



2013 Minerals Yearbook

GYPSUM [ADVANCE RELEASE]

GYPSUM

By Robert D. Crangle, Jr.

Domestic survey data and tables were prepared by Susan M. Weaver, statistical assistant, and the world production table was prepared by Lisa D. Miller, international data coordinator.

In 2013, the United States ranked second worldwide in the production of crude mined gypsum, with 15.5 million metric tons (Mt) of production and a reported value of \$137 million. This was an increase of 4% and 20%, respectively, from 2012. China was the world's leading producer and consumer of mined gypsum, with estimated production of 129 Mt of crude gypsum (table 7). The consumption of gypsum in the United States decreased slightly from 30,700 Mt in 2012 to 30,200 Mt in 2013. Calcined gypsum production increased by 14% to 14.6 Mt in 2013 compared with 12.8 Mt produced in 2012.

The estimated sales of synthetic gypsum decreased by 11% to 10.8 Mt in 2013. Coal-burning powerplants in the United States are required to operate sulfur dioxide scrubbing systems, which results in the precipitation of large amounts of byproduct gypsum. Because byproduct gypsum is available at a substantially lower cost than its mined counterpart, a number of wallboard production facilities have been constructed adjacent to coal-fired powerplants. Approximately 51% of the synthetic gypsum produced in 2013 was neither sold nor used and in most cases was discarded (American Coal Ash Association, 2014).

Legislation and Government Programs

Several million tons of gypsum waste are generated every year by building demolition, wallboard installation, and wallboard manufacturing. Construction costs are lower when full pieces of uncut wallboard are used in place of multiple, smaller remnants. As a result, between 10% and 12% of the wallboard used in new construction and renovation is discarded as scrap. Only a small part of this waste has been recycled. In 2010, the Massachusetts Department of Energy and Environmental Affairs banned the disposal of clean wallboard from State waste disposal facilities (Massachusetts Department of Energy and Environmental Affairs, 2011). To date, no other State has instituted a similar regulation that addresses the disposal of wallboard. As landfill space becomes more scarce, recycling is expected to increase. In addition to recycling scrap in wallboard plants, wallboard scrap may also be ground and used as a soil conditioner.

Wallboard manufacturers and the construction industry have been exploring ways to return scrap and waste wallboard to plants for recycling. Other potential markets for recycled gypsum include cement production, as a stucco additive, sludge drying, water treatment, grease absorption, and marking of athletic fields. Until costs and legislation associated with the disposal of scrap gypsum in landfills becomes more restrictive, recycling will likely continue to remain a low priority within the industry.

Imports of corrosive wallboard from China into the United States continued to be an issue. The U.S. Consumer Product Safety Commission received more than 4,000 reports of possible

corrosive wallboard from residents in 44 States, the District of Columbia, American Samoa, and Puerto Rico (U.S. Consumer Product Safety Commission, 2014). Sulfide gases emitted from the problematic drywall were suspected of damaging copper wiring and plumbing and also posed concerns for human health (Global Gypsum Magazine, 2010). Following several years of complaints regarding corrosive wallboard imported from China, a class-action settlement among owners of approximately 20,000 affected single-family homes, most of which are located in Gulf Coast and southern U.S. States, and Chinese wallboard manufacturer, Knauf Plasterboard Tianjin Co. Ltd., was settled on July 9, 2013 (U.S. District Court, 2013).

Production

Industry data for gypsum were collected by the U.S. Geological Survey (USGS) from semiannual and annual surveys of gypsum operations and from quarterly data provided by the Gypsum Association. In 2013, the USGS annual survey canvassed 112 gypsum production operations that accounted for all domestic output of crude, calcined, and byproduct gypsum. Data were available for all the operations through this survey, the Gypsum Association, the American Coal Ash Association, State agencies, and Federal agencies. Some production was estimated on the basis of employment records published by the Mine Safety and Health Administration.

The United States was the world's second leading producer of crude gypsum in 2013, accounting for 6% of global output (table 7). During 2013, crude gypsum in the United States was mined by 46 companies at 54 mines in 16 States (table 2). The leading crude gypsum-producing States were, in descending order, Texas, Oklahoma, Kansas, Nevada, Indiana, California, and Iowa, which together accounted for 78% of total domestic output.

The U.S. gypsum industry primarily consisted of a few large, vertically integrated companies that mined gypsum and manufactured wallboard, plaster, and other gypsum products. Companies with the highest production levels of crude gypsum were Georgia-Pacific LLC with 10 mines, USG Corp. (USG) with 8 mines, National Gypsum Co. with 6 mines, CertainTeed Corp. with 6 mines, American Gypsum with 3 mines, and PABCO Gypsum with 1 mine. In 2013, these six companies produced 49% of U.S. crude gypsum.

In 2013, domestic output of calcined gypsum increased by 14% to 14.6 Mt valued at \$402 million (table 1); 12.6 Mt of calcined gypsum was used in the production of plasters and prefabricated products (table 3).

In addition to crude gypsum production, synthetic gypsum was generated as a byproduct of various industrial processes. The primary source of synthetic gypsum was flue gas desulfurization (FGD) systems at coal-fired electric

powerplants. Smaller quantities of synthetic gypsum were derived as byproducts of chemical processes such as acid neutralization, citric acid production, sugar production from sugar beets, and titanium dioxide production. Synthetic gypsum was used as a substitute for crude gypsum, principally for wallboard manufacturing, cement production, and agricultural purposes, in descending order of tonnage.

