

ALCOA INC.  
Form 10-K  
February 19, 2016  
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**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, 2015**

**OR**

TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d)  
OF THE SECURITIES EXCHANGE ACT OF 1934

Commission File Number 1-3610

**ALCOA INC.**

(Exact name of registrant as specified in its charter)

Pennsylvania  
(State of incorporation) 25-0317820  
(I.R.S. Employer Identification No.)  
**390 Park Avenue, New York, New York 10022-4608**

(Address of principal executive offices) (Zip code)

**Registrant's telephone numbers:**

**Investor Relations----- (212) 836-2674**

**Office of the Secretary----- (212) 836-2732**

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

| Title of each class   | Name of each exchange on which registered |
|---|---|
| Common Stock, par value \$1.00 per share                            | New York Stock Exchange                   |
| Depository Shares, each representing a 1/10 <sup>th</sup> ownership | New York Stock Exchange                   |
| interest in a share of 5.375% Class B Mandatory Convertible         |   |

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Preferred Stock, Series 1, par value \$1.00 per share

**Securities registered pursuant to Section 12(g) of the Act: None**

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 Exchange 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, and (2) has been subject to such filing requirements for the past 90 days. Yes  No .

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Website, 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 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.

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 outstanding common stock, other than shares held by persons who may be deemed affiliates of the registrant, as of the last business day of the registrant's most recently completed second fiscal quarter was approximately \$14 billion. As of February 11, 2016, there were 1,314,845,888 shares of common stock, par value \$1.00 per share, of the registrant outstanding.

### **Documents incorporated by reference.**

Part III of this Form 10-K incorporates by reference certain information from the registrant's definitive Proxy Statement for its 2016 Annual Meeting of Shareholders to be filed pursuant to Regulation 14A (Proxy Statement).

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In this Form 10-K, selected items of information and data are incorporated by reference to portions of the Proxy Statement. Unless otherwise provided herein, any reference in this report to disclosures in the Proxy Statement shall constitute incorporation by reference of only that specific disclosure into this Form 10-K.

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**PART I**

**Item 1. Business.**

**General**

Formed in 1888, Alcoa Inc. is a Pennsylvania corporation with its principal office in New York, New York. In this report, unless the context otherwise requires, Alcoa or the Company means Alcoa Inc. and all subsidiaries consolidated for the purposes of its financial statements.

The Company's Internet address is <http://www.alcoa.com>. Alcoa makes available free of charge on or through its website its 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 soon as reasonably practicable after the Company electronically files such material with, or furnishes it to, the Securities and Exchange Commission (SEC). The information on the Company's Internet site is not a part of, or incorporated by reference in, this annual report on Form 10-K. The SEC maintains an Internet site that contains these reports at <http://www.sec.gov>.

**Forward-Looking Statements**

This report contains (and oral communications made by Alcoa may contain) statements that relate to future events and expectations and, as such, constitute forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. Forward-looking statements include those containing such words as anticipates, believes, could, estimates, expects, forecasts, goal, intends, may, outlook, seeks, sees, should, targets, will, will likely result, would, or other words of similar meaning. All statements that reflect Alcoa's expectations, assumptions or projections about the future other than statements of historical fact are forward-looking statements, including, without limitation, forecasts concerning global demand growth for aluminum, supply/demand balances, growth of the aerospace, automotive and other end markets, or other trend projections, anticipated financial results or operating performance, statements about Alcoa's strategies, objectives, goals, targets, outlook, and business and financial prospects, including statements regarding the separation transaction; the future performance of Value-Add Company and Upstream Company if the separation is completed; the expected benefits of the separation; projections of improved profitability, enhanced shareholder value, competitive position, market share, growth opportunities, credit ratings, revenues, cash flow or other financial items of the separated companies; the expected timing of completion of the separation; and the expected qualification of the separation as a tax-free transaction.

Forward-looking statements are subject to a number of known and unknown risks, uncertainties and other factors and are not guarantees of future performance. Actual results, performance or outcomes may differ materially from those expressed in or implied by those forward-looking statements. For a discussion of some of the specific factors that may cause Alcoa's actual results to differ materially from those projected in any forward-looking statements, see the following sections of this report: Part I, Item 1A. (Risk Factors), Part II, Item 7. (Management's Discussion and Analysis of Financial Condition and Results of Operations), including the disclosures under Segment Information and Critical Accounting Policies and Estimates, and Note N and the Derivatives Section of Note X to the Consolidated Financial Statements in Part II, Item 8. (Financial Statements and Supplementary Data). Market projections are subject to the risks discussed above and other risks in the market. Alcoa disclaims any intention or obligation to update publicly any forward-looking statements, whether in response to new information, future events or otherwise, except as required by applicable law.

**Overview**

Alcoa is a global leader in lightweight metals engineering and manufacturing. Alcoa's innovative, multi-material products, which include aluminum, titanium, and nickel, are used worldwide in aerospace, automotive, commercial transportation, packaging, building and construction, oil and gas, defense, consumer electronics, and industrial applications.

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Alcoa is also the world leader in the production and management of primary aluminum, fabricated aluminum, and alumina combined, through its active participation in all major aspects of the industry: technology, mining, refining, smelting, fabricating, and recycling. Aluminum is a commodity that is traded on the London Metal Exchange (LME) and priced daily. Sales of primary aluminum and alumina represent approximately 40% of Alcoa’s revenues. The price of aluminum influences the operating results of Alcoa.

Alcoa is a global company operating in 30 countries. Based upon the country where the point of sale occurred, the United States and Europe generated 55% and 26%, respectively, of Alcoa’s sales in 2015. In addition, Alcoa has investments and operating activities in, among others, Australia, Brazil, China, Guinea, Iceland, Russia, and Saudi Arabia. Governmental policies, laws and regulations, and other economic factors, including inflation and fluctuations in foreign currency exchange rates and interest rates, affect the results of operations in these countries.

Alcoa’s operations consist of five worldwide reportable segments: Alumina, Primary Metals, Global Rolled Products, Engineered Products and Solutions, and Transportation and Construction Solutions.

**Description of the Business**

Information describing Alcoa’s businesses can be found on the indicated pages of this report:

| <b>Item</b>   | <b>Page(s)</b> |
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| The following tables and related discussion of the Company’s Bauxite Interests, Alumina Refining and Primary Aluminum Facilities and Capacities, Global Rolled Products, Engineered Products and Solutions and Transportation and Construction Solutions provide additional description of Alcoa’s businesses. The Alumina segment primarily consists of a series of affiliated operating entities referred to as Alcoa World Alumina and Chemicals (AWAC). Alcoa owns 60% and Alumina Limited owns 40% of these individual entities. For more information on AWAC, see Exhibit Nos. 10(a) through 10(f)(1) to this report. |                |

**Proposed Separation Transaction**

On September 28, 2015, Alcoa announced that its Board of Directors approved a plan to separate into two independent, publicly-traded companies. One company will comprise the Alumina and Primary Metals segments and the other company will comprise the Global Rolled Products, Engineered Products and Solutions, and Transportation and Construction Solutions segments. Alcoa is targeting to complete the separation in the second half of 2016. The

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transaction is subject to a number of conditions, including, but not limited to, final approval by Alcoa's Board of Directors, receipt of a favorable opinion of legal counsel with respect to the tax-free nature of the transaction for U.S. federal income tax purposes, completed financing, and the effectiveness of a Form 10 registration statement to be filed with the U.S. Securities and Exchange Commission. Upon completion of the separation, Alcoa shareholders will own all of the outstanding shares of both companies. Alcoa may, at any time and for any reason until the proposed transaction is complete, abandon the separation plan or modify or change its terms.

### **Bauxite Interests**

This Bauxite Interests section explains the Company's interests in various bauxite mines throughout the world. Bauxite is one of the Company's basic raw materials and is also a product sold into the third-party marketplace. This section provides mine description and reserve and annual production figures in respect of the Company's interests.

Aluminum is one of the most abundant elements in the earth's crust. Aluminum metal is produced by smelting alumina. Alumina is produced primarily from refining bauxite. Bauxite contains various aluminum hydroxide minerals, the most important of which are gibbsite and boehmite. Alcoa processes most of the bauxite that it mines into alumina. The Company obtains bauxite from its own resources and from those belonging to the AWAC enterprise, located in the countries listed in the table below, as well as pursuant to both long-term and short-term contracts and mining leases. Tons of bauxite are reported as bone dry metric tons (bdmt) unless otherwise stated. See the glossary of bauxite mining related terms at the end of this section.

During 2015, mines operated by Alcoa (owned by Alcoa and AWAC) produced 38.3 million bdmt and separately mines operated by third parties (with Alcoa and AWAC equity interests) produced 7.0 million bdmt on a proportional equity basis for a total bauxite production of 45.3 million bdmt.

Based on the terms of its bauxite supply contracts, AWAC bauxite purchases from Mineração Rio do Norte S.A. (MRN) and Compagnie des Bauxites de Guinée (CBG) differ from its proportional equity in those mines. Therefore during 2015, AWAC had access to 47.8 million bdmt of production from its portfolio of mines.

During 2015, AWAC sold 2.0 million bdmt of bauxite to third parties and purchased 1.1 million bdmt from third parties. The bauxite delivered to Alcoa and AWAC refineries amounted to 46.8 million bdmt during 2015.

The Company is growing its third-party bauxite sales business. During the third quarter of 2015, Alcoa received permission from the Government of Western Australia to export trial shipments from its Western Australia mines.

The Company has access to large bauxite deposit areas with mining rights that extend in most cases more than 20 years from the date of this report. For purposes of evaluating the amount of bauxite that will be available to supply as feedstock to its refineries, the Company considers both estimates of bauxite resources as well as calculated bauxite reserves. Bauxite resources represent deposits for which tonnage, densities, shape, physical characteristics, grade and mineral content can be estimated with a reasonable level of confidence based on the amount of exploration sampling and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes. Bauxite reserves represent the economically mineable part of resource deposits, and include diluting materials and allowances for losses, which may occur when the material is mined. Appropriate assessments and studies have been carried out to define the reserves, and include consideration of and modification by realistically assumed mining, metallurgical, economic, marketing, legal, environmental, social and governmental factors. Alcoa employs a conventional approach (including additional drilling with successive tightening of the drill grid) with customized techniques to define and characterize its various bauxite deposit types allowing Alcoa to confidently establish the extent of its bauxite resources and their ultimate conversion to reserves.

The table below only includes the amount of proven and probable reserves controlled by the Company. While the level of reserves may appear low in relation to annual production levels, they are consistent with historical levels of reserves for the Company's mining locations. Given the Company's extensive bauxite resources, the abundant supply of bauxite

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globally and the length of the Company's rights to bauxite, it is not cost-effective to invest the significant funds and efforts necessary to establish bauxite reserves that reflect the total size of the bauxite resources available to the Company. Rather, bauxite resources are upgraded annually to reserves as needed by the location. Detailed assessments are progressively undertaken within a proposed mining area and mine activity is then planned to achieve a uniform quality in the supply of blended feedstock to the relevant refinery. Alcoa believes its present sources of bauxite on a global basis are sufficient to meet the forecasted requirements of its alumina refining operations for the foreseeable future.

**Bauxite Resource Development Guidelines**

Alcoa has developed best practice guidelines for bauxite reserve and resource classification at its operating bauxite mines. Alcoa's reserves are declared in accordance with Alcoa's internal guidelines as administered by the Alcoa Ore Reserves Committee (AORC). The reported ore reserves set forth in the table below are those that Alcoa estimates could be extracted economically with current technology and in current market conditions. Alcoa does not use a price for bauxite, alumina, or aluminum to determine its bauxite reserves. The primary criteria for determining bauxite reserves are the feed specifications required by the customer alumina refinery. In addition to these specifications, a number of modifying factors have been applied to differentiate bauxite reserves from other mineralized material. Alcoa mining locations have annual in-fill drilling programs designed to progressively upgrade the reserve and resource classification of their bauxite.

**Alcoa Bauxite Interests, Share of Reserves and Annual Production<sup>1</sup>**

| Country                  | Project                         | Owners Mining Rights (% Entitlement)   | Expiration Date of Mining Rights | Probable Reserves (million bdmt) | Proven Reserves (million bdmt) | Available Alumina Content (%)<br>AvAl <sub>2</sub> O <sub>3</sub> | Reactive Silica Content (%)<br>RxSiO <sub>2</sub> | 2015 Annual Production (million bdmt) |
|--------------------------|---------------------------------|--|----------------------------------|----------------------------------|--------------------------------|---|---|---------------------------------------|
| Australia                | Darling Range Mines ML1SA       | Alcoa of Australia Limited (AofA) <sup>2</sup> (100%)  | 2024                             | 28.5                             | 150.0                          | 33.0  | 0.9   | 31.7                                  |
| Brazil                   | Poços de Caldas                 | Alcoa Alumínio S.A. (Alumínio) <sup>3</sup> (100%)   | 2020 <sup>4</sup>                | 0.9                              | 1.3                            | 39.6  | 4.4   | 0.3                                   |
|                          | Juruti <sup>4</sup>             |  | 2100 <sup>4</sup>                | 8.7                              | 26.5                           | 47.7  | 4.1   | 4.7                                   |
|                          | RN101, RN102, RN103, RN104, #34 | Alcoa World Alumina Brasil Ltda. (AWA Brasil) <sup>2</sup> (100%)  |                                  |                                  |                                |   |   |                                       |
| Suriname                 | Coermotibo and Onverdacht       | Suriname Aluminum Company, L.L.C. (Suralco) <sup>2</sup> (55%)<br>N.V. Alcoa Minerals of Suriname (AMS) <sup>5</sup> (45%) | 2033 <sup>6</sup>                | 0.0                              | 0.0                            | N/A   | N/A   | 1.6                                   |
| <b>Equity interests:</b> |                                 |  |                                  |                                  |                                |   |   |                                       |
| Brazil                   | Trombetas                       | Mineração Rio do Norte S.A. (MRN) <sup>7</sup> (18.2%)   | 2046 <sup>4</sup>                | 3.7                              | 10.4                           | 49.5  | 4.5   | 3.0                                   |
| Guinea                   | Boké                            | Compagnie des Bauxites de Guinée (CBG) <sup>8</sup>  | 2038 <sup>9</sup>                | 59.5                             | 23.2                           | TAl <sub>2</sub> O <sub>3</sub> <sub>10</sub>                     | TSiO <sub>2</sub> <sup>10</sup>                   | 3.4                                   |
|                          |                                 | (22.95%)   |                                  |                                  |                                | 48.5  | 1.7   |                                       |
| Kingdom of Saudi Arabia  | Al Badiyah                      | Maden Bauxite & Alumina Company (25.1%) <sup>11</sup>  | 2037                             | 33.8                             | 19.3                           | TAA <sup>12</sup>   | TSiO <sub>2</sub> <sup>12</sup>                   | 0.6                                   |
|                          |                                 |  |                                  |                                  |                                | 49.4  | 8.6   |                                       |





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- <sup>1</sup> This table shows only the AWAC and/or Alcoa share (proportion) of reserve and annual production tonnage.
- <sup>2</sup> This entity is part of the AWAC group of companies and is owned 60% by Alcoa and 40% by Alumina Limited.
- <sup>3</sup> Alumínio is owned 100% by Alcoa.
- <sup>4</sup> Brazilian mineral legislation does not establish the duration of mining concessions. The concession remains in force until the exhaustion of the deposit. The Company estimates that (i) the concessions at Poços de Caldas will last at least until 2020, (ii) the concessions at Trombetas will last until 2046 and (iii) the concessions at Juruti will last until 2100. Depending, however, on actual and future needs, the rate at which the deposits are exploited and government approval is obtained, the concessions may be extended to (or expire at) a later (or an earlier) date.
- <sup>5</sup> Alcoa World Alumina LLC (AWA LLC) owns 100% of N.V. Alcoa Minerals of Suriname (AMS). Suralco and AMS are parts of the AWAC group of companies which are owned 60% by Alcoa and 40% by Alumina Limited.
- <sup>6</sup> At the end of 2015, AWAC's bauxite mineral and mining rights remained valid until 2033. The AWAC mines in Suriname were curtailed in the fourth quarter of 2015. There are no plans for AWAC to restart these mines and there are no reserves to declare.
- <sup>7</sup> Alumínio holds an 8.58% total interest, AWA Brasil holds a 4.62% total interest and AWA LLC holds a 5% total interest in MRN. MRN is jointly owned with affiliates of Rio Tinto Alcan Inc., Companhia Brasileira de Alumínio, Companhia Vale do Rio Doce, BHP Billiton Plc (BHP Billiton) and Norsk Hydro. Alumínio, AWA Brasil, and AWA LLC purchase bauxite from MRN under long-term supply contracts.
- <sup>8</sup> AWA LLC owns a 45% interest in Halco (Mining), Inc. (Halco). Halco owns 100% of Boké Investment Company, a Delaware company, which owns 51% of CBG. The Guinean Government owns 49% of CBG, which has the exclusive right through 2038 to develop and mine bauxite in certain areas within an approximately 2939 square kilometer concession in northwestern Guinea.
- <sup>9</sup> AWA LLC and Alumina Española, S.A. have bauxite purchase contracts with CBG that expire in 2033. Before that expiration date, AWA LLC and Alumina Española, S.A. expect to negotiate extensions of their contracts as CBG will have concession rights until 2038. The CBG concession can be renewed beyond 2038 by agreement of the Government of Guinea and CBG should more time be required to commercialize the remaining economic bauxite within the concession.
- <sup>10</sup> Guinea - Boké: CBG prices bauxite and plans the mine based on the bauxite qualities of total alumina ( $TA_2D_3$ ) and total silica ( $TSiO_2$ ).
- <sup>11</sup> Maden Bauxite & Alumina Company is a joint venture owned by Saudi Arabian Mining Company (Maden) (74.9%) and AWA Saudi Limited (25.1%). AWA Saudi Limited is part of the AWAC group of companies and is owned 60% by Alcoa and 40% by Alumina Limited.
- <sup>12</sup> Kingdom of Saudi Arabia - Al-Baiha: Bauxite reserves and mine plans are based on the bauxite qualities of total available alumina (TAA) and total silica ( $TSiO_2$ ).

Qualifying statements relating to the table above:

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**Australia Darling Range Mines:** Huntly and Willowdale are the two AWAC active mines in the Darling Range of Western Australia. The mineral lease issued by the State of Western Australia to AofA is known as ML1SA and its term extends to 2024. The lease can be renewed for an additional twenty-one year period to 2045. The declared reserves are as for December 31, 2015. The amount of reserves reflects the total AWAC share. Additional resources are routinely upgraded by additional exploration and development drilling to reserve status. The Huntly and Willowdale mines supply bauxite to three local AWAC alumina refineries.

**Brazil Poços de Caldas:** Declared reserves are as for December 31, 2015. Tonnage is total Alcoa share. Additional resources are being upgraded to reserves as needed.

**Brazil Juruti RN101, RN102, RN103, RN104, #34:** Declared reserves are as for December 31, 2015. All reserves are on Capiranga Plateau. Declared reserves are total AWAC share. Declared reserve tonnages and the annual production tonnage are washed product tonnages. The Juruti mine's operating license is periodically renewed.

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**Suriname Suralco:** The AWAC mines in Suriname were curtailed in the fourth quarter of 2015. AWAC has no plans to restart these mines and there are no reserves to declare.

**Brazil Trombetas-MRN:** Declared reserves have been estimated by MRN as for December 31, 2015. The CP Report for December 31, 2015 reserves is expected to be issued on or about February 29, 2016. Declared and annual production tonnages reflect the total for Alumínio and AWAC shares (18.2%). Declared tonnages are washed product tonnages.

**Guinea Boké-CBG:** Declared reserves are based on export quality bauxite and have been estimated by CBG as for December 31, 2015. The CP Report for December 31, 2015 reserves is expected to be issued in March 2016. Declared tonnages reflect only the AWAC share of CBG's reserves. Annual production tonnage is reported based on AWAC's 22.95% share. Declared reserves quality is reported based on total alumina ( $\text{TAI}_2\text{O}_3$ ) and total silica ( $\text{TSiO}_2$ ) because CBG export bauxite is sold on this basis. Additional resources are being routinely drilled and modeled to upgrade to reserves as needed.

**Kingdom of Saudi Arabia Al Ba'itha:** The Al Ba'itha Mine began production during 2014 and production was increased in 2015. Declared reserves are as for December 31, 2015. The proven reserves have been decremented for 2015 mine production. The declared reserves are located in the South Zone of the Az Zabirah Bauxite Deposit. The reserve tonnage in this declaration is AWAC share only (25.1%).

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The following table provides additional information regarding the Company's bauxite mines:

| <b>Mine &amp; Location</b>   | <b>Means of Access</b>   | <b>Operator</b> | <b>Title, Lease or Options</b>  | <b>History</b>  | <b>Type of Mine Mineralization Style</b>  | <b>Power Source</b>   | <b>Facilities, Use &amp; Condition</b>   |
|--|--|-----------------|---|---|---|---|--|
| Australia Darling Range; Huntly and Willowdale.                      | Mine locations accessed by roads. Ore is transported to refineries by long distance conveyor and rail.   | Alcoa           | Mining lease from the Western Australia Government. ML1SA. Expires in 2024.   | Mining began in 1963.   | Open-cut mines.<br><br>Bauxite is derived from the weathering of Archean granites and gneisses and Precambrian dolerite.            | Electrical energy from natural gas is supplied by the refinery.                                   | Infrastructure includes buildings for administration and services; workshops; power distribution; water supply; crushers; long distance conveyors.   |
| Brazil Poços de Caldas. Closest town is Poços de Caldas, MG, Brazil. | Mine locations are accessed by road. Ore transport to the refinery is by road.   | Alcoa           | Mining licenses from the Government of Brazil and Minas Gerais. Company claims and third-party leases. Expires in 2020.                       | Mining began in 1965.   | Open-cut mines.<br><br>Bauxite derived from the weathering of nepheline syenite and phonolite.                                      | Commercial grid power.  | Mines and facilities are operating.<br>Mining offices and services are located at the refinery.<br><br>Numerous small deposits are mined by contract miners and the ore is trucked to either the refinery stockpile or intermediate stockpile area.  |
| Brazil Juruti. Closest town is Juruti located on the Amazon River.   | The mine's port at Alcoa Juruti is located on the Amazon River and accessed by ship.<br><br>Ore is transported from the mine site to the port by | Alcoa           | Mining licenses from the Government of Brazil and Pará. Mining rights do not have a legal expiration date. See footnote 4 to the table above. | The Juruti deposit was systematically evaluated by Reynolds Metals Company beginning in 1974.<br><br>Alcoa merged Reynolds into the | Open-cut mines.<br>Bauxite derived from weathering during the Tertiary of Cretaceous fine to medium grained feldspathic sandstones. | Electrical energy from fuel oil is generated at the mine site. Commercial grid power at the port. | Mines and facilities are operating.<br><br>Mine production has been reduced to align with the reduced production of the Poços refinery which is now producing specialty alumina. At the mine site: Fixed plant facilities for crushing and washing the ore; mine services offices and workshops; power generation; water supply; stockpiles; rail sidings. |

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|          |  |  |       |   |  |  |                        |  |
|----------|--|--|-------|---|--|--|------------------------|--|
|          | Company owned rail.  |  |       | Operating licenses for the mine, washing plant and RR have been renewed with validity until 2018.   | Alcoa then executed a due diligence program and expanded the exploration area.   | The deposits are covered by the Belterra clays.  |                        | At the port: Mine and rail administrative offices and services; port control facilities with stockpiles and ship loader.   |
|          |  |  |       | Operating license for the port remains valid until the government agency formalizes the renewal.  | Mining began in 2009.  |  |                        |  |
| Suriname | Coermotibo and Onverdacht. Mines are located in the districts of Para and Marowijne. | The mines are accessed by road. Ore is delivered to the refinery by road from the Onverdacht area and by river barge from the Coermotibo area. | Alcoa | Brokopondo Concession from the Government of Suriname. Concessions formerly owned by a BHP Billiton (BHP) subsidiary that was a 45% joint venture partner in the Surinamese bauxite mining and alumina refining joint ventures. AWA LLC acquired that subsidiary in 2009. After the acquisition of the subsidiary, its name was changed to N.V. Alcoa Minerals of Suriname. | Alcoa became active in Suriname in 1916 with the founding of the Suriname Bauxite Company.<br><br>Bauxite was first exported in 1922. The Brokopondo Agreement was signed in 1958.<br><br>As noted, Suralco bought the bauxite and alumina interests of a BHP subsidiary from BHP in 2009. | Open-cut mines.<br><br>At one of the mines, the overburden is dredged and mining progresses with conventional open-cut methods. The protoliths of the bauxite have been completely weathered. The bauxite deposits are mostly derived from the weathering of Tertiary Paleogene arkosic sediments. In some places, the bauxite overlies Precambrian granitic and gneissic rocks which have been deeply weathered to saprolite. Bauxitization likely occurred during the middle to late Eocene Epoch. | Commercial grid power. | Mine and port facilities are operating. In the Onverdacht mining areas, the bauxite is mined and transported to the refinery by truck. In the Coermotibo mining areas, the bauxite is mined, stockpiled and then transported to the refinery by barge. Some of the ore is washed in a small beneficiation plant located in the Coermotibo area. The main mining administrative offices, services, workshops and laboratory are located at the refinery in Paranam. The ore is crushed at Paranam and fed into the refining process.<br><br>The Suralco mines were curtailed in the fourth quarter of 2015. There are no plans for AWAC to restart these mines. |
|          |  |  |       | Expires in 2033.  |  |  |                        |  |

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|   | <b>Means of</b>  |                 | <b>Title,</b>   |                | <b>Type of</b>           |  | <b>Facilities,</b>                               |  |
|---|--|-----------------|---|----------------|--------------------------|--|--|--|
| <b>Mine &amp; Location</b>  | <b>Access</b>  | <b>Operator</b> | <b>Lease or</b>   | <b>Options</b> | <b>History</b>           | <b>Mine Mineralization Style</b>   | <b>Power Source</b>                              | <b>Condition</b>   |
| Brazil MRN. Closest town is Trombetas in the State of Pará, Brazil. | The mine and port areas are connected by sealed road and company owned rail. | MRN             | Mining rights and licenses from the Government of Brazil. |                | Mining began in 1979.    | Open-cut mines.  | MRN generates its own electricity from fuel oil. | Ore mined from several plateaus is crushed and transported to the washing plant by long-distance conveyors.  |
|   | Washed ore is transported to Porto Trombetas by rail.                        |                 | Concession rights expire in 2046.                         |                | Major expansion in 2003. | Bauxite derived from weathering during the Tertiary of Cretaceous fine to medium grained feldspathic sandstones. |  | The washing plant is located in the mining zone.   |
|   | Trombetas is accessed by river and by air at the airport.                    |                 |   |                |                          | The deposits are covered by the Belterra clays.  |  | Washed ore is transported to the port area by company-owned and operated rail.   |
|   |  |                 |   |                |                          |  |  | At Porto Trombetas the ore is loaded onto customer ships berthed in the Trombetas River. Some ore is dried and the drying facilities are located in the port area. |
|   |  |                 |   |                |                          |  |  | Mine planning and services and mining equipment workshops are located in the mine zone.  |
|   |  |                 |   |                |                          |  |  | The main administrative, rail and port control offices and various workshops are located in the port area.   |

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|   |   |                                   |  |  |  |   |   |
|---|---|-----------------------------------|--|--|--|---|---|
|   |   |                                   |  |  |  |   | MRN's main housing facilities, the city, are located near the port.   |
| Guinea CBG.   | The mine and port areas are connected by sealed road and company-operated rail. Ore is transported to the port at Kamsar by rail. There are air strips near both the mine and port. | CBG                               | CBG Lease expires in 2038. The lease is renewable in 25-year increments. CBG's rights are specified within the Basic Agreement and Amendment 1 to the Basic Agreement with the Government of Guinea. | Construction began in 1969. First export ore shipment was in 1973.   | Open-cut mines. The bauxite deposits within the CBG lease are of two general types. TYPE 1: In-situ laterization of Ordovician and Devonian plateau sediments locally intruded by dolerite dikes and sills. TYPE 2: Sangaredi type deposits are derived from clastic deposition of material eroded from the Type 1 laterite deposits and possibly some of the prooliths from the TYPE 1 plateaus deposits. | The company generates its own electricity from fuel oil at both Kamsar and Sangaredi. | The mines, port and all facilities are operating. Mine offices, workshops, power generation and water supply for the mine and company mine city are located at Sangaredi. The main administrative offices, port control, railroad control, workshops, power generation and water supply are located in Kamsar. Ore is crushed, dried and exported from Kamsar. CBG has company cities within both Kamsar and Sangaredi. |
| Closest town to the mine is Sangaredi.  |   |                                   |  |  |  |   |   |
| Closest town to the port is Kamsar. The CBG Lease is located within the Boké, Telimele and Gaoual administrative regions.   |   |                                   |  |  |  |   |   |
| These are not operated by the company.  |   |                                   |  |  |  |   |   |
| Kingdom of Saudi Arabia Al Bahaitha Mine. Qibah is the closest regional centre to the mine, located in the Qassim province. | The mine and refinery are connected by road and rail. Ore is transported to the refinery at Ras Al Khair by rail.   | Ma'aden Bauxite & Alumina Company | The current mining lease will expire in 2037.  | The initial discovery and delineation of bauxite resources was carried out between 1979 and 1984. The southern zone of the Az Zabirah deposit was granted to Ma'aden in 1999. Mine construction was completed in the second quarter of 2015, and the mining operations | Open-cut mine. Bauxite occurs as a paleolaterite profile developed at an angular unconformity between underlying late Triassic to early Cretaceous sediments (parent rock sequence Biyadh Formation) and the overlying late Cretaceous   | The company generates electricity at the mine site from fuel oil.                     | The mine includes fixed plants for crushing and train loading; workshops and ancillary services; power plant; and water supply. There is a company village with supporting facilities. Mining operations commenced in 2014. Mine construction was completed in the second quarter of 2015 and the mining operations continued at  |

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continued at  
planned levels.

Wasia Formation  
(overburden  
sequence).

planned levels.



**Table of Contents***Kingdom of Saudi Arabia Joint Venture*

In December 2009, Alcoa and Saudi Arabian Mining Company (Ma'aden) entered into a joint venture to develop a fully integrated aluminum complex in the Kingdom of Saudi Arabia. In its initial phases, the complex includes a bauxite mine with an initial capacity of 4 million bdm<sup>t</sup> per year; an alumina refinery with an initial capacity of 1.8 million mt per year (mtpy); an aluminum smelter with an initial capacity of ingot, slab and billet of 740,000 mtpy; and a rolling mill with initial capacity of 380,000 mtpy. The mill will produce a variety of sheet products.

The refinery, smelter and rolling mill are located within the Ras Al Khair industrial zone on the east coast of the Kingdom of Saudi Arabia.

The smelter and refinery are fully operational. The mine construction was completed in the second quarter of 2015 and ramp up of operations is proceeding as planned.

Total capital investment is expected to be approximately \$10.8 billion (SAR 40.5 billion). Ma'aden owns a 74.9% interest in the joint venture. Alcoa owns a 25.1% interest in the smelter and rolling mill, with AWAC holding a 25.1% interest in the mine and refinery. For additional information regarding the joint venture, see the Equity Investments section of Note I to the Consolidated Financial Statements in Part II, Item 8. (Financial Statements and Supplementary Data).

**Glossary of Bauxite Mining Related Terms**

| <b>Term</b>                               | <b>Abbreviation</b>              | <b>Definition</b>   |
|---|----------------------------------|---|
| Alcoa Ore Reserves Committee              | AORC                             | The group within Alcoa, which is comprised of Alcoa geologists and engineers, that specifies the guidelines by which bauxite reserves and resources are classified. These guidelines are used by Alcoa managed mines. |
| Alumina                                   | Al <sub>2</sub> O <sub>3</sub>   | A compound of aluminum and oxygen. Alumina is extracted from bauxite using the Bayer Process. Alumina is a raw material for smelters to produce aluminum metal.   |
| AORC Guidelines                           |                                  | The Alcoa guidelines used by Alcoa managed mines to classify reserves and resources. These guidelines are issued by the Alcoa Ore Reserves Committee.   |
| Available alumina content                 | AvAl <sub>2</sub> O <sub>3</sub> | The amount of alumina extractable from bauxite using the Bayer Process.   |
| Bauxite                                   |                                  | The principal raw material (rock) used to produce alumina. Bauxite is refined using the Bayer Process to extract alumina.   |
| Bayer Process                             |                                  | The principal industrial means of refining bauxite to produce alumina.  |
| Bone dry metric ton                       | Bdmt                             | Tonnage reported on a zero moisture basis.  |
| Coermotibo                                |                                  | The mining area in Suriname containing the deposits of Bushman Hill, CBO Explo, Lost Hill and Remnant. These mines have been curtailed.   |
| Competent Persons Report                  | CP Report                        | Joint Ore Reserves Committee (JORC) Code compliant Reserves and Resources Report.   |
| Juruti RN101, RN102, RN103,<br>RN104, #34 |                                  | Mineral claim areas in Brazil associated with the Juruti mine, within which Alcoa has mining operating licenses issued by the state.  |
| ML1SA                                     |                                  | The Mineral lease issued by the State of Western Australia to Alcoa. Alcoa mines located at Huntly and Willowdale operate within ML1SA.   |
| Onverdacht                                |                                  | The mining area in Suriname containing the deposits of Kaaimangrasi, Klaverblad, Lelydorp1 and Sumau 1. These mines have been curtailed.  |

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| <b>Term</b>             | <b>Abbreviation</b>             | <b>Definition</b>  |
|-------------------------|---------------------------------|--|
| Open-cut mine           |                                 | The type of mine in which an excavation is made at the surface to extract mineral ore (bauxite). The mine is not underground and the sky is viewable from the mine floor.  |
| Probable reserve        |                                 | That portion of a reserve, i.e. bauxite reserve, where the physical and chemical characteristics and limits are known with sufficient confidence for mining and to which various mining modifying factors have been applied. Probable reserves are at a lower confidence level than proven reserves. |
| Proven reserve          |                                 | That portion of a reserve, i. e. bauxite reserve, where the physical and chemical characteristics and limits are known with high confidence and to which various mining modifying factors have been applied.   |
| Reactive silica         | RxSiO <sub>2</sub>              | The amount of silica contained in the bauxite that is reactive within the Bayer Process.   |
| Reserve                 |                                 | That portion of mineralized material, i.e. bauxite, that Alcoa has determined to be economically feasible to mine and supply to an alumina refinery.   |
| Resources               |                                 | Resources are bauxite occurrences and/or concentrations of economic interest that are in such form, quality and quantity that are reasonable prospects for economic extraction.  |
| Silica                  | SiO <sub>2</sub>                | A compound of silicon and oxygen.  |
| Total alumina content   | TAl <sub>2</sub> O <sub>3</sub> | The total amount of alumina in bauxite. Not all of this alumina is extractable or available in the Bayer Process.  |
| Total available alumina | TAA                             | The total amount of alumina extractable from bauxite by the Bayer Process. This term is commonly used when there is a hybrid or variant Bayer Process that will refine the bauxite.  |
| Total silica            | TSiO <sub>2</sub>               | The total amount of silica contained in the bauxite.   |

**Alumina Refining Facilities and Capacity**

Alcoa is the world's leading producer of alumina. Alcoa's alumina refining facilities and its worldwide alumina capacity are shown in the following table:

**Alcoa Worldwide Alumina Refining Capacity**

| <b>Country</b> | <b>Facility</b>   | <b>Owners<br/>(% of Ownership)</b>      | <b>Nameplate<br/>Capacity<sup>1</sup><br/>(000 MTPY)</b> | <b>Alcoa<br/>Consolidated<br/>Capacity<sup>2</sup><br/>(000 MTPY)</b> |
|----------------|-------------------|---|--|---|
| Australia      | Kwinana           | AofA <sup>3</sup> (100%)                | 2,190  | 2,190   |
|                | Pinjarra          | AofA (100%)                             | 4,234  | 4,234   |
|                | Wagerup           | AofA (100%)                             | 2,555  | 2,555   |
| Brazil         | Poços de Caldas   | Alumínio <sup>4</sup> (100%)            | 390 <sup>5</sup>   | 390   |
|                | São Luís (Alumar) | AWA Brasil <sup>3</sup> (39%)           |  |   |
|                |                   | Rio Tinto Alcan Inc. <sup>6</sup> (10%) |  |   |
|                |                   | Alumínio (15%)                          |  |   |
|                |                   | BHP Billiton <sup>6</sup> (36%)         | 3,500  | 1,890   |

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| Country       | Facility          | Owners<br>(% of Ownership)                        | Alcoa   |  |
|---------------|-------------------|---|---|--|
|               |                   |   | Nameplate Capacity <sup>1</sup><br>(000 MTPY) | Consolidated Capacity <sup>2</sup><br>(000 MTPY) |
| Spain         | San Ciprián       | Alúmina Española, S.A. <sup>3</sup> (100%)        | 1,500 <sup>7</sup>                            | 1,500  |
| Suriname      | Suralco           | Suralco <sup>3</sup> (55%) AMS <sup>8</sup> (45%) | 2,207 <sup>9</sup>                            | 2,207  |
| United States | Point Comfort, TX | AWA LLC <sup>3</sup> (100%)                       | 2,305 <sup>10</sup>                           | 2,305  |
| TOTAL         |                   |   | 18,881  | 17,271   |

<sup>1</sup> Nameplate Capacity is an estimate based on design capacity and normal operating efficiencies and does not necessarily represent maximum possible production.

<sup>2</sup> The figures in this column reflect Alcoa's share of production from these facilities. For facilities wholly-owned by AWAC entities, Alcoa takes 100% of the production.

<sup>3</sup> This entity is part of the AWAC group of companies and is owned 60% by Alcoa and 40% by Alumina Limited.

<sup>4</sup> This entity is owned 100% by Alcoa.

<sup>5</sup> As a result of the decision to fully curtail the Poços de Caldas smelter, management initiated a reduction in alumina production at this refinery. The capacity that is operating at this refinery is producing at an approximately 45% output level.

<sup>6</sup> The named company or an affiliate holds this interest.

<sup>7</sup> The capacity that is operating at this refinery is producing at an approximately 95% output level.

<sup>8</sup> AWA LLC owns 100% of N.V. Alcoa Minerals of Suriname (AMS). AWA LLC is part of the AWAC group of companies and is owned 60% by Alcoa and 40% by Alumina Limited.

<sup>9</sup> The Suralco alumina refinery now has been fully curtailed (see below).

<sup>10</sup> The Point Comfort alumina refinery will be fully curtailed (see below).

As of December 31, 2015, Alcoa had approximately 2,801,000 mtpy of idle capacity against total Alcoa Consolidated Capacity of 17,271,000 mtpy.

In March 2015, the Company initiated a 12-month review of 2,800,000 mtpy in refining capacity for possible curtailment (partial or full), permanent closure or divestiture. This review is part of the Company's target to lower Alcoa's refining operations on the global alumina cost curve to the 21st percentile (currently 23<sup>rd</sup>) by the end of 2016. As part of this review, in March 2015, the Company decided to curtail 443,000 mtpy (one digester) of capacity at the Suralco refinery; this action was completed by the end of April 2015.

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Additionally, in September, the Company decided to curtail the remaining capacity (887,000 mtpy two digesters) at Suralco; the Company completed it by the end of November 2015 (877,000 mtpy of capacity at Suralco had previously been curtailed). The Company is currently in discussions with the Suriname government to determine the best long-term solution for Suralco due to limited bauxite reserves and the absence of a long-term energy alternative.

During 2015, Alcoa undertook curtailment of the remaining 2,010,000 mtpy of capacity at the Point Comfort, Texas refinery (295,000 mtpy had previously been curtailed). This action is expected to be completed by the end of June 2016 (375,000 mtpy was completed by the end of December 2015).

As noted above, Alcoa and Ma'aden have developed an alumina refinery in the Kingdom of Saudi Arabia. Initial capacity of the refinery is 1.8 million mtpy. The refinery produced approximately 1.0 million mt in 2015. For additional information regarding the joint venture, see the Equity Investments section of Note I to the Consolidated Financial Statements in Part II, Item 8. (Financial Statements and Supplementary Data).

In November 2005, AWA LLC and Rio Tinto Alcan Inc. (RTA) signed a Basic Agreement with the Government of Guinea that sets forth the framework for development of a 1.5 million mtpy alumina refinery in Guinea. In 2006, the

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Basic Agreement was approved by the Guinean National Assembly and was promulgated into law. The Basic Agreement was originally set to expire in November 2008, but was extended several times, most recently to November 2015. Alcoa completed a pre-feasibility study in 2008, further pre-feasibility work in 2012, and concluded its evaluation of the project in 2015. AWA LLC and RTA agreed that current market conditions are unable to support the development of the project as originally conceived and the Basic Agreement expired in November 2015.

In September 2006, Alcoa received environmental approval from the Government of Western Australia for expansion of the Wagerup alumina refinery to a maximum capacity of 4.7 million mtpy, a potential increase of over 2 million mtpy. This approval had a term of five years and included environmental conditions that must be satisfied before Alcoa could seek construction approval for the project. The project was suspended in November 2008 due to global economic conditions and the unavailability of a secure long-term energy supply in Western Australia. These constraints continue and as such the project remains under suspension. In May 2012, the Government of Western Australia granted Alcoa a 5 year extension of the original environmental approval. In 2015, Alcoa applied for a further five year extension. The extension has not yet been granted and there has been no additional work done on the project.

In 2015, Alcoa and Vietnam National Coal-Minerals Industries Group began discussions regarding potential cooperation to improve the operational and technical performance of the Tan Rai Refinery which started up in 2014. In January 2016, the parties entered into a non-disclosure agreement to support and further the development of this potential cooperation. The parties continue to discuss a Memorandum of Understanding (MOU).

**Primary Aluminum Facilities and Capacity**

The Company's primary aluminum smelters and their respective capacities are shown in the following table:

**Alcoa Worldwide Smelting Capacity**

| Country       | Facility                                 | Owners<br>(% Of Ownership)  | Alcoa   |                                     |
|---------------|--|---|---|-------------------------------------|
|               |  |   | Nameplate Capacity <sup>1</sup><br>(000 MTPY) | Capacity <sup>2</sup><br>(000 MTPY) |
| Australia     | Portland                                 | AofA (55%)<br><br>CITIC <sup>3</sup> (22.5%)                      |   |                                     |
| Brazil        | São Luís (Alumar)                        | Marubeni <sup>3</sup> (22.5%)<br>Alumínio (60%)                   | 358   | 197 <sup>4,5</sup>                  |
| Canada        | Baie Comeau, Québec<br>Bécancour, Québec | BHP Billiton <sup>3</sup> (40%)<br>Alcoa (100%)<br>Alcoa (74.95%) | 447<br>280                                    | 268 <sup>6</sup><br>280             |
|               | Deschambault, Québec                     | Rio Tinto Alcan Inc. <sup>7</sup> (25.05%)<br>Alcoa (100%)        | 413<br>260                                    | 310<br>260                          |
| Iceland       | Fjarðaál                                 | Alcoa (100%)  | 344   | 344                                 |
| Norway        | Lista                                    | Alcoa (100%)  | 94  | 94                                  |
|               | Mosjøen                                  | Alcoa (100%)  | 188   | 188                                 |
| Spain         | Avilés                                   | Alcoa (100%)  | 93 <sup>8</sup>                               | 93                                  |
|               | La Coruña                                | Alcoa (100%)  | 87 <sup>8</sup>                               | 87                                  |
|               | San Ciprián                              | Alcoa (100%)  | 228   | 228                                 |
| United States | Evansville, IN (Warrick)                 | Alcoa (100%)  | 269 <sup>9</sup>                              | 269                                 |
|               | Massena West, NY                         | Alcoa (100%)  | 130   | 130                                 |
|               | Rockdale, TX                             | Alcoa (100%)  | 191 <sup>10</sup>                             | 191                                 |

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|       |                        |              |                   |       |
|-------|------------------------|--------------|-------------------|-------|
|       | Ferndale, WA (Intalco) | Alcoa (100%) | 279 <sup>11</sup> | 279   |
|       | Wenatchee, WA          | Alcoa (100%) | 184 <sup>12</sup> | 184   |
| TOTAL |                        |              | 3,845             | 3,401 |

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- <sup>1</sup> Nameplate Capacity is an estimate based on design capacity and normal operating efficiencies and does not necessarily represent maximum possible production.
- <sup>2</sup> The figures in this column reflect Alcoa's share of production from these facilities.
- <sup>3</sup> The named company or an affiliate holds this interest.
- <sup>4</sup> This figure includes the minority interest of Alumina Limited in the Portland facility, which is owned by AofA. From this facility, Alcoa takes 100% of the production allocated to AofA.
- <sup>5</sup> The Portland smelter has approximately 30,000 mtpy of idle capacity.
- <sup>6</sup> The Alumar smelter has been fully curtailed since April 2015 (see below).
- <sup>7</sup> Owned through Rio Tinto Alcan Inc.'s interest in Pechiney Reynolds Québec, Inc., which is owned by Rio Tinto Alcan Inc. and Alcoa.
- <sup>8</sup> The Avilés and La Coruña smelters have approximately 56,000 mtpy of idle capacity combined.
- <sup>9</sup> In January 2016, Alcoa announced that it will permanently close the Warrick smelter by the end of the first quarter of 2016 (see below).
- <sup>10</sup> The Rockdale smelter has been fully curtailed since the end of 2008.
- <sup>11</sup> The Intalco smelter has had approximately 49,000 mtpy of idle capacity. In November 2015, the Company announced that it would idle the remaining 230,000 mtpy capacity by the end of the first quarter of 2016. In January 2016, Alcoa announced that it will delay this further curtailment of the smelter until the end of the second quarter of 2016 (see below).
- <sup>12</sup> The Wenatchee smelter has had approximately 41,000 mtpy of idle capacity. The Company idled the remaining 143,000 mtpy of capacity by the end of December 2015.  
As of December 31, 2015, Alcoa had approximately 778,000 mtpy of idle capacity against total Alcoa Consolidated Capacity of 3,401,000 mtpy.
- In March 2015, the Company initiated a 12-month review of 500,000 mtpy of smelting capacity for possible curtailment (partial or full), permanent closure or divestiture. This review is part of the Company's target to lower Alcoa's smelting operations on the global aluminum cost curve to the 38th percentile (currently 43<sup>rd</sup>) by 2016. As part of this review, in March 2015, Alcoa decided to curtail the remaining capacity (74,000 mtpy) at the Alumar smelter; this action was completed in April 2015.

Separate from the smelting capacity review described above, in June 2015, Alcoa decided to permanently close the Poços de Caldas smelter (96,000 mtpy) in Brazil effective immediately. The Poços de Caldas smelter had been temporarily idle since May 2014 due to challenging global market conditions for primary aluminum and higher operating costs, which made the smelter uncompetitive. The decision to permanently close the Poços de Caldas smelter was based on the fact that these underlying conditions had not improved. As a result, the Poços de Caldas smelter was removed from the table above.

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In November 2015, Alcoa announced that it would curtail 503,000 mtpy of aluminum smelting capacity amid prevailing market conditions by idling capacity at the Massena West (130,000 mtpy), Intalco (230,000 mtpy) and Wenatchee (143,000 mtpy) smelters. The curtailment of the remaining capacity at Wenatchee was completed by the end of December 2015 and the curtailment of the remaining capacity at Intalco was expected to be completed by the end of March 2016. The casthouses at Massena West and Intalco will continue to operate. Later in November 2015, the Company announced that it had entered into a three-and-a-half year agreement with New York State to increase the competitiveness of the Massena West smelter. As a result, the Massena West smelter will continue to operate.

In January 2016, the Company announced it will delay the curtailment (230,000 mtpy) of its Intalco smelter in Ferndale, Washington until the end of the second quarter of 2016. Recent decreases in energy and raw material costs have made it more cost effective in the near term to keep the smelter operating.



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In January 2016, Alcoa announced that it will permanently close its 269,000 mtpy Warrick Operations smelter in Evansville, Indiana by the end of the first quarter of 2016. The rolling mill and power plant at Warrick Operations will continue to operate.

As noted above, Alcoa and Ma'aden have developed an aluminum smelter in the Kingdom of Saudi Arabia. The smelter has an initial nameplate capacity of 740,000 mtpy. Since mid-2014, the smelter has been operating at full capacity and it produced 757,833 mt in 2015.

In 2014, Alcoa and the Brunei Economic Development Board agreed to extend for four years an existing MOU to enable more detailed studies into the feasibility of establishing a modern, gas-powered aluminum smelter in Brunei Darussalam to follow a period of strategic assessment of global market conditions.

In 2007, Alcoa and the Greenland Government entered into an MOU regarding cooperation on a feasibility study for an aluminum smelter with a 360,000 mtpy capacity in Greenland. The MOU also encompasses a hydroelectric power system and related infrastructure improvements, including a port. Due to unfavorable global market conditions for primary aluminum, Alcoa and the Greenland Government entered into negotiations in 2015 to address, among other subjects, formalizing an extension of estimated dates for Alcoa to achieve certain of its undertakings under the MOU, and providing the Greenland Government latitude to develop hydro resources throughout Greenland. Negotiations between the parties are anticipated to complete in 2016.

## **Global Rolled Products**

The Company's Global Rolled Products segment represents Alcoa's midstream operations. For a discussion of this segment's business, see Results of Operations Segment Information in Part II, Item 7. (Management's Discussion and Analysis of Financial Condition and Results of Operations) and Note Q to the Consolidated Financial Statements Segment and Geographic Area Information in Part II, Item 8. (Financial Statements and Supplementary Data).

In March 2015, Alcoa sold its Russia-based aluminum mill in Belaya Kalitva, Alcoa Metallurg Rus, to a subsidiary of Stupino Titanium Co.

In September 2015, Alcoa announced the completion of an expansion at its Tennessee facility dedicated to supplying aluminum sheet to the automotive industry. The Tennessee plant will provide aluminum sheet to automakers such as Ford Motor Company, Fiat Chrysler Automobiles and General Motors. The expansion created approximately 200 full-time jobs.

In 2014, Alcoa announced a \$190 million investment at its Davenport Works facility to expand its product offerings in the aerospace and industrial markets through the installation of technology that will enhance the performance of thick aluminum and aluminum-lithium plate for use in various applications such as wing ribs and fuselage frames for the aerospace market. Construction on this project began in 2015, with first customer production expected in 2017.

In October 2015, Alcoa entered into an agreement with the Danieli Group, a global supplier of plants and equipment to the metals industry, to license and commercialize its Micromill technology. Under the agreement, Alcoa licenses the patented technology to Danieli that will manufacture and sell Micromill equipment to mill operators that will also be licensed by Alcoa. The Alcoa-patented Micromill process produces metal with a microstructure that is distinct from the microstructure obtained from conventional rolling, allowing the production of an aluminum alloy for automotive applications that has 40 percent greater formability and 30 percent greater strength than the incumbent aluminum used today while meeting stringent automotive surface quality requirements. Additionally, automotive parts made with Micromill material will be twice as formable and at least 30 percent lighter than parts made from high strength steel. The Micromill will enable the next generation of automotive aluminum products, and equip Alcoa to capture growing automotive demand.

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Also in 2014, Alcoa announced a \$40 million investment in its Itapissuma, Brazil rolling mill to increase production of specialty foils for aseptic and flexible packages. Initial work for the expansion is underway and commissioning is expected to begin in 2016.

As noted above, Alcoa and Saudi Arabian Mining Company (Ma'aden) entered into a joint venture to develop a fully integrated aluminum complex in the Kingdom of Saudi Arabia. It includes among other things the Ma'aden Rolling Company, which owns the rolling mill that has capacity to produce 380,000 mtpy and is 74 acres under roof.

**Global Rolled Products Principal Facilities**

| Country        | Location                 | Owners <sup>1</sup> |                  | Products                          |
|----------------|--------------------------|---------------------|------------------|-----------------------------------|
|                |                          |                     | (% Of Ownership) |                                   |
| Brazil         | Itapissuma               | Alcoa               | (100%)           | Specialty Foil                    |
| China          | Kunshan                  | Alcoa               | (100%)           | Sheet and Plate                   |
|                | Qinhuangdao <sup>2</sup> | Alcoa               | (100%)           | Sheet and Plate                   |
| Hungary        | Székesfehérvár           | Alcoa               | (100%)           | Sheet and Plate/Slabs and Billets |
| Italy          | Fusina                   | Alcoa               | (100%)           | Sheet and Plate                   |
| Russia         | Samara                   | Alcoa               | (100%)           | Sheet and Plate                   |
| United Kingdom | Birmingham               | Alcoa               | (100%)           | Plate                             |
| United States  | Davenport, IA            | Alcoa               | (100%)           | Sheet and Plate                   |
|                | Danville, IL             | Alcoa               | (100%)           | Sheet and Plate                   |
|                | Newburgh, IN             | Alcoa               | (100%)           | Sheet                             |
|                | Hutchinson, KS           | Alcoa               | (100%)           | Sheet and Plate                   |
|                | Lancaster, PA            | Alcoa               | (100%)           | Sheet and Plate                   |
|                | Alcoa, TN                | Alcoa               | (100%)           | Sheet                             |
|                | Texarkana, TX            | Alcoa               | (100%)           | Sheet and Plate <sup>3</sup>      |
|                | San Antonio, TX          | Alcoa               | (100%)           | Micromill                         |

<sup>1</sup> Facilities with ownership described as Alcoa (100%) are either leased or owned directly or indirectly by the Company.

<sup>2</sup> Leased property or partially leased property.

<sup>3</sup> The Texarkana rolling mill facility has been idle since September 2009 due to a continued weak outlook in common alloy markets. In September 2015, the Company announced that it is restarting its Texarkana casthouse to meet demand for aluminum slab for the automotive industry. The aluminum slab that will be cast at Texarkana will be turned into aluminum sheet at Alcoa's recently expanded automotive facility in Davenport, Iowa and its rolling mill in Lancaster, Pennsylvania.

**Engineered Products and Solutions**

This segment represents a portion of Alcoa's downstream operations. For a discussion of this segment's business, see Results of Operations Segment Information in Part II, Item 7. (Management's Discussion and Analysis of Financial Condition and Results of Operations) and Note Q to the Consolidated Financial Statements Segment and Geographic Area Information in Part II, Item 8. (Financial Statements and Supplementary Data). In the third quarter 2015, Alcoa realigned its downstream portfolio into two segments (Engineered Products and Solutions and Transportation and Construction Solutions). Following the realignment, Engineered Products and Solutions consists of: Alcoa Titanium & Engineered Products; Alcoa Fastening Systems & Rings; Alcoa Forgings and Extrusions; and Alcoa Power and Propulsion.

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On March 3, 2015, Alcoa completed its acquisition of TITAL, a privately held company based in Germany. TITAL is a leader in titanium and aluminum structural castings for aircraft engines and airframes. In addition, TITAL is a leader in process technology.

In June 2015, Alcoa announced that it is investing \$22 million in Hot Isotopic Pressing technology at its facility in Whitehall, Michigan. The investment will enable Alcoa to capture growing demand for advanced titanium, nickel and additive manufactured parts for the world's bestselling engines. Alcoa expects that the new technology will be ready for product qualification in 2016.

On July 23, 2015, Alcoa completed the acquisition of RTI International Metals, Inc. (RTI), a global supplier of titanium and specialty metal products and services for commercial aerospace, defense, energy and medical device markets. Following the acquisition, RTI was renamed Alcoa Titanium & Engineered Products.

Also in October 2015, Alcoa officially opened its expanded jet engines part facility in La Porte, Indiana. The \$100 million expansion of the Indiana facility enables Alcoa to manufacture single piece structural parts that are 60 percent larger than those already produced in La Porte.

In 2014, Alcoa commenced an expansion of its Hampton, Virginia facility to create the capability to employ a new process technology that improves jet engine blades. The expansion was completed in fourth quarter 2015. The Hampton facility includes technology that cuts the weight of the Company's highest-volume jet engine blades by 20 percent and significantly improves aerodynamic performance.

Alcoa and VSMPO-AVISMA Corporation signed a cooperation agreement in October 2013, which allowed the companies to meet growing demand for high-end titanium and aluminum products for aircraft manufacturers worldwide. The new joint venture will focus on manufacturing high-end aerospace products, such as landing gear and forged wing components, at Alcoa's plant in Samara, Russia. The definitive Shareholders Agreement was executed by the parties on July 16, 2014, and the deal is expected to close in the second quarter of 2016. The facility is now operational.

**Engineered Products and Solutions Principal Facilities**

| Country   | Facility                           | Owners <sup>1</sup> |                  | Products                                      |
|-----------|------------------------------------|---------------------|------------------|---|
|           |                                    |                     | (% Of Ownership) |   |
| Australia | Oakleigh                           | Alcoa               | (100%)           | Fasteners                                     |
| Canada    | Georgetown, Ontario <sup>2</sup>   | Alcoa               | (100%)           | Aerospace Castings                            |
|           | Laval, Québec                      | Alcoa               | (100%)           | Aerospace Casting and Machining               |
| China     | Nantong                            | Alcoa               | (100%)           | Aerospace Castings                            |
|           | Suzhou <sup>2</sup>                | Alcoa               | (100%)           | Fasteners and Rings                           |
| France    | Dives-sur-Mer                      | Alcoa               | (100%)           | Aerospace and Industrial Gas Turbine Castings |
|           | Evron                              | Alcoa               | (100%)           | Aerospace and Specialty Castings              |
|           | Gennevilliers                      | Alcoa               | (100%)           | Aerospace and Industrial Gas Turbine Castings |
|           | Montbrison                         | Alcoa               | (100%)           | Fasteners                                     |
|           | St. Cosme-en-Vairais <sup>2</sup>  | Alcoa               | (100%)           | Fasteners                                     |
|           | Toulouse                           | Alcoa               | (100%)           | Fasteners                                     |
|           | Us-par-Vigny                       | Alcoa               | (100%)           | Fasteners                                     |
| Germany   | Bestwig                            | Alcoa               | (100%)           | Aerospace Castings                            |
|           | Erwitte                            | Alcoa               | (100%)           | Aerospace Castings                            |
|           | Hannover <sup>2</sup>              | Alcoa               | (100%)           | Extrusions                                    |
|           | Hildesheim-Bavenstedt <sup>2</sup> | Alcoa               | (100%)           | Fasteners                                     |
|           | Kelkheim <sup>2</sup>              | Alcoa               | (100%)           | Fasteners                                     |

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| <b>Owners<sup>1</sup></b>  |                           |  |  |            |
|----------------------------|---------------------------|--|--|------------|
| <b>Country</b>             | <b>Facility</b>           | <b>(% Of Ownership)</b>  | <b>Products</b>  |            |
| Hungary                    | Eger                      | Alcoa (100%)   | Forgings   |            |
|                            | Nemesvámos                | Alcoa (100%)   | Fasteners  |            |
|                            | Székesfehérvár            | Alcoa (100%)   | Aerospace and Industrial Gas Turbine Castings and Forgings |            |
| Japan                      | Nomi                      | Alcoa (100%)   | Aerospace and Industrial Gas Turbine Castings              |            |
| Mexico                     | Ciudad Acuña <sup>2</sup> | Alcoa (100%)   | Aerospace Castings/Fasteners                               |            |
| Morocco                    | Casablanca <sup>2</sup>   | Alcoa (100%)   | Fasteners  |            |
| Russia                     | Samara <sup>3</sup>       | Alcoa (100%)   | Extrusions and Forgings                                    |            |
| South Korea                | Kyoungnam                 | Alcoa (100%)   | Extrusions   |            |
| United Kingdom             | Darley Dale               | Alcoa (100%)   | Forgings   |            |
|                            | Ecclesfield               | Alcoa (100%)   | Ingot Castings   |            |
|                            | Exeter <sup>2</sup>       | Alcoa (100%)   | Aerospace and Industrial Gas Turbine Castings and Alloy    |            |
|                            | Glossop                   | Alcoa (100%)   | Ingot Castings   |            |
|                            | Ickles                    | Alcoa (100%)   | Ingot Castings   |            |
|                            | Leicester <sup>2</sup>    | Alcoa (100%)   | Fasteners  |            |
|                            | Low Moor                  | Alcoa (100%)   | Extrusions   |            |
|                            | Meadowhall                | Alcoa (100%)   | Forgings   |            |
|                            | Provincial Park           | Alcoa (100%)   | Forgings   |            |
|                            | Redditch <sup>2</sup>     | Alcoa (100%)   | Fasteners  |            |
|                            | River Don                 | Alcoa (100%)   | Forgings   |            |
|                            | Telford                   | Alcoa (100%)   | Fasteners  |            |
|                            | Welwyn Garden City        | Alcoa (100%)   | Aerospace Formed Parts                                     |            |
|                            | United States             | Chandler, AZ   | Alcoa (100%)   | Extrusions |
|                            |                           | Tucson, AZ <sup>2</sup>  | Alcoa (100%)   | Fasteners  |
|                            |                           | Carson, CA <sup>2</sup>  | Alcoa (100%)   | Fasteners  |
|                            |                           | City of Industry, CA <sup>2</sup>  | Alcoa (100%)   | Fasteners  |
| Fontana, CA                |                           | Alcoa (100%)   | Rings  |            |
| Fullerton, CA <sup>2</sup> |                           | Alcoa (100%)   | Fasteners  |            |
| Newbury Park, CA           |                           | Alcoa (100%)   | Fasteners  |            |
| Rancho Cucamonga, CA       |                           | Alcoa (100%)   | Rings  |            |
| Sylmar, CA                 |                           | Alcoa (100%)   | Fasteners  |            |
| Torrance, CA               |                           | Alcoa (100%)   | Fasteners  |            |
| Branford, CT               |                           | Alcoa (100%)   | Aerospace Coatings   |            |
| Winsted, CT                |                           | Alcoa (100%)   | Aerospace Machining  |            |
| Savannah, GA               |                           | Alcoa (100%)   | Forgings   |            |
| Lafayette, IN              |                           | Alcoa (100%)   | Extrusions   |            |
| La Porte, IN               | Alcoa (100%)              | Aerospace and Industrial Gas Turbine Castings                                      |  |            |
| Burlington, MA             | Alcoa (100%)              | Powdered Metal Parts   |  |            |
| Baltimore, MD <sup>2</sup> | Alcoa (100%)              | Extrusions   |  |            |
| Whitehall, MI              | Alcoa (100%)              | Aerospace/Industrial Gas Turbine Castings Coatings/Ti Alloy and Specialty Products |  |            |

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| <b>Owners<sup>1</sup></b> |                             |                         |   |
|---------------------------|-----------------------------|-------------------------|---|
| <b>Country</b>            | <b>Facility</b>             | <b>(% Of Ownership)</b> | <b>Products</b>   |
|                           | Washington, MO              | Alcoa (100%)            | Aerospace Formed Parts                                  |
|                           | Big Lake, MN                | Alcoa (100%)            | Aerospace and Medical Device Machining                  |
|                           | Coon Rapids, MN             | Alcoa (100%)            | Medical Device Machining                                |
|                           | New Brighton, MN            | Alcoa (100%)            | Aerospace Machining                                     |
|                           | Roseville, MN <sup>2</sup>  | Alcoa (100%)            | Aerospace Machining                                     |
|                           | Dover, NJ                   | Alcoa (100%)            | Aerospace and Industrial Gas Turbine Castings and Alloy |
|                           | Verdi, NV                   | Alcoa (100%)            | Rings   |
|                           | Kingston, NY <sup>2</sup>   | Alcoa (100%)            | Fasteners   |
|                           | Massena, NY                 | Alcoa (100%)            | Extrusions  |
|                           | Rochester, NY               | Alcoa (100%)            | Rings   |
|                           | Canton, OH                  | Alcoa (100%)            | Ferro-Titanium Alloys and Titanium Mill Products        |
|                           | Cleveland, OH               | Alcoa (100%)            | Aerospace Castings                                      |
|                           | Niles, OH                   | Alcoa (100%)            | Titanium Mill Products                                  |
|                           | Alcoa Center, PA            | Alcoa (100%)            | Ingot Castings  |
|                           | Morristown, TN <sup>2</sup> | Alcoa (100%)            | Aerospace and Industrial Gas Turbine Ceramic Products   |
|                           | Austin, TX                  | Alcoa (100%)            | Additively Manufactured Parts                           |
|                           | Houston, TX                 | Alcoa (100%)            | Extrusions  |
|                           | Spring, TX                  | Alcoa (100%)            | Deep Water Drilling Machining                           |
|                           | Waco, TX <sup>2</sup>       | Alcoa (100%)            | Fasteners   |
|                           | Wichita Falls, TX           | Alcoa (100%)            | Aerospace and Industrial Gas Turbine Castings           |
|                           | Hampton, VA <sup>2</sup>    | Alcoa (100%)            | Aerospace and Industrial Gas Turbine Castings           |
|                           | Martinsville, VA            | Alcoa (100%)            | Titanium Mill Products                                  |

<sup>1</sup> Unless otherwise noted, facilities with ownership described as Alcoa (100%) are owned by the Company.

<sup>2</sup> Leased property or partially leased property.

<sup>3</sup> The operating results of this facility are reported in the Global Rolled Products segment.

**Transportation and Construction Solutions**

The Company's Transportation and Construction Solutions segment represents a portion of Alcoa's downstream operations. For a discussion of this segment's business, see Results of Operations Segment Information in Part II, Item 7. (Management's Discussion and Analysis of Financial Condition and Results of Operations) and Note Q to the Consolidated Financial Statements Segment and Geographic Area Information in Part II, Item 8. (Financial Statements and Supplementary Data). As part of its realignment of the value-add portfolio and creation of this new segment, the Company also moved the Latin American soft alloy extrusions business to Transportation and Construction Solutions.

In January 2015, Alcoa opened its expanded wheels manufacturing plant in Hungary, doubling Alcoa's capacity to produce its Dura-Bright® EVO surface-treated wheels compared with 2014 production levels. The \$13 million expansion is expected to create 35 new jobs in Hungary once the facility reaches full capacity.

Alcoa Wheel and Transportation Products has vertically integrated by building a new aluminum casthouse in Mexico for a total cost of \$22 million to convert the scrap generated throughout the Mexico wheels flowpaths into ingot. While the first ingot was cast in November 2014, the run rate production was achieved in March 2015.

**Table of Contents****Transportation and Construction Solutions Principal Facilities**

| Country        | Facility                    | Owners <sup>1</sup> |                  | Products               |
|----------------|-----------------------------|---------------------|------------------|------------------------|
|                |                             |                     | (% Of Ownership) |                        |
| Brazil         | Itapissuma                  | Alcoa (100%)        |                  | Extrusions             |
|                | Tubarão                     | Alcoa (100%)        |                  | Extrusions             |
|                | Utinga                      | Alcoa (100%)        |                  | Extrusions             |
| Canada         | Lethbridge, Alberta         | Alcoa (100%)        |                  | Architectural Products |
|                | Pointe Claire, Quebec       | Alcoa (100%)        |                  | Architectural Products |
|                | Vaughan, Ontario            | Alcoa (100%)        |                  | Architectural Products |
| France         | Guerande                    | Alcoa (100%)        |                  | Architectural Products |
|                | Lézat-sur-Lèze <sup>2</sup> | Alcoa (100%)        |                  | Architectural Products |
|                | Merxheim <sup>2</sup>       | Alcoa (100%)        |                  | Architectural Products |
|                | Vendarques                  | Alcoa (100%)        |                  | Architectural Products |
| Germany        | Iserlohn                    | Alcoa (100%)        |                  | Architectural Products |
| Hungary        | Székesfehérvár              | Alcoa (100%)        |                  | Forgings               |
| Japan          | Jōetsu City <sup>2</sup>    | Alcoa (100%)        |                  | Forgings               |
| Mexico         | Monterrey                   | Alcoa (100%)        |                  | Forgings               |
| Morocco        | Casablanca <sup>2</sup>     | Alcoa (67%)         |                  | Architectural Products |
|                |                             | Ahmed Hattabi (33%) |                  |                        |
| Netherlands    | Harderwijk                  | Alcoa (100%)        |                  | Architectural Products |
| Spain          | Irutzun                     | Alcoa (100%)        |                  | Architectural Products |
| United Kingdom | Runcorn                     | Alcoa (100%)        |                  | Architectural Products |
| United States  | Springdale, AZ              | Alcoa (100%)        |                  | Architectural Products |
|                | Visalia, CA                 | Alcoa (100%)        |                  | Architectural Products |
|                | Eastman, GA                 | Alcoa (100%)        |                  | Architectural Products |
|                | Barberton, OH               | Alcoa (100%)        |                  | Forgings               |
|                | Chillicothe, OH             | Alcoa (100%)        |                  | Forgings               |
|                | Cleveland, OH               | Alcoa (100%)        |                  | Forgings               |
|                | Bloomsburg, PA              | Alcoa (100%)        |                  | Architectural Products |
|                | Cranberry, PA               | Alcoa (100%)        |                  | Architectural Products |
|                | Denton, TX <sup>2</sup>     | Alcoa (100%)        |                  | Forgings               |

<sup>1</sup> Facilities with ownership described as Alcoa (100%) are owned by the Company.

<sup>2</sup> Leased property or partially leased property.

**Table of Contents****Sources and Availability of Raw Materials**

The major raw materials purchased in 2015 for each of the Company's reportable segments are listed below.

**Alumina**

Bauxite  
Caustic soda  
Electricity  
Fuel oil  
Lime (CaO)  
Natural gas

**Primary Metals**

Alloying materials  
Alumina  
Aluminum fluoride  
Calcined petroleum coke  
Cathode blocks  
Electricity  
Liquid pitch  
Natural gas

**Global Rolled Products**

Alloying materials  
Aluminum scrap  
Coatings  
Electricity  
Lube oil  
Natural gas  
Packaging materials  
Primary aluminum (ingot, slab, billet, P1020, high purity)  
Steam

**Engineered Products and Solutions**

Alloying materials  
Electricity  
Natural gas  
Nickel alloys  
Primary aluminum (ingot, billet, P1020, high purity)  
Resin  
Stainless steel  
Steel  
Titanium alloys  
Titanium sponge

**Transportation and Construction Solutions**

Aluminum coil  
Electricity  
Natural gas  
Paint/Coating  
Primary aluminum (ingot, billet, P1020, high purity)  
Resin  
Scrap aluminum

Generally, other materials are purchased from third-party suppliers under competitively priced supply contracts or bidding arrangements. The Company believes that the raw materials necessary to its business are and will continue to be available.

For each metric ton of alumina produced, Alcoa consumes the following amounts of the identified raw material inputs (approximate range across relevant facilities):

| <b>Raw Material</b>      | <b>Units</b> | <b>Consumption per MT of Alumina</b> |  |
|--------------------------|--------------|--------------------------------------|--|
| Bauxite                  | mt           | 2.2                                  | 3.7                                    |
| Caustic soda             | kg           | 60                                   | 150                                    |
| Electricity              | kWh          | 200                                  | 260 total consumed (0 to 210 imported) |
| Fuel oil and natural gas | GJ           | 6.3                                  | 11.9                                   |
| Lime (CaO)               | kg           | 6                                    | 58                                     |

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For each metric ton of aluminum produced, Alcoa consumes the following amounts of the identified raw material inputs (approximate range across relevant facilities):

| <b>Raw Material</b>     | <b>Units</b> | <b>Consumption per MT of Aluminum</b> |
|-------------------------|--------------|---------------------------------------|
| Alumina                 | mt           | 1.92 ±0.02                            |
| Aluminum fluoride       | kg           | 16.5 ±6.5                             |
| Calcined petroleum coke | mt           | 0.37 ±0.02                            |
| Cathode blocks          | mt           | 0.006 ±0.002                          |
| Electricity             | kWh          | 12900 17000                           |
| Liquid pitch            | mt           | 0.10 ±0.03                            |
| Natural gas             | mcf          | 3.5 ±1.5                              |

Explanatory Note: Certain aluminum produced by Alcoa also includes alloying materials. Because of the number of different types of elements that can be used to produce Alcoa's various alloys, providing a range of such elements would not be meaningful. With the exception of a very small number of internally used products, Alcoa produces its alloys in adherence to an Aluminum Association standard. The Aluminum Association, of which Alcoa is an active member, uses a specific designation system to identify alloy types. In general, each alloy type has a major alloying element other than aluminum but will also have other constituents as well, but of lesser amounts.

**Energy**

Employing the Bayer Process, Alcoa refines alumina from bauxite ore. Alcoa then produces aluminum from the alumina by an electrolytic process requiring substantial amounts of electric power. Energy accounts for approximately 19% of the Company's total alumina refining production costs. Electric power accounts for approximately 23% of the Company's primary aluminum production costs. Alcoa generates approximately 14% of the power used at its smelters worldwide and generally purchases the remainder under long-term arrangements. The paragraphs below summarize the sources of power and natural gas for Alcoa's smelters and refineries.

*North America Electricity*

The Deschambault, Baie Comeau, and Bécancour smelters in Québec purchase electricity under long-term contracts with Hydro-Québec executed in 2014, which will expire on December 31, 2029. Upon expiration, Alcoa will have the option of extending the term of the Baie Comeau contract to February 23, 2036. The smelter located in Baie Comeau, Québec purchases approximately 73% of its power needs under the Hydro-Québec contract, and the remainder from a 40% owned hydroelectric generating company, Manicouagan Power Limited Partnership.

The Company's wholly-owned subsidiary, Alcoa Power Generating Inc. (APGI) owns and operates the Yadkin hydroelectric project, consisting of four dams in North Carolina, and the Warrick coal-fired power plant located in Indiana.

For several years, APGI has been pursuing a new long-term license for the Yadkin hydroelectric project from the Federal Energy Regulatory Commission (FERC). In 2007, APGI filed with FERC a Relicensing Settlement Agreement signed by a majority of interested stakeholders that broadly resolved open issues. The National Environmental Policy Act process was complete, and a final environmental impact statement was issued in April 2008. The remaining requirement for relicensing was the issuance by North Carolina of the required water quality certification under Section 401 of the Clean Water Act (401 WQC). North Carolina's Department of Environment Quality ((DEQ), formally known as Department of Environment and Natural Resources (DENR)) issued a 401 WQC to APGI on October 23, 2015. The period for appeals has passed with no aggrieved party filing an appeal. FERC has been notified of the final 401 WQC, completing all necessary items required for FERC to process the application.



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On August 2, 2013, the State of North Carolina filed suit in state court seeking a declaratory ruling that it, not APGI, owns the Yadkin riverbed beneath the hydroelectric project as well as a portion of the project dams. APGI removed the riverbed lawsuit to federal court in 2013. On May 6, 2015, U.S. Federal Judge Terrance Boyle declared that the relevant segment of the Yadkin River was not navigable at the time of North Carolina statehood and issued a ruling on September 28, 2015 that APGI owns the riverbed for the 37-mile relevant segment. The State of North Carolina has filed an appeal with the Fourth Circuit Court of Appeals.

Pending completion of the relicensing process, APGI received year-to-year license renewals from FERC starting in May 2008, and will continue to operate under annual licenses until FERC issues a new license. Since the permanent closure of the Badin, North Carolina smelter, power generated from APGI's Yadkin system is largely being sold to an affiliate, Alcoa Power Marketing LLC, and then into the wholesale market.

APGI generates substantially all of the power used at the Company's Warrick, Indiana smelter using nearby coal reserves. Since May 2005, Alcoa has owned the nearby Friendsville, Illinois coal reserves, with the Friendsville Mine being operated by Vigo Coal Company, Inc. (Vigo Coal). The Friendsville Mine is producing approximately 900,000 tons of coal per year and is scheduled to cease production at the end of March 2016. Liberty Mine, also owned by Alcoa and operated by Vigo Coal, produces coal and is operating at a level of approximately 1.4 million tons per year. Friendsville and Liberty Mines together supply 99% of the power plant's needs. The balance of the coal used is royalty coal.

In the State of Washington, Alcoa's Wenatchee smelter is served by a contract with Chelan County Public Utility District (Chelan PUD) under which Alcoa receives approximately 26% of the hydropower output of Chelan PUD's Rocky Reach and Rock Island dams. In November 2015, Alcoa announced the curtailment of the Wenatchee smelter which was completed by the end of December 2015.

Starting on January 1, 2013, the Intalco smelter began receiving physical power from the Bonneville Power Administration (BPA) pursuant to a contract executed between Alcoa and BPA, under which Alcoa receives physical power at the Northwest Power Act mandated industrial firm power (IP) rate through September 30, 2022. In May 2015, the contract was amended to reduce the amount of physical power received from BPA and allow for additional purchases of market power.

Prior to 2007, power for the Rockdale smelter in Texas was historically supplied from Company-owned generating units and Sandow Unit 4 owned by Luminant Generation Company LLC (formerly TXU Generation Company LP) (Luminant), both of which used lignite supplied by the Company's Sandow Mine and Three Oaks Mine. Upon completion of lignite mining in the Sandow Mine in 2005, lignite supply transitioned to the formerly Alcoa-owned Three Oaks Mine. The Company retired its three wholly-owned generating units at Rockdale (Sandow Units 1, 2 and 3) in late 2006, and transitioned to an arrangement under which Luminant is to supply all of the Rockdale smelter's electricity requirements under a long-term power contract that does not expire until at least the end of 2038, with the parties having the right to terminate the contract after 2013 if there has been an unfavorable change in law or after 2025 (by Luminant only) if the cost of the electricity exceeds the market price. In August 2007, Luminant and Alcoa closed on the definitive agreements under which Luminant has constructed and operates a new circulating fluidized bed power plant (Sandow Unit 5) adjacent to the existing Sandow Unit 4 and, in September 2007, on the sale of Three Oaks Mine to Luminant. Concurrent with entering into the agreements under which Luminant constructed and operates Sandow Unit 5, Alcoa and Luminant entered into a power purchase agreement whereby Alcoa purchased power from Luminant. That Sandow Unit 5 power purchase agreement was terminated by Alcoa, effective December 1, 2010. In June 2008, Alcoa temporarily idled half of the capacity at the Rockdale smelter and in November 2008 curtailed the remainder of Rockdale's smelting capacity. In late 2011, Alcoa announced that it would permanently close two of the six idled potlines at the smelter. Demolition and remediation activities related to these actions were completed in 2013. On April 29, 2014, Luminant Generation LLC, Luminant Mining Company LLC, Sandow Power Company LLC and their affiliated debtors filed petitions under Chapter 11 of the U.S. Bankruptcy Code with the U.S. Bankruptcy Court for the District of Delaware. The Bankruptcy Court has confirmed the debtors' amended plan of reorganization and has

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entered an order approving the debtors' assumption of the Sandow Unit 4 agreement and certain other related agreements with the Company.

In the Northeast, the Massena West smelter in New York receives physical power from the New York Power Authority (NYPA) pursuant to a contract between Alcoa and NYPA, which expires in 2045. In December 2015, Alcoa and NYPA agreed upon a new power contract that will expire in 2019. Upon final approval of the contract by New York State, which is expected in the first half of 2016, the new power contract for physical power will replace the prior contract.

