

**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549**

FORM 10-K

Annual Report Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934

For the fiscal year ended
December 31, 2016

or

Transition Report Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934

For the transition period from
to

Commission file number 001-12658

ALBEMARLE CORPORATION

(Exact name of registrant as specified in its charter)

VIRGINIA

(State or other jurisdiction of
incorporation or organization)

54-1692118

(I.R.S. Employer
Identification No.)

4350 Congress Street, Suite 700

Charlotte, North Carolina 28209

(Address of principal executive offices) (Zip Code)

Registrant's telephone number, including area code: **(980) 299-5700**

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Name of each exchange on which registered
COMMON STOCK, \$.01 Par Value	NEW YORK STOCK EXCHANGE

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes No

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. Yes No

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for at least the past 90 days. Yes No

Indicate by check mark whether the registrant has submitted electronically and posted on its Corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). Yes No

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§229.405) is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K.

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or a smaller reporting company. See the definitions of "large accelerated filer," "accelerated filer," and "smaller reporting company" in Rule 12b-2 of the Exchange Act. (Check one):

Large accelerated filer Accelerated filer Non-accelerated filer Smaller reporting company

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes No

The aggregate market value of the voting and non-voting common equity stock held by non-affiliates of the registrant was approximately \$8.9 billion based on the reported last sale price of common stock on June 30, 2016, the last business day of the registrant's most recently completed second quarter.

Number of shares of common stock outstanding as of February 20, 2017: 112,566,316

Documents Incorporated by Reference

Portions of Albemarle Corporation's definitive Proxy Statement for its 2017 Annual Meeting of Shareholders to be filed with the Securities and Exchange Commission pursuant to Regulation 14A under the Securities Exchange Act of 1934, as amended, are incorporated by reference into Parts II and III of this Form 10-K.

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PART I

Item 1. Business.

Albemarle Corporation was incorporated in Virginia in 1993. Our principal executive offices are located at 4350 Congress Street, Suite 700, Charlotte, North Carolina 28209. Unless the context otherwise indicates, the terms “Albemarle,” “we,” “us,” “our” or “the Company” mean Albemarle Corporation and its consolidated subsidiaries.

On December 14, 2016, we completed the sale of the Chemetall[®] Surface Treatment business to BASF SE for cash proceeds of approximately \$3.1 billion, net of purchase price adjustments. The Chemetall Surface Treatment business was acquired on January 12, 2015 as part of the acquisition of Rockwood Holdings, Inc. (“Rockwood”). For additional information, see “Recent Acquisitions, Joint Ventures and Divestitures” beginning on page 9, and also Note 3, “Divestitures,” to our consolidated financial statements included in Part II, Item 8 of this report.

On January 12, 2015 (the “Acquisition Closing Date”), we completed the acquisition (the “Merger”) of Rockwood pursuant to an Agreement and Plan of Merger (the “Merger Agreement”) for a purchase price of approximately \$5.7 billion. As a result, Rockwood became a wholly-owned subsidiary of Albemarle. For additional information about the Merger, see “Recent Acquisitions, Joint Ventures and Divestitures” beginning on page 9, and also Note 2, “Acquisitions,” to our consolidated financial statements included in Part II, Item 8 of this report.

We are a leading global developer, manufacturer and marketer of highly-engineered specialty chemicals that meet customer needs across a diverse range of end markets. The end markets we serve include petroleum refining, consumer electronics, energy storage, construction, automotive, lubricants, pharmaceuticals, crop protection, food safety and custom chemistry services. We believe that our commercial and geographic diversity, technical expertise, innovative capability, flexible, low-cost global manufacturing base, experienced management team and strategic focus on our core base technologies will enable us to maintain leading market positions in those areas of the specialty chemicals industry in which we operate.

We and our joint ventures currently operate 31 production and research and development (“R&D”) facilities, as well as a number of administrative and sales offices, around the world. As of December 31, 2016, we served approximately 3,000 customers in approximately 100 countries. For information regarding our unconsolidated joint ventures see Note 10, “Investments,” to our consolidated financial statements included in Part II, Item 8 of this report.

Business Segments

During 2016, we managed and reported our operations under three reportable segments: Lithium and Advanced Materials, Bromine Specialties and Refining Solutions. Each segment has a dedicated team of sales, research and development, process engineering, manufacturing and sourcing, and business strategy personnel and has full accountability for improving execution through greater asset and market focus, agility and responsiveness. Financial results and discussion about our segments included in this Annual Report on Form 10-K are organized according to these categories except where noted.

For financial information regarding our reportable segments, including revenues generated for each of the last three fiscal years from each of the product categories included in our reportable segments, and geographic area information, see Note 25, “Segment and Geographic Area Information,” to our consolidated financial statements included in Part II, Item 8 of this report.

Lithium and Advanced Materials Segment

As of December 31, 2016, our Lithium and Advanced Materials segment consisted of two product categories: Lithium and Performance Catalyst Solutions.

Lithium. Our Lithium business develops advanced materials for a wide range of industries and end markets. Our Lithium business is a low-cost producer of one of the most diverse product portfolios of lithium derivatives in the industry.

We develop and manufacture a broad range of basic lithium compounds, including lithium carbonate, lithium hydroxide, lithium chloride, and value-added lithium specialties and reagents, including butyllithium and lithium aluminum hydride. Lithium is a key component in products and processes used in a variety of applications and industries, which include lithium batteries used in consumer electronics and automobiles, high performance greases, thermoplastic elastomers for car tires, rubber soles and plastic bottles, catalysts for chemical reactions, organic synthesis processes in the areas of steroid chemistry and vitamins, various life science applications, as well as intermediates in the pharmaceutical industry, among other applications. We also develop and manufacture cesium products for the chemical and pharmaceutical industries, and zirconium, barium and titanium products for various pyrotechnical applications, including airbag igniters.

In addition to developing and supplying lithium compounds, we provide technical services, including the handling and use of reactive lithium products. We also offer our customers recycling services for lithium-containing by-products resulting from synthesis with organolithium products, lithium metal and other reagents. We plan to continue to focus on the development of new products and applications.

Lithium—Customers

Our most significant customers include Panasonic Corporation, Umicore S.A., Binova International Co. Ltd., Samsung SDI Co. Ltd. and Corning Inc., among others.

Lithium—Competition

The global lithium market consists of producers located in the Americas, Asia-Pacific and, to a lesser extent, Africa. We are a leading global provider of lithium compounds. Major competitors include FMC Corporation, Sociedad Quimica y Minera de Chile S.A., SichuanTianqi Lithium, and Jiangxi Ganfeng Lithium. In the metal-based specialty chemicals business, key competitors include Cabot Corporation and Sigma-Aldrich Corporation. Competition in the global lithium market is based on product quality, product diversity, reliability of supply and customer service.

Lithium—Raw Materials and Significant Supply Contracts

We obtain lithium through solar evaporation of our ponds at the Salar de Atacama, in Chile, and in Silver Peak, Nevada. After we obtain the lithium brine from the Salar de Atacama, we process it into lithium carbonate and lithium chloride at a plant in nearby La Negra, Chile. The lithium brine from our Silver Peak site is processed into lithium carbonate at our plant in Silver Peak. Subsequently, in other locations in the United States (“U.S.”), Germany, France and Taiwan, we further process the materials into various derivatives, depending on the markets we serve. In addition, we have entered an agreement with Bolland Minera S.A. for the exclusive exploration and acquisition rights to a lithium resource in Antofalla, within the Catamarca Province of Argentina. If necessary, we can also obtain lithium from other sources.

Our mineral rights with respect to the Salar de Atacama in Chile consist exclusively of our right to access lithium brine pursuant to a long-term contract with the Chilean government, originally entered into in January 1975 by one of our predecessors and subsequently amended and restated. Our contract with the Chilean government will remain in effect until the date on which we have produced and sold 200,000 metric tons of lithium in any of its forms from the Salar de Atacama. As of December 31, 2016, the remaining amount of lithium we were permitted to sell under the contract equaled approximately 115,000 metric tons of total lithium. In February 2016, we announced that we were granted approval by the Environmental Assessment Commission of the Antofagasta Region to increase our currently authorized lithium brine removal rate in the Salar de Atacama. The size of the area at the Salar de Atacama covered by our claims is approximately 16,700 hectares. We currently own the land on which we operate our facility at the Salar de Atacama and our processing facility in La Negra. However, the ownership of the land at the Salar de Atacama will revert to the Chilean government once we have sold all amounts of lithium remaining under our contract with the Chilean government (the ownership of the land and fixed assets in La Negra will remain unchanged). In December 2016, we also announced that we amended our lithium production rights agreement with the Chilean Economic Development Agency (“CORFO”) to both extend the term of that agreement and increase our authorized lithium quota at our facility in the Salar de Atacama, Chile. The amended agreement provides us with sufficient lithium to produce over 80,000 metric tons annually of technical and battery grade lithium salts over the next 27 years at our expanding battery grade manufacturing facilities in La Negra, Antofagasta.

Our mineral rights in Silver Peak, Nevada consist of our right to access lithium brine pursuant to our permitted and certificated senior water rights, a settlement agreement with the U.S. government, originally entered into in June 1991, and our patented and unpatented land claims. Pursuant to the 1991 agreement, our water rights and our land claims, we have rights to all lithium that we can remove economically from the Clayton Valley Basin in Nevada. We have been operating at the Silver Peak site since 1966. Our Silver Peak site covers a surface of approximately 15,301 acres, 10,826 acres of which we own through a subsidiary. The remaining acres are owned by the U.S. government from whom we lease the land pursuant to an unpatented land claim and lease agreement which is renewed annually. Based on our 2016 production levels, we believe that the amount of lithium brine we can economically obtain from our Silver Peak, Nevada site pursuant to our rights could support the current levels of lithium carbonate production for approximately 20 years. Assuming certain operating conditions are satisfied, our annual lithium carbonate production capacity is estimated to be approximately 6,000 metric tons at our Silver Peak facility. However, no assurance can be given that the indicated levels of production of lithium carbonate at either Silver Peak or La Negra will be realized.

We also own a 49% interest in Windfield Holdings Pty Ltd, which directly owns 100% of the equity of Talison Lithium Pty Ltd, a company incorporated in Australia (“Talison”). Talison, through its wholly-owned subsidiaries, owns and operates a lithium mine in Greenbushes, Western Australia and mines lithium ore, which is then milled and processed to separate lithium

concentrate from the rest of the ore. The ore is processed into battery-grade lithium carbonate and lithium hydroxide at our Jiangxi and Sichuan, China facilities, which were recently acquired from Jiangxi Jiangli New Materials Science and Technology Co. Ltd. Talison currently sells the lithium concentrate to its shareholders. Talison has a leading position in two categories of lithium concentrates: (i) technical-grade lithium concentrates which have low iron content for use in the manufacture of glass, ceramics and heat-proof cookware; and (ii) a high-yielding chemical-grade lithium concentrate, used to produce lithium chemicals which form the basis for the manufacture of lithium-ion batteries for laptop computers, mobile phones, electric bicycles and electric vehicles. Assuming certain operating conditions are satisfied, the annual lithium concentrate production capacity at the Talison facility is estimated to be approximately 575,000 metric tons. However, no assurance can be given that the indicated levels of production of lithium concentrate at Talison will be realized.

Performance Catalyst Solutions (“PCS”). We have four product lines in our PCS division: polymer catalysts, curatives, organometallics and electronic materials. We manufacture organometallic co-catalysts (e.g., aluminum, magnesium and zinc alkyls) as well as metallocene components and co-catalysts (e.g., methylaluminumoxane, organoborons, metallocene compounds, and finished polymerization catalysts comprising these products). We also offer finished single-site catalysts with or without our proprietary ActivCat[®] activation technology and a line of proprietary Ziegler-Natta catalysts under the Advantage[™] brand. Our co-catalysts and finished catalysts are used in our customers’ production of polyolefin polymers. Such polymers are commodity (i.e., Ziegler-Natta polymerization technology-based) and specialty (i.e., Single Site polymerization technology-based) plastics serving a wide variety of end markets including packaging, non-packaging, films and injection molding. Some of our organometallic products are also used in the manufacture of alpha-olefins (i.e., hexene, octene, decene). In electronic materials, we manufacture and sell high purity metal organic products into electronic applications such as the production of light-emitting diodes (“LEDs”) for displays and general lighting, as well as other products used in the production of solar cells. Our curatives include a range of curing agents used in polyurethanes, epoxies and other engineered resins.

PCS—Customers

Our PCS business customers include multinational corporations such as ExxonMobil Corporation, Chevron Corporation, Total Petrochemicals, Saudi Basic Industries Corporation and INEOS Group Holdings S.A. There are thousands of polyolefin and elastomer units worldwide which require a constant supply of co-catalysts and finished catalysts.

PCS—Competition

Our PCS business serves the global market including the Americas, Europe, Asia and the Middle East. Our major competitors in the PCS market include AkzoNobel, Chemtura Corporation and W.R. Grace & Co. in the polyolefin catalysts and co-catalysts areas. Lonza is our main competitor in the curatives market.

PCS—Raw Materials and Significant Supply Contracts

The major raw materials we use in our PCS operations include aluminum, ethylene, alpha-olefins, isobutylene and toluene, most of which are readily available from numerous independent suppliers and are purchased or provided under contracts at prices we believe are competitive. The cost of raw materials is generally based on market prices, although we may use contracts with price caps or other tools, as appropriate, to mitigate price volatility.

Bromine Specialties Segment

Our bromine and bromine-based business includes products used in fire safety solutions and other specialty chemicals applications. Our fire safety technology enables the use of plastics in high performance, high heat applications by enhancing the flame resistant properties of these materials. End market products that benefit from our fire safety technology include plastic enclosures for consumer electronics, printed circuit boards, wire and cable products, electrical connectors, textiles and foam insulation. Our bromine-based business also includes specialty chemicals products such as elemental bromine, alkyl bromides, inorganic bromides, brominated powdered activated carbon and a number of bromine fine chemicals. These specialty products are used in chemical synthesis, oil and gas well drilling and completion fluids, mercury control, water purification, beef and poultry processing and various other industrial applications. Other specialty chemicals that we produce include tertiary amines for surfactants, biocides, and disinfectants and sanitizers.

Customers

Our bromine business offers more than 40 products to a variety of end markets. We sell our products mostly to chemical manufacturers and processors, such as polymer resin suppliers, drilling and oil service companies, beef and poultry processors, water treatment and photographic companies, energy producers and other specialty chemical companies.

Sales of bromine and brominated derivatives in Asia are expected to grow long-term due primarily to the underlying growth in consumer demand. In response to this development, we have established a sales and marketing network in China, Japan, Korea and Singapore with products sourced from the U.S., Europe, China and the Middle East.

A number of customers of our bromine business operate in cyclical industries, including the consumer electronics and oil field industries. As a result, demand from our customers in such industries is also cyclical.

Competition

Our bromine business serves the markets in the Americas, Asia, Europe and the Middle East, each of which is highly competitive. Product performance and quality, price and contract terms are the primary factors in determining which qualified supplier is awarded a contract. Research and development, product and process improvements, specialized customer services, the ability to attract and retain skilled personnel and maintenance of a good safety record have also been important factors to compete effectively in the marketplace. Our most significant competitors are Chemtura Corporation and Israel Chemicals Ltd.

Raw Materials and Significant Supply Contracts

The bromine we use is sourced from two locations: Arkansas and the Dead Sea. Our bromine production operations in Arkansas are supported by an active brine rights leasing program. We estimate that, at current production levels, we will be able to produce bromine in Arkansas for more than 50 years. In addition, through our 50% interest in Jordan Bromine Company Limited (“JBC”), a consolidated joint venture with operations in Safi, Jordan, we source bromine from the Dead Sea, which is believed to have indefinite quantities of brine. In addition, we have a joint venture with Weifang Sinobrom Import and Export Company, Ltd. (“Sinobrom”) in China that allows us the option to source bromine directly from China’s Shandong Province brine fields.

Refining Solutions Segment

Our two main product lines in this segment are (i) Clean Fuels Technologies, which is primarily composed of hydroprocessing catalysts (“HPC”), and (ii) Heavy Oil Upgrading (“HOU”), which is primarily composed of fluidized catalytic cracking (“FCC”) catalysts and additives. HPC products are widely applied throughout the refining industry. Their application enables the upgrading of oil fractions to clean fuels and other usable oil feedstocks and products by removing sulfur, nitrogen and other impurities from the feedstock. In addition, they improve product properties by adding hydrogen and in some cases improve the performance of downstream catalysts and processes. We continuously seek to add more value to refinery operations by offering HPC products that meet our customers’ requirements for profitability and performance in the very demanding refining market. FCC catalysts assist in the high yield cracking of less desired refinery petroleum streams into derivative, higher-value products such as transportation fuels and petrochemical feedstocks like propylene. Our FCC additives are used to reduce emissions of sulfur dioxide and nitrogen oxide in FCC units and to increase liquefied petroleum gas olefins yield, such as propylene, and to boost octane in gasoline. Albemarle offers unique refinery catalysts to crack and treat the lightest to the heaviest feedstocks while meeting refinery yield and product needs. We offer a wide range of HPC products and provide customized FCC catalyst systems to our customers.

Customers

Our Refining Solutions segment customers include multinational corporations such as ExxonMobil Corporation, Chevron Corporation, TOTAL S.A., Saudi Aramco and its joint ventures, and INEOS Group Holdings S.A.; independent petroleum refining companies such as Valero Energy Corporation, SK Energy Holdings, Reliance Industries and Marathon Petroleum; national petroleum refining companies such as Petróleo Brasileiro S.A., Petróleos Mexicanos, Kuwait National Petroleum Company, Abu Dhabi National Oil Company and Indian Oil Corp.

In 2016, the total number of refineries world wide was reduced from 634 to 615 and we see this trend continuing with smaller refineries shutting down and being replaced by mega refineries, with growth concentrated in the Middle East and Asia. Oil refining has again increased moderately compared to the previous year.

We estimate that there are currently approximately 565 FCC units being operated globally, each of which requires a constant supply of FCC catalysts. In addition, we estimate that there are approximately 3,200 HPC units being operated globally, or a capacity of approximately 45 million barrels per day, each of which typically requires replacement HPC catalysts once every one to four years.

Competition

Our Refining Solutions segment serves the global market including the Americas, Asia, Europe and the Middle East, each of which is highly competitive. Product performance and quality, price and contract terms are the primary factors in determining which qualified supplier is awarded a contract.

Research and development, product and process improvements, specialized customer services, the ability to attract and retain skilled personnel and the maintenance of a good safety record have also been important factors to compete effectively in the Catalysts marketplace. Through our research and development programs, we strive to differentiate our business by developing value-added products and products based on proprietary technologies.

Our major competitors in the HPC catalysts market include Criterion Catalysts and Technologies, Advanced Refining Technologies and Haldor Topsoe. Our major competitors in the FCC catalysts market include W.R. Grace & Co., BASF Corporation and China Petrochemical Corporation (Sinopec).

Raw Materials and Significant Supply Contracts

The major raw materials we use in our Refining Solutions operations include sodium silicate, sodium aluminate, kaolin, rare earths and metals such as molybdenum, nickel and cobalt, most of which are readily available from numerous independent suppliers and are purchased or provided under contracts at prices we believe are competitive. The cost of raw materials is generally based on market prices, although we may use contracts with price caps or other tools, as appropriate, to mitigate price volatility.

Sales, Marketing and Distribution

We have an international strategic account program that uses cross-functional teams to serve large global customers. This program emphasizes creative strategies to improve and strengthen strategic customer relationships with emphasis on creating value for customers and promoting post-sale service. Complementing this program are regional Albemarle sales personnel around the world who serve numerous additional customers around the world. We also utilize commissioned sales representatives and specialists in specific market areas, some of which are affiliated with subsidiaries of large chemical companies.

Research and Development

We believe that in order to generate revenue growth, maintain our margins and remain competitive, we must continually invest in research and development, product and process improvements and specialized customer services. Through research and development, we continue to seek increased margins by introducing value-added products and proprietary processes and innovative green chemistry technologies. Our green chemistry efforts focus on the development of products that benefit society in a manner that minimizes waste and the use of raw materials and energy, avoids the use of toxic reagents and solvents and is produced in safe, environmentally friendly manufacturing processes. Green chemistry is encouraged with our researchers through periodic focus group discussions and special rewards and recognition for outstanding new green developments.

Our research and development efforts support each of our business segments. The objective of the Lithium research and development effort was to develop innovative chemistries and technologies with applications relevant within targeted key markets. Research and development efforts are generally focused on both process development (e.g., pilot plant for the recycling of lithium ion batteries) as well as new product development (e.g., for lithium ion battery applications). PCS research efforts are focused on catalyst performance, improving and extending our line of curing agents and formulations, as well as process improvements.

The focus of research in Bromine Specialties is divided among new and improved flame retardants and new uses for bromine and bromine-based products. Fire safety solutions research is focused primarily on developing new flame retardants which not only meet the higher performance requirements required by today's polymer producers, formulators and original equipment manufacturers but which also have superior toxicological and environmental profiles. Another area of research is the development of bromine-based products for use as biocides in industrial water treatment and food safety applications and as additives used to reduce mercury emissions from coal-fired power plants.

Our Refining Solutions research is focused on the needs of our refinery catalysts customers. Refinery catalysts research is focused primarily on the development of more effective catalysts and related additives to produce clean fuels and to maximize the production of the highest value refined products through hydrotreating catalyst technologies. With regard to HOU, we focus our efforts on increasing the yield of olefins, such as propylene and butylene, and increasing the yield and quality of fuels made from more complex and less pure feedstock through the use of novel FCC technologies.

We incurred research and development expenses of \$80.5 million, \$89.2 million and \$88.3 million during 2016, 2015 and 2014, respectively.

Intellectual Property

Our intellectual property, including our patents, licenses and trade names, is an important component of our business. As of December 31, 2016, we owned approximately 2,100 active patents and approximately 800 pending patent applications in key strategic markets worldwide. We also have acquired rights under patents and inventions of others through licenses, and we license certain patents and inventions to third parties.

Regulation

Our business is subject to a broad array of employee health and safety laws and regulations, including those under the Occupational Safety and Health Act (“OSHA”). We also are subject to similar state laws and regulations as well as local laws and regulations for our non-U.S. operations. We devote significant resources and have developed and implemented comprehensive programs to promote the health and safety of our employees and we maintain an active health, safety and environmental program. We finished 2016 with an OSHA occupational injury and illness incident rate of 0.53 for Albemarle employees and nested contractors, compared to 0.60 in 2015.

Our business and our customers are subject to significant requirements under the European Community Regulation for the Registration, Evaluation, Authorization and Restriction of Chemicals (“REACH”). REACH imposes obligations on European Union manufacturers and importers of chemicals and other products into the European Union to compile and file comprehensive reports, including testing data, on each chemical substance, and perform chemical safety assessments. Additionally, substances of high concern, as defined under REACH, are subject to an authorization process. Authorization may result in restrictions in the use of products by application or even banning the product. REACH regulations impose significant additional responsibilities on chemical producers, importers, downstream users of chemical substances and preparations, and the entire supply chain. Our significant manufacturing presence and sales activities in the European Union requires significant compliance costs and may result in increases in the costs of raw materials we purchase and the products we sell. Increases in the costs of our products could result in a decrease in their overall demand; additionally, customers may seek products that are not regulated by REACH, which could also result in a decrease in the demand of certain products subject to the REACH regulations.

In June 2016, modifications to the Toxic Substances Control Act (“TSCA”) in the U.S. were signed into law, requiring chemicals to be assessed against a risk-based safety standard and for the elimination of unreasonable risks identified during risk evaluation. Other pending initiatives potentially will require toxicological testing and risk assessments of a wide variety of chemicals, including chemicals used or produced by us. These initiatives include the Voluntary Children's Chemical Evaluation Program, and High Production Volume Chemical Initiative in the U.S., as well as new initiatives in Asia and other regions. These assessments may result in heightened concerns about the chemicals involved and additional requirements being placed on the production, handling, labeling or use of the subject chemicals. Such concerns and additional requirements could also increase the cost incurred by our customers to use our chemical products and otherwise limit the use of these products, which could lead to a decrease in demand for these products.

Historically, there has been scrutiny of certain brominated flame retardants by regulatory authorities, legislative bodies and environmental interest groups in various countries. We manufacture a broad range of brominated flame retardant products, which are used in a variety of applications. Concern about the impact of some of our products on human health or the environment may lead to regulation or reaction in our markets independent of regulation.

Environmental Regulation

We are subject to numerous foreign, federal, state and local environmental laws and regulations, including those governing the discharge of pollutants into the air and water, the management and disposal of hazardous substances and wastes and the cleanup of contaminated properties. Ongoing compliance with such laws and regulations is an important consideration for us. Key aspects of our operations are subject to these laws and regulations. In addition, we incur substantial capital and operating costs in our efforts to comply with them.

Liabilities associated with the investigation and cleanup of hazardous substances, as well as personal injury, property damages or natural resource damages arising from the release of, or exposure to, such hazardous substances, may be imposed in many situations without regard to violations of laws or regulations or other fault, and may also be imposed jointly and severally (so that a responsible party may be held liable for more than its share of the losses involved, or even the entire loss). Such liabilities also may be imposed on many different entities with a relationship to the hazardous substances at issue, including, for example, entities that formerly owned or operated the property affected by the hazardous substances and entities that arranged

for the disposal of the hazardous substances at the affected property, as well as entities that currently own or operate such property. We are subject to such laws, including the federal Comprehensive Environmental Response, Compensation and Liability Act, commonly known as CERCLA or Superfund, in the U.S., and similar foreign and state laws. We may have liability as a potentially responsible party (“PRP”) with respect to active off-site locations under CERCLA or state equivalents. We have sought to resolve our liability as a PRP at these sites through indemnification by third parties and settlements, which would provide for payment of our allocable share of remediation costs. Because the cleanup costs are estimates and are subject to revision as more information becomes available about the extent of remediation required, and in some cases we have asserted a defense to any liability, our estimates could change. Moreover, liability under CERCLA and equivalent state statutes may be joint and several, meaning that we could be required to pay in excess of our pro rata share of remediation costs. Our understanding of the financial strength of other PRPs has been considered, where appropriate, in estimating our liabilities. Accruals for these matters are included in the environmental reserve discussed below. Our management is actively involved in evaluating environmental matters and, based on information currently available to us, we have concluded that our outstanding environmental liabilities for unresolved waste sites currently known to us should not have a material effect on our operations.

We use and generate hazardous substances and wastes in our operations and may become subject to claims for personal injury and/or property damage relating to the release of such substances into the environment. In addition, some of our current properties are, or have been, used for industrial purposes, which could contain currently unknown contamination that could expose us to governmental requirements or claims relating to environmental remediation, personal injury and/or property damage. While we conduct our operations so as to minimize the risk of incurring such losses, the nature of our business and the types of operations in which we engage create a potential for such losses to occur. These risks could expose us to substantial liability for personal injury, wrongful death, property damage, loss of production, pollution and other environmental damages. Depending on the frequency and severity of such incidents, it is possible that the Company’s operating costs, insurability and relationships with customers, employees and regulators could be impaired. In particular, our customers may elect not to purchase our product if they view our safety record as unacceptable. This could also cause us to lose customers and substantial revenues. However, we believe that the likelihood of an environmental-related catastrophic occurrence or a series of occurrences that could materially affect the Company’s financial position or competitiveness is low.

We record accruals for environmental matters when it is probable that a liability has been incurred and the amount of the liability can be reasonably estimated. It is possible that new information or future developments could require us to reassess our potential exposure related to environmental matters. We may incur significant costs and liabilities in order to comply with existing environmental laws and regulations. It is also possible that other developments, such as increasingly strict environmental laws, regulations and orders of regulatory agencies, as well as claims for damages to property and the environment or injuries to employees and other persons resulting from our current or past operations, could result in substantial costs and liabilities in the future. As this information becomes available, or other relevant developments occur, we will adjust our accrual amounts accordingly. While there are still uncertainties related to the ultimate costs we may incur, based upon our evaluation and experience to date, we believe our reserves are adequate. We cannot assure you that, as a result of former, current or future operations, there will not be some future impact on us relating to new regulations or additional environmental remediation or restoration liabilities. See “Safety and Environmental Matters” in Item 7. Management’s Discussion and Analysis of Financial Condition and Results of Operations on page 53.

Climate Change

The growing concerns about climate change and the related increasingly stringent regulations may provide us with new or expanded business opportunities. We provide solutions to companies pursuing alternative fuel products and technologies (such as renewable fuels, gas-to-liquids and others), emission control technologies (including mercury emissions), alternative transportation vehicles and energy storage technologies and other similar solutions. As demand for, and legislation mandating or incentivizing the use of alternative fuel technologies that limit or eliminate greenhouse gas emissions increase, we continue to monitor the market and offer solutions where we have appropriate technology and believe we are well positioned to take advantage of opportunities that may arise if new legislation is enacted.

Recent Acquisitions, Joint Ventures and Divestitures

Over the last three years, we have devoted resources to acquisitions and joint ventures, including the subsequent integration of acquired businesses. These acquisitions and joint ventures have expanded our base business, provided our customers with a wider array of products and presented new alternatives for discovery through additional chemistries. In addition, we have pursued opportunities to divest businesses which do not fit our high priority business growth profile. Following is a summary of our acquisitions, joint ventures and divestitures during recent years.

On December 14, 2016, we completed the sale of the Chemetall Surface Treatment business to BASF SE for cash proceeds of approximately \$3.1 billion, net of purchase price adjustments. The Chemetall Surface Treatment business was acquired on January 12, 2015 as part of the acquisition of Rockwood. The Chemetall Surface Treatment business is a leading global supplier of applied surface treatments and services for metal, plastic and glass substrates in a wide range of industries and end markets. This sale reflects our commitment to investing in future growth of our high priority businesses, reducing leverage and returning capital to shareholders.

On December 31, 2016, we completed the acquisition of the lithium hydroxide and lithium carbonate conversion assets of Jiangxi Jiangli New Materials Science and Technology Co. Ltd. for a purchase price of approximately \$145 million. This includes manufacturing assets and supporting business functions located in both Jiangxi and Sichuan, China focused on the production of battery-grade lithium carbonate and lithium hydroxide. We believe this acquisition will enable us to supply premium lithium salts to an expanded global customer base while solidifying our leading position in the lithium industry.

On January 12, 2015, we completed the acquisition of Rockwood for a purchase price of approximately \$5.7 billion, with Rockwood becoming a wholly-owned subsidiary of Albemarle. Through the acquisition of Rockwood, we became a leading integrated and low cost global producer of lithium and lithium compounds used in lithium-ion batteries for electronic devices, alternative transportation vehicles and energy storage technologies, meeting the significant growth in global demand for these products.

In 2015, our Chemetall Surface Treatment business completed several acquisitions, including (1) all remaining shares of its Shanghai Chemetall joint venture for a purchase price of \$57.6 million, (2) the aluminum finishing business of Chemal GmbH & Co. KG (“Chemal GmbH”), based in Hamm, Germany for a purchase price of \$2.2 million and (3) the remaining noncontrolling interests’ share of Nanjing Chemetall Surface Technologies Co., Ltd for a purchase price of \$4.8 million. The ownership interests of each of these acquisitions were transferred to BASF SE in the sale of the Chemetall Surface Treatment business on December 14, 2016.

In 2015, we announced our intention to pursue strategic alternatives, including divestitures, related to certain businesses which include minerals-based flame retardants and specialty chemicals, fine chemistry services and metal sulfides. On January 4, 2016, we completed the sale of our metal sulfides business to Treibacher Industrie AG for net proceeds of approximately \$137 million. Included in the transaction were sites in Vienna and Arnoldstein, Austria, and Tribotec’s proprietary sulfide synthesis process. On February 1, 2016, we completed the sale of our minerals-based flame retardants and specialty chemicals business to Huber Engineered Materials, a division of J.M. Huber Corporation, for net proceeds of approximately \$187 million. The transaction included Albemarle’s Martinswerk GmbH subsidiary and manufacturing facility located in Bergheim, Germany, and Albemarle’s 50% ownership interest in Magnifin Magnesiaprodukte GmbH, a joint-venture with Radex Heraklith Industriebeteiligung AG at Breitenau, Austria. In April 2016, the Company concluded that it would discontinue efforts to sell the fine chemistry services business.

On September 1, 2014, we closed the sale of our antioxidant, ibuprofen and propofol businesses and assets to SI Group, Inc. and received net proceeds of \$104.7 million. Included in the transaction were Albemarle’s manufacturing sites in Orangeburg, South Carolina and Jinshan, China, along with Albemarle’s antioxidant product lines manufactured in Ningbo, China.

Employees

As of December 31, 2016, we had approximately 5,000 employees, including employees of our consolidated joint ventures, of whom 2,700, or 54%, are employed in the U.S. and Latin America; 1,350, or 27%, are employed in Europe; 600, or 12%, are employed in Asia and 350, or 7%, are employed in the Middle East. Certain of these employees are represented by unions or works councils. We believe that we generally have a good relationship with our employees, and with the unions and works councils that represent certain employees.

Available Information

Our website address is <http://www.albemarle.com>. We make available free of charge through our website our Annual Report on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K and amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended (“Exchange Act”), as well as reports on Forms 3, 4 and 5 filed pursuant to Section 16 of the Exchange Act, as soon as reasonably practicable after such documents are electronically filed with, or furnished to, the Securities and Exchange Commission (“SEC”). The information on our website is not, and shall not be deemed to be, a part of this report or incorporated into any other filings we make with the SEC. These reports may also be obtained at the SEC’s Public Reference Room at 100 F Street, N.E., Washington, DC 20549.

The SEC also maintains a website at <http://www.sec.gov> that contains reports, proxy statements and other information regarding SEC registrants, including Albemarle.

Our Corporate Governance Guidelines, Code of Business Conduct and the charters of the Audit and Finance, Health, Safety and Environment, Executive Compensation, and Nominating and Governance Committees of our Board of Directors are also available on our website and are available in print to any shareholder upon request by writing to Investor Relations, 451 Florida Street, Baton Rouge, Louisiana 70801, or by calling (225) 388-8011.

Item 1A. Risk Factors.

You should consider carefully the following risks when reading the information, including the financial information, contained in this Annual Report on Form 10-K.

Adverse conditions in the economy and volatility and disruption of financial markets can negatively impact our customers, suppliers and other business partners and therefore have a material adverse effect on our results of operations.

A global, regional or localized economic downturn may reduce customer demand or inhibit our ability to produce our products, negatively impacting our operating results. Our business and operating results have been and will continue to be sensitive to economic downturns (including credit market tightness which can impact our liquidity as well as that of our customers, suppliers and other business partners), declining consumer and business confidence, fluctuating commodity prices, volatile exchange rates and other challenges that can affect the economy. Our customers may experience deterioration of their businesses, cash flow shortages and difficulty obtaining financing, leading them to delay or cancel plans to purchase products, and they may not be able to fulfill their obligations in a timely fashion. Further, suppliers and other business partners may experience similar conditions, which could impact their ability to fulfill their obligations to us. Also, it could be difficult to find replacements for business partners without incurring significant delays or cost increases.

Our inability to secure key raw materials, or to pass through increases in costs and expenses for other raw materials and energy, on a timely basis or at all, could have an adverse effect on the margins of our products and our results of operations.

The long-term profitability of our operations will be, in part, related to our ability to continue to economically obtain resources, including energy and raw materials. For example, our lithium and bromine businesses rely upon our continued ability to produce, or otherwise obtain, lithium and bromine of sufficient quality in adequate amounts. If we fail to secure and retain the rights to continue to access these key raw materials, we may have to restrict or suspend our operations that rely upon these key resources, which could harm our business, results of operations and financial condition. In addition, other raw material and energy costs account for a significant percentage of our total costs of products sold, even if they can be obtained on commercially reasonable terms. Our raw material and energy costs can be volatile and may increase significantly. Increases are primarily driven by tightening of market conditions and major increases in the pricing of basic building blocks for our products such as crude oil, chlorine and metals (including molybdenum and rare earths which are used in the refinery catalysts business). We generally attempt to pass through changes in the prices of raw materials and energy to our customers, but we may be unable to do so (or may be delayed in doing so). There also is a risk that raising prices charged to our customers could result in a loss of sales volumes. Our inability to efficiently and effectively pass through price increases, or inventory impacts resulting from price volatility, could adversely affect our margins.

We face competition from other specialty chemical companies, which places downward pressure on the prices and margins of our products and may adversely affect our businesses and results of operations.

We compete against a number of highly competitive global specialty chemical producers. Competition is based on several key criteria, including product performance and quality, product price, product availability and security of supply, and responsiveness of product development in cooperation with customers and customer service. Some of our competitors are larger than we are and may have greater financial resources. These competitors may also be able to maintain significantly greater operating and financial flexibility. As a result, these competitors may be better able to withstand changes in conditions within our industry. In addition, our products are facing increasing competition from market participants in China. Competitors' pricing decisions could compel us to decrease our prices, which could negatively affect our margins and profitability adversely. Our ability to maintain or increase our profitability is, and will continue to be, dependent upon our ability to offset decreases in the prices and margins of our products by improving production efficiency and volume and other productivity enhancements, shifting to higher margin chemical products and improving existing products through innovation and research and development. If we are unable to do so or to otherwise maintain our competitive position, we could lose market share to our competitors.

Within the end-use markets in which we compete, competition is intense. Substitute products also exist for many of our products. Therefore, we face substantial risk that certain events, such as new product development by our competitors, changing

customer needs, production advances for competing products, price changes in raw materials and products, our failure to secure patents or the expiration of patents, could result in declining demand for our products as our customers switch to substitute products or undertake manufacturing of such products on their own. If we are unable to develop, produce or market our products to effectively compete against our competitors, our results of operations may materially suffer.

We believe that our customers are increasingly looking for strong, long-term relationships with a few key suppliers that help them improve product performance, reduce costs, or support new product development. To satisfy these growing customer requirements, our competitors have been consolidating within product lines through mergers and acquisitions. We may also need to invest and spend more on research and development and marketing costs to strengthen existing customer relationships, as well as attract new customers.

Albemarle's brands, product image and trademarks represent the unique product identity of each of our products and are important symbols of the Company's reputation. Accordingly, the performance of our business could be adversely affected by any marketing and promotional materials used by our competitors that make false or unsubstantiated claims, imply immoral or improper conduct or are otherwise disparaging to our Company or its products. Further, our own actions could hurt such brands, product image and trademarks if our products underperform or we otherwise draw negative publicity.

Downturns in our customers' industries could adversely affect our sales and profitability.

Downturns in the businesses that use our specialty chemicals may adversely affect our sales. Many of our customers are in industries, including the electronics, building and construction, oilfield and automotive industries, which are cyclical in nature, or which are subject to secular downturns. Historically, cyclical or secular industry downturns have resulted in diminished product demand, excess manufacturing capacity and lower average selling prices, and we may experience similar problems in the future. A decline in our customers' industries may have a material adverse effect on our sales and profitability.

Our results are subject to fluctuation because of irregularities in the demand for our HPC catalysts and certain of our agrichemicals.

Our HPC catalysts are used by petroleum refiners in their processing units to reduce the quantity of sulfur and other impurities in petroleum products. The effectiveness of HPC catalysts diminishes with use, requiring the HPC catalysts to be replaced, on average, once every one to three years. The sales of our HPC catalysts, therefore, are largely dependent on the useful life cycle of the HPC catalysts in the processing units and may vary materially by quarter. In addition, the timing and profitability of HPC catalysts sales can have a significant impact on revenue and profit in any one quarter. Sales of our agrichemicals are also subject to fluctuation as demand varies depending on climate and other environmental conditions, which may prevent or reduce farming for extended periods. In addition, crop pricing and timing of when farms alternate from one crop to another crop in a particular year can also alter sales of agrichemicals.

Changes in our customers' products can reduce the demand for our specialty chemicals.

Our customers use our specialty chemicals for a broad range of applications. Changes in our customers' products or processes may enable our customers to reduce consumption of the specialty chemicals that we produce or make our specialty chemicals unnecessary. Customers may also find alternative materials or processes that do not require our products. Should a customer decide to use a different material due to price, performance or other considerations, we may not be able to supply a product that meets the customer's new requirements. Consequently, it is important that we develop new products to replace the sales of products that mature and decline in use. Our business, results of operations, cash flows and margins could be materially adversely affected if we are unable to manage successfully the maturation of our existing products and the introduction of new products.

Our research and development efforts may not succeed and our competitors may develop more effective or successful products.

Our industries and the end markets into which we sell our products experience technological change and product improvement. Manufacturers periodically introduce new products or require new technological capacity to develop customized products. Our growth will depend on our ability to gauge the direction of the commercial and technological progress in all key end markets and upon our ability to fund and successfully develop, manufacture and market products in such changing end markets. As a result, we must commit substantial resources each year to research and development. We will have to continue to identify, develop, market and in certain cases, secure regulatory approval for innovative products on a timely basis to replace or enhance existing products in order to maintain our profit margins and our competitive position. Ongoing investments in research and development for future products could result in higher costs without a proportional increase in revenues. Additionally, we may not be successful in developing new products and/or technology, either alone or with third parties, or licensing intellectual property rights from third parties on a commercially competitive basis. Our new products may not be

accepted by our customers or may fail to receive regulatory approval. Moreover, new products may have lower margins than the products they replace. If we fail to keep pace with the evolving technological innovations in our end markets on a competitive basis, our business, financial condition and results of operations could be adversely affected.

Our inability to protect our intellectual property rights could have a material adverse effect on our business, financial condition and results of operations.

Protection of our proprietary processes, methods and compounds and other technology is important to our business. We generally rely on patent, trade secret, trademark and copyright laws of the United States and certain other countries in which our products are produced or sold, as well as licenses and nondisclosure and confidentiality agreements, to protect our intellectual property rights. The patent, trade secret, trademark and copyright laws of some countries, or their enforcement, may not protect our intellectual property rights to the same extent as the laws of the United States. Failure to protect our intellectual property rights may result in the loss of valuable proprietary technologies. Additionally, some of our technologies are not covered by any patent or patent application and, even if a patent application has been filed, it may not result in an issued patent. If patents are issued to us, those patents may not provide meaningful protection against competitors or against competitive technologies. We cannot assure you that our intellectual property rights will not be challenged, invalidated, circumvented or rendered unenforceable.

We also conduct research and development activities with third parties and license certain intellectual property rights from third parties and we plan to continue to do so in the future. We endeavor to license or otherwise obtain intellectual property rights on terms favorable to us. However, we may not be able to license or otherwise obtain intellectual property rights on such terms or at all. Our inability to license or otherwise obtain such intellectual property rights could have a material adverse effect on our ability to create a competitive advantage and create innovative solutions for our customers, which will adversely affect our net sales and our relationships with our customers.

We could face patent infringement claims from our competitors or others alleging that our processes or products infringe on their proprietary technologies. If we are found to be infringing on the proprietary technology of others, we may be liable for damages and we may be required to change our processes, redesign our products partially or completely, pay to use the technology of others, stop using certain technologies or stop producing the infringing product entirely. Even if we ultimately prevail in an infringement suit, the existence of the suit could prompt customers to switch to products that are not the subject of infringement suits. We may not prevail in intellectual property litigation and such litigation may result in significant legal costs or otherwise impede our ability to produce and distribute key products.

We also rely upon unpatented proprietary manufacturing expertise, continuing technological innovation and other trade secrets to develop and maintain our competitive position. While we generally enter into confidentiality agreements with our employees and third parties to protect our intellectual property, we cannot assure you that our confidentiality agreements will not be breached, that they will provide meaningful protection for our trade secrets and proprietary manufacturing expertise or that adequate remedies will be available in the event of an unauthorized use or disclosure of our trade secrets or manufacturing expertise. In addition, our trade secrets and know-how may be improperly obtained by other means, such as a breach of our information technologies security systems or direct theft.

Our business and operations could suffer in the event of cybersecurity breaches.

Attempts to gain unauthorized access to our information technology systems become more sophisticated over time. These attempts, which might be related to industrial or other espionage, include covertly introducing malware to our computers and networks and impersonating authorized users, among others. We seek to detect and investigate all security incidents and to prevent their recurrence, but in some cases we might be unaware of an incident or its magnitude and effects. The theft, unauthorized use or publication of our intellectual property and/or confidential business information could harm our competitive position, reduce the value of our investment in research and development and other strategic initiatives or otherwise adversely affect our business. To the extent that any cybersecurity breach results in inappropriate disclosure of our customers' or licensees' confidential information, we may incur liability as a result. In addition, the devotion of additional resources to the security of our information technology systems in the future could significantly increase the cost of doing business or otherwise adversely impact our financial results.

Our substantial international operations subject us to risks of doing business in foreign countries, which could adversely affect our business, financial condition and results of operations.

We conduct a substantial portion of our business outside the United States. Accordingly, our business is subject to risks related to the differing legal, political, social and regulatory requirements and economic conditions of many jurisdictions. Risks inherent in international operations include the following:

- fluctuations in foreign currency exchange rates may affect product demand and may adversely affect the profitability in U.S. dollars of products and services we provide in international markets where payment for our products and services is made in the local currency;
- transportation and other shipping costs may increase, or transportation may be inhibited;
- increased cost or decreased availability of raw materials;
- changes in foreign laws and tax rates or U.S. laws and tax rates with respect to foreign income may unexpectedly increase the rate at which our income is taxed, impose new and additional taxes on remittances, repatriation or other payments by subsidiaries, or cause the loss of previously recorded tax benefits;
- foreign countries may adopt other restrictions on foreign trade or investment, including currency exchange controls;
- trade sanctions could result in losing access to customers and suppliers in those countries;
- unexpected adverse changes in foreign laws or regulatory requirements may occur;
- agreements may be difficult to enforce and receivables difficult to collect;
- compliance with a variety of foreign laws and regulations may be burdensome;
- compliance with anti-bribery and anti-corruption laws (such as the Foreign Corrupt Practices Act) as well as anti-money-laundering laws may be costly;
- unexpected adverse changes in export duties, quotas and tariffs and difficulties in obtaining export licenses;
- general economic conditions in the countries in which we operate could have an adverse effect on our earnings from operations in those countries;
- foreign operations may experience staffing difficulties and labor disputes;
- termination or substantial modification of international trade agreements;
- foreign governments may nationalize private enterprises;
- increased sovereign risk (such as default by or deterioration in the economies and credit worthiness of local governments) may occur; and
- our business and profitability in a particular country could be affected by political or economic repercussions from terrorist activities and the response to such activities, the possibility of hyperinflationary conditions and political instability in certain countries.

In addition, certain of our joint ventures operate, and we have ongoing capital projects in, high-risk regions of the world such as the Middle East and South America. Unanticipated events such as geopolitical changes could result in a write-down of our investment in the affected joint venture or a delay or cancellation of those capital projects, which could negatively impact our future growth and profitability. Our success as a global business will depend, in part, upon our ability to succeed in differing legal, regulatory, economic, social and political conditions by developing, implementing and maintaining policies and strategies that are effective in each location where we and our joint ventures do business.

Furthermore, our subsidiaries are subject to rules and regulations related to anti-bribery prohibitions of the U.S. and other countries and export controls and economic embargoes, violations of which may carry substantial penalties. For example, export control and economic embargo regulations limit the ability of our subsidiaries to market, sell, distribute or otherwise transfer their products or technology to prohibited countries or persons. Failure to comply with these regulations could subject our subsidiaries to fines, enforcement actions and/or have an adverse effect on our reputation and the value of our common stock.

Changes in, or the interpretation of, tax legislation or rates throughout the world could materially impact our results.

Our effective tax rate and related tax balance sheet attributes could be impacted by changes in tax legislation throughout the world. Currently, the majority of our net sales are generated from customers located outside the United States, and a substantial portion of our assets and employees are located outside of the United States.

We have not accrued income taxes or foreign withholding taxes on undistributed earnings for most non-U.S. subsidiaries, because those earnings are intended to be indefinitely reinvested in the operations of those subsidiaries. Certain tax proposals

with respect to such earnings could substantially increase our tax expense, which would substantially reduce our income and have a material adverse effect on our results of operations and cash flows from operating activities. We have provided deferred income taxes on the portion of undistributed foreign earnings determined not to be indefinitely reinvested in our foreign operations.

Our future effective tax rates could be affected by changes in the mix of earnings in countries with differing statutory tax rates, expirations of tax holidays or rulings, changes in the assessment regarding the realization of the valuation of deferred tax assets, or changes in tax laws and regulations or their interpretation. Recent developments, including the European Commission's investigations on illegal state aid as well as the Organisation for Economic Co-operation and Development ("OECD") project on Base Erosion and Profit Shifting may result in changes to long-standing tax principles, which could adversely affect our effective tax rates or result in higher cash tax liabilities.

We are subject to the regular examination of our income tax returns by various tax authorities. Examinations in material jurisdictions or changes in laws, rules, regulations or interpretations by local taxing authorities could result in impacts to tax years open under statute or to foreign operating structures currently in place. We regularly assess the likelihood of adverse outcomes resulting from these examinations or changes in laws, rules, regulations or interpretations to determine the adequacy of our provision for taxes. It is possible the outcomes from these examinations will have a material adverse effect on our financial condition and operating results.

We are exposed to fluctuations in foreign exchange rates, which may adversely affect our operating results and net income.

We conduct our business and incur costs in the local currency of most of the countries in which we operate. Changes in exchange rates between these foreign currencies and the U.S. Dollar will affect the recorded levels of our assets, liabilities, net sales, cost of goods sold and operating margins and could result in exchange losses. The primary currencies to which we have exposure are the European Union Euro, Japanese Yen, Chinese Renminbi, South Korean Won, Australian Dollar and Chilean Peso. Exchange rates between these currencies and the U.S. Dollar in recent years have fluctuated significantly and may do so in the future. With respect to our potential exposure to foreign currency fluctuations and devaluations, for the year ended December 31, 2016, approximately 30% of our net sales were denominated in such currencies. Significant changes in these foreign currencies relative to the U.S. Dollar could also have an adverse effect on our ability to meet interest and principal payments on any foreign currency-denominated debt outstanding. In addition to currency translation risks, we incur currency transaction risks whenever one of our operating subsidiaries or joint ventures enters into either a purchase or a sales transaction using a different currency from its functional currency. Our operating results and net income may be affected by any volatility in currency exchange rates and our ability to manage effectively our currency transaction and translation risks.

Our business could be adversely affected by environmental, health and safety laws and regulations to which our raw materials, products and facilities are subject.

In the jurisdictions in which we operate, we are subject to numerous federal, state and local environmental, health and safety laws and regulations, including those governing the discharge of pollutants into the air and water, the management and disposal of hazardous substances and wastes and the cleanup of contaminated properties. Further, some of the raw materials we handle are subject to government regulation. These regulations affect the manufacturing processes, handling, uses and applications of our products. In addition, our production facilities and a number of our distribution centers require numerous operating permits. Due to the nature of these requirements and changes in our operations, our operations may exceed limits under permits or we may not have the proper permits to operate our operations. Ongoing compliance with such laws, regulations and permits is an important consideration for us and we incur substantial capital and operating costs in our compliance efforts.

