



# 2012 Minerals Yearbook

---

## SODA ASH

---

# SODA ASH

By Thomas P. Dolley

**Domestic survey data and tables were prepared by Martha L. Jackson, statistical assistant, and the world production table was prepared by Glenn J. Wallace, international data coordinator.**

The U.S. soda ash industry continued a trend of increased production and value in 2012 since experiencing a decline in domestic and export sales caused by adverse global economic conditions in 2009 in the major soda ash-consuming sectors. The annual average unit value of soda ash set a record high in 2012, and soda ash exports increased as well, accounting for 55% of total production. U.S. soda ash production was 11.1 million metric tons (Mt) valued at \$1.74 billion. World soda ash production was estimated at 52.9 Mt, an increase from 51 Mt in 2011 (tables 1, 7).

Soda ash, also known as sodium carbonate ( $\text{Na}_2\text{CO}_3$ ), 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 extremely competitive in world markets because the majority of the world output of soda ash is made synthetically, which is usually a more expensive process.

## 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 2012 behind China. U.S. production of natural soda ash from California and Wyoming was 11.1 Mt in 2012. Based on about 14.5 million metric tons per year (Mt/yr) (16 million short tons per year) of total nameplate production capacity, the U.S. soda ash industry operated at 77% of total capacity. This capacity utilization rate appears to be low because it is calculated partially based on the full nameplate capacity of all operations, some of which included nameplate capacity idled since 2009 (FMC Corp., 2011a, b). During 2012, FMC Corp. was producing about 454,000 t/yr (500,000 short ton per year) at its previously idled Granger facility in Green River, WY, and was proceeding with plans to expand production to full capacity at 1.2 Mt/yr (Martin, 2012).

Approximately 2.5 Mt/yr of nameplate capacity (2.7 million short tons per year), which represented about 17% of total industry nameplate capacity, was idled in 2012. This available capacity could be brought back online when market conditions

improve. 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. Individual effective capacity data are not publicly disclosed. 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 2012—four companies operating five plants in Wyoming that produced soda ash from underground trona ore and one in California that produced soda ash from sodium-carbonate-rich brines. One company operated a mine and plant in Wyoming and a plant in Colorado, which produced sodium bicarbonate using soda ash feedstock from the company's Wyoming soda ash facility.

Each of the U.S. companies is either wholly owned or partially owned by foreign soda ash-producing companies or foreign soda ash consumers. The U.S. soda ash industry was 62% foreign owned and 38% domestically owned. At yearend, the countries and foreign percentage ownership were India, 21%; Belgium, 19%; Japan, 11%; and the Republic of Korea, 11% (table 3).

Economic distress experienced by the U.S. soda ash industry in 2004, caused partially by the emergence of China as a competitor in the export market to Asia, led to the passage of the Soda Ash Royalty Reduction Act of 2006. Passage of the legislation lowered the Federal royalty rate of 6% to 2% for a 5-year period for holders of Federal sodium leases prior to the legislation's expiration date of October 11, 2011. An extension of the royalty reduction remained under consideration in 2012 and into 2013 (Abbey, 2011; U.S. Department of the Interior, 2011, p. 1–3; Industrial Minerals, 2013).

## Consumption

The USGS collects soda ash consumption data by end use 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 found in this report.

In 2012, U.S. apparent consumption and reported consumption were nearly identical. Apparent consumption of soda ash was 4.98 Mt; reported consumption was 5.06 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 calculated quantity available for domestic consumption

based on balancing supply (production, imports, and inventory adjustments) with external demand (exports).

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 for summertime beverage consumption). 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 by end use in 2012 was glass, 48%; chemicals, 29%; soap and detergents, 8%; distributors, 6%; flue gas desulfurization and other, 3% each; pulp and paper, 2%; and water treatment, 1% (table 4).

**Chemicals.**—Soda ash is used to manufacture many sodium-base inorganic chemicals, including sodium bicarbonate, sodium chromates, sodium phosphates, and sodium silicates.

