



2015 Minerals Yearbook

SODA ASH [ADVANCE RELEASE]

SODA ASH

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After increasing each year since 2009, U.S. soda ash production decreased slightly and exports decreased by 4% in 2015 compared with those of 2014. The annual average unit value of soda ash increased by 4% in 2015 from that of 2014 but was still slightly lower than the record high set in 2012. U.S. soda ash exports accounted for 55% of total domestic production based on export data from the U.S. Census Bureau. U.S. soda ash production was 11.6 million metric tons (Mt) valued at \$1.8 billion in 2015 (table 1). World soda ash production was estimated to be 53.4 Mt, slightly more than the revised total of 52.7 Mt in 2014 (tables 1, 7).

Soda ash, also known as sodium carbonate (Na_2CO_3), is an alkali chemical refined from the mineral trona or from naturally occurring sodium-carbonate-bearing brines (the soda ash from both is referred to as natural soda ash) or manufactured from one of several chemical processes (the soda ash from this process is referred to as synthetic soda ash).

Soda ash is an important industrial compound used to manufacture chemicals, glass, pulp and paper, soaps and detergents, and many other familiar consumer products. The United States has the world's largest natural deposit of trona and is the world's second-ranked soda-ash-producing nation. U.S. natural soda ash is a cost-effective option in world markets because most of the world output of soda ash is made synthetically, which is usually a more expensive process.

Legislation and Government Programs

Legislation to keep the Federal royalty rate on soda ash production from Federal lands at or below the 4% level was introduced by congressional representatives from California, Colorado, Oregon, Wyoming, and a few other States. The initial measures were introduced in the U.S. House of Representatives in April and were passed out of committee in July (Cook, 2015). In September, a companion bill was introduced in the Senate titled The Soda Ash Competitiveness Act, which would set royalty rates at 2% for the next 5 years (Wyden, 2015). Neither bill was passed during the 2015 legislative session, and the 6% default royalty rate took effect at the start of fiscal year 2016 on October 1, 2015. Congressional sponsors of lower royalty legislation planned to renew efforts to pass rate-lowering legislation in 2016 (Webb, 2015).

Production

Soda ash production and inventory data were collected by the U.S. Geological Survey (USGS) from monthly, quarterly, and annual voluntary surveys of the U.S. soda ash industry. A survey request was sent to each of the five soda ash companies, all of which responded, representing 100% of the total production data in this report (table 1).

The United States remained the world's second-ranked soda-ash-producing nation in 2015 behind China. U.S. production of natural soda ash from California and Wyoming was 11.6 Mt in 2015. Based on about 13.7 million metric tons per year (Mt/yr) (15.2 million short tons per year) of total nameplate production capacity, the U.S. soda ash industry operated at 84% of total capacity.

The U.S. soda ash industry used the term "effective capacity" to minimize the effect that "mothballed capacity" had on operating rates. This resulted in higher capacity utilization percentages. Effective capacity data for individual producers are not publicly disclosed. Three of the largest producers use nameplate capacities to determine export allocations set by a U.S. export association, the American Natural Soda Ash Corp. (ANSAC).

The U.S. soda ash industry consisted of five companies in 2015—four companies operating five plants in Wyoming that produced soda ash from underground trona ore and one plant in California that produced soda ash from sodium-carbonate-rich brines (table 3). One company operated a mine and a plant in Wyoming and a plant in Colorado, which produced sodium bicarbonate using soda ash feedstock from the company's Wyoming soda ash facility. The operation in Colorado could produce soda ash from local nahcolite but because of production cost considerations chose to use the soda ash from Wyoming in place of the local material.

Each of the U.S. companies was either wholly owned or partially owned by foreign soda-ash-producing companies or foreign soda ash consumers. The U.S. soda ash industry was 54% foreign owned and 46% domestically owned. At yearend, the countries and their percentage of ownership of U.S. soda ash producers were India, 23%; Belgium, 15%; Turkey, 11%; and Japan, 5%.

Two of the five U.S. soda ash producers changed ownership in 2015. In April 2015, Tronox Ltd. (Stamford, CT) purchased the alkali division of FMC Corp. (Philadelphia, PA). FMC had announced its intent to sell its alkali division in September 2014 (Tronox Ltd., 2015a).

