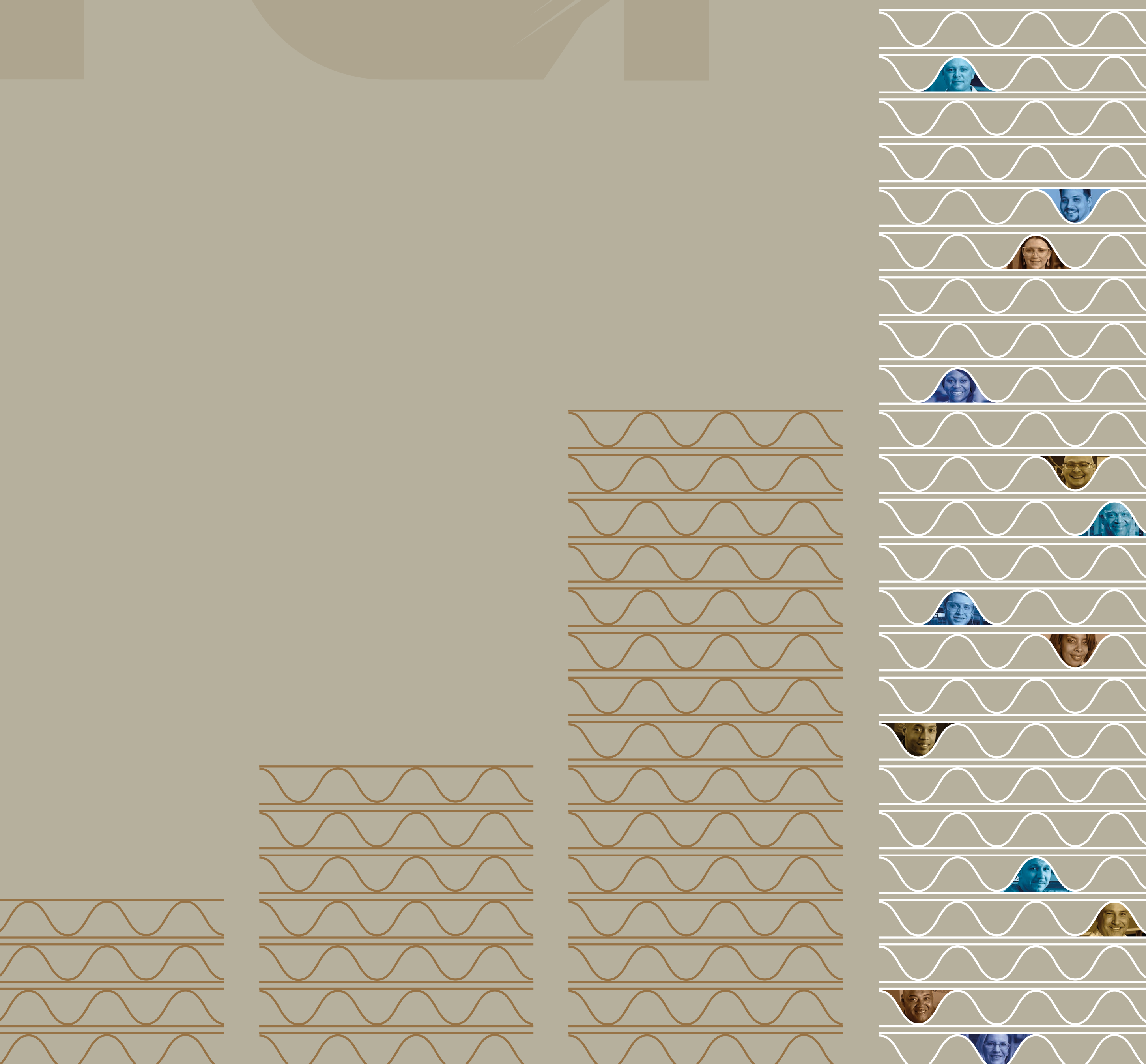
PACKAGING CORPORATION OF AMERICA

2017 ANNUAL REPORT



SALES EBITDA MARGIN

EARNINGS PER SHARE EBITDA

OPERATING INCOME

CORRUGATED PRODUCTS SHIPMENTS

CONTAINERBOARD VOLUME

PACKAGING CORPORATION OF AMERICA is an ideas and solutions company. As PCA grows and delivers results for our stakeholders, our Packaging division continues to build upon our long history of excellence in designing, engineering and manufacturing corrugated products. Our Boise Paper division delivers **Quality You Can Trust**™ into offices and homes every day, with an emphasis on the highest level of customer service and operational excellence. Together, we are focused on bringing our strengths, experience and expertise to a growing number of customers across the United States.

The cornerstone of our business is the relationship between PCA customers and PCA people. Our success is made possible by a highly engaged, results-oriented workforce operating in an entrepreneurial culture and is driven by adding value to our customers' businesses.

PCA is one of the largest producers of containerboard and corrugated products in the United States. We manufacture many grades of kraft linerboard and corrugating medium at our containerboard mills and produce a wide variety of corrugated containers and displays at our converting facilities.

BOISE PAPER is the third largest producer of uncoated freesheet in North America. Our team is dedicated to providing high-quality products, outstanding customer service and industry-leading supply chain performance, with a product portfolio that includes office, printing and converting, and pressure sensitive papers.

RESULTS ORIENTED

PCA's common stock is listed on the New York Stock Exchange under the ticker symbol **PKG**.

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, 2017

Commission file number 1-15399

PACKAGING CORPORATION OF AMERICA

(Exact Name of Registrant as Specified in its Charter)

Delaware	**36-4277050**
(State or Other Jurisdiction of Incorporation or Organization)	*(I.R.S. Employer Identification No.)*
1955 West Field Court, Lake Forest, Illinois	**60045**
(Address of Prinicpal Executive Offices)	*(Zip Code)*

Registrant's telephone number, including area code:
(847) 482-3000

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

Title of Each Class	Name of Each Exchange On Which Registered
Common Stock, $0.01 par value	New York Stock Exchange

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 Act. Yes ☐ No ☒

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

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

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

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

Large accelerated filer	☒	Accelerated filer	☐
Non-accelerated filer	☐ (Do not check if a smaller reporting company)	Smaller reporting company	☐
Emerging growth company	☐		

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

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

At June 30, 2017, the last day of the Registrant's most recently completed second fiscal quarter, the aggregate market value of Registrant's common equity held by non-affiliates was approximately $10,380,184,252 based upon the closing sale price as reported on the New York Stock Exchange. This calculation of market value has been made for the purposes of this report only and should not be considered as an admission or conclusion by the Registrant that any person is in fact an affiliate of the Registrant.

On February 23, 2018, there were 94,349,822 shares of Common Stock outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

Specified portions of the Proxy Statement for the Registrant's 2018 Annual Meeting of Stockholders are incorporated by reference to the extent indicated in Part III of this Form 10-K.

Table of Contents

PART I

Item 1. *BUSINESS*

Packaging Corporation of America ("we," "us," "our," "PCA," or the "Company") is the fourth largest producer of containerboard products and the third largest producer of uncoated freesheet (UFS) in North America, based on production capacity. We operate five containerboard mills, three white paper mills and 94 corrugated products manufacturing plants. We are headquartered in Lake Forest, Illinois and operate primarily in the United States.

We report in three reportable segments: Packaging, Paper and Corporate and Other. For segment financial information see Note 17, Segment Information, of the Notes to Consolidated Financial Statements in "Part II, Item 8, Financial Statements and Supplementary Data" of this Form 10-K.

On October 2, 2017, we acquired substantially all of the assets of Sacramento Container Corporation, and 100% of the membership interests of Northern Sheets, LLC and Central California Sheets, LLC for a cash purchase price of $265 million, funded with cash on hand. The acquired companies operate two full-line corrugated products operations and sheet feeders in McClellan, California and Kingsburg, California.

During the third quarter of 2017, we announced that we would discontinue production of uncoated freesheet and certain types of pressure sensitive grades of white paper at our Wallula, Washington mill in the second quarter of 2018. We will convert the No. 3 paper machine at the mill to a 400,000 ton-per-year virgin kraft linerboard machine. After the conversion, the Wallula mill will produce only containerboard.

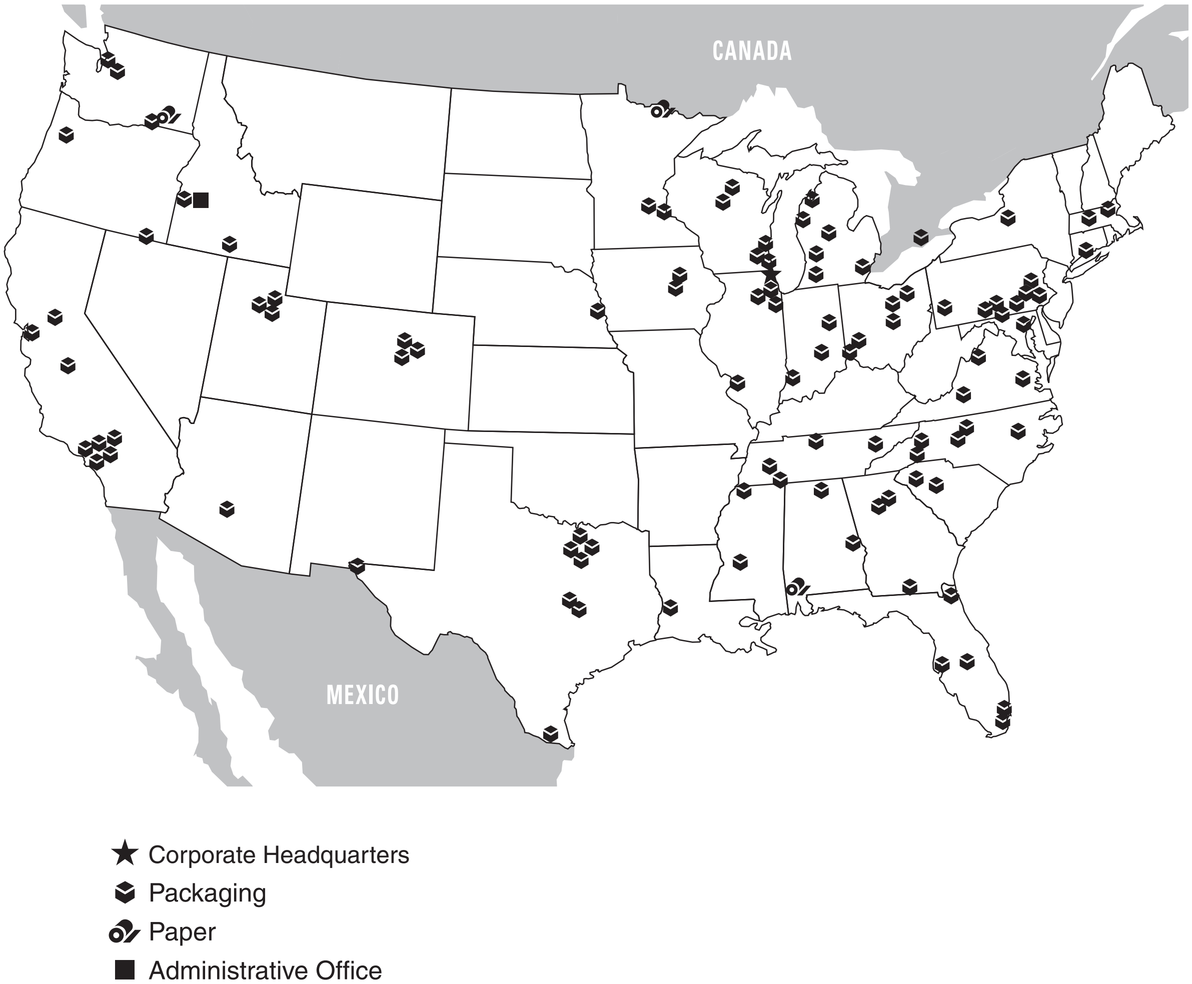
Production and Shipments

The following table summarizes the Packaging segment's containerboard production and corrugated products shipments and the Paper segment's production.

			First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Full Year
Containerboard Production (thousand tons)	PCA	2017	932	947	996	1,006	3,881
		2016	898	926	950	962	3,736
		2015	882	938	933	903	3,656
Corrugated Shipments (BSF)	PCA	2017	13.6	13.9	13.7	14.5	55.7
		2016	12.3	12.7	13.1	13.2	51.3
		2015	11.9	12.4	12.5	12.1	48.9
White Paper (UFS) Production (thousand tons)	PCA	2017	273	289	278	278	1,118
		2016	283	268	288	288	1,127
		2015	288	273	294	262	1,117
Market Pulp Production (a) (thousand tons)	PCA	2017	—	—	—	—	—
		2016	16	10	12	7	45
		2015	27	23	25	23	98

(a) On December 1, 2016, PCA ceased production of softwood market pulp at our Wallula, Washington mill and permanently shut down the No.1 machine.

Below is a map of our locations:



Packaging

Packaging Products

Our containerboard mills produce linerboard and semi-chemical corrugating medium, which are papers primarily used in the production of corrugated products. Our corrugated products manufacturing plants produce a wide variety of corrugated packaging products, including conventional shipping containers used to protect and transport manufactured goods, multi-color boxes and displays with strong visual appeal that help to merchandise the packaged product in retail locations, and honeycomb protective packaging. In addition, we are a large producer of packaging for meat, fresh fruit and vegetables, processed food, beverages, and other industrial and consumer products.

During the year ended December 31, 2017, our Packaging segment produced 3.9 million tons of containerboard at our mills. Our corrugated products manufacturing plants sold 55.7 billion square feet (BSF) of corrugated products. Our net sales to third parties totaled $5.3 billion in 2017.

Facilities

We currently manufacture our Packaging products at five containerboard mills, one containerboard machine (at our Wallula, Washington white paper mill), corrugated manufacturing operations, and protective packaging operations. Total annual containerboard capacity is 4,111,000 tons. The following provides more details of our operations:

Counce. Our Counce, Tennessee mill produces kraft linerboard. The mill can produce basis weights from 26 lb. to 90 lb. The mill also produces a variety of performance and specialty grades of linerboard.

DeRidder. Our DeRidder, Louisiana mill produces kraft linerboard on its No. 1 machine and linerboard and semi-chemical corrugating medium on its No. 3 machine. The mill can produce linerboard in basis weights of 26 lb. to 69 lb. and medium in basis weights of 23 lb. to 33 lb.

Valdosta. Our Valdosta, Georgia mill produces kraft linerboard. The mill can produce basis weights from 35 lb. to 96 lb.

Tomahawk. Our Tomahawk, Wisconsin mill produces semi-chemical corrugating medium. The Tomahawk mill can produce basis weights from 23 lb. to 47 lb. and a variety of performance and specialty grades of corrugating medium.

Filer City. Our Filer City, Michigan mill produces semi-chemical corrugating medium. Filer City can produce corrugating medium in basis weights from 20 lb. to 47 lb.

Wallula. Our Wallula, Washington mill primarily produces white paper, but also produces semi-chemical corrugating medium on one of its two paper machines. Wallula can produce corrugating medium in basis weights from 23 lb. to 45 lb. As described above, we are converting the No. 3 machine at the mill from white paper to kraft linerboard. After the conversion, the Wallula mill will solely produce containerboard.

We operate 94 corrugated manufacturing operations, a technical and development center, nine regional design centers, a rotogravure printing operation, and a complement of packaging supplies and distribution centers. Of the 94 manufacturing facilities, 61 operate as combining operations, commonly called corrugated plants, which manufacture corrugated sheets and finished corrugated packaging products, 32 are sheet plants, which procure combined sheets and manufacture finished corrugated packaging products, and one is a corrugated sheet-only manufacturer.

Corrugated products plants tend to be located in close proximity to customers to minimize freight costs. Each of our plants serve a market radius of approximately 150 miles. Our sheet plants are generally located in close proximity to our larger corrugated plants, which enables us to offer additional services and converting capabilities such as small volume and quick turnaround items.

Major Raw Materials Used

Fiber supply. Fiber is the largest raw material cost to manufacture containerboard. We consume both wood fiber and recycled fiber in our containerboard mills. We have no 100% recycled mills, or mills whose fiber consumption consists solely of recycled fiber. To reduce our fiber costs, we have invested in processes and equipment to ensure a high degree of fiber flexibility. Our mill system has the capability to shift a portion of its fiber consumption between softwood, hardwood, and recycled sources. All of our mills, other than the Valdosta mill, can utilize some recycled fiber in their containerboard production. Our ability to use various types of virgin and recycled fiber helps mitigate the impact of changes in the prices of various fibers. Our corrugated manufacturing operations generate recycled fiber as a by-product from the manufacturing process, which is consumed by our mills. In 2017, our usage of recycled fiber, net of internal generation, represents 17% of our containerboard production.

We procure wood fiber through leases of cutting rights, long-term supply agreements, and market purchases and believe we have adequate sources of fiber supply.

We participate in the Sustainable Forestry Initiative® (SFI), the Programme for the Endorsement of Forest Certification (PEFC), as well as the Forest Stewardship Council (FSC), and we are certified under their sourcing standards. These standards are aimed at ensuring the long-term health and conservation of forestry resources. We are committed to sourcing wood fiber through environmentally, socially, and economically sustainable practices and promoting resource and conservation stewardship ethics.

Energy supply. Energy at our packaging mills is obtained through purchased or self-generated fuels and electricity. Fuel sources include natural gas, by-products of the containerboard manufacturing and pulping process (including black liquor and wood waste), purchased wood waste, and other purchased fuels. Each of our mills self-generates process steam requirements from by-products (black liquor and wood waste), as well as from the various purchased fuels. The process steam is used throughout the production process and also to generate electricity.

In 2017, our packaging mills consumed about 63 million MMBTU's of fuel to produce both steam and electricity. Of the 63 million MMBTU's consumed, about 62% was from mill generated by-products and 38% was from purchased fuels. Of the 38% in purchased fuels, 61% was from natural gas, 33% was from purchased wood waste and 6% was from other purchased fuels.

Chemical supply. We consume various chemicals in the production of containerboard, including caustic soda and sulfuric acid. Most of our chemicals are purchased under contracts, which are bid or negotiated periodically.

Sales, Marketing, and Distribution

Our corrugated products are sold through our direct sales and marketing organization, independent brokers, and distribution partners. We have sales representatives and a sales manager at most of our corrugated manufacturing operations and also have corporate account managers who serve customer accounts with a national presence. Additionally, our design centers maintain an on-site dedicated graphics sales force. In addition to direct sales and marketing personnel, we utilize new product development engineers and product graphics and design specialists. These individuals are located at both the corrugated plants and the design centers. General marketing support is located at our corporate headquarters.

Our containerboard sales group is responsible for the coordination of linerboard and corrugating medium, order processing, and sales to our corrugated plants, to outside domestic customers, and to export customers. These personnel also coordinate and execute all containerboard trade agreements with other containerboard manufacturers.

Containerboard produced in our mills is shipped by rail or truck. Our corrugated products are delivered by truck due to our large number of customers and their demand for timely service. Our corrugated manufacturing operations typically serve customers within a 150-mile radius. We sometimes use third-party warehouses for short-term storage of corrugated products.

Customers

We sell corrugated products to over 18,000 customers in over 35,000 locations. About three-quarters of our corrugated products sales are to regional and local accounts, which are broadly diversified across industries and geographic locations. The remaining one-quarter of our customer base consists primarily of national accounts that have multiple locations and are served by a number of PCA plants. No single customer exceeds 10% of segment sales.

The primary end-use markets in the United States for corrugated products are shown below as reported in the 2016 Fibre Box Association annual report:

Food, beverages, and agricultural products	45%
Retail and wholesale trade	22%
Miscellaneous manufacturing	12%
Paper and other products	11%
Chemical, plastic, and rubber products	10%

Competition

As of December 31, 2017, we were the fourth largest producer of containerboard products in the United States, according to industry sources and our own estimates. According to industry sources, corrugated products are produced by about 475 U.S. companies operating approximately 1,200 plants. The primary basis for competition for most of our packaging products includes quality, service, price, product design, and innovation. Most corrugated products are manufactured to the customer's specifications. Corrugated producers generally sell within a 150-mile radius of their plants and compete with other corrugated producers in their local region. Competition in our corrugated products operations tends to be regional, although we also face competition from large competitors with significant national account presence.

On a national level, our primary competitors are International Paper Company, WestRock Company, Georgia-Pacific LLC, KapStone Paper and Packaging Corporation, and Pratt Industries. However, with our strategic focus on regional and local accounts, we also compete with the smaller, independent producers.

Paper

We are the third largest manufacturer of uncoated freesheet in the United States, according to industry sources and our own estimates. We manufacture and sell white papers, including both commodity and specialty papers, which may have custom or specialized features such as colors, coatings, high brightness, and recycled content. White papers consist of communication papers (cut-size office papers and printing and converting papers) and pressure sensitive papers, including release liners, which our customers use to produce labels for use in consumer and commercially-packaged products.

Facilities

We currently have three white paper mills located in the United States. Total annual white paper capacity is 990,000 tons. The following paragraphs describe our white paper mills:

Jackson. Our Jackson, Alabama mill produces both commodity and specialty papers on two paper machines.

International Falls. Our International Falls, Minnesota mill produces both commodity and specialty papers on two paper machines.

Wallula. Our Wallula, Washington mill has the ability, on one machine, to switch production between pressure sensitive papers and a variety of white paper grades. The mill also produces corrugating medium. As described above, we are converting the No. 3 machine at the mill from white paper to kraft linerboard. Upon the conversion, the Wallula mill will solely produce containerboard.

Major Raw Materials Used

Fiber supply. Fiber is the largest raw material cost in this segment. We consume wood fiber, recycled fiber, and purchased pulp. Our Jackson mill purchases recycled fiber to produce our line of recycled office papers. We purchase wood fiber through contracts and open-market purchase, and we purchase pulp from third parties pursuant to contractual agreements.

We participate in the Sustainable Forestry Initiative® (SFI) and the Forest Stewardship Council® (FSC) and are certified under the SFI sourcing standards. We procure all wood fiber for our white paper mills through our certified systems that are managed in accordance with the SFI and FSC standards. These standards are aimed at ensuring the long-term health and conservation of forestry resources.

Energy supply. We obtain energy through purchased or self-generated fuels and electricity. Fuel sources include natural gas, electricity, by-products of the manufacturing and pulping process (including black liquor and wood waste), and purchased wood waste. Each of the paper mills self-generates process steam requirements from by-products (black liquor and wood waste), as well as from the various purchased fuels. The process steam is used throughout the production process and to generate electricity.

In 2017, our white paper mills consumed about 33 million MMBTU's of fuel to produce both steam and electricity. Of the 33 million MMBTU's consumed, about 63% was from mill generated by-products and 37% was from purchased fuels. Of the 37% in purchased fuels, 80% was from natural gas and 20% from purchased wood waste.

Chemical supply. We consume various chemicals in the production of white papers, including starch, precipitated calcium carbonate, caustic soda, sodium chlorate, dyestuffs, and optical brighteners. Most of our chemicals are purchased under contracts, which are bid or negotiated periodically.

Sales, Marketing, and Distribution

Our white papers are sold primarily through our sales and marketing organization. We ship to customers both directly from our mills and through distribution centers and a network of outside warehouses by rail or truck. This allows us to respond quickly to customer requirements.

Customers

We have over 180 customers in approximately 500 locations. These customers include paper merchants, commercial and financial printers, envelope converters, and customers who use our pressure sensitive paper for specialty applications such as consumer and commercial product labels. We have established long-term relationships with many of our customers. Office Depot, Inc. is our largest customer in the Paper segment. We have an agreement with Office Depot in which we will supply at least 50% of Office Depot's requirements for commodity office papers through December 2018. The agreement will renew automatically through December 2019; however, there are circumstances that could cause the agreement to terminate in 2018. If this were to occur, Office Depot's purchase obligations under the agreement would phase out over two years. In 2017, our sales revenue to Office Depot represented 43% of our Paper segment sales revenue.

Competition

The markets in which our Paper segment competes are large and highly competitive. Commodity grades of white paper are globally traded, with numerous worldwide manufacturers, and as a result, these products compete primarily on the basis of price. All of our paper manufacturing facilities are located in the United States, and although we compete primarily in the domestic market, we do face competition from foreign producers. In 2016, as a result of a case brought by us and other domestic producers before United States international trade authorities, antidumping and countervailing duties at various levels were imposed on producers of uncoated freesheet papers produced in Australia, Brazil, China, Indonesia, and Portugal. These duties remain in effect. Other factors influencing competition from overseas producers include domestic and foreign demand and foreign currency exchange rates. In general, paper production does not rely on proprietary processes or formulas, except in highly specialized or custom grades.

Our largest competitors include Domtar Corporation, International Paper Company, and Georgia-Pacific LLC. We also face competition from overseas producers. Although price is the primary basis for competition in most of our paper grades, quality and service are also important competitive determinants. Our white papers compete with electronic data transmission, e-readers, electronic document storage alternatives, and paper grades we do not produce. Increasing shifts to these alternatives have had, and are likely to continue to have, an adverse effect on traditional print media and paper usage and lower demand for communication papers.

Corporate and Other

Our Corporate and Other segment includes corporate support staff services and related assets and liabilities. This segment also includes transportation assets, such as rail cars and trucks, which we use to transport some of our products from our manufacturing sites, and assets related to a 50% owned variable interest entity, Louisiana Timber Procurement Company, L.L.C. (LTP).

Employees

As of December 31, 2017, we had approximately 14,600 employees, including 4,400 salaried and 10,200 hourly employees. Approximately 65% of our hourly employees worked pursuant to collective bargaining agreements. The majority of our unionized employees are represented by the United Steel Workers (USW), the International Brotherhood of Teamsters (IBT), the International Association of Machinists (IAM), and the Association of Western Pulp and Paper Workers (AWPPW). We are currently in negotiations to renew or extend any union contracts that have recently expired or are expiring in the near future. During 2017, we experienced no work stoppages, and we believe we have satisfactory labor relations with our employees.

Environmental Matters

A discussion of the financial impact of our compliance with environmental laws is presented under the caption “Environmental Matters” in “Part II, Item 7. Management’s Discussion and Analysis of Financial Condition and Results of Operations” of this Form 10-K.

Executive Officers of the Registrant

Brief statements setting forth the age at February 28, 2018, the principal occupation, employment during the past five years, the year in which such person first became an officer of PCA, and other information concerning each of our executive officers appears below.

***Mark W. Kowlzan,* 62, Chairman and Chief Executive Officer** — Mr. Kowlzan has served as PCA’s Chairman since January 2016 and as Chief Executive Officer and a director since July 2010. From 1998 through June 2010, Mr. Kowlzan led the company’s containerboard mill system, first as Vice President and General Manager and then as Senior Vice President - Containerboard. From 1996 through 1998, Mr. Kowlzan served in various senior mill-related operating positions with PCA and Tenneco Packaging, including as manager of the Counce linerboard mill. Prior to joining Tenneco Packaging, Mr. Kowlzan spent 15 years at International Paper Company, a global paper and packaging company, where he held a series of operational and managerial positions within its mill organization. Mr. Kowlzan is a member of the board of American Forest and Paper Association.

***Thomas A. Hassfurther,* 62, Executive Vice President — Corrugated Products** — Mr. Hassfurther has served as Executive Vice President - Corrugated Products of PCA since September 2009. From February 2005 to September 2009, Mr. Hassfurther served as Senior Vice President - Sales and Marketing, Corrugated Products. Prior to this he held various senior-level management and sales positions at PCA and Tenneco Packaging. Mr. Hassfurther joined the company in 1977.

***Charles J. Carter,* 58, Senior Vice President — Containerboard Mill Operations** — Mr. Carter has served as Senior Vice President - Containerboard Mill Operations since July 2013. Prior to this, he served as Vice President – Containerboard Mill Operations since January 2011. From March 2010 to January 2011, Mr. Carter served as PCA's Director of Papermaking Technology. Prior to joining PCA in 2010, Mr. Carter spent 28 years with various pulp and paper companies in managerial and technical positions of increasing responsibility, most recently as Vice President and General Manager of the Calhoun, Tennessee mill of Abitibi Bowater from 2007 to 2010 and as manager of SP Newsprint's Dublin, Georgia mill from 1999 to 2007.

***Robert P. Mundy,* 56, Senior Vice President and Chief Financial Officer** — Mr. Mundy has served as PCA's Senior Vice President since July 2015 and Chief Financial Officer since September 2015. He previously served as Senior Vice President and Chief Financial Officer of Verso Corporation, a leading North American supplier of coated papers to catalog and magazine publishers, from 2006 to June 2015. Verso Corporation filed for Chapter 11 bankruptcy in January 2016. Prior to that, he worked at International Paper Company, from 1983 to 2006, where he was Director of Finance of the Coated and Supercalendered Papers division from 2002 to 2006, Director of Finance Projects from 2001 to 2002, Controller of Masonite Corporation from 1999 to 2001, and Controller of the Petroleum and Minerals business from 1996 to 1999. He served in various business positions at International Paper from 1983 to 1996.

***Kent A. Pflederer,* 47, Senior Vice President, General Counsel and Secretary** — Mr. Pflederer has served as Senior Vice President, General Counsel and Corporate Secretary since January 2013 and has led our legal department since June 2007. Prior to joining PCA, Mr. Pflederer served as Senior Counsel, Corporate and Securities, at Hospira, Inc. from 2004 to 2007 and served in the corporate and securities practice at Mayer Brown, LLP from 1996 to 2004.

***Thomas W.H. Walton,* 58, Senior Vice President — Sales and Marketing, Corrugated Products** — Mr. Walton has served as Senior Vice President - Sales and Marketing, Corrugated Products since October 2009. Prior to this, he served as a Vice President and Area General Manager within the Corrugated Products Group since 1998. Mr. Walton joined the company in 1981 and has also held positions in production, sales, and general management.

Available Information

PCA's internet website address is *www.packagingcorp.com*. Our annual reports 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 or 15(d) of the Securities Exchange Act of 1934 are available free of charge through our website as soon as reasonably practicable after they are electronically filed with, or furnished to, the Securities and Exchange Commission. In addition, our Code of Ethics may be accessed in the Investor Relations section of PCA's website. PCA's website and the information contained or incorporated therein are not intended to be incorporated into this report.

Item 1A. *RISK FACTORS*

Some of the statements in this report and, in particular, statements found in Management's Discussion and Analysis of Financial Condition and Results of Operations, that are not historical in nature are forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. Forward-looking statements include statements about our expectations regarding our future liquidity, earnings, expenditures, and financial condition. These statements are often identified by the words "will," "should," "anticipate," "believe," "expect," "intend," "estimate," "hope," or similar expressions. These statements reflect management's current views with respect to future events and are subject to risks and uncertainties. There are important factors that could cause actual results to differ materially from those in forward-looking statements, many of which are beyond our control. These factors, risks and uncertainties include, but are not limited to, the factors described below.

Our actual results, performance, or achievement could differ materially from those expressed in, or implied by, these forward-looking statements, and accordingly, we can give no assurances that any of the events anticipated by the forward-looking statements will transpire or occur, or if any of them do so, what impact they will have on our results of operations or financial condition. In view of these uncertainties, investors are cautioned not to place undue reliance on these forward-looking statements. We expressly disclaim any obligation to publicly revise or otherwise update any forward-looking statements that have been made to reflect the occurrence of events after the date hereof.

In addition to the risks and uncertainties we discuss elsewhere in this Form 10-K (particularly in "Part II, Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations") or in our other filings with the Securities and Exchange Commission (SEC), the following are important factors that could cause our actual results to differ materially from those we project in any forward-looking statement.

Industry Cyclicality — Changes in the prices of our products could materially affect our financial condition, results of operations, and liquidity. Macroeconomic conditions and fluctuations in industry capacity can create changes in prices, sales volumes, and margins for most of our products, particularly commodity grades of packaging and paper products. Prices for all of our products are driven by many factors, including general economic conditions, demand for our products, and competitive conditions in our industry, and we have little influence over the timing and extent of price changes, which may be unpredictable and volatile. In addition, our selling prices are influenced by index levels published by trade publications. Changes in how these index levels are determined or maintained may affect our sales prices. If supply exceeds demand, industry operating conditions deteriorate or other factors result in lower prices for our products, our earnings and operating cash flows would be harmed.

General Economic Conditions — If business and economic conditions deteriorate, our business, results of operations, liquidity, and financial position may be harmed. General global and U.S. economic conditions directly affect the demand and production of consumer goods, employment levels, the availability and cost of credit, and ultimately, the profitability of our business. If economic conditions deteriorate and result in higher unemployment rates, lower family income, unfavorable currency exchange rates, lower corporate earnings, lower business investment, and lower consumer spending, we may experience lower demand for our products and products of our customers which utilize our products. If economic conditions result in higher inflation, we may experience higher production and transportation costs, which we may not be able to recover through higher prices or otherwise. Changes in tax laws or tax rates may have a material impact on our future cash taxes, effective tax rate or deferred tax assets and liabilities. These conditions are beyond our control and may have a significant impact on our business, results of operations, liquidity, and financial position. See Management's Discussion and Analysis of Financial Condition and Results of Operations in Part II, Item 7 and Note 6, Income Taxes, of the Notes to the Consolidated Financial Statements in "Part II, Item 8. Financial Statements and Supplementary Data" of this Form 10-K, for additional information on the impact of the Tax Cuts and Jobs Act (H.R.1) enacted in December 2017.

Competition — The intensity of competition in the industries in which we operate could result in downward pressure on pricing and volume, which could lower earnings and operating cash flows. Our industries are highly competitive, with no single containerboard, corrugated packaging, or white paper producer having a dominant position. Containerboard and commodity white paper products cannot generally be differentiated by producer, which tends to intensify price competition. The corrugated packaging industry is also sensitive to changes in economic conditions, as well as other factors including innovation, design, quality, and service. To the extent that one or more competitors are more successful than we are with respect to any key competitive factor, our business could be adversely affected. Our packaging products also compete, to some extent, with various other packaging materials, including products made of paper, plastics, wood, and various types of metal. If we are unable to successfully compete, we may lose market share or may be required to charge lower sales prices for our products, both of which would reduce our earnings and operating cash flows.