Compliance with environmental laws generally increases the costs of manufacturing, registration/approval requirements, transportation and storage of raw materials and finished products, and storage and disposal of wastes, and could have a material adverse effect on our results of operations. We may incur substantial costs, including fines, damages, criminal or civil sanctions and remediation costs, or experience interruptions in our operations, for violations arising under these laws or permit requirements. Furthermore, environmental laws are subject to change and have become increasingly stringent in recent years. We expect this trend to continue and anticipate that compliance will continue to require materially increased capital expenditures and operating and compliance costs.

Violations of environmental, health and safety laws and regulations may subject us to fines, penalties and other liabilities and may require us to change certain business practices or curtail production.

If we violate environmental, health and safety laws or regulations, in addition to being required to correct such violations, we can be held liable in administrative, civil or criminal proceedings for substantial fines and other sanctions could be imposed

that could disrupt or limit our operations. Liabilities associated with the investigation and cleanup of hazardous substances, as well as personal injury, property damages or natural resource damages arising from the release of, or exposure to, such hazardous substances, may be imposed in many situations without regard to violations of laws or regulations or other fault, and may also be imposed jointly and severally (so that a responsible party may be held liable for more than its share of the losses involved, or even the entire loss). Such liabilities may also be imposed on many different entities, including, for example, current and prior property owners or operators, as well as entities that arranged for the disposal of the hazardous substances. Such liabilities can be difficult to identify or quantify.

We use, and in the past have used, hazardous substances at many of our facilities, and we have in the past, and may in the future, be subject to claims relating to exposure to hazardous materials and the associated liabilities may be material. We also have generated, and continue to generate, hazardous wastes at a number of our facilities. Some of our facilities also have lengthy histories of manufacturing or other activities that may have resulted in site contamination. We have also given contractual indemnities for environmental conditions relating to facilities we no longer own or operate. The nature of our business, including historical operations at our current and former facilities, exposes us to risks of liability under environmental laws and regulations due to the production, storage, use, transportation and sale of materials that can cause contamination or personal injury if released into the environment. Additional information may arise in the future concerning the nature or extent of our liability with respect to identified sites, and additional sites may be identified for which we are alleged to be liable, that could cause us to materially increase our environmental accrual or the upper range of the costs we believe we could reasonably incur for such matters.

Our business and financial results may be adversely affected by various legal and regulatory proceedings.

We are involved from time to time in legal and regulatory proceedings, which may be material in the future. The outcome of proceedings, lawsuits and claims may differ from our expectations, leading us to change estimates of liabilities and related insurance receivables.

Legal and regulatory proceedings, whether with or without merit, and associated internal investigations, may be time-consuming and expensive to prosecute, defend or conduct, divert management's attention and other resources, inhibit our ability to sell our products, result in adverse judgments for damages, injunctive relief, penalties and fines, and otherwise negatively affect our business.

We may be subject to indemnity claims and liable for other payments relating to properties or businesses we have divested.

In connection with the sale of certain properties and businesses, we have agreed to indemnify the purchasers for certain types of matters, such as certain breaches of representations and warranties, taxes and certain environmental matters.

With respect to environmental matters, the discovery of contamination arising from properties that we have divested may expose us to indemnity obligations under the sale agreements with the buyers of such properties or cleanup obligations and other damages under applicable environmental laws.

We may not have insurance coverage for such indemnity obligations or cash flows to make such indemnity or other payments. Further, we cannot predict the nature of and the amount of any indemnity or other obligations we may have to the applicable purchaser. Such payments may be costly and may adversely affect our financial condition and results of operations.

At several of our properties where hazardous substances are known to exist (including some sites where hazardous substances are being investigated or remediated), we believe we are entitled to contractual indemnification from one or more former owners or operators; however, in the event we make a claim, the indemnifier may disagree with us or not have the financial capacity to fulfill its indemnity obligation. If our contractual indemnity is not upheld or effective, our accrual and/or our costs for the investigation and cleanup of hazardous substances could increase materially.

We may be exposed to certain regulatory and financial risks related to climate change.

Growing concerns about climate change may result in the imposition of additional regulations or restrictions to which we may become subject. Climate changes include changes in rainfall and in storm patterns and intensities, water shortages, significantly changing sea levels and increasing atmospheric and water temperatures, among others. For example, there have been concerns regarding the declining water level of the Dead Sea, from which our joint venture, JBC, produces bromine. A number of governments or governmental bodies have introduced or are contemplating regulatory changes in response to climate change, including regulating greenhouse gas emissions. Potentially, additional U.S. federal regulation will be forthcoming with respect to greenhouse gas emissions (including carbon dioxide) and/or "cap and trade" legislation that could have impacts on our operations. In addition, we have operations in the European Union, Brazil, China, Japan, Jordan, Saudi Arabia, Singapore and the United Arab Emirates, which have implemented measures to achieve objectives under the Kyoto Protocol, an

international agreement linked to the United Nations Framework Convention on Climate Change (“UNFCCC”), which set binding targets for reducing greenhouse gas emissions.

The outcome of new legislation or regulation in the U.S. and other jurisdictions in which we operate may result in new or additional requirements, additional charges to fund energy efficiency activities, fees or restrictions on certain activities. While certain climate change initiatives may result in new business opportunities for us in the area of alternative fuel technologies and emissions control, compliance with these initiatives may also result in additional costs to us, including, among other things, increased production costs, additional taxes, reduced emission allowances or additional restrictions on production or operations. Any adopted future climate change regulations could also negatively impact our ability to compete with companies situated in areas not subject to such limitations. Even without such regulation, increased public awareness and adverse publicity about potential impacts on climate change emanating from us or our industry could harm us. We may not be able to recover the cost of compliance with new or more stringent laws and regulations, which could adversely affect our business and negatively impact our growth. Furthermore, the potential impacts of climate change and related regulation on our customers are highly uncertain and may adversely affect us.

Regulation, or the threat of regulation, of some of our products could have an adverse effect on our sales and profitability.

We manufacture or market a number of products that are or have been the subject of attention by regulatory authorities and environmental interest groups. For example, for many years we have marketed methyl bromide, a chemical that is particularly effective as a soil fumigant. In recent years, the market for methyl bromide has changed significantly, driven by the Montreal Protocol of 1987 and the London Amendment of 1990 and related regulations prompted by findings regarding the chemical’s potential to deplete the ozone layer. Completion of the phase-out of methyl bromide as a fumigant took effect January 1, 2005, with critical uses allowed in the U.S. on an annual basis until feasible alternatives are available, with methyl bromide scheduled to be completely phased out in 2017.

Over the past decade, there has been increasing scrutiny of certain brominated flame retardants by regulatory authorities, legislative bodies and environmental interest groups in various countries. We manufacture a broad range of brominated flame retardant products, which are used in a variety of applications to protect people, property and the environment from the negative consequences of fire. Concern about the impact of some of our products on human health or the environment may lead to regulation, or reaction in our markets independent of regulation, that could reduce or eliminate markets for such products.

Agencies in the European Union continue to evaluate the risks to human health and the environment associated with certain brominated flame retardants such as tetrabromobisphenol A and decabromodiphenylethane, both of which we manufacture. Additional government regulations, including limitations or bans on the use of brominated flame retardants, could result in a decline in our net sales of brominated flame retardants and have an adverse effect on our sales and profitability. In addition, the threat of additional regulation or concern about the impact of brominated flame retardants on human health or the environment could lead to a negative reaction in our markets that could reduce or eliminate our markets for these products, which could have an adverse effect on our sales and profitability.

Our business and our customers are subject to significant requirements under REACH, which imposes obligations on European Union manufacturers and importers of chemicals and other products into the European Union to compile and file comprehensive reports, including testing data, on each chemical substance, and perform chemical safety assessments. Additionally, substances of high concern, as defined under REACH, are subject to an authorization process, which may result in restrictions in the use of products by application or even banning the product. REACH regulations impose significant additional burdens on chemical producers, importers, downstream users of chemical substances and preparations, and the entire supply chain. See “Regulation” in Item 1. Business on page 8. Our significant manufacturing presence and sales activities in the European Union requires significant compliance costs and may result in increases in the costs of raw materials we purchase and the products we sell. Increases in the costs of our products could result in a decrease in their overall demand; additionally, customers may seek products that are not regulated by REACH, which could also result in a decrease in the demand of certain products subject to the REACH regulations.

In June 2016, modifications to the TSCA in the U.S. were signed into law, requiring chemicals to be assessed against a risk-based safety standard and for the elimination of unreasonable risks identified during risk evaluation. Other pending initiatives potentially will require toxicological testing and risk assessments of a wide variety of chemicals, including chemicals used or produced by us. These initiatives include the Voluntary Children's Chemical Evaluation Program, and High Production Volume Chemical Initiative in the U.S., as well as new initiatives in Asia and other regions. These assessments may result in heightened concerns about the chemicals involved and additional requirements being placed on the production, handling, labeling or use of the subject chemicals. Such concerns and additional requirements could also increase the cost incurred by our

customers to use our chemical products and otherwise limit the use of these products, which could lead to a decrease in demand for these products. Such a decrease in demand would likely have an adverse impact on our business and results of operations.

We could be subject to damages based on claims brought against us by our customers or lose customers as a result of the failure of our products to meet certain quality specifications.

Our products provide important performance attributes to our customers' products. If a product fails to perform in a manner consistent with quality specifications or has a shorter useful life than guaranteed, a customer could seek replacement of the product or damages for costs incurred as a result of the product failing to perform as guaranteed. These risks apply to our refinery catalysts in particular because, in certain instances, we sell our refinery catalysts under agreements that contain limited performance and life cycle guarantees. Also, because many of our products are integrated into our customers' products, we may be requested to participate in, or fund in whole or in part the costs of, a product recall conducted by a customer. For example, some of our businesses supply products to customers in the automotive industry. In the event one of these customers conducts a product recall that it believes is related to one of our products, we may be asked to participate in, or fund in whole or in part, such a recall.

Our customers often require our subsidiaries to represent that our products conform to certain product specifications provided by our customers. Any failure to comply with such specifications could result in claims or legal action.

A successful claim or series of claims against us could have a material adverse effect on our financial condition and results of operations and could result in a loss of one or more customers.

Our business is subject to hazards common to chemical businesses, any of which could injure our employees or other persons, damage our facilities or other properties, interrupt our production and adversely affect our reputation and results of operations.

Our business is subject to hazards common to chemical manufacturing, storage, handling and transportation, including explosions, fires, inclement weather, natural disasters, mechanical failure, unscheduled downtime, transportation interruptions, remediation, chemical spills, discharges or releases of toxic or hazardous substances or gases and other risks. These hazards can cause personal injury and loss of life to our employees and other persons, severe damage to, or destruction of, property and equipment and environmental contamination. In addition, the occurrence of disruptions or material operating problems at our facilities due to any of these hazards may diminish our ability to meet our output goals. Accordingly, these hazards and their consequences could adversely affect our reputation and have a material adverse effect on our operations as a whole, including our results of operations and cash flows, both during and after the period of operational difficulties.

Natural disasters and weather-related matters could impact our results of operations.

Historically, major hurricanes have caused significant disruption to the operations on the U.S. Gulf Coast for many of our customers and our suppliers of certain raw materials, which had an adverse impact on volume and cost for some of our products. Our operations in Chile could be subject to significant rain events and earthquakes. If similar weather-related matters or other natural disasters occur in the future, they could negatively affect the results of operations at our sites in the affected regions as well as have adverse impacts on the global economy.

Our insurance may not fully cover all potential exposures.

We maintain property, business interruption, casualty, and other insurance, but such insurance may not cover all risks associated with the hazards of our business and is subject to limitations, including deductibles and coverage limits. We may incur losses beyond the limits, or outside the coverage, of our insurance policies, including liabilities for environmental remediation. In addition, from time to time, various types of insurance for companies in the specialty chemical industry have not been available on commercially acceptable terms or, in some cases, have not been available at all. We are potentially at additional risk if one or more of our insurance carriers fail. Additionally, severe disruptions in the domestic and global financial markets could adversely impact the ratings and survival of some insurers. Future downgrades in the ratings of enough insurers could adversely impact both the availability of appropriate insurance coverage and its cost. In the future, we may not be able to obtain coverage at current levels, if at all, and our premiums may increase significantly on coverage that we maintain.

If we are unable to retain key personnel or attract new skilled personnel, it could have an adverse effect on our business.

Our success depends on our ability to attract and retain key personnel, and we rely heavily on our management team. The unanticipated departure of any key member of our management team could have an adverse effect on our business. In addition, because of the specialized and technical nature of our business, our performance is dependent on the continued service of, and on our ability to attract and retain, qualified management, scientific, technical, marketing and support personnel. Competition

for such personnel is intense, and we may be unable to continue to attract or retain such personnel. In addition, because of our reliance on our senior management team, our future success depends, in part, on our ability to identify and develop or recruit talent to succeed our senior management and other key positions throughout the organization. If we fail to identify and develop or recruit successors, we are at risk of being harmed by the departures of these key employees.

Effective succession planning is also important to our long-term success. Failure to ensure effective transfer of knowledge and smooth transitions involving key employees could hinder our strategic planning and execution.

Some of our employees are unionized, represented by workers' councils or are employed subject to local laws that are less favorable to employers than the laws of the U.S.

As of December 31, 2016, we had approximately 5,000 employees, including employees of our consolidated joint ventures. Certain of these employees are represented by unions or workers' councils. In addition, a large number of our employees are employed in countries in which employment laws provide greater bargaining or other rights to employees than the laws of the United States. Such employment rights require us to work collaboratively with the legal representatives of the employees to effect any changes to labor arrangements. For example, most of our employees in Europe are represented by workers' councils that must approve any changes in conditions of employment, including salaries and benefits and staff changes, and may impede efforts to restructure our workforce. Although we believe that we have a good working relationship with our employees, a strike, work stoppage, slowdown or significant dispute with our employees could result in a significant disruption of our operations or higher ongoing labor costs.

Our joint ventures may not operate according to their business plans if our partners fail to fulfill their obligations, which may adversely affect our results of operations and may force us to dedicate additional resources to these joint ventures.

We currently participate in a number of joint ventures and may enter into additional joint ventures in the future. The nature of a joint venture requires us to share control with unaffiliated third parties. If our joint venture partners do not fulfill their obligations, the affected joint venture may not be able to operate according to its business plan. In that case, our results of operations may be adversely affected and we may be required to increase the level of our commitment to the joint venture. Also, differences in views among joint venture participants may result in delayed decisions or failures to agree on major issues. If these differences cause the joint ventures to deviate from their business plans, our results of operations could be adversely affected.

We may not be able to consummate future acquisitions or integrate acquisitions into our business, which could result in unanticipated expenses and losses.

As part of our business growth strategy, we have acquired businesses and entered into joint ventures in the past and intend to pursue acquisitions and joint venture opportunities in the future. Our ability to implement this component of our growth strategy will be limited by our ability to identify appropriate acquisition or joint venture candidates and our financial resources, including available cash and borrowing capacity. The expense incurred in consummating acquisitions or entering into joint ventures, the time it takes to integrate an acquisition or our failure to integrate businesses successfully, could result in unanticipated expenses and losses. Furthermore, we may not be able to realize any of the anticipated benefits from acquisitions or joint ventures.

The process of integrating acquired operations into our existing operations may result in unforeseen operating difficulties and may require significant financial resources that would otherwise be available for the ongoing development or expansion of existing operations. Some of the risks associated with the integration of acquisitions include:

- potential disruption of our ongoing business and distraction of management;
- unforeseen claims and liabilities, including unexpected environmental exposures;
- unforeseen adjustments, charges and write-offs;
- problems enforcing the indemnification obligations of sellers of businesses or joint venture partners for claims and liabilities;
- unexpected losses of customers of, or suppliers to, the acquired business;
- difficulty in conforming the acquired businesses' standards, processes, procedures and controls with our operations;
- in the case of foreign acquisitions, the need to integrate operations across different cultures and languages and to address the particular economic, currency, political and regulatory risks associated with specific countries;
- variability in financial information arising from the implementation of purchase price accounting;
- inability to coordinate new product and process development;

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- loss of senior managers and other critical personnel and problems with new labor unions and cultural challenges associated with integrating employees from the acquired company into our organization; and
 - challenges arising from the increased scope, geographic diversity and complexity of our operations.

Although our pension plans currently meet minimum funding requirements, events could occur that would require us to make significant contributions to the plans and reduce the cash available for our business.

We have several defined benefit pension plans around the world, including in the United States, United Kingdom, Germany, Belgium and Japan. We are required to make cash contributions to our pension plans to the extent necessary to comply with minimum funding requirements imposed by the various countries' benefit and tax laws. The amount of any such required contributions will be determined annually based on an actuarial valuation of the plans as performed by the plans' actuaries.

In previous years, we have made voluntary contributions to our U.S. qualified defined benefit pension plans. We anticipate approximately \$6.0 million of required cash contributions during 2017 for our defined benefit pension plans. Additional voluntary pension contributions in and after 2017 may vary depending on factors such as asset returns, interest rates, and legislative changes. The amounts we may elect or be required to contribute to our pension plans in the future may increase significantly. These contributions could be substantial and would reduce the cash available for our business.

Further, an economic downturn or recession or market disruption in the capital and credit markets may adversely impact the value of our pension plan assets, our results of operations, our statement of changes in stockholders' equity and our liquidity. Our funding obligations could change significantly based on the investment performance of the pension plan assets and changes in actuarial assumptions for local statutory funding valuations. Any deterioration of the capital markets or returns available in such markets may negatively impact our pension plan assets and increase our funding obligations for one or more of these plans and negatively impact our liquidity. We cannot predict the impact of this or any further market disruption on our pension funding obligations.

The occurrence or threat of extraordinary events, including domestic and international terrorist attacks, may disrupt our operations and decrease demand for our products.

Chemical-related assets may be at greater risk of future terrorist attacks than other possible targets in the United States and throughout the world. As a result, we are subject to existing federal rules and regulations (and may be subject to additional legislation or regulations in the future) that impose site security requirements on chemical manufacturing facilities, which increase our overhead expenses.

We are also subject to federal regulations that have heightened security requirements for the transportation of hazardous chemicals in the United States. We believe we have met these requirements but additional federal and local regulations that limit the distribution of hazardous materials are being considered. We ship and receive materials that are classified as hazardous. Bans on movement of hazardous materials through cities, like Washington, D.C., could affect the efficiency of our logistical operations. Broader restrictions on hazardous material movements could lead to additional investment to produce hazardous raw materials and change where and what products we manufacture.

The Chemical Facility Anti-Terrorism Standards program ("CFATS Program"), which is administered by the Department of Homeland Security ("DHS"), identifies and regulates chemical facilities to ensure that they have security measures in place to reduce the risks associated with potential terrorist attacks on chemical plants located in the US. In December 2014, the Protecting and Securing Chemical Facilities from Terrorist Attacks Act of 2014 ("CFATS Act") was enacted. The CFATS Act reauthorizes the CFATS Program for four years. DHS has released an interim final rule under the CFATS Program that imposes comprehensive federal security regulations for high-risk chemical facilities in possession of specified quantities of chemicals of interest. This rule establishes risk-based performance standards for the security of the U.S.'s chemical facilities. It requires covered chemical facilities to prepare Security Vulnerability Assessments, which identify facility security vulnerabilities, and to develop and implement Site Security Plans, which include measures that satisfy the identified risk-based performance standards. We cannot determine with certainty the costs associated with any security measures that DHS may require.

The occurrence of extraordinary events, including future terrorist attacks and the outbreak or escalation of hostilities, cannot be predicted, and their occurrence can be expected to continue to negatively affect the economy in general and specifically the markets for our products. The resulting damage from a direct attack on our assets, or assets used by us, could include loss of life and property damage. In addition, available insurance coverage may not be sufficient to cover all of the damage incurred or, if available, may be prohibitively expensive.

We will need a significant amount of cash to service our indebtedness and our ability to generate cash depends on many factors beyond our control.

Our ability to generate sufficient cash flow from operations or use existing cash balances to make scheduled payments on our debt depends on a range of economic, competitive and business factors, many of which are outside our control. Our business may not generate sufficient cash flow from operations to service our debt obligations. If we are unable to service our debt obligations, we may need to refinance all or a portion of our indebtedness on or before maturity, reduce or delay capital expenditures, sell assets or raise additional equity. We may not be able to refinance any of our indebtedness, sell assets or raise additional equity on commercially reasonable terms or at all, which could cause us to default on our obligations and impair our liquidity. Our inability to generate sufficient cash flow or use existing cash balances to satisfy our debt obligations, or to refinance our obligations on commercially reasonable terms, could have a material adverse effect on our business and financial condition.

Restrictive covenants in our debt instruments may adversely affect our business.

Our senior credit facilities and the indentures governing our senior notes contain select restrictive covenants. These covenants provide constraints on our financial flexibility. The failure to comply with these or other covenants governing other indebtedness, including indebtedness incurred in the future, could result in an event of default, which, if not cured or waived, could have a material adverse effect on our business, financial condition and results of operations, including cross-defaults to other debt facilities. See “Financial Condition and Liquidity—Long-Term Debt” in Item 7. Management’s Discussion and Analysis of Financial Condition and Results of Operations on page 51.

Changes in credit ratings issued by nationally recognized statistical rating organizations could adversely affect our cost of financing, the market price of our securities and our debt service obligations.

Credit rating agencies rate our debt securities on factors that include our operating results, actions that we take, their view of the general outlook for our industry and their view of the general outlook for the economy. Actions taken by the rating agencies can include maintaining, upgrading or downgrading the current rating or placing us on a watch list for possible future downgrading. Downgrading the credit rating of our debt securities or placing us on a watch list for possible future downgrading would likely increase our cost of future financing, could limit our access to the capital markets and have an adverse effect on the market price of our securities.

Borrowings under a portion of our debt facilities bear interest at floating rates, and are subject to adjustment based on the ratings of our senior unsecured long-term debt. The downgrading of any of our ratings or an increase in any of the benchmark interest rates would result in an increase of our interest expense on our variable rate borrowings.

Because a significant portion of our operations is conducted through our subsidiaries and joint ventures, our ability to service our debt may be dependent on our receipt of distributions or other payments from our subsidiaries and joint ventures.

A significant portion of our operations is conducted through our subsidiaries and joint ventures. As a result, our ability to service our debt may be partially dependent on the earnings of our subsidiaries and joint ventures and the payment of those earnings to us in the form of dividends, loans or advances and through repayment of loans or advances from us. Payments to us by our subsidiaries and joint ventures will be contingent upon our subsidiaries’ or joint ventures’ earnings and other business considerations and may be subject to statutory or contractual restrictions. In addition, there may be significant tax and other legal restrictions on the ability of non-U.S. subsidiaries or joint ventures to remit money to us.

We may continue to expand our business through acquisitions and we may incur additional indebtedness, including indebtedness related to acquisitions.

We have historically expanded our business primarily through acquisitions. A part of our business strategy is to continue to grow through acquisitions that complement our existing technologies and accelerate our growth. Our credit facilities have limited financial maintenance covenants. In addition, the indenture and other agreements governing our senior notes does not limit our ability to incur additional indebtedness in connection with acquisitions or otherwise. As a result, we may incur substantial additional indebtedness in connection with acquisitions.

This additional indebtedness and the related debt service obligations could have important consequences, including:

- reducing flexibility in planning for, or reacting to, changes in our businesses, the competitive environment and the industries in which we operate, and to technological and other changes;
- lowering credit ratings;

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- reducing access to capital and increasing borrowing costs generally or for any additional indebtedness to finance future operating and capital expenses and for general corporate purposes;
 - reducing funds available for operations, capital expenditures and other activities; and
 - creating competitive disadvantages relative to other companies with lower debt levels.

We may be subject to increased tax exposure resulting from Rockwood pre-acquisition periods.

Under the terms of certain purchase agreements, third party sellers have agreed to substantially indemnify us for tax liabilities pertaining to Rockwood's pre-acquisition periods generally until the applicable statutes of limitations expire. To the extent that such companies fail to indemnify or satisfy their obligations, or if any amount is not covered by the terms of the indemnity, earnings could be negatively impacted in future periods through increased tax expense.

We have not established proven or probable reserves through the completion of a feasibility study for the minerals that we produce.

We have not established proven or probable reserves, as defined by the SEC under Industry Guide 7, through the completion of a "final" or "bankable" feasibility study for any of the minerals that we produce. Since we commenced production without having established proven or probable reserves, there may be greater inherent uncertainty as to whether or not mineralized material can be economically obtained as originally planned and anticipated. Also, because we do not have any proven or probable reserves, we may not be able to continue to produce such minerals at existing levels or to expand our production capacity in the future which could harm our business, results or operations and financial condition.

Future events may impact our deferred tax asset position and U.S. deferred federal income taxes on undistributed earnings of international affiliates that are considered to be indefinitely reinvested.

We evaluate our ability to utilize deferred tax assets and our need for valuation allowances based on available evidence. This process involves significant management judgment about assumptions that are subject to change from period to period based on changes in tax laws or variances between future projected operating performance and actual results. We are required to establish a valuation allowance for deferred tax assets if we determine, based on available evidence at the time the determination is made, that it is more likely than not that some portion or all of the deferred tax assets will not be utilized. In making this determination, we evaluate all positive and negative evidence as of the end of each reporting period. Future adjustments (either increases or decreases), to the deferred tax asset valuation allowance are determined based upon changes in the expected realization of the net deferred tax assets. The utilization of our deferred tax assets ultimately depends on the existence of sufficient taxable income in either the carry-back or carry-forward periods under the applicable tax law. Due to significant estimates used to establish the valuation allowance and the potential for changes in facts and circumstances, it is reasonably possible that we will be required to record adjustments to the valuation allowance in future reporting periods. Changes to the valuation allowance or the amount of deferred tax liabilities could have a materially adverse effect on our business, financial condition and results of operations. Further, should we change our assertion regarding the permanent reinvestment of the undistributed earnings in foreign operations, a deferred tax liability may need to be established.

If our goodwill, intangible assets or long-lived assets become impaired, we may be required to record a significant charge to earnings.

Under U.S. Generally Accepted Accounting Principles ("GAAP"), we review our intangible assets and long-lived assets for impairment when events or changes in circumstances indicate the carrying value may not be recoverable. Goodwill is tested for impairment on October 31 of each year, or more frequently if required. Factors that may be considered a change in circumstances, indicating that the carrying value of our goodwill, intangible assets or long-lived assets may not be recoverable, include, but are not limited to, a decline in our stock price and market capitalization, reduced future cash flow estimates, and slower growth rates in our industry. We may be required to record a significant charge in our financial statements during the period in which any impairment of our goodwill, intangible assets or long-lived assets is determined, negatively impacting our results of operations.

Our required capital expenditures may exceed our estimates.

Our capital expenditures for continuing operations generally consist of expenditures to maintain and improve existing equipment and substantial investments in new equipment. Commencement of production requires start-up, commission and certification of product quality by our customers, which may impact the expected timing of sales of product from such facility. Construction of large chemical operations is subject to numerous risks and uncertainties, including, among others, the ability to complete the project on a timely basis and in accordance with the estimated budget for such project and our ability to estimate future demand for our products.

Future capital expenditures may be significantly higher, depending on the investment requirements of each of our business lines, and may also vary substantially if we are required to undertake actions to compete with new technologies in our industry. We may not have the capital necessary to undertake these capital investments. If we are unable to do so, we may not be able to effectively compete in some of our markets.

Item 1B. Unresolved Staff Comments.

NONE

Item 2. Properties.

We operate on a global basis. Our principal executive offices in Charlotte, NC, our corporate office in Baton Rouge, LA and regional shared services offices in Budapest, Hungary and Dalian, China are leased. We and our affiliates also operate regional sales and administrative offices in various locations throughout the world, which are generally leased.

We believe that our production facilities, research and development facilities, and sales and administrative offices are generally well maintained, effectively used and are adequate to operate our business. During 2016, the Company's manufacturing plants operated at approximately 71% capacity in the aggregate.

Set forth below is information regarding our significant production facilities operated by our affiliates and us:

Location	Business Segment	Principal Use	Owned/Leased
Amsterdam, the Netherlands	Refining Solutions	Production of refinery catalysts, research and product development activities	Owned
Baton Rouge, Louisiana	Lithium and Advanced Materials; Bromine Specialties	Research and product development activities, and production of flame retardants, catalysts and additives	Owned; on leased land
Bitterfeld, Germany	Refining Solutions	Refinery catalyst regeneration, rejuvenation, and sulfiding	Owned by Eurecat S.A., a joint venture owned 50% by each of IFP Investissements and us
Cambridge, U.K.	Lithium and Advanced Materials	Production of performance catalysts	Leased
Greenbushes, Australia	Lithium and Advanced Materials	Production of lithium spodumene minerals and lithium concentrate	Owned by Windfield Holdings Pty Ltd, a joint venture in which we own 49%, and Sichuan Tianqi Lithium Industries Inc. which owns the remaining interest
Jubail, Saudi Arabia	Lithium and Advanced Materials	Manufacturing and marketing of organometallics	Owned by Saudi Organometallic Chemicals Company LLC, a joint venture owned 50% by each of Saudi Specialty Chemicals Company (a SABIC affiliate) and us
Kings Mountain, North Carolina	Lithium and Advanced Materials	Production of technical and battery grade lithium hydroxide	Owned
La Negra, Chile	Lithium and Advanced Materials	Production of lithium carbonate and lithium chloride	Owned
Langelsheim, Germany	Lithium and Advanced Materials	Production of butyllithium, lithium chloride, specialty products, lithium hydrides, cesium, special metals	Owned
Louvain-la-Neuve, Belgium	Lithium and Advanced Materials; Bromine Specialties; Refining Solutions; All Other	Regional offices and research and customer technical service activities	Owned
La Voulte, France	Refining Solutions	Refinery catalysts regeneration and treatment, research and development activities	Owned by Eurecat S.A., a joint venture owned 50% by each of IFP Investissements and us

Location	Business Segment	Principal Use	Owned/Leased
Magnolia, Arkansas	Bromine Specialties	Production of flame retardants, bromine, inorganic bromides, agricultural intermediates and tertiary amines	Owned
McAlester, Oklahoma	Refining Solutions	Refinery catalyst regeneration, rejuvenation, pre-reclaim burn off, as well as specialty zeolites and additives marketing activities	Owned by Eurecat S.A., a joint venture owned 50% by each of IFP Investissements and us
Meishan, China	Lithium and Advanced Materials	Production of lithium carbonate and lithium hydroxide	Owned
Mobile, Alabama	Lithium and Advanced Materials	Production of tin stabilizers	Owned by PMC Group, Inc. which operates the plant for Stannica LLC, a joint venture owned 50% by each of PMC Group Inc. and us
New Johnsonville, Tennessee	Lithium and Advanced Materials	Production of specialty products	Owned
Niihama, Japan	Refining Solutions	Production of refinery catalysts	Leased by Nippon Ketjen Company Limited, a joint venture owned 50% by each of Sumitomo Metal Mining Company Limited and us
Pasadena, Texas	Lithium and Advanced Materials; All Other	Production of aluminum alkyls, alkenyl succinic anhydride, orthoalkylated anilines, and other specialty chemicals	Owned
Pasadena, Texas	Refining Solutions	Production of refinery catalysts, research and development activities	Owned
Pasadena, Texas	Refining Solutions	Refinery catalysts regeneration services	Owned by Eurecat U.S. Incorporated, a joint venture in which we own a 57.5% interest and a consortium of entities in various proportions owns the remaining interest
Safi, Jordan	Bromine Specialties	Production of bromine and derivatives and flame retardants	Owned and leased by JBC, a joint venture owned 50% by each of Arab Potash Company Limited and us
Salar de Atacama, Chile	Lithium and Advanced Materials	Production of lithium brine and potash	Owned; however ownership will revert to the Chilean government once we have sold all remaining amounts under our contract with the Chilean government pursuant to which we obtain lithium brine in Chile
Santa Cruz, Brazil	Refining Solutions	Production of catalysts, research and product development activities	Owned by Fábrica Carioca de Catalisadores S.A, a joint venture owned 50% by each of Petrobras Química S.A.—PETROQUISA and us
Silver Peak, Nevada	Lithium and Advanced Materials	Production of lithium brine and lithium carbonate	Owned
South Haven, Michigan	All Other	Production of custom fine chemistry products including pharmaceutical actives	Owned
Taichung, Taiwan	Lithium and Advanced Materials	Production of butyllithium	Owned
Takaishi City, Osaka, Japan	Lithium and Advanced Materials	Production of aluminum alkyls	Owned by Nippon Aluminum Alkyls, a joint venture owned 50% by each of Mitsui Chemicals, Inc. and us
Twinsburg, Ohio	Bromine Specialties	Production of bromine-activated carbon	Leased

Location	Business Segment	Principal Use	Owned/Leased
Twinsburg, Ohio	Bromine Specialties	Production of bromine-activated carbon	Leased
Tyrone, Pennsylvania	All Other	Production of custom fine chemistry products, agricultural intermediates, performance polymer products and research and development activities	Owned
Xinyu, China	Lithium and Advanced Materials	Production of lithium carbonate and lithium hydroxide	Owned
Yeosu, South Korea	Lithium and Advanced Materials	Research and product development activities/small scale production of catalysts and catalyst components	Owned

Item 3. Legal Proceedings.

We are involved from time to time in legal proceedings of types regarded as common in our business, including administrative or judicial proceedings seeking remediation under environmental laws, such as Superfund, products liability, breach of contract liability and premises liability litigation. Where appropriate, we may establish financial reserves for such proceedings. We also maintain insurance to mitigate certain of such risks.

Item 4. Mine Safety Disclosures.

Not applicable.

Executive Officers of the Registrant.

The names, ages and biographies of our executive officers, as of February 20, 2017, are set forth below. The term of office of each officer is until the meeting of the Board of Directors following the next annual shareholders' meeting (May 12, 2017).

Name	Age	Position
Luther C. Kissam IV	52	Chairman, President and Chief Executive Officer
Matthew K. Juneau	56	Executive Vice President, Corporate Strategy and Investor Relations
Karen G. Narwold	57	Executive Vice President, Chief Administrative Officer
Scott A. Tozier	51	Executive Vice President, Chief Financial Officer
Donald J. LaBauve, Jr.	50	Vice President, Corporate Controller, Chief Accounting Officer

Luther C. Kissam IV was elected as Chairman of the Board of Directors in November 2016, first elected to our Board of Directors effective November 2011, elected as Chief Executive Officer effective September 2011 and as our President effective May 2013. Previously, Mr. Kissam served as President from March 2010 until March 2012, Executive Vice President, Manufacturing, Law and HS&E from May 2009 until March 2010, and as Senior Vice President, Manufacturing and Law and Corporate Secretary from January 2008 until May 2009. Mr. Kissam joined us in October 2003 and served as Vice President, General Counsel and Corporate Secretary from that time until December 2005, when he was promoted to Senior Vice President, General Counsel and Corporate Secretary. Before joining us, Mr. Kissam served as Vice President, General Counsel and Secretary of Merisant Company (manufacturer and marketer of sweetener and consumer food products), having previously served as Associate General Counsel of Monsanto Company (provider of agricultural products and solutions).

Matthew K. Juneau was elected as our Executive Vice President of Corporate Strategy and Investor Relations effective May 2015. Previously, Mr. Juneau served as Senior Vice President, President Performance Chemicals since December 2013, Vice President, Polymer Solutions since March 2012, Vice President, Global Sales and Services from May 2009 to February 2012, and prior to that as Division Vice President of our performance chemicals business in the Fine Chemistry division since January 2007. Prior to that, Mr. Juneau held various positions of increasing responsibility in research and development and business management with us including Managing Director of our European operations from January 2003 until December 2007. Mr. Juneau joined us as a chemical engineer in June 1982.

Karen G. Narwold joined us in September of 2010 and currently serves as Executive Vice President and Chief Administrative Officer. Ms. Narwold has over 25 years of legal, management and business experience with global industrial and chemical companies. After five years in private practice, she served as Vice President, General Counsel, Human Resources

and Secretary of GrafTech International Ltd., a global graphite and carbon manufacturer and former subsidiary of Union Carbide. She then served as Vice President and Strategic Counsel of Barzel Industries, a North American steel processor and distributor. Ms. Narwold resigned from Barzel in November 2009, after Barzel reached an agreement to sell substantially all of its assets in a planned transaction that was consummated in a sale pursuant to Section 363 of the U.S. Bankruptcy Code. Prior to joining Albemarle, Ms. Narwold served as Special Counsel with Kelley Drye & Warren LLP and with Symmetry Advisors where she worked in the areas of strategic, financial and capital structure planning and restructuring for public and private companies.

Scott A. Tozier was elected as our Executive Vice President and Chief Financial Officer effective January 2011. Mr. Tozier also served as our Chief Accounting Officer from January 2013 until February 2014. Mr. Tozier has over 25 years of diversified international financial management experience. Following four years of assurance services with the international firm Ernst & Young, LLP, Mr. Tozier joined Honeywell International, Inc., where his 16 year career spanned senior financial positions in the U.S., Australia and Europe. His roles of increasing responsibilities included management of financial planning, analysis and reporting, global credit and treasury services and Chief Financial Officer of Honeywell's Transportation Systems, Turbo Technologies and Building Solutions divisions. Most recently, Mr. Tozier served as Vice President of Finance, Operations and Transformation of Honeywell International, Inc.

Donald J. LaBauve Jr. was elected Vice President, Corporate Controller effective February 2013, and Chief Accounting Officer effective February 2014, after having previously served as Vice President, Finance - Business Operations since April 2009. Mr. LaBauve served as Chief Financial Officer, Fine Chemistry from April 2007 until April 2009, and prior to that time held the role of Controller, Polymer Solutions from January 2006 through March 2007. Since joining the Company as Ethyl Corporation in April 1990, Mr. LaBauve has held various staff and leadership positions of increasing responsibility within the finance function, including an assignment to our European headquarters in Belgium in April 2000 where he held the regional finance leadership role from July 2002 through June 2005.

PART II

Item 5. Market for the Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities.

Our common stock trades on the New York Stock Exchange ("NYSE") under the symbol "ALB." The following table sets forth on a per share basis the high and low sales prices for our common stock for the periods indicated as reported on the NYSE composite transactions reporting system and the dividends declared per share on our common stock.

	Common Stock Price Range		Dividends Declared Per Share of Common Stock
	High	Low	
2015			
First Quarter	\$ 62.23	\$ 46.78	\$ 0.29
Second Quarter	\$ 64.99	\$ 52.23	\$ 0.29
Third Quarter	\$ 55.83	\$ 41.37	\$ 0.29
Fourth Quarter	\$ 57.99	\$ 44.10	\$ 0.29
2016			
First Quarter	\$ 64.33	\$ 45.78	\$ 0.305
Second Quarter	\$ 84.99	\$ 63.40	\$ 0.305
Third Quarter	\$ 87.29	\$ 75.11	\$ 0.305
Fourth Quarter	\$ 92.24	\$ 76.32	\$ 0.305

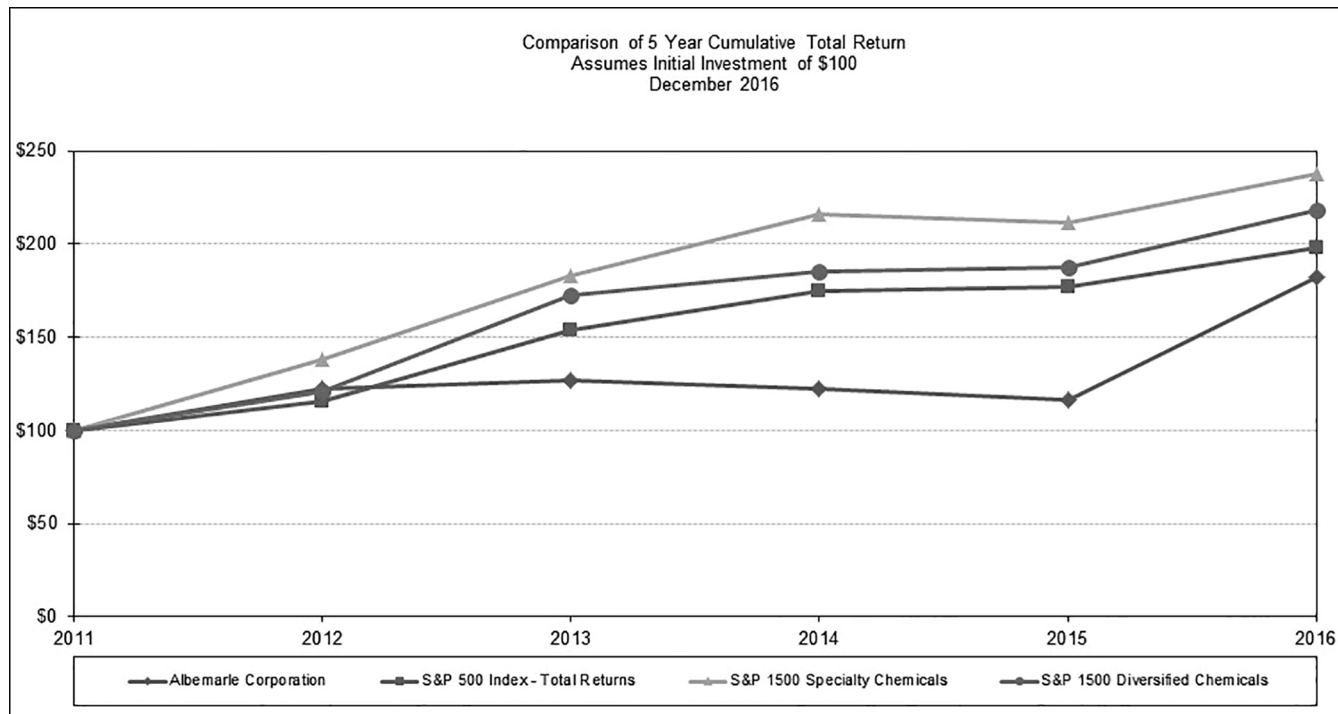
There were 112,523,790 shares of common stock held by 2,661 shareholders of record as of December 31, 2016. On February 23, 2017, we declared a dividend of \$0.32 per share of common stock, payable April 3, 2017.

The information required by Item 201(d) of Regulation S-K is contained in our definitive Proxy Statement for our 2017 Annual Meeting of Shareholders to be filed with the SEC pursuant to Regulation 14A under the Exchange Act, or the Proxy Statement, and is incorporated herein by reference.

Stock Performance Graph

The graph below shows the cumulative total shareholder return assuming the investment of \$100 in our common stock on December 31, 2011 and the reinvestment of all dividends thereafter. The information contained in the graph below is furnished

and therefore not to be considered “filed” with the SEC, and is not incorporated by reference into any document that incorporates this Annual Report on Form 10-K by reference.



Item 6. Selected Financial Data.

The information for the five years ended December 31, 2016, is contained in the “Five-Year Summary” included in Part IV, Item 15, Exhibit 99.1 and incorporated herein by reference.

Item 7. Management’s Discussion and Analysis of Financial Condition and Results of Operations.

Forward-looking Statements

Some of the information presented in this Annual Report on Form 10-K, including the documents incorporated by reference, may constitute forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. Such forward-looking statements are based on our current expectations, which are in turn based on assumptions that we believe are reasonable based on our current knowledge of our business and operations. We have used words such as “anticipate,” “believe,” “could,” “estimate,” “expect,” “intend,” “may,” “should,” “would,” “will” and variations of such words and similar expressions to identify such forward-looking statements.

These forward-looking statements are not guarantees of future performance and involve certain risks, uncertainties and assumptions, which are difficult to predict and many of which are beyond our control. Therefore, there can be no assurance that our actual results will not differ materially from the results and expectations expressed or implied in the forward-looking statements. Factors that could cause actual results to differ materially include, without limitation:

- changes in economic and business conditions;
- changes in financial and operating performance of our major customers and industries and markets served by us;
- the timing of orders received from customers;
- the gain or loss of significant customers;
- competition from other manufacturers;
- changes in the demand for our products or the end-user markets in which our products are sold;
- limitations or prohibitions on the manufacture and sale of our products;
- availability of raw materials;
- increases in the cost of raw materials and energy, and our ability to pass through such increases;

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- changes in our markets in general;
 - fluctuations in foreign currencies;
 - changes in laws and government regulation impacting our operations or our products;
 - the occurrence of regulatory proceedings, claims or litigation;
 - the occurrence of cyber-security breaches, terrorist attacks, industrial accidents, natural disasters or climate change;
 - hazards associated with chemicals manufacturing;
 - the inability to maintain current levels of product or premises liability insurance or the denial of such coverage;
 - political unrest affecting the global economy, including adverse effects from terrorism or hostilities;
 - political instability affecting our manufacturing operations or joint ventures;
 - changes in accounting standards;
 - the inability to achieve results from our global manufacturing cost reduction initiatives as well as our ongoing continuous improvement and rationalization programs;
 - changes in the jurisdictional mix of our earnings and changes in tax laws and rates;
 - changes in monetary policies, inflation or interest rates that may impact our ability to raise capital or increase our cost of funds, impact the performance of our pension fund investments and increase our pension expense and funding obligations;
 - volatility and uncertainties in the debt and equity markets;
 - technology or intellectual property infringement, including cyber-security breaches, and other innovation risks;
 - decisions we may make in the future;
 - the ability to successfully execute, operate and integrate acquisitions and divestitures; and
 - the other factors detailed from time to time in the reports we file with the SEC.

We assume no obligation to provide revisions to any forward-looking statements should circumstances change, except as otherwise required by securities and other applicable laws. The following discussion should be read together with our consolidated financial statements and related notes included in this Annual Report on Form 10-K.

The following is a discussion and analysis of results of operations for the years ended December 31, 2016, 2015 and 2014. A discussion of consolidated financial condition and sources of additional capital is included under a separate heading “Financial Condition and Liquidity” on page 49.

Overview

We are a leading global developer, manufacturer and marketer of highly-engineered specialty chemicals that meets customer needs across an exceptionally diverse range of end markets. The end markets we serve include the petroleum refining, consumer electronics, energy storage, construction, automotive, lubricants, pharmaceuticals, crop protection, food safety and custom chemistry services. We believe that our commercial and geographic diversity, technical expertise, innovative capability, flexible, low-cost global manufacturing base, experienced management team and strategic focus on our core base technologies will enable us to maintain leading market positions in those areas of the specialty chemicals industry in which we operate.

Secular trends favorably impacting demand within the end markets that we serve combined with our diverse product portfolio, broad geographic presence and customer-focused solutions will continue to be key drivers to our future earnings growth. We continue to build upon our existing green solutions portfolio and our ongoing mission to provide innovative, yet commercially viable, clean energy products and services to the marketplace. We believe our disciplined cost reduction efforts, ongoing productivity improvements position us well to take advantage of strengthening economic conditions as they occur while softening the negative impact of the current challenging global economic environment.

2016 Highlights

- In the first quarter, we increased our quarterly dividend for the 22nd consecutive year, to \$0.305 per share.
- Effective January 1, 2016, our former Performance Chemicals reportable segment was split into two separate reportable segments: (1) Lithium and Advanced Materials and (2) Bromine Specialties. This split did not affect the existing Refining Solutions reportable segment.
- On January 4, 2016, we closed the sale of the metal sulfides business for cash proceeds of approximately \$137 million and recorded a gain of \$11.5 million before income taxes in 2016 related to the sale.

- On February 1, 2016, we closed the sale of the minerals-based flame retardants and specialty chemicals business for cash proceeds of approximately \$187 million and recorded a gain of \$112.3 million before income taxes in 2016 related to the sale.
- We were granted approval by the Environmental Assessment Commission of the Antofagasta Region to increase our currently authorized lithium brine extraction rate at the Company's facility in the Salar de Atacama, Chile.
- We amended our lithium production rights agreement with the Chilean Economic Development Agency ("CORFO") to provide us with sufficient lithium to support the production of technical and battery grade lithium carbonate and lithium chloride over a 27-year period at our expanding battery grade manufacturing facilities in La Negra, Antofagasta.
- We announced that we are discontinuing production of hexabromocyclododecane ("HBCD")-based flame retardants to focus on supplying GreenCrest[®] polymeric fire safety solutions, a sustainable alternative to HBCD.
- We relocated our corporate and principle executive headquarters from Baton Rouge, LA to Charlotte, NC.
- We entered an agreement with Bolland Minera S.A., for the exclusive exploration and acquisition rights to a lithium resource in Antofalla, within the Catamarca Province of Argentina.
- We announced that Tianqi Lithium Corporation ("Tianqi") gave notice of its decision to exercise an option to acquire a 20% indirect ownership interest in Rockwood Lithium GmbH, a wholly-owned German subsidiary of Albemarle, and its subsidiaries. In February 2017, we announced that Albemarle and Tianqi terminated the option agreement, and as a result we will retain 100% of the ownership interest in Rockwood Lithium GmbH.
- On December 14, 2016, we completed the sale of the Chemetall Surface Treatment business to BASF SE for cash proceeds of approximately \$3.1 billion, net of purchase price adjustments, and recorded an after-tax gain of \$135.0 million in 2016 related to the sale.
- We repaid the \$1.25 billion September 2015 Term Loan Agreement in full, primarily with proceeds from the sales of the Chemetall Surface Treatment business, the metal sulfides business and the minerals-based flame retardants and specialty chemicals business.
- On December 31, 2016, we completed the acquisition of the lithium hydroxide and lithium carbonate conversion business of Jiangxi Jiangli New Materials Science and Technology Co. Ltd. for a purchase price of approximately \$145 million.
- We achieved earnings from continuing operations of \$478.6 million during 2016 as compared to \$327.6 million for 2015. Cash flows from operations in 2016 were \$733.4 million. Earnings from continuing operations for 2016 includes pension and other postretirement benefit ("OPEB") actuarial losses of \$18.3 million after income taxes, compared to pension and OPEB actuarial gains of \$21.4 million after income taxes in 2015.

Outlook

The current global business environment presents a diverse set of opportunities and challenges in the markets we serve, from slow and uneven global growth, currency exchange volatility, significantly low crude oil prices, a dynamic pricing environment in bromine derivatives and an ever-changing landscape in electronics, to the continuous need for cutting edge catalysts and technology by our refinery customers, diverse energy storage needs including exciting opportunities in electric vehicles, and increasingly stringent environmental standards. Amidst these dynamics, we believe our business fundamentals are sound and that we are strategically well-positioned as we remain focused on increasing sales volumes, significant deleveraging, optimizing and improving the value of our portfolio through pricing and product development, managing costs and delivering value to our customers. We believe that our businesses remain positioned to capitalize on new business opportunities and long-term trends driving growth within our end markets and to respond quickly to improved economic conditions. Additionally, we achieved our goal regarding synergies from the acquisition of the Rockwood businesses.

On December 14, 2016, we completed the sale of the Chemetall Surface Treatment business to BASF SE for cash proceeds of approximately \$3.1 billion, net of purchase price adjustments. A portion of the proceeds have been used to reduce leverage, while the remaining proceeds are expected to be used to invest in growth of the remaining businesses and to return capital to shareholders.