*Australia Electricity*

In 2015 Alcoa permanently closed the Anglesea power station and associated coal mine in Victoria. The power station had previously provided electricity to the Point Henry smelter which closed in 2014. Since the Port Henry smelter closure, electricity was sold into the National Electricity Market (NEM); however a combination of low electricity prices and significant future capital expenditure meant the facility was no longer viable.

The Portland smelter continues to purchase electricity from the State Electricity Commission of Victoria (SECV) under a contract with Alcoa Portland Aluminium Pty Ltd, a wholly-owned subsidiary of AofA, that extends to October 2016. Upon the expiration of this contract, the Portland smelter will purchase power from the NEM variable spot market. In March 2010, AofA and Eastern Aluminium (Portland) Pty Ltd separately entered into fixed for floating swap contracts with Loy Yang (now AGL) in order to manage their exposure to the variable energy rates from the NEM. The fixed for floating swap contract with AGL for the Point Henry smelter was terminated in 2013. The fixed for floating swap contract with AGL for the Portland smelter operates from the date of expiration of the current contract with the SECV and continues until December 2036.

*Brazil Electricity* Alumínio owns a 25.74% stake in Consórcio Machadinho, which is the owner of the Machadinho hydroelectric power plant located in southern Brazil.

Alumínio has a 42.18% interest in Energética Barra Grande S.A., which built the Barra Grande hydroelectric power plant in southern Brazil.

Alumínio also has a 34.97% share in Serra do Facão Energia S.A., which built the Serra do Facão hydroelectric power plant in the southeast of Brazil.

Alumínio is also participating in the Estreito hydropower project in northern Brazil, through Estreito Energia S.A. (an Alumínio wholly owned company) holding a 25.49% stake in Consórcio Estreito Energia, which is the owner of the hydroelectric power plant.

A consortium in which Alumínio participates and that had received concessions for the Pai Querê hydropower project in southern Brazil (Alumínio's share is 35%) decided not to pursue the development of this concession which will be returned to the Federal Government.

Since May 2015 (after full curtailment of Poços de Caldas and Alumar smelters), the excess generation capacity of around 460MW has been sold into the market.

*Europe Electricity*

Alcoa's smelters at San Ciprián, La Coruña and Avilés, Spain purchase electricity under bilateral power contracts that commenced on January 1, 2013. The contracts for San Ciprián and Avilés smelters each have a four-year term (expiring December 31, 2016). The contract for the La Coruña smelter, which expired on December 31, 2015, has been extended for an additional year (expiring December 31, 2016).

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A competitive bidding mechanism to allocate interruptibility rights in Spain was settled during 2014 to be applied starting from January 1, 2015. The first auction process to allocate rights took place in November 2014, where Alcoa secured 275MW of interruptibility rights for the 2015 period for the San Ciprián smelter. A second auction process took place in December 2014, where Alcoa secured an additional 100MW of interruptibility rights for the 2015 period for the San Ciprián smelter (20x5MW), 120MW for the La Coruña smelter (24x5MW) and 110MW for the Avilés smelter (22x5MW). The auction process to allocate the rights for the following period took place in the first week of September 2015, where Alcoa secured interruptibility rights for 2016 in the amount of 375MW for San Ciprián Smelter (3x90MW + 21x5MW), 115MW for Avilés Smelter (23x5MW) and 120MW for La Coruña smelter (24x5MW).

Alcoa owns two smelters in Norway, Lista and Mosjøen, which have long-term power arrangements in place that continue until the end of 2019. Financial compensation of the indirect carbon emissions costs passed through in the electricity bill is received in accordance with EU Commission Guidelines and Norwegian compensation regime.

*Iceland Electricity*

Alcoa's Fjarðaál smelter in eastern Iceland began operation in 2007. Central to those operations is a forty-year power contract under which Landsvirkjun, the Icelandic national power company, built the Kárahnjúkar dam and hydropower project, and supplies competitively priced electricity to the smelter. In late 2009, Iceland imposed two new taxes on power intensive industries, both for a period of three years, from 2010 through 2012. One tax is based on energy consumption; the other is a pre-payment of certain other charges that was recoverable partly in 2014 and will be fully recovered by end of 2018. In 2012, Iceland extended the energy consumption tax through 2015.

*Spain Natural Gas*

In order to facilitate the full conversion of the San Ciprián, Spain alumina refinery from fuel oil to natural gas, in October 2013, Alumina Española SA (AE) and Gas Natural Transporte SDG SL (GN) signed a take or pay gas pipeline utilization agreement. Pursuant to that agreement, the ultimate shareholders of AE, Alcoa Inc. and Alumina Limited, agreed to guarantee the payment of AE's contracted gas pipeline utilization over the four years of the commitment period; in the event AE fails to do so, each shareholder being responsible for its respective proportionate share (i.e., 60/40). Such commitment came into force six months after the gas pipeline was put into operation by GN. The gas pipeline was completed in January 2015 and the refinery has switched to natural gas consumption for 100% of its needs.

Three supply contracts were signed in 2014 for the supply of natural gas to the San Ciprián, Spain alumina refinery during the 2015 period with Endesa, Union Fenosa Gas and BP, expiring by April 2016, December 2015 and December 2015, respectively. In 2015, the Endesa supply contract expiring in April 2016 was extended until June 2017, the BP supply contract expiring in December 2015 was extended until December 2016 and a new contract with Gas Natural Fenosa was signed expiring by December 2016. Pursuant to those agreements, Alcoa Inversiones España, S.L. and Alumina Limited agreed to guarantee the payment of AE's obligations under the Endesa contract that expires in April 2016, each shareholder being responsible for its respective proportionate share (i.e., 60/40). In the same way, Alcoa Inespal S.A. and Alumina Limited have agreed to guarantee the payment of AE's obligations under the Gas Natural Fenosa contract over its respective length, with each entity being responsible for its proportionate share (i.e., 60/40).

*North America Natural Gas*

In order to supply its refinery and smelters in the U.S. and Canada, Alcoa generally procures natural gas on a competitive bid basis from a variety of sources, including producers in the gas production areas and independent gas marketers. For Alcoa's larger consuming locations in Canada and the U.S., the gas commodity and the interstate pipeline transportation are procured (directly or via the local distribution companies) to provide increased flexibility and reliability. Contract pricing for gas is typically based on a published industry index or New York Mercantile Exchange (NYMEX) price. The Company may choose to reduce its exposure to NYMEX pricing by hedging a portion of required natural gas consumption.

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AofA holds a 20% equity interest in the Dampier-to-Bunbury natural gas pipeline (this interest was purchased in October 2004). This pipeline transports gas from the northwest gas fields to Alcoa's alumina refineries and other users in the Southwest of Western Australia. Alcoa uses gas to co-generate steam and electricity for its alumina refining processes at the Kwinana, Pinjarra and Wagerup refineries. More than 90% of Alcoa's gas requirements for the remainder of the decade are secured under long-term contracts. In 2015, AofA entered into a number of long-term gas supply agreements which now means a significant portion of Alcoa's gas supplies are secured to 2030. Alcoa has remained actively involved with projects aimed at developing cost-based gas supply opportunities.

**Energy Facilities**

The following table sets forth the electricity generation capacity and 2015 generation of facilities in which the Company has an ownership interest:

| <b>Alcoa Consolidated Capacity</b> |                       |                         |                              |
|------------------------------------|-----------------------|-------------------------|------------------------------|
| <b>Country</b>                     | <b>Facility</b>       | <b>(MW)<sup>1</sup></b> | <b>2015 Generation (MWh)</b> |
| Australia                          | Anglesea <sup>2</sup> | 150                     | 798,542                      |
| Brazil                             | Barra Grande          | 156                     | 1,562,663                    |
|                                    | Estreito              | 157                     | 1,088,018                    |
|                                    | Machadinho            | 119                     | 1,780,924                    |
|                                    | Serra do Facão        | 60                      | 171,294                      |
|                                    | Manicouagan           | 132                     | 1,161,994                    |
| Canada                             | Manicouagan           | 132                     | 1,161,994                    |
| Suriname                           | Afobaka               | 189                     | 673,950                      |
| United States                      | Warrick               | 657                     | 4,538,257                    |
|                                    | Yadkin                | 215                     | 661,214                      |
| <b>TOTAL</b>                       |                       | <b>1,835</b>            | <b>12,436,856</b>            |

<sup>1</sup> The Consolidated Capacity of the Brazilian energy facilities is the assured energy that is approximately 55% of hydropower plant nominal capacity.

<sup>2</sup> The Anglesea facility was permanently closed on August 31, 2015.

**Patents, Trade Secrets and Trademarks**

The Company believes that its domestic and international patent, trade secret and trademark assets provide it with a significant competitive advantage. The Company's rights under its patents, as well as the products made and sold under them, are important to the Company as a whole and, to varying degrees, important to each business segment. The patents owned by Alcoa generally concern particular products or manufacturing equipment or techniques. Alcoa's business as a whole is not, however, materially dependent on any single patent, trade secret or trademark. As a result of product development and technological advancement, the Company continues to pursue patent protection in jurisdictions throughout the world. At the end of 2015, the Company's worldwide patent portfolio consisted of approximately 986 pending patent applications and 1,923 granted patents.

The Company has a number of trade secrets, mostly regarding manufacturing processes and material compositions that give many of its businesses important advantages in their markets. The Company continues to strive to improve those processes and generate new material compositions that provide additional benefits.

The Company also has a number of domestic and international registered trademarks that have significant recognition within the markets that are served. Examples include the name Alcoa and the Alcoa symbol for aluminum products, Howmet metal castings, Hucasteners, Kawneer® building panels and Dura-Bright® wheels with easy-clean surface treatments. The Company's rights under its trademarks are important to the Company as a whole and, to varying degrees, important to each business segment.



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### **Competitive Conditions**

Alcoa is subject to highly competitive conditions in all aspects of its aluminum and non-aluminum businesses. Competitors include a variety of both U.S. and non-U.S. companies in all major markets. Innovation, price, quality, and service are the principal competitive factors in Alcoa's markets. Where aluminum, titanium and nickel products compete with other materials such as steel and plastics for automotive and building applications; magnesium, composites, and plastics for aerospace and defense applications aluminum, titanium and nickel's diverse characteristics, particularly the strength, light weight, recyclability, and flexibility are also significant factors. Alcoa's customer intimacy, advanced manufacturing capability, technology, technical expertise, and innovation in multi-materials and in specialized alloys provide Alcoa a competitive advantage in certain markets and/or for certain products. For Alcoa's segments that market products under Alcoa's brand names, brand recognition, and brand loyalty also play a role. In addition Alcoa's competitive position depends, in part, on the Company's access to an economical power supply to sustain its operations in various countries.

### **Research and Development**

Alcoa, a light metals technology leader, engages in research and development programs that include process and product development, and basic and applied research. Expenditures for research and development (R&D) activities were \$238 million in 2015, \$218 million in 2014, and \$192 million in 2013.

The Company continued to work on new developments in all business segments in 2015. With a focus on multi-materials, the Company integrated acquisitions of TITAL, Firth Rixson and RTI which expanded its reach into aerospace by adding advanced technologies and materials capabilities, particularly in titanium the world's fastest-growing aerospace metal.

The Company continued leveraging new technologies in 2015. Among them, the Company entered into a Joint Development Agreement with Ford to collaborate on next-generation aluminum alloys for automotive parts using Micromill technology. Working with Phinergy on advancing an aluminum air battery technology, the Company will make an equity investment of up to \$10 million and will be the exclusive anode provider for applications with auto OEMs and energy utilities. Additionally, the Company completed its jet engine expansion in Hampton, Virginia. This facility includes technology that cuts the weight of the Company's highest-volume jet engine blades by 20 percent and significantly improves aerodynamic performance.

The Company has invested \$60 million in the expansion of its R&D center designed to accelerate the development of additive manufacturing, with a focus on producing metal powder materials tailored for a range of additive process technologies. Alcoa will further its development of advanced 3D-printing design and manufacturing techniques such as Alcoa's Ampliforge process to improve production speeds, reduce costs, and achieve geometries not possible through traditional methods. The investment also leverages the Company's testing and process control expertise to overcome challenges with qualifying new 3D-printed parts, starting with aerospace applications.

In 2015 several products spanning various industries were brought to market. Notably, Ford began use of Micromill<sup>®</sup> material, and Alcoa and Danieli Group agreed to license intellectual property associated with advanced Micromill<sup>®</sup> alloys and process technology. Samsung unveiled its Galaxy S6 Smartphone using 6013 Alcoa Power Plate product for 70 percent greater strength than standard aluminum. The Company launched four foundry alloys that offer strength, thermal performance, corrosion resistance, and at least 20% better fatigue resistance in automotive applications. In addition, Dura-Bright<sup>®</sup> EVO, Alcoa's most durable, easy-to-maintain commercial truck wheel, was brought to the North American market.

### **Environmental Matters**

Information relating to environmental matters is included in Note N to the Consolidated Financial Statements under the caption Environmental Matters on pages 130-134. Approved capital expenditures for new or expanded facilities for environmental control are approximately \$60 million for 2016 and \$70 million for 2017.

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### Employees

Total worldwide employment at the end of 2015 was approximately 60,000 employees in 26 countries. About 37,000 of these employees are represented by labor unions. The Company believes that relations with its employees and any applicable union representatives generally are good.

In the U.S., approximately 10,000 employees are represented by various labor unions. The largest collective bargaining agreement is the master collective bargaining agreement between Alcoa and the United Steelworkers (USW). The USW master agreement covers approximately 6,100 employees at 11 U.S. locations; the current labor agreement expires on May 15, 2019. There are 18 other collective bargaining agreements in the U.S. with varying expiration dates. On a regional basis, collective bargaining agreements with varying expiration dates cover approximately 14,650 employees in Europe and Russia, 13,710 employees in North America, 4,350 employees in Central and South America, 3,100 employees in Australia, and 925 employees in China.

### Executive Officers of the Registrant

The names, ages, positions and areas of responsibility of the executive officers of the Company as of February 19, 2016 are listed below.

**Robert S. Collins**, 49, Vice President and Controller. Mr. Collins was elected to his current position in October 2013. He served as Assistant Controller from May 2009 to October 2013. Prior to his role as Assistant Controller, Mr. Collins was Director of Financial Transactions and Policy, providing financial accounting support for Alcoa's transactions in global mergers, acquisitions and divestitures. Before joining Alcoa in 2005, Mr. Collins worked in the audit and mergers and acquisitions practices at PricewaterhouseCoopers LLP for 14 years.

**Roy C. Harvey**, 41, Executive Vice President, President of Global Primary Products. Mr. Harvey was elected to his current position effective October 2015. From June 2014 to October 2015, he was Executive Vice President, Human Resources and Environment, Health, Safety and Sustainability. Prior to that, Mr. Harvey was Chief Operating Officer for Global Primary Products from July 2013 to June 2014, where he focused on the day-to-day operations of Alcoa's aluminum smelters, alumina refineries and bauxite mines worldwide. Prior to that, Mr. Harvey was Chief Financial Officer for Global Primary Products from December 2011 to July 2013. In addition to these roles, Mr. Harvey served as Director of Investor Relations, interfacing with securities analysts and investors globally on Alcoa's performance and strategic direction, from September 2010 to November 2011 and was Director of Corporate Treasury from January 2010 to September 2010. Mr. Harvey joined Alcoa in 2002 as a business analyst for Global Primary Products in Knoxville, Tennessee. In 2005, he moved to the São Luis Plant in Brazil, as cashhouse manager in the smelter and then as the plant controller. In 2007, he became plant manager for the San Ciprián, Spain, smelter and a year later was named Director of Finance and Business Integration for Global Primary Products Europe.

**Olivier M. Jarrault**, 54, Executive Vice President Alcoa and Group President, Engineered Products and Solutions. Mr. Jarrault was elected an Alcoa Executive Vice President effective January 21, 2011 and was named Group President of Engineered Products and Solutions effective January 1, 2011. He served as Chief Operating Officer of Engineered Products and Solutions from February 2010 to January 1, 2011. Mr. Jarrault joined Alcoa in 2002 when Alcoa acquired Fairchild Fasteners from The Fairchild Corporation. He served as President of Alcoa Fastening Systems from 2002 to February 2010. He was elected a Vice President of Alcoa in November 2006.

**Klaus Kleinfeld**, 58, Director, Chairman of the Board and Chief Executive Officer. Mr. Kleinfeld was elected to Alcoa's Board of Directors in November 2003 and became Chairman on April 23, 2010. He has been Chief Executive Officer of Alcoa since May 8, 2008. He was President and Chief Executive Officer from May 8, 2008 to April 23, 2010. He was President and Chief Operating Officer of Alcoa from October 1, 2007 to May 8, 2008. Mr. Kleinfeld was President and Chief Executive Officer of Siemens AG, the global electronics and industrial conglomerate, from January 2005 to June 2007. He served as Deputy Chairman of the Managing Board and Executive Vice President of Siemens AG from 2004 to January 2005. He was President and Chief Executive Officer of Siemens Corporation, the U.S. arm of Siemens AG, from 2002 to 2004.

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**Christoph Kollatz**, 55, Executive Vice President, Corporate Development, Strategy and New Ventures. Mr. Kollatz joined Alcoa in 2015 and was elected an Executive Vice President of Alcoa in September 2015. Before joining Alcoa, Mr. Kollatz was Chief Information and Process Officer at Lufthansa from 2012 to 2015, overseeing the IT technology infrastructure, as well as IT applications, supporting financial and customer operations. Prior to Lufthansa, from 2011 to 2012, Mr. Kollatz created and led a start-up business within SAP, introducing a new database technology to the market. Mr. Kollatz held a series of leadership, strategy and technology positions at Siemens from 1989 to 2011, including as CEO of Siemens IT Solutions and Services.

**Kay H. Meggers**, 51, Executive Vice President Alcoa and Group President, Global Rolled Products. Mr. Meggers was elected an Alcoa Executive Vice President in December 2011. He was named Group President, Global Rolled Products effective November 14, 2011. Before his most recent appointment, he led Alcoa's Business Excellence/ Corporate Strategy resource unit and was also responsible for overseeing Alcoa's Asia-Pacific region. He joined Alcoa in February 2010 as Vice President, Corporate Initiatives, a position responsible for planning and coordinating major strategic initiatives from enhancing technology and innovation as part of the Alcoa Technology Advantage program to spearheading growth strategies for China and Brazil. He was elected a Vice President of Alcoa in June 2011. Before joining Alcoa, Mr. Meggers was Senior Vice President at Siemens U.S. Building Technologies Division and served for three years as Business Unit Head of Building Automation. In 2006, he served for nine months as Division Head of Fire Safety, also part of Siemens U.S. Building Technologies Division. Between 2002 and 2005, he served as Vice President of Strategic Planning at Siemens U.S.

**Vas Nair**, 50, Executive Vice President, Human Resources and Environment, Health, Safety and Sustainability. Ms. Nair was appointed Executive Vice President, Human Resources and Environment, Health, Safety and Sustainability in November 2015. Prior to being appointed to her current role, Ms. Nair was Chief Talent and Diversity Officer, with global responsibility for diversity and inclusion from February 2015 to October 2015. Prior to joining Alcoa, Ms. Nair was VP of Global Learning and Talent Development at Estee Lauder from November 2010 to January 2015. Ms. Nair was Vice President and Chief Learning Officer at Schering-Plough from November 2003 to October 2009.

**William F. Oplinger**, 49, Executive Vice President and Chief Financial Officer. Mr. Oplinger was elected to his current position effective April 1, 2013. Since joining Alcoa in 2000, Mr. Oplinger has held key corporate positions in financial analysis and planning and as Director of Investor Relations. He also has held key positions in the Global Primary Products business, including as Controller, Operational Excellence Director, Chief Financial Officer and Chief Operating Officer. As Chief Operating Officer of Alcoa's Global Primary Products business from December 2011 to March 2013, Mr. Oplinger was responsible for the day-to-day operations of the business' global network of aluminum smelters, refineries and mines.

**Audrey Strauss**, 68, Executive Vice President, Chief Legal Officer and Secretary. Ms. Strauss was elected to her current position upon joining Alcoa in May 2012. Prior to joining Alcoa, she was a senior litigation partner from 1990 to 2012 at Fried Frank Harris Shriver and Jacobson LLP (Fried Frank), a law firm based in New York. Prior to her practice at Fried Frank, Ms. Strauss served in the U.S. Attorney's office for the Southern District of New York from 1975 to 1982, where she was Chief Appellate Attorney and Chief of the Fraud Unit.

The Company's executive officers are elected or appointed to serve until the next annual meeting of the Board of Directors (held in conjunction with the annual meeting of shareholders) except in the case of earlier death, retirement, resignation or removal.

**Item 1A. Risk Factors.**

Alcoa's business, financial condition and results of operations may be impacted by a number of factors. In addition to the factors discussed elsewhere in this report, the following risks and uncertainties could materially harm its business, financial condition or results of operations, including causing Alcoa's actual results to differ materially from those projected in any forward-looking statements. The following list of significant risk factors is not all-inclusive or necessarily in order of importance. Additional risks and uncertainties not presently known to Alcoa or that Alcoa currently deems immaterial also may materially adversely affect us in future periods.



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### **The aluminum industry and aluminum end-use markets are highly cyclical and are influenced by a number of factors, including global economic conditions.**

The aluminum industry generally is highly cyclical, and Alcoa is subject to cyclical fluctuations in global economic conditions and aluminum end-use markets. Alcoa sells many products to industries that are cyclical, such as the commercial construction and transportation, automotive, and aerospace industries, and the demand for its products is sensitive to, and quickly impacted by, demand for the finished goods manufactured by its customers in these industries, which may change as a result of changes in the general U.S. or worldwide economy, currency exchange rates, energy prices or other factors beyond its control.

The demand for aluminum is highly correlated to economic growth. For example, the European sovereign debt crisis that began in late 2009 had an adverse effect on European demand for aluminum and aluminum products. The Chinese market is a significant source of global demand for, and supply of, commodities, including aluminum. A sustained slowdown in China's economic growth and aluminum demand, or a significant slowdown in other markets, that is not offset by decreases in supply or by increased aluminum demand in emerging economies, such as India, Brazil, and several South East Asian countries, could have an adverse effect on the global supply and demand for aluminum and aluminum prices.

While Alcoa believes that the long-term prospects for aluminum and aluminum products are positive, the Company is unable to predict the future course of industry variables or the strength of the global economy and the effects of government intervention. Negative economic conditions, such as a major economic downturn, a prolonged recovery period, a downturn in the commodity sector, or disruptions in the financial markets, could have a material adverse effect on Alcoa's business, financial condition or results of operations.

### **Alcoa could be materially adversely affected by declines in aluminum prices, including global, regional and product-specific prices.**

The overall price of primary aluminum consists of several components: 1) the underlying base metal component, which is typically based on quoted prices from the London Metal Exchange (LME); 2) the regional premium, which comprises the incremental price over the base LME component that is associated with the physical delivery of metal to a particular region (e.g., the Midwest premium for metal sold in the United States); and 3) the product premium, which represents the incremental price for receiving physical metal in a particular shape (e.g., coil, billet, slab, rod, etc.) or alloy. Each of the above three components has its own drivers of variability.

The LME price is typically driven by macroeconomic factors, global supply and demand of aluminum (including expectations for growth and contraction and the level of global inventories), and financial investors. An imbalance in global supply and demand of aluminum, such as decreasing demand without corresponding supply declines, could have a negative impact on aluminum pricing. Speculative trading in aluminum and the influence of hedge funds and other financial institutions participating in commodity markets have also increased in recent years, potentially contributing to higher levels of price volatility. In 2015, the cash LME price of aluminum reached a high of \$1,919 per metric ton and a low of \$1,424 per metric ton. High LME inventories, or the release of substantial inventories into the market, could lead to a reduction in the price of aluminum. Declines in the LME price have had a negative impact on Alcoa's results of operations.

Additionally, Alcoa's results could be adversely affected by decreases in regional premiums that participants in the physical metal market pay for immediate delivery of aluminum. Regional premiums tend to vary based on the supply of and demand for metal in a particular region and associated transportation costs. LME warehousing rules could cause aluminum prices to decrease and surpluses have caused regional premiums to decrease, which would have a negative impact on the Company's results of operations.

Product premiums generally are a function of supply and demand for a given primary aluminum shape and alloy combination in a particular region. A sustained weak LME aluminum pricing environment, deterioration in LME aluminum prices, or a decrease in regional premiums or product premiums could have a material adverse effect on Alcoa's business, financial condition, and results of operations or cash flow.

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### **LME warehousing rules could cause aluminum prices to decrease.**

Since 2013, the LME has been engaged in a program aimed at reforming the rules under which registered warehouses in its global network operate. The initial rule changes took effect on February 1, 2015, and the LME has announced additional changes that will be implemented in 2016. These rule changes, and any subsequent changes that the exchange chooses to make, could impact the supply/demand balance in the primary aluminum physical market and may impact regional delivery premiums and LME aluminum prices. Decreases in regional delivery premiums and/or decreases in LME aluminum prices could have a material adverse effect on Alcoa's business, financial condition, and results of operations or cash flow.

### **Alcoa may not be able to realize the expected benefits from its strategy of transforming its portfolio by growing its value-add business and by creating a lower cost, competitive commodity business by optimizing its portfolio.**

Alcoa is continuing to execute on its strategy of transforming its portfolio by growing its value-add business to capture profitable growth as a lightweight metals innovation leader and by creating a lower cost, competitive commodity business by optimizing its portfolio. It is investing in its value-add manufacturing and engineering businesses to capture growth opportunities in strong end markets like automotive and aerospace. Alcoa is building out its value-add businesses, including by introducing innovative new products and technology solutions, and investing in expansions of value-add capacity. Alcoa's growth projects include the joint venture with Ma'aden in Saudi Arabia; the automotive expansions in Davenport, Iowa and Alcoa, Tennessee; the aluminum lithium capacity expansion in Lafayette, Indiana, at the Alcoa Technical Center in Pennsylvania and at the Kitts Green plant in the United Kingdom; and the expansion in aerospace capabilities in La Porte, Indiana, Hampton, Virginia and Davenport, Iowa. From time to time, Alcoa also pursues growth opportunities that are strategically aligned with its objectives, such as the acquisition of the Firth Rixson business (completed in November 2014), the acquisition of TITAL (completed in March 2015) and the acquisition of RTI International Metals (completed in July 2015). In addition, Alcoa is optimizing its rolling mill portfolio as part of its strategy for profitable growth in the midstream business. At the same time, the Company is creating a competitive commodity business by taking decisive actions to lower the cost base of its upstream operations, including closing, selling or curtailing high-cost global smelting capacity, optimizing alumina refining capacity, and pursuing the sale of its interest in certain other operations.

Alcoa has made, and may continue to plan and execute, acquisitions and divestitures and take other actions to grow or streamline its portfolio. Although management believes that its strategic actions are beneficial to Alcoa, there is no assurance that anticipated benefits will be realized. Adverse factors may prevent Alcoa from realizing the benefits of its growth projects, including unfavorable global economic conditions, currency fluctuations, or unexpected delays in target timelines. Acquisitions present significant challenges and risks, including the effective integration of the business into the Company, unanticipated costs and liabilities, and the ability to realize anticipated benefits, such as growth in market share, revenue or margins, at the levels or in the timeframe expected. The Company may be unable to manage acquisitions successfully.

With respect to portfolio optimization actions such as divestitures, curtailments and closures, Alcoa may face barriers to exit from unprofitable businesses or operations, including high exit costs or objections from various stakeholders. In addition, Alcoa may retain unforeseen liabilities for divested entities if a buyer fails to honor all commitments. Alcoa's business operations are capital intensive, and curtailment or closure of operations or facilities may include significant charges, including employee separation costs, asset impairment charges and other measures.

There can be no assurance that acquisitions, growth investments, divestitures or closures will be undertaken or completed in their entirety as planned or that they will be beneficial to Alcoa.

### **Market-driven balancing of global aluminum supply and demand may be disrupted by non-market forces or other impediments to production closures.**

In response to market-driven factors relating to the global supply and demand of aluminum, Alcoa has curtailed or closed portions of its aluminum production. Certain other aluminum producers have independently undertaken to make cuts in production as well. However, the existence of non-market forces on global aluminum industry capacity, such as political pressures in certain countries to keep jobs or to maintain or further develop industry self-sufficiency, may

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prevent or delay the closure or curtailment of certain producers' smelters, irrespective of their position on the industry cost curve. Other production cuts may be impeded by long-term contracts to buy power or raw materials. If industry overcapacity persists due to the disruption by such non-market forces on the market-driven balancing of the global supply and demand of aluminum, the resulting weak pricing environment and margin compression may adversely affect the operating results of aluminum producers, including Alcoa.

### **Alcoa's operations consume substantial amounts of energy; profitability may decline if energy costs rise or if energy supplies are interrupted.**

Alcoa's operations consume substantial amounts of energy. Although Alcoa generally expects to meet the energy requirements for its alumina refineries and primary aluminum smelters from internal sources or from long-term contracts, certain conditions could negatively affect Alcoa's results of operations, including the following:

significant increases in electricity costs rendering smelter operations uneconomic;

significant increases in fuel oil or natural gas prices;

unavailability of electrical power or other energy sources due to droughts, hurricanes or other natural causes;

unavailability of energy due to energy shortages resulting in insufficient supplies to serve consumers;

interruptions in energy supply or unplanned outages due to equipment failure or other causes;

curtailment of one or more refineries or smelters due to the inability to extend energy contracts upon expiration or to negotiate new arrangements on cost-effective terms or due to the unavailability of energy at competitive rates; or

curtailment of one or more smelters due to a regulatory authority's determination that power supply interruptibility rights granted to Alcoa under an interruptibility regime in place under the laws of the country in which the smelter is located do not comply with the regulatory authority's state aid rules, thus rendering the smelter operations that had been relying on such country's interruptibility regime uneconomic.

If events such as those listed above were to occur, the resulting high energy costs or the disruption of an energy source or the requirement to repay all or a portion of the benefit Alcoa received under a power supply interruptibility regime could have a material adverse effect on Alcoa's business and results of operations.

### **Alcoa's profitability could be adversely affected by increases in the cost of raw materials or by significant lag effects of decreases in commodity or LME-linked costs.**

Alcoa's results of operations are affected by changes in the cost of raw materials, including energy, carbon products, caustic soda and other key inputs, as well as freight costs associated with transportation of raw materials to refining and smelting locations. Alcoa may not be able to fully offset the effects of higher raw material costs or energy costs through price increases, productivity improvements or cost reduction programs. Similarly, Alcoa's operating results are affected by significant lag effects of declines in key costs of production that are commodity or LME-linked. For example, declines in the LME-linked costs of alumina and power during a particular period may not be adequate to offset sharp declines in metal price in that period. Increases in the cost of raw materials or decreases in input costs that are disproportionate to concurrent sharper decreases in the price of aluminum could have a material adverse effect on Alcoa's operating results.

### **Alcoa is exposed to fluctuations in foreign currency exchange rates and interest rates, as well as inflation, and other economic factors in the countries in which it operates.**

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Economic factors, including inflation and fluctuations in foreign currency exchange rates and interest rates, competitive factors in the countries in which Alcoa operates, and continued volatility or deterioration in the global economic and financial environment could affect Alcoa's revenues, expenses and results of operations. Changes in the valuation of the U.S. dollar against other currencies, particularly the Australian dollar, Brazilian real, Canadian dollar,

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Euro and Norwegian kroner, may affect Alcoa's profitability as some important inputs are purchased in other currencies, while the Company's upstream products are generally sold in U.S. dollars. In addition, although a strong U.S. dollar generally has a positive impact on Alcoa's near-term profitability, over a longer term, a strong U.S. dollar may have an unfavorable impact to Alcoa's position on the global aluminum cost curve due to Alcoa's U.S. smelting portfolio. As the U.S. dollar strengthens, the cost curve shifts down for smelters outside the U.S. but costs for Alcoa's U.S. smelting portfolio may not decline.

**Alcoa may not be able to successfully realize future targets or goals established for its business segments, at the levels or by the dates targeted.**

From time to time, Alcoa may announce future targets or goals for its business, which are based on the Company's then current expectations, estimates, forecasts and projections about the operating environment, economies and markets in which Alcoa operates. Future targets and goals reflect the Company's beliefs and assumptions and its perception of historical trends, then current conditions and expected future developments, as well as other factors management believes are appropriate in the circumstances. As such, targets and goals are inherently subject to significant business, economic, competitive and other uncertainties and contingencies regarding future events, including the risks discussed in this report. The actual outcome may be materially different. There can be no assurance that any targets or goals established by the Company will be accomplished at the levels or by the dates targeted, if at all. Failure to achieve the targets or goals by the Company may have a material adverse effect on its business, financial condition, results of operations or the market price of its securities.

**Alcoa faces significant competition, which may have an adverse effect on profitability.**

As discussed in Part I, Item 1. (Business – Competitive Conditions) of this report, the markets for Alcoa's aluminum and non-aluminum products are highly competitive. Alcoa's competitors include a variety of both U.S. and non-U.S. companies in all major markets, including some that are subsidized. Alcoa's metals, including aluminum, titanium and nickel, compete with other materials, such as steel, plastics, composites, ceramics, and glass, among others, for various applications in Alcoa's key markets. New product offerings or new technologies in the marketplace may compete with or replace Alcoa products. The willingness of customers to accept substitutes for the products sold by Alcoa, the ability of large customers to exert leverage in the marketplace to affect the pricing for fabricated aluminum products, and technological advancements or other developments by or affecting Alcoa's competitors or customers could affect Alcoa's results of operations. In addition, Alcoa's competitive position depends, in part, on the Company's ability to leverage its innovation expertise across its businesses and key end markets and, in the case of its upstream businesses, having access to an economical power supply to sustain its operations in various countries.

**A downgrade of Alcoa's credit ratings could limit Alcoa's ability to obtain future financing, increase its borrowing costs, increase the pricing of its credit facilities, adversely affect the market price of its securities, trigger letter of credit or other collateral postings, or otherwise impair its business, financial condition, and results of operations.**

Standard and Poor's Ratings Services currently rates Alcoa's long-term debt BBB-, the lowest level of investment grade rating, with a stable ratings outlook (ratings and outlook were affirmed on March 9, 2015). On September 28, 2015, S&P issued a statement that these ratings and outlook for Alcoa were not affected by Alcoa's plan to separate into two publicly-traded companies. On May 29, 2013, Moody's Investors Service downgraded Alcoa's long-term debt rating from Baa3 to Ba1, which is below investment grade, and changed the outlook from rating under review to stable. On April 30, 2015, Moody's changed the outlook from stable to positive. On September 28, 2015, Moody's affirmed these ratings and changed the current outlook from positive to developing based on Alcoa's plan to separate into two publicly-traded companies. On January 21, 2016, Moody's placed Alcoa's long-term debt rating under review and changed the current outlook from developing to rating under review, while leaving Alcoa's short-term debt rating unchanged. On April 11, 2014, Fitch Ratings downgraded Alcoa's rating from BBB- to BB+, a below investment grade rating, and changed the outlook from negative to stable. On April 16, 2015, Fitch Ratings affirmed Alcoa's rating of

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BB+ but revised Alcoa's outlook to positive. On September 30, 2015, Fitch placed these ratings on ratings watch positive based on Alcoa's plan to separate into two publicly-traded companies.

There can be no assurance that one or more of these or other rating agencies will not take negative actions with respect to Alcoa's ratings. Increased debt levels, adverse aluminum market or macroeconomic conditions, a deterioration in the Company's debt protection metrics, a contraction in the Company's liquidity, or other factors could potentially trigger such actions. A rating agency may lower, suspend or withdraw entirely a rating or place it on negative outlook or watch if, in that rating agency's judgment, circumstances so warrant.

A downgrade of Alcoa's credit ratings by one or more rating agencies could adversely impact the market price of Alcoa's securities; adversely affect existing financing (for example, a downgrade by Standard and Poor's or a further downgrade by Moody's would subject Alcoa to higher costs under Alcoa's Five-Year Revolving Credit Agreement and certain of its other revolving credit facilities); limit access to the capital (including commercial paper) or credit markets or otherwise adversely affect the availability of other new financing on favorable terms, if at all; result in more restrictive covenants in agreements governing the terms of any future indebtedness that the Company incurs; increase the cost of borrowing or fees on undrawn credit facilities; result in vendors or counterparties seeking collateral or letters of credit from Alcoa; or otherwise impair Alcoa's business, financial condition and results of operations.

### **Cyber attacks and security breaches may threaten the integrity of Alcoa's intellectual property and other sensitive information, disrupt its business operations, and result in reputational harm and other negative consequences that could have a material adverse effect on its financial condition and results of operations.**

Alcoa faces global cybersecurity threats, which may range from uncoordinated individual attempts to sophisticated and targeted measures, known as advanced persistent threats, directed at the Company. Cyber attacks and security breaches may include, but are not limited to, attempts to access information, computer viruses, denial of service and other electronic security breaches.

The Company believes that it faces a heightened threat of cyber attacks due to the industries it serves, the locations of its operations and its technological innovations. The Company has experienced cybersecurity attacks in the past, including breaches of its information technology systems in which information was taken, and may experience them in the future, potentially with more frequency or sophistication. Based on information known to date, past attacks have not had a material impact on Alcoa's financial condition or results of operations. However, due to the evolving nature of cybersecurity threats, the scope and impact of any future incident cannot be predicted. While the Company continually works to safeguard its systems and mitigate potential risks, there is no assurance that such actions will be sufficient to prevent cyber attacks or security breaches that manipulate or improperly use its systems or networks, compromise confidential or otherwise protected information, destroy or corrupt data, or otherwise disrupt its operations. The occurrence of such events could negatively impact Alcoa's reputation and its competitive position and could result in litigation with third parties, regulatory action, loss of business, potential liability and increased remediation costs, any of which could have a material adverse effect on its financial condition and results of operations. In addition, such attacks or breaches could require significant management attention and resources, and result in the diminution of the value of the Company's investment in research and development.

### **Joint ventures and other strategic alliances may not be successful.**

Alcoa participates in joint ventures and has formed strategic alliances and may enter into other similar arrangements in the future. For example, in December 2009, Alcoa formed a joint venture with Ma'aden, the Saudi Arabian Mining Company, to develop a fully integrated aluminum complex (including a bauxite mine, alumina refinery, aluminum smelter and rolling mill) in the Kingdom of Saudi Arabia. Although the Company has, in connection with the Saudi Arabia joint venture and its other existing joint ventures and strategic alliances, sought to protect its interests, joint ventures and strategic alliances inherently involve special risks. Whether or not Alcoa holds majority interests or maintains operational control in such arrangements, its partners may:

have economic or business interests or goals that are inconsistent with or opposed to those of the Company;

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exercise veto rights so as to block actions that Alcoa believes to be in its or the joint venture's or strategic alliance's best interests;

take action contrary to Alcoa's policies or objectives with respect to its investments; or

as a result of financial or other difficulties, be unable or unwilling to fulfill their obligations under the joint venture, strategic alliance or other agreements, such as contributing capital to expansion or maintenance projects.

There can be no assurance that Alcoa's joint ventures or strategic alliances will be beneficial to Alcoa, whether due to the above-described risks, unfavorable global economic conditions, increases in construction costs, currency fluctuations, political risks, or other factors.

**Alcoa's business and growth prospects may be negatively impacted by limits in its capital expenditures.**

Alcoa requires substantial capital to invest in growth opportunities and to maintain and prolong the life and capacity of its existing facilities. For 2016, generating positive cash flow from operations that will exceed capital expenditures continues to be an Alcoa target. Insufficient cash generation or capital project overruns may negatively impact Alcoa's ability to fund as planned its sustaining and return-seeking capital projects. Over the long term, Alcoa's ability to take advantage of improved aluminum or other market conditions or growth opportunities in its midstream and downstream businesses may be constrained by earlier capital expenditure restrictions, which could adversely affect the long-term value of its business and the Company's position in relation to its competitors.

Alcoa may also need to address commercial and political issues in relation to its reductions in capital expenditures in certain of the jurisdictions in which it operates. If Alcoa's interest in its joint ventures is diluted or it loses key concessions, its growth could be constrained. Any of the foregoing could have a material adverse effect on the Company's business, results of operations, financial condition and prospects.

**Alcoa's global operations expose the Company to risks that could adversely affect Alcoa's business, financial condition, operating results or cash flows.**

Alcoa has operations or activities in numerous countries and regions outside the United States, including Brazil, China, Europe, Guinea, Russia, and the Kingdom of Saudi Arabia. The Company's global operations are subject to a number of risks, including:

economic and commercial instability risks, including those caused by sovereign and private debt default, corruption, and changes in local government laws, regulations and policies, such as those related to tariffs and trade barriers, taxation, exchange controls, employment regulations and repatriation of earnings;

geopolitical risks such as political instability, civil unrest, expropriation, nationalization of properties by a government, imposition of sanctions, renegotiation or nullification of existing agreements, mining leases and permits;

war or terrorist activities;

major public health issues such as an outbreak of a pandemic or epidemic (such as Sudden Acute Respiratory Syndrome, Avian Influenza, H7N9 virus, or the Ebola virus), which could cause disruptions in Alcoa's operations or workforce;

difficulties enforcing intellectual property and contractual rights in certain jurisdictions; and

unexpected events, including fires or explosions at facilities, and natural disasters.

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While the impact of any of the foregoing factors is difficult to predict, any one or more of them could adversely affect Alcoa's business, financial condition, operating results or cash flows. Existing insurance arrangements may not provide protection for the costs that may arise from such events.



**Table of Contents****An adverse decline in the liability discount rate, lower-than-expected investment return on pension assets and other factors could affect Alcoa's results of operations or amount of pension funding contributions in future periods.**

Alcoa's results of operations may be negatively affected by the amount of expense Alcoa records for its pension and other postretirement benefit plans, reductions in the fair value of plan assets and other factors. U.S. generally accepted accounting principles (GAAP) require that Alcoa calculate income or expense for the plans using actuarial valuations.

These valuations reflect assumptions about financial market and other economic conditions, which may change based on changes in key economic indicators. The most significant year-end assumptions used by Alcoa to estimate pension or other postretirement benefit income or expense for the following year are the discount rate applied to plan liabilities and the expected long-term rate of return on plan assets. In addition, Alcoa is required to make an annual measurement of plan assets and liabilities, which may result in a significant charge to shareholders equity. For a discussion regarding how Alcoa's financial statements can be affected by pension and other postretirement benefits accounting policies, see Critical Accounting Policies and Estimates Pension and Other Postretirement Benefits in Part II, Item 7. (Management's Discussion and Analysis of Financial Condition and Results of Operations) and Note W to the Consolidated Financial Statements Pension and Other Postretirement Benefits in Part II, Item 8. (Financial Statements and Supplementary Data). Although GAAP expense and pension funding contributions are impacted by different regulations and requirements, the key economic factors that affect GAAP expense would also likely affect the amount of cash or securities Alcoa would contribute to the pension plans.

Potential pension contributions include both mandatory amounts required under federal law and discretionary contributions to improve the plans funded status. The Moving Ahead for Progress in the 21st Century Act ( MAP-21 ), enacted in 2012, provided temporary relief for employers like Alcoa who sponsor defined benefit pension plans related to funding contributions under the Employee Retirement Income Security Act of 1974 by allowing the use of a 25-year average discount rate within an upper and lower range for purposes of determining minimum funding obligations. In 2014, the Highway and Transportation Funding Act (HATFA) was signed into law. HATFA extended the relief provided by MAP-21 and modified the interest rates that had been set by MAP-21. In 2015, the Bipartisan Budget Act of 2015 (BBA 2015) was signed into law. BBA 2015 extends the relief period provided by HATFA. Alcoa believes that the relief provided by BBA 2015 will moderately reduce the cash flow sensitivity of the Company's U.S. pension plans' funded status to potential declines in discount rates over the next several years. However, higher than expected pension contributions due to a decline in the plans' funded status as a result of declines in the discount rate or lower-than-expected investment returns on plan assets could have a material negative effect on the Company's cash flows. Adverse capital market conditions could result in reductions in the fair value of plan assets and increase the Company's liabilities related to such plans, adversely affecting Alcoa's liquidity and results of operations.

**Unanticipated changes in our tax provisions or exposure to additional tax liabilities could affect Alcoa's future profitability.**

Alcoa is subject to income taxes in both the United States and various non-U.S. jurisdictions. Its domestic and international tax liabilities are dependent upon the distribution of income among these different jurisdictions. Changes in applicable domestic or foreign tax laws and regulations, or their interpretation and application, including the possibility of retroactive effect, could affect the Company's tax expense and profitability. Alcoa's tax expense includes estimates of additional tax that may be incurred for tax exposures and reflects various estimates and assumptions. The assumptions include assessments of future earnings of the Company that could impact the valuation of its deferred tax assets. The Company's future results of operations could be adversely affected by changes in the effective tax rate as a result of a change in the mix of earnings in countries with differing statutory tax rates, changes in the overall profitability of the Company, changes in tax legislation and rates, changes in generally accepted accounting principles, changes in the valuation of deferred tax assets and liabilities, the results of tax audits and examinations of previously filed tax returns or related litigation and continuing assessments of its tax exposures. Corporate tax reform and tax law changes continue to be analyzed in the United States and in many other jurisdictions. Significant changes to the U.S. corporate tax system in particular could have a substantial impact, positive or negative, on Alcoa's effective tax rate, cash tax expenditures, and deferred tax assets and liabilities.

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**Union disputes and other employee relations issues could adversely affect Alcoa's financial results.**

A significant portion of Alcoa's employees are represented by labor unions in a number of countries under various collective bargaining agreements with varying durations and expiration dates. For more information, see "Employees" in Part I, Item 1. (Business) of this report. While Alcoa was previously successful in renegotiating the master collective bargaining agreement with the United Steelworkers (the most recent renegotiation having taken place in June 2014), Alcoa may not be able to satisfactorily renegotiate that agreement or other collective bargaining agreements in the U.S. and other countries when they expire. In addition, existing collective bargaining agreements may not prevent a strike or work stoppage at Alcoa's facilities in the future. Alcoa may also be subject to general country strikes or work stoppages unrelated to its business or collective bargaining agreements. Any such work stoppages (or potential work stoppages) could have a material adverse effect on Alcoa's financial results.

**Alcoa could be adversely affected by changes in the business or financial condition of a significant customer or customers.**

A significant downturn or deterioration in the business or financial condition of a key customer or customers supplied by Alcoa could affect Alcoa's results of operations in a particular period. Alcoa's customers may experience delays in the launch of new products, labor strikes, diminished liquidity or credit unavailability, weak demand for their products, or other difficulties in their businesses. If Alcoa is not successful in replacing business lost from such customers, profitability may be adversely affected.

**Alcoa may not be able to successfully develop and implement technology initiatives.**

Alcoa is working on new developments for a number of strategic projects in all business segments, including additive manufacturing, alloy development, engineered finishes and product design, high speed continuous casting and rolling technology, and other advanced manufacturing technologies. For more information on Alcoa's research and development programs, see "Research and Development" in Part I, Item 1. (Business) of this report. There can be no assurance that such developments or technologies will be commercially feasible or beneficial to Alcoa.

**Alcoa's human resource talent pool may not be adequate to support the Company's growth.**

Alcoa's existing operations and development projects require highly skilled executives and staff with relevant industry and technical experience. The inability of the Company or the industry to attract and retain such people may adversely impact Alcoa's ability to adequately meet project demands and fill roles in existing operations. Skills shortages in engineering, technical service, construction and maintenance contractors and other labor market inadequacies may also impact activities. These shortages may adversely impact the cost and schedule of development projects and the cost and efficiency of existing operations.

**Alcoa may not realize expected benefits from its productivity and cost-reduction initiatives.**

Alcoa has undertaken, and may continue to undertake, productivity and cost-reduction initiatives to improve performance and conserve cash, including new procurement strategies for raw materials, such as backward integration and non-traditional sourcing from numerous geographies, deployment of company-wide business process models, such as Alcoa's degrees of implementation process in which ideas are executed in a disciplined manner to generate savings, and overhead cost reductions. There is no assurance that these initiatives will be successful or beneficial to Alcoa or that estimated cost savings from such activities will be realized.

**Alcoa may be exposed to significant legal proceedings, investigations or changes in U.S. federal, state or foreign law, regulation or policy.**

Alcoa's results of operations or liquidity in a particular period could be affected by new or increasingly stringent laws, regulatory requirements or interpretations, or outcomes of significant legal proceedings or investigations adverse to

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Alcoa. The Company may experience a change in effective tax rates or become subject to unexpected or rising costs associated with business operations or provision of health or welfare benefits to employees due to changes in laws, regulations or policies. The Company is also subject to a variety of legal compliance risks. These risks include, among other things, potential claims relating to product liability, health and safety, environmental matters, intellectual property rights, government contracts, taxes, and compliance with U.S. and foreign export laws, anti-bribery laws, competition laws and sales and trading practices. Alcoa could be subject to fines, penalties, damages (in certain cases, treble damages), or suspension or debarment from government contracts.

While Alcoa believes it has adopted appropriate risk management and compliance programs to address and reduce these risks, the global and diverse nature of its operations means that these risks will continue to exist, and additional legal proceedings and contingencies may arise from time to time. In addition, various factors or developments can lead the Company to change current estimates of liabilities or make such estimates for matters previously not susceptible of reasonable estimates, such as a significant judicial ruling or judgment, a significant settlement, significant regulatory developments or changes in applicable law. A future adverse ruling or settlement or unfavorable changes in laws, regulations or policies, or other contingencies that the Company cannot predict with certainty could have a material adverse effect on the Company's results of operations or cash flows in a particular period. For additional information regarding the legal proceedings involving the Company, see the discussion in Part I, Item 3. (Legal Proceedings) of this report and in Note N to the Consolidated Financial Statements in Part II, Item 8. (Financial Statements and Supplementary Data).

**Alcoa is subject to a broad range of health, safety and environmental laws and regulations in the jurisdictions in which it operates and may be exposed to substantial costs and liabilities associated with such laws and regulations.**

Alcoa's operations worldwide are subject to numerous complex and increasingly stringent health, safety and environmental laws and regulations. The costs of complying with such laws and regulations, including participation in assessments and cleanups of sites, as well as internal voluntary programs, are significant and will continue to be so for the foreseeable future. Environmental laws may impose cleanup liability on owners and occupiers of contaminated property, including past or divested properties, regardless of whether the owners and occupiers caused the contamination or whether the activity that caused the contamination was lawful at the time it was conducted. Environmental matters for which Alcoa may be liable may arise in the future at its present sites, where no problem is currently known, at previously owned sites, sites previously operated by the Company, sites owned by its predecessors or sites that it may acquire in the future. Compliance with environmental, health and safety legislation and regulatory requirements may prove to be more limiting and costly than the Company anticipates. Alcoa's results of operations or liquidity in a particular period could be affected by certain health, safety or environmental matters, including remediation costs and damages related to certain sites. Additionally, evolving regulatory standards and expectations can result in increased litigation and/or increased costs, all of which can have a material and adverse effect on earnings and cash flows.

**Climate change, climate change legislation or regulations and greenhouse effects may adversely impact Alcoa's operations and markets.**

Energy is a significant input in a number of Alcoa's operations. There is growing recognition that consumption of energy derived from fossil fuels is a contributor to global warming.

A number of governments or governmental bodies have introduced or are contemplating legislative and regulatory change in response to the potential impacts of climate change. There is also current and emerging regulation, such as the mandatory renewable energy target in Australia, Québec's transition to a cap and trade system with compliance required beginning 2013, the European Union Emissions Trading Scheme and the United States Clean Power Plan, which became effective on December 22, 2015. Alcoa will likely see changes in the margins of greenhouse gas-intensive assets and energy-intensive assets as a result of regulatory impacts in the countries in which the Company operates. These regulatory mechanisms may be either voluntary or legislated and may impact Alcoa's operations.

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directly or indirectly through customers or Alcoa's supply chain. Inconsistency of regulations may also change the attractiveness of the locations of some of the Company's assets. Assessments of the potential impact of future climate change legislation, regulation and international treaties and accords are uncertain, given the wide scope of potential regulatory change in countries in which Alcoa operates. The Company may realize increased capital expenditures resulting from required compliance with revised or new legislation or regulations, costs to purchase or profits from sales of, allowances or credits under a cap and trade system, increased insurance premiums and deductibles as new actuarial tables are developed to reshape coverage, a change in competitive position relative to industry peers and changes to profit or loss arising from increased or decreased demand for goods produced by the Company and indirectly, from changes in costs of goods sold.

The potential physical impacts of climate change on the Company's operations are highly uncertain, and will be particular to the geographic circumstances. These may include changes in rainfall patterns, shortages of water or other natural resources, changing sea levels, changing storm patterns and intensities, and changing temperature levels. These effects may adversely impact the cost, production and financial performance of Alcoa's operations.

**Alcoa's plan to separate into two independent publicly-traded companies is subject to various risks and uncertainties and may not be completed in accordance with the expected plans or anticipated timeline, or at all, and will involve significant time and expense, which could disrupt or adversely affect Alcoa's business.**

On September 28, 2015, Alcoa announced plans to separate into two independent publicly-traded companies: a Value-Add company comprising the Global Rolled Products, Engineered Products and Solutions, and Transportation and Construction Solutions segments, and an Upstream company comprising the Alumina and Primary Metals segments. The separation, which is currently targeted to be completed in the second half of 2016, is subject to approval by Alcoa's Board of Directors of the final terms of the separation and market, regulatory and certain other conditions. Unanticipated developments, including, among others, failure of the separation to qualify for the expected tax treatment, the possibility that any third-party consents required in connection with the separation will not be received, material adverse changes in aluminum industry conditions and changes in global economic and financial market conditions generally, could delay or prevent the completion of the proposed separation, or cause the proposed separation to occur on terms or conditions that are different or less favorable than expected.

Alcoa expects that the process of completing the proposed separation will be time-consuming and involve significant costs and expenses, which may be significantly higher than what it currently anticipates and may not yield a benefit if the separation is not completed. Executing the proposed separation will require significant time and attention from Alcoa's senior management and employees, which could disrupt the Company's ongoing business and adversely affect the financial results and results of operations. Alcoa may also experience increased difficulties in attracting, retaining and motivating employees during the pendency of the separation and following its completion, which could harm the Company's businesses.

**The separation may not achieve some or all of the anticipated benefits.**

Alcoa may not realize some or all of the anticipated strategic, financial, operational or other benefits from the separation. As independent publicly-traded companies, the Value-Add and Upstream companies will be smaller, less diversified companies with a narrower business focus and may be more vulnerable to changing market conditions, such as changes in aluminum industry conditions, which could result in increased volatility in their cash flows, working capital and financing requirements and could materially and adversely affect the respective business, financial condition and results of operations. Further, there can be no assurance that the combined value of the common stock of the two publicly-traded companies will be equal to or greater than what the value of Alcoa's common stock would have been had the proposed separation not occurred.

**The proposed separation may result in disruptions to, and negatively impact Alcoa's relationships with, the Company's suppliers, customers and other business partners.**

Uncertainty related to the proposed separation may lead suppliers, customers and other parties with which Alcoa currently does business or may do business in the future to terminate or attempt to negotiate changes in existing

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business relationships, or to consider entering into business relationships with parties other than Alcoa. These disruptions could have a material and adverse effect on Alcoa's businesses, financial condition, results of operations and prospects, or the businesses, financial condition, results of operations and prospects of the independent companies resulting from the separation. The effect of such disruptions could be exacerbated by any delays in the completion of the separation.

### **Item 1B. Unresolved Staff Comments.**

None.

### **Item 2. Properties.**

Alcoa's principal office is located at 390 Park Avenue, New York, New York 10022-4608. Alcoa's corporate center is located at 201 Isabella Street, Pittsburgh, Pennsylvania 15212-5858. The Alcoa Technical Center for research and development is located at 100 Technical Drive, Alcoa Center, Pennsylvania 15069-0001.

Alcoa leases some of its facilities; however, it is the opinion of management that the leases do not materially affect the continued use of the properties or the properties' values.

Alcoa believes that its facilities are suitable and adequate for its operations. Although no title examination of properties owned by Alcoa has been made for the purpose of this report, the Company knows of no material defects in title to any such properties. See Notes A and H to the financial statements for information on properties, plants and equipment.

Alcoa has active plants and holdings under the following segments and in the following geographic areas:

#### **ALUMINA**

**Bauxite**: See the tables and related text in the **Bauxite Interests** section on pages 3-10 of this report.

**Alumina**: See the table and related text in the **Alumina Refining Facilities and Capacity** section on pages 10-12 of this report.

#### **PRIMARY METALS**

See the table and related text in the **Primary Aluminum Facilities and Capacity** section on pages 12-14 of this report.

#### **GLOBAL ROLLED PRODUCTS**

See the table and related text in the **Global Rolled Products Facilities** section on page 14-15 of this report.

#### **ENGINEERED PRODUCTS AND SOLUTIONS**

See the table and related text in the **Engineered Products and Solutions Facilities** section on pages 15-18 of this report.

#### **TRANSPORTATION AND CONSTRUCTION SOLUTIONS**

See the table and related text in the **Transportation and Construction Solutions** section on pages 18-19 of this report.

### **Item 3. Legal Proceedings.**

In the ordinary course of its business, Alcoa is involved in a number of lawsuits and claims, both actual and potential.

#### **Litigation**

**Italian Energy Matter**

As previously reported, before 2002, Alcoa purchased power in Italy in the regulated energy market and received a drawback of a portion of the price of power under a special tariff in an amount calculated in accordance with a

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published resolution of the Italian Energy Authority, Energy Authority Resolution n. 204/1999 ( 204/1999 ). In 2001, the Energy Authority published another resolution, which clarified that the drawback would be calculated in the same manner, and in the same amount, in either the regulated or unregulated market. At the beginning of 2002, Alcoa left the regulated energy market to purchase energy in the unregulated market. Subsequently, in 2004, the Energy Authority introduced regulation no. 148/2004 which set forth a different method for calculating the special tariff that would result in a different drawback for the regulated and unregulated markets. Alcoa challenged the new regulation in the Administrative Court of Milan and received a favorable judgment in 2006. Following this ruling, Alcoa continued to receive the power price drawback in accordance with the original calculation method, through 2009, when the European Commission declared all such special tariffs to be impermissible state aid. In 2010, the Energy Authority appealed the 2006 ruling to the Consiglio di Stato (final court of appeal). On December 2, 2011, the Consiglio di Stato ruled in favor of the Energy Authority and against Alcoa, thus presenting the opportunity for the energy regulators to seek reimbursement from Alcoa of an amount equal to the difference between the actual drawback amounts received over the relevant time period, and the drawback as it would have been calculated in accordance with regulation 148/2004. On February 23, 2012, Alcoa filed its appeal of the decision of the Consiglio di Stato (this appeal was subsequently withdrawn in March 2013). On March 26, 2012, Alcoa received a letter from the agency (Cassa Conguaglio per il Settore Elettrico (CCSE)) responsible for making and collecting payments on behalf of the Energy Authority demanding payment in the amount of approximately \$110 million ( 85 million), including interest. By letter dated April 5, 2012, Alcoa informed CCSE that it disputes the payment demand of CCSE since (i) CCSE was not authorized by the Consiglio di Stato decisions to seek payment of any amount, (ii) the decision of the Consiglio di Stato has been appealed (see above), and (iii) in any event, no interest should be payable. On April 29, 2012, Law No. 44 of 2012 ( 44/2012 ) came into effect, changing the method to calculate the drawback. On February 21, 2013, Alcoa received a revised request letter from CCSE demanding Alcoa's subsidiary, Alcoa Trasformazioni S.r.l., make a payment in the amount of \$97 million ( 76 million), including interest, which reflects a revised calculation methodology by CCSE and represents the high end of the range of reasonably possible loss associated with this matter of \$0 to \$97 million ( 76 million). Alcoa has rejected that demand and has formally challenged it through an appeal before the Administrative Court on April 5, 2013. The Administrative Court scheduled a hearing for December 19, 2013, which was subsequently postponed until April 17, 2014, and further postponed until June 19, 2014. On this date the Administrative Court listened to Alcoa's oral argument, and on September 2, 2014, rendered its decision. The Administrative Court declared the payment request of CCSE and the Energy Authority to Alcoa to be unsubstantiated based on the 148/2004 resolution with respect to the January 19, 2007 through November 19, 2009 timeframe. On December 18, 2014, the CCSE and the Energy Authority appealed the Administrative Court's September 2, 2014 decision; however, a date for the hearing has not been scheduled. As a result of the conclusion of the European Commission Matter on January 26, 2016 described below, the Company has modified its outlook with respect to a portion of the pending legal proceedings related to this matter. At this time, the Company is unable to reasonably predict the ultimate outcome for this matter.

**European Commission Matter**

As previously reported, in July 2006, the European Commission (EC) announced that it had opened an investigation to establish whether an extension of the regulated electricity tariff granted by Italy to some energy-intensive industries complied with European Union (EU) state aid rules. The Italian power tariff extended the tariff that was in force until December 31, 2005 through November 19, 2009 (Alcoa had been incurring higher power costs at its smelters in Italy subsequent to the tariff end date through the end of 2012). The extension was originally through 2010, but the date was changed by legislation adopted by the Italian Parliament effective on August 15, 2009. Prior to expiration of the tariff in 2005, Alcoa had been operating in Italy for more than 10 years under a power supply structure approved by the EC in 1996. That measure provided a competitive power supply to the primary aluminum industry and was not considered state aid from the Italian Government. The EC's announcement expressed concerns about whether Italy's extension of the tariff beyond 2005 was compatible with EU legislation and potentially distorted competition in the European market of primary aluminum, where energy is an important part of the production costs.

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On November 19, 2009, the EC announced a decision in this matter stating that the extension of the tariff by Italy constituted unlawful state aid, in part, and, therefore, the Italian Government is to recover a portion of the benefit Alcoa received since January 2006 (including interest). The amount of this recovery was to be based on a calculation prepared by the Italian Government (see below). In late 2009, after discussions with legal counsel and reviewing the bases on which the EC decided, including the different considerations cited in the EC decision regarding Alcoa's two smelters in Italy, Alcoa recorded a charge of \$250 million ( 173 million), which included \$20 million ( 14 million) to write off a receivable from the Italian Government for amounts due under the now expired tariff structure and \$230 million ( 159 million) to establish a reserve. On April 19, 2010, Alcoa filed an appeal of this decision with the General Court of the EU (see below). Prior to 2012, Alcoa was involved in other legal proceedings related to this matter that separately sought the annulment of the EC's July 2006 decision to open an investigation alleging that such decision did not follow the applicable procedural rules and requested injunctive relief to suspend the effectiveness of the EC's November 19, 2009 decision. However, the decisions by the General Court, and subsequent appeals to the European Court of Justice, resulted in the denial of these remedies.

In June 2012, Alcoa received formal notification from the Italian Government with a calculated recovery amount of \$375 million ( 303 million); this amount was reduced by \$65 million ( 53 million) for amounts owed by the Italian Government to Alcoa, resulting in a net payment request of \$310 million ( 250 million). In a notice published in the Official Journal of the European Union on September 22, 2012, the EC announced that it had filed an action against the Italian Government on July 18, 2012 to compel it to collect the recovery amount (on October 17, 2013, the European Court of Justice ordered Italy to so collect). On September 27, 2012, Alcoa received a request for payment in full of the \$310 million ( 250 million) by October 31, 2012. Following discussions with the Italian Government regarding the timing of such payment, Alcoa paid the requested amount in five quarterly installments of \$69 million ( 50 million) beginning in October 2012 through December 2013. Notwithstanding the payments made, Alcoa's estimate of the most probable loss of the ultimate outcome of this matter and the low end of the range of reasonably possible loss, which is \$174 million ( 159 million) to \$332 million ( 303 million), remains the \$174 million ( 159 million) recorded in 2009 (the U.S. dollar amount reflects the effects of foreign currency movements since 2009). Alcoa no longer has a reserve for this matter; instead, Alcoa has a noncurrent asset reflecting the excess of the total of the five payments made to the Italian Government over the reserve recorded in 2009. At December 31, 2015, the noncurrent asset was \$100 million ( 91 million) (this does not include the \$58 million ( 53 million) for amounts owed by the Italian Government to Alcoa mentioned above).

On October 16, 2014, Alcoa received notice from the General Court of the EU that its April 19, 2010 appeal of the EC's November 19, 2009 decision was denied. On December 27, 2014, Alcoa filed an appeal of the General Court's October 16, 2014 ruling to the European Court of Justice (ECJ). Following submission of the EC's response to the appeal, on June 10, 2015, Alcoa filed a request for an oral hearing before the ECJ; no decision on that request was received. On January 26, 2016, Alcoa was informed that the ECJ had dismissed Alcoa's December 27, 2014 appeal of the General Court's October 16, 2014 ruling. The dismissal of Alcoa's appeal represents the conclusion of the legal proceedings in this matter. There will be no further reporting of this matter.

**Environmental Matters**

Alcoa is involved in proceedings under the Comprehensive Environmental Response, Compensation and Liability Act, also known as Superfund (CERCLA) or analogous state provisions regarding the usage, disposal, storage or treatment of hazardous substances at a number of sites in the U.S. The Company has committed to participate, or is engaged in negotiations with federal or state authorities relative to its alleged liability for participation, in clean-up efforts at several such sites. The most significant of these matters, including the remediation of the Grasse River in Massena, NY, are discussed in the Environmental Matters section of Note N to the Consolidated Financial Statements under the caption Environmental Matters on pages 130-134.

As previously reported, in August 2005, Dany Lavoie, a resident of Baie Comeau in the Canadian Province of Québec, filed a Motion for Authorization to Institute a Class Action and for Designation of a Class Representative against Alcoa Canada Ltd., Alcoa Limitée, Societe Canadienne de Metaux Reynolds Limitée and Canadian British Aluminum in the



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Superior Court of Québec in the District of Baie Comeau. Plaintiff seeks to institute the class action on behalf of a putative class consisting of all past, present and future owners, tenants and residents of Baie Comeau's St. Georges neighborhood. He alleges that defendants, as the present and past owners and operators of an aluminum smelter in Baie Comeau, have negligently allowed the emission of certain contaminants from the smelter, specifically Polycyclic Aromatic Hydrocarbons or PAHs, that have been deposited on the lands and houses of the St. Georges neighborhood and its environs causing damage to the property of the putative class and causing health concerns for those who inhabit that neighborhood. Plaintiff originally moved to certify a class action, sought to compel additional remediation to be conducted by the defendants beyond that already undertaken by them voluntarily, sought an injunction against further emissions in excess of a limit to be determined by the court in consultation with an independent expert, and sought money damages on behalf of all class members. In May 2007, the court authorized a class action suit to include only people who suffered property damage or personal injury damages caused by the emission of PAHs from the smelter. In September 2007, plaintiffs filed the claim against the original defendants, which the court had authorized in May. Alcoa has filed its Statement of Defense and plaintiffs filed an Answer to that Statement. Alcoa also filed a Motion for Particulars with respect to certain paragraphs of plaintiffs' Answer and a Motion to Strike with respect to certain paragraphs of plaintiffs' Answer. In late 2010, the court denied these motions. The Soderberg smelting process that plaintiffs allege to be the source of emissions of concern has ceased operations and has been dismantled. No further formal court proceedings or discovery has occurred, while technical advisors nominated by agreement of the parties confer on potential health impacts of prior emissions. This protocol has been agreed to by the parties who have also advised the court regarding the process. Plaintiffs have filed a motion seeking appointment of an expert to advise the court on matters of sampling of homes and standards for interior home remediation. Alcoa has announced its opposition to that motion. Although initially setting a schedule for briefing, during January 2016, the court notified the parties that it was suspending that schedule until further notice. No further schedule has been set. Further proceedings in the case will await resolution of the motion. At this stage of the proceeding, the Company is unable to reasonably predict an outcome or to estimate a range of reasonably possible loss.

As previously reported, in October 2006, in *Barnett, et al. v. Alcoa and Alcoa Fuels, Inc.*, Warrick Circuit Court, County of Warrick, Indiana; 87-C01-0601-PL-499, forty-one plaintiffs sued Alcoa Inc. and a subsidiary, asserting claims similar to those asserted in *Musgrave v. Alcoa, et al.*, Warrick Circuit Court, County of Warrick, Indiana; 87-C01-0601-CT-006. In November 2007, Alcoa Inc. and its subsidiary filed a motion to dismiss the Barnett cases. In October 2008, the Warrick County Circuit Court granted Alcoa's motions to dismiss, dismissing all claims arising out of alleged occupational exposure to wastes at the Squaw Creek Mine, but in November 2008, the trial court clarified its ruling, indicating that the order does not dispose of plaintiffs' personal injury claims based upon alleged recreational or non-occupational exposure. Plaintiffs also filed a second amended complaint in response to the court's orders granting Alcoa's motion to dismiss. On July 7, 2010, the court granted the parties' joint motions for a general continuance of trial settings. Discovery in this matter remains stayed. The Company is unable to reasonably predict an outcome or to estimate a range of reasonably possible loss because plaintiffs have merely alleged that their medical condition is attributable to exposure to materials at the Squaw Creek Mine but no further information is available due to the discovery stay.

As previously reported, in 1996, Alcoa acquired the Fusina, Italy smelter and rolling operations and the Portovesme, Italy smelter (both of which are owned by Alcoa's subsidiary, Alcoa Trasformazioni S.r.l.) from Alumix, an entity owned by the Italian Government. Alcoa also acquired the extrusion plants located in Feltre and Bolzano, Italy. At the time of the acquisition, Alumix indemnified Alcoa for pre-existing environmental contamination at the sites. In 2004, the Italian Ministry of Environment (MOE) issued orders to Alcoa Trasformazioni S.r.l. and Alumix for the development of a clean-up plan related to soil contamination in excess of allowable limits under legislative decree and to institute emergency actions and pay natural resource damages. On April 5, 2006, Alcoa Trasformazioni S.r.l.'s Fusina site was also sued by the MOE and Minister of Public Works (MOPW) in the Civil Court of Venice for an alleged liability for environmental damages, in parallel with the orders already issued by the MOE. Alcoa Trasformazioni S.r.l. appealed the orders, defended the civil case for environmental damages and filed suit against Alumix, as discussed below. Similar issues also existed with respect to the Bolzano and Feltre plants, based on orders

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issued by local authorities in 2006. Most, if not all, of the underlying activities occurred during the ownership of Alumix, the governmental entity that sold the Italian plants to Alcoa.

As noted above, in response to the 2006 civil suit by the MOE and MOPW, Alcoa Trasformazioni S.r.l. filed suit against Alumix claiming indemnification under the original acquisition agreement, but brought that suit in the Court of Rome due to jurisdictional rules. In June 2008, the parties (Alcoa and now Ligestra S.r.l. (Ligestra), the successor to Alumix) signed a preliminary agreement by which they have committed to pursue a settlement. The Court of Rome accepted the request, and postponed the Court's expert technical assessment, reserving its ability to fix the deadline depending on the development of negotiations. Alcoa and Ligestra agreed to a settlement in December 2008 with respect to the Feltre site. Ligestra paid the sum of 1.08 million Euros and Alcoa committed to clean up the site. Further postponements were granted by the Court of Rome, and the next hearing is fixed for December 20, 2016. In the meantime, Alcoa Trasformazioni S.r.l. and Ligestra reached a preliminary agreement for settlement of the liabilities related to Fusina, allocating 80% and 20% of the remediation costs to Ligestra and Alcoa, respectively. In January 2014, a final agreement with Ligestra was signed, and on February 5, 2014, Alcoa signed a final agreement with the MOE and MOPW settling all environmental issues at the Fusina site. As set out in the agreement between Alcoa and Ligestra, those two parties will share the remediation costs and environmental damages claimed by the MOE and MOPW. The remediation project filed by Alcoa and Ligestra has been approved by the MOE. See Note N to the Consolidated Financial Statements under the caption "Fusina and Portovesme, Italy" on page 131. To provide time for settlement with Ligestra, the MOE and Alcoa jointly requested and the Civil Court of Venice has granted a series of postponements of hearings in the Venice trial, assuming that the case will be closed. Following the settlement, the parties caused the Court to dismiss the proceedings. The proceedings were, however, restarted in April 2015 by the MOE and MOPW because the Ministers had not ratified the settlement of February 5, 2014. The Ministers announced in December 2015 that they will ratify the settlement in the following months.

Alcoa and Ligestra have signed a similar agreement relating to the Portovesme site. However, that agreement is contingent upon final acceptance of the proposed soil remediation project for Portovesme that was rejected by the MOE in the fourth quarter of 2013. Alcoa submitted a revised proposal in May 2014 and a further revised proposal in February 2015, in agreement with Ligestra. The MOE issued a Ministerial Decree approving the final project in October 2015. Work on the soil remediation project will commence in 2016 and is expected to be completed in 2019. Alcoa and Ligestra are now working on a final groundwater remediation project which is expected to be submitted to the MOE for review during 2016. While the issuance of the decree for the soil remediation project has provided reasonable certainty regarding liability for the soil remediation, with respect to the groundwater remediation project Alcoa is unable to reasonably predict an outcome or to estimate a range of reasonably possible loss beyond what is described in Footnote N to the Consolidated Financial Statements for several reasons. First, certain costs relating to the groundwater remediation are not yet fixed. In connection with any proposed groundwater remediation plan for Portovesme, the Company understands that the MOE has substantial discretion in defining what must be managed under Italian law, as well as the extent and duration of that remediation program. As a result, the scope and cost of the final groundwater remediation plan remain uncertain for Portovesme; Alcoa and Ligestra are still negotiating a final settlement for groundwater remediation at Portovesme, for an allocation of the cost based on the new remediation project approved by the MOE. In addition, once a groundwater remediation project is submitted, should a final settlement with Ligestra not be reached, Alcoa should be held responsible only for its share of pollution. However, the area is impacted by many sources of pollution, as well as historical pollution. Consequently, the allocation of liabilities would need a very complex technical evaluation by the authorities that has not yet been performed.

As previously reported, on November 30, 2010, Alcoa World Alumina Brasil Ltda. (AWAB) received notice of a lawsuit that had been filed by the public prosecutors of the State of Pará in Brazil in November 2009. The suit names AWAB and the State of Pará, which, through its Environmental Agency, had issued the operating license for the Company's new bauxite mine in Juruti. The suit concerns the impact of the project on the region's water system and alleges that certain conditions of the original installation license were not met by AWAB. In the lawsuit, plaintiffs requested a preliminary injunction suspending the operating license and ordering payment of compensation. On April 14, 2010, the court denied plaintiffs' request. AWAB presented its defense in March 2011, on grounds that it was in compliance with the terms and conditions of its operating license, which included plans to mitigate the impact of the

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project on the region's water system. In April 2011, the State of Pará defended itself in the case asserting that the operating license contains the necessary plans to mitigate such impact, that the State monitors the performance of AWAB's obligations arising out of such license, that the licensing process is valid and legal, and that the suit is meritless. The Company's position is that any impact from the project had been fully repaired when the suit was filed. The Company also believes that Jará Lake has not been affected by any project activity and any evidence of pollution from the project would be unreliable. Following the preliminary injunction request, the plaintiffs took no further action until October 2014, when in response to the court's request and as required by statute, they restated the original allegations in the lawsuit. The Company is not certain whether or when the action will proceed. Given that this proceeding is in its preliminary stage and the current uncertainty in this case, the Company is unable to reasonably predict an outcome or to estimate a range of reasonably possible loss.

As previously reported, by an amended complaint filed April 21, 2005, Alcoa Global Fasteners, Inc. was added as a defendant in Orange County Water District (OCWD) v. Northrop Corporation, et al., civil action 04cc00715 (Superior Court of California, County of Orange). OCWD alleges contamination or threatened contamination of a drinking water aquifer by Alcoa, certain of the entities that preceded Alcoa at the same locations as property owners and/or operators, and other current and former industrial and manufacturing businesses that operated in Orange County in past decades. OCWD seeks to recover the cost of aquifer remediation and attorney's fees. Trial on statutory, non-jury claims commenced on February 10, 2012, and continued through September 2012 when the case was submitted to the court for decision. On December 11, 2012, the court issued its tentative ruling in the matter dismissing plaintiff OCWD's remaining statutory claims against all defendants. The court's tentative ruling also invited further briefing on the decision and it is subject to modification. On January 21, 2013, defendants filed a joint brief responding to ten specific questions posed by the court's tentative ruling. The joint brief argued that the court should make further findings of fact and law in favor of the defendants in response to the ten questions. Alcoa Global Fasteners, Inc. also filed a separate brief on two of the questions arguing that the court should determine that it is neither a cause of ground water contamination nor a cause of plaintiff's incurred costs. Remaining in the case at this time are common law trespass and nuisance claims for a Phase II trial which has not been scheduled. OCWD has asserted a total remedy cost of at least \$150 million plus attorneys' fees; however, the amount in controversy at this stage is limited to sums already expended by the OCWD, approximately \$4 million. The court has indicated that it is not likely to grant the OCWD's request for declaratory relief as to future sums the OCWD expends. On February 28, 2013, the court held a hearing on its tentative Statement of Decision finding that OCWD had not met its burden on the element of causation and, following that hearing, on May 10, 2013, issued a supplemental tentative decision, finding that plaintiff had not met its burden of proof. On that date, the court ordered defendants to submit a proposed statement of decision, followed by filing of objections and counter-proposed statement of decision by the plaintiff and responses by the defendants. All filings were completed by September 23, 2013 at which time the matter was submitted to the court for final decision. On October 29, 2013, the court issued its final Statement of Decision (SOD) which resolved the statutory law liability claims of the Phase I trial favorably to Alcoa and the other Phase I trial defendants. The plaintiff and the trial defendants disagree on the consequences of the SOD and the Phase I trial on the remaining two tort claims of nuisance and trespass. On December 19, 2013, the court held a Case Management Conference and approved the parties' proposed briefing schedule regarding remaining issues. On June 20, 2014, following the full briefing by the parties, the trial court entered final judgment in favor of Alcoa and the other trial defendants on the remaining tort claims. On August 18, 2014, the OCWD filed a notice of appeal of the judgment with the Superior Court of the County of Orange. On October 14, 2015, the OCWD submitted its opening brief. Defendants' response brief is due March 14, 2016.

### *St. Croix Proceedings*

*Abednego and Abraham cases.* As previously reported, on January 14, 2010, Alcoa was served with a multi-plaintiff action complaint involving several thousand individual persons claiming to be residents of St. Croix who are alleged to have suffered personal injury or property damage from Hurricane Georges or winds blowing material from the St. Croix Alumina, L.L.C. (SCA) facility on the island of St. Croix (U.S. Virgin Islands) since the time of the hurricane. This complaint, *Abednego, et al. v. Alcoa, et al.* was filed in the Superior Court of the Virgin Islands, St. Croix Division. Following an unsuccessful attempt by Alcoa and SCA to remove the case to federal court, the case has been lodged in the Superior Court. The complaint names as defendants the same entities that were sued in a February 1999

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action arising out of the impact of Hurricane Georges on the island and added as a defendant the current owner of the alumina facility property.