In October 2015, OCI Enterprises Inc. (a subsidiary of OCI Company Ltd., Seoul, Republic of Korea) sold their interest in OCI Resources LP to Ciner Group (Istanbul, Turkey). The new operating company in Wyoming was named Ciner Wyoming LLC and would continue to be jointly owned with minority partner Natural Resources Partners L.P. (Houston, TX). Ciner Group also owned Eti Soda, which produces soda ash from trona in Beypazari, Turkey (Sweetwater Now, 2015).

Consumption

The USGS collected consumption data by end use for soda ash on a quarterly basis from the marketing and sales

departments of each company. Every effort has been made to categorize company sales within the correct end-use sector. Quarterly reports are often revised in subsequent quarters because of customer reclassifications or other factors. All U.S. soda ash companies responded to the quarterly surveys; data represented 100% of the total reported consumption data in this report.

In 2015, U.S. apparent consumption increased by 4% compared with that of 2014. Apparent consumption of soda ash was 5.22 Mt; reported consumption was 4.99 Mt (table 1). Reported consumption and apparent consumption do not necessarily correspond because reported consumption is sales reported by producers, whereas apparent consumption is the quantity available for domestic consumption calculated by subtracting exports from the sum of production, imports, and changes in inventories.

In the domestic market, large-volume buyers of soda ash were primarily the major glass-container manufacturers whose purchases were seasonal (more beverage containers are made in the second and third quarters because of increased beverage consumption during the summer). Soda ash sales to the flat glass sector depended more on the state of the economy because the leading uses of flat glass were in automobile manufacture and residential housing and commercial building construction. These two major industrial sectors are especially sensitive to changing economic conditions, and soda ash sales follow trends in the two sectors. The distribution of soda ash for domestic consumption by end use in 2015 was glass, 48%; chemicals, 30%; soaps and detergents, 7%; distributors, 6%; flue gas desulfurization, 4%; other, 3%; and pulp and paper and water treatment, 1% each (table 4).

Chemicals.—Soda ash is used to manufacture many sodium-base inorganic chemicals, including sodium bicarbonate, sodium chromates, sodium phosphates, and sodium silicates. Chemical production accounted for 1.5 Mt of soda ash consumption.

Glass.—Glass manufacture used 2.4 Mt of soda ash, about 48% of domestic soda ash consumption, in different types of glass as follows: container, 47%; flat, 41%; and fiber and other glass, about 6% each. Glass containers are made for beverages (carbonated and noncarbonated drinks such as alcoholic beverages, sodas, and juices), chemical and household products, food, medical products, and toiletries and cosmetics.

Soaps and Detergents.—Detergents ranked third in the use of soda ash with 328,000 t. Soda ash was used as a builder to emulsify oil stains, reduce the redeposition of dirt during washing and rinsing, provide alkalinity for cleaning, and soften laundry water. In addition, soda ash was a component of sodium tripolyphosphate (STPP), another major builder in detergent formulations. Soda ash consumption for STPP detergents has been decreasing because the use of phosphatic detergents has declined because they can contribute to decreased quality of water habitats.

In response to the environmental concern that cardboard detergent packaging contributes to the volume of landfill waste, detergent manufacturers changed formulations to make compact and superconcentrated products. These reformulations require sodium silicates and synthetic zeolites, which are made from soda ash.

Liquid detergents, which do not contain any soda ash, competed with soda-ash-containing powdered detergents and have become the preferred form of household laundry detergent. In 2015, about 75% of household laundry detergent sales in the United States were liquid.

Stocks

Yearend 2015 stocks of dense soda ash in domestic plant silos, terminals, warehouses, and on teamtracks (small railroad siding or spur tracks) were 285,000 metric tons (t), which was about 5% more than those in 2014. Producers indicated that a supply problem could exist if inventories decreased to less than 180,000 t. Most consumers of soda ash did not have the storage facilities to accommodate large quantities of soda ash and needed to rely on suppliers to provide the material on a timely basis.

Prices

The annual average unit value in 2015 for bulk, dense natural soda ash, free on board (f.o.b.) Green River, WY, and Searles Valley, CA, was \$155.30 per metric ton (\$140.88 per short ton), which was a 4% increase from that of the previous year (table 1). The value is not a “price,” but rather it is the sum of the combined revenue of California and Wyoming bulk, dense soda ash sold on an f.o.b. plant basis at list, spot, or discount prices; on long-term contracts; and for export, divided by the quantity of soda ash sold. Only merchant soda ash is used to derive the annual value; therefore, no soda ash for value-added products or soda liquors is included. The list prices quoted in trade journals or by producers differ from the annual average values reported to and by the USGS.

