RAYONIER ADVANCED MATERIALS INC.
Form 10-K
March 01, 2019
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UNITED STATES SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549
FORM 10-K
(Mark One)
x ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the fiscal year ended December 31, 2018
or
o TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the transition period from to
Commission File Number 001-36285
RAYONIER ADVANCED MATERIALS INC.
Incorporated in the State of Delaware
I.R.S. Employer Identification No. 46-4559529
1301 RIVERPLACE BOULEVARD, SUITE 2300
JACKSONVILLE, FL 32207
(Principal Executive Office)
Telephone Number: (904) 357-4600
Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Name of exchange on which registered
Common stock, par value $0.01 per share	New York Stock Exchange
8.00% Series A Mandatory Convertible Preferred Stock, par value $0.01 per share	New York Stock Exchange

Securities to be 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 x NO o
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 o NO x
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 x NO o
Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted 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 such files).
YES x NO o
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. x
Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company" and "emerging growth company" in Rule 12b-2 of the Exchange Act.
Large accelerated filer x Accelerated filer o

Non-accelerated filer o Smaller reporting company o
Emerging growth company o

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. o

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

The aggregate market value of the Common Stock of the registrant held by non-affiliates at the close of business on June 30, 2018 was $857,934,441 based on the closing sale price as reported on the New York Stock Exchange.

The registrant had 49,277,270 shares of Common Stock, $.01 par value per share, outstanding as of February 22, 2019.

Portions of the registrant’s definitive proxy statement to be filed with the Securities and Exchange Commission in connection with the 2019 annual meeting of the stockholders are incorporated by reference in Part III hereof. Such proxy statement will be filed with the Securities and Exchange Commission within 120 days of the registrant’s fiscal year ended December 31, 2018.

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Note About Forward-Looking Statements

Certain statements in this Annual Report on Form 10-K (this “Report”) regarding anticipated financial, business, legal or other outcomes including business and market conditions, outlook and other similar statements relating to Rayonier Advanced Materials’ (“the Company”) future events, developments, or financial or operational performance or results, are “forward-looking statements” made pursuant to the safe harbor provisions of the Private Securities Litigation Reform Act of 1995 and other federal securities laws. These forward-looking statements are identified by the use of words such as “may,” “will,” “should,” “expect,” “estimate,” “believe,” “intend,” “forecast,” “anticipate” “guidance” and other language. However, the absence of these or similar words or expressions does not mean a statement is not forward-looking. While we believe these forward-looking statements are reasonable when made, forward-looking statements are not guarantees of future performance or events and undue reliance should not be placed on these statements. Although we believe the expectations reflected in any forward-looking statements are based on reasonable assumptions, we can give no assurance these expectations will be attained and it is possible actual results may differ materially from those indicated by these forward-looking statements due to a variety of risks and uncertainties. The following risk factors and those contained in Item 1A — Risk Factors, among others, could cause actual results or events to differ materially from the Company’s historical experience and those expressed in forward-looking statements made in this document.

Amounts contained in this Report may not always add due to rounding.

Part I

When we refer to “we,” “us,” “our,” “the Company,” or “Rayonier Advanced Materials” we mean Rayonier Advanced Materials Inc. and its consolidated subsidiaries. References herein to “Notes to Financial Statements” refer to the Notes to the Consolidated Financial Statements of Rayonier Advanced Materials Inc. included in Item 8 of this Report.

Risks Relating to the Business

- The businesses we operate are highly competitive and many of them are cyclical, which may result in fluctuations in pricing and volume that can adversely impact our business, financial condition and results of operations.
- Our ten largest customers represent approximately 35 percent of our 2018 sales, and the loss of all or a substantial portion of our revenue from these large customers could have a material adverse effect on our business.
- A material disruption at one of our major manufacturing facilities could prevent us from meeting customer demand, reduce our sales and profitability, increase our cost of production and capital needs, or otherwise adversely affect our business, financial condition and results of operation.
- Changes in raw material and energy availability and prices could affect our business, financial condition and results of operations.
- The availability of, and prices for, wood fiber could materially impact our business, results of operations and financial condition.
- We are subject to risks associated with doing business outside of the United States.
- Our operations require substantial capital.
- Currency fluctuations may have a negative impact on our business, financial condition and results of operations.
- Restrictions on trade through tariffs, countervailing and anti-dumping duties, quotas and other trade barriers, in the United States and internationally, especially with respect to China, Canada and as a result of “Brexit”, could adversely affect our ability to access certain markets and otherwise impact our results of operations.
- We depend on third parties for transportation services and increases in costs and the availability of transportation could adversely affect our business.
- Our business is subject to extensive environmental laws, regulations and permits that may restrict or adversely affect our financial results and how we conduct business.
- The potential impacts of climate change and climate-related initiatives, remain uncertain at this time.
- Our failure to maintain satisfactory labor relations could have a material adverse effect on our business.
- We are dependent upon attracting and retaining key personnel, the loss of whom could adversely affect our business.
- Failure to develop new products or discover new applications for our existing products, or our inability to protect the intellectual property underlying such new products or applications, could have a negative impact on our business.

- The risk of loss of the Company’s intellectual property and sensitive business information, or disruption of its manufacturing operations, in each case due to cyberattacks or cybersecurity breaches, could adversely impact the Company.
- We may need to make significant additional cash contributions to our retirement benefit plans if investment returns on pension assets are lower than expected or interest rates decline, and/or due to changes to regulatory, accounting and actuarial requirements.
- We have significant debt obligations that could adversely affect our business and our ability to meet our obligations.

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- The phase-out of the London Inter Bank Office Rate (“LIBOR”) as an interest rate benchmark could result in an increase to our borrowing costs.
- Challenges in the commercial and credit environments may materially adversely affect our future access to capital.
- We may need additional financing in the future to meet our capital needs or to make acquisitions, and such financing may not be available on favorable terms, if at all, and may be dilutive to existing stockholders.
- The inability to effectively integrate the Tembec Inc. (“Tembec”) acquisition and meet our financial objectives therefrom, and any future acquisitions we may make, may affect our results.

Risks Related to the Company’s Common Stock and Certain Corporate Matters

- Your percentage of ownership in the Company may be diluted in the future.
- Our common stock ranks junior to our Mandatory Convertible Preferred Stock, Series A (the “Preferred Stock”) with respect to dividends and amounts payable in the event of our liquidation.
- Certain provisions of the Preferred Stock could prevent or delay an acquisition of the Company, which could decrease the price of our common stock.
- Certain provisions in our amended and restated certificate of incorporation and bylaws, and of Delaware law, could prevent or delay an acquisition of the Company, which could decrease the price of our common stock.

Forward-looking statements are only as of the date they are made, and the Company undertakes no duty to update its forward-looking statements except as required by law. You are advised, however, to review any further disclosures we have made or may make in our filings and other submissions to the U.S. Securities and Exchange Commission (the “SEC”), including those on Forms 10-Q, 10-K, 8-K and other reports. Details on each of the above risk factors are more specifically described in Item 1A - Risk Factors.

Note About Non-GAAP Financial Measures

A “non-GAAP financial measure” is generally defined as a numerical measure of a company’s historical or future performance that excludes or includes amounts, or is subject to adjustments, so as to be different from the most directly comparable measure calculated and presented in accordance with U.S. Generally Accepted Accounting Principles (“GAAP”). This Report contains certain non-GAAP financial measures, including Earnings Before Interest, Taxes, Depreciation and Amortization (“EBITDA”), adjusted EBITDA, and adjusted free cash flows. These non-GAAP measures are reconciled to each of their respective most directly comparable GAAP financial measures in Item 7 — Management’s Discussion and Analysis of Financial Condition and Results of Operations.

We believe these non-GAAP measures provide useful information to our Board of Directors, management and investors regarding certain trends relating to our financial condition and results of operations. Our management uses these non-GAAP measures to compare our performance to that of prior periods for trend analyses, purposes of determining management incentive compensation and budgeting, forecasting and planning purposes.

We do not consider non-GAAP measures an alternative to financial measures determined in accordance with GAAP. The principal limitation of these non-GAAP financial measures is they may exclude significant expense and income items that are required by GAAP to be recognized in our consolidated financial statements. In addition, they reflect the exercise of management’s judgment about which expense and income items are excluded or included in determining these non-GAAP financial measures. In order to compensate for these limitations, reconciliations of the non-GAAP financial measures we use to their most directly comparable GAAP measures are provided. Non-GAAP financial measures should not be relied upon, in whole or part, in evaluating the financial condition, results of operations or future prospects of the Company.

Item 1. Business

Rayonier Advanced Materials Inc. is a global leader of cellulose-based technologies, including high purity cellulose specialties, a natural polymer commonly found in cell phone and computer screens, filters and pharmaceuticals. Prior to June 27, 2014, we consisted of Rayonier Inc.’s (“Rayonier’s”) wholly-owned performance fibers business, the global leader in the production of cellulose specialties. On that date, holders of Rayonier common shares received one share of our common stock for every three Rayonier common shares held on the record date. This resulted in our separation from Rayonier and the start of our business as an independent, publicly traded company.

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Starting from a tree and building upon more than 90 years of experience in cellulose chemistry, we provide our customers high quality cellulose specialties pulp products that make up the essential building blocks for their products while providing exceptional service and value.

On November 17, 2017, we completed the acquisition of Tembec which manufactures cellulose specialties, commodity products, forest products, pulp and paper (the "Acquisition"). The Acquisition created a combined company with leading positions across the cellulose specialties product spectrum, including acetate, ethers, high-strength viscose, filtration and other cellulose specialties, as well as adding complementary assets in the forest products, pulp and paper businesses. Consequently, we now operate in the following business segments:

- High Purity Cellulose
- Forest Products
- Pulp
- Paper

See Note 19 - Segment and Geographical Information of our consolidated financial statements for more information.

With the completion of the Acquisition, we announced a strategy to grow EBITDA and drive long-term value for our stockholders. Our plan focuses on the following four strategic pillars:

- Cost Transformation - driving sustainable cost reductions by fostering a culture of continuous improvement.
- New Products - expanding our business by developing next generation cellulose fibers and other value-added products utilizing our cellulose processing technology, expertise and co-products. We have made significant progress in developing and applying proprietary technologies to new products in many of the end-market segments we serve.
- Market Optimization - maximizing the profitability of our existing products and assets by optimizing the intersection of our customers' needs, our manufacturing capabilities and transportation costs to drive higher value for our customers and our Company.
- Investments - delivering a capital allocation strategy that maximizes our risk adjusted returns. We intend to de-lever our balance sheet through EBITDA growth and repayment of indebtedness with a target net leverage ratio of 2.5 times EBITDA. In conjunction with this de-leveraging, we will allocate capital across high return investments in our facilities, acquisitions and other external investments to grow profitability, as well as return capital to stockholders through stock buybacks and dividends.

High Purity Cellulose

The High Purity Cellulose segment, and in particular the cellulose specialties product line, is the primary driver of our profitability. Cellulose specialties are natural polymers, used as raw materials to manufacture a broad range of consumer-oriented products such as cigarette filters, liquid crystal displays, impact-resistant plastics, thickeners for food products, pharmaceuticals, cosmetics, high-tenacity rayon yarn for tires and industrial hoses, food casings, paints and lacquers. We manufacture products tailored to the precise and demanding chemical and physical specifications of our customers, achieving industry-leading purity and product functionality. Our ability to consistently manufacture high-quality cellulose specialties products is the result of our proprietary production processes, intellectual property, and more than ninety years of technical expertise and knowledge of cellulosic chemistry.

Additionally, a significant portion of our production capacity is dedicated to manufacturing high-purity commodity products for viscose and absorbent materials applications. Commodity viscose is a raw material required for the manufacture of viscose staple fibers which are used in woven applications such as rayon textiles for clothing and other fabrics, and in non-woven applications such as baby wipes, cosmetic and personal wipes, industrial wipes and mattress ticking. Absorbent materials, typically referred to as fluff fibers, are used as an absorbent medium in products such as disposable baby diapers, feminine hygiene products, incontinence pads, convalescent bed pads, industrial towels and wipes and non-woven fabrics. Cellulose specialties typically contain over 95 percent cellulose, while commodity products typically contain less than 95 percent cellulose.

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Products

Cellulose Specialties

Cellulose specialties are a natural polymer primarily derived from either wood or cotton and are used as a principal raw material to manufacture a broad range of products. Cellulose specialties generally command a price premium and earn higher margins relative to other commodity wood pulp products. Typically, product pricing is set annually in the fourth quarter for the following year based on discussions with customers and the terms of contractual arrangements.

Cellulose specialties are a dissolving wood pulp product which target a combination of high purity and high viscosity. Unlike other wood pulps used for their physical properties, cellulose specialties are sought after for the unique chemical properties they impart on downstream products.

Derived from wood, our cellulose specialties require high levels of purity, consistency and process knowledge. Our products play a significant role in our customers' manufacturing processes, which require cellulose specialties of high purity and uniformity for efficient production. Therefore, our customers demand products of the highest quality. As a result, our products are custom-engineered and manufactured to each customers' unique specifications and require a stringent qualification process; our quality and consistency allow our customers to operate more efficiently and cost-effectively.

One of our key competitive advantages is our unique ability to leverage our global manufacturing asset base to provide our customers greater supply chain security for cellulose specialties fibers. With our four facilities and five manufacturing lines capable of producing cellulose specialties, we are the only cellulose specialties producer in the world with flexibility to use both hardwood and softwood fibers, kraft and sulfite cooking processes, and a variety of proprietary chemical treatments to provide customized product functionality. Additionally, we possess significant process knowledge: the understanding of wood fiber properties and their modification under a sequence of chemical processes, accumulated and developed over 90 years of practical application to satisfy a variety of customer needs. This process knowledge, combined with our manufacturing scale and flexibility and knowledge of customers' applications and specifications, makes us the industry's most adaptable modifier of cellulose fibers.