Also as previously reported, on March 1, 2012, Alcoa was served with a separate multi-plaintiff action complaint involving approximately 200 individual persons alleging claims essentially identical to those set forth in the *Abednego v. Alcoa* complaint. This complaint, *Abraham, et al. v. Alcoa, et al.*, was filed on behalf of plaintiffs previously dismissed in the federal court proceeding involving the original litigation over Hurricane Georges impacts. The matter was originally filed in the Superior Court of the Virgin Islands, St. Croix Division, on March 30, 2011.

Alcoa and other defendants in the *Abraham* and *Abednego* cases filed or renewed motions to dismiss each case in March 2012 and August 2012 following service of the *Abraham* complaint on Alcoa and remand of the *Abednego* complaint to Superior Court, respectively. By order dated August 10, 2015, the Superior Court dismissed plaintiffs' complaints without prejudice to re-file the complaints individually, rather than as a multi-plaintiff filing. The order also preserves the defendants' grounds for dismissal if new, individual complaints are filed.

**Glencore Contractual Indemnity Claim.** As previously reported, on June 5, 2015, Alcoa World Alumina LLC (AWA) and SCA filed a complaint in Delaware Chancery Court for a declaratory judgment and injunctive relief to resolve a dispute between Alcoa and Glencore Ltd. (Glencore) with respect to claimed obligations under a 1995 asset purchase agreement between Alcoa and Glencore. The dispute arose from Glencore's demand that Alcoa indemnify it for liabilities it may have to pay to Lockheed Martin (Lockheed) related to the St. Croix alumina refinery. Lockheed had earlier filed suit against Glencore in federal court in New York seeking indemnity for liabilities it had incurred and would incur to the U.S. Virgin Islands to remediate certain properties at the refinery property and claimed that Glencore was required by an earlier, 1989 purchase agreement to indemnify it. Glencore had demanded that Alcoa indemnify and defend it in the Lockheed case and threatened to claim over against Alcoa in the New York action despite exclusive jurisdiction for resolution of disputes under the 1995 purchase agreement being in Delaware. After Glencore conceded that it was not seeking to add Alcoa to the New York action, AWA and SCA dismissed their complaint in the Chancery Court case and on August 6, 2015 filed a complaint for declaratory judgment in Delaware Superior Court. AWA and SCA filed a motion for judgment on the pleadings on September 16, 2015. Glencore answered AWA's and SCA's complaint and asserted counterclaims on August 27, 2015, and on October 2, 2015 filed its own motion for judgment on the pleadings. Argument on the parties' motions was held by the court on December 7, 2015 and by order dated February 8, 2016, the court granted Alcoa's motion and denied Glencore's motion resulting in Alcoa not being liable to indemnify Glencore for the Lockheed action. The decision also leaves for pretrial discovery and possible summary judgment or trial Glencore's claims for costs and fees it incurred in defending and settling an earlier Superfund action brought against Glencore by the Government of the Virgin Islands. On February 17, 2016, Glencore filed notice of its application for interlocutory appeal of the February 8 ruling. AWA and SCA have 10 days to respond. The Company is unable to reasonably predict an outcome for the remaining claims.

**Other Matters**

As previously reported, along with various asbestos manufacturers and distributors, Alcoa and its subsidiaries as premises owners are defendants in several hundred active lawsuits filed on behalf of persons alleging injury predominantly as a result of occupational exposure to asbestos at various Company facilities. In addition, an Alcoa subsidiary company has been named, along with a large common group of industrial companies, in a pattern complaint where the Company's involvement is not evident. Since 1999, several thousand such complaints have been filed. To date, the subsidiary has been dismissed from almost every case that was actually placed in line for trial. Alcoa, its subsidiaries and acquired companies, all have had numerous insurance policies over the years that provide coverage for asbestos based claims. Many of these policies provide layers of coverage for varying periods of time and for varying locations. Alcoa has significant insurance coverage and believes that its reserves are adequate for its known asbestos exposure related liabilities. The costs of defense and settlement have not been and are not expected to be material to the results of operations, cash flows, and financial position of the Company.

As previously reported, on August 2, 2013, the State of North Carolina, by and through its agency, the North Carolina Department of Administration, filed a lawsuit against Alcoa Power Generating Inc. (APGI) in Superior Court, Wake County, North Carolina (Docket No. 13-CVS-10477). The lawsuit asserts ownership of certain submerged lands and

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hydropower generating structures situated at Alcoa's Yadkin Hydroelectric Project (the "Yadkin Project"), including the submerged riverbed of the Yadkin River throughout the Yadkin Project and a portion of the hydroelectric dams that Alcoa owns and operates pursuant to a license from the Federal Energy Regulatory Commission. The suit seeks declaratory relief regarding North Carolina's alleged ownership interests in the riverbed and the dams and further declaration that Alcoa has no right, license or permission from North Carolina to operate the Yadkin Project. By notice filed on September 3, 2013, Alcoa removed the matter to the U.S. District Court for the Eastern District of North Carolina (Docket No. Civil Action No. 5: 13-cv-633). By motion filed September 3, 2013, the Yadkin Riverkeeper sought permission to intervene in the case. On September 25, 2013, Alcoa filed its answer in the case and also filed its opposition to the motion to intervene by the Yadkin Riverkeeper. The Court denied the State's Motion to Remand and initially permitted the Riverkeeper to intervene although the Riverkeeper has now voluntarily withdrawn as an intervening party and will participate as amicus.

On July 21, 2014, the parties each filed a motion for summary judgment. On November 20, 2014, the Court denied Alcoa's motion for summary judgment and denied in part and granted in part the State of North Carolina's motions for summary judgment. The Court held that under North Carolina law, the burden of proof as to title to property is shifted to a private party opposing a state claim of property ownership. The court conducted a trial on navigability on April 21-22, 2015, and, after ruling orally from the bench on April 22, 2015, on May 5, 2015, entered Findings of Fact and Conclusions of Law as to Navigability, ruling in APGI's favor that the state failed to meet its burden to prove that the Relevant Segment, as stipulated by the parties, was navigable for commerce at statehood. Subsequently, APGI filed a motion for summary judgment as to title; the state filed opposition papers. On September 28, 2015, the Court granted summary judgment in APGI's favor and found that the evidence demonstrates that APGI holds title to the riverbed. The Court further directed judgment to be entered in APGI's favor and closed the case. On October 13, 2015, the State of North Carolina filed notice of its appeal to the United States Court of Appeals for the Fourth Circuit.

*Tax*

As previously reported, in September 2010, following a corporate income tax audit covering the 2003 through 2005 tax years, an assessment was received as a result of Spain's tax authorities disallowing certain interest deductions claimed by a Spanish consolidated tax group owned by the Company. An appeal of this assessment in Spain's Central Tax Administrative Court by the Company was denied in October 2013. In December 2013, the Company filed an appeal of the assessment in Spain's National Court.

Additionally, following a corporate income tax audit of the same Spanish tax group for the 2006 through 2009 tax years, Spain's tax authorities issued an assessment in July 2013 similarly disallowing certain interest deductions. In August 2013, the Company filed an appeal of this second assessment in Spain's Central Tax Administrative Court, which was denied in January 2015. The Company filed an appeal of this second assessment in Spain's National Court in March 2015.

The combined assessments (remeasured for a tax rate change enacted in November 2014) total \$263 million (€ 241 million). The Company believes it has meritorious arguments to support its tax position and intends to vigorously litigate the assessments through Spain's court system. However, in the event the Company is unsuccessful, a portion of the assessments may be offset with existing net operating losses available to the Spanish consolidated tax group. Additionally, it is possible that the Company may receive similar assessments for tax years subsequent to 2009. At this time, the Company is unable to reasonably predict an outcome for this matter.

As previously reported, between 2000 and 2002, Alcoa Alumínio (Alumínio) sold approximately 2,000 metric tons of metal per month from its Poços de Caldas facility, located in the State of Minas Gerais (the "State"), to Alfio, a customer also located in the State. Sales in the State were exempted from value-added tax (VAT) requirements. Alfio subsequently sold metal to customers outside of the State, but did not pay the required VAT on those transactions. In July 2002, Alumínio received an assessment from State auditors on the theory that Alumínio should be jointly and severally liable with Alfio for the unpaid VAT. In June 2003, the administrative tribunal found Alumínio liable, and Alumínio filed a judicial case in the State in February 2004 contesting the finding. In May 2005, the Court of First Instance found Alumínio solely liable, and a panel of a State appeals court confirmed this finding in April 2006.

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Alumínio filed a special appeal to the Superior Tribunal of Justice (STJ) in Brasilia (the federal capital of Brazil) later in 2006. In 2011, the STJ (through one of its judges) reversed the judgment of the lower courts, finding that Alumínio should neither be solely nor jointly and severally liable with Alfio for the VAT, which ruling was then appealed by the State. In August 2012, the STJ agreed to have the case reheard before a five-judge panel. A decision from this panel is pending, but additional appeals are likely. At December 31, 2015, the assessment totaled \$35 million (R\$135 million), including penalties and interest. While the Company believes it has meritorious defenses, the Company is unable to reasonably predict an outcome.

## **Other Contingencies**

In addition to the matters discussed above, various other lawsuits, claims, and proceedings have been or may be instituted or asserted against Alcoa, including those pertaining to environmental, product liability, safety and health, and tax matters. While the amounts claimed in these other matters may be substantial, the ultimate liability cannot now be determined because of the considerable uncertainties that exist. Therefore, it is possible that the Company's liquidity or results of operations in a particular period could be materially affected by one or more of these other matters. However, based on facts currently available, management believes that the disposition of these other matters that are pending or asserted will not have a material adverse effect, individually or in the aggregate, on the financial position of the Company.

## **Item 4. Mine Safety Disclosures.**

The information concerning mine safety violations or other regulatory matters required by Section 1503(a) of the Dodd-Frank Wall Street Reform and Consumer Protection Act and Item 104 of Regulation S-K (17 CFR 229.104) is included in Exhibit 95 of this report, which is incorporated herein by reference.

**Table of Contents****PART II****Item 5. Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities.**

The Company's common stock is listed on the New York Stock Exchange where it trades under the symbol AA. The Company's quarterly high and low trading stock prices and dividends per common share for 2015 and 2014 are shown below.

| Quarter | 2015     |          |          | 2014     |         |          |
|---------|----------|----------|----------|----------|---------|----------|
|         | High     | Low      | Dividend | High     | Low     | Dividend |
| First   | \$ 17.10 | \$ 12.65 | \$ 0.03  | \$ 12.97 | \$ 9.82 | \$ 0.03  |
| Second  | 14.29    | 11.15    | 0.03     | 15.18    | 12.34   | 0.03     |
| Third   | 11.23    | 7.97     | 0.03     | 17.36    | 14.56   | 0.03     |
| Fourth  | 11.18    | 7.81     | 0.03     | 17.75    | 13.71   | 0.03     |
| Year    | 17.10    | 7.81     | \$ 0.12  | 17.75    | 9.82    | \$ 0.12  |

The number of holders of record of common stock was approximately 10,101 as of February 11, 2016.

**Table of Contents****Stock Performance Graph**

The following graph compares the most recent five-year performance of Alcoa's common stock with (1) the Standard & Poor's 500 Index and (2) the Standard & Poor's 500 Materials Index, a group of 27 companies categorized by Standard & Poor's as active in the materials market sector. Such information shall not be deemed to be filed.

| As of December 31,                  | 2010   | 2011  | 2012  | 2013  | 2014   | 2015  |
|-------------------------------------|--------|-------|-------|-------|--------|-------|
| <b>Alcoa Inc.</b>                   | \$ 100 | \$ 57 | \$ 58 | \$ 72 | \$ 107 | \$ 68 |
| <b>S&amp;P 500® Index</b>           | 100    | 102   | 118   | 157   | 178    | 181   |
| <b>S&amp;P 500® Materials Index</b> | 100    | 90    | 104   | 130   | 139    | 128   |

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Source: Research Data Group, Inc. ([www.researchdatagroup.com/S&P.htm](http://www.researchdatagroup.com/S&P.htm))



**Table of Contents****Item 6. Selected Financial Data.**

(dollars in millions, except per-share amounts and realized prices; shipments in thousands of metric tons [kmt])

| For the year ended December 31,                                   | 2015      | 2014      | 2013       | 2012      | 2011      |
|---|-----------|-----------|------------|-----------|-----------|
| Sales   | \$ 22,534 | \$ 23,906 | \$ 23,032  | \$ 23,700 | \$ 24,951 |
| Amounts attributable to Alcoa:                                    |           |           |            |           |           |
| (Loss) income from continuing operations                          | \$ (322)  | \$ 268    | \$ (2,285) | \$ 191    | \$ 614    |
| Loss from discontinued operations                                 | -         | -         | -          | -         | (3)       |
| Net (loss) income   | \$ (322)  | \$ 268    | \$ (2,285) | \$ 191    | \$ 611    |
| Earnings per share attributable to Alcoa common shareholders:     |           |           |            |           |           |
| Basic:  |           |           |            |           |           |
| (Loss) income from continuing operations                          | \$ (0.31) | \$ 0.21   | \$ (2.14)  | \$ 0.18   | \$ 0.58   |
| Loss from discontinued operations                                 | -         | -         | -          | -         | (0.01)    |
| Net (loss) income   | \$ (0.31) | \$ 0.21   | \$ (2.14)  | \$ 0.18   | \$ 0.57   |
| Diluted:  |           |           |            |           |           |
| (Loss) income from continuing operations                          | \$ (0.31) | \$ 0.21   | \$ (2.14)  | \$ 0.18   | \$ 0.55   |
| Loss from discontinued operations                                 | -         | -         | -          | -         | -         |
| Net (loss) income   | \$ (0.31) | \$ 0.21   | \$ (2.14)  | \$ 0.18   | \$ 0.55   |
| Shipments of alumina (kmt)  | 10,755    | 10,652    | 9,966      | 9,295     | 9,218     |
| Shipments of aluminum products (kmt)                              | 4,537     | 4,794     | 4,994      | 5,197     | 5,037     |
| Alcoa's average realized price per metric ton of primary aluminum | \$ 2,069  | \$ 2,405  | \$ 2,243   | \$ 2,327  | \$ 2,636  |
| Cash dividends declared per common share                          | \$ 0.12   | \$ 0.12   | \$ 0.12    | \$ 0.12   | \$ 0.12   |
| Total assets*   | 36,528    | 37,363    | 35,696     | 40,129    | 40,083    |
| Total debt  | 9,103     | 8,852     | 8,319      | 8,829     | 9,371     |
| Cash provided from operations                                     | 1,582     | 1,674     | 1,578      | 1,497     | 2,193     |
| Capital expenditures  | 1,180     | 1,219     | 1,193      | 1,261     | 1,287     |

\* In November 2015, Alcoa adopted changes issued by the Financial Accounting Standards Board to the balance sheet classification of deferred income taxes (see the Recently Adopted Accounting Guidance section of Note A to the Consolidated Financial Statements in Part II Item 8 of this Form 10-K). Additionally, for comparative purposes, management elected to retrospectively apply these changes to all periods presented.

The data presented in the Selected Financial Data table should be read in conjunction with the information provided in Management's Discussion and Analysis of Financial Condition and Results of Operations in Part II Item 7 and the Consolidated Financial Statements in Part II Item 8 of this Form 10-K.

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

(dollars in millions, except per-share amounts and ingot prices; production and shipments in thousands of metric tons [kmt])

**Overview****Our Business**

Alcoa is a global leader in lightweight metals engineering and manufacturing. Alcoa's innovative, multi-material products, which include aluminum, titanium, and nickel, are used worldwide in aerospace, automotive, commercial transportation, packaging, building and construction, oil and gas, defense, consumer electronics, and industrial applications.

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Alcoa is also the world leader in the production and management of primary aluminum, fabricated aluminum, and alumina combined, through its active participation in all major aspects of the industry: technology, mining, refining, smelting, fabricating, and recycling. Aluminum is a commodity that is traded on the London Metal Exchange (LME) and priced daily. Sales of primary aluminum and alumina represent approximately 40% of Alcoa's revenues. The price of aluminum influences the operating results of Alcoa.

Alcoa is a global company operating in 30 countries. Based upon the country where the point of sale occurred, the United States and Europe generated 55% and 26%, respectively, of Alcoa's sales in 2015. In addition, Alcoa has investments and operating activities in, among others, Australia, Brazil, China, Guinea, Iceland, Russia, and Saudi Arabia. Governmental policies, laws and regulations, and other economic factors, including inflation and fluctuations in foreign currency exchange rates and interest rates, affect the results of operations in these countries.

### **Management Review of 2015 and Outlook for the Future**

In 2015, growth in global aluminum demand reached 6%, which was slightly less than management's projection (7%) at the end of 2014. However, significant market headwinds negatively impacted the smelting portion of Alcoa's upstream operations as the average LME price (on 15-day lag) of aluminum declined 10% and regional premiums decreased substantially (39% in the United States and Canada and 44% in Europe) compared to 2014. The refining portion of the upstream operations continued to make progress in shifting customer pricing away from the LME aluminum price to a mixture of alumina index/spot pricing; however, this was overshadowed by a decrease in the average alumina index/spot price. Conversely, Alcoa's upstream operations realized the benefit of a stronger U.S. dollar in 2015 compared to 2014. In the midstream operations, after-tax operating income was stable in 2015 from 2014 despite generating \$1,052 less revenue due to the closure and divestiture of six rolling mills, while the downstream operations received the benefit of \$1,310 in combined revenue combined from three acquisitions. Across all operations, cost headwinds continued to be a challenge; however, management was able to more than offset these with net productivity improvements.

Separate from the 2015 operational results, management initiated a number of portfolio actions during the year. In the upstream operations, following similar actions taken in both 2014 and 2013, smelting capacity of 217 kmt was curtailed (another 230 kmt will be curtailed by the end of June 2016) and 96 kmt (all of which was previously curtailed) was permanently closed (another 269 kmt will be closed by the end of March 2016). Additionally, refining capacity of 1,705 kmt was curtailed (another 1,635 kmt will be curtailed by the end of June 2016). Management also completed the divestiture of another rolling mill (three rolling mills were previously divested in December 2014) in the midstream operations that was no longer part of the strategic direction of Alcoa. From a growth perspective, Alcoa completed the acquisition of two businesses, mostly aerospace-related, both of which will enhance the portfolio of Alcoa's downstream operations.

As a result of the previously mentioned capacity reductions, Alcoa's 2015 results were negatively impacted by significant restructuring charges related to these actions. Additionally, developments in legal matters in Italy, an assessment of the realizability of certain deferred tax assets, and an impairment of goodwill caused unfavorable impacts in Alcoa's 2015 results.

Management continued its focus on liquidity and cash flows, generating incremental improvements in procurement efficiencies, overhead rationalization, and disciplined capital spending. This focus and the related results enabled Alcoa to end 2015 with a solid financial position, consistent with the end of 2014.

The following financial information reflects certain key measures of Alcoa's 2015 results:

Sales of \$22,534 and Net loss of \$322, or \$0.31 per diluted share;

Total segment after-tax operating income of \$1,906, a decrease of 3% from 2014;

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Cash from operations of \$1,582, reduced by \$470 in pension plan contributions and a \$300 prepayment to secure a future supply of gas in Australia;

Capital expenditures of \$1,180, under \$1,500 for the sixth consecutive year;

Cash on hand at the end of the year of \$1,919, in excess of \$1,400 for the seventh consecutive year;

Increase in total debt of \$251, but a decline of \$1,475 since 2008; and

Total debt of \$9,103, Net margin of \$1,968, and Depreciation, depletion, and amortization of \$1,280 (Net margin is equivalent to Sales minus the following items: Cost of goods sold; Selling, general administrative, and other expenses; Research and development expenses; and Provision for depreciation, depletion, and amortization).

In 2016, management is projecting continued growth (increase of 6%) in the global consumption of primary aluminum, a slight change from that of the last four years, led by China at an estimated 8%. All other regions in the world, except for Brazil and Russia (both are projected to be flat with 2015), are expected to have positive growth in aluminum demand over 2015, including North America at an estimated 5%. After considering forecasted added production, along with expected industry-wide capacity reductions, both of which are mainly driven by China, management anticipates a deficit in the aluminum market. For alumina, growth in global consumption is estimated to be 6%, and demand is expected to slightly exceed supply due to capacity reductions in China, as well as other parts of the world.

Management also anticipates improved market conditions for value-add products in the aerospace, building and construction, packaging, automotive, and industrial gas turbine global end markets, despite declines in certain regions, while the commercial transportation global end market is expected to decrease. Many of the conditions that drove these markets in 2015 will continue throughout 2016.

Aerospace is expected to be driven by large commercial aircraft due to a greater than nine-year order backlog. For building and construction, awarded nonresidential contracts are projected to be up once again in North America while a slight decline in Europe is expected. In packaging, growth in China and Europe, mainly driven by the penetration of aluminum in the growing beer segment and the conversion from steel cans to aluminum cans, respectively, is expected to more than offset a slight decrease in North America. For automotive, growth is anticipated in the United States (due to the replacement of older vehicles, low borrowing rates, and the decline in gasoline prices) and China (due to evolving emissions policies based on new clean air legislation enacted in 2014 and a continued increase in the percentage of the population driving automobiles), as well as Europe. Industrial gas turbines are expected to see growth as a result of new demand for high technology turbines and upgrades of existing turbines. In commercial transportation, improving conditions in both Europe and China are expected to be more than offset by weakness in North America, due to high inventory levels as a result of one of the highest production years ever in 2015 and projected lower orders.

Looking ahead over the next year, management will continue to focus on lowering Alcoa's refining and smelting operations on the respective global cost curves to the 21st and 38th percentiles, respectively. At December 31, 2015, Alcoa's refining operations were at the 23rd percentile, a two-percentage point improvement from 2014, and its smelting operations remained at the 43rd percentile on the respective global cost curves. Actions taken to improve Alcoa's position on the global alumina cost curve included, in late 2014, the sale of an ownership interest in a mining and refining joint venture in Jamaica and the conversion of the fuel source from fuel oil to natural gas at a refinery in Spain, and, in 2015, the curtailment of 1,330 kmt of high-cost capacity in Suriname. Actions taken in the smelting operations included, in late 2014, the sale of an ownership interest in a smelter in the United States and the renewal of a power contract at each of the three smelters in Canada, and, in 2015, the curtailment and closure of 170 kmt combined of high-cost capacity in Brazil. Also, both the refining and smelting operations benefitted from productivity improvements, new initiatives as well as the full realization of those implemented in 2014. While the benefits of the actions in the refining operations can be seen in Alcoa's improved position on the global alumina cost curve at the end of 2015, the benefits from the actions in the smelting operations were offset by a downward shift in the global aluminum cost curve, primarily due to the strong U.S. dollar and curtailments/closures of capacity from other smelting industry participants.

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Other actions taken in 2015 to help drive a lower position on the respective global cost curves include additional curtailments and/or closures of 2,100 kmt of refining capacity and 499 kmt of smelting capacity, all within the United States. The initiation of these actions occurred late in 2015 and will be completed during the first half of 2016; therefore, management expects to realize the benefits of curtailing/closing this high-cost capacity during 2016. Additionally, Alcoa has initiatives to drive further productivity improvements during 2016, including from procurement and overhead programs. Furthermore, the smelter and the refinery at the joint venture in Saudi Arabia are expected to provide a two-percentage point reduction on each of the respective global cost curves by the end of 2016 (from 2013).

Management will also continue to focus on revenue growth for both the midstream and downstream operations, which is expected from multiple sources. The midstream operations anticipate positive contributions from both the Davenport, IA rolling mill facility and Tennessee rolling mill facility (expansion completed in September 2015), both of which serve the growing demand for aluminum sheet in the U.S. automotive and market as a result of changing emission regulations. Likewise, the downstream operations expect favorable results from projects completed in late 2014 and throughout 2015 to meet growing demand in both the aerospace and commercial transportation end markets. These projects include an expansion of aluminum lithium capabilities in Lafayette, IN, expansions in LaPorte, IN and Hampton, VA to provide nickel-based super alloy structural components and airfoil blades for jet engines, and an expansion at a facility in Hungary to double production of aluminum wheels. Additionally, the downstream operations completed three acquisitions (mostly aerospace-related) in November 2014 through July 2015 (see Engineered Products and Solutions in Segment Information under Results of Operations below) that will incrementally increase revenue. Furthermore, in 2014 and 2015, Alcoa entered into a number of multi-year supply agreements related to the aerospace end market valued at approximately \$13,500, including six contracts valued at more than \$6,700 combined with four major customers in the aerospace end market. Under one of these six contracts, the midstream operations will supply aluminum sheet and plate, and under the other five contracts, the downstream operations will supply jet engine components (including aluminum and aluminum-lithium fan blades), multi-material fastening systems, titanium plate and billet, and titanium seat track assemblies.

In addition to focusing on the above-mentioned operational improvements, management has committed to executing the following transaction. On September 28, 2015, Alcoa announced that its Board of Directors approved a plan to separate into two independent, publicly-traded companies. One company will comprise the Alumina and Primary Metals segments and the other company will comprise the Global Rolled Products, Engineered Products and Solutions, and Transportation and Construction Solutions segments. Alcoa is targeting to complete the separation in the second half of 2016. The transaction is subject to a number of conditions, including, but not limited to, final approval by Alcoa's Board of Directors, receipt of a favorable opinion of legal counsel with respect to the tax-free nature of the transaction for U.S. federal income tax purposes, and the effectiveness of a Form 10 registration statement to be filed with the U.S. Securities and Exchange Commission. Upon completion of the separation, Alcoa shareholders will own all of the outstanding shares of both companies. Alcoa may, at any time and for any reason until the proposed transaction is complete, abandon the separation plan or modify or change its terms.

## **Results of Operations**

### **Earnings Summary**

Net loss attributable to Alcoa for 2015 was \$322, or \$0.31 per diluted share, compared with Net income attributable to Alcoa of \$268, or \$0.21 per share, in 2014. The decrease in results of \$590 was mostly due to a lower average realized price for both aluminum and alumina, a charge for legal matters in Italy, unfavorable price/product mix in the midstream and downstream operations, an unfavorable change in income taxes due to a higher amount of discrete income tax charges and nondeductible items, lower energy sales, and higher costs. These negative impacts were partially offset by net favorable foreign currency movements, net productivity improvements, higher volume in the midstream and downstream operations, and lower charges and expenses related to a number of portfolio actions (e.g., capacity reductions, divestitures, acquisitions).

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Net income attributable to Alcoa for 2014 was \$268, or \$0.21 per share, compared with Net loss attributable to Alcoa of \$2,285, or \$2.14 per share, in 2013. The improvement in results of \$2,553 was primarily due to the absence of all of the following: an impairment of goodwill, a discrete income tax charge for valuation allowances on certain deferred tax assets, and charges for the resolution of a legal matter. Other significant changes in results included the following: higher energy sales, a higher average realized price for primary aluminum, net productivity improvements, and net favorable foreign currency movements. These other changes were mostly offset by higher charges and expenses related to a number of portfolio actions (e.g., capacity reductions, divestitures, acquisitions), higher overall input costs, and an unfavorable change in income taxes due to higher operating results.

**Sales** Sales for 2015 were \$22,534 compared with sales of \$23,906 in 2014, a decline of \$1,372, or 6%. The decrease was primarily due to the absence of sales related to capacity that was closed, sold or curtailed in the midstream and upstream operations (see Global Rolled Products and Primary Metals in Segment Information below), a lower average realized price for aluminum in both the upstream and midstream operations and for alumina in the upstream operations, unfavorable foreign currency movements in the midstream and downstream operations, and lower energy sales (both as a result of lower pricing and unfavorable foreign currency movements). These negative impacts were partially offset by the addition of sales from three recently acquired businesses (see Engineered Products and Solutions in Segment Information below), higher volume across all segments, favorable product mix in the midstream operations, and higher buy/resell activity for primary aluminum.

Sales for 2014 were \$23,906 compared with sales of \$23,032 in 2013, an improvement of \$874, or 4%. The increase was mainly the result of higher volumes in the midstream, downstream, and alumina portion of the upstream operations, higher energy sales resulting from excess power due to curtailed smelter capacity, increased buy/resell activity for primary aluminum, and a higher average realized price for primary aluminum. These positive impacts were partially offset by lower primary aluminum volumes, including those related to curtailed and shutdown smelter capacity, and unfavorable price/product mix in the midstream operations.

**Cost of Goods Sold** COGS as a percentage of Sales was 80.2% in 2015 compared with 80.1% in 2014. The percentage was negatively impacted by a lower average realized price for both aluminum and alumina in the upstream operations, unfavorable price/product mix in the midstream and downstream operations, lower energy sales, and higher costs. These negative impacts were mostly offset by net favorable foreign currency movements due to a stronger U.S. dollar, net productivity improvements across all segments, higher volume in the midstream and downstream operations, a favorable LIFO (last in, first out) adjustment due to lower prices for aluminum and alumina (\$208), lower inventory write-downs related to the decisions to permanently shut down and/or curtail capacity in the upstream and midstream operations (difference of \$23 see Restructuring and Other Charges below), and the absence of costs related to a new labor agreement that covers employees at 10 locations in the United States (see below).

COGS as a percentage of Sales was 80.1% in 2014 compared with 83.7% in 2013. The percentage was positively impacted by net productivity improvements across all segments, both the previously mentioned higher energy sales and higher average realized price for primary aluminum, net favorable foreign currency movements due to a stronger U.S. dollar, lower costs for caustic and carbon, and the absence of costs related to a planned maintenance outage in 2013 at a power plant in Australia. These positive impacts were partially offset by higher costs for bauxite, energy, and labor, higher inventory write-downs related to the decisions to permanently shut down certain smelter and rolling mill capacity (difference of \$58 see Restructuring and Other Charges below), and costs related to a new labor agreement that covers employees at 10 locations in the United States (see below).

On June 6, 2014, the United Steelworkers ratified a new five-year labor agreement covering approximately 6,100 employees at 10 U.S. locations; the previous labor agreement expired on May 15, 2014. In 2014, as a result of the preparation for and ratification of the new agreement, Alcoa recognized \$18 (\$12 after-tax) in COGS for, among other items, business contingency costs and a one-time signing bonus for employees. Additionally, as a result of the provisions of the new labor agreement, a significant plan amendment was adopted by one of Alcoa's U.S. pension plans. Accordingly, this plan was required to be remeasured, which resulted in a \$13 decrease to 2014 net periodic benefit cost.

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**Selling, General Administrative, and Other Expenses** SG&A expenses were \$979, or 4.3% of Sales, in 2015 compared with \$995, or 4.2% of Sales, in 2014. The decrease of \$16 was principally the result of favorable foreign currency movements due to a stronger U.S. dollar, the absence of SG&A related to closed and sold locations, and lower acquisition costs (\$15), partially offset by expenses for professional and consulting services related to the planned separation of Alcoa (\$24 see Management Review of 2015 and Outlook for the Future above) and new SG&A related to inorganic growth in the Engineered Products and Solutions segment.

SG&A expenses were \$995, or 4.2% of Sales, in 2014 compared with \$1,008, or 4.4% of Sales, in 2013. The decline of \$13 was due to decreases in various expenses, including legal and consulting fees and contract services, mostly offset by costs associated with the acquisition of Firth Rixson (\$42 see Engineered Products and Solutions in Segment Information below) and higher stock-based compensation expense.

**Research and Development Expenses** R&D expenses were \$238 in 2015 compared with \$218 in 2014 and \$192 in 2013. The increase in 2015 as compared to 2014 was mainly driven by additional spending related to the upgrade of a Micromill in San Antonio, TX, which was completed during 2015 and began production of automotive sheet on a limited basis, for the Global Rolled Products segment and additive manufacturing for 3-D printing, partially offset by lower spending related to inert anode and carbothermic technology for the Primary Metals segment. The increase in 2014 as compared to 2013 was primarily caused by spending related to an upgrade of a Micromill in San Antonio, TX for the Global Rolled Products segment and additional spending related to inert anode and carbothermic technology for the Primary Metals segment.

**Provision for Depreciation, Depletion, and Amortization** The provision for DD&A was \$1,280 in 2015 compared with \$1,371 in 2014. The decrease of \$91, or 7%, was mostly due to favorable foreign currency movements due to a stronger U.S. dollar, particularly against the Australian dollar and Brazilian real, and the absence of DD&A (\$71) related to the divestiture and/or permanent closure of five smelters, six rolling mills, one refinery, and one rod mill (see Alumina, Primary Metals, and Global Rolled Products in Segment Information below), all of which occurred from March 2014 through June 2015. These positive impacts were partially offset by new DD&A (\$93) associated with three acquisitions that occurred from November 2014 through July 2015 (see Engineered Products and Solutions in Segment Information below).

The provision for DD&A was \$1,371 in 2014 compared with \$1,421 in 2013. The decrease of \$50, or 4%, was principally the result of favorable foreign currency movements due to a stronger U.S. dollar, particularly against the Australian dollar and Brazilian real, and a reduction in expense related to the permanent shutdown of smelter capacity in Australia, Canada, the United States, and Italy that occurred at different points during both 2013 and 2014 (see Primary Metals in Segment Information below). These items were somewhat offset by new DD&A associated with both the acquisition of Firth Rixson in November 2014 (see Engineered Products and Solutions in Segment Information below) and assets placed into service in January 2014 related to the completed automotive expansion at the Davenport, IA plant.

**Impairment of Goodwill** In 2015 and 2013, Alcoa recognized an impairment of goodwill in the amount of \$25 and \$1,731 (\$1,719 after noncontrolling interest), respectively, related to the annual impairment review of the soft alloy extrusion business in Brazil and the Primary Metals segment, respectively, (see Goodwill in Critical Accounting Policies and estimates below).

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**Restructuring and Other Charges** Restructuring and other charges for each year in the three-year period ended December 31, 2015 were comprised of the following:

|  | 2015     | 2014     | 2013   |
|--|----------|----------|--------|
| Asset impairments  | \$ 335   | \$ 406   | \$ 116 |
| Layoff costs   | 299      | 259      | 201    |
| Legal matters in Italy                                       | 201      | -        | -      |
| Net loss on divestitures of businesses                       | 161      | 332      | -      |
| Resolution of a legal matter                                 | -        | -        | 391    |
| Other  | 213      | 199      | 82     |
| Reversals of previously recorded layoff and other exit costs | (14)     | (28)     | (8)    |
| Restructuring and other charges                              | \$ 1,195 | \$ 1,168 | \$ 782 |

Layoff costs were recorded based on approved detailed action plans submitted by the operating locations that specified positions to be eliminated, benefits to be paid under existing severance plans, union contracts or statutory requirements, and the expected timetable for completion of the plans.

**2015 Actions.** In 2015, Alcoa recorded Restructuring and other charges of \$1,195 (\$836 after-tax and noncontrolling interest), which were comprised of the following components: \$438 (\$281 after-tax and noncontrolling interest) for exit costs related to decisions to permanently shut down and demolish three smelters and a power station (see below); \$246 (\$118 after-tax and noncontrolling interest) for the curtailment of two refineries and two smelters (see below); \$201 (pre- and after-tax) related to legal matters in Italy; a \$161 (\$151 after-tax and noncontrolling interest) net loss related to the March 2015 divestiture of a rolling mill in Russia (see Global Rolled Products in Segment Information below) and post-closing adjustments associated with three December 2014 divestitures; \$143 (\$102 after-tax and noncontrolling interest) for layoff costs, including the separation of approximately 2,100 employees (425 in the Transportation and Construction Solutions segment, 645 in the Engineered Products and Solutions segment, 380 in the Primary Metals segment, 90 in the Global Rolled Products segment, 85 in the Alumina segment, and 475 in Corporate); \$34 (\$14 after-tax and noncontrolling interest) for asset impairments, virtually all of which was related to prior capitalized costs for an expansion project at a refinery in Australia that is no longer being pursued; an \$18 (\$13 after-tax) gain on the sale of land related to one of the rolling mills in Australia that was permanently closed in December 2014 (see 2014 Actions below); a net charge of \$4 (a net credit of \$7 after-tax and noncontrolling interest) for other miscellaneous items; and \$14 (\$11 after-tax and noncontrolling interest) for the reversal of a number of small layoff reserves related to prior periods.

During 2015, management initiated various alumina refining and aluminum smelting capacity curtailments and/or closures. The curtailments were composed of the remaining capacity at all of the following: the São Luís smelter in Brazil (74 kmt-per-year); the Suriname refinery (1,330 kmt-per-year); the Point Comfort, TX refinery (2,010 kmt-per-year); and the Wenatchee, WA smelter (143 kmt-per-year). All of the curtailments were completed in 2015 except for 1,635 kmt-per-year at the Point Comfort refinery, which is expected to be completed by the end of June 2016. The permanent closures were composed of the capacity at the Warrick, IN smelter (269 kmt-per-year) (includes the closure of a related coal mine) and the infrastructure of the Massena East, NY smelter (potlines were previously shut down in both 2013 and 2014 see 2013 Actions and 2014 Actions below), as the modernization of this smelter is no longer being pursued. The shutdown of the Warrick smelter is expected to be completed by the end of March 2016.

The decisions on the above actions were part of a separate 12-month review in refining (2,800 kmt-per-year) and smelting (500 kmt-per-year) capacity initiated by management in March 2015 for possible curtailment (partial or full), permanent closure or divestiture. While many factors contributed to each decision, in general, these actions were initiated to maintain competitiveness amid prevailing market conditions for both alumina and aluminum. Demolition and remediation activities related to the Warrick smelter and the Massena East location will begin in 2016 and are expected to be completed by the end of 2020.

Separate from the actions initiated under the reviews described above, in mid-2015, management approved the permanent shutdown and demolition of the Poços de Caldas smelter (capacity of 96 kmt-per-year) in Brazil and the

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Anglesea power station (includes the closure of a related coal mine) in Australia. The entire capacity at Poços de Caldas had been temporarily idled since May 2014 and the Anglesea power station was shut down at the end of August 2015. Demolition and remediation activities related to the Poços de Caldas smelter and the Anglesea power station began in late 2015 and are expected to be completed by the end of 2026 and 2020, respectively.

The decision on the Poços de Caldas smelter was due to management's conclusion that the smelter was no longer competitive as a result of challenging global market conditions for primary aluminum, which led to the initial curtailment, that have not dissipated and higher costs. For the Anglesea power station, the decision was made because a sale process did not result in a sale and there would have been imminent operating costs and financial constraints related to this site in the remainder of 2015 and beyond, including significant costs to source coal from available resources, necessary maintenance costs, and a depressed outlook for forward electricity prices. The Anglesea power station previously supplied approximately 40 percent of the power needs for the Point Henry smelter, which was closed in August 2014 (see 2014 Actions below).

In 2015, costs related to the shutdown and curtailment actions included asset impairments of \$217, representing the write-off of the remaining book value of all related properties, plants, and equipment; \$156 for the layoff of approximately 3,100 employees (1,800 in the Primary Metals segment and 1,300 in the Alumina segment), including \$30 in pension costs; accelerated depreciation of \$84 related to certain facilities as they continued to operate during 2015; and \$227 in other exit costs. Additionally in 2015, remaining inventories, mostly operating supplies and raw materials, were written down to their net realizable value, resulting in a charge of \$90 (\$43 after-tax and noncontrolling interest), which was recorded in COGS. The other exit costs of \$227 represent \$76 in asset retirement obligations and \$86 in environmental remediation, both of which were triggered by the decisions to permanently shut down and demolish the aforementioned structures in the United States, Brazil, and Australia (includes the rehabilitation of a related coal mine in each of Australia and the United States), and \$65 in supplier and customer contract-related costs.

As of December 31, 2015, approximately 1,500 of the 5,200 employees were separated. The remaining separations for 2015 restructuring programs are expected to be completed by the end of 2016. In 2015, cash payments of \$42 were made against layoff reserves related to 2015 restructuring programs.

**2014 Actions.** In 2014, Alcoa recorded Restructuring and other charges of \$1,168 (\$703 after-tax and noncontrolling interest), which were comprised of the following components: \$693 (\$443 after-tax and noncontrolling interest) for exit costs related to decisions to permanently shut down and demolish three smelters and two rolling mills (see below); a \$332 (\$163 after-tax and noncontrolling interest) net loss for the divestitures of four operations (see Alumina, Primary Metals, and Global Rolled Products in Segment Information below); \$68 (\$45 after-tax and noncontrolling interest) for the temporary curtailment of two smelters and a related production slowdown at one refinery (see below); \$51 (\$36 after-tax and noncontrolling interest) for layoff costs, including the separation of approximately 1,120 employees (470 in the Engineered Products and Solutions segment, 360 in the Transportation and Construction Solutions segment, 45 in the Global Rolled Products segment, 60 in the Alumina and Primary Metals segments combined, and 185 in Corporate); \$34 (\$26 after-tax) for asset impairments related to prior capitalized costs for a modernization project at a smelter in Canada that is no longer being pursued; a net charge of \$18 (\$11 after-tax and noncontrolling interest) for other miscellaneous items, including \$2 (\$2 after-tax) for asset impairments and accelerated depreciation; and \$28 (\$21 after-tax and noncontrolling interest) for the reversal of a number of layoff reserves related to prior periods, including those associated with a smelter in Italy due to changes in facts and circumstances (see below).

In early 2014, management approved the permanent shutdown and demolition of the remaining capacity (84 kmt-per-year) at the Massena East, NY smelter and the full capacity (190 kmt-per-year) at the Point Henry smelter in Australia. The capacity at Massena East was fully shut down by the end of March 2014 and the Point Henry smelter was fully shut down in August 2014. Demolition and remediation activities related to both the Massena East and Point Henry smelters began in late 2014 and are expected to be completed by the end of 2020 and 2018, respectively.

The decisions on the Massena East and Point Henry smelters were part of a 15-month review of 460 kmt of smelting capacity initiated by management in May 2013 (see 2013 Actions below) for possible curtailment. Through this review,



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management determined that the remaining capacity of the Massena East smelter was no longer competitive and the Point Henry smelter had no prospect of becoming financially viable. Management also initiated the temporary curtailment of the remaining capacity (62 kmt-per-year) at the Poços de Caldas smelter and additional capacity (85 kmt-per-year) at the São Luís smelter, both in Brazil. These curtailments were completed by the end of May 2014. As a result of these curtailments, 200 kmt-per-year of production at the Poços de Caldas refinery was reduced by the end of June 2014.

Also in early 2014, management approved the permanent shutdown of Alcoa's two rolling mills in Australia, Point Henry and Yennora. This decision was made due to the significant impact of excess can sheet capacity in both Australia and Asia. The two rolling mills had a combined can sheet capacity of 200 kmt-per-year and were closed by the end of 2014. Demolition and remediation activities related to the two rolling mills began in mid-2015 and are expected to be completed by the end of 2018.

Additionally, in August 2014, management approved the permanent shutdown and demolition of the capacity (150 kmt-per-year) at the Portovesme smelter in Italy, which had been idle since November 2012. This decision was made because the fundamental reasons that made the Portovesme smelter uncompetitive remained unchanged, including the lack of a viable long-term power solution. Demolition and remediation activities related to the Portovesme smelter will begin in 2016 and are expected to be completed by the end of 2020 (delayed due to discussions with the Italian government and other stakeholders).

In 2014, costs related to the shutdown and curtailment actions included \$208 for the layoff of approximately 1,790 employees (1,210 in the Primary Metals segment, 470 in the Global Rolled Products segment, 80 in the Alumina segment, and 30 in Corporate), including \$26 in pension costs; accelerated depreciation of \$204 related to the three facilities in Australia as they continued to operate during 2014; asset impairments of \$166 representing the write-off of the remaining book value of all related properties, plants, and equipment; and \$183 in other exit costs. Additionally in 2014, remaining inventories, mostly operating supplies and raw materials, were written down to their net realizable value, resulting in a charge of \$67 (\$47 after-tax and noncontrolling interest), which was recorded in COGS. The other exit costs of \$183 represent \$95 in asset retirement obligations and \$42 in environmental remediation, both of which were triggered by the decisions to permanently shut down and demolish the aforementioned structures in Australia, Italy, and the United States, and \$46 in other related costs, including supplier and customer contract-related costs.

As of December 31, 2015, approximately 2,500 of the 2,870 employees (previously 2,910) were separated. The total number of employees associated with 2014 restructuring programs was updated to reflect employees, who were initially identified for separation, accepting other positions within Alcoa and natural attrition. The remaining separations for 2014 restructuring programs are expected to be completed by the end of 2016. In 2015 and 2014, cash payments of \$62 and \$141, respectively, were made against layoff reserves related to 2014 restructuring programs.

**2013 Actions.** In 2013, Alcoa recorded Restructuring and other charges of \$782 (\$585 after-tax and noncontrolling interests), which were comprised of the following components: \$391 (\$305 after-tax and noncontrolling interest) related to the resolution of a legal matter; \$245 (\$183 after-tax) for exit costs related to the permanent shutdown and demolition of certain structures at three smelter locations (see below); \$87 (\$61 after-tax and noncontrolling interests) for layoff costs, including the separation of approximately 1,110 employees (340 in the Primary Metals segment, 250 in the Global Rolled Products segment, 220 in the Engineered Products and Solutions segment, 85 in the Alumina segment, 75 in the Transportation and Construction Solutions segment and 140 in Corporate), of which 590 relates to a global overhead reduction program, and \$9 in pension plan settlement charges related to previously separated employees; \$25 (\$17 after-tax) in net charges, including \$12 (\$8 after-tax) for asset impairments, related to retirements and/or the sale of previously idled structures; \$25 (\$13 after-tax and noncontrolling interests) for asset impairments related to the write-off of capitalized costs for projects no longer being pursued due to the market environment; a net charge of \$17 (\$12 after-tax and noncontrolling interests) for other miscellaneous items, including \$3 (\$2 after-tax) for asset impairments; and \$8 (\$6 after-tax and noncontrolling interests) for the reversal of a number of small layoff reserves related to prior periods.

In May 2013, management approved the permanent shutdown and demolition of two potlines (capacity of 105 kmt-per-year) that utilize Soderberg technology at the Baie Comeau smelter in Québec, Canada (remaining capacity of 280

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kmt-per-year composed of two prebake potlines) and the full capacity (44 kmt-per-year) at the Fusina smelter in Italy. Additionally, in August 2013, management approved the permanent shutdown and demolition of one potline (capacity of 41 kmt-per-year) that utilizes Soderberg technology at the Massena East, NY smelter (remaining capacity of 84 kmt-per-year composed of two Soderberg potlines). The aforementioned Soderberg lines at Baie Comeau and Massena East were fully shut down by the end of September 2013 while the Fusina smelter was previously temporarily idled in 2010. Demolition and remediation activities related to all three facilities began in late 2013 and are expected to be completed by the end of 2016 for Massena East and by the end of 2017 for both Baie Comeau and Fusina.

The decisions on the Soderberg lines for Baie Comeau and Massena East were part of a 15-month review of 460 kmt of smelting capacity initiated by management in May 2013 for possible curtailment, while the decision on the Fusina smelter was in addition to the capacity being reviewed. Factors leading to all three decisions were in general focused on achieving sustained competitiveness and included, among others: lack of an economically viable, long-term power solution (Italy); changed market fundamentals; other existing idle capacity; and restart costs.

In 2013, exit costs related to the shutdown actions included \$114 for the layoff of approximately 550 employees (Primary Metals segment), including \$83 in pension costs; accelerated depreciation of \$58 (Baie Comeau) and asset impairments of \$18 (Fusina and Massena East) representing the write-off of the remaining book value of all related properties, plants, and equipment; and \$55 in other exit costs. Additionally in 2013, remaining inventories, mostly operating supplies and raw materials, were written down to their net realizable value resulting in a charge of \$9 (\$6 after-tax), which was recorded in COGS. The other exit costs of \$55 represent \$48 in asset retirement obligations and \$5 in environmental remediation, both of which were triggered by the decisions to permanently shut down and demolish these structures, and \$2 in other related costs.

As of December 31, 2015, the separations associated with 2013 restructuring programs were essentially complete. In 2015, 2014, and 2013, cash payments of \$7, \$39, and \$33, respectively, were made against layoff reserves related to 2013 restructuring programs.

Alcoa does not include Restructuring and other charges in the results of its reportable segments. The pretax impact of allocating such charges to segment results would have been as follows:

|   | 2015     | 2014     | 2013   |
|---|----------|----------|--------|
| Alumina                                   | \$ 233   | \$ 287   | \$ 11  |
| Primary Metals                            | 691      | 553      | 295    |
| Global Rolled Products                    | 131      | 266      | 15     |
| Engineered Products and Solutions         | 49       | 13       | 12     |
| Transportation and Construction Solutions | 8        | 10       | 16     |
| Segment total                             | 1,112    | 1,129    | 349    |
| Corporate                                 | 83       | 39       | 433    |
| Total restructuring and other charges     | \$ 1,195 | \$ 1,168 | \$ 782 |

**Interest Expense** Interest expense was \$498 in 2015 compared with \$473 in 2014. The increase of \$25, or 5%, was primarily due to an 8% higher average debt level, somewhat offset by the absence of fees paid associated with the execution and termination of a 364-day senior unsecured bridge term loan facility related to the then-planned acquisition of Firth Rixson (\$13 see Engineered Products and Solutions in Segment Information below). The higher average debt level was mostly attributable to higher outstanding long-term debt due to the September 2014 issuance of \$1,250 in 5.125% Notes, the proceeds of which were used to pay a portion of the purchase price of the Firth Rixson acquisition.

Interest expense was \$473 in 2014 compared with \$453 in 2013. The increase of \$20, or 4%, was principally caused by lower capitalized interest (\$43), largely due to the progress completed at the aluminum complex in Saudi Arabia, and fees paid associated with the execution and termination of a 364-day senior unsecured bridge term loan facility related to the then-planned acquisition of Firth Rixson (\$13 see Engineered Products and Solutions in Segment Information below). These items were partially offset by a 3% lower average debt level and lower amortization of debt-related costs

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due to the conversion of convertible notes. The lower average debt level was mostly attributable to lower outstanding long-term debt due to the March 2014 conversion of \$575 in 5.25% Convertible Notes and the June 2013 repayment of \$422 in 6.00% Notes, partially offset by the September 2014 issuance of \$1,250 in 5.125% Notes.

**Other Expenses (Income), net** Other expenses, net was \$2 in 2015 compared with \$47 in 2014. The decrease of \$45 was mainly the result of a gain on the sale of land both around the Lake Charles, LA anode facility and at Alcoa's former Sherwin, TX refinery site (\$49) and the remaining equity investment in a China rolling mill (\$19) and a favorable change in deferred compensation. These items were somewhat offset by the absence of a gain on the sale of a mining interest in Suriname (\$28) and a portion of an equity investment in a China rolling mill (\$14), an unfavorable change in the cash surrender value of company-owned life insurance, and a net unfavorable change in mark-to-market derivative contracts.

Other expenses, net was \$47 in 2014 compared with Other income, net of \$25 in 2013. The change of \$72 was mostly due to an unfavorable change in mark-to-market derivative aluminum contracts (\$42), net unfavorable foreign currency movements (\$34), a higher equity loss related to Alcoa's share of the joint venture in Saudi Arabia due to start-up costs of the entire complex, including restart costs for one of the smelter potlines that was previously shut down due to a period of instability, and a smaller improvement in the cash surrender value of company-owned life insurance. These items were somewhat offset by a gain on the sale of a mining interest in Suriname (\$28) and a portion of an equity investment in a China rolling mill (\$14).

**Income Taxes** Alcoa's effective tax rate was 179.4% (provision on income) in 2015 compared with the U.S. federal statutory rate of 35%. The effective tax rate differs from the U.S. federal statutory rate principally due to a \$190 discrete income tax charge for valuation allowances on certain deferred tax assets in the United States and Iceland (see Income Taxes in Critical Accounting Policies and Estimates below), a \$201 charge for legal matters in Italy (see Restructuring and Other Charges above) and a \$25 impairment of goodwill (see Impairment of Goodwill above) that are nondeductible for income tax purposes, a loss on the sale of a rolling mill in Russia (see Global Rolled Products in Segment Information below) for which no tax benefit was recognized, a \$34 net discrete income tax charge as described below, and restructuring charges related to the curtailment of a refinery in Suriname (see Restructuring and Other Charges above), a portion for which no tax benefit was recognized.

In 2015, Alcoa World Alumina and Chemicals (AWAC), a joint venture owned 60% by Alcoa and 40% by Alumina Limited (Alcoa consolidates AWAC for financial reporting purposes), recognized an \$85 discrete income tax charge for a valuation allowance on certain deferred tax assets in Suriname (see Income Taxes in Critical Accounting Policies and Estimates below), which were related mostly to employee benefits and tax loss carryforwards. Alcoa also had a \$51 deferred tax liability related to its 60%-share of these deferred tax assets that was written off as a result of the valuation allowance recognized by AWAC.

Alcoa's effective tax rate was 64.4% (provision on income) in 2014 compared with the U.S. federal statutory rate of 35%. The effective tax rate differs from the U.S. federal statutory rate mainly due to restructuring charges related to operations in Italy (no tax benefit) and Australia (benefit at a lower tax rate) (see Restructuring and Other Charges above), a \$52 (\$31 after noncontrolling interest) discrete income tax charge related to a tax rate change in Brazil (see below), a loss on the sale of three rolling mills in Europe (no tax benefit) (see Global Rolled Products in Segment Information below), and a \$27 (\$16 after noncontrolling interest) discrete income tax charge for the remeasurement of certain deferred tax assets of a subsidiary in Spain due to a November 2014 enacted tax rate change (from 30% in 2014 to 28% in 2015 to 25% in 2016). These items were somewhat offset by foreign income taxed in lower rate jurisdictions and a \$9 discrete income tax benefit for the release of a valuation allowance related to operations in Germany due to the initiation of a tax planning strategy.

In December 2011, one of Alcoa's subsidiaries in Brazil applied for a tax holiday related to its expanded mining and refining operations. During 2013, the application was amended and re-filed and, separately, a similar application was filed for another one of the Company's subsidiaries in Brazil. The deadline for the Brazilian government to deny the application was July 11, 2014. Since Alcoa did not receive notice that its applications were denied, the tax holiday took effect automatically on July 12, 2014. As a result, the tax rate applicable to qualified holiday income for these

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subsidiaries decreased significantly (from 34% to 15.25%), resulting in future cash tax savings over the 10-year holiday period (retroactively effective as of January 1, 2013). Additionally, a portion of one of the subsidiaries net deferred tax asset that reverses within the holiday period was remeasured at the new tax rate (the net deferred tax asset of the other subsidiary was not remeasured since it could still be utilized against the subsidiary's future earnings not subject to the tax holiday). This remeasurement resulted in a decrease to that subsidiary's net deferred tax asset and a noncash charge to earnings of \$52 (\$31 after noncontrolling interest).

Alcoa's effective tax rate was 23.6% in 2013 (provision on a loss) compared with the U.S. federal statutory rate of 35%. The effective tax rate differs (by (58.6)% points) from the U.S. federal statutory rate primarily due to a \$1,731 impairment of goodwill (see Impairment of Goodwill above) and a \$209 charge for a legal matter (see Restructuring and Other Charges above) that are nondeductible for income tax purposes, a \$372 discrete income tax charge for valuation allowances on certain deferred tax assets in Spain and the United States (see Income Taxes in Critical Accounting Policies and Estimates below), restructuring charges related to operations in Canada (benefit at a lower tax rate) and Italy (no tax benefit) (see Restructuring and Other Charges above), and a \$9 discrete income tax charge related to prior year taxes in Spain and Australia. These items were slightly offset by an \$18 discrete income tax benefit related to new U.S. tax legislation (see below).

On January 2, 2013, the American Taxpayer Relief Act of 2012 was signed into law and reinstated various expired or expiring temporary business tax provisions through 2013. Two specific temporary business tax provisions that expired in 2011 and impacted Alcoa are the look-through rule for payments between related controlled foreign corporations and the research and experimentation credit. The expiration of these two provisions resulted in Alcoa recognizing a higher income tax provision of \$18 in 2012. As tax law changes are accounted for in the period of enactment, Alcoa recognized an \$18 discrete income tax benefit in 2013 related to the 2012 tax year to reflect the extension of these provisions. Beginning on January 1, 2014, these two provisions once again expired. On December 19, 2014, the Tax Increase Prevention Act of 2014 was signed into law, which retroactively extended for one year (i.e. calendar year 2014) a number of the tax provisions that expired at the end of 2013, including the two specific aforementioned provisions. Beginning on January 1, 2015, these two provisions once again expired. On December 18, 2015, the Consolidated Appropriations Act, 2016 was signed into law, which retroactively (as of January 1, 2015) extended for two or five years or made permanent a number of the tax provisions that expired at the end of 2014, including the two specific aforementioned provisions. The look-through rule for payments between related controlled foreign corporations was renewed for five years (through 2019) and the research and experimentation credit was made permanent.

Management anticipates that the effective tax rate in 2016 will be between 30% and 35%. However, business portfolio actions, changes in the current economic environment, tax legislation or rate changes, currency fluctuations, ability to realize deferred tax assets, and the results of operations in certain taxing jurisdictions may cause this estimated rate to fluctuate.

**Noncontrolling Interests** Net income attributable to noncontrolling interests was \$125 in 2015 compared with Net loss attributable to noncontrolling interests of \$91 in 2014 and Net income attributable to noncontrolling interests of \$41 in 2013. These amounts were virtually all related to Alumina Limited's 40% ownership interest in AWAC. In 2015, AWAC generated income compared to a loss in both 2014 and 2013.

In 2015, the change in AWAC's results was principally due to improved operating results, the absence of restructuring and other charges related to both the permanent shutdown of the Point Henry smelter in Australia (see Restructuring and Other Charges above) and the divestiture of an ownership interest in a mining and refining joint venture in Jamaica (see Alumina in Segment Information below), and the absence of a combined \$79 (\$32 was noncontrolling interest's share) discrete income tax charge related to a respective tax rate change in both Brazil and Spain (see Income Taxes above). These positive impacts were somewhat offset by restructuring charges related to the curtailment of both the refinery in Suriname and in Point Comfort, TX and the permanent closure of the Anglesea power station and coal mine (see Restructuring and Other Charges above), an \$85 (\$34 was noncontrolling interest's share) discrete income tax charge for a valuation allowance on certain deferred tax assets (see Income Taxes above), and the absence of a \$28 gain (\$11 was noncontrolling interest's share) on the sale of a mining interest in Suriname. The improvement in

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AWAC's operating results was largely attributable to net favorable foreign currency movements, net productivity improvements, and lower input costs, slightly offset by a lower average realized alumina price (see Alumina in Segment Information below).

In 2014, AWAC generated a smaller loss compared to 2013 mainly driven by the absence of a \$384 charge for a legal matter (see below), improved operating results, and a \$28 gain (\$11 was noncontrolling interest's share) on the sale of a mining interest in Suriname. These positive impacts were mostly offset by restructuring and other charges associated with both the permanent shutdown of the Point Henry smelter in Australia (see Restructuring and Other Charges above) and the divestiture of an ownership interest in a mining and refining joint venture in Jamaica (see Alumina in Segment Information below) and a combined \$79 (\$32 was noncontrolling interest's share) discrete income tax charge related to a respective tax rate change in both Brazil and Spain (see Income Taxes above). The improvement in AWAC's operating results was principally due to net favorable foreign currency movements and net productivity improvements, partially offset by an increase in input costs (see Alumina in Segment Information below). Even though AWAC generated an overall loss in both 2014 and 2013, the noncontrolling interest's share resulted in income in 2013 due to the manner in which the charges and costs related to a legal matter were allocated. A description of how these charges and costs for this legal matter impacted Noncontrolling interests follows.

The noncontrolling interest's share of AWAC's charge for a legal matter in 2013 and 2012 was \$58 (related to the aforementioned \$384) and \$34 (an \$85 charge related to the civil portion of the same legal matter), respectively. In 2012, the \$34 was based on the 40% ownership interest of Alumina Limited, while, in 2013, the \$58 was based on 15%. The application of a different percentage was due to the criteria in a 2012 allocation agreement between Alcoa and Alumina Limited related to this legal matter being met. Additionally, the \$34 charge, as well as costs related to this legal matter, was retroactively adjusted to reflect the terms of the allocation agreement, resulting in a credit to Noncontrolling interests of \$41 in 2013. In summary, Noncontrolling interests included a charge of \$17 and \$34 related to this legal matter in 2013 and 2012, respectively.

## **Segment Information**

Alcoa's operations consist of five worldwide reportable segments: Alumina, Primary Metals, Global Rolled Products, Engineered Products and Solutions, and Transportation and Construction Solutions (see below). Segment performance under Alcoa's management reporting system is evaluated based on a number of factors; however, the primary measure of performance is the after-tax operating income (ATOI) of each segment. Certain items such as the impact of LIFO inventory accounting; metal price lag (see below); interest expense; noncontrolling interests; corporate expense (general administrative and selling expenses of operating the corporate headquarters and other global administrative facilities, along with depreciation and amortization on corporate-owned assets); restructuring and other charges; and other items, including intersegment profit eliminations, differences between tax rates applicable to the segments and the consolidated effective tax rate, and other nonoperating items such as foreign currency transaction gains/losses and interest income are excluded from segment ATOI.

Effective in the second quarter of 2015, management removed the impact of metal price lag from the results of the Global Rolled Products and Engineered Products and Solutions (now Engineered Products and Solutions and Transportation and Construction Solutions see below) segments in order to enhance the visibility of the underlying operating performance of these businesses. Metal price lag describes the timing difference created when the average price of metal sold differs from the average cost of the metal when purchased by the respective segment. In general, when the price of metal increases, metal price lag is favorable, and when the price of metal decreases, metal price lag is unfavorable. The impact of metal price lag is now reported as a separate line item in Alcoa's reconciliation of total segment ATOI to consolidated net (loss) income attributable to Alcoa. As a result, this change does not impact the consolidated results of Alcoa. Segment information for all prior periods presented was updated to reflect this change.

In the third quarter of 2015, management approved a realignment of Alcoa's Engineered Products and Solutions segment due to the expansion of this part of Alcoa's business portfolio through both organic and inorganic growth. This realignment consisted of moving both the Alcoa Wheel and Transportation Products and Building and Construction Systems business units to a new reportable segment named Transportation and Construction Solutions.

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Additionally, the Latin American soft alloy extrusions business previously included in Corporate was moved into the new Transportation and Construction Solutions segment. The remaining Engineered Products and Solutions segment consists of the Alcoa Fastening Systems and Rings (renamed to include portions of the Firth Rixson business acquired in November 2014), Alcoa Power and Propulsion (includes the TITAL business acquired in March 2015), Alcoa Forgings and Extrusions (includes the other portions of Firth Rixson), and Alcoa Titanium and Engineered Products (a new business unit that consists solely of the RTI International Metals business acquired in July 2015) business units. Segment information for all prior periods presented was updated to reflect the new segment structure.

ATOI for all reportable segments totaled \$1,906 in 2015, \$1,968 in 2014, and \$1,267 in 2013. The following information provides shipments, sales, and ATOI data for each reportable segment, as well as certain production, realized price, and average cost data, for each of the three years in the period ended December 31, 2015. See Note Q to the Consolidated Financial Statements in Part II Item 8 of this Form 10-K for additional information.

**Alumina**

|  | 2015     | 2014     | 2013     |
|--|----------|----------|----------|
| Alumina production (kmt)                                 | 15,720   | 16,606   | 16,618   |
| Third-party alumina shipments (kmt)                      | 10,755   | 10,652   | 9,966    |
| Alcoa's average realized price per metric ton of alumina | \$ 317   | \$ 324   | \$ 328   |
| Alcoa's average cost per metric ton of alumina*          | \$ 237   | \$ 282   | \$ 295   |
| Third-party sales  | \$ 3,455 | \$ 3,509 | \$ 3,326 |
| Intersegment sales                                       | 1,687    | 1,941    | 2,235    |
| Total sales  | \$ 5,142 | \$ 5,450 | \$ 5,561 |
| ATOI   | \$ 746   | \$ 370   | \$ 259   |

\* Includes all production-related costs, including raw materials consumed; conversion costs, such as labor, materials, and utilities; depreciation, depletion, and amortization; and plant administrative expenses.

This segment represents a portion of Alcoa's upstream operations and consists of the Company's worldwide refining system. Alumina mines bauxite, from which alumina is produced and then sold directly to external smelter customers, as well as to the Primary Metals segment (see Primary Metals below), or to customers who process it into industrial chemical products. More than half of Alumina's production is sold under supply contracts to third parties worldwide, while the remainder is used internally by the Primary Metals segment. Alumina produced by this segment and used internally is transferred to the Primary Metals segment at prevailing market prices. A portion of this segment's third-party sales are completed through the use of agents, alumina traders, and distributors. Generally, the sales of this segment are transacted in U.S. dollars while costs and expenses of this segment are transacted in the local currency of the respective operations, which are the Australian dollar, the Brazilian real, the U.S. dollar, and the euro.

AWAC is an unincorporated global joint venture between Alcoa and Alumina Limited and consists of a number of affiliated operating entities, which own, or have an interest in, or operate the bauxite mines and alumina refineries within the Alumina segment (except for the Poços de Caldas refinery in Brazil and a portion of the São Luís refinery in Brazil). Alcoa owns 60% and Alumina Limited owns 40% of these individual entities, which are consolidated by the Company for financial reporting purposes. As such, the results and analysis presented for the Alumina segment are inclusive of Alumina Limited's 40% interest.

In December 2014, AWAC completed the sale of its ownership stake in Jamalco, a bauxite mine and alumina refinery joint venture in Jamaica, to Noble Group Ltd. Jamalco was 55% owned by a subsidiary of AWAC, and, while owned by AWAC, 55% of both the operating results and assets and liabilities of this joint venture were included in the Alumina segment. As it relates to AWAC's previous 55% ownership stake, the refinery (AWAC's share of the capacity was 779 kmt-per-year) generated sales (third-party and intersegment) of approximately \$200 in 2013, and the refinery and mine combined, at the time of divestiture, had approximately 500 employees. See Restructuring and Other Charges in Results of Operations above.

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In 2015, alumina production decreased by 886 kmt compared to 2014. The decline was mostly the result of the absence of production at the Jamalco refinery (see above) and lower production at the Suralco (Suriname see below) and Poços de Caldas (Brazil see below) refineries, slightly offset by higher production at the San Ciprian (Spain) and Point Comfort (Texas) refineries.

In March 2015, management initiated a 12-month review of 2,800 kmt in refining capacity for possible curtailment (partial or full), permanent closure or divestiture. This review is part of management's target to lower Alcoa's refining operations on the global alumina cost curve to the 21st percentile (currently 23rd) by the end of 2016. As part of this review, in 2015, management decided to curtail all of the operating capacity at both the Suralco (1,330 kmt-per-year) and Point Comfort (2,010 kmt-per-year) refineries. The curtailment of the capacity at Suralco was completed by the end of November 2015. Management is currently in discussions with the Suriname government to determine the best long-term solution for Suralco due to limited bauxite reserves and the absence of a long-term energy alternative. The curtailment of the capacity at Point Comfort is expected to be completed by the end of June 2016 (375 kmt-per-year was completed by the end of December 2015). Suralco and Point Comfort have nameplate capacity of 2,207 kmt-per-year and 2,305 kmt-per-year, respectively, of which 877 kmt and 295 kmt, respectively was curtailed prior to the review. See Restructuring and Other Charges in Results of Operations above for a description of the associated charges related to these actions.

In 2014, alumina production decreased by 12 kmt compared to 2013. The decline was mainly driven by lower production at the Poços de Caldas, Jamalco, and San Ciprian refineries, mostly offset by higher production at every other refinery in the global system. The Poços de Caldas refinery started to reduce production in early 2014 in response to management's decision to fully curtail the Poços de Caldas smelter by the end of May 2014 (see Primary Metals below). As a result, management reduced the alumina production at the Poços de Caldas refinery by approximately 200 kmt-per-year by mid-2014. This reduction was replaced by an increase in production at lower cost refineries within Alcoa's global system. Additionally, the decrease at the refinery in Jamaica was due to the absence of production for one month as a result of the sale of the ownership stake in Jamalco (see above).

Third-party sales for the Alumina segment decreased 2% in 2015 compared with 2014, largely attributable to a 2% decline in average realized price, somewhat offset by a 1% increase in volume. The change in average realized price was mostly driven by a decrease in both the average alumina index/spot price and average LME-based price, somewhat offset by a higher percentage (75% compared to 68%) of smelter-grade alumina shipments linked to an alumina index/spot price instead of an LME-based price.

Third-party sales for this segment improved 6% in 2014 compared with 2013, primarily related to a 7% improvement in volume.

Intersegment sales for the Alumina segment declined 13% in both 2015 compared with 2014 and 2014 compared with 2013. The decrease in both periods was mostly the result of lower demand from the Primary Metals segment, as a result of the closure, curtailment or divestiture of a number of smelters (see Primary Metals below), and a lower average realized price.

ATOI for the Alumina segment increased \$376 in 2015 compared with 2014, mainly caused by net favorable foreign currency movements due to a stronger U.S. dollar, especially against the Australian dollar and Brazilian real; net productivity improvements; and lower input costs, including natural gas, fuel oil, and transportation, all of which were slightly offset by higher labor and maintenance costs. These positive impacts were slightly offset by the previously mentioned lower average realized price and the absence of a gain on the sale of a mining interest in Suriname (\$18).

ATOI for this segment improved \$111 in 2014 compared with 2013, mostly due to net favorable foreign currency movements due to a stronger U.S. dollar, especially against the Australian dollar, net productivity improvements, and a gain on the sale of a mining interest in Suriname (\$18). These positive impacts were partially offset by higher input costs, including natural gas (particularly higher prices in Australia), bauxite (mainly due to a new mining site in Suriname), and labor and maintenance, all of which were somewhat offset by lower costs for caustic; and a higher equity loss due to start-up costs of the bauxite mine and refinery in Saudi Arabia.

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In 2016, alumina production will be approximately 2,500 kmt lower, mostly due to the curtailment of the Point Comfort and Suralco refineries. Also, the continued shift towards alumina index and spot pricing is expected to average 85% of third-party smelter-grade alumina shipments. Additionally, net productivity improvements are anticipated.

**Primary Metals**

|  | 2015     | 2014     | 2013     |
|--|----------|----------|----------|
| Aluminum production (kmt)                                  | 2,811    | 3,125    | 3,550    |
| Third-party aluminum shipments (kmt)                       | 2,478    | 2,534    | 2,801    |
| Alcoa's average realized price per metric ton of aluminum* | \$ 2,069 | \$ 2,405 | \$ 2,243 |
| Alcoa's average cost per metric ton of aluminum**          | \$ 2,064 | \$ 2,252 | \$ 2,201 |
| Third-party sales  | \$ 5,591 | \$ 6,800 | \$ 6,596 |
| Intersegment sales   | 2,170    | 2,931    | 2,621    |
| Total sales  | \$ 7,761 | \$ 9,731 | \$ 9,217 |
| ATOI   | \$ 155   | \$ 594   | \$ (20)  |

\* Average realized price per metric ton of aluminum includes three elements: a) the underlying base metal component, based on quoted prices from the LME; b) the regional premium, which represents the incremental price over the base LME component that is associated with the physical delivery of metal to a particular region (e.g., the Midwest premium for metal sold in the United States); and c) the product premium, which represents the incremental price for receiving physical metal in a particular shape (e.g., billet, slab, rod, etc.) or alloy.

\*\* Includes all production-related costs, including raw materials consumed; conversion costs, such as labor, materials, and utilities; depreciation and amortization; and plant administrative expenses.

This segment represents a portion of Alcoa's upstream operations and consists of the Company's worldwide smelting system. Primary Metals purchases alumina, mostly from the Alumina segment (see Alumina above), from which primary aluminum is produced and then sold directly to external customers and traders, as well as to Alcoa's midstream operations and, to a lesser extent, downstream operations. Results from the sale of aluminum powder, scrap, and excess energy are also included in this segment, as well as the results of aluminum derivative contracts and buy/resell activity. Primary aluminum produced by Alcoa and used internally is transferred to other segments at prevailing market prices. The sale of primary aluminum represents approximately 90% of this segment's third-party sales. Buy/resell activity occurs when this segment purchases metal and resells such metal to external customers or the midstream and downstream operations in order to maximize smelting system efficiency and to meet customer requirements. Generally, the sales of this segment are transacted in U.S. dollars while costs and expenses of this segment are transacted in the local currency of the respective operations, which are the U.S. dollar, the euro, the Norwegian kroner, Icelandic krona, the Canadian dollar, the Brazilian real, and the Australian dollar.

In November 2014, Alcoa completed the sale of an aluminum rod plant located in Bécancour, Québec, Canada to Sural Laminated Products. This facility takes molten aluminum and shapes it into the form of a rod, which is used by customers primarily for the transportation of electricity. While owned by Alcoa, the operating results and assets and liabilities of this plant were included in the Primary Metals segment. In conjunction with this transaction, Alcoa entered into a multi-year agreement with Sural Laminated Products to supply molten aluminum for the rod plant. The aluminum rod plant generated sales of approximately \$200 in 2013 and, at the time of divestiture, had approximately 60 employees. See Restructuring and Other Charges in Results of Operations above.

In December 2014, Alcoa completed the sale of its 50.33% ownership stake in the Mt. Holly smelter located in Goose Creek, South Carolina to Century Aluminum Company. While owned by Alcoa, 50.33% of both the operating results and assets and liabilities related to the smelter were included in the Primary Metals segment. As it relates to Alcoa's previous 50.33% ownership stake, the smelter (Alcoa's share of the capacity was 115 kmt-per-year) generated sales of approximately \$280 in 2013 and, at the time of divestiture, had approximately 250 employees. See Restructuring and Other Charges in Results of Operations above.

At December 31, 2015, Alcoa had 778 kmt of idle capacity on a base capacity of 3,401 kmt. In 2015, idle capacity increased 113 kmt compared to 2014, mostly due to the curtailment of 217 kmt combined at a smelter in each the



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United States and Brazil, partially offset by the permanent closure of the Poços de Caldas smelter in Brazil (96 kmt-per-year). Base capacity declined 96 kmt between December 31, 2015 and 2014 due to the previously mentioned permanent closure of the Poços de Caldas smelter. A detailed description of each of these actions follows below.

At December 31, 2014, Alcoa had 665 kmt of idle capacity on a base capacity of 3,497 kmt. In 2014, idle capacity increased 10 kmt compared to 2013 due to the curtailment of 159 kmt combined at two smelters in Brazil, mostly offset by the permanent closure of the Portovesme smelter in Italy (150 kmt-per-year). Base capacity declined 540 kmt between December 31, 2014 and 2013 due to the permanent closure of both a smelter in Australia and two remaining potlines at a smelter in the United States (274 kmt combined), the previously mentioned permanent closure of the Portovesme smelter, and the sale of Alcoa's ownership stake in the Mt. Holly smelter (see above). A detailed description of each of these actions follows below.

In March 2015, management initiated a 12-month review of 500 kmt in smelting capacity for possible curtailment (partial or full), permanent closure or divestiture. This review is part of management's target to lower Alcoa's smelting operations on the global aluminum cost curve to the 38th percentile (currently 43rd) by 2016. In summary, under this review, management approved the curtailment of 447 kmt-per-year and the closure of 269 kmt-per-year. The following is a description of each action.

Also in March 2015, management decided to curtail the remaining capacity (74 kmt-per-year) at the São Luís smelter in Brazil; this action was completed in April 2015. In 2013 and 2014 combined, Alcoa curtailed capacity of 194 kmt-per-year at the São Luís smelter under a prior management review (see below).

Additionally, in November 2015, management decided to curtail the remaining capacity at the Intalco (230 kmt-per-year) and Wenatchee (143 kmt-per-year) smelters, both in Washington. These two smelters previously had curtailed capacity of 90 kmt-per-year combined. The curtailment of the remaining capacity at Wenatchee was completed by the end of December 2015 and the curtailment of the remaining capacity at Intalco is expected to be completed by the end of June 2016.

Furthermore, in December 2015, management approved the permanent closure of the Warrick, IN smelter (269 kmt-per-year). This decision was made as this smelter is no longer competitive in light of prevailing market conditions for the price of aluminum. The shutdown of the Warrick smelter is expected to be completed by the end of March 2016.

Separate from the 2015 smelting capacity review described above, in June 2015, management approved the permanent closure of the Poços de Caldas smelter effective immediately. The Poços de Caldas smelter had been temporarily idle since May 2014 (see below) due to challenging global market conditions for primary aluminum and higher operating costs, which made the smelter uncompetitive. The decision to permanently close the Poços de Caldas smelter was based on the fact that these underlying conditions had not improved.

In May 2013, management initiated a 15-month review of 460 kmt in smelting capacity for possible curtailment. This review was aimed at maintaining Alcoa's competitiveness despite falling aluminum prices and focused on the highest-cost smelting capacity and those plants that have long-term risk due to factors such as energy costs or regulatory uncertainty. In 2014, an additional 250 kmt of smelting capacity was included in the review. In summary, under this review, management approved the closure of 146 kmt-per-year and 274 kmt-per-year and the curtailment of 131 kmt-per-year and 159 kmt-per-year in 2013 and 2014, respectively. The following is a description of each action.

Also in May 2013, management approved the permanent closure of two potlines (105 kmt-per-year) that utilize Soderberg technology at the Baie Comeau smelter in Quebec, Canada. Additionally, in August 2013, management approved the permanent closure of one potline (41 kmt-per-year) that utilizes Soderberg technology at the Massena East, NY smelter. The shutdown of these three lines was completed by the end of September 2013. The Baie Comeau smelter has a remaining capacity of 280 kmt-per-year composed of two prebake potlines and the Massena East smelter had a remaining capacity of 84 kmt-per-year composed of two Soderberg potlines (see below).

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Additionally, in August 2013, management decided to curtail 97 kmt-per-year at the São Luís smelter and 31 kmt-per-year at the Poços de Caldas smelter. This action was also completed by the end of September 2013. An additional 3 kmt-per-year was curtailed at the Poços de Caldas smelter by the end of 2013.

In January 2014, management approved the permanent closure of the remaining capacity (84 kmt-per-year) at the Massena East smelter, which represented two Soderberg potlines that were no longer competitive. This shutdown was completed by the end of March 2014. In February 2014, management approved the permanent closure of the Point Henry smelter (190 kmt-per-year) in Australia. This decision was made as management determined that the smelter had no prospect of becoming financially viable. The shutdown of the Point Henry smelter was completed in August 2014.

Also, in March 2014, management decided to curtail the remaining capacity (62 kmt-per-year) at the Poços de Caldas smelter and additional capacity (85 kmt-per-year) at the São Luís smelter. The curtailment of this capacity was completed by the end of May 2014. An additional 12 kmt-per-year was curtailed at the São Luís smelter during the remainder of 2014.

Separate from the 2013-2014 smelting capacity review described above, in June 2013, management approved the permanent closure of the Fusina smelter (44 kmt-per-year) in Italy as the underlying conditions that led to the idling of the smelter in 2010 had not fundamentally changed, including low aluminum prices and the lack of an economically viable, long-term power solution. In August 2014, management approved the permanent closure of the Portovesme smelter, which had been idle since November 2012. This decision was made because the fundamental reasons that made the Portovesme smelter uncompetitive remained unchanged, including the lack of a viable long-term power solution.