Lithium and Advanced Materials: We expect continued strong growth in 2017, led by demand in battery-grade applications and continued price improvement in Lithium. PCS experienced weaker profitability in 2016 due to weakness in the curatives market and the bankruptcy filing of one of our customers which resulted in a \$10 million impact to Income from continuing operations before income taxes and adjusted EBITDA during the year. While we expect further negative impacts from the bankruptcy filing in 2017, we expect PCS profitability to stabilize in 2017 due to productivity gains and increased volumes due to market demand, offset slightly by unfavorable pricing due to excess supply.

On a longer term basis, we believe that demand for lithium will continue to grow as new applications for lithium power continue to be developed and the use of plug-in hybrid electric vehicles and battery electric vehicles escalates. In addition, we expect growth in PCS from growing global demand for plastics driven by rising standards of living and infrastructure spending, particularly in Asia and the Middle East.

Bromine Specialties: The Bromine Specialties business had a solid 2016, with the lack of the methyl bromide product net sales more than offset by volume growth in fire safety and other derivatives, as well as lower variable costs. We expect to see relatively flat growth on net sales and profitability in 2017. With sustained low oil prices, we expect stable, albeit low, drilling completion fluid demand throughout the year. While it is possible oil prices could rebound some in 2017, the short-term impact will be to raw material cost. Offshore well completions lag oil pricing, which would likely extend beyond 2017. We are expecting relatively stable fire safety and other derivative net sales and profits in 2017.

On a longer term basis, we continue to believe that improving global standards of living, widespread digitization, increasing demand for data management capacity and the potential for increasingly stringent fire safety regulations in developing markets are likely to drive continued demand for fire safety products. Absent an increase in regulatory pressure on offshore drilling, we would expect this business to follow a long-term growth trajectory once oil prices recover from recent levels as we expect that deep water drilling will continue to increase around the world. We are focused on profitably growing our globally competitive bromine and derivatives production network to serve all major bromine consuming products and markets. We believe the global supply/demand gap could tighten as demand for existing and possible new uses of bromine expands over time. The combination of solid, long-term business fundamentals, with our strong cost position, product innovations and effective management of raw material costs will enable us to manage our business through end market challenges and to capitalize on opportunities that are expected with favorable market trends in select end markets.

Refining Solutions: Following the downturn in 2015 (primarily caused by cash preservation measures from oil companies, triggered by oil price volatility), in 2016 we saw a significant increase in the number of “Hydro treating unit” catalyst change-outs and related catalyst demand. In addition to catalyst demand increase, we also saw a marked improvement in catalyst product mix year over year. Despite ongoing uncertainty of oil prices and the ensuing impact on crude slates used by refiners and resulting demand for catalysts, we expect sustained performance in our clean fuels technology business driven by refining change-outs and balanced product mix. We also expect solid performance from our heavy oil upgrading division despite a number of scheduled maintenance shutdowns and plant turnarounds at refiners, which could dampen heavy oil upgrading demand in 2017. We also anticipate headwinds from rising raw material costs in 2017 following historically low prices in 2016.

On a longer term basis, we believe increased global demand for transportation fuels from a growing population and increasing mobility and the implementation of more stringent fuel quality requirements will drive growth in our Refining Solutions business. Delivering superior end-use performance continues to be the most effective way to create sustainable value in the refinery catalysts industry, and we believe our technologies continue to provide significant performance and financial benefits to refiners challenged to meet tighter regulations around the world, those managing new contaminants present in North America tight oil, and those in the Middle East and Asia seeking to use heavier feedstock while pushing for higher propylene yields. Longer term, we believe that the global crude supply will get heavier and more sour, a trend that bodes well for our catalysts portfolio. With superior technology and production capacities, and expected growth in end market demand, we believe that Refining Solutions remains well-positioned for the future.

All Other: During the first quarter of 2016, we closed the previously announced sales of the metal sulfides business and the minerals-based flame retardants and specialty chemicals business. The cash generated from the sale of these businesses was used to reduce borrowings outstanding under the September 2015 Term Loan Agreement. In April 2016, we concluded that we would suspend efforts to sell the fine chemistry services business. This business will continue to be reported outside the Company’s reportable segments. We expect the next few years to be a challenging for fine chemistry services due to a challenging agriculture industry environment, as well as customer order timing in pharmaceuticals.

Corporate: In the first quarter of 2017, we increased our quarterly dividend rate to \$0.32 per share. We continue to focus on cash generation, working capital management and process efficiencies. We expect our global effective tax rate for 2017 to be approximately 22.0%; however, our rate will vary based on the locales in which income is actually earned and remains subject to potential volatility from changing legislation in the United States and other tax jurisdictions.

Actuarial gains and losses related to our defined benefit pension and OPEB plan obligations are reflected in Corporate as a component of non-operating pension and OPEB plan costs under mark-to-market accounting. Results for the year ended December 31, 2016 include an actuarial loss of \$26.7 million (\$18.3 million after income taxes), as compared to a gain of \$30.1 million (\$21.4 million after income taxes) from continuing operations for the year ended December 31, 2015.

We remain committed to evaluating the merits of any opportunities that may arise for acquisitions or other business development activities that will complement our business footprint. Additional information regarding our products, markets and financial performance is provided at our web site, www.albemarle.com. Our web site is not a part of this document nor is it incorporated herein by reference.

Results of Operations

The following data and discussion provides an analysis of certain significant factors affecting our results of operations during the periods included in the accompanying consolidated statements of income.

Selected Financial Data

	Year Ended December 31,			Percentage Change	
	2016	2015	2014	2016 vs. 2015	2015 vs. 2014
	(In thousands, except percentages and per share amounts)				
NET SALES	\$ 2,677,203	\$ 2,826,429	\$ 2,445,548	(5)%	16 %
Cost of goods sold	1,706,627	1,966,196	1,674,700	(13)%	17 %
GROSS PROFIT	970,576	860,233	770,848	13 %	12 %
GROSS PROFIT MARGIN	36.3%	30.4%	31.5%		
Selling, general and administrative expenses	380,464	300,440	355,135	27 %	(15)%
Research and development expenses	80,475	89,187	88,310	(10)%	1 %
Restructuring and other, net	—	(6,804)	25,947	(100)%	(126)%
Gain on sales of businesses, net	(122,298)	—	—	*	— %
Acquisition and integration related costs	57,384	132,299	30,158	(57)%	339 %
OPERATING PROFIT	574,551	345,111	271,298	66 %	27 %
OPERATING PROFIT MARGIN	21.5%	12.2%	11.1%		
Interest and financing expenses	(65,181)	(81,650)	(41,358)	(20)%	97 %
Other income (expenses), net	5,894	47,283	(16,761)	(88)%	*
INCOME FROM CONTINUING OPERATIONS BEFORE INCOME TAXES AND EQUITY IN NET INCOME OF UNCONSOLIDATED INVESTMENTS	515,264	310,744	213,179	66 %	46 %
Income tax expense	96,263	11,134	18,484	*	(40)%
Effective tax rate	18.7%	3.6%	8.7%		
INCOME FROM CONTINUING OPERATIONS BEFORE EQUITY IN NET INCOME OF UNCONSOLIDATED INVESTMENTS	419,001	299,610	194,695	40 %	54 %
Equity in net income of unconsolidated investments (net of tax)	59,637	27,978	35,742	113 %	(22)%
NET INCOME FROM CONTINUING OPERATIONS	478,638	327,588	230,437	46 %	42 %
Income (loss) from discontinued operations (net of tax)	202,131	32,476	(69,531)	*	*
NET INCOME	680,769	360,064	160,906	89 %	124 %
Net income attributable to noncontrolling interests	(37,094)	(25,158)	(27,590)	47 %	(9)%
NET INCOME ATTRIBUTABLE TO ALBEMARLE CORPORATION	\$ 643,675	\$ 334,906	\$ 133,316	92 %	151 %
NET INCOME FROM CONTINUING OPERATIONS AS A PERCENTAGE OF NET SALES	17.9%	11.6%	9.4%		
Basic earnings (loss) per share:					
Continuing operations	\$ 3.93	\$ 2.72	\$ 2.57	44 %	6 %
Discontinued operations	1.80	0.29	(0.88)	*	*
	\$ 5.73	\$ 3.01	\$ 1.69	90 %	78 %
Diluted earnings (loss) per share:					
Continuing operations	\$ 3.90	\$ 2.71	\$ 2.57	44 %	5 %
Discontinued operations	1.78	0.29	(0.88)	*	*
	\$ 5.68	\$ 3.00	\$ 1.69	89 %	78 %

* Percentage calculation is not meaningful.

Comparison of 2016 to 2015

Net Sales

For the year ended December 31, 2016, we recorded net sales of \$2.68 billion, a 5% decrease compared to net sales of \$2.83 billion for the corresponding period of 2015. On January 4, 2016, we closed the sale of the metal sulfides business and on February 1, 2016, we closed the sale of the minerals-based flame retardants and specialty chemicals business. The divestiture of these businesses reduced net sales by \$265.3 million as compared to corresponding period of 2015. Excluding the impact of the divested businesses noted above, net sales increased by \$116.1 million due to \$78.8 million of higher volumes as a result of market demand and \$37.2 million of favorable price impacts.

Gross Profit

For the year ended December 31, 2016, our gross profit increased \$110.3 million, or 13%, from the corresponding 2015 period. Gross profit includes charges of \$55.9 million for the year ended December 31, 2015 for the utilization of the inventory markup recorded as part of purchase accounting for the acquisition of Rockwood. The divestiture of our metal sulfides and minerals-based flame retardants businesses in the first quarter of 2016 reduced gross profit by \$40.6 million as compared to the year ended December 31, 2015. Excluding the inventory markup charges and the impact of divestitures, gross profit increased by \$95.1 million, or 10.4%, due primarily to higher overall sales volumes, favorable pricing impacts, and \$24.6 million in lower variable and fixed costs. Overall, these factors contributed to a higher gross profit margin for the year ended December 31, 2016 of 36.3%, up from 30.4% in the corresponding period in 2015. Excluding the inventory markup charges and the impact of divestitures, gross profit margin was 36.7% for the year ended December 31, 2016 as compared to 34.6% in the corresponding period in 2015.

Selling, General and Administrative Expenses

For the year ended December 31, 2016, our selling, general and administrative (“SG&A”) expenses increased \$80.0 million, or 27%, compared to the year ended December 31, 2015. SG&A expenses for 2016 included approximately \$29.3 million of pension and OPEB costs (including mark-to-market actuarial losses of \$26.3 million) allocated to SG&A, as compared to \$28.3 million of pension and OPEB benefits (including mark-to-market actuarial gains of \$28.1 million) allocated to SG&A in 2015. Excluding the \$57.6 million increase in SG&A related to pension and OPEB plans, SG&A increased by \$22.4 million, or 6.8%, primarily due to increased compensation costs. As a percentage of net sales, SG&A expenses were 14.2% in 2016, compared to 10.6% in 2015. Excluding the impact of pension and OPEB mark-to-market actuarial losses and gains, SG&A expenses as a percentage of net sales were 13.2% in 2016 and 11.6% in 2015.

The mark-to-market actuarial loss in 2016 is primarily attributable to a decrease in the weighted-average discount rate to 4.43% from 4.67% for our U.S. pension plans and to 2.00% from 2.76% for our foreign pension plans to reflect market conditions as of the December 31, 2016 measurement date. The mark-to-market actuarial loss in 2016 was partially offset by a higher return on pension plan assets in 2016 than was expected, as a result of overall market and investment portfolio performance. The weighted-average actual return on our U.S. and foreign pension plan assets was 8.11% versus an expected return of 6.85%.

The mark-to-market actuarial gain in 2015 is primarily attributable to: (a) an increase in the weighted-average discount rate to 4.67% from 4.19% for our U.S. pension plans and to 2.76% from 2.22% for our foreign pension plans to reflect market conditions as of the December 31, 2015 measurement date, and (b) changes in mortality assumptions. The mark-to-market actuarial gain in 2015 was partially offset by a lower return on pension plan assets in 2015 than was expected, as a result of overall market and investment portfolio performance. The weighted-average actual return on our U.S. and foreign pension plan assets was (2.58)% versus an expected return of 6.77%.

Research and Development Expenses

For the year ended December 31, 2016, our R&D expenses decreased \$8.7 million, or 10%, from the year ended December 31, 2015. As a percentage of net sales, R&D expenses were 3.0% in 2016, compared to 3.2% in 2015.

Restructuring and Other, Net

Included in Restructuring and other, net, for the year ended December 31, 2015 is a gain of \$6.8 million (\$5.4 million after income taxes) recognized upon the sale of land in Avonmouth, U.K., which was utilized by the phosphorus flame retardants business we exited in 2012.

Gain on Sales of Businesses, Net

The year ended December 31, 2016 included gains before income taxes of \$11.5 million and \$112.3 million related to the sales of the metal sulfides business and the minerals-based flame retardants and specialty chemicals business, respectively, both of which closed in the first quarter of 2016. In addition, Gain on sales of businesses, net, for the year ended December 31, 2016 included a loss of \$1.5 million on the sale of our wafer reclaim business.

Acquisition and Integration Related Costs

The year ended December 31, 2016 included \$52.1 million of acquisition and integration related costs directly related to the acquisition of Rockwood (mainly consisting of professional services, costs to achieve synergies, relocation costs, and other integration costs) and \$5.3 million of costs in connection with other significant projects. The year ended December 31, 2015 included \$123.9 million of acquisition and integration related costs directly related to the acquisition of Rockwood (mainly consisting of professional services and advisory fees, costs to achieve synergies, relocation costs, and other integration costs) and \$8.4 million of costs in connection with other significant projects.

Interest and Financing Expenses

Interest and financing expenses for the year ended December 31, 2016 decreased \$16.5 million to \$65.2 million from the corresponding 2015 period, due mainly to lower debt levels as well as the favorable impact of the refinancing of the senior notes assumed from Rockwood that was completed on October 15, 2015, partially offset by \$1.9 million of accelerated deferred financing costs as a result of the repayment of our term loan in December 2016.

Other Income, Net

Other income, net, for the year ended December 31, 2016 was \$5.9 million versus \$47.3 million for the corresponding 2015 period. The change was primarily due to \$51.8 million of favorable foreign currency transaction gains in 2015. The foreign currency gains are primarily related to cash denominated in U.S. Dollars held by foreign subsidiaries where the European Union Euro serves as the functional currency. This was partially offset by a \$2.9 million gain in the fair value of our investment in private equity securities recorded during the third quarter of 2016 and \$4.4 million in amortization of bridge financing fees and other financing fees related to the acquisition of Rockwood recorded in 2015.

Income Tax Expense

The effective income tax rate for 2016 was 18.7% compared to 3.6% for 2015. Our effective income tax rate differs from the U.S. Federal statutory income tax rates in the comparative periods mainly due to the impact of earnings from outside the U.S. The rate for 2015 also differs as a result of net impacts from the tax on the deemed repatriation of foreign income from legacy Rockwood offset by the reversal of a deferred tax liability established in the opening balance sheet for the portion of legacy Rockwood earnings that were not indefinitely reinvested. Our effective tax rate for 2016 was affected by discrete net tax expense items of \$20.2 million related mainly to a tax gain from restructuring the ownership of a foreign subsidiary, foreign tax rate changes, provision to return adjustments and changes in valuation allowances necessary due to the restructuring. Our effective income tax rate in 2015 was affected by discrete net tax benefit items of \$41.2 million related mainly to the release of prior year uncertain tax positions associated with lapses in statutes of limitations and audit closures, and items associated with U.S. provision to return adjustments. See Note 20, "Income Taxes" to our consolidated financial statements included in Part II, Item 8 of this report for a reconciliation of the U.S. federal statutory income tax rate to our effective rate for 2016 and 2015.

Equity in Net Income of Unconsolidated Investments

Equity in net income of unconsolidated investments was \$59.6 million for the year ended December 31, 2016 compared to \$28.0 million in the same period last year. The equity in net income of unconsolidated investments for the year ended December 31, 2015 included a \$27.1 million charge for utilization of fair value adjustments to inventories as well as a \$2.0 million impairment charge related to our unconsolidated investment in Fábrica Carioca de Catalisadores SA. Excluding these charges, equity in net income of unconsolidated investments increased by \$2.5 million primarily due to higher equity income reported by our Refining Solutions segment joint venture Nippon Ketjen Company Limited primarily due to higher sales volumes and higher equity income reported by our Lithium and Advanced Materials joint venture Windfield Holdings Pty. Ltd. due to higher sales volumes, partially offset by the sale of our ownership interest in Magnifin Magnesiaprodukte GmbH (which was included in the minerals based flame retardants business) in 2016.

Income from Discontinued Operations

Income from discontinued operations, after income taxes, was \$202.1 million for the year ended December 31, 2016 compared to \$32.5 million in the same period last year. The year ended December 31, 2016 included a pre-tax gain of \$388.0 million (\$135.0 million after income taxes) related to the sale of our Chemetall Surface Treatment business, which closed on December 14, 2016. This gain represents the difference between the carrying value of the related assets and their fair value as determined by the sales price less estimated costs to sell, and included the reversal of \$81.4 million of foreign currency translation loss out of Accumulated other comprehensive loss. Excluding this gain, the change relates to the discontinuation depreciation and amortization expense in the second half of 2016 due to discontinued operations accounting, favorable sales prices and volumes due to market demands, lower interest expense, as well as a \$20.0 million charge of fair value adjustments to inventories in connection with the Rockwood acquisition in 2015.

Net Income Attributable to Noncontrolling Interests

For the year ended December 31, 2016, net income attributable to noncontrolling interests was \$37.1 million compared to \$25.2 million in the same period last year. This increase of \$11.9 million was due primarily to changes in consolidated income related to our Jordanian joint venture from higher sales volumes.

Net Income Attributable to Albemarle Corporation

Net income attributable to Albemarle Corporation increased to \$643.7 million for the year ended December 31, 2016, from \$334.9 million for the corresponding period of 2015. The year ended December 31, 2016 included net gains of \$250.5 million after income taxes related to the sale of businesses, including discontinued operations. The year ended December 31, 2015 included a \$67.1 million charge after income taxes for utilization of fair value adjustments to inventories. Excluding these items, net income attributable to Albemarle decreased by \$8.8 million. The decrease was primarily due to \$51.8 million of favorable foreign currency transaction gains in 2015 related to cash denominated in U.S. Dollars held by foreign subsidiaries where the European Union Euro serves as the functional currency and the impact of the operations of the divestitures completed in 2016, partially offset by higher gross profit associated with stronger business results, a reduction in acquisition and integration costs, lower interest associated with lower debt levels and the favorable impact of the refinancing that was completed on October 15, 2015. In addition, our effective tax rate increased in 2016 due to discrete net tax expense items of \$20.2 million related mainly to a tax gain from restructuring the ownership of a foreign subsidiary, foreign tax rate changes, provision to return adjustments and changes in valuation allowances necessary due to the restructuring, as compared to discrete net tax benefit items in 2015 of \$41.2 million related mainly to the release of prior year uncertain tax positions associated with lapses in statutes of limitations and audit closures, and items associated with U.S. provision to return adjustments.

Other Comprehensive Income (Loss), Net of Tax

Total other comprehensive income (loss), after income taxes, was \$8.3 million in 2016 compared to (\$360.8) million in 2015. The majority of these amounts are the result of translating our foreign subsidiary financial statements from their local currencies to U.S. Dollars. In 2016, other comprehensive loss from foreign currency translation adjustments was \$20.8 million, mainly as a result of unfavorable movements in the British Pound Sterling of approximately \$25 million, the Chinese Renminbi of approximately \$12 million, the Korean Won of approximately \$6 million, the Turkish Lira of approximately \$6 million, partially offset by favorable movements in the European Union Euro of approximately \$15 million and the Brazilian Real of approximately \$13 million. Included in the currency movements for 2016 is the favorable effect of \$81.4 million in accumulated foreign currency translation losses that were reversed as a result of the sale of the Chemetall Surface Treatment business. Also included in total other comprehensive income for 2016 is income of \$26.1 million in connection with the revaluation of our €700.0 million senior notes which were designated as a hedge of our net investment in foreign operations. In 2015, other comprehensive loss from foreign currency translation adjustments was \$413.0 million, mainly as a result of unfavorable movements in the European Union Euro of approximately \$279 million, the British Pound Sterling of approximately \$49 million, the Brazilian Real of approximately \$30 million, the Turkish Lira of approximately \$10 million, the Korean Won of approximately \$7 million, the Chinese Renminbi of approximately \$8 million, the South African Rand of approximately \$8 million and a net unfavorable variance in various other currencies totaling approximately \$23 million (each approximately \$5 million or less). Also included in total other comprehensive loss for 2015 is income of \$50.9 million in connection with the revaluation of our €700.0 million senior notes and settlement of related foreign currency forward contracts, both of which were designated as a hedge of our net investment in foreign operations.

Segment Information Overview. We have identified three reportable segments according to the nature and economic characteristics of our products as well as the manner in which the information is used internally by the Company's chief

operating decision maker to evaluate performance and make resource allocation decisions. Our reportable business segments consist of: (1) Lithium and Advanced Materials, (2) Bromine Specialties and (3) Refining Solutions.

Summarized financial information concerning our reportable segments is shown in the following tables. Results for 2015 have been recast to reflect the change in segments previously noted. The “All Other” category comprises three operating segments that do not fit into any of our core businesses subsequent to the acquisition of Rockwood: minerals-based flame retardants and specialty chemicals, fine chemistry services and metal sulfides. During 2016, we completed the sales of the metal sulfides business and the minerals-based flame retardants and specialty chemicals business.

The Corporate category is not considered to be a segment and includes corporate-related items not allocated to the reportable segments. Pension and OPEB service cost (which represents the benefits earned by active employees during the period) and amortization of prior service cost or benefit are allocated to the segments, All Other, and Corporate, whereas the remaining components of pension and OPEB benefits cost or credit (“Non-operating pension and OPEB items”) are included in Corporate. Segment data includes intersegment transfers of raw materials at cost and allocations for certain corporate costs.

The Company’s chief operating decision maker uses earnings before interest, taxes, depreciation and amortization, as adjusted on a consistent basis for certain non-recurring or unusual items such as acquisition and integration related costs, utilization of inventory markup, gains or losses on sales of businesses, restructuring charges, facility divestiture charges, non-operating pension and OPEB items and other significant non-recurring items (“adjusted EBITDA”), in a balanced manner and on a segment basis to assess the ongoing performance of the Company’s business segments and to allocate resources. In addition, management uses adjusted EBITDA for business planning purposes and as a significant component in the calculation of performance-based compensation for management and other employees. The Company has reported adjusted EBITDA because management believes it provides transparency to investors and enables period-to-period comparability of financial performance. Adjusted EBITDA is a financial measure that is not required by, or presented in accordance with, U.S. GAAP. Adjusted EBITDA should not be considered as an alternative to Net income (loss) attributable to Albemarle Corporation, the most directly comparable financial measure calculated and reported in accordance with U.S. GAAP, or any other financial measure reported in accordance with U.S. GAAP.

	Year Ended December 31,				Percentage
	2016	%	2015	%	Change
	(In thousands, except percentages)				2016 vs. 2015
Net sales:					
Lithium and Advanced Materials	\$ 968,216	36.2 %	\$ 834,590	29.5 %	16 %
Bromine Specialties	792,425	29.6 %	775,729	27.4 %	2 %
Refining Solutions	732,137	27.3 %	729,261	25.8 %	— %
All Other	180,988	6.8 %	471,434	16.7 %	(62)%
Corporate	3,437	0.1 %	15,415	0.6 %	(78)%
Total net sales	<u>\$ 2,677,203</u>	<u>100.0 %</u>	<u>\$ 2,826,429</u>	<u>100.0 %</u>	<u>(5)%</u>
Adjusted EBITDA:					
Lithium and Advanced Materials	\$ 363,360	48.0 %	\$ 312,867	41.4 %	16 %
Bromine Specialties	226,926	29.9 %	222,653	29.5 %	2 %
Refining Solutions	238,963	31.5 %	197,595	26.1 %	21 %
All Other	14,772	1.9 %	53,993	7.1 %	(73)%
Corporate	(85,804)	(11.3)%	(31,108)	(4.1)%	176 %
Total adjusted EBITDA	<u>\$ 758,217</u>	<u>100.0 %</u>	<u>\$ 756,000</u>	<u>100.0 %</u>	<u>— %</u>

See below for a reconciliation of adjusted EBITDA, the non-GAAP financial measure, from Net income (loss) attributable to Albemarle Corporation, the most directly comparable financial measure calculated and reported in accordance with U.S. GAAP, (in thousands):

	Lithium and Advanced Materials	Bromine Specialties	Refining Solutions	Reportable Segments Total	All Other	Corporate	Consolidated Total
2016							
Net income (loss) attributable to Albemarle Corporation	\$ 261,394	\$ 187,364	\$ 202,874	\$ 651,632	\$ 131,301	\$ (139,258)	\$ 643,675
Depreciation and amortization	101,966	39,562	36,089	177,617	7,302	6,056	190,975
(Gain) loss on sales of businesses, net ^(a)	—	—	—	—	(123,831)	1,533	(122,298)
Acquisition and integration related costs ^(b)	—	—	—	—	—	57,384	57,384
Interest and financing expenses	—	—	—	—	—	65,181	65,181
Income tax expense	—	—	—	—	—	96,263	96,263
Income from discontinued operations (net of tax)	—	—	—	—	—	(202,131)	(202,131)
Non-operating pension and OPEB items	—	—	—	—	—	25,589	25,589
Other ^(c)	—	—	—	—	—	3,579	3,579
Adjusted EBITDA	<u>\$ 363,360</u>	<u>\$ 226,926</u>	<u>\$ 238,963</u>	<u>\$ 829,249</u>	<u>\$ 14,772</u>	<u>\$ (85,804)</u>	<u>\$ 758,217</u>
2015							
Net income (loss) attributable to Albemarle Corporation	\$ 148,821	\$ 186,474	\$ 161,585	\$ 496,880	\$ 32,781	\$ (194,755)	\$ 334,906
Depreciation and amortization	84,069	36,179	34,039	154,287	18,183	8,703	181,173
Utilization of inventory markup ^(d)	79,977	—	—	79,977	3,029	—	83,006
Restructuring and other, net ^(e)	—	—	—	—	—	(6,804)	(6,804)
Acquisition and integration related costs ^(b)	—	—	—	—	—	132,299	132,299
Interest and financing expenses	—	—	—	—	—	81,650	81,650
Income tax expense	—	—	—	—	—	11,134	11,134
Income from discontinued operations (net of tax)	—	—	—	—	—	(32,476)	(32,476)
Non-operating pension and OPEB items	—	—	—	—	—	(35,300)	(35,300)
Other ^(f)	—	—	1,971	1,971	—	4,441	6,412
Adjusted EBITDA	<u>\$ 312,867</u>	<u>\$ 222,653</u>	<u>\$ 197,595</u>	<u>\$ 733,115</u>	<u>\$ 53,993</u>	<u>\$ (31,108)</u>	<u>\$ 756,000</u>

(a) See “Gain on Sales of Businesses, Net” on page 34 for a description of these costs.

(b) See “Acquisition and Integration Related Costs” on page 34 for a description of these costs.

(c) Includes amounts recorded in (1) Research and development expenses related to the write-off of fixed assets of \$1.4 million and (2) Selling, general and administrative expenses related to the net loss on the sales of properties of \$0.9 million and (3) Other income (expenses), net related to environmental charges related to a site formerly owned by Albemarle of \$2.4 million, partially offset by a gain related to a previously disposed of site in China of \$1.1 million.

(d) In connection with the acquisition of Rockwood, the Company valued Rockwood’s existing inventory at fair value as of the Acquisition Closing Date, which resulted in a markup of the underlying net book value of the inventory totaling approximately \$103.4 million. The inventory markup was expensed over the estimated remaining selling period. For the year ended December 31, 2015, \$55.9 million was included in Cost of goods sold, and Equity in net income of unconsolidated investments was reduced by \$27.1 million, related to the utilization of the inventory markup.

(e) See “Restructuring and Other, Net” on page 33 for a description of this gain.

(f) Refining Solutions includes an impairment charge of approximately \$2.0 million related to our unconsolidated investment in Fábrica Carioca de Catalisadores SA. Corporate includes approximately \$4.4 million of financing-related fees expensed in connection with the acquisition of Rockwood.

Lithium and Advanced Materials

Lithium and Advanced Materials segment net sales for the year ended December 31, 2016 were \$968.2 million, up \$133.6 million, or 16%, in comparison to the same period in 2015. The increase was primarily driven by \$78.0 million of favorable

Lithium sales volumes due to market demand, \$70.6 million of favorable Lithium price impacts due primarily to price increases in our battery-grade lithium carbonate and hydroxide applications, and \$0.7 million of favorable currency translation impacts, partially offset by \$26.9 million of unfavorable PCS volume and price impacts due primarily to weakness in the curatives market and the bankruptcy filing of one of our customers. Adjusted EBITDA for Lithium and Advanced Materials increased 16%, or \$50.5 million, to \$363.4 million for the year ended December 31, 2016, compared to the same period in 2015 primarily due to higher overall sales volumes, favorable price impacts and \$4.4 million of favorable currency translation impacts.

Bromine Specialties

Bromine Specialties segment net sales for the year ended December 31, 2016 were \$792.4 million, up \$16.7 million, or 2%, in comparison to the same period in 2015. The increase was driven mainly by \$22.9 million of favorable volumes due to our ability to supply globally in a tighter market environment for certain products and \$2.5 million of favorable currency translation impacts, partially offset by \$8.7 million of unfavorable price impacts. Adjusted EBITDA for Bromine Specialties increased 2%, or \$4.3 million, to \$226.9 million for the year ended December 31, 2016, compared to the same period in 2015, primarily due to \$15.9 million of lower fixed and variable costs, and \$2.4 million of favorable currency translation impacts, partially offset by a \$12.4 million increase in net income attributable to noncontrolling interests due to higher sales volumes from our Jordanian joint venture and unfavorable price impacts.

Refining Solutions

Refining Solutions segment net sales for the year ended December 31, 2016 were \$732.1 million, an increase of \$2.9 million, or 0.4%, compared to the year ended December 31, 2015. This increase was primarily due to \$14.9 million of higher Clean Fuels Technology volumes due to demand, partially offset by \$9.7 million of lower Heavy Oil Upgrading volumes due to demand and \$3.2 million of unfavorable currency translation impacts. Refining Solutions adjusted EBITDA increased 21%, or \$41.4 million, to \$239.0 million for the year ended December 31, 2016 in comparison to the corresponding period of 2015, primarily driven by higher overall sales volumes, \$13.2 million of lower variable and fixed costs and \$8.8 million in increased equity in net income from unconsolidated investments from our joint venture Nippon Ketjen Company Limited primarily due to higher sales volumes.

All Other

On January 4, 2016, we closed the sale of the metal sulfides business, and on February 1, 2016, we closed the sale of the minerals-based flame retardants and specialty chemicals business. The divestiture of these businesses reduced net sales and adjusted EBITDA for year ended December 31, 2016 as compared to the prior year period by \$265.3 million and \$34.2 million, respectively.

All Other net sales for the year ended December 31, 2016 were \$181.0 million, a decrease of \$290.4 million compared to the year ended December 31, 2015. Excluding the impact of the divested businesses noted above, All Other net sales decreased by \$25.1 million due to \$13.8 million of unfavorable price impacts and \$11.3 million of lower sales volume due to market demand in the fine chemistry services business. All Other adjusted EBITDA was down 73%, or \$39.2 million, for the year ended December 31, 2016 in comparison to the same period of 2015. Excluding the impact of divested businesses noted above, All Other adjusted EBITDA decreased by \$5.0 million due to lower overall sales in fine chemistry services, partially offset by \$14.2 million of lower fixed and variable costs.

Corporate

Corporate adjusted EBITDA was a charge of \$85.8 million for the year ended December 31, 2016, an increase of \$54.7 million, compared to the year ended December 31, 2015, primarily due to a reduction in foreign currency gains of \$49.5 million. The foreign transaction gains are primarily related to cash denominated in U.S. Dollars held by foreign subsidiaries where the European Union Euro serves as the functional currency

Comparison of 2015 to 2014

Net Sales

For the year ended December 31, 2015, we recorded net sales of \$2.83 billion, a 16% increase compared to net sales of \$2.45 billion for the corresponding period of 2014. Approximately \$591.0 million of the increase was attributable to the impact of the Rockwood acquisition. Excluding the acquisition of Rockwood, net sales decreased by \$210.1 million primarily due to \$106.5 million of unfavorable sales volumes, \$87.7 million of unfavorable impacts from currency translation and \$15.8 million of unfavorable price impacts due to market conditions and portfolio mix. The unfavorable sales volumes were due to lower Clean Fuels Technologies, Fine Chemistry Services, and Bromine volumes partially offset by increased Heavy Oil Upgrading

and PCS sales volumes. The unfavorable price impacts were primarily due to lower Refining Solutions, Fine Chemistry Services, and PCS prices partly offset by favorable price impacts for Bromine.

Gross Profit

For the year ended December 31, 2015, our gross profit increased \$89.4 million, or 12%, from the corresponding 2014 period. Gross profit for 2015 included \$1.7 million of pension and OPEB benefits (including mark-to-market actuarial gains of \$2.0 million) allocated to cost of good sold, as compared to \$36.5 million of pension and OPEB costs (including mark-to-market actuarial losses of \$36.4 million) allocated to cost of goods sold in 2014. Excluding the \$38.2 million increase in gross profit related to pension and OPEB plans, gross profit increased by \$51.2 million due to \$133.9 million of gross profit attributable to the performance of the acquired Rockwood business, which included a \$55.9 million charge for the utilization of the inventory markup recorded as part of purchase accounting for the acquisition, partially offset by an \$82.7 million decrease in gross profit due primarily to unfavorable impacts from currency translation, unfavorable price impacts due to market conditions and portfolio mix and lower overall sales volumes. Overall, these factors contributed to a lower gross profit margin for the year ended December 31, 2015 of 30.4%, down from 31.5% in the corresponding period of 2014. Excluding the impact of pension and OPEB mark-to-market actuarial losses and gains, our gross profit margin was 30.4% in 2015 and 33.0% in 2014.

The mark-to-market actuarial loss in 2014 was primarily attributable to: (a) a decrease in the weighted-average discount rate for our pension plans to 4.12% from 5.00% to reflect market conditions as of the December 31, 2014 measurement date, and (b) changes in mortality assumptions, and to a lesser extent, other demographic assumptions related to our pension plans. The mark-to-market actuarial loss in 2014 was partially offset by a higher return on pension plan assets in 2014 than was expected, as a result of overall market and investment portfolio performance. The weighted-average actual return on our U.S. pension plan assets was 8.87% versus an expected return of 6.91%.

Selling, General and Administrative Expenses

For the year ended December 31, 2015, our SG&A expenses decreased \$54.7 million, or 15%, compared to the year ended December 31, 2014. SG&A expenses for 2015 included approximately \$28.3 million of pension and OPEB benefits (including mark-to-market actuarial gains of \$28.1 million) allocated to SG&A, as compared to \$97.1 million of pension and OPEB costs (including mark-to-market actuarial losses of \$94.5 million) allocated to SG&A in 2014. Excluding the \$125.4 million decrease in SG&A related to pension and OPEB plans, SG&A increased by \$70.7 million, or 27.4%, due to the acquisition of Rockwood, net of realized synergies. As a percentage of net sales, SG&A expenses were 10.6% in 2015, compared to 14.5% in 2014. Excluding the impact of pension and OPEB mark-to-market actuarial losses and gains, SG&A expenses as a percentage of net sales were 11.6% in 2015 and 10.7% in 2014.

The mark-to-market actuarial gain in 2015 was primarily attributable to: (a) an increase in the weighted-average discount rate to 4.67% from 4.19% for our U.S. pension plans and to 2.76% from 2.22% for our foreign pension plans to reflect market conditions as of the December 31, 2015 measurement date, and (b) changes in mortality assumptions. The mark-to-market actuarial gain in 2015 was partially offset by a lower return on pension plan assets in 2015 than was expected, as a result of overall market and investment portfolio performance. The weighted-average actual return on our U.S. and foreign pension plan assets was (2.58)% versus an expected return of 6.77%. The mark-to-market actuarial loss in 2014 resulted from the factors as discussed in *Gross Profit* above.

Research and Development Expenses

For the year ended December 31, 2015, our R&D expenses increased \$0.9 million, or 1%, from the year ended December 31, 2014, primarily due to the acquisition of Rockwood. As a percentage of net sales, R&D expenses were 3.2% in 2015, compared to 3.6% in 2014.

Restructuring and Other, Net

Included in Restructuring and other, net, for the year ended December 31, 2015 is a gain of \$6.8 million (\$5.4 million after income taxes) recognized upon the sale of land in Avonmouth, U.K., which was utilized by the phosphorus flame retardants business we exited in 2012. Restructuring and other, net, of \$25.9 million for the year ended December 31, 2014 included the following items:

- (a) Estimated costs of approximately \$20.5 million (\$13.6 million after income taxes) in connection with action we initiated to reduce the high cost supply capacity of certain aluminum alkyl products, primarily through the termination of a third party manufacturing contract.

(b) An impairment charge of \$3.0 million (\$1.9 million after income taxes) for certain capital project costs also related to aluminum alkyls capacity which we do not expect to recover.

(c) Other net charges of \$2.4 million (\$1.4 million after income taxes), mainly in connection with a write-off of certain multi-product facility project costs that we do not expect to recover in future periods.

Acquisition and Integration Related Costs

The year ended December 31, 2015 included \$123.9 million of acquisition and integration related costs directly related to the acquisition of Rockwood (mainly consisting of professional services and advisory fees, costs to achieve synergies, relocation costs, and other integration costs) and \$8.4 million of costs in connection with other significant projects. The year ended December 31, 2014 included \$23.6 million of acquisition and integration related costs directly related to the acquisition of Rockwood and \$6.6 million of costs in connection with other significant projects.

Interest and Financing Expenses

Interest and financing expenses for the year ended December 31, 2015 increased \$40.3 million to \$81.7 million from the corresponding 2014 period, due mainly to higher borrowing levels in connection with the acquisition of Rockwood. Included in 2015 is a charge of approximately \$5.4 million related to the early extinguishment of the 4.625% senior notes we assumed from Rockwood.

Other Income (Expenses), Net

Other income (expenses), net, for the year ended December 31, 2015 was \$47.3 million versus (\$16.8) million for the corresponding 2014 period. The change was due mainly to \$54.7 million of favorable foreign currency transaction gains and a \$12.3 million reduction in amortization of bridge facility fees and other financing fees related to the acquisition of Rockwood. The foreign currency gains are primarily related to cash denominated in U.S. Dollars held by foreign subsidiaries where the European Union Euro serves as the functional currency.

Income Tax Expense

The effective income tax rate for 2015 was 3.6% compared to 8.7% for 2014. Our effective income tax rate differs from the U.S. federal statutory income tax rates in the comparative periods mainly due to the impact of earnings from outside the U.S., including net impacts on the release of the liability from earnings that were not indefinitely reinvested and were repatriated from legacy Rockwood. Our effective tax rate for 2015 was affected by discrete net tax benefit items of \$41.2 million related mainly to the release of prior year uncertain tax positions associated with lapses in statutes of limitations and audit closures, and items associated with U.S. provision to return adjustments. Our effective income tax rate in 2014 was affected by tax benefits of \$74.2 million related to restructuring charges, a pension plan actuarial loss and the release of reserves related principally to the expiration of the U.S. federal statute of limitations. See Note 20, "Income Taxes" to our consolidated financial statements included in Part II, Item 8 of this report for a reconciliation of the U.S. federal statutory income tax rate to our effective rate for 2015 and 2014.

Equity in Net Income of Unconsolidated Investments

Equity in net income of unconsolidated investments was \$28.0 million for the year ended December 31, 2015 compared to \$35.7 million in the same period last year. The current year equity in net income of unconsolidated investments included a \$27.1 million charge for utilization of fair value adjustments to inventories as well as a \$2.0 million impairment charge related to our unconsolidated investment in Fábrica Carioca de Catalisadores SA. Excluding these charges, equity in net income of unconsolidated investments increased by \$21.4 million primarily due to equity income derived from unconsolidated investments we acquired from Rockwood, reported in the Lithium and Advanced Materials segment, partially offset by lower equity income reported by our Refining Solutions segment joint venture Nippon Ketjen Company Limited primarily due to lower sales volumes.

Income (Loss) from Discontinued Operations

Income from discontinued operations, after income taxes, of \$32.5 million for the year ended December 31, 2015 included the operations of the Chemetall Surface Treatment business, which was sold on December 14, 2016, as well as the allocation of interest expense not directly attributable to other operations based on the ratio of net assets held for sale to the sum of total net assets plus consolidated debt. Loss from discontinued operations, after income taxes, of \$69.5 million for the year ended December 31, 2014 included a pre-tax charge of \$85.5 million (\$65.7 million after income taxes) related to the sale of our antioxidant, ibuprofen and propofol businesses and assets to SI Group, Inc., which closed on September 1, 2014. This

charge represented the difference between the carrying value of the related assets and their fair value as determined by the sales price less estimated costs to sell, and was primarily attributable to the write-off of goodwill, intangibles and long-lived assets, net of cumulative foreign currency translation gains of \$17.8 million.

Net Income Attributable to Noncontrolling Interests

For the year ended December 31, 2015, net income attributable to noncontrolling interests was \$25.2 million compared to \$27.6 million in the same period last year. This decrease of \$2.4 million was due primarily to changes in consolidated income related to our Jordanian joint venture.

Net Income Attributable to Albemarle Corporation

Net income attributable to Albemarle Corporation increased to \$334.9 million for the year ended December 31, 2015, from \$133.3 million for the corresponding period of 2014. The total estimated impact of the Rockwood acquisition is income of approximately \$3.8 million before income taxes, including earnings of the acquiree (including discontinued operations, as included in Note 2, "Acquisitions" to our consolidated financial statements included in Part II, Item 8 of this report), acquisition and integration related costs, interest expense associated with additional borrowings, and other currency transaction gains related to the execution of the closing. Excluding the impact of the Rockwood acquisition, net income increased approximately \$197.8 million primarily due to a \$144.4 million decrease in pension and OPEB charges versus the prior year, the loss from discontinued operations and restructuring and other charges in the prior year of \$69.5 million and \$25.9 million, respectively, plus the gain on sale of land of \$6.8 million in restructuring and other for the 2015 period, partly offset by unfavorable impacts in operating profit of approximately \$48.8 million, including the unfavorable impacts of currency translation.

Other Comprehensive Loss, Net of Tax

Total other comprehensive loss, after income taxes, was \$360.8 million in 2015 compared to \$178.7 million in 2014. The majority of these amounts are the result of translating our foreign subsidiary financial statements from their local currencies to U.S. Dollars. In 2015, other comprehensive loss from foreign currency translation adjustments was \$413.0 million, mainly as a result of unfavorable movements in the European Union Euro of approximately \$279 million, the British Pound Sterling of approximately \$49 million, the Brazilian Real of approximately \$30 million, the Turkish Lira of approximately \$10 million, the Korean Won of approximately \$7 million, the Chinese Renminbi of approximately \$8 million, the South African Rand of approximately \$8 million and a net unfavorable variance in various other currencies totaling approximately \$23 million (each approximately \$5 million or less). Also included in total other comprehensive loss for 2015 is income of \$50.9 million in connection with the revaluation of our €700.0 million senior notes which were designated as a hedge of our net investment in foreign operations. In 2014, other comprehensive loss from foreign currency translation adjustments was \$168.7 million, mainly as a result of unfavorable movements in the European Union Euro of approximately \$124 million, the Chinese Renminbi of approximately \$18 million and the Brazilian Real of approximately \$13 million. Also included in total other comprehensive loss for 2014 is a realized loss of \$21.0 million related to an interest rate swap which settled in the fourth quarter of 2014, and income of \$11.4 million in connection with the revaluation of our €700.0 million senior notes and settlement of related foreign currency forward contracts, both of which were designated as a hedge of our net investment in foreign operations.

Segment Information Overview. Summarized financial information concerning our reportable segments is shown in the following tables. Results for 2015 and 2014 have been recast to reflect the change in segments previously noted.

	Year Ended December 31,				Percentage
	2015	%	2014	%	Change
	(In thousands, except percentages)				
Net sales:					
Lithium and Advanced Materials	\$ 834,590	29.5 %	\$ 312,788	12.8 %	167 %
Bromine Specialties	775,729	27.4 %	808,857	33.1 %	(4)%
Refining Solutions	729,261	25.8 %	852,139	34.8 %	(14)%
All Other	471,434	16.7 %	471,764	19.3 %	— %
Corporate	15,415	0.6 %	—	— %	*
Total net sales	<u>\$ 2,826,429</u>	<u>100.0 %</u>	<u>\$ 2,445,548</u>	<u>100.0 %</u>	16 %
Adjusted EBITDA:					
Lithium and Advanced Materials	\$ 312,867	41.4 %	\$ 81,596	14.5 %	283 %
Bromine Specialties	222,653	29.5 %	224,976	40.0 %	(1)%
Refining Solutions	197,595	26.1 %	256,485	45.6 %	(23)%
All Other	53,993	7.1 %	73,973	13.2 %	(27)%
Corporate	(31,108)	(4.1)%	(74,875)	(13.3)%	(58)%
Total adjusted EBITDA	<u>\$ 756,000</u>	<u>100.0 %</u>	<u>\$ 562,155</u>	<u>100.0 %</u>	34 %

* Percentage calculation is not meaningful.

See below for a reconciliation of adjusted EBITDA, the non-GAAP financial measure, from Net income (loss) attributable to Albemarle Corporation, the most directly comparable financial measure calculated and reported in accordance with GAAP, (in thousands):

	Lithium and Advanced Materials	Bromine Specialties	Refining Solutions	Reportable Segments Total	All Other	Corporate	Consolidated Total
2015							
Net income (loss) attributable to Albemarle Corporation	\$ 148,821	\$ 186,474	\$ 161,585	\$ 496,880	\$ 32,781	\$ (194,755)	\$ 334,906
Depreciation and amortization	84,069	36,179	34,039	154,287	18,183	8,703	181,173
Utilization of inventory markup ^(a)	79,977	—	—	79,977	3,029	—	83,006
Restructuring and other, net ^(b)	—	—	—	—	—	(6,804)	(6,804)
Acquisition and integration related costs ^(c)	—	—	—	—	—	132,299	132,299
Interest and financing expenses	—	—	—	—	—	81,650	81,650
Income tax expense	—	—	—	—	—	11,134	11,134
Income from discontinued operations (net of tax)	—	—	—	—	—	(32,476)	(32,476)
Non-operating pension and OPEB items	—	—	—	—	—	(35,300)	(35,300)
Other ^(d)	—	—	1,971	1,971	—	4,441	6,412
Adjusted EBITDA	<u>\$ 312,867</u>	<u>\$ 222,653</u>	<u>\$ 197,595</u>	<u>\$ 733,115</u>	<u>\$ 53,993</u>	<u>\$ (31,108)</u>	<u>\$ 756,000</u>
2014							
Net income (loss) attributable to Albemarle Corporation	\$ 65,806	\$ 189,059	\$ 223,815	\$ 478,680	\$ 60,495	\$ (405,859)	\$ 133,316
Depreciation and amortization	15,790	35,917	32,670	84,377	13,478	2,552	100,407
Restructuring and other, net ^(b)	—	—	—	—	—	25,947	25,947
Acquisition and integration related costs ^(c)	—	—	—	—	—	30,158	30,158
Interest and financing expenses	—	—	—	—	—	41,358	41,358
Income tax expense	—	—	—	—	—	18,484	18,484
Loss from discontinued operations (net of tax)	—	—	—	—	—	69,531	69,531
Non-operating pension and OPEB items	—	—	—	—	—	125,462	125,462
Other ^(e)	—	—	—	—	—	17,492	17,492
Adjusted EBITDA	<u>\$ 81,596</u>	<u>\$ 224,976</u>	<u>\$ 256,485</u>	<u>\$ 563,057</u>	<u>\$ 73,973</u>	<u>\$ (74,875)</u>	<u>\$ 562,155</u>

- (a) In connection with the acquisition of Rockwood, the Company valued Rockwood's existing inventory at fair value as of the Acquisition Closing Date, which resulted in a markup of the underlying net book value of the inventory totaling approximately \$103.4 million. The inventory markup was expensed over the estimated remaining selling period. For the year ended December 31, 2015, \$55.9 million was included in Cost of goods sold, and Equity in net income of unconsolidated investments was reduced by \$27.1 million, related to the utilization of the inventory markup.
- (b) See "Restructuring and Other, Net" on page 39 for a description of this gain.
- (c) See "Acquisition and Integration Related Costs" on page 40 for a description of these costs.
- (d) Refining Solutions includes an impairment charge of approximately \$2.0 million related to our unconsolidated investment in Fábrica Carioca de Catalisadores SA. Corporate includes approximately \$4.4 million of financing-related fees expensed in connection with the acquisition of Rockwood.
- (e) Financing-related fees expense in connection with the acquisition of Rockwood.

Lithium and Advanced Materials

Lithium and Advanced Materials segment net sales for the year ended December 31, 2015 were \$834.6 million, up \$521.8 million, or 167%, in comparison to the same period in 2014. The increase was driven mainly by the acquisition of Rockwood and \$26.0 million of favorable PCS volumes due to higher demand, partially offset by \$7.4 million of unfavorable impacts from currency translation, primarily due to the weaker European Union Euro. Adjusted EBITDA for Lithium and Advanced Materials was up 283%, or \$231.3 million, to \$312.9 million for the year ended December 31, 2015, compared to the same period in 2014, with approximately \$213.5 million due to the acquisition of Rockwood and \$24.6 million in higher PCS sales

volumes due to strong demand, partially offset by \$3.6 million of unfavorable impacts of currency translation, primarily due to the weaker European Union Euro.

Bromine Specialties

Bromine Specialties segment net sales for the year ended December 31, 2015 were \$775.7 million, a decrease of \$33.1 million, or 4%, in comparison to the same period in 2014. The decrease was driven mainly by \$21.8 million of unfavorable volumes on weaker demand and \$20.5 million of unfavorable impacts from currency translation, primarily due to the weaker European Union Euro, partially offset by \$9.4 million of favorable price impacts on certain products. Adjusted EBITDA for Bromine Specialties decreased 1%, or \$2.3 million, to \$222.7 million for the year ended December 31, 2015, compared to the same period in 2014, with approximately \$12.5 million of unfavorable impacts of currency translation, primarily due to the weaker European Union Euro, partially offset by \$9.4 million in favorable pricing impacts due to market conditions.