On July 7, Tronox announced a price increase of \$12 per short ton effective September 1, 2015, or as contracts allowed for all grades of soda ash and for bulk and packaged products. The Tronox list price for bulk, dense soda ash was \$302 per short ton and list prices for packaged soda ash ranged from \$357 per short ton to \$367 per short ton (Tronox Ltd., 2015b). A similar price increase of about \$12 per short ton also was announced by several other soda ash producers (Lu, 2015).

Foreign Trade

The majority of U.S. soda ash exports were controlled by ANSAC, which is involved exclusively in the export trade of soda ash, defined as an alkali product designated by the chemical formula Na_2CO_3 , whether manufactured by brine evaporation and purification, Solvay process, trona refining, or any other means. Under the Treaty of Rome agreement (1958), ANSAC is not permitted to ship soda ash to the countries of the European Union (EU); however, the members of the U.S. soda ash industry formed another organization for shipping to this region. The American-European Soda Ash Shipping Association, Inc. (AESSA) is engaged solely in storage, transportation, and other related logistical and technical support activities to promote and further its members' individual commerce in soda ash being shipped to the countries of the EU. ANSAC and AESSA were formed as Webb-Pomerene export associations under the authority of the U.S. Federal Trade Commission.

According to the U.S. Census Bureau, U.S. exports of soda ash for 2015 were 6.39 Mt, which represented about 55% of U.S. soda ash production. For comparison, exports accounted for only 5% of U.S. production in 1970, 13% in 1980, 26% in 1990, and 38% in 2000. In 2015, the regional distribution of U.S. soda ash exports to 61 countries was as follows: Asia, 29%; South America, 29%; North America, 19%; Europe, 8%; the Middle East and Oceania, 5% each; Africa, 3%; Central America, 1%; and the Caribbean, less than 0.5% (table 5). The average free alongside ship value was \$207 per metric ton in 2015 compared with \$195 per ton in 2014. In 2015, the 11 leading countries, representing 72% of total U.S. soda ash exports were, in decreasing order of tonnage, Brazil, 16%; Mexico, 15%; Indonesia, 10%; Australia and Chile, 5% each; Canada, Japan, and Taiwan, 4% each; and the Republic of Korea, Thailand, and the United Kingdom, 3% each (table 6). About 44% of all U.S. soda ash exports went through the Columbia-Snake River customs district in Idaho, Oregon, and Washington; the Port Arthur, TX, district ranked second with 24% of the total; and the Laredo, TX, district was third with 12% of the total (table 5).

The quantity of imports of soda ash in 2015 was 39,800 t, about the same amount imported in 2014, and came from 15 countries according to U.S. Census Bureau data. Imports account for a very small portion of soda ash supply in the United States. In 2015, 92% of U.S. soda ash imports were from Germany (56%), the United Kingdom (18%), Italy (13%), and Mexico (5%). The remaining imports were from Bulgaria, China, the Czech Republic, France, Hong Kong, India, Japan, the Netherlands, Poland, Taiwan, and Turkey. Although Hong Kong is listed as a source of soda ash imports, Hong Kong is not thought to produce soda ash. It is possible that the data were erroneous or that the product was transshipped from another location. Imports from China were thought to be sodium carbonate peroxohydrate, which is the active ingredient in algaecides and fungicides. The national average cost, insurance, and freight value of imported soda ash was \$170 per metric ton, and the customs value was \$142 per metric ton.

World Review

Soda ash is a mature commodity and the leading consumers of soda ash were, for the most part, developed nations where consumption tends to increase in proportion to rates of growth of population and gross domestic product. In developing countries, per capita consumption is lower than in developed countries because these countries do not yet have a well-established industrial base. Although the production and consumption quantities varied among the countries, the end-use patterns were basically the same—glass, chemicals, and detergents were the major use sectors.

In 2015, world soda ash production was estimated to be 53.4 Mt, which was a slight increase from that of 2014. Table 7 lists 2015 production of natural and synthetic soda ash for 20 countries; the leading producer was China (49%) and the United States ranked second (22%). In addition to these 20 countries, several others were thought to produce soda ash and are listed in a footnote in table 7, but reliable data were not available for the formulation of production estimates.

Only Botswana, China, Ethiopia, Kenya, Turkey, and the United States produce soda ash from natural sources; the remaining 14 nations manufacture soda ash through various chemical processes, primarily the Solvay process. China and Turkey are believed to produce soda ash using natural sources and synthetic processes.