Our white paper products compete with electronic data transmission and document storage alternatives. Increasing shifts to electronic alternatives have had and will continue to have an adverse effect on usage of these products. As a result of such competition, we are experiencing decreasing demand for most of our existing white paper products. As the use of these alternatives grows, demand for paper products is likely to further decline. Declines in demand for our paper products may adversely affect our earnings and operating cash flows.

Some of our competitors are larger than we are and may have greater financial and other resources, greater manufacturing economies of scale, greater energy self-sufficiency, or lower operating costs, compared to our Company. We may be unable to compete effectively with these companies particularly during economic downturns. Some of the factors that may adversely affect our ability to compete in the markets in which we participate include the entry of new competitors into the markets we serve, increased competition from overseas producers, our competitors' pricing strategies, our inability to anticipate and respond to changing customer preferences, and our inability to maintain the cost-efficiency of our facilities.

Inflation and Other General Cost Increases — We may not be able to offset higher costs. We are subject to both contractual, inflationary, and other general cost increases, including with regard to our labor costs and purchases of raw materials and transportation services. General economic conditions may result in higher inflation, which may increase our exposure to higher costs. If we are unable to offset these cost increases by price increases, growth, and/or cost reductions in our operations, these inflationary and other general cost increases could have a material adverse effect on our operating cash flows, profitability, and liquidity.

In 2017, our total company costs including cost of sales (COS) and selling, general, and administrative expenses (SG&A) was $5.5 billion, and excluding non-cash costs (depreciation, depletion and amortization, pension and postretirement expense, and share-based compensation expense) was $5.1 billion. A 1% increase in COS and SG&A costs would increase costs by $55 million and cash costs by $51 million.

Cost of Fiber — An increase in the cost of fiber could increase our manufacturing costs and lower our earnings. The market price of wood fiber varies based upon availability, source, and the costs of fuels used in the harvesting and transportation of wood fiber. The cost and availability of wood fiber can also be impacted by weather, general logging conditions, geography, and regulatory activity.

The availability and cost of recycled fiber depends heavily on recycling rates and the domestic and global demand for recycled products. We purchase recycled fiber for use at four of our five containerboard mills as well as the containerboard machine at our Wallula, Washington mill. In 2017, we purchased approximately 670,000 tons of recycled fiber, net of the recycled fiber generated by our corrugated box plants. The amount of recycled fiber purchased each year varies based upon production and the prices of both recycled fiber and wood fiber.

Periods of supply and demand imbalance have created significant price volatility. Periods of higher recycled fiber costs and unusual price volatility have occurred in the past, including during 2017 as demand for domestic recycled fiber from Asian producers fluctuated significantly, and may occur again in the future, which could result in higher costs and lower earnings. A $10 per ton price increase in recycled fiber for our containerboard mills, would result in approximately $7 million of additional expense based on 2017 consumption.

Cost of Purchased Fuels and Chemicals — An increase in the cost of purchased fuels and chemicals could lead to higher manufacturing costs, resulting in reduced earnings. We have the ability to use various types of purchased fuels in our manufacturing operations, including natural gas, bark, and other purchased fuels. Fuel prices, in particular prices for oil and natural gas, have fluctuated dramatically in the past. New and more stringent environmental regulations may discourage, reduce the availability of, or make more expensive, the use of certain fuels, particularly coal and fossil fuels. In addition, costs for key chemicals used in our manufacturing operations also fluctuate. These fluctuations impact our manufacturing costs and result in earnings volatility. If fuel and chemical prices rise, our production costs and transportation costs will increase and cause higher manufacturing costs and reduced earnings. A $0.10 per million MMBTU in natural gas prices would result in approximately $3 million of additional expense, based on 2017 usage.

Transportation Costs — Reduced truck and rail availability could lead to higher costs or poorer service, resulting in lower earnings, and harm our ability to distribute our products. We ship our products primarily by truck and rail. We have experienced lower availability of third-party trucking services and interruptions or delays in rail services. We have also experienced higher costs for transportation services in general. These factors could lead to even higher transportation costs in the future and harm our ability to distribute our products in a timely manner. We may not be able to recover higher transportation costs through higher prices or otherwise, which would result in lower earnings.

Material Disruption of Manufacturing — A material disruption at one of our manufacturing facilities could prevent us from meeting customer demand, reduce our sales, and/or negatively affect our results of operations and financial condition. Our business depends on continuous operation of our facilities, particularly at our mills. Any of our manufacturing facilities, or any of our machines within such facilities, could cease operations unexpectedly for a significant period of time due to a number of events, including:

- Unscheduled maintenance outages.
- Prolonged power failures.
- Equipment failure.
- Explosion of a boiler or other major facilities.
- Disruption in the supply of raw materials, such as wood fiber, energy, or chemicals.
- A chemical spill or release.
- Closure or curtailment related to environmental concerns.
- Labor difficulties.
- Disruptions in the transportation infrastructure, including roads, bridges, railroad tracks, and tunnels.
- Fires, floods, earthquakes, hurricanes, or other catastrophes.
- Terrorism or threats of terrorism.
- Other operational problems.

We experienced an explosion at the DeRidder mill during 2017, which resulted in facility downtime and damage. Net of insurance proceeds, we incurred $5 million of property damage and business interruption losses during the year and we are party to multiple lawsuits relating to alleged injuries resulting from such explosion.

These events could harm our ability to produce our products and serve our customers and may lead to higher costs and reduced earnings.

Environmental Matters — PCA may incur significant environmental liabilities with respect to both past and future operations. We are subject to, and must comply with, a variety of federal, state and local environmental laws, particularly those relating to air and water quality, waste disposal and the cleanup of contaminated soil and groundwater. Because environmental regulations are constantly evolving, we have incurred, and will continue to incur, costs to maintain compliance with those laws. See Item 7. “Management’s Discussion and Analysis of Financial Condition and Results of Operations — Environmental Matters” for estimates of expenditures we expect to make for environmental compliance in the next few years. New and more stringent environmental regulations may be adopted and may require us to incur significant additional capital expenditures to modify or replace certain of our boilers. In addition, environmental regulations may increase the cost of our raw materials and purchased energy. Although we have established reserves to provide for known environmental liabilities, these reserves may change over time due to the enactment of new environmental laws or regulations or changes in existing laws or regulations, which might require additional significant environmental expenditures.

Mergers and Acquisitions — Our acquired businesses may underperform relative to our expectations, and we may not be able to successfully integrate these businesses into our own. We have completed several mergers and acquisitions and investments in recent years, including our acquisition of Sacramento Container Corporation during 2017. Our success will depend in part on our ability to successfully integrate, and receive the intended benefits from, these acquisitions. There may be difficulties, costs and delays involved in the integration of these businesses into ours. Integration requires modification of operational and financial systems and may result in significant additional expenses. If the acquired businesses underperform relative to our expectations, or if we fail to successfully integrate these businesses, our business, financial condition and results of operations may be materially and adversely affected.

Customer Concentration — Office Depot represents a significant portion of PCA's paper business. We have a supply agreement with Office Depot, our largest customer in the Paper segment. The agreement requires Office Depot to buy, and us to supply, at least 50% of Office Depot's requirements for commodity office papers through December 2018.

In 2017, sales to Office Depot represented 43% of our Paper segment sales and 7% of our consolidated sales. If these sales are reduced, including if we are unable to renew the agreement at committed volumes, we would need to find new customers. We may not be able to fully replace any lost sales, and any new sales may be at lower prices or higher costs. Any significant deterioration in the financial condition of Office Depot affecting its ability to pay or any other change that makes Office Depot less willing to purchase our products will harm our business and results of operations.

Labor Relations — If we experience strikes or other work stoppages, our business will be harmed. Our workforce is highly unionized and operates under various collective bargaining agreements. We must negotiate to renew or extend any union contracts that have recently expired or are expiring in the near future. While we believe that we have generally had satisfactory labor relations, we may not be able to successfully negotiate new agreements without work stoppages or labor difficulties in the future or renegotiate them on favorable terms. If we are unable to successfully renegotiate the terms of any of these agreements, or if we experience any extended interruption of operations at any of our facilities as a result of strikes or other work stoppages, our business, results of operations and financial condition may be harmed.

Reliance on Personnel — We may fail to attract and retain qualified personnel, including key management personnel. Our ability to operate and grow our business depends on our ability to attract and retain employees with the skills necessary to operate and maintain our facilities, produce our products and serve our customers. The increasing demand for qualified personnel may make it more difficult for us to attract and retain qualified employees. Changing demographics and labor work force trends may make it difficult for us to replace retiring employees at our manufacturing and other facilities. If we fail to attract and retain qualified personnel, or if we experience labor shortages, we may experience higher costs and other difficulties, and our business may be adversely impacted.

In addition, we rely on key executive and management personnel to manage our business efficiently and effectively. As our business has grown in size and geographic scope, we have relied on these individuals to manage increasingly complex operations. The loss of any of our key personnel could adversely affect our business.

Cyber Security — Risks related to security breaches of company, customer, employee, and vendor information, as well as the technology that manages our operations and other business processes, could adversely affect our business. We rely on various information technology systems to capture, process, store, and report data and interact with customers, vendors, and employees. Despite careful security and controls design, implementation, updating, and internal and independent third-party assessments, our information technology systems, and those of our third party providers, could become subject to cyber attacks or security breaches. Network, system, and data breaches could result in misappropriation of sensitive data or operational disruptions including interruption to systems availability and denial of access to and misuse of applications required by our customers to conduct business with us. Misuse of internal applications; theft of intellectual property, trade secrets, or other corporate assets; and inappropriate disclosure of confidential information could stem from such incidents. Delayed sales, slowed production, or other issues resulting from these disruptions could result in lost sales, business delays, and negative publicity and could have a material adverse effect on our operations, financial condition, or operating cash flows.

Debt obligations — Our debt service obligations may reduce our operating flexibility. At December 31, 2017, we had $2.7 billion of debt outstanding and a $326.9 million undrawn revolving credit facility, after deducting letters of credit. All debt is comprised of fixed-rate senior notes. We and our subsidiaries are not restricted from incurring, and may incur, additional indebtedness in the future.

Our current borrowings, plus any future borrowings, may affect our ability to operate our business, including, without limitation:

- Result in significant cash requirements to make interest and maturity payments on our outstanding indebtedness;
- Increase our vulnerability to adverse changes in our business or industry conditions;
- Increase our vulnerability to increases in interest rates;
- Limit our ability to obtain additional financing for working capital, capital expenditures, general corporate, and other purposes;
- Limit our flexibility in planning for, or reacting to, changes in our business and our industry; and
- Limit our flexibility to make acquisitions.

Further, if we cannot service our indebtedness, we may have to take actions to secure additional cash by selling assets, seeking additional equity or reducing investments, which may not be achievable on acceptable terms or at all.

Market Price of our Common Stock — The market price of our common stock may be volatile, which could cause the value of the stock to decline. Securities markets worldwide periodically experience significant price declines and volume fluctuations due to macroeconomic factors and other factors beyond our control. This market volatility, as well as general economic, market, or political conditions, could reduce the market price of our common stock in spite of our operating performance. In addition, our operating results could be below the expectations of public market analysts and investors, and in response, the market price of our common stock could decrease significantly.

Item 1B. *UNRESOLVED STAFF COMMENTS*

None.

Item 2. *PROPERTIES*

We own and lease properties in our business. Primarily all of our leases are noncancelable and are accounted for as operating leases. These leases are not subject to early termination except for standard nonperformance clauses.

Information concerning capacity and utilization of our principal operating facilities, the segments that use those facilities, and a map of geographical locations is presented in “Part I, Item 1. Business” of this Form 10-K. We assess the condition and capacity of our manufacturing, distribution, and other facilities needed to meet our operating requirements. Our properties have been generally well maintained and are in good operating condition. In general, our facilities have sufficient capacity and are adequate for our production and distribution requirements.

We currently own buildings and land for five containerboard mills and three white paper mills. Additionally, we have 94 corrugated manufacturing operations, of which the buildings and land for 56 are owned, including 46 combining operations, or corrugated plants, one corrugated sheet-only manufacturer, and nine sheet plants. We lease the building for 11 corrugated plants and 27 sheet plants. We own warehouses and miscellaneous other properties, including sales offices and woodlands management offices. We lease space for regional design centers and numerous other distribution centers, warehouses, and facilities. The equipment in these leased facilities is, in virtually all cases, owned by us, except for forklifts and other rolling stock, which are generally leased.

We lease the cutting rights to approximately 75,000 acres of timberland located near our Valdosta mill (68,000 acres) and our Counce mill (7,000 acres). On average, these cutting rights agreements have terms with approximately 14 years remaining. Additionally, we lease approximately 9,000 acres of land for a fiber farm, located near our Wallula mill, where we plant, grow, and harvest fiber.

Our corporate headquarters is located in Lake Forest, Illinois. The headquarter facility is leased for the next four years with provisions for two additional five year lease extensions. We also lease an administrative office in Boise, Idaho, through July 2025.

Item 3. *LEGAL PROCEEDINGS*

Information concerning legal proceedings can be found in Note 18, Commitments, Guarantees, Indemnifications, and Legal Proceedings, of the Notes to Consolidated Financial Statements in “Part II, Item 8. Financial Statements and Supplementary Data” of this Form 10-K.

Item 4. *MINE SAFETY DISCLOSURE*

Not applicable.

PART II

Item 5. *MARKET FOR REGISTRANT’S COMMON EQUITY, RELATED STOCKHOLDER MATTERS, AND ISSUER PURCHASES OF EQUITY SECURITIES*

Market Information

PCA’s common stock is listed on the New York Stock Exchange (NYSE) under the symbol “PKG”. The following table sets forth the high and low sales prices as reported by the NYSE and the cash dividends declared per common share during the last two years.

	2017			2016		
	Market Price		Dividends	Market Price		Dividends
Quarter Ended	High	Low	Declared	High	Low	Declared
March 31	$ 96.87	$ 84.01	$0.63	$62.67	$44.32	$0.55
June 30	113.52	89.73	0.63	71.31	58.44	0.55
September 30	119.43	105.81	0.63	82.77	65.12	0.63
December 31	121.38	108.49	0.63	88.41	78.03	0.63

Stockholders

On February 23, 2018, there were 66 holders of record of our common stock.

Dividend Policy

PCA expects to continue to pay regular cash dividends, although there is no assurance as to the timing or level of future dividend payments because these depend on future earnings, capital requirements, and financial condition. The timing and amount of future dividends are subject to the determination of PCA’s Board of Directors.

On August 31, 2016, PCA announced an increase of its quarterly cash dividend on its common stock from an annual payout of $2.20 per share to an annual payout of $2.52 per share. The first quarterly dividend of $0.63 per share was paid on October 14, 2016 to shareholders of record as of September 15, 2016.

During the year ended December 31, 2017, we paid $237.6 million of dividends to shareholders. On December 14, 2017 PCA's Board of Directors approved a regular quarterly cash dividend of $0.63 per share of common stock, which was paid on January 12, 2018 to shareholders of record as of December 26, 2017. The dividend payment was $59.4 million.

Purchases of Equity Securities

Stock Repurchase Program

On February 25, 2016, PCA announced that its Board of Directors authorized the repurchase of $200.0 million of the Company's outstanding common stock. At the time of the announcement, there was no remaining authority under previously announced programs. Repurchases may be made from time to time in open market or privately negotiated transactions in accordance with applicable securities regulations. The timing and amount of repurchases will be determined by the Company in its discretion based on factors such as PCA's stock price and market and business conditions.

The Company did not repurchase any shares of its common stock under this authority during the year ended December 31, 2017. In 2016, we paid $100.3 million to repurchase 1,987,187 shares of common stock which fully depleted the $93.3 million of repurchase authority under previous authorizations by our board of directors. In 2015, we paid $154.7 million to repurchase 2,326,493 shares of common stock. As of December 31, 2017, we are authorized to repurchase $193.0 million of the Company's common stock.

Pursuant to its equity incentive plan, the Company withholds shares from vesting employee equity awards to cover employee tax liabilities. Total shares withheld in 2017 were 97,946 to cover $10.8 million in employee tax liabilities. Total shares withheld in 2016 were 172,438 to cover $11.2 million of employee tax liabilities. Total shares withheld in 2015 were 129,983 for $8.7 million. Shares withheld are included in the number of shares repurchased in the table below.

The following table presents information related to our repurchases of common stock made under repurchase plans authorized by PCA's Board of Directors, and shares withheld to cover taxes on vesting of equity awards, during the three months ended December 31, 2017:

Issuer Purchases of Equity Securities

Period	Total Number of Shares Purchased(a)	Average Price Paid Per Share	Total Number of Shares Purchased as Part of Publicly Announced Plans or Programs	Approximate Dollar Value of Shares That May Yet Be Purchased Under the Plans or Programs (in millions)
October 1-31, 2017	—	$ —	—	$193.0
November 1-30, 2017	—	—	—	193.0
December 1-31, 2017	500	117.76	—	193.0
Total	**500(a)**	**$117.26**	**—**	**$193.0**

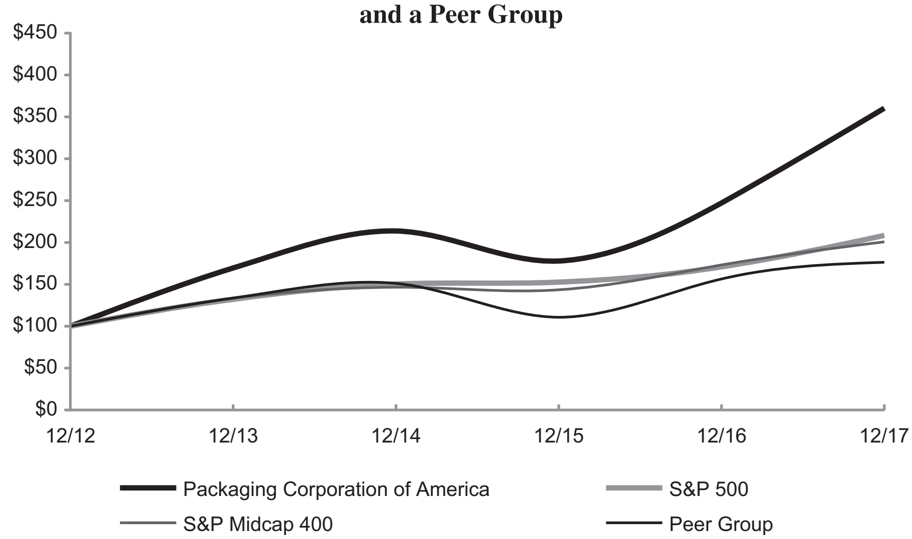
(a) 500 shares were withheld from employees to cover income and payroll taxes on equity awards that vested during the period.

Performance Graph

The graph below compares PCA's cumulative 5-year total shareholder return on common stock with the cumulative total returns of the S&P 500 index; the S&P Midcap 400 index; and a Peer Group that includes two publicly-traded companies, which are International Paper Company and KapStone Paper and Packaging Corporation. The graph tracks the performance of a $100 investment (including the reinvestment of all dividends) in our common stock, in each index, and in the peer groups' common stock from December 31, 2012, through December 31, 2017. The stock price performance included in this graph is not necessarily indicative of future stock price performance.

COMPARISON OF 5 YEAR CUMULATIVE TOTAL RETURN*

Among Packaging Corporation of America, the S&P 500 Index, the S&P Midcap 400 Index, and a Peer Group



*$100 invested on 12/31/12 in stock or index, including reinvestment of dividends.
Fiscal year ending December 31.

Copyright© 2018 Standard & Poor's, a division of S&P Global. All rights reserved.

	Cumulative Total Return					
	December 31					
	2012	2013	2014	2015	2016	2017
Packaging Corporation of America	$100.00	$169.39	$213.59	$178.16	$247.80	$360.53
S&P 500	100.00	132.39	150.51	152.59	170.84	208.14
S&P Midcap 400	100.00	133.50	146.54	143.35	173.08	201.20
Peer Group	100.00	133.53	151.13	110.96	156.68	176.03

The information in the graph and table above is not deemed "filed" with the Securities and Exchange Commission and is not to be incorporated by reference in any of PCA's filings under the Securities Act of 1933 or the Securities Exchange Act of 1934, whether made before or after the date of this Annual Report on Form 10-K, except to the extent that PCA specifically incorporates such information by reference.

Item 6. *SELECTED FINANCIAL DATA*

The following table sets forth selected historical financial data of PCA (dollars and shares in millions, except per share data). The information contained in the table should be read in conjunction with the disclosures in "Part II, Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations" and "Part II, Item 8. Financial Statements and Supplementary Data" of this Form 10-K.

	Year Ended December 31				
	2017(a)	**2016(a)**	**2015(a)**	**2014(a)**	**2013(a)**
Statement of Income Data(b):					
Net Sales	$6,444.9	$5,779.0	$5,741.7	$5,852.6	$3,665.3
Net Income	668.6	449.6	436.8	392.6	441.3
Net income per common share:					
— basic	7.09	4.76	4.47	3.99	4.57
— diluted	7.07	4.75	4.47	3.99	4.52
Weighted average common shares outstanding:					
— basic	93.5	93.5	96.6	97.0	96.6
— diluted	93.7	93.7	96.7	97.1	97.5
EBITDA(c)	$1,322.6	$1,138.3	$1,106.5	$1,083.7	$ 683.7
Cash dividends declared per common share	2.52	2.36	2.20	1.60	1.51
Balance Sheet Data(b):					
Total assets	$6,197.5	$5,777.0	$5,272.3	$5,258.7	$5,182.1
Total debt obligations	2,650.7	2,667.4	2,319.7	2,365.2	2,558.6
Stockholders' equity	2,182.6	1,759.8	1,633.3	1,521.4	1,356.8

(a) On October 25, 2013, we acquired Boise Inc. (Boise). Our financial results include Boise subsequent to acquisition.

(b) Effective January 1, 2016, the Company adopted Accounting Standards Update (ASU) 2015-03 (Topic 835): *Simplifying the Presentation of Debt Issuance Costs*. We applied this guidance retrospectively, as required, and reclassified the debt issuance costs from "Other long-term assets" to "Long-term debt" on our Consolidated Balance Sheet to conform with current period presentation. Total assets for all periods presented have been updated to reflect this adoption.

Effective December 31, 2015, the Company adopted Accounting Standards Update 2015-17, *Balance Sheet Classification of Deferred Taxes.* The guidance eliminates the requirement to classify deferred taxes between current and noncurrent and requires that all deferred tax assets and liabilities, along with any related valuation allowance, be classified as noncurrent on the balance sheet. Our total assets for all periods presented have been updated to reflect this adoption.

Effective January 1, 2014, the Company changed its method of accounting for inventories from lower of cost, as determined by the LIFO method, or market, to lower of cost, as determined by the average cost method, or market. The Company applied the change retrospectively to all prior periods presented herein in accordance with US generally accepted accounting principles (GAAP) relating to accounting changes.

(c) EBITDA represents income before interest (interest expense and interest income), income tax provision (benefit), and depreciation, amortization, and depletion. We present EBITDA because it provides a means to evaluate our performance on an ongoing basis using the same measure that is used by our management and because it is frequently used by investors and other interested parties in the evaluation of companies. EBITDA, however, is not a measure of our liquidity or financial performance under generally accepted accounting principles (GAAP) and should not be considered as an alternative to net income, income from operations, or any other performance measure derived in accordance with GAAP or as an alternative to cash flow from operating activities as a measure of our liquidity. Any analysis of non-GAAP financial measures should be done in conjunction with results presented in accordance with GAAP. The non-GAAP measures are not intended to be substitutes for GAAP financial measures and should not be used as such. See "Reconciliations of Non-GAAP Financial Measures to Reported Amounts" included in "Part II, Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations" of this Form 10-K for a reconciliation of non-GAAP measures to the most comparable GAAP measure.

Item 7. *MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS*

The following discussion and analysis of historical results of operations and financial condition should be read in conjunction with the audited financial statements and the notes thereto which appear elsewhere in this Form 10-K. This discussion includes forward-looking statements regarding our expectations with respect to our future performance, liquidity, and capital resources. Such statements, along with any other non-historical statements in the discussion, are forward-looking. See our discussion regarding forward-looking statements included under "Part I, Item 1A. Risk Factors" of this Form 10-K.

Overview

PCA is the fourth largest producer of containerboard products and the third largest producer of uncoated freesheet paper in North America, based on production capacity. We operate five containerboard mills, three paper mills, and 94 corrugated products manufacturing plants. Our containerboard mills produce linerboard and corrugating medium, which are papers primarily used in the production of corrugated products. Our corrugated products manufacturing plants produce a wide variety of corrugated packaging products, including conventional shipping containers used to protect and transport manufactured goods, multi-color boxes and displays with strong visual appeal that help to merchandise the packaged product in retail locations, and honeycomb protective packaging. In addition, we are a large producer of packaging for meat, fresh fruit and vegetables, processed food, beverages, and other industrial and consumer products. We also manufacture and sell white papers, including both commodity and specialty papers, which may have custom or specialized features such as colors, coatings, high brightness, and recycled content. We are headquartered in Lake Forest, Illinois and operate primarily in the United States.

Executive Summary

Net sales were $6.44 billion for the year ended December 31, 2017 and $5.78 billion in 2016. We reported $669 million of net income, or $7.07 per diluted share, compared to $450 million, or $4.75 per share in 2016. Net income included $100 million of income for special items (discussed below) in 2017, including $122 million of estimated income tax benefit related to the enactment in December 2017 of the Tax Cut and Jobs Act (H.R.1), compared to $12 million of expense in 2016. Excluding special items, we recorded $569 million of net income, or $6.02 per diluted share in 2017, compared to $462 million, or $4.88 per diluted share, in 2016. The increase was driven primarily by higher containerboard and corrugated products prices and mix and sales and production volumes driven by strong demand, partially offset by lower sales and production volumes and prices and mix in our Paper segment, higher input and operating costs, higher annual outage expenses, and higher depreciation expense and higher freight costs. For additional detail on special items included in reported GAAP results, see "Item 7. Reconciliations of Non-GAAP Financial Measures to Reported Amounts."

Packaging segment income from operations was $944 million in 2017, compared to $711 million in 2016. Packaging segment EBITDA excluding special items was $1,257 million in 2017, compared to $1,019 million in 2016. The increase was driven primarily by higher containerboard and corrugated products prices and mix and sales and production volumes driven by strong demand; partially offset by higher input costs, primarily recycled fiber and energy; higher labor costs; and higher freight and depreciation expense.

Paper segment income from operations was $62 million in 2017, compared to $138 million in 2016. Paper segment EBITDA excluding special items was $153 million in 2017, compared to $199 million in 2016. The decrease was due primarily to lower paper sales and production volumes and prices and mix, higher energy costs, and higher annual outage expenses.

During the third quarter of 2017, the Company announced that it will discontinue production of uncoated freesheet and coated one-side grades at its Wallula, Washington mill in the second quarter of 2018 to begin the conversion of the No. 3 paper machine to a 400,000 ton-per-year virgin kraft linerboard machine. The Company incurred charges in the Paper segment relating to these activities during 2017 as described below under "Special Items and Earnings per Diluted Share, Excluding Special Items," and will incur future charges. The total capital cost of the conversion is expected to be approximately $150 million.

Also, to further our corrugated products business growth strategy, on October 2, 2017, the Company acquired substantially all of the assets of Sacramento Container Corporation, and 100% of the membership interests of Northern Sheets, LLC and Central California Sheets, LLC (collectively the "Sacramento Container acquisition") for $265 million with cash on hand. The acquired companies operate two full-line corrugated product operations and sheet feeders in McClellan, California and Kingsburg, California. The operating results of the companies acquired in the Sacramento Container acquisition are included in our results and reported in the Packaging segment from and after October 2, 2017. We are in the process of integrating these operations into our business.

During 2016, we made two acquisitions of corrugated products businesses in the Packaging segment: TimBar Corporation ("TimBar") and Columbus Container, Inc. ("Columbus Container"). On August 29, 2016, we acquired substantially all of the assets of TimBar, a large independent corrugated products producer with six domestic corrugated products production facilities for a purchase price of $386 million. To finance the acquisition, we borrowed $385 million under a new five-year term loan facility, which we have subsequently refinanced. On November 30, 2016, we acquired substantially all of the assets of Columbus Container for a purchase price of $100 million. Columbus Container is a full-service provider of corrugated packaging products, with a full-line corrugated products plant and warehousing facilities and other related operations located in Indiana and Illinois. We used available cash on hand to pay the purchase price for Columbus Container. The operating results of TimBar and Columbus Container are included in our results and reported in the Packaging segment from and after the respective dates of acquisition. Accordingly, 2016 reflects a partial year of ownership of these operations and 2017 reflects a full year of ownership of these operations. These operations have been substantially integrated into our business and have helped drive growth in our corrugated products volumes during 2017.

On December 13, 2017, we issued $1 billion of senior notes, consisting of $500 million of three year notes bearing interest at a fixed rate of 2.45% and $500 million of ten year notes bearing interest at a fixed rate of 3.40%. We used the net proceeds of the offering to repay all of our outstanding variable-rate term loan debt, which was approximately $976 million at the time of the offering. As a result, all of our outstanding long-term debt as of December 31, 2017 bears interest at fixed rates.

Special Items and Earnings per Diluted Share, Excluding Special Items

Earnings per diluted share, excluding special items, in 2017 and 2016 were as follows:

	Year Ended December 31	
	2017	**2016**
Earnings per diluted share	$ 7.07	$4.75
Special items:		
Facilities closure and other costs(a)	(0.04)	0.08
Acquisition and integration related costs(b)	0.01	0.03
Wallula mill restructuring(c)	0.21	—
Expiration of timberland repurchase option(d)	(0.01)	—
Deferred debt issuance costs(e)	0.01	—
Tax reform(f)	(1.29)	—
Internal legal entity consolidation(g)	0.04	—
DeRidder mill incident(h)	0.03	—
Hexacomb working capital adjustment(i)	(0.01)	—
Ceased production of market pulp at Wallula(j)	—	0.02
Total special items (income) expense	(1.05)	0.13
Earnings per diluted share, excluding special items	$ 6.02	$4.88

(a) For 2017, includes $5.8 million of income primarily related to the sale of land corresponding to the closure of a corrugated products facility, partially offset by closure costs related to corrugated products facilities, a paper administration facility, a corporate administration facility, and a lump sum settlement of a multiemployer pension plan withdrawal liability for one of our corrugated products facilities. For 2016, includes $11.9 million of closure costs related to corrugated product facilities and a paper products facility, and a lump sum settlement of a multiemployer pension plan withdrawal liability for one of our corrugated products facilities.
(b) For 2017, includes $1.7 million of charges related to the Sacramento Container Corporation acquisition and integration costs related to other recent acquisitions. For 2016, includes $4.5 million of acquisition-related costs for the TimBar Corporation and Columbus Container, Inc. acquisitions.
(c) Includes $33.4 million of charges related to our determination to discontinue production of uncoated free sheet and coated one-side grades at the Wallula, Washington mill in the second quarter of 2018 and convert the No. 3 paper machine to a high-performance 100% virgin kraft linerboard machine.
(d) Includes a $2.0 million gain related to the expiration of a repurchase option corresponding to timberland previously sold.
(e) Includes $1.8 million of expense related to the write-off of deferred debt issuance costs in connection with the December 2017 debt refinancing, described above.
(f) Includes $122.1 million of estimated income tax benefit related to the enactment in December 2017 of the Tax Cuts and Jobs Act (H.R.1) primarily for the re-measurement of our net deferred tax liability as a result of the reduction in the U.S. corporate income tax rate.
(g) Includes $3.3 million of tax expense for the change in value of deferred taxes as a result of an internal legal entity consolidation that will simplify future operating activities.
(h) Includes $5.0 million of costs for the property damage and business interruption insurance deductible corresponding to the February 2017 explosion at our DeRidder, Louisiana mill.
(i) Includes $2.3 million of income related to a working capital adjustment from the April 2015 sale of our Hexacomb corrugated manufacturing operations in Europe and Mexico.
(j) Includes $2.7 million of costs related to ceased production of softwood market pulp operations at our Wallula, Washington mill and the permanent shutdown of the No.1 machine.

Management excludes special items, as it believes these items are not necessarily reflective of the ongoing results of operations of our business. We present these measures because they provide a means to evaluate the performance of our segments and our company on an ongoing basis using the same measures that are used by our management, because these measures assist in providing a meaningful comparison between periods presented and because these measures are frequently used by investors and other interested parties in the evaluation of companies and the performance of their segments. A reconciliation of diluted EPS to diluted EPS excluding special items is included above and the reconciliations of other non-GAAP measures used in this Management's Discussion and Analysis of Financial Condition and Results of Operations, to the most comparable measure reported in accordance with GAAP, are included later in Item 7 under "Reconciliations of Non-GAAP Financial Measures to Reported Amounts." Any analysis of non-GAAP financial measures should be done in conjunction with results presented in accordance with GAAP. The non-GAAP measures are not intended to be substitutes for GAAP financial measures and should not be used as such.

Industry and Business Conditions

Trade publications reported North American industry-wide corrugated products total shipments increased 2.5% during 2017, compared to 2016. Reported industry containerboard production increased 3.1% compared to 2016, and reported industry containerboard inventories at the end of 2017 were approximately 2.4 million tons, up 3.3% compared to 2016. Reported containerboard export shipments were up 4.1% compared to 2016. In 2017, trade publications reported a $50 price per ton increase on linerboard in April. Corrugating medium increased $50, $20, and $10 per ton in April, July, and August respectively.

The market for communication papers competes heavily with electronic data transmission and document storage alternatives. Increasing shifts to these alternatives have reduced usage of traditional print media and communication papers. Trade publications reported North American uncoated freesheet paper shipments were down 3.4% in 2017, compared to 2016. Average prices reported by a trade publication for cut size office papers were lower by $19 per ton, or 1.9%, in 2017, compared to 2016.