**Glass.**—Glass manufacture represented about 48% of domestic soda ash consumption as follows: container, 52%; flat, 38%; and fiber and other, 5% each. Glass containers are made for beverages (beer and carbonated and noncarbonated drinks), chemical and household products, food, liquor, medical products, and toiletries and cosmetics.

**Soaps and Detergents.**—Detergents were the third ranked use of soda ash. Soda ash was used as a builder to emulsify oil stains, to reduce the redeposition of dirt during washing and rinsing, to provide alkalinity for cleaning, and to soften laundry water. In addition, soda ash was a component of sodium tripolyphosphate (STPP), another major builder in detergent formulations. Soda ash consumption has been decreasing because phosphatic detergents can contribute to eutrophication, which is an environmental concern. Many regions of the Nation have adopted phosphate limitations or bans, affecting about 40% of the U.S. population.

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 required sodium silicates and synthetic zeolites, which are made from soda ash. Liquid detergents, which do not contain any soda ash, competed with powdered detergents and commanded about 50% of the household laundry detergent market in 2012.

## Stocks

Yearend 2012 stocks of dense soda ash in domestic plant silos, terminals, warehouses, and on teamtracks (a small railroad siding or spur track) amounted to 338,000 metric tons (t). Producers indicated that a potential 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 value in 2012 for bulk, dense natural soda ash, free on board (f.o.b.) Green River, WY, and Searles Valley, CA, was \$156.42 per metric ton (\$141.90 per short ton), which was a 6% increase from that of the previous year. The value is not a “price,” but rather the value 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 differed from the annual average values reported to and by the USGS.

Only July 2, Tata Chemicals North America Inc. announced a soda ash price increase of \$10 per short ton effective July 2, 2012, or as contracts allowed for all grades of soda ash and for bulk and packaged products. Tata Chemicals’ new list price for bulk, dense soda ash was \$275 per short ton (Tata Chemicals North America Inc., 2012). On July 10, FMC followed with a soda ash price increase of \$10 per short ton effective August 1, 2012, or as contracts allowed for all grades of soda ash and for both bulk and packaged products. The company stated that the increase was necessary to “recover cost increases and to support continued investment in the business.” The new FMC list price for bulk, dense soda ash was \$275 per short ton (FMC Corp., 2012a).

## 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  $\text{Na}_2\text{CO}_3$ , 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 European Union (EU); however, the members of the U.S. soda ash industry formed another organization for shipping to this region. It is the American-European Soda Ash Shipping Association, Inc. (AESSA) that 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 EU. Both 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. soda ash exports for 2012 were 6.11 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 2012, the regional percentage distribution of U.S. exports to 56 countries were Asia, 29%; South America, 27%; North America, 22%; Europe, 9%; Africa, 5%; the Middle East and Oceania, 3% each; Central America, 1%; and the

Caribbean, less than 1% (table 5). The average free alongside ship value was \$202.43 per metric ton in 2012 compared with \$190.07 per ton in 2011. Although the data in tables 1 and 6 are rounded to three significant digits, the unit values listed in table 6 are based on the unrounded statistics. In 2012, the 10 leading countries, representing 68% of total U.S. soda ash exports were, in decreasing order and percentage of total, Mexico, 18%; Brazil, 11%; Indonesia, 10%; Chile, 6%; Canada, 5%; the Netherlands, 4%; Japan, 4%; the Republic of Korea, 3%; Thailand, 3%; and Taiwan, 3% (table 6). About 45% of all U.S. soda ash exports went through the Columbia-Snake River customs district in Idaho, Oregon, and Washington; the Port Arthur, TX, customs district was the second-ranked customs district with 25% of the total; and the Laredo, TX, customs district was third with 14% of the total (table 5).