Eight countries produced 1 Mt/yr or more of soda ash. They were, in descending order of tonnage, China, the United States, Russia, Germany, India, Turkey, Poland, and France. These nations accounted for 93% of world production in 2015. Bulgaria, Romania, and Ukraine had production installations that were rated at about 1 Mt/yr; however, adverse economic conditions caused these nations to produce below their facilities' design capacities.

China.—Soda ash producers in China encountered lower domestic demand and lower soda ash prices in 2015 after producers added capacity during the last few years, bringing total soda ash capacity in China to about 32 Mt/yr. In response, producers worked to increase exports, especially to other countries in Asia. China's exports to other parts of Asia increased by about 34% during the first 6 months of 2015 and U.S. exports to Asia during this same period grew by about 3% (Syrett and Li, 2015).

India.—Rohit Surfactants Private Ltd., a Pakistan-based producer of laundry detergent, announced plans to construct a soda ash plant in Gujarat. Rohit Surfactants also was building a detergent plant in southern India (Unnithan, 2015).

GHCL Ltd. announced a capacity expansion of its Saurashtra, Gujarat, soda ash plant. The two-phase plan called for an additional 100,000 metric tons per year (t/yr) by the end of 2017 and another 150,000 t/yr by yearend 2019 (Rao, 2015).

Kenya.—Tata Chemicals Magadi Ltd. lowered the price of soda ash produced from Lake Magadi owing to soil erosion into the lake that affected the purity of the soda ash. Because the alkalinity level of the produced soda ash was lowered, the purchase price for the soda ash was reduced as well (Kairu, 2015).

Pakistan.—ICI Pakistan Ltd. announced a 150,000-t/yr capacity expansion at its soda ash plant in Khwera, increasing the total capacity to 500,000 t/yr. This expansion followed a 13% net sales increase for the plant (News International, The, 2015).

Thailand.—Solvay S.A. planned to build a 100,000-t/yr sodium bicarbonate plant in Map Ta Phut, Rayong, which was expected to be operational by yearend 2016. Solvay intended to export more than one-half of the production to other countries in Asia (Changson, 2015).

Outlook

U.S. annual soda ash production and exports declined slightly compared to the previous year after increasing each year since 2009. The average unit value in 2015 increased to slightly less than the record unit value set in 2012. Contract prices for 2016 reportedly averaged about \$5 per metric ton more than the 2015 contract prices (Lu, 2015). Three groups dominate production and have become the world's leading suppliers of soda ash—ANSAC of the United States (which represented three of the five domestic producers in 2014), China's producers,

and Solvay S.A. of Belgium. In addition, Turkish soda ash producers, with access to the world's second largest trona deposit, could potentially become a major supplier. It is very likely that some smaller soda ash facilities throughout the world may close because of energy and environmental considerations and competition from the major producers.

With the economy generally improving in the United States and throughout much of the world, U.S. soda ash production is expected to increase slightly in 2016 and 2017. U.S. exports, which leveled off in 2015, are expected to return to modest growth in the near future. It is projected that U.S. suppliers will continue to achieve higher sales prices by competing with the more expensive foreign synthetic soda ash. Overall global economic conditions are expected to continue to improve during the next few years and stimulate greater world soda ash consumption. Global consumption of soda ash is projected to increase by about 2% per year during the next 5 years. The United States likely will continue to compete with producers in China for the Far East markets. Asia and South America remain the most likely areas for increased soda ash consumption in the near future.