Outlook

Looking ahead to the first quarter of 2018, we expect continued strong demand in our Packaging segment, although our containerboard production and sales volumes will be lower than in the fourth quarter of 2017 due to scheduled outages at three of our mills during the quarter. We will continue to implement our recently announced price increases in our Paper segment and expect sales volume to be slightly lower. We expect inflation in almost all areas across our entire cost base. We anticipate continued higher freight costs as well as higher labor and benefits costs with annual wage increases and other timing-related expenses. Although we anticipate price inflation on recycled fiber to be fairly flat, we do expect some inflation in our energy costs and with most of our chemical, and repair and materials costs, and seasonally colder weather will increase energy usage and wood costs. Our depreciation and interest expense will be slightly higher as well. We will benefit from a lower tax rate going forward with the passage of the Tax Cuts and Jobs Act during the fourth quarter of 2017. Considering these items, and other items, we expect first quarter earnings, excluding special items, to be slightly lower than fourth quarter 2017.

Results of Operations

Year Ended December 31, 2017, Compared with Year Ended December 31, 2016

The historical results of operations of PCA for the years ended December 31, 2017 and 2016 are set forth below (dollars in millions):

	Year Ended December 31		
	2017	**2016**	**Change**
Packaging	$5,312.3	$4,584.8	$727.5
Paper	1,051.8	1,093.9	(42.1)
Corporate and other and eliminations	80.8	100.3	(19.5)
Net sales	$6,444.9	$5,779.0	$665.9
Packaging	$ 943.7	$ 711.1	$232.6
Paper	61.5	138.1	(76.6)
Corporate and other	(74.0)	(68.9)	(5.1)
Income from operations	$ 931.2	$ 780.3	$150.9
Interest expense, net	(102.6)	(91.8)	(10.8)
Income before taxes	828.6	688.5	140.1
Income tax expense	(160.0)	(238.9)	78.9
Net income	$ 668.6	$ 449.6	$219.0
Net income excluding special items(a)	$ 569.1	$ 462.0	$107.1
EBITDA(a)	$1,322.6	$1,138.3	$184.3
EBITDA excluding special items(a)	$1,342.1	$1,154.5	$187.6

(a) See “Reconciliations of Non-GAAP Financial Measures to Reported Amounts” included in this Item 7 for a reconciliation of non-GAAP measures to the most comparable GAAP measure.

Net Sales

Net sales increased $666 million, or 11.5%, to $6,445 million in 2017, compared to $5,779 million in 2016.

Packaging. Net sales increased $728 million, or 15.9%, to $5,312 million, compared to $4,585 million in 2016, due to increased containerboard and corrugated products volume ($428 million) and higher domestic and export containerboard and corrugated products prices and mix ($299 million). In 2017, our domestic containerboard prices increased 11.1% and export prices increased 17.2% compared to 2016. Containerboard outside shipments increased 7.9%, and total corrugated products shipments were up 8.6%, compared to 2016. Prices reported by trade publications increased $50 per ton on linerboard in April; corrugating medium increased $50, $20, and $10 per ton in April, July, and August respectively.

Paper. Net sales decreased $42 million, or 3.8%, to $1,052 million, compared to $1,094 million in 2016. The decrease was due to lower pulp volume ($47 million) as a result of the December 2016 shutdown of our market pulp operations at our Wallula mill, and unfavorable changes in prices and mix ($7 million), partially offset by higher white paper volume ($12 million).

Gross Profit

Gross profit increased $197 million in 2017, compared to 2016. The increase was driven primarily by higher containerboard and corrugated products prices and mix and sales and production volumes, partially offset by lower Paper segment prices and mix and sales and production volumes, and higher input and operating costs. In 2017, gross profit included special items of $10 million related to the conversion of the No. 3 machine at the Wallula mill and $1 million of acquisition-related costs, compared to $5 million in 2016 for facility closure and acquisition-related costs.

Selling, General, and Administrative Expenses

Selling, general, and administrative expenses increased $52 million in 2017, compared to 2016. The increase in 2017 was due primarily to higher administrative costs corresponding to the acquisitions of TimBar and Columbus Container in the second half of 2016 and Sacramento Container in the fourth quarter of 2017.

Other Expense, Net

Other income (expense), net for the years ended December 31, 2017 and 2016 are set forth below (dollars in millions):

	Year Ended December 31	
	2017	2016
Wallula mill restructuring	$(23.1)	$ —
Asset disposals and write-offs	(10.5)	(11.9)
Acquisition and integration related costs	(0.8)	(3.3)
Expiration of timberland repurchase option	2.0	—
Hexacomb working capital adjustment	2.3	—
Facilities closure and other costs	5.9	(10.3)
DeRidder mill incident	9.7	—
Ceased production of market pulp at Wallula	—	(0.6)
Other	(3.9)	1.8
Total	$(18.4)	$(24.3)

We discuss these items in more detail in Note 5, Other Expense, Net of the Condensed Notes to the Consolidated Financial Statements in “Part II, Item 8. Financial Statements” of this Form 10-K.

Income from Operations

Income from operations increased $151 million, or 19.3%, for the year ended December 31, 2017, compared to 2016. 2017 income from operations included $30 million of expense for special items compared to $19 million of expense in 2016. Special items in 2017 consist of $33 million of charges related to the conversion of the Wallula No. 3 paper machine, $5 million for the property damage and business interruption insurance deductible related to the DeRidder mill incident, $2 million for integration-related costs, and $11 million in net gains related to facility closures and land sales, an adjustment to Hexacomb working capital, and the expiration of a repurchase option corresponding to timberland previously sold. 2016 special items included $11 million of facility closure costs related to corrugated manufacturing facilities and a paper distribution center, $4 million of TimBar and Columbus Container acquisition-related costs, $3 million related to shutdown of market pulp operations at our Wallula mill, and $1 million related to our withdrawal from a multiemployer pension plan for one of our corrugated products facilities.

Packaging. Segment income from operations increased $233 million to $944 million, compared to $711 million in 2016. The increase in 2017 related primarily to higher containerboard and corrugated products prices and mix ($223 million), and higher containerboard and corrugated products sales and production volumes ($81 million), partially offset by higher costs for input costs ($49 million), labor and fringes ($21 million), freight ($13 million), converting and other costs ($8 million), and higher depreciation expense ($12 million). Special items in 2017 included expense of $5 million for property damage and business interruption insurance deductible related to the DeRidder mill incident, $2 million in integration-related costs, and $11 million in net gains related to facility closures and land sales and an adjustment to Hexacomb working capital and the expiration of a repurchase option corresponding to timberland previously sold. Special items in 2016 included $9 million of facility closure costs, $4 million of TimBar and Columbus Container acquisition-related costs, and $1 million related to our withdrawal from a multiemployer pension plan for one of our corrugated products facilities.

Paper. Segment income from operations decreased $77 million to $62 million, compared to $138 million in 2016. The decrease primarily related to lower sales and production volumes ($17 million), lower paper prices and mix ($8 million), and higher costs for energy ($12 million) and annual outage expenses ($10 million). Special items during 2017 included expense of $33 million related to the conversion of the Wallula No. 3 machine to kraft linerboard, compared to $4 million related to the shutdown of market pulp operations at our Wallula mill and facilities closures in 2016.

Interest Expense, Net, and Income Taxes

Interest expense, net, during 2017 increased $11 million compared to 2016. The increase in interest expense was primarily due to interest on term loan borrowings for the TimBar acquisition made in August 2016, higher interest rates on variable rate debt due to higher LIBOR in 2017 compared to 2016, and interest on the new notes related to the December 2017 refinancing.

During 2017, income tax expense decreased $79 million compared to 2016 primarily due to changes as a result of H.R. 1 (P.L. 115-97), originally known as the “Tax Cuts and Jobs Act” (the “Tax Act”), which the President signed into law on December 22, 2017. The effective tax rate for 2017 and 2016 was 19.3% and 34.7%, respectively. For additional information regarding the impact of the Tax Act, see Note 6, Income Taxes, in “Part II, Item 8. Financial Statements and Supplementary Data” of this Form 10-K.

Year Ended December 31, 2016, Compared with Year Ended December 31, 2015

The historical results of operations of PCA for the years ended December 31, 2016 and 2015 are set forth below (dollars in millions):

	Year Ended December 31		
	2016	2015	Change
Packaging	$4,584.8	$4,477.3	$107.5
Paper	1,093.9	1,143.1	(49.2)
Corporate and other and eliminations	100.3	121.3	(21.0)
Net sales	$5,779.0	$5,741.7	$ 37.3
Packaging	$ 711.1	$ 714.9	$ (3.8)
Paper	138.1	112.5	25.6
Corporate and other	(68.9)	(77.4)	8.5
Income from operations	$ 780.3	$ 750.0	$ 30.3
Interest expense, net	(91.8)	(85.5)	(6.3)
Income before taxes	688.5	664.5	24.0
Income tax expense	(238.9)	(227.7)	(11.2)
Net income	$ 449.6	$ 436.8	$ 12.8
Net income excluding special items(a)	$ 462.0	$ 442.6	$ 19.4
EBITDA(a)	$1,138.3	$1,106.5	$ 31.8
EBITDA excluding special items(a)	$1,154.5	$1,106.2	$ 48.3

(a) See "Reconciliations of Non-GAAP Financial Measures to Reported Amounts" included in this Item 7 for a reconciliation of non-GAAP measures to the most comparable GAAP measure.

Net Sales

Net sales increased $37 million, or 0.6%, to $5,779 million in 2016, compared to $5,742 million in 2015.

Packaging. Sales increased $108 million, or 2.4%, to $4,585 million, compared to $4,477 million in 2015. The increase was driven by increased corrugated products sales volume ($177 million), in large part due to our TimBar and Columbus Container acquisitions, partially offset by unfavorable changes in price and mix ($58 million) and the April 1, 2015 sale of our Hexacomb operations in Mexico and Europe ($11 million). Total corrugated products shipments in 2016 increased 5.0% over 2015. Packaging segment prices were lower than 2015, but trended up in the fourth quarter as we began implementing previously announced price increases to our containerboard and corrugated products customers. On average during 2016, our export prices were down 7.0% and domestic containerboard pricing was down 2.9% compared to 2015.

Paper. Sales decreased $49 million, or 4.3%, to $1,094 million, compared to $1,143 million in 2015. The decrease was related to lower volume as a result of the 2016 shutdown of market pulp operations at our Wallula mill, ($53 million), partially offset by favorable changes in price and mix ($3 million).

Gross Profit

Gross profit increased $68 million, or 5.6%, in 2016, compared to 2015. The increase was primarily due to higher containerboard and corrugated products volumes and lower fiber, energy, and freight costs, partially offset by lower prices and mix in containerboard and corrugated products. In 2016, gross profit included special items of $5 million for facility closure and acquisition-related costs, compared to $9 million in 2015, most of which related to incremental depreciation expense related to changing the estimated useful lives of assets in connection with our DeRidder mill restructuring.

Selling, General, and Administrative Expenses

Selling, general, and administrative expenses increased $20 million, or 4.4%, in 2016, compared to 2015. The increase in 2016 was due primarily to higher administrative costs of $16 million corresponding to the TimBar and Columbus Container acquisitions.

Other Expense, Net

Other income (expense), net for the years ended December 31, 2016 and 2015 are set forth below (dollars in millions):

	Year Ended December 31,	
	2016	**2015**
Asset disposals and write-offs	$(11.9)	$(14.0)
Facilities closure and other costs	(10.3)	—
Acquisition and integration related costs	(3.3)	(12.9)
Ceased production of market pulp at Wallula	(0.6)	—
DeRidder restructuring	—	7.1
Sale of St. Helens Paper Mill Site	—	6.7
Refundable state tax credit	—	3.6
Other	1.8	2.8
Total	$(24.3)	$ (6.7)

We discuss these items in more detail in Note 5, Other Expense, Net of the Condensed Notes to the Consolidated Financial Statements in "Part II, Item 8. Financial Statements" of this Form 10-K.

Income from Operations

Income from operations increased $30 million, or 4.0%, for the year ended December 31, 2016, compared to 2015. Our 2016 income from operations included $19 million of expense from special items, compared with $9 million of expense from special items in 2015. Special items for 2016 included $11 million of facility closure costs related to corrugated manufacturing facilities and a paper distribution center, $4 million of TimBar and Columbus Container acquisition-related costs, $3 million related to shutdown of market pulp operations at our Wallula mill, and $1 million related to our withdrawal from a multiemployer pension plan for one of our corrugated products facilities. Special items for 2015 included $14 million of Boise acquisition-related expense, $2 million of expense related to restructuring the DeRidder mill, partially offset by $7 million gain on the sale of our St. Helens paper mill site.

Packaging. Segment income from operations decreased $4 million, or 0.5%, to $711 million, compared to $715 million in 2015. The decrease is primarily related to lower domestic containerboard and corrugated products prices and mix ($48 million), lower export containerboard prices ($12 million), higher labor and fringe costs ($12 million), higher depreciation expense ($5 million), a 2015 state tax credit related to investments and jobs retained at our DeRidder mill ($4 million), and other items that were individually insignificant. These items were partially offset by higher volumes ($34 million), and lower freight ($19 million), mill outage ($14 million), and input ($22 million) costs. Special items in 2016 included $9 million of facility closure costs, $4 million of TimBar and Columbus Container acquisition-related costs, and $1 million related to our withdrawal from a multiemployer pension plan for one of our corrugated products facilities. Special items in 2015 included $4 million of Boise integration-related costs and $2 million of DeRidder restructuring charges.

Paper. Segment income from operations increased $26 million, or 22.8%, to $138 million, compared to $113 million for 2015. The increase is due primarily to lower input ($40 million), mill outage ($14 million), and labor ($3 million) costs, and higher paper prices and mix ($3 million), partially offset by lower volumes ($23 million). Special items expense in 2016 included $3 million related to the shutdown of market pulp operations at our Wallula mill and $2 million of facility closure costs in 2016. Special items income in 2015 included a $7 million gain on the sale of the St. Helens mill site in 2015.

Interest Expense, Net, and Income Taxes

Interest expense, net, increased $6 million in 2016 compared to 2015 primarily due to term loan borrowings for the TimBar acquisition made in August 2016 as well as higher LIBOR.

During 2016, we recorded $239 million of income tax expense, compared to $228 million of expense during 2015. The effective tax rate for 2016 and 2015 was 34.7% and 34.3%, respectively.

Liquidity and Capital Resources

Sources and Uses of Cash

Our primary sources of liquidity are net cash provided by operating activities and available borrowing capacity under our revolving credit facility. We ended the year with $217 million of cash and $327 million of unused borrowing capacity under the revolving credit facility, net of letters of credit. Currently, our primary uses of cash are for operations, capital expenditures, acquisitions, debt service (including voluntary payments of debt), repurchases of common stock, and declared common stock dividends. We believe that net cash generated from operating activities, cash on hand, available borrowings under our revolving credit facility and available capital through access to capital markets will be adequate to meet our liquidity and capital requirements, including payments of any declared common stock dividends, for the foreseeable future. As our debt or credit facilities become due, we will need to repay, extend or replace such indebtedness. Our ability to do so will be subject to future economic conditions and financial, business, and other factors, many of which are beyond our control.

Below is a summary table of our cash flows, followed by a discussion of our sources and uses of cash through operating activities, investing activities, and financing activities (dollars in millions):

	Year Ended December 31		
	2017	2016	2015
Net cash provided by (used for):			
Operating activities	$ 856.1	$ 806.9	$ 768.6
Investing activities	(609.1)	(769.6)	(298.1)
Financing activities	(269.4)	17.8	(411.2)
Net (decrease) increase in cash and cash equivalents	$ (22.4)	$ 55.1	$ 59.3

Operating Activities

Our operating cash flow is primarily driven by our earnings and changes in operating assets and liabilities, such as accounts receivable, inventories, accounts payable and other accrued liabilities, as well as other factors described below. Cash requirements for operating activities are subject to PCA's operating needs and the timing of collection of receivables and payments of payables and expenses.

2017

During 2017, net cash provided by operating activities was $856 million, compared to $807 million for 2016, an increase of $49 million. Cash from operations excluding changes in cash used for operating assets and liabilities increased $200 million. The increase was primarily due to higher income from operations as discussed above. Cash decreased by $151 million due to changes in operating assets and liabilities. The decrease was primarily due to higher accounts receivable levels in 2017 compared to 2016 because of increased sales and timing of collections; and a higher federal and state income tax receivable in 2017 compared to 2016 primarily due to an overpayment of required taxes made in 2017 prior to the enactment of tax reform. These changes were partially offset by an increase in accounts payable levels in 2017 compared to 2016 primarily related to timing of payments.

2016

During 2016, net cash provided by operating activities was $807 million, compared with $769 million for 2015, an increase of $38 million. Cash from operations excluding changes in cash used for operating assets and liabilities decreased $30 million. The decrease resulted from 2016 cash contributions of $57 million to our pension plans, partially offset by higher 2016 earnings. Changes in operating assets and liabilities increased cash by $69 million. This increase was primarily due to higher accounts payable levels in 2016 compared to 2015 due to the timing of payments; lower required cash tax payments in 2016 resulting from utilization of prior year overpayments; and an increase in accrued liabilities due primarily to higher compensation and benefits accruals. These changes were partially offset by higher inventories at the end of 2016 in order to prebuild for planned maintenance outages that would reduce production in the first quarter of 2017 and higher accounts receivable levels related to differences in the timing of collections of receivables.

Investing Activities

2017

We used $609 million for investing activities in 2017, compared to $770 million in 2016. In 2017, we spent $343 million for internal capital investments, compared to $274 million in 2016. During 2017, taking into account purchase price adjustments, we spent $274 million for the Sacramento Container acquisition, compared to $485 million for the TimBar and Columbus Container acquisitions.

The details of capital expenditures for property and equipment, excluding acquisitions, by segment for the years ended December 31, 2017, 2016, and 2015, are included in the table below (dollars in millions).

	Year Ended December 31		
	2017	2016	2015
Packaging	$305.1	$239.9	$250.3
Paper	22.6	31.6	58.5
Corporate and Other	15.3	2.8	5.7
	$343.0	$274.3	$314.5

We expect capital investments in 2018 to be between $440 million and $460 million, including $134 million for the Wallula No. 3 paper machine conversion to kraft linerboard. These expenditures could increase or decrease as a result of a number of factors, including our financial results, strategic opportunities, future economic conditions, and our regulatory compliance requirements. We currently estimate capital expenditures to comply with environmental regulations will be about $8 million in 2018. Our estimated environmental expenditures could vary significantly depending upon the enactment of new environmental laws and regulations, including those related to greenhouse gas emissions and industrial boilers. For additional information, see “Environmental Matters” in this Management’s Discussion and Analysis of Financial Condition and Results of Operations.

At December 31, 2017, the Company had commitments for capital expenditures of $281 million. The Company believes that cash-on-hand combined with cash flow from operations will be sufficient to fund these commitments.

2016

We used $770 million for investing activities in 2016, compared to $298 million in 2015. In 2016, we spent $274 million for capital investments, compared to $314 million in 2015. During 2016, we spent $485 million for the TimBar and Columbus Container acquisitions. In April of 2015, we received $23 million of cash proceeds for the sale of our Hexacomb corrugated manufacturing operations in Mexico and Europe.

Financing Activities

2017

In 2017, net cash used for financing activities was $269 million, compared with $18 million of cash provided by financing activities in 2016, a decrease of $287 million. The change primarily related to changes in indebtedness during the respective years, and higher dividend payments in 2017 compared to 2016, partially offset by $100 million of share repurchases in 2016, with no such repurchase activity in 2017. To reduce exposure to variable interest rates, in December 2017, we issued a total of $1 billion in three-year and ten-year notes with fixed interest rates of 2.45% and 3.40%, respectively, and used the proceeds to fully pay down our five-year and seven-year term loans. In 2016, we made $37 million of principal payments on long-term debt and capital leases and received $385 million of proceeds from the issuance of a term loan to finance the TimBar acquisition, resulting in a net increase in debt of $348 million. We paid $238 million of dividends in 2017 compared to $216 million in 2016.

2016

In 2016, net cash provided by financing activities was $18 million, compared to $411 million used for financing activities in 2015, an increase of $429 million. The change primarily related to higher indebtedness and $54 million of lower repurchases of common stock in 2016 compared to 2015. Indebtedness increased in 2016 as described above to fund the TimBar acquisition. In 2015, we reduced indebtedness with $48 million of principal payments. We paid $216 million of dividends in 2016, compared with $201 million of dividends in 2015. On August 31, 2016, PCA's Board of Directors increased the regular quarterly cash dividend to $0.63 per share from the previous $0.55 per share, beginning with the dividend paid on September 15, 2016.

For more information about our debt, treasury lock derivative instruments, and commitments, see Note 9, Debt, Note 13, Derivative Instruments and Hedging Activities, and Note 18, Commitments, Guarantees, Indemnifications, and Legal Proceedings, respectively, of the Notes to Consolidated Financial Statements in "Part II, Item 8. Financial Statements and Supplementary Data" of this Form 10-K.

Commitments

Contractual Obligations

The table below sets forth our enforceable and legally binding obligations as of December 31, 2017, for the categories described below. Some of the amounts included in the table are based on management's estimates and assumptions about these obligations, including their duration, the possibility of renewal, anticipated actions by third parties, and other factors. Because these estimates and assumptions are necessarily subjective, our actual payments may vary from those reflected in the table. Purchase orders made in the ordinary course of business are excluded from the table below. Any amounts for which we are liable under purchase orders are reflected on the Consolidated Balance Sheets as accounts payable and accrued liabilities (dollars in millions):

	Payments Due by Period				
		Less Than 1 Year	1-3 Years	3-5 Years	More Than 5 Years
	Total	2018	2019-2020	2021-2022	2023 & After
6.50% Senior Notes, due March 2018	$ 150.0	$150.0	$ —	$ —	$ —
2.45% Senior Notes, due December 2020	500.0	$ —	500.0	—	—
3.90% Senior Notes, due June 2022	400.0	—	—	400.0	—
4.50% Senior Notes, due November 2023	700.0	—	—	—	700.0
3.65% Senior Notes, due September 2024	400.0	—	—	—	400.0
3.40% Senior Notes, due December 2027	500.0	—	—	—	500.0
Total short-term and long-term debt(a)	2,650.0	150.0	500.0	400.0	1,600.0
Interest on long-term debt(b)	573.0	95.8	181.9	149.6	145.7
Capital lease obligations, including interest	28.5	2.7	5.4	5.4	15.0
Operating leases(c)	263.8	63.8	95.1	48.7	56.2
Capital commitments	281.3	281.3	—	—	—
Purchase commitments:					
Raw materials(d)	389.5	49.3	95.7	85.5	159.0
Energy related(e)	34.8	30.5	4.3	—	—
Other liabilities reflected on our Consolidated Balance Sheet(f):					
Compensation and benefits(g)	374.9	47.3	106.2	120.0	101.4
Other(h)	76.5	11.6	7.2	2.7	55.0
	$4,672.3	$732.3	$995.8	$811.9	$2,132.3

(a) The table assumes our long-term debt is held to maturity and includes the current portion of long-term debt. See Note 9, Debt, of the Notes to Consolidated Financial Statements in "Part II, Item 8. Financial Statements and Supplementary Data" of this Form 10-K. Amounts reported are gross amounts and do not include unamortized debt discounts of $4.3 million at December 31, 2017.

(b) Amounts represent estimated future interest payments as of December 31, 2017, assuming our long-term debt is held to maturity. All interest rates are fixed.

(c) We enter into operating leases in the normal course of business. We lease some of our operating facilities, as well as other property and equipment, under operating leases. Some lease agreements provide us with the option to renew the lease or purchase the leased property. Our operating lease obligations would change if we exercised these renewal options and/or if we entered into additional operating lease agreements.

(d) Included among our raw materials purchase obligations are contracts to purchase approximately $372.7 million of wood fiber. Purchase prices under most of these agreements are set quarterly, semiannually, or annually based on regional market prices, and the estimate is based on contract terms or first quarter 2018 pricing. Except for deposits required pursuant to wood supply contracts, these obligations are not recorded in our consolidated financial statements until contract payment terms take effect. Our log, fiber, and wood chip obligations are subject to change based on, among other things, the effect of governmental laws and regulations, disruptions to our manufacturing operations, and log and fiber availability.

(e) We enter into utility contracts for the purchase of electricity and natural gas. We also purchase these services under utility tariffs. The contractual and tariff arrangements include multiple-year commitments and minimum annual purchase requirements. Our payment obligations were based upon prices in effect on December 31, 2017, or contract language, if available.

(f) Long-term deferred income taxes of $239.5 million and unrecognized tax benefits of $5.3 million, including interest and penalties, are excluded from this table, because the timing of their future cash outflows are uncertain.

(g) Amounts primarily consist of pension and postretirement obligations, including current portion of $2.4 million. We have minimum qualified pension contributions of approximately $4.6 million in 2018. See Note 10, Employee Benefit Plans and Other Postretirement Benefits, of the Notes to Consolidated Financial Statements in "Part II, Item 8. Financial Statements and Supplementary Data" of this Form 10-K, for additional information.

(h) Amounts primarily consist of workers compensation, environmental, and asset retirement obligations.

Off-Balance-Sheet Arrangements

The Company does not have any off-balance sheet arrangements as of December 31, 2017.

Inflation and Other General Cost Increases

We are subject to both contractual, inflation, and other general cost increases. If we are unable to offset these cost increases by price increases, growth, and/or cost reductions in our operations, these inflation and other general cost increases could have a material adverse effect on our operating cash flows, profitability, and liquidity.

In 2017, our total company costs including cost of sales (COS) and selling, general, and administrative expenses (SG&A) was $5.5 billion, and excluding non-cash costs (depreciation, pension and postretirement expense, and share-based compensation expense) was $5.1 billion. A 1% increase in COS and SG&A costs would increase costs by $55 million and cash costs by $51 million.

Certain items of product input costs have historically been subject to more cost volatility including fiber, purchased energy, and chemicals.

Energy

In 2017, our mills, including both packaging and paper mills, consumed about 96 million MMBTU's of fuel, including internally generated and externally purchased, to produce both steam and electricity. The following table for 2017 provides the total MMBTU's purchased externally by fuel type each quarter and the average cost per MMBTU by fuel type for the year. Our mills represent about 90% of our total purchased fuel costs. The cost per MMBTU includes the cost of the fuel plus our transportation and delivery costs.

	2017 Fuel Purchased (millions of MMBTU's)					2017 Avg.
Fuel Type	**First Quarter**	**Second Quarter**	**Third Quarter**	**Fourth Quarter**	**Full Year**	**Cost / MMBTU**
Natural gas	6.71	5.59	5.56	6.51	24.37	$3.66
Purchased bark	2.24	2.57	2.57	2.75	10.13	2.29
Other purchased fuels	0.41	0.46	0.44	0.32	1.63	4.19
Total Mills	9.36	8.62	8.57	9.58	36.13	$3.30

In addition, the mills purchased 21.68 million CkWh (hundred kilowatt-hours) of electricity in 2017. The purchases by quarter and the average cost per CkWh were as follows:

	2017 Purchased Electricity (millions of CkWh)					2017 Avg.
	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Full Year	Cost / CkWh
Purchased electricity	5.36	5.48	5.40	5.44	21.68	$5.63

Environmental Matters

Environmental compliance requirements are a significant factor affecting our business. We employ processes in the manufacture of containerboard, paper, and pulp, which result in various discharges, emissions and waste disposal. These processes are subject to numerous federal, state, local and foreign environmental laws and regulations. We operate and expect to continue to operate, under environmental permits and similar authorizations from various governmental authorities that regulate such discharges, emissions, and waste disposal. The most significant of these laws affecting the Company are:

- Resource Conservation and Recovery Act (RCRA);
- Clean Water Act (CWA);
- Clean Air Act (CAA);
- The Emergency Planning and Community Right-to-Know-Act (EPCRA);
- Toxic Substance Control Act (TSCA); and
- Safe Drinking Water Act (SDWA).

We believe that we are currently in material compliance with these and all applicable environmental rules and regulations. Because environmental regulations are constantly evolving, the Company has incurred, and will continue to incur, costs to maintain compliance with these and other environmental laws. The Company works diligently to anticipate and budget for the impact of applicable environmental regulations, and does not currently expect that future environmental compliance obligations will materially affect its business or financial condition. For the years ended December 31, 2017, 2016, and 2015, we spent $39 million, $44 million, and $43 million, respectively, to comply with the requirements of these and other environmental laws. Additionally, we had $9 million of environmental capital expenditures in 2017, $8 million in 2016, and $16 million in 2015.

In January 2013, the U.S. Environmental Protection Agency (the "EPA") established a three-year deadline for compliance with the Boiler MACT regulations, establishing air emissions standards and certain other requirements for industrial boilers. PCA's compliance actions involved modifying or replacing certain boilers and all PCA mills are in full compliance with Boiler MACT requirements. On July 29, 2016, the U.S. Court of Appeals for the District of Columbia Circuit issued a ruling on the consolidated cases challenging Boiler MACT. The court vacated key portions of the rule, including emission limits for certain subcategories of solid fuel boilers, and remanded issues to the EPA for further rulemaking. At this time, we cannot predict with certainty how the recent decision will impact our existing Boiler MACT compliance efforts or whether we will incur additional costs to comply with any revised standards.

As is the case with any industrial operation, PCA has, in the past, incurred costs associated with the remediation of soil or groundwater contamination, as required by the federal Comprehensive Environmental Response, Compensation and Liability Act, commonly known as the federal "Superfund" law, and analogous state laws. Cleanup requirements arise with respect to properties the Company currently owns or operates, former facilities and off-site facilities where the Company has disposed of hazardous substances. As part of the sale to PCA of the containerboard and corrugated products business of Pactiv Corporation in April 1999, Pactiv agreed to retain all liability for all former facilities and all sites associated with pre-closing off-site waste disposal.

Pactiv also retained environmentally impaired real property in Filer City, Michigan unrelated to current mill operations. In addition, OfficeMax (now an indirect, wholly owned subsidiary of Office Depot) retains responsibility for certain environmental liabilities related to some of the businesses, facilities, and assets we acquired from Boise. Generally, this responsibility relates to hazardous substance releases and other environmental incidents that arose before 2004. Some of these liabilities could be significant; however, Office Depot may not have sufficient funds to satisfy its indemnification obligations, and in some cases, we may not be entitled to such indemnification.

Because liability for remediation costs under environmental laws is strict, meaning that liability is imposed without fault, joint and several, meaning that liability is imposed on each party without regard to contribution, and retroactive, PCA could receive notifications of cleanup liability in the future and this liability could be material. From 2006 through 2017, there were no significant environmental remediation costs at PCA's mills and corrugated plants. As of December 31, 2017, we maintained an environmental reserve of $31.5 million relating to on-site landfills and surface impoundments as well as ongoing and anticipated remedial projects. The Company believes that it is not reasonably possible that future environmental expenses above the $31.5 million accrued at December 31, 2017, will have a material impact on its financial condition, results of operations, and cash flows.

While legislation regarding the regulation of greenhouse gas emissions has been proposed at the federal level, it is uncertain whether such legislation will be passed and, if so, what the breadth and scope of such legislation will be. The result of the regulation of greenhouse gas emissions could be an increase in our future environmental compliance costs, through caps, taxes or additional capital expenditures to modify facilities, which may be material. However, climate change legislation and the resulting future energy policy could also provide us with opportunities if the use of renewable energy is encouraged. We currently self-generate a significant portion of our power requirements at our mills using bark, black liquor and biomass as fuel, which are derived from renewable resources. While we believe we are well-positioned to take advantage of any renewable energy incentives, it is uncertain what the ultimate costs and opportunities of any climate change legislation will be and how our business and industry will be affected.

Critical Accounting Policies and Estimates

Management's discussion and analysis of financial condition and results of operations are based upon the Company's consolidated financial statements, which have been prepared in accordance with accounting principles generally accepted in the United States of America. The preparation of these financial statements requires us to make estimates and judgments that affect the reported amounts of assets, liabilities, revenues and expenses, and related disclosures of contingent assets and liabilities. On an ongoing basis, PCA evaluates its estimates, including those related to business combinations, goodwill and intangible assets, pensions and other postretirement benefits, environmental liabilities, income taxes, and long-lived asset impairment, among others. PCA bases its estimates on historical experience and on various other assumptions that are believed to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates under different assumptions or conditions.

Critical accounting estimates are those that are most important to the portrayal of our financial condition and results. These estimates require management's most difficult, subjective, or complex judgments. We review the development, selection, and disclosure of our critical accounting estimates with the Audit Committee of our board of directors. The Company believes that of its significant accounting policies, the following involve a higher degree of judgment and/or complexity:

Pensions

The Company accounts for defined benefit pension plans in accordance with Accounting Standards Codification (ASC) 715, "Compensation - Retirement Benefits." The calculation of pension expense and pension liabilities requires decisions about a number of key assumptions that can significantly affect expense and liability amounts, including discount rates, expected return on plan assets, expected rate of compensation increases, longevity and service lives of participants, expected contributions, and other factors. The pension assumptions used to measure pension expense and liabilities are discussed in Note 10, Employee Benefit Plans and Other Postretirement Benefits.

We recognize the funded status of our pension plans on our Consolidated Balance Sheet and recognize the actuarial and experience gains and losses and the prior service costs and credits as a component of "Accumulated Other Comprehensive Loss" in our Consolidated Statement of Changes in Stockholders' Equity. Actual results that differ from assumptions are accumulated and amortized over future periods and, therefore, generally affect recognized expense in future periods. At December 31, 2017, we had approximately $142.1 million of actuarial losses and prior service costs, net of tax, recorded in "Accumulated other comprehensive loss" on our Consolidated Balance Sheet. Accumulated losses in excess of 10% of the greater of the projected benefit obligation or the market-related value of assets will be recognized on a straight-line basis over the average remaining service period of active employees in PCA plans (which is between seven to ten years) and over the average remaining lifetime of inactive participants of Boise plans (which is between 25 and 28 years), to the extent that losses are not offset by gains in subsequent years. While we believe that the assumptions used to measure our pension obligations are reasonable, differences in actual experience or changes in assumptions may materially affect our pension obligations and future expense.