See Restructuring and Other Charges in Results of Operations above for a description of the associated charges related to all of the above actions in 2015, 2014, and 2013.

In 2015, aluminum production declined by 314 kmt, mainly the result of the absence of and/or lower production at the combined four smelters (Point Henry, São Luís, Massena East, and Poços de Caldas) impacted by the 2014 and 2015 capacity reviews and at the smelter divested in 2014 (Mt. Holly), all of which is described above.

In 2014, aluminum production decreased by 425 kmt, mostly due to lower production at the five smelters (São Luís, Massena East, Point Henry, Baie Comeau, and Poços de Caldas) impacted by the 2013-2014 capacity review described above.

Third-party sales for the Primary Metals segment declined 18% in 2015 compared with 2014, primarily due to a 14% drop in average realized price, the absence of sales (approximately \$585) from five smelters and a rod mill that were closed, curtailed or divested in 2014, and lower energy sales in Brazil, due to both a decrease in energy prices and a weaker Brazilian real. These negative impacts were slightly offset by higher volume in the remaining smelter portfolio and higher buy/resell activity. The change in average realized price was largely attributable to a 10% lower average LME price (on 15-day lag) and lower regional premiums, which dropped by an average of 39% in the United States and Canada and 44% in Europe. The higher buy/resell activity was primarily related to the fulfillment of customer orders with aluminum purchased from the smelter at the Saudi Arabia joint venture.

Third-party sales for the Primary Metals segment increased 3% in 2014 compared with 2013, mainly due to higher energy sales in Brazil resulting from excess power due to curtailed smelter capacity, higher buy/resell activity, and a 7% increase in average realized price, mostly offset by lower volumes, including from the five smelters impacted by the 2013 and 2014 capacity reductions. The change in average realized price was driven by higher regional premiums, which increased by an average of 84% in the United States and Canada and 56% in Europe.

Intersegment sales for the Primary Metals segment declined 26% in 2015 compared with 2014, mainly the result of lower demand from the midstream and downstream businesses and a decrease in average realized price. The decline related to the midstream business was driven by the absence of shipments to four of the five rolling mills (the fifth mill

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purchased scrap metal from third-parties) that were either divested or permanently closed in December 2014 (see Global Rolled Products below). Intersegment sales for this segment improved 12% in 2014 compared with 2013, principally due to an increase in average realized price, driven by higher regional premiums, and higher demand from the midstream and downstream businesses.

ATOI for the Primary Metals segment decreased \$439 in 2015 compared with 2014, primarily caused by both the previously mentioned lower average realized aluminum price and lower energy sales, higher energy costs (mostly in Spain as the 2014 interruptibility rights were more favorable than the 2015 structure), and an unfavorable impact related to the curtailment of the São Luís smelter. These negative impacts were somewhat offset by net favorable foreign currency movements due to a stronger U.S. dollar against most major currencies, net productivity improvements, the absence of a write-off of inventory related to the permanent closure of the Portovesme, Point Henry, and Massena East smelters (\$44), and a lower equity loss related to the joint venture in Saudi Arabia, including the absence of restart costs for one of the potlines that was previously shut down due to a period of instability.

ATOI for this segment climbed \$614 in 2014 compared with 2013, principally related to a higher average realized aluminum price; the previously mentioned energy sales in Brazil; net productivity improvements; net favorable foreign currency movements due to a stronger U.S. dollar against all major currencies; lower costs for carbon and alumina; and the absence of costs related to a planned maintenance outage in 2013 at a power plant in Australia. These positive impacts were slightly offset by an unfavorable impact associated with the 2013 and 2014 capacity reductions described above, including a write-off of inventory related to the permanent closure of the Portovesme, Point Henry, and Massena East smelters (\$44), and higher energy costs (particularly in Spain), labor, and maintenance.

In 2016, aluminum production will be approximately 450 kmt lower and third-party sales will reflect the absence of approximately \$400 both as a result of the 2015 curtailment and closure actions. Also, energy sales in Brazil will be negatively impacted by a decline in energy prices, while net productivity improvements are anticipated.

**Global Rolled Products**

|  | 2015     | 2014     | 2013     |
|--|----------|----------|----------|
| Third-party aluminum shipments (kmt)                       | 1,775    | 1,964    | 1,905    |
| Alcoa's average realized price per metric ton of aluminum* | \$ 3,514 | \$ 3,743 | \$ 3,730 |
| Third-party sales  | \$ 6,238 | \$ 7,351 | \$ 7,106 |
| Intersegment sales   | 125      | 185      | 178      |
| Total sales  | \$ 6,363 | \$ 7,536 | \$ 7,284 |
| ATOI   | \$ 244   | \$ 245   | \$ 292   |

\* Generally, average realized price per metric ton of aluminum includes two elements: a) the price of metal (the underlying base metal component plus a regional premium – see the footnote to the table in Primary Metals above for a description of these two components), and b) the conversion price, which represents the incremental price over the metal price component that is associated with converting primary aluminum into sheet and plate. In this circumstance, the metal price component is a pass-through to this segment's customers with limited exception (e.g., fixed-priced contracts, certain regional premiums).

This segment represents Alcoa's midstream operations and produces aluminum sheet and plate for a variety of end markets. Approximately one-half of the third-party shipments in this segment consist of sheet sold directly to customers in the packaging end market for the production of aluminum cans (beverage, food, and pet food). Seasonal increases in can sheet sales are generally experienced in the second and third quarters of the year. This segment also includes sheet and plate sold directly to customers and through distributors related to the aerospace, automotive, commercial transportation, building and construction, and industrial products (mainly used in the production of machinery and equipment and consumer durables) end markets. A small portion of this segment also produces aseptic foil for the packaging end market. While the customer base for flat-rolled products is large, a significant amount of sales of sheet and plate is to a relatively small number of customers. In this circumstance, the sales and costs and expenses of this segment are transacted in the local currency of the respective operations, which are mostly the U.S. dollar, the euro, the Russian ruble, the Brazilian real, and the British pound.

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In March 2015, Alcoa completed the sale of a rolling mill located in Belaya Kalitva, Russia to a wholly-owned subsidiary of Stupino Titanium Company. While owned by Alcoa, the operating results and assets and liabilities of the rolling mill were included in the Global Rolled Products segment. The rolling mill generated sales of approximately \$130 in 2014 and, at the time of divestiture, had approximately 1,870 employees. See Restructuring and Other Charges in Results of Operations above.

In February 2014, management approved the permanent shutdown of Alcoa's two rolling mills in Australia, Point Henry and Yennora. This decision was made due to the significant impact of excess can sheet capacity in both Australia and Asia. The two rolling mills had a combined can sheet capacity of 200 kmt-per-year and were closed by the end of 2014. See Restructuring and Other Charges in Results of Operations above for a description of the associated charges.

In December 2014, Alcoa completed the sale of three rolling mills located in Spain (Alicante and Amorebieta) and France (Castelsarrasin) to a subsidiary of Atlas Holdings LLC. While owned by Alcoa, the operating results and assets and liabilities of the rolling mills were included in the Global Rolled Products segment. In conjunction with this transaction, Alcoa entered into a multi-year agreement with the buyer to supply aluminum for the rolling mills. The rolling mills combined generated sales of approximately \$500 in 2013 and, at the time of divestiture, had approximately 750 employees. See Restructuring and Other Charges in Results of Operations above.

Third-party sales for the Global Rolled Products segment declined 15% in 2015 compared with 2014, primarily driven by the absence of sales (\$1,052) from six rolling mills in Australia, Spain, Russia, and France (see above), unfavorable pricing, mostly due to a decrease in metal prices (both LME and regional premium components), and unfavorable foreign currency movements, mainly the result of a weaker euro, Russian ruble, and Brazilian real. These negative impacts were somewhat offset by increased demand of the remaining rolling portfolio and favorable product mix (automotive and aerospace versus industrial products). The volume improvement of the remaining portfolio was largely attributable to the automotive (North America) and can sheet packaging (China) end markets, slightly offset by lower demand in the industrial products end market.

Third-party sales for this segment improved 3% in 2014 compared with 2013, principally caused by increased demand, somewhat offset by unfavorable price/product mix related to the packaging, aerospace, and industrial products end markets. Volume improvements were mostly driven by the automotive and commercial transportation end markets.

ATOI for the Global Rolled Products segment decreased \$1 in 2015 compared with 2014, primarily attributable to unfavorable price/product mix, largely the result of overall pricing pressure in the global can sheet packaging end market, and higher costs related to growth projects, including research and development as Alcoa develops and qualifies products from a new Micromill production process and the ramp-up of the Tennessee automotive expansion. These negative impacts were virtually offset by net productivity improvements across most businesses and higher volumes of the remaining rolling portfolio, principally driven by higher demand in the automotive end market.

ATOI for this segment declined \$47 in 2014 compared with 2013, mainly the result of unfavorable price/product mix related to the packaging, aerospace, and industrial products end markets; higher input costs, including energy, labor, maintenance, and transportation; a larger equity loss due to start-up costs related to the rolling mill at the joint venture in Saudi Arabia; a write-off of inventory related to the decision to permanently shut down the Point Henry and Yennora rolling mills (\$9); and costs (business continuity and contract specific) related to a new labor agreement that covers employees at three rolling mills in the United States (\$4) (see COGS in Results of Operations above). These negative impacts were partially offset by net productivity improvements across most businesses and overall higher volumes.

In 2016, demand in the automotive end market is expected to remain strong and the automotive expansion at the Davenport, IA facility will operate at full capacity for the entire year while the automotive expansion at the Tennessee facility will continue to ramp-up, both of which will serve the growing demand for aluminum-intensive vehicles. Also, costs related to the ramp-up of the Tennessee facility and the previously-idled casthouse in Texarkana, TX, as well as for preparations to run the Warrick, IN rolling facility on cold metal as a result of the planned closure of the Warrick smelter (see Primary Metals above), are expected. Additionally, net productivity improvements are anticipated.

**Table of Contents****Engineered Products and Solutions**

|                   | 2015     | 2014     | 2013     |
|-------------------|----------|----------|----------|
| Third-party sales | \$ 5,342 | \$ 4,217 | \$ 4,054 |
| ATOI              | \$ 595   | \$ 579   | \$ 569   |

This segment represents a portion of Alcoa's downstream operations and produces products that are used mostly in the aerospace (commercial and defense), commercial transportation, and power generation end markets. Such products include fastening systems (titanium, steel, and nickel alloys) and seamless rolled rings (mostly nickel alloys); and investment castings (nickel super alloys, titanium, and aluminum), including airfoils and forged jet engine components (e.g., jet engine disks), all of which are sold directly to customers and through distributors. More than 70% of the third-party sales in this segment are from the aerospace end market. A small part of this segment also produces various forging and extrusion metal products for the oil and gas, industrial products, automotive, and land and sea defense end markets. Seasonal decreases in sales are generally experienced in the third quarter of the year due to the European summer slowdown across all end markets. Generally, the sales and costs and expenses of this segment are transacted in the local currency of the respective operations, which are mostly the U.S. dollar and the euro.

In March 2015, Alcoa completed the acquisition of an aerospace castings company, TITAL, a privately held company with approximately 650 employees based in Germany. TITAL produces aluminum and titanium investment casting products for the aerospace and defense end markets. In 2014, TITAL generated sales of approximately \$100. The purpose of this acquisition is to capture increasing demand for advanced jet engine components made of titanium, establish titanium-casting capabilities in Europe, and expand existing aluminum casting capacity. The operating results and assets and liabilities of TITAL were included within the Engineered Products and Solutions segment since the date of acquisition.

Also in March 2015, Alcoa signed a definitive agreement to acquire RTI International Metals, Inc. (RTI), a global supplier of titanium and specialty metal products and services for the commercial aerospace, defense, energy, and medical device end markets. On July 23, 2015, after satisfying all customary closing conditions and receiving the required regulatory and RTI shareholder approvals, Alcoa completed the acquisition of RTI. The purpose of this acquisition is to expand Alcoa's range of titanium offerings and add advanced technologies and materials, primarily related to the aerospace end market. In 2014, RTI generated net sales of \$794 and had approximately 2,600 employees. Alcoa estimates that RTI will generate approximately \$1,200 in Third-party sales by 2019. In executing its integration plan for RTI, Alcoa expects to realize annual cost savings of approximately \$100 by 2019 due to synergies derived from procurement and productivity improvements, leveraging Alcoa's global shared services, and driving profitable growth. The operating results and assets and liabilities of RTI were included within the Engineered Products and Solutions segment since the date of acquisition.

On November 19, 2014, after satisfying all customary closing conditions and receiving the required regulatory approvals, Alcoa completed the acquisition of Firth Rixson, a global leader in aerospace jet engine components. Firth Rixson manufactures rings, forgings, and metal products for the aerospace end market, as well as other markets requiring highly engineered material applications. The purpose of this acquisition is to strengthen Alcoa's aerospace business and position the Company to capture additional aerospace growth with a broader range of high-growth, value-add jet engine components. This business generated sales of approximately \$970 in 2014 and has 13 operating facilities in the United States, United Kingdom, Europe, and Asia employing approximately 2,400 people combined. In executing its integration plan for Firth Rixson, Alcoa expects to realize annual cost savings of more than \$100 by 2019 due to synergies derived from procurement and productivity improvements, optimizing internal metal supply, and leveraging Alcoa's global shared services. The operating results and assets and liabilities of Firth Rixson were included within the Engineered Products and Solutions segment since the date of acquisition.

Third-party sales for the Engineered Products and Solutions segment improved 27% in 2015 compared with 2014, largely attributable to the third-party sales (\$1,310) of three acquired businesses (see above), primarily aerospace-related, and higher volumes in this segment's organic businesses, mostly related to the aerospace end market. These positive impacts were slightly offset by unfavorable foreign currency movements, principally driven by a weaker euro.

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Third-party sales for this segment increased 4% in 2014 compared with 2013, primarily due to higher volumes and the acquisition of Firth Rixson (\$81 see above). The higher volumes were mostly related to the aerospace (commercial) and commercial transportation end markets, somewhat offset by lower volumes in the industrial gas turbine end market.

ATOI for the Engineered Products and Solutions segment increased \$16 in 2015 compared with 2014, principally the result of net productivity improvements across most businesses, a positive contribution from inorganic growth, and overall higher volumes in this segment's organic businesses. These positive impacts were partially offset by unfavorable price/product mix, higher costs related to growth projects, and net unfavorable foreign currency movements, primarily related to a weaker euro.

ATOI for this segment climbed \$10 in 2014 compared with 2013, mainly due to net productivity improvements across all businesses and overall higher volumes, partially offset by higher costs, primarily labor, and unfavorable product mix.

In 2016, demand in the commercial aerospace end market is expected to remain strong, driven by significant order backlog. Also, third-party sales will include a positive impact due to a full year of sales related to the acquisitions of RTI and TITAL. Additionally, net productivity improvements are anticipated while pricing pressure across all markets is expected.

**Transportation and Construction Solutions**

|                   | 2015     | 2014     | 2013     |
|-------------------|----------|----------|----------|
| Third-party sales | \$ 1,882 | \$ 2,021 | \$ 1,951 |
| ATOI              | \$ 166   | \$ 180   | \$ 167   |

This segment represents a portion of Alcoa's downstream operations and produces products that are used mostly in the nonresidential building and construction and commercial transportation end markets. Such products include integrated aluminum structural systems, architectural extrusions, and forged aluminum commercial vehicle wheels, which are sold directly to customers and through distributors. A small part of this segment also produces aluminum products for the industrial products end market. Generally, the sales and costs and expenses of this segment are transacted in the local currency of the respective operations, which are mostly the U.S. dollar, the euro, and the Brazilian real.

Third-party sales for the Transportation and Construction Solutions segment decreased 7% in 2015 compared with 2014, primarily driven by unfavorable foreign currency movements, principally caused by a weaker euro and Brazilian real, and lower volume related to the building and construction end market, somewhat offset by higher volume related to the commercial transportation end market.

Third-party sales for this segment increased 4% in 2014 compared with 2013, mostly the result of higher volume related to the commercial transportation and building and construction end markets, somewhat offset by lower volume in the industrial products and market.

ATOI for the Transportation and Construction Solutions segment declined \$14 in 2015 compared with 2014, mainly due to higher costs, net unfavorable foreign currency movements, primarily related to a weaker euro and Brazilian real, and unfavorable price/product mix. These negative impacts were mostly offset by net productivity improvements across all businesses.

ATOI for this segment improved \$13 in 2014 compared with 2013, principally attributable to net productivity improvements across all businesses and overall higher volumes, partially offset by unfavorable product mix and higher costs, primarily labor.

In 2016, the non-residential building and construction end market is expected to improve through growth in North America but will be slightly offset by overall weakness in Europe. Also, North America build rates in the commercial

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transportation end market are expected to decline while improvements in Europe are anticipated. Additionally, net productivity improvements are anticipated.

**Reconciliation of ATOI to Consolidated Net (Loss) Income Attributable to Alcoa**

Items required to reconcile total segment ATOI to consolidated net (loss) income attributable to Alcoa include: the impact of LIFO inventory accounting; metal price lag; interest expense; noncontrolling interests; corporate expense (general administrative and selling expenses of operating the corporate headquarters and other global administrative facilities, along with depreciation and amortization on corporate-owned assets); restructuring and other charges; and other items, including intersegment profit eliminations, differences between tax rates applicable to the segments and the consolidated effective tax rate, and other nonoperating items such as foreign currency transaction gains/losses and interest income.

The following table reconciles total segment ATOI to consolidated net (loss) income attributable to Alcoa:

|  | 2015     | 2014     | 2013       |
|--|----------|----------|------------|
| Total segment ATOI                                   | \$ 1,906 | \$ 1,968 | \$ 1,267   |
| Unallocated amounts (net of tax):                    |          |          |            |
| Impact of LIFO                                       | 136      | (54)     | 52         |
| Metal price lag                                      | (133)    | 78       | (45)       |
| Interest expense                                     | (324)    | (308)    | (294)      |
| Noncontrolling interests                             | (125)    | 91       | (41)       |
| Corporate expense                                    | (266)    | (284)    | (274)      |
| Impairment of goodwill                               | (25)     | -        | (1,731)    |
| Restructuring and other charges                      | (943)    | (894)    | (607)      |
| Other  | (548)    | (329)    | (612)      |
| Consolidated net (loss) income attributable to Alcoa | \$ (322) | \$ 268   | \$ (2,285) |

The significant changes in the reconciling items between total segment ATOI and consolidated net (loss) income attributable to Alcoa for 2015 compared with 2014 consisted of:

a change in the Impact of LIFO, mostly due to lower prices for both aluminum, driven by both lower base metal prices (LME) and regional premiums, and alumina (decrease in price at December 31, 2015 indexed to December 31, 2014 compared to an increase in price at December 31, 2014 indexed to December 31, 2013);

a change in Metal price lag, the result of lower prices for aluminum;

an increase in Interest expense, principally caused by an 8% higher average debt level, which was largely attributable to higher outstanding long-term debt due to the September 2014 issuance of \$1,250 in 5.125% Notes, somewhat offset by the absence of fees paid associated with the execution and termination of a 364-day senior unsecured bridge term loan facility related to the then-planned acquisition of Firth Rixson (\$8);

a change in Noncontrolling interests, due to the change in results of AWAC, primarily driven by improved operating results and lower restructuring and other charges related to a number of portfolio actions (e.g. capacity reductions and a divestiture), slightly offset by the absence of a gain on the sale of a mining interest in Suriname (\$11 was noncontrolling interest's share);

a decline in Corporate expense, largely attributable to decreases in various expenses, including lower acquisition costs (\$13), partially offset by expenses related to the planned separation of Alcoa (\$24);

an increase in Restructuring and other charges, mostly the result of a charge for legal matters in Italy, partially offset by lower restructuring and other charges associated with a number of portfolio actions (e.g. capacity reductions and divestitures); and

a change in Other, primarily due to a discrete income tax charge for valuation allowances on certain deferred tax assets in the United States and Iceland (\$190), write-downs of inventories related to various shutdown and curtailment actions (\$75), a net discrete income tax charge for a valuation allowance on certain deferred



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tax assets (\$34), and charges for separate environmental matters in both Norway and Italy (\$15), somewhat offset by a discrete income tax charge related to a tax rate change in both Brazil and Spain (\$79) and higher gains on various asset sales (\$35).

The significant changes in the reconciling items between total segment ATOI and consolidated net income (loss) attributable to Alcoa for 2014 compared with 2013 consisted of:

a change in the Impact of LIFO, mostly due to higher prices for aluminum, driven by both higher base metal prices (LME) and regional premiums (increase in price at December 31, 2014 indexed to December 31, 2013 compared to a decrease in price at December 31, 2013 indexed to December 31, 2012), and the absence of significant reductions in LIFO inventory quantities, which caused a partial liquidation of the lower cost LIFO inventory base in 2013 (income of \$17 in 2013);

a change in Metal price lag, the result of higher prices for aluminum;

an increase in Interest expense, primarily the result of lower capitalized interest (\$28) and fees paid associated with the execution and termination of a 364-day senior unsecured bridge term loan facility related to the then-planned acquisition of Firth Rixson (\$8), partially offset by a 3% lower average debt level and lower amortization of debt-related costs due to the conversion of convertible notes;

a change in Noncontrolling interests, due to the change in the results of AWAC, mainly driven by restructuring and other charges associated with both the permanent shutdown of the Point Henry smelter in Australia and the divestiture of an ownership interest in a mining and refining joint venture in Jamaica and a discrete income tax charge related to a tax rate change in both Brazil and Spain (\$32 combined was noncontrolling interest's share), partially offset by improved operating results, the absence of a charge for a legal matter (\$17 was noncontrolling interest's share), and a gain on the sale of a mining interest in Suriname (\$11 was noncontrolling interest's share);

an increase in Corporate expense, mostly related to costs associated with the acquisition of Firth Rixson (\$34), partially offset by decreases in various expenses;

an increase in Restructuring and other charges, principally caused by higher costs related to decisions to permanently shut down and/or temporarily curtail refinery, smelter and/or rolling mill capacity and a net loss on the divestiture of four operations, partially offset by the absence of a charge for a legal matter (\$322); and

a change in Other, largely attributable to the absence of a discrete income tax charge for valuation allowances on certain deferred tax assets in Spain and the United States (\$372), slightly offset by a discrete income tax charge related to a tax rate change in both Brazil and Spain (\$79).

**Environmental Matters**

See the Environmental Matters section of Note N to the Consolidated Financial Statements in Part II Item 8 of this Form 10-K.

**Liquidity and Capital Resources**

Alcoa maintains a disciplined approach to cash management and strengthening of its balance sheet. In 2015, as has been the focus since 2008, management initiated actions to significantly improve Alcoa's cost structure and liquidity, providing the Company with the ability to operate effectively. Such actions include procurement efficiencies and overhead rationalization to reduce costs, working capital initiatives to yield significant cash improvements, and maintaining a sustainable level of capital expenditures. In 2016, this approach will continue with the ultimate goal of generating cash from operations that exceeds capital expenditures.

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Along with the foregoing actions, cash provided from operations and financing activities is expected to be adequate to cover Alcoa's operational and business needs over the next 12 months. For an analysis of long-term liquidity, see Contractual Obligations and Off-Balance Sheet Arrangements below.

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At December 31, 2015, cash and cash equivalents of Alcoa were \$1,919, of which \$1,107 was held outside the United States. Alcoa has a number of commitments and obligations related to the Company's growth strategy in foreign jurisdictions, resulting in the need for cash outside the United States. As such, management does not have a current expectation of repatriating cash held in foreign jurisdictions.

### **Cash from Operations**

Cash provided from operations in 2015 was \$1,582 compared with \$1,674 in 2014. The decrease of \$92, or 5%, was due to a negative change in noncurrent assets of \$328, lower operating results (net (loss) income plus net add-back for noncash transactions in earnings) and a negative change in noncurrent liabilities of \$18, mostly offset by a positive change associated with working capital of \$572 and lower pension contributions of \$31.

The components of the positive change in working capital were as follows:

a favorable change of \$524 in receivables, mostly driven by lower customer sales as a result of closed, divested, and curtailed locations and lower metal prices;

a positive change of \$291 in inventories, largely attributable to the absence of inventory build related to the ramp-up of automotive production at the Davenport, IA plant and customer requirements related to smelters that have been curtailed or shut down;

a favorable change of \$71 in prepaid expenses and other current assets;

a negative change of \$346 in accounts payable, trade, principally the result of timing of payments;

a positive change of \$14 in accrued expenses, mainly caused by a smaller payment to the United States government due to the resolution of a legal matter (see below); and

a favorable change of \$18 in taxes, including income taxes.

The unfavorable change in noncurrent assets was mostly related to a \$300 prepayment made under a natural gas supply agreement in Australia (see below).

On April 8, 2015, Alcoa's majority-owned subsidiary, Alcoa of Australia Limited (AofA), which is part of AWAC, secured a new 12-year gas supply agreement to power its three alumina refineries in Western Australia beginning in July 2020. This agreement was conditional on the completion of a third-party acquisition of the related energy assets from the then-current owner, which occurred in June 2015. The terms of AofA's gas supply agreement require a prepayment of \$500 to be made in two installments. The first installment of \$300 was made at the time of the completion of the third-party acquisition and the second installment of \$200 will be made in April 2016 (previously was scheduled in January 2016).

Cash provided from operations in 2014 was \$1,674 compared with \$1,578 in 2013. The increase of \$96, or 6%, was due to higher operating results (net income plus net add-back for noncash transactions in earnings) and a positive change in noncurrent assets of \$114, mostly offset by a negative change associated with working capital of \$620, a negative change in noncurrent liabilities of \$138, and higher pension contributions of \$39.

The components of the negative change in working capital were as follows:

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an unfavorable change of \$171 in receivables, primarily related to higher customer sales;

a negative change of \$380 in inventories, largely attributable to inventory build for the ramp-up of automotive production at the Davenport, IA plant and customer requirements related to smelters that were curtailed or shut down in 2014;

an unfavorable change of \$16 in prepaid expenses and other current assets;

a negative change of \$70 in accounts payable, trade, principally the result of timing of payments;

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an unfavorable change of \$33 in accrued expenses, mainly caused by \$139 in higher payments for layoff and other exit costs associated with restructuring actions and an \$88 payment to the United States government due to the resolution of a legal matter (see below), partially offset by the absence of \$148 ( 109) in payments to the Italian government related to a November 2009 European Commission decision on electricity pricing for certain energy-intensive industries; and

a positive change of \$50 in taxes, including income taxes, mostly driven by higher pretax income.

The higher pension contributions of \$39 were principally driven by special termination benefits of \$86 for employees affected by the 2013 shutdown of capacity at a smelter in Canada.

On August 8, 2014, the Highway and Transportation Funding Act (HATFA) was signed into law by the United States government. HATFA, in part, provides temporary relief for employers who sponsor defined benefit pension plans related to funding contributions under the Employee Retirement Income Security Act of 1974. Specifically, HATFA modifies the interest rates that had been set in 2012 by the Moving Ahead for Progress in the 21<sup>st</sup> Century Act. This relief had an immediate impact on the calculation of the then remaining funding contributions in 2014, resulting in a reduction of \$100 in minimum required pension funding.

In 2014, Alcoa World Alumina LLC, a majority-owned subsidiary of Alcoa, and Alcoa Inc. paid a combined \$88 to the United States government due to the resolution of a legal matter. Additionally, another \$74 was paid in 2015 and will be paid in each of the three subsequent years, 2016 (paid in January 2016) through 2018.

### **Financing Activities**

Cash used for financing activities was \$441 in 2015 compared with cash provided from financing activities of \$2,250 in 2014 and cash used for financing activities of \$679 in 2013.

The use of cash in 2015 was principally the result of \$2,030 in payments on debt, mostly related to the repayment of borrowings under certain revolving credit facilities (see below) and the repayment of convertible notes assumed in conjunction with the acquisition of RTI (see below); \$223 in dividends paid to shareholders; and \$104 in net cash paid to the noncontrolling interest in AWAC, Alumina Limited. These items were mostly offset by \$1,901 in additions to debt, virtually all of which was the result of borrowings under certain revolving credit facilities (see below).

The source of cash in 2014 was mostly driven by \$2,878 in additions to debt, virtually all of which was the result of \$1,238 in net proceeds from the issuance of new senior debt securities used for the acquisition of Firth Rixson (see below) and \$1,640 in borrowings under certain revolving credit facilities (see below); net proceeds of \$1,211 from the issuance of mandatory convertible preferred stock related to the aforementioned acquisition; and \$150 in proceeds from employee exercises of 17.3 million stock options at a weighted average exercise price of \$8.70 (not in millions). These items were somewhat offset by \$1,723 in payments on debt, mostly related to \$1,640 for the repayment of borrowings under certain revolving credit facilities (see below), and \$161 in dividends paid to shareholders.

The use of cash in 2013 was primarily due to \$2,317 in payments on debt, mainly related to \$1,850 for the repayment of borrowings under certain credit facilities (see below), a \$422 early repayment of 6.00% Notes due July 2013, and \$27 for previous borrowings on the loans supporting the Estreito hydroelectric power project in Brazil; \$132 in dividends paid to shareholders; and net cash paid to noncontrolling interests of \$97, most of which relates to Alumina Limited's share of AWAC. These items were partially offset by \$1,852 in additions to debt, virtually all of which was the result of borrowings under certain credit facilities (see below).

In July 2015, through the acquisition of RTI (see Engineered Products and Solutions in Segment Information above), Alcoa assumed the obligation to repay two tranches of convertible debt; one tranche was due and settled in cash on December 1, 2015 (principal amount of \$115) and the other tranche is due October 15, 2019 (principal amount of \$403), unless earlier converted or purchased by Alcoa at the holder's option upon a fundamental change. Upon conversion of the 2019 convertible notes in accordance with their terms, holders will receive, at Alcoa's election, cash,

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shares of common stock (up to 27,990,966 shares), or a combination of cash and shares. On the maturity date, each holder of outstanding notes will be entitled to receive on such date \$1,000 (not in millions) in cash for each \$1,000 (not in millions) in principal amount of notes, together with accrued and unpaid interest to, but not including, the maturity date.

On July 25, 2014, Alcoa entered into a Five-Year Revolving Credit Agreement (the "Credit Agreement") with a syndicate of lenders and issuers named therein. The Credit Agreement provides a \$4,000 senior unsecured revolving credit facility (the "Credit Facility"), the proceeds of which are to be used to provide working capital or for other general corporate purposes of Alcoa. Subject to the terms and conditions of the Credit Agreement, Alcoa may from time to time request increases in lender commitments under the Credit Facility, not to exceed \$500 in aggregate principal amount, and may also request the issuance of letters of credit, subject to a letter of credit sublimit of \$1,000 under the Credit Facility.

The Credit Facility was scheduled to mature on July 25, 2019; however, on July 7, 2015, Alcoa received approval for a one-year extension of the maturity date by the lenders and issuers that support the Credit Facility. As such, the Credit Facility now matures on July 25, 2020, unless extended or earlier terminated in accordance with the provisions of the Credit Agreement. Alcoa may make one additional one-year extension request during the remaining term of the Credit Facility, subject to the lender consent requirements set forth in the Credit Agreement. Under the provisions of the Credit Agreement, Alcoa will pay a fee of 0.25% (based on Alcoa's long-term debt ratings as of December 31, 2015) of the total commitment per annum to maintain the Credit Facility.

The Credit Facility is unsecured and amounts payable under it will rank *pari passu* with all other unsecured, unsubordinated indebtedness of Alcoa. Borrowings under the Credit Facility may be denominated in U.S. dollars or euros. Loans will bear interest at a base rate or a rate equal to LIBOR, plus, in each case, an applicable margin based on the credit ratings of Alcoa's outstanding senior unsecured long-term debt. The applicable margin on base rate loans and LIBOR loans will be 0.50% and 1.50% per annum, respectively, based on Alcoa's long-term debt ratings as of December 31, 2015. Loans may be prepaid without premium or penalty, subject to customary breakage costs.

The Credit Agreement replaces Alcoa's Five-Year Revolving Credit Agreement, dated as of July 25, 2011 (the "Former Credit Agreement"), which was scheduled to mature on July 25, 2017. The Former Credit Agreement, which had a total capacity of \$3,750 and was undrawn, was terminated effective July 25, 2014.

The Credit Agreement includes covenants substantially similar to those in the Former Credit Agreement, including, among others, (a) a leverage ratio, (b) limitations on Alcoa's ability to incur liens securing indebtedness for borrowed money, (c) limitations on Alcoa's ability to consummate a merger, consolidation or sale of all or substantially all of its assets, and (d) limitations on Alcoa's ability to change the nature of its business. As of December 31, 2015, Alcoa was in compliance with all such covenants.

The obligation of Alcoa to pay amounts outstanding under the Credit Facility may be accelerated upon the occurrence of an "Event of Default" as defined in the Credit Agreement. Such Events of Default include, among others, (a) Alcoa's failure to pay the principal of, or interest on, borrowings under the Credit Facility, (b) any representation or warranty of Alcoa in the Credit Agreement proving to be materially false or misleading, (c) Alcoa's breach of any of its covenants contained in the Credit Agreement, and (d) the bankruptcy or insolvency of Alcoa.

There were no amounts outstanding at December 31, 2015 and no amounts were borrowed during 2015 and 2014 under the Credit Facility. Also, there were no amounts borrowed during 2014 related to the Former Credit Agreement.

In addition to the Credit Agreement above, Alcoa has a number of other credit agreements that provide a combined borrowing capacity of \$990, as of December 31, 2015, of which \$890 is due to expire in 2016 and \$100 is due to expire in 2017. The purpose of any borrowings under these credit arrangements is to provide for working capital requirements and for other general corporate purposes. The covenants contained in all these arrangements are the same as the Credit Agreement (see above).

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In 2015, 2014, and 2013, Alcoa borrowed and repaid \$1,890, \$1,640, and \$1,850, respectively, under the respective credit arrangements. The weighted-average interest rate and weighted-average days outstanding of the respective borrowings during 2015, 2014, and 2013 were 1.61%, 1.54%, and 1.57%, respectively, and 69 days, 67 days, and 213 days, respectively.

In February 2014, Alcoa's automatic shelf registration statement filed with the Securities and Exchange Commission expired. On July 11, 2014, Alcoa filed a new shelf registration statement, which was amended on July 25, 2014 and became effective on July 30, 2014, for up to \$5,000 of securities on an unallocated basis for future issuance. As of December 31, 2015, \$2,500 in securities were issued under the new shelf registration statement.

In September 2014, Alcoa completed two public securities offerings under its shelf registration statement for (i) \$1,250 of 25 million depositary shares, each representing a 1/10th interest in a share of Alcoa's 5.375% Class B Mandatory Convertible Preferred Stock, Series 1, par value \$1 per share, liquidation preference \$500 per share, and (ii) \$1,250 of 5.125% Notes due 2024. The net proceeds of the offerings were used to finance the cash portion of the acquisition of Firth Rixson (see Engineered Products and Solutions in Segment Information above).

Alcoa's cost of borrowing and ability to access the capital markets are affected not only by market conditions but also by the short- and long-term debt ratings assigned to Alcoa's debt by the major credit rating agencies.

On March 9, 2015, Standard and Poor's Ratings Services (S&P) affirmed the following ratings for Alcoa: long-term debt at BBB- and short-term debt at A-3. Additionally, S&P changed the current outlook from negative to stable. On September 28, 2015 S&P issued a statement that these ratings and outlook for Alcoa were not affected by Alcoa's plan to separate into two publicly-traded companies.

On April 16, 2015 Fitch affirmed the following ratings for Alcoa: long-term debt at BB+ and short-term debt at B. Additionally, Fitch changed the current outlook from stable to positive. On September 30, 2015, Fitch placed these ratings on ratings watch positive based on Alcoa's plan to separate into two publicly-traded companies.

On April 30, 2015, Moody's Investor Service (Moody's) affirmed the following ratings for Alcoa; long-term debt at Ba1 and short-term debt at Speculative Grade Liquidity Rating-1. Additionally, Moody's changed the current outlook from stable to positive. On September 28, 2015, Moody's affirmed these ratings and changed the current outlook from positive to developing based on Alcoa's plan to separate into two publicly-traded companies. On January 21, 2016, Moody's placed Alcoa's long-term debt rating under review and changed the current outlook from developing to rating under review, while leaving Alcoa's short-term debt rating unchanged.

## **Investing Activities**

Cash used for investing activities was \$1,060 in 2015 compared with \$3,460 in 2014 and \$1,290 in 2013.

The use of cash in 2015 was mainly due to \$1,180 in capital expenditures (includes costs related to environmental control in new and expanded facilities of \$141), 38% of which related to growth projects, including the aerospace expansion at the La Porte, IN plant, the automotive expansion at the Alcoa, TN plant, the aerospace expansion (thick plate stretcher) at the Davenport, IA plant, the aerospace expansion (isothermal press) at the Savannah, GA plant (Firth Rixson), and the specialty foil expansion at the Itapissuma plant in Brazil; \$205 (net of cash acquired) for the acquisition of TITAL (see Engineered Products and Solutions in Segment Information above); and \$134 in additions to investments, including the purchase of \$70 in equities and fixed income securities held by Alcoa's captive insurance company and equity contributions of \$29 related to the aluminum complex joint venture in Saudi Arabia. These items were somewhat offset by \$302 in cash acquired with RTI International Metals (see Engineered Products and Solutions in Segment Information above); \$112 in proceeds from the sale of assets and businesses, composed of three land sales in Australia and the United States combined and post-closing adjustments related to an ownership stake in a smelter, four rolling mills, and an ownership stake in a bauxite mine/alumina refinery divested from December 2014 through March 2015; and \$40 in sales of investments, related to the sale of \$21 in equities and fixed income securities held by Alcoa's captive insurance company and \$19 in proceeds from the sale of the remaining portion of an equity investment in a China rolling mill.

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The use of cash in 2014 was principally due to \$2,385 (net of cash acquired) for the acquisition of Firth Rixson (see Engineered Products and Solutions in Segment Information above); \$1,219 in capital expenditures (includes costs related to environmental control in new and expanded facilities of \$129), 40% of which related to growth projects, including the automotive expansions at the Alcoa, TN and Davenport, IA fabrication plants, the aerospace expansion at the La Porte, IN plant, the aluminum-lithium capacity expansion at the Lafayette, IN plant, and the specialty foil expansion at the Itapissuma plant in Brazil; and \$195 in additions to investments, including equity contributions of \$120 related to the aluminum complex joint venture in Saudi Arabia and the purchase of \$49 in equities and fixed income securities held by Alcoa's captive insurance company. These items were slightly offset by \$253 in proceeds from the sale of assets and businesses, largely attributable to the sale of an ownership stake in a bauxite mine and refinery in Jamaica (see Alumina in Segment Information above), an ownership stake in a smelter in the United States (see Primary Metals in Segment Information above), three rolling mills in Spain and France combined (see Global Rolled Products in Segment Information above), and a rod plant in Canada (see Primary Metals in Segment Information above); and \$57 in sales of investments, mostly related to \$42 in combined proceeds from the sale of a mining interest in Suriname and a portion of an equity investment in a China rolling mill.

The use of cash in 2013 was primarily due to \$1,193 in capital expenditures (includes costs related to environmental control in new and expanded facilities of \$143), 34% of which related to growth projects, including the automotive expansion at the Davenport, IA fabrication plant, the aluminum-lithium capacity expansion at the Lafayette, IN plant, and the automotive sheet expansion at the Alcoa, TN plant; and \$293 in additions to investments, including equity contributions of \$171 related to the aluminum complex joint venture in Saudi Arabia and the purchase of \$54 in equities and fixed income securities held by Alcoa's captive insurance company. These items were slightly offset by a net change in restricted cash of \$170, mostly related to the release of funds to be used for capital expenditures of the automotive expansion at the Davenport, IA fabrication plant (see Noncash Financing and Investing Activities below).

### **Noncash Financing and Investing Activities**

In July 2015, Alcoa purchased all outstanding shares of RTI common stock in a stock-for-stock transaction valued at \$870. As a result, Alcoa issued 87 million shares of its common stock to consummate this transaction, which was not reflected in Alcoa's Statement of Consolidated Cash Flows as it represents a noncash financing activity.

In early 2014, holders of \$575 principal amount of Alcoa's 5.25% Convertible Notes due March 15, 2014 (the 2014 Notes) exercised their option to convert the 2014 Notes into 89 million shares of Alcoa common stock. The conversion rate for the 2014 Notes was 155.4908 shares of Alcoa's common stock per \$1,000 (in full dollars) principal amount of notes, equivalent to a conversion price of \$6.43 per share. The difference between the \$575 principal amount of the 2014 Notes and the \$89 par value of the issued shares increased Additional capital on Alcoa's Consolidated Balance Sheet. This transaction was not reflected in Alcoa's Statement of Consolidated Cash Flows as it represents a noncash financing activity.

In late 2014, Alcoa paid \$2,995 (net of cash acquired) to acquire Firth Rixson (see Engineered Products and Solutions in Segment Information above). A portion of this consideration was paid through the issuance of 37 million shares in Alcoa common stock valued at \$610. The issuance of common stock was not reflected in Alcoa's Statement of Consolidated Cash Flows as it represents a noncash investing activity.

In August 2012, Alcoa received a loan of \$250 for the purpose of financing all or part of the cost of acquiring, constructing, reconstructing, and renovating certain facilities at Alcoa's rolling mill plant in Davenport, IA. Because this loan can only be used for this purpose, the net proceeds of \$248 were classified as restricted cash. Since restricted cash is not part of cash and cash equivalents, this transaction was not reflected in Alcoa's Statement of Consolidated Cash Flows as it represents a noncash activity. As funds were expended for the project, the release of the cash was reflected as both an inflow on the Net change in restricted cash line and an outflow on the Capital expenditures line in the Investing Activities section of the Statement of Consolidated Cash Flows. At December 31, 2013 and 2012, Alcoa had \$13 and \$171, respectively, of restricted cash remaining related to this transaction. In 2014, the remaining funds were expended on the project.



**Table of Contents****Contractual Obligations and Off-Balance Sheet Arrangements**

**Contractual Obligations.** Alcoa is required to make future payments under various contracts, including long-term purchase obligations, financing arrangements, and lease agreements. Alcoa also has commitments to fund its pension plans, provide payments for other postretirement benefit plans, and fund capital projects. As of December 31, 2015, a summary of Alcoa's outstanding contractual obligations is as follows (these contractual obligations are grouped in the same manner as they are classified in the Statement of Consolidated Cash Flows in order to provide a better understanding of the nature of the obligations and to provide a basis for comparison to historical information):

|  | Total     | 2016     | 2017-2018 | 2019-2020 | Thereafter |
|--|-----------|----------|-----------|-----------|------------|
| <b>Operating activities:</b>               |           |          |           |           |            |
| Energy-related purchase obligations        | \$ 16,555 | \$ 1,311 | \$ 2,128  | \$ 2,009  | \$ 11,107  |
| Raw material purchase obligations          | 6,970     | 1,612    | 1,183     | 815       | 3,360      |
| Other purchase obligations                 | 1,317     | 166      | 328       | 328       | 495        |
| Operating leases                           | 853       | 243      | 298       | 174       | 138        |
| Interest related to total debt             | 3,817     | 500      | 933       | 723       | 1,661      |
| Estimated minimum required pension funding | 2,150     | 300      | 850       | 1,000     | -          |
| Other postretirement benefit payments      | 2,095     | 230      | 450       | 440       | 975        |
| Layoff and other restructuring payments    | 250       | 235      | 15        | -         | -          |
| Deferred revenue arrangements              | 147       | 20       | 41        | 34        | 52         |
| Uncertain tax positions                    | 52        | -        | -         | -         | 52         |
| <b>Financing activities:</b>               |           |          |           |           |            |
| Total debt                                 | 9,102     | 59       | 1,810     | 2,158     | 5,075      |
| Dividends to shareholders                  | -         | -        | -         | -         | -          |
| <b>Investing activities:</b>               |           |          |           |           |            |
| Capital projects                           | 861       | 586      | 223       | 52        | -          |
| Equity contributions                       | 10        | 10       | -         | -         | -          |
| Payments related to acquisitions           | 150       | -        | -         | 150       | -          |
| Totals                                     | \$ 44,329 | \$ 5,272 | \$ 8,259  | \$ 7,883  | \$ 22,915  |

**Obligations for Operating Activities**

Energy-related purchase obligations consist primarily of electricity and natural gas contracts with expiration dates ranging from 1 year to 32 years. Raw material obligations consist mostly of bauxite (relates to Alcoa's bauxite mine interests in Guinea and Brazil), caustic soda, alumina, aluminum fluoride, calcined petroleum coke, cathode blocks, and various metals with expiration dates ranging from less than 1 year to 18 years. Other purchase obligations consist principally of freight for bauxite and alumina with expiration dates ranging from 1 to 16 years. Many of these purchase obligations contain variable pricing components, and, as a result, actual cash payments may differ from the estimates provided in the preceding table. Operating leases represent multi-year obligations for certain land and buildings, alumina refinery process control technology, plant equipment, vehicles, and computer equipment.

Interest related to total debt is based on interest rates in effect as of December 31, 2015 and is calculated on debt with maturities that extend to 2042. The effect of outstanding interest rate swaps, which are accounted for as fair value hedges, was included in interest related to total debt. As of December 31, 2015, these hedges effectively convert the interest rate from fixed to floating on \$200 of debt through 2018. As the contractual interest rates for certain debt and interest rate swaps are variable, actual cash payments may differ from the estimates provided in the preceding table.

Estimated minimum required pension funding and postretirement benefit payments are based on actuarial estimates using current assumptions for discount rates, long-term rate of return on plan assets, rate of compensation increases, and health care cost trend rates, among others. The minimum required contributions for pension funding are estimated to be \$300 for 2016, \$375 for 2017, \$475 for 2018, \$425 for 2019, and \$575 for 2020. These expected pension contributions reflect the impacts of the Pension Protection Act of 2006; the Worker, Retiree, and Employer Recovery Act of 2008; the Moving Ahead for Progress in the 21<sup>st</sup> Century Act of 2012; the Highway and Transportation Funding

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Act of 2014; and the Bipartisan Budget Act of 2015. Other postretirement benefit payments are expected to approximate \$220 to \$230 annually for years 2016 through 2020 and \$195 annually for years 2021 through 2025. Such payments will be slightly offset by subsidy receipts related to Medicare Part D, which are estimated to be approximately \$15 to \$20 annually for years 2016 through 2025. Alcoa has determined that it is not practicable to present pension funding and other postretirement benefit payments beyond 2020 and 2025, respectively.

Layoff and other restructuring payments expected to be paid within one year primarily relate to severance costs. Amounts scheduled to be paid beyond one year are related to ongoing site remediation work and special layoff benefit payments.

Deferred revenue arrangements require Alcoa to deliver alumina and sheet and plate to certain customers over the specified contract period (through 2027 for an alumina contract and through 2020 for a sheet and plate contract). While these obligations are not expected to result in cash payments, they represent contractual obligations for which the Company would be obligated if the specified product deliveries could not be made.

Uncertain tax positions taken or expected to be taken on an income tax return may result in additional payments to tax authorities. The amount in the preceding table includes interest and penalties accrued related to such positions as of December 31, 2015. The total amount of uncertain tax positions is included in the *Thereafter* column as the Company is not able to reasonably estimate the timing of potential future payments. If a tax authority agrees with the tax position taken or expected to be taken or the applicable statute of limitations expires, then additional payments will not be necessary.

### **Obligations for Financing Activities**

Total debt amounts in the preceding table represent the principal amounts of all outstanding debt, including short-term borrowings and long-term debt. Maturities for long-term debt extend to 2042.

Alcoa has historically paid quarterly dividends on its preferred and common stock. Including dividends on preferred stock, Alcoa paid \$223 in dividends to shareholders during 2015. This amount includes dividends related to a new class of preferred stock issued in September 2014 (see Financing Activities in Liquidity and Capital Resources above). Because all dividends are subject to approval by Alcoa's Board of Directors, amounts are not included in the preceding table unless such authorization has occurred. There were \$17 of preferred stock dividends approved to be paid on January 1, 2016; however, Alcoa paid the dividends on December 31, 2015. As of December 31, 2015, there were 1,310,610,141 shares of outstanding common stock and 546,024 and 2,500,000 shares of outstanding Class A and Class B preferred stock, respectively. The annual Class A and Class B preferred stock dividends are at the rate of \$3.75 and \$26.8750 per share, respectively, and the annual common stock dividend is \$0.12 per share.

### **Obligations for Investing Activities**

Capital projects in the preceding table only include amounts approved by management as of December 31, 2015. Funding levels may vary in future years based on anticipated construction schedules of the projects. It is expected that significant expansion projects will be funded through various sources, including cash provided from operations. Total capital expenditures are anticipated to be approximately \$1,400 in 2016.

Equity contributions represent Alcoa's committed investment related to a joint venture in Saudi Arabia. Alcoa is a participant in a joint venture to develop a new aluminum complex in Saudi Arabia, comprised of a bauxite mine, alumina refinery, aluminum smelter, and rolling mill, which requires the Company to contribute approximately \$1,100. As of December 31, 2015, Alcoa has made equity contributions of \$981. Based on changes to both the project's capital investment and equity and debt structure from the initial plans, the estimated \$1,100 equity contribution may be reduced. The timing of the amounts included in the preceding table may vary based on changes in anticipated construction schedules of the project.

Payments related to acquisitions are based on provisions in certain acquisition agreements that state additional funds are due to the seller from Alcoa if the businesses acquired achieve stated financial and operational thresholds. Amounts

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are only presented in the preceding table if it is has been determined that payment is more likely than not to occur. In connection with the acquisition of Firth Rixson (see Engineered Products and Solutions in Segment Information above), Alcoa entered into an earn-out agreement, which states that Alcoa will make earn-out payments up to an aggregate maximum amount of \$150 through 2020. The amounts in the preceding table represent Alcoa's best estimate of when the payments may be made.

**Off-Balance Sheet Arrangements.** At December 31, 2015, Alcoa has maximum potential future payments for guarantees issued on behalf of a third party of \$478. These guarantees expire at various times between 2017 and 2024 and relate to project financing for the aluminum complex in Saudi Arabia. Alcoa also has outstanding bank guarantees related to tax matters, outstanding debt, workers compensation, environmental obligations, energy contracts, and customs duties, among others. The total amount committed under these guarantees, which expire at various dates between 2016 and 2023 was \$320 at December 31, 2015.

Alcoa has outstanding letters of credit primarily related to workers' compensation, energy contracts (including \$200 related to an expected April 2016 prepayment under a gas supply contract), and leasing obligations. The total amount committed under these letters of credit, which automatically renew or expire at various dates, mostly in 2016, was \$510 at December 31, 2015. Alcoa also has outstanding surety bonds primarily related to tax matters, contract performance, workers compensation, environmental-related matters, and customs duties. The total amount committed under these bonds, which automatically renew or expire at various dates, mostly in 2016, was \$159 at December 31, 2015.

**Critical Accounting Policies and Estimates**

The preparation of the Consolidated Financial Statements in accordance with accounting principles generally accepted in the United States of America requires management to make certain judgments, estimates, and assumptions regarding uncertainties that affect the amounts reported in the Consolidated Financial Statements and disclosed in the accompanying Notes. Areas that require significant judgments, estimates, and assumptions include accounting for derivatives and hedging activities; environmental and litigation matters; asset retirement obligations; the testing of goodwill, equity investments, and properties, plants, and equipment for impairment; estimating fair value of businesses to be divested; pension plans and other postretirement benefits obligations; stock-based compensation; and income taxes.

Management uses historical experience and all available information to make these judgments, estimates, and assumptions, and actual results may differ from those used to prepare the Company's Consolidated Financial Statements at any given time. Despite these inherent limitations, management believes that Management's Discussion and Analysis of Financial Condition and Results of Operations and the Consolidated Financial Statements and accompanying Notes provide a meaningful and fair perspective of the Company.

A summary of the Company's significant accounting policies is included in Note A to the Consolidated Financial Statements in Part II Item 8 of this Form 10-K. Management believes that the application of these policies on a consistent basis enables the Company to provide the users of the Consolidated Financial Statements with useful and reliable information about the Company's operating results and financial condition.

**Derivatives and Hedging.** Derivatives are held for purposes other than trading and are part of a formally documented risk management program. For derivatives designated as fair value hedges, Alcoa measures hedge effectiveness by formally assessing, at least quarterly, the historical high correlation of changes in the fair value of the hedged item and the derivative hedging instrument. For derivatives designated as cash flow hedges, Alcoa measures hedge effectiveness by formally assessing, at least quarterly, the probable high correlation of the expected future cash flows of the hedged item and the derivative hedging instrument. The ineffective portions of both types of hedges are recorded in sales or other income or expense in the current period. If the hedging relationship ceases to be highly effective or it becomes probable that an expected transaction will no longer occur, future gains or losses on the derivative instrument are recorded in other income or expense.

Alcoa accounts for interest rate swaps related to its existing long-term debt and hedges of firm customer commitments for aluminum as fair value hedges. As a result, the fair values of the derivatives and changes in the fair values of the

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underlying hedged items are reported in other current and noncurrent assets and liabilities in the Consolidated Balance Sheet. Changes in the fair values of these derivatives and underlying hedged items generally offset and are recorded each period in sales or interest expense, consistent with the underlying hedged item.

Alcoa accounts for hedges of foreign currency exposures and certain forecasted transactions as cash flow hedges. The fair values of the derivatives are recorded in other current and noncurrent assets and liabilities in the Consolidated Balance Sheet. The effective portions of the changes in the fair values of these derivatives are recorded in other comprehensive income and are reclassified to sales, cost of goods sold, or other income or expense in the period in which earnings are impacted by the hedged items or in the period that the transaction no longer qualifies as a cash flow hedge. These contracts cover the same periods as known or expected exposures, generally not exceeding five years.

If no hedging relationship is designated, the derivative is marked to market through earnings.

Cash flows from derivatives are recognized in the Statement of Consolidated Cash Flows in a manner consistent with the underlying transactions.

**Environmental Matters.** Expenditures for current operations are expensed or capitalized, as appropriate. Expenditures relating to existing conditions caused by past operations, which will not contribute to future revenues, are expensed. Liabilities are recorded when remediation costs are probable and can be reasonably estimated. The liability may include costs such as site investigations, consultant fees, feasibility studies, outside contractors, and monitoring expenses. Estimates are generally not discounted or reduced by potential claims for recovery. Claims for recovery are recognized as agreements are reached with third parties. The estimates also include costs related to other potentially responsible parties to the extent that Alcoa has reason to believe such parties will not fully pay their proportionate share. The liability is continuously reviewed and adjusted to reflect current remediation progress, prospective estimates of required activity, and other factors that may be relevant, including changes in technology or regulations.

**Litigation Matters.** For asserted claims and assessments, liabilities are recorded when an unfavorable outcome of a matter is deemed to be probable and the loss is reasonably estimable. Management determines the likelihood of an unfavorable outcome based on many factors such as the nature of the matter, available defenses and case strategy, progress of the matter, views and opinions of legal counsel and other advisors, applicability and success of appeals processes, and the outcome of similar historical matters, among others. Once an unfavorable outcome is deemed probable, management weighs the probability of estimated losses, and the most reasonable loss estimate is recorded. If an unfavorable outcome of a matter is deemed to be reasonably possible, then the matter is disclosed and no liability is recorded. With respect to unasserted claims or assessments, management must first determine that the probability that an assertion will be made is likely, then, a determination as to the likelihood of an unfavorable outcome and the ability to reasonably estimate the potential loss is made. Legal matters are reviewed on a continuous basis to determine if there has been a change in management's judgment regarding the likelihood of an unfavorable outcome or the estimate of a potential loss.

**Asset Retirement Obligations.** Alcoa recognizes asset retirement obligations (AROs) related to legal obligations associated with the normal operation of Alcoa's bauxite mining, alumina refining, and aluminum smelting facilities. These AROs consist primarily of costs associated with spent pot lining disposal, closure of bauxite residue areas, mine reclamation, and landfill closure. Alcoa also recognizes AROs for any significant lease restoration obligation, if required by a lease agreement, and for the disposal of regulated waste materials related to the demolition of certain power facilities. The fair values of these AROs are recorded on a discounted basis, at the time the obligation is incurred, and accreted over time for the change in present value. Additionally, Alcoa capitalizes asset retirement costs by increasing the carrying amount of the related long-lived assets and depreciating these assets over their remaining useful life.

Certain conditional asset retirement obligations (CAROs) related to alumina refineries, aluminum smelters, and fabrication facilities have not been recorded in the Consolidated Financial Statements due to uncertainties surrounding the ultimate settlement date. A CARO is a legal obligation to perform an asset retirement activity in which the timing and/or method of settlement are conditional on a future event that may or may not be within Alcoa's control. Such

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uncertainties exist as a result of the perpetual nature of the structures, maintenance and upgrade programs, and other factors. At the date a reasonable estimate of the ultimate settlement date can be made, Alcoa would record an ARO for the removal, treatment, transportation, storage and/or disposal of various regulated assets and hazardous materials such as asbestos, underground and aboveground storage tanks, polychlorinated biphenyls, various process residuals, solid wastes, electronic equipment waste, and various other materials. Such amounts may be material to the Consolidated Financial Statements in the period in which they are recorded. If Alcoa was required to demolish all such structures immediately, the estimated CARO as of December 31, 2015 ranges from less than \$1 to \$46 per structure (156 structures) in today's dollars.

**Goodwill.** Goodwill is not amortized; instead, it is reviewed for impairment annually (in the fourth quarter) or more frequently if indicators of impairment exist or if a decision is made to sell or exit a business. A significant amount of judgment is involved in determining if an indicator of impairment has occurred. Such indicators may include deterioration in general economic conditions, negative developments in equity and credit markets, adverse changes in the markets in which an entity operates, increases in input costs that have a negative effect on earnings and cash flows, or a trend of negative or declining cash flows over multiple periods, among others. The fair value that could be realized in an actual transaction may differ from that used to evaluate the impairment of goodwill.

Goodwill is allocated among and evaluated for impairment at the reporting unit level, which is defined as an operating segment or one level below an operating segment. Alcoa has ten reporting units, of which four are included in the Engineered Products and Solutions segment and three are included in the Transportation and Construction Solutions segment. The remaining three reporting units are the Alumina segment, the Primary Metals segment (all goodwill was impaired in 2013 see below), and the Global Rolled Products segment. More than 70% of Alcoa's total goodwill is allocated to two reporting units as follows: Alcoa Fastening Systems and Rings (AFSR) (\$2,232) and Alcoa Power and Propulsion (APP) (\$1,695) businesses, both of which are included in the Engineered Products and Solutions segment. These amounts include an allocation of Corporate's goodwill.

In November 2014, Alcoa acquired Firth Rixson (see Engineered Products and Solutions in Segment Information under Results of Operations above), and, as a result recognized \$1,801 in goodwill. This amount was allocated between the AFSR and Alcoa Forgings and Extrusion reporting units, which is part of the Engineered Products and Solutions segment. In March and July 2015, Alcoa acquired TITAL and RTI, respectively, (see Engineered Products and Solutions in Segment Information under Results of Operations above) and recognized \$118 and \$240, respectively, in goodwill. The goodwill amount related to TITAL was allocated to the APP reporting unit and the amount related to RTI was allocated to Alcoa Titanium and Engineered Products, a new Alcoa reporting unit that consists solely of the acquired RTI business and is part of the Engineered Products and Solutions segment.

In reviewing goodwill for impairment, an entity has the option to first assess qualitative factors to determine whether the existence of events or circumstances leads to a determination that it is more likely than not (greater than 50%) that the estimated fair value of a reporting unit is less than its carrying amount. If an entity elects to perform a qualitative assessment and determines that an impairment is more likely than not, the entity is then required to perform the existing two-step quantitative impairment test (described below), otherwise no further analysis is required. An entity also may elect not to perform the qualitative assessment and, instead, proceed directly to the two-step quantitative impairment test. The ultimate outcome of the goodwill impairment review for a reporting unit should be the same whether an entity chooses to perform the qualitative assessment or proceeds directly to the two-step quantitative impairment test.

Alcoa's policy for its annual review of goodwill is to perform the qualitative assessment for all reporting units not subjected directly to the two-step quantitative impairment test. Generally, management will proceed directly to the two-step quantitative impairment test for two to three reporting units (based on facts and circumstances) during each annual review of goodwill. This policy will result in each of the nine reporting units with goodwill being subjected to the two-step quantitative impairment test at least once during every three-year period.

Under the qualitative assessment, various events and circumstances (or factors) that would affect the estimated fair value of a reporting unit are identified (similar to impairment indicators above). These factors are then classified by the

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type of impact they would have on the estimated fair value using positive, neutral, and adverse categories based on current business conditions. Additionally, an assessment of the level of impact that a particular factor would have on the estimated fair value is determined using high, medium, and low weighting. Furthermore, management considers the results of the most recent two-step quantitative impairment test completed for a reporting unit and compares the weighted average cost of capital (WACC) between the current and prior years for each reporting unit.

During the 2015 annual review of goodwill, management performed the qualitative assessment for seven reporting units, the Alumina segment, the four reporting units in the Engineered Products and Solutions segment, including AFSR and APP, and two reporting units in the Transportation and Construction Solutions segment. Management concluded that it was not more likely than not that the estimated fair values of the seven reporting units were less than their carrying values. As such, no further analysis was required.

Under the two-step quantitative impairment test, the evaluation of impairment involves comparing the current fair value of each reporting unit to its carrying value, including goodwill. Alcoa uses a discounted cash flow (DCF) model to estimate the current fair value of its reporting units when testing for impairment, as management believes forecasted cash flows are the best indicator of such fair value. A number of significant assumptions and estimates are involved in the application of the DCF model to forecast operating cash flows, including markets and market share, sales volumes and prices, production costs, tax rates, capital spending, discount rate, and working capital changes. Most of these assumptions vary significantly among the reporting units. Cash flow forecasts are generally based on approved business unit operating plans for the early years and historical relationships in later years. The betas used in calculating the individual reporting units' WACC rate are estimated for each business with the assistance of valuation experts.

In the event the estimated fair value of a reporting unit per the DCF model is less than the carrying value, additional analysis would be required. The additional analysis would compare the carrying amount of the reporting unit's goodwill with the implied fair value of that goodwill, which may involve the use of valuation experts. The implied fair value of goodwill is the excess of the fair value of the reporting unit over the fair value amounts assigned to all of the assets and liabilities of that unit as if the reporting unit was acquired in a business combination and the fair value of the reporting unit represented the purchase price. If the carrying value of goodwill exceeds its implied fair value, an impairment loss equal to such excess would be recognized, which could significantly and adversely impact reported results of operations and shareholders' equity.

During the 2015 annual review of goodwill, management proceeded directly to the two-step quantitative impairment test for two reporting units as follows: Global Rolled Products segment and the soft alloys extrusion business in Brazil (hereafter "SAE"), which is included in the Transportation and Construction Solutions segment. The estimated fair value of the Global Rolled Products segment was substantially in excess of its respective carrying value, resulting in no impairment. For SAE, the estimated fair value as determined by the DCF model was lower than the associated carrying value. As a result, management performed the second step of the impairment analysis in order to determine the implied fair value of the SAE reporting unit's goodwill. The results of the second-step analysis showed that the implied fair value of the goodwill was zero. Therefore, in the fourth quarter of 2015, Alcoa recorded a goodwill impairment of \$25. The impairment of the SAE goodwill resulted from headwinds from the recent downturn in the Brazilian economy and the continued erosion of gross margin despite the execution of cost reduction strategies. As a result of the goodwill impairment, there is no goodwill remaining for the SAE reporting unit.

Goodwill impairment tests in prior years indicated that goodwill was not impaired for any of the Company's reporting units, except for the Primary Metals segment in 2013 (see below), and there were no triggering events since that time that necessitated an impairment test.

In 2013, for Primary Metals, the estimated fair value as determined by the DCF model was lower than the associated carrying value. As a result, management performed the second step of the impairment analysis in order to determine the implied fair value of Primary Metals' goodwill. The results of the second-step analysis showed that the implied fair value of goodwill was zero. Therefore, in the fourth quarter of 2013, Alcoa recorded a goodwill impairment of \$1,731 (\$1,719 after noncontrolling interest). As a result of the goodwill impairment, there is no goodwill remaining for the Primary Metals reporting unit.

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The impairment of Primary Metals goodwill resulted from several causes: the prolonged economic downturn; a disconnect between industry fundamentals and pricing that has resulted in lower metal prices; and the increased cost of alumina, a key raw material, resulting from expansion of the Alumina Price Index throughout the industry. All of these factors, exacerbated by increases in discount rates, continue to place significant downward pressure on metal prices and operating margins, and the resulting estimated fair value, of the Primary Metals business. As a result, management decreased the near-term and long-term estimates of the operating results and cash flows utilized in assessing Primary Metals goodwill for impairment. The valuation of goodwill for the second step of the goodwill impairment analysis is considered a level 3 fair value measurement, which means that the valuation of the assets and liabilities reflect management's own judgments regarding the assumptions market participants would use in determining the fair value of the assets and liabilities.

**Equity Investments.** Alcoa invests in a number of privately-held companies, primarily through joint ventures and consortia, which are accounted for on the equity method. The equity method is applied in situations where Alcoa has the ability to exercise significant influence, but not control, over the investee. Management reviews equity investments for impairment whenever certain indicators are present suggesting that the carrying value of an investment is not recoverable. This analysis requires a significant amount of judgment from management to identify events or circumstances indicating that an equity investment is impaired. The following items are examples of impairment indicators: significant, sustained declines in an investee's revenue, earnings, and cash flow trends; adverse market conditions of the investee's industry or geographic area; the investee's ability to continue operations measured by several items, including liquidity; and other factors. Once an impairment indicator is identified, management uses considerable judgment to determine if the impairment is other than temporary, in which case the equity investment is written down to its estimated fair value. An impairment that is other than temporary could significantly and adversely impact reported results of operations.

**Properties, Plants, and Equipment.** Properties, plants, and equipment are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount of such assets (asset group) may not be recoverable. Recoverability of assets is determined by comparing the estimated undiscounted net cash flows of the operations related to the assets (asset group) to their carrying amount. An impairment loss would be recognized when the carrying amount of the assets (asset group) exceeds the estimated undiscounted net cash flows. The amount of the impairment loss to be recorded is calculated as the excess of the carrying value of the assets (asset group) over their fair value, with fair value determined using the best information available, which generally is a DCF model. The determination of what constitutes an asset group, the associated estimated undiscounted net cash flows, and the estimated useful lives of assets also require significant judgments.

**Discontinued Operations and Assets Held For Sale.** The fair values of all businesses to be divested are estimated using accepted valuation techniques such as a DCF model, valuations performed by third parties, earnings multiples, or indicative bids, when available. A number of significant estimates and assumptions are involved in the application of these techniques, including the forecasting of markets and market share, sales volumes and prices, costs and expenses, and multiple other factors. Management considers historical experience and all available information at the time the estimates are made; however, the fair value that is ultimately realized upon the divestiture of a business may differ from the estimated fair value reflected in the Consolidated Financial Statements.

**Pension and Other Postretirement Benefits.** Liabilities and expenses for pension and other postretirement benefits are determined using actuarial methodologies and incorporate significant assumptions, including the interest rate used to discount the future estimated liability, the expected long-term rate of return on plan assets, and several assumptions relating to the employee workforce (salary increases, health care cost trend rates, retirement age, and mortality).

The interest rate used to discount future estimated liabilities is determined using a Company-specific yield curve model (above-median) developed with the assistance of an external actuary. The cash flows of the plans' projected benefit obligations are discounted using a single equivalent rate derived from yields on high quality corporate bonds, which represent a broad diversification of issuers in various sectors, including finance and banking, consumer products, transportation, insurance, and pharmaceutical, among others. The yield curve model parallels the plans' projected cash flows, which have an average duration of 10 years, and the underlying cash flows of the bonds included in the model

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exceed the cash flows needed to satisfy the Company's plans' obligations multiple times. In 2015, 2014, and 2013, the discount rate used to determine benefit obligations for U.S. pension and other postretirement benefit plans was 4.29%, 4.00%, and 4.80%, respectively. The impact on the liabilities of a change in the discount rate of 1/4 of 1% would be approximately \$430 and either a charge or credit of approximately \$15 to after-tax earnings in the following year.

In conjunction with the annual measurement of the funded status of Alcoa's pension and other postretirement benefit plans at December 31, 2015, management elected to change the manner in which the interest cost component of net periodic benefit cost will be determined in 2016 and beyond. Previously, the interest cost component was determined by multiplying the single equivalent rate described above and the aggregate discounted cash flows of the plans' projected benefit obligations. Under the new methodology, the interest cost component will be determined by aggregating the product of the discounted cash flows of the plans' projected benefit obligations for each year and an individual spot rate (referred to as the spot rate approach). This change will result in a lower interest cost component of net periodic benefit cost under the new methodology compared to the previous methodology of approximately \$100 (\$65 after-tax) in 2016. Management believes this new methodology, which represents a change in an accounting estimate, is a better measure of the interest cost as each year's cash flows are specifically linked to the interest rates of bond payments in the same respective year.

The expected long-term rate of return on plan assets is generally applied to a five-year market-related value of plan assets (a four-year average or the fair value at the plan measurement date is used for certain non-U.S. plans). The process used by management to develop this assumption is one that relies on a combination of historical asset return information and forward-looking returns by asset class. As it relates to historical asset return information, management focuses on the annual, 10-year moving, and 20-year moving averages when developing this assumption. Management also incorporates expected future returns on current and planned asset allocations using information from various external investment managers and consultants, as well as management's own judgment.

For 2015, 2014, and 2013, management used 7.75%, 8.00%, and 8.50% as its expected long-term rate of return, which was based on the prevailing and planned strategic asset allocations, as well as estimates of future returns by asset class. These rates fell within the respective range of the 20-year moving average of actual performance and the expected future return developed by asset class. In 2015, the decrease of 25 basis points in the expected long-term rate of return was due to a decrease in the 20-year moving average of actual performance. For 2016, management anticipates that 7.75% will be the expected long-term rate of return.

A change in the assumption for the expected long-term rate of return on plan assets of 1/4 of 1% would impact after-tax earnings by approximately \$20 for 2015.

During 2014, an independent U.S. organization that publishes standard mortality rates based on statistical analysis and studies issued updated mortality tables. The rates within these standard tables are used by actuaries as one of the many assumptions when measuring a company's projected benefit obligation for pension and other postretirement benefit plans. The funded status of all of Alcoa's pension and other postretirement benefit plans are measured as of December 31 each calendar year. During the measurement process at the end of 2014, Alcoa, with the assistance of an external actuary, considered the rates in the new mortality tables, along with specific data related to Alcoa's retiree population, to develop the mortality-related assumptions used to measure the benefit obligation of various U.S. benefit plans. As a result, Alcoa recognized a charge of approximately \$100 (\$65 after-tax) in other comprehensive loss related to the updated mortality assumptions.

In 2015, a net charge of \$10 (after-tax and noncontrolling interest) was recorded in other comprehensive loss, primarily due to the unfavorable performance of the plan assets, which was mostly offset by the amortization of actuarial losses and a 30 basis point increase in the discount rate. In 2014, a net charge of \$69 (after-tax and noncontrolling interest) was recorded in other comprehensive loss, primarily due to an 80 basis point decrease in the discount rate and a change in the mortality assumption (see above), which was mostly offset by the favorable performance of the plan assets and the amortization of actuarial losses. In 2013, a net benefit of \$531 (after-tax and noncontrolling interest) was recorded in other comprehensive loss, primarily due to a 65 basis point increase in the discount rate and the amortization of actuarial losses.



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**Stock-based Compensation.** Alcoa recognizes compensation expense for employee equity grants using the non-substantive vesting period approach, in which the expense (net of estimated forfeitures) is recognized ratably over the requisite service period based on the grant date fair value. The fair value of new stock options is estimated on the date of grant using a lattice-pricing model. Determining the fair value of stock options at the grant date requires judgment, including estimates for the average risk-free interest rate, dividend yield, volatility, and exercise behavior. These assumptions may differ significantly between grant dates because of changes in the actual results of these inputs that occur over time.

As part of Alcoa's stock-based compensation plan design, individuals who are retirement-eligible have a six-month requisite service period in the year of grant. As a result, a larger portion of expense will be recognized in the first half of each year for these retirement-eligible employees. Compensation expense recorded in 2015, 2014, and 2013 was \$92 (\$61 after-tax), \$87 (\$58 after-tax), and \$71 (\$48 after-tax), respectively. Of these amounts, \$17, \$15, and \$14 in 2015, 2014, and 2013, respectively, pertains to the acceleration of expense related to retirement-eligible employees.

Most plan participants can choose whether to receive their award in the form of stock options, stock awards, or a combination of both. This choice is made before the grant is issued and is irrevocable.

**Income Taxes.** The provision for income taxes is determined using the asset and liability approach of accounting for income taxes. Under this approach, the provision for income taxes represents income taxes paid or payable (or received or receivable) for the current year plus the change in deferred taxes during the year. Deferred taxes represent the future tax consequences expected to occur when the reported amounts of assets and liabilities are recovered or paid, and result from differences between the financial and tax bases of Alcoa's assets and liabilities and are adjusted for changes in tax rates and tax laws when enacted.

Valuation allowances are recorded to reduce deferred tax assets when it is more likely than not (greater than 50%) that a tax benefit will not be realized. In evaluating the need for a valuation allowance, management considers all potential sources of taxable income, including income available in carryback periods, future reversals of taxable temporary differences, projections of taxable income, and income from tax planning strategies, as well as all available positive and negative evidence. Positive evidence includes factors such as a history of profitable operations, projections of future profitability within the carryforward period, including from tax planning strategies, and Alcoa's experience with similar operations. Existing favorable contracts and the ability to sell products into established markets are additional positive evidence. Negative evidence includes items such as cumulative losses, projections of future losses, or carryforward periods that are not long enough to allow for the utilization of a deferred tax asset based on existing projections of income. Deferred tax assets for which no valuation allowance is recorded may not be realized upon changes in facts and circumstances, resulting in a future charge to establish a valuation allowance. Existing valuation allowances are re-examined under the same standards of positive and negative evidence. If it is determined that it is more likely than not that a deferred tax asset will be realized, the appropriate amount of the valuation allowance, if any, is released. Deferred tax assets and liabilities are also re-measured to reflect changes in underlying tax rates due to law changes and the granting and lapse of tax holidays.

In 2013, Alcoa recognized a \$372 discrete income tax charge for valuation allowances on certain deferred tax assets in Spain and the United States. Of this amount, a \$237 valuation allowance was established on the full value of the deferred tax assets related to a Spanish consolidated tax group. These deferred tax assets have an expiration period ranging from 2016 (for certain credits) to an unlimited life (for operating losses). After weighing all available positive and negative evidence, as described above, management determined that it was no longer more likely than not that Alcoa will realize the tax benefit of these deferred tax assets. This was mainly driven by a decline in the outlook of the Primary Metals business (2013 realized prices were the lowest since 2009) combined with prior year cumulative losses of the Spanish consolidated tax group. During 2014, the underlying value of the deferred tax assets decreased due to a remeasurement as a result of the enactment of new tax rates in Spain beginning in 2015 (see Income Taxes in Earnings Summary under Results of Operations above), the sale of a member of the Spanish consolidated tax group, and a change in foreign currency exchange rates. As a result, the valuation allowance decreased by the same amount. At December 31, 2015, the amount of the valuation allowance was \$149. This valuation allowance was reevaluated as of December 31, 2015, and no change to the allowance was deemed necessary based on all available evidence. The need

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for this valuation allowance will be assessed on a continuous basis in future periods and, as a result, a portion or all of the allowance may be reversed based on changes in facts and circumstances.

The remaining \$135 recognized in 2013 relates to a valuation allowance established on a portion of available foreign tax credits in the United States. These credits can be carried forward for 10 years, and have an expiration period ranging from 2016 to 2023 as of December 31, 2013 (2016 to 2025 as of December 31, 2015). After weighing all available positive and negative evidence, as described above, management determined that it was no longer more likely than not that Alcoa will realize the full tax benefit of these foreign tax credits. This was primarily due to lower foreign sourced taxable income after consideration of tax planning strategies and after the inclusion of earnings from foreign subsidiaries projected to be distributable as taxable foreign dividends. This valuation allowance was reevaluated as of December 31, 2015, and due to reductions in foreign sourced taxable income, a \$134 discrete income tax charge was recognized. Additionally, \$15 of foreign tax credits expired at the end of 2015 resulting in a corresponding decrease to the valuation allowance. At December 31, 2015, the amount of the valuation allowance was \$254. The need for this valuation allowance will be assessed on a continuous basis in future periods and, as a result, an increase or decrease to this allowance may result based on changes in facts and circumstances.

In 2015, Alcoa recognized an additional \$141 discrete income tax charge for valuation allowances on certain deferred tax assets in Iceland and Suriname. Of this amount, an \$85 valuation allowance was established on the full value of the deferred tax assets in Suriname, which were related mostly to employee benefits and tax loss carryforwards. These deferred tax assets have an expiration period ranging from 2016 to 2022. The remaining \$56 charge relates to a valuation allowance established on a portion of the deferred tax assets recorded in Iceland. These deferred tax assets have an expiration period ranging from 2017 to 2023. After weighing all available positive and negative evidence, as described above, management determined that it was no longer more likely than not that Alcoa will realize the tax benefit of either of these deferred tax assets. This was mainly driven by a decline in the outlook of the Primary Metals business, combined with prior year cumulative losses and a short expiration period. The need for this valuation allowance will be assessed on a continuous basis in future periods and, as a result, a portion or all of the allowance may be reversed based on changes in facts and circumstances.

Tax benefits related to uncertain tax positions taken or expected to be taken on a tax return are recorded when such benefits meet a more likely than not threshold. Otherwise, these tax benefits are recorded when a tax position has been effectively settled, which means that the statute of limitation has expired or the appropriate taxing authority has completed their examination even though the statute of limitations remains open. Interest and penalties related to uncertain tax positions are recognized as part of the provision for income taxes and are accrued beginning in the period that such interest and penalties would be applicable under relevant tax law until such time that the related tax benefits are recognized.

## **Related Party Transactions**

Alcoa buys products from and sells products to various related companies, consisting of entities in which Alcoa retains a 50% or less equity interest, at negotiated prices between the two parties. These transactions were not material to the financial position or results of operations of Alcoa for all periods presented.

## **Recently Adopted Accounting Guidance**

See the Recently Adopted Accounting Guidance section of Note A to the Consolidated Financial Statements in Part II Item 8 of this Form 10-K.

## **Recently Issued Accounting Guidance**

See the Recently Issued Accounting Guidance section of Note A to the Consolidated Financial Statements in Part II Item 8 of this Form 10-K.

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

See the Derivatives section of Note X to the Consolidated Financial Statements in Part II Item 8 of this Form 10-K.