Commodity Products

We can easily shift our High Purity Cellulose segment manufacturing assets between commodity viscose and absorbent materials production to take advantage of market conditions and generate the most attractive margins.

Commodity viscose is primarily sold to producers of viscose staple fibers which in turn are used primarily to manufacture rayon fibers which are widely used in the clothing and textile industries. Shifts in fashion styles and textile fiber blending have increased demand for viscose staple fibers. Additionally, variability in cotton linter supply and increasing environmental concerns about cotton production have resulted in viscose staple producers shifting volume away from cotton linter pulp to wood-based dissolving pulp.

Absorbent materials, or fluff fibers, are typically used in consumer products such as baby diapers. These fibers provide a medium for fluid acquisition, distribution and retention in the products in which they are incorporated.

Pricing for commodity products is typically referenced to published indexes or based on publicly available spot market prices.

Competition

Cellulose Specialties

Significant intellectual property, capital investment and technical expertise are needed to design and manufacture customized cellulose specialties fibers to exacting customer specifications. The product must be formulated to achieve the desired characteristics including parameters for purity, viscosity, brightness, reactivity and other physical properties. Product qualification time can be lengthy, extending six to twenty-four months. Resulting customer relationships are typically long-term, and are based on an understanding of our customers' production processes and technical expertise which we utilize to help solve our customers' production issues and support new product development. Further, establishing a production line and obtaining the necessary production technologies requires substantial capital and ongoing maintenance expenditures.

Product performance, technical service and price are principal methods of competition in cellulose specialties. Product performance is primarily determined by the chemical attributes of the pulp, including purity, viscosity and uniformity of the cellulose specialties. Our processes, which are a key element of our intellectual property, are capable of

generating cellulose specialties purity levels in excess of 98 percent as well as the highest levels of viscosity derived from wood pulp.

We compete with both domestic and foreign producers in cellulose specialties. Competitors include GP Cellulose, Borregaard, Bracell, Sappi, Nippon, Cosmo Specialty Fibers and Aditya Birla Group. Some competitors use both wood and cotton linter

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fibers, as a source of cellulose fibers. Our multiple manufacturing lines, processes and intellectual property allow us to compete in more segments of the cellulose specialties market than any of our competitors.

Commodity Products

The principal method of competition in commodity products is price, as purity and uniformity are less critical differentiators. We compete with both domestic and foreign producers of commodity products.

For commodity viscose, many competitors derive their commodity viscose from either wood or cotton. Although cellulose specialties can generally be sold to meet commodity viscose demand, the reverse is not typically true. However, in recent years commodity viscose has continued to supplant cotton as the preferred raw material input for viscose staple fiber production. For commodity viscose, major competitors include Sappi, Aditya Birla Group, Lenzing and Bracell.

For absorbent materials, major competitors include GP Cellulose, Domtar and International Paper.

Forest Products

We manufacture and market high-quality construction-grade softwood lumber in North America through our seven sawmills located in Canada.

Approximately 59 percent of our sales are exported from Canada to the U.S. On December 28, 2017, the United States Department of Commerce (“USDOC”) issued a determination for countervailing and anti-dumping duties (collectively, the “Duties”) of approximately 20 percent on imports of softwood lumber from Canada. On January 3, 2018, the USDOC issued orders to the United States Customs and Border Protection to collect the Duties on softwood lumber imports from Canada.

Products

We manufacture finished dimensional lumber (2 by 4’s, 2 by 8’s, etc.) primarily made of spruce, pine, or fir, used in the construction of residential and multi-family homes, light industrial and commercial facilities, and the home repair and remodel markets. Wood chips, a by-product of the lumber manufacturing process, are used as raw materials in our High Purity Cellulose, Pulp and Paper facilities in Canada. Additionally, bark and sawdust are used for fuel in several of our operations.

Competition

The principal method of competition in the Forest Products segment is price, which is based on individual sawmill efficiency, the availability of competitively-priced raw materials, demand for wood products used in the construction of residential and multi-family homes as well as demand from the repair and remodel of existing homes. Residential and multi-family home construction is influenced by demographic factors such as population growth, employment, consumer confidence, consumer income, availability of financing and interest rate levels, and the supply and pricing of existing homes on the market. Repair and remodel activity is affected by the size and age of existing housing inventory and access to home equity financing and other credit.

Our significant competitors include West Fraser Timber Ltd., Resolute Forest Products, Weyerhauser, Georgia Pacific, Interfor, Canfor, Eacom and other producers of softwood lumber in North America.

Pulp

We manufacture and market high-yield pulp which is used by paper manufacturers to produce paperboard, packaging, printing and writing papers and a variety of other paper products. Pricing for high-yield is typically referenced to published indices marketed through our internal sales team. Our two production facilities located in Canada have the capacity to annually produce 570,000 metric tons of high-yield pulp.

Products

We produce high-yield pulps at our Matane and Temiscaming plants in Quebec, primarily from hardwood aspen and maple species. These pulps are used by paper manufacturers to produce paperboard products, printing and writing papers and a variety of other paper grades.

Competition

The principal method of competition in the Pulp segment is price. Price is impacted by the balance between supply and demand as affected by global economic conditions, changes in consumption and capacity, the level of customer and producer

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inventories, and fluctuations in currency exchange rates. To a lesser extent, quality and service are also considered competitive determinants.

Significant competitors include Millar Western, West Fraser, Paper Excellence, Estonia Cell and Winstone.

Paper

We manufacture paperboard and newsprint. Paperboard, produced in the Temiscaming plant in Quebec, is used for printing documents, brochures, promotional materials, packaging, paperback book or catalog covers, file folders, tags, and tickets. Newsprint, produced in the Kapuskasing plant in Ontario, is a paper grade used for newspapers, advertising materials and other publications.

Pricing for paperboard and newsprint is typically referenced to published indices and marketed through our internal sales team. Our two production facilities located in Canada have the capacity to annually produce 180,000 metric tons of paperboard and 205,000 metric tons of newsprint.

Products

Products in the Paper business include:

- Paperboard, produced in the Temiscaming plant, is used for packaging, printing documents, brochures, promotional materials, paperback book or catalog covers, file folders, tags and tickets.

- Newsprint, produced in the Kapuskasing plant, is a paper grade used to print newspapers, advertising materials and other publications.

Competition

The principal method of competition in the Paper segment is price. Price is impacted by the balance between supply and demand as affected by global economic conditions, changes in consumption and capacity, the level of customer and producer inventories, and fluctuations in currency exchange rates. To a lesser extent, quality and service are also considered competitive determinants, particularly for paperboard.

For paperboard, our significant competitors include Westrock, Metsa, Clearwater, and Sappi.

For newsprint, our significant competitors include Resolute Forest Products, White Birch Paper, Kruger, as well as independent producers.

Raw Materials and Input Costs

All our manufacturing operations require significant amounts of wood fiber, in the form of logs or wood chips, as a raw material and energy to produce our products. Additionally, our High Purity Cellulose, Pulp and Paper manufacturing processes require significant amounts of chemicals. These raw materials and input costs are subject to significant changes in prices as a result of weather conditions, supply and demand. To control cost, we continually pursue reductions in usage and costs of key supplies, services and raw materials. We do not foresee any material constraints in the near term from pricing or availability.

Wood

Our Canadian Forest Products operations rely on the consistent supply of substantial quantities of logs. Substantially all timberlands in Canada are government-owned and the right to harvest timber is acquired through provincially-granted licenses. Licenses grant the holder the right to harvest, for a fee, up to a specified quantity of timber annually. Government objectives in granting licenses include responsible management of timber, soils, wildlife, water and fish resources and the preservation of biodiversity and the protection of cultural values. The objectives also include achieving the fullest possible economic utilization of the forest resources and employment in local communities. In addition, license holders are required to replant the trees harvested to ensure re-establishment of the forest after harvesting. Reforestation projects are planned and supervised by our forest resource management staff and subject to approval by relevant government authorities. Our timber harvesting operations are performed directly or carried out by independent contractors under our forest resource management supervision.

In Canada, the High Purity Cellulose, Pulp and Paper plants are supplied with wood chips produced as a by-product from the lumber manufacturing process.

In the U.S. and France, we supply wood chips to our High Purity Cellulose plants through the purchase of chips from lumber producers or produce chips through our wood chipping facilities.

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Chemicals

Chemicals, which include caustic soda (sodium hydroxide), sulfuric acid, ammonia, sodium chlorate and various specialty chemicals, are purchased under negotiated supply agreements with third parties. The prices for these products are impacted by various factors including supply and demand, environmental regulation, energy prices and overall economic conditions.

Energy

Our energy is primarily produced through the burning of lignin and other residual biomass in recovery and power boilers located at our plants. However, our manufacturing facilities still utilize significant amounts of fuel oil, natural gas and purchased electricity to supplement their energy requirements. In addition, energy prices impact our transportation costs for delivery of raw materials to our manufacturing facilities and delivery of our finished products to customers.

Intellectual Property

Substantially all of our intellectual property relates to our High Purity Cellulose segment. We own patents, trademarks and trade secrets, and have developed significant know-how, particularly in the production of high purity cellulose, which we deem important to our operations. We intend to protect our intellectual property, including, when appropriate, filing patent applications for inventions that we deem important to our business and operations. Our U.S. patents generally have a duration of 20 years from the date of filing. We also require key employees to enter into non-compete agreements as appropriate.

Seasonality

Our financial results are not significantly affected by seasonal changes.

Customers

No single customer accounted for more than 10 percent of our consolidated net sales during the year ended December 31, 2018. See Note 19 — Segment and Geographical Information of our consolidated financial statements for more information on our major customers.

Research and Development

Research and development capabilities and activities are focused on the High Purity Cellulose segment. The quality and consistency of our cellulose specialties and research and development capabilities create a significant competitive advantage; they are important factors in achieving an optimal value for our cellulose specialties products. Our research and development efforts are primarily directed at further developing products and technologies, improving the quality of cellulose fiber grades, improving manufacturing efficiency and environmental controls and reducing fossil fuel consumption. We continue to grow our research and development activities to develop and market additional new products and applications.

We spent $6 million, $4 million and $4 million on research and development for the years ended December 31, 2018, 2017 and 2016, respectively.

Environmental Matters

Our manufacturing operations are subject to significant federal, state, provincial and local environmental regulations. For a more detailed discussion, see Item 1A — Risk Factors, Item 3 — Legal Proceedings, Item 7 — Management's Discussion and Analysis of Financial Condition and Results of Operations — Environmental Regulation. Additionally, see Note 9 — Liabilities for Disposed Operations and Note 20 — Commitments and Contingencies of our consolidated financial statements for more information.

Employee Relations

We currently employ approximately 4,200 people in the United States, Canada and France. See Note 20 — Commitments and Contingencies of our consolidated financial statements for more information. We believe relations with our employees are satisfactory.

Availability of Reports and Other Information

Our annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K, proxy statements and amendments to those reports filed or furnished pursuant to Sections 13(a) or 14 of the Securities Exchange Act of 1934 are made available to the public free of charge in the Investor Relations section of our website www.rayonieram.com, shortly after we electronically file such material with, or furnish them to, the SEC. All reports

we file with or furnish to the SEC are also available

free of charge on the SEC's website, https://www.sec.gov. Our corporate governance guidelines and charters of all committees of our board of directors are also available on our website.

Item 1A. Risk Factors

Our operations are subject to a number of risks and events including, but not limited to, those listed below. When considering an investment in our securities, you should carefully read and consider these risks, together with all other information in this Report and our other filings and submissions to the SEC. If any of the events described in the following risk factors actually occur, our business, financial condition or operating results, as well as the market price of our securities, could be materially adversely affected.

Business and Operating Risks

The businesses we operate are highly competitive and many of them are cyclical, which may result in fluctuations in pricing and volume that can adversely affect our business, financial condition and results of operations.

Competition, demand fluctuations and cyclicality are the most significant drivers of sales volumes and pricing for our products. We face significant competition from domestic and foreign producers in virtually all of our businesses. For example, our cellulose specialties product line has seen increased cellulose specialties production capacity from our competitors, some of whom have lower raw material, wood and production costs than us, combined with demand weakness, particularly in the acetate grades, which have collectively driven cellulose specialties sales prices down substantially over the past several years. Likewise, volumes have declined meaningfully over the past two years due to these factors. There can be no assurance these declines will not continue into the near future.

With respect to demand for cellulose specialties, and in particular our acetate grades, the majority of these acetate grades are used to manufacture acetate tow, which is used to make the filter component of a cigarette. Significant increases in cigarette costs and potential actions taken by the United States and other countries to discourage smoking, such as tax increases on tobacco products, policy changes and future legislation, may have a material adverse effect on the demand for tobacco products. For example, actions by the Chinese government to curb corruption and limit smoking in public buildings have had some impact on cigarette consumption. Additionally, increased use of e-cigarettes, electronically heated tobacco products and smokeless tobacco products, by way of example, may affect demand for traditional cigarettes.

Our lumber, paper, high yield pulp and paper-related commodity businesses are highly cyclical and influenced by a variety of factors. These include periods of excess product supply due to industry capacity increases, periods of decreased demand due to reduced economic activity or market conditions, inventory de-stocking by customers and fluctuations in currency exchange rates. These factors may cause significant price changes over a short period, as we saw in 2018 in our lumber business. To address these factors, we have in the past, and may in the future, elect to schedule production curtailments and shutdowns to address, for example, unfavorable economic conditions, reduced demand for our products or the end products of our customers, lack of economically viable fiber in Canada, reduced market prices and other factors. In particular, our lumber, newsprint and high yield pulp businesses have been the subject of curtailments and shutdowns in the past.

In sum, continued competitive pressures and demand weakness, as well as the cyclicality of our commodity businesses, may have a material impact on our future sales prices and volumes and, therefore, our business, financial condition and results of operations.

Our ten largest customers represent approximately 35 percent of our 2018 revenue, and the loss of all or a substantial portion of our revenue from these large customers could have a material adverse effect on our business.