Imports of soda ash decreased to 13,000 t in 2012 and came from 20 countries according to U.S. Census Bureau data. In 2012, 74% of soda ash imports were from Italy (32%), Canada (17%), Mexico (13%), and the United Kingdom (12%). The remaining 26% of imports was from Argentina, Belgium, China, Denmark, the Dominican Republic, France, Germany, Greece, Hong Kong, India, Japan, Poland, the Republic of Korea, Romania, Turkey, and Ukraine. The Dominican Republic and Hong Kong were listed as sources; however, neither country produces soda ash. It is possible that the entry was erroneous or that the product was transhipped from another location, such as imports from Canada (which no longer produces soda ash) that may have originated from England. The imports from China actually were thought to be sodium carbonate peroxohydrate that is the active ingredient in algacides and fungicides. The average cost, insurance, and freight value of imported soda ash was \$258.30 per ton, and the customs value was \$207.53 per ton.

## World Review

Soda ash is a mature commodity in which consumption tends to increase in proportion to population and gross domestic product growth rates. For this reason, the leading consumers of soda ash were, for the most part, developed nations with lower growth rates compared with those of developing countries. The developing nations tend to use less soda ash than developed nations but have higher growth rates. 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 sectors.

In 2012, world soda ash production was estimated to be 52.9 Mt, which was a 4% increase from that of 2011. Of the 28 countries that produce natural and synthetic soda ash, the United States was the world's second-ranked producer, accounting for 21% of total world output. Only Botswana, China, Ethiopia, Kenya, Turkey, and the United States produce soda ash from natural sources; the remaining 22 nations manufacture soda ash through various chemical processes, primarily the Solvay process. Total world natural soda ash production represented about 22% of combined world soda ash production.

Eight countries produced 1 Mt/yr or more of soda ash. They were, in descending order, China, the United States, Russia, Germany, Turkey, India, Poland, and France (table 7). These nations accounted for 87% of world production in 2012.

Bulgaria, Romania, and Ukraine had production installations that were rated at about 1 Mt/yr; adverse economic conditions, however, caused these nations to produce below their facilities' design capacities.

**China.**—In 2012, prices for Chinese soda ash dropped as demand fell in China and abroad. Additionally, other factors in the price drop included a fall in raw material prices, soda ash overcapacity in China, and the relative low cost of soda ash produced in the United States (Industrial Minerals, 2012b).

**India.**—One of India's largest soda ash producers, Gujarat Heavy Chemicals Ltd. (GHCL), was served a closure notice in 2012 by the Gujarat Pollution Control Board. The reasons for the closure notice were for causing air and water pollution. The plant reopened after a closure lasting for 15 days. GHCL's plant produces about 850,000 t/yr of synthetic soda ash (Industrial Minerals, 2012a).

**Saudi Arabia.**—The International Institute for Democracy and Electoral Assistance (IDEA) established the IDEA Soda Ash and Calcium Chloride Co. (ISACC) that awarded an engineering and project management contract for the construction of the first synthetic soda ash plant in Jubail II Industrial City. Plans to build the \$300 million soda ash plant progressed in 2012. Project engineering and management were awarded to Jacobs Engineering Group Inc. of the United States. The production capacity of the plant was planned to be 500,000 t/yr of soda ash and 575,000 t/yr of calcium chloride. Startup was expected by yearend 2014 (Industrial Minerals, 2012a).

**Uzbekistan.**—During 2012, the Kungrad Soda Plant began work on expanding production capacity to 150,000 t/yr of soda ash. Completion of the project was expected in the next few years. Initial design capacity of the plant was 100,000 t/yr of soda ash and the plant produced 97,800 t of soda ash in 2011. The main customers of the Kungrad Soda Plant were Kazakhstan, Turkmenistan, and Russia (Hasanov, 2012).

## Outlook

The domestic and foreign industries that consume soda ash continued recovering from the global economic problems that began in 2008. U.S. soda ash producers increased production and exports in 2012 with soda ash prices reaching a record high. Three dominant groups have survived to become the world's leading suppliers of soda ash—ANSAC of the United States (which represented three of the five domestic producers in 2012), Chinese producers, and Solvay S.A. of Belgium. It is very likely that some smaller soda ash facilities in the world may close because of energy and environmental considerations and competition from the major producers.

