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

The following management's discussion and analysis is intended to help the reader understand Resolute Forest Products, our results of operations, cash flows and financial condition. The discussion is provided as a supplement to, and should be read in conjunction with, our consolidated financial statements and the accompanying notes (or, the "*Consolidated Financial Statements*") contained in Item 8, "Financial Statements and Supplementary Data" of this Annual Report on Form 10-K (or, "*Form 10-K*").

When we refer to "Resolute Forest Products," "Resolute," "we," "our," "us," or the "Company," we mean Resolute Forest Products Inc. with its subsidiaries, either individually or collectively, unless otherwise indicated.

OVERVIEW

Resolute Forest Products is a global leader in the forest products industry with a diverse range of products, including market pulp, tissue, wood products, newsprint and specialty papers, which are marketed in close to 70 countries. The Company owns or operates some 40 facilities, as well as power generation assets, in the U.S. and Canada. We are the largest Canadian producer of wood products east of the Canadian Rockies, the largest producer of uncoated mechanical papers in North America, and a competitive pulp producer in North America. We are also a leading global producer of newsprint and an emerging tissue producer.

We report our activities in five business segments: market pulp, tissue, wood products, newsprint and specialty papers. We believe an integrated approach across these segments maximizes value creation for our Company and stakeholders.

We are guided by our vision and values, focusing on safety, sustainability, profitability, accountability, and teamwork. We believe we can be distinguished by the following competitive strengths:

- *Competitive cost structure combined with diversified and integrated asset base*
  - large-scale and cost-effective operations, including significant internal energy production from cogeneration and hydroelectric facilities, which support our value proposition;
  - control over fiber transformation chain from standing timber to end-product for the majority of our offering;
  - nearly 100% of our products sourced from high-quality virgin fiber;
  - harvesting rights for the majority of fiber needs in Canada; and
  - sophisticated logistics capabilities to meet demanding customer expectations.
- *Solid balance sheet*
  - favorable pricing and flexibility under borrowing agreements together with our liquidity levels support ability to weather challenging market cycles and to execute transformation strategy;
  - significant tax assets to defer cash income taxes and provide synergies to execute this strategy; and
  - customers benefit from a financially stable and reliable business partner in a challenging industry.
- *Seasoned management team*
  - deep industry expertise, with influential leaders in forestry, operations, environmental risk management and public policy;
  - culture of accountability, encouraging transparency and straightforwardness; and
  - core identity tied to renewable resources we harvest in a truly sustainable manner.

Our Business

Products

For information on our products, see Part I, Item 1, "Business – Products" of this Form 10-K.

Strategy and highlights

Our corporate strategy is focused on continuing to transform the Company away from mature markets and declining products toward a more profitable and sustainable organization over the long run, founded on a competitive portfolio of manufacturing assets and a solid presence in long-term growth markets. Our strategy is based on maximizing value generation from structurally declining paper, growing in pulp and wood products, integrating our pulp into value-added quality tissue, and investing in product innovation, while maintaining a disciplined approach to capital allocation.

Maximizing value generation from paper

Our paper products – newsprint and specialty papers – remain an important part of our business, generating cash to help finance our transformation strategy. In order to remain competitive in mature and declining markets that our paper operations face, we strive to consistently:

- maintain a stringent focus on controlling costs and optimizing our diversified asset base;
- manage production and inventory levels; and
- focus production at our most profitable and lower-cost facilities and machines.

Growing in pulp and wood products

Market pulp and wood products are core segments for the Company, and we believe in their long-term, sustained growth potential. We are confident in our ability to generate attractive returns for shareholders as operators of these assets. Our strategy is to take an opportunistic approach to these strategic initiatives, such as:

- spending to improve productivity and/or lower costs;
- investing selectively in organic expansions; and
- pursuing opportunistic strategic acquisitions.

For example, we recently completed the acquisition of three sawmills in the U.S. South, with combined production capacity of 550 million board feet once ramped-up. The transaction will give us immediate scale in an attractive region, with quality assets in a rich fiber basket, close to growing end-markets, and it gives us an opportunity to create value by deploying our operational expertise in sawmilling, with a focus on reliability, productivity and safety. We plan to pursue capital investments started under the previous owner, to maintain appropriate working capital, and to upgrade maintenance practices.

Integrating our pulp into value-added quality tissue

We entered the tissue market in 2015 with the construction of a greenfield tissue facility at our Calhoun (Tennessee) site and the acquisition of two tissue mills and a recovered paper facility in Florida. The purpose of our diversification into tissue is to add value with the integration of our market pulp, particularly as printing and writing demand for pulp continues to decline. We also believe that the tissue business will provide a more stable source of revenue and profitability.

Our tissue operations are almost entirely supplied from our pulp mills, creating synergies and minimizing risks associated with cyclical market pulp pricing. For our Calhoun tissue facility, pulp is transferred directly as slush pulp into the tissue operation, reducing process, energy, handling and logistics costs. Equipped with three modern converting lines sized specifically for the tissue machine, our Calhoun tissue facility mostly sells converted products that target the fast growing premium private-label markets in the U.S.

Investing in product innovation

Fiber from trees is renewable, reusable and fossil-free, and we believe that it can serve as a core pillar in the ongoing shift away from fossil-based materials toward renewable alternatives. With our large-scale access to high-quality fiber, our expertise in managing its value-transformation chain and our strategically-located manufacturing facilities, we believe in investing in our business to build a competitive forest products company for the future.

For example, today we manufacture wood pellets used in renewable energy production from sawmill byproducts and, in partnership with a leading industry research organization, we recently launched an innovative pilot bio-refinery plant to produce lignin and cellulosic sugars for uses such as wood adhesives, animal feed and composites. In early 2020, we also announced the construction of a commercial plant to produce cellulose filaments, a new sustainable biomaterial derived from wood fiber that can be integrated into commercial and consumer products for many industries, including transportation, construction and energy, increasing the resistance and durability of those products. The cellulose filaments will be marketed with the help of Performance BioFilaments Inc., a joint venture established in 2014 by Resolute and Mercer International Inc., dedicated to the development of non-traditional applications for cellulose filaments.

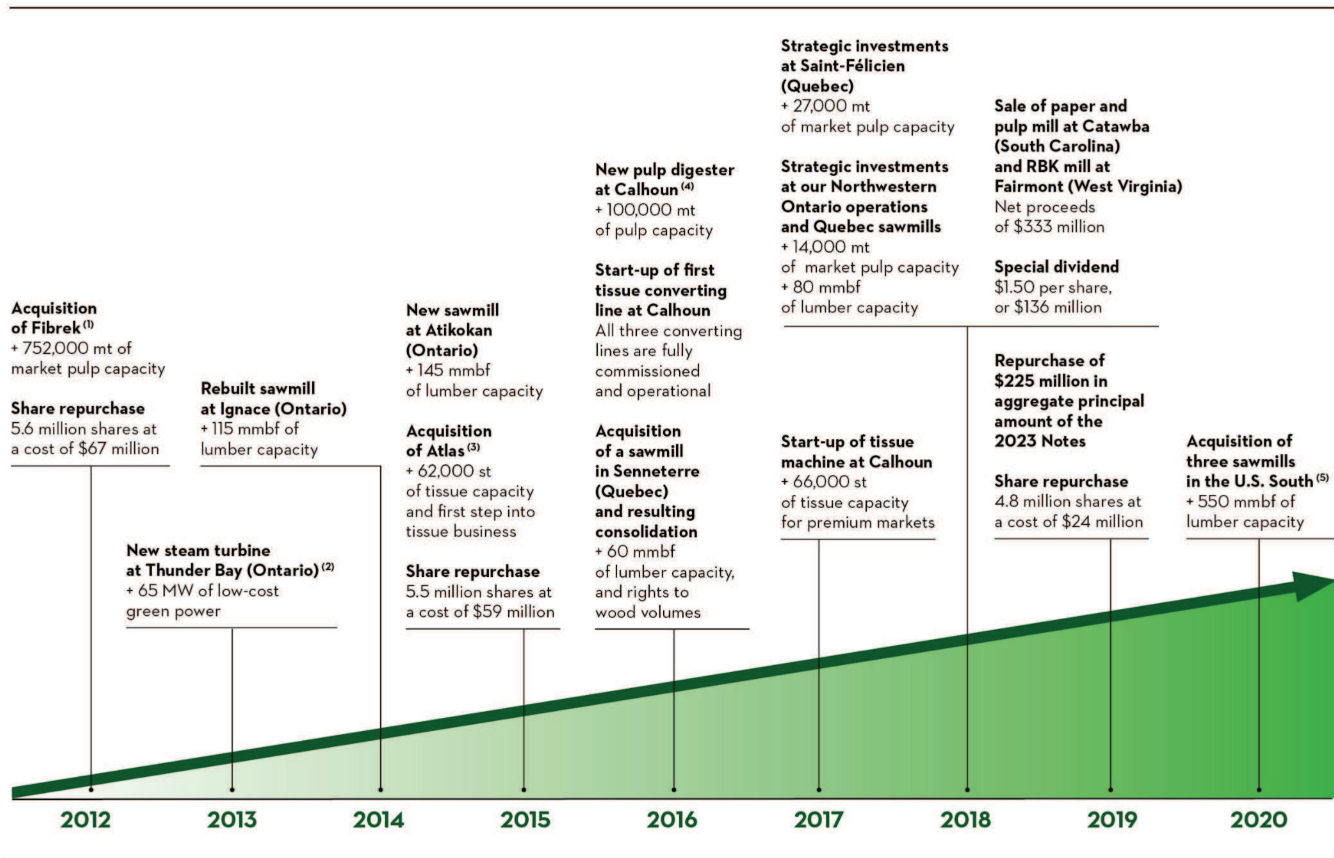
We see certain megatrends around evolving customer preferences toward more renewable alternatives, urbanization and demographic changes that could open opportunities for our Company in value-added engineered wood products to capitalize on the growing role of wood in multi-family residential and commercial construction, as well as innovative fiber-derived products.