Sixteen synthetic gypsum producers sold an estimated 10.8 Mt of synthetic gypsum during 2013, with an estimated value of \$17.9 million. Approximately 51% of the synthetic gypsum produced in 2013 was neither sold nor used and in most cases was discarded (American Coal Ash Association, 2014).

For 2013, gypsum-derived products, including agricultural products, cement, plasters, and wallboard, totaled 14.1 Mt with a value of \$3.01 billion. This represented a production increase of 12% from the 12.5 Mt produced in 2012 and a 30% increase in value from \$2.31 billion (table 3). The large increase in value was mainly attributed to higher prices assessed for prefabricated products.

During 2013, eight companies manufactured gypsum wallboard products at 67 plants in the United States. Approximately 21.8 billion square feet (2.03 billion square meters) of wallboard products were shipped, a 15% increase compared with 2012 (table 4).

In 2013, Georgia-Pacific completed its \$710 million purchase of Temple-Inland Building Products, which included the acquisition of two gypsum mines and 15 plant localities. Koch Industries, Inc., based in Wichita, KS, purchased Georgia-Pacific in 2005 (Market Watch, 2013). The decline in the U.S. housing market that began in 2007 and continued through 2010 resulted in flat and declining sales for most gypsum producers, which led to layoffs and the idling of wallboard production plants (Crangle, 2011). However, beginning in late 2010 and continuing through 2013, housing starts, an indicator of gypsum consumption in residential construction, increased each year. In 2013, housing starts increased by 18% from those of 2012 (U.S. Census Bureau, 2014b).

Consumption

In 2013, U.S. apparent consumption of domestic gypsum was more than 29.5 Mt, slightly less than that of 2012. Domestic sources (mined crude plus an estimated 10.8 Mt of synthetic gypsum consumed) met approximately 89% of domestic consumption requirements; imports, totaling 3.29 Mt, satisfied the remaining need. In 2013, approximately 66% of the gypsum mined or produced in the United States came from synthetic sources, 10% less than that of 2012 (American Coal Ash Association, 2014). Synthetic gypsum continued to be a significant component of the overall gypsum marketplace in 2013. This was largely the result of the lower costs associated with the purchase and transportation of FGD gypsum, which is often available near the same urban centers where wallboard production facilities are located.

Gypsum output is categorized as either calcined or uncalcined (table 3). Calcined gypsum was produced domestically from mined crude and synthetic gypsum to manufacture wallboard and plaster products. Uncalcined gypsum was used to produce portland cement and in agriculture. Miscellaneous uses, such

as athletic field markings, accounted for less than 1% of gypsum consumption.

In 2013, more than 99% of calcined gypsum was used in the production of prefabricated products, most of which consisted of wallboard (table 3). Type X gypsum board, so named because of extra fire retardation qualities, consumed 40%, by weight, of calcined gypsum. Half-inch wallboard accounted for 38% of total calcined gypsum consumption. Water- and moisture-resistant board, typically used in bathroom and kitchen walls, accounted for 10% of calcined gypsum consumption. Other wallboard, including mobile-home board, predecorated wallboard, sheathing, and veneer base, composed most of the balance (table 4).

Uncalcined gypsum consumption in the United States decreased by 7% to 1.44 Mt in 2013 from 1.56 Mt in 2012. About 875,000 metric tons (t), or 61%, was consumed in portland cement production (table 3). Gypsum is added to cement to retard its setting time and accounts for 2% to 4%, by weight, of cement output (Roskill Information Services Ltd., 2009, p. 320). Most of the remainder of the uncalcined gypsum consumed, about 569,000 t, was used for agricultural purposes, which was an increase of 10% from that of 2012. Finely ground gypsum rock was used in agriculture and other industries to neutralize acidic soils, improve soil permeability, add nutrients, stabilize slopes, and provide catalytic support for maximum fertilizer benefits. Small quantities of high-purity gypsum also were used in a wide range of industrial applications, including the production of food, glass, paper, and pharmaceuticals.

Gypsum waste generated by the wallboard manufacturing process may be recycled. The gypsum core and paper covering are separated, and the gypsum is reinjected with new material into the manufacturing stream.

Prices

In 2013, the average unit values (free on board, mine or plant) reported by U.S. producers were \$8.86 per metric ton for crude gypsum, an increase of 15% from that of 2012, and \$27.60 per ton for calcined gypsum, a decrease of 4% from that of 2012 (table 1). The average unit value for plaster reported by domestic producers during the year was \$430 per ton, slightly more than that which was reported in 2012 (table 3). The average unit value of uncalcined gypsum used primarily for agricultural purposes was approximately \$40.30 per ton, a 10% decrease from 2012, and that used in cement production was about \$20.60 per ton, a 12% increase from 2012 (table 3).

During 2013, prices for gypsum wallboard increased by 14% and total wallboard production increased by 15% (table 4). The combined average price of ½-inch wallboard for 20 major U.S. metropolitan cities at the conclusion of 2013 was \$224 per 100 square meters (\$212 per 1,000 square feet). Average ½-inch wallboard prices were lowest in St. Louis, MO (\$107 per 100 square meters or \$100 per 1,000 square feet), followed by Detroit, MI (\$113 per 100 square meters or \$105 per 1,000 square feet), and Cleveland, OH (\$129 per 100 square meters or \$120 per 1,000 square feet). The highest average wallboard prices were in Boston, MA (\$346 per 100 square meters or \$321 per 1,000 square feet), followed by Pittsburgh, PA (\$318 per 100 square meters or \$295 per 1,000 square feet),

and San Francisco, CA (\$287 per 100 square meters or \$267 per 1,000 square feet) (Engineering News-Record, 2014).

