

SODA ASH

(Data in thousand metric tons, unless otherwise noted)

Domestic Production and Use: Five companies in Wyoming and one in California composed the U.S. soda ash (sodium carbonate) industry, which was the largest in the world. The six producers, with a combined annual nameplate capacity of 12 million tons, operated at 84% of nameplate capacity. Sodium bicarbonate, sodium sulfate, potassium chloride, potassium sulfate, borax, and other minerals were produced as coproducts from sodium carbonate production in California. Sodium bicarbonate, sodium sulfite, sodium tripolyphosphate, and chemical caustic soda were manufactured as coproducts at several of the Wyoming soda ash plants. The total estimated value of domestic soda ash produced in 1996 was \$778 million.¹

The reported distribution of soda ash by end use was glass, 48%; chemicals, 25%; soap and detergents, 12%; distributors, 5%; pulp and paper and miscellaneous, 3% each; and water treatment and flue gas desulfurization, 2% each.

Salient Statistics—United States:	1992	1993	1994	1995	1996^e
Production ²	9,380	8,960	9,320	10,100	10,100
Imports for consumption	72	89	79	83	95
Exports	2,960	2,800	3,230	3,570	3,650
Consumption: Reported	6,320	6,310	6,240	6,500	6,550
Apparent	6,360	6,350	6,260	6,510	6,550
Price: Quoted, yearend, soda ash, dense, bulk, f.o.b. Green River, WY, dollars per short ton	98.00	98.00	105.00	105.00	105.00
F.o.b. Searles Valley, CA, same basis	123.00	123.00	130.00	130.00	130.00
Average sales value (natural source), f.o.b. mine or plant, same basis	80.93	74.34	70.44	74.50	77.00
Stocks, producer, yearend	371	274	203	306	300
Employment, mine and plant, number	2,800	2,800	2,800	2,800	2,800
Net import reliance ³ as a percent of apparent consumption	E	E	E	E	E

Recycling: There is no recycling of soda ash by producers; however, glass container producers are using cullet glass, thereby reducing soda ash consumption.

Import Sources (1992-95): Canada, 99%; and other, 1%.

Tariff: Item	Number	Most favored nation (MFN) 12/31/96	Non-MFN⁴ 12/31/96
Disodium carbonate	2836.20.0000	1.2% ad val.	8.5% ad val.

Depletion Allowance: 14% (Domestic), 14% (Foreign). For natural only.

Government Stockpile: None.

Events, Trends, and Issues: Several soda ash capacity expansions, closures, and acquisitions were announced in 1996. The largest U.S. soda ash-producing company, which was the only domestic producer that was exclusively U.S.-owned, formed a joint venture with two Japanese soda ash companies; one was a glass producer and the other a soda ash distributor. The two Japanese companies would own 20% of the partnership and would provide \$150 million to finance part of a 635,000-ton-per-year expansion project. The Japanese partners will export their share of soda ash to their host country.

Another Japanese company, which was a partner in a Wyoming soda ash venture, announced it planned to close its synthetic soda ash facility in Chiba, Japan, in 1997. The announcement followed a decision by its Belgian-owned U.S. partner to expand production capacity by more than 50% to 3.18 million tons. A second Wyoming jointventure partnership with another Japanese soda ash producer closed a plant in Japan in September.

In April, a U.S. soda ash producer in California purchased the synthetic soda ash operations of a producer in Australia. The facility has an annual capacity of 400,000 tons. The U.S. company also acquired the soda ash operation in France of a former European soda ash producer. These transactions resulted in this U.S. company becoming the third largest soda ash producer in the world.

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The European Economic Commission opened its investigation in 1996 of antiumping practices by several U.S. soda ash producers. The Commission determined in 1995 that most of the U.S. industry sold soda ash at less than the prevailing European sales prices, and imposed provisional duties on all but one of the U.S. companies. The Commission continued its investigation into 1997.

The outlook for soda ash through 1997 is very good. World demand for soda ash was expected to grow 1.5% to 2% annually through the remainder of this century. Domestic demand should be slightly higher than in 1996; however, soda ash consumption in the glass container manufacturing sector is estimated to decline further.

World Production, Reserves, and Reserve Base:

	Production		Reserves ^{5 6}	Reserve base ⁶
	1995	1996 ^e		
Natural				
United States	10,100	10,100	⁷ 23,000,000	⁷ 39,000,000
Botswana	202	150	400,000	NA
Chad	NA	NA	NA	NA
Kenya	145	150	7,000	NA
Mexico	—	—	200,000	450,000
Turkey	—	—	200,000	240,000
Uganda	NA	NA	20,000	NA
Other countries	—	—	<u>260,000</u>	<u>220,000</u>
World total, natural (rounded)	10,400	10,400	24,000,000	40,000,000
World total, synthetic (rounded)	21,000	21,000	—	—
World total (rounded)	31,000	31,000	—	—

World Resources: Soda ash is obtained from trona and sodium carbonate-rich brines. The world's largest deposit of trona is in the Green River Basin of Wyoming. About 47 billion metric tons of identified soda ash resources could be recovered from the 56 billion tons of bedded trona⁴ and the 47 billion tons of interbedded or intermixed trona and halite that are in beds more than 1.2 meters thick. About 34 billion tons of reserve base soda ash could be obtained from the 36 billion tons of halite-free trona and the 25 billion tons of interbedded or intermixed trona and halite that are in beds more than 1.8 meters thick. Underground room-and-pillar mining, using a combination of conventional, continuous, and shortwall mining equipment, is the primary method of mining Wyoming trona ore. The method has an average 45% mining recovery, which is higher than the 30% average mining recovery from solution mining. Improved solution mining techniques, such as horizontal drilling to establish communication between well pairs, could increase this extraction rate and enable companies to develop some of the deeper economic trona. Wyoming trona resources are being depleted at the rate of about 15 million tons per year (8.3 million tons of soda ash). Searles and Owens Lakes in California contain an estimated 815 million tons of soda ash reserves. There are at least 62 identified natural sodium carbonate deposits in the world, some of which have been quantified. Although soda ash can be manufactured from salt and limestone, both of which are practically inexhaustible, synthetic soda ash is more costly to produce and generates environmentally deleterious wastes. Commercial mining of nahcolite is presently being done by one producer in Colorado, and two other companies are trying to obtain financing for development of competing nahcolite projects. None of the ventures are associated with oil shale mining or with dawsonite recovery.

Substitutes: Caustic soda can be substituted for soda ash in certain uses, particularly in the pulp and paper, water treatment, and certain chemical sectors. Soda ash, soda liquors, or trona can be used as feedstock to manufacture chemical caustic soda, which is an alternative to electrolytic caustic soda.

^eEstimated. E Net exporter. NA Not available.

¹Does not include values for soda liquors and mine waters.

²Natural only.

³Defined as imports - exports + adjustments for Government and industry stock changes.

⁴See Appendix B.

⁵The reported quantities are sodium carbonate only. About 1.8 tons of trona yields 1 ton of sodium carbonate.

⁶See Appendix C for definitions.

⁷From trona, nahcolite, and dawsonite sources.