Disciplined approach to capital allocation

As we operate in a capital-intensive and cyclical industry, we believe that the proper allocation of capital is a top priority, and that it should be done in a disciplined manner, with a view to maximize free cash flow through the business cycle and to generate attractive returns for our shareholders. Accordingly, we:

- spend our capital in a disciplined, strategic and focused manner, concentrating on our most competitive sites and the highest-return projects;
- explore value-creating opportunities to divest idled, non-core or marginal operations;
- seek to maintain conservative debt levels and solid financial liquidity that over time are sufficient to support the evolution of our transformation strategy;
- based on market conditions, seek to retire, repay or refinance our outstanding indebtedness with a view to reducing costs and enhancing our financial flexibility; and
- return excess capital over time to our shareholders through dividends and share repurchases.

Here is a summary of some of our key strategic initiatives since 2012:



(1) By acquiring Fibrek Inc. (or, "*Fibrek*"), our market pulp capacity increased by over 70%.

(2) The installed steam turbine at our Thunder Bay pulp and paper mill maximizes our local woodlands, sawmill, pulp and paper, and energy operations by fully utilizing forest-based biomass to produce green electricity.

(3) With the acquisition of Atlas Paper Holdings Inc. and its subsidiaries (or, "*Atlas*"), we gained an immediate position in the North American consumer tissue market and access to a customer base to accelerate the sale and distribution of our Calhoun tissue production.

(4) Incremental pulp capacity from the pulp digester serves in part to supply slush pulp to our Calhoun tissue machine.

(5) The acquisition of three sawmills in the U.S. South from Conifex Timber Inc., with combined production capacity of 550 million board feet, gives us immediate scale in an attractive region, with quality assets in a rich fiber basket, close to growing end-markets. The facilities produce construction-grade dimensional lumber and decking products from locally sourced southern yellow pine for distribution within the U.S.

Sustainable development and performance

Our sustainability strategy is based on a balanced approach to environmental, social and economic performance, designed to enhance our competitive position. It is supported by public commitments in a number of key performance areas, focusing primarily on:

- improving resource efficiency, which helps control wood fiber, chemical, and energy costs, three significant input costs in our industry;
- moving beyond regulatory compliance and environmental incident management to differentiate ourselves as an environmental supplier of choice;
- positioning Resolute as a competitive employer; and
- building solid relations in our operating communities.

Our recent key sustainability achievements include:

- Beating our safety target by achieving an Occupational Safety and Health Administration incident rate of 0.49 in 2019. Safety is our first priority, and we strive for zero injuries.
- Achieving an 83% reduction in absolute greenhouse gas (or, "*GHG*") emissions (scope 1 and 2), below 2000 levels.
- Inaugurating a C$23 million biorefinery plant at our Thunder Bay pulp and paper mill in partnership with FPInnovations. The initiative is focused on developing new ways to efficiently produce and commercialize innovative biochemicals derived from wood.
- Announcing a C$27 million project to establish a commercial plant specializing in the production of cellulose filaments, a sustainable biomaterial derived from wood fiber, at our Kénogami (Quebec) paper mill.
- Continuing implementation of a $45 million strategic investment plan at our Saint-Félicien pulp mill to improve the operation, increase average daily production capacity, and reduce GHG emissions from the use of fossil fuels by 20%, or approximately 35,000 metric tons of CO_2 equivalents per year.
- Increasing facilities' energy efficiency and lowering GHG emissions, including initiatives at our Alma (Quebec) and Kénogami specialty paper mills to optimize boiler performance for a reduction of 6,000 metric tons of CO_2 equivalents per year, as well as our Baie-Comeau newsprint mill to increase control of combustion for a 50% reduction in oil usage, or approximately 4,000 metric tons of CO_2 equivalents per year.
- Deploying a carbon capture unit and ancillary equipment at our Saint-Félicien pulp mill to improve growth rates at Serres Toundra Inc. in which we hold a 49% interest.
- Maintaining certification of 100% of Resolute-owned or managed woodlands to at least one internationally recognized forest management standard (Sustainable Forestry Initiative®, or "*SFI*®", and/or Forest Stewardship Council®, or "*FSC*®"). As a result, our commitments extend well beyond strict compliance with applicable forestry regulations, which in Quebec and Ontario are already among the most, if not the most, rigorous in the world.
- Maintaining internationally recognized chain of custody certifications at 100% of our manufacturing facilities (SFI, FSC, and the Programme for the Endorsement of Forest Certification), with the exception of the tissue operation at our Calhoun facility, which is expected to have its fiber-tracking system certified in 2020.
- Launching our regional procurement web portal to support the development of local and regional business in our operating communities as part of our commitment to further integrate sustainability practices in our procurement process.
- Appointing Suzanne Blanchet as a member of our board of directors and chair of the Environmental, Health and Safety Committee.
- Continuing to report climate change, water security, and forests disclosures to CDP. Full disclosures and scores are available on CDP's website (https://www.cdp.net/), though this information is not incorporated by reference into this Form 10-K and should not be considered part of this or any other report that we file with or furnish to the U.S. Securities and Exchange Commission (or, the "*SEC*").
- Continuing to implement our proactive approach to environmental management by beating our environmental incidents target (class 1 and 2) by recording 18 environmental incidents in 2019.
- Maintaining active engagement of union officials, employees, mayors and other community leaders, First Nations partners, small community business owners, customers, and representatives of governments at various levels.
- In addition to developing information resources such as BorealForestFacts.com and The Resolute Blog, we continued to expand the scope of our social media presence as well as our engagement on the Forum boréal and Boreal Forum social media platforms. These Quebec and Ontario sites provide a forum for fact-based discussion concerning sustainable forestry practices in the boreal forest and they help to ensure that individual and community voices are heard, particularly when it comes to the importance of forestry to Northern communities in Canada. The information contained on or connected to BorealForestFacts.com, The Resolute Blog and the Forum boréal and Boreal Forum social media platforms, is not incorporated by reference into this Form 10-K and should not be considered part of this or any other report that we file with or furnish to the SEC.
- Other sustainability performance indicators and disclosures prepared in accordance with the Global Reporting Initiative's GRI Standards are available on our website (www.resolutefp.com). Such sustainability disclosures on our

website are not incorporated by reference into this Form 10-K and should not be considered part of this or any other report that we file with or furnish to the SEC.

Our leadership and sustainability accomplishments have been recognized by independent organizations. In 2019, we received extensive regional, North American and global recognition for our sustainability achievements. Some of the more noteworthy included:

- the Business Intelligence Group Sustainability Award, in the Sustainability Initiative of the Year category (August 1, 2019);
- Canada's 2020 Clean50 and 2020 Clean16 **(www.clean50.com)**, for our President and Chief Executive Officer's contribution to sustainability and clean capitalism in Canada (October 3, 2019);
- three gold International Business Awards (known as the "Stevies®"), for Energy Industry Innovation of the Year, Company of the Year – Manufacturing (Large) and Corporate Social Responsibility Program of the Year for the U.S. and Canada (October 19, 2019); and
- the American Forest and Paper Association's Leadership in Sustainability Award, in the Energy Efficiency/Greenhouse Gas Reduction (Large Company) category (November 11, 2019).

Power generation

We produce electricity at six cogeneration facilities and seven hydroelectric dams. The output is consumed internally or sold under contract to third parties. This allows us to reduce our costs by generating energy internally at a lower cost compared to open market purchases, and by producing revenue from external sales.

This table provides a breakdown of the output capacity (based on installed capacity and operating expectations in 2020) available for internal consumption at our existing production facilities:

		Energy	
INTERNAL CONSUMPTION	**Type**	**Capacity (MW)**	**Consumption (MWh/Year)**
Calhoun (Tennessee)	Cogeneration	64	330,000
Coosa Pines (Alabama)	Cogeneration	25	154,000
Hydro Saguenay (Quebec) (7 dams)	Hydroelectric	170	1,117,000
Thunder Bay (Ontario)	Cogeneration	25	197,000

We estimate that the approximate annualized cost savings to our operations attributable to internal consumption from our cogeneration assets and hydroelectric facilities is between $35 million and $40 million.

The table below shows the facilities where we currently produce electricity to sell externally as green power produced from renewable sources at favorable rates, almost all of which we buy back at lower rates for use in our operations:

		Energy	
EXTERNAL SALES	**Type**	**Capacity (MW)**	**Annualized Sales (MWh/Year)**
Dolbeau (Quebec)	Cogeneration	28	195,000
Gatineau (Quebec)	Cogeneration	15	108,000
Saint-Félicien (Quebec)	Cogeneration	43	287,000
Thunder Bay (Ontario)	Cogeneration	65	397,000

External sales generated from our cogeneration assets reduced cost of sales, excluding depreciation, amortization and distribution costs (or, "*COS*"), by $36 million, $37 million and $40 million for the years ended December 31, 2019, 2018 and 2017, respectively.