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**Item 8. Financial Statements and Supplementary Data.**

**Management's Reports to Alcoa Shareholders**

**Management's Report on Financial Statements and Practices**

The accompanying Consolidated Financial Statements of Alcoa Inc. and its subsidiaries (the Company) were prepared by management, which is responsible for their integrity and objectivity. The statements were prepared in accordance with accounting principles generally accepted in the United States of America and include amounts that are based on management's best judgments and estimates. The other financial information included in the annual report is consistent with that in the financial statements.

Management also recognizes its responsibility for conducting the Company's affairs according to the highest standards of personal and corporate conduct. This responsibility is characterized and reflected in key policy statements issued from time to time regarding, among other things, conduct of its business activities within the laws of the host countries in which the Company operates and potentially conflicting outside business interests of its employees. The Company maintains a systematic program to assess compliance with these policies.

**Management's Report on Internal Control over Financial Reporting**

Management is responsible for establishing and maintaining adequate internal control over financial reporting for the Company. In order to evaluate the effectiveness of internal control over financial reporting, as required by Section 404 of the Sarbanes-Oxley Act, management has conducted an assessment, including testing, using the criteria in *Internal Control Integrated Framework (2013)*, issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). The Company's system of internal control over financial reporting is 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. The 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 accounting principles generally accepted in the United States of America, 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.

Based on the assessment, management has concluded that the Company maintained effective internal control over financial reporting as of December 31, 2015, based on criteria in *Internal Control Integrated Framework (2013)* issued by the COSO.

The effectiveness of the Company's internal control over financial reporting as of December 31, 2015 has been audited by PricewaterhouseCoopers LLP, an independent registered public accounting firm, as stated in their report, which is included herein.

RTI International Metals has been excluded from management's assessment of internal control over financial reporting as of December 31, 2015, as it was acquired by the Company in a purchase business combination in July 2015. RTI International Metals is a 100% owned subsidiary whose total assets (excluding goodwill and intangible assets) and total sales represent 5% and 1%, respectively, of the related consolidated financial statement amounts of the Company as of and for the year ended December 31, 2015.

/s/ Klaus Kleinfeld

Klaus Kleinfeld

Chairman and

Chief Executive Officer

/s/ William F. Oplinger  
William F. Oplinger

Executive Vice President and

Chief Financial Officer

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**Report of Independent Registered Public Accounting Firm**

To the Shareholders and Board of Directors of Alcoa Inc.

In our opinion, the accompanying consolidated balance sheet and the related statements of consolidated operations, consolidated comprehensive loss, changes in consolidated equity, and consolidated cash flows present fairly, in all material respects, the financial position of Alcoa Inc. and its subsidiaries (the Company) at December 31, 2015 and 2014, and the results of their operations and their cash flows for each of the three years in the period ended December 31, 2015 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, 2015, 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.

As disclosed in Recently Adopted Accounting Guidance in Note A to the consolidated financial statements, the Company changed the classification of current deferred income tax assets and liabilities in the consolidated balance sheet at December 31, 2015 and 2014.

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 accounting principles generally accepted in the United States of America. 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 accounting principles generally accepted in the United States of America, 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 the accompanying Management's Report on Internal Control over Financial Reporting, management has excluded RTI International Metals from its assessment of internal control over financial reporting as of December 31, 2015 because it was acquired by the Company in a purchase business combination in July 2015. We have also excluded RTI International Metals from our audit of internal control over financial reporting. RTI International Metals is a 100% owned subsidiary whose total assets (excluding goodwill and intangible assets) and total sales represent 5% and 1%, respectively, of the related consolidated financial statement amounts of the Company as of and for the year ended December 31, 2015.

/s/ PricewaterhouseCoopers LLP

PricewaterhouseCoopers LLP

Pittsburgh, Pennsylvania

February 19, 2016



**Table of Contents****Alcoa and subsidiaries****Statement of Consolidated Operations****(in millions, except per-share amounts)**

| <b>For the year ended December 31,</b>                           | <b>2015</b>  | <b>2014</b>   | <b>2013</b>       |
|--|--------------|---------------|-------------------|
| Sales (Q)  | \$ 22,534    | \$ 23,906     | \$ 23,032         |
| Cost of goods sold (exclusive of expenses below)                 | 18,069       | 19,137        | 19,286            |
| Selling, general administrative, and other expenses              | 979          | 995           | 1,008             |
| Research and development expenses                                | 238          | 218           | 192               |
| Provision for depreciation, depletion, and amortization          | 1,280        | 1,371         | 1,421             |
| Impairment of goodwill (A & E)                                   | 25           | -             | 1,731             |
| Restructuring and other charges (D)                              | 1,195        | 1,168         | 782               |
| Interest expense (V)   | 498          | 473           | 453               |
| Other expenses (income), net (O)                                 | 2            | 47            | (25)              |
| Total costs and expenses   | 22,286       | 23,409        | 24,848            |
| Income (loss) before income taxes                                | 248          | 497           | (1,816)           |
| Provision for income taxes (T)                                   | 445          | 320           | 428               |
| Net (loss) income  | (197)        | 177           | (2,244)           |
| Less: Net income (loss) attributable to noncontrolling interests | 125          | (91)          | 41                |
| <b>Net (Loss) Income Attributable to Alcoa</b>                   | <b>(322)</b> | <b>\$ 268</b> | <b>\$ (2,285)</b> |
| <b>Amounts Attributable to Alcoa Common Shareholders (S):</b>    |              |               |                   |
| Net (loss) income  | (391)        | \$ 247        | \$ (2,287)        |
| Earnings per share:  |              |               |                   |
| Basic  | \$ (0.31)    | \$ 0.21       | \$ (2.14)         |
| Diluted  | \$ (0.31)    | \$ 0.21       | \$ (2.14)         |

The accompanying notes are an integral part of the consolidated financial statements.

**Table of Contents****Alcoa and subsidiaries****Statement of Consolidated Comprehensive Loss**

(in millions)

| For the year ended December 31,   | Alcoa             |                 |                   | Noncontrolling Interests |                 |                 | Total             |                   |                   |
|---|-------------------|-----------------|-------------------|--------------------------|-----------------|-----------------|-------------------|-------------------|-------------------|
|   | 2015              | 2014            | 2013              | 2015                     | 2014            | 2013            | 2015              | 2014              | 2013              |
| Net (loss) income   | \$ (322)          | \$ 268          | \$ (2,285)        | \$ 125                   | \$ (91)         | \$ 41           | \$ (197)          | \$ 177            | \$ (2,244)        |
| Other comprehensive loss, net of tax (B):   |                   |                 |                   |                          |                 |                 |                   |                   |                   |
| Change in unrecognized net actuarial loss and prior service cost/benefit related to pension and other postretirement benefits | (10)              | (69)            | 531               | 8                        | (13)            | 26              | (2)               | (82)              | 557               |
| Foreign currency translation adjustments  | (1,566)           | (1,025)         | (968)             | (429)                    | (241)           | (367)           | (1,995)           | (1,266)           | (1,335)           |
| Net change in unrealized gains on available-for-sale securities   | (5)               | (2)             | (1)               | -                        | -               | -               | (5)               | (2)               | (1)               |
| Net change in unrecognized losses on cash flow hedges   | 827               | 78              | 181               | (1)                      | -               | 3               | 826               | 78                | 184               |
| Total Other comprehensive loss, net of tax  | (754)             | (1,018)         | (257)             | (422)                    | (254)           | (338)           | (1,176)           | (1,272)           | (595)             |
| <b>Comprehensive loss</b>   | <b>\$ (1,076)</b> | <b>\$ (750)</b> | <b>\$ (2,542)</b> | <b>\$ (297)</b>          | <b>\$ (345)</b> | <b>\$ (297)</b> | <b>\$ (1,373)</b> | <b>\$ (1,095)</b> | <b>\$ (2,839)</b> |

The accompanying notes are an integral part of the consolidated financial statements.



**Table of Contents****Alcoa and subsidiaries****Consolidated Balance Sheet**

(in millions)

| <b>December 31,</b>  | <b>2015</b>      | <b>2014</b>      |
|--|------------------|------------------|
| <b>Assets</b>  |                  |                  |
| Current assets:  |                  |                  |
| Cash and cash equivalents (X)  | \$ 1,919         | \$ 1,877         |
| Receivables from customers, less allowances of \$13 in 2015 and \$14 in 2014 (U) | 1,340            | 1,395            |
| Other receivables (U)  | 522              | 733              |
| Inventories (G)  | 3,442            | 3,082            |
| Prepaid expenses and other current assets  | 730              | 761              |
| Total current assets   | 7,953            | 7,848            |
| Properties, plants, and equipment, net (H)                                       | 14,815           | 16,426           |
| Goodwill (A & E)   | 5,401            | 5,247            |
| Investments (I)  | 1,685            | 1,944            |
| Deferred income taxes (T)  | 2,668            | 3,139            |
| Other noncurrent assets (J)  | 4,006            | 2,759            |
| <b>Total Assets</b>  | <b>\$ 36,528</b> | <b>\$ 37,363</b> |
| <b>Liabilities</b>   |                  |                  |
| Current liabilities:   |                  |                  |
| Short-term borrowings (K & X)  | \$ 38            | \$ 54            |
| Accounts payable, trade  | 2,889            | 3,152            |
| Accrued compensation and retirement costs  | 850              | 937              |
| Taxes, including income taxes  | 239              | 265              |
| Other current liabilities  | 1,174            | 1,021            |
| Long-term debt due within one year (K & X)                                       | 21               | 29               |
| Total current liabilities  | 5,211            | 5,458            |
| Long-term debt, less amount due within one year (K & X)                          | 9,044            | 8,769            |
| Accrued pension benefits (W)   | 3,298            | 3,291            |
| Accrued other postretirement benefits (W)  | 2,106            | 2,155            |
| Other noncurrent liabilities and deferred credits (L)                            | 2,738            | 2,896            |
| Total liabilities  | 22,397           | 22,569           |
| Contingencies and commitments (N)  |                  |                  |
| <b>Equity</b>  |                  |                  |
| Alcoa shareholders' equity:  |                  |                  |
| Preferred stock (R)  | 55               | 55               |
| Mandatory convertible preferred stock (R)  | 3                | 3                |
| Common stock (R)   | 1,391            | 1,304            |
| Additional capital   | 10,019           | 9,284            |
| Retained earnings  | 8,834            | 9,379            |
| Treasury stock, at cost  | (2,825)          | (3,042)          |
| Accumulated other comprehensive loss (B)   | (5,431)          | (4,677)          |
| Total Alcoa shareholders' equity   | 12,046           | 12,306           |
| Noncontrolling interests (M)   | 2,085            | 2,488            |
| Total equity   | 14,131           | 14,794           |
| <b>Total Liabilities and Equity</b>  | <b>\$ 36,528</b> | <b>\$ 37,363</b> |

The accompanying notes are an integral part of the consolidated financial statements.

**Table of Contents****Alcoa and subsidiaries****Statement of Consolidated Cash Flows**

(in millions)

| <b>For the year ended December 31,</b>  | <b>2015</b>    | <b>2014</b>    | <b>2013</b>    |
|---|----------------|----------------|----------------|
| <b>Cash from Operations</b>   |                |                |                |
| Net (loss) income   | \$ (197)       | \$ 177         | \$ (2,244)     |
| Adjustments to reconcile net (loss) income to cash from operations:   |                |                |                |
| Depreciation, depletion, and amortization   | 1,280          | 1,372          | 1,422          |
| Deferred income taxes (T)   | 34             | (35)           | 178            |
| Equity income, net of dividends   | 158            | 104            | 77             |
| Impairment of goodwill (A & E)  | 25             | -              | 1,731          |
| Restructuring and other charges (D)   | 1,195          | 1,168          | 782            |
| Net gain from investing activities - asset sales (O)  | (74)           | (47)           | (10)           |
| Net periodic pension benefit cost (W)   | 485            | 423            | 516            |
| Stock-based compensation (R)  | 92             | 87             | 71             |
| Excess tax benefits from stock-based payment arrangements   | (9)            | (9)            | -              |
| Other   | (32)           | 66             | 4              |
| Changes in assets and liabilities, excluding effects of acquisitions, divestitures, and foreign currency translation adjustments: |                |                |                |
| Decrease (increase) in receivables  | 212            | (312)          | (141)          |
| (Increase) decrease in inventories  | (64)           | (355)          | 25             |
| Decrease (increase) in prepaid expenses and other current assets  | 46             | (25)           | (9)            |
| (Decrease) increase in accounts payable, trade  | (90)           | 256            | 326            |
| (Decrease) in accrued expenses  | (437)          | (451)          | (418)          |
| Increase (decrease) in taxes, including income taxes  | 25             | 7              | (43)           |
| Pension contributions (W)   | (470)          | (501)          | (462)          |
| (Increase) in noncurrent assets   | (370)          | (42)           | (156)          |
| (Decrease) increase in noncurrent liabilities   | (227)          | (209)          | (71)           |
| <b>Cash provided from operations</b>  | <b>1,582</b>   | <b>1,674</b>   | <b>1,578</b>   |
| <b>Financing Activities</b>   |                |                |                |
| Net change in short-term borrowings (original maturities of three months or less) (K)   | (16)           | (2)            | 5              |
| Additions to debt (original maturities greater than three months) (K)   | 1,901          | 2,878          | 1,852          |
| Debt issuance costs   | (3)            | (17)           | (3)            |
| Payments on debt (original maturities greater than three months) (K)  | (2,030)        | (1,723)        | (2,317)        |
| Proceeds from exercise of employee stock options (R)  | 25             | 150            | 13             |
| Excess tax benefits from stock-based payment arrangements   | 9              | 9              | -              |
| Issuance of mandatory convertible preferred stock (R)   | -              | 1,211          | -              |
| Dividends paid to shareholders  | (223)          | (161)          | (132)          |
| Distributions to noncontrolling interests   | (106)          | (120)          | (109)          |
| Contributions from noncontrolling interests (M)   | 2              | 53             | 12             |
| Acquisitions of noncontrolling interests (M & P)  | -              | (28)           | -              |
| <b>Cash (used for) provided from financing activities</b>   | <b>(441)</b>   | <b>2,250</b>   | <b>(679)</b>   |
| <b>Investing Activities</b>   |                |                |                |
| Capital expenditures  | (1,180)        | (1,219)        | (1,193)        |
| Acquisitions, net of cash acquired (F & P)  | 97             | (2,385)        | -              |
| Proceeds from the sale of assets and businesses (F)   | 112            | 253            | 13             |
| Additions to investments (I & N)  | (134)          | (195)          | (293)          |
| Sales of investments (I)  | 40             | 57             | -              |
| Net change in restricted cash   | (20)           | (2)            | 170            |
| Other   | 25             | 31             | 13             |
| <b>Cash used for investing activities</b>   | <b>(1,060)</b> | <b>(3,460)</b> | <b>(1,290)</b> |
| <b>Effect of exchange rate changes on cash and cash equivalents</b>   | <b>(39)</b>    | <b>(24)</b>    | <b>(33)</b>    |

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|   |                 |                 |                 |
|---|-----------------|-----------------|-----------------|
| Net change in cash and cash equivalents         | 42              | 440             | (424)           |
| Cash and cash equivalents at beginning of year  | 1,877           | 1,437           | 1,861           |
| <b>Cash and cash equivalents at end of year</b> | <b>\$ 1,919</b> | <b>\$ 1,877</b> | <b>\$ 1,437</b> |

The accompanying notes are an integral part of the consolidated financial statements.

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## Alcoa and subsidiaries

## Statement of Changes in Consolidated Equity

(in millions, except per-share amounts)

|   | Alcoa Shareholders              |       |          |              |                    |                   |                |                                      |                          |              |
|---|---------------------------------|-------|----------|--------------|--------------------|-------------------|----------------|--------------------------------------|--------------------------|--------------|
|   | Mandatory convertible preferred |       |          | Common stock | Additional capital | Retained earnings | Treasury stock | Accumulated other comprehensive loss | Noncontrolling interests | Total equity |
|   | Preferred stock                 | stock | stock    |              |                    |                   |                |                                      |                          |              |
|   | Preferred stock                 | stock | stock    | Common stock | Additional capital | Retained earnings | Treasury stock | Accumulated other comprehensive loss | Noncontrolling interests | Total equity |
| <b>Balance at December 31, 2012</b>                   | 55                              | -     | 1,178    | 7,560        | 11,689             | (3,881)           | (3,402)        | 3,324                                | 16,523                   |              |
| Net (loss) income                                     | -                               | -     | -        | -            | (2,285)            | -                 | -              | 41                                   | (2,244)                  |              |
| Other comprehensive loss (B)                          | -                               | -     | -        | -            | -                  | -                 | (257)          | (338)                                | (595)                    |              |
| Cash dividends declared:                              |                                 |       |          |              |                    |                   |                |                                      |                          |              |
| Preferred @ \$3.75 per share                          | -                               | -     | -        | -            | (2)                | -                 | -              | -                                    | (2)                      |              |
| Common @ \$0.12 per share                             | -                               | -     | -        | -            | (130)              | -                 | -              | -                                    | (130)                    |              |
| Stock-based compensation (R)                          | -                               | -     | -        | 71           | -                  | -                 | -              | -                                    | 71                       |              |
| Common stock issued: compensation plans (R)           | -                               | -     | -        | (122)        | -                  | 119               | -              | -                                    | (3)                      |              |
| Distributions   | -                               | -     | -        | -            | -                  | -                 | -              | (109)                                | (109)                    |              |
| Contributions (M)                                     | -                               | -     | -        | -            | -                  | -                 | -              | 12                                   | 12                       |              |
| Other   | -                               | -     | -        | -            | -                  | -                 | -              | (1)                                  | (1)                      |              |
| <b>Balance at December 31, 2013</b>                   | 55                              | -     | 1,178    | 7,509        | 9,272              | (3,762)           | (3,659)        | 2,929                                | 13,522                   |              |
| Net (loss) income                                     | -                               | -     | -        | -            | 268                | -                 | -              | (91)                                 | 177                      |              |
| Other comprehensive loss (B)                          | -                               | -     | -        | -            | -                  | -                 | (1,018)        | (254)                                | (1,272)                  |              |
| Cash dividends declared:                              |                                 |       |          |              |                    |                   |                |                                      |                          |              |
| Preferred Class A @ \$3.75 per share                  | -                               | -     | -        | -            | (2)                | -                 | -              | -                                    | (2)                      |              |
| Preferred Class B @ \$7.53993 per share               | -                               | -     | -        | -            | (19)               | -                 | -              | -                                    | (19)                     |              |
| Common @ \$0.12 per share                             | -                               | -     | -        | -            | (140)              | -                 | -              | -                                    | (140)                    |              |
| Stock-based compensation (R)                          | -                               | -     | -        | 87           | -                  | -                 | -              | -                                    | 87                       |              |
| Common stock issued: compensation plans (R)           | -                               | -     | -        | (584)        | -                  | 720               | -              | -                                    | 136                      |              |
| Issuance of mandatory convertible preferred stock (R) | -                               | 3     | -        | 1,210        | -                  | -                 | -              | -                                    | 1,213                    |              |
| Issuance of common stock (F, K, & R)                  | -                               | -     | 126      | 1,059        | -                  | -                 | -              | -                                    | 1,185                    |              |
| Distributions   | -                               | -     | -        | -            | -                  | -                 | -              | (120)                                | (120)                    |              |
| Contributions (M)                                     | -                               | -     | -        | -            | -                  | -                 | -              | 53                                   | 53                       |              |
| Purchase of equity from noncontrolling interest (F)   | -                               | -     | -        | 3            | -                  | -                 | -              | (31)                                 | (28)                     |              |
| Other   | -                               | -     | -        | -            | -                  | -                 | -              | 2                                    | 2                        |              |
| <b>Balance at December 31, 2014</b>                   | \$ 55                           | \$ 3  | \$ 1,304 | \$ 9,284     | \$ 9,379           | \$ (3,042)        | \$ (4,677)     | \$ 2,488                             | \$ 14,794                |              |
| Net (loss) income                                     | -                               | -     | -        | -            | (322)              | -                 | -              | 125                                  | (197)                    |              |
| Other comprehensive loss (B)                          | -                               | -     | -        | -            | -                  | -                 | (754)          | (422)                                | (1,176)                  |              |
| Cash dividends declared:                              |                                 |       |          |              |                    |                   |                |                                      |                          |              |
| Preferred Class A @ \$3.75 per share                  | -                               | -     | -        | -            | (2)                | -                 | -              | -                                    | (2)                      |              |
| Preferred Class B @ \$26.8750 per share               | -                               | -     | -        | -            | (67)               | -                 | -              | -                                    | (67)                     |              |
| Common @ \$0.12 per share                             | -                               | -     | -        | -            | (154)              | -                 | -              | -                                    | (154)                    |              |
| Equity option on convertible notes (F)                | -                               | -     | -        | 55           | -                  | -                 | -              | -                                    | 55                       |              |
| Stock-based compensation (R)                          | -                               | -     | -        | 92           | -                  | -                 | -              | -                                    | 92                       |              |
| Common stock issued: compensation plans (R)           | -                               | -     | -        | (195)        | -                  | 217               | -              | -                                    | 22                       |              |
| Issuance of common stock (F, K, & R)                  | -                               | -     | 87       | 783          | -                  | -                 | -              | -                                    | 870                      |              |

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|                                     |              |             |                 |                  |                 |                   |                   |                 |                  |
|-------------------------------------|--------------|-------------|-----------------|------------------|-----------------|-------------------|-------------------|-----------------|------------------|
| Distributions                       | -            | -           | -               | -                | -               | -                 | -                 | (106)           | (106)            |
| Contributions (M)                   | -            | -           | -               | -                | -               | -                 | -                 | 2               | 2                |
| Other                               | -            | -           | -               | -                | -               | -                 | -                 | (2)             | (2)              |
| <b>Balance at December 31, 2015</b> | <b>\$ 55</b> | <b>\$ 3</b> | <b>\$ 1,391</b> | <b>\$ 10,019</b> | <b>\$ 8,834</b> | <b>\$ (2,825)</b> | <b>\$ (5,431)</b> | <b>\$ 2,085</b> | <b>\$ 14,131</b> |

The accompanying notes are an integral part of the consolidated financial statements.

**Table of Contents****Alcoa and subsidiaries****Notes to the Consolidated Financial Statements****(dollars in millions, except per-share amounts)****A. Summary of Significant Accounting Policies**

**Basis of Presentation.** The Consolidated Financial Statements of Alcoa Inc. and subsidiaries ( Alcoa or the Company ) are prepared in conformity with accounting principles generally accepted in the United States of America (GAAP) and require management to make certain judgments, estimates, and assumptions. These may affect the reported amounts of assets and liabilities and the disclosure of contingent assets and liabilities at the date of the financial statements. They also may affect the reported amounts of revenues and expenses during the reporting period. Actual results could differ from those estimates upon subsequent resolution of identified matters. Certain prior year amounts have been reclassified to conform to the current year presentation.

**Principles of Consolidation.** The Consolidated Financial Statements include the accounts of Alcoa and companies in which Alcoa has a controlling interest. Intercompany transactions have been eliminated. The equity method of accounting is used for investments in affiliates and other joint ventures over which Alcoa has significant influence but does not have effective control. Investments in affiliates in which Alcoa cannot exercise significant influence are accounted for on the cost method.

Management also evaluates whether an Alcoa entity or interest is a variable interest entity and whether Alcoa is the primary beneficiary. Consolidation is required if both of these criteria are met. Alcoa does not have any variable interest entities requiring consolidation.

**Related Party Transactions.** Alcoa buys products from and sells products to various related companies, consisting of entities in which Alcoa retains a 50% or less equity interest, at negotiated prices between the two parties. These transactions were not material to the financial position or results of operations of Alcoa for all periods presented.

**Cash Equivalents.** Cash equivalents are highly liquid investments purchased with an original maturity of three months or less.

**Inventory Valuation.** Inventories are carried at the lower of cost or market, with cost for approximately half of U.S. and Canadian inventories determined under the last-in, first-out (LIFO) method. The cost of other inventories is principally determined under the average-cost method.

**Properties, Plants, and Equipment.** Properties, plants, and equipment are recorded at cost. Depreciation is recorded principally on the straight-line method at rates based on the estimated useful lives of the assets. For greenfield assets, which refer to the construction of new assets on undeveloped land, the units of production method is used to record depreciation. These assets require a significant period (generally greater than one-year) to ramp-up to full production capacity. As a result, the units of production method is deemed a more systematic and rational method for recognizing depreciation on these assets. Depreciation is recorded on temporarily idled facilities until such time management approves a permanent shutdown. The following table details the weighted-average useful lives of structures and machinery and equipment by reporting segment (numbers in years):

| Segment                                   | Structures | Machinery and equipment |
|---|------------|-------------------------|
| Alumina:                                  |            |                         |
| Alumina refining                          | 30         | 27                      |
| Bauxite mining                            | 34         | 17                      |
| Primary Metals:                           |            |                         |
| Aluminum smelting                         | 36         | 22                      |
| Power generation                          | 31         | 22                      |
| Global Rolled Products                    | 31         | 21                      |
| Engineered Products and Solutions         | 29         | 18                      |
| Transportation and Construction Solutions | 28         | 19                      |

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Gains or losses from the sale of assets are generally recorded in other income or expenses (see policy below for assets classified as held for sale and discontinued operations). Repairs and maintenance are charged to expense as incurred. Interest related to the construction of qualifying assets is capitalized as part of the construction costs.

Properties, plants, and equipment are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount of such assets (asset group) may not be recoverable. Recoverability of assets is determined by comparing the estimated undiscounted net cash flows of the operations related to the assets (asset group) to their carrying amount. An impairment loss would be recognized when the carrying amount of the assets (asset group) exceeds the estimated undiscounted net cash flows. The amount of the impairment loss to be recorded is calculated as the excess of the carrying value of the assets (asset group) over their fair value, with fair value determined using the best information available, which generally is a discounted cash flow (DCF) model. The determination of what constitutes an asset group, the associated estimated undiscounted net cash flows, and the estimated useful lives of assets also require significant judgments.

**Mineral Rights.** Alcoa recognizes mineral rights upon specific acquisitions of land that include such underlying rights, primarily in Jamaica (in December 2014, Alcoa divested its ownership stake in the joint venture in Jamaica see Note F). This land is purchased for the sole purpose of mining bauxite. The underlying bauxite reserves are known at the time of acquisition based on associated drilling and analysis and are considered to be proven reserves. The acquisition cost of the land and mineral rights are amortized as the bauxite is produced based on the level of minable tons determined at the time of purchase. Mineral rights are included in Properties, plants, and equipment on the accompanying Consolidated Balance Sheet.

**Deferred Mining Costs.** Alcoa recognizes deferred mining costs during the development stage of a mine life cycle. Such costs include the construction of access and haul roads, detailed drilling and geological analysis to further define the grade and quality of the known bauxite, and overburden removal costs. These costs relate to sections of the related mines where Alcoa is either currently extracting bauxite or is preparing for production in the near term. These sections are outlined and planned incrementally and generally are mined over periods ranging from one to five years, depending on mine specifics. The amount of geological drilling and testing necessary to determine the economic viability of the bauxite deposit being mined is such that the reserves are considered to be proven, and the mining costs are amortized based on this level of reserves. Deferred mining costs are included in Other noncurrent assets on the accompanying Consolidated Balance Sheet.

**Goodwill and Other Intangible Assets.** Goodwill is not amortized; instead, it is reviewed for impairment annually (in the fourth quarter) or more frequently if indicators of impairment exist or if a decision is made to sell or exit a business. A significant amount of judgment is involved in determining if an indicator of impairment has occurred. Such indicators may include deterioration in general economic conditions, negative developments in equity and credit markets, adverse changes in the markets in which an entity operates, increases in input costs that have a negative effect on earnings and cash flows, or a trend of negative or declining cash flows over multiple periods, among others. The fair value that could be realized in an actual transaction may differ from that used to evaluate the impairment of goodwill.

Goodwill is allocated among and evaluated for impairment at the reporting unit level, which is defined as an operating segment or one level below an operating segment. Alcoa has ten reporting units, of which four are included in the Engineered Products and Solutions segment and three are included in the Transportation and Construction Solutions segment. The remaining three reporting units are the Alumina segment, the Primary Metals segment (all goodwill was impaired in 2013 see below), and the Global Rolled Products segment. More than 70% of Alcoa's total goodwill is allocated to two reporting units as follows: Alcoa Fastening Systems and Rings (AFSR) (\$2,232) and Alcoa Power and Propulsion (APP) (\$1,695) businesses, both of which are included in the Engineered Products and Solutions segment. These amounts include an allocation of Corporate's goodwill.

In November 2014, Alcoa acquired Firth Rixson (see Note F), and, as a result recognized \$1,801 in goodwill. This amount was allocated between the AFSR and Alcoa Forgings and Extrusion reporting units, which is part of the Engineered Products and Solutions segment. In March and July 2015, Alcoa acquired TITAL and RTI, respectively,

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(see Note F) and recognized \$118 and \$240, respectively, in goodwill. The goodwill amount related to TITAL was allocated to the APP reporting unit and the amount related to RTI was allocated to Alcoa Titanium and Engineered Products, a new Alcoa reporting unit that consists solely of the acquired RTI business and is part of the Engineered Products and Solutions segment.

In reviewing goodwill for impairment, an entity has the option to first assess qualitative factors to determine whether the existence of events or circumstances leads to a determination that it is more likely than not (greater than 50%) that the estimated fair value of a reporting unit is less than its carrying amount. If an entity elects to perform a qualitative assessment and determines that an impairment is more likely than not, the entity is then required to perform the existing two-step quantitative impairment test (described below), otherwise no further analysis is required. An entity also may elect not to perform the qualitative assessment and, instead, proceed directly to the two-step quantitative impairment test. The ultimate outcome of the goodwill impairment review for a reporting unit should be the same whether an entity chooses to perform the qualitative assessment or proceeds directly to the two-step quantitative impairment test.

Alcoa's policy for its annual review of goodwill is to perform the qualitative assessment for all reporting units not subjected directly to the two-step quantitative impairment test. Generally, management will proceed directly to the two-step quantitative impairment test for two to three reporting units (based on facts and circumstances) during each annual review of goodwill. This policy will result in each of the nine reporting units with goodwill being subjected to the two-step quantitative impairment test at least once during every three-year period.

Under the qualitative assessment, various events and circumstances (or factors) that would affect the estimated fair value of a reporting unit are identified (similar to impairment indicators above). These factors are then classified by the type of impact they would have on the estimated fair value using positive, neutral, and adverse categories based on current business conditions. Additionally, an assessment of the level of impact that a particular factor would have on the estimated fair value is determined using high, medium, and low weighting. Furthermore, management considers the results of the most recent two-step quantitative impairment test completed for a reporting unit and compares the weighted average cost of capital (WACC) between the current and prior years for each reporting unit.

During the 2015 annual review of goodwill, management performed the qualitative assessment for seven reporting units, the Alumina segment, the four reporting units in the Engineered Products and Solutions segment, including AFSR and APP, and two reporting units in the Transportation and Construction Solutions segment. Management concluded that it was not more likely than not that the estimated fair values of the seven reporting units were less than their carrying values. As such, no further analysis was required.

Under the two-step quantitative impairment test, the evaluation of impairment involves comparing the current fair value of each reporting unit to its carrying value, including goodwill. Alcoa uses a DCF model to estimate the current fair value of its reporting units when testing for impairment, as management believes forecasted cash flows are the best indicator of such fair value. A number of significant assumptions and estimates are involved in the application of the DCF model to forecast operating cash flows, including markets and market share, sales volumes and prices, production costs, tax rates, capital spending, discount rate, and working capital changes. Most of these assumptions vary significantly among the reporting units. Cash flow forecasts are generally based on approved business unit operating plans for the early years and historical relationships in later years. The betas used in calculating the individual reporting units' WACC rate are estimated for each business with the assistance of valuation experts.

In the event the estimated fair value of a reporting unit per the DCF model is less than the carrying value, additional analysis would be required. The additional analysis would compare the carrying amount of the reporting unit's goodwill with the implied fair value of that goodwill, which may involve the use of valuation experts. The implied fair value of goodwill is the excess of the fair value of the reporting unit over the fair value amounts assigned to all of the assets and liabilities of that unit as if the reporting unit was acquired in a business combination and the fair value of the reporting unit represented the purchase price. If the carrying value of goodwill exceeds its implied fair value, an impairment loss equal to such excess would be recognized, which could significantly and adversely impact reported results of operations and shareholders' equity.



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During the 2015 annual review of goodwill, management proceeded directly to the two-step quantitative impairment test for two reporting units as follows: Global Rolled Products segment and the soft alloys extrusion business in Brazil (hereafter SAE), which is included in the Transportation and Construction Solutions segment. The estimated fair value of the Global Rolled Products segment was substantially in excess of its respective carrying value, resulting in no impairment. For SAE, the estimated fair value as determined by the DCF model was lower than the associated carrying value. As a result, management performed the second step of the impairment analysis in order to determine the implied fair value of the SAE reporting unit's goodwill. The results of the second-step analysis showed that the implied fair value of the goodwill was zero. Therefore, in the fourth quarter of 2015, Alcoa recorded a goodwill impairment of \$25. The impairment of the SAE goodwill resulted from headwinds from the recent downturn in the Brazilian economy and the continued erosion of gross margin despite the execution of cost reduction strategies. As a result of the goodwill impairment, there is no goodwill remaining for the SAE reporting unit.

Goodwill impairment tests in prior years indicated that goodwill was not impaired for any of the Company's reporting units, except for the Primary Metals segment in 2013 (see below), and there were no triggering events since that time that necessitated an impairment test.

In 2013, for Primary Metals, the estimated fair value as determined by the DCF model was lower than the associated carrying value. As a result, management performed the second step of the impairment analysis in order to determine the implied fair value of Primary Metals' goodwill. The results of the second-step analysis showed that the implied fair value of goodwill was zero. Therefore, in the fourth quarter of 2013, Alcoa recorded a goodwill impairment of \$1,731 (\$1,719 after noncontrolling interest). As a result of the goodwill impairment, there is no goodwill remaining for the Primary Metals reporting unit.

The impairment of Primary Metals' goodwill resulted from several causes: the prolonged economic downturn; a disconnect between industry fundamentals and pricing that has resulted in lower metal prices; and the increased cost of alumina, a key raw material, resulting from expansion of the Alumina Price Index throughout the industry. All of these factors, exacerbated by increases in discount rates, continue to place significant downward pressure on metal prices and operating margins, and the resulting estimated fair value, of the Primary Metals business. As a result, management decreased the near-term and long-term estimates of the operating results and cash flows utilized in assessing Primary Metals' goodwill for impairment. The valuation of goodwill for the second step of the goodwill impairment analysis is considered a level 3 fair value measurement, which means that the valuation of the assets and liabilities reflect management's own judgments regarding the assumptions market participants would use in determining the fair value of the assets and liabilities.

Intangible assets with indefinite useful lives are not amortized while intangible assets with finite useful lives are amortized generally on a straight-line basis over the periods benefited. The following table details the weighted-average useful lives of software and other intangible assets by reporting segment (numbers in years):

| Segment                                   | Software | Other intangible assets |
|---|----------|-------------------------|
| Alumina                                   | 7        | 15                      |
| Primary Metals                            | 6        | 37                      |
| Global Rolled Products                    | 9        | 14                      |
| Engineered Products and Solutions         | 7        | 32                      |
| Transportation and Construction Solutions | 8        | 23                      |

**Equity Investments.** Alcoa invests in a number of privately-held companies, primarily through joint ventures and consortia, which are accounted for using the equity method. The equity method is applied in situations where Alcoa has the ability to exercise significant influence, but not control, over the investee. Management reviews equity investments for impairment whenever certain indicators are present suggesting that the carrying value of an investment is not recoverable. This analysis requires a significant amount of judgment from management to identify events or circumstances indicating that an equity investment is impaired. The following items are examples of impairment indicators: significant, sustained declines in an investee's revenue, earnings, and cash

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flow trends; adverse market conditions of the investee's industry or geographic area; the investee's ability to continue operations measured by several items, including liquidity; and other factors. Once an impairment indicator is identified, management uses considerable judgment to determine if the impairment is other than temporary, in which case the equity investment is written down to its estimated fair value. An impairment that is other than temporary could significantly and adversely impact reported results of operations.

**Revenue Recognition.** Alcoa recognizes revenue when title, ownership, and risk of loss pass to the customer, all of which occurs upon shipment or delivery of the product and is based on the applicable shipping terms. The shipping terms vary across all businesses and depend on the product, the country of origin, and the type of transportation (truck, train, or vessel).

Alcoa periodically enters into long-term supply contracts with alumina and aluminum customers and receives advance payments for product to be delivered in future periods. These advance payments are recorded as deferred revenue, and revenue is recognized as shipments are made and title, ownership, and risk of loss pass to the customer during the term of the contracts. Deferred revenue is included in Other current liabilities and Other noncurrent liabilities and deferred credits on the accompanying Consolidated Balance Sheet.

**Environmental Matters.** Expenditures for current operations are expensed or capitalized, as appropriate. Expenditures relating to existing conditions caused by past operations, which will not contribute to future revenues, are expensed. Liabilities are recorded when remediation costs are probable and can be reasonably estimated. The liability may include costs such as site investigations, consultant fees, feasibility studies, outside contractors, and monitoring expenses. Estimates are generally not discounted or reduced by potential claims for recovery. Claims for recovery are recognized as agreements are reached with third parties. The estimates also include costs related to other potentially responsible parties to the extent that Alcoa has reason to believe such parties will not fully pay their proportionate share. The liability is continuously reviewed and adjusted to reflect current remediation progress, prospective estimates of required activity, and other factors that may be relevant, including changes in technology or regulations.

**Litigation Matters.** For asserted claims and assessments, liabilities are recorded when an unfavorable outcome of a matter is deemed to be probable and the loss is reasonably estimable. Management determines the likelihood of an unfavorable outcome based on many factors such as the nature of the matter, available defenses and case strategy, progress of the matter, views and opinions of legal counsel and other advisors, applicability and success of appeals processes, and the outcome of similar historical matters, among others. Once an unfavorable outcome is deemed probable, management weighs the probability of estimated losses, and the most reasonable loss estimate is recorded. If an unfavorable outcome of a matter is deemed to be reasonably possible, then the matter is disclosed and no liability is recorded. With respect to unasserted claims or assessments, management must first determine that the probability that an assertion will be made is likely, then, a determination as to the likelihood of an unfavorable outcome and the ability to reasonably estimate the potential loss is made. Legal matters are reviewed on a continuous basis to determine if there has been a change in management's judgment regarding the likelihood of an unfavorable outcome or the estimate of a potential loss.

**Asset Retirement Obligations.** Alcoa recognizes asset retirement obligations (AROs) related to legal obligations associated with the normal operation of Alcoa's bauxite mining, alumina refining, and aluminum smelting facilities. These AROs consist primarily of costs associated with spent pot lining disposal, closure of bauxite residue areas, mine reclamation, and landfill closure. Alcoa also recognizes AROs for any significant lease restoration obligation, if required by a lease agreement, and for the disposal of regulated waste materials related to the demolition of certain power facilities. The fair values of these AROs are recorded on a discounted basis, at the time the obligation is incurred, and accreted over time for the change in present value. Additionally, Alcoa capitalizes asset retirement costs by increasing the carrying amount of the related long-lived assets and depreciating these assets over their remaining useful life.

Certain conditional asset retirement obligations (CAROs) related to alumina refineries, aluminum smelters, and fabrication facilities have not been recorded in the Consolidated Financial Statements due to uncertainties surrounding the ultimate settlement date. A CARO is a legal obligation to perform an asset retirement activity in which the timing

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and/or method of settlement are conditional on a future event that may or may not be within Alcoa's control. Such uncertainties exist as a result of the perpetual nature of the structures, maintenance and upgrade programs, and other factors. At the date a reasonable estimate of the ultimate settlement date can be made, Alcoa would record an ARO for the removal, treatment, transportation, storage, and/or disposal of various regulated assets and hazardous materials such as asbestos, underground and aboveground storage tanks, polychlorinated biphenyls (PCBs), various process residuals, solid wastes, electronic equipment waste, and various other materials. Such amounts may be material to the Consolidated Financial Statements in the period in which they are recorded.

**Income Taxes.** The provision for income taxes is determined using the asset and liability approach of accounting for income taxes. Under this approach, the provision for income taxes represents income taxes paid or payable (or received or receivable) for the current year plus the change in deferred taxes during the year. Deferred taxes represent the future tax consequences expected to occur when the reported amounts of assets and liabilities are recovered or paid, and result from differences between the financial and tax bases of Alcoa's assets and liabilities and are adjusted for changes in tax rates and tax laws when enacted.

Valuation allowances are recorded to reduce deferred tax assets when it is more likely than not that a tax benefit will not be realized. In evaluating the need for a valuation allowance, management considers all potential sources of taxable income, including income available in carryback periods, future reversals of taxable temporary differences, projections of taxable income, and income from tax planning strategies, as well as all available positive and negative evidence. Positive evidence includes factors such as a history of profitable operations, projections of future profitability within the carryforward period, including from tax planning strategies, and Alcoa's experience with similar operations. Existing favorable contracts and the ability to sell products into established markets are additional positive evidence. Negative evidence includes items such as cumulative losses, projections of future losses, or carryforward periods that are not long enough to allow for the utilization of a deferred tax asset based on existing projections of income. Deferred tax assets for which no valuation allowance is recorded may not be realized upon changes in facts and circumstances, resulting in a future charge to establish a valuation allowance. Existing valuation allowances are re-examined under the same standards of positive and negative evidence. If it is determined that it is more likely than not that a deferred tax asset will be realized, the appropriate amount of the valuation allowance, if any, is released. Deferred tax assets and liabilities are also re-measured to reflect changes in underlying tax rates due to law changes and the granting and lapse of tax holidays.

Tax benefits related to uncertain tax positions taken or expected to be taken on a tax return are recorded when such benefits meet a more likely than not threshold. Otherwise, these tax benefits are recorded when a tax position has been effectively settled, which means that the statute of limitation has expired or the appropriate taxing authority has completed their examination even though the statute of limitations remains open. Interest and penalties related to uncertain tax positions are recognized as part of the provision for income taxes and are accrued beginning in the period that such interest and penalties would be applicable under relevant tax law until such time that the related tax benefits are recognized.

**Stock-Based Compensation.** Alcoa recognizes compensation expense for employee equity grants using the non-substantive vesting period approach, in which the expense (net of estimated forfeitures) is recognized ratably over the requisite service period based on the grant date fair value. The fair value of new stock options is estimated on the date of grant using a lattice-pricing model. Determining the fair value of stock options at the grant date requires judgment, including estimates for the average risk-free interest rate, dividend yield, volatility, and exercise behavior. These assumptions may differ significantly between grant dates because of changes in the actual results of these inputs that occur over time.

Most plan participants can choose whether to receive their award in the form of stock options, stock awards, or a combination of both. This choice is made before the grant is issued and is irrevocable.

**Derivatives and Hedging.** Derivatives are held for purposes other than trading and are part of a formally documented risk management program. For derivatives designated as fair value hedges, Alcoa measures hedge effectiveness by formally assessing, at inception and at least quarterly, the historical high correlation of changes in the fair value of the

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hedged item and the derivative hedging instrument. For derivatives designated as cash flow hedges, Alcoa measures hedge effectiveness by formally assessing, at inception and at least quarterly, the probable high correlation of the expected future cash flows of the hedged item and the derivative hedging instrument. The ineffective portions of both types of hedges are recorded in sales or other income or expense in the current period. If the hedging relationship ceases to be highly effective or it becomes probable that an expected transaction will no longer occur, future gains or losses on the derivative instrument are recorded in other income or expense.

Alcoa accounts for interest rate swaps related to its existing long-term debt and hedges of firm customer commitments for aluminum as fair value hedges. As a result, the fair values of the derivatives and changes in the fair values of the underlying hedged items are reported in other current and noncurrent assets and liabilities in the Consolidated Balance Sheet. Changes in the fair values of these derivatives and underlying hedged items generally offset and are recorded each period in sales or interest expense, consistent with the underlying hedged item.

Alcoa accounts for hedges of foreign currency exposures and certain forecasted transactions as cash flow hedges. The fair values of the derivatives are recorded in other current and noncurrent assets and liabilities in the Consolidated Balance Sheet. The effective portions of the changes in the fair values of these derivatives are recorded in other comprehensive income and are reclassified to sales, cost of goods sold, or other income or expense in the period in which earnings are impacted by the hedged items or in the period that the transaction no longer qualifies as a cash flow hedge. These contracts cover the same periods as known or expected exposures, generally not exceeding five years.

If no hedging relationship is designated, the derivative is marked to market through earnings.

Cash flows from derivatives are recognized in the Statement of Consolidated Cash Flows in a manner consistent with the underlying transactions.

**Foreign Currency.** The local currency is the functional currency for Alcoa's significant operations outside the United States, except for certain operations in Canada, Russia, and Iceland, where the U.S. dollar is used as the functional currency. The determination of the functional currency for Alcoa's operations is made based on the appropriate economic and management indicators.

**Acquisitions.** Alcoa's business acquisitions are accounted for using the acquisition method. The purchase price is allocated to the assets acquired and liabilities assumed based on their estimated fair values. Any excess purchase price over the fair value of the net assets acquired is recorded as goodwill. For all acquisitions, operating results are included in the Statement of Consolidated Operations from the date of the acquisition.

**Discontinued Operations and Assets Held For Sale.** For those businesses where management has committed to a plan to divest, each business is valued at the lower of its carrying amount or estimated fair value less cost to sell. If the carrying amount of the business exceeds its estimated fair value, an impairment loss is recognized. Fair value is estimated using accepted valuation techniques such as a DCF model, valuations performed by third parties, earnings multiples, or indicative bids, when available. A number of significant estimates and assumptions are involved in the application of these techniques, including the forecasting of markets and market share, sales volumes and prices, costs and expenses, and multiple other factors. Management considers historical experience and all available information at the time the estimates are made; however, the fair value that is ultimately realized upon the divestiture of a business may differ from the estimated fair value reflected in the Consolidated Financial Statements. Depreciation, depletion, and amortization expense is not recorded on assets of a business to be divested once they are classified as held for sale. Businesses to be divested are classified in the Consolidated Financial Statements as either discontinued operations or held for sale.

For businesses classified as discontinued operations, the balance sheet amounts and results of operations are reclassified from their historical presentation to assets and liabilities of operations held for sale on the Consolidated Balance Sheet and to discontinued operations on the Statement of Consolidated Operations, respectively, for all periods presented. The gains or losses associated with these divested businesses are recorded in discontinued operations on the

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Statement of Consolidated Operations. The Statement of Consolidated Cash Flows is also reclassified for assets and liabilities of operations held for sale and discontinued operations for all periods presented. Additionally, segment information does not include the assets or operating results of businesses classified as discontinued operations for all periods presented. These businesses are expected to be disposed of within one year.

For businesses classified as held for sale that do not qualify for discontinued operations treatment, the balance sheet and cash flow amounts are reclassified from their historical presentation to assets and liabilities of operations held for sale for all periods presented. The results of operations continue to be reported in continuing operations. The gains or losses associated with these divested businesses are recorded in restructuring and other charges on the Statement of Consolidated Operations. The segment information includes the assets and operating results of businesses classified as held for sale for all periods presented. Management expects that Alcoa will have continuing involvement with these businesses following their divestiture, primarily in the form of equity participation, or ongoing aluminum or other significant supply contracts.

**Recently Adopted Accounting Guidance.** On January 1, 2015, Alcoa adopted changes issued by the Financial Accounting Standards Board (FASB) to reporting discontinued operations and disclosures of disposals of components of an entity. These changes require a disposal of a component to meet a higher threshold in order to be reported as a discontinued operation in an entity's financial statements. The threshold is defined as a strategic shift that has, or will have, a major effect on an entity's operations and financial results such as a disposal of a major geographical area or a major line of business. Additionally, the following two criteria have been removed from consideration of whether a component meets the requirements for discontinued operations presentation: (i) the operations and cash flows of a disposal component have been or will be eliminated from the ongoing operations of an entity as a result of the disposal transaction, and (ii) an entity will not have any significant continuing involvement in the operations of the disposal component after the disposal transaction. Furthermore, equity method investments now may qualify for discontinued operations presentation. These changes also require expanded disclosures for all disposals of components of an entity, whether or not the threshold for reporting as a discontinued operation is met, related to profit or loss information and/or asset and liability information of the component. The adoption of these changes had no impact on the Consolidated Financial Statements. This guidance will need to be considered in the event Alcoa initiates a disposal of a component.

In September 2015, the FASB issued changes to the accounting for measurement-period adjustments related to business combinations. Currently, an acquiring entity is required to retrospectively adjust the balance sheet amounts of the acquiree recognized at the acquisition date with a corresponding adjustment to goodwill during the measurement period, as well as revise comparative information for prior periods presented within financial statements as needed, including revising income effects, such as depreciation and amortization, as a result of changes made to the balance sheet amounts of the acquiree. Such adjustments are required when new information is obtained about facts and circumstances that existed as of the acquisition date that, if known, would have affected the measurement of the amounts initially recognized or would have resulted in the recognition of additional assets or liabilities. The measurement period is the period after the acquisition date during which the acquirer may adjust the balance sheet amounts recognized for a business combination (generally up to one year from the date of acquisition). The changes eliminate the requirement to make such retrospective adjustments, and, instead require the acquiring entity to record these adjustments in the reporting period they are determined. Additionally, the changes require the acquiring entity to present separately on the face of the income statement or disclose in the notes to the financial statements the portion of the amount recorded in current-period income by line item that would have been recorded in previous reporting periods if the adjustment to the balance sheet amounts had been recognized as of the acquisition date. These changes were to become effective for Alcoa on January 1, 2016; however, early adoption is permitted. As such, Alcoa elected to early adopt these changes upon issuance and applied the new requirements to three acquisitions (see Note F). In 2015, Alcoa recognized adjustments to the original balance sheet amounts of these three acquisitions, resulting in the recognition of amounts in current period operations that would have been recorded in previous reporting periods had the adjustments to the balance sheet amounts been recognized as of the respective acquisition date. Such amounts recorded in current period operations were not material to the Statement of Consolidated Operations for the year ended December 31, 2015.

In November 2015, the FASB issued changes to the balance sheet classification of deferred taxes, which Alcoa immediately adopted. These changes simplify the presentation of deferred income taxes by requiring all deferred

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income tax assets and liabilities to be classified as noncurrent in a classified balance sheet. The current requirement that deferred tax assets and liabilities of a tax-paying component of an entity be offset and presented as a single amount is not affected by these changes. As such, all deferred income tax assets and liabilities were classified in the Deferred income taxes and Other noncurrent liabilities and deferred credits, respectively, line items on the December 31, 2015 Consolidated Balance Sheet. Additionally, management elected to update the December 31, 2014 Consolidated Balance Sheet for these changes for comparative purposes. As a result \$421 of current deferred income tax assets (previously reported in Prepaid expenses and other current assets) and \$83 of current deferred income tax liabilities (previously reported in Taxes, including income taxes) were reclassified to the aforementioned noncurrent asset (\$385) and liability (\$47) line items on the December 31, 2014 Consolidated Balance Sheet.

**Recently Issued Accounting Guidance.** In January 2015, the FASB issued changes to the presentation of extraordinary items. Such items are defined as transactions or events that are both unusual in nature and infrequent in occurrence, and, currently, are required to be presented separately in an entity's income statement, net of income tax, after income from continuing operations. The changes eliminate the concept of an extraordinary item and, therefore, the presentation of such items will no longer be required. Notwithstanding this change, an entity will still be required to present and disclose a transaction or event that is both unusual in nature and infrequent in occurrence in the notes to the financial statements. These changes become effective for Alcoa on January 1, 2016. Management has determined that the adoption of these changes will not have an impact on the Consolidated Financial Statements.

In February 2015, the FASB issued changes to the analysis that an entity must perform to determine whether it should consolidate certain types of legal entities. These changes (i) modify the evaluation of whether limited partnerships and similar legal entities are variable interest entities or voting interest entities, (ii) eliminate the presumption that a general partner should consolidate a limited partnership, (iii) affect the consolidation analysis of reporting entities that are involved with variable interest entities, particularly those that have fee arrangements and related party relationships, and (iv) provide a scope exception from consolidation guidance for reporting entities with interests in legal entities that are required to comply with or operate in accordance with requirements that are similar to those in Rule 2a-7 of the Investment Company Act of 1940 for registered money market funds. These changes become effective for Alcoa on January 1, 2016. Management is currently evaluating the potential impact of these changes on the Consolidated Financial Statements.

In April 2015, the FASB issued changes to the presentation of debt issuance costs. Currently, such costs are required to be presented as a deferred asset in an entity's balance sheet and amortized into interest expense over the term of the related debt instrument. The changes require that debt issuance costs be presented in an entity's balance sheet as a direct deduction from the carrying value of the related debt liability. The amortization of debt issuance costs remains unchanged. These changes become effective for Alcoa on January 1, 2016. In August 2015, the FASB issued an update to these changes based on an announcement of the staff of the U.S. Securities and Exchange Commission. This change provides an exception to the April 2015 FASB changes allowing debt issuance costs related to line-of-credit arrangements to continue to be presented as an asset regardless of whether there are any outstanding borrowings under such arrangement. This additional change also becomes effective for Alcoa on January 1, 2016. Management has determined that the adoption of all of these changes will result in a decrease of \$58 to both Other noncurrent assets and Long-term debt, less amount due within one year on the accompanying Consolidated Balance Sheet.

In July 2015, the FASB issued changes to the subsequent measurement of inventory. Currently, an entity is required to measure its inventory at the lower of cost or market, whereby market can be replacement cost, net realizable value, or net realizable value less an approximately normal profit margin. The changes require that inventory be measured at the lower of cost and net realizable value, thereby eliminating the use of the other two market methodologies. Net realizable value is defined as the estimated selling prices in the ordinary course of business less reasonably predictable costs of completion, disposal, and transportation. These changes do not apply to inventories measured using LIFO (last-in, first-out) or the retail inventory method. Currently, Alcoa applies the net realizable value market option to measure non-LIFO inventories at the lower of cost or market. These changes become effective for Alcoa on January 1, 2017. Management has determined that the adoption of these changes will not have an impact on the Consolidated Financial Statements.

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In May 2014, the FASB issued changes to the recognition of revenue from contracts with customers. These changes created a comprehensive framework for all entities in all industries to apply in the determination of when to recognize revenue, and, therefore, supersede virtually all existing revenue recognition requirements and guidance. This framework is expected to result in less complex guidance in application while providing a consistent and comparable methodology for revenue recognition. The core principle of the guidance is that an entity should recognize revenue to depict the transfer of promised goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. To achieve this principle, an entity should apply the following steps: (i) identify the contract(s) with a customer, (ii) identify the performance obligations in the contract(s), (iii) determine the transaction price, (iv) allocate the transaction price to the performance obligations in the contract(s), and (v) recognize revenue when, or as, the entity satisfies a performance obligation. In August 2015, the FASB deferred the effective date by one year, making these changes effective for Alcoa on January 1, 2018. Management is currently evaluating the potential impact of these changes on the Consolidated Financial Statements.

In August 2014, the FASB issued changes to the disclosure of uncertainties about an entity's ability to continue as a going concern. Under GAAP, continuation of a reporting entity as a going concern is presumed as the basis for preparing financial statements unless and until the entity's liquidation becomes imminent. Even if an entity's liquidation is not imminent, there may be conditions or events that raise substantial doubt about the entity's ability to continue as a going concern. Because there is no guidance in GAAP about management's responsibility to evaluate whether there is substantial doubt about an entity's ability to continue as a going concern or to provide related note disclosures, there is diversity in practice whether, when, and how an entity discloses the relevant conditions and events in its financial statements. As a result, these changes require an entity's management to evaluate whether there are conditions or events, considered in the aggregate, that raise substantial doubt about the entity's ability to continue as a going concern within one year after the date that financial statements are issued. Substantial doubt is defined as an indication that it is probable that an entity will be unable to meet its obligations as they become due within one year after the date that financial statements are issued. If management has concluded that substantial doubt exists, then the following disclosures should be made in the financial statements: (i) principal conditions or events that raised the substantial doubt, (ii) management's evaluation of the significance of those conditions or events in relation to the entity's ability to meet its obligations, (iii) management's plans that alleviated the initial substantial doubt or, if substantial doubt was not alleviated, management's plans that are intended to at least mitigate the conditions or events that raise substantial doubt, and (iv) if the latter in (iii) is disclosed, an explicit statement that there is substantial doubt about the entity's ability to continue as a going concern. These changes become effective for Alcoa for the 2016 annual period. Management has determined that the adoption of these changes will not have an impact on the Consolidated Financial Statements. Subsequent to adoption, this guidance will need to be applied by management at the end of each annual period and interim period therein to determine what, if any, impact there will be on the Consolidated Financial Statements in a given reporting period.

**Table of Contents****B. Accumulated Other Comprehensive Loss**

The following table details the activity of the four components that comprise Accumulated other comprehensive loss for both Alcoa's shareholders and noncontrolling interests:

|  | Alcoa      |            |            | Noncontrolling Interests |          |          |
|--|------------|------------|------------|--------------------------|----------|----------|
|  | 2015       | 2014       | 2013       | 2015                     | 2014     | 2013     |
| <b>Pension and other postretirement benefits (W)</b>   |            |            |            |                          |          |          |
| Balance at beginning of period   | \$ (3,601) | \$ (3,532) | \$ (4,063) | \$ (64)                  | \$ (51)  | \$ (77)  |
| Other comprehensive (loss) income:   |            |            |            |                          |          |          |
| Unrecognized net actuarial loss and prior service cost/benefit                                 | (478)      | (492)      | 281        | 5                        | (22)     | 28       |
| Tax benefit (expense)  | 170        | 167        | (88)       | (1)                      | 7        | (9)      |
| Total Other comprehensive (loss) income before reclassifications, net of tax                   | (308)      | (325)      | 193        | 4                        | (15)     | 19       |
| Amortization of net actuarial loss and prior service cost/benefit <sup>(1)</sup>               | 458        | 394        | 520        | 6                        | 3        | 11       |
| Tax expense <sup>(2)</sup>   | (160)      | (138)      | (182)      | (2)                      | (1)      | (4)      |
| Total amount reclassified from Accumulated other comprehensive loss, net of tax <sup>(8)</sup> | 298        | 256        | 338        | 4                        | 2        | 7        |
| Total Other comprehensive (loss) income  | (10)       | (69)       | 531        | 8                        | (13)     | 26       |
| Balance at end of period   | \$ (3,611) | \$ (3,601) | \$ (3,532) | \$ (56)                  | \$ (64)  | \$ (51)  |
| <b>Foreign currency translation</b>  |            |            |            |                          |          |          |
| Balance at beginning of period   | \$ (846)   | \$ 179     | \$ 1,147   | \$ (351)                 | \$ (110) | \$ 257   |
| Other comprehensive loss <sup>(3)</sup>  | (1,566)    | (1,025)    | (968)      | (429)                    | (241)    | (367)    |
| Balance at end of period   | \$ (2,412) | \$ (846)   | \$ 179     | \$ (780)                 | \$ (351) | \$ (110) |
| <b>Available-for-sale securities</b>   |            |            |            |                          |          |          |
| Balance at beginning of period   | \$ -       | \$ 2       | \$ 3       | \$ -                     | \$ -     | \$ -     |
| Other comprehensive loss <sup>(4)</sup>  | (5)        | (2)        | (1)        | -                        | -        | -        |
| Balance at end of period   | \$ (5)     | \$ -       | \$ 2       | \$ -                     | \$ -     | \$ -     |
| <b>Cash flow hedges (X)</b>  |            |            |            |                          |          |          |
| Balance at beginning of period   | \$ (230)   | \$ (308)   | \$ (489)   | \$ (2)                   | \$ (2)   | \$ (5)   |
| Other comprehensive income (loss):   |            |            |            |                          |          |          |
| Net change from periodic revaluations  | 1,138      | 78         | 205        | (1)                      | -        | 4        |
| Tax expense  | (340)      | (21)       | (43)       | -                        | -        | (1)      |
| Total Other comprehensive income before reclassifications, net of tax                          | 798        | 57         | 162        | (1)                      | -        | 3        |
| Net amount reclassified to earnings:   |            |            |            |                          |          |          |
| Aluminum contracts <sup>(5)</sup>  | 21         | 27         | 18         | -                        | -        | -        |
| Energy contracts <sup>(6)</sup>  | 6          | -          | -          | -                        | -        | -        |
| Foreign exchange contracts <sup>(5)</sup>  | 5          | (3)        | 2          | -                        | -        | -        |
| Interest rate contracts <sup>(7)</sup>   | 1          | 1          | 2          | -                        | -        | -        |
| Nickel contracts <sup>(6)</sup>  | 2          | -          | -          | -                        | -        | -        |
| Sub-total  | 35         | 25         | 22         | -                        | -        | -        |
| Tax (expense) <sup>(2)</sup>   | (6)        | (4)        | (3)        | -                        | -        | -        |
| Total amount reclassified from Accumulated other comprehensive loss, net of tax <sup>(8)</sup> | 29         | 21         | 19         | -                        | -        | -        |
| Total Other comprehensive income (loss)  | 827        | 78         | 181        | (1)                      | -        | 3        |
| Balance at end of period   | \$ 597     | \$ (230)   | \$ (308)   | \$ (3)                   | \$ (2)   | \$ (2)   |



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- (1) These amounts were included in the computation of net periodic benefit cost for pension and other postretirement benefits (see Note W).
- (2) These amounts were included in Provision for income taxes on the accompanying Statement of Consolidated Operations.
- (3) In all periods presented, there were no tax impacts related to rate changes and no amounts were reclassified to earnings.
- (4) In all periods presented, unrealized and realized gains and losses related to these securities were immaterial. Realized gains and losses were included in Other expenses (income), net on the accompanying Statement of Consolidated Operations.
- (5) These amounts were included in Sales on the accompanying Statement of Consolidated Operations.
- (6) These amounts were included in Cost of goods sold on the accompanying Statement of Consolidated Operations.
- (7) These amounts were included in Interest expense on the accompanying Statement of Consolidated Operations.
- (8) A positive amount indicates a corresponding charge to earnings and a negative amount indicates a corresponding benefit to earnings. These amounts were reflected on the accompanying Statement of Consolidated Operations in the line items indicated in footnotes 1 through 7.

**C. Asset Retirement Obligations**

Alcoa has recorded AROs related to legal obligations associated with the normal operations of bauxite mining, alumina refining, and aluminum smelting facilities. These AROs consist primarily of costs associated with spent pot lining disposal, closure of bauxite residue areas, mine reclamation, and landfill closure. Alcoa also recognizes AROs for any significant lease restoration obligation, if required by a lease agreement, and for the disposal of regulated waste materials related to the demolition of certain power facilities.

In addition to AROs, certain CAROs related to alumina refineries, aluminum smelters, and fabrication facilities have not been recorded in the Consolidated Financial Statements due to uncertainties surrounding the ultimate settlement date. Such uncertainties exist as a result of the perpetual nature of the structures, maintenance and upgrade programs, and other factors. At the date a reasonable estimate of the ultimate settlement date can be made (e.g., planned demolition), Alcoa would record an ARO for the removal, treatment, transportation, storage, and/or disposal of various regulated assets and hazardous materials such as asbestos, underground and aboveground storage tanks, PCBs, various process residuals, solid wastes, electronic equipment waste, and various other materials. If Alcoa was required to demolish all such structures immediately, the estimated CARO as of December 31, 2015 ranges from less than \$1 to \$46 per structure (156 structures) in today's dollars.

The following table details the carrying value of recorded AROs by major category (of which \$97 and \$76 was classified as a current liability as of December 31, 2015 and 2014, respectively):

| <b>December 31,</b>              | <b>2015</b>   | <b>2014</b>   |
|----------------------------------|---------------|---------------|
| Spent pot lining disposal        | \$ 141        | \$ 170        |
| Closure of bauxite residue areas | 165           | 178           |
| Mine reclamation                 | 191           | 167           |
| Demolition*                      | 117           | 114           |
| Landfill closure                 | 30            | 31            |
| Other                            | 4             | 3             |
|                                  | <b>\$ 648</b> | <b>\$ 663</b> |

\* In 2015 and 2014, AROs were recorded as a result of management's decision to permanently shut down and demolish certain structures (see Note D).

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The following table details the changes in the total carrying value of recorded AROs:

| <b>December 31,</b>                    | <b>2015</b> | <b>2014</b> |
|--|-------------|-------------|
| Balance at beginning of year           | \$ 663      | \$ 629      |
| Accretion expense                      | 19          | 25          |
| Payments                               | (74)        | (84)        |
| Liabilities incurred                   | 96          | 144         |
| Divestitures*                          | -           | (20)        |
| Foreign currency translation and other | (56)        | (31)        |
| Balance at end of year                 | \$ 648      | \$ 663      |

\* In 2014, this amount relates to the sale of an interest in a bauxite mine and alumina refinery in Jamaica and a smelter in the United States (see Note F).

**D. Restructuring and Other Charges**

Restructuring and other charges for each year in the three-year period ended December 31, 2015 were comprised of the following:

|  | <b>2015</b> | <b>2014</b> | <b>2013</b> |
|--|-------------|-------------|-------------|
| Asset impairments  | \$ 335      | \$ 406      | \$ 116      |
| Layoff costs   | 299         | 259         | 201         |
| Legal matters in Italy (N)                                   | 201         | -           | -           |
| Net loss on divestitures of businesses (F)                   | 161         | 332         | -           |
| Resolution of a legal matter (N)                             | -           | -           | 391         |
| Other  | 213         | 199         | 82          |
| Reversals of previously recorded layoff and other exit costs | (14)        | (28)        | (8)         |
| Restructuring and other charges                              | \$ 1,195    | \$ 1,168    | \$ 782      |

Layoff costs were recorded based on approved detailed action plans submitted by the operating locations that specified positions to be eliminated, benefits to be paid under existing severance plans, union contracts or statutory requirements, and the expected timetable for completion of the plans.

**2015 Actions.** In 2015, Alcoa recorded Restructuring and other charges of \$1,195 (\$836 after-tax and noncontrolling interest), which were comprised of the following components: \$438 (\$281 after-tax and noncontrolling interest) for exit costs related to decisions to permanently shut down and demolish three smelters and a power station (see below); \$246 (\$118 after-tax and noncontrolling interest) for the curtailment of two refineries and two smelters (see below); \$201 (pre- and after-tax) related to legal matters in Italy (see Note N); a \$161 (\$151 after-tax and noncontrolling interest) net loss related to the March 2015 divestiture of a rolling mill in Russia and post-closing adjustments associated with three December 2014 divestitures (see Note F); \$143 (\$102 after-tax and noncontrolling interest) for layoff costs, including the separation of approximately 2,100 employees (425 in the Transportation and Construction Solutions segment, 645 in the Engineered Products and Solutions segment, 380 in the Primary Metals segment, 90 in the Global Rolled Products segment, 85 in the Alumina segment, and 475 in Corporate); \$34 (\$14 after-tax and noncontrolling interest) for asset impairments, virtually all of which was related to prior capitalized costs for an expansion project at a refinery in Australia that is no longer being pursued; an \$18 (\$13 after-tax) gain on the sale of land related to one of the rolling mills in Australia that was permanently closed in December 2014 (see 2014 Actions below); a net charge of \$4 (a net credit of \$7 after-tax and noncontrolling interest) for other miscellaneous items; and \$14 (\$11 after-tax and noncontrolling interest) for the reversal of a number of small layoff reserves related to prior periods.

During 2015, management initiated various alumina refining and aluminum smelting capacity curtailments and/or closures. The curtailments were composed of the remaining capacity at all of the following: the São Luís smelter in Brazil (74,000 metric-tons-per-year); the Suriname refinery (1,330,000 metric-tons-per-year); the Point Comfort, TX

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refinery (2,010,000 metric-tons-per-year); and the Wenatchee, WA smelter (143,000 metric-tons-per-year). All of the curtailments were completed in 2015 except for 1,635,000 metric-tons-per-year at the Point Comfort refinery, which is expected to be completed by the end of June 2016. The permanent closures were composed of the capacity at the Warrick, IN smelter (269,000 metric-tons-per-year) (includes the closure of a related coal mine) and the infrastructure of the Massena East, NY smelter (potlines were previously shut down in both 2013 and 2014 see 2013 Actions and 2014 Actions below), as the modernization of this smelter is no longer being pursued. The shutdown of the Warrick smelter is expected to be completed by the end of March 2016.

The decisions on the above actions were part of a separate 12-month review in refining (2,800,000 metric-tons-per-year) and smelting (500,000 metric-tons-per-year) capacity initiated by management in March 2015 for possible curtailment (partial or full), permanent closure or divestiture. While many factors contributed to each decision, in general, these actions were initiated to maintain competitiveness amid prevailing market conditions for both alumina and aluminum. Demolition and remediation activities related to the Warrick smelter and the Massena East location will begin in 2016 and are expected to be completed by the end of 2020.

Separate from the actions initiated under the reviews described above, in mid-2015, management approved the permanent shutdown and demolition of the Poços de Caldas smelter (capacity of 96,000 metric-tons-per-year) in Brazil and the Anglesea power station (includes the closure of a related coal mine) in Australia. The entire capacity at Poços de Caldas had been temporarily idled since May 2014 and the Anglesea power station was shut down at the end of August 2015. Demolition and remediation activities related to the Poços de Caldas smelter and the Anglesea power station began in late 2015 and are expected to be completed by the end of 2026 and 2020, respectively.

The decision on the Poços de Caldas smelter was due to management's conclusion that the smelter was no longer competitive as a result of challenging global market conditions for primary aluminum, which led to the initial curtailment, that have not dissipated and higher costs. For the Anglesea power station, the decision was made because a sale process did not result in a sale and there would have been imminent operating costs and financial constraints related to this site in the remainder of 2015 and beyond, including significant costs to source coal from available resources, necessary maintenance costs, and a depressed outlook for forward electricity prices. The Anglesea power station previously supplied approximately 40 percent of the power needs for the Point Henry smelter, which was closed in August 2014 (see 2014 Actions below).

In 2015, costs related to the shutdown and curtailment actions included asset impairments of \$217, representing the write-off of the remaining book value of all related properties, plants, and equipment; \$156 for the layoff of approximately 3,100 employees (1,800 in the Primary Metals segment and 1,300 in the Alumina segment), including \$30 in pension costs (see Note W); accelerated depreciation of \$84 related to certain facilities as they continued to operate during 2015; and \$227 in other exit costs. Additionally in 2015, remaining inventories, mostly operating supplies and raw materials, were written down to their net realizable value, resulting in a charge of \$90 (\$43 after-tax and noncontrolling interest), which was recorded in Cost of goods sold on the accompanying Statement of Consolidated Operations. The other exit costs of \$227 represent \$76 in asset retirement obligations and \$86 in environmental remediation, both of which were triggered by the decisions to permanently shut down and demolish the aforementioned structures in the United States, Brazil, and Australia (includes the rehabilitation of a related coal mine in each of Australia and the United States), and \$65 in supplier and customer contract-related costs.

As of December 31, 2015, approximately 1,500 of the 5,200 employees were separated. The remaining separations for 2015 restructuring programs are expected to be completed by the end of 2016. In 2015, cash payments of \$42 were made against layoff reserves related to 2015 restructuring programs.

**2014 Actions.** In 2014, Alcoa recorded Restructuring and other charges of \$1,168 (\$703 after-tax and noncontrolling interest), which were comprised of the following components: \$693 (\$443 after-tax and noncontrolling interest) for exit costs related to decisions to permanently shut down and demolish three smelters and two rolling mills (see below); a \$332 (\$163 after-tax and noncontrolling interest) net loss for the divestitures of four operations (see Note F); \$68 (\$45 after-tax and noncontrolling interest) for the temporary curtailment of two smelters and a related production slowdown

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at one refinery (see below); \$51 (\$36 after-tax and noncontrolling interest) for layoff costs, including the separation of approximately 1,120 employees (470 in the Engineered Products and Solutions segment, 360 in the Transportation and Construction Solutions segment, 45 in the Global Rolled Products segment, 60 in the Alumina and Primary Metals segments combined, and 185 in Corporate); \$34 (\$26 after-tax) for asset impairments related to prior capitalized costs for a modernization project at a smelter in Canada that is no longer being pursued; a net charge of \$18 (\$11 after-tax and noncontrolling interest) for other miscellaneous items, including \$2 (\$2 after-tax) for asset impairments and accelerated depreciation; and \$28 (\$21 after-tax and noncontrolling interest) for the reversal of a number of layoff reserves related to prior periods, including those associated with a smelter in Italy due to changes in facts and circumstances (see below).

In early 2014, management approved the permanent shutdown and demolition of the remaining capacity (84,000 metric-tons-per-year) at the Massena East, NY smelter and the full capacity (190,000 metric-tons-per-year) at the Point Henry smelter in Australia. The capacity at Massena East was fully shut down by the end of March 2014 and the Point Henry smelter was fully shut down in August 2014. Demolition and remediation activities related to both the Massena East and Point Henry smelters began in late 2014 and are expected to be completed by the end of 2020 and 2018, respectively.

The decisions on the Massena East and Point Henry smelters were part of a 15-month review of 460,000 metric tons of smelting capacity initiated by management in May 2013 (see 2013 Actions below) for possible curtailment. Through this review, management determined that the remaining capacity of the Massena East smelter was no longer competitive and the Point Henry smelter had no prospect of becoming financially viable. Management also initiated the temporary curtailment of the remaining capacity (62,000 metric-tons-per-year) at the Poços de Caldas smelter and additional capacity (85,000 metric-tons-per-year) at the São Luís smelter, both in Brazil. These curtailments were completed by the end of May 2014. As a result of these curtailments, 200,000 metric-tons-per-year of production at the Poços de Caldas refinery was reduced by the end of June 2014.

Also in early 2014, management approved the permanent shutdown of Alcoa's two rolling mills in Australia, Point Henry and Yennora. This decision was made due to the significant impact of excess can sheet capacity in both Australia and Asia. The two rolling mills had a combined can sheet capacity of 200,000 metric-tons-per-year and were closed by the end of 2014. Demolition and remediation activities related to the two rolling mills began in mid-2015 and are expected to be completed by the end of 2018.

Additionally, in August 2014, management approved the permanent shutdown and demolition of the capacity (150,000 metric-tons-per-year) at the Portovesme smelter in Italy, which had been idle since November 2012. This decision was made because the fundamental reasons that made the Portovesme smelter uncompetitive remained unchanged, including the lack of a viable long-term power solution. Demolition and remediation activities related to the Portovesme smelter will begin in 2016 and are expected to be completed by the end of 2020 (delayed due to discussions with the Italian government and other stakeholders).

In 2014, costs related to the shutdown and curtailment actions included \$208 for the layoff of approximately 1,790 employees (1,210 in the Primary Metals segment, 470 in the Global Rolled Products segment, 80 in the Alumina segment, and 30 in Corporate), including \$26 in pension costs (see Note W); accelerated depreciation of \$204 related to the three facilities in Australia as they continued to operate during 2014; asset impairments of \$166 representing the write-off of the remaining book value of all related properties, plants, and equipment; and \$183 in other exit costs. Additionally in 2014, remaining inventories, mostly operating supplies and raw materials, were written down to their net realizable value, resulting in a charge of \$67 (\$47 after-tax and noncontrolling interest), which was recorded in Cost of goods sold on the accompanying Statement of Consolidated Operations. The other exit costs of \$183 represent \$95 in asset retirement obligations and \$42 in environmental remediation, both of which were triggered by the decisions to permanently shut down and demolish the aforementioned structures in Australia, Italy, and the United States, and \$46 in other related costs, including supplier and customer contract-related costs.

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As of December 31, 2015, approximately 2,500 of the 2,870 employees (previously 2,910) were separated. The total number of employees associated with 2014 restructuring programs was updated to reflect employees, who were initially identified for separation, accepting other positions within Alcoa and natural attrition. The remaining separations for 2014 restructuring programs are expected to be completed by the end of 2016. In 2015 and 2014, cash payments of \$62 and \$141, respectively, were made against layoff reserves related to 2014 restructuring programs.

**2013 Actions.** In 2013, Alcoa recorded Restructuring and other charges of \$782 (\$585 after-tax and noncontrolling interests), which were comprised of the following components: \$391 (\$305 after-tax and noncontrolling interest) related to the resolution of a legal matter (see Government Investigations under Litigation in Note N); \$245 (\$183 after-tax) for exit costs related to the permanent shutdown and demolition of certain structures at three smelter locations (see below); \$87 (\$61 after-tax and noncontrolling interests) for layoff costs, including the separation of approximately 1,110 employees (340 in the Primary Metals segment, 250 in the Global Rolled Products segment, 220 in the Engineered Products and Solutions segment, 85 in the Alumina segment, 75 in the Transportation and Construction Solutions segment and 140 in Corporate), of which 590 relates to a global overhead reduction program, and \$9 in pension plan settlement charges related to previously separated employees; \$25 (\$17 after-tax) in net charges, including \$12 (\$8 after-tax) for asset impairments, related to retirements and/or the sale of previously idled structures; \$25 (\$13 after-tax and noncontrolling interests) for asset impairments related to the write-off of capitalized costs for projects no longer being pursued due to the market environment; a net charge of \$17 (\$12 after-tax and noncontrolling interests) for other miscellaneous items, including \$3 (\$2 after-tax) for asset impairments; and \$8 (\$6 after-tax and noncontrolling interests) for the reversal of a number of small layoff reserves related to prior periods.

In May 2013, management approved the permanent shutdown and demolition of two potlines (capacity of 105,000 metric-tons-per-year) that utilize Soderberg technology at the Baie Comeau smelter in Québec, Canada (remaining capacity of 280,000 metric-tons-per-year composed of two prebake potlines) and the full capacity (44,000 metric-tons-per-year) at the Fusina smelter in Italy. Additionally, in August 2013, management approved the permanent shutdown and demolition of one potline (capacity of 41,000 metric-tons-per-year) that utilizes Soderberg technology at the Massena East, NY smelter (remaining capacity of 84,000 metric-tons-per-year composed of two Soderberg potlines). The aforementioned Soderberg lines at Baie Comeau and Massena East were fully shut down by the end of September 2013 while the Fusina smelter was previously temporarily idled in 2010. Demolition and remediation activities related to all three facilities began in late 2013 and are expected to be completed by the end of 2016 for Massena East and by the end of 2017 for both Baie Comeau and Fusina.

The decisions on the Soderberg lines for Baie Comeau and Massena East were part of a 15-month review of 460,000 metric tons of smelting capacity initiated by management in May 2013 for possible curtailment, while the decision on the Fusina smelter was in addition to the capacity being reviewed. Factors leading to all three decisions were in general focused on achieving sustained competitiveness and included, among others: lack of an economically viable, long-term power solution (Italy); changed market fundamentals; other existing idle capacity; and restart costs.