Refining Solutions

Refining Solutions segment net sales for the year ended December 31, 2015 were \$729.3 million, a decrease of \$122.9 million, or 14%, compared to the year ended December 31, 2014. This decrease was predominantly due to \$103.5 million of unfavorable Clean Fuels Technology volumes due to customer demand, \$15.0 million unfavorable Clean Fuels Technology and Heavy Oil Upgrading pricing impacts due to product and customer mix, and \$30.4 million of unfavorable impacts from currency translation, primarily due to the weaker European Union Euro, partially offset by \$30.4 million of higher Heavy Oil Upgrading volumes. Refining Solutions adjusted EBITDA decreased 23%, or \$58.9 million, to \$197.6 million for the year ended December 31, 2015 in comparison to the corresponding period of 2014. This decrease was due primarily to lower overall sales volumes primarily in Clean Fuels Technology due to lower demand, unfavorable pricing and mix due to economic conditions and specific crude feeds, and unfavorable impacts of currency translation, primarily due to the weaker European Union Euro, partially offset by \$21.7 million in favorable pricing on raw materials and natural gas.

All Other

All Other net sales for the year ended December 31, 2015 were \$471.4 million, a decrease of \$0.3 million compared to the year ended December 31, 2014. The decrease was driven mainly by \$55.3 million of unfavorable Fine Chemistry Services volumes, and \$29.4 million of unfavorable impacts from currency translation impacts, primarily due to the weaker European Union Euro, offset by the acquisition of Rockwood. All Other adjusted EBITDA was down 27%, or \$20.0 million, for the year ended December 31, 2015 in comparison to the same period of 2014. This decrease was due primarily to lower overall sales and unfavorable impacts from currency translation, primarily due to the weaker European Union Euro, partially offset by the acquisition of Rockwood.

Corporate

Corporate adjusted EBITDA was a charge of \$31.1 million for the year ended December 31, 2015, a decrease of \$43.8 million, compared to the year ended December 31, 2014. The change was due mainly to \$52.7 million of foreign currency translation gains and achieved synergies partially offset by the acquisition of Rockwood. The foreign translation gains are primarily related to cash denominated in U.S. Dollars held by foreign subsidiaries where the European Union Euro serves as the functional currency.

Summary of Critical Accounting Policies and Estimates

Estimates, Assumptions and Reclassifications

The preparation of financial statements in conformity with U.S. GAAP requires management to make estimates and assumptions that affect the reported amounts of revenues, expenses, assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements. Listed below are the estimates and assumptions that we consider to be critical in the preparation of our financial statements.

Certain amounts in the accompanying consolidated financial statements and notes thereto have been reclassified to conform to the current presentation.

Property, Plant and Equipment. We assign the useful lives of our property, plant and equipment based upon our internal engineering estimates which are reviewed periodically. The estimated useful lives of our property, plant and equipment range from two to sixty years and depreciation is recorded on the straight-line method, with the exception of our long-term mineral rights, which are depleted on a units-of-production method. We evaluate the recovery of our property, plant and equipment by comparing the net carrying value of the asset group to the undiscounted net cash flows expected to be generated from the use

and eventual disposition of that asset group when events or changes in circumstances indicate that its carrying amount may not be recoverable. If the carrying amount of the asset group is not recoverable, the fair value of the asset group is measured and if the carrying amount exceeds the fair value, an impairment loss is recognized.

Acquisition Method of Accounting. We recognize the identifiable assets acquired, the liabilities assumed and any noncontrolling interest in the acquiree at their estimated fair values on the date of acquisition for acquired businesses. Determining the fair value of these items requires management's judgment, the utilization of independent valuation experts and involves the use of significant estimates and assumptions with respect to the timing and amounts of future cash inflows and outflows, discount rates, customer attrition rates, royalty rates, market prices and tax rates, among other items. The judgments made in the determination of the estimated fair value assigned to the assets acquired, the liabilities assumed and any noncontrolling interest in the investee, as well as the estimated useful life of each asset and the duration of each liability, can materially impact the financial statements in periods after acquisition, such as through depreciation and amortization expense. For more information on our acquisitions and application of the acquisition method, see Note 2, "Acquisitions" to our consolidated financial statements included in Part II, Item 8 of this report.

Income Taxes. We assume the deductibility of certain costs in our income tax filings, and we estimate the future recovery of deferred tax assets, uncertain tax positions and indefinite investment assertions.

Environmental Remediation Liabilities. We estimate and accrue the costs required to remediate a specific site depending on site-specific facts and circumstances. Cost estimates to remediate each specific site are developed by assessing (i) the scope of our contribution to the environmental matter, (ii) the scope of the anticipated remediation and monitoring plan and (iii) the extent of other parties' share of responsibility.

Actual results could differ materially from the estimates and assumptions that we use in the preparation of our financial statements.

Revenue Recognition

We recognize sales when the revenue is realized or realizable, and has been earned, in accordance with authoritative accounting guidance. We recognize net sales as risk and title to the product transfer to the customer, which usually occurs at the time shipment is made. Significant portions of our sales are sold free on board shipping point or on an equivalent basis, and other transactions are based upon specific contractual arrangements. Our standard terms of delivery are generally included in our contracts of sale, order confirmation documents and invoices. We recognize revenue from services when performance of the services has been completed. Where the Company incurs pre-production design and development costs under long-term supply contracts, these costs are expensed where they relate to the products sold unless contractual guarantees for reimbursement exist. Conversely, these costs are capitalized if they pertain to equipment that we will own and use in producing the products to be supplied and expect to utilize for future revenue generating activities.

Goodwill and Other Intangible Assets

We account for goodwill and other intangibles acquired in a business combination in conformity with current accounting guidance which requires goodwill and indefinite-lived intangible assets to not be amortized.

We test goodwill for impairment by comparing the estimated fair value of our reporting units to the related carrying value. We estimate the fair value based on present value techniques involving future cash flows. Future cash flows include assumptions about sales volumes, selling prices, raw material prices, labor and other employee benefit costs, capital additions, income taxes, working capital, and other economic or market-related factors. Significant management judgment is involved in estimating these variables and they include inherent uncertainties since they are forecasting future events. We perform a sensitivity analysis by using a range of inputs to confirm the reasonableness of these estimates being used in the goodwill impairment analysis. We use a Weighted Average Cost of Capital ("WACC") approach to determine our discount rate for goodwill recoverability testing. Our WACC calculation incorporates industry-weighted average returns on debt and equity from a market perspective. The factors in this calculation are largely external to the Company and, therefore, are beyond our control. We test our recorded goodwill for impairment in the fourth quarter of each year or upon the occurrence of events or changes in circumstances that would more likely than not reduce the fair value of our reporting units below their carrying amounts. The Company performed its annual goodwill impairment test as of October 31, 2016 and concluded there was no impairment as of that date. In addition, no indications of impairment in any of our reporting units were indicated by the sensitivity analysis.

We assess our indefinite-lived intangible assets, which include trade names, for impairment annually and between annual tests if events or changes in circumstances indicate that it is more likely than not that the asset is impaired. The indefinite-lived intangible asset impairment standard allows us to first assess qualitative factors to determine if a quantitative impairment test is

necessary. Further testing is only required if we determine, based on the qualitative assessment, that it is more likely than not that the indefinite-lived intangible asset's fair value is less than its carrying amount. If we determine based on the qualitative assessment that it is more likely than not that the asset is impaired, an impairment test is performed by comparing the fair value of the indefinite-lived intangible asset to its carrying amount.

Definite-lived intangible assets, such as purchased technology, patents, customer lists and trade names, are amortized over their estimated useful lives generally for periods ranging from five to twenty-five years. Except for customer lists and relationships associated with our Lithium business, which are amortized using the pattern of economic benefit method, definite-lived intangible assets are amortized using the straight-line method. We evaluate the recovery of our definite-lived intangible assets by comparing the net carrying value of the asset group to the undiscounted net cash flows expected to be generated from the use and eventual disposition of that asset group when events or changes in circumstances indicate that its carrying amount may not be recoverable. If the carrying amount of the asset group is not recoverable, the fair value of the asset group is measured and if the carrying amount exceeds the fair value, an impairment loss is recognized. See Note 12, "Goodwill and Other Intangibles" to our consolidated financial statements included in Part II, Item 8 of this report.

Pension Plans and Other Postretirement Benefits

Under authoritative accounting standards, assumptions are made regarding the valuation of benefit obligations and the performance of plan assets. As required, we recognize a balance sheet asset or liability for each of our pension and OPEB plans equal to the plan's funded status as of the measurement date. The primary assumptions are as follows:

- **Discount Rate**—The discount rate is used in calculating the present value of benefits, which is based on projections of benefit payments to be made in the future.
- **Expected Return on Plan Assets**—We project the future return on plan assets based on prior performance and future expectations for the types of investments held by the plans as well as the expected long-term allocation of plan assets for these investments. These projected returns reduce the net benefit costs recorded currently.
- **Rate of Compensation Increase**—For salary-related plans, we project employees' annual pay increases, which are used to project employees' pension benefits at retirement.
- **Mortality Assumptions**—Assumptions about life expectancy of plan participants are used in the measurement of related plan obligations.

Actuarial gains and losses are recognized annually in our consolidated statements of income in the fourth quarter and whenever a plan is determined to qualify for a remeasurement during a fiscal year. The remaining components of pension and OPEB plan expense, primarily service cost, interest cost and expected return on assets, are recorded on a monthly basis. The market-related value of assets equals the actual market value as of the date of measurement.

During 2016, we made changes to assumptions related to discount rates and expected rates of return on plan assets. We consider available information that we deem relevant when selecting each of these assumptions.

Our U.S. defined benefit plans for non-represented employees are closed to new participants, with no additional benefits accruing under these plans as participants' accrued benefits have been frozen. In selecting the discount rates for the U.S. plans, we consider expected benefit payments on a plan-by-plan basis. As a result, the Company uses different discount rates for each plan depending on the demographics of participants and the expected timing of benefit payments. For 2016, the discount rates were calculated using the results from a bond matching technique developed by Milliman, which matched the future estimated annual benefit payments of each respective plan against a portfolio of bonds of high quality to determine the discount rate. We believe our selected discount rates are determined using preferred methodology under authoritative accounting guidance and accurately reflect market conditions as of the December 31, 2016 measurement date.

In selecting the discount rates for the foreign plans, we look at long-term yields on AA-rated corporate bonds when available. Our actuaries have developed yield curves based on the yields of constituent bonds in the various indices as well as on other market indicators such as swap rates, particularly at the longer durations. For the Eurozone, we apply the Aon Hewitt yield curve to projected cash flows from the relevant plans to derive the discount rate. For the U.K., the discount rate is determined by applying the Aon Hewitt yield curve for typical schemes of similar duration to projected cash flows of Albemarle's U.K. plan. In other countries where there is not a sufficiently deep market of high-quality corporate bonds, we set the discount rate by referencing the yield on government bonds of an appropriate duration.

At December 31, 2016, the weighted-average discount rate for the U.S. and foreign pension plans was decreased to 4.43% and 2.00%, respectively, from 4.67% and 2.76%, respectively, at December 31, 2015 to reflect market conditions as of

the December 31, 2016 measurement date. The discount rate for the OPEB plans at December 31, 2016 and 2015 was 4.35% and 4.59%, respectively.

In estimating the expected return on plan assets, we consider past performance and future expectations for the types of investments held by the plan as well as the expected long-term allocations of plan assets to these investments. For the years 2016 and 2015, the weighted-average expected rate of return on U.S. pension plan assets was 6.89% and 6.88%, respectively, and the weighted-average expected rate of return on foreign pension plan assets was 6.66% and 5.76%, respectively. Effective January 1, 2017, the weighted-average expected rate of return on U.S. and foreign pension plan assets is 6.89% and 6.16%, respectively. The weighted-average expected rate of return on plan assets for our OPEB plans was 7.00% during 2016 and 2015. There has been no change to the assumed rate of return on OPEB plan assets effective January 1, 2017.

In projecting the rate of compensation increase, we consider past experience in light of movements in inflation rates. At December 31, 2016, the assumed weighted-average rate of compensation increase changed to 3.18% from 3.16% for our foreign pension plans.

In October 2015, the Society of Actuaries (“SOA”) published an updated Mortality Improvement Scale, MP-2015. The updated improvement scale incorporated two additional years of mortality data and reflected a trend toward somewhat smaller improvements in longevity. In addition, the SOA released a set of factors to adjust the RP-2014 Mortality Tables to base year 2006. We revised our mortality assumption to incorporate these updated mortality improvements for purposes of measuring our U.S. pension and OPEB obligations at December 31, 2015. In October 2016, the SOA published an updated Mortality Improvement Scale, MP-2016. The updated improvement scale incorporates three additional years of mortality data (2012 – 2014) and a modification of two other input values to improve the model’s year-over-year stability. We utilized the same base mortality, SOA RP-2014 Adjusted to 2006 Total Dataset Mortality, but we revised our mortality assumption to incorporate the MP-2016 Mortality Improvement Scale for purposes of measuring our U.S. pension and OPEB obligations at December 31, 2016.

At December 31, 2016, the assumed rate of increase in the pre-65 and post-65 per capita cost of covered health care benefits for U.S. retirees was zero as the employer-paid premium caps (pre-65 and post-65) were met starting January 1, 2013.

A variance in the assumptions discussed above would have an impact on the projected benefit obligations, the accrued OPEB liabilities, and the annual net periodic pension and OPEB cost. The following table reflects the sensitivities associated with a hypothetical change in certain assumptions, primarily in the U.S. (in thousands):

	(Favorable) Unfavorable			
	1% Increase		1% Decrease	
	Increase (Decrease) in Benefit Obligation	Increase (Decrease) in Benefit Cost	Increase (Decrease) in Benefit Obligation	Increase (Decrease) in Benefit Cost
Actuarial Assumptions				
Discount Rate:				
Pension	\$ (102,744)	\$ 3,671	\$ 124,185	\$ (5,054)
Other postretirement benefits	\$ (5,117)	\$ 265	\$ 6,128	\$ (334)
Expected return on plan assets:				
Pension	*	\$ (5,852)	*	\$ 5,852
Other postretirement benefits	*	\$ (16)	*	\$ 16

* Not applicable.

Of the \$609.2 million total pension and postretirement assets at December 31, 2016, \$86.1 million, or approximately 14%, are measured using the net asset value as a practical expedient. Gains or losses attributable to these assets are recognized in the consolidated balance sheets as either an increase or decrease in plan assets. See Note 15, “Pension Plans and Other Postretirement Benefits” to our consolidated financial statements included in Part II, Item 8 of this report.

Income Taxes

We use the liability method for determining our income taxes, under which current and deferred tax liabilities and assets are recorded in accordance with enacted tax laws and rates. Under this method, the amounts of deferred tax liabilities and assets at the end of each period are determined using the tax rate expected to be in effect when taxes are actually paid or recovered. Future tax benefits are recognized to the extent that realization of such benefits is more likely than not. In order to record deferred tax assets and liabilities, we are following guidance under ASU 2015-17, which requires deferred tax assets and liabilities to be classified as noncurrent on the balance sheet, along with any related valuation allowance.

Deferred income taxes are provided for the estimated income tax effect of temporary differences between the financial statement carrying amounts and the tax basis of existing assets and liabilities. Deferred tax assets are also provided for operating losses, capital losses and certain tax credit carryovers. A valuation allowance, reducing deferred tax assets, is established when it is more likely than not that some portion or all of the deferred tax assets will not be realized. The realization of such deferred tax assets is dependent upon the generation of sufficient future taxable income of the appropriate character. Although realization is not assured, we do not establish a valuation allowance when we believe it is more likely than not that a net deferred tax asset will be realized.

We only recognize a tax benefit after concluding that it is more likely than not that the benefit will be sustained upon audit by the respective taxing authority based solely on the technical merits of the associated tax position. Once the recognition threshold is met, we recognize a tax benefit measured as the largest amount of the tax benefit that, in our judgment, is greater than 50% likely to be realized. Interest and penalties related to income tax liabilities are included in Income tax expense on the consolidated statements of income.

We are subject to income taxes in the U.S. and numerous foreign jurisdictions. Due to the statute of limitations, we are no longer subject to U.S. federal income tax audits by the Internal Revenue Service (“IRS”) for years prior to 2013. In 2016, the IRS finalized its audit of legacy Albemarle’s U.S. consolidated group for 2011 and 2012. Due to the statute of limitations, we also are no longer subject to U.S. state income tax audits prior to 2010.

With respect to jurisdictions outside the U.S., several audits are in process. During 2016, the German tax authorities continued and announced audits on multiple German subsidiaries that have since divested, for various years from 2006 through 2015. Also during 2016, audits of our Japanese, Taiwan, Singapore and Netherlands subsidiaries were closed with no issue. In addition, we have various audits ongoing for the years 2007 through 2014 related to Canada, Russia, India and Italy, all of which are entities that have since been divested.

While we believe we have adequately provided for all tax positions, amounts asserted by taxing authorities could be greater than our accrued position. Accordingly, additional provisions on federal and foreign tax-related matters could be recorded in the future as revised estimates are made or the underlying matters are settled or otherwise resolved.

Since the timing of resolutions and/or closure of tax audits are uncertain, it is difficult to predict with certainty the range of reasonably possible significant increases or decreases in the liability related to uncertain tax positions that may occur within the next twelve months. Our current view is that it is reasonably possible that we could record a decrease in the liability related to uncertain tax positions, relating to a number of issues, up to approximately \$3.2 million as a result of closure of tax statutes. As a result of the sale of the Chemetall Surface Treatment business, we agreed to indemnify certain income and non-income tax liabilities, including uncertain tax positions, associated with the entities sold. The associated liability is recorded in Other noncurrent liabilities. See Note 16, “Other Noncurrent Liabilities,” and Note 20, “Income Taxes,” for further details.

We have designated the undistributed earnings of substantially all of our foreign operations as indefinitely reinvested and as a result we do not provide for deferred income taxes on the unremitted earnings of these subsidiaries. If it is determined that cash can be repatriated with little to no tax consequences, we may choose to repatriate cash at that time. Our foreign earnings are computed under U.S. federal tax earnings and profits (“E&P”) principles. In general, to the extent our financial reporting book basis over tax basis of a foreign subsidiary exceeds these E&P amounts, deferred taxes have not been provided, as they are essentially permanent in duration. The determination of the amount of such unrecognized deferred tax liability is not practicable. We provide for deferred income taxes on our undistributed earnings of foreign operations that are not deemed to be indefinitely invested.

Stock-based Compensation Expense

The fair value of restricted stock awards, restricted stock unit awards and performance unit awards with a service condition are determined based on the number of shares or units granted and the quoted price of our common stock on the date of grant, and the fair value of stock options is determined using the Black-Scholes valuation model. The fair value of performance unit awards with a service and a market condition are estimated on the date of grant using a Monte Carlo simulation model. The fair value of these awards is determined after giving effect to estimated forfeitures. Such value is recognized as expense over the service period, which is generally the vesting period of the equity grant. To the extent restricted stock awards, restricted stock unit awards, performance unit awards and stock options are forfeited prior to vesting in excess of the estimated forfeiture rate, the corresponding previously recognized expense is reversed as an offset to operating expenses.

Financial Condition and Liquidity

Overview

The principal uses of cash in our business generally have been capital investments, funding working capital, acquisitions and repayment of debt. We also make contributions to our defined benefit pension plans, pay dividends to our shareholders and repurchase shares of our common stock. Historically, cash to fund the needs of our business has been principally provided by cash from operations, debt financing and equity issuances.

We are continually focused on working capital efficiency particularly in the areas of accounts receivable and inventory. We anticipate that cash on hand, cash provided by operating activities, proceeds from divestitures and long-term borrowings will be sufficient to pay our operating expenses, satisfy debt service obligations, fund capital expenditures and other investing activities, fund pension contributions and pay dividends for the foreseeable future.

Cash Flow

Our cash and cash equivalents were \$2.27 billion at December 31, 2016 as compared to \$213.7 million at December 31, 2015. Cash provided by operating activities was \$733.4 million, \$360.7 million and \$492.6 million during the years ended December 31, 2016, 2015 and 2014, respectively.

The increase in cash provided by operating activities in 2016 versus 2015 was primarily due to increased overall sales volumes and prices, lower fixed and variable costs, lower acquisition and integration related costs in connection with the Rockwood acquisition and lower payments for interest and taxes, partially offset by an increase in accounts receivable from higher sales in certain regions with longer payment terms, as compared to 2015. The decrease in cash provided by operating activities in 2015 versus 2014 was primarily due to higher acquisition and integration related costs in connection with the Rockwood acquisition, higher payments for interest and higher payments for income taxes in 2015, as compared to 2014.

During 2016, cash on hand, cash provided by operations and \$3.33 billion of cash proceeds from divestitures funded \$1.42 billion of debt repayments, \$196.7 million of capital expenditures for plant, machinery and equipment, dividends to shareholders of \$135.4 million, and pension and postretirement contributions of \$20.1 million. Also during 2016, our consolidated joint venture, JBC, paid dividends of approximately \$105 million, which resulted in dividends to noncontrolling interests of \$35.9 million. During 2015, cash on hand, cash provided by operations, a return of capital from an unconsolidated investment and proceeds from borrowings funded \$2.1 billion for acquisitions, \$227.6 million of capital expenditures for plant, machinery and equipment, dividends to shareholders of \$119.3 million, and pension and postretirement contributions of \$21.6 million. Also during 2015, our consolidated joint venture, JBC, paid dividends of approximately \$70 million, which resulted in dividends to noncontrolling interests of \$23.3 million. During 2014, cash on hand, cash provided by operations and proceeds from divestitures funded payments of \$150.0 million for repurchases of our common stock, \$110.6 million of capital expenditures for plant, machinery and equipment, dividends to shareholders of \$84.1 million, \$33.4 million for the settlement of a forward starting interest rate swap, debt financing costs of \$17.6 million and pension and postretirement contributions of \$13.9 million. Also during 2014, our consolidated joint venture, JBC, paid dividends of approximately \$51 million, which resulted in dividends to noncontrolling interests of \$15.5 million. Additionally, in 2014 we issued a series of new senior notes totaling approximately \$1.9 billion.

On December 14, 2016, we completed the previously announced sale of the Chemetall Surface Treatment business to BASF SE for cash proceeds of approximately \$3.1 billion, net of purchase price adjustments. As a result of the sale, we have recorded a gain of \$388.0 million before income taxes and a tax liability of \$253.0 million related to the difference between the sales price and the proportionate carrying value of the interests sold. We have used the proceeds to significantly reduce leverage, including repaying the outstanding balance of the September 2015 Term Loan Agreement in full and approximately \$153 million of Commercial Paper Notes in December 2016. In addition, through February 2017, we repaid the 3.00% Senior notes in full, €307.0 million of the 1.875% Senior notes and \$174.7 million of the 4.50% Senior notes, as well as related redemption premiums of \$45.2 million. We intend to use the remaining proceeds to invest heavily in the growth of the remaining businesses and return capital to shareholders.

On January 4, 2016, we closed the sale of our metal sulfides business to Treibacher Industrie AG. Included in the transaction were sites in Vienna and Arnoldstein, Austria, and Tribotec's proprietary sulfide syntheses process. We received net proceeds of approximately \$137 million, which were used to repay a portion of the outstanding balance under the September 2015 Term Loan Agreement, and recorded a gain of \$11.5 million before income taxes in 2016 related to the sale of this business.

On February 1, 2016, we closed the sale of our mineral-based flame retardants and specialty chemicals businesses to Huber Engineered Materials, a division of J.M. Huber Corporation. The transaction included Albemarle's Martinswerk GmbH subsidiary and manufacturing facility located in Bergheim, Germany, and Albemarle's 50% ownership interest in Magnifin Magnesiaprodukte GmbH, a joint-venture with Radex Heraklith Industriebeteiligung AG at Breitenau, Austria. We received net proceeds of approximately \$187 million, which were used to repay a portion of the outstanding balance under the September 2015 Term Loan Agreement, and recorded a gain of \$112.3 million before income taxes in 2016 related to the sale of these businesses.

Net current assets increased to approximately \$2.17 billion at December 31, 2016 from \$214.3 million at December 31, 2015, with the increase being primarily due to the proceeds from the sale of the Chemetall Surface Treatment business sold in December 2016, partially offset by the divestiture of the related net current assets held for sale. Included in net current assets at December 31, 2015 was \$312.3 million of assets held for sale, net of related liabilities. Other changes in the components of net current assets are due to the timing of the sale of goods and other normal transactions leading up to the balance sheet dates and are not the result of any policy changes by the Company, and do not reflect any change in either the quality of our net current assets or our expectation of success in converting net working capital to cash in the normal course of business.

Capital expenditures were \$196.7 million, \$227.6 million and \$110.6 million for the years ended December 31, 2016, 2015 and 2014, respectively, and were incurred mainly for plant, machinery and equipment. Capital expenditures for discontinued operations were \$19.3 million and \$23.7 million for the years ended December 31, 2016 and 2015, respectively. We expect our capital expenditures to approximate \$375 million in 2017 for Lithium growth and capacity increases, productivity and continuity of operations projects. Of the total capital expenditures, our projects related to the continuity of operations is expected to remain in the range of 4-6% of net sales, similar to prior years.

During 2016, we incurred \$52.1 million of acquisition and integration related costs directly related to the acquisition of Rockwood (mainly consisting of professional services, costs to achieve synergies, relocation costs, and other integration costs) and \$5.3 million of costs in connection with other significant projects. In 2015, we incurred \$123.9 million of acquisition and integration related costs directly related to the acquisition of Rockwood (mainly consisting of professional services and advisory fees, costs to achieve synergies, relocation costs, and other integration costs) and \$8.4 million of costs in connection with other significant projects. In 2014, we incurred \$23.6 million of acquisition and integration related costs directly related to the acquisition of Rockwood and \$6.6 million of costs in connection with other significant projects.

During 2014 we repurchased approximately 2.2 million shares of our common stock pursuant to the terms of our Board authorized share repurchase program. All of the shares repurchased in 2014 were also repurchased pursuant to the terms of accelerated share repurchase agreements with major financial institutions. There were no shares of our common stock repurchased during 2015 or 2016. In November 2016, our Board of Directors authorized an increase in the number of shares the Company is permitted to repurchase under our share repurchase program, pursuant to which the Company is now permitted to repurchase up to a maximum of 15,000,000 shares, including those previously authorized but not yet repurchased.

On February 23, 2017, we increased our quarterly dividend rate to \$0.32 per share, a 5% increase from the quarterly rate of \$0.305 per share paid in 2016.

At December 31, 2016 and December 31, 2015, our cash and cash equivalents included \$846.4 million and \$200.7 million, respectively, held by our foreign subsidiaries. The majority of these foreign cash balances are associated with earnings that we have asserted are indefinitely reinvested and which we plan to use to support our continued growth plans outside the U.S. through funding of capital expenditures, acquisitions, research, operating expenses or other similar cash needs of our foreign operations. From time to time, we repatriate cash associated with earnings from our foreign subsidiaries to the U.S. for normal operating needs through intercompany dividends, but only from subsidiaries whose earnings we have not asserted to be indefinitely reinvested or whose earnings qualify as "previously taxed income" as defined by the Internal Revenue Code. For the years ended December 31, 2016, 2015 and 2014, we repatriated approximately \$53.7 million, \$122.5 million and \$10.0 million of cash associated with earnings, respectively, as part of these foreign earnings cash repatriation activities.

While we continue to closely monitor our cash generation, working capital management and capital spending in light of continuing uncertainties in the global economy, we believe that we will continue to have the financial flexibility and capability to opportunistically fund future growth initiatives. Additionally, we anticipate that future capital spending including business acquisitions, share repurchases and other cash outlays should be financed primarily with cash flow provided by operations and cash on hand, with additional cash needed, if any, provided by borrowings. The amount and timing of any additional borrowings will depend on our specific cash requirements.

Long-Term Debt

As of February 20, 2017, we have the following senior notes outstanding:

<u>Issue Month/Year</u>	<u>Principal (in millions)</u>	<u>Interest Rate</u>	<u>Interest Payment Dates</u>		<u>Maturity Date</u>
December 2014	€393.0	1.875%	December 8		December 8, 2021
November 2014	\$425.0	4.15%	June 1	December 1	December 1, 2024
November 2014	\$350.0	5.45%	June 1	December 1	December 1, 2044
December 2010	\$175.3	4.50%	June 15	December 15	December 15, 2020

On December 14, 2016, we completed the previously announced sale of the Chemetall Surface Treatment business to BASF SE for cash proceeds of approximately \$3.1 billion, net of purchase price adjustments. Through February 2017, we used a portion of the proceeds to repay the 3.00% Senior notes in full, €307.0 million of the 1.875% Senior notes and \$174.7 million of the 4.50% Senior notes, as well as related tender premiums of \$45.2 million.

Our senior notes are senior unsecured obligations and rank equally with all our other senior unsecured indebtedness from time to time outstanding. The senior notes are effectively subordinated to any of our existing or future secured indebtedness and to the existing and future indebtedness of our subsidiaries. As is customary for such long-term debt instruments, each senior note outstanding has terms that allow us to redeem the notes before its maturity, in whole at any time or in part from time to time, at a redemption price equal to the greater of (i) 100% of the principal amount of the senior notes to be redeemed, or (ii) the sum of the present values of the remaining scheduled payments of principal and interest thereon (exclusive of interest accrued to the date of redemption) discounted to the redemption date on a semi-annual basis using the comparable government rate (as defined in the indentures governing the senior notes) plus between 25 and 40 basis points, depending on the note, plus, in each case, accrued interest thereon to the date of redemption. Holders may require us to purchase such notes at 101% upon a change of control triggering event, as defined in the indentures. The senior notes are subject to typical events of default, including bankruptcy and insolvency events, nonpayment and the acceleration of certain subsidiary indebtedness of \$40 million or more caused by a nonpayment default.

Upon completion of the Rockwood acquisition, we assumed Rockwood's senior notes with an aggregate principal amount of \$1.25 billion. On October 15, 2015, our wholly-owned subsidiary, Rockwood Specialties Group, Inc., redeemed all of the outstanding 4.625% senior notes at a redemption price equal to 103.469% of the principal amount of the notes, representing a premium of \$43.3 million, plus accrued and unpaid interest to the redemption date. The guarantees of the 4.625% senior notes and the senior notes we issued in 2014 were released upon repayment of the 4.625% senior notes.

The 4.625% senior notes we assumed from Rockwood were repaid with proceeds from a new term loan agreement we entered into on September 14, 2015 (the "September 2015 Term Loan Agreement") with JPMorgan Chase Bank, N.A. (the "Administrative Agent") and certain other lenders. The September 2015 Term Loan Agreement provided for borrowings under a 364-day term loan facility (the "364-Day Facility") and a five-year term loan facility (the "Five-Year Facility"), or collectively, the "Term loan facilities." During the year ended December 31, 2016, the Company repaid the 364-Day Facility and Five-Year Facility in full, primarily with proceeds from the sales of the Chemetall Surface Treatment business, the metal sulfides business and the minerals-based flame retardants and specialty chemicals business. The interest rate on both Term loan facilities was LIBOR plus 1.375%.

Our revolving, unsecured credit agreement dated as of February 7, 2014, as amended, (the "February 2014 Credit Agreement") currently provides for borrowings of up to \$1.0 billion and matures on February 7, 2020. Borrowings bear interest at variable rates based on the LIBOR for deposits in the relevant currency plus an applicable margin which ranges from 1.000% to 1.700%, depending on the Company's credit rating from Standard & Poor's Ratings Services ("S&P"), Moody's Investors Services ("Moody's") and Fitch Ratings ("Fitch"). The applicable margin on the facility was 1.300% as of December 31, 2016. There were no borrowings outstanding under the February 2014 Credit Agreement as of December 31, 2016.

Borrowings under the February 2014 Credit Agreement are conditioned upon compliance with the following covenants: (a) consolidated funded debt, as defined in the agreement, must be less than or equal to 3.50 times consolidated EBITDA, as defined in the agreement, which reflects adjustments for certain non-recurring or unusual items such as restructuring charges, facility divestiture charges and other significant non-recurring items (herein "consolidated adjusted EBITDA" or "adjusted EBITDA"), as of the end of any fiscal quarter; (b) with the exception of certain liens as specified in the agreement, liens may not attach to assets when the aggregate amount of all indebtedness secured by such liens plus unsecured subsidiary indebtedness, other than indebtedness incurred by our subsidiaries under the February 2014 Credit Agreement, would exceed 20% of consolidated net worth, as defined in the agreement; and (c) with the exception of certain indebtedness as specified in

the agreement, subsidiary indebtedness may not exceed the difference between 20% of consolidated net worth, as defined in the agreement, and indebtedness secured by liens permitted under the agreement.

On May 29, 2013, we entered into agreements to initiate a commercial paper program on a private placement basis under which we may issue unsecured commercial paper notes (the “Commercial Paper Notes”) from time-to-time up to a maximum aggregate principal amount outstanding at any time of \$750.0 million. The proceeds from the issuance of the Commercial Paper Notes are expected to be used for general corporate purposes, including the repayment of other debt of the Company. Our February 2014 Credit Agreement is available to repay the Commercial Paper Notes, if necessary. Aggregate borrowings outstanding under the February 2014 Credit Agreement and the Commercial Paper Notes will not exceed the \$1.0 billion current maximum amount available under the February 2014 Credit Agreement. The Commercial Paper Notes will be sold at a discount from par, or alternatively, will be sold at par and bear interest at rates that will vary based upon market conditions at the time of issuance. The maturities of the Commercial Paper Notes will vary but may not exceed 397 days from the date of issue. The definitive documents relating to the commercial paper program contain customary representations, warranties, default and indemnification provisions. Using a portion of the proceeds from the sale of the Chemetall Surface Treatment business, we repaid approximately \$153 million of Commercial Paper Notes in December 2016. At December 31, 2016, we had \$247.5 million of Commercial Paper Notes outstanding bearing a weighted-average interest rate of approximately 1.46% and a weighted-average maturity of 37 days. The Commercial Paper Notes are classified as Current portion of long-term debt in our consolidated balance sheets at December 31, 2016 and December 31, 2015.

The non-current portion of our long-term debt amounted to \$2.12 billion at December 31, 2016, compared to \$3.14 billion at December 31, 2015. The decrease is attributable to the term loan repaid with the proceeds from the sale of the Chemetall Surface Treatment business in December 2016. In addition, at December 31, 2016, we had the ability to borrow \$752.5 million under our commercial paper program and the February 2014 Credit Agreement, and \$221.0 million under other existing lines of credit, subject to various financial covenants under our February 2014 Credit Agreement. We have the ability and intent to refinance our borrowings under our other existing credit lines with borrowings under the February 2014 Credit Agreement, as applicable. Therefore, the amounts outstanding under those credit lines, if any, are classified as long-term debt. We believe that as of December 31, 2016 we were, and currently are, in compliance with all of our debt covenants. For additional information about our long-term debt obligations, see Note 14, “Long-Term Debt,” to our consolidated financial statements included in Part II, Item 8 of this report.

Off-Balance Sheet Arrangements

In the normal course of business with customers, vendors and others, we have entered into off-balance sheet arrangements, including bank guarantees and letters of credit, which totaled approximately \$51.3 million at December 31, 2016. None of these off-balance sheet arrangements has, or is likely to have, a material effect on our current or future financial condition, results of operations, liquidity or capital resources.

Other Obligations

The following table summarizes our contractual obligations for capital projects, various take or pay and throughput agreements, long-term debt, operating leases and other commitments as of December 31, 2016 (in thousands):

	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>Thereafter</u>
Long-term debt obligations ^(a)	\$ 247,544	\$ —	\$ 250,000	\$ 388,939	\$ 727,440	\$ 775,000
Expected interest payments on long-term debt obligations ^(b)	53,821	53,950	53,891	50,526	43,217	475,464
Operating lease obligations (rental)	12,065	10,153	7,878	6,369	5,490	19,240
Take or pay / throughput agreements ^(c)	34,569	14,474	12,420	11,470	10,919	27,656
Letters of credit and guarantees	23,619	5,052	795	199	315	21,357
Capital projects	44,364	142	109	10	12	545
Total	<u>\$ 415,982</u>	<u>\$ 83,771</u>	<u>\$ 325,093</u>	<u>\$ 457,513</u>	<u>\$ 787,393</u>	<u>\$ 1,319,262</u>

(a) Amounts represent the expected principal payments of our long-term debt and do not include any fair value adjustments, premiums or discounts. In the first quarter of 2017, we have repaid approximately \$743.7 million of senior notes using a portion the proceeds from the sale of the Chemetall Surface Treatment business. This will reduce our long-term debt obligation in the above table by \$250.0 million in 2019, \$174.7 million in 2020 and \$319.0 million in 2021.

(b) Interest on our fixed rate borrowings was calculated based on the stated rates of such borrowings. A weighted average interest rate of approximately 1.60% was used for our remaining long-term debt obligations. In the first quarter of 2017, we have repaid approximately

\$743.7 million of senior notes using the proceeds from the sale of the Chemetall Surface Treatment business. As a result of the repayments, interest payments will be reduced by approximately \$21 million annually.

- (c) These amounts primarily relate to contracts entered into with certain third party vendors in the normal course of business to secure raw materials for our production processes. In order to secure materials, sometimes for long durations, these contracts mandate a minimum amount of product to be purchased at predetermined rates over a set timeframe.

Amounts in the table above exclude required employer pension contributions. Contributions to our domestic and foreign qualified and nonqualified pension plans, including our supplemental executive retirement plan (“SERP”), are expected to approximate \$10 million in 2017. We may choose to make additional pension contributions in excess of this amount. We made contributions of approximately \$12.2 million to our domestic and foreign pension plans for continuing operations (both qualified and nonqualified) during the year ended December 31, 2016.

The liability related to uncertain tax positions, including interest and penalties, recorded in Other noncurrent liabilities totaled \$27.9 million and \$101.7 million at December 31, 2016 and 2015, respectively. Related assets for corresponding offsetting benefits recorded in Other assets totaled \$15.1 million and \$50.9 million at December 31, 2016 and 2015, respectively. We cannot estimate the amounts of any cash payments during the next twelve months associated with these liabilities and are unable to estimate the timing of any such cash payments in the future at this time.

Liquidity Outlook

We anticipate that cash on hand and cash provided by operating activities, divestitures and borrowings will be sufficient to pay our operating expenses, satisfy debt service obligations, fund any capital expenditures and share repurchases, make acquisitions, make pension contributions and pay dividends for the foreseeable future. Our main focus over the next three years, in terms of uses of cash, will be investing in growth of the businesses and the return of value to shareholders. Additionally, we will continue to evaluate the merits of any opportunities that may arise for acquisitions of businesses or assets, which may require additional liquidity.

Our cash flows from operations may be negatively affected by adverse consequences to our customers and the markets in which we compete as a result of moderating global economic conditions and reduced capital availability.

While we maintain business relationships with a diverse group of financial institutions, an adverse change in their credit standing could lead them to not honor their contractual credit commitments, decline funding under existing but uncommitted lines of credit, not renew their extensions of credit or not provide new financing. While the global corporate bond and bank loan markets remain strong, periods of elevated uncertainty related to global economic and/or geopolitical concerns may limit efficient access to such markets for extended periods of time. If such concerns heighten, we may incur increased borrowing costs and reduced credit capacity as our various credit facilities mature. When the U.S. Federal Reserve or similar national reserve banks in other countries decide to tighten the monetary supply in response, for example, to improving economic conditions, we may incur increased borrowing costs as interest rates increase on our variable rate credit facilities, as our various credit facilities mature or as we refinance any maturing fixed rate debt obligations.

Overall, with generally strong cash-generative businesses and no significant long-term debt maturities before 2020, we believe we have and will maintain a solid liquidity position.

We had cash and cash equivalents totaling \$2.3 billion as of December 31, 2016, of which \$846.4 million is held by our foreign subsidiaries. This cash represents an important source of our liquidity and is invested in short-term investments including time deposits and readily marketable securities with relatively short maturities. The cash held by our foreign subsidiaries is intended for use outside of the U.S. We anticipate that any needs for liquidity within the U.S. in excess of our cash held in the U.S. can be readily satisfied with borrowings under our existing U.S. credit facilities or our commercial paper program.

Safety and Environmental Matters

We are subject to federal, state, local and foreign requirements regulating the handling, manufacture and use of materials (some of which may be classified as hazardous or toxic by one or more regulatory agencies), the discharge of materials into the environment and the protection of the environment. To our knowledge, we are currently complying and expect to continue to comply in all material respects with applicable environmental laws, regulations, statutes and ordinances. Compliance with existing federal, state, local and foreign environmental protection laws is not expected to have a material effect on capital expenditures, earnings or our competitive position, but the costs associated with increased legal or regulatory requirements could have an adverse effect on our results.

Among other environmental requirements, we are subject to the federal Superfund law, and similar state laws, under which we may be designated as a PRP, and may be liable for a share of the costs associated with cleaning up various hazardous waste sites. Management believes that in cases in which we may have liability as a PRP, our liability for our share of cleanup is de minimis. Further, almost all such sites represent environmental issues that are quite mature and have been investigated, studied and in many cases settled. In de minimis situations, our policy generally is to negotiate a consent decree and to pay any apportioned settlement, enabling us to be effectively relieved of any further liability as a PRP, except for remote contingencies. In other than de minimis PRP matters, our records indicate that unresolved PRP exposures should be immaterial. We accrue and expense our proportionate share of PRP costs. Because management has been actively involved in evaluating environmental matters, we are able to conclude that the outstanding environmental liabilities for unresolved PRP sites should not have a material adverse effect upon our results of operations or financial condition.

Our environmental and safety operating costs charged to expense were \$34.4 million, \$39.5 million and \$35.7 million in 2016, 2015 and 2014, respectively, excluding depreciation of previous capital expenditures, and are expected to be in the same range in the next few years. Costs for remediation have been accrued and payments related to sites are charged against accrued liabilities, which at December 31, 2016 totaled approximately \$34.9 million, an increase of \$3.5 million from \$31.4 million at December 31, 2015. See Note 17, "Commitments and Contingencies" to our consolidated financial statements included in Part II, Item 8 of this report for a reconciliation of our environmental liabilities for the years ended December 31, 2016, 2015 and 2014.

We believe that any sum we may be required to pay in connection with environmental remediation and asset retirement obligation matters in excess of the amounts recorded should occur over a period of time and should not have a material adverse effect upon our results of operations, financial condition or cash flows on a consolidated annual basis, although any such sum could have a material adverse impact on our results of operations, financial condition or cash flows in a particular quarterly reporting period.

Capital expenditures for pollution-abatement and safety projects, including such costs that are included in other projects, were approximately \$28.8 million, \$18.6 million and \$15.2 million in 2016, 2015 and 2014, respectively. In the future, capital expenditures for these types of projects may increase due to more stringent environmental regulatory requirements and our efforts in reaching sustainability goals. Management's estimates of the effects of compliance with governmental pollution-abatement and safety regulations are subject to (a) the possibility of changes in the applicable statutes and regulations or in judicial or administrative construction of such statutes and regulations and (b) uncertainty as to whether anticipated solutions to pollution problems will be successful, or whether additional expenditures may prove necessary.

Recently Issued Accounting Pronouncements

See Note 1, "Summary of Significant Accounting Policies" to our consolidated financial statements included in Part II, Item 8 of this report for a discussion of our Recently Issued Accounting Pronouncements.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk.

The primary currencies to which we have foreign currency exchange rate exposure are the Euro, Japanese Yen, Chinese Renminbi, South Korean Won, Australian Dollar and Chilean Peso. In response to greater fluctuations in foreign currency exchange rates in recent periods, we have increased the degree of exposure risk management activities to minimize the potential impact on earnings.

We manage our foreign currency exposures by balancing certain assets and liabilities denominated in foreign currencies and through the use, from time to time, of foreign currency forward contracts. The principal objective of such contracts is to minimize the financial impact of changes in foreign currency exchange rates. The counterparties to these contractual agreements are major financial institutions with which we generally have other financial relationships. We are exposed to credit loss in the event of nonperformance by these counterparties. However, we do not anticipate nonperformance by the counterparties. We do not utilize financial instruments for trading or other speculative purposes.

The primary method we use to reduce foreign currency exposure is to identify natural hedges, in which the operating activities denominated in respective currencies across various subsidiaries balance in respect to timing and the underlying exposures. In the event a natural hedge is not available, we may employ a forward contract to reduce exposure, generally expiring within one year. While these contracts are subject to fluctuations in value, such fluctuations are intended to offset the changes in the value of the underlying exposures being hedged. Unless otherwise noted, gains and losses on foreign currency forward contracts are recognized currently in income, and generally do not have a significant impact on results of operations.

At December 31, 2016, our financial instruments subject to foreign currency exchange risk consisted of foreign currency forward contracts with an aggregate notional value of \$251.6 million and with a fair value representing a net liability position of \$0.2 million. Fluctuations in the value of these contracts are intended to offset the changes in the value of the underlying exposures being hedged. We conducted a sensitivity analysis on the fair value of our foreign currency hedge portfolio assuming an instantaneous 10% change in select foreign currency exchange rates from their levels as of December 31, 2016, with all other variables held constant. A 10% appreciation of the U.S. Dollar against foreign currencies that we hedge would result in a decrease of approximately \$7.9 million in the fair value of our foreign currency forward contracts. A 10% depreciation of the U.S. Dollar against these foreign currencies would result in an increase of approximately \$6.0 million in the fair value of our foreign currency forward contracts. The sensitivity of the fair value of our foreign currency hedge portfolio represents changes in fair values estimated based on market conditions as of December 31, 2016, without reflecting the effects of underlying anticipated transactions. When those anticipated transactions are realized, actual effects of changing foreign currency exchange rates could have a material impact on our earnings and cash flows in future periods.

On December 18, 2014, the carrying value of our 1.875% Euro-denominated senior notes was designated as an effective hedge of our net investment in foreign subsidiaries where the Euro serves as the functional currency, and beginning on the date of designation, gains or losses on the revaluation of these senior notes to our reporting currency have been and will be recorded in accumulated other comprehensive income (loss). In January 2017, we repaid €307.0 million of these senior notes using proceeds from the sale of the Chemetall Surface Treatment business. This repayment did not impair the designated hedge of our net investment in foreign subsidiaries where the Euro serves as the functional currency.

We are exposed to changes in interest rates that could impact our results of operations and financial condition. We manage global interest rate and foreign exchange exposure as part of our regular operational and financing strategies. We had variable interest rate borrowings of \$286.4 million and \$1.7 billion outstanding at December 31, 2016 and 2015, respectively. These borrowings represented 11% and 44% of total outstanding debt and bore average interest rates of 1.35% and 1.51% at December 31, 2016 and 2015, respectively. A hypothetical 10% increase (approximately 13 basis points) in the average interest rate applicable to these borrowings would change our annualized interest expense by approximately \$0.4 million as of December 31, 2016. We may enter into interest rate swaps, collars or similar instruments with the objective of reducing interest rate volatility relating to our borrowing costs.

Our raw materials are subject to price volatility caused by weather, supply conditions, political and economic variables and other unpredictable factors. Historically, we have not used futures, options or swap contracts to manage the volatility related to the above exposures. However, the refinery catalysts business has used financing arrangements to provide long-term protection against changes in metals prices. We seek to limit our exposure by entering into long-term contracts when available, and we seek price increase limitations through contracts. These contracts do not have a significant impact on our results of operations.

Item 8. Financial Statements and Supplementary Data.**MANAGEMENT’S REPORT ON INTERNAL CONTROL OVER FINANCIAL REPORTING**

Our management is responsible for establishing and maintaining adequate internal control over financial reporting as defined in Exchange Act Rule 13a-15(f) and 15d-15(f). Our internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with accounting principles generally accepted in the United States. Our internal control over financial reporting includes those policies and procedures that (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of assets; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with accounting principles generally accepted in the United States, and that receipts and expenditures of the Company are being made only in accordance with management’s and our directors’ authorizations; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of our assets that could have a material effect on the financial statements.

Under the supervision and with the participation of our management, including our principal executive officer and principal financial officer, we conducted an evaluation of the effectiveness of our internal control over financial reporting as of December 31, 2016. In making this assessment, management used the criteria for effective internal control over financial reporting described in the *Internal Control—Integrated Framework 2013* set forth by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). Based on the assessment, management concluded that, as of December 31, 2016, our internal control over financial reporting was effective to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles in the United States. The concept of reasonable assurance is based on the recognition that there are inherent limitations in all systems of internal control. Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Our management's assessment of internal control over financial reporting as of December 31, 2016 excludes the Jiangxi Jiangli New Materials Science and Technology Co. Ltd. lithium business (or “Jiangxi Jiangli Lithium”) because it was acquired by the Company in a purchase business combination during 2016. Jiangxi Jiangli Lithium is a wholly-owned subsidiary whose total assets and total revenues represent 2% and 0%, respectively, of the related consolidated financial statement amounts as of and for the year ended December 31, 2016.

The effectiveness of our internal control over financial reporting as of December 31, 2016 has been audited by PricewaterhouseCoopers LLP, an independent registered public accounting firm, as stated in their report which is included herein.

/s/ LUTHER C. KISSAM IV

Luther C. Kissam IV
Chairman, President and Chief Executive Officer
(principal executive officer)
February 27, 2017

Report of Independent Registered Public Accounting Firm

To the Board of Directors and Shareholders of Albemarle Corporation:

In our opinion, the accompanying consolidated financial statements listed in the index appearing under Item 15(a) (1) present fairly, in all material respects, the financial position of Albemarle Corporation and its subsidiaries (or the “Company”) at December 31, 2016 and December 31, 2015, and the results of their operations and their cash flows for each of the three years in the period ended December 31, 2016 in conformity with accounting principles generally accepted in the United States of America. Also in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2016, based on criteria established in *Internal Control—Integrated Framework 2013* issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). The Company’s management is responsible for these financial statements, for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management’s Report on Internal Control over Financial Reporting. Our responsibility is to express opinions on these financial statements and on the Company’s internal control over financial reporting based on our integrated audits. We conducted our audits in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the financial statements are free of material misstatement and whether effective internal control over financial reporting was maintained in all material respects. Our audits of the financial statements included examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements, assessing the accounting principles used and significant estimates made by management, and evaluating the overall financial statement presentation. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

A company’s internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company’s internal control over financial reporting includes those policies and procedures that (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company’s assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

As described in Management’s Report on Internal Control over Financial Reporting, management has excluded the Jiangxi Jiangli New Materials Science and Technology Co. Ltd. lithium business (or “Jiangxi Jiangli Lithium”) from its assessment of internal control over financial reporting as of December 31, 2016 because it was acquired by the Company in a purchase business combination during 2016. We have also excluded Jiangxi Jiangli Lithium from our audit of internal control over financial reporting. Jiangxi Jiangli Lithium is a wholly-owned subsidiary whose total assets and total revenues represent 2% and 0%, respectively, of the related consolidated financial statement amounts as of and for the year ended December 31, 2016.