While we are not dependent on any single customer or group of customers, our ten largest customers accounted for approximately 35 percent of revenue in 2018. Due to the highly competitive nature of our businesses, we regularly bid for new business and to retain/renew existing business and, as such, we are subject to the potential for meaningful revenue and volume gains and losses.

In addition, some of the industries in which our end-use customers participate, such as construction, home building, publishing, packaging, automotive and textiles, are cyclical in nature, thus posing risks to us which are beyond our control. These industries are highly competitive and may experience overcapacity and reductions in end use demand, each of which may affect demand for and pricing of our products. The consequences of this could include the reduction, delay or cancellation of customer orders.

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We are also subject to credit risk associated with these customers. If one or more of our ten largest customers were to become bankrupt, insolvent or otherwise were unable to pay for its products, we may incur significant write-offs of accounts that may have a material adverse effect on our business, financial condition and results of operations. Although we continue to strive to broaden and diversify our customer base, a significant portion of our revenue is derived from these ten customers, and the loss of all or a substantial portion of sales to any of these customers, or significant, unfavorable changes to pricing or terms contained in contracts with them, could materially affect our business, financial condition or results of operations. See Note 19 — Segment and Geographical Information of our consolidated financial statements for more information on our major customers.

A material disruption at one of our major manufacturing facilities could prevent us from meeting customer demand, reduce our sales and profitability, increase our cost of production and capital needs, or otherwise adversely affect our business, financial condition and results of operation.

Any of our major manufacturing facilities, or a significant portion of any of these facilities, could cease operations unexpectedly or suffer a material disruption to all or a portion of its operations due to a number of events, including:

- unscheduled outages or downtime due to the need for unexpected maintenance or equipment failure, such as for portions of our facilities that produce steam and electricity (such as boilers and turbines), pollution control equipment, and equipment directly used to manufacture our products;
- prolonged power interruptions or failures;
- explosion of a boiler or other pressure vessel;
- interruptions in the supply of raw materials, including chemicals and wood fiber;
- disruptions to or failures of the transportation infrastructure, such as roads, bridges, railroad tracks and tunnels, as well as lack of availability of rail, trucking and ocean shipping equipment and service from third party transportation providers;
- interruption or material reduction of water supply;
- a chemical spill or release or other event causing risks to the environment or human health and safety;
- information technology system failures and cybersecurity incidents;
- fires, floods, windstorms, earthquakes, hurricanes or other similar catastrophes, such as the hurricanes which impacted our Jesup, Georgia and Fernandina Beach, Florida plants in 2017;
- labor interruptions, such as the strike at our Temiscaming, Quebec facility in 2014;
- terrorism or threats of terrorism; and
- other operational problems resulting from these and other risks.

Some of these matters are discussed in more detail in other sections of this Item 1A-Risk Factors. Depending on the nature, extent and length of any operational interruption, the event could materially affect our business, financial condition and results of operations.

Changes in raw material and energy availability and prices could affect our results of operations and financial condition.

Raw material costs and energy, such as chemicals, oil and natural gas and electricity are a significant operating expense. The cost of these inputs can be volatile and are susceptible to rapid and substantial increases due to factors beyond our control, such as lack of availability, changing economic and weather conditions, political or other unrest or instability in energy-producing nations, and supply and demand considerations. For example, caustic soda, a key manufacturing input in our high purity cellulose business, has historically had significant price volatility. Similarly, the price of oil and natural gas (including its pipeline transportation element) is subject to fluctuations based on market and other factors. In contracts for certain of our products, pricing is set annually or otherwise not subject to change for a contractually-agreed period of time, so in some cases we may have limited ability to pass along fluctuations in these input costs once the contract price for the relevant period has been established. In addition, industrial and other policies of the governments and governmental agencies having jurisdiction over our facilities may change, due to changes in political leadership or otherwise, which also could adversely impact the cost of energy and its transportation. While we often use various strategies to mitigate the potential impact of this pricing volatility, such as long term contracting and the purchase of derivative commodity contracts, the impact of raw material and energy

pricing increases could materially adversely affect our business, financial condition and results of operations.

The availability of, and prices for, wood fiber may significantly impact our business, results of operations and financial condition.

Wood fiber is the single largest raw material in the manufacturing process for virtually all of our products. Many factors can impact its availability and pricing: One key factor is whether the land on which the timber is grown is owned by private parties or governmental entities. For example, fiber for our U.S. and French facilities is primarily harvested from privately-held lands,

while fiber for our Canadian facilities is primarily harvested from lands owned or controlled by the governments of the provinces of Ontario and Quebec, respectively, which are often referred to as “Crown lands”. In 2018, approximately 90 percent of the Company’s fiber requirements in Canada were sourced from Crown lands. The Company’s current agreements with provincial authorities grant timber “tenures” for terms varying from five to 20 years and may be subject to renewals every five years. In Canada, the Company currently manages approximately 25 million acres (ten million hectares) of Crown lands for timber production. The price and availability of this Canadian fiber depends, in large part, on the Company’s ability to replace or renew these agreements on acceptable terms or enter into acceptable alternative fiber supply arrangements with provincial authorities. The terms of any replacement, renewal or alternative arrangement are based on legislative and regulatory provisions as well as governmental policy. Therefore, changes in legislation, regulatory regimes or policy in the provinces in which we operate may reduce the availability of fiber and increase costs through the imposition of additional and more stringent harvesting, rehabilitation and silvicultural standards or the alteration of fee structures. Although we expect these agreements to be extended in the ordinary course as they come up for renewal, there can be no assurance that they will be renewed, extended or replaced in the future on acceptable terms, or at all, or that the amount of timber that the Company is permitted to harvest will not decrease.

Also, Aboriginal communities in Canada, often referred to as “First Nations”, have claimed substantial portions of land in various provinces based on claims of Aboriginal title or traditional/historical interest. Canadian courts have recognized that Aboriginal people may possess rights in respect of land used or occupied by their ancestors and have encouraged the federal and provincial governments and Aboriginal people to resolve rights claims through the negotiation of treaties. We operate in territories in which Aboriginal people assert these types of rights and interests. To accommodate the traditional activities of these communities during forestry planning and operations, the Company has concluded agreements, and is currently negotiating other agreements, with many First Nations communities and other agreements are in development. These agreements support an approach of active engagement with Aboriginal communities that serves to ensure the identification of issues and facilitates constructive problem-solving.

Regulatory developments and environmental litigation also have caused, and may cause in the future, significant reductions in the amount of timber available for commercial harvest from non-Crown lands in Canada and privately-owned lands in the U.S. and France, thereby increasing prices for these sources of wood fiber. In Canada, for example, future legislation and policy changes, litigation advanced by environmental groups and Aboriginal communities concerning rights and limitations on harvesting and use of timberlands, the protection of endangered species, the promotion of forest diversity and the response to and prevention of wildfires could also affect wood fiber supply, pricing and availability.

In addition, much of the wood fiber we use is sourced by or from third party contractors who harvest, chip and/or truck the fiber to our manufacturing facilities, either as logs for lumber and chipping, or as chips directly to our manufacturing facilities. Another key factor in fiber supply and pricing is the availability of experienced logging and fiber transportation contractors in the areas in which our manufacturing facilities are located. Moreover, to the extent that fiber must be sourced from greater distances from our facilities due to unavailability of more proximate fiber, this could also impact pricing due to additional transportation cost. Significant reduction in the availability of experienced contractors could also impact wood fiber supply, pricing and availability.

Finally, natural conditions, such as weather, timber growth cycles and restrictions on access to timberlands for harvesting (for example, due to prolonged wet or cold conditions) may also limit the availability and increase the price of wood, as may other factors, including damage by fire, insect infestation, disease, prolonged drought and natural disasters such as wind storms and hurricanes. For example, during the past two years we have seen more frequent wet weather in the Southeastern U.S. region from which we source our fiber, which can result in reduced availability of supply and higher prices, especially for hardwoods. It is unclear whether these conditions will persist into the future.

In sum, any sustained decrease in harvestable lands or wood supply, or increase in fiber prices, whether sourced from Crown lands in Canada or from private parties in Canada, the U.S. or France, or changes in the logging and transportation supply base, or significant changes to historically customary natural conditions, could materially increase our costs and thereby materially impact our business, financial condition and results of operations.

We are subject to risks associated with doing business outside of the United States.

We have significant manufacturing facilities outside of the United States, in Canada and France, and a significant portion of our sales are to customers and customer locations outside of the United States, including Canada, China, Japan, South Korea, the European Union and other international markets. Sales to customers outside of the United States made up approximately 63 percent of our revenue in 2018. The manufacture and sale of our products in non-U.S. markets results in risks that are inherent in conducting business under international laws, regulations and customs. We expect international sales will continue to contribute significantly to our financial condition and future growth. The risks associated with our business outside the United States include:

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- maintaining and governing international subsidiaries and managing international operations;
- the need to comply with, changes in and reinterpretations of, the laws, regulations and enforcement priorities of the countries in which we manufacture and sell our products;
- responsibility to comply with anti-bribery laws such as the U.S. Foreign Corrupt Practices Act and similar anti-bribery laws in other jurisdictions;
- trade protection laws, policies and measures and other regulatory requirements affecting trade and investment, including loss or modification of exemptions for taxes and tariffs, imposition of new tariffs and duties and import and export licensing requirements, as discussed below in more detail;
- repatriating cash from foreign countries to the United States;
- changes in tax laws and their interpretations in the countries in which we do business, including the potential impact on the value of recorded or future deferred tax assets and liabilities;
- product damage or losses incurred during shipping;
- political instability and actual or anticipated military or political conflicts;
- economic instability, inflation, recessions and interest rate and currency exchange rate fluctuations, as discussed below in more detail;
- uncertainties regarding non-U.S. judicial systems, rules and procedures; and
- minimal or limited protection of intellectual property in some countries.

These and other risks of doing business outside of the United States could adversely affect our business, financial condition and results of operations.

Our operations require substantial capital.

We require substantial capital for ongoing maintenance, repair and replacement of existing facilities and equipment. Although we maintain our production equipment with regular scheduled maintenance, key pieces of equipment and systems, some of which are large in scale, may need to be repaired or replaced periodically. Moreover, some of the facilities we acquired as part of the Tembec acquisition in 2017 have deferred capital expenditures due to Tembec’s cash flows limitations in recent years, which may require the Company to make additional investments. The costs of repairing or replacing such equipment and the associated downtime of the affected production line could adversely affect our financial condition and results of operations. In addition, new or existing environmental regulations at times require additional capital expenditures for compliance. We believe our capital resources are currently adequate to meet our current projected operating needs, capital expenditures and other cash requirements. However, if for any reason we are unable to provide for our operating needs, capital expenditures and other cash requirements on reasonable economic terms, we could experience an adverse effect on our business, financial condition and results of operations.

Currency fluctuations may have a negative impact on our business, financial condition and results of operations.

We have manufacturing operations in the United States, Canada and France. The Company also sells its products all over the world, in either U.S dollars, Canadian dollars or Euros. As a result, the Company is exposed to movements in foreign currency exchange rates, and its earnings are affected by increases or decreases in the value of the U.S. dollar and in the value of the Canadian dollar and Euro relative to the U.S. dollar. In addition to ordinary course currency fluctuations, specific events such as Brexit have had, and could in the future have, impact on currency valuation. The Company’s risk management policy allows management, with oversight from the Audit Committee of its Board of Directors, to hedge a significant portion of its exposure to fluctuations in foreign currency exchange rates. To accomplish this, the Company has used, and may in the future continue to use, derivative instruments, such as currency options and foreign exchange forward contracts, to mitigate its exposure to fluctuations in foreign currency exchange rates, but there can be no assurance that the Company will be protected against substantial foreign currency fluctuations or that such fluctuations will not have a material adverse impact on our business, financial condition and results of operations.

Restrictions on trade through tariffs, countervailing and anti-dumping duties, quotas and other trade barriers, in the United States and internationally, could adversely affect our ability to access certain markets.

We manufacture our products in the United States, Canada and France, and sell them into more than 40 countries. Our financial results are highly dependent on our ability to sell our products globally. Trade barriers such as tariffs, countervailing and dumping duties, quotas and similar restrictions on trade have in the past, and could in the future,

result in materially reduced revenues and profitability. Examples of the effects of such restrictions on trade and tariffs on our business in China, Canada and as a result of “Brexit” are set forth below.

China

In 2018, the Company had total sales of $361 million of products shipped to customers in China and, of this amount, $222 million were of products manufactured in the United States. The continuing uncertainty, volatility and trade tensions, tariffs and

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negotiations between China and the U.S. have impacted our business in China and could do so in the future. On September 17, 2018, the U.S. Trade Representative ("USTR") announced that an additional 10 percent tariff would be imposed on more than 5,700 tariff lines, effective September 24, 2018. Absent an agreement between the U.S, and China or action by the USTR, tariffs on these lines will increase to 25 percent on April 1, 2019. On September 24, 2018, in retaliation for the U.S. tariffs, China announced a five percent tariff on approximately $60 billion in U.S. products exported to China, which includes all wood pulp sold by the Company from the U.S. into China. The Chinese government has also indicated the potential for additional retaliation in response to the U.S. tariffs, which could take the form of additional tariffs on U.S. products exported by the Company into China, or other actions such as quotas or other limitations on Chinese purchases from U.S.-based companies, including the Company. While the Company is exploring alternatives to serve its Chinese customers from its non-U.S. facilities, failure of the U.S. and Chinese governments to reach acceptable agreements regarding trade, as well as continued trade volatility and additional trade-related actions by the Chinese government, could have a material impact on our business, financial condition and results of operations.