References Cited

- Changson, Pichaya, 2015, Solvay set to expand Thai operations: The Nation [Thailand], September 16. (Accessed September 16, 2015, at <http://www.nationmultimedia.com/business/Solvay-set-to-expand-Thai-operations-30268850.html>.)
- Cook, Paul, 2015, Rep. Paul Cook introduces Soda Ash Competitiveness Act to secure American mining jobs: Washington, DC, U.S. House of Representatives press release, April 23. (Accessed April 26, 2015, at <http://cook.house.gov/media-center/press-releases/rep-paul-cook-introduces-soda-ash-competitiveness-act-to-secure-american>.)
- Kairu, Pauline, 2015, Kenya—Soda ash mining in Magadi threatened by soil erosion into the lake: All Africa, July 8. (Accessed July 9, 2015, at <http://allafrica.com/stories/201507081087.html>.)
- Lu, Emma, 2015, US soda ash contracts settling about \$5/ton higher: ICIS News, November 17. (Accessed November 18, 2015, at <http://www.icis.com/resources/news/2015/11/17/9944996/us-soda-ash-contracts-settling-about-5-ton-higher/>.)
- News International, The, 2015, ICI Pakistan to spend \$90mln on light soda ash plant in Khewra: The News International [Karachi, Pakistan], August 28. (Accessed September 1, 2015, at <http://www.thenews.com.pk/print/58967-ici-pakistan-to-spend-90mln-on-light-soda-ash-plant-in-khewra>.)
- Rao, Rakesh, 2015, GHCL to invest Rs 1050 crore to expand soda ash & textile capacity: Business Standard [New Delhi, India], August 7. (Accessed August 18, 2015, at http://www.business-standard.com/article/b2b-connect/ghcl-to-invest-rs-1050-crore-to-expand-soda-ash-textile-capacity-115080700461_1.html.)
- Sweetwater Now, 2015, OCI sold to Ciner Group: Sweetwater Now [Rock Springs, WY], October 26. (Accessed October 27, 2015, at <http://sweetwaternow.com/oci-sold-ciner-group/>.)

- Syrett, Laura, and Li, Albert, 2015, Chinese soda ash—Mission creep: Industrial Minerals, August 20. (Accessed August 24, 2015, via <http://www.indmin.com/>.)
- Tronox Ltd., 2015a, Tronox announces closing of alkali chemicals acquisition: Stamford, CT, Tronox Ltd. press release, April 1. (Accessed April 2, 2015, at <http://investor.tronox.com/releasedetail.cfm?ReleaseID=904602>.)
- Tronox Ltd., 2015b, Tronox increases soda ash prices: Stamford, CT, Tronox Ltd. press release, July 7. (Accessed November 2, 2015, at <http://investor.tronox.com/releasedetail.cfm?ReleaseID=921051>.)
- Unnithan, Chitra, 2015, Ghari detergent all set to enter Nirma's home turf: Times of [Delhi] India, July 4. (Accessed July 8, 2015, at <http://timesofindia.indiatimes.com/business/india-business/Ghari-detergent-all-set-to-enter-Nirmas-home-turf/articleshow/47938452.cms>.)
- Webb, Dennis, 2015, Royalty rates untouched in bill: The Daily Sentinel [Grand Junction, CO], December 16. (Accessed December 18, 2015, at <http://www.gjsentinel.com/news/articles/royalty-rates-untouched-in-bill>.)
- Wyden, Ron, 2015, Wyden, Barrasso introduce bill to help American soda ash producers compete in global market: Washington, DC, U.S. Senate press release, September 16. (Accessed September 20, 2015, at <https://www.wyden.senate.gov/news/press-releases/wyden-barrasso-introduce-bill-to-help-american-soda-ash-producers-compete-in-global-market>.)

GENERAL SOURCES OF INFORMATION

U.S. Geological Survey Publications

- Evaporites and Brines. Ch. in *United States Mineral Resources*, Professional Paper 820, 1973.
- Historical Statistics for Mineral and Material Commodities in the United States. Data Series 140.
- Soda Ash. Ch. in *Mineral Commodity Summaries*, annual.
- Soda Ash. *Mineral Industry Surveys*, monthly.

Other

- Engineering and Mining Journal, commodities survey.
- Industrial Minerals.
- Manufacture of Soda. American Chemical Society Monograph Series, 1942.
- Natural Soda Ash. Van Nostrand Reinhold, 1992.
- Proceedings of the First International Soda Ash Conference. Wyoming State Geological Survey, 1998.
- Soda Ash. Ch. in *Industrial Minerals and Rocks*, Society for Mining, Metallurgy, and Exploration, Inc., 1994.
- Soda Ash. *Mining Engineering*, annual review of industrial minerals (June issue).
- Soda Ash and Sodium Sulfate. Ch. in *Mineral Facts and Problems*, U.S. Bureau of Mines Bulletin 675, 1985.