/s/ PricewaterhouseCoopers LLP
New Orleans, Louisiana
February 27, 2017

CONSOLIDATED STATEMENTS OF INCOME

(In Thousands, Except Per Share Amounts)

Year Ended December 31	2016	2015	2014
Net sales	\$ 2,677,203	\$ 2,826,429	\$ 2,445,548
Cost of goods sold	1,706,627	1,966,196	1,674,700
Gross profit	970,576	860,233	770,848
Selling, general and administrative expenses	380,464	300,440	355,135
Research and development expenses	80,475	89,187	88,310
Restructuring and other, net	—	(6,804)	25,947
Gain on sales of businesses, net	(122,298)	—	—
Acquisition and integration related costs	57,384	132,299	30,158
Operating profit	574,551	345,111	271,298
Interest and financing expenses	(65,181)	(81,650)	(41,358)
Other income (expenses), net	5,894	47,283	(16,761)
Income from continuing operations before income taxes and equity in net income of unconsolidated investments	515,264	310,744	213,179
Income tax expense	96,263	11,134	18,484
Income from continuing operations before equity in net income of unconsolidated investments	419,001	299,610	194,695
Equity in net income of unconsolidated investments (net of tax)	59,637	27,978	35,742
Net income from continuing operations	478,638	327,588	230,437
Income (loss) from discontinued operations (net of tax)	202,131	32,476	(69,531)
Net income	680,769	360,064	160,906
Net income attributable to noncontrolling interests	(37,094)	(25,158)	(27,590)
Net income attributable to Albemarle Corporation	\$ 643,675	\$ 334,906	\$ 133,316
Basic earnings (loss) per share:			
Continuing operations	\$ 3.93	\$ 2.72	\$ 2.57
Discontinued operations	1.80	0.29	(0.88)
	\$ 5.73	\$ 3.01	\$ 1.69
Diluted earnings (loss) per share:			
Continuing operations	\$ 3.90	\$ 2.71	\$ 2.57
Discontinued operations	1.78	0.29	(0.88)
	\$ 5.68	\$ 3.00	\$ 1.69
Weighted-average common shares outstanding—basic	112,379	111,182	78,696
Weighted-average common shares outstanding—diluted	113,239	111,556	79,102
Cash dividends declared per share of common stock	\$ 1.22	\$ 1.16	\$ 1.10

See accompanying notes to the consolidated financial statements.

CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME (LOSS)

*(In Thousands)***Year Ended December 31**

	<u>2016</u>	<u>2015</u>	<u>2014</u>
Net income	\$ 680,769	\$ 360,064	\$ 160,906
Other comprehensive income (loss), net of tax:			
Foreign currency translation	(20,825)	(412,970)	(168,673)
Pension and postretirement benefits	834	(758)	(487)
Net investment hedge	26,133	50,861	11,384
Interest rate swap	2,116	2,101	(20,962)
Total other comprehensive income (loss), net of tax	<u>8,258</u>	<u>(360,766)</u>	<u>(178,738)</u>
Comprehensive income (loss)	<u>689,027</u>	<u>(702)</u>	<u>(17,832)</u>
Comprehensive income attributable to noncontrolling interests	(36,477)	(23,267)	(27,510)
Comprehensive income (loss) attributable to Albemarle Corporation	<u>\$ 652,550</u>	<u>\$ (23,969)</u>	<u>\$ (45,342)</u>

See accompanying notes to the consolidated financial statements.

CONSOLIDATED BALANCE SHEETS

(In Thousands)

December 31	2016	2015
Assets		
Current assets:		
Cash and cash equivalents	\$ 2,269,756	\$ 213,734
Trade accounts receivable, less allowance for doubtful accounts (2016—\$15,312; 2015—\$3,390)	486,035	397,912
Other accounts receivable	41,985	74,989
Inventories	450,263	439,513
Other current assets	58,579	62,922
Assets held for sale	—	641,932
Total current assets	3,306,618	1,831,002
Property, plant and equipment, at cost	3,910,522	3,700,472
Less accumulated depreciation and amortization	1,550,382	1,379,377
Net property, plant and equipment	2,360,140	2,321,095
Investments	457,533	435,584
Noncurrent assets held for sale	—	2,971,455
Other assets	142,320	194,398
Goodwill	1,540,032	1,460,552
Other intangibles, net of amortization	354,564	383,868
Total assets	\$ 8,161,207	\$ 9,597,954
Liabilities and Equity		
Current liabilities:		
Accounts payable	\$ 281,874	\$ 239,572
Accrued expenses	322,165	313,259
Current portion of long-term debt	247,544	674,994
Dividends payable	34,104	32,306
Liabilities held for sale	—	329,598
Income taxes payable	254,416	26,956
Total current liabilities	1,140,103	1,616,685
Long-term debt	2,121,718	3,142,163
Postretirement benefits	50,538	49,647
Pension benefits	298,695	299,983
Noncurrent liabilities held for sale	—	464,207
Other noncurrent liabilities	194,810	239,104
Deferred income taxes	412,739	384,852
Commitments and contingencies (Note 17)		
Equity:		
Albemarle Corporation shareholders' equity:		
Common stock, \$.01 par value (authorized 150,000 shares), issued and outstanding — 112,524 in 2016 and 112,219 in 2015	1,125	1,122
Additional paid-in capital	2,084,418	2,059,151
Accumulated other comprehensive loss	(412,412)	(421,288)
Retained earnings	2,121,931	1,615,407
Total Albemarle Corporation shareholders' equity	3,795,062	3,254,392
Noncontrolling interests	147,542	146,921
Total equity	3,942,604	3,401,313
Total liabilities and equity	\$ 8,161,207	\$ 9,597,954

See accompanying notes to the consolidated financial statements.

CONSOLIDATED STATEMENTS OF CHANGES IN EQUITY

(In Thousands, Except Share Data)

	Common Stock		Additional Paid-in Capital	Accumulated Other Comprehensive Income (Loss)	Retained Earnings	Total Albemarle Shareholders' Equity	Non- controlling Interests	Total Equity
	Shares	Amounts						
Balance at January 1, 2014	80,052,842	\$ 801	\$ 9,957	\$ 116,245	\$ 1,500,358	\$ 1,627,361	\$ 115,415	\$ 1,742,776
Net income					133,316	133,316	27,590	160,906
Other comprehensive loss				(178,658)		(178,658)	(80)	(178,738)
Cash dividends declared					(86,364)	(86,364)	(15,535)	(101,899)
Noncontrolling interests' share of contributed capital in subsidiary						—	1,780	1,780
Stock-based compensation and other			13,556			13,556		13,556
Exercise of stock options	77,546	1	2,712			2,713		2,713
Shares repurchased	(2,190,254)	(22)	(13,319)		(136,659)	(150,000)		(150,000)
Tax benefit related to stock plans			826			826		826
Issuance of common stock, net	141,937	1	(1)			—		—
Shares withheld for withholding taxes associated with common stock issuances	(51,547)	(1)	(3,284)			(3,285)		(3,285)
Balance at December 31, 2014	78,030,524	\$ 780	\$ 10,447	\$ (62,413)	\$ 1,410,651	\$ 1,359,465	\$ 129,170	\$ 1,488,635
Balance at January 1, 2015	78,030,524	\$ 780	\$ 10,447	\$ (62,413)	\$ 1,410,651	\$ 1,359,465	\$ 129,170	\$ 1,488,635
Net income					334,906	334,906	25,158	360,064
Other comprehensive loss				(358,875)		(358,875)	(1,891)	(360,766)
Cash dividends declared					(130,150)	(130,150)	(23,286)	(153,436)
Stock-based compensation and other			13,696			13,696		13,696
Exercise of stock options	18,000	—	517			517		517
Tax deficiency related to stock plans			(167)			(167)		(167)
Issuance of common stock, net	85,900	1	(1)			—		—
Acquisition of Rockwood	34,113,064	341	2,036,209			2,036,550	17,582	2,054,132
Noncontrolling interest assumed in acquisition of Shanghai Chemetall							4,843	4,843
Purchase of noncontrolling interest							(4,655)	(4,655)
Shares withheld for withholding taxes associated with common stock issuances	(28,137)	—	(1,550)			(1,550)		(1,550)
Balance at December 31, 2015	112,219,351	\$ 1,122	\$ 2,059,151	\$ (421,288)	\$ 1,615,407	\$ 3,254,392	\$ 146,921	\$ 3,401,313
Balance at January 1, 2016	112,219,351	\$ 1,122	\$ 2,059,151	\$ (421,288)	\$ 1,615,407	\$ 3,254,392	\$ 146,921	\$ 3,401,313
Net income					643,675	643,675	37,094	680,769
Other comprehensive income (loss)				8,876		8,876	(618)	8,258
Cash dividends declared					(137,151)	(137,151)	(35,855)	(173,006)
Stock-based compensation and other			16,251			16,251		16,251
Exercise of stock options	212,343	2	9,400			9,402		9,402
Tax benefit related to stock plans			1,811			1,811		1,811
Issuance of common stock, net	131,596	1	(1)			—		—
Shares withheld for withholding taxes associated with common stock issuances	(39,500)	—	(2,194)			(2,194)		(2,194)
Balance at December 31, 2016	112,523,790	\$ 1,125	\$ 2,084,418	\$ (412,412)	\$ 2,121,931	\$ 3,795,062	\$ 147,542	\$ 3,942,604

See accompanying notes to the consolidated financial statements.

CONSOLIDATED STATEMENTS OF CASH FLOWS

(In Thousands)

Year Ended December 31

	<u>2016</u>	<u>2015</u>	<u>2014</u>
Cash and cash equivalents at beginning of year	\$ 213,734	\$ 2,489,768	\$ 477,239
Cash flows from operating activities:			
Net income	680,769	360,064	160,906
Adjustments to reconcile net income to cash flows from operating activities:			
Depreciation and amortization	226,169	260,076	103,572
(Gain) loss associated with restructuring and other	—	(6,804)	6,333
(Gain) loss on sales of businesses, net	(510,278)	—	85,515
Stock-based compensation	17,031	15,188	14,267
Excess tax benefits realized from stock-based compensation arrangements	(2,121)	(121)	(826)
Equity in net income of unconsolidated investments (net of tax)	(61,534)	(30,999)	(35,742)
Dividends received from unconsolidated investments and nonmarketable securities	43,759	59,912	40,688
Pension and postretirement expense (benefit)	41,546	(38,817)	133,681
Pension and postretirement contributions	(20,068)	(21,613)	(13,916)
Unrealized gain on investments in marketable securities	(3,655)	(1,239)	(825)
Deferred income taxes	21,121	(136,298)	(64,947)
Changes in current assets and liabilities, net of effects of acquisitions and divestitures:			
(Increase) decrease in accounts receivable	(42,816)	(8,788)	36,221
Decrease (increase) in inventories	25,974	27,649	(6,486)
Decrease in other current assets excluding deferred income taxes	1,808	12,756	5,809
Increase in accounts payable	43,953	23,745	28,296
Increase (decrease) in accrued expenses and income taxes payable	210,276	(96,896)	(6,680)
Other, net	61,469	(57,126)	6,743
Net cash provided by operating activities	<u>733,403</u>	<u>360,689</u>	<u>492,609</u>
Cash flows from investing activities:			
Acquisition of Rockwood, net of cash acquired	—	(2,051,645)	—
Other acquisitions, net of cash acquired	(126,747)	(48,845)	—
Cash payments related to acquisitions and other	(81,987)	—	—
Capital expenditures	(196,654)	(227,649)	(110,576)
Decrease in restricted cash	—	57,550	—
Cash proceeds from divestitures, net	3,325,571	8,883	104,718
Return of capital from unconsolidated investment	—	98,000	—
Payment for settlement of interest rate swap	—	—	(33,425)
Sales of marketable securities, net	305	998	649
Repayments from (long-term advances to) joint ventures	—	2,156	(7,499)
Net cash provided by (used in) investing activities	<u>2,920,488</u>	<u>(2,160,552)</u>	<u>(46,133)</u>
Cash flows from financing activities:			
Proceeds from issuance of senior notes	—	—	1,888,197
Proceeds from borrowings of other long-term debt	—	2,250,000	—
Repayments of long-term debt	(1,252,302)	(2,626,241)	(6,017)
Other (repayments) borrowings, net	(163,721)	54,625	(5,825)
Dividends paid to shareholders	(135,353)	(119,302)	(84,102)
Dividends paid to noncontrolling interests	(35,855)	(23,286)	(15,535)
Purchase of noncontrolling interest	—	(4,784)	—
Repurchases of common stock	—	—	(150,000)
Proceeds from exercise of stock options	9,401	517	2,713
Excess tax benefits realized from stock-based compensation arrangements	2,121	121	826
Withholding taxes paid on stock-based compensation award distributions	(2,194)	(1,549)	(3,284)
Debt financing costs	—	(4,544)	(17,644)
Other	—	(3,882)	—
Net cash (used in) provided by financing activities	<u>(1,577,903)</u>	<u>(478,325)</u>	<u>1,609,329</u>
Net effect of foreign exchange on cash and cash equivalents	<u>(19,966)</u>	<u>2,154</u>	<u>(43,276)</u>
Increase (decrease) in cash and cash equivalents	<u>2,056,022</u>	<u>(2,276,034)</u>	<u>2,012,529</u>
Cash and cash equivalents at end of year	<u>\$ 2,269,756</u>	<u>\$ 213,734</u>	<u>\$ 2,489,768</u>

See accompanying notes to the consolidated financial statements.

NOTE 1—Summary of Significant Accounting Policies:

Basis of Consolidation

The consolidated financial statements include the accounts and operations of Albemarle Corporation and our wholly owned, majority owned and controlled subsidiaries. Unless the context otherwise indicates, the terms “Albemarle,” “we,” “us,” “our” or “the Company” mean Albemarle Corporation and its consolidated subsidiaries. For entities that we control and are the primary beneficiary, but own less than 100%, we record the minority ownership as noncontrolling interest. We apply the equity method of accounting for investments in which we have an ownership interest from 20% to 50% or where we exercise significant influence over the related investee’s operations. All significant intercompany accounts and transactions are eliminated in consolidation.

As described further in Note 2, “Acquisitions,” we completed our acquisition of Rockwood Holdings, Inc. (“Rockwood”) on January 12, 2015. The consolidated financial statements contained herein include the results of operations of Rockwood, commencing on January 13, 2015.

Organizational Realignment

Effective January 1, 2016, we realigned our organizational structure to split our former Performance Chemicals reportable segment into two reportable segments: (1) Lithium and Advanced Materials and (2) Bromine Specialties. As a result, our three reportable segments include: Lithium and Advanced Materials, Bromine Specialties and Refining Solutions. Throughout this document, including these consolidated financial statements and related footnotes, current and prior year financial information is presented in accordance with this structure.

Discontinued Operations

Effective January 1, 2015, a component or group of components that is classified as held for sale or that has been disposed of by sale, and which represents a strategic shift that has or will have a major effect on our operations and financial results, is reported as discontinued operations beginning in the period when these criteria are met. Our assets and liabilities held for sale at December 31, 2015 did not meet the criteria to be presented as discontinued operations.

On December 14, 2016, the Company closed the sale of the Chemetall Surface Treatment business to BASF SE. In accordance with the applicable accounting guidance, the Company began accounting for this business as discontinued operations in the consolidated statements of income and excluded the business from segment results for all periods presented. Related assets and liabilities are classified as held for sale as of December 31, 2015 in accordance with accounting standards for reporting discontinued operations. See Note 3, “Divestitures,” for additional information.

On September 1, 2014, the Company closed the sale of its antioxidant, ibuprofen and propofol businesses and assets to SI Group, Inc. In accordance with the accounting guidance for discontinued operations in effect prior to January 1, 2015, the financial results of this disposed group were presented as discontinued operations in the consolidated statements of income and excluded from segment results for 2014. See Note 3, “Divestitures,” for additional information.

Estimates, Assumptions and Reclassifications

The preparation of financial statements in conformity with generally accepted accounting principles (“GAAP”) in the United States (“U.S.”) requires management to make estimates and assumptions that affect the reported amounts of revenues, expenses, assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements. Actual results could differ from those estimates.

Certain amounts in the accompanying consolidated financial statements and notes thereto have been reclassified to conform to the current presentation.

Revenue Recognition

We recognize sales when the revenue is realized or realizable, and has been earned, in accordance with authoritative accounting guidance. We recognize net sales as risk and title to the product transfer to the customer, which usually occurs at the time shipment is made. Significant portions of our sales are sold free on board shipping point or on an equivalent basis, and other transactions are based upon specific contractual arrangements. Our standard terms of delivery are generally included in our contracts of sale, order confirmation documents and invoices. We recognize revenue from services when performance of the services has been completed. Where the Company incurs pre-production design and development costs under long-term supply contracts, these costs are expensed where they relate to the products sold unless contractual guarantees for reimbursement exist.

Conversely, these costs are capitalized if they pertain to equipment that we will own and use in producing the products to be supplied and expect to utilize for future revenue generating activities.

Performance and Life Cycle Guarantees

We provide customers certain performance guarantees and life cycle guarantees primarily in Refining Solutions. These guarantees entitle the customer to claim compensation if the product does not conform to performance standards originally agreed upon. Performance guarantees relate to minimum technical specifications that products produced with the delivered product must meet, such as yield and product quality. Life cycle guarantees relate to minimum periods for which performance of the delivered product is guaranteed. When either performance guarantees or life cycle guarantees are contractually agreed upon, an assessment of the appropriate revenue recognition treatment is evaluated. When testing or modeling of historical results predict that the performance or life cycle criteria will be satisfied, revenue is recognized in accordance with shipping terms at the time of delivery. When testing or modeling of historical results predict that the performance or life cycle criteria may not be satisfied, we bill the customer upon shipment and defer the related revenue and cost associated with these products. These deferrals are released to earnings when the contractual period expires, and are generally not significant.

Shipping and Handling Costs

Amounts billed to customers in a sales transaction related to shipping and handling have been classified as net sales and the cost incurred by us for shipping and handling has been classified as cost of goods sold in the accompanying consolidated statements of income. In addition, taxes billed to customers in a sales transaction are presented in the consolidated statements of income on a net basis.

Cash and Cash Equivalents

Cash and cash equivalents include cash and highly liquid investments with insignificant interest rate risks and original maturities of three months or less.

Inventories

Inventories are stated at lower of cost or market with cost determined primarily on the first-in, first-out basis. Cost is determined on the weighted-average basis for a small portion of our inventories at foreign plants and our stores, supplies and other inventory. A portion of our domestic produced finished goods and raw materials are determined on the last-in, first-out basis.

Property, Plant and Equipment

Property, plant and equipment include costs of assets constructed, purchased or leased under a capital lease, related delivery and installation costs and interest incurred on significant capital projects during their construction periods. Expenditures for renewals and betterments also are capitalized, but expenditures for normal repairs and maintenance are expensed as incurred. Costs associated with yearly planned major maintenance are generally deferred and amortized over 12 months or until the same major maintenance activities must be repeated, whichever is shorter. The cost and accumulated depreciation applicable to assets retired or sold are removed from the respective accounts, and gains or losses thereon are included in income.

We assign the useful lives of our property, plant and equipment based upon our internal engineering estimates which are reviewed periodically. The estimated useful lives of our property, plant and equipment range from two to sixty years and depreciation is recorded on the straight-line method, with the exception of our long-term mineral rights, which are depleted on a units-of-production method.

We evaluate the recovery of our property, plant and equipment by comparing the net carrying value of the asset group to the undiscounted net cash flows expected to be generated from the use and eventual disposition of that asset group when events or changes in circumstances indicate that its carrying amount may not be recoverable. If the carrying amount of the asset group is not recoverable, the fair value of the asset group is measured and if the carrying amount exceeds the fair value, an impairment loss is recognized.

Investments

Investments are accounted for using the equity method of accounting if the investment gives us the ability to exercise significant influence, but not control, over the investee. Significant influence is generally deemed to exist if we have an ownership interest in the voting stock of the investee between 20% and 50%, although other factors, such as representation on

the investee's board of directors and the impact of commercial arrangements, are considered in determining whether the equity method of accounting is appropriate. Under the equity method of accounting, we record our investments in equity-method investees in the consolidated balance sheets as Investments and our share of investees' earnings or losses together with other-than-temporary impairments in value as Equity in net income of unconsolidated investments in the consolidated statements of income. We evaluate our equity method investments for impairment whenever events or changes in circumstances indicate that the carrying amounts of such investments may be impaired. If a decline in the value of an equity method investment is determined to be other than temporary, a loss is recorded in earnings in the current period.

Our Saudi Organometallic Chemicals Company ("SOCC") joint venture in Saudi Arabia, included in our Lithium and Advanced Materials segment, is emerging from the start-up phase and experienced a small net loss as of December 31, 2016, indicating the carrying value potentially may be impaired. As a result, we assessed the recoverability of the investment and related balances in this venture as of December 31, 2016. As of December 31, 2016, the carrying amount of our equity interest in SOCC was \$7.5 million and we had loans receivable from this venture that totaled \$30.0 million. Based on our assessment, we expect to recover the carrying amount of our equity investment and related balances, and concluded that no other-than-temporary impairment exists as of December 31, 2016. In order to fully recover our investment and related balances, we and our venture partner are actively developing strategies to reduce costs and increase volumes at the venture, which would improve the financial performance of the investment.

Certain mutual fund investments are accounted for as trading equities and are marked-to-market on a periodic basis through the consolidated statements of income. Investments in joint ventures and nonmarketable securities of immaterial entities are estimated based upon the overall performance of the entity where financial results are not available on a timely basis.

Environmental Compliance and Remediation

Environmental compliance costs include the cost of purchasing and/or constructing assets to prevent, limit and/or control pollution or to monitor the environmental status at various locations. These costs are capitalized and depreciated based on estimated useful lives. Environmental compliance costs also include maintenance and operating costs with respect to pollution prevention and control facilities and other administrative costs. Such operating costs are expensed as incurred. Environmental remediation costs of facilities used in current operations are generally immaterial and are expensed as incurred. We accrue for environmental remediation costs and post-remediation costs that relate to existing conditions caused by past operations at facilities or off-plant disposal sites in the accounting period in which responsibility is established and when the related costs are estimable. In developing these cost estimates, we evaluate currently available facts regarding each site, with consideration given to existing technology, presently enacted laws and regulations, prior experience in remediation of contaminated sites, the financial capability of other potentially responsible parties and other factors, subject to uncertainties inherent in the estimation process. If the amount and timing of the cash payments for a site are fixed or reliably determinable, the liability is discounted. Additionally, these estimates are reviewed periodically, with adjustments to the accruals recorded as necessary.

Research and Development Expenses

Our research and development expenses related to present and future products are expensed as incurred. These expenses consist primarily of personnel-related costs and other overheads, as well as outside service and consulting costs incurred for specific programs. Our U.S. facilities in Michigan, Pennsylvania, Texas and Louisiana and our global facilities in the Netherlands, Germany, Belgium and Korea form the capability base for our contract research and custom manufacturing businesses. These business areas provide research and scale-up services primarily to innovative life science companies.

Goodwill and Other Intangible Assets

We account for goodwill and other intangibles acquired in a business combination in conformity with current accounting guidance that requires that goodwill and indefinite-lived intangible assets not be amortized.

We test goodwill for impairment by comparing the estimated fair value of our reporting units to the related carrying value. We estimate the fair value based on present value techniques involving future cash flows. Future cash flows include assumptions about sales volumes, selling prices, raw material prices, labor and other employee benefit costs, capital additions, income taxes, working capital, and other economic or market-related factors. Significant management judgment is involved in estimating these variables and they include inherent uncertainties since they are forecasting future events. We perform a sensitivity analysis by using a range of inputs to confirm the reasonableness of these estimates being used in the goodwill impairment analysis. We use a Weighted Average Cost of Capital ("WACC") approach to determine our discount rate for goodwill recoverability testing. Our WACC calculation incorporates industry-weighted average returns on debt and equity from a market perspective. The factors in this calculation are largely external to the Company and, therefore, are beyond our control.

We test our recorded goodwill for impairment in the fourth quarter of each year or upon the occurrence of events or changes in circumstances that would more likely than not reduce the fair value of our reporting units below their carrying amounts. The Company performed its annual goodwill impairment test as of October 31, 2016 and concluded there was no impairment as of that date. In addition, no indications of impairment in any of our reporting units were indicated by the sensitivity analysis.

We assess our indefinite-lived intangible assets, which include trade names, for impairment annually and between annual tests if events or changes in circumstances indicate that it is more likely than not that the asset is impaired. The indefinite-lived intangible asset impairment standard allows us to first assess qualitative factors to determine if a quantitative impairment test is necessary. Further testing is only required if we determine, based on the qualitative assessment, that it is more likely than not that the indefinite-lived intangible asset's fair value is less than its carrying amount. If we determine based on the qualitative assessment that it is more likely than not that the asset is impaired, an impairment test is performed by comparing the fair value of the indefinite-lived intangible asset to its carrying amount.

Definite-lived intangible assets, such as purchased technology, patents, customer lists and trade names, are amortized over their estimated useful lives generally for periods ranging from five to twenty-five years. Except for customer lists and relationships associated with our Lithium business, which are amortized using the pattern of economic benefit method, definite-lived intangible assets are amortized using the straight-line method. We evaluate the recovery of our definite-lived intangible assets by comparing the net carrying value of the asset group to the undiscounted net cash flows expected to be generated from the use and eventual disposition of that asset group when events or changes in circumstances indicate that its carrying amount may not be recoverable. If the carrying amount of the asset group is not recoverable, the fair value of the asset group is measured and if the carrying amount exceeds the fair value, an impairment loss is recognized. See Note 12, "Goodwill and Other Intangibles."

Pension Plans and Other Postretirement Benefits

Under authoritative accounting standards, assumptions are made regarding the valuation of benefit obligations and the performance of plan assets. As required, we recognize a balance sheet asset or liability for each of our pension and other postretirement benefit ("OPEB") plans equal to the plan's funded status as of the measurement date. The primary assumptions are as follows:

- **Discount Rate**—The discount rate is used in calculating the present value of benefits, which is based on projections of benefit payments to be made in the future.
- **Expected Return on Plan Assets**—We project the future return on plan assets based on prior performance and future expectations for the types of investments held by the plans, as well as the expected long-term allocation of plan assets for these investments. These projected returns reduce the net benefit costs recorded currently.
- **Rate of Compensation Increase**—For salary-related plans, we project employees' annual pay increases, which are used to project employees' pension benefits at retirement.
- **Mortality Assumptions**—Assumptions about life expectancy of plan participants are used in the measurement of related plan obligations.

Actuarial gains and losses are recognized annually in our consolidated statements of income in the fourth quarter and whenever a plan is determined to qualify for a remeasurement during a fiscal year. The remaining components of pension and OPEB plan expense, primarily service cost, interest cost and expected return on assets, are recorded on a monthly basis. The market-related value of assets equals the actual market value as of the date of measurement.

During 2016, we made changes to assumptions related to discount rates and expected rates of return on plan assets. We consider available information that we deem relevant when selecting each of these assumptions.

In selecting the discount rates for the U.S. plans, we consider expected benefit payments on a plan-by-plan basis. As a result, the Company uses different discount rates for each plan depending on the demographics of participants and the expected timing of benefit payments. For 2016, the discount rates were calculated using the results from a bond matching technique developed by Milliman, which matched the future estimated annual benefit payments of each respective plan against a portfolio of bonds of high quality to determine the discount rate. We believe our selected discount rates are determined using preferred methodology under authoritative accounting guidance and accurately reflect market conditions as of the December 31, 2016 measurement date.

In selecting the discount rates for the foreign plans, we look at long-term yields on AA-rated corporate bonds when available. Our actuaries have developed yield curves based on the yields on the constituent bonds in the various indices as well as on other market indicators such as swap rates, particularly at the longer durations. For the Eurozone, we apply the Aon Hewitt yield curve to projected cash flows from the relevant plans to derive the discount rate. For the United Kingdom

(“U.K.”), the discount rate is determined by applying the Aon Hewitt yield curve for typical schemes of similar duration to projected cash flows of Albemarle’s U.K. plan. In other countries where there is not a sufficiently deep market of high-quality corporate bonds, we set the discount rate by referencing the yield on government bonds of an appropriate duration.

In estimating the expected return on plan assets, we consider past performance and future expectations for the types of investments held by the plan as well as the expected long-term allocation of plan assets to these investments. In projecting the rate of compensation increase, we consider past experience in light of movements in inflation rates.

In October 2015, the Society of Actuaries (“SOA”) published an updated Mortality Improvement Scale, MP-2015. The updated improvement scale incorporated two additional years of mortality data and reflected a trend toward somewhat smaller increases in longevity. In addition, the SOA released a set of factors to adjust the RP-2014 Mortality Tables to base year 2006. We revised our mortality assumption to incorporate these updated mortality improvements for purposes of measuring our U.S. pension and OPEB obligations at December 31, 2015. In October 2016, the SOA published an updated Mortality Improvement Scale, MP-2016. The updated improvement scale incorporates three additional years of mortality data (2012 – 2014) and a modification of two other input values to improve the model’s year-over-year stability. We utilized the same base mortality, SOA RP-2014 Adjusted to 2006 Total Dataset Mortality, but we revised our mortality assumption to incorporate the MP-2016 Mortality Improvement Scale for purposes of measuring our U.S. pension and OPEB obligations at December 31, 2016.

Employee Savings Plans

Certain of our employees participate in our defined contribution 401(k) employee savings plan, which is generally available to all U.S. full-time salaried and non-union hourly employees and to employees who are covered by a collective bargaining agreement that provides for such participation. Additionally, the Company sponsors various defined contribution plans for certain employees at foreign locations, the most significant of which is a plan in the Netherlands similar to a collective defined contribution plan.

Deferred Compensation Plan

We maintain an Executive Deferred Compensation Plan (“EDCP”), adopted in 2001, and subsequently amended. The purpose of the EDCP is to provide current tax planning opportunities as well as supplemental funds upon the retirement or death of certain of our employees. The EDCP is intended to aid in attracting and retaining employees of exceptional ability by providing them with these benefits. We also maintain a Benefit Protection Trust (the “Trust”) that was created to provide a source of funds to assist in meeting the obligations of the EDCP, subject to the claims of our creditors in the event of our insolvency. Assets of the Trust are consolidated in accordance with authoritative guidance. The assets of the Trust consist primarily of mutual fund investments (which are accounted for as trading securities and are marked-to-market on a monthly basis through the consolidated statements of income) and cash and cash equivalents.

Stock-based Compensation Expense

The fair value of restricted stock awards, restricted stock unit awards and performance unit awards with a service condition are determined based on the number of shares or units granted and the quoted price of our common stock on the date of grant, and the fair value of stock options is determined using the Black-Scholes valuation model. The fair value of performance unit awards with a service condition and a market condition are estimated on the date of grant using a Monte Carlo simulation model. The fair value of these awards is determined after giving effect to estimated forfeitures. Such value is recognized as expense over the service period, which is generally the vesting period of the equity grant. To the extent restricted stock awards, restricted stock unit awards, performance unit awards and stock options are forfeited prior to vesting in excess of the estimated forfeiture rate, the corresponding previously recognized expense is reversed as an offset to operating expenses.

Income Taxes

We use the liability method for determining our income taxes, under which current and deferred tax liabilities and assets are recorded in accordance with enacted tax laws and rates. Under this method, the amounts of deferred tax liabilities and assets at the end of each period are determined using the tax rate expected to be in effect when taxes are actually paid or recovered. Future tax benefits are recognized to the extent that realization of such benefits is more likely than not. In order to record deferred tax assets and liabilities, we are following guidance under ASU 2015-17, which requires deferred tax assets and liabilities to be classified as noncurrent on the balance sheet, along with any related valuation allowance.

Deferred income taxes are provided for the estimated income tax effect of temporary differences between the financial statement carrying amounts and the tax basis of existing assets and liabilities. Deferred tax assets are also provided for operating losses, capital losses and certain tax credit carryovers. A valuation allowance, reducing deferred tax assets, is

established when it is more likely than not that some portion or all of the deferred tax assets will not be realized. The realization of such deferred tax assets is dependent upon the generation of sufficient future taxable income of the appropriate character. Although realization is not assured, we do not establish a valuation allowance when we believe it is more likely than not that a net deferred tax asset will be realized.

We only recognize a tax benefit after concluding that it is more likely than not that the benefit will be sustained upon audit by the respective taxing authority based solely on the technical merits of the associated tax position. Once the recognition threshold is met, we recognize a tax benefit measured as the largest amount of the tax benefit that, in our judgment, is greater than 50% likely to be realized. Under current accounting guidance for uncertain tax positions, interest and penalties related to income tax liabilities are included in Income tax expense on the consolidated statements of income.

We have designated the undistributed earnings of substantially all of our foreign operations as indefinitely reinvested and as a result we do not provide for deferred income taxes on the unremitted earnings of these subsidiaries. If it is determined that cash can be repatriated with little to no tax consequences, we may choose to repatriate cash at that time. Our foreign earnings are computed under U.S. federal tax earnings and profits, or E&P, principles. In general, to the extent our financial reporting book basis over tax basis of a foreign subsidiary exceeds these E&P amounts, deferred taxes have not been provided as they are essentially permanent in duration. The determination of the amount of such unrecognized deferred tax liability is not practicable. We provide for deferred income taxes on our undistributed earnings of foreign operations that are not deemed to be indefinitely reinvested.

Accumulated Other Comprehensive (Loss) Income

Accumulated other comprehensive (loss) income comprises principally foreign currency translation adjustments, amounts related to the revaluation of our euro-denominated senior notes which were designated as a hedge of our net investment in foreign operations in 2014, a realized loss on a forward starting interest rate swap entered into in 2014 which was designated as a cash flow hedge, and deferred income taxes related to the aforementioned items.

Foreign Currency Translation

The assets and liabilities of all foreign subsidiaries were prepared in their respective functional currencies and translated into U.S. Dollars based on the current exchange rate in effect at the balance sheet dates, while income and expenses were translated at average exchange rates for the periods presented. Translation adjustments are reflected as a separate component of equity.

Foreign exchange transaction gains (losses) were \$2.4 million, \$51.8 million and (\$3.7) million for the years ended December 31, 2016, 2015 and 2014, respectively, and are included in Other income (expenses), net, in our consolidated statements of income, with the unrealized portion included in Other, net, in our consolidated statements of cash flows. The gains in 2015 are primarily related to cash denominated in U.S. Dollars held by foreign subsidiaries where the European Union Euro serves as the functional currency, which was repatriated using the applicable transaction rates during the first quarter of 2015.

Derivative Financial Instruments

We manage our foreign currency exposures by balancing certain assets and liabilities denominated in foreign currencies and through the use of foreign currency forward contracts from time to time, which generally expire within one year. The principal objective of such contracts is to minimize the financial impact of changes in foreign currency exchange rates. While these contracts are subject to fluctuations in value, such fluctuations are generally expected to be offset by changes in the value of the underlying foreign currency exposures being hedged. Unless otherwise noted, gains and losses on foreign currency forward contracts are recognized currently in Other income (expenses), net, and generally do not have a significant impact on results of operations.

We may also enter into interest rate swaps, collars or similar instruments from time to time, with the objective of reducing interest rate volatility relating to our borrowing costs.

The counterparties to these contractual agreements are major financial institutions with which we generally have other financial relationships. We are exposed to credit loss in the event of nonperformance by these counterparties. However, we do not anticipate nonperformance by the counterparties. We do not utilize financial instruments for trading or other speculative purposes. Our foreign currency forward contracts outstanding at December 31, 2016 and 2015 have not been designated as hedging instruments under Accounting Standards Codification ("ASC") 815, *Derivatives and Hedging*.

Recently Issued Accounting Pronouncements

In May 2014, the Financial Accounting Standards Board (“FASB”) issued accounting guidance designed to enhance comparability of revenue recognition practices across entities, industries, jurisdictions and capital markets. The core principle of the guidance is that revenue recognized from a transaction or event that arises from a contract with a customer should reflect the consideration to which an entity expects to be entitled in exchange for goods or services provided. To achieve that core principle the new guidance sets forth a five-step revenue recognition model that will need to be applied consistently to all contracts with customers, except those that are within the scope of other topics in the ASC. Also required are new disclosures to help users of financial statements better understand the nature, amount, timing and uncertainty of revenues and cash flows from contracts with customers. The new disclosures include qualitative and quantitative information about contracts with customers, significant judgments made in applying the revenue guidance, and assets recognized related to the costs to obtain or fulfill a contract. In March 2016 and April 2016, the FASB issued amendments to this new guidance that provides clarification about principal versus agent considerations, identification of performance obligations and accounting for the licensing of intellectual property. In May 2016, the FASB issued an amendment to the guidance that provides clarification about collectability, noncash consideration, presentation of sales tax, and transition. In December 2016, the FASB issued an amendment to the guidance that provides narrow-scope improvements and practical expedient regarding collectability, presentation of sales tax collected from customers, non-cash considerations, contract modifications at transition, completed contracts at transition and other technical corrections. These new requirements become effective for annual and interim reporting periods beginning after December 15, 2017. Early adoption is permitted for annual and interim reporting periods beginning after December 15, 2016. We expect to adopt the new standard in the first quarter of 2018 using the modified retrospective method. We have made significant progress in evaluating our existing contracts and accounting policies to determine the impact this standard will have on the consolidated financial statements and related disclosures.

In February 2015, the FASB issued accounting guidance that changes the analysis that reporting entities must perform to determine whether certain types of legal entities should be consolidated. Specifically, the amendments affect (a) limited partnerships and similar legal entities; (b) the consolidation analysis of reporting entities that are involved with variable interest entities, particularly those that have fee arrangements and related party relationships; and (c) certain investment funds. These amendments became effective on January 1, 2016 and did not have a material effect on our consolidated financial statements.

In April and August 2015, the FASB issued accounting guidance that changes the balance sheet presentation of debt issuance costs (except for debt issuance costs related to line-of-credit arrangements). The guidance requires debt issuance costs relating to a recognized debt liability to be presented as a direct deduction from the carrying amount of the associated debt liability in the balance sheet. This new requirement became effective on January 1, 2016. See Note 14, “Long-Term Debt,” for additional information.

In April 2015, the FASB issued accounting guidance that, among other things, provides for a practical expedient related to interim period remeasurements of defined benefit plan assets and obligations. The practical expedient permits entities to remeasure plan assets and obligations using the month-end that is closest to the date of the actual event. Disclosure of such election and related month-end remeasurement date is required. This guidance became effective on January 1, 2016 and did not have a material effect on our consolidated financial statements.

In April 2015, the FASB issued accounting guidance which clarifies the proper method of accounting for fees paid in a cloud computing arrangement. The guidance requires software licenses included in a cloud computing arrangement to be accounted for consistently with the acquisition of other software licenses. If a cloud computing arrangement does not include a software license, the arrangement should be accounted for as a service contract. This guidance became effective on January 1, 2016 and did not have a material effect on our consolidated financial statements.

In May 2015, the FASB issued accounting guidance for which investments measured at net asset value per share (or its equivalent) using the practical expedient should no longer be categorized within the fair value hierarchy. Although removed from the fair value hierarchy, disclosure of the nature, risks and amount of investments for which fair value is measured using the practical expedient is still required. This guidance became effective on January 1, 2016 and did not have a material effect on our consolidated financial statements. See Note 15, “Pension Plans and Other Postretirement Benefits,” and Note 23, “Fair Value Measurement,” for additional information.

In July 2015, the FASB issued accounting guidance that requires inventory to be measured at the lower of cost and net realizable value. The scope of this guidance excludes inventory measured using the last-in first-out method or the retail inventory method. This new requirement will be effective for fiscal years beginning after December 15, 2016, including interim periods within those fiscal years, and is to be applied prospectively. Early application is permitted. We do not expect this guidance to have a significant impact on our financial statements.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS

In February 2016, the FASB issued accounting guidance that requires assets and liabilities arising from leases to be recorded on the balance sheet. Additional disclosures are required regarding the amount, timing, and uncertainty of cash flows from leases. This new guidance will be effective for fiscal years beginning after December 15, 2018, including interim periods within those fiscal years, and is to be applied using a modified retrospective approach. Early application is permitted. The impact of this new requirement on our financial statements is being assessed and is not yet known.

In March 2016, the FASB issued accounting guidance that simplifies several aspects of the accounting for share-based payment awards. Among other things, this guidance requires all tax effects related to share-based payment awards to be recognized as income tax expense or benefit on the income statement, thus eliminating all additional paid-in capital pools. An entity should recognize excess tax benefits regardless of whether the benefit reduces income taxes payable in the current period. For interim reporting purposes, excess tax benefits and tax deficiencies should be accounted for as discrete items in the reporting period in which they occur. Additionally, this new guidance requires all tax related cash flows resulting from share-based payments to be presented as an operating activity on the statement of cash flows rather than as a financing activity. This guidance will be effective for annual periods beginning after December 15, 2016, including interim periods within those fiscal years. Early adoption is permitted. We do not expect this guidance to have a significant impact on our financial statements.

In August 2016, the FASB issued accounting guidance which clarifies the proper presentation and classification of certain cash receipts and cash payments in the statement of cash flows. The new guidance addresses cash flow issues including, but not limited to, debt prepayments or debt extinguishment costs and distributions received from equity method investments. This guidance will be effective for fiscal years beginning after December 15, 2017, including interim periods within those fiscal years, and is to be applied on a retrospective basis. Early adoption is permitted. We do not expect this guidance to have a significant impact on our financial statements.

In November 2016, the FASB issued accounting guidance that requires restricted cash and restricted cash equivalents to be included with cash and cash equivalents when reconciling the beginning and end of period total amounts shown on the statement of cash flows. This guidance will be effective for fiscal years beginning after December 15, 2017, including interim periods within those fiscal years, and is to be applied on a retrospective basis. Early adoption is permitted. We do not expect this guidance to have a significant impact on our financial statements.

In January 2017, the FASB issued accounting guidance to clarify the definition of a business for determining whether transactions should be accounted for as acquisitions (or disposals) of assets or businesses. This guidance will be effective for fiscal years beginning after December 15, 2017, including interim periods within those fiscal years, and is to be applied on a prospective basis. Early adoption is permitted. We currently do not expect this guidance to have a significant impact on our financial statements.

In January 2017, the FASB issued accounting guidance to simplify the accounting for goodwill impairment. The guidance removes Step 2 of the goodwill impairment test, which requires a reporting unit to calculate the implied fair value of goodwill by assigning the fair value of a reporting unit to all of its assets and liabilities as if that reporting unit has been acquired in a business combination. A goodwill impairment will now be the amount by which a reporting unit's carrying value exceeds its fair value, not to exceed the carrying amount of goodwill. All other goodwill impairment guidance will remain unchanged. Entities will continue to have the option to perform a qualitative assessment to determine if a quantitative impairment test is necessary. This guidance will be effective for fiscal years beginning after December 15, 2019, including interim periods within those fiscal years, and is to be applied on a prospective basis. Early adoption is permitted for goodwill impairment tests performed after January 1, 2017. We do not expect this guidance to have a significant impact on our financial statements.

NOTE 2—Acquisitions:

On January 12, 2015 (the "Acquisition Closing Date"), we completed the acquisition of all outstanding shares of Rockwood (the "Merger") for a purchase price of approximately \$5.7 billion. As a result, Rockwood became a wholly-owned subsidiary of Albemarle.

Purchase Price Allocation

The aggregate purchase price noted above was allocated to the major categories of assets and liabilities acquired based upon their estimated fair values at the Acquisition Closing Date, which were based, in part, upon third-party appraisals for certain assets, including specifically-identified intangible assets. The excess of the purchase price over the estimated fair value of the net assets acquired was approximately \$2.8 billion and was recorded as goodwill.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS

The allocation of the Rockwood purchase price was finalized in the first quarter of 2016. The following table summarizes the allocation of the purchase price paid and the amounts of assets acquired and liabilities assumed for the Rockwood acquisition based upon estimated fair values at the date of acquisition (in thousands):

Total purchase price	\$ 5,725,321
Net assets acquired:	
Cash and cash equivalents	\$ 1,555,139
Trade and other accounts receivable	262,947
Inventories	290,496
Other current assets	86,267
Property, plant and equipment	1,383,480
Investments	529,453
Other assets	25,538
Definite-lived intangible assets:	
Patents and technology	227,840
Trade names and trademarks	234,610
Customer lists and relationships	1,280,142
Indefinite-lived intangible assets:	
Trade names and trademarks	104,380
Other	26,670
Current liabilities	(406,532)
Long-term debt	(1,319,132)
Pension benefits	(316,086)
Other noncurrent liabilities	(195,052)
Deferred income taxes	(845,884)
Noncontrolling interests	(17,582)
Total identifiable net assets	<u>2,906,694</u>
Goodwill	<u>2,818,627</u>
Total net assets acquired ^(a)	<u>\$ 5,725,321</u>

(a) Total net assets acquired includes amounts for the Chemetall Surface Treatment business, which is reported as discontinued operations. See Note 3, "Divestitures," for additional information.

Significant changes to the purchase price allocation since our initial preliminary estimates reported in the first quarter of 2015 were primarily related to decreases in the estimated fair values of certain current assets, property, plant and equipment, investments and intangible assets and increases in certain other noncurrent liabilities and noncontrolling interests, which resulted in an increase to recognized goodwill of approximately \$193.8 million. This increase to recognized goodwill includes approximately \$1.5 million that was recognized during the year ended December 31, 2016, within one year of the acquisition date, based on changes to intangible assets, property, plant and equipment and deferred taxes.

Goodwill arising from the acquisition consists largely of the anticipated synergies and economies of scale from the combined companies and the overall strategic importance of the acquired businesses to Albemarle. The goodwill attributable to the acquisition is not amortizable or deductible for tax purposes.

Included in Acquisition and integration related costs on our consolidated statements of income for the years ended December 31, 2016, 2015 and 2014 is \$52.1 million, \$123.9 million and \$23.6 million, respectively, of integration costs resulting from the acquisition of Rockwood (mainly consisting of professional services fees, costs to achieve synergies, relocation costs, and other integration costs) and \$5.3 million, \$8.4 million and \$6.6 million, respectively, of costs in connection with other significant projects.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS

The weighted-average amortization periods for the intangible assets acquired are 20 years for patents and technology, 20 years for trade names and trademarks and 24 years for customer lists and relationships. The weighted-average amortization period for all definite-lived intangible assets acquired is 23 years.

Unaudited Pro Forma Financial Information

The following unaudited pro forma results of operations of the Company for the years ended December 31, 2015 and 2014 assume that the Merger occurred on January 1, 2014. The pro forma amounts include certain adjustments, including interest expense, depreciation, amortization expense and income taxes. The pro forma amounts for the years ended December 31, 2015 and 2014 were adjusted to exclude approximately \$137.7 million and \$23.6 million, respectively, of nonrecurring acquisition and integration related costs. Additionally, pro forma amounts for the year ended December 31, 2015 were adjusted to exclude approximately \$103.4 million of charges related to the utilization of the inventory markup as further described in Note 25, "Segment and Geographic Area Information." The pro forma results do not include adjustments related to cost savings or other synergies anticipated as a result of the Merger. In addition, pro forma amounts are not adjusted to reflect the Chemetall Surface Treatment business as discontinued operations. Accordingly, these unaudited pro forma results are presented for informational purposes only and are not necessarily indicative of what the actual results of operations of the combined company would have been if the acquisition had occurred as of January 1, 2014, nor are they indicative of future results of operations.

	Year Ended December 31,	
	2015	2014
	(in thousands, except per share amounts)	
Pro forma Net sales	\$ 3,684,665	\$ 3,870,428
Pro forma Net income	\$ 527,997	\$ 353,313
Pro forma Net income per share:		
Basic	\$ 4.75	\$ 3.13
Diluted	\$ 4.73	\$ 3.12

Litigation Related to the Merger

On February 19, 2015, Verition Multi-Strategy Master Fund Ltd. and Verition Partners Master Fund Ltd., who collectively owned approximately 882,000 shares of Rockwood common stock immediately prior to the Merger, commenced an action in the Delaware Chancery Court seeking appraisal of their shares of Rockwood common stock pursuant to Delaware General Corporation Law § 262. These shareholders exercised their right not to receive the Merger Consideration for each share of Rockwood common stock owned by such shareholders. Following the Merger, these shareholders ceased to have any rights with respect to their Rockwood shares, except for their rights to seek an appraisal of the cash value of their Rockwood shares under Delaware law. On March 16, 2015, Albemarle, on behalf of Rockwood, filed an Answer and Verified List in response to the appraisal petition. On November 2, 2015, the court granted the parties' jointly stipulated amended scheduling order, which set forth dates for fact and expert discovery, as well as trial. On December 21, 2015, the parties entered into a Settlement Agreement and Release to resolve the matter, and on January 11, 2016, the Court dismissed the matter with prejudice.

Other Acquisitions

On December 31, 2016, we completed the acquisition of all equity interests in the lithium hydroxide and lithium carbonate conversion business of Jiangxi Jiangli New Materials Science and Technology Co. Ltd. for a cash purchase price of approximately \$145 million. This includes manufacturing assets located in both Jiangxi and Sichuan, China focused on the production of battery-grade lithium carbonate and lithium hydroxide. This acquisition will enable us to supply premium lithium salts to an expanded global customer base while solidifying our leading position in the lithium industry.

The aggregate purchase price was allocated to the major categories of assets and liabilities acquired based upon their estimated fair values as of December 31, 2016, which were based, in part, upon outside preliminary appraisals for certain assets. The preliminary estimated fair values of the assets and liabilities acquired were primarily related to Property, plant and equipment of \$29.0 million and Deferred tax assets of \$1.6 million. In addition, the estimated fair value of net working capital acquired was \$47.1 million, however, an equal liability was recorded in Accrued expenses, as it will be repaid to the previous owners of the acquired business. The excess of the purchase price over the preliminary estimated fair value of the net assets acquired was approximately \$113.6 million and was recorded as goodwill. The allocation of the purchase price to the assets acquired and liabilities assumed, including the residual amount allocated to goodwill, is based upon preliminary information and is subject to change within the measurement period (up to one year from the acquisition date) as additional information concerning final asset and liability valuations is obtained. The primary areas of the preliminary purchase price allocation that

are not yet finalized relate to the property, plant and equipment, other intangible assets, as well as various working capital accounts. The fair values of the assets acquired and liabilities assumed are based on management's preliminary estimates and assumptions, as well as other information compiled by management, including valuations that utilize customary valuation procedures and techniques. While the Company believes that such preliminary estimates provide a reasonable basis for estimating the fair value of assets acquired and liabilities assumed, it will evaluate any necessary information prior to finalization of the amounts. During the measurement period, the Company will adjust assets or liabilities if new information is obtained about facts and circumstances that existed as of the acquisition date that, if known, would have resulted in revised estimated values of those assets or liabilities as of that date.

Goodwill arising from the acquisition consists largely of the anticipated synergies and economies of scale from the combined assets and the overall strategic importance of the acquired assets to Albemarle. The goodwill attributable to the acquisition will not be amortizable or deductible for tax purposes.

In 2015, our Chemetall Surface Treatment business completed several additional acquisitions, including (1) all remaining shares of its Shanghai Chemetall joint venture for a purchase price of \$57.6 million, (2) the aluminum finishing business of Chemal GmbH & Co. KG ("Chemal GmbH"), based in Hamm, Germany for a purchase price of \$2.2 million and (3) the remaining noncontrolling interests' share of Nanjing Chemetall Surface Technologies Co., Ltd for a purchase price of \$4.8 million. The ownership interests of each of these acquisitions were transferred to BASF SE in the sale of the Chemetall Surface Treatment business on December 14, 2016. See Note 3, "Divestitures," for additional information about the sale of the Chemetall Surface Treatment business.