Foreign Trade

In 2013, the United States led the world in international trade of gypsum and gypsum products (tables 5, 6). The United States imported crude gypsum from 11 countries and exported to 81 countries and territories, 76% of which went to Canada.

Imports of crude gypsum in 2013 were slightly more than those of 2012 and accounted for 11% of apparent consumption. Canada and Mexico accounted for 76% of imported gypsum, and imports from Spain supplied most of the remainder. The majority of imports from Canada went to East Coast plants, and Mexican sources chiefly served the West Coast. Most of the crude gypsum imported by the United States from Mexico was produced by Compañía Minera Caopas, S.A. de C.V. and Compañía Occidental Mexicana S.A. de C.V. in Baja California Sur, both of which operate mines on the Baja California Peninsula (Compañía Occidental Mexicana S.A. de C.V., 2005; Compañía Minera Caopas, S.A. de C.V., 2010). Almost all gypsum imported from Canada came from Nova Scotia. The completion of large wallboard manufacturing plants near coal-fired powerplants along the east coast may reduce gypsum imports in the future.

Wallboard exports decreased by 3% in 2013, totaling about 834,000 t valued at \$150 million, of which approximately 92% went to Canada. Wallboard imports, almost all of which originated from Canada and Mexico, increased by 10% in 2013, totaling 327,000 t valued at \$66.8 million (table 6).

World Production

Global crude gypsum production in 2013 was estimated to be 244 Mt, a slight increase compared with that of 2012, when production totaled 240 Mt (table 1). In 2013, 79 countries produced gypsum, with the top 10 producers accounting for 82% of total world production (table 7). China was the leading producer of crude gypsum in 2013 with an estimated 129.0 Mt, followed by the United States with 15.5 Mt, Iran with 15 Mt, Turkey with 8.3 Mt, Spain with 6.4 Mt, Thailand with 6.3 Mt, Japan with 5.5 Mt, Russia with 5.1 Mt, Mexico with 5.1 Mt, and Italy with 4.1 Mt.

North American production accounted for 9% of total crude gypsum production. Although the use of gypsum wallboard increased worldwide, only industrialized nations used gypsum primarily for wallboard products. In developing countries, especially in Asia and the Middle East, most gypsum was used in the production of cement or plaster products. World production may have been underestimated because output by some foreign gypsum producers was used to manufacture products onsite, which may not have been reported. Additionally, production from small deposits in developing nations was intermittent and in many cases unreported.

Worldwide, the leading use of gypsum is in the manufacture of cement and concrete. In 2012, the last year worldwide end-use data were available, cement manufacture accounted for approximately 50% of worldwide gypsum consumption, and plaster products, including wallboard, accounted for

approximately 30% of all consumption (Satterthwaite, 2013; van Oss, 2013).

As a low-value, high-bulk mineral commodity mined from deposits widely distributed throughout the world, gypsum tended to be consumed within the many countries where it was produced. Less than 20% of the world's crude gypsum production was estimated to enter international trade. Only a few countries, such as Canada, Mexico, Spain, and Thailand, were major crude gypsum exporters; of these, Canada and Mexico were significant exporters because their large deposits were near wallboard markets in the United States.

Estimated world production capacity for gypsum wallboard in 2013 exceeded 17 billion square meters per year (about 183 billion square feet per year) at more than 250 plants worldwide. Approximately 20% of this capacity was in the United States; Asia and Western Europe each accounted for about 20% of capacity.

World Review

Asia.—Boral Ltd., Australia's leading building and construction materials producer, announced a joint venture with USG Corp. in October 2013, owned 50% by each company, under which USG paid \$575 million to Boral (Yueyang, 2013). Boral remained the leading supplier of wallboard in Asia in 2013. Boral Gypsum announced a 40% wallboard market share throughout Asia (Boral Ltd., 2014, p. 14).

Europe.—Lafarge Group (France) sold its gypsum operations in North America in August 2013 to an affiliate of Lone Star Funds, a private equity firm headquartered in Dallas, TX, in an attempt to focus its organizational efforts toward aggregates, cement, and concrete operations (Lafarge Group, 2014, p. 27).

Canada.—Canada produced 2.65 Mt of crude gypsum, a 4% increase from 2.55 Mt in 2012. About 1.08 Mt, or 41% of Canada's production, was exported to the United States. In 2013, CGC Inc. (a subsidiary of USG) was the largest manufacturer of gypsum wallboard in eastern Canada and accounted for approximately \$417 million, or 11%, of USG's total global net sales (USG Corp., 2014, p. 2, 21).

China.—In 2013, Beijing New Building Materials (BNBM), the leading gypsum board producer in the world, operated wallboard plants in China with an estimated production capacity of 1.65 billion square meters per year. Between 2006 and 2013, China's wallboard production grew at an annual production rate of 21%, with 2.7 billion square meters of manufactured wallboard in 2013 (Tiwari, 2014). The Knauf Group (Germany) expanded its production capacity at its China-based operations by 50% (Global Gypsum, 2012). Wallboard has become the standard building material in commercial construction for non-load-bearing walls and ceilings in China, with an estimated 80% of all domestically consumed wallboard used in commercial construction (Global Gypsum Magazine, 2011). Because gypsum use in residential construction is lower, the potential for substantial growth in wallboard consumption exists in China (Rapoza, 2013).