TABLE 1
SALIENT SODA ASH STATISTICS¹

(Thousand metric tons and thousand dollars except average annual value)

	2011	2012	2013	2014	2015
United States:					
Production:					
Soda ash:					
Quantity	10,700	11,100	11,500	11,700	11,600
Value	1,580,000	1,740,000	1,660,000 ^r	1,730,000 ^r	1,800,000
Value, average annual:					
Per short ton	\$133.57	\$141.90	\$131.71 ^r	\$134.87 ^r	\$140.88
Per metric ton	\$147.24	\$156.42	\$145.18 ^r	\$149.56	\$155.30
Wyoming trona	16,500	17,100	17,400	17,300	17,600
Exports:					
Quantity	5,470	6,150 ^r	6,460 ^r	6,670	6,390
Value	1,040,000	1,240,000	1,210,000	1,300,000	1,320,000
Imports for consumption:					
Quantity	27	13	13	39	40
Value	5,660	3,360	3,470	6,900 ^r	6,760
Stocks, December 31, producers [†]	282	338	348	271	285
Consumption:					
Apparent	5,290 ^r	5,000 ^r	5,010 ^r	5,020 ^r	5,220
Reported	5,150	5,060	5,120	5,170	4,990
World, production ^e	50,000 ^r	51,700 ^r	51,300 ^r	52,700 ^r	53,400

^eEstimated. ^rRevised.

¹Data are rounded to no more than three significant digits, except average annual value.

TABLE 2
U.S. PRODUCTION OF SODIUM COMPOUNDS, BY MONTH¹

(Thousand metric tons)

	2014		2015	
	Soda ash	Wyoming trona ²	Soda ash	Wyoming trona ²
January	957	1,400	1,010	1,630
February	904	1,380	925	1,450
March	1,060	1,510	1,010	1,540
April	926	1,500	983	1,400
May	890	1,480	920	1,440
June	975	1,480	980	1,500
July	1,000	1,460	1,010	1,510
August	1,030	1,430	971	1,480
September	917	1,420	915	1,460
October	985	1,480	927	1,280
November	996	1,450	973	1,510
December	1,020	1,300	952	1,450
Total	11,700	17,300	11,600	17,600

¹Data are rounded to no more than three significant digits; may not add to totals shown.

²Includes solution-mined trona.

TABLE 3
U.S. PRODUCERS OF SODA ASH IN 2015

(Million short tons unless otherwise noted)

Company	Partner(s)	Plant nameplate capacity	Plant location	Source of sodium carbonate
Tronox Alkali Wyoming Corp.:				
Granger	None	1.30	Granger, WY	Underground trona.
Green River	Joint venture with Sumitomo Corp. (6%)	3.55	Green River, WY	Do.
Ciner Wyoming LLC	Ciner Resources Corp. (51%) and Natural Resources Partners L.P. (49%)	3.25	do.	Do.
Searles Valley Minerals, Inc.	None	1.45	Trona, CA	Dry lake brine.
Solvay Chemicals, Inc., Green River	Joint venture with Asahi Glass Co. (20%)	2.80	Green River, WY	Underground trona.
Tata Chemicals (Soda Ash) Partners	Joint venture with Owens-Illinois, Inc. (25%)	2.80	do.	Do.
Total		15.20		
Total	million metric tons	13.70		

Do., do. Ditto.

TABLE 4
REPORTED CONSUMPTION OF SODA ASH IN THE UNITED STATES, BY END USE, BY QUARTER¹

(Thousand metric tons)

NAICS ² code	End use	2015				Total	
		2014	1st quarter	2d quarter	3d quarter		4th quarter
3272	Glass:						
327213	Container	1,150	265	296	294	282	1,140
327211	Flat	978	225	248	251	246	970
327993	Fiber	151	34	36	39	41	150
327212	Other	131	34	35	31	34	134
	Total	2,410	558	616	615	603	2,390
32518	Chemicals	1,540	351	382	368	391	1,490
325611	Soaps and detergents	352	83	77	84	84	328
322	Pulp and paper	64	15	17	14	13	59
221310	Water treatment ³	55	17	15	17	16	65
56221	Flue gas desulfurization	231	49	55	66	51	221
4246	Distributors	284	74	71	73	68	286
	Other	228	44	40	30	28	142
	Total domestic consumption ⁴	5,170	1,190	1,270	1,270	1,250	4,990
	Exports ⁵	6,550	1,640	1,660	1,560	1,590	6,440
	Canada	229	58	59	57	56	230
	Total industry sales ⁶	11,700	2,830	2,930	2,820	2,840	11,400
	Total sales from plants	11,900	2,870	2,940	2,900	2,850	11,600
	Total production	11,700	2,940	2,880	2,890	2,850	11,600

¹Data are rounded to no more than three significant digits; may not add to totals shown.

