

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 86% 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 1998 was \$840 million.¹

Based on final 1997 data, the estimated 1998 reported distribution of soda ash by end use was glass, 49%; chemicals, 26%; soap and detergents, 12%; distributors, 5%; flue gas desulfurization, 3%; pulp and paper and miscellaneous, 2% each; and water treatment, 1%.

Salient Statistics—United States:	1994	1995	1996	1997	1998^e
Production ²	9,320	10,100	10,200	10,700	10,300
Imports for consumption	79	83	107	101	75
Exports	3,230	3,570	3,840	4,190	3,800
Consumption: Reported	6,260	6,500	6,390	6,480	6,600
Apparent	6,240	6,510	6,470	6,670	6,600
Price: Quoted, yearend, soda ash, dense, bulk, f.o.b. Green River, WY, dollars per short ton	105.00	105.00	105.00	105.00	105.00
F.o.b. Searles Valley, CA, same basis	130.00	130.00	130.00	130.00	130.00
Average sales value (natural source), f.o.b. mine or plant, same basis	70.44	74.50	82.60	77.25	74.00
Stocks, producer, yearend	203	306	271	259	325
Employment, mine and plant, number	2,800	2,800	2,800	2,800	2,700
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 (1994-97): Canada, 99%; and other, 1%.

Tariff: Item	Number	Normal Trade Relations (NTR) 12/31/98	Non-NTR⁴ 12/31/98
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: The economic problems in Asia that continued throughout 1998 severely reduced U.S. exports of soda ash. Shipments to Indonesia, the Republic of Korea, and Thailand decreased from 26% of total exports in 1996 to 16% of total in 1998. On the positive side, exports to Brazil, Chile, Japan, Mexico, and Taiwan increased from 32% to total exports in 1996 to 38% in 1998. An antidumping investigation of U.S. soda ash imported by Brazil that began in 1996 ended in March 1998 in favor of the U.S. soda ash export association. With the problems in the Asian economy, resumption of exports to Brazil provided some relief to the troubled export market.

The synthetic soda ash producer in England, which had previously purchased its rival soda ash plant in the Netherlands, was itself acquired by a group of U.S. investors, including a major bank.

A major domestic fertilizer company acquired the assets of the California soda ash producer early in the year, but was seeking to divest itself of all or part of the operation by yearend. Another U.S. soda ash producer remained for sale throughout the year.

A \$400 million soda ash project in northwest Colorado was announced at midyear. The operation was scheduled to produce 900,000 tons of soda ash annually from nahcolite, which is naturally occurring sodium bicarbonate. A 26-kilometer pipeline would transport the solution mined material to a processing plant located near a rail line. Mining

SODA ASH

could begin by 2000. A prospective sixth Wyoming soda ash producer constructed a soda ash pilot plant with a capacity of 5 tons per day. Startup of the demonstration plant that will test new technology was scheduled for January 1999.

A soda ash producer in Wyoming completed its 800,000-ton-per-year expansion at yearend. Because of the downturn in soda ash demand in several regions of the world, the company decided to integrate the new expansion while taking 900,000 tons of capacity out of service until market conditions improve. In the interim, the company plans to use the time to refurbish the older equipment to improve the operating efficiency.

The outlook for soda ash through 1999 is forecast to be similar to that of 1998. Despite the economic problems in certain regions, the overall world demand for soda ash is expected to grow 1.5% to 2% annually in the early part of the next century. Domestic demand should be slightly higher than in 1998 when a titanium dioxide producer comes completely on-stream with new technology that will convert byproduct liquid wastes into a marketable product by using more than 230,000 tons of soda ash annually.

World Production, Reserves, and Reserve Base:

	Production		Reserves ^{5 6}	Reserve base ⁶
	1997	1998 ^e		
Natural:				
United States	10,700	10,300	⁷ 23,000,000	⁷ 39,000,000
Botswana	170	160	400,000	NA
Kenya	220	200	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)	11,100	10,700	24,000,000	40,000,000
World total, synthetic (rounded)	21,100	20,300	—	—
World total (rounded)	32,100	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 trona 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 Lake and Owens Lake 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 D for definitions.

⁷From trona, nahcolite, and dawsonite sources.