We believe that the accounting estimate related to pensions is a critical accounting estimate because it is highly susceptible to change from period to period. As discussed above, the future effects of pension plans on our financial position and results of operations will depend on economic conditions, employee demographics, mortality rates, retirement rates, investment performance, and funding decisions, among other factors. The following table presents selected assumptions used and expected to be used in the measurement of pension expense in the following periods (dollars in millions):

	Year Ending December 31,	Year Ended December 31	
	2018	2017	2016
Pension expense	$26.9	$24.8	$27.4
Assumptions			
Discount rate	3.66%	4.24%	4.49%
Expected rate of return on plan assets	6.06%	6.55%	6.57%

A change of 0.25% in either direction to the discount rate or the expected rate of return on plan assets would have had the following effect on 2017 and 2018 pension expense (dollars in millions):

		Increase (Decrease) in Pension Expense(a)	
	Base Expense	0.25% Increase	0.25% Decrease
2017			
Discount rate	$25.3	$(1.9)	$2.2
Expected rate of return on plan assets	25.3	(2.1)	2.1
2018			
Discount rate	$26.9	$(2.2)	$2.5
Expected rate of return on plan assets	26.9	(2.3)	2.3

(a) The sensitivities shown above are specific to 2017 and 2018. The sensitivities may not be additive, so the impact of changing multiple factors simultaneously cannot be calculated by combining the individual sensitivities shown.

For more information related to our pension benefit plans, see Note 10, Employee Benefit Plans and Other Postretirement Benefits, of the Notes to Consolidated Financial Statements in "Part II, Item 8. Financial Statements and Supplementary Data" of this Form 10-K.

Goodwill Impairment

Goodwill represents the excess of the cost of an acquired business over the fair value of the identifiable tangible and intangible assets acquired and liabilities assumed in a business combination. At December 31, 2017, we had $883.2 million of goodwill, of which, during 2017, we recorded $151.1 million in connection with the acquisition of Sacramento Container Corporation. At December 31, 2017, we had $828.0 million and $55.2 million of goodwill recorded in our Packaging and Paper segments, respectively.

We maintain two reporting units for purposes of our goodwill impairment testing, Packaging and Paper, which are the same as our operating segments discussed in Note 17, Segment Information, of the Notes to Consolidated Financial Statements in "Part II, Item 8. Financial Statements and Supplementary Data" of this Form 10-K. We test goodwill for impairment annually in the fourth quarter or sooner if events or changes in circumstances indicate that the carrying value of the asset may exceed fair value.

Under ASU 2017-04 (Topic 350), "Intangibles—Goodwill and Other – Simplifying the Test for Goodwill Impairment," companies are no longer required to determine the fair value of individual assets and liabilities of a reporting unit to measure goodwill impairment, thus eliminating Step Two of the analysis that was required under the prior guidance. Under ASU 2017-04, goodwill impairment testing is performed by comparing the fair value of the reporting unit with its carrying amount and recognizing an impairment charge for the amount by which the carrying amount exceeds the reporting unit's fair value. The Company adopted this ASU prospectively beginning with its annual goodwill impairment test in the fourth quarter of 2017.

The update to the standard does not eliminate the optional qualitative assessment of goodwill impairment that is often used to determine if the quantitative assessment is necessary. The qualitative assessment requires the evaluation of certain events and circumstances such as macroeconomic conditions, industry and market considerations, cost factors and overall financial performance, as well as company and reporting unit specific items. If, after assessing these qualitative factors, the Company determines that it is more likely than not that the carrying value of the reporting unit is less than its fair value, then no further testing is required. Otherwise, the Company would perform a quantitative analysis.

The quantitative analysis requires companies to compare the fair value of the reporting units to which goodwill was assigned to their respective carrying values. In calculating fair value, we use the income approach as our primary indicator of fair value. Under the income approach, we calculate the fair value of a reporting unit based on the present value of estimated future cash flows. These estimates are based on a number of factors including industry experience, business expectations and the economic environment. If the fair value exceeds the carrying value, no further work is required and no impairment loss is recognized. If the carrying value exceeds the fair value, the goodwill of the reporting unit is potentially impaired, and the carrying value of goodwill is then reduced to the implied value, or to zero if the fair value of the assets exceeds the fair value of the reporting unit, through an impairment charge.

During the annual goodwill impairment test performed in the fourth quarter of 2017, we assessed qualitative factors to determine whether it was more likely than not that the fair value of each reporting unit was less than its carrying value. Based on the results of the qualitative impairment test, we determined that it was more likely than not that the carrying value was less than the fair value of the Packaging and Paper reporting units.

If management's estimates of future operating results materially change or if there are changes to other assumptions, the estimated fair value of our goodwill could change significantly. Such change could result in impairment charges in future periods, which could have a significant noncash impact on our operating results and financial condition. We cannot predict the occurrence of future events that might adversely affect the reported value of our goodwill. As additional information becomes known, we may change our estimates.

Long-Lived Asset Impairment

An impairment of a long-lived asset exists when the carrying value of an asset is not recoverable through future undiscounted cash flows from operations and when the carrying value of the asset exceeds its fair value. Long-lived asset impairment is a critical accounting estimate, as it is susceptible to change from period to period.

We review the carrying value of long-lived assets, including intangible assets, for impairment when events or changes in circumstances indicate that the carrying amount of assets may not be recoverable. For purposes of testing for impairment, we group our long-lived assets at the lowest level for which identifiable cash flows are largely independent of the cash flows from other assets and liabilities. Our asset groupings vary based on the related business in which the long-lived asset is employed and the interrelationship between those long-lived assets in producing net cash flows. Asset groupings could change in the future if changes in the operations of the business or business environment affect the way particular long-lived assets are employed or the interrelationships between assets. To estimate whether the carrying value of an asset or asset group is impaired, we estimate the undiscounted cash flows that could be generated under a range of possible outcomes. To measure future cash flows, we are required to make assumptions about future production volumes, future product pricing, and future expenses to be incurred. In addition, estimates of future cash flows may change based on the availability of fiber, environmental requirements, capital spending, and other strategic management decisions. We estimate the fair value of an asset or asset group based on quoted market prices for similar assets and liabilities or inputs that are observable either directly (Level 1 measurement) or indirectly (the amount for which the asset(s) could be bought or sold in a current transaction with a third party) when available (Level 2 measurement). When quoted market prices are not available, we use a discounted cash flow model to estimate fair value (Level 3 measurement).

We periodically assess the estimated useful lives of our assets. Changes in circumstances, such as changes to our operational or capital strategy, changes in regulation, or technological advances, may result in the actual useful lives differing from our estimates. Revisions to the estimated useful lives of assets requires judgment and constitutes a change in accounting estimate, which is accounted for prospectively by adjusting or accelerating depreciation and amortization rates. In 2017, we recognized incremental depreciation expense of $10.5 million, primarily related to the announced second quarter 2018 discontinuation of uncoated free sheet and coated one-side grades at the Wallula, Washington mill associated with the conversion of the No. 3 paper machine to a high-performance 100% virgin kraft linerboard machine. In 2016, we recognized incremental depreciation expense of $2.9 million, primarily related to facilities closure costs and the Wallula mill restructuring.

New and Recently Adopted Accounting Standards

For a listing of our new and recently adopted accounting standards, see Note 2, Summary of Significant Accounting Policies, of the Notes to Consolidated Financial Statements in "Part II, Item 8. Financial Statements and Supplementary Data" of this Form 10-K.

Reconciliations of Non-GAAP Financial Measures to Reported Amounts

Income from operations excluding special items, net income excluding special items, EBITDA, and EBITDA excluding special items are non-GAAP financial measures. Management excludes special items, as it believes that these items are not necessarily reflective of the ongoing operations of our business. These measures are presented because they provide a means to evaluate the performance of our segments and our Company on an ongoing basis using the same measures that are used by our management, because these measures assist in providing a meaningful comparison between periods and because these measures are frequently used by investors and other interested parties in the evaluation of companies and the performance of their segments. Any analysis of non-GAAP financial measures should be done in conjunction with results presented in accordance with GAAP. The non-GAAP measures are not intended to be substitutes for GAAP financial measures and should not be used as such. Reconciliations of the non-GAAP measures to the most comparable measure reported in accordance with GAAP for the years ended December 31, 2017, 2016, and 2015, follow (dollars in millions):

	Year Ended December 31					
	2017			2016		
	Income before Taxes	Income Taxes	Net Income	Income before Taxes	Income Taxes	Net Income
As reported in accordance with GAAP	$828.6	$(160.0)	$ 668.6	$688.5	$(238.9)	$449.6
Special items:						
Facilities closure and other costs(a)	(5.8)	2.3	(3.5)	11.9	(4.2)	7.7
Acquisition and integration related costs(b)	1.7	(0.7)	1.0	4.5	(1.6)	2.9
Wallula mill restructuring(c)	33.4	(13.1)	20.3	—	—	—
Expiration of timberland repurchase option(d)	(2.0)	0.8	(1.2)	—	—	—
Deferred debt issuance costs(e)	1.8	(0.7)	1.1	—	—	—
Tax reform(f)	—	(122.1)	(122.1)	—	—	—
Internal legal entity consolidation(g)	—	3.3	3.3	—	—	—
DeRidder mill incident(h)	5.0	(2.0)	3.0	—	—	—
Hexacomb working capital adjustment(i)	(2.3)	0.9	(1.4)	—	—	—
Ceased production of market pulp at Wallula(j)	—	—	—	2.7	(0.9)	1.8
Total special items	31.8	(131.3)	(99.5)	19.1	(6.7)	12.4
Excluding special items	$860.4	$(291.3)	$ 569.1	$707.6	$(245.6)	$462.0

	Year Ended December 31		
	2015		
	Income before Taxes	Income Taxes	Net Income
As reported in accordance with GAAP	$664.5	$(227.7)	$436.8
Special items:			
DeRidder restructuring(k)	2.0	(0.7)	1.3
Acquisition and integration related costs(b)	13.4	(4.5)	8.9
Sale of St. Helens paper mill site(l)	(6.7)	2.3	(4.4)
Total special items	8.7	(2.9)	5.8
Excluding special items	$673.2	$(230.6)	$442.6

(a) For 2017, includes income primarily related to the sale of land corresponding to the closure of a corrugated products facility, partially offset by closure costs related to corrugated products facilities, a paper administration facility, a corporate administration facility, and a lump sum settlement of a multiemployer pension plan withdrawal liability for one of our corrugated products facilities. For 2016, includes closure costs related to corrugated product facilities and a paper products facility, and a lump sum settlement of a multiemployer pension plan withdrawal liability for one of our corrugated products facilities.

(b) For 2017, includes charges related to the Sacramento Container Corporation acquisition and integration costs related to other recent acquisitions. For 2016, includes acquisition-related costs for the TimBar Corporation and Columbus Container acquisitions. For 2015, includes Boise acquisition integration-related and other costs, primarily for severance, retention, travel, and professional fees.

(c) Includes $33.4 million of charges related to our determination to discontinue production of uncoated free sheet and coated one-side grades at the Wallula, Washington mill in the second quarter of 2018 and convert the No. 3 paper machine to a high-performance 100% virgin kraft linerboard machine.

(d) Includes a gain related to the expiration of a repurchase option corresponding to timberland previously sold.
(e) Includes expense related to the write-off of deferred debt issuance costs in connection with the December 2017 debt refinancing.
(f) Includes an estimated income tax benefit related to the enactment in December 2017 of the Tax Cuts and Jobs Act (H.R.1) primarily for the re-measurement of our net deferred tax liability as a result of the reduction in the U.S. corporate income tax rate.
(g) Includes tax expense for the change in value of deferred taxes as a result of an internal legal entity consolidation that will simplify future operating activities.
(h) Includes costs for the property damage and business interruption insurance deductible corresponding to the February 2017 explosion at our DeRidder, Louisiana mill.
(i) Includes income related to a working capital adjustment from the April 2015 sale of our Hexacomb corrugated manufacturing operations in Europe and Mexico.
(j) Includes costs related to ceased production of softwood market pulp operations at our Wallula, Washington mill and the permanent shutdown of the No.1 machine.
(k) Includes amounts from restructuring activities at our mill in DeRidder, Louisiana including costs related to the conversion of the No. 3 newsprint machine to containerboard, our exit from the newsprint business, and other improvements.
(l) In September 2015, we sold the remaining land, buildings, and equipment at our paper mill site in St. Helens, Oregon where we ceased paper production in December 2012. We recorded a $6.7 million gain on the sale.

The following table reconciles net income (loss) to EBITDA and EBITDA excluding special items for the periods indicated (dollars in millions):

	Year Ended December 31				
	2017	2016	2015	2014	2013
Net income	$ 668.6	$ 449.6	$ 436.8	$ 392.6	$441.3
Interest expense, net	102.6	91.8	85.5	88.4	58.3
Provision (benefit) for income taxes	160.0	238.9	227.7	221.7	(17.7)
Depreciation, amortization, and depletion	391.4	358.0	356.5	381.0	201.8
EBITDA	$1,322.6	$1,138.3	$1,106.5	$1,083.7	$683.7
Special items:					
Acquisition and integration related costs	$ 1.7	$ 4.5	$ 13.4	$ 18.4	$ 34.6
Facilities closure and other costs	(6.0)	11.1	—	—	—
Wallula mill restructuring	23.1	—	—	—	—
Expiration of timberland repurchase option	(2.0)	—	—	—	—
DeRidder mill incident	5.0	—	—	—	—
Hexacomb working capital adjustment	(2.3)	—	—	—	—
Ceased production of market pulp at Wallula	—	0.6	—	—	—
DeRidder restructuring	—	—	(7.0)	23.9	—
Sale of St. Helens paper mill site	—	—	(6.7)	—	—
Class action lawsuit settlement	—	—	—	17.6	—
Acquisition inventory step-up	—	—	—	—	21.5
Pension curtailment charges	—	—	—	—	10.9
EBITDA excluding special items	$1,342.1	$1,154.5	$1,106.2	$1,143.6	$750.7

The following table reconciles segment income (loss) to EBITDA and EBITDA excluding special items (dollars in millions):

	Year Ended December 31		
	2017	2016	2015
Packaging			
Segment income	$ 943.7	$ 711.1	$ 714.9
Depreciation, amortization, and depletion	317.5	293.3	297.3
EBITDA	1,261.2	1,004.4	1,012.2
Acquisition and integration related costs	1.7	4.2	4.1
Facilities closure and other costs	(7.2)	10.2	—
Expiration of timberland repurchase option	(2.0)	—	—
DeRidder mill incident	5.0	—	—
Hexacomb working capital adjustment	(1.6)	—	—
DeRidder restructuring	—	—	(7.0)
EBITDA excluding special items	**$1,257.1**	**$1,018.8**	**$1,009.3**
Paper			
Segment income	$ 61.5	$ 138.1	$ 112.5
Depreciation, amortization, and depletion	67.6	59.6	54.9
EBITDA	129.1	197.7	167.4
Facilities closure and other costs	0.4	0.9	—
Wallula mill restructuring	23.1	—	—
Ceased production of market pulp at Wallula	—	0.6	—
Sale of St. Helens paper mill site	—	—	(6.7)
EBITDA excluding special items	**$ 152.6**	**$ 199.2**	**$ 160.7**
Corporate and Other			
Segment loss	$ (74.0)	$ (68.9)	$ (77.4)
Depreciation, amortization, and depletion	6.3	5.1	4.3
EBITDA	(67.7)	(63.8)	(73.1)
Facilities closure and other costs	0.8	—	—
Hexacomb working capital adjustment	(0.7)	—	—
Acquisition and integration related costs	—	0.3	9.3
EBITDA excluding special items	**$ (67.6)**	**$ (63.5)**	**$ (63.8)**
EBITDA	**$1,322.6**	**$1,138.3**	**$1,106.5**
EBITDA excluding special items	**$1,342.1**	**$1,154.5**	**$1,106.2**

Item 7A. ***QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK***

PCA is exposed to the impact of interest rate changes and changes in the market value of its financial instruments. PCA periodically enters into derivatives in order to minimize these risks, but not for trading purposes. We were not party to any derivative-based arrangements at December 31, 2017. For a discussion of derivatives and hedging activities, see Note 13, Derivative Instruments and Hedging Activities, of the Notes to Consolidated Financial Statements in "Part II, Item 8. Financial Statements and Supplementary Data" of this Form 10-K.

At December 31, 2017, the interest rates on 100% of PCA's outstanding debt are fixed.

Item 8. *FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA*

INDEX TO FINANCIAL STATEMENTS

Packaging Corporation of America Consolidated Financial Statements

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the stockholders and board of directors
Packaging Corporation of America:

Opinion on the Consolidated Financial Statements

We have audited the accompanying consolidated balance sheets of Packaging Corporation of America and subsidiaries (the "Company") as of December 31, 2017 and 2016, the related consolidated statements of income and comprehensive income, changes in stockholders' equity, and cash flows for each of the years in the three-year period ended December 31, 2017, and the related notes (collectively, the "consolidated financial statements"). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2017 and 2016, and the results of its operations and its cash flows for each of the years in the three-year period ended December 31, 2017, in conformity with U.S. generally accepted accounting principles.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) ("PCAOB"), the Company's internal control over financial reporting as of December 31, 2017, based on criteria established in *Internal Control—Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission, and our report dated February 28, 2018 expressed an unqualified opinion on the effectiveness of the Company's internal control over financial reporting.

Basis for Opinion

These consolidated financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these consolidated financial statements based on our audits. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that our audits provide a reasonable basis for our opinion.

/s/ KPMG LLP

We have served as the Company's auditor since 2014.

Chicago, Illinois
February 28, 2018

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM ON INTERNAL CONTROL OVER FINANCIAL REPORTING

To the stockholders and board of directors
Packaging Corporation of America:

Opinion on Internal Control Over Financial Reporting

We have audited Packaging Corporation of America and subsidiaries' (the "Company") internal control over financial reporting as of December 31, 2017, based on criteria established in *Internal Control — Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission. In our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2017, based on criteria established in *Internal Control — Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) ("PCAOB"), the consolidated balance sheets of the Company as of December 31, 2017 and 2016, and the related consolidated statements of income and comprehensive income, changes in stockholders' equity, and cash flows for each of the years in the three-year period ended December 31, 2017, and related notes (collectively, the consolidated financial statements), and our report dated February 28, 2018 expressed an unqualified opinion on those consolidated financial statements.

The Company acquired Sacramento Container Corporation, Northern Sheets LLC and Central California Sheets LLC (collectively, Sacramento Container) during 2017, and management excluded from its assessment of the effectiveness of the Company's internal control over financial reporting as of December 31, 2017, Sacramento Container's internal control over financial reporting. As of and for the year ended December 31, 2017, Sacramento Container accounted for approximately 5% of the Company's consolidated total assets and 1% of consolidated net sales. Our audit of internal control over financial reporting of the Company also excluded an evaluation of the internal control over financial reporting of Sacramento Container.

Basis for Opinion

The Company's management is responsible 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 an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. 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 audit also included performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

Definition and Limitations of Internal Control Over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) 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.

/s/ KPMG LLP

Chicago, Illinois
February 28, 2018

Packaging Corporation of America

Consolidated Statements of Income and Comprehensive Income
(dollars in millions, except per-share data)

	Year Ended December 31,		
	2017	**2016**	**2015**
Statements of Income			
Net sales	$ 6,444.9	$ 5,779.0	$ 5,741.7
Cost of sales	(4,972.7)	(4,503.3)	(4,533.7)
Gross profit	1,472.2	1,275.7	1,208.0
Selling and administrative expenses	(522.6)	(471.1)	(451.3)
Other expense, net	(18.4)	(24.3)	(6.7)
Income from operations	931.2	780.3	750.0
Interest expense, net	(102.6)	(91.8)	(85.5)
Income before taxes	828.6	688.5	664.5
Provision for income taxes	(160.0)	(238.9)	(227.7)
Net income	$ 668.6	$ 449.6	$ 436.8
Net income per common share:			
Basic	$ 7.09	$ 4.76	$ 4.47
Diluted	$ 7.07	$ 4.75	$ 4.47
Dividends declared per common share	$ 2.52	$ 2.36	$ 2.20
Statements of Comprehensive Income:			
Net income	$ 668.6	$ 449.6	$ 436.8
Other comprehensive income (loss), net of tax:			
Foreign currency translation adjustment	$ (0.2)	$ —	$ 2.7
Reclassification adjustments to cash flow hedges included in net income, net of tax of $2.2 million, $2.2 million, and $2.2 million for 2017, 2016, and 2015, respectively	3.5	3.5	3.5
Amortization of pension and postretirement plans actuarial loss and prior service cost, net of tax of $4.9 million, $4.2 million, and $5.6 million for 2017, 2016, and 2015, respectively	8.2	6.7	8.8
Changes in unfunded employee benefit obligations, net of tax of $18.0 million, $15.7 million, and ($8.9) million for 2017, 2016, and 2015, respectively	(28.8)	(24.9)	14.0
Other comprehensive income (loss)	(17.3)	(14.7)	29.0
Comprehensive income	$ 651.3	$ 434.9	$ 465.8

See notes to consolidated financial statements.

Packaging Corporation of America

Consolidated Balance Sheets

(dollars and shares in millions, except per-share data)

	December 31	
	2017	2016
ASSETS		
Current assets:		
Cash and cash equivalents	$ 216.9	$ 239.3
Accounts receivable, net of allowance for doubtful accounts and customer deductions of $12.6 million and $10.1 million as of December 31, 2017 and 2016, respectively	830.7	689.2
Inventories	762.5	723.6
Prepaid expenses and other current assets	35.5	30.3
Federal and state income taxes receivable	69.5	13.9
Total current assets	1,915.1	1,696.3
Property, plant and equipment, net	2,924.9	2,895.7
Goodwill	883.2	737.9
Other intangible assets, net	410.0	367.1
Other long-term assets	64.3	80.0
Total assets	$6,197.5	$5,777.0
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Current maturities of long-term debt	$ 150.0	$ 25.8
Capital lease obligations	1.3	1.3
Accounts payable	402.9	323.8
Dividends payable	60.5	59.9
Accrued liabilities	203.2	201.2
Accrued interest	14.8	13.4
Total current liabilities	832.7	625.4
Long-term liabilities:		
Long-term debt	2,480.4	2,620.0
Capital lease obligations	19.0	20.3
Deferred income taxes	239.5	334.7
Compensation and benefits	372.5	357.2
Other long-term liabilities	70.8	59.6
Total long-term liabilities	3,182.2	3,391.8
Commitments and contingent liabilities		
Stockholders' equity:		
Common stock, par value $0.01 per share, 300.0 million shares authorized, 94.3 million and 94.2 million shares issued as of December 31, 2017 and 2016, respectively	0.9	0.9
Additional paid in capital	471.2	451.4
Retained earnings	1,867.4	1,447.1
Accumulated other comprehensive loss	(156.9)	(139.6)
Total stockholders' equity	2,182.6	1,759.8
Total liabilities and stockholders' equity	$6,197.5	$5,777.0

See notes to consolidated financial statements.

Packaging Corporation of America

Consolidated Statements of Cash Flows
(dollars in millions)

	Year Ended December 31		
	2017	**2016**	**2015**
Cash Flows from Operating Activities:			
Net income	$ 668.6	$ 449.6	$ 436.8
Adjustments to reconcile net income to net cash provided by operating activities:			
Depreciation, depletion, and amortization of intangibles	391.4	358.0	356.5
Amortization of deferred financing costs	10.0	7.8	7.8
Share-based compensation expense	20.6	19.7	18.2
Deferred income tax (benefit) provision	(84.5)	(4.0)	1.7
Net loss on impairment of assets	13.5	—	—
Pension and post retirement benefits expense, net of contributions	(20.4)	(30.5)	31.2
Other, net	3.0	1.4	(19.8)
Changes in operating assets and liabilities, net of acquisitions:			
(Increase) decrease in assets—			
Accounts receivable	(115.1)	(3.6)	9.5
Inventories	(21.0)	(25.7)	(11.9)
Prepaid expenses and other current assets	(5.2)	—	4.1
Increase (decrease) in liabilities—			
Accounts payable	41.0	16.6	(37.3)
Accrued liabilities	8.4	(3.2)	(15.5)
Federal and state income tax payable / receivable	(54.2)	20.8	(12.7)
Net cash provided by operating activities	856.1	806.9	768.6
Cash Flows from Investing Activities:			
Additions to property, plant, and equipment	(343.0)	(274.3)	(314.5)
Proceeds from sale of a business	—	—	23.0
Acquisitions of businesses, net of cash acquired	(273.8)	(485.4)	—
Additions to other long term assets	(7.8)	(10.4)	(12.3)
Proceeds from asset disposals	16.6	0.5	1.5
Other, net	(1.1)	—	4.2
Net cash used for investing activities	(609.1)	(769.6)	(298.1)
Cash Flows from Financing Activities:			
Proceeds from issuance of debt	997.8	385.0	—
Repayments of debt and capital lease obligations	(1,011.9)	(37.5)	(47.6)
Financing costs paid	(6.8)	(2.0)	—
Common stock dividends paid	(237.6)	(216.1)	(200.8)
Repurchases of common stock	—	(100.3)	(154.7)
Shares withheld to cover employee restricted stock taxes	(10.8)	(11.2)	(8.7)
Other, net	(0.1)	(0.1)	0.6
Net cash provided by (used for) financing activities	(269.4)	17.8	(411.2)
Net (decrease) increase in cash and cash equivalents	(22.4)	55.1	59.3
Cash and cash equivalents, beginning of year	239.3	184.2	124.9
Cash and cash equivalents, end of year	$ 216.9	$ 239.3	$ 184.2

See notes to consolidated financial statements.

Packaging Corporation of America

Consolidated Statements of Changes in Stockholders' Equity
(dollars in millions and shares in thousands)

	Common Stock		Additional Paid in Capital	Retained Earnings	Accumulated Other Comprehensive Loss	Total Stockholders' Equity
	Shares	Amount				
Balance at January 1, 2015	98,368	$ 1.0	$432.1	$1,242.2	$(153.9)	$1,521.4
Common stock repurchases and retirements	(2,326)	—	(15.6)	(139.1)	—	(154.7)
Common stock withheld and retired to cover taxes on vested stock awards	(131)	—	(0.8)	(7.9)	—	(8.7)
Common stock dividends declared	—	—	—	(214.7)	—	(214.7)
Restricted stock/performance unit grants and cancellations	218	—	6.0	—	—	6.0
Share-based compensation expense	—	—	18.2	—	—	18.2
Comprehensive income	—	—	—	436.8	29.0	465.8
Balance at December 31, 2015	96,129	$ 1.0	$439.9	$1,317.3	$(124.9)	$1,633.3
Common stock repurchases and retirements	(1,987)	$(0.1)	(13.1)	(87.1)	—	(100.3)
Common stock withheld and retired to cover taxes on vested stock awards	(172)	—	(1.1)	(10.1)	—	(11.2)
Common stock dividends declared	—	—	—	(222.6)	—	(222.6)
Restricted stock/performance unit grants and cancellations	243	—	5.7	—	—	5.7
Share-based compensation expense	—	—	19.7	—	—	19.7
Other	—	—	0.3	—	—	0.3
Comprehensive income	—	—	—	449.6	(14.7)	434.9
Balance at December 31, 2016	94,213	$ 0.9	$451.4	$1,447.1	$(139.6)	$1,759.8
Common stock withheld and retired to cover taxes on vested stock awards	(98)	—	(0.7)	(10.1)	—	(10.8)
Common stock dividends declared	—	—	—	(238.2)	—	(238.2)
Share-based compensation	235	—	20.6	—	—	20.6
Other	—	—	(0.1)	—	—	(0.1)
Comprehensive income	—	—	—	668.6	(17.3)	651.3
Balance at December 31, 2017	94,350	$ 0.9	$471.2	$1,867.4	$(156.9)	$2,182.6

See notes to consolidated financial statements.

Notes to Consolidated Financial Statements

1. Nature of Operations and Basis of Presentation

Packaging Corporation of America ("we," "us," "our," "PCA," or the "Company") was incorporated on January 25, 1999. In April 1999, PCA acquired the containerboard and corrugated packaging products business of Pactiv Corporation (Pactiv), formerly known as Tenneco Packaging, Inc., a wholly owned subsidiary of Tenneco Inc. In October 2013, PCA acquired Boise Inc. (Boise). After the acquisition of Boise, we became a large diverse manufacturer of both packaging and paper products. We are headquartered in Lake Forest, Illinois and we operate primarily in the United States. We have approximately 14,600 employees.

We report our businesses in three reportable segments: Packaging, Paper, and Corporate and Other. Our Packaging segment produces a wide variety of corrugated packaging products. The Paper segment manufactures and sells a range of papers, including communication-based papers, and pressure sensitive papers. During the third quarter of 2017, the Company announced that it will discontinue the production of uncoated free sheet and coated one-side grades at the Wallula, Washington mill in the second quarter of 2018 to begin the conversion of the No.3 machine to a 400,000 ton-per-year virgin kraft linerboard machine. Corporate and other includes support staff services and related assets and liabilities, transportation assets, and activity related to other ancillary support operations. For more information about our segments, see Note 17, Segment Information.

The consolidated financial statements include the accounts of PCA and its majority-owned subsidiaries after elimination of intercompany balances and transactions.

2. Summary of Significant Accounting Policies

Use of Estimates

The preparation of financial statements in conformity with accounting principles generally accepted in the United States of America requires management to make estimates and assumptions about future events. These estimates and the underlying assumptions affect the amounts of assets and liabilities reported, disclosures about contingent assets and liabilities, and reported amounts of revenues and expenses. These estimates and assumptions are based on management's best estimates and judgment. Management evaluates its estimates and assumptions on an ongoing basis using historical experience and other factors, including the current economic environment. We adjust such estimates and assumptions when facts and circumstances dictate. As future events and their effects cannot be determined with precision, actual results could differ significantly from these estimates. Changes in these estimates will be reflected in the consolidated financial statements in future periods.

Revenue Recognition

We recognize revenue when the following criteria are met: persuasive evidence of an agreement exists, the customer takes title and assumes risks and rewards of ownership or services have been rendered, our price to the buyer is fixed or determinable, and collectability is reasonably assured. The timing of revenue recognition is dependent on transfer of title, which is normally either on exit from our plants (i.e., shipping point) or on arrival at customer's location (i.e., destination point). Shipping and handling billings to a customer are included in net sales. Shipping and handling costs, such as freight to our customers' destinations, are included in cost of sales. We present taxes collected from customers and remitted to governmental authorities on a net basis in our Consolidated Statements of Income.

Planned Major Maintenance Costs

The Company accounts for its planned major maintenance activities in accordance with ASC 360, *Property, Plant, and Equipment*, using the deferral method. All maintenance costs incurred during the year are expensed in the year in which the maintenance activity occurs.

Share-Based Compensation

We recognize compensation expense for awards granted under the PCA long-term equity incentive plans based on the fair value on the grant date. We recognize the cost of the equity awards expected to vest over the period the awards vest. See Note 12, Share-Based Compensation, for more information.

Research and Development

Research and development costs are expensed as incurred. The amount charged to expense was $12.8 million, $13.3 million, and $13.1 million for the years ended December 31, 2017, 2016, and 2015, respectively.

Cash and Cash Equivalents

Cash and cash equivalents include all cash balances and highly liquid investments with a stated maturity of three months or less. Cash equivalents are stated at cost, which approximates market. Cash and cash equivalents totaled $216.9 million and $239.3 million at December 31, 2017 and 2016, respectively, which included cash equivalents of $160.2 million and $178.4 million, respectively. At December 31, 2017 and 2016, we had $1.8 million and $3.4 million, respectively, of cash at our operations outside the United States.

Trade Accounts Receivable, Allowance for Doubtful Accounts, and Customer Deductions

Trade accounts receivable are stated at the amount we expect to collect. The collectability of our accounts receivable is based upon a combination of factors. In circumstances where a specific customer is unable to meet its financial obligations to PCA (e.g., bankruptcy filings, substantial downgrading of credit sources), a specific reserve for bad debts is recorded against amounts due to the Company to reduce the net recorded receivable to the amount the Company reasonably believes will be collected. For all other customers, reserves for bad debts are recognized based on historical collection experience. If collection experience deteriorates (i.e., higher than expected defaults or an unexpected material adverse change in a major customer's ability to meet its financial obligations to the Company), the estimate of the recoverability of amounts due could be reduced by a material amount. We periodically review our allowance for doubtful accounts and adjustments to the valuation allowance are recorded as income or expense. Trade accounts receivable balances that remain outstanding after we have used reasonable collection efforts are written off through a charge to the valuation allowance and a credit to accounts receivable. At December 31, 2017 and 2016, the allowance for doubtful accounts was $4.2 million and $3.8 million, respectively.

The customer deductions reserve represents the estimated amount required for customer returns, allowances, and earned discounts. Based on the Company's experience, customer returns, allowances, and earned discounts have averaged approximately 1% of gross selling price. Accordingly, PCA reserves 1% of its open customer accounts receivable balance for these items. The reserves for customer deductions of $8.4 million and $6.3 million at December 31, 2017 and 2016, respectively, are also included as a reduction of the accounts receivable balance.

Derivative Instruments and Hedging Activities

The Company records its derivatives, if any, in accordance with ASC 815, *Derivatives and Hedging*. The guidance requires the Company to recognize derivative instruments as either assets or liabilities on the balance sheet at fair value. The accounting for changes in the fair value of a derivative depends on the intended use and designation of the derivative instrument. For a derivative designated as a fair value hedge, the gain or loss on the derivative is recognized in earnings in the period of change at fair value together with the offsetting gain or loss on the hedged item. For a derivative instrument designated as a cash flow hedge, the effective portion of the derivative's gain or loss is initially reported as a component of accumulated other comprehensive income (loss)

(AOCI) and is subsequently recognized in earnings when the hedged exposure affects earnings. The ineffective portion of the gain or loss is recognized in earnings. We were not party to any derivative-based arrangements at December 31, 2017 and 2016.

Fair Value Measurements

PCA measures the fair value of its financial instruments in accordance with ASC 820, *Fair Value Measurements and Disclosures*. The guidance defines fair value as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants. It is determined based on assumptions that market participants would use in pricing an asset or liability. As a basis for considering such assumptions, ASC 820 establishes the following hierarchy that prioritizes the inputs to valuation methodologies used to measure fair value:

Level 1 — Valuations based on quoted prices for identical assets and liabilities in active markets.

Level 2 — Valuations based on observable inputs other than quoted prices included in Level 1, such as quoted prices for similar assets and liabilities in active markets, quoted prices for identical or similar assets and liabilities in markets that are not active, or other inputs that are observable or can be corroborated by observable market data.

Level 3 — Valuations based on unobservable inputs in which there is little or no market data, which require the reporting entity to develop its own assumptions.