In April of 2014, China's Ministry of Commerce ("MOFCOM") issued a final determination assessing a 17.2 percent duty on imports of our lower purity commodity viscose dissolving pulp into China from our Jesup, Georgia and Fernandina Beach, Florida plants in the United States, and a 13 percent duty for similar imports into China from our plant in Temiscaming (Quebec), Canada. This product is primarily utilized to produce viscose staple fiber for use in the manufacture of fabrics. MOFCOM's final determination has remained in place for five years, but may be extended for an additional five years at the discretion of MOFCOM. If extended beyond its original 2019 expiration, MOFCOM's duty could have an adverse effect on our sales of commodity viscose dissolving pulp into China.

Canada

The Company operates six softwood lumber mills in Ontario and Quebec, Canada and, in 2018, sold approximately $179 million of softwood lumber into the United States from Canada. The United States and Canada have a history dating to the early 1980s of trade disputes relating to the export of softwood lumber from Canada into the United States. Each dispute has been resolved via agreement or litigation, which generally involved some combination of duties and/or quotas as well as a return of all or most of the duties previously paid by Canadian softwood lumber producers. In October of 2015, a ten-year Softwood Lumber Agreement (the "SLA") between the United States and Canada, which resolved the 2001-2006 lumber dispute between the countries, expired. No agreement was reached to extend or renew it, and as a result, after a one-year cooling off period the United States commenced a dumping investigation of lumber exports from Canada into the U.S. In 2017, anti-dumping and countervailing duties were assessed by the United States Department of Commerce ("Commerce") on lumber exported into the United States, with the Company being assigned an anti-dumping duty rate of 6 percent and a countervailing duty rate of 14 percent. These duties are being legally challenged by Canada under both the North American Free Trade Agreement ("NAFTA") and World Trade Organization ("WTO") dispute resolution processes. The Company paid approximately $26 million in lumber duties in 2018, but expects to eventually receive most of these duties back in the event of a favorable ruling under the NAFTA or WTO process or a settlement of the dispute. No assurances can be given that the duties will be overturned or repaid through the legal process or a negotiated settlement, or that lumber pricing, which as of December 31, 2018 was at very low levels in the United States, will be sufficient to substantially offset their impact.

In 2017, the United States, Mexico and Canada began a process for the renegotiation of the North American Free Trade Agreement ("NAFTA"), and on September 30, 2018, the USTR announced a new treaty to replace NAFTA with a treaty called the U.S.-Mexico-Canada Agreement ("USMCA"), which was signed by the parties on December 1, 2018. However, USMCA must be ratified by the U.S. Congress before it can go into effect. The Company manufactures various products in the United States and Canada, sells various products to customers in all three countries, and purchases various products and services from suppliers and contractors in all three countries. While it is unclear whether and when the U.S. Congress will approve USMCA, the Company does not believe USMCA, if ratified in its current form, will have a material impact on the business, financial condition or results of operations of the Company.

"Brexit"

The Company does not currently operate any manufacturing facilities, have any significant sales to customers, or have any major supply chain relationships, in Great Britain. As such, with respect to the exit of Great Britain from the European Union (“EU”), whether under a negotiated agreement with the EU or pursuant to a “hard” exit absent such an agreement, the Company does not expect Brexit to have a material impact on its business, financial condition or results of operations. However, the Company does have manufacturing facilities in the EU (in France) and in 2018 had $360 million of sales to customers in the EU, so to the extent that Brexit impacts the EU’s economy generally, specific regions of the EU or specific companies located in the EU, no assurances can be given that such events would not have a material impact on the Company’s business, financial condition or results of operations.

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We depend on third parties for transportation services and increases in costs and the availability of transportation could adversely affect our business.

Our business depends on transportation services provided by third parties, both domestically and internationally. We rely on these providers for transportation of the products we manufacture as well as delivery of raw materials to our manufacturing facilities. A significant portion of the products we manufacture and raw materials we use are transported by railroad or trucks, and internationally by ship.

If any of our transportation providers were to fail to deliver the goods we manufacture in a timely manner, or damaged them during transport, we may be unable to sell those products at full value, or at all. Similarly, if any of these providers were to fail to deliver raw materials to us in a timely manner, we may be unable to timely manufacture our products in response to customer demand. Finally, if any of the ports we commonly use for international shipping, or the port system generally, were to suffer work stoppages, slowdowns or strikes, we could be adversely impacted.

Our business is subject to extensive environmental laws, regulations and permits that may restrict or adversely affect how we conduct business and our financial results.

Our plants are subject to stringent environmental laws, regulations and permits that may limit operations and production. Many of our operations are subject to stringent environmental laws, regulations and permits that contain conditions governing how we operate our facilities including how much and, in some cases, what types of products we can produce. These laws, regulations and permits, now and in the future, may restrict our current production, limit our ability to increase production and impose significant costs on our operations with respect to environmental compliance. It is expected that, overall, costs will likely increase over time as environmental laws, regulations and permit conditions become more stringent, and as the expectations of the communities in which we operate become more demanding.

Environmental laws, regulations and permits are constantly changing and are generally becoming more restrictive. Laws, regulations, permits and related judicial decisions and administrative interpretations affecting our business are subject to change, and new laws and regulations are frequently enacted. These laws and regulations may limit, prohibit or affect, among other things, air emissions, wastewater discharges, receiving water quality, remedial standards for contaminated property and groundwater, and the type of chemicals we use in our manufacturing processes. Over time, the complexity and stringency of these laws and regulations have increased and the enforcement of these laws and regulations has intensified. Environmental regulatory authorities have pursued a number of initiatives which, if implemented, could impose additional operational and pollution control obligations on industrial facilities like ours, especially in the area of air emissions and wastewater and storm water control. See Item 7 - Management's Discussion and Analysis of Financial Condition and Results of Operations - Environmental Regulation for further information. Environmental laws and regulations will likely continue to become more restrictive and over time could adversely affect our business, financial condition and results of operations.

Environmental groups, Aboriginal communities (in Canada) and interested individuals may seek to delay or prevent a variety of operations. We expect that environmental groups, Aboriginal communities and interested individuals will intervene with increasing frequency in the regulatory processes in areas where we operate plants and manage and operate timberlands. External engagement with these groups and communities are requirements of our licenses to manage and operate timberlands in Quebec and Ontario, and in the case of Aboriginal communities are often required by treaty. Delays, restrictions and increased cost caused by the intervention of these groups or interested individuals could adversely affect our operating results. In addition to intervention in regulatory proceedings, interested groups and individuals may file or threaten to file lawsuits that seek to prevent us from obtaining permits, implementing capital improvements or pursuing operating plans. For example, in March 2014, litigation was commenced in federal court by the Altamaha Riverkeeper ("ARK") alleging violations of federal and state environmental laws relating to permitted wastewater discharges from our Jesup plant (although it was dismissed by the court on summary judgment in 2015), and in January of 2016 the same group brought an action in the Georgia Office of Administrative Hearings against the Georgia Environmental Protection Division of the Natural Resources ("EPD") in opposition to the issuance by EPD of a renewed wastewater treatment permit for our Jesup plant. While these proceedings have been decided, to date, largely in the Company's favor, we expect continuing attempts at legal intervention by ARK and others. See Item 3 - Legal Proceedings for a description of the pending legal proceedings with ARK.

We currently own or may acquire properties that require environmental remediation or otherwise are subject to environmental and other liabilities. We currently own, may have liability at formerly operated manufacturing facilities that we do not currently own, and may acquire additional facilities in the future, which are subject to environmental liabilities, such as remediation of soil, sediment and groundwater contamination and other liabilities. The cost of assessment and remediation of contaminated properties could be substantial and adversely affect financial results. These costs could include, without limitation, costs of investigation and assessment, corrective measures, installation of pollution control equipment and other remediation and closure costs, as well as third-party claims for property damage and personal injury as a result of alleged violations of, or liabilities arising out of,

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environmental laws and regulations. Although we believe we currently have adequate liabilities recorded, legal requirements relating to assessment and remediation of contaminated properties continue to become more stringent and there can be no assurance actual expenditures will not exceed current liabilities and forecasts, or that other presently unknown liabilities will not be discovered in the future. See Item 7 - Management's Discussion and Analysis of Financial Condition and Results of Operations - Environmental Regulation and Note 9 - Liabilities for Disposed Operations.

The potential impacts of climate change, and climate-related governmental initiatives, remain uncertain at this time. The potential longer-term impacts of climate change to the business and operations of the Company, both positive and negative, are unclear. There are numerous international, federal and state-level initiatives and proposals to address domestic and global climate issues. Within the United States, Canada and France, most of these would or currently regulate and/or tax, in one fashion or another, the production of carbon dioxide and other "greenhouse gases" to facilitate the reduction of carbon compound emissions to the atmosphere, and provide tax and other incentives to produce and use more "clean energy."

In 2015, the U.S. Environmental Protection Agency (the "EPA") issued its final Clean Power Plan rule to regulate greenhouse gas ("GHG") emissions from electric power plants. The regulation is not directed at industry generally, but has very broad requirements that could affect fuel and energy prices for industrial energy consumers. Further, the rule directs states to customize their regulations, which could lead to different results in different states and create additional uncertainty. The rule was legally challenged by a number of states, industry groups and environmental organizations. In February 2016, the U.S. Supreme Court granted a stay of its implementation while the rule is reviewed by lower courts. In October 2017, the EPA took steps to begin the regulatory process to repeal the Clean Power Plan. If not otherwise repealed or invalidated by the courts, it is unclear what impact this rule would have on our operations.

In December 2015, the United States signed the Paris Agreement on climate change (the "Paris Agreement"), which was entered into under the auspices of the 1992 U.N. Framework Convention on Climate Change (the "UN Framework"), a treaty signed by the U.S. and ratified by the U.S. Senate. The Paris Agreement includes national targets for greenhouse gas emissions reductions and other provisions designed to reduce greenhouse gas emissions worldwide and provide financial incentives to developing nations to discourage greenhouse gas emissions. As of December 31, 2017, 197 countries have signed the Paris Agreement and approximately 175 have ratified it, but on June 1, 2017 President Trump announced that the United States would withdraw from the agreement, a process that will take four years.

The federal government of Canada has indicated its intent to regulate priority air pollutants and GHGs under the Clean Air Act and the Canadian Environmental Protection Act. Under the proposed targets, The Company's Canadian pulp and paper mills may be required to reduce air pollutants, such as particulate matter ("PM"), sulphur oxides ("SOx") emissions, nitrogen oxides ("NOx") and GHGs. While industry consultations are ongoing with the federal government, the cost of making any such reductions is currently unknown; however, the requirements associated with PM, SOx and NOx are not expected to be material to the Company given its current operations and pollution control systems. In lieu of the Canadian federal programs, both Ontario and Quebec (as well as France) have implemented "cap and trade" programs and, at this time, only the Company's Temiscaming site in Québec was a net purchaser of credits under these programs in 2018. However, in July of 2018, the newly elected provincial government in Ontario terminated Ontario's cap and trade program, which would instead subject the province to the federal Canadian requirements. In any case, the impact of the cost of GHG credits to suppliers to the Company may be reflected in the cost of wood, other raw materials and energy purchased by the Company. To date, the cost of GHG credits purchased by our business has not been material, though no assurances can be given that they will not substantially increase in the future, and especially in Canada after 2020, because the law and cost of GHG credits after such date is currently not known.

Additional business and regulatory initiatives may be implemented to address GHG emissions and other climate-change-related concerns. If such initiatives are implemented we may be required to incur additional capital expenditures, increased operating costs for wood fiber or raw materials, and/or mitigating expenses, such as carbon taxes or other charges, to address and comply with any such initiatives. No assurance can be given that the increased costs associated with compliance of future GHG-related requirements will not have a material adverse effect on our

business, financial condition and results of operations.
Our failure to maintain satisfactory labor relations could have a material adverse effect on our business.
As of December 31, 2018, approximately 75 percent of our global work force is unionized. As a result, we are required to negotiate the wages, benefits and other terms of employment with these employees collectively. Our financial results could be adversely affected if labor negotiations resulted in substantially higher compensation costs or materially restricted how we run our operations. In addition, our inability to negotiate acceptable contracts with any of these unions as existing agreements expire could result in strikes or work stoppages by the affected workers. Four of our collective bargaining agreements, representing approximately 24 percent of our employees, either have expired in 2018 and have not yet been renewed, or are scheduled to expire in 2019 in their ordinary course, and negotiations relating to new agreements have commenced or will commence shortly. While

we do not expect any significant labor interruptions, if our unionized employees were to engage in a strike or other work stoppage at one or more of our major facilities, we could experience a significant disruption of our operations, which could materially affect our business, financial condition and results of operations.

We are dependent upon attracting and retaining key personnel, the loss of whom could adversely affect our business.

We believe our success depends, to a significant extent, upon our ability to attract and retain key senior management and operations management personnel. Changing demographics and labor work force trends may result in the loss of knowledge and skills as experienced workers retire. Furthermore, some of our facilities are in relatively remote locations, which can adversely impact our ability to recruit and retain employees. Our failure to retain these key personnel and recruit qualified replacements for retiring employees could adversely affect our business, financial condition or results of operations.

Failure to develop new products or discover new applications for our existing products, or our inability to protect the intellectual property underlying such new products or applications, could have a negative impact on our business.

We have an active research and development program to develop new products and new applications for our existing products. However, there can be no assurance this program will be successful, either from a product development or commercialization perspective, or that any particular invention, product or development, or the program as a whole, will lead to significant revenue or profit generation. Moreover, some of our new products and new applications may not contain intellectual property that can be protected under applicable law. Failure to generate meaningful revenue and profit from our research and product development efforts could adversely affect our business, financial condition and results of operations in the future.

The risk of loss of the Company's intellectual property and sensitive business information, or disruption of its manufacturing operations, in each case due to cyberattacks or cybersecurity breaches, could adversely impact the Company.