2019 Overview

ASU 2016-02 "Leases"

Effective January 1, 2019, we adopted Accounting Standards Update (or, "*ASU*") 2016-02, "Leases," issued by the Financial Accounting Standards Board, and the series of related accounting standard updates that followed, through a cumulative-effect adjustment as of that date. For more information, including the effect on our Consolidated Balance Sheet as of January 1, 2019, refer to Note 2, "Summary of Significant Accounting Policies – New accounting pronouncements adopted in 2019," to our Consolidated Financial Statements.

Long-term debt

On January 3, 2019, we repurchased $225 million in aggregate principal amount of our 5.875% senior unsecured noted due 2023 (or, the "*2023 Notes*"). On May 14, 2019, we entered into an amendment to our senior secured asset-based revolving credit facility (or, "*ABL Credit Facility*"*)*, providing for an extension of the maturity date to May 14, 2024, and representing a voluntary reduction of the aggregate lender commitment of $100 million. On October 28, 2019, we entered into an amended and restated senior secured credit facility for up to $360 million, replacing our existing $185 million senior secured credit facility. See below under "Liquidity and Capital Resources – Capital Resources" for more information.

Fibrek litigation

On September 26, 2019, the Quebec Superior Court in Canada rendered a decision fixing the fair value of the shares of the dissenting Fibrek shareholders at C$1.99 per share, or C$31 million in aggregate, plus interest and an additional indemnity, for a total currently estimated at C$44 million ($33 million) payable in cash. As previously reported, we accrued C$14 million ($10 million) for the payment of the dissenting shareholders' claims. Following the court decision, we have accrued an additional C$30 million ($23 million), and as a result recorded $23 million in "Other (expense) income, net" in our Consolidated Statement of Operations for the year ended December 31, 2019. Of the total amount of C$44 million, C$19 million ($14 million) was payable immediately and paid on October 2, 2019, bringing the remaining balance to C$25 million ($19 million), which is recorded in "Other liabilities" in our Consolidated Balance Sheet as of December 31, 2019. We are appealing the decision, therefore the payment of any additional consideration and its timing will depend on the outcome of the appeal.

Share repurchase program

With our repurchase of 4.8 million shares at a cost of $24 million during the year ended December 31, 2019, we completed our $150 million share repurchase program.

Indefinite idling of Augusta mill

In November 2019, we announced the indefinite idling of the Augusta (Georgia) mill, with newsprint capacity of 214,000 metric tons, as a result of the decline in North American newsprint consumption. We took 158,000 metric tons of temporary downtime in newsprint in 2019; the decision allows us to focus production on fewer, more competitive mills and to eliminate fixed costs associated with surplus capacity. As a result of the indefinite idling of the Augusta mill, we recorded accelerated depreciation of $8 million and severance and other costs of $10 million (recorded in "Closure costs, impairment and other related charges" in our Consolidated Statement of Operations for the year ended December 31, 2019), as well as inventory write-downs of $13 million (recorded in "Cost of sales, excluding depreciation, amortization and distribution costs" in our Consolidated Statement of Operations for the year ended December 31, 2019).

Business acquisition

On February 1, 2020 (or, the "*Closing Date*"), we acquired from Conifex Timber Inc. all of the equity securities and membership interests in certain of its subsidiaries, the business of which consists mainly in the operation of three sawmills and related assets in Cross City (Florida) and in Glenwood and El Dorado (Arkansas) (or, the "*U.S. Sawmill Business*"). The fair value of the consideration, paid in cash at the Closing Date, for the U.S. Sawmill Business acquired was $175 million, subject to post-closing working capital adjustments. We financed the acquisition by borrowing $175 million under our revolving credit facilities. For more information, see Note 21, "Subsequent Event," to our Consolidated Financial Statements.

2019 vs. 2018

Our operating income was $17 million during the year, compared to $379 million in 2018. Excluding special items, we generated operating income of $46 million in 2019, compared to $362 million in 2018. Special items are described below.

Our net loss in 2019 was $47 million, or $0.51 per share, compared to net income of $235 million, or $2.52 per diluted share, in 2018. Our net loss for 2019, excluding special items, was $46 million, or $0.50 per share, compared to net income of $183 million, or $1.96 per diluted share, in 2018.

Year Ended December 31, 2019 *(In millions, except per share amounts)*	**Operating Income**	**Net Loss**	**EPS**
GAAP, as reported	$ 17	$ (47)	$ (0.51)
Adjustments for special items:			
Closure costs, impairment and other related charges	18	18	0.19
Inventory write-downs related to closures	13	13	0.14
Net gain on disposition of assets	(2)	(2)	(0.02)
Non-operating pension and other postretirement benefit credits	—	(47)	(0.51)
Other expense, net	—	22	0.24
Income tax effect of special items	—	(3)	(0.03)
Adjusted for special items [1]	$ 46	$ (46)	$ (0.50)

Year Ended December 31, 2018 *(In millions, except per share amounts)*	**Operating Income**	**Net Income**	**EPS**
GAAP, as reported	$ 379	$ 235	$ 2.52
Adjustments for special items:			
Closure costs, impairment and other related charges	121	121	1.30
Inventory write-downs related to closures	(1)	(1)	(0.01)
Start-up costs	8	8	0.09
Net gain on disposition of assets	(145)	(145)	(1.55)
Non-operating pension and other postretirement benefit credits	—	(50)	(0.54)
Other income, net	—	(5)	(0.06)
Income tax effect of special items	—	20	0.21
Adjusted for special items [1]	$ 362	$ 183	$ 1.96

(1) Operating income (loss), net income (loss) and net income (loss) per share (or, "*EPS*"), in each case as adjusted for special items, are not financial measures recognized under U.S. generally accepted accounting principles (or, "*GAAP*"). We calculate operating income (loss), as adjusted for special items, as operating income (loss) from our Consolidated Statements of Operations, adjusted for items such as closure costs, impairment and other related charges, inventory write-downs related to closures, start-up costs, and gains and losses on disposition of assets that are excluded from our segment's performance from GAAP operating income (loss). We calculate net income (loss), as adjusted for special items, as net income (loss) from our Consolidated Statements of Operations, adjusted for the same special items applied to operating income (loss), in addition to non-operating pension and other postretirement benefit (or, "*OPEB*") costs and credits, other income and expense, net, and the income tax effect of the special items. EPS, as adjusted for special items, is calculated as net income (loss), as adjusted for special items, per diluted share. We believe that using these non-GAAP measures is useful because they are consistent with the indicators management uses internally to measure the Company's performance, and it allows the reader to compare our operations and financial performance from period to period. Operating income (loss), net income (loss) and EPS, in each case as adjusted for special items, are internal measures, and therefore may not be comparable to those of other companies. These non-GAAP measures should not be viewed as substitutes to financial measures determined under GAAP.

Fourth Quarter Overview

Three months ended December 31, 2019 vs. December 31, 2018

Our operating loss was $69 million in the quarter, compared to operating income of $75 million in the year-ago period. Excluding special items, we incurred an operating loss of $39 million in the quarter, compared to operating income of $54 million in the year-ago period. Special items are described below.

Our net loss in the quarter was $71 million, or $0.79 per share, compared to net income of $36 million, or $0.38 per diluted share, in the year-ago period. Our net loss in the quarter, excluding special items, was $53 million, or $0.59 per share, compared to net income of $4 million, or $0.04 per diluted share, in the year-ago period.

Three Months Ended December 31, 2019 *(In millions, except per share amounts)*	**Operating Loss**	**Net Loss**	**EPS**
GAAP, as reported	$ (69)	$ (71)	$ (0.79)
Adjustments for special items:			
Closure costs, impairment and other related charges	18	18	0.20
Inventory write-downs related to closures	13	13	0.14
Net gain on disposition of assets	(1)	(1)	(0.01)
Non-operating pension and other postretirement benefit credits	—	(11)	(0.12)
Income tax effect of special items	—	(1)	(0.01)
Adjusted for special items [(1)]	$ (39)	$ (53)	$ (0.59)

Three Months Ended December 31, 2018 *(In millions, except per share amounts)*	**Operating Income**	**Net Income**	**EPS**
GAAP, as reported	$ 75	$ 36	$ 0.38
Adjustments for special items:			
Closure costs, impairment and other related charges	120	120	1.27
Net gain on disposition of assets	(141)	(141)	(1.49)
Non-operating pension and other postretirement benefit credits	—	(12)	(0.13)
Other income, net	—	(1)	(0.01)
Income tax effect of special items	—	2	0.02
Adjusted for special items [(1)]	$ 54	$ 4	$ 0.04

(1) Operating income (loss), net income (loss) and EPS, in each case as adjusted for special items, are non-GAAP financial measures. For more information on the calculation and reasons we include these measures, see note 1 under “Overview – 2019 Overview” above.