Japan.—Yoshino Gypsum Co., Ltd., which opened Japan's first wallboard factory in 1921, was the leading wallboard producer with 16 plants throughout Japan. The company's combined capacity of 350 million square meters per year

accounted for about 80% of Japan's total wallboard output (Global Gypsum Magazine, 2012). With few crude gypsum mining resources, Japan stopped producing crude gypsum in 1976 and has relied upon synthetic and recycled gypsum since then to meet much of its domestic demand (Pressler, 1984).

Mexico.—In 2013, gypsum production in Mexico was 5.09 Mt, an 8% increase from that of 2012. About 1.41 Mt, or 28% of Mexico's 2013 crude gypsum production, was exported to the United States. In 2013, USG Mexico, S.A. de C.V., the leading manufacturer of wallboard in Mexico with three manufacturing facilities, produced more than 55% of Mexico's wallboard and reported net sales of \$177 million (USG Corp., 2014, p. 2, 29).

Outlook

The median sales price for residential new homes increased nationwide in 2013 by approximately 9% from that of 2012 (U.S. Census Bureau, 2014a). A combination of increased housing starts, up by more than 18% from 2012, coupled with historically low 30-year mortgage interest rates and a low level of housing inventory continue to encourage increased sales activities within the housing sector in 2013, and by extension, the wallboard marketplace (Irwin, 2012; Brennan, 2013; Freddie Mac, 2014). Because the residential housing market is responsible for approximately 60% of the consumption of gypsum products, a key economic indicator used by the gypsum and wallboard industries is the number of new housing starts, as measured by the issuance of new building permits. Since 1959, the average number of housing starts, including multidwelling units, is 1.5 million per year. Housing starts averaged about 1.8 million per year during the 5 years preceding the recessionary years, which began in 2007. Housing starts in 2012 and 2013 were 781,000 and 925,000, respectively (U.S. Census Bureau, 2014b). As the surplus of residential real estate dwellings constructed before 2009 is drawn down, the Nation's annual population growth of more than 3,000,000, alone, may necessitate an increase in residential construction in the near future (Irwin, 2011; Zibel and Bater, 2011; U.S. Census Bureau, 2013).

The future of synthetic gypsum, following more than 20 years of large annual growth rates, may begin to slow as significant supplies of comparatively less expensive and cleaner burning natural gas compete with coal in the generation of electrical power. The increased production and consumption of domestic shale gas could lead to a corresponding decrease in coal consumption and, with it, a decrease in the production of synthetic gypsum. Shale-gas production in 2013 was 11.9 billion cubic feet (BCF), which was 13% more than that of 2012, and more than four times the 2.87 BCF produced in 2008 (U.S. Energy Information Administration, 2014).

In the long term, as disposal areas fill and the opening of new disposal sites becomes increasingly difficult, power companies may continue in the trend of converting electrical generation plants to operate on natural gas, especially if shale-gas supplies continue to offer an economically attractive alternative to coal. Because the retrofitting of coal-fired electric powerplants with desulfurization systems has been accomplished for most plants and less expensive natural gas is available for electrical

generation, FGD production may stabilize. The changeover of crude to FGD gypsum likely will be limited to FGD plants within close proximity to wallboard production facilities or to new wallboard plants that would be constructed adjacent to existing FGD plants.

The U.S. gypsum industry has been moving toward the use of large-capacity wallboard plants supplied from multiple sources, including synthetic gypsum from coal-fired powerplants. These larger wallboard plants have been built in regions of high population and growth, which are the areas of highest consumption. Older and less efficient crude-gypsum-fed plants may find it increasingly difficult to compete but could see a revival with regard to the possibility of lesser amounts of consumed FGD. In response to increased public awareness, the gypsum industry may boost the recycling of scrap gypsum in its raw materials streams. The industry may also increase the use of labels, such as the U.S. Green Building Council's LEED program, which certifies varying levels of eco-conscious building practices (U.S. Green Building Council, 2015).

Industry trends indicate significant developments abroad in the coming decade. The pace and magnitude of wallboard plant construction in Asia, particularly in China, India, and Thailand, suggest that the continent, with billions of potential consumers, will likely become one of the world's leading gypsum wallboard markets. Should the economic conditions in the United States more favorably affect the U.S. housing sector, and in turn domestic consumption for gypsum, Canada's gypsum production could increase. Elsewhere, growth in wallboard production capacity and the recognition of the convenience and economy of wallboard as a building material in Central America, Europe, India, and South America means that wallboard manufacturing may require increased gypsum production in future years. A decline in national and global economic conditions, however, could hamper such growth.