²North American Industry Classification System.

³Includes soda ash equivalent from soda liquors and purge liquors sold to powerplants for water treatment. Sales of mine water are excluded.

⁴Imports reported by the producer/importer have been distributed into appropriate end-use categories.

⁵As reported by producers; includes Canada. Data may not agree with those reported by the U.S. Census Bureau for the same periods.

⁶Represents soda ash from domestic origin (production and inventory changes) and imports and exports. Includes soda ash sold by coproducers and distributed by purchasers into appropriate end-use categories.

TABLE 5
REGIONAL DISTRIBUTION OF U.S. SODA ASH EXPORTS, BY CUSTOMS DISTRICTS, IN 2015¹
(Metric tons)

Customs districts	North America	Central America	South America	Caribbean	Europe	Middle East	Africa	Asia	Oceania	Total	Percentage of total
Atlantic:											
Charleston, SC	--	--	--	--	--	--	--	1,870	--	1,870	(2)
Miami, FL	--	9	692	291	--	--	--	--	--	992	(2)
New York, NY	--	--	--	--	1,170	--	--	1,610	--	2,780	(2)
Norfolk, VA	--	--	--	--	617	--	--	189	--	807	(2)
Philadelphia, PA	--	--	--	--	229	--	--	--	--	229	(2)
Savannah, GA	--	--	--	--	242	--	--	--	--	242	(2)
Gulf:											
Houston-Galveston, TX	--	1,440	422,000	771	55	363	41	47,000	--	471,000	7
New Orleans, LA	2	200	--	--	13	10	--	--	--	225	(2)
Port Arthur, TX	--	3,950	832,000	4,960	479,000	--	219,000	--	--	1,540,000	24
North-central:											
Chicago, IL	--	--	--	--	49	--	--	250	--	298	(2)
Cleveland, OH	--	--	--	--	--	--	--	49	--	49	(2)
Detroit, MI	164,000	--	--	--	--	--	--	--	--	164,000	3
Duluth, MN	4,980	--	--	--	--	--	--	--	--	4,980	(2)
Great Falls, MT	33,300	--	--	--	--	--	--	--	--	33,300	(2)
Pembina, ND	3,070	--	--	--	--	--	--	--	--	3,070	(2)
Northeast:											
Buffalo, NY	31,500	--	--	--	--	--	--	--	--	31,500	(2)
Ogdensburg, NY	1,900	--	--	--	--	--	--	--	--	1,900	(2)
St. Albans, VT	3	--	--	--	--	--	--	--	--	3	(2)
Pacific:											
Columbia-Snake River, ID-OR-WA	--	70,800	376,000	--	6,000	285,000	--	1,750,000	316,000	2,800,000	44
Los Angeles, CA	6,660	--	157,000	--	--	64,600	--	75,900	60	304,000	5
San Diego, CA	86,300	--	39,600	--	--	--	--	--	--	126,000	2
San Francisco, CA	--	--	--	--	--	--	--	26	--	26	(2)
Seattle, WA	13,500	--	--	--	--	--	--	26	--	13,500	(2)
Southwest:											
El Paso, TX	139,000	--	--	--	--	--	--	--	--	139,000	2
Laredo, TX	747,000	--	--	--	--	--	--	--	--	747,000	12
Nogales, AZ	1,300	--	--	--	--	--	--	--	--	1,300	(2)
Unknown	531	--	--	--	--	--	--	--	--	531	(2)
Total	1,230,000	76,400	1,830,000	6,020	488,000	350,000	219,000	1,880,000	316,000	6,390,000	100
Percentage of total	19	1	29	(2)	8	5	3	29	5	100	XX

XX Not applicable. -- Zero.

¹Data are rounded to no more than three significant digits; may not add to totals shown.

²Less than ½ unit.

Source: U.S. Census Bureau.