NOTE 3—Divestitures:

Chemetall Surface Treatment Business

On June 17, 2016, we entered into a definitive agreement to sell the Chemetall Surface Treatment business to BASF SE. On December 14, 2016, the Company closed the sale of this business and received cash proceeds of approximately \$3.1 billion, net of purchase price adjustments. Included in Income (loss) from discontinued operations (net of tax) for the year ended December 31, 2016 is a pre-tax gain of \$388.0 million (\$135.0 million after income taxes) related to the sale of this business, which included a reversal of \$81.4 million of foreign currency translation loss out of Accumulated other comprehensive loss. This gain represents the difference between the carrying value of the related net assets and their fair value as determined by the sales price less estimated costs to sell. The sale of the Chemetall Surface Treatment business reflects the Company's commitment to investing in the future growth of its high priority businesses, reducing leverage and returning capital to shareholders.

The Chemetall Surface Treatment business was acquired on January 12, 2015 as part of the acquisition of Rockwood, see Note 2, "Acquisitions," for further details. The sale of the Chemetall Surface Treatment business, a separate reportable segment, qualifies for discontinued operations treatment because it represents a strategic shift that will have a major effect on the Company's operations and financial results. As a result, in the second quarter of 2016, the Company began accounting for this business as discontinued operations in the consolidated statements of income and excluded the business from segment results for the years ended December 31, 2016 and 2015, the periods this business was owned by Albemarle. Related assets and liabilities are classified as held for sale for all periods presented. As of the date this business qualified for discontinued operations treatment, the Company stopped recording depreciation and amortization expense on assets of the Chemetall Surface Treatment business.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS

The major components of Income (loss) from discontinued operations (net of tax) for the years ended December 31, 2016 and 2015 were as follows (in thousands):

	Year Ended December 31,	
	2016	2015
Net sales	\$ 813,285	\$ 824,906
Cost of goods sold	416,934	488,267
Operating expenses, net ^(a)	268,402	239,316
Interest and financing expenses ^(b)	38,227	51,072
Other income, net	(2,485)	(4,214)
Gain on sale of discontinued operations	(387,980)	—
Income before income taxes	480,187	50,465
Income tax expense ^(c)	278,056	17,989
Income from discontinued operations (net of tax)	<u>\$ 202,131</u>	<u>\$ 32,476</u>

- (a) Operating expenses, net for discontinued operations includes mark-to-market actuarial (losses) gains of (\$8.5) million and \$8.9 million during the years ended December 31, 2016 and 2015, respectively.
- (b) Interest and financing expenses included the allocation of interest expense not directly attributable to other operations as well as interest expense related to debt to be assumed by the buyer. The allocation of interest expense to discontinued operations was based on the ratio of net assets held for sale to the sum of total net assets plus consolidated debt. There was no interest expense allocated to discontinued operations for the year ended December 31, 2014, as the Chemetall Surface Treatment business was not owned by the Company during this period.
- (c) Income tax expense for the year ended December 31, 2016 included a charge of \$253.0 million related to the gain on sale of discontinued operations.

The carrying amounts of the major classes of assets and liabilities for the Chemetall Surface Treatment business classified as held for sale at December 31, 2015, were as follows (in thousands):

	December 31, 2015
Assets	
Current assets	\$ 237,447
Net property, plant and equipment	163,643
Goodwill	1,433,259
Other intangibles, net of amortization	1,349,179
All other noncurrent assets	25,374
Assets held for sale	<u>\$ 3,208,902</u>
Liabilities	
Current liabilities	\$ 200,892
Deferred income taxes	351,465
All other noncurrent liabilities	112,742
Liabilities held for sale	<u>\$ 665,099</u>

Depreciation and amortization and capital expenditures from discontinued operations for the years ended December 31, 2016 and 2015 were as follows (in thousands):

	Year Ended December 31,	
	2016	2015
Depreciation and amortization	\$ 35,194	\$ 78,903
Capital expenditures	\$ 19,281	\$ 23,738

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS

Antioxidant, Ibuprofen and Propofol Businesses

On April 15, 2014, the Company signed a definitive agreement to sell its antioxidant, ibuprofen and propofol businesses and assets to SI Group, Inc. Included in the transaction were Albemarle's manufacturing sites in Orangeburg, South Carolina and Jinshan, China, along with Albemarle's antioxidant product lines manufactured in Ningbo, China. On September 1, 2014, the Company closed the sale of these businesses and assets and received net proceeds of \$104.7 million. A working capital settlement of \$7.6 million was received in the first quarter of 2015. Financial results of the disposed group have been presented as discontinued operations in the consolidated statements of income for the year ended December 31, 2014 in effect before adopting the new standard on January 1, 2015. A summary of results of discontinued operations for the year ended December 31, 2014 is as follows (in thousands):

	Year Ended December 31, 2014
Net sales	<u>\$ 154,273</u>
Loss from discontinued operations	\$ (90,439)
Income tax benefit	<u>(20,908)</u>
Loss from discontinued operations (net of tax)	<u>\$ (69,531)</u>

Included in Income (loss) from discontinued operations for the year ended December 31, 2014 are pre-tax charges of \$85.5 million (\$65.7 million after income taxes) related to the loss on the sale of the disposed group, representing the difference between the carrying value of the related assets and their fair value as determined by the sales price less estimated costs to sell. The loss is primarily attributable to the write-off of goodwill, intangibles and long-lived assets, net of cumulative foreign currency translation gains of \$17.8 million.

Other Assets Held for Sale

In 2015, we announced our intention to pursue strategic alternatives, including divestitures, related to certain businesses which include minerals-based flame retardants and specialty chemicals, fine chemistry services and metal sulfides. In the fourth quarter of 2015, we determined that the assets held for sale criteria were met for these businesses as well as a small group of assets at an idled site. As of the December 31, 2015 balance sheet date, the Company expected to complete the sales of the businesses included in assets and liabilities held for sale and therefore such amounts were classified as current. These businesses did not qualify for discontinued operations treatment because the Company's management did not consider their sale or potential sale as representing a strategic shift that had or will have a major effect on the Company's operations and financial results.

On November 5, 2015, the Company signed a definitive agreement to sell its Tribotec metal sulfides business to Treibacher Industrie AG. Included in the transaction were sites in Vienna and Arnoldstein, Austria, and Tribotec's proprietary sulfide synthesis process. On January 4, 2016, the Company closed the sale of this business, effective for the first day of business in 2016. We received net proceeds of approximately \$137 million and recorded a gain of \$11.5 million before income taxes in 2016 related to the sale of this business.

On December 16, 2015, the Company signed a definitive agreement to sell its minerals-based flame retardants and specialty chemicals business to Huber Engineered Materials, a division of J.M. Huber Corporation. The transaction included Albemarle's Martinswerk GmbH subsidiary and manufacturing facility located in Bergheim, Germany, and Albemarle's 50% ownership interest in Magnifin Magnesiaprodukte GmbH, a joint-venture with Radex Heraklith Industriebeteiligung AG at Breitenau, Austria. On February 1, 2016, the Company closed the sale of these businesses. We received net proceeds of approximately \$187 million and recorded a gain of \$112.3 million before income taxes in 2016 related to the sale of these businesses.

In April 2016, the Company concluded that it would discontinue efforts to sell its fine chemistry services business, and as a result, this business is accounted for as held and used beginning in the second quarter of 2016.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS

The carrying amounts of the major classes of assets and liabilities of these businesses classified as held for sale at December 31, 2015, were as follows (in thousands):

	December 31, 2015
Assets	
Current assets	\$ 156,421
Net property, plant and equipment	115,865
Goodwill	46,794
Other intangibles, net of amortization	66,324
All other noncurrent assets	19,081
Assets held for sale	<u>\$ 404,485</u>
Liabilities	
Current liabilities	\$ 72,756
Deferred income taxes	24,947
All other noncurrent liabilities	31,003
Liabilities held for sale	<u>\$ 128,706</u>

Also included in Gain on sales of businesses, net, for the year ended December 31, 2016 was a loss of \$1.5 million on the sale of our wafer reclaim business.

NOTE 4—Supplemental Cash Flow Information:

Supplemental information related to the consolidated statements of cash flows is as follows (in thousands):

	Year Ended December 31,		
	2016	2015	2014
Cash paid during the year for:			
Income taxes (net of refunds of \$9,270, \$7,333 and \$6,035 in 2016, 2015 and 2014, respectively) ^(a)	\$ 143,404	\$ 162,408	\$ 56,174
Interest (net of capitalization)	\$ 96,948	\$ 153,271	\$ 33,604
Supplemental non-cash disclosures related to investing activities:			
Capital expenditures included in Accounts payable	\$ 33,622	\$ 45,826	\$ 20,373

(a) Cash paid for income taxes during 2015 included approximately \$111 million of taxes paid on repatriation of earnings from legacy Rockwood entities.

Other, net within Cash flows from operating activities on the consolidated statements of cash flows for the years ended December 31, 2016, 2015 and 2014 included \$40.8 million, (\$70.7) million and \$1.1 million, respectively, related to losses (gains) on fluctuations in foreign currency exchange rates.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS

NOTE 5—Earnings Per Share:

Basic and diluted earnings per share from continuing operations are calculated as follows (in thousands, except per share amounts):

	Year Ended December 31,		
	2016	2015	2014
Basic earnings per share from continuing operations			
Numerator:			
Net income from continuing operations	\$ 478,638	\$ 327,588	\$ 230,437
Net income from continuing operations attributable to noncontrolling interests	(37,094)	(25,158)	(27,590)
Net income from continuing operations attributable to Albemarle Corporation	\$ 441,544	\$ 302,430	\$ 202,847
Denominator:			
Weighted-average common shares for basic earnings per share	112,379	111,182	78,696
Basic earnings per share from continuing operations	\$ 3.93	\$ 2.72	\$ 2.57
Diluted earnings per share from continuing operations			
Numerator:			
Net income from continuing operations	\$ 478,638	\$ 327,588	\$ 230,437
Net income from continuing operations attributable to noncontrolling interests	(37,094)	(25,158)	(27,590)
Net income from continuing operations attributable to Albemarle Corporation	\$ 441,544	\$ 302,430	\$ 202,847
Denominator:			
Weighted-average common shares for basic earnings per share	112,379	111,182	78,696
Incremental shares under stock compensation plans	860	374	406
Weighted-average common shares for diluted earnings per share	113,239	111,556	79,102
Diluted earnings per share from continuing operations	\$ 3.90	\$ 2.71	\$ 2.57

The Company's policy on how to determine windfalls and shortfalls for purposes of calculating assumed stock award proceeds under the treasury stock method when determining the denominator for diluted earnings per share is to exclude the impact of pro forma deferred tax assets (i.e. the windfall or shortfall that would be recognized in the financial statements upon exercise of the award). At December 31, 2016, all common stock equivalents were included in the computation of diluted earnings per share.

Included in the calculation of basic earnings per share are unvested restricted stock awards that contain nonforfeitable rights to dividends. At December 31, 2016, there were 6,000 unvested shares of restricted stock awards outstanding.

We have the authority to issue 15 million shares of preferred stock in one or more classes or series. As of December 31, 2016, no shares of preferred stock have been issued.

In November 2016, our Board of Directors authorized an increase in the number of shares the Company is permitted to repurchase under our share repurchase program, pursuant to which the Company is now permitted to repurchase up to a maximum of 15 million shares, including those previously authorized but not yet repurchased.

Under its Board authorized share repurchase program, in 2014 the Company repurchased 2,190,254 shares of its common stock pursuant to accelerated share repurchase ("ASR") agreements with two financial institutions. Amounts paid pursuant to the ASR agreements were \$150 million in 2014, and these purchases were funded through a combination of available cash on hand and debt. The Company determined that each of the ASR agreements met the criteria to be accounted for as a forward contract indexed to its own stock and were therefore treated as equity instruments. The final number of shares delivered upon settlement of each agreement was determined with reference to the daily Rule 10b-18 volume weighted-average prices of the Company's common stock over the term of each agreement, less a forward price adjustment amount. The shares repurchased reduced the Company's weighted average shares outstanding for purposes of calculating basic and diluted earnings per share.

There were no shares of the Company's common stock repurchased during the years ended December 31, 2016 and 2015. As of December 31, 2016, there were 15,000,000 remaining shares available for repurchase under the Company's authorized share repurchase program.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS

NOTE 6—Other Accounts Receivable:

Other accounts receivable consist of the following at December 31, 2016 and 2015 (in thousands):

	December 31,	
	2016	2015
Value added tax/consumption tax	\$ 15,324	\$ 23,758
Other	26,661	51,231
Total ^(a)	<u>\$ 41,985</u>	<u>\$ 74,989</u>

(a) As of December 31, 2015, \$8.3 million of Other accounts receivable were classified as Assets held for sale in the consolidated balance sheets. See Note 3, “Divestitures,” for additional information.

NOTE 7—Inventories:

The following table provides a breakdown of inventories at December 31, 2016 and 2015 (in thousands):

	December 31,	
	2016	2015
Finished goods	\$ 289,102	\$ 264,025
Raw materials and work in process ^(a)	109,706	122,038
Stores, supplies and other	51,455	53,450
Total inventories ^(b)	<u>\$ 450,263</u>	<u>\$ 439,513</u>

(a) Included \$47.1 million and \$39.1 million at December 31, 2016 and 2015, respectively, of work in process related to the Lithium product category.

(b) As of December 31, 2015, \$162.8 million of Inventories were classified as Assets held for sale in the consolidated balance sheets. See Note 3, “Divestitures,” for additional information.

Approximately 19% of our inventories are valued using the last-in, first-out (“LIFO”) method at December 31, 2016 and 2015. The portion of our domestic inventories stated on the LIFO basis amounted to \$87.5 million and \$85.1 million at December 31, 2016 and 2015, respectively, which are below replacement cost by approximately \$33.8 million and \$36.9 million, respectively.

NOTE 8—Other Current Assets:

Other current assets consist of the following at December 31, 2016 and 2015 (in thousands):

	December 31,	
	2016	2015
Income tax receivables	\$ 15,085	\$ 22,649
Prepaid expenses	42,240	38,609
Other	1,254	1,664
Total ^(a)	<u>\$ 58,579</u>	<u>\$ 62,922</u>

(a) As of December 31, 2015, \$11.9 million of Other current assets were classified as Assets held for sale in the consolidated balance sheets. See Note 3, “Divestitures,” for additional information.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS

NOTE 9—Property, Plant and Equipment:

Property, plant and equipment, at cost, consist of the following at December 31, 2016 and 2015 (in thousands):

	Useful Lives (Years)	December 31,	
		2016	2015
Land	—	\$ 120,842	\$ 120,702
Land improvements	5 – 30	59,387	57,833
Buildings and improvements	10 – 45	256,603	236,577
Machinery and equipment ^(a)	2 – 45	2,501,481	2,216,085
Long-term mineral rights and production equipment costs	7 – 60	654,006	652,871
Construction in progress	—	318,203	416,404
Total ^(b)		\$ 3,910,522	\$ 3,700,472

- (a) Consists primarily of (1) short-lived production equipment components, office and building equipment and other equipment with estimated lives ranging 2 – 7 years, (2) production process equipment (intermediate components) with estimated lives ranging 8 – 19 years, (3) production process equipment (major unit components) with estimated lives ranging 20 – 29 years, and (4) production process equipment (infrastructure and other) with estimated lives ranging 30 – 45 years.
- (b) As of December 31, 2015, \$424.1 million of Property, plant and equipment, at cost, was classified as Assets held for sale in the consolidated balance sheets. See Note 3, “Divestitures,” for additional information.

The cost of property, plant and equipment is depreciated generally by the straight-line method. Depletion of long-term mineral rights is based on the units-of-production method. Depreciation expense amounted to \$178.8 million, \$162.2 million and \$97.9 million during the years ended December 31, 2016, 2015 and 2014, respectively. Depreciation expense related to discontinued operations was \$8.9 million, \$18.5 million and \$2.3 million during the years ended December 31, 2016, 2015 and 2014, respectively. Interest capitalized on significant capital projects in 2016, 2015 and 2014 was \$6.8 million, \$11.2 million and \$2.4 million, respectively.

NOTE 10—Investments:

Investments include our share of unconsolidated joint ventures, nonmarketable securities and marketable equity securities. The following table details our investment balances at December 31, 2016 and 2015 (in thousands):

	December 31,	
	2016	2015
Joint ventures ^(a)	\$ 429,794	\$ 411,119
Nonmarketable securities	169	208
Marketable equity securities	27,570	24,257
Total	\$ 457,533	\$ 435,584

- (a) Balance at December 31, 2015 excludes our investment in Magnifin Magnesiaprodukte GmbH & Co. KG (“Magnifin”) and two investments included in the sale of the Chemetall Surface Treatment business, which are included in Assets held for sale. Refer to Note 3, “Divestitures,” for additional information.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS

Our ownership positions in significant unconsolidated investments are shown below:

	December 31,		
	2016	2015	2014
* Windfield Holdings Pty. Ltd. - a joint venture with Sichuan Tianqi Lithium Industries, Inc., that mines lithium ore and produces lithium concentrate	49%	49%	—%
* Nippon Aluminum Alkyls - a joint venture with Mitsui Chemicals, Inc. that produces aluminum alkyls	50%	50%	50%
* Magnifin Magnesiaprodukte GmbH & Co. KG - a joint venture with Radex Heraklith Industriebeteiligung AG that produces specialty magnesium hydroxide products ^(a)	—%	50%	50%
* Nippon Ketjen Company Limited - a joint venture with Sumitomo Metal Mining Company Limited that produces refinery catalysts	50%	50%	50%
* Eurecat S.A. - a joint venture with IFP Investissements for refinery catalysts regeneration services	50%	50%	50%
* Fábrica Carioca de Catalisadores S.A. - a joint venture with Petrobras Quimica S.A. - PETROQUISA that produces catalysts and includes catalysts research and product development activities	50%	50%	50%

(a) On February 1, 2016, we sold our investment in Magnifin as part of the sale of the minerals-based flame retardants and specialty chemicals business. Refer to Note 3, "Divestitures," for additional information.

Our investment in the significant unconsolidated joint ventures above amounted to \$404.6 million and \$402.6 million as of December 31, 2016 and 2015, respectively, and the amount included in Equity in net income of unconsolidated investments (net of tax) in the consolidated statements of income totaled \$56.8 million, \$25.4 million and \$34.7 million for the years ended December 31, 2016, 2015 and 2014, respectively. As further described in Note 25, "Segment and Geographic Area Information," Equity in net income of unconsolidated investments (net of tax) for the year ended December 31, 2015 was reduced by \$27.1 million related to the utilization of the inventory markup to fair value in connection with the acquisition of Rockwood. Undistributed earnings attributable to our significant unconsolidated investments represented approximately \$99.4 million and \$105.9 million of our consolidated retained earnings at December 31, 2016 and 2015, respectively. All of the unconsolidated joint ventures in which we have investments are private companies and accordingly do not have a quoted market price available.

The following summary lists our assets, liabilities and results of operations for our significant unconsolidated joint ventures presented herein (in thousands):

	December 31,	
	2016	2015
Summary of Balance Sheet Information:		
Current assets	\$ 383,203	\$ 331,630
Noncurrent assets	913,643	935,790
Total assets	<u>\$ 1,296,846</u>	<u>\$ 1,267,420</u>
Current liabilities	\$ 138,474	\$ 106,966
Noncurrent liabilities	319,801	339,604
Total liabilities	<u>\$ 458,275</u>	<u>\$ 446,570</u>

	Year Ended December 31,		
	2016	2015	2014
Summary of Statements of Income Information:			
Net sales	\$ 590,980	\$ 560,376	\$ 499,394
Gross profit	\$ 267,241	\$ 253,569	\$ 164,063
Income before income taxes	\$ 189,016	\$ 157,501	\$ 101,983
Net income	\$ 126,872	\$ 111,491	\$ 71,466

We have evaluated each of the unconsolidated investments pursuant to current accounting guidance and none qualify for consolidation. Dividends received from our significant unconsolidated investments were \$42.1 million, \$58.1 million and \$39.6 million in 2016, 2015 and 2014, respectively.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS

At December 31, 2016 and 2015, the carrying amount of our investments in unconsolidated joint ventures differed from the amount of underlying equity in net assets by approximately (\$6.8) million and \$11.5 million, respectively. These amounts represent the differences between the value of certain assets of the joint ventures and our related valuation on a U.S. GAAP basis. As of December 31, 2016 and 2015, \$0.6 million and \$0.8 million, respectively, remained to be amortized over the remaining useful lives of the assets with the balance of the difference representing primarily our share of the joint ventures' goodwill.

The Company holds a 49% equity interest in Windfield Holdings Pty. Ltd. ("Windfield"), which we acquired in the Rockwood acquisition. With regards to the Company's ownership in Windfield, the parties share risks and benefits disproportionate to their voting interests. As a result, the Company considers Windfield to be a variable interest entity ("VIE"). However, the Company does not consolidate Windfield as it is not the primary beneficiary. The carrying amount of our 49% equity interest in Windfield, which is our most significant VIE, was \$288.6 million at December 31, 2016. The Company's aggregate net investment in all other entities which it considers to be VIE's for which the Company is not the primary beneficiary was \$8.8 million and \$7.8 million at December 31, 2016 and December 31, 2015, respectively. Our unconsolidated VIE's are reported in Investments in the consolidated balance sheets. The Company does not guarantee debt for, or have other financial support obligations to, these entities, and its maximum exposure to loss in connection with its continuing involvement with these entities is limited to the carrying value of the investments. Included in the consolidated statement of cash flows for the year ended December 31, 2015, is a return of capital from Windfield of \$98.0 million.

The Company holds a 50% equity interest in Jordan Bromine Company Limited ("JBC"), reported in the Bromine Specialties segment. The Company consolidates this venture as it is considered the primary beneficiary due to its operational and financial control.

Assets of the Trust, in conjunction with our EDCP, are accounted for as trading securities in accordance with authoritative accounting guidance. The assets of the Trust consist primarily of mutual fund investments and are marked-to-market on a monthly basis through the consolidated statements of income. As of December 31, 2016 and 2015, these marketable securities amounted to \$22.0 million and \$21.6 million, respectively.

At December 31, 2016 and 2015, loans receivable from our 50%-owned joint venture, SOCC, totaled approximately \$30.0 million and are included in Other assets in the consolidated balance sheets. Interest on these loans is based on either the London Inter-Bank Offered Rate ("LIBOR") or Saudi Arabia Inter-Bank Offered Rate ("SAIBOR"), plus a margin of 1.275%, per annum. Principal repayments on amounts outstanding under this arrangement are required as mutually agreed upon by the joint venture partners, but with any outstanding balances due in full no later than December 31, 2021.

Our SOCC joint venture in Saudi Arabia, included in our Lithium and Advanced Materials segment, is emerging from the start-up phase and experienced a small net loss as of December 31, 2016, indicating the carrying value potentially may be impaired. As a result, we assessed the recoverability of the investment and related balances in this venture as of December 31, 2016. As of December 31, 2016, the carrying amount of our equity interest in SOCC was \$7.5 million and we had loans receivable from this venture that totaled \$30.0 million. Based on our assessment, we expect to recover the carrying amount of our equity investment and related balances, and concluded that no other-than-temporary impairment exists as of December 31, 2016. In order to fully recover our investment and related balances, we and our venture partner are actively developing strategies to reduce costs and increase volumes at the venture, which would improve the financial performance of the investment.

NOTE 11—Other Assets:

Other assets consist of the following at December 31, 2016 and 2015 (in thousands):

	December 31,	
	2016	2015
Deferred income taxes—noncurrent ^(a)	\$ 61,132	\$ 75,813
Assets related to unrecognized tax benefits ^(a)	15,076	50,875
Long-term advances to joint ventures ^(b)	31,776	31,780
Other	34,336	35,930
Total ^(c)	<u>\$ 142,320</u>	<u>\$ 194,398</u>

(a) See Note 1, "Summary of Significant Accounting Policies" and Note 20, "Income Taxes."

(b) See Note 10, "Investments."

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS

(c) As of December 31, 2015, \$8.6 million of Other Assets were classified as Assets held for sale in the consolidated balance sheets. See Note 3, “Divestitures,” for additional information.

NOTE 12—Goodwill and Other Intangibles:

Goodwill and other intangibles consist principally of goodwill, customer lists, trade names, trademarks, patents and other intangibles.

The following table summarizes the changes in goodwill by reportable segment for the years ended December 31, 2016 and 2015 (in thousands):

	Lithium and Advanced Materials	Bromine Specialties	Refining Solutions	All Other	Total
Balance at December 31, 2014 ^(a)	\$ 21,697	\$ 20,319	\$ 192,657	\$ 8,589	\$ 243,262
Acquisition of Rockwood	1,293,467	—	—	41,151	1,334,618
Reclass to assets held for sale ^(b)	—	—	—	(46,794)	(46,794)
Foreign currency translation adjustments	(47,659)	—	(19,929)	(2,946)	(70,534)
Balance at December 31, 2015 ^{(a)(c)}	1,267,505	20,319	172,728	—	1,460,552
Acquisition of Rockwood ^(d)	(1,706)	—	—	—	(1,706)
Other acquisitions ^(e)	113,555	—	—	—	113,555
Reclass from assets held for sale ^(f)	—	—	—	6,586	6,586
Foreign currency translation adjustments	(31,093)	—	(7,862)	—	(38,955)
Balance at December 31, 2016	<u>\$ 1,348,261</u>	<u>\$ 20,319</u>	<u>\$ 164,866</u>	<u>\$ 6,586</u>	<u>\$ 1,540,032</u>

- (a) The December 31, 2015 and 2014 balances have been recast to reflect a change in segments. See Note 25, “Segment and Geographic Area Information,” for further details.
- (b) Represents Goodwill of the minerals-based flame retardants and specialty chemicals, fine chemistry services and metal sulfides businesses. See Note 3, “Divestitures,” for additional information.
- (c) As of December 31, 2015, \$1.5 billion of Goodwill was classified as Assets held for sale in the consolidated balance sheets. See Note 3, “Divestitures,” for additional information.
- (d) Represents final purchase price adjustments for the Rockwood acquisition recorded for the year ended December 31, 2016. Excludes \$3.2 million of final purchase price adjustments for businesses reported as discontinued operations.
- (e) Represents preliminary purchase price adjustments for the Jiangxi Jiangli New Materials Science and Technology Co. Ltd. acquisition recorded for the year ended December 31, 2016. See Note 2, “Acquisitions,” for additional information.
- (f) Represents Goodwill of the fine chemistry services business, which was reported in Assets held for sale on the consolidated balance sheets as of December 31, 2015, but reclassified back to Goodwill during the year end December 31, 2016. See Note 3, “Divestitures,” for additional information.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS

Other intangibles consist of the following at December 31, 2016 and 2015 (in thousands):

	Customer Lists and Relationships	Trade Names and Trademarks ^(a)	Patents and Technology	Other	Total
Gross Asset Value					
Balance at December 31, 2014	\$ 48,479	\$ 17,555	\$ 40,398	\$ 23,441	\$ 129,873
Acquisition of Rockwood	386,330	—	58,230	—	444,560
Reclass to assets held for sale ^(b)	(16,608)	—	(54,060)	(1,454)	(72,122)
Foreign currency translation adjustments and other	(19,476)	(632)	(4,424)	(4,208)	(28,740)
Balance at December 31, 2015	398,725	16,923	40,144	17,779	473,571
Reclass from assets held for sale ^(c)	—	—	—	1,454	1,454
Foreign currency translation adjustments and other	(10,832)	(409)	(1,710)	(389)	(13,340)
Balance at December 31, 2016	<u>\$ 387,893</u>	<u>\$ 16,514</u>	<u>\$ 38,434</u>	<u>\$ 18,844</u>	<u>\$ 461,685</u>
Accumulated Amortization					
Balance at December 31, 2014	\$ (22,931)	\$ (7,912)	\$ (32,831)	\$ (22,074)	\$ (85,748)
Amortization	(11,441)	(423)	(4,654)	(401)	(16,919)
Reclass to assets held for sale ^(b)	596	—	3,880	1,322	5,798
Foreign currency translation adjustments and other	1,120	249	1,597	4,200	7,166
Balance at December 31, 2015	(32,656)	(8,086)	(32,008)	(16,953)	(89,703)
Amortization	(18,034)	—	(574)	(431)	(19,039)
Reclass from assets held for sale ^(c)	—	—	—	(1,322)	(1,322)
Foreign currency translation adjustments and other	1,525	134	899	385	2,943
Balance at December 31, 2016	<u>\$ (49,165)</u>	<u>\$ (7,952)</u>	<u>\$ (31,683)</u>	<u>\$ (18,321)</u>	<u>\$ (107,121)</u>
Net Book Value at December 31, 2015 ^(d)	<u>\$ 366,069</u>	<u>\$ 8,837</u>	<u>\$ 8,136</u>	<u>\$ 826</u>	<u>\$ 383,868</u>
Net Book Value at December 31, 2016	<u>\$ 338,728</u>	<u>\$ 8,562</u>	<u>\$ 6,751</u>	<u>\$ 523</u>	<u>\$ 354,564</u>

(a) Balances as of December 31, 2015 and 2016 include only indefinite-lived intangible assets.

(b) Represents Other intangibles and related amortization of the minerals-based flame retardants and specialty chemicals, fine chemistry services and metal sulfides businesses. See Note 3, "Divestitures," for additional information.

(c) Represents Other intangibles and related amortization of the fine chemistry services business, which was reported in Assets held for sale on the consolidated balance sheets as of December 31, 2015, but reclassified back to Other intangibles during the year end December 31, 2016. See Note 3, "Divestitures," for additional information.

(d) As of December 31, 2015, \$1.4 billion of Other intangibles, net of amortization were classified as Assets held for sale in the consolidated balance sheets. See Note 3 "Divestitures," for additional information.

Useful lives range from 15 – 25 years for customer lists and relationships; 17 – 20 years for patents and technology; and 5 – 15 years for other.

Amortization of other intangibles amounted to \$19.0 million, \$16.9 million and \$5.7 million for the years ended December 31, 2016, 2015 and 2014, respectively. Included in amortization for the year ended December 31, 2016 and 2015 is \$15.9 million and \$8.7 million, respectively, of amortization using the pattern of economic benefit method. Amortization of other intangibles related to discontinued operations was \$26.3 million, \$60.4 million and \$0.9 million for the years ended December 31, 2016, 2015 and 2014, respectively.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS

Total estimated amortization expense of other intangibles, excluding other intangibles in assets held for sale, for the next five fiscal years is as follows (in thousands):

	Estimated Amortization Expense
2017	\$ 20,714
2018	\$ 22,019
2019	\$ 22,327
2020	\$ 21,671
2021	\$ 21,392

NOTE 13—Accrued Expenses:

Accrued expenses consist of the following at December 31, 2016 and 2015 (in thousands):

	December 31,	
	2016	2015
Employee benefits, payroll and related taxes	\$ 92,478	\$ 91,970
Obligations in connection with acquisitions ^(a)	47,082	128,881
Other ^(b)	182,605	92,408
Total ^(c)	\$ 322,165	\$ 313,259

(a) As of December 31, 2016 included accruals related to net working capital amounts arising from the acquisition of the lithium business of Jiangxi Jiangli New Materials Science and Technology Co. Ltd. The balance as of December 31, 2015 included accruals related to certain litigation matters and businesses divested by Rockwood prior to the Acquisition Closing Date.

(b) No individual component exceeds 5% of total current liabilities.

(c) As of December 31, 2015, \$112.1 million of Accrued expenses were classified as Liabilities held for sale in the consolidated balance sheets. See Note 3, "Divestitures," for additional information.

NOTE 14—Long-Term Debt:

Long-term debt consisted of the following at December 31, 2016 and 2015 (in thousands):

	December 31,	
	2016	2015
Term loan facilities, net of unamortized debt issuance costs of \$2,833 at December 31, 2015	\$ —	\$ 1,247,167
1.875% Senior notes, net of unamortized discount and debt issuance costs of \$7,823 at December 31, 2016 and \$9,904 at December 31, 2015	719,617	759,151
3.00% Senior notes, net of unamortized discount and debt issuance costs of \$1,286 at December 31, 2016 and \$1,726 at December 31, 2015	248,714	248,274
4.15% Senior notes, net of unamortized discount and debt issuance costs of \$3,859 at December 31, 2016 and \$4,346 at December 31, 2015	421,141	420,654
4.50% Senior notes, net of unamortized discount and debt issuance costs of \$2,380 at December 31, 2016 and \$2,982 at December 31, 2015	347,620	347,018
5.45% Senior notes, net of unamortized discount and debt issuance costs of \$4,313 at December 31, 2016 and \$4,468 at December 31, 2015	345,687	345,532
Commercial paper notes	247,503	351,349
Variable-rate foreign bank loans	38,939	77,452
Variable-rate domestic bank loans	—	20,479
Miscellaneous	41	81
Total long-term debt ^(a)	2,369,262	3,817,157
Less amounts due within one year	247,544	674,994
Long-term debt, less current portion	\$ 2,121,718	\$ 3,142,163

(a) As of December 31, 2015, \$20.3 million of long-term debt was classified as Liabilities held for sale in the consolidated balance sheets. See Note 3, "Divestitures," for additional information.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS

As a result of the adoption of new accounting guidance effective January 1, 2016 on a retrospective basis, unamortized debt issuance costs are now deducted from the carrying amount of the associated debt liability on the balance sheet. The reclassification of these unamortized debt issuance costs resulted in reductions of \$17.1 million in Long-term debt and Other assets on the consolidated balance sheets as of December 31, 2015. See Note 1, “Summary of Significant Accounting Policies,” for additional information.

Aggregate annual maturities of long-term debt as of December 31, 2016 are as follows (in millions): 2017—\$247.5; 2018—\$0.0; 2019—\$250.0; 2020—\$388.9; 2021—\$727.4; thereafter—\$775.0.

Senior Notes

In the fourth quarter of 2014, we issued a series of senior notes (collectively, the “2014 Senior Notes”) as follows:

- €700.0 million aggregate principal amount of senior notes, issued on December 8, 2014, bearing interest at a rate of 1.875% payable annually on December 8 of each year, beginning in 2015. The effective interest rate on these senior notes is approximately 2.10%. These senior notes mature on December 8, 2021.
- \$250.0 million aggregate principal amount of senior notes, issued on November 24, 2014, bearing interest at a rate of 3.00% payable semi-annually on June 1 and December 1 of each year, beginning June 1, 2015. The effective interest rate on these senior notes is approximately 3.18%. These senior notes mature on December 1, 2019.
- \$425.0 million aggregate principal amount of senior notes, issued on November 24, 2014, bearing interest at a rate of 4.15% payable semi-annually on June 1 and December 1 of each year, beginning June 1, 2015. The effective interest rate on these senior notes is approximately 5.06%. These senior notes mature on December 1, 2024.
- \$350.0 million aggregate principal amount of senior notes, issued on November 24, 2014, bearing interest at a rate of 5.45% payable semi-annually on June 1 and December 1 of each year, beginning June 1, 2015. The effective interest rate on these senior notes is approximately 5.50%. These senior notes mature on December 1, 2044.

Our \$350.0 million aggregate principal amount of senior notes, issued on December 10, 2010, bear interest at a rate of 4.50% payable semi-annually on June 15 and December 15 of each year. The effective interest rate on these senior notes is approximately 4.70%. These senior notes mature on December 15, 2020.

Through February 2017, using a portion of the proceeds from the sale of the Chemetall Surface Treatment business, we repaid the 3.00% Senior notes in full, €307.0 million of the 1.875% Senior notes and \$174.7 million of the 4.50% Senior notes, as well as related tender premiums of \$45.2 million.

Upon completion of the Rockwood acquisition, we assumed Rockwood’s senior notes with an aggregate principal amount of \$1.25 billion. Under the terms of the indenture governing the senior notes, as amended and supplemented, on October 15, 2015, our wholly-owned subsidiary, Rockwood Specialties Group, Inc., redeemed all of the outstanding Rockwood senior notes at a redemption price equal to 103.469% of the principal amount of the notes, representing a premium of \$43.3 million, plus accrued and unpaid interest to the redemption date. The guarantees of these senior notes and the 2014 Senior Notes were released upon repayment of these senior notes. Included in Interest and financing expenses in our consolidated statements of income and Other, net, in our consolidated statements of cash flows for the year ended December 31, 2015 is a loss on early extinguishment of approximately \$5.4 million related to these senior notes.

Our \$325.0 million aggregate principal amount of senior notes, which were issued on January 20, 2005 and bore interest at a rate of 5.10%, matured and were repaid on February 1, 2015. The effective interest rate on these senior notes was approximately 5.19%. As a result of the refinancing of these senior notes prior to December 31, 2014, these senior notes were included in Current portion of long-term debt at December 31, 2014.

In anticipation of refinancing our 5.10% senior notes in the fourth quarter of 2014, on January 22, 2014, we entered into a pay fixed, receive variable rate forward starting interest rate swap with J.P. Morgan Chase Bank, N.A., to be effective October 15, 2014. Our risk management objective and strategy for undertaking this hedge was to eliminate the variability in the interest rate and partial credit spread on the 20 future semi-annual coupon payments that we will pay in connection with our 4.15% senior notes. The notional amount of the swap was \$325.0 million and the fixed rate was 3.281%, with the cash settlement determined by reference to the changes in the U.S. Dollar 3-month LIBOR and credit spreads from the date we entered into the swap until the date the swap was settled (October 15, 2014). This derivative financial instrument was designated and accounted for as a cash flow hedge under ASC 815, *Derivatives and Hedging*. We determined there was no ineffectiveness during the term of the swap. On October 15, 2014, the swap was settled, resulting in a payment to the counterparty of \$33.4 million. This amount was recorded in Accumulated other comprehensive (loss) income and is being amortized to interest expense over the life of the 4.15% senior notes. The amount to be reclassified to interest expense from Accumulated other comprehensive (loss) income during the next twelve months is approximately \$3.3 million.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS

In connection with the offering of the 1.875% Euro-denominated senior notes which were priced on December 1, 2014, we entered into two forward contracts on November 24, 2014, each with a notional value of €350.0 million, to exchange a total of €700.0 million for U.S. Dollars, with settlement occurring on December 18, 2014, and with the total notional value representing an amount equivalent to the gross proceeds from the offering of the 1.875% Euro-denominated senior notes. The objective of entering into these forward contracts was to minimize the financial impact of changes in the Euro-to-U.S. Dollar exchange rate with respect to our foreign subsidiaries where the Euro serves as the functional currency. From the effective date of the contracts until the date of settlement, the forward contracts were designated as effective hedges of our net investment in these foreign subsidiaries. Upon settlement, a gain of \$5.2 million was recorded in accumulated other comprehensive (loss) income, and such amount is expected to remain in accumulated other comprehensive (loss) income until the complete or substantially complete liquidation of our investment in these foreign subsidiaries. On December 18, 2014, the carrying value of the 1.875% Euro-denominated senior notes was designated as an effective hedge of our net investment in foreign subsidiaries where the Euro serves as the functional currency, and beginning on the date of designation, gains or losses on the revaluation of these senior notes to our reporting currency have been and will be recorded in accumulated other comprehensive (loss) income. During the years ended December 31, 2016 and 2015, gains of \$26.1 million and \$50.9 million were recorded in accumulated other comprehensive (loss) income in connection with the revaluation of these senior notes to our reporting currency.

September 2015 Term Loan Agreement

The senior notes we assumed from Rockwood were repaid with proceeds from a new term loan agreement we entered into on September 14, 2015 (the “September 2015 Term Loan Agreement”) with JPMorgan Chase Bank, N.A. (the “Administrative Agent”) and certain other lenders. The September 2015 Term Loan Agreement provided for borrowings under a 364-day term loan facility (the “364-Day Facility”) and a five-year term loan facility (the “Five-Year Facility”), or collectively, the “Term loan facilities.” During the year ended December 31, 2016, the Company repaid the 364-Day Facility and Five-Year Facility in full, primarily with proceeds from the sales of the Chemetall Surface Treatment business, the metal sulfides business and the minerals-based flame retardants and specialty chemicals business. The interest rate on both Term loan facilities was LIBOR plus 1.375%.

Credit Agreement

Our revolving, unsecured credit agreement dated as of February 7, 2014, as amended, (the “February 2014 Credit Agreement”) currently provides for borrowings of up to \$1.0 billion and matures on February 7, 2020. Borrowings bear interest at variable rates based on the LIBOR for deposits in the relevant currency plus an applicable margin which ranges from 1.000% to 1.700%, depending on the Company’s credit rating from Standard & Poor’s Ratings Services (“S&P”), Moody’s Investors Services (“Moody’s”) and Fitch Ratings (“Fitch”). The applicable margin on the facility was 1.300% as of December 31, 2016.

Borrowings under the February 2014 Credit Agreement are conditioned upon compliance with the following covenants: (a) consolidated funded debt, as defined in the agreement, must be less than or equal to 3.50 times consolidated EBITDA, as defined in the agreement, (which reflects adjustments for certain non-recurring or unusual items such as acquisition and integration related costs, utilization of inventory markup, gains or losses on sales of businesses, restructuring charges, facility divestiture charges and other significant non-recurring items), or herein “consolidated adjusted EBITDA,” as of the end of any fiscal quarter; (b) with the exception of certain liens as specified in the agreement, liens may not attach to assets when the aggregate amount of all indebtedness secured by such liens plus unsecured subsidiary indebtedness, other than indebtedness incurred by our subsidiaries under the February 2014 Credit Agreement, would exceed 20% of consolidated net worth, as defined in the agreement; and (c) with the exception of certain indebtedness as specified in the agreement, subsidiary indebtedness may not exceed the difference between 20% of consolidated net worth, as defined in the agreement, and indebtedness secured by liens permitted under the agreement.

In January 2015, we borrowed \$250.0 million under the February 2014 Credit Agreement in connection with the acquisition of Rockwood, and such amount was repaid in full in February 2015. As of December 31, 2016, there were no borrowings outstanding under the February 2014 Credit Agreement.

Commercial Paper Notes

On May 29, 2013, we entered into agreements to initiate a commercial paper program on a private placement basis under which we may issue unsecured commercial paper notes (the “Commercial Paper Notes”) from time-to-time up to a maximum aggregate principal amount outstanding at any time of \$750.0 million. The proceeds from the issuance of the Commercial Paper Notes are expected to be used for general corporate purposes, including the repayment of other debt of the Company. Our February 2014 Credit Agreement is available to repay the Commercial Paper Notes, if necessary. Aggregate borrowings outstanding under the February 2014 Credit Agreement and the Commercial Paper Notes will not exceed the \$1.0 billion current maximum amount available under the February 2014 Credit Agreement. The Commercial Paper Notes will be sold at a

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS

discount from par, or alternatively, will be sold at par and bear interest at rates that will vary based upon market conditions at the time of issuance. The maturities of the Commercial Paper Notes will vary but may not exceed 397 days from the date of issue. The definitive documents relating to the commercial paper program contain customary representations, warranties, default and indemnification provisions. Using a portion of the proceeds from the sale of the Chemetall Surface Treatment business, we repaid approximately \$153 million of Commercial Paper Notes in December 2016. At December 31, 2016, we had \$247.5 million of Commercial Paper Notes outstanding bearing a weighted-average interest rate of approximately 1.46% and a weighted-average maturity of 37 days.

August 2014 Term Loan Agreement and Cash Bridge Facility

On August 15, 2014, we entered into a term loan credit agreement (the “August 2014 Term Loan Agreement”) providing for a tranche of senior unsecured term loan in an aggregate amount of \$1.0 billion that were intended to be used as short-term borrowings to fund a portion of the cash consideration for the Rockwood acquisition and pay related fees and expenses. In January 2015, we borrowed and repaid \$1.0 billion and \$816.5 million, respectively, under the August 2014 Term Loan Agreement. In February 2015, the remaining balance outstanding was repaid in full. The weighted-average interest rate on borrowings under the August 2014 Term Loan Agreement was approximately 1.67%.

On December 2, 2014, we entered into an agreement for a senior unsecured cash bridge facility (the “Cash Bridge Facility”) pursuant to which the lenders thereunder would provide up to \$1.15 billion in loans intended to be used as short-term borrowings to fund a portion of the cash consideration for the Rockwood acquisition and pay related fees and expenses, with maturity 60 days following the completion of the Rockwood acquisition. In January 2015, we borrowed and repaid \$800.0 million under the Cash Bridge Facility. The weighted-average interest rate on borrowings under the Cash Bridge Facility was approximately 1.67%.

Structuring and underwriting fees of approximately \$19.0 million were paid in 2014 in connection with bridge financing arrangements, which are reflected in Other, net, in our consolidated statements of cash flows. These costs were capitalized and were expensed over the term of the facilities or until the date at which permanent financing was obtained and the facilities were eliminated. Accordingly, we expensed \$16.7 million in 2014 and \$2.3 million in 2015, which is reflected in Other income(expenses), net, in the consolidated statements of income and Other, net, in our consolidated statements of cash flows.

Financing Costs

Debt financing costs paid in 2014 in connection with the 2014 Senior Notes, August 2014 Term Loan Agreement and February 2014 Credit Agreement were \$17.6 million. In 2015, we paid approximately \$4.5 million of debt financing costs primarily related to the 2014 Senior Notes, the September 2015 Term Loan Agreement and amendments to the February 2014 Credit Agreement.

Other

We have additional uncommitted credit lines with various U.S. and foreign financial institutions that provide for borrowings of up to approximately \$263 million at December 31, 2016. Outstanding borrowings under these agreements were \$38.9 million and \$97.9 million at December 31, 2016 and 2015, respectively. The average interest rate on borrowings under these agreements during 2016, 2015 and 2014 was approximately 0.94%, 0.74% and 0.83%, respectively.

At December 31, 2016 and 2015, we had the ability and intent to refinance our borrowings under our other existing credit lines with borrowings under the February 2014 Credit Agreement. Therefore, the amounts outstanding under those credit lines, if any, are classified as long-term debt at December 31, 2016 and 2015. At December 31, 2016, we had the ability to borrow \$752.5 million under our commercial paper program and the February 2014 Credit Agreement.

We believe that as of December 31, 2016, we were, and currently are, in compliance with all of our debt covenants.

NOTE 15—Pension Plans and Other Postretirement Benefits:

We maintain various noncontributory defined benefit pension plans covering certain employees, primarily in the U.S., the U.K., Germany and Japan. In connection with the acquisition of Rockwood, in the first quarter of 2015 we assumed the obligations of various defined benefit pension plans that were maintained by Rockwood which cover certain employees, primarily in the U.S., the U.K. and Germany. We also have a contributory defined benefit plan covering certain Belgian employees. The benefits for these plans are based primarily on compensation and/or years of service. Our U.S. and U.K. defined benefit plans for non-represented employees are closed to new participants, with no additional benefits accruing under these plans as participants’ accrued benefits have been frozen. The funding policy for each plan complies with the requirements

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS

of relevant governmental laws and regulations. The pension information for all periods presented includes amounts related to salaried and hourly plans.

The following provides a reconciliation of benefit obligations, plan assets and funded status, as well as a summary of significant assumptions, for our defined benefit pension plans (in thousands):

	Year Ended December 31, 2016		Year Ended December 31, 2015	
	U.S. Pension Plans	Foreign Pension Plans	U.S. Pension Plans	Foreign Pension Plans
Change in benefit obligations:				
Benefit obligation at January 1	\$ 682,839	\$ 245,747	\$ 729,652	\$ 53,112
Service cost	1,028	3,133	1,233	3,909
Interest cost	30,514	6,570	30,235	6,405
Plan amendments	—	—	—	864
Actuarial loss (gain)	7,357	28,083	(54,140)	(30,978)
Benefits paid	(56,050)	(9,793)	(37,512)	(11,283)
Acquisitions	—	—	13,371	270,618
Divestitures	—	(6,372)	—	—
Reclass to liabilities held for sale	—	—	—	(26,608)
Employee contributions	—	245	—	256
Foreign exchange gain	—	(21,724)	—	(20,105)
Settlements/curtailments	—	(427)	—	(161)
Other	—	818	—	(282)
Benefit obligation at December 31	<u>\$ 665,688</u>	<u>\$ 246,280</u>	<u>\$ 682,839</u>	<u>\$ 245,747</u>
Change in plan assets:				
Fair value of plan assets at January 1	\$ 555,084	\$ 64,911	\$ 598,250	\$ 9,444
Actual return on plan assets	37,725	12,534	(16,306)	630
Employer contributions	1,323	10,911	1,398	11,864
Benefits paid	(56,050)	(9,793)	(37,512)	(11,283)
Acquisitions	—	—	9,254	56,418
Employee contributions	—	245	—	256
Foreign exchange loss	—	(10,492)	—	(2,189)
Settlements/curtailments	—	—	—	(161)
Other	—	559	—	(68)
Fair value of plan assets at December 31	<u>\$ 538,082</u>	<u>\$ 68,875</u>	<u>\$ 555,084</u>	<u>\$ 64,911</u>
Funded status at December 31	<u>\$ (127,606)</u>	<u>\$ (177,405)</u>	<u>\$ (127,755)</u>	<u>\$ (180,836)</u>

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS

	December 31, 2016		December 31, 2015	
	U.S. Pension Plans	Foreign Pension Plans	U.S. Pension Plans	Foreign Pension Plans
Amounts recognized in consolidated balance sheets:				
Current liabilities (accrued expenses)	\$ (1,100)	\$ (5,216)	\$ (1,110)	\$ (7,498)
Noncurrent liabilities (pension benefits)	(126,506)	(172,189)	(126,645)	(173,338)
Net pension liability	<u>\$ (127,606)</u>	<u>\$ (177,405)</u>	<u>\$ (127,755)</u>	<u>\$ (180,836)</u>
Amounts recognized in accumulated other comprehensive income (loss):				
Prior service benefit	\$ (136)	\$ (322)	\$ (211)	\$ (1,046)
Net amount recognized	<u>\$ (136)</u>	<u>\$ (322)</u>	<u>\$ (211)</u>	<u>\$ (1,046)</u>
Weighted-average assumptions used to determine benefit obligations at December 31:				
Discount rate	4.43%	2.00%	4.67%	2.76%
Rate of compensation increase	—%	3.18%	—%	3.16%

The accumulated benefit obligation for all defined benefit pension plans was \$901.4 million and \$916.7 million at December 31, 2016 and 2015, respectively.

