

## SODA ASH

(Data in thousand metric tons unless otherwise noted)

**Domestic Production and Use:** The total value of domestic soda ash (sodium carbonate) produced in 2008 was estimated to be about \$1.4 billion.<sup>1</sup> The U.S. soda ash industry comprised four companies in Wyoming operating five plants, one company in California with one plant, and one company with one mothballed plant in Colorado that owns one of the Wyoming plants. The five producers have a combined annual nameplate capacity of 14.5 million tons. Salt, sodium sulfate, and borax were produced as coproducts of sodium carbonate production in California. Sodium bicarbonate, sodium sulfite, and chemical caustic soda were manufactured as coproducts at several of the Wyoming soda ash plants. Sodium bicarbonate was produced at the Colorado operation using soda ash feedstock shipped from the company's Wyoming facility.

Based on final 2007 reported data, the estimated 2008 distribution of soda ash by end use was glass, 49%; chemicals, 30%; soap and detergents, 8%; distributors, 5%; miscellaneous uses, 3%; flue gas desulfurization and water treatment, 2% each; and pulp and paper, 1%.

<b><u>Salient Statistics—United States:</u></b>	<b><u>2004</u></b>	<b><u>2005</u></b>	<b><u>2006</u></b>	<b><u>2007</u></b>	<b><u>2008<sup>e</sup></u></b>
Production <sup>2</sup>	11,000	11,000	11,000	11,100	11,200
Imports for consumption	6	8	7	9	15
Exports	4,670	4,680	4,820	5,130	5,200
Consumption:					
Reported	6,260	6,200	6,110	5,940	6,000
Apparent	6,290	6,380	6,100	6,030	6,000
Price:					
Quoted, yearend, soda ash, dense, bulk:					
F.o.b. Green River, WY, dollars per short ton	105.00	155.00	155.00	155.00	260.00
F.o.b. Searles Valley, CA, same basis	130.00	180.00	180.00	180.00	285.00
Average sales value (natural source), f.o.b. mine or plant, dollars per short ton	63.75	80.19	96.64	103.53	115.00
Stocks, producer, yearend	338	243	290	206	200
Employment, mine and plant, number	2,600	2,600	2,600	2,600	2,500
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 (2004-07):** United Kingdom, 36%; Mexico, 27%; China, 17%; Germany, 8%; and other, 12%.

<b><u>Tariff:</u></b>	<b><u>Item</u></b>	<b><u>Number</u></b>	<b><u>Normal Trade Relations</u></b>
			<b><u>12-31-08</u></b>
	Disodium carbonate	2836.20.0000	1.2% ad val.

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

**Government Stockpile:** None.

**Events, Trends, and Issues:** A major soda ash manufacturer in India purchased a United States chemical company for \$1.05 billion that included a 75% interest in the company's Wyoming soda ash operation. The Indian company also had soda ash production facilities in India, Kenya, the Netherlands, and the United Kingdom. As a result of the acquisition, the U.S. soda ash industry for the first time was no longer a U.S. majority-owned industry, with foreign ownership now accounting for 60% of total domestic nameplate capacity. The same Indian soda ash company proposed to develop the natural soda ash deposit at Lake Natron in Tanzania, which is the breeding ground for 75% of the world's Lesser Flamingo bird population. The proposed project would produce 500,000 tons of soda ash; however, there were concerns about the plant's environmental impact on the flamingos.

The leading U.S. soda ash producer in Wyoming announced it would restart the remaining 700,000 tons of mothballed capacity at its Granger facility by 2012. U.S. export sales have risen as world market conditions have improved for soda ash. Global energy consumption has increased, and that caused soda ash production costs and transportation costs to rise accordingly for all soda ash producers. In the United States, the industry announced an increase of \$50 per short ton in May 2008 for the list and off-list price of bulk soda ash, and a \$40-per-short-ton increase in August.

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A joint venture between a major United States soda ash producer and Saudi Arabia's largest glass container manufacturer was formed in February 2008. A synthetic soda ash plant with an annual production capacity of 900,000 tons was to be built in Saudi Arabia with the first phase of construction to be completed by 2010. Salt, limestone, and energy would be supplied from local sources.

The adverse economic conditions in domestic automobile production and housing starts that affected soda ash consumption in the flat glass and fiberglass sectors in 2007 continued through 2008. Notwithstanding the continuing economic and energy problems in certain areas of the world, overall global demand for soda ash is expected to grow from 1.5% to 2% annually for the next several years. If the domestic economy improves, U.S. demand may be slightly higher in 2009.

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

Natural:	Production		Reserves <sup>4,5</sup>	Reserve base <sup>5</sup>
	2007	2008 <sup>e</sup>		
United States	11,100	11,200	<sup>6</sup> 23,000,000	<sup>6</sup> 39,000,000
Botswana	250	250	400,000	NA
Kenya	370	380	7,000	NA
Mexico	—	—	200,000	450,000
Turkey	—	—	200,000	240,000
Uganda	NA	NA	20,000	NA
Other countries	—	—	260,000	220,000
World total, natural (rounded)	11,700	11,800	24,000,000	40,000,000
World total, synthetic (rounded)	33,300	34,200	XX	XX
World total (rounded)	45,000	46,000	XX	XX

**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 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 conventional and continuous mining, is the primary method of mining Wyoming trona ore. This method has an average 45% mining recovery, whereas average recovery from solution mining is 30%. Improved solution-mining techniques, such as horizontal drilling to establish communication between well pairs, could increase this extraction rate and entice companies to develop some of the deeper trona beds. 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, only 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. XX Not applicable. — 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.