Financial instruments measured at fair value on a recurring basis include the fair value of our pension and postretirement benefit assets and liabilities. See Note 10, Employee Benefit Plans and Other Postretirement Benefits for more information. Other assets and liabilities measured and recognized at fair value on a nonrecurring basis include assets acquired and liabilities assumed in acquisitions and our asset retirement obligations. Given the nature of these assets and liabilities, evaluating their fair value from the perspective of a market participant is inherently complex. Assumptions and estimates about future values can be affected by a variety of internal and external factors. Changes in these factors may require us to revise our estimates and could require us to retroactively adjust provisional amounts that we recorded for the fair values of assets acquired and liabilities assumed in connection with business combinations. These adjustments could have a material effect on our financial condition and results of operations. See Note 3, Acquisitions and Dispositions, and Note 11, Asset Retirement Obligations, for more information.

Inventory Valuation

We value our raw materials, work in process, and finished goods inventories using lower of cost, as determined by the average cost method, or market. Supplies and materials are valued at the first-in, first-out (FIFO) or average cost methods.

The components of inventories were as follows (dollars in millions):

	December 31	
	2017	2016
Raw materials	$279.8	$271.9
Work in process	12.6	12.9
Finished goods	217.0	206.5
Supplies and materials	253.1	232.3
Inventories	$762.5	$723.6

Property, Plant, and Equipment

Property, plant, and equipment are recorded at cost. Cost includes expenditures for major improvements and replacements and the amount of interest cost associated with significant capital additions. Repairs and maintenance costs are expensed as incurred. When property and equipment are retired, sold, or otherwise disposed of, the asset's carrying amount and related accumulated depreciation are removed from the accounts and any gain or loss is included in "Net income" in our Consolidated Statements of Income.

Property, plant, and equipment consisted of the following (dollars in millions):

	December 31	
	2017	2016
Land and land improvements	$ 156.0	$ 149.7
Buildings	729.8	717.1
Machinery and equipment	5,162.5	4,951.4
Construction in progress	194.5	125.4
Other	68.4	66.7
Property, plant and equipment, at cost	6,311.2	6,010.3
Less accumulated depreciation	(3,386.3)	(3,114.6)
Property, plant and equipment, net	$ 2,924.9	$ 2,895.7

The amount of interest capitalized from construction in progress was $2.5 million, $2.5 million, and $2.0 million for the years ended December 31, 2017, 2016, and 2015, respectively.

Depreciation is computed on the straight-line basis over the estimated useful lives of the related assets. Assets under capital leases are depreciated on the straight-line method over the term of the lease or the useful life, if shorter. The following lives are used for the various categories of assets:

Buildings and land improvements	5 to 40 years
Machinery and equipment	3 to 25 years
Trucks and automobiles	3 to 10 years
Furniture and fixtures	3 to 20 years
Computers and hardware	3 to 10 years
Leasehold improvements	Period of the lease or useful life, if shorter

The amount of depreciation expense was $347.8 million, $324.1 million, and $323.0 million for the years ended December 31, 2017, 2016, and 2015, respectively. In 2017, we recognized incremental depreciation expense of $10.5 million, primarily related to the announced second quarter 2018 discontinuation of uncoated free sheet and coated one-side grades at the Wallula, Washington mill associated with the conversion of the No. 3 paper machine to a high-performance 100% virgin kraft linerboard machine. In 2016, we recognized incremental depreciation expense of $2.9 million, primarily related to facilities closure costs and the Wallula, Washington mill restructuring due to the discontinuation of market pulp production. During the year ended December 31, 2015, we recognized $9.0 million of incremental depreciation expense primarily related to shortening the useful lives of assets related to the restructuring at the DeRidder, Louisiana, mill.

Pursuant to the terms of an industrial revenue bond, title to certain property, plant, and equipment was transferred to a municipal development authority in 2009 in order to receive a property tax abatement. The title of these assets will revert back to PCA upon retirement or cancellation of the bond. The assets are included in the consolidated balance sheets under the caption "Property, plant, and equipment, net" as all risks and rewards remain with the Company.

Leases

We assess lease classification as either capital or operating at lease inception or upon modification. We lease some of our locations, as well as other property and equipment, under operating leases. For purposes of determining straight-line rent expense, the lease term is calculated from the date of possession of the facility, including any periods of free rent and any renewal option periods that are reasonably assured of being exercised.

Long-Lived Asset Impairment

Long-lived assets other than goodwill and other intangibles are reviewed for impairment in accordance with provisions of ASC 360, *Property, Plant and Equipment*. In the event that facts and circumstances indicate that the carrying amount of any long-lived assets may be impaired, an evaluation of recoverability is performed. If an evaluation is required, the estimated future undiscounted cash flows associated with the asset (or group of assets) is compared to the assets (or group of assets) carrying amount to determine if a write-down to fair value is required.

Goodwill and Intangible Assets

The Company has capitalized certain intangible assets, primarily goodwill, customer relationships, and trademarks and trade names, based on their estimated fair value at the date of acquisition. Amortization is provided for customer relationships on a straight-line basis over periods ranging from ten to 40 years, and trademarks and trade names over periods ranging from two to 20 years.

Goodwill, which amounted to $883.2 million and $737.9 million for the years ended December 31, 2017 and 2016, respectively, is not amortized but is subject to an annual impairment test in accordance with ASC 350, *Intangibles — Goodwill and Other*. We test goodwill for impairment annually in the fourth quarter or sooner if events or changes in circumstances indicate that the carrying value of the asset may exceed fair value. Additionally, we evaluate the remaining useful lives of our finite-lived purchased intangible assets to determine whether any adjustments to the useful lives are necessary. The Company concluded that none of the goodwill or intangible assets were impaired in the 2017, 2016, and 2015 annual impairment tests. See Note 7, Goodwill and Intangible Assets for additional information.

Pension and Postretirement Benefits

Several estimates and assumptions are required to record pension costs and liabilities, including discount rate, return on assets, and longevity and service lives of employees. We review and update these assumptions annually unless a plan curtailment or other event occurs, requiring we update the estimates on an interim basis. While we believe the assumptions used to measure our pension and postretirement benefit obligations are reasonable, differences in actual experience or changes in assumptions may materially affect our pension and postretirement benefit obligations and future expense. See Note 10, Employee Benefit Plans and Other Postretirement Benefits, for additional information.

For postretirement health care plan accounting, the Company reviews external data and its own historical trends for health care costs to determine the health care cost trend rate assumption.

Environmental Matters

Environmental expenditures that extend the life of the related property or mitigate or prevent future environmental contamination are capitalized. Liabilities are recorded for environmental contingencies when such costs are probable and reasonably estimable. These liabilities are adjusted as further information develops or circumstances change. Environmental expenditures related to existing conditions resulting from past or current operations from which no current or future benefit is discernible are expensed as incurred.

Asset Retirement Obligations

The Company accounts for its retirement obligations related predominantly to landfill closure, wastewater treatment pond dredging, closed-site monitoring costs, and certain leasehold improvements under ASC 410, *Asset Retirement and Environmental Obligations*, which requires recognition of legal obligations associated with the retirement of long-lived assets whether these assets are owned or leased. These legal obligations are recognized at fair value at the time that the obligations are incurred. When we record the liability, we capitalize the cost by increasing the carrying amount of the related long-lived asset, which is amortized to expense over the useful life of the asset. See Note 11, Asset Retirement Obligations, for additional information.

Deferred Financing Costs

PCA has capitalized certain costs related to obtaining its financing. These costs are amortized to interest expense using the effective interest rate method over the terms of the related financing, which range from five to ten years. At December 31, 2017 and 2016 deferred financing costs were $15.3 million and $12.4 million, respectively, and were recorded in "Long-Term Debt" on our Consolidated Balance Sheets.

Cutting Rights and Fiber Farms

We lease the cutting rights to approximately 75,000 acres of timberland, and we lease 9,000 acres of land where we operate fiber farms as a source of future fiber supply. For our cutting rights and fiber farms, we capitalize the annual lease payments and reforestation costs associated with these leases. Costs are recorded as depletion when the timber or fiber is harvested and used in operations or sold to customers. Capitalized long-term lease costs for our cutting rights and fiber farms, primarily recorded in "Other long-term assets" on our Consolidated Balance Sheets, were $31.5 million and $43.9 million as of December 31, 2017 and 2016, respectively. The amount of depletion expense was $5.2 million, $4.7 million, and $7.0 million for the years ended December 31, 2017, 2016, and 2015, respectively. Additionally, in conjunction with the announced conversion of the No. 3 machine at the Wallula mill to kraft linerboard, management performed a recoverability test on associated fiber farms and deemed the asset group to not be fully recoverable. As a result of the recoverability calculation on the fiber farm asset group, the Company recorded an impairment loss of $13.5 million in the third quarter of 2017.

Deferred Software Costs

PCA capitalizes costs related to the purchase and development of software, which is used in its business operations. The costs attributable to these software systems are amortized over their estimated useful lives based on various factors such as the effects of obsolescence, technology, and other economic factors. Net capitalized software costs recorded in "Other long-term assets" on our Consolidated Balance Sheets were $3.3 million and $4.5 million for the years ended December 31, 2017 and 2016, respectively. Software amortization expense was $2.3 million, $2.5 million, and $3.0 million for the years ended December 31, 2017, 2016, and 2015, respectively.

Income Taxes

PCA utilizes the liability method of accounting for income taxes whereby it recognizes deferred tax assets and liabilities for the future tax consequences of temporary differences between the tax basis of assets and liabilities and their reported amounts in the financial statements. Deferred tax assets will be reduced by a valuation allowance if, based upon management's estimates, it is more likely than not that a portion of the deferred tax assets will not be realized in a future period. The estimates utilized in the recognition of deferred tax assets are subject to revision in future periods based on new facts or circumstances. PCA's practice is to recognize interest and penalties related to unrecognized tax benefits in income tax expense.

Trade Agreements

PCA regularly trades containerboard with other manufacturers primarily to reduce shipping costs. These agreements are entered into with other producers on an annual basis, pursuant to which both parties agree to ship an identical number of tons of containerboard to each other within the agreement period. These agreements lower transportation costs by allowing each party's containerboard mills to ship containerboard to the other party's closer corrugated products plant. PCA tracks each shipment to ensure that the other party's shipments to PCA match PCA's shipments to the other party during the agreement period. Such transfers are possible because containerboard is a commodity product with no distinguishing product characteristics. These transactions are accounted for at carrying value, and revenue is not recorded as the transactions do not represent the culmination of an earnings process. The transactions are recorded into inventory accounts, and no sale or income is recorded until such inventory is converted to a finished product and sold to an end-use customer.

Business Combinations

The Company accounts for acquisitions under ASC 805, *Business Combinations*, which requires separate recognition of assets acquired and liabilities assumed from goodwill, at the acquisition date fair values. Goodwill as of the acquisition date is measured as the excess of consideration transferred over the net of the acquisition date fair values of the assets acquired and liabilities assumed. During the measurement period, which may be up to one year from the acquisition date, the Company records adjustments to the assets acquired and liabilities assumed with the corresponding offset to goodwill. Upon the conclusion of the measurement period or final determination of the values of assets acquired or liabilities assumed, whichever comes first, any subsequent adjustments are recorded to the consolidated financial statements. In January 2017, the FASB issued ASU 2017-01, *Clarifying the Definition of a Business*, which adds guidance to assist entities with evaluating whether transactions should be accounted for as acquisitions (disposals) of assets or businesses. The guidance of ASU 2017-01 is effective for fiscal years beginning after December 15, 2017.

New and Recently Adopted Accounting Standards

Effective January 1, 2018, the Company will adopt Financial Accounting Standards Board ("FASB") ASU 2014-09 (Topic 606): *Revenue from Contracts with Customers*. This ASU amends the guidance for revenue recognition to replace numerous industry-specific requirements. The ASU implements a five-step process for customer contract revenue recognition that focuses on transfer of control as opposed to transfer of risk and rewards. The amendment also requires enhanced disclosures regarding the nature, amount, timing and uncertainty of revenue and cash flows from contracts with customers.

The Company will adopt the standard utilizing the modified retrospective method, in which case the cumulative effect of applying the standard is recognized at the date of initial application on January 1, 2018.

We established a transition team to analyze the impact of the standard on our revenue contracts by reviewing our current accounting policies and practices and identifying potential differences that would result from applying the requirements of the new standard. Specifically, we identified significant revenue streams within each of our reportable segments and reviewed representative contracts to identify corresponding purchase obligations, variable consideration, acquisition costs and fulfillment costs. In addition, we identified and assessed appropriate changes to our business processes, systems and controls to support revenue recognition and disclosures under the new standard. This team has reported its findings and progress of the project to management and the Audit Committee on a periodic basis.

During our assessment, the Company considered whether the adoption would require a transition from point-in-time revenue recognition to an over-time approach for products produced by the Company without an alternative use, which would result in acceleration of revenue. The Company determined that based on the express terms included in the majority of its contracts, and the Company's standard terms and conditions, an enforceable right of payment that includes a reasonable profit throughout the duration of the contract did not exist. Therefore, the Company remains at a point-in-time approach and records revenue at the point control transfers to the customer.

While the adoption of ASU 2014-09 on January 1, 2018 will not have a material effect on the Company's financial position or results of operations, the new standard requires additional disclosures around revenue recognition in the notes to the financial statements, which the Company will comply with beginning in 2018. Additionally, the following adjustment and reclassification of certain costs will be made in 2018:

a. The Company ships a portion of its products to customers under a consignment agreement. These products do not have an alternative use and, under the new standard, revenue associated with these products will be required to be recognized earlier than under prior revenue recognition standards. Utilizing the modified retrospective method, the cumulative impact of adopting the new standard will be an increase of approximately $1.6 million, net of tax, to opening retained earnings as of January 1, 2018.

b. The new revenue standard also provides additional clarity concerning contract fulfillment costs. As a result, certain warehousing costs are considered contract fulfillment costs and, upon adoption of ASU 2014-09 are classified as Cost of Sales instead of Selling and General and Administrative expenses beginning January 1, 2018. There will be no impact on the Company's income from operations and no resulting cumulative adjustment to beginning retained earnings upon adoption.

Effective January 1, 2017, the Company adopted ASU 2016-09 (Topic 718): *Improvements to Employee Share-Based Payment Accounting*, which is intended to improve the accounting for share-based payment transactions as part of the FASB's simplification initiative. This ASU requires all excess tax benefits and deficiencies from share-based payment awards (including tax benefits of dividends on share-based payment awards) to be recognized in the income statement when the awards vest or are settled. Excess tax benefits and deficiencies were previously recognized in additional paid in capital in our consolidated balance sheet. Additionally, the guidance requires these excess tax benefits and deficiencies to be presented as an operating activity in the statement of cash flows rather than as a financing activity. As a result of this adoption, the Company recorded $6.8 million of excess tax benefits from share-based compensation as an income tax benefit in the income statement for the year ended December 31, 2017. The Company also retrospectively reclassified excess tax benefits and deficiencies as an operating activity rather than as a financing activity on its consolidated statements of cash flows. The Company will continue to estimate forfeitures at the time of the grant. The Company had no unrecognized excess tax benefits from prior periods to record upon the adoption of this ASU, and all other adopted amendments did not have a material impact on the Company's financial position, results of operations and cash flow.

Effective January 1, 2017, the Company prospectively adopted ASU 2015-11 (Topic 330): *Simplifying the Measurement of Inventory*, as part of its simplification initiative. Under the ASU, inventory is measured at the "lower of cost and net realizable value" and other options that currently exist for market value will be eliminated. ASU 2015-11 defines net realizable value as the estimated selling prices in the ordinary course of business, less reasonably predictable costs of completion, disposal and transportation. No other changes were made to the current guidance on inventory measurement. The adoption of this guidance did not have a material impact on the Company's financial position, results of operations and cash flow.

In January 2017, the FASB issued ASU 2017-04 (Topic 350): *Intangibles—Goodwill and Other—Simplifying the Test for Goodwill Impairment*, eliminating the requirement to determine the fair value of individual assets and liabilities of a reporting unit to measure goodwill impairment. Under ASU 2017-04, goodwill impairment testing will be performed by comparing the fair value of the reporting unit with its carrying amount and recognizing an impairment charge for the amount by which the carrying amount exceeds the reporting unit's fair value. This ASU is effective for annual and interim goodwill impairment tests in fiscal years beginning after December 15, 2019, and early adoption is permitted. The Company adopted this ASU prospectively beginning with its annual goodwill impairment test in the fourth quarter of 2017.

In March 2017, the FASB issued ASU 2017-07, *Compensation: Improving the Presentation of Net Periodic Pension Cost and Net Periodic Postretirement Benefit Cost.* The guidance in this update requires that an employer disaggregate the service cost component from the other components of net benefit cost. Non-service cost components of net periodic pension cost are required to be presented in the income statement separately from the service cost component and outside the subtotal of operating income. The amendments in the update also allow only the service cost component to be eligible for capitalization for internally developed capital projects. The adoption of this accounting guidance will impact the presentation of our income from operations (used to measure the earnings performance of the Company's business segments), which will be offset by a corresponding change in non-operating pension expense to reflect the impact of presenting the non-service cost component of net periodic pension expense outside of operating income. The amendments in this update are effective for annual periods beginning after December 15, 2017 (January 1, 2018 for us), including interim periods within those annual periods. Early adoption is permitted. The amendments should be applied retrospectively for the income statement presentations and prospectively for the capitalization of service costs. While the adoption of this standard will impact the results of operations, the Company does not anticipate an impact on its financial position or cash flows.

In May 2017, the FASB issued ASU 2017-09 *Compensation—Stock Compensation* (Topic 718): *Scope of Modification Accounting*, to clarify which changes to the terms or conditions of a share-based payment award require an entity to apply modification accounting in Topic 718. This ASU is effective for annual periods beginning after December 15, 2017. This ASU will be applied prospectively when changes to the terms or conditions of a share-based payment award occur.

In January 2017, the FASB issued ASU 2017-01 (Topic 805): *Clarifying the Definition of a Business*, which amends the guidance in ASC 805, "Business Combinations". The ASU changes the definition of a business to assist entities with evaluating when a set of transferred assets and activities is a business. Under the new guidance, an entity first determines whether substantially all of the fair value of the gross assets acquired is concentrated in a single identifiable asset or a group of similar identifiable assets. If this threshold is met, the set is not a business. If it is not met, the entity then evaluates whether the set meets the requirements that a business include, at a minimum, an input and a substantive process that together significantly contribute to the ability to create outputs. The ASU defines an output as "the result of inputs and processes applied to those inputs that provide goods or services to customers, investment income (such as dividends or interest), or other revenues." The ASU is effective for annual reporting periods beginning after December 15, 2017, including interim periods within those annual periods, and early adoption is permitted. The ASU will be applied prospectively to any transactions subsequent to adoption.

In August 2016, the FASB issued ASU 2016-15 (Topic 230), *Statement of Cash Flows: Classification of Certain Cash Receipts and Cash Payments*. This ASU adds or clarifies guidance on the classification of certain cash receipts and payments in the statement of cash flows. It is effective for annual periods beginning after December 15, 2017, and interim periods within those annual periods, with early adoption permitted. The Company does not expect this ASU to have a material impact on the Company's financial condition, results of operations, or cash flows.

In February 2016, the FASB issued ASU 2016-02 (Topic 842): *Leases*. This ASU amends a number of aspects of lease accounting, including requiring lessees to recognize operating leases with a term greater than one year on their balance sheet as a right-of-use asset and corresponding lease liability, measured at the present value of the lease payments. This ASU is effective for fiscal years beginning after December 15, 2018, including interim periods within those fiscal years, and early adoption is permitted. This ASU is required to be adopted using a modified retrospective approach. We currently plan to adopt this ASU on January 1, 2019 and expect to recognize a liability and corresponding asset associated with in-scope operating leases, but are still in the process of determining the effects on our financial statements and the processes required to account for leasing activity on an ongoing basis.

There were no other accounting standards recently issued that had or are expected to have a material impact on our financial position or results of operations.

3. Acquisitions

Sacramento Container Acquisition

On October 2, 2017, PCA acquired substantially all of the assets of Sacramento Container Corporation, and 100% of the membership interests of Northern Sheets, LLC and Central California Sheets, LLC (collectively referred to as "Sacramento Container") for a purchase price of $265 million. Funding for the $265 million purchase price came from available cash on hand. Assets acquired include full-line corrugated products and sheet feeder operations in both McClellan, California and Kingsburg, California. Sacramento Container provides packaging solutions to customers serving portions of California's strong agricultural market. Sacramento Container's financial results are included in the Packaging segment from the date of acquisition. For the period ended December 31, 2017, Sacramento Container accounted for $58.5 million, or 1%, of the Company's net sales. Had the acquisition occurred at the beginning of 2016, the Company's net sales would have been $6.6 billion and $6.0 billion for 2017 and 2016, respectively.

The Company accounted for the Sacramento Container acquisition using the acquisition method of accounting in accordance with ASC 805, *Business Combinations*. The total purchase price has been preliminarily allocated to tangible and intangible assets acquired and liabilities assumed based on respective fair values, as follows (dollars in millions):

	Initial Allocation	Adjustments	Revised Allocation
Goodwill	$151.1	$ —	$151.1
Other intangible assets	72.6	—	72.6
Property, plant and equipment	26.7	—	26.7
Other net assets	14.6	8.8	23.4
Net assets acquired	$265.0	$8.8	$273.8

In October of 2017, we increased the purchase price by $8.8 million as a result of a working capital adjustment paid to the seller. We recorded the adjustment as an $8.8 million increase to other net assets acquired. The purchase price above is preliminary and is subject to the finalization of various valuations and assessments, primarily related to property, plant, and equipment and intangible assets. Our current estimates and assumptions may change as more information becomes available. We expect to finalize the valuation within the 12-month period following the acquisition date.

Goodwill is calculated as the excess of the purchase price over the fair value of the net assets acquired. Among the factors that contributed to the recognition of goodwill were Sacramento Container's commitment to continuous improvement and regional synergies, as well as the expected increases in PCA's containerboard integration levels. Goodwill is deductible for tax purposes.

Other intangible assets, primarily customer relationships, were assigned an estimated weighted average useful life of 9.7 years.

Property, plant and equipment were assigned estimated useful lives ranging from one to 13 years.

Columbus Container Acquisition

On November 30, 2016, PCA acquired substantially all of the assets of Columbus Container, Inc., an independent corrugated products producer with one corrugated products production facility and five warehousing facilities, for a purchase price of $99.7 million, net of cash acquired. We paid the purchase price with available cash on hand. Columbus Container is a full-service provider of corrugated packaging products utilizing state-of-the-art technologies and design centers to provide customers a solution for nearly any packaging need. Columbus Container's financial results are included in the Packaging segment from the date of acquisition.

The Company accounted for the Columbus Container acquisition using the acquisition method of accounting in accordance with ASC 805, *Business Combinations*. The total purchase price has been allocated to tangible and intangible assets acquired and liabilities assumed based on respective fair values, as follows (dollars in millions):

	12/31/16 Allocation	Adjustments	Revised Allocation
Goodwill	$36.6	$(4.7)	$ 31.9
Other intangible assets	26.3	6.0	32.3
Property, plant and equipment	27.2	1.0	28.2
Other net assets	9.6	(0.1)	9.5
Net assets acquired	$99.7	$ 2.2	$101.9

During the third quarter of 2017, we increased the purchase price by $2.2 million as a result of a working capital adjustment paid to the seller. We recorded the adjustment as a $2.2 million increase to goodwill.

Goodwill is calculated as the excess of the purchase price over the fair value of the net assets acquired. Among the factors that contributed to the recognition of goodwill were Columbus Container's commitment to continuous improvement and innovation in their operations, as well as the expected increases in PCA's containerboard integration levels. Goodwill is deductible for tax purposes.

Other intangible assets, primarily customer relationships, were assigned an estimated weighted average useful life of 14.1 years.

Property, plant and equipment were assigned estimated useful lives ranging from one to 32 years.

TimBar Acquisition

On August 29, 2016, PCA acquired substantially all of the assets of TimBar Corporation ("TimBar"), a large independent corrugated products producer with six corrugated products production facilities, for a purchase price of $385.6 million, net of cash acquired. We financed the acquisition with a new $385.0 million five-year term loan facility. TimBar provides solutions to customers in the higher margin retail, industrial packaging and display and fulfillment markets with a focus on multi-color graphics and technical innovation. TimBar's financial results are included in the Packaging segment from the date of acquisition.

The Company accounted for the TimBar acquisition using the acquisition method of accounting in accordance with ASC 805, *Business Combinations*. The total purchase price has been allocated to tangible and intangible assets acquired and liabilities assumed based on respective fair values, as follows (dollars in millions):

	12/31/16 Allocation	Adjustments	Revised Allocation
Goodwill	$157.3	$(1.1)	$156.2
Other intangible assets	94.4		94.4
Property, plant and equipment	95.3		95.3
Other net assets	38.6		38.6
Net assets acquired	$385.6	$(1.1)	$384.5

During the first quarter of 2017, we received $1.1 million from the seller related to a working capital adjustment. We recorded the adjustment as a decrease to goodwill which lowered the purchase price to $384.5 million.

Goodwill is calculated as the excess of the purchase price over the fair value of the net assets acquired. Among the factors that contributed to the recognition of goodwill were TimBar's commitment to continuous improvement and innovation in their operations, as well as the expected increases in PCA's containerboard integration levels. Goodwill is deductible for tax purposes.

Other intangible assets, primarily customer relationships, were assigned an estimated weighted average useful life of 14.2 years.

Property, plant and equipment were assigned estimated useful lives ranging from two to 24 years.

4. Earnings Per Share

The following table sets forth the computation of basic and diluted income per common share for the periods presented (dollars and shares in millions, except per share data).

	Year Ended December 31		
	2017	2016	2015
Numerator:			
Net income	$668.6	$449.6	$436.8
Less: distributed and undistributed earnings allocated to participating securities	(5.6)	(4.4)	(5.2)
Net income attributable to common stockholders	$663.0	$445.2	$431.6
Denominator:			
Weighted average common shares outstanding	93.5	93.5	96.6
Effect of dilutive securities	0.2	0.2	0.1
Diluted common shares outstanding	93.7	93.7	96.7
Basic income per common share	$ 7.09	$ 4.76	$ 4.47
Diluted income per common share	$ 7.07	$ 4.75	$ 4.47

5. Other Expense, Net

The components of other income (expense), net, were as follows (dollars in millions)

	Year Ended December 31,		
	2017	2016	2015
Wallula mill restructuring(a)	$(23.1)	$ —	$ —
Asset disposals and write-offs	(10.5)	(11.9)	(14.0)
Acquisition and integration related costs(b)(c)(d)	(0.8)	(3.3)	(12.9)
Expiration of timberland repurchase option(e)	2.0	—	—
Hexacomb working capital adjustment(f)	2.3	—	—
Facilities closure and other costs(g)	5.9	(10.3)	—
DeRidder mill incident(h)	9.7	—	—
Ceased production of market pulp at Wallula(i)	—	(0.6)	—
DeRidder restructuring(j)	—	—	7.1
Sale of St. Helens Paper Mill Site(k)	—	—	6.7
Refundable state tax credit(l)	—	—	3.6
Other	(3.9)	1.8	2.8
Total	$(18.4)	$(24.3)	$ (6.7)

(a) Includes $23.1 million of charges related to our determination to discontinue production of uncoated free sheet and coated one-side grades at the Wallula, Washington mill in the second quarter of 2018 and convert the No. 3 paper machine to a high-performance 100% virgin kraft linerboard machine.

(b) For 2017, includes charges related to the Sacramento Container Corporation acquisition and integration costs related to other recent acquisitions.
(c) For 2016, includes charges related to the acquisition and integration of TimBar Corporation.
(d) For 2015, includes Boise acquisition integration-related and other costs, which primarily relate to severance, retention, travel, and professional fees.
(e) Includes a gain related to the expiration of a repurchase option corresponding to timberland previously sold.
(f) Includes income related to a working capital adjustment from the April 2015 sale of our Hexacomb corrugated manufacturing operations in Europe and Mexico.
(g) For 2017, includes income primarily related to the sale of land corresponding to the closure of a corrugated products facility, partially offset by closure costs related to corrugated products facilities, a paper administration facility, a corporate administration facility, and a lump sum settlement of a multiemployer pension plan withdrawal liability for one of our corrugated products facilities. For 2016, includes expenses related to the closure of corrugated products facilities and a paper administration facility and a lump sum settlement of a multiemployer pension plan withdrawal liability for one of our corrugated products facilities.
(h) Includes the property damage and business interruption insurance recoveries and corresponding costs related to the February 2017 explosion at our DeRidder, Louisiana mill.
(i) Includes costs related to ceased softwood market pulp operations at our Wallula, Washington mill and the permanent shutdown of the No. 1 machine.
(j) Includes $7.1 million of income from vendor settlements related to our restructuring activities at our DeRidder, Louisiana mill.
(k) Includes a gain related to the sale of the remaining land, buildings, and equipment at our paper mill site in St. Helens, Oregon where we ceased paper production in December 2012.
(l) Includes a tax credit from the State of Louisiana related to capital investment and the jobs retained at the DeRidder, Louisiana mill.

6. Income Taxes

On December 22, 2017, the President signed into law H.R.1 (P.L. 115-97), originally known as the "Tax Cuts and Jobs Act" (the "Tax Act"). The Tax Act significantly revises the U.S. tax code by, among other items, reducing the federal corporate tax rate from 35% to 21%, providing for the full expensing of certain depreciable property, eliminating the corporate alternative minimum tax, limiting the deductibility of interest expense, further limiting the deductibility of certain executive compensation, limiting the use of net operating loss carryforwards created in tax years beginning after December 31, 2017, and implementing a territorial tax system imposing a deemed repatriation transition tax ("Transition Tax") on earnings of foreign subsidiaries.

Generally accepted accounting principles require companies to record the impact of the Tax Act in their financial statements for the period during which the Tax Act becomes law, even if provisions of the Tax Act become effective at a future date. The SEC staff recently issued Staff Accounting Bulletin ("SAB") 118, Income Tax Accounting Implications of the Tax Cuts and Jobs Act, which provides guidance on accounting for the effects and includes a measurement period that ends when a company has obtained, prepared and analyzed the information necessary to finalize its accounting of the Tax Act which cannot extend beyond one year. In accordance with SAB 118, a company must reflect the income tax effects of those aspects of the Tax Act for which the accounting under ASC 740, Income Taxes, is complete. To the extent that a company's accounting for certain income tax effects of the Tax Act is incomplete, but it is able to determine a reasonable estimate, it must record a provisional estimate in the financial statements. If a company cannot determine a provisional estimate to be included in the financial statements, it should continue to apply ASC 740 on the basis of the provisions of the tax laws that were in effect immediately before the enactment of the Tax Act.

Based on currently available information, the Tax Act resulted in a one-time total net tax benefit of $122.1 million in the period ending December 31, 2017, primarily related to the re-measurement of our U.S. deferred tax assets and liabilities to the lower enacted corporate tax rate for $128.0 million offset by a reduction in the domestic manufacturers deduction for $5.1 million, the Transition Tax and other current year tax reform impacts of $0.8 million.

Our accounting for the following elements of the Tax Act are not yet complete; however, we were able to make reasonable estimates of certain effects and, therefore, recorded provisional adjustments. These estimates may be affected by additional analysis and are subject to change due to a variety of factors, including, among others: (i) management's further assessment of the Tax Act and related regulatory guidance; (ii) further guidance that may be issued by the Treasury, Financial Accounting Standards Board, Securities and Exchange Commission, Internal Revenue Service, or state, local or other taxing authorities; and (iii) actions the Company may take as a result of the Tax Act.

Re-measurement of Net Deferred Tax Liability: As a result of the Company's net deferred tax liability position, we have recorded a one-time provisional income tax benefit of $128.0 million for the year ended December 31, 2017, as a result of the reduction in the federal corporate tax rate.

Cost Recovery: While we have not yet completed a full analysis of our 2017 capital expenditures that could qualify for immediate expensing, we have recorded a provisional benefit for bonus depreciation that resulted in a decrease of approximately $24.6 million to our current income taxes payable and a corresponding increase in our deferred tax liabilities (after considering the effects of the reduction in the federal corporate tax rate).

Deemed Repatriation Transition Tax: The Transition Tax is a tax on previously untaxed accumulated and current earnings and profits ("E&P") of certain of our foreign subsidiaries. To determine the amount of the Transition Tax, we must determine, in addition to other factors, the amount of post-1986 E&P of the relevant subsidiaries, as well as the amount of non-U.S. income taxes paid on such earnings. We were able to make a reasonable estimate of the Transition Tax and recorded a provisional Transition Tax obligation of approximately $0.1 million.

The Company believes the impact of certain foreign related provisions in the Tax Act, such as the base erosion anti-abuse tax ("BEAT"), the tax on global intangible low-taxed income ("GILTI"), and the reduced rate of tax on certain foreign-derived intangible income ("FDII"), will be immaterial based on our primarily domestic operations. The impact of certain domestic related provisions in the Tax Act, such as the limitation on interest expense deductibility and net operating loss carryforwards will also be immaterial. The Company will continue to analyze the impact on future periods of the limitation on the deductibility of certain executive compensation. The Company estimates, based on forecasted 2018 results, that its combined federal and state effective tax rate will be in the range of 24% to 26%.

