

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 2020 was estimated to be about \$1.5 billion,¹ and the quantity produced was 9.7 million tons, about 17% less than that of the previous year. The U.S. soda ash industry comprised four companies in Wyoming operating five plants and one company in California operating one plant. The five producing companies have a combined annual nameplate capacity of 13.9 million tons (15.3 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 2020 quarterly reports, the estimated distribution of soda ash by end use was glass, 48%; chemicals, 28%; miscellaneous uses, 8%; soap and detergents, 6%; distributors, 5%; flue gas desulfurization, 3%; pulp and paper, 1%; and water treatment, 1%.

<u>Salient Statistics—United States:</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020^e</u>
Production ²	11,800	12,000	11,900	11,700	9,700
Imports for consumption	35	19	51	115	90
Exports	6,760	6,990	6,960	7,020	5,700
Consumption:					
Apparent ³	5,030	5,040	4,980	4,830	4,100
Reported	5,120	4,910	4,850	4,720	4,400
Price, average sales value (natural source), free on board (f.o.b.) mine or plant:					
Dollars per metric ton	149.83	146.26	148.69	153.24	154
Dollars per short ton	135.92	132.68	134.89	139.02	140
Stocks, producer, yearend	336	293	297	289	320
Employment, mine and plant, number ^e	2,500	2,600	2,600	2,600	2,500
Net import reliance ⁴ as a percentage of apparent consumption	E	E	E	E	E

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

Import Sources (2016–19): Turkey, 62%; Germany, 9%; Italy, 7%; Bulgaria, 5%; and other, 17%.

Tariff:	Item	Number	Normal Trade Relations
			<u>12–31–20</u>
	Disodium carbonate	2836.20.0000	1.2% ad val.

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

Government Stockpile: None.

Events, Trends, and Issues: Primarily owing to the global COVID-19 pandemic, U.S. soda ash consumption, exports, imports, production, and sales significantly decreased in 2020 from those of 2019. More than one-half of U.S. production of soda ash was exported, and exports were estimated to have decreased by 19% compared with those in 2019. Domestic consumption reported by producers decreased by about 7% in 2020 compared with that of 2019, and apparent consumption in 2020 decreased by about 15% compared with that of 2019.

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 in other parts of the world.

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After increasing capacity during the past 3 years, total production capacity in Turkey is estimated to be between 4 million and 5 million tons per year, and soda ash shipments, especially for export, are expected to increase during the next few years. Total United States imports, mostly from Turkey, have recently been about 100,000 tons per year, which is more than double the average amount of annual imports during the past decade.

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 2020; multiple producers in China; and Solvay S.A. of Belgium. Increasing soda ash exports from Turkey may affect sales from these three groups. The United States likely will remain competitive with producers in China and Turkey for markets elsewhere in Asia. Asia and South America remain the most likely areas for increased soda ash consumption in the near future.

World Production and Reserves: Reserves for Turkey were revised based on Government and industry reports.

	Mine production		Reserves ^{5, 6}
	2019	2020 ^e	
Natural:			
United States	11,700	9,700	723,000,000
Botswana	290	250	400,000
Ethiopia	18	20	400,000
Kenya	330	300	7,000
Turkey	3,500	3,400	1,650,000
Other countries	NA	NA	280,000
World total, natural (rounded)	15,800	14,000	26,000,000
World total, synthetic (rounded)	41,000	38,000	XX
World total (rounded)	56,800	52,000	XX

World Resources:⁶ Natural 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, the resources of 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 costlier 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. NA Not available. XX Not applicable.

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

²Natural only.

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

⁴Defined as imports – exports + adjustments for industry stock changes.

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

⁶See Appendix C for resource and reserve definitions and information concerning data sources.

⁷From trona, nahcolite, and dawsonite deposits.