Like most companies, the Company has been, and expects in the future to continue to be, subject to attempted cyberattacks. Cyberattacks or cybersecurity breaches could compromise the Company's intellectual property and confidential business information, cause a disruption to the Company's operations, or harm the Company's reputation. The Company's information technology systems, some of which are dependent on services provided by third parties, serve an important role in the efficient operation of its business. This role includes ordering and managing equipment, parts and raw materials from suppliers, managing inventory, managing the processes we use to produce finished products, facilitating order entry and fulfillment and processing of transactions, summarizing and reporting financial results, facilitating internal and external communications, administering human resources functions, retaining certain personal information and providing other processes necessary to manage our business. While the Company has implemented and maintains what it believes to be appropriate cybersecurity policies, programs, controls and systems, there can be no assurance a cyberattack would not be successful, or that such a cybersecurity breach will not occur. Such an event could have a material adverse impact on the Company's results of operations and financial condition.

We may need to make significant additional cash contributions to our retirement benefit plans if investment returns on pension assets are lower than expected or interest rates decline, and/or due to changes to regulatory, accounting and actuarial requirements.

We have a qualified non-contributory defined benefit pension plan, which covers many of our salaried and hourly employees in the United States. The Federal Pension Protection Act of 2006 requires certain capitalization levels be maintained in each of these benefit plans. Our non-U.S. pension plans, while currently fully funded, will also require periodic contributions to ensure that applicable legal requirements are met. Because it is unknown what the investment return on pension assets will be in future years or what interest rates may be at any point in time, no assurances can be given that applicable law will not require us to make future material plan contributions. In addition, it is possible new or additional accounting rules and changes to actuarial requirements (for example, if life expectancy assumptions for participants are increased) may also result in the need for additional contributions to the plans. Any such contributions could adversely affect our financial condition. See Item 7 - Management's Discussion and Analysis of Financial Condition and Results of Operations - Critical Accounting Policies and Use of Estimates for additional information about these plans, including funding status.

We have debt obligations that could adversely affect our business and our ability to meet our obligations.

As of December 31, 2018, our total combined indebtedness was approximately $1.2 billion. This significant amount of debt could have important consequences to us and our investors, including:

- requiring a substantial portion of our cash flows from operations to make interest payments on this debt;
- making it more difficult to satisfy debt service and other obligations;
- increasing the risk of a future credit ratings downgrade of our debt, which could increase future debt costs and limit the future availability of debt financing;

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- increasing our vulnerability to general adverse economic and industry conditions;
- reducing the cash flows available to fund capital expenditures and other corporate purposes and to grow our business;
- limiting our flexibility in planning for, or reacting to, market or other changes in our businesses and industry;
- placing us at a competitive disadvantage to our competitors that may not be as highly leveraged with debt; and
- limiting our ability to borrow additional funds as needed or take advantage of business opportunities as they arise, pay cash dividends or repurchase common stock.

To the extent we incur additional indebtedness, the risks described above could increase. In addition, our actual cash requirements in the future may be greater than expected. Our cash flows from operations may not be sufficient to repay all of the outstanding debt as it becomes due, and we may not be able to borrow money, sell assets or otherwise raise funds on acceptable terms, or at all, to refinance our debt.

The phase-out of LIBOR as an interest rate benchmark in 2021 may impact our borrowing costs.

The reporting of financial information used to determine LIBOR is scheduled to cease in 2021. As of December 31, 2018, we had approximately $599 million in term loan indebtedness with interest payment terms based on LIBOR, which matures in either 2022 or 2024, as applicable, after the phase-out of LIBOR. Under the terms of these loans, if LIBOR is no longer calculated, interest on the loans would be determined by using a comparable or successor widely-published alternative rate designated by the administrative agent. We have not yet been advised by the administrative agent of its selected alternative rate. While we do not believe that a change from LIBOR to an alternative rate will have a material impact on our borrowing costs or ability to access capital, no assurances relating to the potential impact can be provided at this time.

Challenges in the commercial and credit environments may materially adversely affect our future access to capital.

Our ability to issue debt or equity or enter into other financing arrangements on acceptable terms could be materially adversely affected if there is a material decline in the pricing or sales volume for our products, or if significantly unfavorable changes in economic conditions occur. Volatility in the world financial markets could increase borrowing or other costs of capital or affect our ability to gain access to the capital markets, which could have a material adverse effect on our competitive position, business, financial condition, results of operations and cash flows.

We may need additional financing in the future to meet our capital needs or to make acquisitions, and such financing may not be available on favorable terms, if at all, and may be dilutive to existing stockholders.

We may need to seek additional financing for general corporate purposes. For example, we may need to increase our investment in research and development activities, make strategic investments in our facilities or require funding to invest in joint ventures or make acquisitions. We may be unable to obtain desired additional financing on terms favorable to us, if at all. For example, during periods of volatile credit markets, there is a risk that lenders, even those with strong balance sheets and sound lending practices, could fail or refuse to honor their credit commitments and obligations, including but not limited to extending credit up to the maximum permitted by a credit facility and otherwise accessing capital and/or honoring loan commitments. If our lenders are unable to fund borrowings under their loan commitments or we are unable to borrow, it could be difficult to replace such loan commitments on similar terms or at all. If adequate funds are not available on acceptable terms, we may be unable to fund growth opportunities, successfully develop or enhance products or respond to competitive pressures, any of which could negatively affect our business. If we raise additional funds through the issuance of equity securities, our stockholders will experience dilution of their ownership interest. If we raise additional funds by issuing debt, the terms of such debt may subject us to limitations on our operations and ability to pay dividends due to restrictive covenants in addition to those that are expected to be in place pursuant to our existing indebtedness.

The inability to effectively integrate the Tembec acquisition, and any future acquisitions we may make, may affect our results.

As part of our growth strategy, we may pursue acquisitions of complementary businesses and product lines, such as the November 2017 acquisition of Tembec Inc., and invest in joint ventures. The ability to grow through acquisitions or other investments depends upon our ability to identify, negotiate, complete and integrate suitable acquisitions or joint venture arrangements. For example, we have disclosed our synergy and business objectives relating to our acquisition of Tembec Inc. and achievement of these synergies and objectives is subject to a number of uncertainties, including risks attendant to successfully and effectively consolidating each company’s technologies, organizations,

processes, controls, policies and operations. If we fail to successfully integrate the acquisition of Tembec Inc., or any future acquisition we may make, our business, financial condition and results of operations could be materially adversely affected.

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Risks Related to the Company's Common Stock and Certain Corporate Matters

Your percentage of ownership in the Company may be diluted in the future.

In the future, your percentage ownership in the Company may be diluted because of equity issuances for acquisitions, capital market transactions or other corporate purposes, including equity awards we will grant to our directors, officers and employees. Our employees have options to purchase shares of our common stock and we anticipate our compensation committee will grant additional stock options or other stock-based awards to our employees. Such awards will have a dilutive effect on our earnings per share, which could adversely affect the market price of our common stock. From time to time, we will issue additional options or other stock-based awards to our employees under our employee benefits plans.

In addition, our amended and restated certificate of incorporation authorizes us to issue, without the approval of our stockholders, one or more classes or series of preferred stock having such designation, powers, preferences and relative, participating, optional and other special rights, including preferences over our common stock respecting dividends and distributions, as our board of directors generally may determine. The terms of one or more classes or series of preferred stock could dilute the voting power or reduce the value of our common stock. For example, we could grant the holders of preferred stock the right to elect some number of our directors in all events or on the happening of specified events or the right to veto specified transactions. Similarly, the repurchase or redemption rights or liquidation preferences we could assign to holders of preferred stock could affect the residual value of the common stock. In particular, note that, on August 10, 2016, the Company issued 1,725,000 shares of Mandatory Convertible Preferred Stock, Series A (the "Preferred Stock"), as more fully described in that certain Registration Statement on Form S-3 (File No. 333-209747) and Prospectus filed with the SEC on February 26, 2016, as amended by that certain Prospectus Supplement dated August 4, 2016 (the "Prospectus Supplement"). As a result of this offering, unless earlier converted, the Preferred Stock will automatically convert to common stock of the Company on a mandatory conversion date expected to be August 15, 2019, at a conversion rate described in the Prospectus Supplement. See Note 12 - Stockholders' Equity (Deficit) of our consolidated financial statements for more information on the Preferred Stock.

Our common stock ranks junior to the Preferred Stock with respect to dividends and amounts payable in the event of our liquidation.

Our common stock ranks junior to our Preferred Stock with respect to the payment of dividends and amounts payable in the event of our liquidation, dissolution or winding-up. This means, unless full cumulative dividends have been paid or set aside for payment on all outstanding Preferred Stock for all past dividend periods and the then current dividend period, subject to certain exceptions, no dividends may be declared or paid on our common stock. Likewise, in the event of our voluntary or involuntary liquidation, dissolution or winding-up, no distribution of our assets may be made to holders of our common stock until we have paid to Preferred Stock holders a liquidation preference equal to $100.00 per share plus accrued and unpaid dividends.

Certain provisions of the Preferred Stock could prevent or delay an acquisition of the Company, which could decrease the price of our common stock.

Certain terms of our Preferred Stock could make it more difficult or more expensive for a third party to acquire the Company. For example, as more fully described in the Prospectus Supplement, if a fundamental change (including, certain consolidation or merger involving us) were to occur on or prior to August 15, 2019, holders of our Preferred Stock may have the right to convert their Preferred Stock, in whole or in part, at a fundamental change conversion rate and be entitled to receive a fundamental change dividend make-whole amount equal to the present value of all remaining dividend payments on their Preferred Stock, plus accumulated and unpaid dividends, if any. These features of the Preferred Stock could increase the cost of acquiring us or otherwise discourage a third party from acquiring the Company.

Item 1B. Unresolved Staff Comments

None.

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Item 2. Properties

The following table details the significant properties we owned or leased at December 31, 2018:

Segment/Location	Annual Production Capacity	Owned/Leased
High Purity Cellulose Facilities (a):		
Jesup, Georgia, United States	330,000 metric tons of cellulose specialties or commodity products	Owned
Fernandina Beach, Florida, United States	245,000 metric tons of commodity products 155,000 metric tons of cellulose specialties or commodity products	Owned
Temiscaming, Quebec, Canada	150,000 metric tons of cellulose specialties or commodity products	Owned
Tartas, France	140,000 metric tons of cellulose specialties or commodity products	Owned
Forest Products Group Facilities (b):		
La Sarre, Quebec, Canada	135,000 thousand board feet of lumber	Owned
Bearn, Quebec, Canada	110,000 thousand board feet of lumber	Owned
Chapleau, Ontario, Canada	135,000 thousand board feet of lumber	Owned
Cochrane, Ontario, Canada	160,000 thousand board feet of lumber	Owned
Hearst, Ontario, Canada	110,000 thousand board feet of lumber	Owned
Huntsville, Ontario, Canada	15,000 thousand board feet of lumber	Owned
Kapuskasing, Ontario, Canada	105,000 thousand board feet of lumber	Owned
Pulp Facilities (a):		
Temiscaming, Quebec, Canada	300,000 metric tons of high-yield pulp	Owned
Matane, Quebec, Canada	270,000 metric tons of high-yield pulp	Owned
Paper Facilities (a):		
Kapuskasing, Ontario, Canada	205,000 metric tons of newspaper	Owned
Temiscaming, Quebec, Canada	180,000 metric tons of paperboard	Owned
Wood Chipping Facilities (a):		
Offerman, Georgia, United States	880,000 short green tons of wood chips	Owned
Collins, Georgia, United States	780,000 short green tons of wood chips	Owned
Eastman, Georgia, United States	350,000 short green tons of wood chips	Owned
Barnesville, Georgia, United States	350,000 short green tons of wood chips	Owned
Quitman, Georgia, United States	200,000 short green tons of wood chips	Owned
Corporate and Other:		
Jacksonville, Florida, United States	Corporate Headquarters	Leased

(a) During 2018, these facilities produced at or near capacity levels for most of the year.

(b) Capacity represents targeted production for these facilities. On average, these facilities produce at approximately 80 percent of capacity due to economic conditions, wood availability, and downtime.

Our manufacturing facilities are maintained through ongoing capital investments, regular maintenance and equipment upgrades. As a result, production capacities may vary from the amounts listed above.

Item 3. Legal Proceedings

The Company is engaged in various legal and regulatory actions and proceedings, and has been named as a defendant in various lawsuits and claims arising in the ordinary course of its business. While the Company has procured reasonable and customary insurance covering risks normally occurring in connection with its businesses, the Company has in certain cases retained

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some risk through the operation of self-insurance, primarily in the areas of workers' compensation, property insurance, business interruption and general liability. While there can be no assurance, the ultimate outcome of these actions, either individually or in the aggregate, is not expected to have a material adverse effect on the Company's financial position, results of operations or cash flows, except as may be noted below.

Jesup Plant Permit

On January 27, 2016, the Altamaha Riverkeeper ("ARK") filed a Petition for Hearing in the Office of Administrative Hearings for the State of Georgia, captioned Altamaha Riverkeeper, Inc. v. Environmental Protection Division (the "EPD"), Georgia Department of Natural Resources, in which ARK appealed the issuance by the EPD to the Company of a new permit for the treatment and discharge of waste water from the Jesup mill, which was to go into effect March 1, 2016. In the petition, ARK claims, among other things, that the issuance of the permit by the EPD would violate Georgia's narrative water quality standard, a rule promulgated by the Georgia Department of Natural Resources Board pursuant to certain provisions of the Clean Water Act and the Georgia Water Quality Control Act. The petition seeks to have the permit invalidated and modified as demanded by ARK. On February 16, 2016, the Company moved to legally intervene, as a party-in-interest, in this matter (because the EPD, as the permit issuer, is the named defendant) and its petition was granted by the administrative law judge ("ALJ"). The trial was held in June of 2016, and on September 30, 2016 the ALJ issued her decision. While the ALJ rejected many of ARK's claims, she held there existed a reasonable potential for the Company's treated effluent discharged to the Altamaha River to cause a violation of Georgia's narrative water quality standard, but only under low (rather than "normal") river flow conditions. As such, the ALJ reversed the issuance of the new permit by EPD and remanded the matter back to the EPD for consideration and issuance of a permit that comports with this ruling.