With the continued recovery in the U.S. and world economy, U.S. soda ash production for 2013 through 2015 is expected to increase. Because exports now exceed domestic consumption, it is forecast that U.S. soda ash suppliers will continue to achieve higher soda ash sales prices by placing greater emphasis on export sales to compete with the more expensive foreign synthetic soda ash. Global economic problems are expected to ease slowly in the next few years and stimulate world soda ash consumption. The United States likely will continue to compete with Chinese soda ash producers in the Far Eastern markets. U.S. soda ash exports started to increase in 2010 and

the trend has continued. U.S. soda ash exports in 2013 are expected to increase, causing domestic soda ash production to increase slightly. Asia and South America remain the most likely areas for increased soda ash consumption in the near future. Additionally, some major soda ash producers were optimistic about increased demand for soda ash in the near term (FMC Corp., 2012b; Tata Chemicals Ltd., 2012).

## References Cited

- Abbey, Robert, 2011, Statement of testimony before Subcommittee on Public Lands and Forests: United States Senate, S.1144, August 3, 3 p. (Accessed September 22, 2011, at [http://www.blm.gov/pgdata/etc/medialib/blm/wo/Communications\\_Directorate/2011\\_congressional.Par.66530.File.dat/S.1144.SodaAsh.Competition.Act.FINAL.pdf](http://www.blm.gov/pgdata/etc/medialib/blm/wo/Communications_Directorate/2011_congressional.Par.66530.File.dat/S.1144.SodaAsh.Competition.Act.FINAL.pdf).)
- FMC Corp., 2011a, FMC increases soda ash production capacity in response to strong export demand: Philadelphia, PA, FMC Corp. news release, January 7, 1 p. (Accessed February 11, 2011, at <http://www.fmcchemicals.com/LinkClick.aspx?link=ContentGranger+PR+010711+FINAL.pdf&tabid=4660&mid=10623>.)
- FMC Corp., 2011b, FMC starts design work to add capacity to Wyoming soda ash facility: Philadelphia, PA, FMC Corp. news release, June 10. (Accessed August 2, 2011, at <http://www.fmcchemicals.com/LinkClick.aspx?link=ContentFINAL+Granger+Second+Phase+Announce+June2011.pdf&tabid=4660&mid=10623>.)
- FMC Corp., 2012a, FMC increases soda ash prices: Philadelphia, PA, FMC Corp. news release, July 10. (Accessed June 10, 2013, at <http://phx.corporate-ir.net/phoenix.zhtml?c=117919&p=irol-ewsArticle&ID=1713402&highlight=>.)
- FMC Corp., 2012b, FMC on growth track to double sales and more than double earnings by 2015: Philadelphia, PA, FMC Corp. news release, December 11, 1 p. (Accessed June 26, 2013, at <http://phx.corporate-ir.net/phoenix.zhtml?c=117919&p=irol-newsArticle&ID=1766368&highlight=>.)
- Hasanov, Humayun, 2012, Nearing 100 percent: Tashkent, Uzbekistan Today, March 2. (Accessed June 25, 2013, at [http://www.ut.uz/eng/business/nearing\\_100\\_percent5.mgr](http://www.ut.uz/eng/business/nearing_100_percent5.mgr).)
- Industrial Minerals, 2012a, India's Gujarat Heavy Chemicals served soda ash closure notice: Industrial Minerals, no. 533, February, p. 12.
- Industrial Minerals, 2012b, Mineral prices drop as demand wanes in China: Industrial Minerals, no. 538, July, p. 54–55.
- Industrial Minerals, 2013, Economic recovery boosts soda ash demand: Industrial Minerals, no. 548, May, p. 30–34.
- Martin, David, 2012, FMC plans Granger plant expansion: The Green River [WY] Star, March 21. (Accessed June 17, 2013, at [http://www.greenriverstar.com/news/article\\_6a38381e-56e2-5477-8e70-7fee844e7e45.html](http://www.greenriverstar.com/news/article_6a38381e-56e2-5477-8e70-7fee844e7e45.html).)