In 2013, exit costs related to the shutdown actions included \$114 for the layoff of approximately 550 employees (Primary Metals segment), including \$83 in pension costs (see Note W); accelerated depreciation of \$58 (Baie Comeau) and asset impairments of \$18 (Fusina and Massena East) representing the write-off of the remaining book value of all related properties, plants, and equipment; and \$55 in other exit costs. Additionally in 2013, remaining inventories, mostly operating supplies and raw materials, were written down to their net realizable value resulting in a charge of \$9 (\$6 after-tax), which was recorded in Cost of goods sold on the accompanying Statement of Consolidated Operations. The other exit costs of \$55 represent \$48 in asset retirement obligations and \$5 in environmental remediation, both of which were triggered by the decisions to permanently shut down and demolish these structures, and \$2 in other related costs.

As of December 31, 2015, the separations associated with 2013 restructuring programs were essentially complete. In 2015, 2014, and 2013, cash payments of \$7, \$39, and \$33, respectively, were made against layoff reserves related to 2013 restructuring programs.

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Alcoa does not include Restructuring and other charges in the results of its reportable segments. The pretax impact of allocating such charges to segment results would have been as follows:

|   | 2015     | 2014     | 2013   |
|---|----------|----------|--------|
| Alumina                                   | \$ 233   | \$ 287   | \$ 11  |
| Primary Metals                            | 691      | 553      | 295    |
| Global Rolled Products                    | 131      | 266      | 15     |
| Engineered Products and Solutions         | 49       | 13       | 12     |
| Transportation and Construction Solutions | 8        | 10       | 16     |
| Segment total                             | 1,112    | 1,129    | 349    |
| Corporate                                 | 83       | 39       | 433    |
| Total restructuring and other charges     | \$ 1,195 | \$ 1,168 | \$ 782 |

Activity and reserve balances for restructuring charges were as follows:

|                                       | Layoff costs | Other exit costs | Total  |
|---------------------------------------|--------------|------------------|--------|
| Reserve balances at December 31, 2012 | \$ 59        | \$ 52            | \$ 111 |
| <b>2013:</b>                          |              |                  |        |
| Cash payments                         | (63)         | (11)             | (74)   |
| Restructuring charges                 | 201          | 85               | 286    |
| Other*                                | (101)        | (84)             | (185)  |
| Reserve balances at December 31, 2013 | 96           | 42               | 138    |
| <b>2014:</b>                          |              |                  |        |
| Cash payments                         | (191)        | (22)             | (213)  |
| Restructuring charges                 | 259          | 194              | 453    |
| Other*                                | (66)         | (180)            | (246)  |
| Reserve balances at December 31, 2014 | 98           | 34               | 132    |
| <b>2015:</b>                          |              |                  |        |
| Cash payments                         | (111)        | (12)             | (123)  |
| Restructuring charges                 | 299          | 233              | 532    |
| Other*                                | (60)         | (231)            | (291)  |
| Reserve balances at December 31, 2015 | \$ 226       | \$ 24            | \$ 250 |

\* Other includes reversals of previously recorded restructuring charges and the effects of foreign currency translation. In 2015, 2014, and 2013, Other for layoff costs also included a reclassification of \$35, \$26, and \$92, respectively, in pension and/or other postretirement benefits costs, as these obligations were included in Alcoa's separate liability for pension and other postretirement benefits obligations (see Note W).

Additionally in 2015, 2014, and 2013, Other for other exit costs also included a reclassification of the following restructuring charges: \$76, \$95, and \$58, respectively, in asset retirement and \$86, \$47, and \$12, respectively, in environmental obligations, as these liabilities were included in Alcoa's separate reserves for asset retirement obligations (see Note C) and environmental remediation (see Note N).

The remaining reserves are expected to be paid in cash during 2016, with the exception of approximately \$10 to \$15, which is expected to be paid over the next several years for ongoing site remediation work and special layoff benefit payments.

**Table of Contents****E. Goodwill and Other Intangible Assets**

The following table details the changes in the carrying amount of goodwill:

|                               | Alumina | Primary<br>Metals | Global<br>Rolled<br>Products | Engineered<br>Products<br>and<br>Solutions | Transportation<br>and<br>Construction<br>Solutions | Corporate* | Total    |
|-------------------------------|---------|-------------------|------------------------------|--|--|------------|----------|
| Balance at December 31, 2013: |         |                   |                              |  |  |            |          |
| Goodwill                      | \$ 9    | \$ 989            | \$ 218                       | \$ 2,606                                   | \$ 117   | \$ 1,235   | \$ 5,174 |
| Accumulated impairment losses | -       | (989)             | -                            | -  | (28)   | (742)      | (1,759)  |
|                               | 9       | -                 | 218                          | 2,606                                      | 89   | 493        | 3,415    |
| Acquisitions (F)              | -       | -                 | -                            | 1,898                                      | -  | -          | 1,898    |
| Divestitures (F)              | (3)     | -                 | -                            | -  | -  | -          | (3)      |
| Translation                   | 2       | -                 | (8)                          | (46)                                       | (3)  | (8)        | (63)     |
| Balance at December 31, 2014: |         |                   |                              |  |  |            |          |
| Goodwill                      | 8       | 989               | 210                          | 4,458                                      | 114  | 1,227      | 7,006    |
| Accumulated impairment losses | -       | (989)             | -                            | -  | (28)   | (742)      | (1,759)  |
|                               | 8       | -                 | 210                          | 4,458                                      | 86   | 485        | 5,247    |
| Acquisitions (F)              | -       | -                 | -                            | 261  | -  | -          | 261      |
| Divestitures (F)              | -       | -                 | (1)                          | -  | -  | -          | (1)      |
| Impairment                    | -       | -                 | -                            | -  | (25)   | -          | (25)     |
| Translation                   | (2)     | -                 | (8)                          | (59)                                       | (3)  | (9)        | (81)     |
| Balance at December 31, 2015: |         |                   |                              |  |  |            |          |
| Goodwill                      | 6       | 989               | 201                          | 4,660                                      | 111  | 1,218      | 7,185    |
| Accumulated impairment losses | -       | (989)             | -                            | -  | (53)   | (742)      | (1,784)  |
|                               | 6       | -                 | 201                          | 4,660                                      | 58   | 476        | 5,401    |

\* As of December 31, 2015, the amount reflected in Corporate is allocated to four of Alcoa's five reportable segments (\$146 to Alumina, \$59 to Global Rolled Products, \$253 to Engineered Products and Solutions, and \$18 to Transportation and Construction Solutions) included in the table above for purposes of impairment testing (see Note A). This goodwill is reflected in Corporate for segment reporting purposes because it is not included in management's assessment of performance by the four reportable segments.

In 2015 and 2013, Alcoa recognized an impairment of goodwill in the amount of \$25 and \$1,731 (\$1,719 after noncontrolling interest), respectively, related to the annual impairment review of the soft alloy extrusion business in Brazil (included in the Transportation and Construction Solutions segment) and the Primary Metals segment, respectively, (see Goodwill and Other Intangible Assets policy in Note A).

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Other intangible assets, which are included in Other noncurrent assets on the accompanying Consolidated Balance Sheet, were as follows:

|   | <b>Gross<br/>carrying<br/>amount</b> | <b>Accumulated<br/>amortization</b> |
|---|--------------------------------------|-------------------------------------|
| <b>December 31, 2015</b>                    |                                      |                                     |
| Computer software                           | \$ 969                               | \$ (801)                            |
| Patents and licenses                        | 135                                  | (104)                               |
| Other intangibles*                          | 988                                  | (74)                                |
| Total amortizable intangible assets         | 2,092                                | (979)                               |
| Indefinite-lived trade names and trademarks | 45                                   | -                                   |
| Total other intangible assets               | \$ 2,137                             | \$ (979)                            |

\* As of December 31, 2015, Other intangibles include amounts related to the acquisitions of Firth Rixson, TITAL, and RTI (see Note F).

|   | <b>Gross<br/>carrying<br/>amount</b> | <b>Accumulated<br/>amortization</b> |
|---|--------------------------------------|-------------------------------------|
| <b>December 31, 2014</b>                    |                                      |                                     |
| Computer software                           | \$ 973                               | \$ (775)                            |
| Patents and licenses                        | 133                                  | (98)                                |
| Other intangibles*                          | 493                                  | (35)                                |
| Total amortizable intangible assets         | 1,599                                | (908)                               |
| Indefinite-lived trade names and trademarks | 46                                   | -                                   |
| Total other intangible assets               | \$ 1,645                             | \$ (908)                            |

\* As of December 31, 2014, Other intangibles include amounts related to the acquisition of Firth Rixson (see Note F).

Computer software consists primarily of software costs associated with an enterprise business solution (EBS) within Alcoa to drive common systems among all businesses.

Amortization expense related to the intangible assets in the tables above for the years ended December 31, 2015, 2014, and 2013 was \$77, \$69, and \$73, respectively, and is expected to be in the range of approximately \$75 to \$85 annually from 2016 to 2020.

**F. Acquisitions and Divestitures**

Pro forma results of the Company, assuming all acquisitions described below were made at the beginning of the earliest prior period presented, would not have been materially different from the results reported.

**2015 Acquisitions.** In March 2015, Alcoa completed the acquisition of an aerospace structural castings company, TITAL, for \$204 ( 188) in cash (an additional \$1 ( 1) was paid in September 2015 to settle working capital in accordance with the purchase agreement). This transaction is no longer subject to post-closing adjustments. TITAL, a privately held company with approximately 650 employees based in Germany, produces aluminum and titanium investment casting products for the aerospace and defense end markets. The purpose of this acquisition is to capture increasing demand for advanced jet engine components made of titanium, establish titanium-casting capabilities in Europe, and expand existing aluminum casting capacity. The assets, including the associated goodwill, and liabilities of this business were included within Alcoa's Engineered Products and Solutions segment since the date of acquisition. Based on the preliminary allocation of the purchase price, goodwill of \$118 was recorded for this transaction, none of which is estimated to be deductible for income tax purposes. The final allocation of the purchase price will be based on management's best estimates, including a third-party valuation of certain assets acquired, which may result in the identification of other intangible assets. This valuation is expected to be completed in March 2016.



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Also in March 2015, Alcoa signed a definitive agreement to acquire RTI International Metals, Inc. (RTI), a U.S. company that was publicly traded on the New York Stock Exchange under the ticker symbol RTI. On July 23, 2015, after satisfying all customary closing conditions and receiving the required regulatory and RTI shareholder approvals, Alcoa completed the acquisition of RTI. Alcoa purchased all outstanding shares of RTI common stock in a stock-for-stock transaction valued at \$870 (based on the \$9.96 per share July 23, 2015 closing price of Alcoa's common stock). Each issued and outstanding share of RTI common stock prior to the completion of the transaction was converted into the right to receive 2.8315 shares of Alcoa common stock. In total, Alcoa issued 87,397,414 shares of its common stock to consummate this transaction, which was not reflected in the accompanying Statement of Consolidated Cash Flows as it represents a noncash financing activity. The exchange ratio was the quotient of a \$41 per RTI common share acquisition price and the \$14.48 per share March 6, 2015 closing price of Alcoa's common stock. In addition to the transaction price, Alcoa also paid \$25 (\$19 after-tax) in professional fees and costs related to this acquisition. This amount was recorded in Selling, general administrative, and other expenses on the accompanying Statement of Consolidated Operations.

RTI is a global supplier of titanium and specialty metal products and services for the commercial aerospace, defense, energy, and medical device end markets. The purpose of this acquisition is to expand Alcoa's range of titanium offerings and add advanced technologies and materials, primarily related to the aerospace end market. In 2014, RTI generated net sales of \$794 and had approximately 2,600 employees. The operating results and assets and liabilities of RTI were included within Alcoa's Engineered Products and Solutions segment since the date of acquisition. Third-party sales and after-tax operating income (Alcoa's primary segment performance measure - see Note Q) of RTI from the acquisition date through December 31, 2015 were \$309 and less than \$(1), respectively.

The following table represents the preliminary allocation of the purchase price by major asset acquired and liability assumed, as well as the amount of goodwill recognized:

|   |          |
|---|----------|
| Assets:   |          |
| Cash and cash equivalents                       | \$ 302   |
| Receivables from customers                      | 103      |
| Inventories                                     | 531      |
| Prepaid expenses and other current assets       | 47       |
| Properties, plants, and equipment               | 436      |
| Goodwill  | 240      |
| Other noncurrent assets                         | 93       |
| Total assets                                    | \$ 1,752 |
| Liabilities:                                    |          |
| Accounts payable                                | \$ 90    |
| Other current liabilities                       | 94       |
| Long-term debt due within one year              | 115      |
| Long-term debt, less amount due within one year | 385      |
| Other noncurrent liabilities                    | 138      |
| Total liabilities                               | \$ 822   |
| Equity:   |          |
| Additional capital                              | \$ 60    |
| Total equity                                    | \$ 60    |

The amounts in the table above are subject to change based, in part, on management's review of a third-party valuation of the assets acquired and liabilities assumed, which is expected to be completed in mid-2016.

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As reflected in the table above, Alcoa recognized goodwill of \$240, which represents the earnings growth potential of RTI, Alcoa's ability to expand its titanium capabilities in the aerospace market, and expected synergies from combining the operations of the two companies. This goodwill was allocated to a new Alcoa reporting unit associated with the Engineered Products and Solutions segment, Alcoa Titanium and Engineered Products, which consists solely of the acquired RTI business. None of this goodwill is deductible for income tax purposes.

The other noncurrent assets in the table above include an estimate for intangible assets of \$73, most of which were included in Alcoa's other intangibles class (see Note E). The specific identification and weighted-average amortization period for these intangible assets is dependent on the final valuation.

As part of this acquisition, Alcoa assumed the obligation to repay two tranches of convertible debt; one tranche was due and settled in cash on December 1, 2015 (principal amount of \$115) and the other tranche is due on October 15, 2019 (principal amount of \$403). Upon conversion of the 2019 convertible notes in accordance with their terms, holders will receive, at Alcoa's election, cash, shares of common stock (up to 27,990,966 shares), or a combination of cash and shares. This cash conversion feature requires the convertible notes to be bifurcated into a liability component and an equity component. The fair value of the liability component was determined by calculating the net present value of the cash flows of the convertible notes using the interest rate of a similar instrument without a conversion feature. The fair value of the equity component is the difference between the fair value of the entire instrument on the date of acquisition and the fair value of the liability and is included as Additional capital on the accompanying Consolidated Balance Sheet.

**2015 Divestitures.** In 2015, Alcoa completed the divestiture of an operation in Russia (see below) and had post-closing adjustments, as provided for in the respective purchase agreements, related to three divestitures completed in December 2014 (see 2014 Divestitures below). The divestiture and post-closing adjustments combined resulted in net cash received of \$30 and a net loss of \$161 (\$151 after-tax and noncontrolling interest), which was recorded in Restructuring and other charges (see Note D) on the accompanying Statement of Consolidated Operations. These four divestitures are no longer subject to post-closing adjustments.

In March 2015, Alcoa completed the sale of a rolling mill located in Belaya Kalitva, Russia to a wholly-owned subsidiary of Stupino Titanium Company. While owned by Alcoa, the operating results and assets and liabilities of the rolling mill were included in the Global Rolled Products segment. The rolling mill generated sales of approximately \$130 in 2014 and, at the time of divestiture, had approximately 1,870 employees.

**2014 Acquisitions.** In June 2014, Alcoa signed a purchase agreement to acquire an aerospace jet engine components company, Firth Rixson, from Oak Hill Capital Partners for \$2,850. The purchase price was composed of \$2,350 in cash and \$500 of Alcoa common stock. The common stock component was equivalent to 36,523,010 shares at a per share price of \$13.69, as determined in the agreement. In conjunction with the purchase agreement, Alcoa also entered into an earn-out agreement, which states that Alcoa will make earn-out payments up to an aggregate maximum amount of \$150 through December 31, 2020 upon certain conditions (see below for additional information). On November 19, 2014, after satisfying all customary closing conditions and receiving the required regulatory approvals, Alcoa completed the acquisition of Firth Rixson for \$2,995. The purchase price was composed of \$2,385 in cash (net of cash acquired) and \$610 of Alcoa common stock. The cash portion of the transaction price increased by \$35 due to working capital and other adjustments based on the provisions of the purchase agreement. The common stock portion of the transaction price was based on the closing market price (\$16.69 per share) of Alcoa's common stock on the acquisition date. This transaction is subject to certain post-closing adjustments as defined in the purchase agreement.

In addition to the transaction price, Alcoa also paid \$42 (\$34 after-tax) in professional fees and costs related to this acquisition. This amount was recorded in Selling, general administrative, and other expenses on the accompanying Statement of Consolidated Operations. Additionally, Alcoa recorded \$13 (\$8 after-tax) in Interest expense on the accompanying Statement of Consolidated Operations for costs associated with the execution (in June 2014) and termination (in September 2014) of a \$2,500 364-day senior unsecured bridge term loan facility. This facility was entered into for the purpose of financing all or a portion of the cash consideration for this acquisition and to pay fees and expenses incurred in connection therewith. However, in September 2014, the facility was no longer necessary as Alcoa completed the issuance of \$2,500 in debt (see Note K) and equity (see Note R) instruments to finance the acquisition.

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Firth Rixson manufactures rings, forgings, and metal products for the aerospace end market, as well as other markets requiring highly engineered material applications. This business has 13 operating facilities in the United States, United Kingdom, Europe, and Asia employing approximately 2,400 people combined. The purpose of this acquisition is to strengthen Alcoa's aerospace business and position the Company to capture additional aerospace growth with a broader range of high-growth, value-add jet engine components. The operating results and assets and liabilities of Firth Rixson were included within the Engineered Products and Solutions segment since the date of acquisition. Third-party sales and after-tax operating income (Alcoa's primary segment performance measure - see Note Q) of Firth Rixson from the acquisition date through December 31, 2014 were \$81 and \$(12), respectively.

The following table represents the final allocation of the purchase price by major asset acquired and liability assumed, as well as the amount of goodwill recognized and the net present value of the potential earn-out:

|   |          |
|---|----------|
| Assets:                                   |          |
| Receivables from customers                | \$ 193   |
| Inventories                               | 227      |
| Prepaid expenses and other current assets | 22       |
| Properties, plants, and equipment         | 493      |
| Goodwill                                  | 1,801    |
| Other noncurrent assets                   | 758      |
| Total assets                              | \$ 3,494 |
| Liabilities:                              |          |
| Accounts payable                          | \$ 162   |
| Other current liabilities                 | 100      |
| Contingent consideration                  | 130      |
| Other noncurrent liabilities              | 107      |
| Total liabilities                         | \$ 499   |

As reflected in the table above, Alcoa recognized goodwill of \$1,801, which represents the earnings growth potential of Firth Rixson and expected synergies from combining the operations of the two companies. The goodwill was allocated to two of Alcoa's reporting units associated with the Engineered Products and Solutions segment, Alcoa Fastening Systems and Rings (\$1,117) and Alcoa Forging and Extrusions (\$684), on a relative fair value basis. None of the goodwill is deductible for income tax purposes.

The other noncurrent assets in the table above represent intangible assets, which were included in the other intangibles class (see Note E). These intangible assets consist primarily of customer relationships and contracts, backlog, qualifications, and technology, and have a weighted-average amortization period of 35 years.

The contingent consideration liability presented in the table above represents the net present value of the potential earn-out of \$150 (Level 3 in the fair value hierarchy - see Note X). This earn-out is contingent on the Firth Rixson forging business in Savannah, Georgia achieving certain identified financial targets through December 31, 2020. Management has determined that payment of the maximum amount is probable based on the forecasted financial performance of this location. It is estimated that the earn-out will be paid in 2019 through 2020. The fair value of this liability will be updated in future periods with any change resulting in a corresponding charge or credit to earnings.

In August 2014, Alcoa completed the acquisition of the 30% outstanding noncontrolling interest in the aluminum brazing sheet venture in Kunshan City, China from Shanxi Yuncheng Engraving Group for \$28. The \$3 difference between the purchase price and the carrying value of the noncontrolling interest on Alcoa's Consolidated Balance Sheet was included in Additional capital.

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**2014 Divestitures.** In 2014, Alcoa completed the divestiture of four operations as described below. Combined, these transactions yielded net cash proceeds of \$247 and resulted in a net loss of \$332 (\$163 after-tax and noncontrolling interest), which was recorded in Restructuring and other charges (see Note D) on the accompanying Statement of Consolidated Operations. All four transactions were subject to certain post-closing adjustments as defined in the respective purchase agreements as of December 31, 2014 (see 2015 Divestitures above).

In November 2014, Alcoa completed the sale of an aluminum rod plant located in Bécancour, Québec, Canada to Sural Laminated Products. This facility takes molten aluminum and shapes it into the form of a rod, which is used by customers primarily for the transportation of electricity. While owned by Alcoa, the operating results and assets and liabilities of this plant were included in the Primary Metals segment. In conjunction with this transaction, Alcoa entered into a multi-year agreement with Sural Laminated Products to supply molten aluminum for the rod plant. The aluminum rod plant generated sales of approximately \$200 in 2013 and, at the time of divestiture, had approximately 60 employees.

In December 2014, Alcoa's majority-owned subsidiary (60%), Alcoa World Alumina and Chemicals (AWAC), completed the sale of its ownership stake in a bauxite mine and alumina refinery joint venture in Jamaica to Noble Group Ltd. The joint venture was 55% owned by a subsidiary of AWAC, which is 40% owned by Alumina Limited. While owned by AWAC, 55% of both the operating results and assets and liabilities of this joint venture were included in the Alumina segment. As it relates to AWAC's previous 55% ownership stake, the refinery (AWAC's share of the capacity was 778,800 metric-tons-per-year) generated sales (third-party and intersegment) of approximately \$200 in 2013, and the refinery and mine combined, at the time of divestiture, had approximately 500 employees.

Also in December 2014, Alcoa completed the sale of its 50.33% ownership stake in the Mt. Holly smelter located in Goose Creek, South Carolina to Century Aluminum Company. While owned by Alcoa, 50.33% of both the operating results and assets and liabilities related to the smelter were included in the Primary Metals segment. As it relates to Alcoa's previous 50.33% ownership stake, the smelter (Alcoa's share of the capacity was 115,000 metric-tons-per-year) generated sales of approximately \$280 in 2013 and, at the time of divestiture, had approximately 250 employees.

Additionally in December 2014, Alcoa completed the sale of three rolling mills located in Spain (Alicante and Amorebieta) and France (Castelsarrasin) to a subsidiary of Atlas Holdings LLC. While owned by Alcoa, the operating results and assets and liabilities of the rolling mills were included in the Global Rolled Products segment. In conjunction with this transaction, Alcoa entered into a multi-year agreement with the buyer to supply aluminum for the rolling mills. The rolling mills combined generated sales of approximately \$500 in 2013 and, at the time of divestiture, had approximately 750 employees.

**G. Inventories**

| <b>December 31,</b>     | <b>2015</b> | <b>2014</b> |
|-------------------------|-------------|-------------|
| Finished goods          | \$ 811      | \$ 768      |
| Work-in-process         | 1,272       | 1,035       |
| Bauxite and alumina     | 445         | 578         |
| Purchased raw materials | 720         | 508         |
| Operating supplies      | 194         | 193         |
|                         | \$ 3,442    | \$ 3,082    |

At December 31, 2015 and 2014, the total amount of inventories valued on a LIFO basis was \$1,373 and \$1,514, respectively. If valued on an average-cost basis, total inventories would have been \$559 and \$767 higher at December 31, 2015 and 2014, respectively. During 2015 and 2013, reductions in LIFO inventory quantities caused partial liquidations of the lower cost LIFO inventory base. These liquidations resulted in the recognition of income of \$1 (\$1 after-tax) in 2015 and \$26 (\$17 after-tax) in 2013.

**Table of Contents****H. Properties, Plants, and Equipment, Net**

| <b>December 31,</b>   | <b>2015</b> | <b>2014</b> |
|---|-------------|-------------|
| Land and land rights, including mines*                      | \$ 481      | \$ 548      |
| Structures:   |             |             |
| Alumina:  |             |             |
| Alumina refining  | 2,387       | 2,750       |
| Bauxite mining  | 1,054       | 1,403       |
| Primary Metals:   |             |             |
| Aluminum smelting   | 3,567       | 3,725       |
| Power generation  | 518         | 645         |
| Global Rolled Products                                      | 1,298       | 1,276       |
| Engineered Products and Solutions*                          | 658         | 547         |
| Transportation and Construction Solutions                   | 239         | 239         |
| Other   | 619         | 715         |
|   | 10,340      | 11,300      |
| Machinery and equipment:                                    |             |             |
| Alumina:  |             |             |
| Alumina refining  | 3,709       | 4,165       |
| Bauxite mining  | 428         | 524         |
| Primary Metals:   |             |             |
| Aluminum smelting   | 6,831       | 7,210       |
| Power generation  | 1,044       | 1,080       |
| Global Rolled Products                                      | 5,372       | 5,333       |
| Engineered Products and Solutions*                          | 2,745       | 2,402       |
| Transportation and Construction Solutions                   | 682         | 669         |
| Other   | 750         | 820         |
|   | 21,561      | 22,203      |
|   | 32,382      | 34,051      |
| Less: accumulated depreciation, depletion, and amortization | 18,872      | 19,091      |
|   | 13,510      | 14,960      |
| Construction work-in-progress*                              | 1,305       | 1,466       |
|   | \$ 14,815   | \$ 16,426   |

\* As of December 31, 2015 and 2014, these line items include amounts related to the acquisitions of Firth Rixson, TITAL, and/or RTI (see Note F).

As of December 31, 2015 and 2014, the net carrying value of temporarily idled smelting assets was \$324 and \$419, representing 778 kmt and 665 kmt of idle capacity, respectively. Also, as of December 31, 2015 and 2014, the net carrying value of temporarily idled refining assets was \$53 and \$62, representing 2,801 kmt and 1,216 kmt of idle capacity, respectively.

**I. Investments**

| <b>December 31,</b> | <b>2015</b> | <b>2014</b> |
|---------------------|-------------|-------------|
| Equity investments  | \$ 1,476    | \$ 1,780    |
| Other investments   | 209         | 164         |
|                     | \$ 1,685    | \$ 1,944    |

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**Equity Investments.** As of December 31, 2015 and 2014, Equity investments included an interest in a project to develop a fully-integrated aluminum complex in Saudi Arabia (see below); bauxite mining interests in Guinea (45% of Halco Mining, Inc.) and Brazil (18.2% of Mineração Rio do Norte S.A.); two hydroelectric power projects in Brazil (see Note N); a natural gas pipeline in Australia (see Note N); a smelter operation in Canada (50% of Pechiney Reynolds Quebec, Inc.); and a hydroelectric power company in Canada (40% of Manicouagan Power Limited Partnership). Pechiney Reynolds Quebec, Inc. owns a 50.1% interest in the Bécancour smelter in Quebec, Canada thereby entitling Alcoa to a 25.05% interest in the smelter. Through two wholly-owned Canadian subsidiaries, Alcoa also owns 49.9% of the Bécancour smelter. Halco Mining, Inc. owns 100% of Boké Investment Company, which owns 51% of Compagnie des Bauxites de Guinée. The investments in the bauxite mining interests in Guinea and Brazil and the natural gas pipeline in Australia are held by wholly-owned subsidiaries of Alcoa World Alumina and Chemicals (AWAC), which is owned 60% by Alcoa and 40% by Alumina Limited. In 2015, 2014, and 2013, Alcoa received \$152, \$86, and \$89, respectively, in dividends from its equity investments.

Alcoa and Saudi Arabian Mining Company (known as Ma'aden) have a 30-year (from December 2009) joint venture shareholders' agreement (automatic extension for an additional 20 years, unless the parties agree otherwise or unless earlier terminated) setting forth the terms for the development, construction, ownership, and operation of an integrated aluminum complex in Saudi Arabia. Specifically, the project being developed by the joint venture consists of: (i) a bauxite mine for the extraction of approximately 4,000 kmt of bauxite from the Al Badiyah bauxite deposit near Quiba in the northern part of Saudi Arabia; (ii) an alumina refinery with an initial capacity of 1,800 kmt; (iii) a primary aluminum smelter with an initial capacity of 740 kmt; and (iv) a rolling mill with an initial capacity of 380 kmt. The refinery, smelter, and rolling mill have been constructed in an industrial area at Ras Al Khair on the east coast of Saudi Arabia. The facilities use critical infrastructure, including power generation derived from reserves of natural gas, as well as port and rail facilities, developed by the government of Saudi Arabia. First production from the smelter, rolling mill, and mine and refinery occurred in December of 2012, 2013, and 2014, respectively.

In 2012, Alcoa and Ma'aden agreed to expand the capabilities of the rolling mill to include a capacity of 100 kmt dedicated to supplying aluminum automotive, building and construction, and foil stock sheet. First production related to the expanded capacity occurred in 2014. This expansion is not expected to result in additional equity investment (see below) due to significant savings anticipated from a change in the project execution strategy of the initial 380 kmt capacity of the rolling mill.

The joint venture is owned 74.9% by Ma'aden and 25.1% by Alcoa and consists of three separate companies as follows: one each for the mine and refinery, the smelter, and the rolling mill. Following the signing of the joint venture shareholders' agreement, Alcoa paid Ma'aden \$80 representing the initial investment in the project. In addition, Alcoa paid \$56 to Ma'aden, representing Alcoa's pro rata share of certain agreed upon pre-incorporation costs incurred by Ma'aden prior to formation of the joint venture.

Ma'aden and Alcoa have put and call options, respectively, whereby Ma'aden can require Alcoa to purchase from Ma'aden, or Alcoa can require Ma'aden to sell to Alcoa, a 14.9% interest in the joint venture at the then fair market value. These options may only be exercised in a six-month window that opens five years after the Commercial Production Date (as defined in the joint venture shareholders' agreement) and, if exercised, must be exercised for the full 14.9% interest. The Commercial Production Date for the smelting company was declared on September 1, 2014. There have not been similar declarations yet for the rolling mill company and the mining and refining company.

The Alcoa affiliate that holds Alcoa's interests in the smelting company and the rolling mill company is wholly owned by Alcoa, and the Alcoa affiliate that holds Alcoa's interests in the mining and refining company is wholly owned by AWAC. Except in limited circumstances, Alcoa may not sell, transfer or otherwise dispose of or encumber or enter into any agreement in respect of the votes or other rights attached to its interests in the joint venture without Ma'aden's prior written consent.

A number of Alcoa employees perform various types of services for the smelting, rolling mill, and refining and mining companies as part of the construction of the fully-integrated aluminum complex. At December 31, 2015 and 2014, Alcoa had an outstanding receivable of \$19 and \$30, respectively, from the smelting, rolling mill, and refining and mining companies for labor and other employee-related expenses.

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Capital investment in the project is expected to total approximately \$10,800 (SAR 40.5 billion) and has been funded through a combination of equity contributions by the joint venture partners and project financing by the joint venture, which has been guaranteed by both partners (see below). Both the equity contributions and the guarantees of the project financing are based on the joint venture's partners' ownership interests. Originally, it was estimated that Alcoa's total equity investment in the joint venture would be approximately \$1,100, of which Alcoa has contributed \$981, including \$29 and \$120 in 2015 and 2014, respectively. Based on changes to both the project's capital investment and equity and debt structure from the initial plans, the estimated \$1,100 equity contribution may be reduced. As of December 31, 2015 and 2014, the carrying value of Alcoa's investment in this project was \$928 and \$983, respectively.

The smelting and rolling mill companies have project financing totaling \$4,311 (reflects principal payments made through December 31, 2015), of which \$1,082 represents Alcoa's share (the equivalent of Alcoa's 25.1% interest in the smelting and rolling mill companies). In conjunction with the financings, Alcoa issued guarantees on behalf of the smelting and rolling mill companies to the lenders in the event that such companies default on their debt service requirements through 2017 and 2020 for the smelting company and 2018 and 2021 for the rolling mill company (Ma'aden issued similar guarantees for its 74.9% interest). Alcoa's guarantees for the smelting and rolling mill companies cover total debt service requirements of \$142 in principal and up to a maximum of approximately \$50 in interest per year (based on projected interest rates). At December 31, 2015 and 2014, the combined fair value of the guarantees was \$7 and \$8, respectively, which was included in Other noncurrent liabilities and deferred credits on the accompanying Consolidated Balance Sheet.

The mining and refining company has project financing totaling \$2,232, of which \$560 represents AWAC's 25.1% interest in the mining and refining company. In conjunction with the financings, Alcoa, on behalf of AWAC, issued guarantees to the lenders in the event that the mining and refining company defaults on its debt service requirements through 2019 and 2024 (Ma'aden issued similar guarantees for its 74.9% interest). Alcoa's guarantees for the mining and refining company cover total debt service requirements of \$120 in principal and up to a maximum of approximately \$30 in interest per year (based on projected interest rates). At December 31, 2015 and 2014, the combined fair value of the guarantees was \$3 and \$4, respectively, which was included in Other noncurrent liabilities and deferred credits on the accompanying Consolidated Balance Sheet. In the event Alcoa would be required to make payments under the guarantees, 40% of such amount would be contributed to Alcoa by Alumina Limited, consistent with its ownership interest in AWAC.

In June 2013, all three joint venture companies entered into a 20-year gas supply agreement with Saudi Aramco, replacing the previous authorized gas allocation of the Ministry of Petroleum and Mineral Resources of Saudi Arabia (the Ministry of Petroleum). The gas supply agreement provides sufficient fuel to meet manufacturing process requirements as well as fuel to the adjacent combined water and power plant being constructed by Saline Water Conversion Corporation, which is owned by the government of Saudi Arabia and is responsible for desalinating sea water and producing electricity for Saudi Arabia. The combined water and power plant will convert the three joint venture companies' gas into electricity and water at cost, which will be supplied to the refinery, smelter, and rolling mill. A \$60 letter of credit previously provided to the Ministry of Petroleum by Ma'aden (Alcoa is responsible for its pro rata share) under the gas allocation was terminated in June 2015 due to the completion of certain auxiliary rolling facilities.

The parties subject to the joint venture shareholders' agreement may not sell, transfer, or otherwise dispose of, pledge, or encumber any interests in the joint venture until certain milestones have been met as defined in both agreements. Under the joint venture shareholders' agreement, upon the occurrence of an unremedied event of default by Alcoa, Ma'aden may purchase, or, upon the occurrence of an unremedied event of default by Ma'aden, Alcoa may sell, its interest for consideration that varies depending on the time of the default.

**Other Investments.** As of December 31, 2015 and 2014, Other investments included \$193 and \$153, respectively, in exchange-traded fixed income and equity securities, which are classified as available-for-sale and are carried at fair value with unrealized gains and losses recognized in other comprehensive income. Unrealized and realized gains and losses related to these securities were immaterial in 2015, 2014, and 2013.

**Table of Contents****J. Other Noncurrent Assets**

| <b>December 31,</b>  | <b>2015</b> | <b>2014</b> |
|--|-------------|-------------|
| Intangibles, net (E)                                       | \$ 1,158    | \$ 737      |
| Fair value of derivative contracts (X)                     | 1,008       | 163         |
| Cash surrender value of life insurance                     | 492         | 506         |
| Gas supply prepayment (N)                                  | 288         | -           |
| Prepaid gas transmission contract (N)                      | 268         | 295         |
| Value-added tax receivable                                 | 233         | 294         |
| Deferred mining costs, net                                 | 203         | 209         |
| Unamortized debt expense                                   | 58          | 65          |
| Prepaid pension benefit (W)                                | 44          | 53          |
| Advance related to European Commission Matter in Italy (N) | -           | 111         |
| Other  | 254         | 326         |
|  | \$ 4,006    | \$ 2,759    |

**K. Debt****Long-Term Debt.**

| <b>December 31,</b>   | <b>2015</b> | <b>2014</b> |
|---|-------------|-------------|
| 5.55% Notes, due 2017   | \$ 750      | \$ 750      |
| 6.50% Bonds, due 2018   | 250         | 250         |
| 6.75% Notes, due 2018   | 750         | 750         |
| 5.72% Notes, due 2019   | 750         | 750         |
| 1.63% Convertible Notes, due 2019*                                | 403         | -           |
| 6.150% Notes, due 2020  | 1,000       | 1,000       |
| 5.40% Notes, due 2021   | 1,250       | 1,250       |
| 5.87% Notes, due 2022   | 627         | 627         |
| 5.125% Notes, due 2024  | 1,250       | 1,250       |
| 5.90% Notes, due 2027   | 625         | 625         |
| 6.75% Bonds, due 2028   | 300         | 300         |
| 5.95% Notes due 2037  | 625         | 625         |
| BNDES Loans, due 2015-2029 (see below for weighted average rates) | 174         | 267         |
| Iowa Finance Authority Loan, due 2042 (4.75%)                     | 250         | 250         |
| Other**   | 61          | 104         |
|   | 9,065       | 8,798       |
| Less: amount due within one year                                  | 21          | 29          |
|   | \$ 9,044    | \$ 8,769    |

\* Amount was assumed in conjunction with the acquisition of RTI (see Note F).

\*\* Other includes various financing arrangements related to subsidiaries, unamortized debt discounts related to the outstanding notes and bonds listed in the table above, an equity option related to the convertible notes due in 2019 (see Note F), and adjustments to the carrying value of long-term debt related to an interest swap contract accounted for as a fair value hedge (see Derivatives in Note X).

The principal amount of long-term debt maturing in each of the next five years is \$21 in 2016, \$771 in 2017, \$1,039 in 2018, \$1,140 in 2019, and \$1,018 in 2020.



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**Public Debt** In early 2014, holders of \$575 principal amount of Alcoa's 5.25% Convertible Notes due March 15, 2014 (the 2014 Notes) exercised their option to convert the 2014 Notes into 89 million shares of Alcoa common stock. The conversion rate for the 2014 Notes was 155.4908 shares of Alcoa's common stock per \$1,000 (in full dollars) principal amount of notes, equivalent to a conversion price of \$6.43 per share. The difference between the \$575 principal amount of the 2014 Notes and the \$89 par value of the issued shares increased Additional capital on the accompanying Consolidated Balance Sheet. This transaction was not reflected in the accompanying Statement of Consolidated Cash Flows as it represents a noncash financing activity.

In September 2014, Alcoa completed a public debt offering under its shelf registration statement for \$1,250 of 5.125% Notes due 2024 (the 2024 Notes). Alcoa received \$1,238 in net proceeds from the public debt offering reflecting an original issue discount. The net proceeds were used, together with the net proceeds of newly issued mandatory convertible preferred stock (see Note R), to finance the cash portion of the acquisition of Firth Rixson (see Note F). The original issue discount was deferred and is being amortized to interest expense over the term of the 2024 Notes. Interest on the 2024 Notes will be paid semi-annually in April and October, commencing April 2015. Alcoa has the option to redeem the 2024 Notes, as a whole or in part, at any time or from time to time, on at least 30 days, but not more than 60 days, prior notice to the holders of the 2024 Notes at a redemption price specified in the 2024 Notes. The 2024 Notes are subject to repurchase upon the occurrence of a change in control repurchase event (as defined in the 2024 Notes) at a repurchase price in cash equal to 101% of the aggregate principal amount of the 2024 Notes repurchased, plus any accrued and unpaid interest on the 2024 Notes repurchased. The 2024 Notes rank *pari passu* with Alcoa's other unsecured unsubordinated indebtedness.

**BNDES Loans** Alcoa Alumínio (Alumínio) has a loan agreement with Brazil's National Bank for Economic and Social Development (BNDES) that provides for a financing commitment of \$397 (R\$687), which is divided into three subloans and was used to pay for certain expenditures of the Estreito hydroelectric power project. Interest on the three subloans is a Brazil real rate of interest equal to BNDES long-term interest rate, 7.00% and 5.00% as of December 31, 2015 and 2014, respectively, plus a weighted-average margin of 1.48%. Principal and interest are payable monthly, which began in October 2011 and end in September 2029 for two of the subloans totaling R\$667 and began in July 2012 and end in June 2018 for the subloan of R\$20. This loan may be repaid early without penalty with the approval of BNDES.

As of December 31, 2015 and 2014, Alumínio's outstanding borrowings were \$136 (R\$522) and \$209 (R\$560), respectively, and the weighted-average interest rate was 8.49%. During 2015 and 2014, Alumínio repaid \$15 (R\$48) and \$20 (R\$47), respectively, of outstanding borrowings. Additionally, Alumínio borrowed less than \$1 (R\$1) and \$1 (R\$2) under the loan in 2015 and 2014, respectively.

Alumínio has another loan agreement with BNDES that provides for a financing commitment of \$85 (R\$177), which also was used to pay for certain expenditures of the Estreito hydroelectric power project. Interest on the loan is a Brazil real rate of interest equal to BNDES long-term interest rate plus a margin of 1.55%. Principal and interest are payable monthly, which began in January 2013 and end in September 2029. This loan may be repaid early without penalty with the approval of BNDES. As of December 31, 2015 and 2014, Alumínio's outstanding borrowings were \$38 (R\$146) and \$58 (R\$156), respectively, and the interest rate was 6.55%. During 2015 and 2014, Alumínio repaid \$3 (R\$10) and \$5 (R\$11), respectively, of outstanding borrowings.

**Credit Facilities.** On July 25, 2014, Alcoa entered into a Five-Year Revolving Credit Agreement (the Credit Agreement) with a syndicate of lenders and issuers named therein. The Credit Agreement provides a \$4,000 senior unsecured revolving credit facility (the Credit Facility), the proceeds of which are to be used to provide working capital or for other general corporate purposes of Alcoa. Subject to the terms and conditions of the Credit Agreement, Alcoa may from time to time request increases in lender commitments under the Credit Facility, not to exceed \$500 in aggregate principal amount, and may also request the issuance of letters of credit, subject to a letter of credit sublimit of \$1,000 under the Credit Facility.

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The Credit Facility was scheduled to mature on July 25, 2019; however, on July 7, 2015, Alcoa received approval for a one-year extension of the maturity date by the lenders and issuers that support the Credit Facility. As such, the Credit Facility now matures on July 25, 2020, unless extended or earlier terminated in accordance with the provisions of the Credit Agreement. Alcoa may make one additional one-year extension request during the remaining term of the Credit Facility, subject to the lender consent requirements set forth in the Credit Agreement. Under the provisions of the Credit Agreement, Alcoa will pay a fee of 0.25% (based on Alcoa's long-term debt ratings as of December 31, 2015) of the total commitment per annum to maintain the Credit Facility.

The Credit Facility is unsecured and amounts payable under it will rank *pari passu* with all other unsecured, unsubordinated indebtedness of Alcoa. Borrowings under the Credit Facility may be denominated in U.S. dollars or euros. Loans will bear interest at a base rate or a rate equal to LIBOR, plus, in each case, an applicable margin based on the credit ratings of Alcoa's outstanding senior unsecured long-term debt. The applicable margin on base rate loans and LIBOR loans will be 0.50% and 1.50% per annum, respectively, based on Alcoa's long-term debt ratings as of December 31, 2015. Loans may be prepaid without premium or penalty, subject to customary breakage costs.

The Credit Agreement replaces Alcoa's Five-Year Revolving Credit Agreement, dated as of July 25, 2011 (the Former Credit Agreement), which was scheduled to mature on July 25, 2017. The Former Credit Agreement, which had a total capacity of \$3,750 and was undrawn, was terminated effective July 25, 2014.

The Credit Agreement includes covenants substantially similar to those in the Former Credit Agreement, including, among others, (a) a leverage ratio, (b) limitations on Alcoa's ability to incur liens securing indebtedness for borrowed money, (c) limitations on Alcoa's ability to consummate a merger, consolidation or sale of all or substantially all of its assets, and (d) limitations on Alcoa's ability to change the nature of its business. As of December 31, 2015, Alcoa was in compliance with all such covenants.

The obligation of Alcoa to pay amounts outstanding under the Credit Facility may be accelerated upon the occurrence of an Event of Default as defined in the Credit Agreement. Such Events of Default include, among others, (a) Alcoa's failure to pay the principal of, or interest on, borrowings under the Credit Facility, (b) any representation or warranty of Alcoa in the Credit Agreement proving to be materially false or misleading, (c) Alcoa's breach of any of its covenants contained in the Credit Agreement, and (d) the bankruptcy or insolvency of Alcoa.

There were no amounts outstanding at December 31, 2015 and 2014 and no amounts were borrowed during 2015 or 2014 under the Credit Facility. Also, there were no amounts borrowed during 2014 related to the Former Credit Agreement.

In addition to the Credit Agreement above, Alcoa has a number of other credit agreements that provide a combined borrowing capacity of \$990 as of December 31, 2015, of which \$890 is due to expire in 2016 and \$100 is due to expire in 2017. The purpose of any borrowings under these credit arrangements is to provide for working capital requirements and for other general corporate purposes. The covenants contained in all these arrangements are the same as the Credit Agreement (see above).

In 2015 and 2014, Alcoa borrowed and repaid \$1,890 and \$1,640, respectively, under the respective credit arrangements. The weighted-average interest rate and weighted-average days outstanding of the respective borrowings during 2015, 2014, and 2013 were 1.61%, 1.54%, and 1.57%, respectively, and 69 days, 67 days, and 213 days, respectively.

**Short-Term Borrowings.** At December 31, 2015 and 2014, Short-term borrowings were \$38 and \$54, respectively. These amounts included \$32 and \$50 at December 31, 2015 and 2014, respectively, related to accounts payable settlement arrangements with certain vendors and third-party intermediaries. These arrangements provide that, at the vendor's request, the third-party intermediary advances the amount of the scheduled payment to the vendor, less an appropriate discount, before the scheduled payment date and Alcoa makes payment to the third-party intermediary on the date stipulated in accordance with the commercial terms negotiated with its vendors. Alcoa records imputed interest related to these arrangements in Interest expense on the accompanying Statement of Consolidated Operations.

**Commercial Paper.** Alcoa had no outstanding commercial paper at December 31, 2015 and 2014. In 2015 and 2014, the average outstanding commercial paper was \$198 and \$257, respectively. Commercial paper matures at various times within one year and had an annual weighted average interest rate of 0.6%, 0.6%, and 0.8% during 2015, 2014, and 2013, respectively.

**Table of Contents****L. Other Noncurrent Liabilities and Deferred Credits**

| <b>December 31,</b>                                       | <b>2015</b>     | <b>2014</b>     |
|---|-----------------|-----------------|
| Environmental remediation (N)                             | \$ 554          | \$ 473          |
| Asset retirement obligations (C)                          | 551             | 587             |
| Income taxes (T)  | 521             | 377             |
| Accrued compensation and retirement costs                 | 329             | 346             |
| Fair value of derivative contracts (X)                    | 208             | 376             |
| Liability related to the resolution of a legal matter (N) | 148             | 222             |
| Contingent payment related to an acquisition (F)          | 130             | 130             |
| Deferred alumina sales revenue                            | 84              | 93              |
| Deferred credit related to derivative contract (X)        | -               | 62              |
| Other   | 213             | 230             |
|   | <b>\$ 2,738</b> | <b>\$ 2,896</b> |

**M. Noncontrolling Interests**

The following table summarizes the noncontrolling shareholders' interests in the equity of certain Alcoa majority-owned consolidated subsidiaries:

| <b>December 31,</b>               | <b>2015</b>     | <b>2014</b>     |
|-----------------------------------|-----------------|-----------------|
| Alcoa World Alumina and Chemicals | \$ 2,071        | \$ 2,474        |
| Other                             | 14              | 14              |
|                                   | <b>\$ 2,085</b> | <b>\$ 2,488</b> |

In 2015, 2014, and 2013, Alcoa received \$2, \$43, and \$9, respectively, in contributions from the noncontrolling shareholder (Alumina Limited) of Alcoa World Alumina and Chemicals.

In August 2014, Alcoa acquired the 30% outstanding noncontrolling interest in its aluminum brazing sheet venture in Kunshan City, China (see Note F).

In 2013, Noncontrolling interests included a charge of \$17 related to a legal matter (see Settlement with Alumina Limited under Litigation in Note N).

**N. Contingencies and Commitments****Contingencies****Litigation***Alba Matter*

**Civil Suit.** On February 27, 2008, Alcoa Inc. received notice that Aluminium Bahrain B.S.C. (Alba) had filed suit against Alcoa, Alcoa World Alumina LLC (AWA), and William Rice (collectively, the Alcoa Parties), and others, in the U.S. District Court for the Western District of Pennsylvania (the Court), Civil Action number 08-299, styled Aluminium Bahrain B.S.C. v. Alcoa Inc., Alcoa World Alumina LLC, William Rice, and Victor Phillip Dahdaleh. The complaint alleged that certain Alcoa entities and their agents, including Victor Phillip Dahdaleh, had engaged in a conspiracy over a period of 15 years to defraud Alba. The complaint further alleged that Alcoa and its employees or agents (1) illegally bribed officials of the government of Bahrain and/or officers of Alba in order to force Alba to purchase alumina at excessively high prices, (2) illegally bribed officials of the government of Bahrain and/or officers of Alba and issued threats in order to pressure Alba to enter into an agreement by which Alcoa would purchase an



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equity interest in Alba, and (3) assigned portions of existing supply contracts between Alcoa and Alba for the sole purpose of facilitating alleged bribes and unlawful commissions. The complaint alleged that Alcoa and the other defendants violated the Racketeer Influenced and Corrupt Organizations Act (RICO) and committed fraud. Alba claimed damages in excess of \$1,000. Alba's complaint sought treble damages with respect to its RICO claims; compensatory, consequential, exemplary, and punitive damages; rescission of the 2005 alumina supply contract; and attorneys' fees and costs.

On October 9, 2012, the Alcoa Parties, without admitting any liability, entered into a settlement agreement with Alba. The agreement called for AWA to pay Alba \$85 in two equal installments, one-half at time of settlement and one-half one year later, and for the case against the Alcoa Parties to be dismissed with prejudice. Additionally, AWA and Alba entered into a long-term alumina supply agreement. On October 9, 2012, pursuant to the settlement agreement, AWA paid Alba \$42.5, and all claims against the Alcoa Parties were dismissed with prejudice. On October 9, 2013 pursuant to the settlement agreement, AWA paid the remaining \$42.5. Based on the settlement agreement, in the 2012 third quarter, Alcoa recorded a \$40 charge in addition to the \$45 charge it recorded in the 2012 second quarter in respect of the suit (see Agreement with Alumina Limited below).

**Government Investigations.** On February 26, 2008, Alcoa Inc. advised the Department of Justice ( DOJ ) and the Securities and Exchange Commission ( SEC ) that it had recently become aware of the claims by Alba as alleged in the Alba civil suit, had already begun an internal investigation and intended to cooperate fully in any investigation that the DOJ or the SEC may commence. On March 17, 2008, the DOJ notified Alcoa that it had opened a formal investigation. The SEC subsequently commenced a concurrent investigation. Alcoa has been cooperating with the government since that time.

In the past year, Alcoa had been seeking settlements of both investigations. In the second quarter of 2013, Alcoa proposed to settle the DOJ matter by offering the DOJ a cash payment of \$103. Based on this offer, Alcoa recorded a charge of \$103 in the 2013 second quarter. Also in the second quarter of 2013, Alcoa exchanged settlement offers with the SEC. However, the SEC staff rejected Alcoa's offer of \$60 and no charge was recorded. During the remainder of 2013, settlement discussions with both the DOJ and the SEC continued.

On January 9, 2014, Alcoa resolved the investigations by the DOJ and the SEC. The settlement with the DOJ was reached with AWA. Under the terms of a plea agreement entered into with the DOJ, effective January 9, 2014, AWA pled guilty to one count of violating the anti-bribery provisions of the Foreign Corrupt Practices Act of 1977, as amended (the FCPA ). As part of the DOJ resolution, AWA agreed to pay a total of \$223, including a fine of \$209 payable in five equal installments over four years. The first installment of \$41.8, plus a one-time administrative forfeiture of \$14, was paid in the first quarter of 2014, the second installment of \$41.8 was paid in the first quarter of 2015, and the remaining installments of \$41.8 each will be paid in the first quarters of 2016 through 2018 (the third installment was paid on January 8, 2016). The DOJ is bringing no case against Alcoa Inc.

Effective January 9, 2014, the Company also settled civil charges filed by the SEC in an administrative proceeding relating to the anti-bribery, internal controls, and books and records provisions of the FCPA. Under the terms of the settlement with the SEC, the Company agreed to a settlement amount of \$175, but will be given credit for the \$14 one-time forfeiture payment, which is part of the DOJ resolution, resulting in a total cash payment to the SEC of \$161 payable in five equal installments over four years. The first and second installments of \$32.2 each were paid to the SEC in the first quarter of 2014 and 2015, respectively, and the remaining installments of \$32.2 each will be paid in the first quarters of 2016 through 2018 (the third installment was paid on January 25, 2016).

There was no allegation in the filings by the DOJ and there was no finding by the SEC that anyone at Alcoa Inc. knowingly engaged in the conduct at issue.

Based on the resolutions with both the DOJ and SEC, in the 2013 fourth quarter, Alcoa recorded a \$288 charge, which includes legal costs of \$7, in addition to the \$103 charge it recorded in the 2013 second quarter in respect of the investigations (see Agreement with Alumina Limited below).

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**Agreement with Alumina Limited.** AWA is a U.S.-based Alcoa World Alumina and Chemicals ( AWAC ) company organized under the laws of Delaware that owns, directly or indirectly, alumina refineries and bauxite mines in the Atlantic region. AWAC is an unincorporated global bauxite mining and alumina refining venture between Alcoa and Alumina Limited. AWAC consists of a number of affiliated operating entities, including AWA, which own, or have an interest in, or operate bauxite mines and alumina refineries in eight countries (seven as of December 31, 2014 due to the divestiture of an ownership interest in a mining and refining joint venture in Jamaica see Note F). Alcoa owns 60% and Alumina Limited owns 40% of these individual entities, which are consolidated by the Company for financial reporting purposes.

In October 2012, Alcoa and Alumina Limited entered into an agreement to allocate the costs of the Alba civil settlement and all legal fees associated with this matter (including the government investigations discussed above) between Alcoa and Alumina Limited on an 85% and 15% basis, respectively, but this would occur only if a settlement is reached with the DOJ and the SEC regarding their investigations. As such, the \$85 civil settlement in 2012 and all legal costs associated with the civil suit and government investigations incurred prior to 2013 were allocated on a 60% and 40% basis in the respective periods on Alcoa's Statement of Consolidated Operations. As a result of the resolutions of the government investigations, the \$384 charge and legal costs incurred in 2013 were allocated on an 85% and 15% basis per the allocation agreement with Alumina Limited. Additionally, the \$85 civil settlement from 2012 and all legal costs associated with the civil suit and government investigations incurred prior to 2013 were reallocated on the 85% and 15% basis. The following table details the activity related to the Alba matter:

|  | 2013   |                 |        | 2012  |                 |       |
|--|--------|-----------------|--------|-------|-----------------|-------|
|  | Alcoa  | Alumina Limited | Total  | Alcoa | Alumina Limited | Total |
| Government investigations <sup>(1)</sup> | \$ 326 | \$ 58           | \$ 384 | \$ -  | \$ -            | \$ -  |
| Civil suit <sup>(1)</sup>                | -      | -               | -      | 51    | 34              | 85    |
| Reallocation of civil suit               | 21     | (21)            | -      | -     | -               | -     |
| Reallocation of legal costs              | 20     | (20)            | -      | -     | -               | -     |
| Loss before income taxes                 | 367    | 17              | 384    | 51    | 34              | 85    |
| Benefit for income taxes                 | 66     | -               | 66     | 18    | -               | 18    |
| Net loss <sup>(2)</sup>                  | \$ 301 | \$ 17           | \$ 318 | \$ 33 | \$ 34           | \$ 67 |

<sup>(1)</sup> The amount in the Total column was recorded in Restructuring and other charges (see Note D).

<sup>(2)</sup> In 2013 and 2012, the amount for Alcoa was included in Net (loss) income attributable to Alcoa, and the amount for Alumina Limited was included in Net income (loss) attributable to noncontrolling interests.

*Other Matters*

On June 5, 2015, AWA and St. Croix Alumina, L.L.C. ( SCA ) filed a complaint in Delaware Chancery Court for a declaratory judgment and injunctive relief to resolve a dispute between Alcoa and Glencore Ltd. ( Glencore ) with respect to claimed obligations under a 1995 asset purchase agreement between Alcoa and Glencore. The dispute arose from Glencore's demand that Alcoa indemnify it for liabilities it may have to pay to Lockheed Martin ( Lockheed ) related to the St. Croix alumina refinery. Lockheed had earlier filed suit against Glencore in federal court in New York seeking indemnity for liabilities it had incurred and would incur to the U.S. Virgin Islands to remediate certain properties at the refinery property and claimed that Glencore was required by an earlier, 1989 purchase agreement to indemnify it. Glencore had demanded that Alcoa indemnify and defend it in the Lockheed case and threatened to claim over against Alcoa in the New York action despite exclusive jurisdiction for resolution of disputes under the 1995 purchase agreement being in Delaware. After Glencore conceded that it was not seeking to add Alcoa to the New York action, AWA and SCA dismissed their complaint in the Chancery Court case and on August 6, 2015 filed a complaint for declaratory judgment in Delaware Superior Court. AWA and SCA filed a motion for judgment on the pleadings on September 16, 2015. Glencore answered AWA's and SCA's complaint and asserted counterclaims on August 27, 2015, and on October 2, 2015 filed its own motion for judgment on the pleadings. Argument on the parties' motions was held by the court on December 7, 2015, and by order dated February 8, 2016, Alcoa's motion was granted and Glencore's motion was denied resulting in Alcoa not being liable to indemnify Glencore for the Lockheed action. On February 17,

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2016, Glencore filed notice of its application for interlocutory appeal of the February 8 ruling. AWA and SCA have 10 days to respond. At this time, the Company is unable to reasonably predict the ultimate outcome for this matter.

Before 2002, Alcoa purchased power in Italy in the regulated energy market and received a drawback of a portion of the price of power under a special tariff in an amount calculated in accordance with a published resolution of the Italian Energy Authority, Energy Authority Resolution n. 204/1999 ( 204/1999 ). In 2001, the Energy Authority published another resolution, which clarified that the drawback would be calculated in the same manner, and in the same amount, in either the regulated or unregulated market. At the beginning of 2002, Alcoa left the regulated energy market to purchase energy in the unregulated market. Subsequently, in 2004, the Energy Authority introduced regulation no. 148/2004, which set forth a different method for calculating the special tariff that would result in a different drawback for the regulated and unregulated markets. Alcoa challenged the new regulation in the Administrative Court of Milan and received a favorable judgment in 2006. Following this ruling, Alcoa continued to receive the power price drawback in accordance with the original calculation method, through 2009, when the European Commission declared all such special tariffs to be impermissible state aid. In 2010, the Energy Authority appealed the 2006 ruling to the Consiglio di Stato (final court of appeal). On December 2, 2011, the Consiglio di Stato ruled in favor of the Energy Authority and against Alcoa, thus presenting the opportunity for the energy regulators to seek reimbursement from Alcoa of an amount equal to the difference between the actual drawback amounts received over the relevant time period, and the drawback as it would have been calculated in accordance with regulation 148/2004. On February 23, 2012, Alcoa filed its appeal of the decision of the Consiglio di Stato (this appeal was subsequently withdrawn in March 2013). On March 26, 2012, Alcoa received a letter from the agency (Cassa Conguaglio per il Settore Elettrico (CCSE)) responsible for making and collecting payments on behalf of the Energy Authority demanding payment in the amount of approximately \$110 ( 85), including interest. By letter dated April 5, 2012, Alcoa informed CCSE that it disputes the payment demand of CCSE since (i) CCSE was not authorized by the Consiglio di Stato decisions to seek payment of any amount, (ii) the decision of the Consiglio di Stato has been appealed (see above), and (iii) in any event, no interest should be payable. On April 29, 2012, Law No. 44 of 2012 ( 44/2012 ) came into effect, changing the method to calculate the drawback. On February 21, 2013, Alcoa received a revised request letter from CCSE demanding Alcoa's subsidiary, Alcoa Trasformazioni S.r.l., make a payment in the amount of \$97 ( 76), including interest, which reflects a revised calculation methodology by CCSE and represents the high end of the range of reasonably possible loss associated with this matter of \$0 to \$97 ( 76). Alcoa has rejected that demand and has formally challenged it through an appeal before the Administrative Court on April 5, 2013. The Administrative Court scheduled a hearing for December 19, 2013, which was subsequently postponed until April 17, 2014, and further postponed until June 19, 2014. On this date, the Administrative Court listened to Alcoa's oral argument, and on September 2, 2014, rendered its decision. The Administrative Court declared the payment request of CCSE and the Energy Authority to Alcoa to be unsubstantiated based on the 148/2004 resolution with respect to the January 19, 2007 through November 19, 2009 timeframe. On December 18, 2014, the CCSE and the Energy Authority appealed the Administrative Court's September 2, 2014 decision; however, a date for the hearing has not been scheduled. As a result of the conclusion of the European Commission Matter on January 26, 2016 described below, management has modified its outlook with respect to a portion of the pending legal proceedings related to this matter. As such, a charge of \$37 ( 34) was recorded in Restructuring and other charges for the year ended December 31, 2015 on the accompanying Statement of Consolidated Operations to establish a partial reserve for this matter. At this time, the Company is unable to reasonably predict the ultimate outcome for this matter.

**European Commission Matter.** In July 2006, the European Commission (EC) announced that it had opened an investigation to establish whether an extension of the regulated electricity tariff granted by Italy to some energy-intensive industries complied with European Union (EU) state aid rules. The Italian power tariff extended the tariff that was in force until December 31, 2005 through November 19, 2009 (Alcoa had been incurring higher power costs at its smelters in Italy subsequent to the tariff end date through the end of 2012). The extension was originally through 2010, but the date was changed by legislation adopted by the Italian Parliament effective on August 15, 2009. Prior to expiration of the tariff in 2005, Alcoa had been operating in Italy for more than 10 years under a power supply structure approved by the EC in 1996. That measure provided a competitive power supply to the primary aluminum industry and was not considered state aid from the Italian Government. The EC's announcement expressed concerns about whether Italy's extension of the tariff beyond 2005 was compatible with EU legislation and potentially distorted competition in the European market of primary aluminum, where energy is an important part of the production costs.

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On November 19, 2009, the EC announced a decision in this matter stating that the extension of the tariff by Italy constituted unlawful state aid, in part, and, therefore, the Italian Government is to recover a portion of the benefit Alcoa received since January 2006 (including interest). The amount of this recovery was to be based on a calculation prepared by the Italian Government (see below). In late 2009, after discussions with legal counsel and reviewing the bases on which the EC decided, including the different considerations cited in the EC decision regarding Alcoa's two smelters in Italy, Alcoa recorded a charge of \$250 ( 173), which included \$20 ( 14) to write off a receivable from the Italian Government for amounts due under the now expired tariff structure and \$230 ( 159) to establish a reserve. On April 19, 2010, Alcoa filed an appeal of this decision with the General Court of the EU (see below). Prior to 2012, Alcoa was involved in other legal proceedings related to this matter that separately sought the annulment of the EC's July 2006 decision to open an investigation alleging that such decision did not follow the applicable procedural rules and requested injunctive relief to suspend the effectiveness of the EC's November 19, 2009 decision. However, the decisions by the General Court, and subsequent appeals to the European Court of Justice, resulted in the denial of these remedies.

In June 2012, Alcoa received formal notification from the Italian Government with a calculated recovery amount of \$375 ( 303); this amount was reduced by \$65 ( 53) for amounts owed by the Italian Government to Alcoa, resulting in a net payment request of \$310 ( 250). In a notice published in the Official Journal of the European Union on September 22, 2012, the EC announced that it had filed an action against the Italian Government on July 18, 2012 to compel it to collect the recovery amount (on October 17, 2013, the European Court of Justice ordered Italy to so collect). On September 27, 2012, Alcoa received a request for payment in full of the \$310 ( 250) by October 31, 2012. Following discussions with the Italian Government regarding the timing of such payment, Alcoa paid the requested amount in five quarterly installments of \$69 ( 50) beginning in October 2012 through December 2013.

On October 16, 2014, Alcoa received notice from the General Court of the EU that its April 19, 2010 appeal of the EC's November 19, 2009 decision was denied. On December 27, 2014, Alcoa filed an appeal of the General Court's October 16, 2014 ruling to the European Court of Justice (ECJ). Following submission of the EC's response to the appeal, on June 10, 2015, Alcoa filed a request for an oral hearing before the ECJ; no decision on that request was received. On January 26, 2016, Alcoa was informed that the ECJ had dismissed Alcoa's December 27, 2014 appeal of the General Court's October 16, 2014 ruling. The dismissal of Alcoa's appeal represents the conclusion of the legal proceedings in this matter. Prior to this dismissal, Alcoa had a noncurrent asset of \$100 ( 91) reflecting the excess of the total of the five payments made to the Italian Government over the reserve recorded in 2009. As a result, this noncurrent asset, along with the \$58 ( 53) for amounts owed by the Italian Government to Alcoa mentioned above plus \$6 ( 6) for interest previously paid, was written-off. A charge of \$164 ( 150) was recorded in Restructuring and other charges for the year ended December 31, 2015 on the accompanying Statement of Consolidated Operations (see Note D).

As a result of the EC's November 19, 2009 decision, management had contemplated ceasing operations at its Italian smelters due to uneconomical power costs. In February 2010, management agreed to continue to operate its smelters in Italy for up to six months while a long-term solution to address increased power costs could be negotiated. Over a portion of this time, a long-term solution was not able to be reached related to the Fusina smelter, therefore, in May 2010, Alcoa and the Italian Government agreed to a temporary idling of the Fusina smelter. As of September 30, 2010, the Fusina smelter was fully curtailed (44,000 metric-tons-per-year). For the Portovesme smelter, Alcoa executed a new power agreement effective September 1, 2010 through December 31, 2012, replacing the short-term, market-based power contract that was in effect since early 2010. This new agreement along with interruptibility rights (i.e. compensation for power interruptions when grids are overloaded) granted to Alcoa for the Portovesme smelter provided additional time to negotiate a long-term solution (the EC had previously determined that the interruptibility rights were not considered state aid).

At the end of 2011, as part of a restructuring of Alcoa's global smelting system, management decided to curtail operations at the Portovesme smelter during 2012 due to the uncertain prospects for viable, long-term power, along with rising raw materials costs and falling global aluminum prices (mid-2011 to late 2011). As of December 31, 2012, the Portovesme smelter was fully curtailed (150,000 metric-tons-per-year).



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In June 2013 and August 2014, Alcoa decided to permanently shut down and demolish the Fusina and Portovesme smelters, respectively, due to persistent uneconomical conditions (see Note D).

**Environmental Matters.** Alcoa participates in environmental assessments and cleanups at more than 100 locations. These include owned or operating facilities and adjoining properties, previously owned or operating facilities and adjoining properties, and waste sites, including Superfund (Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)) sites.

A liability is recorded for environmental remediation when a cleanup program becomes probable and the costs can be reasonably estimated. As assessments and cleanups proceed, the liability is adjusted based on progress made in determining the extent of remedial actions and related costs. The liability can change substantially due to factors such as the nature and extent of contamination, changes in remedial requirements, and technological changes, among others.

Alcoa's remediation reserve balance was \$604 and \$543 at December 31, 2015 and 2014 (of which \$50 and \$70 was classified as a current liability), respectively, and reflects the most probable costs to remediate identified environmental conditions for which costs can be reasonably estimated.

In 2015, the remediation reserve was increased by \$115 due to a charge of \$52 related to the planned demolition of the remaining structures at the Massena East smelter location (see Note D), a charge of \$29 related to the planned demolition of the Poços de Caldas smelter and the Anglesea power station (see Note D), a charge of \$12 related to the Mosjøen location (see below), a charge of \$7 related to the Portovesme location (see below), and a net charge of \$15 associated with a number of other sites. In 2014, the remediation reserve was increased by \$61 due to a charge of \$42 related to the planned demolition of certain structures at the Massena East, NY, Point Henry and Yennora, Australia, and Portovesme, Italy locations (see Note D), a charge of \$3 related to the Portovesme location (see below), and a net charge of \$16 associated with a number of other sites. Of the changes to the remediation reserve in 2015 and 2014, \$86 and \$47, respectively, was recorded in Restructuring and other charges, while the remainder was recorded in Cost of goods sold on the accompanying Statement of Consolidated Operations.

Payments related to remediation expenses applied against the reserve were \$43 and \$46 in 2015 and 2014, respectively. These amounts include expenditures currently mandated, as well as those not required by any regulatory authority or third party. In 2015, the change in the reserve also reflects a decrease of \$16 due to the effects of foreign currency translation and an increase of \$5 related to the acquisition of Firth Rixson (see Note F). In 2014, the change in the reserve also reflects an increase of \$19 due to the effects of foreign currency translation and a reclassification of amounts included in other reserves within Other noncurrent liabilities and deferred credits on Alcoa's Consolidated Balance Sheet as of December 31, 2013.

Included in annual operating expenses are the recurring costs of managing hazardous substances and environmental programs. These costs are estimated to be approximately 2% of cost of goods sold.

The following discussion provides details regarding the current status of certain significant reserves related to current or former Alcoa sites.

**Massena West, NY** Alcoa has an ongoing remediation project related to the Grasse River, which is adjacent to Alcoa's Massena plant site. Many years ago, it was determined that sediments and fish in the river contain varying levels of polychlorinated biphenyls (PCBs). The project, which was selected by the U.S. Environmental Protection Agency (EPA) in a Record of Decision (ROD) issued in April 2013, is aimed at capping PCB contaminated sediments with concentration in excess of one part per million in the main channel of the river and dredging PCB contaminated sediments in the near-shore areas where total PCBs exceed one part per million. At December 31, 2015 and 2014, the reserve balance associated with this matter was \$234 and \$239, respectively. Alcoa is in the planning and design phase, which is expected to be completed in 2017. Subsequently in 2017, the actual remediation fieldwork is expected to commence and take approximately four years. The majority of the project funding is expected to be spent between 2017 and 2021.

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**Sherwin, TX** In connection with the sale of the Sherwin alumina refinery, which was required to be divested as part of the Reynolds merger in 2000, Alcoa agreed to retain responsibility for the remediation of the then existing environmental conditions, as well as a pro rata share of the final closure of the active bauxite residue waste disposal areas (known as the Copano facility). Alcoa's share of the closure costs is proportional to the total period of operation of the active waste disposal areas. At December 31, 2015 and 2014, the reserve balance associated with Sherwin was \$30 and \$32, respectively. Approximately half of the project funding is expected to be spent through 2019. The remainder is not expected to be spent in the foreseeable future as it is dependent upon the operating life of the active waste disposal areas.

**East St. Louis, IL** Alcoa has an ongoing remediation project related to an area used for the disposal of bauxite residue from former alumina refining operations. The project, which was selected by the EPA in a ROD issued in July 2012, is aimed at implementing a soil cover over the affected area. On November 1, 2013, the U.S. Department of Justice lodged a consent decree on behalf of the EPA for Alcoa to conduct the work outlined in the ROD. This consent decree was entered as final in February 2014 by the U.S. Department of Justice. As a result, Alcoa began construction in March 2014; this project is expected to be completed by the end of March 2016 (Alcoa has a second project in East St. Louis that is separate from the matter presented herein on which Alcoa is expecting an EPA decision in 2016 any resulting liability is not expected to be material). At December 31, 2015 and 2014, the reserve balance associated with this matter was \$8 and \$15, respectively.

**Fusina and Portovesme, Italy** In 1996, Alcoa acquired the Fusina smelter and rolling operations and the Portovesme smelter, both of which are owned by Alcoa's subsidiary Alcoa Trasformazioni S.r.l. (Trasformazioni), from Alumix, an entity owned by the Italian Government. At the time of the acquisition, Alumix indemnified Alcoa for pre-existing environmental contamination at the sites. In 2004, the Italian Ministry of Environment and Protection of Land and Sea (MOE) issued orders to Trasformazioni and Alumix for the development of a clean-up plan related to soil contamination in excess of allowable limits under legislative decree and to institute emergency actions and pay natural resource damages. Trasformazioni appealed the orders and filed suit against Alumix, among others, seeking indemnification for these liabilities under the provisions of the acquisition agreement. In 2009, Ligestra S.r.l. (Ligestra), Alumix's successor, and Trasformazioni agreed to a stay of the court proceedings while investigations were conducted and negotiations advanced towards a possible settlement.

In December 2009, Trasformazioni and Ligestra reached an initial agreement for settlement of the liabilities related to Fusina while negotiations continued related to Portovesme (see below). The agreement outlined an allocation of payments to the MOE for emergency action and natural resource damages and the scope and costs for a proposed soil remediation project, which was formally presented to the MOE in mid-2010. The agreement was contingent upon final acceptance of the remediation project by the MOE. As a result of entering into this agreement, Alcoa increased the reserve by \$12 in 2009 for Fusina. Based on comments received from the MOE and local and regional environmental authorities, Trasformazioni submitted a revised remediation plan in the first half of 2012; however, such revisions did not require any change to the existing reserve. In October 2013, the MOE approved the project submitted by Alcoa, resulting in no adjustment to the reserve.

In January 2014, in anticipation of Alcoa reaching a final administrative agreement with the MOE, Alcoa and Ligestra entered into a final agreement related to Fusina for allocation of payments to the MOE for emergency action and natural resource damages and the costs for the approved soil remediation project. The agreement resulted in Ligestra assuming 50% to 80% of all payments and remediation costs. On February 27, 2014, Alcoa and the MOE reached a final administrative agreement for conduct of work. The agreement includes both a soil and groundwater remediation project estimated to cost \$33 (24) and requires payments of \$25 (18) to the MOE for emergency action and natural resource damages. The remediation projects are slated to begin as soon as Alcoa receives final approval from the Ministry of Infrastructure. Based on the final agreement with Ligestra, Alcoa's share of all costs and payments is \$17 (12), of which \$9 (6) related to the damages will be paid annually over a 10-year period, which began in April 2014, and was previously fully reserved.

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Separately, in 2009, due to additional information derived from the site investigations conducted at Portovesme, Alcoa increased the reserve by \$3. In November 2011, Trasformazioni and Ligestra reached an agreement for settlement of the liabilities related to Portovesme, similar to the one for Fusina. A proposed soil remediation project for Portovesme was formally presented to the MOE in June 2012. Neither the agreement with Ligestra nor the proposal to the MOE resulted in a change to the reserve for Portovesme. In November 2013, the MOE rejected the proposed soil remediation project and requested a revised project be submitted. In May 2014, Trasformazioni and Ligestra submitted a revised soil remediation project that addressed certain stakeholders' concerns. Alcoa increased the reserve by \$3 in 2014 to reflect the estimated higher costs associated with the revised soil remediation project, as well as current operating and maintenance costs of the Portovesme site.

In October 2014, the MOE required a further revised project be submitted to reflect the removal of a larger volume of contaminated soil than what had been proposed, as well as design changes for the cap related to the remaining contaminated soil left in place and the expansion of an emergency containment groundwater pump and treatment system that was previously installed. Trasformazioni and Ligestra submitted the further revised soil remediation project in February 2015. As a result, Alcoa increased the reserve by \$7 in March 2015 to reflect the increase in the estimated costs of the project. In October 2015, Alcoa received a final ministerial decree approving the February 2015 revised soil remediation project. Work on the soil remediation project will commence in 2016 and is expected to be completed in 2019. Alcoa and Ligestra are now working on a final groundwater remediation project, which will be submitted to the MOE for review during 2016. The ultimate outcome of this matter may result in a change to the existing reserve for Portovesme.

**Baie Comeau, Quebec, Canada** In August 2012, Alcoa presented an analysis of remediation alternatives to the Quebec Ministry of Sustainable Development, Environment, Wildlife and Parks (MDDEP), in response to a previous request, related to known PCBs and polycyclic aromatic hydrocarbons (PAHs) contained in sediments of the Anse du Moulin bay. As such, Alcoa increased the reserve for Baie Comeau by \$25 in 2012 to reflect the estimated cost of Alcoa's recommended alternative, consisting of both dredging and capping of the contaminated sediments. In July 2013, Alcoa submitted the Environmental Impact Assessment for the project to the MDDEP. The MDDEP notified Alcoa that the project as it was submitted was approved and a final ministerial decree was issued in July 2015. As a result, no further adjustment to the reserve was required in 2015. The decree provides final approval for the project and allows Alcoa to start work on the final project design, which is expected to be completed in 2016 with construction on the project expected to begin in 2017. Completion of the final project design and bidding of the project may result in additional liability in a future period.

**Mosjøen, Norway** In September 2012, Alcoa presented an analysis of remediation alternatives to the Norwegian Environmental Agency (NEA) (formerly the Norwegian Climate and Pollution Agency, or *Klif*), in response to a previous request, related to known PAHs in the sediments located in the harbor and extending out into the fjord. As such, Alcoa increased the reserve for Mosjøen by \$20 in 2012 to reflect the estimated cost of the baseline alternative for dredging of the contaminated sediments. A proposed project reflecting this alternative was formally presented to the NEA in June 2014, and was resubmitted in late 2014 to reflect changes by the NEA. The revised proposal did not result in a change to the reserve for Mosjøen.

In April 2015, the NEA notified Alcoa that the revised project was approved and required submission of the final project design before issuing a final order. Alcoa completed and submitted the final project design, which identified a need to stabilize the related wharf structure to allow for the sediment dredging in the harbor. As a result, Alcoa increased the reserve for Mosjøen by \$11 in June 2015 to reflect the estimated cost of the wharf stabilization. Also in June 2015, the NEA issued a final order approving the project as well as the final project design. In September 2015, Alcoa increased the reserve by \$1 to reflect the potential need (based on prior experience with similar projects) to perform additional dredging if the results of sampling, which is required by the order, don't achieve the required cleanup levels. Project construction will commence in 2016 and is expected to be completed by the end of 2017.

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**Tax.** In September 2010, following a corporate income tax audit covering the 2003 through 2005 tax years, an assessment was received as a result of Spain's tax authorities disallowing certain interest deductions claimed by a Spanish consolidated tax group owned by the Company. An appeal of this assessment in Spain's Central Tax Administrative Court by the Company was denied in October 2013. In December 2013, the Company filed an appeal of the assessment in Spain's National Court.

Additionally, following a corporate income tax audit of the same Spanish tax group for the 2006 through 2009 tax years, Spain's tax authorities issued an assessment in July 2013 similarly disallowing certain interest deductions. In August 2013, the Company filed an appeal of this second assessment in Spain's Central Tax Administrative Court, which was denied in January 2015. The Company filed an appeal of this second assessment in Spain's National Court in March 2015.

The combined assessments (remeasured for a tax rate change enacted in November 2014—see Note T) total \$263 (€241). The Company believes it has meritorious arguments to support its tax position and intends to vigorously litigate the assessments through Spain's court system. However, in the event the Company is unsuccessful, a portion of the assessments may be offset with existing net operating losses available to the Spanish consolidated tax group. Additionally, it is possible that the Company may receive similar assessments for tax years subsequent to 2009. At this time, the Company is unable to reasonably predict an outcome for this matter.