References Cited

- American Coal Ash Association, 2014, 2013 coal combustion product (CCP) production & use survey report: Farmington Hills, MI, American Coal Ash Association, December 31, 1 p. (Accessed April 29, 2015, at <http://www.acaa-usa.org/Portals/9/Files/PDFs/2013ReportFINAL.pdf>.)
- Boral Ltd., 2014, Boral Ltd. annual report 2013: Sydney, New South Wales, Australia, Boral Ltd., 142 p. (Accessed November 21, 2014, at <http://www.boral.com.au/Images/common/pdfs/annual-reports/Boral-Annual-Report-2013.pdf>.)
- Brennan, Morgan, 2013, What to expect from housing in the second half of 2013: Forbes, July 26. (Accessed November 20, 2014, at <http://www.forbes.com/sites/morganbrennan/2013/07/26/what-to-expect-from-housing-in-the-second-half-of-2013/>.)
- Compañía Minera Caopas, S.A. de C.V., 2010, Company profile: Saltillo, Mexico, Compañía Minera Caopas, S.A. de C.V. (Accessed November 12, 2014, at <http://www.caopas.net/Profile.aspx>.)
- Compañía Occidental Mexicana S.A. de C.V., 2005, Untitled: Isla San Marcos, Mexico, Compañía Occidental Mexicana S.A. de C.V. (Accessed November 12, 2014, at <http://www.comsamexico.com.mx/mision.htm>.)
- Crangle, R.D., Jr., 2011, Trends in U.S. gypsum consumption: Global Gypsum Magazine, January, p. 28.
- Engineering News-Record, 2014, Construction economics: Engineering News-Record, v. 270, no. 3, January 20, p. 23–24.
- Freddie Mac, 2014, 30-year fixed-rate mortgages since 1971: McLean, VA, Freddie Mac. (Accessed November 10, 2014, at <http://www.freddiemac.com/pmms/pmms30.htm>.)
- Global Gypsum Magazine, 2010, Corporation focus—China National Building Material Group Corporation: Global Gypsum Magazine, September/October, p. 28.

- Global Gypsum Magazine, 2011, The status and development trends of the wallboard industry in China: Global Gypsum Magazine, March 3. (Accessed April 2, 2014, at <http://www.globalgypsum.com/magazine/articles/322-the-status-and-development-trends-of-the-wallboard-industry-in-china>.)
- Global Gypsum Magazine, 2012, Yoshino Gypsum: Global Gypsum Magazine, March, p. 16.
- Global Gypsum News, 2012, Knauf expands capacity by 50% in China: Global Gypsum News, May 23. (Accessed May 4, 2015, at <http://www.globalgypsum.com/news/item/767-knauf-expands-capacity-by-50-in-china>.)
- Irwin, Neil, 2011, Is housing bouncing back?: The Washington Post, December 20. (Accessed April 3, 2014, at http://www.washingtonpost.com/business/economy/is-housing-bouncing-back/2011/12/20/gIQAwpYY70_story.html.)
- Irwin, Neil, 2012, Wall street is betting on a housing recovery. Here's why that's great news: The Washington Post, December 19. (Accessed April 3, 2014, at <http://www.washingtonpost.com/blogs/wonkblog/wp/2012/12/19/wall-street-is-betting-on-a-housing-recovery-why-thats-great-news/>.)
- Lafarge Group, 2014, Annual report 2013: Paris, France, Lafarge Group, March 22, 290 p. (Accessed November 21, 2014, at http://www.lafarge.com/04022014-press_publication-2013_annual_report-uk.pdf.)
- Market Watch, 2013, Georgia-Pacific completes asset acquisition of Temple-Inland Building Products: Market Watch, July 19. (Accessed September 18, 2014, at <http://www.marketwatch.com/story/georgia-pacific-completes-asset-acquisition-of-temple-inland-building-products-2013-07-19>.)
- Massachusetts Department of Energy and Environmental Affairs, 2011, Massachusetts waste disposal bans: Boston, Massachusetts, Massachusetts Department of Energy and Environmental Affairs, March, 2 p. (Accessed March 31, 2014, at http://www.dighton-ma.gov/public_documents/dightonma_health/MADEP%20Waste%20Ban%20Regulation%20&%20Materials%20Listing.pdf.)
- Pressler, Jean, 1984, Byproduct gypsum, in Kuntze, R.A., ed., The chemistry and technology of gypsum: American Society for Testing and Materials Special Technical Publication 861, p. 105–116.
- Rapoza, Kenneth, 2013, China housing bubble up, up and away: Forbes, March 18. (Accessed April 2, 2014, at <http://www.forbes.com/sites/kenrapoza/2013/03/18/china-housing-bubble-up-up-and-away/>.)
- Roskill Information Services Ltd., 2009, Gypsum and anhydrite—Global industry markets and outlook (10th ed.): London, United Kingdom, Roskill Information Services Ltd., 367 p.
- Satterthwaite, Kerry, 2013, Roskill's market outlook for North American gypsum to 2017: London, United Kingdom, Roskill Information Services Ltd., October 23. (Accessed November 12, 2014, at <http://www.roskill.com/news/roskill2019s-market-outlook-for-north-american-gypsum-to-2017/?searchterm=gypsum>.)
- Tiwari, Ritesh, 2014, Global and China gypsum board industry report 2014–2016: PRWeb. (Accessed November 20, 2014, at <http://www.prweb.com/releases/gypsum-board-industry/report-2014-2016/prweb12155688.htm>.)
- U.S. Census Bureau, 2013, U.S. population projections: U.S. Census Bureau. (Accessed November 20, 2014, at <http://www.census.gov/population/projections/data/national/2012/summarytables.html>.)
- U.S. Census Bureau, 2014a, Median and average sales prices of new homes sold in United States: U.S. Census Bureau, 13 p. (Accessed November 20, 2014, at <https://www.census.gov/construction/nrs/pdf/uspricemon.pdf>.)
- U.S. Census Bureau, 2014b, New privately owned housing units started: U.S. Census Bureau, 2 p. (Accessed November 10, 2014, at <http://www.census.gov/construction/nrc/pdf/startsan.pdf>.)
- U.S. Consumer Product Safety Commission, 2014, Drywall information center: U.S. Consumer Product Safety Commission. (Accessed November 12, 2014, at <http://www.cpsc.gov/en/Safety-Education/Safety-Education-Centers/Drywall-Information-Center/>.)
- U.S. District Court, 2013, MDL–2047 Chinese-manufactured drywall products liability litigation: New Orleans, LA, U.S. District Court, August 23. (Accessed November 13, 2014, at <http://www.laed.uscourts.gov/drywall/Settlements.htm>.)
- U.S. Energy Information Administration, 2014, Natural gas: U.S. Energy Information Administration, October 31. (Accessed November 12, 2014, at http://www.eia.gov/dnav/ng/ng_prod_sum_dc_u_NUS_a.htm.)
- USG Corp., 2014, Form 10–K—2013: U.S. Securities and Exchange Commission, 92 p. (Accessed November 17, 2014, at <http://phx.corporate-ir.net/External.File?item=UGFyZW50SUQ9NTM4NTQzZfENoaWxkSUQ9MjI3OTQ4fFR5cGU9MQ==&t=1>.)
- U.S. Green Building Council, [undated], Overview: Washington, DC, U.S. Green Building Council. (Accessed April 27, 2015, at <http://www.usgbc.org/leed>.)
- van Oss, H.G., 2013, Cement: U.S. Geological Survey Mineral Commodity Summaries 2013, p. 38–39.
- Yueyang, Maggie Lu, 2013, Australia's Boral and USG Corp announce \$1.6 billion joint venture: Reuters, October 16. (Accessed November 20, 2014, at <http://www.reuters.com/article/2013/10/16/us-boral-usg-jv-idUSBRE99F18F20131016>.)
- Zibel, Alan, and Bater, Jeff, 2011, Multifamily construction drives housing starts jump: The Wall Street Journal, December 20. (Accessed April 3, 2014, at <http://online.wsj.com/article/SB10001424052970204791104577110204041040514.html>.)