- Tata Chemicals Ltd., 2012, Moody's affirms Tata Chemicals Ba2 ratings, outlook remains stable: Mumbai, India, Tata Chemicals Ltd. media release, November 27. (Accessed June 26, 2013, at [http://tatachemicals.com/media/releases/201211nov/20121127\\_Moody.html#](http://tatachemicals.com/media/releases/201211nov/20121127_Moody.html#).)
- Tata Chemicals North America Inc., 2012, [Untitled]: East Hanover, NJ, Tata Chemicals North America Inc. announcement, July 2, 1 p. (Accessed June 19, 2013, at [http://www.tatachemicals.com/north-america/media\\_center/pdf/Price\\_increase\\_July\\_02\\_2012.pdf](http://www.tatachemicals.com/north-america/media_center/pdf/Price_increase_July_02_2012.pdf).)
- U.S. Department of the Interior, 2011, U.S. Department of the Interior, report to Congress, the Soda Ash Royalty Reduction Act of 2006: U.S. Department of the Interior, September 30, 36 p. (Accessed October 16, 2011, at [http://www.blm.gov/pgdata/etc/medialib/blm/wo/MINERALS\\_REALTY\\_AND\\_RESOURCE\\_PROTECTION\\_/non-energy\\_minerals.Par.8606.File.dat/SodaAshReport\\_09-30-11.pdf](http://www.blm.gov/pgdata/etc/medialib/blm/wo/MINERALS_REALTY_AND_RESOURCE_PROTECTION_/non-energy_minerals.Par.8606.File.dat/SodaAshReport_09-30-11.pdf).)

## 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 STATISTICS<sup>1</sup>

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

	2008	2009	2010	2011	2012
<u>United States:</u>					
<u>Production:</u>					
<u>Soda ash:</u>					
Quantity	11,300	9,310	10,600	10,700	11,100
Value	1,520,000	1,330,000	1,360,000	1,580,000	1,740,000
<u>Value, average annual:</u>					
Per short ton	\$122.11	\$129.88	\$116.47	\$133.57	\$141.90
Per metric ton	\$134.60	\$143.17	\$128.39	\$147.24	\$156.42
Wyoming trona	17,800	15,100	15,900	16,500	17,100
<u>Exports:</u>					
Quantity	5,370	4,410	5,390	5,470	6,110
Value	939,000	838,000	886,000	1,040,000	1,240,000
<u>Imports for consumption:</u>					
Quantity	13	6	20	27	13
Value	3,820	2,350	5,770	5,660	3,360
Stocks, December 31, producers'	259	217	220	282	338
<u>Consumption:</u>					
Apparent	5,860	4,950	5,200	5,220	4,980
Reported	5,700	5,020	5,270	5,150	5,060
World, production <sup>e</sup>	46,700 <sup>r</sup>	44,100 <sup>r</sup>	47,700 <sup>r</sup>	51,000 <sup>r</sup>	52,900

<sup>e</sup>Estimated. <sup>r</sup>Revised.

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

TABLE 2  
U.S. PRODUCTION OF SODIUM COMPOUNDS, BY MONTH<sup>1</sup>

(Thousand metric tons)

	2011		2012	
	Soda ash	Wyoming trona <sup>2</sup>	Soda ash	Wyoming trona <sup>2</sup>
January	888	1,510	929	1,520
February	813	1,410	833	1,410
March	904	1,480	964	1,560
April	824	1,270	861	1,380
May	881	1,290	833	1,330
June	899	1,370	952	1,470
July	918	1,130	933	1,320
August	970	1,450	1,020	1,460
September	849	1,300	892	1,130
October	941	1,480	982	1,540
November	864	1,360	969	1,570
December	975	1,420	966	1,440
Total	10,700	16,500	11,100	17,100

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

<sup>2</sup>Includes solution-mined trona.