In March 2013, Alcoa's subsidiary, Alcoa World Alumina Brasil (AWAB), was notified by the Brazilian Federal Revenue Office (RFB) that approximately \$110 (R\$220) of value added tax credits previously claimed are being disallowed and a penalty of 50% assessed. Of this amount, AWAB received \$41 (R\$82) in cash in May 2012. The value added tax credits were claimed by AWAB for both fixed assets and export sales related to the Juruti bauxite mine and São Luís refinery expansion. The RFB has disallowed credits they allege belong to the consortium in which AWAB owns an interest and should not have been claimed by AWAB. Credits have also been disallowed as a result of challenges to apportionment methods used, questions about the use of the credits, and an alleged lack of documented proof. AWAB presented defense of its claim to the RFB on April 8, 2013. If AWAB is successful in this administrative process, the RFB would have no further recourse. If unsuccessful in this process, AWAB has the option to litigate at a judicial level. Separately from the AWAB's administrative appeal, in June 2015, new tax law was enacted repealing the provisions in the tax code that were the basis for the RFB assessing a 50% penalty in this matter. As such, the estimated range of reasonably possible loss is \$0 to \$27 (R\$103), whereby the maximum end of this range represents the portion of the disallowed credits applicable to the export sales and excludes the 50% penalty. Additionally, the estimated range of disallowed credits related to AWAB's fixed assets is \$0 to \$30 (R\$117), which would increase the net carrying value of AWAB's fixed assets if ultimately disallowed. It is management's opinion that the allegations have no basis; however, at this time, management is unable to reasonably predict an outcome for this matter.

Between 2000 and 2002, Alcoa Alumínio (Alumínio) sold approximately 2,000 metric tons of metal per month from its Poços de Caldas facility, located in the State of Minas Gerais (the State), to Alfio, a customer also located in the State. Sales in the State were exempted from value-added tax (VAT) requirements. Alfio subsequently sold metal to customers outside of the State, but did not pay the required VAT on those transactions. In July 2002, Alumínio received an assessment from State auditors on the theory that Alumínio should be jointly and severally liable with Alfio for the unpaid VAT. In June 2003, the administrative tribunal found Alumínio liable, and Alumínio filed a judicial case in the State in February 2004 contesting the finding. In May 2005, the Court of First Instance found Alumínio solely liable, and a panel of a State appeals court confirmed this finding in April 2006. Alumínio filed a special appeal to the Superior Tribunal of Justice (STJ) in Brasília (the federal capital of Brazil) later in 2006. In 2011, the STJ (through one of its judges) reversed the judgment of the lower courts, finding that Alumínio should neither be solely nor jointly and severally liable with Alfio for the VAT, which ruling was then appealed by the State. In August 2012, the STJ agreed to have the case reheard before a five-judge panel. A decision from this panel is pending, but additional appeals are likely. At December 31, 2015, the assessment totaled \$35 (R\$135), including penalties and interest. While the Company believes it has meritorious defenses, the Company is unable to reasonably predict an outcome.

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**Other.** In addition to the matters discussed above, various other lawsuits, claims, and proceedings have been or may be instituted or asserted against Alcoa, including those pertaining to environmental, product liability, safety and health, and tax matters. While the amounts claimed in these other matters may be substantial, the ultimate liability cannot now be determined because of the considerable uncertainties that exist. Therefore, it is possible that the Company's liquidity or results of operations in a particular period could be materially affected by one or more of these other matters. However, based on facts currently available, management believes that the disposition of these other matters that are pending or asserted will not have a material adverse effect, individually or in the aggregate, on the financial position of the Company.

**Commitments**

**Investments.** Alumínio, a wholly-owned subsidiary of Alcoa, is a participant in four consortia that each owns a hydroelectric power project in Brazil. The purpose of Alumínio's participation is to increase its energy self-sufficiency and provide a long-term, low-cost source of power for its two smelters (see below) and one refinery. These projects are known as Machadinho, Barra Grande, Serra do Facão, and Estreito.

Alumínio committed to taking a share of the output of the Machadinho and Barra Grande projects each for 30 years and the Serra do Facão and Estreito projects each for 26 years at cost (including cost of financing the project). In the event that other participants in any of these projects fail to fulfill their financial responsibilities, Alumínio may be required to fund a portion of the deficiency. In accordance with the respective agreements, if Alumínio funds any such deficiency, its participation and share of the output from the respective project will increase proportionately.

The Machadinho project reached full capacity in 2002. Alumínio's investment in this project is 30.99%, which entitles Alumínio to approximately 120 megawatts of assured power. The Machadinho consortium is an unincorporated joint venture, and, therefore, Alumínio's share of the assets and liabilities of the consortium are reflected in the respective lines on the accompanying Consolidated Balance Sheet.

The Barra Grande project reached full capacity in 2006. Alumínio's investment in this project is 42.18% and is accounted for under the equity method. This entitles Alumínio to approximately 160 megawatts of assured power. Alumínio's total investment in this project was \$94 (R\$374) and \$132 (R\$355) at December 31, 2015 and 2014, respectively.

The Serra do Facão project reached full capacity in 2010. Alumínio's investment in this project is 34.97% and is accounted for under the equity method. This entitles Alumínio to approximately 65 megawatts of assured power. Alumínio's total investment in this project was \$52 (R\$208) and \$66 (R\$178) at December 31, 2015 and 2014, respectively.

The Estreito project reached full capacity in March 2013. Alumínio's investment in this project is 25.49%, which entitles Alumínio to approximately 150 megawatts of assured power. The Estreito consortium is an unincorporated joint venture, and, therefore, Alumínio's share of the assets and liabilities of the consortium are reflected in the respective lines on the accompanying Consolidated Balance Sheet. As of December 31, 2015, construction of the Estreito project is essentially complete.

Prior to October 2013, Alumínio's power self-sufficiency satisfied approximately 70% of a total energy demand of approximately 690 megawatts from two smelters (São Luís (Alumar) and Poços de Caldas) and one refinery (Poços de Caldas) in Brazil. Since that time, the total energy demand has declined by approximately 675 megawatts due to capacity curtailments of both smelters in both 2013 and 2014, as well as the eventual permanent closure of the Poços de Caldas smelter in 2015.

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In 2004, Alcoa acquired a 20% interest in a consortium, which subsequently purchased the Dampier to Bunbury Natural Gas Pipeline (DBNGP) in Western Australia, in exchange for an initial cash investment of \$17 (A\$24). The investment in the DBNGP, which is classified as an equity investment, was made in order to secure a competitively priced long-term supply of natural gas to Alcoa's refineries in Western Australia. Alcoa made additional contributions of \$141 (A\$176) for its share of the pipeline capacity expansion and other operational purposes of the consortium through September 2011. No further expansion of the pipeline's capacity is planned at this time. In late 2011, the consortium initiated a three-year equity call plan to improve its capitalization structure. This plan required Alcoa to contribute \$39 (A\$40), all of which was made through December 31, 2014. Following the completion of the three-year equity call plan in December 2014, the consortium initiated a new equity call plan to further improve its capitalization structure. This plan requires Alcoa to contribute \$30 (A\$36) through mid 2016, of which \$17 (A\$22) was made through December 31, 2015, including \$16 (A\$21) in 2015. In addition to its equity ownership, Alcoa has an agreement to purchase gas transmission services from the DBNGP. At December 31, 2015, Alcoa has an asset of \$268 (A\$368) representing prepayments made under the agreement for future gas transmission services. Alcoa's maximum exposure to loss on the investment and the related contract is approximately \$380 (A\$520) as of December 31, 2015.

On April 8, 2015, Alcoa's majority-owned subsidiary, Alcoa of Australia Limited (AofA), which is part of AWAC, secured a new 12-year gas supply agreement to power its three alumina refineries in Western Australia beginning in July 2020. This agreement was conditional on the completion of a third-party acquisition of the related energy assets from the then-current owner, which occurred in June 2015. The terms of AofA's gas supply agreement require a prepayment of \$500 to be made in two installments. The first installment of \$300 was made at the time of the completion of the third-party acquisition and the second installment of \$200 will be made in April 2016 (previously was scheduled in January 2016). At December 31, 2015, Alcoa has an asset of \$288 (A\$395), which was included in Other noncurrent assets on the accompanying Consolidated Balance Sheet, representing the first installment.

**Purchase Obligations.** Alcoa is party to unconditional purchase obligations for energy that expire between 2018 and 2036. Commitments related to these contracts total \$74 in 2016, \$130 in 2017, \$133 in 2018, \$126 in 2019, \$129 in 2020, and \$1,711 thereafter. Expenditures under these contracts totaled \$131 in 2015, \$178 in 2014, and \$163 in 2013. Additionally, Alcoa has entered into other purchase commitments for energy, raw materials, and other goods and services, which total \$3,015 in 2016, \$1,807 in 2017, \$1,569 in 2018, \$1,496 in 2019, \$1,401 in 2020, and \$13,251 thereafter.

**Operating Leases.** Certain land and buildings, alumina refinery process control technology, plant equipment, vehicles, and computer equipment are under operating lease agreements. Total expense for all leases was \$210 in 2015, \$227 in 2014, and \$232 in 2013. Under long-term operating leases, minimum annual rentals are \$243 in 2016, \$168 in 2017, \$130 in 2018, \$100 in 2019, \$74 in 2020, and \$138 thereafter.

**Guarantees.** At December 31, 2015, Alcoa has maximum potential future payments for guarantees issued on behalf of a third party of \$478. These guarantees expire at various times between 2017 and 2024 and relate to project financing for the aluminum complex in Saudi Arabia (see Note D). Alcoa also has outstanding bank guarantees related to tax matters, outstanding debt, workers compensation, environmental obligations, energy contracts, and customs duties, among others. The total amount committed under these guarantees, which expire at various dates between 2016 and 2023 was \$320 at December 31, 2015.

**Letters of Credit.** Alcoa has outstanding letters of credit primarily related to workers' compensation, energy contracts (including \$200 related to an expected April 2016 prepayment under a gas supply contract - see Investments above), and leasing obligations. The total amount committed under these letters of credit, which automatically renew or expire at various dates, mostly in 2016, was \$510 at December 31, 2015.

**Surety Bonds.** Alcoa has outstanding surety bonds primarily related to tax matters, contract performance, workers compensation, environmental-related matters, and customs duties. The total amount committed under these bonds, which automatically renew or expire at various dates, mostly in 2016, was \$159 at December 31, 2015.

**Table of Contents****O. Other Expenses (Income), Net**

|  | 2015  | 2014  | 2013    |
|--|-------|-------|---------|
| Equity loss  | \$ 89 | \$ 92 | \$ 68   |
| Interest income  | (16)  | (19)  | (13)    |
| Foreign currency losses (gains), net                       | -     | 1     | (33)    |
| Net gain from asset sales                                  | (74)  | (47)  | (10)    |
| Net loss (gain) on mark-to-market derivative contracts (X) | 23    | 15    | (29)    |
| Other, net   | (20)  | 5     | (8)     |
|  | \$ 2  | \$ 47 | \$ (25) |

In 2015, Net gain from asset sales included a \$49 gain related to the sale of land around both the Lake Charles, LA anode facility and at Alcoa's former Sherwin, TX refinery site, and a \$19 gain related to the sale of the remaining equity investment in a China rolling mill. In 2014, Net gain from asset sales included a \$28 gain and a \$14 gain related to the sale of a mining interest in Suriname and an equity investment in a China rolling mill, respectively.

**P. Cash Flow Information**

Cash paid for interest and income taxes was as follows:

|                                      | 2015   | 2014   | 2013   |
|--------------------------------------|--------|--------|--------|
| Interest, net of amount capitalized  | \$ 487 | \$ 441 | \$ 433 |
| Income taxes, net of amount refunded | \$ 345 | 301    | 200    |

The details related to cash paid for acquisitions (including of a noncontrolling interest in 2014) were as follows:

|  | 2015     | 2014     | 2013 |
|--|----------|----------|------|
| Assets acquired                          | \$ 2,003 | \$ 3,515 | \$ - |
| Liabilities assumed                      | (868)    | (345)    | -    |
| Contingent consideration liability       | -        | (130)    | -    |
| Equity issued                            | (870)    | (610)    | -    |
| Noncontrolling interest acquired         | -        | 31       | -    |
| Increase in Alcoa's shareholders' equity | (60)     | (3)      | -    |
| Cash paid                                | 205      | 2,458    | -    |
| Less: cash acquired                      | 302      | 45       | -    |
| Net cash paid                            | \$ (97)  | \$ 2,413 | \$ - |

**Noncash Financing and Investing Activities.** In July 2015, Alcoa purchased all outstanding shares of RTI common stock in a stock-for-stock transaction valued at \$870 (see Note F). As a result, Alcoa issued 87 million shares of its common stock to consummate this transaction, which was not reflected in the accompanying Statement of Consolidated Cash Flows as it represents a noncash financing activity.

In early 2014, holders of \$575 principal amount of Alcoa's 5.25% Convertible Notes due March 15, 2014 (the 2014 Notes) exercised their option to convert the 2014 Notes into 89 million shares of Alcoa common stock (see Note K). This transaction was not reflected in the accompanying Statement of Consolidated Cash Flows as it represents a noncash financing activity.

In late 2014, Alcoa paid \$2,995 (net of cash acquired) to acquire Firth Rixson (see Note F). A portion of this consideration was paid through the issuance of 37 million shares in Alcoa common stock valued at \$610. The issuance of common stock was not reflected in the accompanying Statement of Consolidated Cash Flows as it represents a noncash investing activity.

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### **Q. Segment and Geographic Area Information**

Alcoa is primarily a producer of aluminum products. Aluminum and alumina represent approximately 80% of Alcoa's revenues. Nonaluminum products include precision castings and aerospace and industrial fasteners. Alcoa's products are used worldwide in transportation (including aerospace, automotive, truck, trailer, rail, and shipping), packaging, building and construction, oil and gas, defense, and industrial applications. Alcoa's segments are organized by product on a worldwide basis. Segment performance under Alcoa's management reporting system is evaluated based on a number of factors; however, the primary measure of performance is the after-tax operating income (ATOI) of each segment. Certain items such as the impact of LIFO inventory accounting; metal price lag (see below); interest expense; noncontrolling interests; corporate expense (general administrative and selling expenses of operating the corporate headquarters and other global administrative facilities, along with depreciation and amortization on corporate-owned assets); restructuring and other charges; and other items, including intersegment profit eliminations, differences between tax rates applicable to the segments and the consolidated effective tax rate, and other nonoperating items such as foreign currency transaction gains/losses and interest income are excluded from segment ATOI. Segment assets exclude, among others, cash and cash equivalents; deferred income taxes; goodwill not allocated to businesses for segment reporting purposes; corporate fixed assets; and LIFO reserves.

The accounting policies of the segments are the same as those described in the Summary of Significant Accounting Policies (see Note A). Transactions among segments are established based on negotiation among the parties. Differences between segment totals and Alcoa's consolidated totals for line items not reconciled are in Corporate.

Effective in the second quarter of 2015, management removed the impact of metal price lag from the results of the Global Rolled Products and Engineered Products and Solutions (now Engineered Products and Solutions and Transportation and Construction Solutions see below) segments in order to enhance the visibility of the underlying operating performance of these businesses. Metal price lag describes the timing difference created when the average price of metal sold differs from the average cost of the metal when purchased by the respective segment. In general, when the price of metal increases, metal price lag is favorable, and when the price of metal decreases, metal price lag is unfavorable. The impact of metal price lag is now reported as a separate line item in Alcoa's reconciliation of total segment ATOI to consolidated net (loss) income attributable to Alcoa. As a result, this change does not impact the consolidated results of Alcoa. Segment information for all prior periods presented was updated to reflect this change.

In the third quarter of 2015, management approved a realignment of Alcoa's Engineered Products and Solutions segment due to the expansion of this part of Alcoa's business portfolio through both organic and inorganic growth. This realignment consisted of moving both the Alcoa Wheel and Transportation Products and Building and Construction Systems business units to a new reportable segment named Transportation and Construction Solutions. Additionally, the Latin American soft alloy extrusions business previously included in Corporate was moved into the new Transportation and Construction Solutions segment. The remaining Engineered Products and Solutions segment consists of the Alcoa Fastening Systems and Rings (renamed to include portions of the Firth Rixson business acquired in November 2014), Alcoa Power and Propulsion (includes the TITAL business acquired in March 2015), Alcoa Forgings and Extrusions (includes the other portions of Firth Rixson), and Alcoa Titanium and Engineered Products (a new business unit that consists solely of the RTI International Metals business acquired in July 2015) business units. Segment information for all prior periods presented was updated to reflect the new segment structure.

Alcoa's operations consist of five worldwide reportable segments as follows:

**Alumina.** This segment represents a portion of Alcoa's upstream operations and consists of the Company's worldwide refining system. Alumina mines bauxite, from which alumina is produced and then sold directly to external smelter customers, as well as to the Primary Metals segment (see Primary Metals below), or to customers who process it into industrial chemical products. More than half of Alumina's production is sold under supply contracts to third parties worldwide, while the remainder is used internally by the Primary Metals segment. Alumina produced by this segment and used internally is transferred to the Primary Metals segment at prevailing market prices. A portion of this segment's third-party sales are completed through the use of agents, alumina traders, and distributors.



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**Primary Metals.** This segment represents a portion of Alcoa's upstream operations and consists of the Company's worldwide smelting system. Primary Metals purchases alumina, mostly from the Alumina segment (see Alumina above), from which primary aluminum is produced and then sold directly to external customers and traders, as well as to Alcoa's midstream operations and, to a lesser extent, downstream operations. Results from the sale of aluminum powder, scrap, and excess energy are also included in this segment, as well as the results of aluminum derivative contracts and buy/resell activity. Primary aluminum produced by Alcoa and used internally is transferred to other segments at prevailing market prices. The sale of primary aluminum represents approximately 90% of this segment's third-party sales. Buy/resell activity occurs when this segment purchases metal and resells such metal to external customers or the midstream and downstream operations in order to maximize smelting system efficiency and to meet customer requirements.

**Global Rolled Products.** This segment represents Alcoa's midstream operations and produces aluminum sheet and plate for a variety of end markets. Approximately one-half of the third-party shipments in this segment consist of sheet sold directly to customers in the packaging end market for the production of aluminum cans (beverage, food, and pet food). Seasonal increases in can sheet sales are generally experienced in the second and third quarters of the year. This segment also includes sheet and plate sold directly to customers and through distributors related to the aerospace, automotive, commercial transportation, building and construction, and industrial products (mainly used in the production of machinery and equipment and consumer durables) end markets. A small portion of this segment also produces aseptic foil for the packaging end market. While the customer base for flat-rolled products is large, a significant amount of sales of sheet and plate is to a relatively small number of customers.

**Engineered Products and Solutions.** This segment represents a portion of Alcoa's downstream operations and produces products that are used mostly in the aerospace (commercial and defense), commercial transportation, and power generation end markets. Such products include fastening systems (titanium, steel, and nickel alloys) and seamless rolled rings (mostly nickel alloys); and investment castings (nickel super alloys, titanium, and aluminum), including airfoils and forged jet engine components (e.g., jet engine disks), all of which are sold directly to customers and through distributors. More than 70% of the third-party sales in this segment are from the aerospace end market. A small part of this segment also produces various forging and extrusion metal products for the oil and gas, industrial products, automotive, and land and sea defense end markets. Seasonal decreases in sales are generally experienced in the third quarter of the year due to the European summer slowdown across all end markets.

**Transportation and Construction Solutions.** This segment represents a portion of Alcoa's downstream operations and produces products that are used mostly in the nonresidential building and construction and commercial transportation end markets. Such products include integrated aluminum structural systems, architectural extrusions, and forged aluminum commercial vehicle wheels, which are sold directly to customers and through distributors. A small part of this segment also produces aluminum products for the industrial products end market.

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The operating results and assets of Alcoa's reportable segments were as follows:

|   | Alumina  | Primary<br>Metals | Global<br>Rolled<br>Products | Engineered<br>Products<br>and<br>Solutions | Transportation<br>and<br>Construction<br>Solutions | Total     |
|---|----------|-------------------|------------------------------|--|--|-----------|
| <b>2015</b>                               |          |                   |                              |  |  |           |
| Sales:                                    |          |                   |                              |  |  |           |
| Third-party sales                         | \$ 3,455 | \$ 5,591          | \$ 6,238                     | \$ 5,342                                   | \$ 1,882   | \$ 22,508 |
| Intersegment sales                        | 1,687    | 2,170             | 125                          | -  | -  | 3,982     |
| Total sales                               | \$ 5,142 | \$ 7,761          | \$ 6,363                     | \$ 5,342                                   | \$ 1,882   | \$ 26,490 |
| Profit and loss:                          |          |                   |                              |  |  |           |
| Equity loss                               | \$ (41)  | \$ (12)           | \$ (32)                      | \$ -                                       | \$ -   | \$ (85)   |
| Depreciation, depletion, and amortization | 296      | 429               | 227                          | 233  | 43   | 1,228     |
| Income taxes                              | 300      | (28)              | 109                          | 282  | 63   | 726       |
| ATOI                                      | 746      | 155               | 244                          | 595  | 166  | 1,906     |
| <b>2014</b>                               |          |                   |                              |  |  |           |
| Sales:                                    |          |                   |                              |  |  |           |
| Third-party sales                         | \$ 3,509 | \$ 6,800          | \$ 7,351                     | \$ 4,217                                   | \$ 2,021   | \$ 23,898 |
| Intersegment sales                        | 1,941    | 2,931             | 185                          | -  | -  | 5,057     |
| Total sales                               | \$ 5,450 | \$ 9,731          | \$ 7,536                     | \$ 4,217                                   | \$ 2,021   | \$ 28,955 |
| Profit and loss:                          |          |                   |                              |  |  |           |
| Equity loss                               | \$ (29)  | \$ (34)           | \$ (27)                      | \$ -                                       | \$ -   | \$ (90)   |
| Depreciation, depletion, and amortization | 387      | 494               | 235                          | 137  | 42   | 1,295     |
| Income taxes                              | 153      | 203               | 89                           | 298  | 69   | 812       |
| ATOI                                      | 370      | 594               | 245                          | 579  | 180  | 1,968     |
| <b>2013</b>                               |          |                   |                              |  |  |           |
| Sales:                                    |          |                   |                              |  |  |           |
| Third-party sales                         | \$ 3,326 | \$ 6,596          | \$ 7,106                     | \$ 4,054                                   | \$ 1,951   | \$ 23,033 |
| Intersegment sales                        | 2,235    | 2,621             | 178                          | -  | -  | 5,034     |
| Total sales                               | \$ 5,561 | \$ 9,217          | \$ 7,284                     | \$ 4,054                                   | \$ 1,951   | \$ 28,067 |
| Profit and loss:                          |          |                   |                              |  |  |           |
| Equity loss                               | \$ (4)   | \$ (51)           | \$ (13)                      | \$ -                                       | \$ -   | \$ (68)   |
| Depreciation, depletion, and amortization | 426      | 526               | 226                          | 124  | 42   | 1,344     |
| Income taxes                              | 66       | (74)              | 123                          | 286  | 67   | 468       |
| ATOI                                      | 259      | (20)              | 292                          | 569  | 167  | 1,267     |
| <b>2015</b>                               |          |                   |                              |  |  |           |
| Assets:                                   |          |                   |                              |  |  |           |
| Capital expenditures                      | \$ 184   | \$ 156            | \$ 307                       | \$ 383                                     | \$ 77  | \$ 1,107  |
| Equity investments                        | 667      | 634               | 217                          | -  | -  | 1,518     |
| Goodwill                                  | 6        | -                 | 201                          | 4,660                                      | 58   | 4,925     |
| Total assets                              | 6,165    | 7,324             | 4,498                        | 10,732                                     | 947  | 29,666    |
| <b>2014</b>                               |          |                   |                              |  |  |           |
| Assets:                                   |          |                   |                              |  |  |           |
| Capital expenditures                      | \$ 246   | \$ 176            | \$ 389                       | \$ 249                                     | \$ 72  | \$ 1,132  |
| Equity investments                        | 669      | 890               | 226                          | -  | -  | 1,785     |
| Goodwill                                  | 8        | -                 | 210                          | 4,458                                      | 86   | 4,762     |
| Total assets                              | 7,350    | 9,308             | 4,908                        | 8,800                                      | 975  | 31,341    |

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The following tables reconcile certain segment information to consolidated totals:

|                                   | 2015      | 2014      | 2013      |
|-----------------------------------|-----------|-----------|-----------|
| <b>Sales:</b>                     |           |           |           |
| Total segment sales               | \$ 26,490 | \$ 28,955 | \$ 28,067 |
| Elimination of intersegment sales | (3,982)   | (5,057)   | (5,034)   |
| Corporate                         | 26        | 8         | (1)       |
| Consolidated sales                | \$ 22,534 | \$ 23,906 | \$ 23,032 |

|  | 2015     | 2014     | 2013       |
|--|----------|----------|------------|
| <b>Net (loss) income attributable to Alcoa:</b>      |          |          |            |
| Total segment ATOI                                   | \$ 1,906 | \$ 1,968 | \$ 1,267   |
| <b>Unallocated amounts (net of tax):</b>             |          |          |            |
| Impact of LIFO                                       | 136      | (54)     | 52         |
| Metal price lag                                      | (133)    | 78       | (45)       |
| Interest expense                                     | (324)    | (308)    | (294)      |
| Noncontrolling interests                             | (125)    | 91       | (41)       |
| Corporate expense                                    | (266)    | (284)    | (274)      |
| Impairment of goodwill                               | (25)     | -        | (1,731)    |
| Restructuring and other charges                      | (943)    | (894)    | (607)      |
| Other  | (548)    | (329)    | (612)      |
| Consolidated net (loss) income attributable to Alcoa | \$ (322) | \$ 268   | \$ (2,285) |

| <b>December 31,</b>                     | 2015      | 2014      |
|---|-----------|-----------|
| <b>Assets:</b>                          |           |           |
| Total segment assets                    | \$ 29,666 | \$ 31,341 |
| Elimination of intersegment receivables | (318)     | (490)     |
| <b>Unallocated amounts:</b>             |           |           |
| Cash and cash equivalents               | 1,919     | 1,877     |
| Deferred income taxes                   | 2,668     | 3,139     |
| Corporate goodwill                      | 476       | 485       |
| Corporate fixed assets, net             | 733       | 819       |
| LIFO reserve                            | (559)     | (767)     |
| Fair value of derivative contracts      | 1,078     | 16        |
| Other                                   | 865       | 943       |
| Consolidated assets                     | \$ 36,528 | \$ 37,363 |

Sales by major product grouping were as follows:

|                                    | 2015     | 2014     | 2013     |
|------------------------------------|----------|----------|----------|
| <b>Sales:</b>                      |          |          |          |
| Alumina                            | \$ 3,333 | \$ 3,401 | \$ 3,151 |
| Primary aluminum                   | 5,085    | 6,011    | 6,194    |
| Flat-rolled aluminum               | 6,238    | 7,351    | 7,106    |
| Investment castings                | 1,812    | 1,784    | 1,807    |
| Fastening systems                  | 2,168    | 1,647    | 1,505    |
| Architectural aluminum systems     | 951      | 1,002    | 977      |
| Aluminum wheels                    | 790      | 786      | 702      |
| Other extruded and forged products | 1,332    | 1,019    | 1,015    |
| Other                              | 825      | 905      | 575      |



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Geographic information for sales was as follows (based upon the country where the point of sale occurred):

|                              | 2015      | 2014      | 2013      |
|------------------------------|-----------|-----------|-----------|
| Sales:                       |           |           |           |
| United States <sup>(1)</sup> | \$ 12,425 | \$ 12,103 | \$ 11,766 |
| Spain <sup>(2) (3)</sup>     | 2,853     | 3,359     | 2,282     |
| Australia                    | 2,196     | 3,028     | 3,240     |
| Brazil                       | 854       | 1,398     | 1,221     |
| France                       | 802       | 915       | 862       |
| United Kingdom               | 698       | 464       | 475       |
| Hungary                      | 622       | 630       | 555       |
| China                        | 565       | 415       | 259       |
| Russia                       | 455       | 642       | 683       |
| Canada                       | 308       | 143       | 123       |
| Germany                      | 264       | 229       | 230       |
| Italy                        | 139       | 150       | 157       |
| Netherlands <sup>(3)</sup>   | 34        | 36        | 524       |
| Norway <sup>(2)</sup>        | 30        | 31        | 283       |
| Other                        | 289       | 363       | 372       |
|                              | \$ 22,534 | \$ 23,906 | \$ 23,032 |

<sup>(1)</sup> Sales of a portion of the alumina from Alcoa's refineries in Suriname, Brazil, Australia, and Jamaica (prior to divestiture see Note F) and most of the aluminum from Alcoa's smelters in Canada occurred in the United States.

<sup>(2)</sup> In 2015, 2014, and 2013, Sales of the aluminum from Alcoa's smelters in Norway occurred in Spain.

<sup>(3)</sup> In 2015 and 2014, Sales of the aluminum from Alcoa's smelter in Iceland occurred in Spain. In 2013, Sales of the aluminum from Alcoa's smelter in Iceland occurred in both Spain and the Netherlands.

Geographic information for long-lived assets was as follows (based upon the physical location of the assets):

| December 31,       | 2015      | 2014      |
|--------------------|-----------|-----------|
| Long-lived assets: |           |           |
| United States      | \$ 5,758  | \$ 5,403  |
| Australia          | 2,159     | 2,538     |
| Brazil             | 2,046     | 3,137     |
| Iceland            | 1,397     | 1,460     |
| Canada             | 1,238     | 1,216     |
| Norway             | 463       | 588       |
| China              | 352       | 389       |
| United Kingdom     | 312       | 333       |
| Russia             | 303       | 443       |
| Spain              | 294       | 339       |
| Hungary            | 190       | 210       |
| Other              | 303       | 370       |
|                    | \$ 14,815 | \$ 16,426 |

**R. Preferred and Common Stock**

**Preferred Stock.** Alcoa has two classes of preferred stock: Class A Preferred Stock and Class B Serial Preferred Stock. Class A Preferred Stock has 660,000 shares authorized at a par value of \$100 per share with an annual \$3.75 cumulative dividend preference per share. There were 546,024 of such shares outstanding at December 31, 2015 and 2014. Class B Serial Preferred Stock has 10 million shares authorized at a par value of \$1 per share. There were 2.5 million of such shares outstanding at December 31, 2015 and 2014 (see below).

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In September 2014, Alcoa completed a public offering under its shelf registration statement for \$1,250 of 25 million depositary shares, each of which represents a 1/10th interest in a share of Alcoa's 5.375% Class B Mandatory Convertible Preferred Stock, Series 1, par value \$1 per share, liquidation preference \$500 per share (the Mandatory Convertible Preferred Stock). The 25 million depositary shares are equivalent to 2.5 million shares of Mandatory Convertible Preferred Stock. Each depositary share entitles the holder, through the depositary, to a proportional fractional interest in the rights and preferences of a share of Mandatory Convertible Preferred Stock, including conversion, dividend, liquidation, and voting rights, subject to terms of the deposit agreement. Alcoa received \$1,213 in net proceeds from the public offering reflecting an underwriting discount. The net proceeds were used, together with the net proceeds of issued debt (see Note K), to finance the cash portion of the acquisition of Firth Rixson (see Note F). The underwriting discount was recorded as a decrease to Additional capital on the accompanying Consolidated Balance Sheet.

The Mandatory Convertible Preferred Stock constitutes a series of Alcoa's Class B Serial Preferred Stock, which ranks senior to Alcoa's common stock and junior to Alcoa's Class A Preferred Stock and existing and future indebtedness. Dividends on the Mandatory Convertible Preferred Stock are cumulative in nature and are paid at the rate of \$26.8750 per annum per share, which commenced January 1, 2015 (paid on December 30, 2014). Holders of the Mandatory Convertible Preferred Stock generally have no voting rights.

On the mandatory conversion date, October 1, 2017, all outstanding shares of Mandatory Convertible Preferred Stock will automatically convert into shares of Alcoa's common stock. Based on the Applicable Market Value (as defined in the terms of the Mandatory Convertible Preferred Stock) of Alcoa's common stock on the mandatory conversion date, each share of Mandatory Convertible Preferred Stock will be convertible into not more than 30.9406 shares of common stock and not less than 25.7838 shares of common stock, subject to certain anti-dilution and other adjustments as described in the terms of the Mandatory Convertible Preferred Stock. At any time prior to October 1, 2017, a holder may elect to convert shares of Mandatory Convertible Preferred Stock, in whole or in part (but in no event less than one share of Mandatory Convertible Preferred Stock), at the minimum conversion rate of 25.7838 shares of common stock, subject to certain anti-dilution and other adjustments as described in the terms of the Mandatory Convertible Preferred Stock. Alcoa does not have the right to redeem the Mandatory Convertible Preferred Stock.

If Alcoa undergoes a fundamental change, as defined in the terms of the Mandatory Convertible Preferred Stock, holders may elect to convert their Mandatory Convertible Preferred Stock, in whole or in part (but in no event less than one share of Mandatory Convertible Preferred Stock), into shares of Alcoa's common stock. The per share conversion rate under a fundamental change is not less than 25.2994 shares of common stock and not more than 30.9406 shares of common stock. Holders who elect to convert will also receive any accumulated and unpaid dividends and a Fundamental Change Dividend Make-whole Amount (as defined in the terms of the Mandatory Convertible Preferred Stock) equal to the present value of all remaining dividend payments on the Mandatory Convertible Preferred Stock.

**Common Stock.** There are 1.8 billion shares authorized at a par value of \$1 per share, and 1,391,211,244 and 1,303,813,830 shares, respectively, were issued at December 31, 2015 and 2014. The current dividend yield as authorized by Alcoa's Board of Directors is \$0.12 per annum or \$0.03 per quarter.

In July 2015, Alcoa issued 87 million shares of common stock as consideration paid to acquire RTI (see Note F).

In early 2014, Alcoa issued 89 million shares of common stock under the terms of Alcoa's 5.25% Convertible Notes due March 15, 2014 (see Note K). Also, in November 2014, Alcoa issued 37 million shares of common stock as part of the consideration paid to acquire an aerospace business, Firth Rixson (see Note F).

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As of December 31, 2015, 77 million shares of common stock were reserved for issuance under Alcoa's stock-based compensation plans, respectively. Alcoa issues shares from treasury stock to satisfy the exercise of stock options and the conversion of stock awards.

**Share Activity** (number of shares)

|   | Common stock |               |
|---|--------------|---------------|
|   | Treasury     | Outstanding   |
| <b>Balance at end of 2012</b>             | 110,694,604  | 1,067,211,953 |
| Conversion of convertible notes           | -            | 310           |
| Issued for stock-based compensation plans | (3,798,899)  | 3,798,899     |
| <b>Balance at end of 2013</b>             | 106,895,705  | 1,071,011,162 |
| Conversion of convertible notes           | -            | 89,383,953    |
| Private placement                         | -            | 36,523,010    |
| Issued for stock-based compensation plans | (19,745,536) | 19,745,536    |
| <b>Balance at end of 2014</b>             | 87,150,169   | 1,216,663,661 |
| Acquisition of RTI                        | -            | 87,397,414    |
| Issued for stock-based compensation plans | (6,099,066)  | 6,099,066     |
| <b>Balance at end of 2015</b>             | 81,051,103   | 1,310,160,141 |

**Stock-based Compensation**

Alcoa has a stock-based compensation plan under which stock options and stock awards are granted in January each year to eligible employees. Most plan participants can choose whether to receive their award in the form of stock options, stock awards, or a combination of both. This choice is made before the grant is issued and is irrevocable. Stock options are granted at the closing market price of Alcoa's common stock on the date of grant and vest over a three-year service period (1/3 each year) with a ten-year contractual term. Stock awards also vest over a three-year service period from the date of grant and certain of these awards also include performance conditions. In 2015, 2014, and 2013, the final number of performance stock awards earned will be based on Alcoa's achievement of sales and profitability targets over the respective three-year period. One-third of the award will be earned each year based on the performance against the pre-established targets for that year. The performance stock awards earned over the three-year period vest at the end of the third year.

In 2015, 2014, and 2013, Alcoa recognized stock-based compensation expense of \$92 (\$61 after-tax), \$87 (\$58 after-tax), and \$71 (\$48 after-tax), respectively, of which approximately 80%, 80%, and 70%, respectively, related to stock awards (there was no stock-based compensation expense capitalized in 2015, 2014, or 2013). At December 31, 2015, there was \$71 (pretax) of unrecognized compensation expense related to non-vested stock option grants and non-vested stock award grants. This expense is expected to be recognized over a weighted average period of 1.6 years. As part of Alcoa's stock-based compensation plan design, individuals who are retirement-eligible have a six-month requisite service period in the year of grant. As a result, a larger portion of expense will be recognized in the first half of each year for these retirement-eligible employees. Of the total pretax compensation expense recognized in 2015, 2014, and 2013, \$17, \$15, and \$14, respectively, pertains to the acceleration of expense related to retirement-eligible employees.

Stock-based compensation expense is based on the grant date fair value of the applicable equity grant. For stock awards, the fair value was equivalent to the closing market price of Alcoa's common stock on the date of grant. For stock options, the fair value was estimated on the date of grant using a lattice-pricing model, which generated a result of \$4.47, \$2.84, and \$2.24 per option in 2015, 2014, and 2013, respectively. The lattice-pricing model uses a number of assumptions to estimate the fair value of a stock option, including an average risk-free interest rate, dividend yield, volatility, exercise behavior, and contractual life. The following paragraph describes in detail the assumptions used to estimate the fair value of stock options granted in 2015 (the assumptions used to estimate the fair value of stock options granted in 2014 and 2013 were not materially different).

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The range of average risk-free interest rates (0.07-1.83%) was based on a yield curve of interest rates at the time of the grant based on the contractual life of the option. The dividend yield (0.8%) was based on a one-year average. Volatility (32-41%) was based on historical and implied volatilities over the term of the option. Alcoa utilized historical option forfeiture data to estimate annual pre- and post-vesting forfeitures (7%). Exercise behavior (50%) was based on a weighted average exercise ratio (exercise patterns for grants issued over the number of years in the contractual option term) of an option's intrinsic value resulting from historical employee exercise behavior. Based upon the other assumptions used in the determination of the fair value, the life of an option (5.9 years) was an output of the lattice-pricing model. The activity for stock options and stock awards during 2015 was as follows (options and awards in millions):

|                                | Stock options |                  | Stock awards |                      |
|--------------------------------|---------------|------------------|--------------|----------------------|
|                                | Number of     | Weighted average | Number of    | Weighted average FMV |
|                                | options       | exercise price   | awards       | per award            |
| Outstanding, January 1, 2015   | 32            | 11.26            | 19           | 9.98                 |
| Granted                        | 3             | 15.55            | 7            | 14.85                |
| Assumed at Acquisition         | 2             | 11.24            | 1            | 9.96                 |
| Exercised                      | (3)           | 8.95             | -            | -                    |
| Converted                      | -             | -                | (5)          | 10.08                |
| Expired or forfeited           | (1)           | 13.39            | (1)          | 11.64                |
| Performance share adjustment   | -             | -                | (1)          | 10.96                |
| Outstanding, December 31, 2015 | 33            | 11.91            | 20           | 11.38                |

As of December 31, 2015, the number of stock options outstanding had a weighted average remaining contractual life of 6.08 years and a total intrinsic value of \$8. Additionally, 23.3 million of the stock options outstanding were fully vested and exercisable and had a weighted average remaining contractual life of 5.25 years, a weighted average exercise price of \$11.82, and a total intrinsic value of \$5 as of December 31, 2015. In 2015, 2014, and 2013, the cash received from stock option exercises was \$25, \$150, and \$13 and the total tax benefit realized from these exercises was \$6, \$28, and \$1, respectively. The total intrinsic value of stock options exercised during 2015, 2014, and 2013 was \$19, \$84, and \$2, respectively.

**S. Earnings Per Share**

Basic earnings per share (EPS) amounts are computed by dividing earnings, after the deduction of preferred stock dividends declared by the average number of common shares outstanding. Diluted EPS amounts assume the issuance of common stock for all potentially dilutive share equivalents outstanding.

The information used to compute basic and diluted EPS attributable to Alcoa common shareholders was as follows (shares in millions):

|  | 2015     | 2014   | 2013       |
|--|----------|--------|------------|
| Net (loss) income attributable to Alcoa                            | \$ (322) | \$ 268 | \$ (2,285) |
| Less: preferred stock dividends declared                           | 69       | 21     | 2          |
| Net (loss) income available to Alcoa common shareholders - basic   | (391)    | 247    | (2,287)    |
| Add: dividends related to mandatory convertible preferred stock    | -        | -      | -          |
| Add: interest expense related to convertible notes                 | -        | -      | -          |
| Net (loss) income available to Alcoa common shareholders - diluted | \$ (391) | \$ 247 | \$ (2,287) |
| Average shares outstanding - basic                                 | 1,259    | 1,162  | 1,070      |
| Effect of dilutive securities:                                     |          |        |            |
| Stock options  | -        | 7      | -          |
| Stock and performance awards                                       | -        | 11     | -          |
| Mandatory convertible preferred stock                              | -        | -      | -          |
| Convertible notes  | -        | -      | -          |
| Average shares outstanding - diluted                               | 1,259    | 1,180  | 1,070      |





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In 2015, basic average shares outstanding and diluted average shares outstanding were the same because the effect of potential shares of common stock was anti-dilutive since Alcoa generated a net loss. As a result, 77 million share equivalents related to mandatory convertible preferred were not included in the computation of diluted EPS. Additionally, 20 million stock awards, 33 million stock options, and 15 million (weighted-average) share equivalents related to convertible debt (acquired from RTI see Note F) were not included in the computation of diluted EPS. Had Alcoa generated net income in 2015, 77 million, 15 million, 12 million, and 3 million potential shares of common stock related to the mandatory convertible preferred stock, convertible notes, stock awards, and stock options, respectively, would have been included in diluted average shares outstanding.

In 2014, 16 million and 22 million share equivalents related to convertible notes and mandatory convertible preferred stock, respectively, were not included in the computation of diluted EPS because their effect was anti-dilutive.

In 2013, basic average shares outstanding and diluted average shares outstanding were the same because the effect of potential shares of common stock was anti-dilutive since Alcoa generated a net loss. As a result, 89 million share equivalents related to convertible notes, 16 million stock awards, and 12 million stock options were not included in the computation of diluted EPS. Had Alcoa generated sufficient income from continuing operations in 2013, 89 million, 9 million, and 2 million potential shares of common stock related to the convertible notes, stock awards, and stock options, respectively, would have been included in diluted average shares outstanding.

Options to purchase 26 million, 3 million, and 12 million shares of common stock at a weighted average exercise price of \$12.75, \$16.24, and \$15.81 per share were outstanding as of December 31, 2015, 2014, and 2013, respectively, but were not included in the computation of diluted EPS because they were anti-dilutive, as the exercise prices of the options were greater than the average market price of Alcoa's common stock.

**T. Income Taxes**

The components of income (loss) before income taxes were as follows:

|               | 2015     | 2014     | 2013       |
|---------------|----------|----------|------------|
| United States | \$ (607) | \$ (125) | \$ (1,269) |
| Foreign       | 855      | 622      | (547)      |
|               | \$ 248   | \$ 497   | \$ (1,816) |

The provision for income taxes consisted of the following:

|                 | 2015   | 2014   | 2013   |
|-----------------|--------|--------|--------|
| Current:        |        |        |        |
| Federal*        | \$ 3   | \$ (3) | \$ 14  |
| Foreign         | 409    | 357    | 235    |
| State and local | (1)    | 1      | 1      |
|                 | 411    | 355    | 250    |
| Deferred:       |        |        |        |
| Federal*        | (108)  | 7      | 84     |
| Foreign         | 142    | (41)   | 95     |
| State and local | -      | (1)    | (1)    |
|                 | 34     | (35)   | 178    |
| Total           | \$ 445 | \$ 320 | \$ 428 |

\* Includes U.S. taxes related to foreign income

The exercise of employee stock options generated a tax benefit of \$3 and \$9 in 2015 and 2014, respectively, and a tax charge of \$1 in 2013, representing only the difference between compensation expense recognized for financial reporting and tax purposes. These amounts decreased equity and increased either current taxes payable or deferred tax assets (not operating losses) in the respective periods.



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Alcoa has unamortized tax-deductible goodwill of \$27 resulting from intercompany stock sales and reorganizations. Alcoa recognizes the tax benefits (at a 28% rate in 2015 and will be at a rate of 25% in 2016 and later years) associated with this tax-deductible goodwill as it is being amortized for local income tax purposes rather than in the period in which the transaction is consummated.

A reconciliation of the U.S. federal statutory rate to Alcoa's effective tax rate was as follows (the effective tax rate for 2015 and 2014 was a provision on income and for 2013 was a provision on a loss):

|  | 2015   | 2014  | 2013    |
|--|--------|-------|---------|
| U.S. federal statutory rate  | 35.0%  | 35.0% | 35.0%   |
| Taxes on foreign operations  | 0.4    | (3.2) | 0.7     |
| Permanent differences on restructuring and other charges and asset disposals | 2.7    | (3.5) | (0.8)   |
| Non-deductible acquisition costs   | 5.2    | 1.7   | -       |
| Equity income/loss   | 4.9    | 3.2   | (0.7)   |
| Noncontrolling interests <sup>(1)</sup>                                      | 11.4   | 6.8   | (3.1)   |
| Statutory tax rate and law changes <sup>(2)</sup>                            | (0.8)  | 17.9  | 0.6     |
| Tax holidays <sup>(3)</sup>  | (11.3) | 6.1   | -       |
| Tax credits  | (3.6)  | (1.3) | 0.2     |
| Changes in valuation allowances  | 135.3  | 3.5   | (23.2)  |
| Impairment of goodwill   | 3.6    | -     | (33.3)  |
| Company-owned life insurance/split-dollar net premiums                       | (2.2)  | (2.2) | 1.1     |
| Other  | (1.2)  | 0.4   | (0.1)   |
| Effective tax rate   | 179.4% | 64.4% | (23.6)% |

(1) In 2014, the noncontrolling interests' impact on Alcoa's effective tax rate was mostly due to the noncontrolling interest's share of a loss on the divestiture of an ownership interest in a mining and refining joint venture in Jamaica (see Note F).

(2) In November 2014, Spain enacted corporate tax reform that changed the corporate tax rate from 30% in 2014 to 28% in 2015 to 25% in 2016. As a result, Alcoa remeasured certain deferred tax assets related to Spanish subsidiaries.

(3) In 2014, a tax holiday for certain Alcoa subsidiaries in Brazil became effective (see below).

The components of net deferred tax assets and liabilities were as follows:

|                                    | 2015                      |                                | 2014                      |                                |
|------------------------------------|---------------------------|--------------------------------|---------------------------|--------------------------------|
|                                    | Deferred<br>tax<br>assets | Deferred<br>tax<br>liabilities | Deferred<br>tax<br>assets | Deferred<br>tax<br>liabilities |
| <b>December 31,</b>                |                           |                                |                           |                                |
| Depreciation                       | \$ 194                    | \$ 1,353                       | \$ 147                    | \$ 1,187                       |
| Employee benefits                  | 2,517                     | 34                             | 2,413                     | 37                             |
| Loss provisions                    | 486                       | 9                              | 441                       | 10                             |
| Deferred income/expense            | 37                        | 294                            | 30                        | 230                            |
| Tax loss carryforwards             | 1,917                     | -                              | 2,075                     | -                              |
| Tax credit carryforwards           | 693                       | -                              | 625                       | -                              |
| Derivatives and hedging activities | -                         | 276                            | 5                         | 39                             |
| Other                              | 680                       | 339                            | 521                       | 297                            |
|                                    | 6,524                     | 2,305                          | 6,257                     | 1,800                          |
| Valuation allowance                | (2,037)                   | -                              | (1,668)                   | -                              |
|                                    | \$ 4,487                  | \$ 2,305                       | \$ 4,589                  | \$ 1,800                       |

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The following table details the expiration periods of the deferred tax assets presented above:

|                          | Expires         | Expires            |                    |               | Total    |
|--------------------------|-----------------|--------------------|--------------------|---------------|----------|
|                          | within          | within             | No                 |               |          |
| <b>December 31, 2015</b> | <b>10 years</b> | <b>11-20 years</b> | <b>expiration*</b> | <b>Other*</b> |          |
| Tax loss carryforwards   | \$ 361          | \$ 694             | \$ 862             | \$ -          | \$ 1,917 |
| Tax credit carryforwards | 492             | 103                | 98                 | -             | 693      |
| Other                    | -               | -                  | 473                | 3,441         | 3,914    |
| Valuation allowance      | (596)           | (704)              | (423)              | (314)         | (2,037)  |
|                          | \$ 257          | \$ 93              | \$ 1,010           | \$ 3,127      | \$ 4,487 |

\* Deferred tax assets with no expiration may still have annual limitations on utilization. Other represents deferred tax assets whose expiration is dependent upon the reversal of the underlying temporary difference. A substantial amount of Other relates to employee benefits that will become deductible for tax purposes over an extended period of time as contributions are made to employee benefit plans and payments are made to retirees.

The total deferred tax asset (net of valuation allowance) is supported by projections of future taxable income exclusive of reversing temporary differences (58%) and taxable temporary differences that reverse within the carryforward period (42%).

Valuation allowances are recorded to reduce deferred tax assets when it is more likely than not (greater than 50%) that a tax benefit will not be realized. In evaluating the need for a valuation allowance, management considers all potential sources of taxable income, including income available in carryback periods, future reversals of taxable temporary differences, projections of taxable income, and income from tax planning strategies, as well as all available positive and negative evidence. Positive evidence includes factors such as a history of profitable operations, projections of future profitability within the carryforward period, including from tax planning strategies, and Alcoa's experience with similar operations. Existing favorable contracts and the ability to sell products into established markets are additional positive evidence. Negative evidence includes items such as cumulative losses, projections of future losses, or carryforward periods that are not long enough to allow for the utilization of a deferred tax asset based on existing projections of income. In certain jurisdictions, deferred tax assets related to cumulative losses exist without a valuation allowance where in management's judgment the weight of the positive evidence more than offsets the negative evidence of the cumulative losses. Upon changes in facts and circumstances, management may conclude that deferred tax assets for which no valuation allowance is currently recorded may not be realized, resulting in a future charge to establish a valuation allowance. Existing valuation allowances are re-examined under the same standards of positive and negative evidence. If it is determined that it is more likely than not that a deferred tax asset will be realized, the appropriate amount of the valuation allowance, if any, is released. Deferred tax assets and liabilities are also re-measured to reflect changes in underlying tax rates due to law changes and the granting and lapse of tax holidays.

In 2013, Alcoa recognized a \$372 discrete income tax charge for valuation allowances on certain deferred tax assets in Spain and the United States. Of this amount, a \$237 valuation allowance was established on the full value of the deferred tax assets related to a Spanish consolidated tax group. These deferred tax assets have an expiration period ranging from 2016 (for certain credits) to an unlimited life (for operating losses). After weighing all available positive and negative evidence, as described above, management determined that it was no longer more likely than not that Alcoa will realize the tax benefit of these deferred tax assets. This was mainly driven by a decline in the outlook of the Primary Metals business (2013 realized prices were the lowest since 2009) combined with prior year cumulative losses of the Spanish consolidated tax group. During 2014, the underlying value of the deferred tax assets decreased due to a remeasurement as a result of the enactment of new tax rates in Spain beginning in 2015, the sale of a member of the Spanish consolidated tax group, and a change in foreign currency exchange rates. As a result the valuation allowance decreased by the same amount. At December 31, 2015, the amount of the valuation allowance was \$149. This valuation allowance was reevaluated as of December 31, 2015, and no change to the allowance was deemed necessary based on all available evidence. The need for this valuation allowance will be assessed on a continuous basis in future periods and, as a result, a portion or all of the allowance may be reversed based on changes in facts and circumstances.

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The remaining \$135 recognized in 2013 relates to a valuation allowance established on a portion of available foreign tax credits in the United States. These credits can be carried forward for 10 years, and have an expiration period ranging from 2016 to 2023 as of December 31, 2013 (2016 to 2025 as of December 31, 2015). After weighing all available positive and negative evidence, as described above, management determined that it was no longer more likely than not that Alcoa will realize the full tax benefit of these foreign tax credits. This was primarily due to lower foreign sourced taxable income after consideration of tax planning strategies and after the inclusion of earnings from foreign subsidiaries projected to be distributable as taxable foreign dividends. This valuation allowance was reevaluated as of December 31, 2015, and due to reductions in foreign sourced taxable income, a \$134 discrete income tax charge was recognized. Additionally, \$15 of foreign tax credits expired at the end of 2015 resulting in a corresponding decrease to the valuation allowance. At December 31, 2015, the amount of the valuation allowance was \$254. The need for this valuation allowance will be assessed on a continuous basis in future periods and, as a result, an increase or decrease to this allowance may result based on changes in facts and circumstances.

In 2015, Alcoa recognized an additional \$141 discrete income tax charge for valuation allowances on certain deferred tax assets in Iceland and Suriname. Of this amount, an \$85 valuation allowance was established on the full value of the deferred tax assets in Suriname, which were related mostly to employee benefits and tax loss carryforwards. These deferred tax assets have an expiration period ranging from 2016 to 2022. The remaining \$56 charge relates to a valuation allowance established on a portion of the deferred tax assets recorded in Iceland. These deferred tax assets have an expiration period ranging from 2017 to 2023. After weighing all available positive and negative evidence, as described above, management determined that it was no longer more likely than not that Alcoa will realize the tax benefit of either of these deferred tax assets. This was mainly driven by a decline in the outlook of the Primary Metals business, combined with prior year cumulative losses and a short expiration period. The need for this valuation allowance will be assessed on a continuous basis in future periods and, as a result, a portion or all of the allowance may be reversed based on changes in facts and circumstances.

In December 2011, one of Alcoa's subsidiaries in Brazil applied for a tax holiday related to its expanded mining and refining operations. During 2013, the application was amended and re-filed and, separately, a similar application was filed for another one of the Company's subsidiaries in Brazil. The deadline for the Brazilian government to deny the application was July 11, 2014. Since Alcoa did not receive notice that its applications were denied, the tax holiday took effect automatically on July 12, 2014. As a result, the tax rate applicable to qualified holiday income for these subsidiaries decreased significantly (from 34% to 15.25%), resulting in future cash tax savings over the 10-year holiday period (retroactively effective as of January 1, 2013). Additionally, a portion of one of the subsidiaries net deferred tax asset that reverses within the holiday period was remeasured at the new tax rate (the net deferred tax asset of the other subsidiary was not remeasured since it could still be utilized against the subsidiary's future earnings not subject to the tax holiday). This remeasurement resulted in a decrease to that subsidiary's net deferred tax asset and a noncash charge to earnings of \$52 (\$31 after noncontrolling interest).

The following table details the changes in the valuation allowance:

| <b>December 31,</b>                               | <b>2015</b> | <b>2014</b> | <b>2013</b> |
|---|-------------|-------------|-------------|
| Balance at beginning of year                      | \$ 1,668    | \$ 1,804    | \$ 1,400    |
| Increase to allowance                             | 472         | 117         | 471         |
| Release of allowance                              | (42)        | (77)        | (41)        |
| Acquisitions and divestitures (F)                 | 29          | (37)        | -           |
| U.S. state tax apportionment and tax rate changes | (45)        | (80)        | (32)        |
| Foreign currency translation                      | (45)        | (59)        | 6           |
| Balance at end of year                            | \$ 2,037    | \$ 1,668    | \$ 1,804    |

The cumulative amount of Alcoa's foreign undistributed net earnings for which no deferred taxes have been provided was approximately \$4,000 at December 31, 2015. Alcoa has a number of commitments and obligations related to the Company's growth strategy in foreign jurisdictions. As such, management has no plans to distribute such earnings in the foreseeable future, and, therefore, has determined it is not practicable to determine the related deferred tax liability.

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Alcoa and its subsidiaries file income tax returns in the U.S. federal jurisdiction and various states and foreign jurisdictions. With a few minor exceptions, Alcoa is no longer subject to income tax examinations by tax authorities for years prior to 2006. All U.S. tax years prior to 2015 have been audited by the Internal Revenue Service. Various state and foreign jurisdiction tax authorities are in the process of examining Alcoa's income tax returns for various tax years through 2014.

A reconciliation of the beginning and ending amount of unrecognized tax benefits (excluding interest and penalties) was as follows:

| <b>December 31,</b>                             | <b>2015</b> | <b>2014</b> | <b>2013</b> |
|---|-------------|-------------|-------------|
| Balance at beginning of year                    | \$ 35       | \$ 63       | \$ 66       |
| Additions for tax positions of the current year | 2           | 2           | 2           |
| Additions for tax positions of prior years      | 15          | 5           | 11          |
| Reductions for tax positions of prior years     | (2)         | (4)         | (2)         |
| Settlements with tax authorities                | (2)         | (29)        | (8)         |
| Expiration of the statute of limitations        | (1)         | -           | (2)         |
| Foreign currency translation                    | (4)         | (2)         | (4)         |
| Balance at end of year                          | \$ 43       | \$ 35       | \$ 63       |

For all periods presented, a portion of the balance at end of year pertains to state tax liabilities, which are presented before any offset for federal tax benefits. The effect of unrecognized tax benefits, if recorded, that would impact the annual effective tax rate for 2015, 2014, and 2013 would be approximately 12%, 4%, and (1)%, respectively, of pretax book income (loss). Alcoa does not anticipate that changes in its unrecognized tax benefits will have a material impact on the Statement of Consolidated Operations during 2016 (see Other Matters in Note N for a matter for which no reserve has been recognized).

It is Alcoa's policy to recognize interest and penalties related to income taxes as a component of the Provision for income taxes on the accompanying Statement of Consolidated Operations. In 2015, 2014, and 2013, Alcoa recognized \$8, \$1, and \$2, respectively, in interest and penalties. Due to the expiration of the statute of limitations, settlements with tax authorities, and refunded overpayments, Alcoa also recognized interest income of \$2, \$5, and \$12 in 2015, 2014, and 2013, respectively. As of December 31, 2015 and 2014, the amount accrued for the payment of interest and penalties was \$9.

**U. Receivables****Sale of Receivables Programs**

Alcoa has an arrangement with three financial institutions to sell certain customer receivables without recourse on a revolving basis. The sale of such receivables is completed through the use of a bankruptcy remote special purpose entity, which is a consolidated subsidiary of Alcoa. This arrangement provides for minimum funding of \$200 up to a maximum of \$500 for receivables sold. On March 30, 2012, Alcoa initially sold \$304 of customer receivables in exchange for \$50 in cash and \$254 of deferred purchase price under this arrangement. Alcoa has received additional net cash funding of \$200 for receivables sold (\$1,258 in draws and \$1,058 in repayments) since the program's inception (no draws or repayments occurred in 2015), including \$40 (\$710 in draws and \$670 in repayments) in 2014.

As of December 31, 2015 and 2014, the deferred purchase price receivable was \$249 and \$356, respectively, which was included in Other receivables on the accompanying Consolidated Balance Sheet. The deferred purchase price receivable is reduced as collections of the underlying receivables occur; however, as this is a revolving program, the sale of new receivables will result in an increase in the deferred purchase price receivable. The net change in the deferred purchase price receivable was reflected in the Decrease (increase) in receivables line item on the accompanying Statement of Consolidated Cash Flows. This activity is reflected as an operating cash flow because the related customer receivables are the result of an operating activity with an insignificant, short-term interest rate risk.

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In 2015 and 2014, the gross cash outflows and inflows associated with the deferred purchase price receivable were \$6,893 and \$7,001, respectively, and \$7,381 and \$7,272, respectively. The gross amount of receivables sold and total cash collected under this program since its inception was \$24,598 and \$24,099 respectively. Alcoa services the customer receivables for the financial institutions at market rates; therefore, no servicing asset or liability was recorded.

**Allowance for Doubtful Accounts**

The following table details the changes in the allowance for doubtful accounts related to customer receivables and other receivables:

| December 31,                        | Customer receivables |       |       | Other receivables |       |       |
|-------------------------------------|----------------------|-------|-------|-------------------|-------|-------|
|                                     | 2015                 | 2014  | 2013  | 2015              | 2014  | 2013  |
| Balance at beginning of year        | \$ 14                | \$ 20 | \$ 39 | \$ 41             | \$ 47 | \$ 74 |
| Provision for doubtful accounts     | 5                    | 2     | 3     | 8                 | 8     | 29    |
| Write off of uncollectible accounts | (4)                  | (3)   | (19)  | (2)               | (4)   | (39)  |
| Recoveries of prior write-offs      | -                    | (2)   | (3)   | 1                 | (7)   | (10)  |
| Other                               | (2)                  | (3)   | -     | 1                 | (3)   | (7)   |
| Balance at end of year              | \$ 13                | \$ 14 | \$ 20 | \$ 49             | \$ 41 | \$ 47 |

**V. Interest Cost Components**

|                           | 2015   | 2014   | 2013   |
|---------------------------|--------|--------|--------|
| Amount charged to expense | \$ 498 | \$ 473 | \$ 453 |
| Amount capitalized        | 57     | 56     | 99     |
|                           | \$ 555 | \$ 529 | \$ 552 |

**W. Pension and Other Postretirement Benefits**

Alcoa maintains pension plans covering most U.S. employees and certain employees in foreign locations. Pension benefits generally depend on length of service, job grade, and remuneration. Substantially all benefits are paid through pension trusts that are sufficiently funded to ensure that all plans can pay benefits to retirees as they become due. Most salaried and non-bargaining hourly U.S. employees hired after March 1, 2006 participate in a defined contribution plan instead of a defined benefit plan.

On June 6, 2014, the United Steelworkers ratified a new five-year labor agreement covering approximately 6,100 employees at 10 U.S. locations; the previous labor agreement expired on May 15, 2014. In 2014, as a result of the preparation for and ratification of the new agreement, Alcoa recognized \$18 (\$12 after-tax) in Cost of goods sold on the accompanying Statement of Consolidated Operations for, among other items, business contingency costs and a one-time signing bonus for employees. Additionally, as a result of the provisions of the new labor agreement, a significant plan amendment was adopted by one of Alcoa's U.S. pension plans. Accordingly, this plan was required to be remeasured, and through this process, the discount rate was updated from 4.80% at December 31, 2013 to 4.25% at May 31, 2014. The plan remeasurement resulted in an increase to both Alcoa's pension liability of \$100 and a combination of the plan's unrecognized net actuarial loss and prior service cost (included in Accumulated other comprehensive loss) of \$65 (after-tax). The plan remeasurement also resulted in a \$13 decrease to 2014 net periodic benefit cost.

Alcoa also maintains health care and life insurance postretirement benefit plans covering eligible U.S. retired employees and certain retirees from foreign locations. Generally, the medical plans are unfunded and pay a percentage of medical expenses, reduced by deductibles and other coverage. Life benefits are generally provided by insurance contracts. Alcoa retains the right, subject to existing agreements, to change or eliminate these benefits. All salaried and certain non-bargaining hourly U.S. employees hired after January 1, 2002 and certain bargaining hourly U.S. employees hired after July 1, 2010 are not eligible for postretirement health care benefits. All salaried and certain hourly U.S. employees that retire on or after April 1, 2008 are not eligible for postretirement life insurance benefits.



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Effective January 1, 2015, Alcoa no longer offers postretirement health care benefits to Medicare-eligible, primarily non-bargaining, U.S. retirees through Company-sponsored plans. Qualifying retirees (hired prior to January 1, 2002), both current and future, may access these benefits in the marketplace by purchasing coverage directly from insurance carriers. This change resulted in the adoption of a significant plan amendment by certain Alcoa U.S. postretirement benefit plans in August 2014. Accordingly, these plans were required to be remeasured, and through this process, the discount rate was updated from 4.80% at December 31, 2013 to 4.15% at August 31, 2014. The remeasurement of the plans resulted in a decrease to both Alcoa's other postretirement benefits liability of \$90 and a combination of the plans' unrecognized net actuarial loss and prior service benefit (included in Accumulated other comprehensive loss) of \$59 (after-tax). The remeasurement of the plans also resulted in a \$7 decrease to 2014 net periodic benefit cost.

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The funded status of all of Alcoa's pension and other postretirement benefit plans are measured as of December 31 each calendar year.

**Obligations and Funded Status**

| December 31,   | Pension benefits |            | Other postretirement benefits |            |
|--|------------------|------------|-------------------------------|------------|
|  | 2015             | 2014       | 2015                          | 2014       |
| <b>Change in benefit obligation</b>  |                  |            |                               |            |
| Benefit obligation at beginning of year  | \$ 15,019        | \$ 13,730  | \$ 2,368                      | \$ 2,592   |
| Service cost   | 187              | 182        | 14                            | 15         |
| Interest cost  | 583              | 640        | 92                            | 114        |
| Amendments   | 18               | 33         | -                             | (111)      |
| Actuarial (gains) losses   | (222)            | 1,552      | 26                            | 16         |
| Acquisitions (F)   | 188              | 455        | 48                            | -          |
| Divestitures (F)   | -                | (142)      | -                             | (10)       |
| Settlements  | (72)             | (134)      | -                             | -          |
| Curtailments   | (12)             | -          | (6)                           | -          |
| Benefits paid, net of participants' contributions  | (1,033)          | (1,051)    | (235)                         | (264)      |
| Medicare Part D subsidy receipts   | -                | -          | 15                            | 19         |
| Foreign currency translation impact  | (409)            | (246)      | (3)                           | (3)        |
| Benefit obligation at end of year*   | \$ 14,247        | \$ 15,019  | \$ 2,319                      | \$ 2,368   |
| <b>Change in plan assets</b>   |                  |            |                               |            |
| Fair value of plan assets at beginning of year   | \$ 11,717        | \$ 10,580  | \$ -                          | \$ -       |
| Actual return on plan assets   | 24               | 1,764      | -                             | -          |
| Employer contributions   | 479              | 507        | -                             | -          |
| Participants' contributions  | 21               | 25         | -                             | -          |
| Benefits paid  | (1,015)          | (1,038)    | -                             | -          |
| Administrative expenses  | (55)             | (54)       | -                             | -          |
| Acquisitions (F)   | 164              | 431        | -                             | -          |
| Divestitures (F)   | -                | (164)      | -                             | -          |
| Settlements  | (72)             | (134)      | -                             | -          |
| Foreign currency translation impact  | (335)            | (200)      | -                             | -          |
| Fair value of plan assets at end of year*  | \$ 10,928        | \$ 11,717  | \$ -                          | \$ -       |
| <b>Funded status*</b>  | \$ (3,319)       | \$ (3,302) | \$ (2,319)                    | \$ (2,368) |
| Less: Amounts attributed to joint venture partners   | (30)             | (33)       | -                             | -          |
| Net funded status  | \$ (3,289)       | \$ (3,269) | \$ (2,319)                    | \$ (2,368) |
| <b>Amounts recognized in the Consolidated Balance Sheet consist of:</b>  |                  |            |                               |            |
| Noncurrent assets  | \$ 44            | \$ 53      | \$ -                          | \$ -       |
| Current liabilities  | (35)             | (31)       | (213)                         | (213)      |
| Noncurrent liabilities   | (3,298)          | (3,291)    | (2,106)                       | (2,155)    |
| Net amount recognized  | \$ (3,289)       | \$ (3,269) | \$ (2,319)                    | \$ (2,368) |
| <b>Amounts recognized in Accumulated Other Comprehensive Loss consist of:</b>                                  |                  |            |                               |            |
| Net actuarial loss   | \$ 5,351         | \$ 5,379   | \$ 398                        | \$ 392     |
| Prior service cost (benefit)   | 70               | 102        | (106)                         | (144)      |
| Total, before tax effect   | 5,421            | 5,481      | 292                           | 248        |
| Less: Amounts attributed to joint venture partners   | 38               | 43         | -                             | -          |
| Net amount recognized, before tax effect   | \$ 5,383         | \$ 5,438   | \$ 292                        | \$ 248     |
| <b>Other Changes in Plan Assets and Benefit Obligations Recognized in Other Comprehensive Loss consist of:</b> |                  |            |                               |            |
| Net actuarial loss   | \$ 440           | \$ 572     | \$ 23                         | \$ 15      |
| Amortization of accumulated net actuarial loss   | (468)            | (391)      | (17)                          | (13)       |
| Prior service (benefit) cost   | (7)              | 26         | 1                             | (112)      |
| Amortization of prior service (cost) benefit   | (25)             | (18)       | 37                            | 25         |
| Total, before tax effect   | (60)             | 189        | 44                            | (85)       |
| Less: Amounts attributed to joint venture partners   | (5)              | 5          | -                             | -          |

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Net amount recognized, before tax effect \$ (55) \$ 184 \$ 44 \$ (85)

\* At December 31, 2015, the benefit obligation, fair value of plan assets, and funded status for U.S. pension plans were \$10,983, \$8,077, and \$(2,906), respectively. At December 31, 2014, the benefit obligation, fair value of plan assets, and funded status for U.S. pension plans were \$11,404, \$8,576, and \$(2,828), respectively.

**Table of Contents****Pension Plan Benefit Obligations**

|   | <b>Pension benefits</b> |             |
|---|-------------------------|-------------|
|   | <b>2015</b>             | <b>2014</b> |
| The projected benefit obligation and accumulated benefit obligation for all defined benefit pension plans was as follows: |                         |             |
| Projected benefit obligation  | \$ 14,247               | \$ 15,019   |
| Accumulated benefit obligation  | 13,832                  | 14,553      |

The aggregate projected benefit obligation and fair value of plan assets for pension plans with projected benefit obligations in excess of plan assets was as follows:

|                              |        |        |
|------------------------------|--------|--------|
| Projected benefit obligation | 14,146 | 14,151 |
| Fair value of plan assets    | 10,786 | 10,777 |

The aggregate accumulated benefit obligation and fair value of plan assets for pension plans with accumulated benefit obligations in excess of plan assets was as follows:

|                                |        |        |
|--------------------------------|--------|--------|
| Accumulated benefit obligation | 12,510 | 13,112 |
| Fair value of plan assets      | 9,512  | 10,144 |

**Components of Net Periodic Benefit Cost**

|  | <b>Pension benefits<sup>(1)</sup></b> |             |             | <b>Other postretirement benefits<sup>(2)</sup></b> |             |             |
|--|---------------------------------------|-------------|-------------|--|-------------|-------------|
|  | <b>2015</b>                           | <b>2014</b> | <b>2013</b> | <b>2015</b>  | <b>2014</b> | <b>2013</b> |
| Service cost                                 | \$ 175                                | \$ 166      | \$ 194      | \$ 14  | \$ 15       | \$ 17       |
| Interest cost                                | 577                                   | 630         | 602         | 92   | 114         | 114         |
| Expected return on plan assets               | (753)                                 | (782)       | (788)       | -  | -           | -           |
| Recognized net actuarial loss                | 468                                   | 391         | 489         | 17   | 13          | 35          |
| Amortization of prior service cost (benefit) | 16                                    | 18          | 19          | (37)   | (25)        | (18)        |
| Settlements <sup>(3)</sup>                   | 16                                    | 26          | 9           | -  | -           | -           |
| Curtailments <sup>(4)</sup>                  | 9                                     | -           | 6           | (4)  | -           | -           |
| Special termination benefits <sup>(5)</sup>  | 16                                    | -           | 77          | -  | -           | -           |
| Net periodic benefit cost <sup>(6)</sup>     | \$ 524                                | \$ 449      | \$ 608      | \$ 82  | \$ 117      | \$ 148      |

(1) In 2015, 2014, and 2013, net periodic benefit cost for U.S. pension plans was \$423, \$335, and \$391, respectively.

(2) In 2015, 2014, and 2013, net periodic benefit cost for other postretirement benefits reflects a reduction of \$34, \$38, and \$55, respectively, related to the recognition of the federal subsidy awarded under Medicare Part D.

(3) In 2015, settlements were due to workforce reductions (see Note D) and the payment of lump sum benefits and/or purchases of annuity contracts. In 2014, settlements were due to workforce reductions (see Note D). In 2013, settlements were due to the payment of lump sum benefits and/or purchases of annuity contracts.

(4) In 2015 and 2013, curtailments were due to elimination of benefits or workforce reductions (see Note D).

(5) In 2015 and 2013, special termination benefits were due to workforce reductions (see Note D).

(6) Amounts attributed to joint venture partners are not included.

**Amounts Expected to be Recognized in Net Periodic Benefit Cost**

|  | <b>Pension benefits</b> |  | <b>Other postretirement benefits</b> |  |
|--|-------------------------|--|--------------------------------------|--|
|  | <b>2016</b>             |  | <b>2016</b>                          |  |
| Net actuarial loss recognition           | 413                     |  | 21                                   |  |
| Prior service cost (benefit) recognition | 15                      |  | (26)                                 |  |



**Table of Contents****Assumptions**

Weighted average assumptions used to determine benefit obligations for U.S. pension and other postretirement benefit plans were as follows (assumptions for non-U.S. plans did not differ materially):

| <b>December 31,</b>           | <b>2015</b> | <b>2014</b> |
|-------------------------------|-------------|-------------|
| Discount rate                 | 4.29%       | 4.00%       |
| Rate of compensation increase | 3.5         | 3.5         |

The discount rate is determined using a Company-specific yield curve model (above-median) developed with the assistance of an external actuary. The cash flows of the plans' projected benefit obligations are discounted using a single equivalent rate derived from yields on high quality corporate bonds, which represent a broad diversification of issuers in various sectors, including finance and banking, consumer products, transportation, insurance, and pharmaceutical, among others. The yield curve model parallels the plans' projected cash flows, which have an average duration of 10 years, and the underlying cash flows of the bonds included in the model exceed the cash flows needed to satisfy the Company's plans' obligations multiple times.

The rate of compensation increase is based upon actual experience. For 2016, the rate of compensation increase will be 3.5%, which approximates the five-year average.

Weighted average assumptions used to determine net periodic benefit cost for U.S. pension and other postretirement benefit plans were as follows (assumptions for non-U.S. plans did not differ materially):

|  | <b>2015</b> | <b>2014</b> | <b>2013</b> |
|--|-------------|-------------|-------------|
| Discount rate*                                   | 4.00%       | 4.80%       | 4.15%       |
| Expected long-term rate of return on plan assets | 7.75        | 8.00        | 8.50        |
| Rate of compensation increase                    | 3.50        | 3.50        | 3.50        |

\* In all periods presented, the respective discount rates were used to determine net periodic benefit cost for most U.S. pension plans for the full annual period. However, the discount rates for a limited number of plans were updated during 2015, 2014, and 2013 to reflect the remeasurement of these plans due to new union labor agreements, settlements, and/or curtailments. The updated discount rates used were not significantly different from the discount rates presented.

In conjunction with the annual measurement of the funded status of Alcoa's pension and other postretirement benefit plans at December 31, 2015, management elected to change the manner in which the interest cost component of net periodic benefit cost will be determined in 2016 and beyond. Previously, the interest cost component was determined by multiplying the single equivalent rate described above and the aggregate discounted cash flows of the plans' projected benefit obligations. Under the new methodology, the interest cost component will be determined by aggregating the product of the discounted cash flows of the plans' projected benefit obligations for each year and an individual spot rate (referred to as the "spot rate" approach). This change will result in a lower interest cost component of net periodic benefit cost under the new methodology compared to the previous methodology of approximately \$100 (\$65 after-tax) in 2016. Management believes this new methodology, which represents a change in an accounting estimate, is a better measure of the interest cost as each year's cash flows are specifically linked to the interest rates of bond payments in the same respective year.

The expected long-term rate of return on plan assets is generally applied to a five-year market-related value of plan assets (a four-year average or the fair value at the plan measurement date is used for certain non-U.S. plans). The process used by management to develop this assumption is one that relies on a combination of historical asset return information and forward-looking returns by asset class. As it relates to historical asset return information, management focuses on the annual, 10-year moving, and 20-year moving averages when developing this assumption. Management also incorporates expected future returns on current and planned asset allocations using information from various external investment managers and consultants, as well as management's own judgment.

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For 2015, 2014, and 2013, the expected long-term rate of return used by management was based on the prevailing and planned strategic asset allocations, as well as estimates of future returns by asset class. These rates fell within the respective range of the 20-year moving average of actual performance and the expected future return developed by asset class. In 2015, the decrease of 25 basis points in the expected long-term rate of return was due to a decrease in the 20-year moving average of actual performance. For 2016, management anticipates that 7.75% will be the expected long-term rate of return.

Assumed health care cost trend rates for U.S. other postretirement benefit plans were as follows (assumptions for non-U.S. plans did not differ materially):

|  | 2015 | 2014 | 2013 |
|--|------|------|------|
| Health care cost trend rate assumed for next year                    | 5.5% | 5.5% | 5.5% |
| Rate to which the cost trend rate gradually declines                 | 4.5% | 4.5% | 4.5% |
| Year that the rate reaches the rate at which it is assumed to remain | 2019 | 2018 | 2017 |

The assumed health care cost trend rate is used to measure the expected cost of gross eligible charges covered by Alcoa's other postretirement benefit plans. For 2016, a 5.5% trend rate will be used, reflecting management's best estimate of the change in future health care costs covered by the plans. The plans' actual annual health care cost trend experience over the past three years has ranged from 4.0% to 9.6%. Management does not believe this three-year range is indicative of expected increases for future health care costs over the long-term.

Assumed health care cost trend rates have an effect on the amounts reported for the health care plan. A one-percentage point change in these assumed rates would have the following effects:

|   | 1%<br>increase | 1%<br>decrease |
|---|----------------|----------------|
| Effect on other postretirement benefit obligations      | \$ 126         | \$ (113)       |
| Effect on total of service and interest cost components | 5              | (5)            |

**Plan Assets**

Alcoa's pension plans' investment policy and weighted average asset allocations at December 31, 2015 and 2014, by asset class, were as follows:

| Asset class       | Policy range | Plan assets<br>at<br>December 31, |      |
|-------------------|--------------|-----------------------------------|------|
|                   |              | 2015                              | 2014 |
| Equities          | 20-55%       | 30%                               | 33%  |
| Fixed income      | 25-55%       | 43                                | 45   |
| Other investments | 15-35%       | 27                                | 22   |
| Total             |              | 100%                              | 100% |

The principal objectives underlying the investment of the pension plans' assets are to ensure that Alcoa can properly fund benefit obligations as they become due under a broad range of potential economic and financial scenarios, maximize the long-term investment return with an acceptable level of risk based on such obligations, and broadly diversify investments across and within various asset classes to protect asset values against adverse movements. Specific objectives for long-term investment strategy include reducing the volatility of pension assets relative to pension liabilities and achieving risk factor diversification across the balance of the asset portfolio. A portion of the assets are matched to the interest rate profile of the benefit obligation through long duration fixed income investments and exposure to broad equity risk has been decreased and diversified through investments in discretionary and

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systematic macro hedge funds, long/short equity hedge funds, and global and emerging market equities. Investments are further diversified by strategy, asset class, geography, and sector to enhance returns and mitigate downside risk. A large number of external investment managers are used to gain broad exposure to the financial markets and to mitigate manager-concentration risk.