GENERAL SOURCES OF INFORMATION

U.S. Geological Survey Publications

- Coal Combustion Products. Ch. in Minerals Yearbook, annual (1994–2000).
- Gypsum. Ch. in Mineral Commodity Summaries, annual.
- Gypsum. Ch. in United States Mineral Resources, Professional Paper 820, 1973.
- Gypsum. Mineral Industry Surveys, monthly.
- Gypsum Deposits of the United States, Bulletin 697, 1920.
- Historical Statistics for Mineral and Material Commodities in the United States. Data Series 140.

Other

- Gypsum. Ch. in Mineral Facts and Problems, U.S. Bureau of Mines Bulletin 675, 1985.
- Gypsum Association.

TABLE 1
SALIENT GYPSUM STATISTICS¹

(Thousand metric tons and thousand dollars)

	2009	2010	2011	2012	2013
United States:					
Crude:					
Production:					
Quantity	10,100 ^r	9,560 ^r	9,770 ^r	14,800 ^r	15,500
Value	74,700 ^r	66,100 ^r	80,400 ^r	115,000 ^r	137,000
Imports for consumption	4,220	3,330	3,330	3,250	3,290
Synthetic gypsum sales ²	8,120	10,700	11,800	12,100	10,800
Calcined:					
Production:					
Quantity	13,400	12,400	11,900	12,800	14,600
Value	471,000	366,000	340,000	366,000	402,000
Products sold, value	1,480,000	1,530,000	1,470,000	2,230,000	2,940,000
Exports, value	37,800	42,200	48,300 ^r	39,200	44,100
Imports for consumption, value	6,800	7,180	7,780	7,150	5,830
World, production	231,000 ^r	226,000 ^r	237,000 ^r	240,000 ^r	244,000 ^e

^eEstimated. ^rRevised.

¹Data are rounded to no more than three significant digits.

²Source: American Coal Ash Association.

TABLE 2
CRUDE GYPSUM MINED IN THE UNITED STATES, BY STATE¹

State	2012			2013		
	Active mines	Quantity (thousand metric tons)	Value (thousands)	Active mines	Quantity (thousand metric tons)	Value (thousands)
Arizona, Colorado, New Mexico	7	1,160	\$10,600	7	1,120	\$9,600
Nevada and Utah	6	1,800	18,800	6	1,790	15,800
Arkansas and Louisiana	2	W	W	2	W	W
California	6	1,380	9,640	7	1,160	17,700
Iowa and Indiana	7 ^r	2,310 ^r	16,800 ^r	7	2,370	19,700
Michigan	3	322	2,250	3	368	3,040
South Dakota and Wyoming	3	W	W	3	W	W
Kansas, Oklahoma, Texas	18	6,750	47,300	19	7,630	61,900
Total	52 ^r	14,800 ^r	115,000 ^r	54	15,500	137,000

^rRevised. W Withheld to avoid disclosing company proprietary data; included in "Total."

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

TABLE 3
 GYPSUM PRODUCTS (MADE FROM DOMESTIC, IMPORTED, AND
 SYNTHETIC GYPSUM) SOLD OR USED IN THE UNITED STATES, BY USE¹

(Thousand metric tons and thousand dollars)

Use	2012		2013	
	Quantity	Value	Quantity	Value
Uncalcined:				
Portland cement	1,040	19,200	875	18,000
Agriculture and miscellaneous ²	519	23,300	569	22,900
Total	1,560	42,500	1,440	40,900
Calcined:				
Plasters	75	32,000	79	34,000
Prefabricated products ³	10,900	2,230,000	12,600	2,940,000
Total	11,000	2,270,000	12,600	2,970,000
Grand total	12,500	2,310,000	14,100	3,010,000

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

²Includes synthetic gypsum.

³Includes weight of paper, metal, or other materials and some synthetic gypsum.