TABLE 3  
U.S. PRODUCERS OF SODA ASH IN 2012

(Million short tons unless otherwise noted)

Company	Partner(s)	Plant nameplate capacity	Plant location	Source of sodium carbonate
FMC Wyoming Corp.:				
Granger	None	1.30	Granger, WY	Underground trona.
Green River	Joint venture with Sumitomo Corp. and Nippon Sheet Glass Co., Ltd. (20%, combined)	3.55	Green River, WY	Do.
OCI Chemical Corp.	DC Chemical Co., Ltd. (51%) and Anadarko Petroleum Corp. (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.
Parachute	do.	1.00	Parachute, CO	Underground nahcolite.
Tata Chemicals (Soda Ash) Partners	Joint venture with Owens-Illinois, Inc. (25%)	2.80	Green River, WY	Underground trona.
Total		16.00		
Total	million metric tons	14.50		

Do., do. Ditto.

TABLE 4  
REPORTED CONSUMPTION OF SODA ASH IN THE UNITED STATES, BY END USE, BY QUARTER<sup>1</sup>

(Thousand metric tons)

NAICS <sup>2</sup> code	End use	2011	2012				Total
			1st quarter	2d quarter	3d quarter	4th quarter	
3272	Glass:						
327213	Container	1,260	322	321	312	306	1,260
327211	Flat	973	219	226	240	243	928
327993	Fiber	132	29	28	29	32	117
327212	Other	122	27	29	26	28	110
	Total	2,480	597	604	608	609	2,420
32518	Chemicals	1,510	373	375	368	366	1,480
325611	Soaps and detergents	430	104	92	96	100	392
322	Pulp and paper	85	21	20	23	18	81
221310	Water treatment <sup>3</sup>	58	16	16	17	14	62
56221	Flue gas desulfurization	160	38	30	49	47	164
422	Distributors	282	71	72	70	68	281
	Other	138	33	49	53	50	185
	Total domestic consumption <sup>4</sup>	5,150	1,250	1,260	1,280	1,270	5,060
	Exports <sup>5</sup>	5,470	1,410	1,430	1,450	1,640	5,930
	Canada	249	63	56	56	66	242
	Total industry sales <sup>6</sup>	10,600	2,670	2,680	2,740	2,910	11,000
	Total sales from plants	15,800	2,670	2,720	2,780	2,920	11,100
	Total production	10,700	2,730	2,650	2,840	2,920	11,100

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

<sup>2</sup>North American Industry Classification System.

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

<sup>4</sup>Imports reported by the producer/importer have been distributed into appropriate end-use categories listed above.

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

<sup>6</sup>Represents 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 2012<sup>1</sup>

(Metric tons)