RESULTS OF OPERATIONS

Consolidated Results

Selected annual financial information

	Years Ended December 31,		
(In millions, except per share amounts)	**2019**	2018	2017
Sales	**$ 2,923**	$ 3,756	$ 3,513
Operating income (loss) per segment:			
Market pulp	**$ 39**	$ 172	$ 79
Tissue	**(16)**	(30)	(6)
Wood products	**(6)**	169	186
Newsprint	**49**	74	(23)
Specialty papers	**33**	40	(9)
Segment total	**99**	425	227
Corporate and other	**(82)**	(46)	(185)
Operating income	**$ 17**	$ 379	$ 42
Net (loss) income attributable to Resolute Forest Products Inc.	**$ (47)**	$ 235	$ (84)
Net (loss) income per share attributable to Resolute Forest Products Inc. common shareholders:			
Basic	**$ (0.51)**	$ 2.57	$ (0.93)
Diluted	**$ (0.51)**	$ 2.52	$ (0.93)
Adjusted EBITDA [(1)]	**$ 213**	$ 574	$ 364

	As of December 31,	
(In millions)	**2019**	2018
Cash and cash equivalents	**$ 3**	$ 304
Total assets	**$ 3,626**	$ 3,935

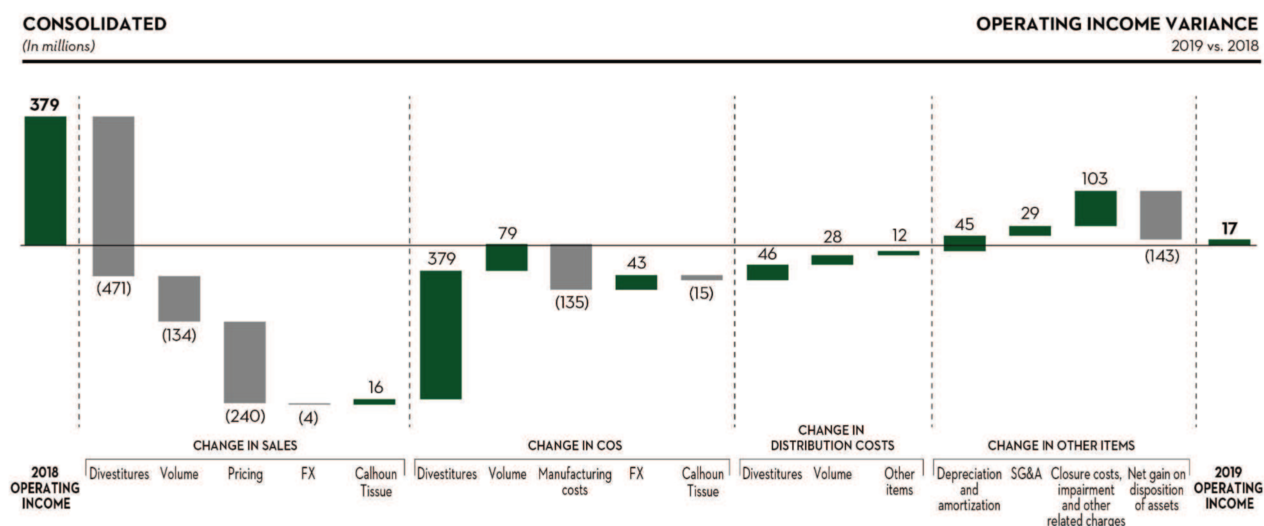
(1) Earnings before interest expense, income taxes, and depreciation and amortization (or, "*EBITDA*") and adjusted EBITDA are not financial measures recognized under GAAP. EBITDA is calculated as net income (loss) including noncontrolling interests from the Consolidated Statements of Operations, adjusted for interest expense, income taxes, and depreciation and amortization. Adjusted EBITDA means EBITDA, excluding special items, such as closure costs, impairment and other related charges, inventory write-downs related to closures, start-up costs, gains and losses on disposition of assets, non-operating pension and OPEB costs and credits, and other income and expense, net. We believe that using non-GAAP measures such as EBITDA and adjusted EBITDA is useful because they are consistent with the indicators management uses internally to measure the Company's performance and it allows the reader to compare our operations and financial performance from period to period. EBITDA and adjusted EBITDA are internal measures, and therefore may not be comparable to those of other companies. These non-GAAP measures should not be viewed as substitutes to financial measures determined under GAAP.

(In millions)	Years Ended December 31, 2019	2018	2017
Net (loss) income including noncontrolling interests	**$ (47)**	$ 235	$ (78)
Interest expense	**31**	47	49
Income tax provision	**58**	152	84
Depreciation and amortization	**167**	212	204
EBITDA	**209**	646	259
Closure costs, impairment and other related charges	**18**	121	82
Inventory write-downs related to closures	**13**	(1)	24
Start-up costs	**—**	8	27
Net gain on disposition of assets	**(2)**	(145)	(15)
Non-operating pension and other postretirement benefit credits	**(47)**	(50)	(7)
Other expense (income), net	**22**	(5)	(6)
Adjusted EBITDA	**$ 213**	$ 574	$ 364

The operating results of our Calhoun tissue operations, previously recorded under "corporate and other," have been recorded in our tissue segment since April 1, 2018.

2019 vs. 2018

Operating income variance analysis



Sales

Sales were $833 million, or 22%, lower in 2019, to $2,923 million. After removing the sales related to the divestitures of the Catawba and Fairmont facilities in the fourth quarter of 2018, sales declined by $362 million. Lower volume reduced sales by $134 million, reflecting lower shipments in newsprint, wood products, and specialty papers, while pricing had an unfavorable impact of $240 million, mainly as a result of a drop in the average transaction price for wood products and market pulp, down by 20% and 9%, respectively. The inclusion of our Calhoun tissue operations' results in our tissue segment for the full year in 2019 increased sales by $16 million.

Cost of sales, excluding depreciation, amortization and distribution costs

COS improved by $351 million in 2019. After removing the COS related to divestitures, the Canadian dollar fluctuation, as well as the effects of lower volume and of the inclusion of Calhoun's tissue operations for the full year in 2019, COS increased by $135 million, largely reflecting:

- higher wood fiber costs ($66 million), mainly due to wood shortages, as well as higher transportation costs;
- unfavorable maintenance costs ($32 million), largely associated with scheduled outages;
- write-downs of mill stores and other supplies inventory associated with the indefinite idling of the Augusta mill ($13 million);
- higher labor expense ($11 million);
- higher chemical costs ($10 million), mainly due to unfavorable usage; and
- lower contribution from our hydroelectric facilities ($8 million), largely due to scheduled maintenance;

partially offset by:

- start-up costs incurred in 2018 ($7 million) for the Calhoun tissue manufacturing and converting facility; and
- favorable recycled fiber prices ($6 million).

Distribution costs

After removing the distribution costs related to divestitures, the Canadian dollar fluctuation, as well as the effects of lower volume and of the inclusion of Calhoun's tissue operations for the full year in 2019, distribution costs decreased by $11 million, reflecting improved freight rates, the new tissue distribution center in Calhoun in the first quarter of 2019, and transportation optimization, mainly in specialty papers.

Depreciation and amortization

Depreciation and amortization was $45 million lower in 2019, mainly reflecting certain newsprint assets that were fully depreciated at the end of the fourth quarter of 2018, the divestitures of the Catawba and Fairmont facilities, and the increase of the useful lives of certain of our newsprint machinery and equipment in the first quarter of 2019.

Selling, general & administrative expenses

Selling, general and administrative (or, "*SG&A*") expenses improved by $29 million in 2019, mainly due to lower incentive plan expense, which is based on company performance, and lower stock-based compensation expense.

Closure costs, impairment and other related charges

See the corresponding variance analysis under "Corporate and Other" below.

Net gain on disposition of assets

See the corresponding variance analysis under "Corporate and Other" below.

Net (loss) income variance analysis

Interest expense

Interest expense was $16 million lower in 2019, as we repurchased $225 million in aggregate principal amount of our 2023 Notes on January 3, 2019, and we fully repaid borrowings of $144 million under our revolving credit facilities in 2018.

Other (expense) income, net

We recorded other expense, net of $22 million in 2019, compared to other income, net of $5 million in the prior year. The difference mostly reflects the $23 million provision related to the Fibrek litigation recorded in 2019.

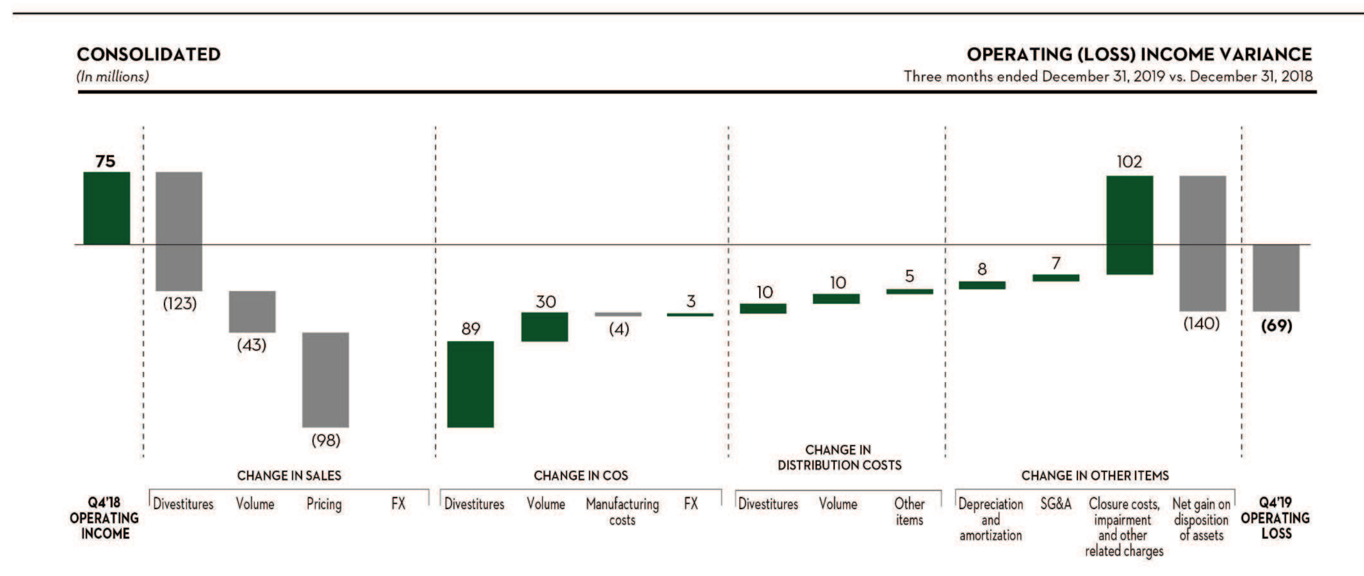
Income taxes

We recorded an income tax provision of $58 million in 2019, on income before income taxes of $11 million, compared to an expected income tax provision of $2 million based on the U.S. federal statutory income tax rate of 21%. The difference mainly reflects: an increase to our valuation allowance related to our U.S. operations ($43 million) where we recognize a valuation allowance against virtually all of our net deferred income tax assets; foreign tax rate differences ($11 million); and U.S. tax on non-U.S. earnings ($7 million); partly offset by state income taxes ($7 million).