The following is an analysis of the components of the consolidated income tax provision (dollars in millions):

	Year Ended December 31		
	2017	**2016**	**2015**
Current income tax provision (benefit) —			
U.S. federal	$209.3	$213.6	$205.1
State and local	34.9	29.1	20.5
Foreign	0.3	0.2	0.4
Total current provision for taxes	244.5	242.9	226.0
Deferred —			
U.S. federal	(90.2)	(1.2)	(3.8)
State and local	5.7	(3.0)	5.6
Foreign	—	0.2	(0.1)
Total deferred provision (benefit) for taxes	(84.5)	(4.0)	1.7
Total provision (benefit) for taxes	$160.0	$238.9	$227.7

The effective tax rate varies from the U.S. federal statutory tax rate principally due to the following (dollars in millions):

	2017	2016	2015
Provision computed at U.S. federal statutory rate of 35%	$ 290.0	$241.0	$232.6
Federal tax reform	(127.2)	—	—
State and local taxes, net of federal benefit	24.0	19.8	20.0
Domestic manufacturers deduction	(21.1)	(21.1)	(19.9)
Other	(5.7)	(0.8)	(5.0)
Total	$ 160.0	$238.9	$227.7

The following details the scheduled expiration dates of our tax effected net operating loss (NOL) and other tax carryforwards at December 31, 2017 (dollars in millions):

	2018 Through 2027	2028 Through 2037	Indefinite	Total
U.S. federal NOLs	$ —	$35.8	$ —	$35.8
State taxing jurisdiction NOLs	1.4	0.9	—	2.3
U.S. federal tax credit carryforwards	—	0.1	—	0.1
U.S. federal and non-U.S. capital loss carryforwards	3.0	—	0.1	3.1
Total	$4.4	$36.8	$0.1	$41.3

Deferred income taxes reflect the net tax effects of temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts for income tax purposes. Deferred income tax assets and liabilities at December 31 are summarized as follows (dollars in millions):

	December 31	
	2017	2016
Deferred tax assets:		
Accrued liabilities	$ 13.7	$ 18.1
Employee benefits and compensation	21.1	45.9
Inventories	15.4	9.9
Net operating loss carryforwards	38.1	67.4
Restricted stock and performance units	9.0	11.7
Pension and postretirement benefits	90.6	136.5
Derivatives	6.1	11.5
Capital loss and general business credit carryforwards	3.2	5.3
Gross deferred tax assets	$ 197.2	$ 306.3
Valuation allowance(a)	(3.1)	(5.2)
Net deferred tax assets	$ 194.1	$ 301.1
Deferred tax liabilities:		
Property, plant and equipment	$(368.6)	$(537.0)
Goodwill and intangible assets	(65.0)	(98.8)
Total deferred tax liabilities	$(433.6)	$(635.8)
Net deferred tax liabilities(b)	$(239.5)	$(334.7)

(a) Deferred tax assets are reduced by a valuation allowance when it is more likely than not that some portion of the deferred tax assets will not be realized. Both the 2017 and 2016 valuation allowance relates to capital losses. We do not expect to generate capital gains before the capital losses expire. If or when recognized, the tax benefits relating to the reversal of any or all of the valuation allowance would be recognized as a benefit to income tax expense.

(b) As of December 31, 2017, we did not recognize U.S. deferred income taxes on our cumulative total of undistributed foreign earnings for our foreign subsidiaries. We indefinitely reinvest our earnings in operations outside the United States. It is not practicable to determine the amount of unrecognized deferred tax liability on these undistributed earnings because the actual tax liability, if any, is dependent on circumstances existing when the repatriation occurs.

Cash payments for federal, state, and foreign income taxes were $298.7 million, $222.1 million, and $238.3 million for the years ended December 31, 2017, 2016, and 2015, respectively.

The following table summarizes the changes related to PCA's gross unrecognized tax benefits excluding interest and penalties (dollars in millions):

	2017	2016	2015
Balance as of January 1	$(5.2)	$(5.8)	$(4.4)
Increases related to prior years' tax positions	—	—	(2.8)
Increases related to current year tax positions	(0.4)	(0.5)	(0.4)
Decreases related to prior years' tax positions	—	0.1	—
Settlements with taxing authorities	—	0.3	0.7
Expiration of the statute of limitations	0.8	0.7	1.1
Balance at December 31	$(4.8)	$(5.2)	$(5.8)

At December 31, 2017, PCA had recorded a $4.8 million gross reserve for unrecognized tax benefits, excluding interest and penalties. Of the total, $4.2 million (net of the federal benefit for state taxes) would impact the effective tax rate if recognized.

PCA recognizes interest accrued related to unrecognized tax benefits and penalties as income tax expense. For both years ended December 31, 2017 and 2016, we had $1.1 million of interest and penalties recorded for unrecognized tax benefits. During the next 12 months, it is reasonably possible that PCA's unrecognized tax benefits related to state apportionment issues could decrease by approximately $3.1 million due to settlements with state taxing authorities.

PCA is subject to taxation in the United States, various state and local, and foreign jurisdictions. A federal examination of the tax years 2010—2012 was concluded in February 2015. A federal examination of the 2013 tax year was concluded in November 2016. The tax years 2014—2017 remain open to federal examination. The tax years 2013—2017 remain open to state examinations. Some foreign tax jurisdictions are open to examination for the 2009 tax year forward. Through the Boise acquisition, PCA recorded net operating losses and credit carryforwards from 2008 through 2011 and 2013 that are subject to examinations and adjustments for at least three years following the year in which utilized.

7. Goodwill and Intangible Assets

Goodwill

Goodwill represents the excess of the cost of an acquired business over the fair value of the identifiable tangible and intangible assets acquired and liabilities assumed in a business combination. At December 31, 2017 and 2016, we had $828.0 million and $682.7 million, respectively, of goodwill recorded in our Packaging segment and $55.2 million for both years in our Paper segment on our Consolidated Balance Sheets.

Changes in the carrying amount of our goodwill were as follows (dollars in millions):

	Packaging	Paper	Goodwill
Balance at January 1, 2016	$488.8	$55.2	$544.0
Acquisitions(a)	193.9	—	193.9
Balance at December 31, 2016	$682.7	$55.2	$737.9
Acquisitions(b)(c)	145.3	—	145.3
Balance at December 31, 2017	$828.0	$55.2	$883.2

(a) In connection with the August 2016 acquisition of TimBar, the Company recoded $157.3 million of goodwill in the Packaging segment. In November 2016, we acquired Columbus Container and recorded $36.6 million of goodwill in the Packaging segment.

(b) In connection with the October 2017 acquisition of Sacramento Container, the Company recorded $151.1 million of goodwill in the Packaging segment.

(c) During 2017, the Company recorded opening balance sheet adjustments related to the TimBar and Columbus Container acquisitions resulting in a decrease to goodwill of $5.8 million.

See Note 3, Acquisitions, for more information.

Intangible Assets

Intangible assets are comprised of customer relationships and trademarks and trade names.

The weighted average useful life, gross carrying amount, and accumulated amortization of our intangible assets were as follows (dollars in millions):

	As of December 31, 2017			As of December 31, 2016		
	Weighted Average Remaining Useful Life (in Years)	Gross Carrying Amount	Accumulated Amortization	Weighted Average Remaining Useful Life (in Years)	Gross Carrying Amount	Accumulated Amortization
Customer relationships(d)	11.8	$497.8	$109.8	13.1	$424.5	$79.8
Trademarks and trade names(d)	9.8	32.9	13.2	10.5	27.7	8.1
Other(d)	3.6	4.3	2.0	4.3	4.2	1.4
Total intangible assets (excluding goodwill)	11.7	$535.0	$125.0	12.9	$456.4	$89.3

(d) In connection with the October 2017 acquisition of Sacramento Container, the Company recorded intangible assets of $68.4 million for customer relationships, $4.1 million for trade names, and $0.1 million for other intangibles. In August 2016, we acquired TimBar and recorded intangible assets of $88.0 million for customer relationships, $4.9 million for trade names, and $1.5 million for other intangibles. In November 2016, we acquired Columbus Container and recorded intangible assets of $30.0 million for customer relationships, $2.2 million for trade names, and $0.2 million for other intangibles. See Note 3, Acquisitions, for more information.

Amortization expense was $35.7 million, $26.6 million, and $22.7 million for the years ended December 31, 2017, 2016, and 2015, respectively. Estimated amortization expense of intangible assets over the next five years is expected to approximate $40.4 million (2018), $37.8 million (2019), $37.7 million (2020), $36.9 million (2021), and $34.5 million (2022).

Impairment Testing

We test goodwill for impairment annually in the fourth quarter or sooner if events or changes in circumstances indicate that the carrying value of the asset may exceed fair value. Additionally, when we experience changes to our business or operating environment, we evaluate the remaining useful lives and recoverability of our finite-lived purchased intangible assets to determine whether any adjustments to the useful lives or impairment are necessary. We completed our test in the fourth quarter and there was no indication of goodwill or intangible asset impairment.

8. Accrued Liabilities

The components of accrued liabilities were as follows (dollars in millions):

	December 31,	
	2017	2016
Compensation and benefits	$127.5	$120.4
Medical insurance and workers' compensation	23.9	28.8
Customer volume discounts and rebates	23.4	18.9
Franchise, property, sales and use taxes	16.0	16.7
Environmental liabilities and asset retirement obligations	4.0	6.4
Severance, retention, and relocation	3.1	3.0
Other	5.3	7.0
Total	$203.2	$201.2

9. Debt

At December 31, 2017 and 2016, our long-term debt and interest rates on that debt were as follows (dollars in millions):

	December 31, 2017		December 31, 2016	
	Amount	Interest Rate	Amount	Interest rate
Revolving Credit Facility, due August 2021	$ —	—%	$ —	—%
Five-Year Term Loan, due August 2021	—	—%	380.2	2.02%
Seven-Year Term Loan, due October 2020	—	—%	630.5	2.40%
6.50% Senior Notes due March 2018	150.0	6.50%	150.0	6.50%
2.45% Senior Notes, net of discount of $0.5 million as of December 31, 2017 due December 2020	499.5	2.45%	—	—%
3.90% Senior Notes, net of discounts of $0.2 million and $0.2 million as of December 30, 2017 and 2016, respectively, due June 2022	399.8	3.90%	399.8	3.90%
4.50% Senior Notes, net of discount of $1.2 million a $1.4 million as of December 30, 2017 and 2016, respectively, due November 2023	698.8	4.50%	698.6	4.50%
3.65% Senior Notes, net of discount of $0.8 million and $0.9 million as of December 31, 2017 and 2016, respectively, due September 2024	399.2	3.65%	399.1	3.65%
3.40% Senior Notes, net of discount of $1.6 million as of December 31, 2017 due December 2027	498.4	3.40%	—	—%
Total	2,645.7	3.80%	2,658.2	3.54%
Less current portion	150.0	6.50%	25.8	2.11%
Less unamortized debt issuance costs	15.3		12.5	
Total long-term debt	$2,480.4	3.64%	$2,620.0	3.57%

On December 13, 2017, the Company issued $500.0 million of 2.45% senior notes due 2020 and $500.0 million of 3.40% senior notes due 2027, through a registered public offering. The net proceeds of $997.8 million were used to repay in full all amounts outstanding under our Seven-Year term loan due October 2020 of $625.6 million and our Five-Year term loan due August 2021 of $350.4 million. Any remaining net proceeds were used to pay $6.8 million of debt issuance costs and for general corporate purposes. The debt issuance costs will be amortized to interest expense using the effective interest method over the terms of the notes.

As of December 31, 2017, the details of our borrowings were as follows:

- *Senior Unsecured Credit Agreement*. On October 18, 2013, we entered into a $1.65 billion senior unsecured credit facility. Loans bear interest at LIBOR plus a margin that is determined based upon our credit ratings. On August 29, 2016, we amended and restated our five-year credit agreement dated October 18, 2013 to include a new five-year $385 million term loan facility to finance the acquisition of TimBar Corporation and to extend the maturity of the revolving credit facility to 2021. The financing consisted of:
  - *Revolving Credit Facility*: A $350.0 million unsecured revolving credit facility with variable interest (LIBOR plus a margin) due August 2021. During 2017, we did not borrow under the Revolving Credit Facility. At December 31, 2017, we had $23.1 million of outstanding letters of credit that were considered outstanding on the revolving credit facility, resulting in $326.9 million of unused borrowing capacity. The outstanding letters of credit were primarily for workers compensation. We are required to pay commitment fees on the unused portions of the credit facility.
  - *Five-Year Term Loan:* A $385.0 million unsecured five-year term loan with variable interest (LIBOR plus 1.250%), payable quarterly, due August 2021. The term loan was repaid on December 13, 2017 with the proceeds received from the note offering discussed above.
  - *Seven-Year Term Loan*: A $650.0 million unsecured term loan with variable interest (LIBOR plus 1.625%), payable quarterly, due October 2020. The term loan was repaid on December 13, 2017 with the proceeds received from the note offering discussed above.
- *6.50% Senior Notes.* On March 25, 2008, we issued $150.0 million of 6.50% senior notes due March 15, 2018, through a registered public offering.
- *3.90% Senior Notes.* On June 26, 2012, we issued $400.0 million of 3.90% senior notes due June 15, 2022, through a registered public offering.
- *4.50% Senior Notes*. On October 22, 2013, we issued $700.0 million of 4.50% senior notes due November 1, 2023, through a registered public offering.
- *3.65% Senior Notes.* On September 5, 2014, we issued $400.0 million of 3.65% senior notes due September 15, 2024, through a registered public offering.
- *2.45% Senior Notes.* On December 13, 2017, we issued $500.0 million of 2.45% senior notes due December 15, 2020, through a registered public offering.
- *3.40% Senior Notes.* On December 13, 2017, we issued $500.0 million of 3.40% senior notes due December 15, 2027, through a registered public offering.

The instruments governing our indebtedness contain financial and other covenants that limit the ability of PCA and its subsidiaries to enter into sale and leaseback transactions, incur liens, incur indebtedness at the subsidiary level, enter into certain transactions with affiliates, merge or consolidate with any other person or sell or otherwise dispose of all or substantially all of our assets. Our credit facility also requires us to comply with certain financial covenants, including maintaining a minimum interest coverage ratio and a maximum leverage ratio. A failure to comply with these restrictions could lead to an event of default, which could result in an acceleration of any outstanding indebtedness and/or prohibit us from drawing on the revolving credit facility. Such an acceleration may also constitute an event of default under the senior notes indenture. At December 31, 2017, we were in compliance with these covenants.

At December 31, 2017, we have $2,645.7 million of fixed-rate senior notes outstanding. At December 31, 2017, the fair value of our fixed-rate debt was estimated to be $2,734.9 million. The difference between the book value and fair value is due to the difference between the period-end market interest rate and the stated rate of our fixed-rate debt. We estimated the fair value of our fixed-rate debt using quoted market prices (Level 2 inputs), discussed further in Note 2, Summary of Significant Accounting Policies.

Repayments, Interest, and Other

In 2017, we used the net proceeds from our 2.45% and 3.40% senior note offerings and other cash on hand to repay debt outstanding of $630.5 million under the Seven-Year Term Loan due October 2020 and $380.2 million under the Five-Year Term Loan due August 2021, both of which are no longer outstanding.

In 2016, we used cash on hand to make principal payments of $25.0 million under our old Five-Year Term Loan, $4.8 million under the new Five-Year Term Loan entered into in 2016, due August 2021, and $6.5 million under the Seven-Year Term Loan, due October 2020.

In 2015, we used cash on hand to repay $40.0 million of debt outstanding under our old Five-Year Term Loan and $6.5 million under the Seven-Year Term Loan, due October 2020.

As of December 31, 2017, annual principal maturities for debt, excluding unamortized debt discount, are: $150.0 million for 2018 which we intend to repay from cash on hand at maturity in March 2018; none for 2019; $500.0 million for 2020; none for 2021; $400.0 million for 2022; and $1.6 billion for 2023 and thereafter.

Interest payments paid in connection with the Company’s debt obligations for the years ended December 31, 2017, 2016, and 2015, were $96.3 million, $88.3 million, and $85.5 million, respectively.

Included in interest expense, net, are amortization of financing costs and amortization of treasury lock settlements. Amortization of treasury lock settlements was a $5.7 million net loss in 2017, 2016, and 2015. Amortization of financing costs in 2017, 2016, and 2015 was $4.0 million (including a $1.8 million write-off of deferred debt issuance costs related to the December 2017 debt refinancing), $1.8 million, and $1.8 million, respectively.

10. Employee Benefit Plans and Other Postretirement Benefits

PCA has defined pension benefit plans for both salaried and hourly employees. The plans covering salaried employees are closed to new entrants with only certain current active participants still accruing benefits. The plans covering certain hourly employees are closed to new participants. We also have a Supplemental Executive Retirement Plan (SERP) and other nonqualified defined benefit pension plans that provide unfunded supplemental retirement benefits to certain of our executives and former executives. The SERP provides for incremental pension benefits in excess of those offered in our principal pension plans.

Other Postretirement Benefits

PCA provides postretirement medical benefits for certain salaried employees and postretirement medical and life insurance benefits for certain hourly employees. For salaried employees, the plan covers employees retiring from PCA on or after attaining age 58 who have had at least 10 years of full-time service with PCA after attaining age 48. In April 2016, the Company provided notice to eligible participants that the Salaried Retiree Medical Plan would be frozen as of December 31, 2016. As a result of the freeze, eligible plan participants who did not retire and elect coverage before December 31, 2016 would lose benefits attributable to service already rendered. In accordance with Accounting Standards Codification (ASC) 715, "Compensation—Retirement Benefits", the Company remeasured the Salaried Retiree Medical Plan benefit obligation using current assumptions, resulting in a decrease in the benefit obligation of $5.1 million with a corresponding increase in accumulated other comprehensive income of $3.1 million and deferred income taxes of $2.0 million.

Obligations and Funded Status of Defined Benefit Pension and Other Postretirement Benefits Plans

The funded status of PCA's plans change from year to year based on the plan asset investment return, contributions, benefit payments, the discount rate used to measure the liability, and expected participant longevity. The following table, which includes only company-sponsored defined benefit and other postretirement benefit plans, reconciles the beginning and ending balances of the projected benefit obligation and the fair value of plan assets. We recognize the unfunded status of these plans on the Consolidated Balance Sheets, and we recognize changes in funded status in the year changes occur through the Consolidated Statements of Comprehensive Income (dollars in millions):

	Pension Plans Year Ended December 31		Postretirement Plans Year Ended December 31	
	2017	2016	2017	2016
Change in Benefit Obligation				
Benefit obligation at beginning of period	$1,158.4	$1,092.5	$ 19.5	$ 21.4
Service cost	23.7	24.5	0.3	0.5
Interest cost	41.6	40.9	0.6	0.6
Plan amendments	17.3	1.8	(0.5)	(5.3)
Actuarial loss (gain)(a)	99.3	35.3	(2.2)	3.7
Participant contributions	—	—	1.3	1.3
Benefits paid	(40.1)	(36.6)	(2.5)	(2.7)
Benefit obligation at plan year end	$1,300.2	$1,158.4	$ 16.5	$ 19.5
Accumulated benefit obligation portion of above	$1,237.7	$1,116.6		
Change in Fair Value of Plan Assets				
Plan assets at fair value at beginning of period	$ 830.4	$ 764.4	$ —	$ —
Actual return on plan assets	121.0	44.4	—	—
Company contributions	43.5	58.2	1.2	1.4
Participant contributions	—	—	1.3	1.3
Benefits paid	(40.1)	(36.6)	(2.5)	(2.7)
Fair value of plan assets at plan year end	$ 954.8	$ 830.4	$ —	$ —
Underfunded status	**$ (345.4)**	**$ (328.0)**	**$(16.5)**	**$(19.5)**
Amounts Recognized on Consolidated Balance Sheets				
Current liabilities	$ (1.4)	$ (1.3)	$ (1.0)	$ (1.2)
Noncurrent liabilities	(344.0)	(326.7)	(15.5)	(18.3)
Accrued obligation recognized at December 31	**$ (345.4)**	**$ (328.0)**	**$(16.5)**	**$(19.5)**
Amounts Recognized in Accumulated Other Comprehensive Loss (Income) (Pre-Tax)				
Prior service cost (credit)	$ 32.7	$ 21.1	$ (5.3)	$ (5.0)
Actuarial loss (gain)	208.5	183.9	(4.0)	(1.9)
Total	**$ 241.2**	**$ 205.0**	**$ (9.3)**	**$ (6.9)**

(a) The actuarial loss in 2017 was due primarily to a decrease in the weighted average discount rate used to estimate our pension benefit obligations. In 2016, a decrease in the weighted average discount rate used to estimate our pension benefit obligations and changes in mortality assumptions from the Society of Actuaries resulted in an actuarial loss.

Components of Net Periodic Benefit Cost and Other Comprehensive (Income) Loss

The components of net periodic benefit cost and other comprehensive (income) loss (pretax) were as follows (dollars in millions):

	Pension Plans			Postretirement Plans		
	Year Ended December 31			Year Ended December 31		
	2017	2016	2015	2017	2016	2015
Service cost	$ 23.7	$ 24.5	$ 24.0	$ 0.3	$ 0.5	$ 1.7
Interest cost	41.6	40.9	46.2	0.6	0.6	1.2
Expected return on plan assets	(53.9)	(49.5)	(53.1)	—	—	—
Net amortization of unrecognized amounts						
Prior service cost (credit)	5.8	5.7	5.5	(0.2)	(0.1)	0.1
Actuarial loss (gain)	7.6	5.8	8.7	(0.1)	(0.4)	0.1
Net periodic benefit cost	$ 24.8	$ 27.4	$ 31.3	$ 0.6	$ 0.6	$ 3.1
Changes in plan assets and benefit obligations recognized in other comprehensive (income) loss						
Actuarial net loss (gain)	$ 32.2	$ 40.4	$(14.5)	$(2.2)	$ 3.6	$(11.4)
Prior service cost (credit)	17.4	1.8	3.0	(0.6)	(5.3)	—
Amortization of prior service cost (credit)	(5.8)	(5.7)	(5.5)	0.2	(0.3)	(0.1)
Amortization of actuarial loss (gain)	(7.6)	(5.8)	(8.7)	0.1	0.8	(0.1)
Total recognized in other comprehensive loss (income)(a)	$ 36.2	$ 30.7	$(25.7)	$(2.5)	$(1.2)	$(11.6)
Total recognized in net periodic benefit cost and other comprehensive loss (income) (pre-tax)	$ 61.0	$ 58.1	$ 5.6	$(1.9)	$(0.6)	$ (8.5)

(a) Accumulated losses in excess of 10% of the greater of the projected benefit obligation or the market-related value of assets will be recognized on a straight-line basis over the average remaining service period of active employees in PCA plans (which is between seven to ten years) and over the average remaining lifetime of inactive participants of Boise plans (which is between 25 and 28 years), to the extent that losses are not offset by gains in subsequent years. The estimated net loss and prior service cost that will be amortized from "Accumulated other comprehensive loss" into net periodic benefit in 2018 is $15.8 million.

The accumulated benefit obligations for the plans with obligations in excess of plan assets, is $1.2 billion.

Assumptions

The following table presents the assumptions used in the measurement of our benefits obligations:

	Pension Plans			Postretirement Plans		
	December 31			December 31		
	2017	**2016**	**2015**	**2017**	**2016**	**2015**
Weighted-Average Assumptions Used to Determine Benefit Obligations at December 31						
Discount rate	3.66%	4.24%	4.51%	3.55%	3.91%	4.35%
Rate of compensation increase	4.00%	4.00%	4.00%	N/A	N/A	N/A
Weighted-Average Assumptions Used to Determine Net Periodic Benefit Cost for the Years Ended December 31						
Discount rate	4.24%	4.49%	4.14%	3.92%	4.17%	3.95%
Expected return on plan assets	6.55%	6.57%	6.73%	N/A	N/A	N/A
Rate of compensation increase	4.00%	4.00%	4.00%	N/A	N/A	N/A

Discount Rate Assumption. The discount rate reflects the current rate at which the pension obligations could be settled on the measurement date: December 31. The discount rate assumption used to calculate the present value of pension and postretirement benefit obligations reflects the rates available on high-quality, fixed-income debt instruments on December 31. In all periods, the bonds included in the models reflect anticipated investments that would be made to match the expected monthly benefit payments over time. The plans' projected cash flows were duration-matched to these models to develop an appropriate discount rate.

Beginning in 2016, we refined the method used to determine the service and interest cost components of our net periodic benefit cost. Previously, the cost was determined using a single weighted-average discount rate derived from the yield curve. Under the refined method, known as the spot rate approach, we will use individual spot rates along the yield curve that correspond with the timing of each benefit payment. We believe this change provides a more precise measurement of service and interest costs by improving the correlation between projected cash outflows and corresponding spot rates on the yield curve.

Asset Return Assumption. The expected return on plan assets reflects the expected long-term rates of return for the categories of investments currently held in the plans as well as anticipated returns for additional contributions made in the future. The expected long-term rate of return is adjusted when there are fundamental changes in expected returns on the plan investments. The weighted-average expected return on plan assets we will use in our calculation of 2018 net periodic pension benefit cost is 6.06%.

Rate of Compensation Increase. The rate of compensation increase is determined by PCA based upon annual reviews. The compensation increase assumption is not applicable for all plans as many of our pension plans are frozen and not accruing benefits.

Health Care Cost Trend Rate Assumptions. PCA assumed health care cost trend rates for its postretirement benefits plans were as follows:

	2017	**2016**	**2015**
Health care cost trend rate assumed for next year	7.57%	7.35%	7.60%
Rate to which the cost trend rate is assumed to decline (the ultimate trend rate)	4.44%	4.50%	4.50%
Year that the rate reaches the ultimate trend rate	2027	2025	2024

Postretirement Health Care Plan Assumptions. For postretirement health care plan accounting, PCA reviews external data and its own historical trends for health care costs to determine the health care cost trend rate assumption.

A one-percentage point change in assumed health care cost trend rates would have the following effects on the 2017 postretirement benefit obligation and the 2016 net post retirement benefit cost (dollars in millions):

	1-Percentage Point Increase	1-Percentage Point Decrease
Effect on postretirement benefit obligation	$0.6	$(0.6)
Effect on net postretirement benefit cost	0.1	—

Investment Policies and Strategies

PCA has retained the services of professional advisors to oversee pension investments and provide recommendations regarding investment strategy. PCA's overall strategy and related apportionments between equity and debt securities may change from time to time based on market conditions, external economic factors, and the funded status of the plans. The general investment objective for all of our plan assets is to optimize growth of the pension plan trust assets, while minimizing the risk of significant losses to enable the plans to satisfy their benefit payment obligations over time. The objectives take into account the long-term nature of the benefit obligations, the liquidity needs of the plans, and the expected risk/return trade-offs of the asset classes in which the plans may choose to invest. Assets of our pension plans were invested in the following classes of securities at December 31, 2017 and 2016:

	Percentage of Fair Value at December 31,	
	2017	2016
Fixed income securities	21%	54%
International equity securities	6%	23%
Domestic equity securities	9%	21%
Real estate securities	—	1%
Other	64%	1%

As of December 31, 2017, the Company was in the process of consolidating the Boise pension plan assets with the PCA pension plans under one trustee. Due to this timing, 100% of the Boise pension plan assets were classified as Other (Cash) on December 31, 2017. Upon completion of the transfer on January 5, 2018, the pension plan assets were invested in the following classes of securities:

	Percentage of Fair Value at January 5, 2018
Fixed income securities	52%
International equity securities	28%
Domestic equity securities	20%

At December 31, 2017, the targeted investment allocations differed between the acquired Boise plans and PCA's historical plans based on funded status. At December 31, 2017, PCA's historical plans, which comprised $403.5 million of the fair value of plan assets, targeted 50% invested in equities, 49% invested in fixed income securities, and 1% in other, whereas the Boise plans, which comprised $551.3 million of the total fair value of plan assets, targeted 54% invested in fixed income securities, 44% invested in equities, and 2% in other. Our retirement committee reviews the investment allocations for reasonableness at a minimum, semi-annually.

Investment securities, in general, are exposed to various risks, such as interest rate, credit, and overall market volatility risk, all of which are subject to change. Due to the level of risk associated with some investment securities, it is reasonably possible that changes in the values of investment securities will occur in the near term, and such changes could materially affect the reported amounts.

Fair Value Measurements of Plan Assets

The following tables set forth, by level within the fair value hierarchy, discussed in Note 2, Summary of Significant Accounting Policies, the pension plan assets, by major asset category, at fair value at December 31, 2017 and 2016 (dollars in millions):

	Fair Value Measurements at December 31, 2017			
Asset Category	**Quoted Prices in Active Markets for Identical Assets (Level 1)**	**Significant Other Observable Inputs (Level 2)**	**Significant Unobservable Inputs (Level 3)**	**Total**
Cash and short-term investments(a)	$602.4	$ 5.7	$ —	$608.1
Mutual funds:				
International equities	56.1	—	—	56.1
Fixed income	95.4	—	—	95.4
Common/collective trust funds(b):				
Domestic equities	—	84.1	—	84.1
International equities	—	5.6	—	5.6
Fixed income	—	59.8	—	59.8
Corporate and government bonds:				
Fixed income	41.3	—	—	41.3
Private equity securities(c)	—	—	4.2	4.2
Total securities at fair value	$795.2	$155.2	$4.2	$954.6
Receivables and accrued expenses				0.2
Total fair value of plan assets				$954.8

	Fair Value Measurements at December 31, 2016			
Asset Category	**Quoted Prices in Active Markets for Identical Assets (Level 1)**	**Significant Other Observable Inputs (Level 2)**	**Significant Unobservable Inputs (Level 3)**	**Total**
Cash and short-term investments	$ —	$ 1.5	$ —	$ 1.5
Mutual funds:				
Domestic equities	65.7	—	—	65.7
International equities	68.7	—	—	68.7
Real estate	9.6	—	—	9.6
Fixed income	108.4	64.8	—	173.2
Common/collective trust funds(b):	—			
Domestic equities	—	107.9	—	107.9
International equities	—	124.5	—	124.5
Fixed income	—	271.6	—	271.6
Private equity securities(c)	—	—	5.7	5.7
Total securities at fair value	$252.4	$570.3	$5.7	$828.4
Receivables and accrued expenses				2.0
Total fair value of plan assets				$830.4

(a) Short-term investments and the Boise pension plan assets classified as cash as of December 31, 2017. The Boise pension plan assets were subsequently allocated to equities and fixed income securities on January 5, 2018 after consolidating with the PCA pension plan assets under one trustee.

(b) Investments in common/collective trust funds valued using net asset values (NAV) provided by the administrator of the funds. The NAV is based on the value of the underlying assets owned by the fund, minus its liabilities, and then divided by the number of units outstanding. While the underlying assets are actively traded on an exchange, the funds are not. There are currently no redemption restrictions on these investments. There are certain funds with one-day redeemable notice.

(c) Investments in this category are invested in the Pantheon Global Secondary Fund IV, LP. The fund specializes in investments in the private equity secondary market and occasionally directly in private companies to maximize capital growth. Fund investments are carried at fair value as determined quarterly using the market approach to estimate the fair value of private investments. The market approach utilizes prices and other relevant information generated by market transactions, type of security, size of the position, degree of liquidity, restrictions on the disposition, latest round of financing data, current financial position, and operating results, among other factors. In circumstances where fair values are not provided with respect to any of the company's fund investments, the investment advisor will seek to determine the fair value of such investments based on information provided by the general partners or managers of such funds or from other sources. Audited financial statements are provided by fund management annually. Notwithstanding the above, the variety of valuation bases adopted and quality of management data of the ultimate underlying investee companies means that there are inherent difficulties in determining the value of the investments. Amounts realized on the sale of these investments may differ from the calculated values. Boise had originally committed to a $15.0 million investment, with $5.0 million of the commitment unfunded at December 31, 2017.

The following table sets forth a summary of changes in the fair value of the pension plans' Level 3 assets for the year ended December 31, 2017 (dollars in millions):

	2017
Balance, beginning of year	$ 5.7
Acquisitions	—
Purchases	—
Sales	(1.5)
Unrealized gain	—
Balance, end of year	$ 4.2

Funding and Cash Flows

PCA makes pension plan contributions that are sufficient to fund its actuarially determined costs, generally equal to the minimum amounts required by the Employee Retirement Income Security Act (ERISA). From time to time, PCA may make discretionary contributions based on the funded status of the plans, tax deductibility, income from operations, and other factors. In 2017, we made contributions of $42.1 million to our qualified pension plans. In 2016, we made contributions of $57.1 million to our qualified pension plans. In 2015, we did not make contributions to our qualified pension plans. We expect to contribute at least the estimated required minimum contributions to our qualified pension plans of approximately $4.6 million in 2018.

The following are estimated benefit payments to be paid to current plan participants by year (dollars in millions). Qualified pension benefit payments are paid from plan assets, while nonqualified pension benefit payments are paid by the Company.

	Pension Plans	Postretirement Plans
2018	$ 45.4	$1.0
2019	49.3	1.0
2020	53.2	1.0
2021	57.0	0.9
2022 – 2025	407.9	5.4

Defined Contribution Plans

Some of our employees participate in contributory defined contribution savings plans, available to most of our salaried and hourly employees. The defined contribution plans permit participants to make contributions by salary reduction pursuant to Section 401(k) of the Code. PCA made employer-matching contributions of $42.8 million, $40.4 million, and $37.9 million in 2017, 2016, and 2015, respectively. In 2015, Company matching contributions to certain full-time salaried employees were made in company stock, through our Employee Stock Ownership Plan (ESOP). All other matching contributions were in cash. Beginning in 2016, all company-matching contributions to all employees were made in cash. We expense employer matching contributions and charge dividends on shares held by the ESOP to retained earnings. Shares of company stock held by the ESOP are included in basic shares for earnings-per-share computations. At December 31, 2017 and 2016, the ESOP held 1.8 million and 2.2 million shares of Company stock, respectively.

Certain salaried and hourly employees that are not participating in a PCA sponsored defined benefit pension plan receive a service-related company retirement contribution to their defined contribution plan account in addition to any employer matching contribution. This contribution increases with years of service and ranges from 3% to 5% of base pay. We contributed $22.4 million, $14.9 million, and $12.4 million for this retirement contribution during the years ended December 31, 2017, 2016, and 2015, respectively.

Deferred Compensation Plans

Key managers can elect to participate in a deferred compensation plan. The deferred compensation plan is unfunded; therefore, benefits are paid from our general assets. At December 31, 2017 and 2016, we had $13.6 million and $13.7 million, respectively, of liabilities attributable to participation in our deferred compensation plan on our Consolidated Balance Sheets.