Customs districts	North America	Central America	South America	Caribbean	Europe	Middle East	Africa	Asia	Oceania	Total	Percentage of total
Atlantic:											
Baltimore, MD	--	--	--	--	195	--	--	--	--	195	(2)
Charleston, SC	--	--	--	--	220	--	--	--	--	220	(2)
Miami, FL	--	109	550	67	--	--	--	--	--	726	(2)
New York, NY	--	--	--	--	1,060	--	--	360	--	1,420	(2)
Norfolk, VA	--	--	--	--	706	--	--	--	--	706	(2)
Philadelphia, PA	--	--	--	--	72	--	--	--	--	72	(2)
Savannah, GA	--	--	--	--	--	--	--	55	--	55	(2)
Gulf:											
Houston-Galveston, TX	--	10,900	146,000	594	49	48	137	--	--	158,000	3
New Orleans, LA	--	--	--	--	--	--	--	67	--	67	(2)
Port Arthur, TX	--	4,000	678,000	3,900	460,000	--	327,000	27,300	--	1,500,000	25
North-central:											
Chicago, IL	--	--	--	--	--	--	--	259	--	259	(2)
Cleveland, OH	11	--	--	--	65	--	--	87	--	163	(2)
Detroit, MI	187,000	--	--	--	18	--	--	--	--	187,000	3
Duluth, MN	22,800	--	--	--	--	--	--	--	--	22,800	(2)
Great Falls, MT	25,600	--	--	--	--	--	--	--	--	25,600	(2)
Pembina, ND	4,280	--	--	--	--	--	--	--	--	4,280	(2)
Northeast:											
Buffalo, NY	29,300	--	--	--	--	--	--	--	--	29,300	(2)
Ogdensburg, NY	1,090	--	--	--	--	--	--	--	--	1,090	(2)
Pacific:											
Columbia-Snake River, ID-OR-WA	--	60,500	544,000	--	67,000	162,000	--	1,750,000	191,000	2,770,000	45
Los Angeles, CA	--	2,500	251,000	--	5,140	98	--	8,280	5,830	273,000	4
San Diego, CA	60,700	--	7,200	--	--	--	--	--	7,730	75,600	1
San Francisco, CA	--	--	--	--	--	3,270	--	59	--	3,330	(2)
Seattle, WA	18,300	--	--	--	--	--	--	12,200	--	30,500	(2)
Southwest:											
Dallas-Fort Worth, TX	--	--	--	--	--	--	58	--	--	58	(2)
El Paso, TX	179,000	--	--	--	--	--	--	--	--	179,000	3
Laredo, TX	840,000	--	--	--	--	--	--	--	--	840,000	14
Nogales, AZ	8	--	--	--	--	--	--	--	--	8	(2)
Unknown	338	--	--	--	--	--	--	--	--	338	(2)
Total	1,370,000	78,000	1,630,000	4,560	534,000	166,000	327,000	1,800,000	204,000	6,110,000	100
Percentage of total	22	1	27	(2)	9	3	5	29	3	100	XX

XX Not applicable. -- Zero.

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

<sup>2</sup>Less than 1/2 unit.

Source: U.S. Census Bureau.



TABLE 6  
U.S. EXPORTS OF SODA ASH, BY COUNTRY<sup>1</sup>

Country	2011			2012		
	Quantity (thousand metric tons)	Value <sup>2</sup> (thousands)	Unit value	Quantity (thousand metric tons)	Value <sup>2</sup> (thousands)	Unit value
Argentina	100	\$19,000	\$190	119	\$24,500	\$206
Australia	136	28,600	210	162	35,600	220
Belgium	138	21,400	155	96	12,800	133
Brazil	659	111,000	169	688	139,000	201
Canada	288	57,500	200	289	56,100	194
Chile	294	51,900	176	362	77,700	215
Colombia	132	22,800	173	168	31,500	188
Costa Rica	24	4,660	194	18	4,010	223
Ecuador	14	2,930	209	27	5,890	218
El Salvador	16	3,350	209	10	2,020	202
France	49	6,910	141	36	5,400	150
Guatemala	37	7,340	198	42	9,100	217
Indonesia	526	112,000	212	639	134,000	210
Japan	240	43,900	183	247	48,900	198
Korea, Republic of	216	46,400	215	193	43,500	225
Lithuania	71	10,800	152	42	5,420	129
Malaysia	43	9,520	221	61	13,500	221
Mexico	886	192,000	217	1,080	238,000	221
Netherlands	204	35,200	173	272	44,000	162
New Zealand	23	4,400	191	42	9,650	230
Peru	104	19,800	191	92	20,400	221
Philippines	66	12,700	193	53	11,800	222
Portugal	27	3,800	141	27	3,720	138
Saudi Arabia	88	13,500	153	101	21,000	207
South Africa	216	29,800	138	153	22,900	150
Spain	69	10,400	150	45	7,240	161
Taiwan	211	43,100	204	184	38,800	211
Thailand	153	29,400	192	186	41,900	225
Tunisia	103	14,100	137	173	30,000	173
United Arab Emirates	55	8,390	152	64	13,100	205
United Kingdom	19	5,810	306	--	--	--
Venezuela	189	43,400	230	172	43,300	252
Vietnam	29	5,400	186	56	11,700	209
Other	48	7,890	164	210	29,800	142
Total	5,470	1,040,000	190	6,110	1,240,000	202

-- Zero.