TABLE 4
 PREFABRICATED GYPSUM PRODUCTS SOLD OR USED IN THE UNITED STATES¹

Product	2012			2013		
	Quantity (thousand square feet)	Quantity ² (thousand metric tons)	Value (thousands)	Quantity (thousand square feet)	Quantity ² (thousand metric tons)	Value (thousands)
Veneer base	199,000	144	\$29,400	213,000	155	\$34,100
Sheathing	385,000	280	77,100	467,000	339	112,000
Regular gypsum board:						
³ / ₈ -inch	360,000	114	20,200	527,000	167	36,900
¹ / ₂ -inch	9,680,000	4,390	823,000	10,700,000	4,860	1,070,000
⁵ / ₈ -inch	292,000	172	35,100	962,000	567	141,000
1-inch	45,400	41	19,300	218	--	98
Total	10,400,000	4,720	897,000	12,200,000	5,590	1,250,000
Type X gypsum board	6,240,000	4,530	899,000	6,970,000	5,060	1,110,000
Predecorated wallboard	W	W	W	W	W	W
⁵ / ₁₆ -inch mobile-home board	W	W	W	W	W	W
Water- and moisture-resistant board	1,440,000	1,050	288,000	1,660,000	1,210	379,000
Other	128,000	93	12,800	159,000	115	15,900
Grand total	18,900,000	10,900	2,230,000	21,800,000	12,600	2,940,000

W Withheld to avoid disclosing company proprietary data; included in "Grand total." -- Zero.

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

²Includes weight of paper, metal, or other materials.

TABLE 5
IMPORTS FOR CONSUMPTION OF CRUDE GYPSUM, BY COUNTRY¹

(Thousand metric tons and thousand dollars)

Country	2012		2013	
	Quantity	Value	Quantity	Value
Canada ²	1,020	12,900	1,080	14,400
Mexico	1,420	14,600	1,410	14,900
Spain	809	12,800	800	13,200
Other	1	286	1	167
Total	3,250	40,600	3,290	42,600

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

²Includes anhydrite.

Source: U.S. Census Bureau.

TABLE 6
U.S. GYPSUM AND GYPSUM PRODUCTS FOREIGN TRADE¹

(Thousand metric tons and thousand dollars)

Year	Crude ²		Plasters ³		Boards ⁴		Other, value ⁵	Total, value
	Quantity	Value	Quantity	Value	Quantity	Value		
Exports:								
2012	408	28,800	140	39,200	856	154,000	57,000	279,000
2013	142	25,100	121	44,100	834	150,000	60,300	280,000
Imports for consumption:								
2012	3,250	40,600	17	7,150	297	49,400	42,400	140,000
2013	3,290	42,600	16	5,830	327	66,800	33,300	149,000

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

²Data are for "Gypsum, anhydrite," Harmonized Tariff Schedule of the United States (HTS) code 2520.10.0000.

³Data are for "Plasters," HTS code 2520.20.0000.

⁴Data are for "Boards, sheets, panels, tiles, and similar articles, not ornamented—Faced or reinforced with paper or paperboard only," HTS code 6809.11.0000.

⁵Data are for "Boards, sheets, panels, tiles, and similar articles, not ornamented: Other," HTS code 6809.19.0000, and "Other articles," HTS code 6809.90.0000.

Source: U.S. Census Bureau.

TABLE 7
GYPSUM: WORLD PRODUCTION, BY COUNTRY^{1,2}

(Thousand metric tons)

Country ³	2009	2010	2011	2012	2013 ^e
Afghanistan	46	63	62 ^e	57 ^r	57
Albania	71 ^r	77 ^r	80	91 ^r	126 ⁴
Algeria	1,757	1,610	1,650 ^e	1,700 ^e	1,700
Argentina	1,355	1,347	1,453	1,433 ^r	1,443 ⁴
Armenia	40	39	34	32 ^r	33
Australia ^c	3,430 ⁴	3,400 ^r	3,000	2,500	3,500
Austria, gypsum and anhydrate	911	872	815	792 ^r	800
Azerbaijan	46	49 ^r	101	151 ^r	152
Bhutan	300	344	352 ^r	313 ^r	350
Bolivia	2	1	1	1 ^r	1 ⁴
Bosnia and Herzegovina	74	65	72	74 ^r	74
Brazil ⁵	2,348	2,638	3,229	3,750 ^r	3,750
Bulgaria ^{e, 5}	128 ⁴	110 ^r	115 ^r	114 ^r	114
Burma	98	81	50 ^e	50 ^e	50
Canada ⁵	3,540	2,717 ^r	2,555 ^r	2,550 ^p	2,654 ^p
Chile	724	758	918	799	1,015 ⁴
China ^e	126,000	126,000 ^r	127,000	128,000	129,000
Croatia	222 ^r	198 ^r	168 ^r	183 ^r	114 ⁴
Cuba	78 ^r	111 ^r	131 ^r	131 ^r	130
Cyprus	218 ^r	240 ^r	335	328 ^r	315
Czech Republic ^c	13 ⁴	5	11	14	11 ⁴
Dominican Republic ⁶	201 ^r	159 ^r	92 ^r	87 ^r	68 ⁴
Egypt ⁵	735	942	966 ^r	1,000 ^{r, e}	1,000
Eritrea ^c	1	1	1	1	1
Ethiopia ^{e, 5}	37 ^r	41 ^r	46 ^r	52 ^r	52
France ^{e, 5}	3,351 ^r	3,440 ^r	4,231 ^r	3,685 ^r	2,300
Georgia	(7)	(7)	(7)	(7)	(7)
Germany, marketable ⁵	1,898	1,822	2,021	1,949	1,950
Greece ^{e, 5}	730 ^r	700 ^r	587 ^r	746 ^r	700
Guatemala ⁸	19	59	20 ^r	100 ^r	118 ⁴
Hungary ^{e, 5}	20 ⁴	20	3	-- ^r	--
India ^e	3,877 ^{r, 4}	3,370 ^{r, 4}	4,918 ^{r, 4}	3,979 ^r	3,538 ⁴
Indonesia ^c	8 ⁴	7	8	8	8
Iran ⁹	13,616	11,914	14,657 ^r	15,000 ^r	15,000
Ireland ^c	400	300	300	450	450
Israel	9	100	20	45 ^r	45
Italy ^c	5,101 ^r	4,441 ^r	5,939 ^r	2,563 ^r	4,100
Jamaica ^c	157 ^r	147 ^r	80 ^r	65 ^r	65
Japan ^c	5,750	5,700	5,600	5,500	5,500
Jordan	304	292	255	857 ^r	857
Kazakhstan ^c	700	700	700	720	720
Kenya ⁵	5	6	7	7	7
Laos	761 ^r	553	686	579 ^r	600
Lebanon ^c	100	105	105	105 ^r	110
Libya ^c	250	250	125	150 ^r	150
Macedonia	155	143	163	158	163 ⁴
Mauritania	37	65 ^r	72 ^r	75	100
Mexico ⁵	5,757	3,560	3,560 ^r	4,693	5,091 ⁴
Moldova	94	100	101	115	120 ⁴
Morocco ^c	NA ^r	NA ^r	NA ^r	NA ^r	NA
Nicaragua ⁵	37	20	30	35	37 ^{p, 4}
Niger ^c	20 ^r	8 ^r	6 ^r	6 ^r	6

