

## SODA ASH

(Data in thousand metric tons, unless otherwise noted)

**Domestic Production and Use:** Four companies in Wyoming operating five plants, one company in California with one plant, and one company with one plant in Colorado composed the U.S. soda ash (sodium carbonate) industry, which was the largest in the world. The six producers have a combined annual nameplate capacity of 14.5 million tons. 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. Sodium bicarbonate was produced as a coproduct at the Colorado operation. The total estimated value of domestic soda ash produced in 2001 was \$780 million.<sup>1</sup>

Based on final 2000 data, the estimated 2001 reported distribution of soda ash by end use was glass, 50%; chemicals, 27%; soap and detergents, 11%; distributors, 6%; flue gas desulfurization and pulp and paper, 2% each; and water treatment and other, 1% each.

<b>Salient Statistics—United States:</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001<sup>e</sup></b>
Production <sup>2</sup>	10,700	10,100	10,200	10,200	10,300
Imports for consumption	101	83	92	75	40
Exports	4,190	3,660	3,620	3,900	4,100
Consumption:					
Reported	6,480	6,550	6,430	6,390	6,200
Apparent	6,670	6,560	6,740	6,430	6,200
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	77.25	75.30	69.11	66.23	69.00
Stocks, producer, yearend	259	273	248	245	275
Employment, mine and plant, number	2,800	2,700	2,600	2,600	2,700
Net import reliance <sup>3</sup> as a percentage 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 (1997-2000):** Canada, 99%; and other, 1%.

<b>Tariff: Item</b>	<b>Number</b>	<b>Normal Trade Relations 12/31/01</b>
Disodium carbonate	2836.20.0000	1.2% ad val.

**Depletion Allowance:** Natural, 14% (Domestic and foreign).

**Government Stockpile:** None.

**Events, Trends, and Issues:** The domestic market for soda ash continued to decrease but was partially offset with an increase in export sales. To alleviate some of the oversupply that has affected the industry, about 2.4 million tons of nameplate capacity was idled by three U.S. producers. This included the entire Granger, WY, facility and a U.S. producer's synthetic soda ash plant in Amherstburg, Ontario, Canada. Rising energy costs also adversely affected the operating economics of the facilities. To counter this, soda ash producers announced a temporary \$7 per ton energy surcharge on top of a \$10 price increase that was to go into effect October 1 or as contracts permitted. The surcharge was rescinded late in the year but was followed by a \$5 price increase, making a total of \$15 for the proposed price increase.

U.S. soda ash exports increased an estimated 5%. This was partially attributed to the closure of the synthetic soda ash plant at Kita Kyushu, Japan, in March. The operation had a capacity of 350,000 tons per year. The company, which was a joint venture partner with a Wyoming soda ash producer, will import its soda ash requirements from the United States.

## SODA ASH

Production of glass containers which declined about 6% in 2001 contributed to reduced soda ash consumption. A major baby food manufacturing company began packaging its products in polyethylene terephthalate (PET) plastic jars in lieu of glass. Another promising sector for increased use of PET is the beer industry. More arenas and stadiums were selling beer in plastic bottles because of their safety and lightweight. Increased demand for PET for these products will cause a corresponding decline in soda ash sales.

The United States will continue to be the largest supplier of soda ash in the world; however, China is rapidly expanding its soda ash manufacturing capability. It is anticipated that competition with China for markets in Asia will be strong in the future. Notwithstanding the economic and energy problems in certain areas of the world, the overall world demand for soda ash is expected to grow 1.5% to 2% annually in the early part of this century. Domestic demand should be slightly higher in 2002.

### World Production, Reserves, and Reserve Base:

	Production		Reserves <sup>4 5</sup>	Reserve base <sup>5</sup>
	2000	2001 <sup>e</sup>		
Natural:				
United States	10,200	10,300	<sup>6</sup> 23,000,000	<sup>6</sup> 39,000,000
Botswana	225	200	400,000	NA
Kenya	246	230	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 (may be rounded)	10,700	10,700	24,000,000	40,000,000
World total, synthetic (rounded)	23,500	22,300	—	—
World total (rounded)	34,200	33,000	—	—

**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.

**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.

<sup>e</sup>Estimated. E Net exporter. NA Not available. — Zero.

<sup>1</sup>Does not include values for soda liquors and mine waters.

<sup>2</sup>Natural only.

<sup>3</sup>Defined as imports - exports + adjustments for Government and industry stock changes.

<sup>4</sup>The reported quantities are sodium carbonate only. About 1.8 tons of trona yields 1 ton of sodium carbonate.

<sup>5</sup>See Appendix C for definitions.

<sup>6</sup>From trona, nahcolite, and dawsonite sources.