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

<sup>2</sup>Free alongside ship value.

Source: U.S. Census Bureau.

TABLE 7  
SODA ASH: ESTIMATED WORLD PRODUCTION, BY COUNTRY<sup>1,2</sup>

(Thousand metric tons)

Country <sup>3</sup>	2008	2009	2010	2011	2012
Australia	310	310	310	310	310
Bosnia and Herzegovina	NA <sup>r</sup>	NA <sup>r</sup>	NA <sup>r</sup>	NA <sup>r</sup>	NA
Botswana <sup>4</sup>	264 <sup>r,5</sup>	215 <sup>r,5</sup>	241 <sup>r,5</sup>	230 <sup>r</sup>	230
Brazil	200	200	200	200	200
Bulgaria	800	800	800	800	800
Chad	12	12	12	13	13
China <sup>5</sup>	18,540	19,450	20,350	22,940 <sup>r</sup>	24,040
Egypt	50	50	50	50	50
Ethiopia <sup>6</sup>	2 <sup>r,5</sup>	2 <sup>r</sup>	2 <sup>r</sup>	2 <sup>r</sup>	2
France	1,000	1,000	1,000	1,000	1,000
Germany <sup>5</sup>	2,715	2,291	2,539	2,668 <sup>r</sup>	2,627
India	1,500	1,500	1,500	1,500	1,500
Italy	500	500	500	500	500
Japan	400	400	400	400	400
Kenya <sup>4</sup>	513 <sup>5</sup>	405 <sup>5</sup>	474 <sup>5</sup>	499 <sup>r,5</sup>	500
Korea, Republic of	-- <sup>r</sup>	-- <sup>r</sup>	-- <sup>r</sup>	-- <sup>r</sup>	300
Mexico	290	290	290	290	290
Netherlands	400	400	400	400	400
Pakistan	250	260	394 <sup>r</sup>	400 <sup>r</sup>	410
Poland	1,190	890	1,010	1,061 <sup>r,5</sup>	1,060
Portugal	150	150	150	150	150
Romania	450	400	350 <sup>r</sup>	420 <sup>r</sup>	450
Russia	2,800	2,322 <sup>r,5</sup>	2,670 <sup>r,5</sup>	2,822 <sup>r,5</sup>	2,850
Spain	500	500	500	500	500
Taiwan	140	140	140	140	140
Turkey	949 <sup>5</sup>	1,079 <sup>5</sup>	1,623 <sup>r,5</sup>	1,749 <sup>r,5</sup>	1,800
Ukraine	978	680	707	700 <sup>r</sup>	700
United Kingdom	500	500	500	500	500
United States <sup>4,5</sup>	11,300	9,310	10,600	10,700	11,100
Total	46,700 <sup>r</sup>	44,100 <sup>r</sup>	47,700 <sup>r</sup>	51,000 <sup>r</sup>	52,900

<sup>r</sup>Revised. NA Not available. -- Zero.

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

<sup>2</sup>Table includes data available through August 1, 2013. Synthetic unless otherwise specified.

<sup>3</sup>In addition to the countries listed, Bosnia and Herzegovina, Iran, and Tanzania produced soda ash; available general information is inadequate for the formulation of reliable estimates of output levels.

<sup>4</sup>Natural only.

<sup>5</sup>Reported figure.

<sup>6</sup>Data for the Ethiopian calendar year ending July 7 of the year listed.