We recorded an income tax provision of $152 million in 2018, on income before income taxes of $387 million, compared to an expected income tax provision of $81 million based on the U.S. federal statutory income tax rate of 21%. The difference reflected mostly: U.S. tax on non-U.S. earnings ($65 million); foreign exchange items ($29 million); foreign tax rate differences ($24 million); and the effect of a nondeductible goodwill impairment charge ($13 million); partly offset by a decrease to our valuation allowance primarily related to our U.S. operations ($59 million).

Q4 of 2019 vs. Q4 of 2018

Operating (loss) income variance analysis



Sales

Sales decreased by $264 million, or 28%, compared to the fourth quarter of 2018, to $668 million. After removing the sales related to the divestitures of the Catawba and Fairmont facilities, sales volume was $43 million lower, mainly due to lower shipments of newsprint and wood products, partially offset by higher volumes of market pulp. Pricing also contributed to a $98 million decrease in sales, reflecting lower average transaction prices for market pulp, newsprint, and specialty papers, down by 26%, 14%, and 7%, respectively.

Cost of sales, excluding depreciation, amortization and distribution costs

COS improved by $118 million in the quarter. After removing the COS related to divestitures, the effect of lower volume, and the Canadian dollar fluctuation, COS increased by $4 million, mainly reflecting:

- higher wood fiber costs ($15 million), mostly due to wood shortages, as well as higher transportation costs; and
- write-downs of mill stores and other supplies inventory associated with the indefinite idling of the Augusta mill ($13 million);

partly offset by:

- a decrease in recycled fiber prices ($9 million);
- favorable maintenance costs ($7 million), mainly attributable to the indefinite idling of the Augusta mill, as well as the timing of scheduled outages;
- lower labor costs ($6 million), mainly attributable to the indefinite idling of the Augusta mill; and

- favorable power prices ($3 million).

Distribution costs

After removing the distribution costs related to divestitures and the effect of lower volume, distribution costs improved by $5 million, reflecting transportation optimization, mainly in specialty papers, and the new tissue distribution center in Calhoun in the first quarter of 2019.

Depreciation and amortization

Depreciation and amortization was $8 million lower in the quarter, mainly reflecting certain newsprint assets that were fully depreciated at the end of the fourth quarter of 2018.

Selling, general & administrative expenses

SG&A expenses improved by $7 million in the quarter, mainly due to lower stock-based compensation expense and lower incentive plan expense, which is based on company performance.

Closure costs, impairment and other related charges

In the fourth quarter of 2019, we recorded closure costs, impairment and other related charges of $18 million, related to the indefinite idling of our paper mill at Augusta, including severance and other costs of $10 million and accelerated depreciation charges of $8 million. This compares to impairment charges of $120 million recorded in the year-ago period, related to the assets from the 2015 acquisition of Atlas, including a goodwill impairment charge of $81 million, fixed assets impairment charges of $29 million, and intangible assets impairment charges of $10 million.

Net gain on disposition of assets

We recorded a net gain on disposition of assets of $1 million in the fourth quarter of 2019, compared to $141 million in the year-ago period, which included: the sale of the paper and pulp mill at Catawba for total cash consideration of $280 million, resulting in a net gain of $101 million; and the sale of the recycled bleached kraft (or, "*RBK*") pulp mill at Fairmont for total cash consideration of $62 million, resulting in a net gain of $40 million.

Net (loss) income variance analysis

Interest expense

Interest expense was $4 million lower in the quarter, as we repurchased $225 million in aggregate principal amount of our 2023 Notes on January 3, 2019.

Income taxes

We recorded an income tax provision of $6 million in the fourth quarter of 2019, on a loss before income taxes of $65 million, compared to an expected income tax benefit of $14 million based on the U.S. federal statutory income tax rate of 21%. The difference reflects mostly an increase to our valuation allowance related to our U.S. operations ($25 million), partly offset by U.S. tax on non-U.S. earnings ($4 million).

We recorded an income tax provision of $41 million in the fourth quarter of 2018, on income before income taxes of $77 million, compared to an expected income tax provision of $16 million based on the U.S. federal statutory income tax rate of 21%. The difference reflected mainly: foreign exchange items ($17 million); the effect of a nondeductible goodwill impairment charge ($13 million); U.S. tax on non-U.S. earnings ($12 million); and foreign tax rate differences ($5 million); partly offset by a decrease to our valuation allowance primarily related to our U.S. operations ($19 million).

<u>2018 vs. 2017</u>

For a variance analysis of our 2018 vs. 2017 results of operations, see Part II, Item 7, "Management's Discussion and Analysis of Financial Condition and Results of Operations – Results of Operations – Consolidated Results – 2018 vs. 2017," of our annual report on Form 10-K for the year ended December 31, 2018, filed with the SEC on March 1, 2019 (or, the "*2018 Annual Report*").

Segment Earnings

We manage our business based on the products we manufacture. Our reportable segments correspond to our principal product lines: market pulp, tissue, wood products, newsprint and specialty papers.

We do not allocate any of the income or loss items following "operating income" in our Consolidated Statements of Operations to our segments because those items are reviewed separately by management. Similarly, we do not allocate to the segments: closure costs, impairment and other related charges; inventory write-downs related to closures; start-up costs; gains and losses on disposition of assets; as well as other discretionary charges or credits.

We allocate depreciation and amortization expense to our segments, although the related fixed assets and amortizable intangible assets are not allocated to segment assets. Additionally, all SG&A expenses are allocated to our segments, with the exception of certain discretionary charges and credits, which we present under "corporate and other."

MARKET PULP

Highlights

(In millions, except where otherwise stated)	Years Ended December 31, 2019	2018	2017
Sales	$ 797	$ 1,085	$ 911
Operating income [1]	$ 39	$ 172	$ 79
EBITDA [2]	$ 62	$ 199	$ 110
(In thousands of metric tons)			
Shipments	1,156	1,424	1,425
Downtime	56	93	84

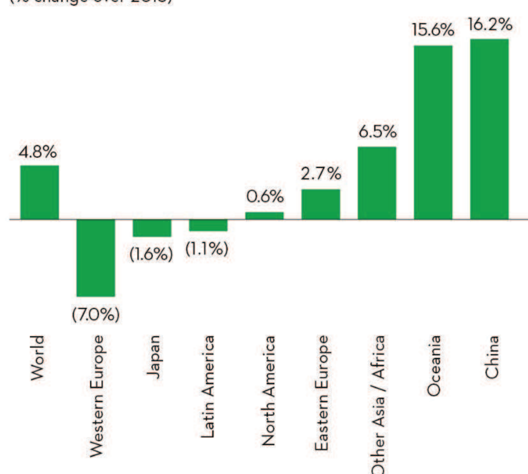
(In thousands of metric tons)	December 31, 2019	2018	2017
Finished goods inventory	68	80	89

(1) Net income including noncontrolling interests is equal to operating income in this segment.

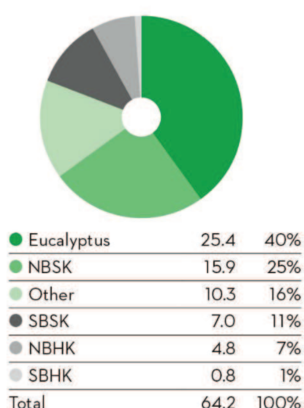
(2) EBITDA, a non-GAAP financial measure, is reconciled below. For more information on the calculation and reasons we include this measure, see note 1 under "Results of Operations – Consolidated Results – Selected annual financial information" above.