TABLE 6
U.S. EXPORTS OF SODA ASH, BY COUNTRY¹

Country	2014			2015		
	Quantity (thousand metric tons)	Value ² (thousands)	Unit value	Quantity (thousand metric tons)	Value ² (thousands)	Unit value
Argentina	93	\$18,200	\$196	89	\$18,300	\$206
Australia	267	52,800	198	293	58,600	200
Belgium	133	21,000	158	115	15,800	137
Brazil	895	169,000	189	1,030	214,000	207
Canada	263 ^r	55,500 ^r	211	252	52,600	209
Chile	324	67,800	209	301	64,600	215
Colombia	207	40,500	196	147	29,500	200
Costa Rica	20	4,040	202	16	3,420	214
Ecuador	34	7,450	219	33	7,450	226
El Salvador	15	2,980	199	12	2,480	206
France	48	7,610	159	45	7,960	177
Guatemala	39	8,430	216	43	9,510	221
India	110	18,400	167	92	16,400	179
Indonesia	634 ^r	130,000 ^r	206 ^r	641	135,000	211
Japan	221	37,200	168	255	46,300	182
Korea, Republic of	227	42,200	186	201	38,800	193
Malaysia	85	17,000	200	80	16,700	208
Mexico	1,010	232,000	230	980	231,000	236
Netherlands	150	23,700	158	110	18,000	164
New Zealand	31	5,650	182	24	4,300	179
Peru	115	23,400	203	74	16,100	217
Philippines	55	10,500	191	55	11,200	204
Saudi Arabia	155	26,000	168	167	30,700	184
South Africa	86	15,200	177	91	17,500	192
Spain	26	4,640	179	17	2,230	131
Taiwan	214	38,400	180	227	43,500	191
Thailand	240	46,000	192	190	39,600	209
Tunisia	195	27,900	143	122	25,200	207
United Arab Emirates	142	24,000	169	183	34,700	190
United Kingdom	155	26,700	172	190	39,400	208
Venezuela	209	46,600	223	150	34,900	233
Vietnam	142 ^r	25,100 ^r	177	125	24,100	193
Other	133 ^r	22,000 ^r	166 ^r	39	10,400	266
Total	6,670	1,300,000	195	6,390	1,320,000	207

^rRevised.

¹Data are rounded to no more than three significant digits, except unit value; may not add to totals shown.

²Free alongside ship value.

Source: U.S. Census Bureau.

TABLE 7
SODA ASH: ESTIMATED WORLD PRODUCTION, BY COUNTRY^{1,2}

(Thousand metric tons)

Country ³	2011	2012	2013	2014	2015
Australia	310	300	150	--	--
Botswana ⁴	260 ^{r,5}	250 ^{r,5}	228 ^{r,5}	269 ^{r,5}	250
China ⁵	22,940	24,010	24,320 ^r	25,260 ^r	26,130
Egypt	130 ^r	130 ^r	130 ^r	130 ^r	130
Ethiopia ^{4,6}	5 ⁵	5	5	6 ^r	6
France	1,000	1,000	1,000	1,000	1,000
Germany ⁵	2,668	2,627	2,548	2,558 ^r	2,600
India	2,300	2,460	2,390	2,380	2,400
Italy	500	500	500	500	500
Japan	373 ⁵	344 ⁵	361 ⁵	350 ⁵	350
Kenya ⁴	499 ⁵	449 ⁵	468 ⁵	409 ^{r,5}	450
Mexico	290	290	290	290	290
Pakistan	372 ^{r,5}	367 ^{r,5}	379 ^{r,5}	437 ^{r,5}	400
Poland	1,061 ⁵	1,111 ^{r,5}	1,052 ⁵	1,100 ⁵	1,100
Portugal	150	150	75	--	--
Romania	420	430	430	425	425
Russia	2,822 ⁵	2,807 ⁵	2,477 ⁵	3,052 ^{r,5}	2,800
Taiwan	140	140	140	--	--
Turkey	1,749 ⁵	1,853 ⁵	1,665	1,828 ^{r,5}	1,900
Ukraine	700	720	720	600 ^r	600
United Kingdom	500	500	450	400	400
United States ^{4,5}	10,700	11,100	11,500	11,700	11,600
Uzbekistan	90	90	90	90 ⁵	90
Total	50,000 ^r	51,700 ^r	51,300 ^r	52,700 ^r	53,400

^rRevised. -- Zero.

¹World totals, U.S. data, and estimated data are rounded to no more than three significant digits; may not add to totals shown.

²Includes data available through June 22, 2016. Synthetic unless otherwise specified.

³In addition to the countries listed, Bosnia and Herzegovina, Brazil, Bulgaria, Chad, Iran, Republic of Korea, Netherlands, Spain, and Tanzania produced soda ash; available information is inadequate for the formulation of reliable estimates of output levels.

⁴Natural only.

⁵Reported figure.

⁶Data for calendar year ending July 7 of the year listed.