Postretirement medical benefits and life insurance is provided for certain groups of U.S. retired employees. Medical and life insurance benefit costs have been funded principally on a pay-as-you-go basis. Although the availability of medical coverage after retirement varies for different groups of employees, the majority of employees who retire before becoming eligible for Medicare can continue group coverage by paying a portion of the cost of a monthly premium designed to cover the claims incurred by retired employees subject to a cap on payments allowed. The availability of group coverage for Medicare-eligible retirees also varies by employee group with coverage designed either to supplement or coordinate with Medicare. Retirees generally pay a portion of the cost of the coverage. Plan assets for retiree life insurance are held under an insurance contract and are reserved for retiree life insurance benefits. In 2005, the postretirement medical benefit available to U.S. employees was changed to provide that employees who are under age 50 as of December 31, 2005 would no longer be eligible for a company-paid retiree medical premium subsidy. Employees who are of age 50 and above as of December 31, 2005 and who retire after January 1, 2006 will have their retiree medical premium subsidy capped. Effective January 1, 2008, our medical insurance for certain groups of U.S. retired employees is now insured through a medical carrier.

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The following provides a reconciliation of benefit obligations, plan assets and funded status, as well as a summary of significant assumptions, for our postretirement benefit plans (in thousands):

	Year Ended December 31,	
	2016	2015
	Other Postretirement Benefits	Other Postretirement Benefits
Change in benefit obligations:		
Benefit obligation at January 1	\$ 56,499	\$ 64,500
Service cost	115	137
Interest cost	2,483	2,573
Actuarial loss (gain)	1,529	(5,690)
Benefits paid	(4,485)	(5,021)
Benefit obligation at December 31	<u>\$ 56,141</u>	<u>\$ 56,499</u>
Change in plan assets:		
Fair value of plan assets at January 1	\$ 3,292	\$ 4,439
Actual return on plan assets	442	280
Employer contributions	2,983	3,594
Benefits paid	(4,485)	(5,021)
Fair value of plan assets at December 31	<u>\$ 2,232</u>	<u>\$ 3,292</u>
Funded status at December 31	<u>\$ (53,909)</u>	<u>\$ (53,207)</u>
	December 31,	
	2016	2015
	Other Postretirement Benefits	Other Postretirement Benefits
Amounts recognized in consolidated balance sheets:		
Current liabilities (accrued expenses)	\$ (3,371)	\$ (3,560)
Noncurrent liabilities (postretirement benefits)	(50,538)	(49,647)
Net postretirement liability	<u>\$ (53,909)</u>	<u>\$ (53,207)</u>
Amounts recognized in accumulated other comprehensive income (loss):		
Prior service benefit	\$ 143	\$ 239
Net amount recognized	<u>\$ 143</u>	<u>\$ 239</u>
Weighted-average assumptions used to determine benefit obligations at December 31:		
Discount rate	4.35%	4.59%
Rate of compensation increase	3.50%	3.50%

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS

The components of pension benefits cost (credit) from continuing operations are as follows (in thousands):

	Year Ended December 31, 2016		Year Ended December 31, 2015		Year Ended December 31, 2014	
	U.S. Pension Plans	Foreign Pension Plans	U.S. Pension Plans	Foreign Pension Plans	U.S. Pension Plans	Foreign Pension Plans
Service cost	\$ 1,028	\$ 3,133	\$ 1,233	\$ 3,909	\$ 7,029	\$ 1,746
Interest cost	30,514	6,570	30,235	6,405	30,491	1,571
Expected return on assets	(36,445)	(4,027)	(40,495)	(3,670)	(39,714)	(427)
Actuarial loss (gain)	5,988	19,418	2,665	(27,043)	116,705	10,270
Amortization of prior service benefit	75	859	75	43	(727)	50
Total net pension benefits cost (credit) ^(a)	\$ 1,160	\$ 25,953	\$ (6,287)	\$ (20,356)	\$ 113,784	\$ 13,210
Weighted-average assumption percentages:						
Discount rate	4.67%	2.76%	4.19%	2.22%	5.14%	3.41%
Expected return on plan assets	6.89%	6.66%	6.88%	5.76%	6.91%	4.00%
Rate of compensation increase	—%	3.16%	—%	3.15%	3.50%	3.16%

(a) For the years ended December 31, 2016 and 2015, \$10.8 million and \$6.2 million, respectively, of net pension benefits credit is included in Income (loss) from discontinued operations (net of tax) in the consolidated statements of income. See Note 3, "Divestitures," for additional information.

Effective January 1, 2017, the weighted-average expected rate of return on plan assets for the U.S. and foreign defined benefit pension plans is 6.89% and 6.16%, respectively.

The estimated amounts to be amortized from accumulated other comprehensive loss into net periodic pension costs during 2017 are as follows (in thousands):

	U.S. Pension Plans	Foreign Pension Plans
Amortization of prior service benefit	\$ 75	\$ 36

The components of postretirement benefits cost (credit) from continuing operations are as follows (in thousands):

	Year Ended December 31,		
	2016	2015	2014
	Other Postretirement Benefits	Other Postretirement Benefits	Other Postretirement Benefits
Service cost	\$ 115	\$ 137	\$ 216
Interest cost	2,483	2,573	3,040
Expected return on assets	(187)	(263)	(342)
Actuarial loss (gain)	1,275	(5,707)	3,868
Amortization of prior service benefit	(95)	(95)	(95)
Total net postretirement benefits cost (credit) ^(a)	\$ 3,591	\$ (3,355)	\$ 6,687
Weighted-average assumption percentages:			
Discount rate	4.59%	4.15%	5.03%
Expected return on plan assets	7.00%	7.00%	7.00%
Rate of compensation increase	3.50%	3.50%	3.50%

(a) For the year ended December 31, 2015, \$2.6 million of net postretirement benefits credit is included in Income (loss) from discontinued operations (net of tax) in the consolidated statements of income. See Note 3, "Divestitures," for additional information.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS

Effective January 1, 2017, the weighted-average expected rate of return on plan assets for our postretirement benefit plans is 7.00%.

The estimated amounts to be amortized from accumulated other comprehensive loss into net periodic postretirement costs during 2017 are as follows (in thousands):

	Other Postretirement Benefits
Amortization of prior service benefit	\$ (95)

Fair value is defined as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date (exit price). The inputs used to measure fair value are classified into the following hierarchy:

- Level 1 Unadjusted quoted prices in active markets for identical assets or liabilities
- Level 2 Unadjusted quoted prices in active markets for similar assets or liabilities, or unadjusted quoted prices for identical or similar assets or liabilities in markets that are not active, or inputs other than quoted prices that are observable for the asset or liability
- Level 3 Unobservable inputs for the asset or liability

We endeavor to utilize the best available information in measuring fair value. Financial assets and liabilities are classified in their entirety based on the lowest level of input that is significant to the fair value measurement. Transfers between levels of the fair value hierarchy are deemed to have occurred on the date of the event or change in circumstance that caused the transfer. There were no transfers between Levels 1 and 2 during the year ended December 31, 2016. Investments for which market quotations are readily available are valued at the closing price on the last business day of the year. Listed securities for which no sale was reported on such date are valued at the mean between the last reported bid and asked price. Securities traded in the over-the-counter market are valued at the closing price on the last business day of the year or at bid price. The net asset value of shares or units is based on the quoted market value of the underlying assets. The market value of corporate bonds is based on institutional trading lots and is most often reflective of bid price. Government securities are valued at the mean between bid and ask prices. Holdings in private equity securities are typically valued using the net asset valuations provided by the underlying private investment companies.

The following tables set forth the assets of our pension and postretirement plans that were accounted for at fair value on a recurring basis as of December 31, 2016 and 2015 (in thousands):

	December 31, 2016	Quoted Prices in Active Markets for Identical Items (Level 1)	Quoted Prices in Active Markets for Similar Items (Level 2)	Unobservable Inputs (Level 3)
Pension Assets:				
Domestic Equity ^(a)	\$ 146,683	\$ 143,987	\$ 2,696	\$ —
International Equity ^(b)	116,649	83,839	32,810	—
Fixed Income ^(c)	255,401	230,309	25,092	—
Absolute Return Measured at Net Asset Value ^(d)	86,112	—	—	—
Cash	2,112	2,112	—	—
Total Pension Assets	<u>\$ 606,957</u>	<u>\$ 460,247</u>	<u>\$ 60,598</u>	<u>\$ —</u>
Postretirement Assets:				
Fixed Income ^(c)	<u>\$ 2,232</u>	<u>\$ —</u>	<u>\$ 2,232</u>	<u>\$ —</u>

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS

	December 31, 2015	Quoted Prices in Active Markets for Identical Items (Level 1)	Quoted Prices in Active Markets for Similar Items (Level 2)	Unobservable Inputs (Level 3)
Pension Assets:				
Domestic Equity ^(a)	\$ 163,408	\$ 161,075	\$ 2,333	\$ —
International Equity ^(b)	115,949	84,019	31,930	—
Fixed Income ^(c)	254,560	231,411	23,149	—
Absolute Return Measured at Net Asset Value ^(d)	80,746	—	—	—
Cash	5,332	5,332	—	—
Total Pension Assets	<u>\$ 619,995</u>	<u>\$ 481,837</u>	<u>\$ 57,412</u>	<u>\$ —</u>
Postretirement Assets:				
Fixed Income ^(c)	<u>\$ 3,292</u>	<u>\$ —</u>	<u>\$ 3,292</u>	<u>\$ —</u>

- (a) Consists primarily of U.S. stock funds that track or are actively managed and measured against the S&P 500 index.
- (b) Consists primarily of international equity funds which invest in common stocks and other securities whose value is based on an international equity index or an underlying equity security or basket of equity securities.
- (c) Consists primarily of debt obligations issued by governments, corporations, municipalities and other borrowers. Also includes insurance policies.
- (d) Consists primarily of funds with holdings in private investment companies. See additional information about the Absolute Return investments below. Holdings in private investment companies are measured at fair value using the net asset value per share as a practical expedient and have not been categorized in the fair value hierarchy as a result of the adoption of new accounting guidance effective January 1, 2016 on a retrospective basis. The fair value amounts of \$86.1 million and \$80.7 million as of December 31, 2016 and 2015, respectively, are included in this table to permit reconciliation to the reconciliation of plan assets table above. See Note 1, "Summary of Significant Accounting Policies," for additional information.

The Company's pension plan assets in the U.S. and U.K. represent approximately 98% of the total pension plan assets. The investment objective of these pension plan assets is to achieve solid returns while preserving capital to meet current plan cash flow requirements. Assets should participate in rising markets, with defensive action in declining markets expected to an even greater degree. Depending on market conditions, the broad asset class targets may range up or down by approximately 10%. These asset classes include but are not limited to hedge fund of funds, bonds and other fixed income vehicles, high yield fixed income securities, equities and distressed debt. At December 31, 2016 and 2015, equity securities held by our pension and OPEB plans did not include direct ownership of Albemarle common stock.

The weighted-average target allocations as of the measurement date are as follows:

	<u>Target Allocation</u>
Equity securities	44%
Fixed income	42%
Absolute return	13%
Other	1%

Our Absolute Return investments consist primarily of our investments in hedge fund of funds. These are holdings in private investment companies with fair values that are based on significant unobservable inputs including assumptions where there is little, if any, market activity for the investment. Investment managers or fund managers associated with these investments provide valuations of the investments on a monthly basis utilizing the net asset valuation approach for determining fair values. These valuations are reviewed by the Company for reasonableness based on applicable sector, benchmark and company performance to validate the appropriateness of the net asset values as a fair value measurement. Where available, audited financial statements are obtained and reviewed for the investments as support for the manager's investment valuation. In general, the investment objective of these funds is high risk-adjusted returns with an emphasis on preservation of capital. The investment strategies of each of the funds vary; however, the objective of our Absolute Return investments is complementary to the overall investment objective of our U.S. pension plan assets.

We made contributions to our defined benefit pension and OPEB plans of \$20.1 million, \$21.6 million and \$13.9 million during the years ended December 31, 2016, 2015 and 2014, respectively, related to continuing and discontinued operations. We expect contributions to our domestic nonqualified and foreign qualified and nonqualified pension plans to approximate \$10

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million in 2017. Also, we expect to pay approximately \$3 million in premiums to our U.S. postretirement benefit plan in 2017. However, we may choose to make additional voluntary pension contributions in excess of these amounts.

The current forecast of benefit payments, which reflects expected future service, amounts to (in millions):

	U.S. Pension Plans	Foreign Pension Plans	Other Postretirement Benefits
2017	\$ 39.6	\$ 9.2	\$ 4.7
2018	\$ 40.9	\$ 8.7	\$ 4.5
2019	\$ 41.9	\$ 8.2	\$ 4.3
2020	\$ 42.7	\$ 9.0	\$ 4.0
2021	\$ 43.1	\$ 9.6	\$ 3.8
2022-2026	\$ 219.2	\$ 51.2	\$ 18.2

We have a supplemental executive retirement plan (“SERP”), which provides unfunded supplemental retirement benefits to certain management or highly compensated employees. The SERP provides for incremental pension benefits to offset the limitations imposed on qualified plan benefits by federal income tax regulations. Costs (credits) relating to our SERP were \$1.6 million, (\$2.1) million and \$7.3 million for the years ended December 31, 2016, 2015 and 2014, respectively. The projected benefit obligation for the SERP recognized in the consolidated balance sheets at December 31, 2016 and 2015 was \$23.5 million and \$23.1 million, respectively. The benefit expenses and obligations of this SERP are included in the tables above. Benefits of \$1.1 million are expected to be paid to SERP retirees in 2017. On October 1, 2012, our Board of Directors approved amendments to the SERP, such that effective December 31, 2014, no additional benefits shall accrue under this plan and participants’ accrued benefits shall be frozen as of that date to reflect the same changes as were made under the U.S. qualified defined benefit plan.

At December 31, 2016, the assumed rate of increase in the pre-65 and post-65 per capita cost of covered health care benefits for U.S. retirees was zero as the employer-paid premium caps (pre-65 and post-65) were met starting January 1, 2013.

Defined Contribution Plans

On March 31, 2004, a new defined contribution pension plan benefit was adopted under the qualified defined contribution plan for U.S. non-represented employees hired after March 31, 2004. On October 1, 2012 our Board of Directors approved certain plan amendments, such that effective January 1, 2013, the defined contribution pension plan benefit is expanded to include non-represented employees hired prior to March 31, 2004, and revised the contribution for all participants to be based on 5% of eligible employee compensation. The employer portion of contributions to our U.S. defined contribution pension plan amounted to \$15.1 million, \$12.8 million, and \$8.4 million in 2016, 2015 and 2014, respectively.

Certain of our employees participate in our defined contribution 401(k) employee savings plan, which is generally available to all U.S. full-time salaried and non-union hourly employees and to employees who are covered by a collective bargaining agreement that provides for such participation. This U.S. defined contribution plan is funded with contributions made by the participants and us. Our contributions to the 401(k) plan amounted to \$12.7 million, \$11.7 million and \$10.0 million in 2016, 2015 and 2014, respectively. Contributions for 2015 include our contributions to Rockwood’s former 401(k) plan which was merged into Albemarle’s 401(k) plan effective December 1, 2015.

In 2006, we formalized a new plan in the Netherlands similar to a collective defined contribution plan. The collective defined contribution plan is supported by annuity contracts through an insurance company. The insurance company unconditionally undertakes the legal obligation to provide specific benefits to specific individuals in return for a fixed amount of premiums. Our obligation under this plan is limited to a variable calculated employer match for each participant plus an additional fixed amount of contributions to assist in covering estimated cost of living and salary increases (indexing) and administrative costs for the overall plan. We paid approximately \$9.5 million, \$7.2 million and \$10.1 million in 2016, 2015 and 2014, respectively, in annual premiums and related costs pertaining to this plan.

Multiemployer Plan

Certain current and former employees of Rockwood participate in a multiemployer plan in Germany, the Pensionskasse Dynamit Nobel Versicherungsverein auf Gegenseitigkeit, Troisdorf (“DN Pensionskasse”), that provides monthly payments in the case of disability, death or retirement. The risks of participating in a multiemployer plan are different from single-employer plans in the following ways: (a) assets contributed to the multiemployer plan by one employer may be used to provide benefits

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to employees of other participating employers, and (b) if a participating employer stops contributing to the plan, the unfunded obligation of the plan may be borne by remaining participating employers.

Some participants in the plan are subject to collective bargaining arrangements, which have no fixed expiration date. The contribution and benefit levels are not negotiated or significantly influenced by these collective bargaining arrangements. Also, the benefit levels generally are not subject to reduction. Under German insurance law, the DN Pensionskasse must be fully funded at all times. The DN Pensionskasse was fully funded as of December 31, 2015, the date of the most recently available information for the plan. This funding level would correspond to the highest funding zone status (at least 80% funded) under U.S. pension regulation. Since the plan liabilities need to be fully funded at all times according to local funding requirements, it is unlikely that the DN Pensionskasse plan will fail to fulfill its obligations, however, in such an event, the Company is liable for the benefits of its employees who participate in the plan. Additional information of the DN Pensionskasse is available in the public domain.

The majority of the Company's contributions are tied to employees' contributions, which are generally calculated as a percentage of base compensation, up to a certain statutory ceiling. Our contributions to this plan for continuing and discontinued operations were €2.7 million (approximately \$3.0 million and \$3.1 million) during the years ended December 31, 2016 and 2015, respectively. The Company's contributions represented more than 5% of total contributions to the DN Pensionskasse in 2016. Effective July 1, 2016, the DN Pensionskasse is subject to a financial improvement plan which expires on December 31, 2022. This financial improvement plan calls for increased capital reserves to avoid future underfunding risk. The value of the additional funding for the year ended December 31, 2016 required under the financial improvement plan is determined upon the completion of the annual financial statements and are payable in the second quarter of 2017. For the remaining years of the financial improvement plan, a portion of the additional funding necessary for the year will be based on an estimate prepared on September 30 of each year and payable in the fourth quarter of each year. The remaining annual amount of additional funding necessary will be determined upon the completion of the annual financial statements and is payable in the second quarter of the following year.

NOTE 16—Other Noncurrent Liabilities:

Other noncurrent liabilities consist of the following at December 31, 2016 and 2015 (in thousands):

	December 31,	
	2016	2015
Liabilities related to uncertain tax positions ^(a)	\$ 27,919	\$ 101,677
Executive deferred compensation plan obligation	22,037	21,631
Environmental liabilities ^(b)	32,595	29,993
Asset retirement obligations ^(b)	36,296	37,230
Tax indemnification liability ^(c)	38,255	—
Other ^(d)	37,708	48,573
Total ^(e)	<u>\$ 194,810</u>	<u>\$ 239,104</u>

(a) See Note 20, "Income Taxes."

(b) See Note 17, "Commitments and Contingencies."

(c) Indemnification of certain income and non-income tax liabilities associated with the Chemetall Surface Treatment entities sold.

(d) No individual component exceeds 5% of total liabilities.

(e) As of December 31, 2015, \$20.2 million of Other noncurrent liabilities were classified as Liabilities held for sale in the consolidated balance sheets. See Note 3, "Divestitures," for additional information.

NOTE 17—Commitments and Contingencies:

In the ordinary course of business, we have commitments in connection with various activities. We believe that amounts recorded are adequate for known items which might become due in the current year. The most significant commitments are as follows:

Environmental

We had the following activity in our recorded environmental liabilities for the years ended December 31, 2016, 2015 and 2014 (in thousands):

	Year Ended December 31,		
	2016	2015	2014
Balance, beginning of year	\$ 31,436	\$ 9,235	\$ 16,599
Expenditures	(2,667)	(4,039)	(4,548)
Acquisition of Rockwood	—	34,626	—
Divestitures	—	(1,826)	(1,954)
Accretion of discount	793	902	—
Additions and revisions of estimates	4,004	150	34
Reclass to liabilities held for sale ^(a)	—	(5,253)	—
Foreign currency translation adjustments and other	1,353	(2,359)	(896)
Balance, end of year ^(b)	34,919	31,436	9,235
Less amounts reported in Accrued expenses	2,324	1,443	4,394
Amounts reported in Other noncurrent liabilities	\$ 32,595	\$ 29,993	\$ 4,841

(a) Represents environmental liabilities of the metal sulfides and minerals-based flame retardants and specialty chemicals businesses. See Note 3, “Divestitures,” for additional information.

(b) As of December 31, 2015, \$3.9 million of environmental liabilities were classified as Liabilities held for sale in the consolidated balance sheets. See Note 3, “Divestitures,” for additional information.

Environmental remediation liabilities included discounted liabilities of \$22.8 million and \$22.0 million at December 31, 2016 and 2015, respectively, discounted at rates with a weighted-average of 3.5%, with the undiscounted amount totaling \$61.1 million and \$59.5 million at December 31, 2016 and 2015, respectively. For certain locations where the Company is operating groundwater monitoring and/or remediation systems, prior owners or insurers have assumed all or most of the responsibility.

The amounts recorded represent our future remediation and other anticipated environmental liabilities. These liabilities typically arise during the normal course of our operational and environmental management activities or at the time of acquisition of the site, and are based on internal analysis as well as input from outside consultants. As evaluations proceed at each relevant site, changes in risk assessment practices, remediation techniques and regulatory requirements can occur, therefore such liability estimates may be adjusted accordingly. The timing and duration of remediation activities at these sites will be determined when evaluations are completed. Although it is difficult to quantify the potential financial impact of these remediation liabilities, management estimates (based on the latest available information) that there is a reasonable possibility that future environmental remediation costs associated with our past operations, in excess of amounts already recorded, could be up to approximately \$16 million before income taxes.

We believe that any sum we may be required to pay in connection with environmental remediation matters in excess of the amounts recorded would likely occur over a period of time and would likely not have a material adverse effect upon our results of operations, financial condition or cash flows on a consolidated annual basis although any such sum could have a material adverse impact on our results of operations, financial condition or cash flows in a particular quarterly reporting period.

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Asset Retirement Obligations

The following is a reconciliation of our beginning and ending asset retirement obligation balances for 2016 and 2015 (in thousands):

	Year Ended December 31,	
	2016	2015
Balance, beginning of year	\$ 37,230	\$ 15,085
Acquisition of Rockwood	—	17,265
Liabilities incurred	—	3,636
Accretion of discount	1,354	1,289
Liabilities settled	(370)	—
Foreign currency translation adjustments and other	(1,918)	(45)
Balance, end of year	<u>\$ 36,296</u>	<u>\$ 37,230</u>

Our asset retirement obligations are recorded in Other noncurrent liabilities in the consolidated balance sheets. Asset retirement obligations assumed through the acquisition of Rockwood primarily relate to post-closure reclamation of sites involved in the surface mining and manufacturing of lithium. We are not aware of any conditional asset retirement obligations that would require recognition in our consolidated financial statements.

Rental Expense

Our rental expenses include a number of operating lease agreements, primarily for office space, transportation equipment and storage facilities. The following schedule details the future non-cancelable minimum lease payments for the next five years and thereafter (in thousands):

	<u>Operating Leases</u>
2017	\$ 12,065
2018	\$ 10,153
2019	\$ 7,878
2020	\$ 6,369
2021	\$ 5,490
Thereafter	\$ 19,240

Rental expense was approximately \$31.4 million, \$34.8 million, and \$31.9 million for 2016, 2015 and 2014, respectively. Rental expense related to discontinued operations was approximately \$11.8 million, \$10.2 million and \$1.3 million for 2016, 2015 and 2014, respectively. Rental expense is shown net of sublease income which was minimal during 2016, 2015 and 2014.

Litigation

We are involved from time to time in legal proceedings of types regarded as common in our business, including administrative or judicial proceedings seeking remediation under environmental laws, such as the federal Comprehensive Environmental Response, Compensation and Liability Act, commonly known as CERCLA or Superfund, products liability, breach of contract liability and premises liability litigation. Where appropriate, we may establish financial reserves for such proceedings. We also maintain insurance to mitigate certain of such risks. Costs for legal services are generally expensed as incurred.

Also see Note 2, "Acquisitions" for a discussion about litigation matters in connection with the Acquisition of Rockwood.

Indemnities

We are indemnified by third parties in connection with certain matters related to acquired and divested businesses. Although we believe that the financial condition of those parties who may have indemnification obligations to the Company is generally sound, in the event the Company seeks indemnity under any of these agreements or through other means, there can be no assurance that any party who may have obligations to indemnify us will adhere to their obligations and we may have to resort to legal action to enforce our rights under the indemnities.

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The Company may be subject to indemnity claims relating to properties or businesses it divested, including properties or businesses that Rockwood divested prior to the Acquisition Closing Date. In the opinion of management, and based upon information currently available, the ultimate resolution of any indemnification obligations owed to the Company or by the Company is not expected to have a material effect on the Company's financial condition, results of operations or cash flows. See Note 16, "Other Noncurrent Liabilities," for the tax indemnification liability related to the sale of the Chemetall Surface Treatment business.

Other

The Company has standby letters of credit and guarantees with various financial institutions. The following table summarizes our letters of credit and guarantee agreements (in thousands):

	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>Thereafter</u>
Letters of credit and other guarantees	\$ 23,619	\$ 5,052	\$ 795	\$ 199	\$ 315	\$ 21,357

The outstanding letters of credit are primarily related to insurance claim payment guarantees with expiration dates ranging from 2017 to 2022. The majority of the Company's other guarantees have terms of one year and mainly consist of performance and environmental guarantees, as well as guarantees to customs and port authorities. The guarantees arose during the ordinary course of business.

We do not have recorded reserves for the letters of credit and guarantees as of December 31, 2016. We are unable to estimate the maximum amount of the potential future liability under guarantees and letters of credit. However, we accrue for any potential loss for which we believe a future payment is probable and a range of loss can be reasonably estimated. We believe our liability under such obligations is immaterial.

We currently, and are from time to time, subject to transactional audits in various taxing jurisdictions and to customs audits globally. We do not expect the financial impact of any of these audits to have a material adverse effect on the Company's results of operations, financial condition or cash flows.

NOTE 18—Stock-based Compensation Expense:

Incentive Plans

We have various share-based compensation plans that authorize the granting of (i) stock options to purchase shares of our common stock, (ii) restricted stock and restricted stock units, (iii) performance unit awards and (iv) stock appreciation rights ("SARs") to employees and non-employee directors. The plans provide for payment of incentive awards in one or more of the following at our option: cash, shares of our common stock, qualified and non-qualified stock options, SARs, restricted stock awards, restricted stock unit awards and performance unit awards. The share-based awards granted by us generally contain vesting provisions ranging from one to five years, and with respect to stock options granted by us, have a term of not more than ten years from the date of grant. Stock options granted to employees generally vest over three years and have a term of ten years. Restricted stock and restricted stock unit awards vest in periods ranging from one to five years from the date of grant. Performance unit awards are earned at a level ranging from 0% to 200% contingent upon the achievement of specific performance criteria over periods ranging from one to three years. Distribution of earned units occurs generally 50% upon completion of the applicable measurement period with the remaining 50% distributed one year thereafter.

We granted 141,661, 313,803 and 222,939 stock options during 2016, 2015 and 2014, respectively. There were no significant modifications made to any share-based grants during these periods.

On April 20, 2010, the maximum number of shares available for issuance to participants under the Albemarle Corporation 2008 Incentive Plan (the "Incentive Plan") increased by 4,470,000 shares to 7,470,000 shares. With respect to any awards, other than stock options or SARs, the number of shares available for awards under the Incentive Plan were reduced by 1.6 shares for each share covered by such award or to which such award related. Effective May 7, 2013, the Albemarle Corporation 2008 Stock Compensation Plan for Non-Employee Directors and the 1996 Directors' Deferred Compensation Plan (as amended and restated in 2005) were merged into the Albemarle Corporation 2013 Stock Compensation and Deferral Election Plan for Non-Employee Directors (the "Non-Employee Directors Plan"). Under the Non-Employee Directors Plan, a maximum aggregate number of 500,000 shares of our common stock is authorized for issuance to the Company's non-employee directors; any shares remaining available for issuance under the prior plans were canceled. The aggregate fair market value of shares that may be issued to a director during any compensation year (as defined in the agreement, generally July 1 to June 30) shall not exceed \$150,000. At December 31, 2016, there were 2,268,750 shares available for grant under the Incentive Plan and 420,091 shares available for grant under the Non-Employee Directors Plan.

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Total stock-based compensation expense associated with our incentive plans for the years ended December 31, 2016, 2015 and 2014 amounted to \$17.0 million, \$15.2 million and \$14.3 million, respectively, and is included in Cost of goods sold and SG&A expenses in the consolidated statements of income. Total related recognized tax benefits for the years ended December 31, 2016, 2015 and 2014 amounted to \$6.2 million, \$5.6 million and \$5.2 million, respectively. As a result of the sale of the Chemetall Surface Treatment business, we converted previously granted incentive awards owed to Chemetall employees to a cash liability to be paid on the original vesting dates of the awards. The Company recognized expense of \$5.8 million, included in Income (loss) from discontinued operations for the year ended December 31, 2016, and an equal liability in Other noncurrent liabilities as of December 31, 2016.

The following table summarizes information about the Company's fixed-price stock options as of and for the year ended December 31, 2016:

	Shares	Weighted-Average Exercise Price	Weighted-Average Remaining Contractual Term (Years)	Aggregate Intrinsic Value (in thousands)
Outstanding at December 31, 2015	1,676,927	\$ 50.76	6.1	\$ 14,152
Granted	141,661	56.56		
Exercised	(212,343)	44.28		
Forfeited	(64,001)	59.03		
Outstanding at December 31, 2016	<u>1,542,244</u>	\$ 51.85	5.5	\$ 52,798
Exercisable at December 31, 2016	<u>858,291</u>	\$ 45.63	3.7	\$ 34,720

The fair value of each option granted during the years ended December 31, 2016, 2015 and 2014 was estimated on the date of grant using the Black-Scholes option-pricing model with the following weighted-average assumptions:

	Year Ended December 31,		
	2016	2015	2014
Dividend yield	1.84%	1.80%	1.71%
Volatility	33.08%	32.92%	33.03%
Average expected life (years)	6	6	6
Risk-free interest rate	1.96%	2.17%	2.94%
Fair value of options granted	\$ 16.06	\$ 16.04	\$ 19.56

Dividend yield is the average of historical yields and those estimated over the average expected life. The stock volatility is based on historical volatilities of our common stock. The average expected life represents the weighted average period of time that options granted are expected to be outstanding giving consideration to vesting schedules and our historical exercise patterns. The risk-free interest rate is based on the U.S. Treasury strip rate with stripped coupon interest for the period equal to the contractual term of the share option grant in effect at the time of grant.

The intrinsic value of options exercised during the years ended December 31, 2016, 2015 and 2014 was \$7.9 million, \$0.5 million and \$2.4 million, respectively. The intrinsic value of a stock option is the amount by which the market value of the underlying stock exceeds the exercise price of the option.

Total compensation cost not yet recognized for nonvested stock options outstanding as of December 31, 2016 is approximately \$6.3 million and is expected to be recognized over a remaining weighted-average period of 1.8 years. Cash proceeds from stock options exercised and tax benefits related to stock options exercised were \$9.4 million and \$2.9 million for the year ended December 31, 2016, respectively. The Company issues new shares of common stock upon exercise of stock options and vesting of restricted common stock awards.

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The following table summarizes activity in performance unit awards as of and for the year ended December 31, 2016:

	Shares	Weighted-Average Grant Date Fair Value Per Share
Nonvested, beginning of period	497,205	\$ 62.04
Granted	139,948	78.03
Vested	(80,970)	61.75
Forfeited	(61,492)	63.61
Nonvested, end of period	<u>494,691</u>	66.42

The weighted average grant date fair value of performance unit awards granted in 2016, 2015 and 2014 was \$10.9 million, \$11.9 million and \$20.1 million, respectively.

The weighted average fair value of performance unit awards that vested during 2016, 2015 and 2014 was \$4.6 million, \$2.5 million and \$7.4 million, respectively, based on the closing prices of our common stock on the dates of vesting. Total compensation cost not yet recognized for nonvested performance unit awards outstanding as of December 31, 2016 is approximately \$12.0 million, calculated based on current expectation of specific performance criteria, and is expected to be recognized over a remaining weighted-average period of approximately 1.3 years. Each performance unit represents one share of common stock.

The following table summarizes activity in non-performance based restricted stock and restricted stock unit awards as of and for the year ended December 31, 2016:

	Shares	Weighted-Average Grant Date Fair Value Per Share
Nonvested, beginning of period	118,121	\$ 58.62
Granted	156,662	56.43
Vested	(53,875)	57.34
Forfeited	(40,252)	54.65
Nonvested, end of period	<u>180,656</u>	57.99

The weighted average grant date fair value of restricted stock and restricted stock unit awards granted in 2016, 2015 and 2014 was \$8.8 million, \$3.5 million and \$2.7 million, respectively. The weighted average fair value of restricted stock and restricted stock unit awards that vested in 2016, 2015 and 2014 was \$3.2 million, \$2.2 million and \$2.1 million, respectively, based on the closing prices of our common stock on the dates of vesting. Total compensation cost not yet recognized for nonvested, non-performance based restricted stock and restricted stock units as of December 31, 2016 is approximately \$6.3 million and is expected to be recognized over a remaining weighted-average period of 2.2 years. The fair value of the non-performance based restricted stock and restricted stock units was estimated on the date of grant adjusted for a dividend factor, if necessary.

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NOTE 19—Accumulated Other Comprehensive (Loss) Income:

The components and activity in Accumulated other comprehensive (loss) income (net of deferred income taxes) consisted of the following during the years ended December 31, 2016, 2015 and 2014 (in thousands):

	Foreign Currency Translation ^(a)	Pension and Post- Retirement Benefits ^(b)	Net Investment Hedge	Interest Rate Swap ^(c)	Total
Accumulated other comprehensive income - balance at December 31, 2013	\$ 115,758	\$ 487	\$ —	\$ —	\$ 116,245
Other comprehensive (loss) income before reclassifications	(151,059)	—	11,384	(21,174)	(160,849)
Amounts reclassified from accumulated other comprehensive (loss) income	(17,614)	(487)	—	212	(17,889)
Other comprehensive (loss) income, net of tax	<u>(168,673)</u>	<u>(487)</u>	<u>11,384</u>	<u>(20,962)</u>	<u>(178,738)</u>
Other comprehensive loss attributable to noncontrolling interests	<u>80</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>80</u>
Accumulated other comprehensive (loss) income - balance at December 31, 2014	\$ (52,835)	\$ —	\$ 11,384	\$ (20,962)	\$ (62,413)
Other comprehensive (loss) income before reclassifications	(412,997)	(774)	50,861	—	(362,910)
Amounts reclassified from accumulated other comprehensive (loss) income	27	16	—	2,101	2,144
Other comprehensive (loss) income, net of tax	<u>(412,970)</u>	<u>(758)</u>	<u>50,861</u>	<u>2,101</u>	<u>(360,766)</u>
Other comprehensive loss attributable to noncontrolling interests	<u>1,891</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>1,891</u>
Accumulated other comprehensive (loss) income - balance at December 31, 2015	\$ (463,914)	\$ (758)	\$ 62,245	\$ (18,861)	\$ (421,288)
Other comprehensive (loss) income before reclassifications	(102,246)	—	26,133	—	(76,113)
Amounts reclassified from accumulated other comprehensive (loss) income	81,421	834	—	2,116	84,371
Other comprehensive (loss) income, net of tax	<u>(20,825)</u>	<u>834</u>	<u>26,133</u>	<u>2,116</u>	<u>8,258</u>
Other comprehensive loss attributable to noncontrolling interests	<u>618</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>618</u>
Accumulated other comprehensive (loss) income - balance at December 31, 2016	<u>\$ (484,121)</u>	<u>\$ 76</u>	<u>\$ 88,378</u>	<u>\$ (16,745)</u>	<u>\$ (412,412)</u>

- (a) Amounts reclassified from accumulated other comprehensive (loss) income for the years ended December 31, 2014 and 2016 are included in Income (loss) from discontinued operations (net of tax) for the years ended December 31, 2014 and 2016 and resulted from the release of cumulative foreign currency translation adjustments into earnings upon the sale of our antioxidant, ibuprofen and propofol businesses and assets which closed on September 1, 2014 and the sale of our Chemetall Surface Treatment business which closed on December 14, 2016. See Note 3, "Divestitures."
- (b) The pre-tax portion of amounts reclassified from accumulated other comprehensive (loss) income consists of amortization of prior service benefit, which is a component of pension and postretirement benefits cost (credit). See Note 15, "Pension Plans and Other Postretirement Benefits."
- (c) The pre-tax portion of amounts reclassified from accumulated other comprehensive (loss) income is included in interest expense.

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The amount of income tax benefit (expense) allocated to each component of Other comprehensive (loss) income for the years ended December 31, 2016, 2015 and 2014 is provided in the following tables (in thousands):

	Foreign Currency Translation	Pension and Postretirement Benefits	Net Investment Hedge ^(a)	Interest Rate Swap ^(b)
2016				
Other comprehensive (loss) income, before tax	\$ (20,849)	\$ 839	\$ 41,209	\$ 3,336
Income tax benefit (expense)	24	(5)	(15,076)	(1,220)
Other comprehensive (loss) income, net of tax	<u>\$ (20,825)</u>	<u>\$ 834</u>	<u>\$ 26,133</u>	<u>\$ 2,116</u>
2015				
Other comprehensive (loss) income, before tax	\$ (451,762)	\$ (751)	\$ 80,746	\$ 3,336
Income tax benefit (expense)	38,792	(7)	(29,885)	(1,235)
Other comprehensive (loss) income, net of tax	<u>\$ (412,970)</u>	<u>\$ (758)</u>	<u>\$ 50,861</u>	<u>\$ 2,101</u>
2014				
Other comprehensive (loss) income, before tax	\$ (163,319)	\$ (772)	\$ 17,971	\$ (33,091)
Income tax (expense) benefit	(5,354)	285	(6,587)	12,129
Other comprehensive (loss) income, net of tax	<u>\$ (168,673)</u>	<u>\$ (487)</u>	<u>\$ 11,384</u>	<u>\$ (20,962)</u>

(a) Other comprehensive (loss) income, before tax, for the year ended December 31, 2014 includes \$12.8 million related to the revaluation of our Euro-denominated senior notes and a \$5.2 million gain on the settlement of related foreign currency forward contracts, both of which were designated as a hedge of our net investment in foreign operations. See Note 14, "Long-Term Debt" for additional information about these transactions.

(b) Other comprehensive (loss) income, before tax, for the year ended December 31, 2014 includes a realized loss of (\$33.4) million on the settlement of our forward starting interest rate swap which was designated and accounted for as a cash flow hedge under ASC 815, *Derivatives and Hedging*. See Note 14, "Long-Term Debt" for additional information about this interest rate swap.

NOTE 20—Income Taxes:

Income from continuing operations before income taxes and equity in net income of unconsolidated investments, and current and deferred income tax expense (benefit) are composed of the following (in thousands):

	Year Ended December 31,		
	2016	2015	2014
Income from continuing operations before income taxes and equity in net income of unconsolidated investments:			
Domestic	\$ 49,630	\$ (15,861)	\$ 45,689
Foreign	465,634	326,605	167,490
Total	<u>\$ 515,264</u>	<u>\$ 310,744</u>	<u>\$ 213,179</u>
Current income tax expense (benefit):			
Federal	\$ 7,717	\$ 76,778	\$ 36,708
State	1,407	(983)	3,209
Foreign	63,957	58,710	25,700
Total	<u>\$ 73,081</u>	<u>\$ 134,505</u>	<u>\$ 65,617</u>
Deferred income tax expense (benefit):			
Federal	\$ 12,230	\$ (127,212)	\$ (32,890)
State	(1,715)	(1,267)	(1,139)
Foreign	12,667	5,108	(13,104)
Total	<u>\$ 23,182</u>	<u>\$ (123,371)</u>	<u>\$ (47,133)</u>
Total income tax expense	<u>\$ 96,263</u>	<u>\$ 11,134</u>	<u>\$ 18,484</u>

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The reconciliation of the U.S. federal statutory rate to the effective income tax rate is as follows:

	% of Income Before Income Taxes		
	2016	2015	2014
Federal statutory rate	35.0%	35.0%	35.0%
State taxes, net of federal tax benefit	(0.1)	1.4	0.2
Change in valuation allowance	3.7	5.7	1.0
Impact of foreign earnings, net ^(a)	(19.3)	(22.0)	(24.8)
Subpart F income	0.2	7.8	1.2
Deemed repatriation of foreign income ^(b)	—	105.5	—
Undistributed earnings of foreign subsidiaries ^{(a)(b)}	0.1	(114.8)	(0.3)
Nondeductible transaction costs	—	2.0	—
Depletion	(1.0)	(1.8)	(2.4)
Revaluation of unrecognized tax benefits/reserve requirements ^(c)	(0.4)	(14.4)	(0.6)
Domestic manufacturing tax deduction	(0.9)	(0.5)	(2.2)
Other items, net	1.4	(0.3)	1.6
Effective income tax rate	18.7%	3.6%	8.7%

- (a) During 2016, 2015 and 2014, we received actual and deemed distributions of \$308.4 million, \$1.4 billion and \$12.6 million, respectively, from various foreign subsidiaries and joint ventures, and realized an expense, net of foreign tax credits, of \$67.5 million, \$350.2 million and \$2.8 million, respectively, related to the repatriation of these earnings, which impacted our effective tax rate. Our statutory rate is decreased by of our share of the income of JBC, a Free Zones company under the laws of the Hashemite Kingdom of Jordan. The applicable provisions of the Jordanian law, and applicable regulations thereunder, do not have a termination provision and the exemption is indefinite. As a Free Zones company, JBC is not subject to income taxes on the profits of products exported from Jordan, and currently, substantially all of the profits are from exports. This gave us a rate benefit of 7.3%, 8.2%, and 12.4% for 2016, 2015, and 2014, respectively.
- (b) In prior years, we designated the undistributed earnings of substantially all of our foreign subsidiaries as indefinitely reinvested. In 2015, we were not indefinitely reinvested in a portion of earnings from legacy Rockwood entities that were part of the repatriation planning, for which a deferred tax liability of \$387.0 million was established in the opening balance sheet. This liability reversed upon the completion of the repatriation with \$356.2 million impacting earnings and \$30.8 million from foreign exchange differences. The reversal of this liability offsets the tax amount of \$327.9 million from legacy Rockwood entities included in the deemed repatriation of foreign income.
- (c) During 2014, we released various tax reserves primarily related to the expiration of the applicable U.S. federal statute of limitations for 2009 through 2010 which provided a net benefit of approximately \$2.5 million. In 2015, the main impact is from the release of reserves on the close of a U.S. federal audit, and lapse of statute of limitations. These releases provided a net benefit of approximately \$42.7 million.

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Deferred income tax assets and liabilities recorded on the consolidated balance sheets as of December 31, 2016 and 2015 consist of the following (in thousands):

	December 31,	
	2016	2015
Deferred tax assets:		
Accrued employee benefits	\$ 32,622	\$ 25,519
Accrued expenses	10,065	24,581
Operating loss carryovers	91,934	116,686
Pensions	96,635	96,133
Tax credit carryovers	1,029	2,555
Other	34,866	35,557
Gross deferred tax assets	<u>267,151</u>	<u>301,031</u>
Valuation allowance	(69,900)	(84,137)
Deferred tax assets	<u>197,251</u>	<u>216,894</u>
Deferred tax liabilities:		
Depreciation	(379,161)	(364,657)
Intangibles	(99,969)	(108,047)
Hedge of Net Investment of Foreign Subsidiary	(51,192)	(36,537)
Other	(18,536)	(16,692)
Deferred tax liabilities	<u>(548,858)</u>	<u>(525,933)</u>
Net deferred tax liabilities	<u>\$ (351,607)</u>	<u>\$ (309,039)</u>
Classification in the consolidated balance sheets:		
Noncurrent deferred tax assets	\$ 61,132	\$ 75,813
Noncurrent deferred tax liabilities	(412,739)	(384,852)
Net deferred tax liabilities	<u>\$ (351,607)</u>	<u>\$ (309,039)</u>

Changes in the balance of our deferred tax asset valuation allowance are as follows (in thousands):

	Year Ended December 31,		
	2016	2015	2014
Balance at January 1	\$ (84,137)	\$ (30,768)	\$ (33,757)
Additions ^(a)	(20,568)	(59,889)	(1,895)
Deductions	34,805	6,520	4,884
Balance at December 31	<u>\$ (69,900)</u>	<u>\$ (84,137)</u>	<u>\$ (30,768)</u>

(a) Additions for the year ended December 31, 2015 includes \$42.0 million related to the acquisition of Rockwood.

At December 31, 2016, we had approximately \$1.6 million of domestic credits available to offset future payments of income taxes, expiring in varying amounts between 2017 and 2026. We have established valuation allowances for \$0.4 million of those domestic credits since we believe that it is more likely than not that the related deferred tax assets will not be realized. We believe that sufficient taxable income will be generated during the carryover period in order to utilize the other remaining credit carryovers.

At December 31, 2016, we have on a pre-tax basis, domestic state net operating losses of \$114.6 million, expiring between 2017 and 2036, which have pre-tax valuation allowances of \$32.2 million established, and domestic state capital losses of \$55.6 million expiring in 2017, which have pre-tax valuation allowances of \$55.6 million established. In addition, we have on a pre-tax basis \$307.8 million of foreign net operating losses of which a majority have an indefinite life, which have pre-tax valuation allowances for \$197.5 million established. We have established valuation allowances for these deferred tax assets since we believe that it is more likely than not that the related deferred tax assets will not be realized. For the same reason, we established pre-tax valuation allowances for \$77.2 million related to foreign deferred tax assets not related to net operating losses. The realization of the deferred tax assets is dependent on the generation of sufficient taxable income in the appropriate tax jurisdictions. Although realization is not assured, we believe it is more likely than not that the remaining deferred tax assets will be realized. However, the amount considered realizable could be reduced if estimates of future taxable income change. We

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believe that it is more likely than not that the Company will generate sufficient taxable income in the future to fully utilize all other deferred tax assets.

As of December 31, 2016, we have not recorded U.S. income taxes on approximately \$3.6 billion of cumulative undistributed earnings of our non-U.S. subsidiaries and joint ventures, which includes the estimated effect of the Chemetall Surface Treatment business divestiture foreign gain of \$2.3 billion, as these earnings are intended to be either indefinitely reinvested or subject to a tax-free liquidation and do not give rise to significant incremental taxes. If it is determined that cash can be repatriated with little to no tax consequences, we may choose to repatriate cash at that time. If in the foreseeable future we can no longer demonstrate that these earnings are indefinitely reinvested, a deferred tax liability will be recognized. A determination of the amount of the unrecognized deferred tax liability related to these undistributed earnings is not practicable.

Liabilities related to uncertain tax positions were \$27.9 million and \$101.7 million at December 31, 2016 and 2015, respectively, inclusive of interest and penalties of \$3.0 million and \$6.5 million at December 31, 2016 and 2015, respectively, and are reported in Other noncurrent liabilities as provided in Note 16, "Other Noncurrent Liabilities." These liabilities at December 31, 2016 and 2015 were reduced by \$15.1 million and \$50.9 million, respectively, for offsetting benefits from the corresponding effects of potential transfer pricing adjustments, state income taxes and rate arbitrage related to foreign structure. These offsetting benefits are recorded in Other assets as provided in Note 11, "Other Assets." The resulting net liabilities of \$9.8 million and \$44.3 million at December 31, 2016 and 2015, respectively, if recognized and released, would favorably affect earnings.

The liabilities related to uncertain tax positions, exclusive of interest, were \$25.4 million and \$95.7 million at December 31, 2016 and 2015, respectively. The following is a reconciliation of our total gross liability related to uncertain tax positions for 2016, 2015 and 2014 (in thousands):

	Year Ended December 31,		
	2016	2015	2014
Balance at January 1	\$ 95,715	\$ 24,969	\$ 29,143
Acquisition of Rockwood	—	124,758	—
Divestitures ^(a)	(55,881)	—	—
Additions for tax positions related to prior years	548	4,329	—
Reductions for tax positions related to prior years	(1,253)	(46,211)	(214)
Additions for tax positions related to current year	1,271	202	2,232
Lapses in statutes of limitations/settlements	(12,591)	(6,736)	(5,057)
Foreign currency translation adjustment	(2,425)	(5,596)	(1,135)
Balance at December 31	<u>\$ 25,384</u>	<u>\$ 95,715</u>	<u>\$ 24,969</u>

(a) Reclassified to Other noncurrent liabilities as a result of the indemnification of certain income tax liabilities associated with the Chemetall Surface Treatment entities sold. See Note 16, "Other Noncurrent Liabilities."

We are subject to income taxes in the U.S. and numerous foreign jurisdictions. Due to the statute of limitations, we are no longer subject to U.S. federal income tax audits by the Internal Revenue Service ("IRS") for years prior to 2013. In 2016, the IRS finalized its audit of legacy Albemarle's U.S. consolidated group for 2011 and 2012. Due to the statute of limitations, we also are no longer subject to U.S. state income tax audits prior to 2010.

With respect to jurisdictions outside the U.S., several audits are in process. During 2016, the German tax authorities continued and announced audits on multiple German subsidiaries that have since divested, for various years from 2006 through 2015. Also during 2016, audits of our Japanese, Taiwan, Singapore, and Netherlands subsidiaries were closed with no issue. In addition, we have various audits ongoing for the years 2007 through 2014 related to Canada, Russia, India, and Italy, all of which are entities that have since been divested.

While we believe we have adequately provided for all tax positions, amounts asserted by taxing authorities could be greater than our accrued position. Accordingly, additional provisions on federal and foreign tax-related matters could be recorded in the future as revised estimates are made or the underlying matters are settled or otherwise resolved.

Since the timing of resolutions and/or closure of tax audits is uncertain, it is difficult to predict with certainty the range of reasonably possible significant increases or decreases in the liability related to uncertain tax positions that may occur within the next twelve months. Our current view is that it is reasonably possible that we could record a decrease in the liability related to uncertain tax positions, relating to a number of issues, up to approximately \$3.2 million as a result of closure of tax statutes.

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NOTE 21—Restructuring and Other:

Restructuring and other, net, reported in the consolidated statements of income for the years ended December 31, 2015 and 2014 consists of the following (in thousands):

	Year Ended December 31,	
	2015	2014
Exit of phosphorus flame retardants business ^(a)	\$ (6,804)	\$ —
Charges in connection with aluminum alkyl supply capacity reduction ^(b)	—	23,521
Other, net ^(c)	—	2,426
Total Restructuring and other, net	<u>\$ (6,804)</u>	<u>\$ 25,947</u>

- (a) In the third quarter of 2015, a gain of \$6.8 million (\$5.4 million after income taxes) was recognized upon the sale of land in Avonmouth, U.K., which was utilized by the phosphorus flame retardants business we exited in 2012. In 2012, charges in connection with our exit of the phosphorus flame retardants business were recorded in Restructuring and other, net, on our consolidated statements of income.
- (b) In 2014, we initiated action to reduce high cost supply capacity of certain aluminum alkyl products, primarily through the termination of a third party manufacturing contract. Based on the contract termination, we estimated costs of approximately \$14.0 million (\$9.3 million after income taxes) in the first quarter and \$6.5 million (\$4.3 million after income taxes) in the fourth quarter for contract termination and volume commitments. Additionally, in the first quarter of 2014 we recorded an impairment charge of \$3.0 million (\$1.9 million after income taxes) for certain capital project costs also related to aluminum alkyls capacity which we do not expect to recover.
- (c) The amount for 2014 mainly consists of charges recorded in the second quarter for certain multi-product facility project costs that we do not expect to recover in future periods, net of other credits recorded in the fourth quarter.