(In millions)	Years Ended December 31, 2019	2018	2017
Net income including noncontrolling interests	$ 39	$ 172	$ 79
Depreciation and amortization	23	27	31
EBITDA	$ 62	$ 199	$ 110

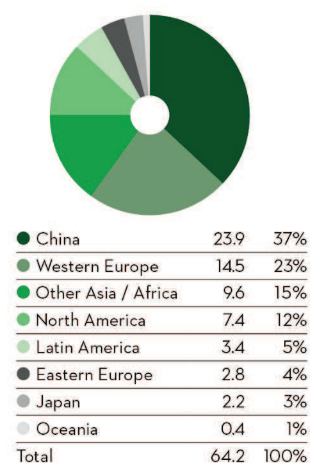
Industry trends



Source: Pulp and Paper Products Council (or "PPPC")



Grade		
Eucalyptus	25.4	40%
NBSK	15.9	25%
Other	10.3	16%
SBSK	7.0	11%
NBHK	4.8	7%
SBHK	0.8	1%
Total	64.2	100%



Region		
China	23.9	37%
Western Europe	14.5	23%
Other Asia / Africa	9.6	15%
North America	7.4	12%
Latin America	3.4	5%
Eastern Europe	2.8	4%
Japan	2.2	3%
Oceania	0.4	1%
Total	64.2	100%

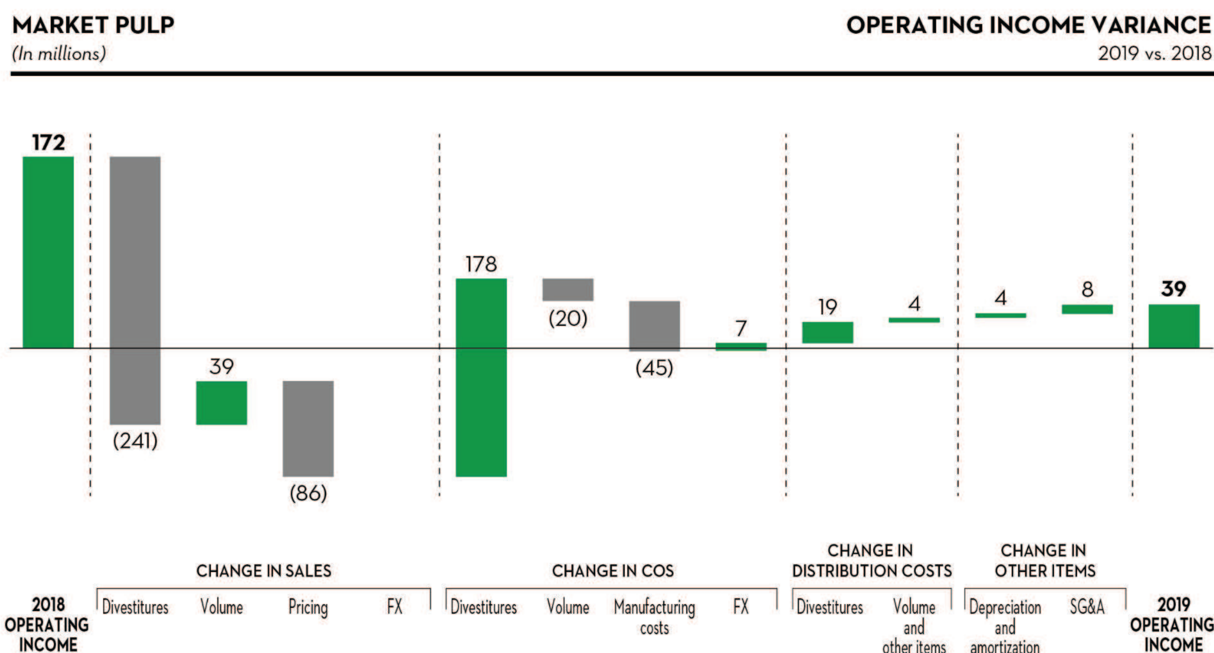
World demand for chemical pulp grew by 4.8% in 2019, reflecting an increase of 16.2% in China, partly offset by a decrease of 7.0% in Western Europe, while North America was essentially unchanged. World capacity grew by 1.1% over the same period.

World demand for softwood pulp increased by 5.8% in 2019, with shipments to China and North America up by 18.4% and 3.1%, respectively, while Western Europe was down by 6.3%. The operating rate was 92%.

In the same period, demand for hardwood pulp rose by 4.5%, with shipments to China up by 15.5%, while Western Europe and North America were down by 7.5% and 3.1%, respectively. The operating rate was 90%.

2019 vs. 2018

Operating income variance analysis



Sales

Sales were $288 million lower, or 27%, to $797 million in 2019, primarily due to lower production capacity resulting from the divestitures of the Catawba and Fairmont facilities in the fourth quarter of 2018. After removing the sales related to these divestitures, sales volume was $39 million higher as a result of better production levels compared to the prior year. Pricing also reduced sales by $86 million. The average transaction price declined by $72 per metric ton, as price increases realized across all grades in 2018 eroded with weaker global pulp markets.

Cost of sales, excluding depreciation, amortization and distribution costs

After adjusting for the effect of higher volume, the COS related to divestitures, and the Canadian dollar fluctuation, manufacturing costs increased by $45 million, reflecting:

- higher wood fiber costs ($30 million), mostly due to wood shortages;
- unfavorable maintenance costs ($22 million), largely associated with scheduled outages; and
- higher chemical costs ($6 million), mainly due to unfavorable usage;

partly offset by:

- a decrease in recycled fiber prices ($6 million);
- favorable steam usage ($4 million); and
- lower power prices ($4 million).

Depreciation and amortization

Depreciation and amortization was $4 million lower in 2019, mainly due to the divestitures of the Catawba and Fairmont facilities.

Selling, general & administrative expenses

SG&A expenses improved by $8 million in the year, mainly due to lower allocated expenses as a result of capacity reductions, and lower incentive plan expense, which is based on company performance.

2018 vs. 2017

For a variance analysis of our 2018 vs. 2017 results of operations, see Part II, Item 7, "Management's Discussion and Analysis of Financial Condition and Results of Operations – Results of Operations – Segment Earnings – Market Pulp – 2018 vs. 2017," of our 2018 Annual Report.

TISSUE

Highlights

(In millions, except where otherwise stated)	Years Ended December 31, 2019	2018	2017
Sales	**$ 165**	$ 130	$ 81
Operating loss [(1)]	**$ (16)**	$ (30)	$ (6)
EBITDA [(2)]	**$ 2**	$ (15)	$ (1)
(In thousands of short tons)			
Shipments [(3)]	**97**	84	53
Downtime	**2**	2	1

(In thousands of short tons)	December 31, 2019	2018	2017
Finished goods inventory [(3)]	**8**	5	11

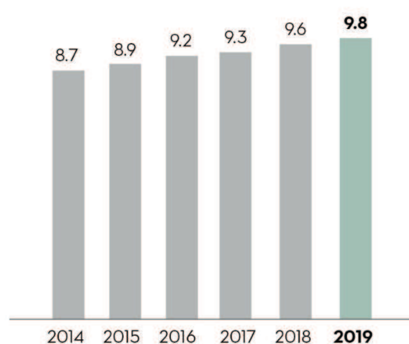
(1) Net loss including noncontrolling interests is equal to operating loss in this segment.

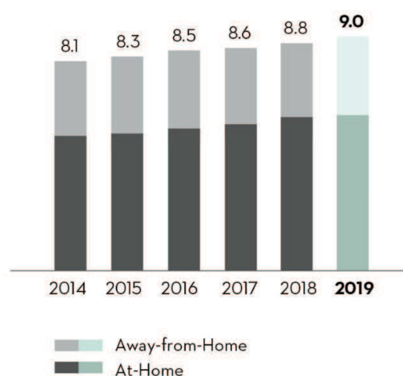
(2) EBITDA, a non-GAAP financial measure, is reconciled below. For more information on the calculation and reasons we include this measure, see note 1 under "Results of Operations – Consolidated Results – Selected annual financial information" above.

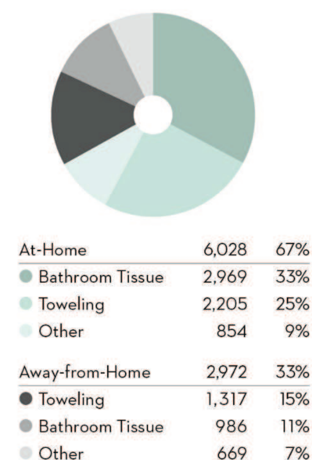
(3) Tissue converted products, which are measured in cases, are converted to short tons.

(In millions)	Years Ended December 31, 2019	2018	2017
Net loss including noncontrolling interests	**$ (16)**	$ (30)	$ (6)
Depreciation and amortization	**18**	15	5
EBITDA	**$ 2**	$ (15)	$ (1)

Industry trends





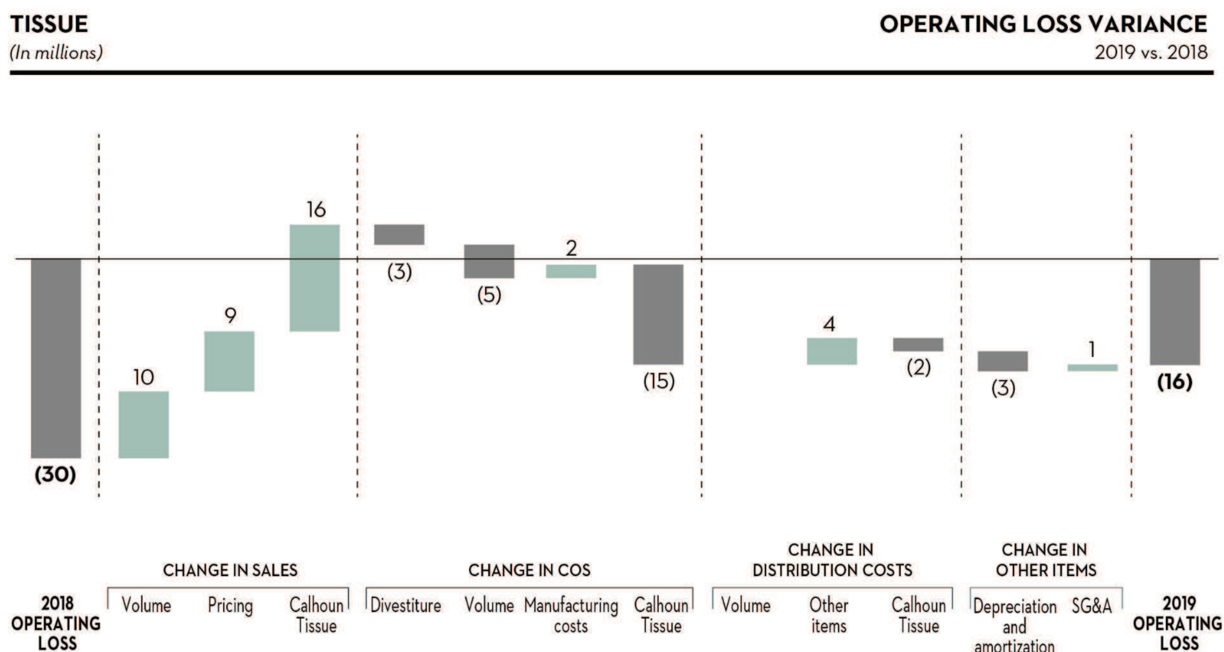


Source: RISI

Total U.S. tissue consumption grew by 2.5% in 2019. Converted product shipments increased by 2.3%, including an improvement of 3.5% in away-from-home shipments, and 1.8% in at-home shipments. U.S. parent roll production increased by 2.9% in 2019, contributing to a 93% average industry production-to-capacity ratio, unchanged from 2018.