See footnotes at end of table.

TABLE 7—Continued
 GYPSUM: WORLD PRODUCTION, BY COUNTRY^{1,2}

(Thousand metric tons)

Country ³	2009	2010	2011	2012	2013 ^e
Nigeria ^e	300	320	320	350	350
Oman	254	395	1,254	1,911	2,785 ⁴
Pakistan	800 ^r	854 ^{r,4}	885 ^{r,e}	1,260 ^r	1,204 ⁴
Paraguay ^e	5	4 ^{r,4}	5	5	5
Peru	321 ^r	313 ^r	482 ^r	389 ^{r,4}	298 ^{p,4}
Poland ⁵	1,277	1,179	1,225 ^r	1,228 ^r	1,270 ⁴
Portugal ⁵	335	337	337	322 ^r	338
Qatar ^e	135	135	135	145 ^r	150
Romania ^e	600 ^r	637 ^r	834 ^r	765 ^r	676 ⁴
Russia ^e	2,900 ⁴	2,900	4,960 ^r	5,000 ^r	5,100
Saudi Arabia ^e	2,000	2,100	2,239 ^r	2,351 ^r	2,400
Slovakia ⁵	131	87	100 ^e	130	110
South Africa	598	513	476	558 ^r	557 ⁴
Spain ⁵	8,181 ^r	6,990	7,826 ^r	6,360 ^r	6,400 ⁴
Sri Lanka	1	(7)	(7)	1	1
Sudan ⁵	30	31	13	117	132 ⁴
Switzerland ^e	300	250 ^r	350 ^r	320 ^r	320
Syria	403	540 ^r	559 ^{r,e}	328 ^r	100
Tajikistan	26	15	11 ^r	16 ^e	14 ⁴
Tanzania ⁵	8	27	9 ^r	92 ^r	280 ⁴
Thailand	8,679	9,985	8,955	6,259 ^r	6,300
Tunisia ^e	360	435 ⁴	534 ⁴	776 ^r	550
Turkey	4,370 ^r	6,322 ^r	5,723 ^r	8,248 ^r	8,300
Turkmenistan ^e	100	100	100	105	NA
Uganda	-- ^r	-- ^r	-- ^r	-- ^r	--
Ukraine	711	679	676	436 ^r	450
United Arab Emirates ^e	200	150	100	50	100
United Kingdom ^{e,5}	1,700	1,700	1,700	1,700	1,700
United States ¹⁰	10,100 ^r	9,560 ^r	9,770 ^r	14,800 ^r	15,500 ⁴
Uzbekistan ^e	48 ⁴	44 ⁴	48	50	51
Venezuela	-- ^r	-- ^r	-- ^r	-- ^r	--
Yemen ^e	200 ^r	200 ^r	100	100	100
Total	231,000 ^r	226,000 ^r	237,000 ^r	240,000 ^r	244,000

^eEstimated. ^pPreliminary. ^rRevised. NA Not available. -- 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 August 12, 2014.

³In addition to the countries listed, Colombia, El Salvador, Honduras, Latvia, Luxembourg, Mongolia, and Serbia produced gypsum, but available information is inadequate to make reliable estimates of output levels.

⁴Reported figure.

⁵Includes anhydrite.

⁶Dominican Republic's gypsum production is reported both in metric tons, as shown above, and in cubic meters, as follows: 2009—66,137; 2010—63,582; 2011—48,785; 2012—102,068; and 2013—80,000 (estimated).

⁷Less than ½ unit.

⁸Amounts are quantities sold; the Ministry of Energy and Mines recollect the data from invoices, with royalty purpose.

⁹Data are for years beginning March 21 of that stated.

¹⁰Excludes byproduct gypsum.