

SODA ASH

(Data in thousand metric tons unless otherwise noted)

Domestic Production and Use: The total value of domestic natural soda ash (sodium carbonate) produced in 2016 was estimated to be about \$1.8 billion.¹ U.S. production of 11.7 million tons was about equal to that of the previous 2 years but about 600,000 tons higher than production in 2012. The U.S. soda ash industry comprised four companies in Wyoming operating five plants and one company in California with one plant. The five producing companies have a combined annual nameplate capacity of 13.7 million tons (15.2 million short tons). Borax, salt, and sodium sulfate were produced as coproducts of sodium carbonate production in California. Chemical caustic soda, sodium bicarbonate, and sodium sulfite were manufactured as coproducts at several of the Wyoming soda ash plants. Sodium bicarbonate was produced at an operation in Colorado using soda ash feedstock shipped from the company's Wyoming facility.

Based on 2016 quarterly reports, the estimated distribution of soda ash by end use was glass, 50%; chemicals, 28%; distributors, 6%; soap and detergents, 6%; flue gas desulfurization, 4%; miscellaneous uses, 3%; water treatment, 2%; and pulp and paper, 1%.

Salient Statistics—United States:	2012	2013	2014	2015	2016^e
Production ²	11,100	11,500	11,700	11,600	11,700
Imports for consumption	13	13	39	40	40
Exports	6,150	6,460	6,670	6,390	6,600
Consumption:					
Apparent	5,000	5,010	5,020	5,220	5,100
Reported	5,060	5,120	5,170	4,990	5,200
Price:					
Average sales value (natural source), f.o.b. mine or plant, dollars per short ton	141.90	131.71	134.87	140.88	141.00
Stocks, producer, yearend	338	348	271	285	300
Employment, mine and plant, number	2,400	2,500	2,500	2,500	2,500
Net import reliance ³ as a percentage of apparent consumption	E	E	E	E	E

Recycling: No soda ash was recycled by producers; however, glass container producers are using cullet glass, thereby reducing soda ash consumption.

Import Sources (2012–15): Germany, 47%; Italy, 18%; United Kingdom, 12%; Mexico, 8%; and other, 15%.

Tariff: Item	Number	Normal Trade Relations 12–31–16
Disodium carbonate	2836.20.0000	1.2% ad val.

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

Government Stockpile: None.

Events, Trends, and Issues: Relatively low production costs and lower environmental impacts provide natural soda ash producers some advantage over producers of synthetic soda ash. The production of synthetic soda ash normally consumes more energy and releases more carbon dioxide than that of natural soda ash. In recent years, U.S. producers of natural soda ash were able to expand their markets when several synthetic soda ash plants were closed or idled around the world.

During 2016, identical legislation was introduced in the U.S. House of Representatives and the U.S. Senate that aimed to reduce the royalty rate on sodium compounds produced on Federal land for 5 years from 6% to 2%. The bills had not been passed by yearend. Congressional representatives also urged Executive Branch negotiators to address capacity issues related to Chinese soda ash production at the 27th annual United States-China Joint Commission on Commerce and Trade meeting.

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After a wastewater dam collapsed, a major producer in China shut down a 3-million-ton-per-year synthetic soda ash production facility, which temporarily boosted United States sales of soda ash in Asia.

Three groups dominate production and have become the world's leading suppliers of soda ash—American National Soda Ash Corp., which represented three of the five domestic producers in 2016; multiple producers in China; and Solvay S.A. of Belgium. The United States likely will remain competitive with producers in China for markets elsewhere in Asia. Asia and South America remain the most likely areas for increased soda ash consumption in the near future. Total production in the United States was likely to increase slightly during 2016 and domestic producers expect continuing modest growth in production and exports through 2020.

World Production and Reserves:

Natural:	Mine production		Reserves ^{4, 5}
	2015	2016 ^e	
United States	11,600	11,700	⁶ 23,000,000
Botswana	250	250	400,000
Kenya	450	290	7,000
Turkey	1,900	1,900	300,000
Other countries	—	—	<u>280,000</u>
World total, natural (rounded)	14,200	14,100	24,000,000
World total, synthetic (rounded)	39,200	39,500	XX
World total (rounded)	53,400	53,600	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, which are in beds more than 1.2 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 enable 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. At least 95 natural sodium carbonate deposits have been identified 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 environmental 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.

^eEstimated. E Net exporter. XX Not applicable. — Zero.

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

²Natural only.

³Defined as imports – exports + adjustments for industry stock changes.

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

⁵See [Appendix C](#) for resource and reserve definitions and information concerning data sources.

⁶From trona, nahcolite, and dawsonite deposits.