The Company strongly disagreed with the decision and appealed it, as did the EPD. The appeal was heard in the Superior Court of Wayne County, Georgia and on March 17, 2017 the Superior Court Judge issued an order reversing ALJ's decision and ordering the permit affirmed as issued by the EPD. ARK appealed this decision to the Georgia Court of Appeals. Before the Court of Appeals ruled, on March 27, 2018 the Georgia Department of Natural Resources Board (the "Board") voted to clarify the language of the narrative water quality standard at issue in this litigation. The language clarification adopted by the Board confirmed and essentially ratified the Superior Court's decision. On June 13, 2018, the Court of Appeals issued its opinion affirming the Superior Court's decision, and remanded the case to the ALJ to apply the standard advocated by the Company and articulated by the Superior Court, as affirmed by the Court of Appeals, to the issuance of the Permit. To provide certainty to the Company while this matter is on remand to the ALJ, the Company and the EPD have entered into a consent order requiring the Company to continue to operate under the conditions of the Permit.

ARK has filed a petition asking the Georgia Supreme Court to hear its appeal of the Court of Appeals decision, and the Company and EPD have filed papers opposing the petition. Granting of certiorari in this case is discretionary on the part of the Georgia Supreme Court. The Company believes the decisions of both the Superior Court and Court of Appeals are legally sound, and we await the decision of the Georgia Supreme Court on ARK's certiorari petition.

Stockholder Lawsuit

On August 17, 2017, the City of Warren General Employees' Retirement System filed a putative class action complaint against the Company, Paul Boynton, our CEO, and Frank Ruperto, our CFO, in the United States District Court, Middle District of Tennessee, Nashville Division. The plaintiffs allege the Company made false statements in filings with the U.S. Securities and Exchange Commission ("SEC") and other public statements related to certain litigation with Eastman Chemical, a customer of the Company, in third quarter and fourth quarter 2015, in violation of §§10(b) and 20(a) of the Securities Exchange Act of 1934, causing unspecified damages to stockholders of the Company who purchased stock in the Company between October 29, 2014 and August 19, 2015. The applicable Eastman litigation was resolved via settlement in 2015. The Company was served with the complaint on August 28, 2017. On November 13, 2017, the Court appointed the Michigan Carpenters' Pension Fund and Local 295 IBT Employer Group Pension Trust Fund as lead plaintiff, and a law firm to act as lead counsel. On January 10, 2018, the Company and the individual defendants filed a motion to dismiss the case for improper venue or, in the alternative, asked the court to transfer it to the U. S. District Court for the Middle District of Florida. Per the court scheduling order, the lead plaintiff filed a consolidated amended complaint (the "CAC") on January 12, 2018. The CAC added Benson Woo,

former CFO of the Company, as an additional defendant.

On June 15, 2018, the U.S. District Court for the Middle District of Tennessee granted the Company’s motion to transfer the case to the Middle District of Florida, and on July 16, 2018 the Company filed a motion to dismiss the case. We await the court’s decision. The Company strongly disagrees with the allegations set forth in the complaint, believes the lawsuit is without merit and will continue to vigorously defend itself in this matter.

In a related matter, on August 16, 2018, the Company received a derivative demand letter on behalf of Russell K. Carlisle, a purported stockholder, demanding that the Company’s Board of Directors investigate and take action on behalf of the Company

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against the individual defendants named in the City of Warren lawsuit and certain current and former members of the Board of Directors of the Company. The demand alleges substantially similar facts as those set forth in the City of Warren action, and claims them to be breaches of fiduciary duties owed to the Company by the individual defendants in City of Warren and members of the Company's Board of Directors during the alleged class period described in the case. The Company, the individuals named and Mr. Carlisle have agreed to toll any action on the derivative claim pending the decision of the U.S. District Court on the Company's motion to dismiss the City of Warren suit.

Item 4. Mine Safety Disclosures

Not applicable.

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Part II

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

Market Information

Our common stock is traded on the New York Stock Exchange under the trading symbol “RYAM”.

Holders

The number of record holders of our common stock at February 22, 2019 was 4,371.

Dividends

Dividends per share data can be found in Item 6 — Selected Financial Data and Note 12 — Stockholders' Equity (Deficit) of our consolidated financial statements.

Issuer Purchases of Equity Securities

The following table provides information regarding our purchases of Rayonier Advanced Materials common stock during the quarter ended December 31, 2018:

Period	Total Number of Shares Purchased	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
September 30 to November 3	—	$ —	—	$ 85,294,000
November 4 to December 1 (a)	1,768,409	$ 14.14	1,768,409	$ 60,294,000
December 2 to December 31	—	$ —	—	$ 60,294,000
Total	1,768,409		1,768,409	

(a) The shares were repurchased under the accelerated share repurchase ("ASR") agreement entered into on November 8, 2018 with JPMorgan Chase Bank, National Association ("JPMorgan"), for the repurchase of an aggregate of $25 million of the Company's common stock. The ASR was implemented under the Company's share repurchase authorization of up to $100 million, which was declared by the Board of Directors on January 29, 2018. As of December 31, 2018, there was approximately $60 million of share repurchase authorization remaining under the program. Refer to Note 12 — Stockholders' Equity (Deficit) for additional information.

Securities Authorized for Issuance under Equity Compensation Plans

See Part III, Item 12 of this report for information relating to our equity compensation plans.

Stock Performance Graph

The following graph compares the performance of Rayonier Advanced Material’s common stock (assuming reinvestment of dividends) with a broad-based market index, Standard & Poor’s (“S&P”) Small Cap 600, and an industry-specific index, the S&P 500 Materials Index. The initial date on the graph, June 27, 2014, reflects the date we separated from our former parent Rayonier. The table and related information shall not be deemed to be “soliciting material” or to be “filed” with the SEC, nor shall such information be incorporated by reference into any future filing under the Securities Act of 1933 or Securities Exchange Act of 1934, each as amended, except to the extent that we specifically incorporate it by reference into such filing.

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The data in the following table was used to create the previous graph:

	6/27/2014	12/31/2014	12/31/2015	12/31/2016	12/31/2017	12/31/2018
Rayonier Advanced Materials	$ 100	$ 61	$ 27	$ 44	$ 60	$ 32
S&P Small Cap 600	$ 100	$ 103	$ 101	$ 128	$ 144	$ 132
S&P 500 Materials Index	$ 100	$ 99	$ 91	$ 106	$ 131	$ 112

Sales of Unregistered Securities

During 2018, we did not issue or sell any unregistered securities.

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Item 6. Selected Financial Data

The following financial data should be read in conjunction with our consolidated financial statements. For 2014, the balance sheet represents our financial position as of December 31, 2014 and the statement of income and statement of cash flows are presented as if the performance fibers business of Rayonier and an allocable portion of its corporate costs had been combined with us for the year ended December 31, 2014.

(millions of dollars except per share amounts)	2018	2017 (d)	2016	2015	2014
Statement of Income Data:					
Net Sales	$2,134	$961	$869	$941	$958
Gross margin (a)	344	143	186	209	227
Operating income (a)	198	61	143	127	66
Net income	128	325	73	55	32
Diluted earnings per share of common stock (b)	$1.96	$5.81	$1.55	$1.30	$0.75
Dividends declared per share of common stock	$0.28	$0.28	$0.28	$0.28	$0.14
Balance Sheet Data:					
Total assets	$2,679	$2,643	$1,422	$1,279	$1,293
Property, plant and equipment, net	1,381	1,408	801	804	843
Total debt	1,188	1,241	783	858	934
Stockholders’ equity (deficit)	707	694	212	(17)	(62)
Statement of Cash Flows Data:					
Cash provided by operating activities	$247	$130	$232	$202	$188
Cash used for investing activities	(116)	(277)	(87)	(78)	(90)
Cash provided by (used in) financing activities	(116)	(84)	80	(89)	(31)
Capital expenditures	(132)	(75)	(89)	(78)	(75)
Non-GAAP Measures (c):					
EBITDA	$380	$480	$235	$209	$149
Adjusted EBITDA	$364	$212	$226	$238	$267
Adjusted Free Cash Flows	$152	$65	$147	$124	$113

(a) The Company adopted Accounting Standards Update (“ASU”) No. 2017-07, Compensation-Retirement Benefits, on January 1, 2018 using the retrospective method. As a result, gross margin and operating income was restated to reflect a $4 million, $5 million, $7 million and $3 million decrease in cost of sales during the years ended December 31, 2017, 2016, 2015 and 2014, respectively. In addition, selling, general and administrative expenses decreased by $1 million for each of the years ended December 31, 2017, 2016 and 2015. The offsetting increases are reflected in non-operating income with no change to the previously reported net income.

(b) For the years ended December 31, 2018, 2017 and 2016, basic and diluted earnings per share include the impact of dividends on the Company’s Preferred Stock. See Note 12 — Stockholders' Equity (Deficit) of our consolidated financial statements for more information. In conjunction with the separation from Rayonier Inc., 42,176,565 shares of our common stock were distributed to Rayonier shareholders on June 27, 2014.

(c) EBITDA, adjusted EBITDA and adjusted free cash flows are non-GAAP measures. See “Note about Non-GAAP Financial Measures” on page 2 for limitations associated with non-GAAP measures. Also see Item 7 — Management’s Discussion and Analysis of Financial Condition and Results of Operations — Performance and Liquidity Indicators for definitions of these non-GAAP measures as well as a reconciliation of EBITDA, adjusted EBITDA and adjusted free cash flows to their most directly comparable GAAP financial measure.

(d) On November 17, 2017, the Company acquired all of the outstanding common shares of Tembec for an aggregate purchase price of approximately $317 million Canadian dollars cash and 8.4 million shares of the Company’s common stock, par value $0.01 per share. See Note 3 — Tembec Acquisition, for a summary of assets and liabilities assumed in the acquisition and the unaudited pro forma net income for the years ended December 31, 2017 and 2016.

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

Overview

We are transforming our business and growing EBITDA to drive long-term value for our stockholders. Our plan centers on the following four Strategic Pillars of Growth:

- Cost Transformation - driving sustainable cost reductions by fostering a culture of continuous improvement.
- New Products - expanding our business by developing next generation cellulose fibers and other value-added products utilizing our cellulose processing technology, expertise and co-products. We have made significant progress in developing and applying proprietary technologies to new products in many of the end-market segments we serve.
- Market Optimization - maximizing the profitability of our existing products and assets by optimizing the intersection of our customers' needs, our manufacturing capabilities and transportation costs to drive higher value for our customers and our Company.
- Investments - delivering a capital allocation strategy that maximizes our risk adjusted returns. We intend to de-lever our balance sheet through EBITDA growth and repayment of indebtedness with a target net leverage ratio of 2.5 times EBITDA. In conjunction with this de-leveraging, we will allocate capital across high return investments in our facilities, acquisitions and other external investments to grow profitability, as well as return capital to stockholders through stock buybacks and dividends.

On November 17, 2017, we acquired Tembec which was engaged in the manufacture of cellulose specialties, commodity products, forest products, pulp and paper. The Acquisition created a combined company with leading positions with acetate and ethers high purity cellulose end-use markets, as well as, a more diversified earnings stream given the addition of the forest products, pulp and paper businesses. We now operate in the following business segments:

- High Purity Cellulose
- Forest Products
- Pulp
- Paper

High Purity Cellulose

We manufacture and market high purity cellulose, which is sold as either cellulose specialties or commodity products. We are the leading global producer of cellulose specialties, which are primarily used in dissolving chemical applications that require a highly purified form of cellulose. Pricing for our cellulose specialties products is typically set by contract for a duration of at least one year based on discussions with customers. Our commodity products primarily consist of commodity viscose and absorbent materials. Commodity viscose is a raw material required for the manufacture of viscose staple fibers which are used in woven and non-woven applications. Absorbent materials, typically referred to as fluff fibers, are used as an absorbent medium in consumer products. Pricing for commodity products is typically referenced to published indexes or based on publicly available spot market prices. Sales of chemicals and energy, a majority of which are by-products, are included in the high purity cellulose segment. In September 2018, we sold our resin operations for approximately $17 million.

Our four production facilities, located in the U.S., Canada and France, have a combined annual production capacity of approximately 775,000 metric tons of cellulose specialties or commodity products. Additionally, we have dedicated approximately 245,000 metric tons of annual production to commodity products.

Wood fiber, chemicals, and energy represent approximately 27 percent, 17 percent and 6 percent, respectively, of the per metric ton cost of sales. Labor, manufacturing and maintenance supplies, depreciation, manufacturing overhead and transportation costs represent the remaining cost of sales.

Forest Products

We manufacture and market high-quality construction-grade lumber in North America. The lumber, primarily spruce, pine, or fir, is used in the construction of residential and multi-family homes, light industrial and commercial facilities, and the home repair and remodel markets. The chips, manufactured as a by-product of the lumber manufacturing process, are used in our

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Canadian High Purity Cellulose, Pulp and Paper plants. Pricing for lumber is typically referenced to published indexes marketed through our internal sales team. Our seven production facilities located in Canada have a targeted annual production capacity of approximately 770 million board feet of lumber.

Wood and energy represents approximately 46 percent and 5 percent, respectively, of the per million board feet cost of sales. Labor, manufacturing and maintenance supplies, depreciation, manufacturing overhead and transportation costs represent the remaining cost of sales.

Pulp

We manufacture and market high-yield pulp which is used by paper manufacturers to produce paperboard, packaging, printing and writing papers and a variety of other paper products. Pricing for high-yield pulp is typically referenced to published indexes marketed through our internal sales team. Our two production facilities located in Canada have the capacity to annually produce 570,000 metric tons of high-yield pulp.