Investment practices comply with the requirements of the Employee Retirement Income Security Act of 1974 (ERISA) and other applicable laws and regulations. The use of derivative instruments is permitted where appropriate and necessary for achieving overall investment policy objectives. Currently, the use of derivative instruments is not significant when compared to the overall investment portfolio.

The following section describes the valuation methodologies used by the trustees to measure the fair value of pension plan assets, including an indication of the level in the fair value hierarchy in which each type of asset is generally classified (see Note X for the definition of fair value and a description of the fair value hierarchy).

**Equities.** These securities consist of: (i) direct investments in the stock of publicly traded U.S. and non-U.S. companies and are valued based on the closing price reported in an active market on which the individual securities are traded (generally classified in Level 1); (ii) the plans' share of commingled funds that are invested in the stock of publicly traded companies and are valued at the net asset value of shares held at December 31 (included in Level 1 if quoted in an active market, otherwise these investments are included in Level 2); and (iii) direct investments in long/short equity hedge funds and private equity (limited partnerships and venture capital partnerships) and are valued by investment managers based on the most recent financial information available, which typically represents significant unobservable data (generally classified as Level 3).

**Fixed income.** These securities consist of: (i) U.S. government debt and are generally valued using quoted prices (included in Level 1); (ii) publicly traded U.S. and non-U.S. fixed interest obligations (principally corporate bonds and debentures) and are valued through consultation and evaluation with brokers in the institutional market using quoted prices and other observable market data (included in Level 2); (iii) cash and cash equivalents, which consist of government securities in commingled funds, and are generally valued using observable market data (included in Level 2); and (iv) commercial and residential mortgage-backed securities and are valued by investment managers based on the most recent financial information available, which typically represents significant unobservable data (generally classified as Level 3).

**Other investments.** These investments include, among others: (i) exchange traded funds, such as gold, and real estate investment trusts and are valued based on the closing price reported in an active market on which the investments are traded (included in Level 1); (ii) the plans' share of commingled funds that are invested in real estate investment trusts and are valued at the net asset value of shares held at December 31 (generally included in Level 3, however, if fair value is able to be determined through the use of quoted market prices of similar assets or other observable market data, then the investments are classified in Level 2); and (iii) direct investments of discretionary and systematic macro hedge funds and private real estate (includes limited partnerships) and are valued by investment managers based on the most recent financial information available, which typically represents significant unobservable data (generally classified as Level 3, however, if fair value is able to be determined through the use of quoted market prices of similar assets or other observable market data, then the investments are classified in Level 2).

The fair value methods described above may not be indicative of net realizable value or reflective of future fair values. Additionally, while Alcoa believes the valuation methods used by the plans' trustees are appropriate and consistent with other market participants, the use of different methodologies or assumptions to determine the fair value of certain financial instruments could result in a different fair value measurement at the reporting date.



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The following table presents the fair value of pension plan assets classified under the appropriate level of the fair value hierarchy:

| <b>December 31, 2015</b>                         | <b>Level 1</b>  | <b>Level 2</b>  | <b>Level 3</b>  | <b>Total</b>     |
|--|-----------------|-----------------|-----------------|------------------|
| <b>Equities:</b>                                 |                 |                 |                 |                  |
| Equity securities                                | \$ 826          | \$ 929          | \$ 170          | \$ 1,925         |
| Long/short equity hedge funds                    | -               | -               | 932             | 932              |
| Private equity                                   | -               | -               | 466             | 466              |
|  | \$ 826          | \$ 929          | \$ 1,568        | \$ 3,323         |
| <b>Fixed income:</b>                             |                 |                 |                 |                  |
| Intermediate and long duration government/credit | \$ 2,496        | \$ 1,255        | \$ -            | \$ 3,751         |
| Other  | -               | 952             | -               | 952              |
|  | \$ 2,496        | \$ 2,207        | \$ -            | \$ 4,703         |
| <b>Other investments:</b>                        |                 |                 |                 |                  |
| Real estate                                      | \$ 158          | \$ 16           | \$ 562          | \$ 736           |
| Discretionary and systematic macro hedge funds   | -               | -               | 1,671           | 1,671            |
| Other  | 126             | -               | 367             | 493              |
|  | \$ 284          | \$ 16           | \$ 2,600        | \$ 2,900         |
| <b>Total*</b>                                    | <b>\$ 3,606</b> | <b>\$ 3,152</b> | <b>\$ 4,168</b> | <b>\$ 10,926</b> |
| <br>   |                 |                 |                 |                  |
| <b>December 31, 2014</b>                         | <b>Level 1</b>  | <b>Level 2</b>  | <b>Level 3</b>  | <b>Total</b>     |
| <b>Equities</b>                                  |                 |                 |                 |                  |
| Equity securities                                | \$ 1,156        | \$ 1,131        | \$ 176          | \$ 2,463         |
| Long/short equity hedge funds                    | -               | -               | 963             | 963              |
| Private equity                                   | -               | -               | 543             | 543              |
|  | \$ 1,156        | \$ 1,131        | \$ 1,682        | \$ 3,969         |
| <b>Fixed income:</b>                             |                 |                 |                 |                  |
| Intermediate and long duration government/credit | \$ 2,998        | \$ 1,900        | \$ -            | \$ 4,898         |
| Other  | -               | 413             | -               | 413              |
|  | \$ 2,998        | \$ 2,313        | \$ -            | \$ 5,311         |
| <b>Other investments:</b>                        |                 |                 |                 |                  |
| Real estate                                      | \$ 152          | \$ 18           | \$ 459          | \$ 629           |
| Discretionary and systematic macro hedge funds   | -               | -               | 1,408           | 1,408            |
| Other  | 140             | -               | 376             | 516              |
|  | \$ 292          | \$ 18           | \$ 2,243        | \$ 2,553         |
| <b>Total**</b>                                   | <b>\$ 4,446</b> | <b>\$ 3,462</b> | <b>\$ 3,925</b> | <b>\$ 11,833</b> |

\* As of December 31, 2015, the total fair value of pension plans assets excludes a net receivable of \$2 which represents securities sold not yet settled plus interest and dividends earned on various investments.

\*\* As of December 31, 2014, the total fair value of pension plans assets excludes a net payable of \$116, which represents assets related to divested businesses (see Note F) to be transferred to the buyers pension plans less securities sold not yet settled plus interest and dividends earned on various investments.

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Pension plan assets classified as Level 3 in the fair value hierarchy represent investments in which the trustees have used significant unobservable inputs in the valuation model. The following table presents a reconciliation of activity for such investments:

|                                     | 2015     | 2014     |
|-------------------------------------|----------|----------|
| Balance at beginning of year        | \$ 3,925 | \$ 3,421 |
| Realized gains                      | 118      | 180      |
| Unrealized gains                    | 94       | 146      |
| Purchases                           | 640      | 868      |
| Sales                               | (481)    | (768)    |
| Issuances                           | -        | -        |
| Settlements                         | -        | -        |
| Acquisitions (F)                    | 12       | 117      |
| Foreign currency translation impact | (140)    | (39)     |
| Transfers in and/or out of Level 3* | -        | -        |
| Balance at end of year              | \$ 4,168 | \$ 3,925 |

\* In 2015 and 2014, there were no transfers of financial instruments into or out of Level 3.

**Funding and Cash Flows**

It is Alcoa's policy to fund amounts for pension plans sufficient to meet the minimum requirements set forth in applicable country benefits laws and tax laws, including the Pension Protection Act of 2006; the Worker, Retiree, and Employer Recovery Act of 2008; the Moving Ahead for Progress in the 21<sup>st</sup> Century Act of 2012; the Highway and Transportation Funding Act of 2014; and the Bipartisan Budget Act of 2015 for U.S. plans. From time to time, Alcoa contributes additional amounts as deemed appropriate. In 2015 and 2014, cash contributions to Alcoa's pension plans were \$470 and \$501. The minimum required contribution to pension plans in 2016 is estimated to be \$300, of which \$218 is for U.S. plans.

Benefit payments expected to be paid to pension and other postretirement benefit plans participants and expected Medicare Part D subsidy receipts are as follows:

| Year ended December 31, | Pension<br>benefits | Gross Other<br>postretirement<br>benefits | Medicare Part D<br>subsidy<br>receipts | Net Other<br>postretirement<br>benefits |
|-------------------------|---------------------|---|--|---|
| 2016                    | \$ 910              | \$ 230                                    | \$ 15                                  | \$ 215                                  |
| 2017                    | 900                 | 225                                       | 15                                     | 210                                     |
| 2018                    | 910                 | 225                                       | 15                                     | 210                                     |
| 2019                    | 910                 | 220                                       | 15                                     | 205                                     |
| 2020                    | 920                 | 220                                       | 20                                     | 200                                     |
| 2021 through 2025       | 4,650               | 975                                       | 80                                     | 895                                     |
|                         | \$ 9,200            | \$ 2,095                                  | \$ 160                                 | \$ 1,935                                |

**Defined Contribution Plans**

Alcoa sponsors savings and investment plans in several countries, including the United States and Australia. Expenses related to these plans were \$142 in 2015, \$151 in 2014, and \$149 in 2013. In the United States, employees may contribute a portion of their compensation to the plans, and Alcoa matches a portion of these contributions in equivalent form of the investments elected by the employee. Prior to January 1, 2014, Alcoa's match was mostly in company stock.

**Table of Contents****X. Derivatives and Other Financial Instruments**

**Fair Value.** 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. The fair value hierarchy distinguishes between (i) market participant assumptions developed based on market data obtained from independent sources (observable inputs) and (ii) an entity's own assumptions about market participant assumptions developed based on the best information available in the circumstances (unobservable inputs). The fair value hierarchy consists of three broad levels, which gives the highest priority to unadjusted quoted prices in active markets for identical assets or liabilities (Level 1) and the lowest priority to unobservable inputs (Level 3). The three levels of the fair value hierarchy are described below:

Level 1 Unadjusted quoted prices in active markets that are accessible at the measurement date for identical, unrestricted assets or liabilities.

Level 2 Inputs other than quoted prices included within Level 1 that are observable for the asset or liability, either directly or indirectly, including quoted prices for similar assets or liabilities in active markets; quoted prices for identical or similar assets or liabilities in markets that are not active; inputs other than quoted prices that are observable for the asset or liability (e.g., interest rates); and inputs that are derived principally from or corroborated by observable market data by correlation or other means.

Level 3 Inputs that are both significant to the fair value measurement and unobservable.

**Derivatives.** Alcoa is exposed to certain risks relating to its ongoing business operations, including financial, market, political, and economic risks. The following discussion provides information regarding Alcoa's exposure to the risks of changing commodity prices, interest rates, and foreign currency exchange rates.

Alcoa's commodity and derivative activities are subject to the management, direction, and control of the Strategic Risk Management Committee (SRMC), which is composed of the chief executive officer, the chief financial officer, and other officers and employees that the chief executive officer selects. The SRMC meets on a periodic basis to review derivative positions and strategy and reports to Alcoa's Board of Directors on the scope of its activities.

The aluminum, energy, interest rate, and foreign exchange contracts are held for purposes other than trading. They are used primarily to mitigate uncertainty and volatility, and to cover underlying exposures. Alcoa is not involved in trading activities for energy, weather derivatives, or other nonexchange commodity trading activities.

A number of Alcoa's aluminum, energy, and foreign exchange contracts are classified as Level 1 and an interest rate contract is classified as Level 2 under the fair value hierarchy. These energy, foreign exchange, and interest rate contracts are not material to Alcoa's Consolidated Financial Statements for all periods presented except as follows for two foreign exchange contracts. Alcoa had a forward contract to purchase \$53 (C\$58) to mitigate the foreign currency risk related to a Canadian-denominated loan, which was repaid on August 31, 2014 upon maturity. The forward contract expired on August 5, 2014 and a gain of \$1 was recognized in Other expenses, net on the accompanying Statement of Consolidated Operations in 2014. Also, Alcoa had a forward contract to purchase \$231 (R\$543) to mitigate the foreign currency risk associated with a potential future transaction denominated in Brazilian reais. This contract expired on March 31, 2014 and a loss of \$4 was recognized in Other expenses, net on the accompanying Statement of Consolidated Operations in 2014.

For the aluminum contracts classified as Level 1, the total fair value of derivatives recorded as assets and liabilities was \$8 and \$58 and \$2 and \$31 at December 31, 2015 and 2014, respectively. These contracts were entered into to either hedge forecasted sales or purchases of aluminum in order to manage the associated aluminum price risk. Certain of these contracts are designated as hedging instruments, either fair value or cash flow, and the remaining are not designated as such. Combined, Alcoa recognized a net gain of \$19, a net loss of \$15, and a net gain of \$4 in Sales on the accompanying Statement of Consolidated Operations in 2015, 2014, and 2013, respectively, related to these aluminum contracts. Additionally, for the contracts designated as cash flow hedges, Alcoa recognized an unrealized gain of \$9 in Other comprehensive loss in 2013.

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In addition to the Level 1 and 2 derivative instruments described above, Alcoa has nine derivative instruments classified as Level 3 under the fair value hierarchy. These instruments are composed of seven embedded aluminum derivatives, an energy contract, and an embedded credit derivative, all of which relate to energy supply contracts associated with eight smelters and three refineries. Five of the embedded aluminum derivatives and the energy contract were designated as cash flow hedging instruments and two of the embedded aluminum derivatives and the embedded credit derivative were not designated as hedging instruments.

The following section describes the valuation methodologies used by Alcoa to measure its Level 3 derivative instruments at fair value. Derivative instruments classified as Level 3 in the fair value hierarchy represent those in which management has used at least one significant unobservable input in the valuation model. Alcoa uses a discounted cash flow model to fair value all Level 3 derivative instruments. Where appropriate, the description below includes the key inputs to those models and any significant assumptions. These valuation models are reviewed and tested at least on an annual basis.

Inputs in the valuation models for Level 3 derivative instruments are composed of the following: (i) quoted market prices (e.g., aluminum prices on the 10-year London Metal Exchange (LME) forward curve and energy prices), (ii) significant other observable inputs (e.g., information concerning time premiums and volatilities for certain option type embedded derivatives and regional premiums for aluminum contracts), and (iii) unobservable inputs (e.g., aluminum and energy prices beyond those quoted in the market). For periods beyond the term of quoted market prices for aluminum, Alcoa estimates the price of aluminum by extrapolating the 10-year LME forward curve. Additionally, for periods beyond the term of quoted market prices for energy, management has developed a forward curve based on independent consultant market research. Where appropriate, valuations are adjusted for various factors such as liquidity, bid/offer spreads, and credit considerations. Such adjustments are generally based on available market evidence (Level 2). In the absence of such evidence, management's best estimate is used (Level 3). If a significant input that is unobservable in one period becomes observable in a subsequent period, the related asset or liability would be transferred to the appropriate classification (Level 1 or 2) in the period of such change (there were no such transfers in the periods presented).

Alcoa has embedded derivatives in two power contracts that index the price of power to the LME price of aluminum. Additionally, in late 2014, Alcoa renewed three power contracts, each of which contain an embedded derivative that indexes the price of power to the LME price of aluminum plus the Midwest premium. The embedded derivatives in these five power contracts are primarily valued using observable market prices; however, due to the length of the contracts, the valuation models also require management to estimate the long-term price of aluminum based upon an extrapolation of the 10-year LME forward curve and/or 5-year Midwest premium curve. Significant increases or decreases in the actual LME price beyond 10 years and/or the Midwest premium beyond 5 years would result in a higher or lower fair value measurement. An increase in actual LME price and/or the Midwest premium over the inputs used in the valuation models will result in a higher cost of power and a corresponding decrease to the derivative asset or increase to the derivative liability. The embedded derivatives have been designated as cash flow hedges of forward sales of aluminum. Unrealized gains and losses were included in Other comprehensive loss on the accompanying Consolidated Balance Sheet while realized gains and losses were included in Sales on the accompanying Statement of Consolidated Operations.

Also, Alcoa has a power contract separate from above that contains an LME-linked embedded derivative. The embedded derivative is valued using the probability and interrelationship of future LME prices, Australian dollar to U.S. dollar exchange rates, and the U.S. consumer price index. Significant increases or decreases in the LME price would result in a higher or lower fair value measurement. An increase in actual LME price over the inputs used in the valuation model will result in a higher cost of power and a corresponding decrease to the derivative asset. This embedded derivative did not qualify for hedge accounting treatment. Unrealized gains and losses from the embedded derivative were included in Other expenses (income), net on the accompanying Statement of Consolidated Operations while realized gains and losses were included in Cost of goods sold on the accompanying Statement of Consolidated Operations as electricity purchases were made under the contract. At the time this derivative asset was recognized, an equivalent amount was recognized as a deferred credit in Other noncurrent liabilities and deferred credits on the

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accompanying Consolidated Balance Sheet (see Note L). This deferred credit is recognized in Other expenses (income), net on the accompanying Statement of Consolidated Operations as power is received over the life of the contract. Alcoa had a similar power contract and related embedded derivative associated with another smelter and rolling mill combined; however, the contract and related derivative instrument matured in July 2014.

Additionally, Alcoa has a natural gas supply contract, which has an LME-linked ceiling. This embedded derivative is valued using probabilities of future LME aluminum prices and the price of Brent crude oil (priced on Platts), including the interrelationships between the two commodities subject to the ceiling. Any change in the interrelationship would result in a higher or lower fair value measurement. An LME ceiling was embedded into the contract price to protect against an increase in the price of oil without a corresponding increase in the price of LME. An increase in oil prices with no similar increase in the LME price would limit the increase of the price paid for natural gas. This embedded derivative did not qualify for hedge accounting treatment. Unrealized gains and losses from the embedded derivative were included in Other expenses (income), net on the accompanying Statement of Consolidated Operations while realized gains and losses were included in Cost of goods sold on the accompanying Statement of Consolidated Operations as gas purchases were made under the contract.

Furthermore, Alcoa has an embedded derivative in a power contract that indexes the difference between the long-term debt ratings of Alcoa and the counterparty from any of the three major credit rating agencies. Management uses market prices, historical relationships, and forecast services to determine fair value. Significant increases or decreases in any of these inputs would result in a lower or higher fair value measurement. A wider credit spread between Alcoa and the counterparty would result in a higher cost of power and a corresponding increase in the derivative liability. This embedded derivative did not qualify for hedge accounting treatment. Unrealized gains and losses were included in Other expenses (income), net on the accompanying Statement of Consolidated Operations while realized gains and losses were included in Cost of goods sold on the accompanying Statement of Consolidated Operations as electricity purchases were made under the contract.

Finally, Alcoa has a derivative contract that will hedge the anticipated power requirements at one of its smelters once the existing power contract expires in September 2016. Beyond the term where market information is available, management has developed a forward curve, for valuation purposes, based on independent consultant market research. Significant increases or decreases in the power market may result in a higher or lower fair value measurement. Lower prices in the power market would cause a decrease in the derivative asset. The derivative contract has been designated as a cash flow hedge of future purchases of electricity. Unrealized gains and losses on this contract were recorded in Other comprehensive loss on the accompanying Consolidated Balance Sheet. Once the designated hedge period begins in September 2016, realized gains and losses will be recorded in Cost of goods sold as electricity purchases are made under the power contract. Alcoa had a similar contract related to another smelter once the prior existing contract expired in 2014, but elected to terminate the new contract in early 2013. This election was available to Alcoa under the terms of the contract and was made due to a projection that suggested the contract would be uneconomical. Prior to termination, the new contract was accounted for in the same manner.

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The following table presents quantitative information related to the significant unobservable inputs described above for Level 3 derivative contracts:

|                               | Fair value at     |   | Range  |
|-------------------------------|-------------------|---|--|
|                               | December 31, 2015 | Unobservable input  | (\$ in full amounts)   |
| <b>Assets:</b>                |                   |   |  |
| Embedded aluminum derivatives | \$ 1,060          | Price of aluminum beyond forward curve  | Aluminum: \$2,060 per metric ton in 2026 to \$2,337 per metric ton in 2029 (two contracts) and \$2,534 per metric ton in 2036 (one contract) |
|                               |                   |   | Midwest premium: \$0.0940 per pound in 2021 to \$0.0940 per pound in 2029 (two contracts) and 2036 (one contract)                            |
| Embedded aluminum derivative  | 69                | Interrelationship of future aluminum prices, foreign currency exchange rates, and the U.S. consumer price index (CPI) | Aluminum: \$1,525 per metric ton in January 2016 to \$1,550 per metric ton in September 2016   |
|                               |                   |   | Foreign currency: A\$1 = \$0.73 in 2016 (January through September)  |
|                               |                   |   | CPI: 1982 base year of 100 and 233 in January 2016 to 236 in September 2016  |
| Embedded aluminum derivative  | 6                 | Interrelationship of LME price to overall energy price  | Aluminum: \$1,512 per metric ton in 2016 to \$1,686 per metric ton in 2019   |
| Embedded aluminum derivative  | -                 | Interrelationship of future aluminum and oil prices   | Aluminum: \$1,525 per metric ton in 2016 to \$1,652 per metric ton in 2018   |
|                               |                   |   | Oil: \$38 per barrel in 2016 to \$53 per barrel in 2018  |
| <b>Liabilities:</b>           |                   |   |  |
| Embedded aluminum derivative  | 169               | Price of aluminum beyond forward curve  | Aluminum: \$2,060 per metric ton in 2026 to \$2,128 per metric ton in 2027   |
| Embedded credit derivative    | 35                | Credit spread between Alcoa and counterparty  | 3.41% to 4.29% (3.85% median)  |
| Energy contract               | 2                 | Price of electricity beyond forward curve   | Electricity: \$45 per megawatt hour in 2019 to \$121 per megawatt hour in 2036   |

\* The fair value of the energy contract reflected as a liability in this table is lower by \$2 compared to the respective amount reflected in the Level 3 tables presented below. This is due to the fact that this contract is in a liability position for the current portion but is in an asset position for the noncurrent portion, and is reflected as such on the accompanying Consolidated Balance Sheet. However, this derivative is reflected as a net liability in the above table for purposes of presenting the assumptions utilized to measure the fair value of the derivative instrument in its entirety.

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The fair values of Level 3 derivative instruments recorded as assets and liabilities in the accompanying Consolidated Balance Sheet were as follows:

|   | December 31,<br>2015 | December 31,<br>2014 |
|---|----------------------|----------------------|
| <b>Asset Derivatives</b>                                |                      |                      |
| Derivatives designated as hedging instruments:          |                      |                      |
| Prepaid expenses and other current assets:              |                      |                      |
| Embedded aluminum derivatives                           | \$ 72                | \$ 24                |
| Other noncurrent assets:                                |                      |                      |
| Embedded aluminum derivative                            | 994                  | 73                   |
| Energy contract   | 2                    | 2                    |
| Total derivatives designated as hedging instruments     | \$ 1,068             | \$ 99                |
| Derivatives not designated as hedging instruments:      |                      |                      |
| Prepaid expenses and other current assets:              |                      |                      |
| Embedded aluminum derivatives                           | \$ 69                | \$ 98                |
| Other noncurrent assets:                                |                      |                      |
| Embedded aluminum derivatives                           | -                    | 71                   |
| Total derivatives not designated as hedging instruments | \$ 69                | \$ 169               |
| Total Asset Derivatives                                 | \$ 1,137             | \$ 268               |
| <b>Liability Derivatives</b>                            |                      |                      |
| Derivatives designated as hedging instruments:          |                      |                      |
| Other current liabilities:                              |                      |                      |
| Embedded aluminum derivative                            | \$ 9                 | \$ 24                |
| Energy contract   | 4                    | -                    |
| Other noncurrent liabilities and deferred credits:      |                      |                      |
| Embedded aluminum derivatives                           | 160                  | 352                  |
| Total derivatives designated as hedging instruments     | \$ 173               | \$ 376               |
| Derivatives not designated as hedging instruments:      |                      |                      |
| Other current liabilities:                              |                      |                      |
| Embedded credit derivative                              | \$ 6                 | \$ 2                 |
| Other noncurrent liabilities and deferred credits:      |                      |                      |
| Embedded credit derivative                              | 29                   | 16                   |
| Total derivatives not designated as hedging instruments | \$ 35                | \$ 18                |
| Total Liability Derivatives                             | \$ 208               | \$ 394               |

The following table shows the net fair values of the Level 3 derivative instruments at December 31, 2015 and the effect on these amounts of a hypothetical change (increase or decrease of 10%) in the market prices or rates that existed as of December 31, 2015:

|                               | Fair value        | Index change |
|-------------------------------|-------------------|--------------|
|                               | asset/(liability) | of + / - 10% |
| Embedded aluminum derivatives | \$ 966            | \$ 340       |
| Embedded credit derivative    | (35)              | 4            |
| Energy contract               | (2)               | 136          |

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The following tables present a reconciliation of activity for Level 3 derivative contracts:

|   | Assets      |          | Liabilities |            | Energy   |
|---|-------------|----------|-------------|------------|----------|
|   | Embedded    |          | Embedded    | Embedded   |          |
|   | aluminum    | Energy   | aluminum    | credit     |          |
| <b>2015</b>   | derivatives | contract | derivatives | derivative | contract |
| Opening balance January 1, 2015   | \$ 266      | \$ 2     | \$ 376      | \$ 18      | \$ -     |
| Total gains or losses (realized and unrealized) included in:  |             |          |             |            |          |
| Sales   | 5           | -        | (16)        | -          | -        |
| Cost of goods sold  | (99)        | -        | -           | -          | -        |
| Other expenses, net   | (8)         | (2)      | -           | 17         | 1        |
| Other comprehensive loss  | 964         | 1        | (191)       | -          | 3        |
| Purchases, sales, issuances, and settlements*   | -           | -        | -           | -          | -        |
| Transfers into and/or out of Level 3*   | -           | -        | -           | -          | -        |
| Foreign currency translation  | 7           | 1        | -           | -          | -        |
| Closing balance December 31, 2015   | \$ 1,135    | \$ 2     | \$ 169      | \$ 35      | \$ 4     |
| Change in unrealized gains or losses included in earnings for derivative contracts held at December 31, 2015: |             |          |             |            |          |
| Sales   | \$ -        | \$ -     | \$ -        | \$ -       | \$ -     |
| Cost of goods sold  | -           | -        | -           | -          | -        |
| Other expenses, net   | (8)         | (2)      | -           | (17)       | 1        |

\* In 2015, there were no purchases, sales, issuances or settlements of Level 3 derivative instruments. Additionally, there were no transfers of derivative instruments into or out of Level 3.

|   | Assets      |          | Liabilities |            | Energy |
|---|-------------|----------|-------------|------------|--------|
|   | Embedded    |          | Embedded    | Embedded   |        |
|   | aluminum    | Energy   | aluminum    | credit     |        |
| <b>2014</b>   | derivatives | contract | derivatives | derivative |        |
| Opening balance January 1, 2014   | \$ 349      | \$ 6     | \$ 410      | \$ 21      |        |
| Total gains or losses (realized and unrealized) included in:  |             |          |             |            |        |
| Sales   | (1)         | -        | (27)        | -          | -      |
| Cost of goods sold  | (163)       | -        | -           | -          | (1)    |
| Other expenses, net   | (15)        | -        | -           | -          | (2)    |
| Other comprehensive loss  | 71          | (4)      | (7)         | -          | -      |
| Purchases, sales, issuances, and settlements*   | -           | -        | -           | -          | -      |
| Transfers into and/or out of Level 3*   | -           | -        | -           | -          | -      |
| Foreign currency translation  | 23          | -        | -           | -          | -      |
| Closing balance December 31, 2014   | \$ 266      | \$ 2     | \$ 376      | \$ 18      |        |
| Change in unrealized gains or losses included in earnings for derivative contracts held at December 31, 2014: |             |          |             |            |        |
| Sales   | \$ -        | \$ -     | \$ -        | \$ -       | \$ -   |
| Cost of goods sold  | -           | -        | -           | -          | -      |
| Other expenses, net   | (15)        | -        | -           | -          | (2)    |

\* In November 2014, three new embedded derivatives were contained within renewed power contracts; however, there was no amount included for issuances as the fair value on the date of issuance was zero. There were no purchases, sales or settlements of Level 3 derivative instruments. Additionally, there were no transfers of derivative instruments into or out of Level 3.



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**Table of Contents****Derivatives Designated As Hedging Instruments Cash Flow Hedges**

For derivative instruments that are designated and qualify as cash flow hedges, the effective portion of unrealized gains or losses on the derivative is reported as a component of other comprehensive income (OCI). Realized gains or losses on the derivative are reclassified from OCI into earnings in the same period or periods during which the hedged transaction impacts earnings. Gains and losses on the derivative representing either hedge ineffectiveness or hedge components excluded from the assessment of effectiveness are recognized directly in earnings immediately.

Alcoa has five Level 3 embedded aluminum derivatives and one Level 3 energy contract (a second one was terminated in early 2013) that have been designated as cash flow hedges as follows.

**Embedded aluminum derivatives.** Alcoa has entered into energy supply contracts that contain pricing provisions related to the LME aluminum price. The LME-linked pricing features are considered embedded derivatives. Five of these embedded derivatives have been designated as cash flow hedges of forward sales of aluminum, three of which were new derivatives contained in three power contracts that were renewed in late 2014. At December 31, 2015 and 2014, these embedded aluminum derivatives hedge forecasted aluminum sales of 3,307 kmt and 3,610 kmt, respectively.

In 2015, 2014, and 2013, Alcoa recognized an unrealized gain of \$1,155, \$78, and \$190, respectively, in Other comprehensive loss related to these five derivative instruments. Additionally, Alcoa reclassified a realized loss of \$21, \$28, and \$29 from Accumulated other comprehensive loss to Sales in 2015, 2014, and 2013, respectively. There was no ineffectiveness related to these five derivative instruments in 2015, 2014, and 2013. Assuming market rates remain constant with the rates at December 31, 2015, a realized gain of \$45 is expected to be recognized in Sales over the next 12 months.

**Energy contract.** Alcoa has a derivative contract that will hedge the anticipated power requirements at one of its smelters once the existing power contract expires in 2016. Alcoa had a similar contract related to another smelter once the prior existing contract expired in 2014, but elected to terminate the new contract in early 2013 (see additional information in description of Level 3 derivative contracts above). At December 31, 2015 and 2014, this energy contract hedges forecasted electricity purchases of 59,409,328 megawatt hours. In 2015, 2014, and 2013, Alcoa recognized an unrealized loss of \$2, an unrealized loss of \$4, and an unrealized gain of \$3, respectively, in Other comprehensive loss. Additionally, Alcoa recognized a loss of \$3 in Other expenses, net related to hedge ineffectiveness in 2015. There was no ineffectiveness related to the respective energy contracts outstanding in 2014 and 2013.

**Derivatives Not Designated As Hedging Instruments**

Alcoa has two Level 3 embedded aluminum derivatives and one Level 3 embedded credit derivative that do not qualify for hedge accounting treatment. As such, gains and losses related to the changes in fair value of these instruments are recorded directly in earnings. In 2015, 2014, and 2013, Alcoa recognized a loss of \$25, a loss of \$13, and a gain of \$36, respectively, in Other expenses (income), net, of which a loss of \$8, a loss of \$15, and a gain of \$28, respectively, related to the two embedded aluminum derivatives and a loss of \$17, a gain of \$2, and a gain of \$8, respectively, related to the embedded credit derivative.

**Material Limitations**

The disclosures with respect to commodity prices, interest rates, and foreign currency exchange risk do not take into account the underlying commitments or anticipated transactions. If the underlying items were included in the analysis, the gains or losses on the futures contracts may be offset. Actual results will be determined by a number of factors that are not under Alcoa's control and could vary significantly from those factors disclosed.

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Alcoa is exposed to credit loss in the event of nonperformance by counterparties on the above instruments, as well as credit or performance risk with respect to its hedged customers' commitments. Although nonperformance is possible, Alcoa does not anticipate nonperformance by any of these parties. Contracts are with creditworthy counterparties and are further supported by cash, treasury bills, or irrevocable letters of credit issued by carefully chosen banks. In addition, various master netting arrangements are in place with counterparties to facilitate settlement of gains and losses on these contracts.

**Other Financial Instruments.** The carrying values and fair values of Alcoa's other financial instruments were as follows:

| December 31,                                    | 2015           |            | 2014           |            |
|---|----------------|------------|----------------|------------|
|   | Carrying value | Fair value | Carrying value | Fair value |
| Cash and cash equivalents                       | \$ 1,919       | \$ 1,919   | \$ 1,877       | \$ 1,877   |
| Restricted cash                                 | 37             | 37         | 20             | 20         |
| Noncurrent receivables                          | 17             | 17         | 17             | 17         |
| Available-for-sale securities                   | 193            | 193        | 153            | 153        |
| Short-term borrowings                           | 38             | 38         | 54             | 54         |
| Commercial paper                                | -              | -          | -              | -          |
| Long-term debt due within one year              | 21             | 21         | 29             | 29         |
| Contingent payment related to an acquisition    | 130            | 130        | 130            | 130        |
| Long-term debt, less amount due within one year | 9,044          | 8,922      | 8,769          | 9,445      |

The following methods were used to estimate the fair values of other financial instruments:

**Cash and cash equivalents, Restricted cash, Short-term borrowings, and Commercial paper.** The carrying amounts approximate fair value because of the short maturity of the instruments. The fair value amounts for Cash and cash equivalents, Restricted cash, and Commercial paper were classified in Level 1, and Short-term borrowings were classified in Level 2.

**Noncurrent receivables.** The fair value of noncurrent receivables was based on anticipated cash flows, which approximates carrying value, and was classified in Level 2 of the fair value hierarchy.

**Available-for-sale securities.** The fair value of such securities was based on quoted market prices. These financial instruments consist of exchange-traded fixed income and equity securities, which are carried at fair value and were classified in Level 1 of the fair value hierarchy.

**Contingent payment related to an acquisition (see Note F).** The fair value was based on the net present value of expected future cash flows and was classified in Level 3 of the fair value hierarchy.

**Long-term debt due within one year and Long-term debt, less amount due within one year.** The fair value was based on quoted market prices for public debt and on interest rates that are currently available to Alcoa for issuance of debt with similar terms and maturities for non-public debt. The fair value amounts for all Long-term debt were classified in Level 2 of the fair value hierarchy.

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**Y. Proposed Separation Transaction**

On September 28, 2015, Alcoa announced that its Board of Directors approved a plan to separate into two independent, publicly-traded companies. One company will comprise the Alumina and Primary Metals segments and the other company will comprise the Global Rolled Products, Engineered Products and Solutions, and Transportation and Construction Solutions segments. Alcoa is targeting to complete the separation in the second half of 2016. The transaction is subject to a number of conditions, including, but not limited to, final approval by Alcoa's Board of Directors, receipt of a favorable opinion of legal counsel with respect to the tax-free nature of the transaction for U.S. federal income tax purposes, and the effectiveness of a Form 10 registration statement to be filed with the U.S. Securities and Exchange Commission. Upon completion of the separation, Alcoa shareholders will own all of the outstanding shares of both companies. Alcoa may, at any time and for any reason until the proposed transaction is complete, abandon the separation plan or modify or change its terms. In 2015, Alcoa recognized \$24 (pre- and after-tax) in Selling, general administrative, and other expenses on the accompanying Statement of Consolidated Operations for costs related to the proposed separation transaction.

**Z. Subsequent Events**

Management evaluated all activity of Alcoa and concluded that no subsequent events have occurred that would require recognition in the Consolidated Financial Statements or disclosure in the Notes to the Consolidated Financial Statements, except as described below.

On January 26, 2016, the European Court of Justice issued a decision in connection with legal proceedings related to whether the extension of energy tariffs by Italy to Alcoa constituted unlawful state aid (see European Commission Matters in Note N). In addition, a separate but related matter was also updated as a result of the aforementioned decision (see Other Matters in the Litigation section of Note N).

**Table of Contents****Supplemental Financial Information (unaudited)****Quarterly Data**

(in millions, except per-share amounts)

|   | First     | Second   | Third    | Fourth*   | Year      |
|---|-----------|----------|----------|-----------|-----------|
| <b>2015</b>   |           |          |          |           |           |
| Sales   | \$ 5,819  | \$ 5,897 | \$ 5,573 | \$ 5,245  | \$ 22,534 |
| Net income (loss) attributable to Alcoa                         | \$ 195    | \$ 140   | \$ 44    | \$ (701)  | \$ (322)  |
| Earnings per share attributable to Alcoa common shareholders**: |           |          |          |           |           |
| Basic   | \$ 0.15   | \$ 0.10  | \$ 0.02  | \$ (0.55) | \$ (0.31) |
| Diluted   | \$ 0.14   | \$ 0.10  | \$ 0.02  | \$ (0.55) | \$ (0.31) |
| <b>2014</b>   |           |          |          |           |           |
| Sales   | \$ 5,454  | \$ 5,836 | \$ 6,239 | \$ 6,377  | \$ 23,906 |
| Net (loss) income attributable to Alcoa                         | \$ (178)  | \$ 138   | \$ 149   | \$ 159    | \$ 268    |
| Earnings per share attributable to Alcoa common shareholders**: |           |          |          |           |           |
| Basic   | \$ (0.16) | \$ 0.12  | \$ 0.13  | \$ 0.12   | \$ 0.21   |
| Diluted   | \$ (0.16) | \$ 0.12  | \$ 0.12  | \$ 0.11   | \$ 0.21   |

\* In the fourth quarter of 2015, Alcoa recorded restructuring and other charges of \$735 (\$507 after-tax and noncontrolling interest), which were primarily related to closures and/or curtailments of a number of smelters and refineries (see Note D) and a charge for legal matters in Italy (see Note N); a discrete income tax charge of \$190 for valuation allowances on certain deferred tax assets in the United States and Iceland (see Note T); and an impairment of goodwill of \$25 (see Goodwill and Other Intangible Assets in Notes A and E). In the fourth quarter of 2014, Alcoa recorded a net loss of \$332 (\$163 after-tax and noncontrolling interest) related to the divestiture of four operations (see Notes D and F).

\*\* Per share amounts are calculated independently for each period presented; therefore, the sum of the quarterly per share amounts may not equal the per share amounts for the year.

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

None.

**Item 9A. Controls and Procedures.**

(a) Evaluation of Disclosure Controls and Procedures

Alcoa's Chief Executive Officer and Chief Financial Officer have evaluated the Company's disclosure controls and procedures, as defined in Rules 13a-15(e) and 15d-15(e) of the Securities Exchange Act of 1934, as of the end of the period covered by this report, and they have concluded that these controls and procedures are effective.

(b) Management's Annual Report on Internal Control over Financial Reporting

Management's Report on Internal Control over Financial Reporting is included in Part II, Item 8 of this Form 10-K beginning on page 89.

(c) Attestation Report of the Registered Public Accounting Firm

The effectiveness of Alcoa's internal control over financial reporting as of December 31, 2015 has been audited by PricewaterhouseCoopers LLP, an independent registered public accounting firm, as stated in their report, which is included in Part II, Item 8 of this Form 10-K on page 90.

(d) Changes in Internal Control over Financial Reporting

There have been no changes in internal control over financial reporting during the fourth quarter of 2015, that have materially affected, or are reasonably likely to materially affect, the Company's internal control over financial reporting.

**Item 9B. Other Information.**

None.

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**PART III**

**Item 10. Directors, Executive Officers and Corporate Governance.**

The information required by Item 401 of Regulation S-K regarding directors is contained under the caption "Item 1 Election of Directors" of the Proxy Statement and is incorporated by reference. The information required by Item 401 of Regulation S-K regarding executive officers is set forth in Part I, Item 1 of this report under "Executive Officers of the Registrant".

The information required by Item 405 of Regulation S-K is contained under the caption "Section 16(a) Beneficial Ownership Reporting Compliance" of the Proxy Statement and is incorporated by reference.

The Company's Code of Ethics for the CEO, CFO and Other Financial Professionals is publicly available on the Company's Internet website at <http://www.alcoa.com> under the section "About Alcoa Corporate Governance". The remaining information required by Item 406 of Regulation S-K is contained under the captions "Corporate Governance" and "Corporate Governance Business Conduct Policies and Code of Ethics" of the Proxy Statement and is incorporated by reference.

The information required by Items 407(c)(3), (d)(4) and (d)(5) of Regulation S-K is included under the captions "Item 1 Election of Directors Nominating Board Candidates Procedures and Director Qualifications" and "Corporate Governance Committees of the Board Audit Committee" of the Proxy Statement and is incorporated by reference.

**Item 11. Executive Compensation.**

The information required by Item 402 of Regulation S-K is contained under the captions "Director Compensation", "Executive Compensation (excluding the information under the caption "Compensation Committee Report")" and "Corporate Governance Recovery of Incentive Compensation of the Proxy Statement". Such information is incorporated by reference.

The information required by Items 407(e)(4) and (e)(5) of Regulation S-K is contained under the captions "Corporate Governance Compensation Committee Interlocks and Insider Participation" and "Executive Compensation Compensation Committee Report" of the Proxy Statement. Such information (other than the Compensation Committee Report, which shall not be deemed to be filed) is incorporated by reference.

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

The information required by Item 201(d) of Regulation S-K relating to securities authorized for issuance under equity compensation plans is contained under the caption "Equity Compensation Plan Information" of the Proxy Statement and is incorporated by reference.

The information required by Item 403 of Regulation S-K is contained under the captions "Alcoa Stock Ownership Stock Ownership of Certain Beneficial Owners" and "Stock Ownership of Directors and Executive Officers" of the Proxy Statement and is incorporated by reference.

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

The information required by Item 404 of Regulation S-K is contained under the captions "Executive Compensation (excluding the information under the caption "Compensation Committee Report")" and "Corporate Governance Related Person Transactions" of the Proxy Statement and is incorporated by reference.

The information required by Item 407(a) of Regulation S-K regarding director independence is contained under the captions "Item 1 Election of Directors" and "Corporate Governance" of the Proxy Statement and is incorporated by reference.

**Item 14. Principal Accounting Fees and Services.**

The information required by Item 9(e) of Schedule 14A is contained under the captions "Item 2 Ratification of the Appointment of the Independent Registered Public Accounting Firm Report of the Audit Committee" and "Audit and Non-Audit Fees" of the Proxy Statement and in Attachment A (Pre-Approval Policies and Procedures for Audit and Non-Audit Services) thereto and is incorporated by reference.



**Table of Contents****PART IV****Item 15. Exhibits, Financial Statement Schedules.**

- (a) The consolidated financial statements and exhibits listed below are filed as part of this report.
- (1) The Company's consolidated financial statements, the notes thereto and the report of the Independent Registered Public Accounting Firm are on pages 90 through 168 of this report.
- (2) Financial statement schedules have been omitted because they are not applicable, not required, or the required information is included in the consolidated financial statements or notes thereto.
- (3) Exhibits.

**Exhibit**

| <b>Number</b> | <b>Description*</b>   |
|---------------|---|
| 2.            | Share Purchase Agreement, dated as of June 25, 2014, by and among Alcoa Inc., Alcoa IH Limited, FR Acquisition Corporation (US), Inc., FR Acquisitions Corporation (Europe) Limited, FR Acquisition Finance Subco (Luxembourg), S.à.r.l. and Oak Hill Capital Partners III, L.P. and Oak Hill Capital Management Partners III, L.P., collectively in their capacity as the Seller Representative, incorporated by reference to exhibit 2.1 to the Company's Current Report on Form 8-K dated June 26, 2014. |
| 3(a).         | Articles of the Registrant, as amended effective September 22, 2014, incorporated by reference to exhibit 3(a) to the Company's Quarterly Report on Form 10-Q for the quarter ended September 30, 2014.   |
| 3(b).         | By-Laws of the Registrant, as amended effective as of February 5, 2016, incorporated by reference to exhibit 3 to the Company's Current Report on Form 8-K dated February 4, 2016.  |
| 4(a).         | Articles. See Exhibit 3(a) above.   |
| 4(b).         | By-Laws. See Exhibit 3(b) above.  |
| 4(c).         | Form of Indenture, dated as of September 30, 1993, between Alcoa Inc. and The Bank of New York Trust Company, N.A., as successor to J. P. Morgan Trust Company, National Association (formerly Chase Manhattan Trust Company, National Association), as successor Trustee to PNC Bank, National Association, as Trustee (undated form of Indenture incorporated by reference to exhibit 4(a) to Registration Statement No. 33-49997 on Form S-3).   |
| 4(c)(1).      | First Supplemental Indenture, dated as of January 25, 2007, between Alcoa Inc. and The Bank of New York Trust Company, N.A., as successor to J.P. Morgan Trust Company, National Association (formerly Chase Manhattan Trust Company, National Association), as successor Trustee to PNC Bank, National Association, as Trustee, incorporated by reference to exhibit 99.4 to the Company's Current Report on Form 8-K (Commission file number 1-3610) dated January 25, 2007.                              |
| 4(c)(2).      | Second Supplemental Indenture, dated as of July 15, 2008, between Alcoa Inc. and The Bank of New York Mellon Trust Company, N.A., as successor in interest to J. P. Morgan Trust Company, National Association (formerly Chase Manhattan Trust Company, National Association), as successor to PNC Bank, National Association), as Trustee, incorporated by reference to exhibit 4(c) to the Company's Current Report on Form 8-K (Commission file number 1-3610) dated July 15, 2008.                      |
| 4(d).         | Form of 5.55% Notes Due 2017, incorporated by reference to exhibit 4(d) to the Company's Annual Report on Form 10-K (Commission file number 1-3610) for the year ended December 31, 2008.   |
| 4(e).         | Form of 5.90% Notes Due 2027, incorporated by reference to exhibit 4(d) to the Company's Annual Report on Form 10-K (Commission file number 1-3610) for the year ended December 31, 2008.   |





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- 4(f). Form of 5.95% Notes Due 2037, incorporated by reference to exhibit 4(d) to the Company's Annual Report on Form 10-K (Commission file number 1-3610) for the year ended December 31, 2008.
- 4(g). Form of 6.75% Notes Due 2018, incorporated by reference to exhibit 4(b) to the Company's Current Report on Form 8-K (Commission file number 1-3610) dated July 15, 2008.
- 4(h). Form of 6.150% Notes Due 2020, incorporated by reference to exhibit 4 to the Company's Current Report on Form 8-K (Commission file number 1-3610) dated August 3, 2010.
- 4(i). Form of 5.40% Notes Due 2021, incorporated by reference to exhibit 4 to the Company's Current Report on Form 8-K dated April 21, 2011.
- 4(j). Form of 5.125% Notes Due 2024, incorporated by reference to exhibit 4.5 to the Company's Current Report on Form 8-K dated September 22, 2014.
- 4(k). Deposit Agreement, dated September 22, 2014, among Alcoa Inc., Computershare Trust Company, N.A., Computershare Inc., and the holders from time to time of the depositary receipts evidencing the Depositary Shares (including Form of Depositary Receipt), incorporated by reference to exhibit 4.1 to the Company's Current Report on Form 8-K dated September 22, 2014.
- 4(l). Form of Depositary Receipt for Deposit Agreement, dated September 22, 2014, among Alcoa Inc., Computershare Trust Company, N.A., Computershare Inc., and the holders from time to time of the depositary receipts evidencing the Depositary Shares, incorporated by reference to exhibit A to exhibit 4.1 to the Company's Current Report on Form 8-K dated September 22, 2014.
- 4(m). Indenture, dated as of December 14, 2010, between RTI International Metals, Inc. and The Bank of New York Trust Company, N.A., as Trustee.
- 4(n). Third Supplemental Indenture, dated as of April 17, 2013, between RTI International Metals, Inc. and The Bank of New York Trust Company, N.A., as Trustee.
- 4(o). Fourth Supplemental Indenture, dated as of July 23, 2015, between RTI International Metals, Inc. and The Bank of New York Trust Company, N.A., as Trustee, incorporated by reference to Exhibit 4.1 on Form 8-K dated July 23, 2015.
- 4(p). Alcoa Retirement Savings Plan for Bargaining Employees, as Amended and Restated effective January 1, 2015.
- 4(q). Alcoa Retirement Savings Plan for Hourly Non-Bargaining Employees, as Amended and Restated effective January 1, 2015.
- 4(r). Alcoa Retirement Savings Plan for Fastener Systems Employees, as Amended and Restated effective January 1, 2015.
- 4(s). Alcoa Retirement Savings Plan for Salaried Employees, as Amended and Restated effective January 1, 2015.
- 10(a). Alcoa's Summary of the Key Terms of the AWAC Agreements, incorporated by reference to exhibit 99.2 to the Company's Current Report on Form 8-K (Commission file number 1-3610) dated November 28, 2001.
- 10(b). Charter of the Strategic Council executed December 21, 1994, incorporated by reference to exhibit 99.3 to the Company's Current Report on Form 8-K (Commission file number 1-3610) dated November 28, 2001.
- 10(c). Amended and Restated Limited Liability Company Agreement of Alcoa Alumina & Chemicals, L.L.C. dated as of December 31, 1994, incorporated by reference to exhibit 99.4 to the Company's Current Report on Form 8-K (Commission file number 1-3610) dated November 28, 2001.

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- 10(d). Shareholders Agreement dated May 10, 1996 between Alcoa International Holdings Company and WMC Limited, incorporated by reference to exhibit 99.5 to the Company's Current Report on Form 8-K (Commission file number 1-3610) dated November 28, 2001.
- 10(e). Side Letter of May 16, 1995 clarifying transfer restrictions, incorporated by reference to exhibit 99.6 to the Company's Current Report on Form 8-K (Commission file number 1-3610) dated November 28, 2001.
- 10(f). Enterprise Funding Agreement, dated September 18, 2006, between Alcoa Inc., certain of its affiliates and Alumina Limited, incorporated by reference to exhibit 10(f) to the Company's Annual Report on Form 10-K (Commission file number 1-3610) for the year ended December 31, 2006.
- 10(f)(1). Amendments to Enterprise Funding Agreement, effective January 25, 2008, between Alcoa Inc., certain of its affiliates and Alumina Limited, incorporated by reference to exhibit 10(f)(1) to the Company's Annual Report on Form 10-K (Commission file number 1-3610) for the year ended December 31, 2007.
- 10(g). Earnout Agreement, dated as of June 25, 2014, by and among Alcoa Inc., FR Acquisition Finance Subco (Luxembourg), S.à.r.l. and Oak Hill Capital Partners III, L.P. and Oak Hill Capital Management Partners III, L.P., collectively in their capacity as the Seller Representative, incorporated by reference to exhibit 10.1 to the Company's Current Report on Form 8-K dated June 26, 2014.
- 10(g)(1). Registration Rights Agreement, dated as of November 19, 2014, by and between Alcoa Inc. and Firth Rixson (Cyprus) Limited, incorporated by reference to exhibit 10.1 to the Company's Current Report on Form 8-K dated November 20, 2014.
- 10(h). Five-Year Revolving Credit Agreement, dated as of July 25, 2014, among Alcoa Inc., the Lenders and Issuers named therein, Citibank, N.A., as Administrative Agent for the Lenders and Issuers, and JPMorgan Chase Bank, N.A., as Syndication Agent, incorporated by reference to exhibit 10.2 to the Company's Current Report on Form 8-K dated July 31, 2014.
- 10(h)(1). Extension Request and Amendment Letter, dated as of June 5, 2015, among Alcoa Inc., each lender and issuer party thereto, and Citibank, N.A., as Administrative Agent, effective July 7, 2015, incorporated by reference to exhibit 10.1 to the Company's Current Report on Form 8-K dated July 13, 2015.
- 10(i). Aluminum Project Framework Shareholders Agreement, dated December 20, 2009, between Alcoa Inc. and Saudi Arabian Mining Company (Ma'aden), incorporated by reference to exhibit 10(i) to the Company's Annual Report on Form 10-K (Commission file number 1-3610) for the year ended December 31, 2009.
- 10(i)(1). First Supplemental Agreement, dated March 30, 2010, to the Aluminium Project Framework Shareholders Agreement, dated December 20, 2009, between Saudi Arabian Mining Company (Ma'aden) and Alcoa Inc., incorporated by reference to exhibit 10(c) to the Company's Quarterly Report on Form 10-Q (Commission file number 1-3610) for the quarter ended March 31, 2010.
- 10(j). Settlement Agreement, dated as of October 9, 2012, by and between Aluminium Bahrain B.S.C., Alcoa Inc., Alcoa World Alumina LLC, and William Rice, incorporated by reference to exhibit 10(a) to the Company's Quarterly Report on Form 10-Q for the quarter ended September 30, 2012.
- 10(k). Plea Agreement dated January 8, 2014, between the United States of America and Alcoa World Alumina LLC, incorporated by reference to exhibit 10(l) to the Company's Annual Report on Form 10-K for the year ended December 31, 2013.
- 10(l). Offer of Settlement of Alcoa Inc. before the Securities and Exchange Commission dated December 27, 2013, incorporated by reference to exhibit 10(m) to the Company's Annual Report on Form 10-K for the year ended December 31, 2013.
- 10(m). Securities and Exchange Commission Order dated January 9, 2014, incorporated by reference to exhibit 10(n) to the Company's Annual Report on Form 10-K for the year ended December 31, 2013.

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- 10(n). Agreement, dated February 1, 2016, by and between Elliott Associates, L.P., Elliott International, L.P., Elliott International Capital Advisors Inc. and Alcoa Inc., incorporated by reference to exhibit 10.1 to the Company's Current Report on Form 8-K dated February 1, 2016.
- 10(o). Alcoa Internal Revenue Code Section 162(m) Compliant Annual Cash Incentive Compensation Plan, incorporated by reference to Attachment D to the Company's Definitive Proxy Statement on Form DEF 14A, filed March 7, 2011.
- 10(p). 2004 Summary Description of the Alcoa Incentive Compensation Plan, incorporated by reference to exhibit 10(g) to the Company's Quarterly Report on Form 10-Q (Commission file number 1-3610) for the quarter ended September 30, 2004.
- 10(p)(1). Incentive Compensation Plan of Alcoa Inc., as revised and restated effective November 8, 2007, incorporated by reference to exhibit 10(k)(1) to the Company's Annual Report on Form 10-K (Commission file number 1-3610) for the year ended December 31, 2007.
- 10(p)(2). Amendment to Incentive Compensation Plan of Alcoa Inc., effective December 18, 2009, incorporated by reference to exhibit 10(n)(2) to the Company's Annual Report on Form 10-K (Commission file number 1-3610) for the year ended December 31, 2009.
- 10(q). Employees' Excess Benefits Plan, Plan C, as amended and restated effective December 31, 2007, incorporated by reference to exhibit 10(l) to the Company's Annual Report on Form 10-K (Commission file number 1-3610) for the year ended December 31, 2007.
- 10(q)(1). Amendments to Employees' Excess Benefits Plan, Plan C, effective December 29, 2008, incorporated by reference to exhibit 10(l)(1) to the Company's Annual Report on Form 10-K (Commission file number 1-3610) for the year ended December 31, 2008.
- 10(q)(2). Amendment to Employees' Excess Benefits Plan C, effective December 18, 2009, incorporated by reference to exhibit 10(o)(2) to the Company's Annual Report on Form 10-K (Commission file number 1-3610) for the year ended December 31, 2009.
- 10(q)(3). Amendment to Employees' Excess Benefits Plan C, effective January 1, 2011, incorporated by reference to exhibit 10(p)(3) to the Company's Annual Report on Form 10-K (Commission file number 1-3610) for the year ended December 31, 2010.
- 10(q)(4). Amendments to Employees' Excess Benefits Plan C, effective January 1, 2012, incorporated by reference to exhibit 10(o)(4) to the Company's Annual Report on Form 10-K for the year ended December 31, 2011.
- 10(q)(5). Amendment to Employees' Excess Benefits Plan C, effective September 1, 2014, incorporated by reference to exhibit 10(c) to the Company's Quarterly Report on Form 10-Q for the quarter ended September 30, 2014.
- 10(r). Deferred Fee Plan for Directors, as amended effective July 9, 1999, incorporated by reference to exhibit 10(g)(1) to the Company's Quarterly Report on Form 10-Q (Commission file number 1-3610) for the quarter ended June 30, 1999.
- 10(s). Restricted Stock Plan for Non-Employee Directors, as amended effective March 10, 1995, incorporated by reference to exhibit 10(h) to the Company's Annual Report on Form 10-K (Commission file number 1-3610) for the year ended December 31, 1994.

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- 10(s)(1). Amendment to Restricted Stock Plan for Non-Employee Directors, effective November 10, 1995, incorporated by reference to exhibit 10(h)(1) to the Company's Annual Report on Form 10-K (Commission file number 1-3610) for the year ended December 31, 1995.
- 10(t). Description of Changes to Non-Employee Director Compensation and Stock Ownership Guidelines, effective January 1, 2011, incorporated by reference to exhibit 10(b) to the Company's Quarterly Report on Form 10-Q (Commission file number 1-3610) for the quarter ended September 30, 2010.
- 10(u). Summary of 2013 Non-Employee Director Compensation and Stock Ownership Guidelines, incorporated by reference to exhibit 10(mm) to the Company's Annual Report on Form 10-K for the year ended December 31, 2012.
- 10(v). Fee Continuation Plan for Non-Employee Directors, incorporated by reference to exhibit 10(k) to the Company's Annual Report on Form 10-K (Commission file number 1-3610) for the year ended December 31, 1989.
- 10(v)(1). Amendment to Fee Continuation Plan for Non-Employee Directors, effective November 10, 1995, incorporated by reference to exhibit 10(i)(1) to the Company's Annual Report on Form 10-K (Commission file number 1-3610) for the year ended December 31, 1995.
- 10(v)(2). Second Amendment to the Fee Continuation Plan for Non-Employee Directors, effective September 15, 2006, incorporated by reference to exhibit 10.2 to the Company's Current Report on Form 8-K (Commission file number 1-3610) dated September 20, 2006.
- 10(w). Deferred Compensation Plan, as amended effective October 30, 1992, incorporated by reference to exhibit 10(k) to the Company's Annual Report on Form 10-K (Commission file number 1-3610) for the year ended December 31, 1992.
- 10(w)(1). Amendments to Deferred Compensation Plan, effective January 1, 1993, February 1, 1994 and January 1, 1995, incorporated by reference to exhibit 10(j)(1) to the Company's Annual Report on Form 10-K (Commission file number 1-3610) for the year ended December 31, 1994.
- 10(w)(2). Amendment to Deferred Compensation Plan, effective June 1, 1995, incorporated by reference to exhibit 10(j)(2) to the Company's Annual Report on Form 10-K (Commission file number 1-3610) for the year ended December 31, 1995.
- 10(w)(3). Amendment to Deferred Compensation Plan, effective November 1, 1998, incorporated by reference to exhibit 10(j)(3) to the Company's Annual Report on Form 10-K (Commission file number 1-3610) for the year ended December 31, 1999.
- 10(w)(4). Amendments to Deferred Compensation Plan, effective January 1, 1999, incorporated by reference to exhibit 10(j)(4) to the Company's Annual Report on Form 10-K (Commission file number 1-3610) for the year ended December 31, 1999.
- 10(w)(5). Amendments to Deferred Compensation Plan, effective January 1, 2000, incorporated by reference to exhibit 10(j)(5) to the Company's Annual Report on Form 10-K (Commission file number 1-3610) for the year ended December 31, 2000.
- 10(w)(6). Amendments to Deferred Compensation Plan, effective January 1, 2005, incorporated by reference to exhibit 10(q)(6) to the Company's Annual Report on Form 10-K (Commission file number 1-3610) for the year ended December 31, 2005.

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- 10(w)(7). Amendments to Deferred Compensation Plan, effective November 1, 2007 incorporated by reference to exhibit 10(p)(7) to the Company's Annual Report on Form 10-K (Commission file number 1-3610) for the year ended December 31, 2007.
- 10(w)(8). Amendments to Deferred Compensation Plan, effective December 29, 2008, incorporated by reference to exhibit 10(p)(8) to the Company's Annual Report on Form 10-K (Commission file number 1-3610) for the year ended December 31, 2008.
- 10(w)(9). Amendment to Deferred Compensation Plan, effective April 1, 2009, incorporated by reference to exhibit 10(s)(9) to the Company's Annual Report on Form 10-K (Commission file number 1-3610) for the year ended December 31, 2009.
- 10(w)(10). Amendment to Deferred Compensation Plan, effective December 18, 2009, incorporated by reference to exhibit 10(s)(10) to the Company's Annual Report on Form 10-K (Commission file number 1-3610) for the year ended December 31, 2009.
- 10(w)(11). Amendment to Deferred Compensation Plan, effective January 1, 2011, incorporated by reference to exhibit 10(u)(11) to the Company's Annual Report on Form 10-K (Commission file number 1-3610) for the year ended December 31, 2010.
- 10(w)(12). Amendment to the Amendment dated as of December 30, 2010 to Deferred Compensation Plan, effective January 1, 2011, incorporated by reference to exhibit 10(t)(12) to the Company's Annual Report on Form 10-K for the year ended December 31, 2012.
- 10(w)(13). Amendment to Deferred Compensation Plan, effective January 1, 2013, incorporated by reference to exhibit 10(t)(13) to the Company's Annual Report on Form 10-K for the year ended December 31, 2012.
- 10(x). Summary of the Executive Split Dollar Life Insurance Plan, dated November 1990, incorporated by reference to exhibit 10(m) to the Company's Annual Report on Form 10-K (Commission file number 1-3610) for the year ended December 31, 1990.
- 10(y). Amended and Restated Dividend Equivalent Compensation Plan, effective January 1, 1997, incorporated by reference to exhibit 10(h) to the Company's Quarterly Report on Form 10-Q (Commission file number 1-3610) for the quarter ended September 30, 2004.
- 10(z). Form of Indemnity Agreement between the Company and individual directors or officers, incorporated by reference to exhibit 10(j) to the Company's Annual Report on Form 10-K (Commission file number 1-3610) for the year ended December 31, 1987.
- 10(aa). 2004 Alcoa Stock Incentive Plan, as amended through November 11, 2005, incorporated by reference to exhibit 10.1 to the Company's Current Report on Form 8-K (Commission file number 1-3610) dated November 16, 2005.
- 10(bb). 2009 Alcoa Stock Incentive Plan, incorporated by reference to Attachment C to the Company's Definitive Proxy Statement on Form DEF 14A (Commission file number 1-3610) filed March 16, 2009.
- 10(bb)(1). Amended and Restated 2009 Alcoa Stock Incentive Plan, dated February 15, 2011, incorporated by reference to exhibit 10(z)(1) to the Company's Annual Report on Form 10-K (Commission file number 1-3610) for the year ended December 31, 2010.

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|------------|---|
| 10(cc).    | Terms and Conditions for Special Retention Awards under the 2009 Alcoa Stock Incentive Plan, effective January 1, 2010, incorporated by reference to exhibit 10(e) to the Company's Quarterly Report on Form 10-Q (Commission file number 1-3610) for the quarter ended March 31, 2010. |
| 10(dd).    | Alcoa Supplemental Pension Plan for Senior Executives, as amended and restated effective December 31, 2007, incorporated by reference to exhibit 10(u) to the Company's Annual Report on Form 10-K (Commission file number 1-3610) for the year ended December 31, 2007.                |
| 10(dd)(1). | Amendment to Alcoa Supplemental Pension Plan for Senior Executives, effective December 29, 2008, incorporated by reference to exhibit 10(u)(1) to the Company's Annual Report on Form 10-K (Commission file number 1-3610) for the year ended December 31, 2008.                        |
| 10(dd)(2). | Amendment to Alcoa Supplemental Pension Plan for Senior Executives, effective December 16, 2009, incorporated by reference to exhibit 10(y)(2) to the Company's Annual Report on Form 10-K (Commission file number 1-3610) for the year ended December 31, 2009.                        |
| 10(dd)(3). | Amendment to Alcoa Supplemental Pension Plan for Senior Executives, effective December 18, 2009, incorporated by reference to exhibit 10(y)(3) to the Company's Annual Report on Form 10-K (Commission file number 1-3610) for the year ended December 31, 2009.                        |
| 10(dd)(4). | Amendment to Alcoa Supplemental Pension Plan for Senior Executives, effective January 1, 2011, incorporated by reference to exhibit 10(bb)(4) to the Company's Annual Report on Form 10-K (Commission file number 1-3610) for the year ended December 31, 2010.                         |
| 10(dd)(5). | Amendments to Alcoa Supplemental Pension Plan for Senior Executives, effective January 1, 2012, incorporated by reference to exhibit 10(aa)(5) to the Company's Annual Report on Form 10-K for the year ended December 31, 2011.  |
| 10(dd)(6). | Amendment to Alcoa Supplemental Pension Plan for Senior Executives, effective September 1, 2014, incorporated by reference to exhibit 10(d) to the Company's Quarterly Report on Form 10-Q for the quarter ended September 30, 2014.  |
| 10(ee).    | Deferred Fee Estate Enhancement Plan for Directors, effective July 10, 1998, incorporated by reference to exhibit 10(r) to the Company's Annual Report on Form 10-K (Commission file number 1-3610) for the year ended December 31, 1998.   |
| 10(ff).    | Alcoa Inc. Change in Control Severance Plan, as amended and restated effective November 8, 2007, incorporated by reference to exhibit 10(x) to the Company's Annual Report on Form 10-K (Commission file number 1-3610) for the year ended December 31, 2007.                           |
| 10(ff)(1). | Amendment to Alcoa Inc. Change in Control Severance Plan, effective December 16, 2009, incorporated by reference to exhibit 10(bb)(1) to the Company's Annual Report on Form 10-K (Commission file number 1-3610) for the year ended December 31, 2009.                                 |
| 10(gg).    | Form of Agreement for Stock Option Awards, effective January 1, 2004, incorporated by reference to exhibit 10(a) to the Company's Quarterly Report on Form 10-Q (Commission file number 1-3610) for the quarter ended September 30, 2004.   |
| 10(hh).    | Form of Agreement for Stock Awards, effective January 1, 2004, incorporated by reference to exhibit 10(b) to the Company's Quarterly Report on Form 10-Q (Commission file number 1-3610) for the quarter ended September 30, 2004.  |

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- 10(ii). Form of Agreement for Performance Share Awards, effective January 1, 2004, incorporated by reference to exhibit 10(c) to the Company's Quarterly Report on Form 10-Q (Commission file number 1-3610) for the quarter ended September 30, 2004.
- 10(jj). Stock Option Award Rules, revised January 1, 2004, incorporated by reference to exhibit 10(d) to the Company's Quarterly Report on Form 10-Q (Commission file number 1-3610) for the quarter ended September 30, 2004.
- 10(kk). Stock Awards Rules, effective January 1, 2004, incorporated by reference to exhibit 10(e) to the Company's Quarterly Report on Form 10-Q (Commission file number 1-3610) for the quarter ended September 30, 2004.
- 10(ll). Performance Share Awards Rules, effective January 1, 2004, incorporated by reference to exhibit 10(f) to the Company's Quarterly Report on Form 10-Q (Commission file number 1-3610) for the quarter ended September 30, 2004.
- 10(mm). 2005 Deferred Fee Plan for Directors, as amended, effective January 1, 2016, incorporated by reference to exhibit 10(a) to the Company's Quarterly Report on Form 10-Q for the quarter ended March 31, 2015 .
- 10(nn). Global Pension Plan, effective January 1, 1998, incorporated by reference to exhibit 10(jj) to the Company's Annual Report on Form 10-K (Commission file number 1-3610) for the year ended December 31, 2004.
- 10(nn)(1). Amendments to Global Pension Plan, incorporated by reference to exhibit 10(jj)(1) to the Company's Annual Report on Form 10-K (Commission file number 1-3610) for the year ended December 31, 2004.
- 10(nn)(2). Amendments to Global Pension Plan, effective January 1, 2005, incorporated by reference to exhibit 10(gg)(2) to the Company's Annual Report on Form 10-K (Commission file number 1-3610) for the year ended December 31, 2005.
- 10(nn)(3). Amendments to Global Pension Plan, effective December 1, 2005, incorporated by reference to exhibit 10(gg)(3) to the Company's Annual Report on Form 10-K (Commission file number 1-3610) for the year ended December 31, 2005.
- 10(nn)(4). Amendments to Global Pension Plan, effective December 29, 2008, incorporated by reference to exhibit 10(ff)(4) to the Company's Annual Report on Form 10-K (Commission file number 1-3610) for the year ended December 31, 2008.
- 10(nn)(5). Amendments to Global Pension Plan, effective July 1, 2009, incorporated by reference to exhibit 10(jj)(5) to the Company's Annual Report on Form 10-K (Commission file number 1-3610) for the year ended December 31, 2009.
- 10(nn)(6). Amendments to Global Pension Plan, effective December 18, 2009, incorporated by reference to exhibit 10(jj)(6) to the Company's Annual Report on Form 10-K (Commission file number 1-3610) for the year ended December 31, 2009.
- 10(nn)(7). Amendment to Global Pension Plan, effective January 1, 2011, incorporated by reference to exhibit 10(mm)(7) to the Company's Annual Report on Form 10-K (Commission file number 1-3610) for the year ended December 31, 2010.
- 10(nn)(8). Amendment to Global Pension Plan, effective January 1, 2011, incorporated by reference to exhibit 10(kk)(8) to the Company's Annual Report on Form 10-K for the year ended December 31, 2012.



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- 10(o0). Executive Severance Agreement, as amended and restated effective December 8, 2008, between Alcoa Inc. and Klaus Kleinfeld, incorporated by reference to exhibit 10(gg) to the Company's Annual Report on Form 10-K (Commission file number 1-3610) for the year ended December 31, 2008.
- 10(o0)(1). Form of Executive Severance Agreement between the Company and new officers entered into after July 22, 2010, incorporated by reference to exhibit 10(a) to the Company's Quarterly Report on Form 10-Q (Commission file number 1-3610) for the quarter ended September 30, 2010.
- 10(pp). Form of Award Agreement for Stock Options, effective January 1, 2006, incorporated by reference to exhibit 10.2 to the Company's Current Report on Form 8-K (Commission file number 1-3610) dated November 16, 2005.
- 10(qq). Form of Award Agreement for Stock Awards, effective January 1, 2006, incorporated by reference to exhibit 10.3 to the Company's Current Report on Form 8-K (Commission file number 1-3610) dated November 16, 2005.
- 10(rr). Form of Award Agreement for Performance Share Awards, effective January 1, 2006, incorporated by reference to exhibit 10.4 to the Company's Current Report on Form 8-K (Commission file number 1-3610) dated November 16, 2005.
- 10(ss). Form of Award Agreement for Performance Stock Options, effective January 1, 2006, incorporated by reference to exhibit 10.5 to the Company's Current Report on Form 8-K (Commission file number 1-3610) dated November 16, 2005.
- 10(tt). Form of Award Agreement for Stock Options, effective May 8, 2009, incorporated by reference to exhibit 10.2 to the Company's Current Report on Form 8-K (Commission file number 1-3610) dated May 13, 2009.
- 10(uu). Terms and Conditions for Stock Options, effective January 1, 2011, incorporated by reference to exhibit 10(c) to the Company's Quarterly Report on Form 10-Q for the quarter ended June 30, 2011.
- 10(vv). Form of Award Agreement for Restricted Share Units, effective May 8, 2009, incorporated by reference to exhibit 10.3 to the Company's Current Report on Form 8-K (Commission file number 1-3610) dated May 13, 2009.
- 10(ww). Terms and Conditions for Restricted Share Units, effective January 1, 2011, incorporated by reference to exhibit 10(b) to the Company's Quarterly Report on Form 10-Q for the quarter ended June 30, 2011.
- 10(xx). Summary Description of Equity Choice Program for Performance Equity Award Participants, dated November 2005, incorporated by reference to exhibit 10.6 to the Company's Current Report on Form 8-K (Commission file number 1-3610) dated November 16, 2005.
- 10(yy). Reynolds Metals Company Benefit Restoration Plan for New Retirement Program, as amended through December 31, 2005, incorporated by reference to exhibit 10(rr) to the Company's Annual Report on Form 10-K (Commission file number 1-3610) for the year ended December 31, 2005.
- 10(yy)(1). Amendments to the Reynolds Metals Company Benefit Restoration Plan for New Retirement Program, effective December 18, 2009, incorporated by reference to exhibit 10(tt)(1) to the Company's Annual Report on Form 10-K (Commission file number 1-3610) for the year ended December 31, 2009.
- 10(yy)(2). Amendments to the Reynolds Metals Company Benefit Restoration Plan for New Retirement Program, effective January 1, 2012, incorporated by reference to exhibit 10(xx)(2) to the Company's Annual Report on Form 10-K for the year ended December 31, 2011.

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| 10(yy)(3). | Amendment to Reynolds Metals Company Benefit Restoration Plan for New Retirement Program, effective September 1, 2014, incorporated by reference to exhibit 10(e) to the Company's Quarterly Report on Form 10-Q for the quarter ended September 30, 2014.  |
| 10(zz).    | Global Expatriate Employee Policy (pre-January 1, 2003), incorporated by reference to exhibit 10(uu) to the Company's Annual Report on Form 10-K (Commission file number 1-3610) for the year ended December 31, 2005.  |
| 10(aaa).   | Form of Special Retention Stock Award Agreement, effective July 14, 2006, incorporated by reference to exhibit 10.3 to the Company's Current Report on Form 8-K (Commission file number 1-3610) dated September 20, 2006.   |
| 10(bbb).   | Omnibus Amendment to Rules and Terms and Conditions of all Awards under the 2004 Alcoa Stock Incentive Plan, effective January 1, 2007, incorporated by reference to exhibit 10(tt) to the Company's Annual Report on Form 10-K (Commission file number 1-3610) for the year ended December 31, 2007. |
| 10(ccc).   | Letter Agreement, dated August 14, 2007, between Alcoa Inc. and Klaus Kleinfeld, incorporated by reference to exhibit 10(b) to the Company's Quarterly Report on Form 10-Q (Commission file number 1-3610) for the quarter ended September 30, 2007.  |
| 10(ddd).   | Employment Offer Letter, dated April 2, 2012, between Alcoa Inc. and Audrey Strauss, incorporated by reference to exhibit 10(b) to the Company's Quarterly Report on Form 10-Q for the quarter ended June 30, 2012.   |
| 10(eee).   | Director Plan: You Make a Difference Award, incorporated by reference to exhibit 10(uu) to the Company's Annual Report on Form 10-K (Commission on file number 1-3610) for the year ended December 31, 2008.  |
| 10(fff).   | Form of Award Agreement for Stock Options, effective January 1, 2010, incorporated by reference to exhibit 10(ddd) to the Company's Annual Report on Form 10-K (Commission file number 1-3610) for the year ended December 31, 2009.  |
| 10(ggg).   | 2013 Alcoa Stock Incentive Plan, incorporated by reference to exhibit 10(a) to the Company's Current Report on Form 8-K dated May 8, 2013.  |
| 10(hhh).   | Alcoa Inc. Terms and Conditions for Stock Option Awards, effective May 3, 2013, incorporated by reference to exhibit 10(b) to the Company's Current Report on Form 8-K dated May 8, 2013.   |
| 10(iii).   | Alcoa Inc. Terms and Conditions for Restricted Share Units, effective May 3, 2013, incorporated by reference to exhibit 10(c) to the Company's Current Report on Form 8-K dated May 8, 2013.  |
| 10(jjj).   | Terms and Conditions (Australian Addendum) 2013 Alcoa Stock Incentive Plan, effective May 3, 2013, incorporated by reference to exhibit 10(d) to the Company's Current Report on Form 8-K dated May 8, 2013.  |
| 10(kkk).   | Amendment to Employees' Excess Benefits Plan C, effective August 11, 2014.  |
| 10(lll).   | Amendment to Deferred Compensation Plan, effective August 11, 2014.   |
| 10(mmm).   | Amendment to Deferred Compensation Plan, effective January 1, 2016.   |
| 10(nnn).   | RTI International Metals, Inc. 2014 Stock and Incentive Plan, incorporated by reference to Exhibit 4(a) to the Company's Current Report on Form 8-K dated July 23, 2015.  |

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| 10(ooo). | RTI International Metals, Inc. 2004 Stock Plan, incorporated by reference to Exhibit 4(b) to the Company's Current Report on Form 8-K dated July 23, 2015.   |
| 10(ppp). | Alcoa Inc. Terms and Conditions for Special Retention Awards under the 2013 Alcoa Stock Incentive Plan, incorporated by reference to exhibit 10(a) to the Company's Quarterly Report on Form 10-Q for the quarter ended June 30, 2013. |
| 10(qqq). | Summary of 2015 Non-Employee Director Compensation and Stock Ownership Guidelines, incorporated by reference to exhibit 10(a) to the Company's Quarterly Report on Form 10-Q for the quarter ended March 31, 2015.                     |
| 12.      | Computation of Ratio of Earnings to Fixed Charges.   |
| 21.      | Subsidiaries of the Registrant.  |
| 23.      | Consent of Independent Registered Public Accounting Firm.  |
| 24.      | Power of Attorney for certain directors.   |
| 31.      | Certifications pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.  |
| 32.      | Certification pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.   |
| 95.      | Mine Safety Disclosure.  |
| 101. INS | XBRL Instance Document.  |
| 101. SCH | XBRL Taxonomy Extension Schema Document.   |
| 101. CAL | XBRL Taxonomy Extension Calculation Linkbase Document.   |
| 101. DEF | XBRL Taxonomy Extension Definition Linkbase Document.  |
| 101. LAB | XBRL Taxonomy Extension Label Linkbase Document.   |
| 101. PRE | XBRL Taxonomy Extension Presentation Linkbase Document.  |

\* Exhibit Nos. 10(o) through 10(qqq) are management contracts or compensatory plans required to be filed as Exhibits to this Form 10-K. Amendments and modifications to other Exhibits previously filed have been omitted when in the opinion of the registrant such Exhibits as amended or modified are no longer material or, in certain instances, are no longer required to be filed as Exhibits.

No other instruments defining the rights of holders of long-term debt of the registrant or its subsidiaries have been filed as Exhibits because no such instruments met the threshold materiality requirements under Regulation S-K. The registrant agrees, however, to furnish a copy of any such instruments to the Commission upon request.

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**SIGNATURES**

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

**ALCOA INC.**

February 19, 2016

By

/s/ Robert S. Collins  
 Robert S. Collins  
 Vice President and Controller

(Also signing as Principal Accounting Officer)

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the registrant and in the capacities and on the dates indicated.

| Signature  | Title   | Date              |
|--|---|-------------------|
| /s/ Klaus Kleinfeld<br><br>Klaus Kleinfeld         | Chairman and Chief Executive Officer<br>(Principal Executive Officer and Director)    | February 19, 2016 |
| /s/ William F. Oplinger<br><br>William F. Oplinger | Executive Vice President and Chief Financial Officer<br>(Principal Financial Officer) | February 19, 2016 |

Arthur D. Collins, Jr., Kathryn S. Fuller, Sean O. Mahoney, Michael G. Morris, E. Stanley O Neal, James W. Owens, John C. Plant, Dr. L. Rafael Reif, Carol L. Roberts, Patricia F. Russo, Ulrich R. Schmidt, Sir Martin Sorrell, Ratan N. Tata and Ernesto Zedillo, each as a Director, on February 19, 2016, by Robert S. Collins, their Attorney-in-Fact.\*

\*By /s/ Robert S. Collins  
 Robert S. Collins  
  
 Attorney-in-Fact