2019 vs. 2018

Operating loss variance analysis



The operating results of our Calhoun tissue operations have been recorded in our tissue segment since April 1, 2018. The operating loss of $12 million incurred in the first quarter of 2018 for our Calhoun tissue manufacturing and converting facility was recorded under "corporate and other."

Sales

Sales were $35 million greater, or 27%, to $165 million in 2019. Shipments rose by 13,000 short tons, primarily due to the inclusion of Calhoun's results in our tissue segment starting on April 1, 2018, and sales volume growth. The average transaction price was $160 per short ton higher, mainly due to favorable product and customer mix, and the realization of previously announced away-from-home products price increases.

Cost of sales, excluding depreciation, amortization and distribution costs

After removing the effects of higher volume and of the inclusion of Calhoun's operations for the full year in 2019, and the impact of higher COS following the divestiture of the Fairmont mill, our manufacturing costs improved by $2 million compared to 2018, mainly due to lower maintenance costs.

Distribution costs

After removing the effect of the inclusion of Calhoun's operations for the full year in 2019, distribution costs improved by $4 million, mainly as a result of the new tissue distribution center in Calhoun in the first quarter of 2019.

Depreciation and amortization

Depreciation and amortization was $3 million higher in 2019, reflecting the effect of the inclusion of Calhoun's results in our tissue segment for the full year in 2019, partly offset by the reduced carrying value of our Florida assets after the impairment charge taken in the fourth quarter of 2018.

2018 vs. 2017

For a variance analysis of our 2018 vs. 2017 results of operations, see Part II, Item 7, “Management’s Discussion and Analysis of Financial Condition and Results of Operations – Results of Operations – Segment Earnings – Tissue – 2018 vs. 2017,” of our 2018 Annual Report.

WOOD PRODUCTS

Highlights

(In millions, except where otherwise stated)	Years Ended December 31, **2019**	2018	2017
Sales	**$ 616**	$ 823	$ 797
Operating (loss) income [1]	**$ (6)**	$ 169	$ 186
EBITDA [2]	**$ 28**	$ 201	$ 219
(In million board feet)			
Shipments [3]	**1,731**	1,846	2,011
Downtime [3]	**242**	147	130

(In million board feet)	December 31, **2019**	2018	2017
Finished goods inventory [3]	**133**	157	124

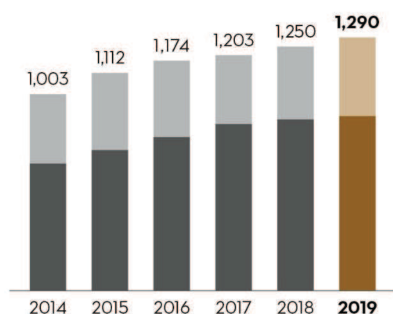
(1) Net (loss) income including noncontrolling interests is equal to operating (loss) income in this segment.

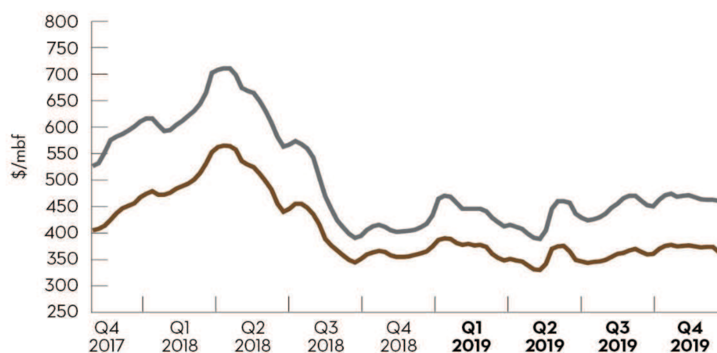
(2) EBITDA, a non-GAAP financial measure, is reconciled below. For more information on the calculation and reasons we include this measure, see note 1 under "Results of Operations – Consolidated Results – Selected annual financial information" above.

(3) Includes wood pellets measured by mass, converted to board feet using a density-based conversion ratio.

(In millions)	Years Ended December 31, **2019**	2018	2017
Net (loss) income including noncontrolling interests	**$ (6)**	$ 169	$ 186
Depreciation and amortization	**34**	32	33
EBITDA	**$ 28**	$ 201	$ 219

Industry trends

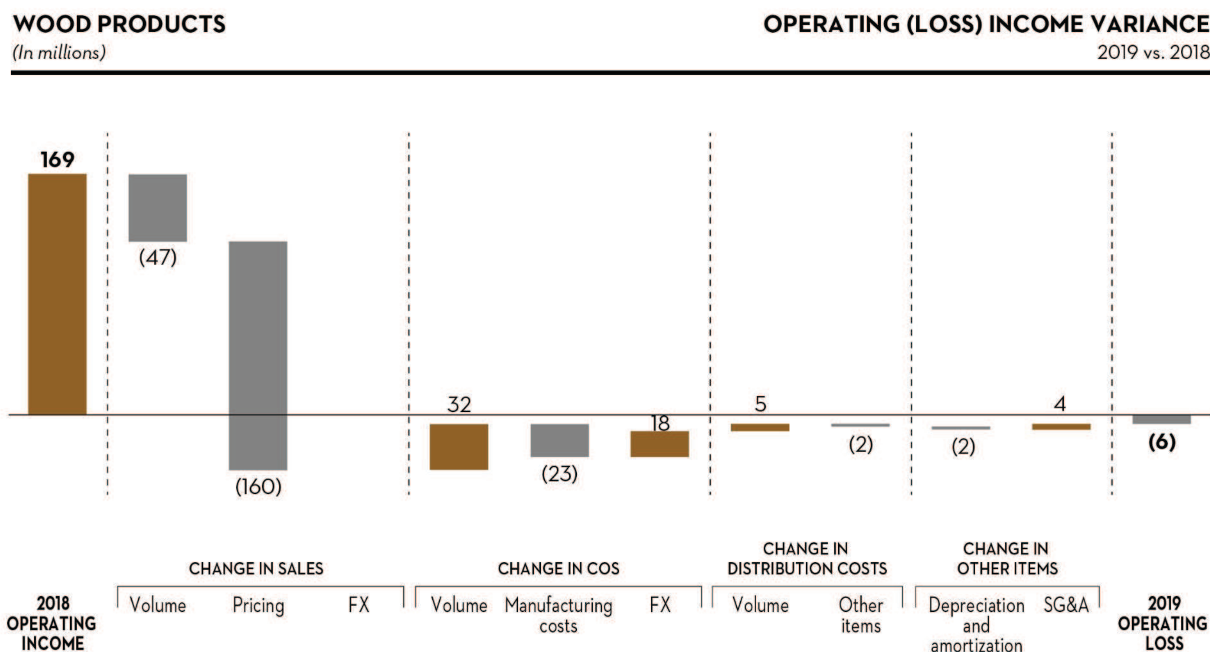




2019 U.S. housing starts were 1.3 million, up by 3.2% compared to 2018, which reflects a 7.3% increase in multi-family starts, and a 1.4% increase in single-family starts. The 2x4 – Random Length (or, "*RL*") #1-2 Kiln Dried Great Lakes (or, "*KD GL*") price dropped by 22.0% in 2019, and the 2x4x8 Stud KD GL price was down by 20.2%.

2019 vs. 2018

Operating (loss) income variance analysis



Sales

Sales were $207 million lower, or 25%, to $616 million in 2019, reflecting a $90 per thousand board feet drop in the average transaction price, or 20%, and a reduction of 115 million board feet in shipments, in each case reflecting a sharp drop in market prices in the second half of 2018, and a slow recovery through 2019. Lack of transportation availability also contributed to the decrease in shipments in the latter part of 2019. Despite lower shipments, finished goods inventory remained at a normal level of 133 million board feet, as we took 95 million board feet of additional downtime compared to 2018, for a total of 242 million board feet in 2019.

Cost of sales, excluding depreciation, amortization and distribution costs

Manufacturing costs increased by $23 million after adjusting for the effect of lower volume and the Canadian dollar fluctuation, mainly reflecting:

- higher wood fiber costs ($13 million), including higher transportation costs;
- an increase in labor costs ($6 million); and
- unfavorable maintenance costs ($5 million).

Selling, general & administrative expenses

SG&A expenses improved by $4 million in the year, mainly due to lower incentive plan expense, which is based on company performance.

2018 vs. 2017

For a variance analysis of our 2018 vs. 2017 results of operations, see Part II, Item 7, “Management’s Discussion and Analysis of Financial Condition and Results of Operations – Results of Operations – Segment Earnings – Wood Products – 2018 vs. 2017,” of our 2018 Annual Report.