11. Asset Retirement Obligations

Our asset retirement obligations relate predominantly to landfill closure, wastewater treatment pond dredging, closed-site monitoring costs, and certain leasehold improvements. In accordance with ASC 410, “Asset Retirement and Environmental Obligations,” we recognize the fair value of these liabilities as an asset retirement obligation and capitalize that cost as part of the cost basis of the related asset in the period in which the costs are incurred if sufficient information is available to reasonably estimate the fair value of the obligation. Fair value estimates are determined using Level 3 inputs in the fair value hierarchy. The fair value of our asset retirement obligations is measured using expected future cash outflows discounted using the company’s credit-adjusted risk-free interest rate. Over time, the liability is accreted to its settlement value, and the capitalized cost is depreciated over the useful life of the related asset. These liabilities are based on the best estimate of costs and are updated periodically to reflect current technology, laws and regulations, inflation, and other economic factors. Occasionally, we become aware of events or circumstances that require us to revise our future estimated cash flows. When revisions become necessary, we recalculate our obligation and adjust our asset and liability accounts utilizing appropriate discount rates. No assets are legally restricted for purposes of settling asset retirement obligations. Upon settlement of the liability, we will recognize a gain or loss for any difference between the settlement amount and the liability recorded.

The following table describes changes to the asset retirement obligation liability (dollars in millions):

	Year Ended December 31	
	2017	2016
Asset retirement obligation at beginning of period	$28.0	$26.2
Accretion expense	1.3	2.3
Payments	(2.3)	(2.2)
Revisions in estimated cash flows	7.9	1.2
Liabilities incurred	0.2	0.5
Asset retirement obligation at end of period	$35.1	$28.0

We have additional asset retirement obligations with indeterminate settlement dates. The fair value of these asset retirement obligations cannot be estimated due to the lack of sufficient information to estimate the settlement dates of the obligations. These asset retirement obligations include, for example, (i) removal and disposal of potentially hazardous materials related to equipment and/or an operating facility if the equipment and/or facilities were to undergo major maintenance, renovation, or demolition and (ii) storage sites or owned facilities for which removal and/or disposal of chemicals and other related materials are required if the operating facility is closed. We will recognize a liability in the period in which sufficient information becomes available to reasonably estimate the fair value of these obligations.

12. Share-Based Compensation

The Company has a long-term equity incentive plan, which allows for grants of stock options, stock appreciation rights, restricted stock, and performance awards to directors, officers, and employees, as well as others who engage in services for PCA. The plan, as amended, terminates May 1, 2023, and authorizes 10.6 million shares of common stock for grant over the life of the plan. As of December 31, 2017, 1.0 million shares remained available for future issuance under the plan. Forfeitures are added back to the pool of shares of common stock available to be granted at a future date.

Restricted Stock

Restricted stock awards granted to officers and employees generally vest at the end of a four-year period, and restricted stock awards granted to directors vest immediately. The fair value of restricted stock is determined based on the closing price of the Company's stock on the grant date. A summary of the Company's restricted stock activity follows:

	2017		2016		2015	
	Shares	Weighted Average Grant-Date Fair Value	Shares	Weighted Average Grant-Date Fair Value	Shares	Weighted Average Grant-Date Fair Value
Restricted stock at January 1	786,079	$ 63.44	1,007,794	$49.47	1,184,299	$41.71
Granted	173,199	107.57	242,835	67.48	218,957	65.16
Vested(a)	(213,992)	51.37	(443,627)	34.11	(389,481)	32.77
Forfeitures	(5,554)	69.03	(20,923)	59.63	(5,981)	66.42
Restricted stock at December 31	739,732	$ 77.23	786,079	$63.44	1,007,794	$49.47

(a) The total fair value of awards upon vesting for the years ended December 31, 2017, 2016, and 2015 was $23.3 million, $28.8 million, and $26.3 million, respectively.

Performance Units

Performance award units granted to certain key employees vest four years after the grant date based on the achievement of defined performance rankings compared to a peer group. The performance units are paid out entirely in shares of the Company's common stock. The awards are valued at the closing price of the Company's stock on the grant date and expensed over the requisite service period based on the most probable number of awards expected to vest.

	2017		2016		2015	
	Units	Weighted Average Grant-Date Fair Value	Units	Weighted Average Grant-Date Fair Value	Units	Weighted Average Grant-Date Fair Value
Performance units at January 1	232,088	$ 62.68	175,675	$59.94	127,489	$58.25
Granted	61,861	108.19	77,017	67.57	53,102	65.04
Vested(a)	(67,391)	56.08	(20,604)	57.58	(4,916)	71.19
Performance units at December 31	226,558	$ 77.07	232,088	$62.68	175,675	$59.94

(a) The total fair value of awards upon vesting for the years ended December 31, 2017, 2016, and 2015 was $7.5 million, $1.1 million, and $0.3 million, respectively. Upon vesting of the awards in 2016 and 2015, PCA issued 21,111 and 5,090 shares, which included 507 and 174 shares, respectively, for dividends accrued during the vesting period.

Compensation Expense

Our share-based compensation expense is recorded in "Selling, general, and administrative expenses." Compensation expense for share-based awards recognized in the Consolidated Statements of Income, net of forfeitures was as follows (dollars in millions):

	Year Ended December 31		
	2017	2016	2015
Restricted stock	$15.0	$15.8	$15.2
Performance units	5.6	3.9	3.0
Impact on income before income taxes	20.6	19.7	18.2
Income tax benefit	(7.9)	(7.7)	(7.1)
Impact on net income	$12.7	$12.0	$11.1

The fair value of restricted stock and performance units is determined based on the closing price of the Company's common stock on the grant date. As PCA's Board of Directors has the ability to accelerate vesting of share-based awards upon an employee's retirement, the Company accelerates the recognition of compensation expense for certain employees approaching normal retirement age.

The unrecognized compensation expense for all share-based awards was as follows (dollars in millions):

	December 31, 2017	
	Unrecognized Compensation Expense	Remaining Weighted Average Recognition Period (in years)
Restricted stock	$30.6	2.5
Performance units	9.8	2.8
Total unrecognized share-based compensation expense	$40.4	2.6

We evaluate share-based compensation expense on a quarterly basis based on our estimate of expected forfeitures, review of recent forfeiture activity, and expected future turnover. We recognize the effect of adjusting the forfeiture rate for all expense amortization in the period that we change the forfeiture estimate. The effect of forfeiture adjustments was insignificant in all periods presented.

13. Derivative Instruments and Hedging Activities

Hedging Strategy

When appropriate, we use derivatives as a risk management tool to mitigate the potential impact of certain market risks. The primary risks managed by using derivative financial instruments are interest rate risks. We do not enter into derivative financial instruments for trading or speculative purposes.

Interest Rate Risk

The Company has used treasury lock derivative instruments to manage interest costs and the risk associated with changing interest rates. In connection with contemplated issuances of ten-year debt securities, PCA entered into interest rate protection agreements with counterparties in 2008, 2010, and 2011 to protect against increases in the ten-year U.S. Treasury Note rate. These treasury rates served as references in determining the interest rates applicable to the debt securities the Company issued in March 2008, February 2011, and June 2012. As a result of changes in the interest rates on those treasury securities between the time PCA entered into the derivative agreements and the time PCA priced and issued the debt securities, the Company: (1) made a payment of $4.4 million to the counterparty upon settlement of the 2008 interest rate protection agreement on March 25, 2008; (2) received a payment of $9.9 million from the counterparties upon settlement of the 2010 interest rate protection agreements on February 4, 2011; and (3) made a payment of $65.5 million to the counterparty upon settlement of the 2011 interest rate protection agreement on June 26, 2012. The Company recorded the effective portion of the settlements in AOCI, and these amounts are being amortized over the terms of the respective notes.

Derivative Instruments

The impact of derivative instruments on the consolidated statements of income and accumulated OCI was as follows (dollars in millions):

	Net Loss Recognized in Accumulated OCI (Effective Portion) December 31,	
	2017	2016
Treasury locks, net of tax	$(14.2)	$(17.7)

	Loss Reclassified from Accumulated OCI into Income (Effective Portion) Year Ended December 31,		
	2017	2016	2015
Amortization of treasury locks (included in interest expense, net)	$(5.7)	$(5.7)	$(5.7)

The net amount of settlement gains or losses on derivative instruments included in accumulated OCI to be amortized over the next 12 months is a net loss of $5.3 million ($3.3 million after-tax).

14. Stockholders' Equity

Dividends

During the year ended December 31, 2017, we paid $237.6 million of dividends to shareholders. On December 14, 2017 PCA's Board of Directors approved a regular quarterly cash dividend of $0.63 per share of common stock, which was paid on January 12, 2018 to shareholders of record as of December 26, 2017. The dividend payment was $59.4 million.

On August 31, 2016, PCA announced an increase of its quarterly cash dividend on its common stock from an annual payout of $2.20 per share to an annual payout of $2.52 per share. The first quarterly dividend of $0.63 per share was paid on October 14, 2016 to shareholders of record as of September 15, 2016.

Share Repurchase Program

On February 25, 2016, PCA announced that its Board of Directors authorized the repurchase of $200.0 million of the Company's outstanding common stock. Repurchases may be made from time to time in open market or privately negotiated transactions in accordance with applicable securities regulations. The timing and amount of repurchases will be determined by the Company in its discretion based on factors such as PCA's stock price and market and business conditions.

The Company did not repurchase any shares of its common stock under this authority during the twelve months ended December 31, 2017. Share repurchase activity in 2015 and 2016 follows (in millions, except share and per share amounts).

	Shares	Weighted Average Price Per Share	Total
2015	2,326,493	$66.50	$154.7
2016	1,987,187	50.49	100.3

All shares repurchased have been retired. At December 31, 2017, $193.0 million of the authorized amount remained available for repurchase of the Company's common stock.

Accumulated Other Comprehensive Income (Loss)

Changes in AOCI, net of taxes, by component follows (dollars in millions). Amounts in parentheses indicate losses.

	Foreign Currency Translation Adjustments	Unrealized Loss On Treasury Locks, Net	Unrealized Loss on Foreign Exchange Contracts	Unfunded Employee Benefit Obligations	Total
Balance at December 31, 2016	$(0.1)	$(17.7)	$(0.3)	$(121.5)	$(139.6)
Other comprehensive income before reclassifications	—	—	—	(28.8)	(28.8)
Amounts reclassified from AOCI	(0.2)	3.5	—	8.2	11.5
Net current-period other comprehensive income	(0.2)	3.5	—	(20.6)	(17.3)
Balance at December 31, 2017	$(0.3)	$(14.2)	$(0.3)	$(142.1)	$(156.9)

The following table presents information about reclassifications out of AOCI (dollars in millions). Amounts in parentheses indicate expenses in the Consolidated Statements of Income.

Details about AOCI Components	Amounts Reclassified from AOCI Year Ended December 31, 2017	2016	
Unrealized loss on treasury locks, net(a)	$ (5.7)	$ (5.7)	
	2.2	2.2	Tax benefit
	$ (3.5)	$ (3.5)	Net of tax
Unfunded employee benefit obligations(b)			
Amortization of prior service costs	$ (5.6)	$ (5.5)	
Amortization of actuarial gains / (losses)	(7.5)	(5.4)	
	(13.1)	(10.9)	Total before tax
	4.9	4.2	Tax benefit
	$ (8.2)	$ (6.7)	Net of tax

(a) This AOCI component is included in interest expense, net. Amount relates to the amortization of the effective portion of treasury lock derivative instruments recorded in AOCI. The net amount of settlement gains or losses on derivative instruments included in AOCI to be amortized over the next 12 months is a net loss of $5.3 million ($3.3 million after-tax). For a discussion of treasury lock derivative instrument activity, see Note 13, Derivative Instruments and Hedging Activities, for additional information.

(b) These AOCI components are included in the computation of net pension and postretirement benefit costs. See Note 10, Employee Benefit Plans and Other Postretirement Benefits, for additional information.

15. Concentrations of Risk

Our Paper segment has had a long-standing commercial and contractual relationship with Office Depot, our largest customer in the paper business. This relationship exposes us to a significant concentration of business and financial risk. Our sales to Office Depot represented 7% and 8% of our total company sales for 2017 and 2016, respectively, and about 43% and 42% of our Paper segment sales revenue for those periods, respectively. At December 31, 2017 and 2016, we had $33.3 million and $31.8 million of accounts receivable due from Office Depot, respectively, which represents 4% and 5% of our total Company receivables, respectively.

In 2017, sales to Office Depot represented 43% of our Paper segment sales. If these sales are reduced, we would need to find new customers. We may not be able to fully replace any lost sales, and any new sales may be at lower prices or higher costs. Any significant deterioration in the financial condition of Office Depot affecting its ability to pay or any other change that affects its willingness to purchase our products will harm our business and results of operations.

Labor

At December 31, 2017, we had approximately 14,600 employees and approximately 45% of these employees worked pursuant to collective bargaining agreements. Approximately 65% of our hourly employees are represented by unions. The majority of our unionized employees are represented by the United Steel Workers (USW), the International Brotherhood of Teamsters (IBT), the International Association of Machinists (IAM), and the Association of Western Pulp and Paper Workers (AWPPW). Approximately 20% of our employees work pursuant to collective bargaining agreements that will expire within the next twelve months.

16. Transactions With Related Parties

Louisiana Timber Procurement Company, L.L.C. (LTP) is a variable-interest entity that is 50% owned by PCA and 50% owned by Boise Cascade Company (Boise Cascade). LTP procures sawtimber, pulpwood, residual chips, and other residual wood fiber to meet the wood and fiber requirements of PCA and Boise Cascade in Louisiana. PCA is the primary beneficiary of LTP and has the power to direct the activities that most significantly affect the economic performance of LTP. Therefore, we consolidate 100% of LTP in our financial statements in our Corporate and Other segment. The carrying amounts of LTP's assets and liabilities (which relate primarily to non-inventory working capital items) on our Consolidated Balance Sheets were both $3.0 million at December 31, 2017 and $5.0 million at December 31, 2016. For 2017, 2016, and 2015, we recorded $86.4 million, $86.9 million, and $88.8 million, respectively, of LTP sales to Boise Cascade in "Net Sales" in the Consolidated Statements of Income and approximately the same amount of expenses in "Cost of Sales".

For 2017, 2016, and 2015, fiber purchases from related parties were $16.6 million**,** $17.2 million, and $20.7 million, respectively. Most of these purchases related to chip and log purchases by LTP from Boise Cascade's wood products business. These purchases are recorded in "Cost of Sales" in the Consolidated Statements of Income.

17. Segment Information

We report our business in three reportable segments: Packaging, Paper, and Corporate and Other. These segments represent distinct businesses that are managed separately because of differing products and services. Each of these businesses require distinct operating and marketing strategies.

Packaging. We manufacture and sell a wide variety of corrugated packaging products, including conventional shipping containers used to protect and transport manufactured goods, multi-color boxes and displays with strong visual appeal that help to merchandise the packaged product in retail locations. In addition, we are a large producer of packaging for meat, fresh fruit and vegetables, processed food, beverages, and other industrial and consumer products.

Paper. We manufacture and sell a range of white papers, including communication-based papers, and pressure sensitive papers. Our white papers can be manufactured as either commodity papers or specialty papers with specialized or custom features, such as colors, coatings, high brightness, or recycled content. Sales for market pulp decreased in 2016 as we ceased softwood market pulp operations at our Wallula, Washington mill with the permanent shutdown of the No.1 machine.

Corporate and Other. Our Corporate and Other segment includes corporate support staff services and related assets and liabilities, and foreign exchange gains and losses. This segment also includes transportation assets, such as rail cars and trucks, which we use to transport our products from some of our manufacturing sites and assets related to LTP. See Note 16, Transactions with Related Parties, for more information related to LTP. Sales in this segment relate primarily to LTP and our rail and truck business. We provide transportation services not only to our own facilities but also, on a limited basis, to third parties when geographic proximity and logistics are favorable. Rail cars and trucks are generally leased.

Each segments' profits and losses are measured on operating profits before interest expense and interest income. For many of these allocated expenses, the related assets and liabilities remain in the Corporate and Other segment.

Segment sales to external customers by product line were as follows (dollars in millions):

	Year Ended December 31,		
	2017	2016	2015
Packaging sales			
Packaging sales	$5,312.3	$4,584.8	$4,477.3
Paper			
White papers	1,051.8	1,065.8	1,089.6
Market pulp	—	28.1	53.5
	1,051.8	1,093.9	1,143.1
Corporate and Other	80.8	100.3	121.3
	$6,444.9	$5,779.0	$5,741.7

Sales to foreign unaffiliated customers during the years ended December 31, 2017, 2016, and 2015 were $390.3 million, $289.5 million, and $177.2 million, respectively. At December 31, 2017 and 2016, we did not have any significant long-lived assets held by foreign operations.

An analysis of operations by reportable segment is as follows (dollars in millions):

	Sales, net						
Year Ended December 31, 2017	Trade	Inter-segment	Total	Operating Income (Loss)	Depreciation, Amortization, and Depletion	Capital Expenditures(k)	Assets
Packaging	$5,288.6	$ 23.7	$5,312.3	$ 943.7(a)	$317.5	$305.1	$4,933.6
Paper	1,051.8	—	1,051.8	61.5(b)	67.6	22.6	945.2
Corporate and Other	104.5	124.7	229.2	(74.0)(c)	6.3	15.3	318.7
Intersegment eliminations	—	(148.4)	(148.4)	—	—	—	—
	$6,444.9	$ —	$6,444.9	931.2	$391.4	$343.0	$6,197.5
Interest expense				(102.6)(j)			
Income before taxes				$ 828.6			

	Sales, net						
Year Ended December 31, 2016	Trade	Inter-segment	Total	Operating Income (Loss)	Depreciation, Amortization, and Depletion	Capital Expenditures(k)	Assets
Packaging	$4,577.4	$ 7.4	$4,584.8	$711.0(d)	$293.3	$239.9	$4,530.5
Paper	1,093.9	—	1,093.9	138.1(e)	59.6	31.6	946.2
Corporate and Other	107.7	139.2	246.9	(68.9)(f)	5.1	2.8	300.3
Intersegment eliminations	—	(146.6)	(146.6)	—	—	—	—
	$5,779.0	$ —	$5,779.0	780.3	$358.0	$274.3	$5,777.0
Interest expense				(91.8)			
Income before taxes				$688.5			

Year Ended December 31, 2015	Sales, net Trade	Inter-segment	Total	Operating Income (Loss)	Depreciation, Amortization, and Depletion	Capital Expenditures(k)	Assets
Packaging	$4,474.1	$ 3.2	$4,477.3	$714.9(g)	$297.3	$250.3	$4,027.9
Paper	1,143.1	—	1,143.1	112.5(h)	54.9	58.5	976.5
Corporate and Other	124.5	133.8	258.3	(77.4)(i)	4.3	5.7	267.9
Intersegment eliminations	—	(137.0)	(137.0)	—	—	—	—
	$5,741.7	$ —	$5,741.7	750.0	$356.5	$314.5	$5,272.3
Interest expense				(85.5)			
Income before taxes				$664.5			

(a) Includes the following:
- o $7.2 million of income, net, primarily related to the sale of land corresponding to the closure of a corrugated products facility, partially offset by closure costs related to corrugated products facilities, and a lump sum settlement of a multiemployer pension plan withdrawal liability for one of our corrugated products facilities.
- o $1.7 million of charges related to the Sacramento Container acquisition and integration costs related to other recent acquisitions.
- o $2.0 million gain related to the expiration of a repurchase option corresponding to timberland previously sold.
- o $1.6 million of income related to a working capital adjustment from the April 2015 sale of our Hexacomb corrugated manufacturing operations in Europe and Mexico.
- o $5.0 million of costs for the property damage and business interruption insurance deductible corresponding to the February 2017 explosion at our DeRidder, Louisiana mill.

(b) Includes $33.4 million of charges related to our determination to discontinue production of uncoated free sheet and coated one-side grades at the Wallula, Washington mill in the second quarter of 2018 and convert the No. 3 paper machine to a high-performance 100% virgin kraft linerboard machine and $0.4 million of charges related to the closure costs of a paper administration facility.

(c) Includes $1.0 million of charges related to the closure costs of a corporate administration facility and $0.7 million of income related to a working capital adjustment from the April 2015 sale of our Hexacomb corrugated manufacturing operations in Europe and Mexico.

(d) Includes $10.2 million of closure costs related to corrugated product facilities and a lump sum settlement of a multiemployer pension plan withdrawal liability for one of our corrugated products facilities and $4.2 million of acquisition-related costs for the TimBar Corporation and Columbus Container acquisitions.

(e) Includes $2.7 million of costs related to ceased softwood market pulp operations at our Wallula, Washington mill and the permanent shut down of the No.1 machine and $1.7 million of closure costs related to a paper products facility.

(f) Includes $0.3 million of acquisition-related costs related to the TimBar Corporation acquisition.

(g) Includes net charges of $2.0 million primarily related to restructuring activities at our mill in DeRidder, Louisiana and $4.1 million of Boise acquisition integration-related and other costs.

(h) In September 2015, we sold the remaining land, buildings, and equipment at our paper mill site in St. Helens, Oregon where we ceased paper production in December 2012. We recorded a $6.7 million gain on the sale.

(i) Includes $9.3 million of Boise acquisition integration-related and other costs. These costs primarily relate to professional fees, severance, retention, relocation, travel, and other integration-related costs.

(j) Includes $1.8 million of expense related to the write-off of deferred debt issuance costs in connection with the December 2017 debt refinancing.

(k) Includes "Additions to property, plant, and equipment" and excludes cash used for "Acquisitions of businesses, net of cash acquired" as reported on our Consolidated Statements of Cash Flows.

18. Commitments, Guarantees, Indemnifications, and Legal Proceedings

We have financial commitments and obligations that arise in the ordinary course of our business. These include long-term debt (discussed in Note 9, Debt), capital commitments, lease obligations, purchase commitments for goods and services, and legal proceedings (discussed below).

Capital Commitments

The Company had capital commitments of approximately $281.3 million and $94.7 million as of December 31, 2017 and 2016, respectively, in connection with the expansion and replacement of existing facilities and equipment.

Lease Obligations

PCA leases space for certain of its facilities, cutting rights to approximately 75,000 acres of timberland, land for a fiber farm, and equipment, primarily vehicles and rolling stock. Remaining lease terms average 14 years and may contain renewal options or escalation clauses. Substantially all lease agreements have fixed payment terms based on the passage of time. Some lease agreements provide us with the option to purchase the leased property. Additionally, some agreements contain renewal options averaging approximately six years. Some leases may require the Company to pay executory costs, which may include property taxes, maintenance and insurance. The minimum lease payments under non-cancelable operating leases with lease terms in excess of one year were as follows (dollars in millions):

2018	$ 63.8
2019	54.0
2020	41.1
2021	29.6
2022	19.1
Thereafter	56.2
Total	$263.8

Total lease expense, including base rent on all leases and executory costs, such as insurance, taxes, and maintenance, for the years ended December 31, 2017, 2016, and 2015, was $100.6 million, $88.3 million and $87.9 million, respectively. These costs are included in "Cost of sales" and "Selling, general, and administrative expenses" in our Consolidated Statements of Income. We had no sublease rental income for the year ended December 31, 2017 and an insignificant amount of sublease rental income in the years ended December 31, 2016 and 2015.

PCA was obligated under capital leases covering buildings and machinery and equipment in the amount of $20.3 million and $21.6 million at December 31, 2017 and 2016, respectively. Assets held under capital lease obligations were included in property, plant, and equipment as follows (dollars in millions):

	Year Ended December 31	
	2017	2016
Buildings	$ 0.3	$ 0.3
Machinery and equipment	28.5	28.5
Total	28.8	28.8
Less accumulated amortization	(15.2)	(13.7)
Total	$ 13.6	$ 15.1

Amortization of assets under capital lease obligations is included in depreciation expense.

The future minimum payments under capitalized leases at December 31, 2017 were as follows (dollars in millions):

2018	$ 2.7
2019	2.7
2020	2.7
2021	2.7
2022	2.7
Thereafter	15.0
Total minimum capital lease payments	28.5
Less amounts representing interest	(8.2)
Present value of net minimum capital lease payments	20.3
Less current maturities of capital lease obligations	(1.3)
Total long-term capital lease obligations	$19.0

Interest expense related to capital lease obligations for the years ended December 31, 2017, 2016, and 2015 was $1.4 million, $1.5 million, and $1.6 million, respectively.

Purchase Commitments

In the table below, we set forth our enforceable and legally binding purchase obligations as of December 31, 2017. Some of the amounts are based on management's estimates and assumptions about these obligations, including their duration, the possibility of renewal, anticipated actions by third parties, and other factors. Because these estimates and assumptions are necessarily subjective, our actual payments may vary from those reflected in the table. Purchase orders made in the ordinary course of business are excluded below. Any amounts for which we are liable under purchase orders are reflected on the Consolidated Balance Sheets as accounts payable and accrued liabilities. These obligations relate to various purchase agreements for items such as minimum amounts of energy and fiber purchases over periods ranging from one year to 22 years. Total purchase commitments were as follows (dollars in millions):

2018	$ 79.8
2019	54.4
2020	45.6
2021	43.0
2022	42.5
Thereafter	159.0
Total	$424.3

The Company purchased a total of $339.1 million, $362.0 million, and $299.6 million during the years ended December 31, 2017, 2016, and 2015, respectively, under these purchase agreements.

Environmental Liabilities

The potential costs for various environmental matters are uncertain due to such factors as the unknown magnitude of possible cleanup costs, the complexity and evolving nature of governmental laws and regulations and their interpretations, and the timing, varying costs and effectiveness of alternative cleanup technologies. From 2006 through 2017, there were no significant environmental remediation costs at PCA's mills and corrugated plants. At December 31, 2017, the Company had $31.5 million of environmental-related reserves recorded on its Consolidated Balance Sheet. Of the $31.5 million, approximately $24.0 million related to environmental-related asset retirement obligations discussed in Note 11, Asset Retirement Obligations, and

$7.5 million related to our estimate of other environmental contingencies. The Company recorded $4.0 million in "Accrued liabilities" and $27.5 million in "Other long-term liabilities" on the Consolidated Balance Sheet. Liabilities recorded for environmental contingencies are estimates of the probable costs based upon available information and assumptions. Because of these uncertainties, PCA's estimates may change. The Company believes that it is not reasonably possible that future environmental expenditures for remediation costs and asset retirement obligations above the $31.5 million accrued as of December 31, 2017, will have a material impact on its financial condition, results of operations, or cash flows.

Guarantees and Indemnifications

We provide guarantees, indemnifications, and other assurances to third parties in the normal course of our business. These include tort indemnifications, environmental assurances, and representations and warranties in commercial agreements. At December 31, 2017, we are not aware of any material liabilities arising from any guarantee, indemnification, or financial assurance we have provided. If we determined such a liability was probable and subject to reasonable determination, we would accrue for it at that time.

DeRidder Mill Incident

On February 8, 2017, a tank located in the pulp mill at the Company's DeRidder, Louisiana facility exploded, resulting in three contractor fatalities and other injuries. The Company has been served with multiple lawsuits and is on notice of additional claims. The Company maintains liability insurance subject to a $1.0 million deductible; however, the incident remains under investigation and the lawsuits are in the early stages. Accordingly, the Company is unable to estimate a range of reasonable possible losses at this time.

The Company has also incurred property damage and business interruption losses and has claimed these losses, subject to a $5.0 million deductible, under its property damage and business interruption insurance policy. As of December 31, 2017, the Company finalized the claim with the insurance carrier for $17.0 million, net of the deductible, which was recorded in "Other expense, net." Payment for the receivable was received in January 2018.

The Company is cooperating with investigations from the U.S. Occupational Health and Safety Administration, the U.S. Chemical Safety Board and the Environmental Protection Agency relating to the incident.

Legal proceedings

We are also a party to various legal actions arising in the ordinary course of our business. These legal actions include commercial liability claims, premises liability claims, and employment-related claims, among others. As of the date of this filing, we believe it is not reasonably possible that any of the legal actions against us will, either individually or in the aggregate, have a material adverse effect on our financial condition, results of operations, or cash flows.

19. Quarterly Results of Operations (unaudited, dollars in millions, except per-share and stock price information)

2017:	First (a)	Second(b)	Third(c)	Fourth(d)	Total
Net sales	$1,536.5	$1,584.0	$1,640.1	$1,684.3	$6,444.9
Gross profit	338.5	364.6	397.3	371.7	1,472.2
Income from operations	203.1	233.8	242.3	252.0	931.2
Net income	117.4	143.2	139.1	268.9	668.6
Basic earnings per share	1.25	1.52	1.47	2.85	7.09
Diluted earnings per share	1.24	1.52	1.47	2.84	7.07
Stock price — high	96.87	113.52	119.43	121.38	121.38
Stock price — low	84.01	89.73	105.81	108.49	84.01

2016:	First(e)	Second(f)	Third(g)	Fourth(h)	Total
Net sales	$1,401.0	$1,417.4	$1,484.0	$1,476.6	$5,779.0
Gross profit	299.0	320.1	329.5	327.1	$1,275.7
Income from operations	180.8	200.2	206.4	192.9	780.3
Net income	103.7	115.9	119.4	110.6	449.6
Basic earnings per share	1.09	1.23	1.27	1.17	4.76
Diluted earnings per share	1.09	1.23	1.26	1.17	4.75
Stock price — high	62.67	71.31	82.77	88.41	88.41
Stock price — low	44.32	58.44	65.12	78.03	44.32

Note: The sum of the quarters may not equal the total of the respective year's earnings per share on either a basic or diluted basis due to changes in the weighted average shares outstanding throughout the year.

(a) Includes $0.6 million of charges related to the closure of corrugated products facilities and lump sum settlement of a multiemployer pension plan withdrawal liability for one of corrugated products facilities ($0.4 million after-tax or $0.1 per diluted share) and $0.2 million of charges related to TimBar Corporation and Columbus Container integration costs ($0.1 million after-tax or $0.0 per diluted share). Also includes $5.0 million of costs for the property damage and business interruption insurance deductible corresponding to the February 2017 explosion at our DeRidder, Louisiana mill ($3.1 million after-tax or $0.03 per diluted share) and $2.3 million of income related to a working capital adjustment from the April 2015 sale of our Hexacomb corrugated manufacturing operations in Europe and Mexico ($1.4 million after-tax or $0.01 per diluted share).

(b) Includes $0.3 million of charges related to the closure of corrugated products facilities ($0.3 million after-tax or $0.0 per diluted share) and $0.2 million of charges related to TimBar Corporation and Columbus Container integration costs ($0.1 after-tax or $0.0 per diluted share).

(c) Includes $0.9 million of charges related to the closure of corrugated products facilities, a paper administration facility, and a lump sum settlement of a multiemployer pension plan withdrawal liability for one of our corrugated products facilities ($0.6 million after-tax or $0.01 per diluted share) and $0.5 million of charges related to the Sacramento Container acquisition and integration costs related to other recent acquisitions ($0.3 million after-tax or $0.0 per diluted share). Also includes $25.3 million of charges related to our determination to discontinue production of uncoated free sheet and coated one-side grades at the Wallula, Washington mill in the second quarter of 2018 and convert the No. 3 paper machine to a high-performance 100% virgin kraft linerboard machine ($15.5 million after-tax or $0.16 per diluted share) and $3.3 million of tax expense for the change in value of deferred taxes as a result of an internal legal entity consolidation that will simplify future operating activities ($0.04 per diluted share).

(d) Includes $7.6 million of income primarily related to the sale of land corresponding to the closure of a corrugated products facility, partially offset by closure costs related to corrugated products facilities, a paper administration facility, and a corporate administration facility ($4.7 million after-tax or $0.05 per diluted share) and $0.9 million of charges related to the Sacramento Container acquisition and integration costs related to other recent acquisitions ($0.5 million after-tax or $0.01 per diluted share), and $8.0 million of charges related to our determination to discontinue production of uncoated free sheet and coated one-side grades at the Wallula, Washington mill in the second quarter of 2018 and convert the No. 3 paper machine to a high-performance 100% virgin kraft linerboard machine ($4.6 million after-tax or $0.05 per diluted share). Also includes $1.8 million of expense related to the write-off of deferred debt issuance costs in connection with the December 2017 debt refinancing ($1.1 million after-tax or $0.01 per diluted share), $2.0 million gain related to the expiration of a repurchase option corresponding to timberland previously sold ($1.2 million after-tax or 0.01 per diluted share), and $122.1 million of estimated income tax benefit related to the enactment in December 2017 of the Tax Cuts and Jobs Act (H.R.1) primarily for the re-measurement of our net deferred tax liability as a result of the reduction in the U.S. corporate income tax rate ($1.29 per diluted share).

(e) Includes $2.8 million of charges related to the closure of a corrugated products facility and a paper products facility ($1.9 million after-tax or $0.02 per diluted share).

(f) Includes $2.6 million of charges related to the closure of corrugated products facilities, a paper products facility, and a lump sum settlement of a multiemployer pension plan withdrawal liability for one of our corrugated products facilities ($1.6 million after-tax or $0.02 per diluted share) and $0.3 million of charges related to the TimBar Corporation acquisition and integration ($0.2 million after-tax or $0.0 per diluted share).

(g) Includes $2.0 million of charges related to the closure of a corrugated products facility and a paper products facility ($1.4 million after-tax or $0.02 per diluted share) and $2.9 million of charges related to the TimBar Corporation and Columbus Container acquisitions and integration ($1.9 million after-tax or $0.02 per diluted share).

(h) Includes $4.5 million of charges related to the closure of a corrugated products facility and a paper products facility ($2.9 million after-tax or $0.03 per diluted share), $2.7 million of costs related to ceased production of softwood market pulp operations at our Wallula, Washington mill and the permanent shutdown of the No. 1 machine ($1.8 million after-tax or $0.02 per diluted share), and $1.2 million of charges related to the TimBar Corporation and Columbus Container acquisitions and integration ($0.8 million after-tax or $0.01 per diluted share).

Item 9. ***CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE***

Not applicable.

Item 9A. ***CONTROLS AND PROCEDURES***

Controls and Procedures

PCA maintains disclosure controls and procedures (as defined in Rule 13a-15(e) of the Securities Exchange Act of 1934) that are designed to provide reasonable assurance that information required to be disclosed in PCA's filings under the Securities Exchange Act is recorded, processed, summarized and reported within the periods specified in the rules and forms of the SEC and that such information is accumulated and communicated to PCA's management, including its Chief Executive Officer and Chief Financial Officer, as appropriate, to allow timely decisions regarding required disclosure.