NOTE 22—Fair Value of Financial Instruments:

In assessing the fair value of financial instruments, we use methods and assumptions that are based on market conditions and other risk factors existing at the time of assessment. Fair value information for our financial instruments is as follows:

Long-Term Debt—the fair values of our senior notes and other fixed rate foreign borrowings are estimated using Level 1 inputs and account for the majority of the difference between the recorded amount and fair value of our long-term debt. The carrying value of our remaining long-term debt reported in the accompanying consolidated balance sheets approximates fair value as substantially all of such debt bears interest based on prevailing variable market rates currently available in the countries in which we have borrowings.

	December 31,			
	2016		2015	
	Recorded Amount	Fair Value	Recorded Amount	Fair Value
	(In thousands)			
Long-term debt	\$ 2,381,370	\$ 2,472,813	\$ 3,834,217	\$ 3,793,179

Foreign Currency Forward Contracts—we enter into foreign currency forward contracts in connection with our risk management strategies in an attempt to minimize the financial impact of changes in foreign currency exchange rates. These derivative financial instruments are used to manage risk and are not used for trading or other speculative purposes. The fair values of our foreign currency forward contracts are estimated based on current settlement values. At December 31, 2016 and 2015, we had outstanding foreign currency forward contracts with notional values totaling \$251.6 million and \$217.7 million, respectively. Our foreign currency forward contracts outstanding at December 31, 2016 and 2015 have not been designated as hedging instruments under ASC 815, *Derivatives and Hedging*. As of December 31, 2016 and December 31, 2015, \$0.2 million and \$0.3 million, respectively, was included in Accrued expenses associated with the fair value of our foreign currency forward contracts.

Gains and losses on foreign currency forward contracts are recognized currently in Other income (expenses), net; further, fluctuations in the value of these contracts are generally expected to be offset by changes in the value of the underlying exposures being hedged. For the years ended December 31, 2016, 2015 and 2014 we recognized gains (losses) of \$16.1 million, (\$38.5) million and (\$17.8) million, respectively, in Other income (expenses), net, in our consolidated statements of income related to the change in the fair value of our foreign currency forward contracts. These amounts are generally expected to be offset by changes in the value of the underlying exposures being hedged which are also reported in Other income (expenses), net. Also, for the years ended December 31, 2016, 2015 and 2014, we recorded (gains) losses of (\$16.1) million, \$38.5 million and \$17.8 million, respectively, related to the change in the fair value of our foreign currency forward contracts, and net cash

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receipts (settlements) of \$16.0 million, (\$37.6) million and (\$18.3) million, respectively, in Other, net, in our consolidated statements of cash flows.

The counterparties to our foreign currency forward contracts are major financial institutions with which we generally have other financial relationships. We are exposed to credit loss in the event of nonperformance by these counterparties. However, we do not anticipate nonperformance by the counterparties.

NOTE 23—Fair Value Measurement:

Fair value is defined as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date (exit price). The inputs used to measure fair value are classified into the following hierarchy:

- Level 1 Unadjusted quoted prices in active markets for identical assets or liabilities
- Level 2 Unadjusted quoted prices in active markets for similar assets or liabilities, or unadjusted quoted prices for identical or similar assets or liabilities in markets that are not active, or inputs other than quoted prices that are observable for the asset or liability
- Level 3 Unobservable inputs for the asset or liability

We endeavor to utilize the best available information in measuring fair value. Financial assets and liabilities are classified in their entirety based on the lowest level of input that is significant to the fair value measurement. Transfers between levels of the fair value hierarchy are deemed to have occurred on the date of the event or change in circumstance that caused the transfer. There were no transfers between Levels 1 and 2 during the year ended December 31, 2016. The following tables set forth our financial assets and liabilities that were accounted for at fair value on a recurring basis as of December 31, 2016 and 2015 (in thousands):

	December 31, 2016	Quoted Prices in Active Markets for Identical Items (Level 1)	Quoted Prices in Active Markets for Similar Items (Level 2)	Unobservable Inputs (Level 3)
Assets:				
Investments under executive deferred compensation plan ^(a)	\$ 22,037	\$ 22,037	\$ —	\$ —
Private equity securities ^(b)	\$ 35	\$ 35	\$ —	\$ —
Private equity securities measured at net asset value ^{(b)(c)}	\$ 5,498	\$ —	\$ —	\$ —
Pension assets ^(d)	\$ 520,845	\$ 460,247	\$ 60,598	\$ —
Pension assets measured at net asset value ^(d)	\$ 86,112	\$ —	\$ —	\$ —
Postretirement assets ^(d)	\$ 2,232	\$ —	\$ 2,232	\$ —
Liabilities:				
Obligations under executive deferred compensation plan ^(a)	\$ 22,037	\$ 22,037	\$ —	\$ —
Foreign currency forward contracts ^(e)	\$ 182	\$ —	\$ 182	\$ —

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	December 31, 2015	Quoted Prices in Active Markets for Identical Items (Level 1)	Quoted Prices in Active Markets for Similar Items (Level 2)	Unobservable Inputs (Level 3)
Assets:				
Investments under executive deferred compensation plan ^(a)	\$ 21,631	\$ 21,631	\$ —	\$ —
Private equity securities ^(b)	\$ 31	\$ 31	\$ —	\$ —
Private equity securities measured at net asset value ^{(b)(c)}	\$ 2,595	\$ —	\$ —	\$ —
Pension assets ^(d)	\$ 539,249	\$ 481,837	\$ 57,412	\$ —
Pension assets measured at net asset value ^(d)	\$ 80,746	\$ —	\$ —	\$ —
Postretirement assets ^(d)	\$ 3,292	\$ —	\$ 3,292	\$ —
Liabilities:				
Obligations under executive deferred compensation plan ^(a)	\$ 21,631	\$ 21,631	\$ —	\$ —
Foreign currency forward contracts ^(e)	\$ 250	\$ —	\$ 250	\$ —

- (a) We maintain an EDCP that was adopted in 2001 and subsequently amended. The purpose of the EDCP is to provide current tax planning opportunities as well as supplemental funds upon the retirement or death of certain of our employees. The EDCP is intended to aid in attracting and retaining employees of exceptional ability by providing them with these benefits. We also maintain a Benefit Protection Trust (the “Trust”) that was created to provide a source of funds to assist in meeting the obligations of the EDCP, subject to the claims of our creditors in the event of our insolvency. Assets of the Trust are consolidated in accordance with authoritative guidance. The assets of the Trust consist primarily of mutual fund investments (which are accounted for as trading securities and are marked-to-market on a monthly basis through the consolidated statements of income) and cash and cash equivalents. As such, these assets and obligations are classified within Level 1.
- (b) Primarily consists of private equity securities classified as available-for-sale and are reported in Investments in the consolidated balance sheets. The changes in fair value are reported in Other income (expenses), net, in our consolidated statements of income.
- (c) Holdings in private equity securities are measured at fair value using the net asset value per share (or its equivalent) practical expedient and have not been categorized in the fair value hierarchy as a result of the adoption of new accounting guidance effective January 1, 2016 on a retrospective basis. The fair value amounts of \$5.5 million and \$2.6 million as of December 31, 2016 and 2015, respectively, are included in this table to permit reconciliation to the marketable equity securities presented in Note 10, “Investments.” See Note 1, “Summary of Significant Accounting Policies,” for additional information.
- (d) See Note 15 “Pension Plans and Other Postretirement Benefits” for further information about fair value measurements of our pension and postretirement plan assets.
- (e) As a result of our global operating and financing activities, we are exposed to market risks from changes in foreign currency exchange rates, which may adversely affect our operating results and financial position. When deemed appropriate, we minimize our risks from foreign currency exchange rate fluctuations through the use of foreign currency forward contracts. Unless otherwise noted, these derivative financial instruments are not designated as hedging instruments under ASC 815, *Derivatives and Hedging*. The foreign currency forward contracts are valued using broker quotations or market transactions in either the listed or over-the-counter markets. As such, these derivative instruments are classified within Level 2.

NOTE 24—Related Party Transactions:

Our consolidated financial statements include sales to and purchases from unconsolidated affiliates in the ordinary course of business as follows (in thousands):

	Year Ended December 31,		
	2016	2015	2014
Sales to unconsolidated affiliates	\$ 29,651	\$ 24,180	\$ 45,415
Purchases from unconsolidated affiliates	130,287	115,697	64,631

NOTE 25—Segment and Geographic Area Information:

Effective January 1, 2016, our former Performance Chemicals reportable segment was split into two reportable segments: (1) Lithium and Advanced Materials and (2) Bromine Specialties. In addition, on June 17, 2016, the Company signed a definitive agreement to sell its Chemetall Surface Treatment business to BASF SE. This business, a separate reportable segment, is classified as discontinued operations and its results are excluded from segment results for all periods presented. As a result, our three reportable segments include Lithium and Advanced Materials, Bromine Specialties and Refining Solutions. Each segment has a dedicated team of sales, research and development, process engineering, manufacturing and sourcing, and

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business strategy personnel and has full accountability for improving execution through greater asset and market focus, agility and responsiveness. The new business structure aligns with the markets and customers we serve through each of the segments. The new structure also facilitates the continued standardization of business processes across the organization, and is consistent with the manner in which information is presently used internally by the Company's chief operating decision maker to evaluate performance and make resource allocation decisions.

Summarized financial information concerning our reportable segments is shown in the following tables. Results for 2015 and 2014 have been recast to reflect the change in segments noted above.

The "All Other" category comprises three operating segments that did not fit into any of our core businesses subsequent to the acquisition of Rockwood: minerals-based flame retardants and specialty chemicals, fine chemistry services and metal sulfides. During the first quarter of 2016, we completed the sales of the metal sulfides business and the minerals-based flame retardants and specialty chemicals business. For additional information about these businesses, see Note 3, "Divestitures."

The Corporate category is not considered to be a segment and includes corporate-related items not allocated to the reportable segments. Pension and OPEB service cost (which represents the benefits earned by active employees during the period) and amortization of prior service cost or benefit are allocated to the reportable segments, All Other, and Corporate, whereas the remaining components of pension and OPEB benefits cost or credit ("Non-operating pension and OPEB items") are included in Corporate. Segment data includes intersegment transfers of raw materials at cost and allocations for certain corporate costs.

The Company's chief operating decision maker uses earnings before interest, taxes, depreciation and amortization, as adjusted on a consistent basis for certain non-recurring or unusual items such as acquisition and integration related costs, utilization of inventory markup, gains or losses on sales of businesses, restructuring charges, facility divestiture charges, non-operating pension and OPEB items and other significant non-recurring items ("adjusted EBITDA"), in a balanced manner and on a segment basis to assess the ongoing performance of the Company's business segments and to allocate resources. In addition, management uses adjusted EBITDA for business planning purposes and as a significant component in the calculation of performance-based compensation for management and other employees. The Company has reported adjusted EBITDA because management believes it provides transparency to investors and enables period-to-period comparability of financial performance. Adjusted EBITDA is a financial measure that is not required by, or presented in accordance with, U.S. GAAP. Adjusted EBITDA should not be considered as an alternative to Net income (loss) attributable to Albemarle Corporation, the most directly comparable financial measure calculated and reported in accordance with U.S. GAAP, or any other financial measure reported in accordance with U.S. GAAP.

	Year Ended December 31,		
	2016	2015	2014
	(In thousands)		
Net sales:			
Lithium and Advanced Materials	\$ 968,216	\$ 834,590	\$ 312,788
Bromine Specialties	792,425	775,729	808,857
Refining Solutions	732,137	729,261	852,139
All Other	180,988	471,434	471,764
Corporate	3,437	15,415	—
Total net sales	<u>\$ 2,677,203</u>	<u>\$ 2,826,429</u>	<u>\$ 2,445,548</u>
Adjusted EBITDA:			
Lithium and Advanced Materials	\$ 363,360	\$ 312,867	\$ 81,596
Bromine Specialties	226,926	222,653	224,976
Refining Solutions	238,963	197,595	256,485
All Other	14,772	53,993	73,973
Corporate	(85,804)	(31,108)	(74,875)
Total adjusted EBITDA	<u>\$ 758,217</u>	<u>\$ 756,000</u>	<u>\$ 562,155</u>

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See below for a reconciliation of adjusted EBITDA, the non-GAAP financial measure, to Net income (loss) attributable to Albemarle Corporation, the most directly comparable financial measure calculated and reported in accordance with U.S. GAAP (in thousands):

	Lithium and Advanced Materials	Bromine Specialties	Refining Solutions	Reportable Segments Total	All Other	Corporate	Consolidated Total
2016							
Net income (loss) attributable to Albemarle Corporation	\$ 261,394	\$ 187,364	\$ 202,874	\$ 651,632	\$ 131,301	\$ (139,258)	\$ 643,675
Depreciation and amortization	101,966	39,562	36,089	177,617	7,302	6,056	190,975
(Gain) loss on sales of businesses, net ^(a)	—	—	—	—	(123,831)	1,533	(122,298)
Acquisition and integration related costs ^(b)	—	—	—	—	—	57,384	57,384
Interest and financing expenses	—	—	—	—	—	65,181	65,181
Income tax expense	—	—	—	—	—	96,263	96,263
Income from discontinued operations (net of tax)	—	—	—	—	—	(202,131)	(202,131)
Non-operating pension and OPEB items	—	—	—	—	—	25,589	25,589
Other ^(c)	—	—	—	—	—	3,579	3,579
Adjusted EBITDA	<u>\$ 363,360</u>	<u>\$ 226,926</u>	<u>\$ 238,963</u>	<u>\$ 829,249</u>	<u>\$ 14,772</u>	<u>\$ (85,804)</u>	<u>\$ 758,217</u>
2015							
Net income (loss) attributable to Albemarle Corporation	\$ 148,821	\$ 186,474	\$ 161,585	\$ 496,880	\$ 32,781	\$ (194,755)	\$ 334,906
Depreciation and amortization	84,069	36,179	34,039	154,287	18,183	8,703	181,173
Utilization of inventory markup ^(d)	79,977	—	—	79,977	3,029	—	83,006
Restructuring and other, net ^(e)	—	—	—	—	—	(6,804)	(6,804)
Acquisition and integration related costs ^(b)	—	—	—	—	—	132,299	132,299
Interest and financing expenses	—	—	—	—	—	81,650	81,650
Income tax expense	—	—	—	—	—	11,134	11,134
Income from discontinued operations (net of tax)	—	—	—	—	—	(32,476)	(32,476)
Non-operating pension and OPEB items	—	—	—	—	—	(35,300)	(35,300)
Other ^(f)	—	—	1,971	1,971	—	4,441	6,412
Adjusted EBITDA	<u>\$ 312,867</u>	<u>\$ 222,653</u>	<u>\$ 197,595</u>	<u>\$ 733,115</u>	<u>\$ 53,993</u>	<u>\$ (31,108)</u>	<u>\$ 756,000</u>
2014							
Net income (loss) attributable to Albemarle Corporation	\$ 65,806	\$ 189,059	\$ 223,815	\$ 478,680	\$ 60,495	\$ (405,859)	\$ 133,316
Depreciation and amortization	15,790	35,917	32,670	84,377	13,478	2,552	100,407
Restructuring and other, net ^(e)	—	—	—	—	—	25,947	25,947
Acquisition and integration related costs ^(b)	—	—	—	—	—	30,158	30,158
Interest and financing expenses	—	—	—	—	—	41,358	41,358
Income tax expense	—	—	—	—	—	18,484	18,484
Loss from discontinued operations (net of tax)	—	—	—	—	—	69,531	69,531
Non-operating pension and OPEB items	—	—	—	—	—	125,462	125,462
Other ^(f)	—	—	—	—	—	17,492	17,492
Adjusted EBITDA	<u>\$ 81,596</u>	<u>\$ 224,976</u>	<u>\$ 256,485</u>	<u>\$ 563,057</u>	<u>\$ 73,973</u>	<u>\$ (74,875)</u>	<u>\$ 562,155</u>

(a) See Note 3, "Divestitures," for additional information.

(b) See Note 2, "Acquisitions," for additional information.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS

- (c) Includes amounts recorded in (1) Research and development expenses related to the write-off of fixed assets of \$1.4 million; (2) Selling, general and administrative expenses related to the net loss on the sales of properties of \$0.9 million and (3) Other income (expenses), net related to environmental charges related to a site formerly owned by Albemarle of \$2.4 million, partially offset by a gain related to a previously disposed of site in China of \$1.1 million.
- (d) In connection with the acquisition of Rockwood, the Company valued Rockwood's existing inventory at fair value as of the Acquisition Closing Date, which resulted in a markup of the underlying net book value of the inventory totaling approximately \$103.4 million. The inventory markup was expensed over the estimated remaining selling period. For the year ended December 31, 2015, \$55.9 million was included in Cost of goods sold, and Equity in net income of unconsolidated investments was reduced by \$27.1 million related to the utilization of the inventory markup.
- (e) See Note 21, "Restructuring and Other," for additional information.
- (f) For the year ended December 31, 2015, Refining Solutions includes an impairment charge of approximately \$2.0 million related to our unconsolidated investment in Fábrica Carioca de Catalisadores SA. For the years ended December 31, 2015 and 2014, Corporate includes approximately \$4.4 million and \$17.5 million, respectively, of financing-related fees expensed in connection with the acquisition of Rockwood.

	As of December 31,		
	2016	2015	2014
	(In thousands)		
Identifiable assets:			
Lithium and Advanced Materials	\$ 3,809,883	\$ 3,658,669	\$ 351,175
Bromine Specialties	724,218	699,929	734,071
Refining Solutions	913,923	937,445	1,100,361
Discontinued Operations	—	3,208,902	—
All Other	130,595	517,695	268,555
Corporate ^(a)	2,582,588	575,314	2,748,275
Total identifiable assets	<u>\$ 8,161,207</u>	<u>\$ 9,597,954</u>	<u>\$ 5,202,437</u>
Goodwill:			
Lithium and Advanced Materials	\$ 1,348,261	\$ 1,267,505	\$ 21,697
Bromine Specialties	20,319	20,319	20,319
Refining Solutions	164,866	172,728	192,657
All Other	6,586	—	8,589
Total goodwill	<u>\$ 1,540,032</u>	<u>\$ 1,460,552</u>	<u>\$ 243,262</u>

- (a) As of December 31, 2016, Corporate included the net proceeds received from the sale of the Chemetall Surface Treatment business completed on December 14, 2016, less the repayment of the term loans and commercial paper using those proceeds. As of December 31, 2014, Corporate included net proceeds received from the issuance of the 2014 Senior Notes, which, together with borrowings from our Commercial Paper Notes, August 2014 Term Loan Agreement and Cash Bridge Facility, were used to finance the cash portion of the Merger Consideration, pay related fees and expenses and repay our senior notes which matured on February 1, 2015. See Note 2, "Acquisitions," Note 3, "Divestitures," and Note 14, "Long-Term Debt" for additional details about these transactions.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS

	Year Ended December 31,		
	2016	2015	2014
	(In thousands)		
Depreciation and amortization:			
Lithium and Advanced Materials	\$ 101,966	\$ 84,069	\$ 15,790
Bromine Specialties	39,562	36,179	35,917
Refining Solutions	36,089	34,039	32,670
Discontinued Operations	35,194	78,903	3,165
All Other	7,302	18,183	13,478
Corporate	6,056	8,703	2,552
Total depreciation and amortization	<u>\$ 226,169</u>	<u>\$ 260,076</u>	<u>\$ 103,572</u>
Capital expenditures:			
Lithium and Advanced Materials	\$ 91,967	\$ 104,344	\$ 12,888
Bromine Specialties	46,414	54,994	39,392
Refining Solutions	27,546	28,836	49,219
Discontinued Operations	19,281	23,738	—
All Other	9,251	13,054	9,053
Corporate	2,195	2,683	24
Total capital expenditures	<u>\$ 196,654</u>	<u>\$ 227,649</u>	<u>\$ 110,576</u>

	Year Ended December 31,		
	2016	2015	2014
	(In thousands)		
Net Sales:			
United States	\$ 797,267	\$ 911,519	\$ 884,373
Foreign ^(a)	1,879,936	1,914,910	1,561,175
Total	<u>\$ 2,677,203</u>	<u>\$ 2,826,429</u>	<u>\$ 2,445,548</u>

(a) In 2016, net sales to China represented 13% of total net sales. No net sales in any other foreign country exceed 10% of total net sales. Also, net sales are attributed to countries based upon shipments to final destination.

	As of December 31,		
	2016	2015	2014
	(In thousands)		
Long-Lived Assets:			
United States	\$ 850,689	\$ 800,214	\$ 698,863
Chile	922,878	916,965	—
Netherlands	145,917	155,128	167,965
Jordan	227,222	230,460	227,805
Australia	288,553	280,222	—
Brazil	46,380	39,299	59,474
Germany	117,027	137,890	75,813
China	31,564	4,773	5,310
France	39,470	39,344	37,347
Korea	65,963	72,685	80,362
United Kingdom	3,665	3,665	3,665
Other foreign countries	54,271	55,234	48,819
Total	<u>\$ 2,793,599</u>	<u>\$ 2,735,879</u>	<u>\$ 1,405,423</u>

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS

Net sales to external customers by product category in each of the segments consists of the following:

	Year Ended December 31,		
	2016	2015	2014
	(In thousands)		
Lithium and Advanced Materials:			
Lithium	\$ 668,852	\$ 508,844	\$ —
Performance Catalyst Solutions	299,364	325,746	312,788
Total Lithium and Advanced Materials	<u>\$ 968,216</u>	<u>\$ 834,590</u>	<u>\$ 312,788</u>
Bromine Specialties	\$ 792,425	\$ 775,729	\$ 808,857
Refining Solutions	\$ 732,137	\$ 729,261	\$ 852,139

NOTE 26—Quarterly Financial Summary (Unaudited):

	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
	(In thousands, except per share amounts)			
2016				
Net sales	\$ 657,211	\$ 669,327	\$ 654,010	\$ 696,655
Gross profit	\$ 242,534	\$ 248,104	\$ 238,972	\$ 240,966
Gain on sales of businesses, net ^(a)	\$ (121,324)	\$ (974)	\$ —	\$ —
Acquisition and integration related costs ^(b)	\$ 18,558	\$ 19,030	\$ 6,749	\$ 13,047
Net income from continuing operations	\$ 218,236	\$ 95,586	\$ 114,512	\$ 50,304
Income (loss) from discontinued operations (net of tax) ^(c)	17,312	(398,340)	23,185	559,974
Net income attributable to noncontrolling interests	(7,362)	(12,067)	(9,477)	(8,188)
Net income (loss) attributable to Albemarle Corporation	<u>\$ 228,186</u>	<u>\$ (314,821)</u>	<u>\$ 128,220</u>	<u>\$ 602,090</u>
Basic earnings (loss) per share:				
Continuing operations	\$ 1.88	\$ 0.74	\$ 0.93	\$ 0.37
Discontinued operations	0.15	(3.54)	0.21	4.98
	<u>\$ 2.03</u>	<u>\$ (2.80)</u>	<u>\$ 1.14</u>	<u>\$ 5.35</u>
Shares used to compute basic earnings per share	112,260	112,339	112,429	112,487
Diluted earnings (loss) per share:				
Continuing operations	\$ 1.87	\$ 0.74	\$ 0.93	\$ 0.37
Discontinued operations	0.15	(3.52)	0.20	4.93
	<u>\$ 2.02</u>	<u>\$ (2.78)</u>	<u>\$ 1.13</u>	<u>\$ 5.30</u>
Shares used to compute diluted earnings per share	112,770	113,175	113,448	113,563

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS

	<u>First Quarter</u>	<u>Second Quarter</u>	<u>Third Quarter</u>	<u>Fourth Quarter</u>
	(In thousands, except per share amounts)			
2015				
Net sales	\$ 692,313	\$ 718,290	\$ 693,216	\$ 722,610
Gross profit	\$ 191,384	\$ 212,031	\$ 219,045	\$ 237,773
Restructuring and other, net ^(d)	\$ —	\$ —	\$ (6,804)	\$ —
Acquisition and integration related costs ^(b)	\$ 57,825	\$ 22,832	\$ 36,514	\$ 15,128
Net income from continuing operations ^(e)	\$ 49,253	\$ 49,218	\$ 59,842	\$ 169,275
(Loss) income from discontinued operations (net of tax)	(2,104)	10,148	11,030	13,402
Net income attributable to noncontrolling interests	(4,034)	(7,219)	(5,480)	(8,425)
Net income attributable to Albemarle Corporation	<u>\$ 43,115</u>	<u>\$ 52,147</u>	<u>\$ 65,392</u>	<u>\$ 174,252</u>
Basic earnings (loss) per share:				
Continuing operations ^(e)	\$ 0.42	\$ 0.37	\$ 0.48	\$ 1.43
Discontinued operations	(0.02)	0.09	0.10	0.12
	<u>\$ 0.40</u>	<u>\$ 0.46</u>	<u>\$ 0.58</u>	<u>\$ 1.55</u>
Shares used to compute basic earnings per share	108,130	112,189	112,202	112,207
Diluted earnings (loss) per share:				
Continuing operations ^(e)	\$ 0.42	\$ 0.37	\$ 0.48	\$ 1.43
Discontinued operations	(0.02)	0.09	0.10	0.12
	<u>\$ 0.40</u>	<u>\$ 0.46</u>	<u>\$ 0.58</u>	<u>\$ 1.55</u>
Shares used to compute diluted earnings per share	108,464	112,607	112,544	112,608

- (a) Included in Gain on sales of businesses, net for the year ended December 31, 2016 is \$11.5 million and \$112.3 million related to the sales of the metal sulfides business and the minerals-based flame retardants and specialty chemicals business, respectively, both of which closed in the first quarter of 2016. In addition, Gain on sales of businesses, net for the year ended December 31, 2016 includes a loss of \$1.5 million on the sale of our wafer reclaim business. See Note 3, "Divestitures," for additional information.
- (b) See Note 2, "Acquisitions," for additional information.
- (c) Included in Income (loss) from discontinued operations (net of tax) for the second quarter of 2016 is a nonrecurring, non-cash tax charge of \$416.7 million related to the change in the Company's assertion over book and tax basis differences for certain entities included in the sale of the Chemetall Surface Treatment business. In the fourth quarter of 2016, this non-cash tax charge was reversed as a result of the completion of the sale. In addition, the fourth quarter of 2016 includes an after-tax gain of \$135.0 million as a result of the sale of the Chemetall Surface Treatment business.
- (d) See Note 21, "Restructuring and Other."
- (e) The fourth quarter of 2015 includes an income tax benefit of \$43.1 million primarily related to the release of certain tax reserves associated with lapses in statutes of limitations and audit closures.

As discussed in Note 1, "Summary of Significant Accounting Policies," actuarial gains and losses related to our defined benefit pension and OPEB plan obligations are recognized annually in our consolidated statements of income in the fourth quarter and whenever a plan is determined to qualify for a rereasurement during a fiscal year. During the year ended December 31, 2016, actuarial losses were recognized as follows: fourth quarter—\$26.7 million (\$18.3 million after income taxes) as a result of the annual rereasurement process. During the year ended December 31, 2015, actuarial gains were recognized as follows: fourth quarter—\$30.1 million (\$21.4 million after income taxes) as a result of the annual rereasurement process.

Item 9. Changes in and Disagreements with Accountants on Accounting and Financial Disclosure.

NONE

Item 9A. Controls and Procedures.

Evaluation of Disclosure Controls and Procedures

Under the supervision and with the participation of our management, including our principal executive officer and principal financial officer, we conducted an evaluation of the effectiveness of the design and operation of our disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934, as amended, or the Exchange Act), as of the end of the period covered by this report. Based on this evaluation, our principal executive officer and principal financial officer concluded that, as of the end of the period covered by this report, our disclosure controls and procedures are effective to ensure that information required to be disclosed by us in the reports that we file or submit under the Exchange Act, is recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms, and that such information is accumulated and communicated to our management, including our principal executive officer and principal financial officer, as appropriate, to allow timely decisions regarding required disclosure.

Design and Evaluation of Internal Control over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting as defined in Exchange Act Rule 13a-15(f) and 15d-15(f). Our management assessed the effectiveness of our internal control over financial reporting as of December 31, 2016. In making this assessment, management used the criteria for effective internal control over financial reporting described in the "Internal Control-Integrated Framework" (2013) set forth by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). Based on the assessment, management concluded that, as of December 31, 2016, our internal control over financial reporting was effective based on those criteria.

The effectiveness of our internal control over financial reporting as of December 31, 2016 has been audited by PricewaterhouseCoopers LLP, an independent registered public accounting firm, as stated in their report, which is included herein. Management's report and the independent registered public accounting firm's report are included in Item 8 under the captions entitled "Management's Report on Internal Control over Financial Reporting" and "Report of Independent Registered Public Accounting Firm" and are incorporated herein by reference.

Changes in Internal Control over Financial Reporting

No change in our internal control over financial reporting (as such term is defined in Exchange Act Rule 13a-15(f)) occurred during the fiscal quarter ended December 31, 2016 that materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

Item 9B. Other Information.

NONE

PART III

Item 10. Directors, Executive Officers and Corporate Governance.

The information required by this Item 10 will be contained in the Proxy Statement and is incorporated herein by reference. In addition, the information in "Executive Officers of the Registrant" appearing after Item 4 in Part I of this Annual Report, is incorporated herein by reference.

Code of Business Conduct

We have adopted a code of business conduct and ethics for directors, officers and employees, known as the Albemarle Code of Business Conduct. The Albemarle Code of Business Conduct is available on our website at <http://www.albemarle.com>. Shareholders may also request a free copy of the Albemarle Code of Business Conduct from: Albemarle Corporation, Attention: Investor Relations, 451 Florida Street, Baton Rouge, Louisiana 70801. We will disclose any amendments to, or waivers from, a provision of our Code of Business Conduct that applies to the principal executive officer, principal financial officer, principal accounting officer or controller, or persons performing similar functions that relates to any element of the Code of Business Conduct as defined in Item 406 of Regulation S-K by posting such information on our website.

New York Stock Exchange Certifications

Because our common stock is listed on the New York Stock Exchange (“NYSE”), our Chief Executive Officer is required to make, and he has made, an annual certification to the NYSE stating that he was not aware of any violation by us of the corporate governance listing standards of the NYSE. Our Chief Executive Officer made his annual certification to that effect to the NYSE as of May 24, 2016. In addition, we have filed, as exhibits to this Annual Report on Form 10-K, the certifications of our principal executive officer and principal financial officer required under Sections 906 and 302 of the Sarbanes Oxley Act of 2002 to be filed with the Securities and Exchange Commission regarding the quality of our public disclosure.

Additional information will be contained in the Proxy Statement and is incorporated herein by reference.

Item 11. Executive Compensation.

The information required by this Item 11 will be contained in the Proxy Statement and is incorporated herein by reference.

Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters.

The information required by this Item 12 will be contained in the Proxy Statement and is incorporated herein by reference.

Item 13. Certain Relationships and Related Transactions, and Director Independence.

The information required by this Item 13 will be contained in the Proxy Statement and is incorporated herein by reference.

Item 14. Principal Accountant Fees and Services.

The information required by this Item 14 will be contained in the Proxy Statement and is incorporated herein by reference.

PART IV

Item 15. Exhibits and Financial Statement Schedules.

(a)(1) The following consolidated financial and informational statements of the registrant are included in Part II Item 8 on pages 56 to 114:

Management’s Report on Internal Control Over Financial Reporting

Report of Independent Registered Public Accounting Firm

Consolidated Balance Sheets as of December 31, 2016 and 2015

Consolidated Statements of Income, Comprehensive Income (Loss), Changes in Equity and Cash Flows for the years ended December 31, 2016, 2015 and 2014

Notes to the Consolidated Financial Statements

(a)(2) No Financial Statement Schedules are provided in accordance with Item 15(a)(2) as the information is either not applicable, not required or has been furnished in the Consolidated Financial Statements or Notes thereto.

(a)(3) Exhibits

The following documents are filed as exhibits to this Annual Report on Form 10-K pursuant to Item 601 of Regulation S-K:

- 2.1 Agreement and Plan of Merger, dated as of July 15, 2014, among Albemarle Corporation, Albemarle Holdings Corporation and Rockwood Holdings, Inc. [filed as Exhibit 2.1 to the Company’s Current Report on Form 8-K (No. 1-12658) filed on July 18, 2014, and incorporated herein by reference].

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- 2.2 Share Purchase Agreement, dated as of June 17, 2016, between Albemarle Corporation and BASF SE [filed as Exhibit 2.1 to the Company's Quarterly Report on Form 10-Q for the quarter ended June 30, 2016 (No. 1-12658), filed on August 5, 2016, and incorporated herein by reference].
 - *2.3 First Amendment to the Share Purchase Agreement, dated December 7, 2016, between Albemarle Corporation and BASF SE.
 - *2.4 Second Amendment to the Share Purchase Agreement, dated December 14, 2016, between Albemarle Corporation and BASF SE.
 - 3.1 Amended and Restated Articles of Incorporation (including Amendment thereto) of Albemarle Corporation [filed as Exhibit 4.1 to the Company's Registration Statement on Form S-3 (No. 333-119723) filed on October 13, 2004, and incorporated herein by reference].
 - 3.2 Amended and Restated Bylaws, effective January 12, 2015, of Albemarle Corporation [filed as Exhibit 3.2 to the Company's Current Report on Form 8-K (No. 1-12658) filed on January 12, 2015, and incorporated herein by reference].
 - 4.1 Indenture, dated as of January 20, 2005, between Albemarle Corporation and The Bank of New York, as trustee [filed as Exhibit 4.1 to the Company's Current Report on Form 8-K (No. 1-12658) filed on January 20, 2005, and incorporated herein by reference].
 - 4.2 Second Supplemental Indenture, dated as of December 10, 2010, between Albemarle Corporation and The Bank of New York Mellon Trust Company, N.A., as successor trustee to The Bank of New York [filed as Exhibit 4.2 to the Company's Current Report on Form 8-K (No. 1-12658) filed on December 10, 2010, and incorporated herein by reference].
 - 4.3 Third Supplemental Indenture, dated as of November 24, 2014, among Albemarle Corporation, Albemarle Holdings Corporation (now Rockwood Holdings, Inc.) and Albemarle Holdings II Corporation (now Rockwood Specialties Group, Inc.) and U.S. Bank National Association, as trustee [filed as Exhibit 4.1 to the Company's Current Report on Form 8-K (No. 1-12658) filed on November 24, 2014, and incorporated herein by reference].
 - 4.4 Fourth Supplemental Indenture, dated as of January 29, 2015, among Albemarle Corporation, Rockwood Holdings, Inc. (as successor by merger to Albemarle Holdings Corporation), Rockwood Specialties Group, Inc. (as successor by merger to Albemarle Holdings II Corporation), The Bank of New York Mellon Trust Company, N.A., a national banking association, as successor to The Bank of New York, as resigning trustee, and U.S. Bank National Association, as successor trustee [filed as Exhibit 4.1 to the Company's Current Report on Form 8-K (No. 1-12658) filed on January 29, 2015, and incorporated herein by reference].
 - 4.5 Form of Global Security for the 4.50% Senior Notes due 2020 [filed as Exhibit 4.3 to the Company's Current Report on Form 8-K (No. 1-12658) filed on December 10, 2010, and incorporated herein by reference].
 - 4.6 Form of Global Security for the 3.000% Senior Notes due 2019 [filed as Exhibit 4.2 to the Company's Current Report on Form 8-K (No. 1-12658) filed on November 24, 2014, and incorporated herein by reference].
 - 4.7 Form of Global Security for the 4.150% Senior Notes due 2024 [filed as Exhibit 4.3 to the Company's Current Report on Form 8-K (No. 1-12658) filed on November 24, 2014, and incorporated herein by reference].
 - 4.8 Form of Global Security for the 5.450% Senior Notes due 2044 [filed as Exhibit 4.4 to the Company's Current Report on Form 8-K (No. 1-12658) filed on November 24, 2014, and incorporated herein by reference].
 - 4.9 Form of Global Security for the 1.875% Senior Notes due 2021 [filed as Exhibit 4.8 to the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2014 (No. 1-12658), and incorporated herein by reference].
 - 10.1 2013 Stock Compensation and Deferral Election Plan for Non-Employee Directors of Albemarle Corporation [filed as Annex A to the Company's definitive Proxy Statement on Schedule 14A (No. 1-12658) filed on March 28, 2013, and incorporated herein by reference].

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- 10.2 First Amendment to the Albemarle Corporation Stock Compensation and Deferral Election Plan [filed as Exhibit 10.1 to the Company's Quarterly Report on Form 10-Q for the quarter ended June 30, 2016 (No. 1-12658), and incorporated herein by reference].
 - 10.3 Compensation Arrangement with Luther C. Kissam, IV, dated August 29, 2003 [filed as Exhibit 10.10 to the Company's Annual Report on Form 10-K for the year ended December 31, 2005 (No. 1-12658), and incorporated herein by reference].
 - 10.4 Albemarle Corporation 2003 Incentive Plan, adopted January 31, 2003 and approved by the shareholders on March 26, 2003 [filed as Annex A to the Company's Definitive Proxy Statement on Schedule 14A (No. 1-12658) filed on February 26, 2003, and incorporated herein by reference].
 - 10.5 First Amendment to the Albemarle Corporation 2003 Incentive Plan, dated as of December 13, 2006 [filed as Exhibit 10.3 to the Company's Current Report on Form 8-K (No. 1-12658) filed on December 18, 2006, and incorporated herein by reference].
 - 10.6 Notice of Performance Unit Award [filed as Exhibit 10.2 to the Company's Current Report on Form 8-K (No. 1-12658) filed on February 25, 2013, and incorporated herein by reference].
 - 10.7 Notice of Restricted Stock Unit Award [filed as Exhibit 10.3 to the Company's Current Report on Form 8-K (No. 1-12658) filed on February 25, 2013, and incorporated herein by reference].
 - 10.8 Notice of Option Grant [filed as Exhibit 10.1 to the Company's Current Report on Form 8-K (No. 1-12658) filed on February 25, 2013, and incorporated herein by reference].
 - 10.9 Notice of Performance-Based Restricted Stock Unit Award [filed as Exhibit 10.4 to the Company's Current Report on Form 8-K (No. 1-12658) filed on February 28, 2014, and incorporated herein by reference].
 - 10.10 Notice of Restricted Stock Unit Award [filed as Exhibit 10.3 to the Company's Current Report on Form 8-K (No. 1-12658) filed on February 28, 2014, and incorporated herein by reference].
 - 10.11 Notice of Option Grant [filed as Exhibit 10.1 to the Company's Current Report on Form 8-K (No. 1-12658) filed on February 28, 2014, and incorporated herein by reference].
 - 10.12 Notice of TSR Performance Unit Award [filed as Exhibit 10.2 to the Company's Current Report on Form 8-K (No. 1-12658) filed on February 28, 2014, and incorporated herein by reference].
 - 10.13 Notice of Option Grant [filed as Exhibit 10.1 to the Company's Current Report on Form 8-K (No. 1-12658) filed on March 2, 2015, and incorporated herein by reference].
 - 10.14 Notice of TSR Performance Unit Award [filed as Exhibit 10.2 to the Company's Current Report on Form 8-K (No. 1-12658) filed on March 2, 2015, and incorporated herein by reference].
 - 10.15 Notice of Restricted Stock Unit Award (2015) [filed as Exhibit 10.14 to the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2015 (No. 1-12658), and incorporated herein by reference].
 - 10.16 Notice of Option Grant [filed as Exhibit 10.1 to the Company's Current Report on Form 8-K (No. 1-12658) filed on March 2, 2016, and incorporated herein by reference].
 - 10.17 Notice of Restricted Stock Unit Award [filed as Exhibit 10.2 to the Company's Current Report on Form 8-K (No. 1-12658) filed on March 2, 2016, and incorporated herein by reference].
 - 10.18 Notice of TSR Performance Unit Award [filed as Exhibit 10.3 to the Company's Current Report on Form 8-K (No. 1-12658) filed on March 2, 2016, and incorporated herein by reference].
 - 10.19 Form Notice of Option Grant under the Albemarle Corporation 2008 Incentive Plan [filed as Exhibit 10.3 to the Company's Current Report on Form 8-K (No. 1-12658) filed on December 9, 2016, and incorporated herein by reference].

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- 10.20 Form Notice of Restricted Stock Unit Award under the Albemarle Corporation 2008 Incentive Plan [filed as Exhibit 10.4 to the Company's Current Report on Form 8-K (No. 1-12658) filed on December 9, 2016, and incorporated herein by reference].
- 10.21 Form Notice of TSR Performance Unit Award under the Albemarle Corporation 2008 Incentive Plan [filed as Exhibit 10.5 to the Company's Current Report on Form 8-K (No. 1-12658) filed on December 9, 2016, and incorporated herein by reference].
- 10.22 Amended and Restated Albemarle Corporation Supplemental Executive Retirement Plan, effective as of January 1, 2005 [filed as Exhibit 10.13 to the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2014 (No. 1-12658), and incorporated herein by reference].
- 10.23 First Amendment to the Albemarle Corporation Supplemental Executive Retirement Plan, dated December 1, 2010 [filed as Exhibit 10.14 to the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2014 (No. 1-12658), and incorporated herein by reference].
- 10.24 Second Amendment to the Albemarle Corporation Supplemental Executive Retirement Plan, dated December 18, 2011 [filed as Exhibit 10.15 to the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2014 (No. 1-12658), and incorporated herein by reference].
- 10.25 Third Amendment to the Albemarle Corporation Supplemental Executive Retirement Plan, dated December 2, 2013 [filed as Exhibit 10.16 to the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2014 (No. 1-12658), and incorporated herein by reference].
- 10.26 Form of Severance Compensation Agreement (Pension-Eligible Employees) [filed as Exhibit 10.19 to the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2015 (No. 1-12658), and incorporated herein by reference].
- 10.27 Form of Severance Compensation Agreement (Non-Pension-Eligible Employees) [filed as Exhibit 10.20 to the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2015 (No. 1-12658), and incorporated herein by reference].
- 10.28 Form of Amendment to Severance Compensation Agreement [filed as Exhibit 10.21 to the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2015 (No. 1-12658), and incorporated herein by reference].
- 10.29 Second Amendment to Severance Compensation Agreement between Luther C. Kissam, IV and Albemarle Corporation [filed as Exhibit 10.1 to the Company's Current Report on Form 8-K (No. 1-12658) filed on December 9, 2016, and incorporated herein by reference].
- 10.30 Form of Second Amendment to Severance Compensation Agreement between each of Karen Narwold, Scott Tozier, and Matthew Juneau, and Albemarle Corporation [filed as Exhibit 10.2 to the Company's Current Report on Form 8-K (No. 1-12658) filed on December 9, 2016, and incorporated herein by reference].
- 10.31 Albemarle Corporation Severance Pay Plan, as revised effective as of December 13, 2006 [filed as Exhibit 10.6 to the Company's Current Report on Form 8-K (No. 1-12658) filed on December 18, 2006, and incorporated herein by reference].
- 10.32 Amended and Restated Albemarle Corporation Benefits Protection Trust, effective as of December 13, 2006 [filed as Exhibit 10.9 to the Company's Current Report on Form 8-K (No. 1-12658) filed on December 18, 2006, and incorporated herein by reference].
- 10.33 Albemarle Corporation Employee Relocation Policy [filed as Exhibit 10.33 to the Company's Quarterly Report on Form 10-Q for the quarter ended June 30, 2008 (No. 1-12658), and incorporated herein by reference].
- 10.34 Albemarle Corporation 2008 Incentive Plan, as amended and restated as of April 20, 2010 [filed as Exhibit 10.1 to the Company's Registration Statement on Form S-8 (No. 333-166828) filed on May 14, 2010, and incorporated herein by reference].

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- 10.35 Amended and Restated Albemarle Corporation Executive Deferred Compensation Plan, effective as of January 1, 2013 [filed as Exhibit 10.23 to the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2014 (No. 1-12658), and incorporated herein by reference].
- 10.36 First Amendment to the Albemarle Corporation Executive Deferred Compensation Plan, dated as of November 14, 2014 [filed as Exhibit 10.24 to the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2014 (No. 1-12658), and incorporated herein by reference].
- 10.37 Second Amendment to the Albemarle Corporation Executive Deferred Compensation Plan, dated as of February 12, 2015 [filed as Exhibit 10.28 to the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2015 (No. 1-12658), and incorporated herein by reference].
- 10.38 Third Amendment to the Albemarle Corporation Executive Deferred Compensation Plan, dated as of July 31, 2015 [filed as Exhibit 10.29 to the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2015 (No. 1-12658), and incorporated herein by reference].
- 10.39 Fourth Amendment to the Albemarle Corporation Executive Deferred Compensation Plan, dated as of December 17, 2015 [filed as Exhibit 10.30 to the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2015 (No. 1-12658), and incorporated herein by reference].
- 10.40 Share Purchase Agreement dated August 31, 2006 among Albemarle Corporation, Albemarle Overseas Development Corporation and International Chemical Investors, SA [filed as Exhibit 10.1 to the Company's Quarterly Report on Form 10-Q for the quarter ended September 30, 2006 (No. 1-12658), and incorporated herein by reference].
- 10.41 Credit Agreement, dated as of February 7, 2014, among Albemarle Corporation and Albemarle Global Finance Company SCA, as borrowers, certain of the Company's subsidiaries that from time to time become parties thereto, the several banks and other financial institutions as may from time to time become parties thereto, and Bank of America, N.A., as Administrative Agent, Swing Line Lender and L/C Issuer [filed as Exhibit 10.1 to the Company's Current Report on Form 8-K (No. 1-12658) filed on February 7, 2014, and incorporated herein by reference].
- 10.42 Credit Agreement, dated as of August 15, 2014, among Albemarle Corporation as borrower, certain of Albemarle Corporation's subsidiaries that from time to time become parties thereto, as guarantors, the several banks and other financial institutions that may from time to time become parties thereto, and Bank of America, N.A., as Administrative Agent [filed as Exhibit 10.1 to the Company's Registration Statement on Form S-4 (No. 333-198415) filed on August 28, 2014, and incorporated herein by reference].
- 10.43 First Amendment to Credit Agreement, dated as of August 15, 2014, among Albemarle Corporation and Albemarle Global Finance Company SCA, as borrowers, the several banks and other financial institutions that may from time to time become parties thereto, and Bank of America, N.A., as Administrative Agent [filed as Exhibit 10.2 to the Company's Registration Statement on Form S-4 (No. 333-198415) filed on August 28, 2014, and incorporated herein by reference].
- 10.44 Cash Bridge Credit Agreement, dated as of December 2, 2014, among Albemarle Corporation as Borrower, the Lenders party thereto, and Bank of America, N.A., as Administrative Agent [filed as Exhibit 10.1 to the Company's Current Report on Form 8-K (No. 1-12658) filed on December 8, 2014, and incorporated herein by reference].
- 10.45 Consent, dated November 24, 2014, of Bank of America, N.A., as Administrative Agent, to Albemarle Corporation, regarding the Credit Agreement, dated as of February 7, 2014 [filed as Exhibit 10.2 to the Company's Current Report on Form 8-K (No. 1-12658) filed on December 8, 2014, and incorporated herein by reference].
- 10.46 Consent, dated November 24, 2014, of Bank of America, N.A., as Administrative Agent, to Albemarle Corporation, regarding the Credit Agreement, dated as of August 15, 2014 [filed as Exhibit 10.2 to the Company's Current Report on Form 8-K (No. 1-12658) filed on December 8, 2014, and incorporated herein by reference].

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- 10.47 First Amendment to Credit Agreement (Term Loan), dated as of December 22, 2014, among Albemarle Corporation, as borrower, certain of Albemarle Corporation's subsidiaries that from time to time become parties thereto, as guarantors, the several banks and other financial institutions as may from time to time become parties thereto, and Bank of America, N.A., as Administrative Agent [filed as Exhibit 10.30 to the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2014 (No. 1-12658), and incorporated herein by reference].
- 10.48 Second Amendment to Credit Agreement and Increase of Aggregate Commitments, dated as of December 22, 2014, among Albemarle Corporation and Albemarle Global Finance Company SCA, as borrowers, the several banks and other financial institutions as may from time to time become parties thereto, and Bank of America, N.A., as Administrative Agent [filed as Exhibit 10.31 to the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2014 (No. 1-12658), and incorporated herein by reference].
- 10.49 Third Amendment to Credit Agreement, dated as of September 14, 2015, among Albemarle Corporation and Albemarle Global Finance Company SCA, as borrowers, the several banks and other financial institutions as may from time to time become parties thereto, and Bank of America, N.A., as Administrative Agent [filed as Exhibit 10.1 to the Company's Quarterly Report on Form 10-Q for the quarter ended September 30, 2015 (No. 1-12658), and incorporated herein by reference].
- 10.50 Term Loan Agreement, dated as of September 14, 2015, among Albemarle Corporation, as borrower, the Lenders party thereto, and JPMorgan Chase Bank, N.A., as Administrative Agent [filed as Exhibit 10.1 to the Company's Current Report on Form 8-K (No. 1-12658) filed on September 14, 2015, and incorporated herein by reference].
- *12.1 Statement of Computation of Ratio of Earnings to Fixed Charges.
- *21.1 Subsidiaries of the Company.
- *23.1 Consent of PricewaterhouseCoopers LLP.
- *31.1 Certification of Chief Executive Officer pursuant to Rule 13a-15(e) and 15d-15(e) of the Securities Exchange Act of 1934, as amended.
- *31.2 Certification of Chief Financial Officer pursuant to Rule 13a-15(e) and 15d-15(e) of the Securities Exchange Act of 1934, as amended.
- *32.1 Certification of Chief Executive Officer pursuant to 18 U.S.C. 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
- *32.2 Certification of Chief Financial Officer pursuant to 18 U.S.C. 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
- *99.1 Five-Year Summary.
- *101 Interactive Data Files (Annual Report on Form 10-K, for the fiscal year ended December 31, 2016, furnished in XBRL (eXtensible Business Reporting Language)).

Attached as Exhibit 101 to this report are the following documents formatted in XBRL: (i) the Consolidated Statements of Income for the fiscal years ended December 31, 2016, 2015 and 2014, (ii) the Consolidated Statements of Comprehensive Income (Loss) for the fiscal years ended December 31, 2016, 2015 and 2014, (iii) the Consolidated Balance Sheets at December 31, 2016 and 2015, (iv) the Consolidated Statements of Changes in Equity for the fiscal years ended December 31, 2016, 2015 and 2014, (v) the Consolidated Statements of Cash Flows for the fiscal years ended December 31, 2016, 2015 and 2014 and (vi) the Notes to Consolidated Financial Statements.

* Included with this filing.

Item 16. Form 10-K Summary.

NONE

