provided by imported sulfur and sulfuric acid. About 90% of sulfur consumed was in the form of sulfuric acid.

Salient Statistics—United States:	2016	2017	2018	2019	2020^e
Production:					
Recovered elemental	9,070	9,070	9,000	8,110	7,600
Other forms	673	560	672	596	520
Total (rounded)	9,740	9,630	9,670	8,710	8,100
Shipments, all forms	9,750	9,680	9,690	8,700	8,100
Imports for consumption:					
Recovered elemental ^e	1,810	1,850	2,230	1,850	2,100
Sulfuric acid, sulfur content	1,050	954	997	971	1,200
Exports:					
Recovered elemental	2,060	2,340	2,390	2,200	1,500
Sulfuric acid, sulfur content	59	80	112	72	70
Consumption, apparent, all forms ¹	10,500	10,100	10,400	9,240	9,800
Price, reported average value, free on board, mine and (or) plant, dollars per ton of elemental sulfur	37.88	46.39	81.16	51.08	40.00
Stocks, producer, yearend	142	124	118	124	110
Employment, mine and (or) plant, number	2,500	2,400	2,400	2,400	2,400
Net import reliance ² as a percentage of apparent consumption	7	4	7	6	17

Recycling: Typically, between 2.5 million tons and 5 million tons of spent sulfuric acid is reclaimed from petroleum refining and chemical processes during any given year.

Import Sources (2016–19): Elemental: Canada, 75%; Russia, 12%; Kazakhstan, 6%; and other, 7%. Sulfuric acid: Canada, 64%; Mexico, 17%; Spain, 6%; and other, 13%. Total sulfur imports: Canada, 71%; Russia 8%; Mexico, 7%; Kazakhstan, 4%; and other, 10%.

Tariff:	Item	Number	Normal Trade Relations 12–31–20
	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.

Events, Trends, and Issues: Total U.S. sulfur production in 2020 was estimated to have decreased by 7% from that of 2019, and shipments also decreased by 7% from those of 2019. Domestic production of elemental sulfur from petroleum refineries and recovery from natural gas operations decreased by 6%. Sulfur production decreased because of a decline in refinery capacity utilization as a result of decreased demand for refinery products owing to the global COVID-19 pandemic and processing of more sweet crude oil. Domestically, refinery sulfur production is expected to remain low as long as COVID-19 restrictions remain in place. Domestic byproduct sulfuric acid is expected to remain relatively constant, unless one or more of the remaining nonferrous-metal smelters close.

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Domestic phosphate rock consumption in 2020 was estimated to have remained the same as that in 2019, which resulted in the same consumption of sulfur to process the phosphate rock into phosphate fertilizers.

World sulfur production was slightly less than it was in 2019 as a result of decreased demand resulting from global COVID-19 pandemic restrictions, but production is likely to increase steadily for the foreseeable future. New sulfur demand associated with phosphate fertilizer projects is expected mostly in Africa, but sulfur demand likely will increase in Asia and Eastern Europe. A major change for 2020 was the implementation of new international standards limiting sulfur oxide emissions from ocean-going ships on January 1, 2020. The global sulfur content limit of marine fuels was reduced to 0.5% from 3.5%, which is likely to lead to increased sulfur recovery from fuels in North America, Asia, and Europe.

Contract sulfur prices in Tampa, FL, began 2020 at around \$46 per long ton. The sulfur price decreased to \$36 per long ton in mid-April, and then increased to \$58 per long ton by the end of September. Fourth-quarter 2020 prices were set at \$69 per long ton. The fourth-quarter price increase was a result of the decreased availability of sulfur owing to reduced output from natural gas and crude oil refining. In the past few years, sulfur prices have been variable, a result of the volatility in the demand for sulfur.

World Production and Reserves:

	Production—All forms		Reserves ³
	2019	2020 ^e	
United States	8,710	8,100	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 are expected to be adequate for the foreseeable future. Because petroleum and sulfide ores can be processed long distances from where they are produced, sulfur production may not be in the country to which the reserves were attributed. For instance, sulfur from Saudi Arabian oil may be recovered at refineries in the United States.
Australia	900	900	
Brazil	500	500	
Canada	6,940	6,300	
Chile	1,500	1,500	
China ⁴	17,500	17,000	
Finland	766	770	
Germany	670	670	
India	3,600	3,600	
Iran	2,200	2,200	
Italy	550	550	
Japan	3,400	3,400	
Kazakhstan	3,500	3,500	
Korea, Republic of	3,080	3,100	
Kuwait	850	850	
Netherlands	510	510	
Poland	1,190	1,200	
Qatar	1,800	1,800	
Russia	7,560	7,500	
Saudi Arabia	6,500	6,500	
United Arab Emirates	3,300	3,300	
Other countries	4,500	4,300	
World total (rounded)	80,000	78,000	

World Resources:³ Resources of elemental sulfur in evaporite and volcanic deposits, and sulfur associated with natural gas, petroleum, tar sands, and metal sulfides, total about 5 billion tons. The sulfur in gypsum and anhydrite is almost limitless, and 600 billion tons of sulfur is contained in coal, oil shale, and shale that is rich in organic matter. Production from these sources would require development of low-cost methods of extraction. 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, but usually at a higher cost.

^eEstimated.

¹Defined as shipments + imports – exports.

²Defined as imports – exports + adjustments for industry stock changes.

³See Appendix C for resource and reserve definitions and information concerning data sources.

⁴Sulfur production in China includes byproduct elemental sulfur recovered from natural gas and petroleum, the estimated sulfur content of byproduct sulfuric acid from metallurgy, and the sulfur content of sulfuric acid from pyrite.