Prior to filing this report, PCA completed an evaluation under the supervision and with the participation of PCA's management, including PCA's Chief Executive Officer and Chief Financial Officer, of the effectiveness of the design and operation of PCA's disclosure controls and procedures as of December 31, 2017. The evaluation of PCA's disclosure controls and procedures included a review of the controls' objectives and design, PCA's implementation of the controls and the effect of the controls on the information generated for use in this report. Based on this evaluation, PCA's Chief Executive Officer and Chief Financial Officer concluded that PCA's disclosure controls and procedures were effective at the reasonable assurance level as of December 31, 2017.

Changes in Internal Control over Financial Reporting

On October 2, 2017, PCA acquired Sacramento Container Corporation, Northern Sheets LLC and Central California Sheets LLC (collectively, "Sacramento Container"). We are currently in the process of evaluating and integrating Sacramento Container's controls over financial reporting which may result in changes or additions to PCA's internal control over financial reporting. Under guidelines established by the SEC, companies are permitted to exclude acquisitions from their assessment of internal control over financial reporting during the first year of an acquisition while integrating the acquired company. We excluded Sacramento Container from the assessment of internal control over financial reporting at December 31, 2017. Except as may relate to the Sacramento Container acquisition, there were no other changes in our internal control over financial reporting (as defined in Rule 13a-15(f) under the Exchange Act) that occurred during the most recent fiscal quarter ended December 31, 2017 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting. As of and for the year ended December 31, 2017, Sacramento Container accounted for approximately 5% of the Company's consolidated total assets and approximately 1% of consolidated net sales.

Management's Report on Internal Control Over Financial Reporting

PCA's management is responsible for establishing and maintaining adequate internal control over financial reporting, as such term is defined in Exchange Act Rule 13a-15(f). Internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. Internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the Company's assets; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures are being made only with proper authorizations; and (3) 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, PCA's internal control over financial reporting may not prevent or detect misstatements. A control system, no matter how well conceived and operated, can provide only reasonable, not absolute, assurance that objectives of the control system are met. Because of the inherent limitations in all control systems, no evaluation of controls can provide absolute assurance that all control issues and instances of fraud, if any, have been detected. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls become inadequate because of changes in conditions, or that the degree of compliance with the policies and procedures may deteriorate.

PCA's management, under the supervision of and with the participation of the Chief Executive Officer and Chief Financial Officer, assessed the Company's internal control over financial reporting as of December 31, 2017, based on criteria established in *Internal Control—Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). Based on this assessment and excluding the operations acquired from Sacramento Container, PCA's management concluded that its internal control over financial reporting was effective as of December 31, 2017, based on the specified criteria.

KPMG LLP, the independent registered public accounting firm that audited PCA's financial statements included in this Form 10-K, has also audited the effectiveness of the Company's internal control over financial reporting. Their attestation report precedes PCA's audited financial statements included elsewhere in this report.

Item 9B. *OTHER INFORMATION*

None.

PART III

Item 10. *DIRECTORS, EXECUTIVE OFFICERS, AND CORPORATE GOVERNANCE*

Information regarding PCA's executive officers required by this Item 10 is set forth in Item 1 of Part I of this report under the caption "Executive Officers of the Registrant."

The following information required by this Item 10 will be included in PCA's Proxy Statement for the 2018 Annual Meeting of Stockholders and is incorporated by reference herein:

- Information regarding PCA's directors included under the caption "Election of Directors"
- Information regarding PCA's Audit Committee and financial experts included under the caption "Election of Directors — Audit Committee"
- Information regarding PCA's code of ethics included under the caption "Election of Directors — Code of Ethics"
- Information regarding PCA's stockholder nominating procedures included under the captions "Election of Directors — Nominating and Governance Committee," "Other Information — Recommendations for Board — Nominated Director Nominees," and "Other Information — Procedures for Nominating Directors or Bringing Business Before the 2018 Annual Meeting"
- Information regarding compliance with Section 16(a) of the Securities Exchange Act of 1934 included under the caption "Section 16(a) Beneficial Ownership Reporting Compliance"

Item 11. *EXECUTIVE COMPENSATION*

Information with respect to executive compensation required by this Item 11 will be included in PCA's Proxy Statement under the captions "Compensation Discussion and Analysis," "Executive Officer and Director Compensation" (including all subcaptions and tables thereunder) and "Board Committees — Compensation Committee" and is incorporated herein by reference.

Item 12. *SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS*

Information with respect to security ownership of certain beneficial owners and management required by this Item 12 will be included in PCA's Proxy Statement under the caption "Ownership of Our Stock" and is incorporated herein by reference.

Authorization of Securities under Equity Compensation Plans — Securities authorized for issuance under our equity compensation plans at December 31, 2017 are as follows:

	Column		
	A	B	C
Plan Category	Number of Securities to Be Issued Upon Exercise of Outstanding Options, Warrants, and Rights (a)	Weighted Average Exercise Price of Outstanding Options, Warrants, and Rights	Number of Securities Remaining Available for Future Issuance Under Equity Compensation Plans (Excluding Securities Reflected in Column A)
Equity compensation plans approved by securityholders	—	$ —	1,008,690
Equity compensation plans not approved by securityholders	N/A	N/A	N/A
Total	**—**	**$ —**	**1,008,690**

(a) Does not include 966,290 shares of unvested restricted stock and performance units granted pursuant to our Amended and Restated 1999 Long-Term Equity Incentive Plan.

Item 13. *CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS, AND DIRECTOR INDEPENDENCE*

Information with respect to certain relationships and related transactions and director independence required by this Item 13 will be included in PCA's Proxy Statement under the captions "Transactions with Related Persons" and "Election of Directors — Determination of Director Independence," respectively, and is incorporated herein by reference.

Item 14. *PRINCIPAL ACCOUNTING FEES AND SERVICES*

Information with respect to fees and services of the principal accountant required by this Item 14 will be included in PCA's Proxy Statement under the caption "Ratification of Appointment of the Independent Registered Public Accounting Firm" under the subcaptions "- Fees to the Independent Registered Public Accounting Firm" and "- Audit Committee Preapproval Policy for Audit and Non-Audit Fees" and are incorporated herein by reference.

PART IV

Item 15. *EXHIBITS, FINANCIAL STATEMENT SCHEDULES*

(a) The following documents are filed as a part of this report:

(1) The financial statements listed in the "Index to Financial Statements."
(2) Financial Statement Schedule.

All schedules for which provision is made in the applicable accounting regulations of the Securities and Exchange Commission are not required under the related instructions, are inapplicable or not material, or the information called for thereby is otherwise included in the financial statements or the accompanying notes to the financial statements and therefore, have been omitted.

(3) Exhibits

Exhibit Number	Description
2.1	Contribution Agreement, dated as of January 25, 1999, among Pactiv Corporation (formerly known as Tenneco Packaging Inc.) ("Pactiv"), PCA Holdings LLC ("PCA Holdings") and Packaging Corporation of America ("PCA"). (Incorporated herein by reference to Exhibit 2.1 to PCA's registration Statement on Form S-4, Registration No. 333-79511).
2.2	Letter Agreement Amending the Contribution Agreement, dated as of April 12, 1999, among Pactiv, PCA Holdings and PCA. (Incorporated herein by reference to Exhibit 2.2 to PCA's Registration Statement on Form S-4, Registration No. 333-79511).
2.3	Agreement and Plan of Merger, dated September 16, 2013, between PCA, Bee Acquisition Corp. and Boise Inc. (Incorporated herein by reference to Exhibit 2.1 to PCA's Current Report on Form 8-K filed September 17, 2013, File No. 1-15399). PCA will furnish supplementally a copy of any omitted schedule or exhibit to the SEC upon request; provided, however, that PCA may request confidential treatment pursuant to Rule 24b-2 of the Securities Exchange Act of 1934, as amended, for any schedule or exhibit so furnished.
3.1	Restated Certificate of Incorporation of PCA. (Incorporated herein by reference to Exhibit 3.1 to PCA's Registration Statement on Form S-4, Registration No. 333-79511).
3.2	Certificate of Amendment to Restated Certificate of Incorporation of PCA. (Incorporated herein by reference to Exhibit 3.2 to PCA's Registration Statement on Form S-4, Registration No. 333-109437.)
3.3	Amended and Restated By-laws of PCA. (Incorporated herein by reference to Exhibit 3.1 to PCA's Current Report on Form 8-K filed December 7, 2012, File No. 1-15399.)
4.1	Form of certificate representing shares of common stock. (Incorporated herein by reference to Exhibit 4.9 to PCA's Registration Statement on Form S-1, Registration No. 333-86963.)
4.2	Indenture, dated as of July 21, 2003, between PCA and U.S. Bank National Association. (Incorporated herein by reference to Exhibit 4.2 to PCA's Quarterly Report on Form 10-Q for the period ended June 30, 2003, File No. 1-15399.)
4.3	First Supplemental Indenture, dated as of July 21, 2003, between PCA and U.S. Bank National Association. (Incorporated herein by reference to Exhibit 4.3 to PCA's Quarterly Report on Form 10-Q for the period ended June 30, 2003, File No. 1-15399.)
4.4	Form of Rule 144A Global Note. (Incorporated herein by reference to Exhibit 4.5 to PCA's Quarterly Report on Form 10-Q for the period ended June 30, 2003, File No. 1-15399.)

Exhibit Number	Description
4.5	Officers' Certificate, dated March 25, 2008, pursuant to Section 301 of the Indenture filed herewith as Exhibit 4.2 (Incorporated herein by reference to Exhibit 4.1 to PCA's Current Report on Form 8-K filed March 25, 2008, File No. 1-15399.)
4.6	6.50% Senior Notes due 2018. (Incorporated herein by reference to Exhibit 4.2 to PCA's Current Report on Form 8-K filed March 25, 2008, File No. 1-15399.)
4.7	Officers' Certificate, dated as of June 26, 2012, pursuant to Section 301 of the Indenture filed herewith as Exhibit 4.2 and 3.90% Senior Notes due 2022. (Incorporated herein by reference to Exhibit 4.2 to PCA's Current Report on Form 8-K filed June 26, 2012, File No. 1-15399.)
4.8	Officers' Certificate, dated as of October 22, 2013, pursuant to Section 301 of the Indenture filed herewith as Exhibit 4.2. (Incorporated herein by reference to Exhibit 4.1 to PCA's Current Report on Form 8-K filed October 22, 2013, File No 1-15399.)
4.9	4.500% Senior Notes due 2023. (Incorporated herein by reference to Exhibit 4.2 to PCA's Current Report on Form 8-K filed October 22, 2013, File No 1-15399.)
4.10	Officers' Certificate, dated September 5, 2014, pursuant to Section 301 of the Indenture filed herewith as Exhibit 4.2 (Incorporated herein by reference to Exhibit 4.1 to PCA's Current Report on Form 8-K filed September 5, 2014, File No. 1-15399).
4.11	3.650% Senior Notes due 2024 (Incorporated herein by reference to Exhibit 4.2 to PCA's Current Report on Form 8-K filed September 5, 2014, File No. 1-15399).
4.12	Officer's Certificate, dated December 13, 2017, pursuant to Section 301 of the Indenture filed herewith as Exhibit 4.2 (Incorporated herein by reference to Exhibit 4.1 to PCA's Current Report on Form 8-K filed December 13, 2017, File No. 1-15399).
4.13	2.450% Senior Notes due 2020 (Incorporated herein by reference to Exhibit 4.2 to PCA's Current Report on Form 8-K filed December 13, 2017, File No. 1-15399).
4.14	3.400% Senior Notes due 2027 (Incorporated herein by reference to Exhibit 4.3 to PCA's Current Report on Form 8-K filed December 13, 2017, File No. 1-15399).
10.1	Amended and Restated Credit Agreement, dated as of August 29, 2016, by and among PCA and the lenders and agents named therein. (Incorporated herein by reference to Exhibit 10.1 to PCA's Current Report on Form 8-K filed September 1, 2016, File No. 1-15399.)
10.2	Packaging Corporation of America Thrift Plan for Hourly Employees and First Amendment of Packaging Corporation of America Thrift Plan for Hourly Employees, effective February 1, 2000. (Incorporated herein by reference to Exhibit 4.5 to PCA's Registration Statement on Form S-8, Registration No. 333-33176.)*
10.3	Packaging Corporation of America Retirement Savings Plan, effective February 1, 2000. (Incorporated herein by reference to Exhibit 4.6 to PCA's Registration Statement on Form S-8, Registration No. 333-33176.)*
10.4	Form of Restricted Stock Award Agreement for employees and non-employee directors under the Amended and Restated 1999 Long-term Equity Incentive Plan. (Incorporated herein by reference to Exhibit 10.3 to PCA's Current Report on Form 8-K, filed March 14, 2006, File No. 1-15399.)*
10.5	Packaging Corporation of America Supplemental Executive Retirement Plan, as Amended and Restated Effective as of January 1, 2005. (Incorporated herein by reference to Exhibit 10.31 to PCA's Annual Report on Form 10-K for the year ended December 31, 2006, File No. 1-15399.)*
10.6	Packaging Corporation of America Deferred Compensation Plan, effective as of January 1, 2009, conformed to incorporate all amendments. (Incorporated herein by reference to Exhibit 10.6 to PCA's Annual Report on Form 10-K for the year ended December 31, 2016, File No. 1-15399.)*

Exhibit Number	Description
10.7	First Amendment of Packaging Corporation of America Supplemental Executive Retirement Plan, effective as of January 1, 2008. (Incorporated herein by reference to Exhibit 10.17 to PCA's Annual Report on Form 10-K for the year ended December 31, 2008, file No. 1-15399.)*
10.8	Amended and Restated 1999 Long-Term Equity Incentive Plan, effective as of May 1, 2013, conformed to incorporate all amendments. (Incorporated herein by reference to Exhibit 10.8 to PCA's Annual Report on Form 10-K for the year ended December 31, 2016, File No. 1-15399.)*
10.9	PCA Amended and Restated Performance Incentive Plan, effective as of May 12, 2015. (Incorporated herein by reference to Appendix A to PCA's Definitive Proxy Statement on Schedule 14A, filed with the SEC on March 27, 2015, File No. 1-15399.)*
10.10	Amended and Restated Executive Incentive Compensation Plan, effective as of December 29, 2017.†
10.11	Second Amendment of Packaging Corporation of America Supplemental Executive Retirement Plan, effective as of February 28, 2013. (Incorporated herein by reference to Exhibit 10.22 to PCA's Annual Report on Form 10-K for the year ended December 31, 2012, File No. 1-15399.)*
10.12	Third Amendment of Packaging Corporation of America Supplemental Executive Retirement Plan, effective as of February 28, 2013. (Incorporated herein by reference to Exhibit 10.23 to PCA's Annual Report on Form 10-K for the year ended December 31, 2012, File No. 1-15399.) *
10.13	Form of Restricted Stock Agreement for executive officer awards made in June 2017. (Incorporated by reference to Exhibit 10.1 to PCA's Quarterly Report on Form 10-Q for the period ended June 30, 2017, File No. 1-15399).*
10.14	Form of Performance Unit Agreement for executive officer awards made in June 2017. (Incorporated by reference to Exhibit 10.2 to PCA's Quarterly Report on Form 10-Q for the period ended June 30, 2017, File No. 1-15399).*
10.15	Performance Based Equity Award Pool for Executive Officers relating to awards made in June 2017. (Incorporated by reference to Exhibit 10.3 to PCA's Quarterly Report on Form 10-Q for the period ended June 30, 2017, File No. 1-15399).*
10.16	Paper Purchase Agreement, dated June 25, 2011 (the "Paper Purchase Agreement"), between Boise White Paper, L.L. C. and OfficeMax Incorporated (Incorporated by reference to Exhibit 10.1 to Boise, Inc.'s Quarterly Report on Form 10-Q for the period ended June 30, 2013, File No. 1-33541)**
10.17	First Amendment to Paper Purchase Agreement, dated June 20, 2013, between Boise White Paper, L.L.C. and OfficeMax Incorporated (Incorporated by reference to Exhibit 10.2 to Boise, Inc.'s Quarterly Report on Form 10-Q for the period ended June 30, 2013, File No. 1-33541)**
10.18	Second Amendment to Paper Purchase Agreement, effective January 1, 2015 and executed and delivered August 19, 2015, between Boise White Paper, L.L.C. and Office Depot Inc. (Incorporated by reference to Exhibit 10.1 to PCA's Quarterly Report on Form 10-Q for the period ended September 30, 2015, File No. 1-33541)**
10.19	Form of Performance Unit Agreement for executive officer awards made in June 2014. (Incorporated by reference to Exhibit 10.1 to PCA's Quarterly Report on Form 10-Q for the period ended June 30, 2014, File No. 1-15399).*
10.20	Form of Restricted Stock Agreement for executive officer awards made in June 2014. (Incorporated by reference to Exhibit 10.2 to PCA's Quarterly Report on Form 10-Q for the period ended June 30, 2014, File No. 1-15399).*

Exhibit Number	Description
10.21	Form of Performance Unit Agreement for executive officer awards made in June 2015. (Incorporated by reference to Exhibit 10.1 to PCA's Quarterly Report on Form 10-Q for the period ended June 30, 2015, File No. 1-15399).*
10.22	Form of Restricted Stock Agreement for executive officer awards made in June 2015. (Incorporated by reference to Exhibit 10.2 to PCA's Quarterly Report on Form 10-Q for the period ended June 30, 2014, File No. 1-15399).*
10.23	Form of Performance Unit Agreement for executive officer awards made in June 2016. (Incorporated by reference to Exhibit 10.2 to PCA's Quarterly Report on Form 10-Q for the period ended June 30, 2016, File No. 1-15399).*
10.24	Form of Restricted Stock Agreement for executive officer awards made in June 2016. (Incorporated by reference to Exhibit 10.1 to PCA's Quarterly Report on Form 10-Q for the period ended June 30, 2016, File No. 1-15399).*
12.1	Statement Regarding Computation of Ratio of Earnings to Fixed Charges.†
21.1	Subsidiaries of the Registrant.†
23.1	Consent of KPMG LLP.†
24.1	Powers of Attorney.†
31.1	Certification of Chief Executive Officer, As Adopted Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.†
31.2	Certification of Chief Financial Officer, As Adopted Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.†
32	Certification of Chief Executive Officer and Chief Financial Officer Pursuant to 18 U.S.C. §1350, As Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.†
101	The following financial information from Packaging Corporation of America's Annual Report on Form 10-K for the year ended December 31, 2017, formatted in XBRL (eXtensible Business Reporting Language): (i) Consolidated Statements of Income for the years ended December 31, 2017, 2016, and 2015, (ii) Consolidated Balance Sheets at December 31, 2017 and 2016, (iii) Consolidated Statements of Cash Flows for the years ended December 31, 2017, 2016, and 2015, (iv) Consolidated Statements of Changes in Stockholders' Equity for the years ended December 31, 2017, 2016, and 2015, (v) the Notes to Consolidated Financial Statements, and (vi) Financial Statement Schedule-Valuation and Qualifying Accounts.

* Management contract or compensatory plan or arrangement.

** Confidential information in this exhibit has been omitted and filed separately with the Securities and Exchange Commission pursuant to a confidential treatment request under Rule 406 of the Securities Act of 1933, as amended.

† Filed herewith.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrants have duly caused this report to be signed on their behalf by the undersigned, thereunto duly authorized on February 28, 2018.

Packaging Corporation of America

/s/ MARK W. KOWLZAN

Mark W. Kowlzan
Chairman of the Board and Chief Executive Officer

/s/ ROBERT P. MUNDY

Robert P. Mundy
Senior Vice President and Chief Financial Officer

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below on February 28, 2018, by the following persons on behalf of the registrants and in the capacities indicated.

Signature	Capacity
/s/ MARK W. KOWLZAN Mark W. Kowlzan	Chairman of the Board and Chief Executive Officer (Principal Executive Officer)
/s/ ROBERT P. MUNDY Robert P. Mundy	Senior Vice President and Chief Financial Officer (Principal Financial and Accounting Officer)
* Cheryl K. Beebe	Director
* Duane Farrington	Director
* Hasan Jameel	Director
* Robert C. Lyons	Director
* Thomas P. Maurer	Director
* Samuel M. Mencoff	Director
* Roger B. Porter	Director
* Thomas S. Souleles	Director
* Paul T. Stecko	Director
* James D. Woodrum	Director
/s/ ROBERT P. MUNDY Robert P. Mundy *(Attorney-In-Fact)*	

Exhibit 31.1

**CEO CERTIFICATION PURSUANT TO SECTION 302
OF THE SARBANES-OXLEY ACT OF 2002**

I, Mark W. Kowlzan, certify that:

(1) I have reviewed this annual report on Form 10-K of Packaging Corporation of America (PCA);

(2) Based on my knowledge, this annual report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this annual report;

(3) Based on my knowledge, the financial statements, and other financial information included in this annual report, fairly present in all material respects the financial condition, results of operations and cash flows of PCA as of, and for, the periods presented in this annual report;

(4) PCA's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for PCA and have:

a) designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to PCA, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

b) designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, 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;

c) evaluated the effectiveness of PCA's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

d) disclosed in this report any change in PCA's internal control over financial reporting that occurred during PCA's most recent fiscal quarter (PCA's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, PCA's internal control over financial reporting; and

(5) PCA's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to PCA's auditors and the Audit Committee of PCA's Board of Directors (or persons performing the equivalent functions):

a) all significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect PCA's ability to record, process, summarize and report financial information; and

b) any fraud, whether or not material, that involves management or other employees who have a significant role in PCA's internal control over financial reporting.

/s/ MARK W. KOWLZAN

Mark W. Kowlzan
Chairman of the Board and Chief Executive Officer

Date: February 28, 2018

Exhibit 31.2

CFO CERTIFICATION PURSUANT TO SECTION 302
OF THE SARBANES-OXLEY ACT OF 2002

I, Robert P. Mundy, certify that:

(1) I have reviewed this annual report on Form 10-K of Packaging Corporation of America (PCA);

(2) Based on my knowledge, this annual report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this annual report;

(3) Based on my knowledge, the financial statements, and other financial information included in this annual report, fairly present in all material respects the financial condition, results of operations and cash flows of PCA as of, and for, the periods presented in this annual report;

(4) PCA's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for PCA and have:

a) designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to PCA, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

b) designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, 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;

c) evaluated the effectiveness of PCA's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

d) disclosed in this report any change in PCA's internal control over financial reporting that occurred during PCA's most recent fiscal quarter (PCA's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, PCA's internal control over financial reporting; and

(5) PCA's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to PCA's auditors and the Audit Committee of PCA's Board of Directors (or persons performing the equivalent functions):

a) all significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect PCA's ability to record, process, summarize and report financial information; and

b) any fraud, whether or not material, that involves management or other employees who have a significant role in PCA's internal control over financial reporting.

/s/ ROBERT P. MUNDY

Robert P. Mundy
Senior Vice President and Chief Financial Officer

Date: February 28, 2018

Exhibit 32

**CERTIFICATIONS OF CHIEF EXECUTIVE OFFICER AND
CHIEF FINANCIAL OFFICER
PURSUANT TO 18 U.S.C. §1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002**

We are providing this Certificate pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, 18 U.S.C., Section 1350. It accompanies the Annual Report on Form 10-K of Packaging Corporation of America for the year ended December 31, 2017.

I, Mark W. Kowlzan, Chief Executive Officer of Packaging Corporation of America (the "Company"), certify, pursuant to 18 U.S.C. § 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that to my knowledge:

(1) The Annual Report of the Company on Form 10-K for the period ended December 31, 2017 fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

(2) The information contained in such Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

/s/ MARK W. KOWLZAN

Mark W. Kowlzan
Chairman of the Board and Chief Executive Officer

Date: February 28, 2018

I, Robert P. Mundy, Chief Financial Officer of Packaging Corporation of America (the "Company"), certify, pursuant to 18 U.S.C. § 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that to my knowledge:

(1) The Annual Report of the Company on Form 10-K for the period ended December 31, 2017 fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

(2) The information contained in such Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

/s/ ROBERT P. MUNDY

Robert P. Mundy
Senior Vice President and Chief Financial Officer

Date: February 28, 2018

Board of Directors

Mark W. Kowlzan
Chairman and Chief
Executive Officer,
Packaging Corporation of America

Cheryl K. Beebe
Retired Executive Vice President
and Chief Financial Officer,
Ingredion Incorporated

Duane C. Farrington
Executive Vice President
and Chief Administrative Officer,
State Farm Mutual Automobile
Insurance Company

Hasan Jameel
Jordan Family Distinguished
Professor of Natural Resource
Innovation, North Carolina State
University

Robert C. Lyons
Executive Vice President and
Chief Financial Officer,
GATX Corporation

Thomas P. Maurer
Retired Partner,
Ernst & Young LLP

Samuel M. Mencoff
Co-Chief Executive Officer,
Madison Dearborn Partners, LLC

Roger B. Porter
IBM Professor of Business and
Government,
Harvard University

Thomas S. Souleles
Managing Director,
Madison Dearborn Partners, LLC

Paul T. Stecko
Retired Chairman and Chief
Executive Officer,
Packaging Corporation of America

James D. Woodrum
Clinical Professor,
Kellogg School of Business
Northwestern University

Executive Officers

Mark W. Kowlzan
Chairman and Chief
Executive Officer

Thomas A. Hassfurther
Executive Vice President,
Corrugated Products

Charles J. Carter
Senior Vice President,
Containerboard Mill Operations

Robert P. Mundy
Senior Vice President and
Chief Financial Officer

Kent A. Pflederer
Senior Vice President,
General Counsel and Secretary

Thomas W. H. Walton
Senior Vice President, Sales
and Marketing, Corrugated Products

Officers

Pamela A. Barnes
Vice President, Controller and
Treasurer

Mark D. Beyma
Vice President,
Area General Manager

Barbara T. Clemens
Vice President,
Paper Sales and Customer Service

Charles G. Colby
Vice President,
Area General Manager

Bruce K. Ellsberry
Vice President,
Area General Manager

Donald R. Haag
Vice President,
Manufacturing Services

Matthew J. Heleva
Vice President,
Area General Manager

Randy G. Herbison
Vice President,
Area General Manager

Jeffrey S. Kaser
Vice President,
Area General Manager

Paul LeBlanc
Vice President, Paper

Edward T. Lees
Vice President,
Area General Manager

Peter A. Martens
Vice President, Finance

Darla J. Olivier
Vice President, Tax

Heidi L. Patton
Vice President,
Containerboard Sales

Joseph F. Perry
Vice President,
Operations Finance

Bruce A. Ridley
Vice President, EH&S
and Operations Services

Robert A. Schneider
Vice President,
Chief Information Officer

Donald R. Shirley
Vice President,
Corporate Process Technology

Jay C. Thiessen
Vice President,
Paper Mill Operations

Robert M. Wilhelm
Vice President, Finance

Shareholder Information

Annual Meeting
The annual meeting of shareholders will be held at 8:30 a.m., central time, on May 15, 2018, at the Company's office located at 1955 West Field Court, Lake Forest, IL 60045.

Shareholder Services
To transfer securities, change address or replace lost certificates, please contact:

Packaging Corporation of America Shareholder Services
c/o Computershare Trust Company N.A., P.O. Box 505000, Louisville, Kentucky 40233-5000
Toll Free: (877) 282-1168 Outside North America: (781) 575-2723
Shareholder Website: www.computershare.com/investor

Stock Exchange Information
Packaging Corporation of America's common stock is listed on the New York Stock Exchange under the symbol PKG.

Certifications
On June 15, 2017, the Company filed with the New York Stock Exchange (the "NYSE") the Annual CEO Certification regarding the Company's compliance with the NYSE's Corporate Governance listing standards as required by Section 303A. 12(a) of the New York Stock Exchange Listed Company Manual. In addition, the Company has filed as exhibits to this Annual Report on Form 10-K for the year ended December 31, 2017, the applicable certifications of its Chief Executive Officer and its Chief Financial Officer required under Section 302 of the Sarbanes-Oxley Act of 2002, regarding the quality of the Company's public disclosures.

Website: www.packagingcorp.com
Corporate news releases, Forms 10-K and 10-Q, annual reports and a variety of additional information of potential interest to investors are available through the Company's website.

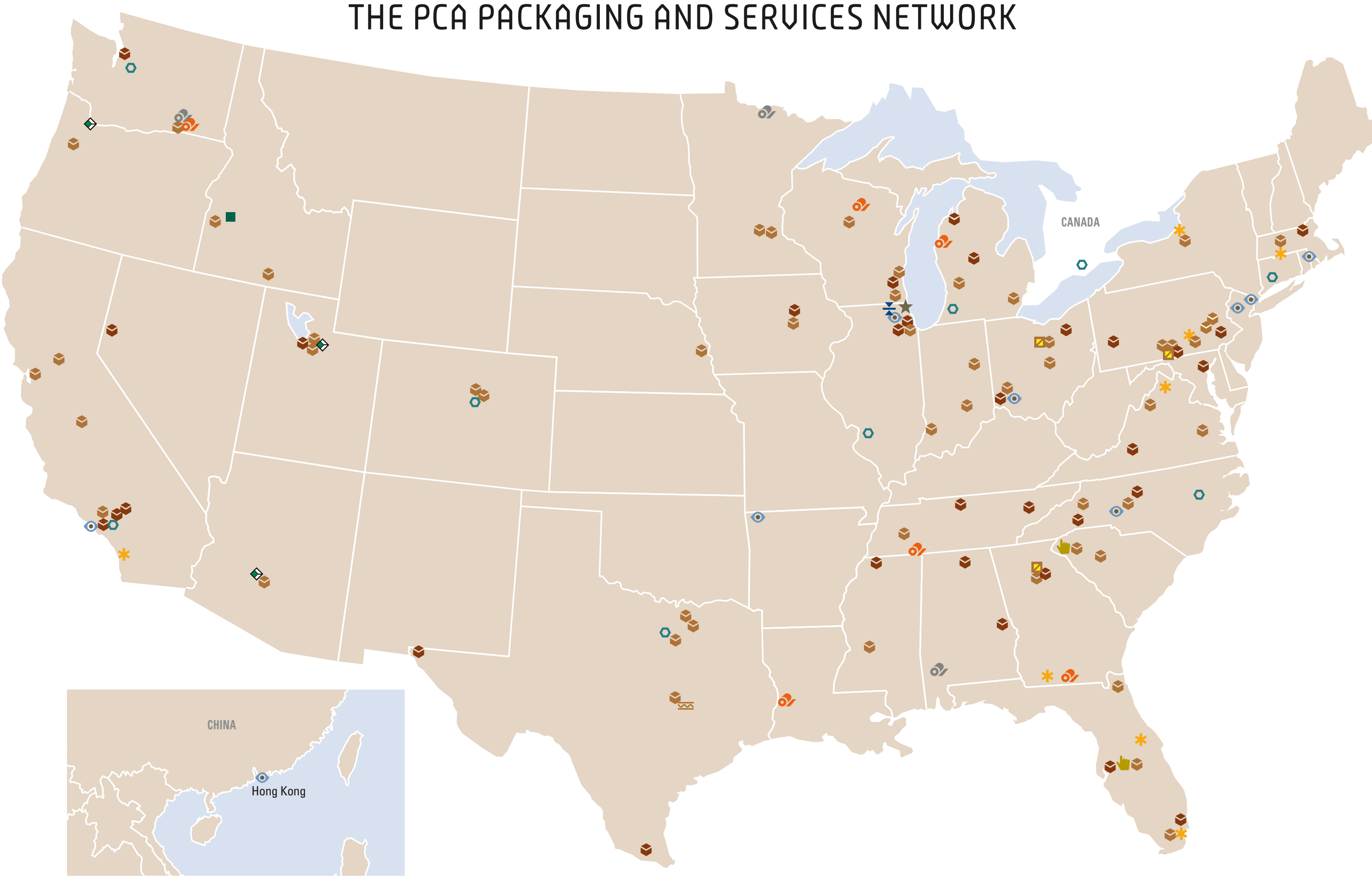
Requests for Information
Additional information is available without charge. For additional copies of annual reports, Forms 10-K and 10-Q or other financial information, please contact:

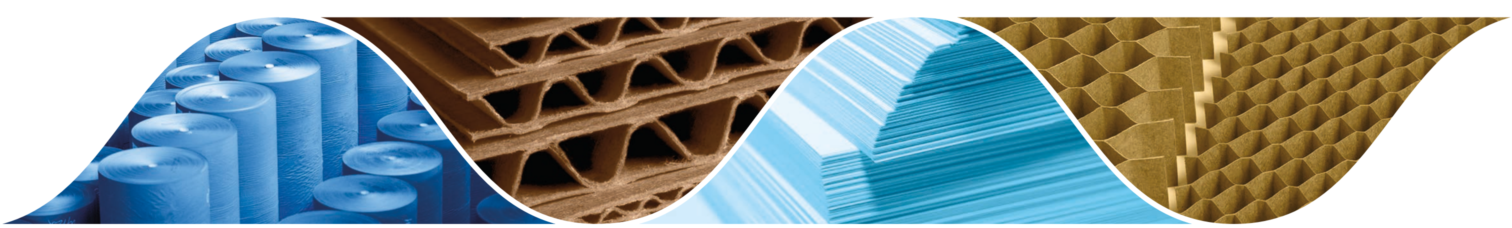
Investor Relations, Packaging Corporation of America, 1955 West Field Court, Lake Forest, IL 60045
Toll Free: (877) 454-2509

GROWING NETWORK

PACKAGING CORPORATION OF AMERICA is a large company with a small-company feel. As we continue to grow, we remain focused on bringing value to our expanding customer base across the nation. As a result of strategic planning and positioning, PCA customers enjoy wide-ranging resources and economies of scale, as well as responsive service in the right place at the right time.

THE PCA PACKAGING AND SERVICES NETWORK





When you choose Packaging Corporation of America, you work with people who do the right things for each other and for our customers. We believe in utilizing the power of strong collaborative relationships, bound by the trust we have earned, to deliver innovative packaging solutions and an outstanding service experience.

People • Customers • Trust

PACKAGING CORPORATION OF AMERICA

1955 WEST FIELD COURT

LAKE FOREST, ILLINOIS 60045

(800) 456-4725

WWW.PACKAGINGCORP.COM

© 2018 Packaging Corporation of America. All rights reserved.