Wood fiber, chemicals, and energy represent approximately 26 percent, 16 percent and 15 percent, respectively, of the per metric ton cost of sales. Labor, manufacturing and maintenance supplies, depreciation, manufacturing overhead and transportation costs represent the remaining cost of sales.

Paper

We manufacture and market paperboard and newsprint. Paperboard is used for printing documents, brochures, promotional materials, paperback book or catalog covers, file folders, tags, and tickets. Newsprint is a paper grade used to print newspapers, advertising materials and other publications.

Pricing for paperboard and newsprint is typically referenced to published indices and marketed through our internal sales team. Our two production facilities located in Canada have the capacity to annually produce 180,000 metric tons of paperboard and 205,000 metric tons of newsprint.

Wood fiber, chemicals, and energy represent approximately 40 percent, 11 percent and 3 percent, respectively, of the per metric ton cost of sales. Labor, manufacturing and maintenance supplies, depreciation, manufacturing overhead and transportation costs represent the remaining cost of sales.

Outlook

High Purity Cellulose

In 2019, we expect stability in cellulose specialties markets. Cellulose specialty sales prices are anticipated to decline approximately 1 percent from 2018 primarily due to a contract acquired from Tembec and excludes any impact of Chinese duties. Cellulose specialty sales volumes are expected to decline approximately 1 percent primarily due to weakness in the acetate market. Commodity product sales prices are expected to increase in 2019. Commodity product sales volumes are expected to increase by over 75,000 metric tons as a result of improved operational reliability and initiatives to reduce inventory levels. Inflation is expected to be approximately 3 percent, driven primarily by higher wood and transportation costs, offset by the expected impact of the Strategic Pillars of Growth in 2019. Excluding the impact of the sale of the resin operations, adjusted EBITDA for the segment is expected to be flat in 2019, with the second half accounting for approximately 55 percent of EBITDA.

Forest Products

Lumber futures prices have improved from their lows in December and our lumber prices are expected to improve as the year progresses. Longer-term, the U.S. housing market remains a key driver of lumber sales prices and we are well positioned to benefit from these long-term trends. In addition, softwood lumber duties of approximately 20 percent on sales to the U.S. are expected to continue throughout 2019. Benefits from capital investments and cost reductions are also expected to provide incremental profitability in 2019. We will aggressively manage the asset utilization of and investment in the segment, including potentially taking downtime as deemed necessary, if market conditions warrant.

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Pulp

High-yield pulp prices are expected to be lower in the first quarter of 2019 compared to fourth quarter of 2018 due to weaker demand, specifically from China. Over the medium term, solid global demand for pulp, reduced recycled fiber imports to China, and global industry production at or near capacity continue to support pulp prices above historical averages. With no significant new capacity expected in the pulp markets through 2020, supply-demand dynamics should continue to yield positive market conditions and strong segment results in 2019.

Paper

In 2019, paperboard prices are expected to remain stable while newsprint sales prices are expected to decline as a result of the reversal of duties in 2018.

Capital Allocation and Investment

We anticipate spending approximately $95 million to $105 million in maintenance capital expenditures across all segments in 2019. In addition, we anticipate spending approximately $28 million on high-return strategic projects in 2019.
We also expect to increase the percentage of our cash flow directed toward debt repayment due to weaker commodity forest products and paper markets. We anticipate the continued return of capital to shareholders through our common stock dividend and the opportunistic repurchase of common shares.

Reconciliation of Non-GAAP measures

For a reconciliation of EBITDA to net income, see Item 7 — Management’s Discussion and Analysis of Financial Condition and Results of Operations — Performance and Liquidity Indicators.

Critical Accounting Policies and Use of Estimates

The preparation of financial statements requires us to make estimates, assumptions and judgments that affect our assets, liabilities, revenues and expenses, and to disclose contingent assets and liabilities in our consolidated financial statements. We base these estimates and assumptions on historical data and trends, current fact patterns, expectations and other sources of information we believe are reasonable. Actual results may differ from these estimates.

Revenue Recognition

Revenue is recognized when performance obligations under the terms of a contract with a customer are satisfied. The majority of the Company's contracts have a single performance obligation to transfer products. Accordingly, the Company recognizes revenue when title and risk of loss have been transferred to the customer. Generally, title passes upon delivery to the customer at the agreed upon location. Revenue is measured as the amount of consideration the Company expects to receive in exchange for transferring products and is generally based upon contractual arrangements with customers or published indices. The Company sells its products both directly to customers and through distributors and agents typically under agreements with payment terms less than 90 days.

Shipping and Handling Costs

The Company has elected to account for shipping and handling as activities to fulfill the promise to transfer the goods. As such, shipping and handling costs incurred are recorded in cost of sales. The Company has elected to exclude from net sales any value add, sales and other taxes which it collects concurrent with revenue-producing activities. These accounting policy elections are consistent with the manner in which the Company historically recorded shipping and handling fees and taxes.

Contract Estimates

The nature of certain of the Company's contracts gives rise to variable consideration, which may be constrained, including volume-based rebates to certain customers. The Company issues rebates to customers when they purchase a certain volume level, primarily retrospective volume-based rebates, which are applied retroactively to prior purchases. The Company estimates the level of volumes based on anticipated purchases at the beginning of the period and records a rebate accrual for each purchase toward the requisite rebate volume. These estimated rebates are included in

the transaction price of the Company's contracts with customers as a reduction to net sales and are included in accrued customer incentives and prepayments in the consolidated balance sheets (see Note 7 — Accrued and Other Current Liabilities). This methodology is consistent with the manner in which the Company historically estimated and recorded volume-based rebates.

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The majority of the Company's revenue is derived from contracts (i) with an original expected length of one year or less and (ii) for which it recognizes revenue at the amount in which it has the right to invoice as product is delivered. The Company has elected the practical expedient not to disclose the value of remaining performance obligations associated with these types of contracts.

The Company has certain contracts which contain performance obligations which are not significant in the context of the contract with the customer. The Company has elected the practical expedient not to assess whether these promised goods or services are performance obligations.

Contract Balances

Contract liabilities primarily relate to prepayments received from the Company's customers before revenue is recognized and volume rebates are payable to customers. These amounts are included in accrued customer incentives and prepayments in the consolidated balance sheets. The Company does not have any material contract assets as of December 31, 2018.

Property, Plant & Equipment

Depreciation expense is computed using the units-of-production method for our High Purity Cellulose, Pulp and Paper plant and equipment and the straight-line method for all other property, plant and equipment over the useful economic lives of the assets involved. The total units of production used to calculate depreciation expense is determined by factoring annual production days, based on normal production conditions, by the economic useful life of the asset involved. The physical life of equipment, however, may be shortened by economic obsolescence caused by environmental regulation, competition or other causes. We depreciate our non-production assets, including office, lab, and transportation equipment, using the straight-line depreciation method over 3 to 25 years. Buildings and land improvements are depreciated using the straight-line method over 15 to 35 years and 5 to 30 years, respectively. We believe these depreciation methods are the most appropriate, versus other generally accepted accounting methods, as they most closely match revenues with expenses.

Gains and losses on the retirement of assets are included in operating income. Long-lived assets are reviewed annually for impairment or whenever events or changes in circumstances indicate the carrying amount of an asset may not be recoverable. Recoverability of assets that are held and used is measured by net undiscounted cash flows expected to be generated by the asset. Property, plant and equipment are grouped for purposes of evaluating recoverability at the combined plant level, the lowest level for which independent cash flows are identifiable. If such assets are considered to be impaired, the impairment to be recognized is measured by the amount by which the carrying value exceeds the fair value of the assets. Assets to be disposed of are reported at the lower of the carrying amount or fair value less costs to sell.

Environmental liabilities associated with disposed operations

At December 31, 2018, we had $161 million of accrued liabilities for environmental costs relating to disposed operations. Numerous cost assumptions are used in estimating these obligations. Factors affecting these estimates include changes in the nature or extent of contamination, changes in the content or volume of the material discharged or treated in connection with one or more impacted sites, requirements to perform additional or different assessment or remediation, changes in technology that may lead to additional or different environmental remediation strategies, approaches and work-plans, discovery of additional or unanticipated contaminated soil, groundwater or sediment on or off-site, changes in remedy selection, changes in law or interpretation of existing law and the outcome of negotiations with governmental agencies or non-governmental parties. We periodically review our environmental liabilities and also engage third-party consultants to assess our ongoing remediation of contaminated sites. Quarterly, we review our environmental liabilities related to assessment activities and remediation costs and adjust them as necessary. Liabilities for financial assurance, monitoring and maintenance activities and other activities are assessed annually. A significant change in any of these estimates could have a material effect on the results of our operations. See Note 9 — Liabilities for Disposed Operations of our consolidated financial statements for more information.

Determining the adequacy of pension and other postretirement benefit assets and liabilities

Our defined benefit pension and postretirement plans for employees in the U.S., Canada and France require numerous estimates and assumptions to determine the proper amount of pension and postretirement liabilities and annual expense to record in our financial statements. The key assumptions include discount rate, return on assets, salary

increases, health care cost trends, mortality rates, longevity and service lives of employees. Although authoritative guidance on how to select most of these assumptions exists, we exercise some degree of judgment when selecting these assumptions based on input from our actuary and other advisors. Different assumptions, as well as actual versus expected results, would change the periodic benefit cost and funded status of the benefit plans recognized in the financial statements.

Our long-term return plan assets assumption was established based on historical long-term rates of return on broad equity and bond indices, discussions with our actuary and investment advisors and consideration of the actual historical annualized rate of

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returns. In determining future pension obligations, we select a discount rate based on information supplied by our actuary. The actuarial rates are developed by models which incorporate high-quality (AA rated), long-term corporate bond rates into their calculations. The weighted average discount rate increased from 3.55 percent at December 31, 2017 to 3.99 percent at December 31, 2018.

Our defined pension plans were underfunded by $174 million at December 31, 2018. The funded status declined in 2018 due to lower than expected investment performance on our plan assets, increased service and interest costs, partially offset by slightly higher discount rates. In 2019, pension expense is expected to increase due primarily to lower expected return on plan assets and higher amortization of actuarial losses partially offset by an increase in the assumed discount rate. Future pension expense will be impacted by many factors including actual investment performance, changes in discount rates, timing of contributions and other employee related matters. See Note 16 — Employee Benefit Plans of our consolidated financial statements for more information.

In 2018, we made mandatory contributions and benefit payments to plan participants of approximately $13 million. We expect to make mandatory and benefit payments to plan participants of approximately $12 million. Future mandatory contribution requirements will vary depending on actual investment performance, changes in valuation assumptions, interest rates and legal requirements to maintain a certain funding status.

The sensitivity of pension expense and projected benefit obligation related to our pension plans to changes in economic assumptions is highlighted below:

	Impact on (in millions):	
	Effect on 2019 Pension Expense	Effect on December 31, 2018 Projected Benefit Obligation
Change in Assumption	(Decrease)/Increase	Increase (Decrease)
50 bp decrease in discount rate	$4	$63
50 bp increase in discount rate	$(4)	$(58)
50 bp decrease in long-term return on assets	$4	
50 bp increase in long-term return on assets	$(4)	

Realizability of both recorded and unrecorded tax assets and tax liabilities

We have recorded certain deferred tax assets we believe will be realized in future periods. The recognition of these tax assets is based on our analysis of both positive and negative evidence about the future realization of the tax benefit of each existing deductible temporary difference or carryforward. Future realization is based on the existence of sufficient taxable income of the appropriate character, within the appropriate taxing jurisdiction (for example country, state or province), and within the carryback and carryforward periods available under the applicable tax laws. The strongest form of positive evidence is the evaluation of adjusted historical earnings and future earnings projections within the applicable carryforward periods. This evidence supports the realizability of all recorded deferred tax assets. Tax assets are reviewed periodically for realizability. This review requires management to make assumptions and estimates about future profitability affecting the realization of these tax assets. If the review indicates the realizability may be less than likely, a valuation allowance is recorded.

Our income tax returns are subject to examination by U.S. federal and state taxing authorities as well as foreign jurisdictions, including Canada and France. In evaluating the tax benefits associated with various tax filing positions, we record a tax benefit for an uncertain tax position if it is more-likely-than-not to be realized upon ultimate settlement of the issue. We record a liability for an uncertain tax position that does not meet this criterion. The liabilities for unrecognized tax benefits are adjusted in the period in which it is determined the issue is settled with the taxing authorities, the statute of limitations expires for the relevant taxing authority to examine the tax position or when new facts or information become available. See Note 18 — Income Taxes of our consolidated financial statements for more information.

Business Combinations

We allocate the total purchase price of assets acquired and liabilities assumed based on their estimated fair value as of the business combination date. In developing estimates of fair values for long-lived assets, including identifiable intangible assets, we utilize a variety of inputs including forecasted cash flows, anticipated growth rates, discount rates, estimated replacement costs and depreciation and obsolescence factors. Determining the fair value for specifically identified intangible assets such as customer lists and trade-names involves judgment. We may refine our estimates and make adjustments to the assets acquired and liabilities assumed over a measurement period, not to exceed one year. Upon the conclusion of the measurement period or the final determination of the values of assets acquired and liabilities assumed, whichever comes first, any subsequent adjustments are

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charged to the consolidated statements of income. Subsequent actual results of the underlying business activity supporting the specifically identified intangible assets could change, requiring us to record impairment charges or adjust their economic lives in future periods.

New Accounting Standards

See Note 2 — Summary of Significant Accounting Policies and New Accounting Pronouncements of our consolidated financial statements for a discussion of recently issued accounting pronouncements that may affect our financial results and disclosures in future periods.

Summary of our results of operations for the three years ended December 31:

Financial Information (in millions, except percentages)	2018	2017	2016
Net Sales	$2,134	$961	$869
Cost of Sales	(1,790)	(818)	(683)
Gross Margin	344	143	186
Selling, general and administrative expenses	(108)	(79)	(37)
Duties	(26)	(1)	—
Other operating expense, net	(12)	(2)	(6)
Operating Income	198	61	143
Interest expense	(60)	(40)	(35)
Interest income and other, net	4	2	1
Other components of net periodic benefit costs	9	(3)	(6)
Gain on bargain purchase	20	317	—
Gain on derivative instrument	—	8	—
Gain on debt extinguishment	1	—	9
Income Before Income Taxes	172	345	112
Income Tax Expense	(44)	(20)	(39)
Net Income	$128	$325	$73
Gross Margin %	16.1 %	14.9 %	21.4 %
Operating Margin %	9.3 %	6.4 %	16.5 %
Effective Tax Rate %	25.4 %	5.7 %	34.9 %

Results of Operations, Year Ended December 31, 2018 versus December 31, 2017

Net sales by segment were as follows:

	2018	2017
Net Sales (in millions)		
High Purity Cellulose	$1,192	$867
Forest Products	356	34
Pulp	346	38
Paper	310	29
Eliminations	(70)	(7)
Total Net Sales	$2,134	$961

Net sales increased $1,173 million, or 122 percent, in 2018 compared to 2017. The increase was primarily due to the inclusion of Tembec’s operations for the full year in 2018, compared to approximately a month and a half during 2017. For further assessment of changes in net sales, see the discussion of operating results by segment.

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Operating income by segment was as follows:

	2018	2017
Operating income (in millions)		
High Purity Cellulose	$112	$120
Forest Products	25	—
Pulp	95	4
Paper	31	(1)
Corporate	(65)	(62)
Total operating income	$198	$61

Operating income for 2018 increased $137 million, or 222 percent, over the prior year. The increase was primarily due to the inclusion of Tembec's operations for the full year in 2018, compared to approximately a month and a half during 2017. For further assessment of changes of operating income, see the discussion of Operating Results by Segment discussion below.

Non-operating Expenses

Interest expense for 2018 increased $20 million over the same prior year. The increase was due to realizing a full year of interest expense from the debt acquired to finance the Tembec acquisition in addition to slightly higher LIBOR rates on our variable-rate debt. For additional information, see Note 8 — Debt and Capital Leases.

Interest income and other, net, increased during the year ended December 31, 2018 when compared to the prior year. In addition, our net periodic benefit cost was also favorable due to our expected return on assets during 2018. See Note 16 — Employee Benefit Plans as well as the foreign exchange gain on the re-measurement of certain debt instruments.

We recognized a $20 million increase to the gain on bargain purchase during 2018 primarily from tax-related adjustments from finalizing the purchase price allocation of the Acquisition. See Note 3 — Tembec Acquisition.

Income Tax Expense

Our effective tax rate for the years ended December 31, 2018 and December 31, 2017 was 25.4 percent and 5.7 percent, respectively. The increase in 2018 is due primarily to higher taxable income and the absence the $317 million of nontaxable bargain purchase gain recorded in 2017. An additional nontaxable gain was recorded in 2018 but the impact was not as significant. See Note 18 — Income Taxes of our consolidated financial statements for more information.

Operating Results by Segment

The Acquisition occurred on November 17, 2017 and, as such, the results of operations for Tembec have been included in our results from that date. In the following analyses, changes in sales and operating income for the segments from 2017 to 2018 that are due to the operations of Tembec for the period from January 1, 2018 through November 16, 2018 are included in the column identified as "Acquisition."

High Purity Cellulose

($ in million)	2018	2017
Net Sales	$1,192	$867
Operating Income	$112	$120
Average Sales Prices ($ per metric ton):		
Cellulose Specialties	$1,334	$1,460
Commodity Products	$818	$733
Sales Volumes (thousands of metric tons):		
Cellulose Specialties	624	453
Commodity Products	298	250

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Changes in High Purity Cellulose net sales are as follows:

Net Sales (in millions)	2017	Changes Attributable to:			2018
		Price	Volume/Mix	Acquisition	
Cellulose specialties	$662	$(51)	$ 8	$ 213	$832
Commodity products and other	183	16	6	39	244
Other sales (a)	22	—	(1)	95	116
Total Net Sales	$867	$(35)	$ 13	$ 347	$1,192

(a) Other sales include sales of electricity, resins, lignin and other by-products to third parties.

Excluding the Acquisition, cellulose specialties sales prices declined in 2018 approximately 4 percent due to lower contracted pricing, as expected. Cellulose specialties and commodity product sales volumes, excluding the impact of the Acquisition, increased primarily due to the timing of revenue recognition.

Changes in High Purity Cellulose operating income are as follows:

Operating Income (in millions)		Gross Margin Changes Attributable to:					
	2017	Price	Volume/ Sales Mix (a)	Cost	Acquisition	SG&A and other	2018
Operating Income	$120	$(35)	$ 13	$(11)	$ 44	$(19)	$112
Operating Margin %	13.8 %	(3.6)%	1.4 %	(1.3)%	0.7 %	(1.6)%	9.4 %

(a) Volume/Sales Mix computed based on contribution margin.

Operating income decreased $8 million or 7 percent in 2018 as the Acquisition and increased sales volumes were more than offset by lower sales prices and higher costs. Costs increased $11 million in 2018 due to higher, one-time energy costs caused by the unusually cold weather in the southeastern U.S. in January, higher wood and chemical costs, and lower production. These costs were partially offset by lower depreciation, lower costs to achieve Cost Transformation savings and the impact of the inventory write-up to fair market value of $6 million. Additionally, 2017 was negatively impacted by $5 million of higher costs for the idling of our production facilities in the southeast U.S. from Hurricane Irma. Selling, general and administrative and other costs increased due to the Acquisition and our share of the loss related to the start-up the lignin joint-venture of $4 million.

Forest Products

(in millions)	2018	2017
Net Sales	$356	$34
Operating income	$25	$—
Average Sales Prices ($ per thousand board feet):		
Lumber	$471	$460
Sales Volumes (millions of board feet):		
Lumber	604	56

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Changes in Forest Products net sales are as follows:

Net Sales (in millions)		Changes Attributable to:			
	2017	Price	Vol/Mix/Other (a)	Acquisition	2018
Lumber	$ 26	$ (5)	$ 2	$ 262	$ 285
Other sales (a)	8	—	4	59	71
Total Net Sales	$ 34	$ (5)	$ 6	$ 321	$ 356

(a) Other sales include sales of logs, wood chips, and other by-products to third-parties and other segments.

Net sales increased during 2018 primarily due to the Acquisition. In addition, prices declined due to lower demand in the latter part of the year offset by slightly higher volumes.

Changes in Forest Products operating income are as follows:

Operating Income (in millions)		Gross Margin Changes Attributable to:					
	2017	Price	Volume/ Sales Mix (a)	Cost	Acquisition	SG&A and other	2018
Operating Income	$ —	$ (5)	$ 2	$ 2	$ 55	$ (29)	$ 25
Operating Margin %	—%	(17.2)%	8.6 %	5.7%	18.0 %	(8.1)%	7.0 %

(a) Volume/Sales Mix computed based on contribution margin.

Operating income for Forest Products increased $25 million during 2018 primarily due to the Acquisition's impact on gross margin of $55 million. Excluding the impact of the Acquisition on gross margin, prices declined as a result of demand weakness in the lumber market, partially offset by slightly higher sales volumes. Costs were lower as the absence of the 2017 inventory write-up to fair value of $5 million was partially offset by higher costs from the market-related downtime and the write-down of inventories to current net realizable value as a result of lower sales prices in December 2018. The change in SG&A and other is a result of the increase of duties paid for lumber sold into the United States of approximately $26 million in 2018 and higher costs as a result of the Acquisition.

Pulp

(in millions)	2018	2017
Net Sales	$ 346	$ 38
Operating income	$ 95	$ 4
Average Sales Prices ($ per metric tons) (a):		
High-yield pulp	$ 665	$ 616
Sales Volumes (in thousands of metric tons) (a):		
High-yield pulp	482	58

(a) Average sales prices and volumes for external sales only.

The Pulp segment sold approximately 65 thousand MTs of high-yield pulp for $26 million to the Paper segment for the production of paperboard during 2018.

Changes in Pulp net sales are as follows:

Net Sales (in millions)	2017	Changes Attributable to:			2018
		Price	Volume/Mix	Acquisition	
High-yield pulp	$ 38	$ 4	$ (2)	$ 306	$ 346

Net sales for Pulp increased during 2018 primarily due to the Acquisition. Excluding the Acquisition, prices were favorable due to higher demand for virgin fiber, partly offset by lower paperboard volume.

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Changes in Pulp operating income are as follows:

Operating Income (in millions)		Gross Margin Changes Attributable to:					
	2017	Price	Volume/ Sales Mix (a)	Cost	Acquisition	SG&A and other	2018
Operating Income	$4	$4	$(1)	$4	$91	$(7)	$95
Operating Margin %	10.5%	8.5%	(1.5)%	10.0%	2.0%	(2.0)%	27.5%

(a) Computed based on contribution margin.

Operating income for Pulp increased $91 million during 2018 primarily due to the Acquisition's impact on gross margin of $91 million. Excluding the impact of the Acquisition on gross margin, prices increased as a result of higher demand for virgin fiber as a result of reduced recycled fiber imports in China, partially offset by slightly lower sales volumes as the markets weakened in December 2018. Costs were lower as the absence of the 2017 inventory write-up to fair value of $6 million was partially offset by higher costs from lower production, in addition to increased wood costs. The change in SG&A and other is a result of the Acquisition.

Paper

(in millions)	2018	2017
Net Sales	$310	$29
Operating income	$31	$(1)
Average Sales Prices ($ per metric ton):		
Paperboard	$1,130	$1,132
Newsprint	$592	$513
Sales Volumes (in metric tons):		
Paperboard	174	17
Newsprint	191	21

Changes in Paper net sales are as follows:

Net Sales (in millions)	2017	Changes Attributable to:			2018
		Price	Volume/Mix	Acquisition	
Paperboard	$19	$—	$2	$176	$197
Newsprint	10	2	(1)	101	113
Total Net Sales	$29	$2	$1	$277	$310

Net sales for Paper increased during 2018 due primarily to the Acquisition.

Changes in Paper operating income are as follows:

Operating Income (in millions)		Gross Margin Changes Attributable to:					
	2017	Price	Volume/ Sales Mix (a)	Cost	Acquisition	SG&A and other	2018
Operating Income	$(1)	$2	$—	$4	$37	$(11)	$31
Operating Margin %	(3.3)%	6.5%	(0.1)%	12.1%	(1.7)%	(3.5)%	10.0%

(a) Computed based on contribution margin.

Operating income for Paper increased $32 million during 2018 primarily due to the Acquisition's impact on gross margin of $37 million. Excluding the impact of the Acquisition on gross margin, prices increased primarily as a result of duties on newsprint imported into the U.S. Costs were lower as the absence of the 2017 inventory write-up to fair value of $6 million was partially offset by higher pulp costs for paperboard and lower production at newsprint and paperboard. The change in SG&A and other is primarily a result of the Acquisition.

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Corporate

(in millions)	2018	2017
Operating loss	$(65)	$(62)

The operating loss for Corporate increased $3 million from 2017. Excluding the $34 million in one-time acquisition related costs in 2017, the loss increased $37 million in 2018 primarily as a result of the inclusion of the Acquisition for the full year.

Results of Operations, Year Ended December 31, 2017 versus December 31, 2016

Net sales by segment were as follows:

	2017	2016
Net Sales (in millions)		
High Purity Cellulose	$867	$869
Forest Products	34	—
Pulp	38	—
Paper	29	—
Eliminations	(7)	—
Total Net Sales	$961	$869

Net sales increased $92 million in 2017 compared to 2016. The increase was primarily due to the Acquisition. For further analysis of net sales, see the below discussion of changes in net sales by segment.

Operating income by segment was as follows:

	2017	2016
Operating Income (in millions)		
High Purity Cellulose	$120	$176
Forest Products	—	—
Pulp	4	—
Paper	(1)	—
Corporate	(62)	(33)
Total Operating Income	$61	$143

Operating income was $61 million in 2017 compared to $143 million in 2016, a decrease of $82 million. The decrease was primarily due to a reduction in gross margin combined with increased selling, general and administrative expenses and other costs associated with the Acquisition. For further analysis, see the below discussion of changes in operating income.

Non-operating Expenses

Interest expense was $40 million for 2017, compared to $35 million in the prior year. Interest expense increased in 2017 due to lower average debt balances, more than offset by higher LIBOR interest rates on floating rate debt and the increased amortization of deferred financing costs as a result of the refinancing of the Company's term loans. See Note 8 — Debt and Capital Leases of our consolidated financial statements for more information.

In connection with the acquisition of Tembec, we recognized a gain on bargain purchase primarily as a result of the elimination of Tembec's valuation allowance associated with certain deferred tax assets. As a result of the refinancing of Tembec's debt, we expect future taxable income will be adequate to realize the benefit of the tax assets. See Note 3 — Tembec Acquisition of our consolidated financial statements for more information.

In connection with the acquisition of Tembec, we entered into a foreign currency collar, a derivative, as an economic hedge of the anticipated cash flows denominated in Canadian dollars. The derivative was not deemed a hedge for accounting purposes and, as a result, we recorded a realized gain on derivative instrument of $8 million in 2017. See Note 10 — Derivative Instruments of our consolidated financial statements for more information.

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Income Tax Expense
Our effective tax rate for 2017 was 5.7 percent compared to 34.9 percent in 2016. The decrease is primarily due to the non-taxable gain on bargain purchase partially offset by the impact of the U.S. tax reform legislation and certain non-deductible acquisition related costs. See Note 18 — Income Taxes of our consolidated financial statements for more information.
Changes in net sales by segment are as follows:

Net Sales (in millions)	2016	Changes Attributable to:			2017
		Price	Volume/Mix	Acquisition	
High Purity Cellulose:					
Cellulose specialties	$695	$(28)	$ (30)	&#	