NEWSPRINT

Highlights

(In millions, except where otherwise stated)	Years Ended December 31, 2019	2018	2017
Sales	$ 773	$ 907	$ 842
Operating income (loss) [1]	$ 49	$ 74	$ (23)
EBITDA [2]	$ 78	$ 140	$ 43
(In thousands of metric tons)			
Shipments	1,315	1,507	1,638
Downtime	158	22	55

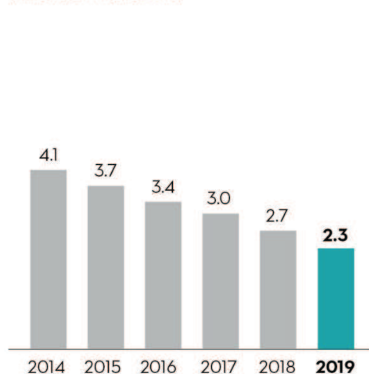
(In thousands of metric tons)	December 31, 2019	2018	2017
Finished goods inventory	105	101	78

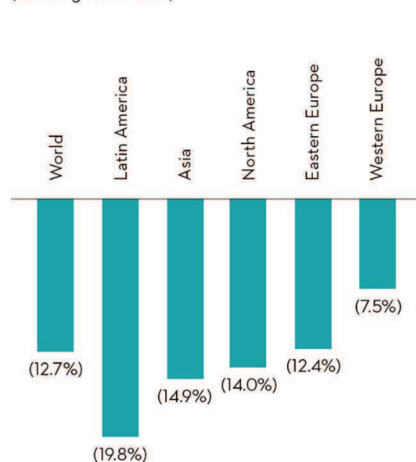
(1) Net income (loss) including noncontrolling interests is equal to operating income (loss) in this segment.

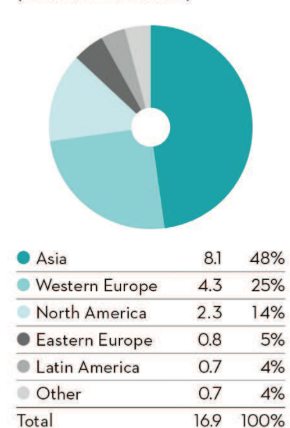
(2) EBITDA, a non-GAAP financial measure, is reconciled below. For more information on the calculation and reasons we include this measure, see note 1 under "Results of Operations – Consolidated Results – Selected annual financial information" above.

(In millions)	Years Ended December 31, 2019	2018	2017
Net income (loss) including noncontrolling interests	$ 49	$ 74	$ (23)
Depreciation and amortization	29	66	66
EBITDA	$ 78	$ 140	$ 43

Industry trends





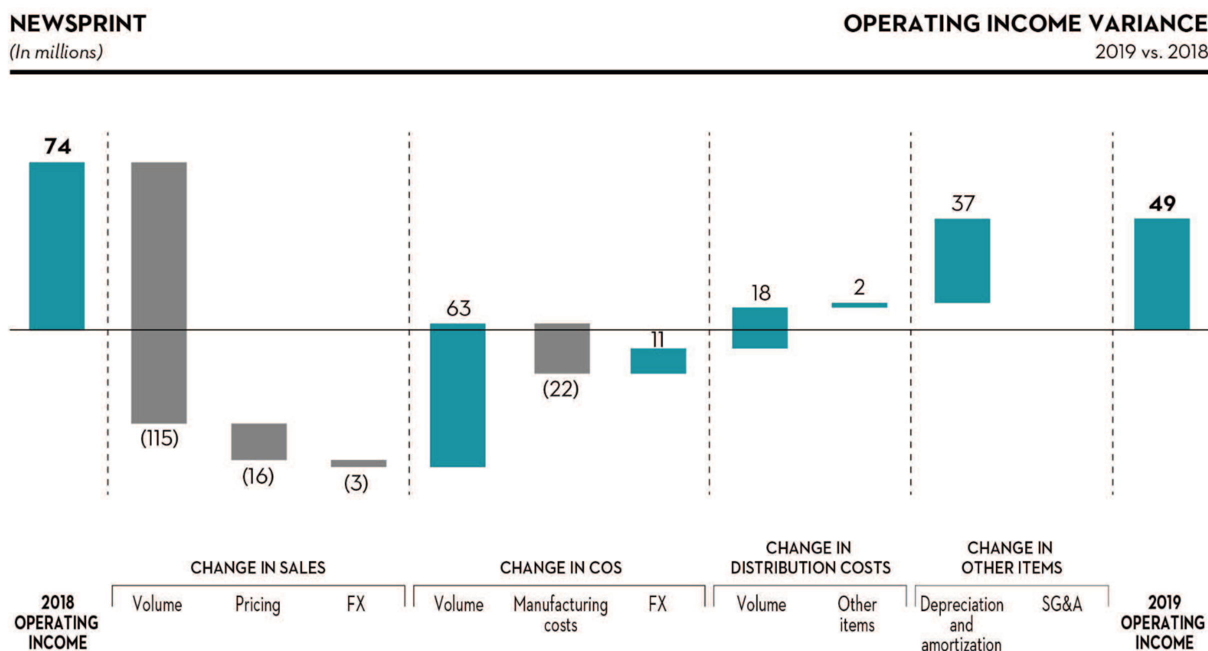


North American newsprint demand fell by 14.0% in 2019, compared to 2018. Demand from newspaper publishers fell by 16.7%, while demand from commercial printers also decreased, by 8.9%. Even with the slower pace of demand decline in the fourth quarter of 2019, the North American shipment-to-capacity ratio dropped to 84%.

Global demand for newsprint fell by 12.7% in 2019, with Asia down by 14.9%, and Western Europe down by 7.5%. Accordingly, the global operating rate decreased to 80%, down from 90% in 2018.

2019 vs. 2018

Operating income variance analysis



Sales

Newsprint sales fell by $134 million, or 15%, to $773 million in 2019. Shipments decreased by 192,000 metric tons, largely reflecting reduced production due to ongoing structural demand decline. The average transaction price was $14 per metric ton lower compared to 2018, as the realization of previously announced price increases in the first half of 2019 was more than offset by weaker market fundamentals, mostly in export markets, in the second half of 2019.

In November 2019, we announced the indefinite idling of the Augusta mill, as a result of the decline in North American newsprint consumption. We took 158,000 metric tons of temporary downtime in 2019, compared to 22,000 metric tons in 2018.

Cost of sales, excluding depreciation, amortization and distribution costs

Manufacturing costs increased by $22 million after adjusting for the effect of lower volume and the Canadian dollar fluctuation, reflecting:

- an increase in wood fiber costs ($14 million), due to wood shortages;
- higher power and steam costs ($6 million), mainly due to unfavorable steam usage; and
- higher labor costs ($3 million).

Depreciation and amortization

Depreciation and amortization was $37 million lower in 2019, reflecting certain assets that were fully depreciated at the end of the fourth quarter of 2018, and the increase of the useful lives of certain of our machinery and equipment in the first quarter of 2019.

2018 vs. 2017

For a variance analysis of our 2018 vs. 2017 results of operations, see Part II, Item 7, “Management’s Discussion and Analysis of Financial Condition and Results of Operations – Results of Operations – Segment Earnings – Newsprint – 2018 vs. 2017,” of our 2018 Annual Report.

SPECIALTY PAPERS

Highlights

	Years Ended December 31,		
(In millions, except where otherwise stated)	**2019**	2018	2017
Sales	**$ 572**	$ 811	$ 882
Operating income (loss) [1]	**$ 33**	$ 40	$ (9)
EBITDA [2]	**$ 76**	$ 87	$ 36
(In thousands of short tons)			
Shipments	**774**	1,130	1,343
Downtime	**50**	21	33

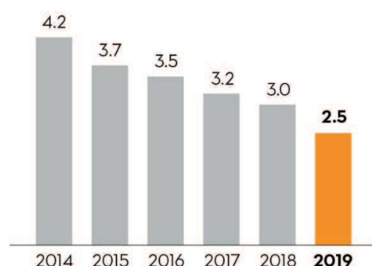
	December 31,		
(In thousands of short tons)	**2019**	2018	2017
Finished goods inventory	**40**	54	66

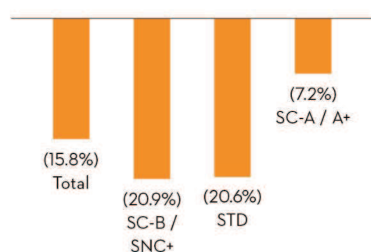
(1) Net income (loss) including noncontrolling interests is equal to operating income (loss) in this segment.

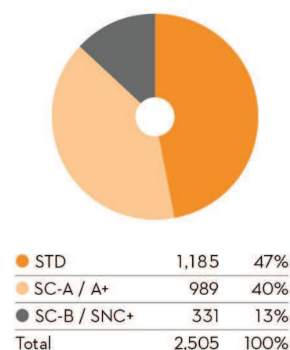
(2) EBITDA, a non-GAAP financial measure, is reconciled below. For more information on the calculation and reasons we include this measure, see note 1 under "Results of Operations – Consolidated Results – Selected annual financial information" above.

	Years Ended December 31,		
(In millions)	**2019**	2018	2017
Net income (loss) including noncontrolling interests	**$ 33**	$ 40	$ (9)
Depreciation and amortization	**43**	47	45
EBITDA	**$ 76**	$ 87	$ 36

Industry trends



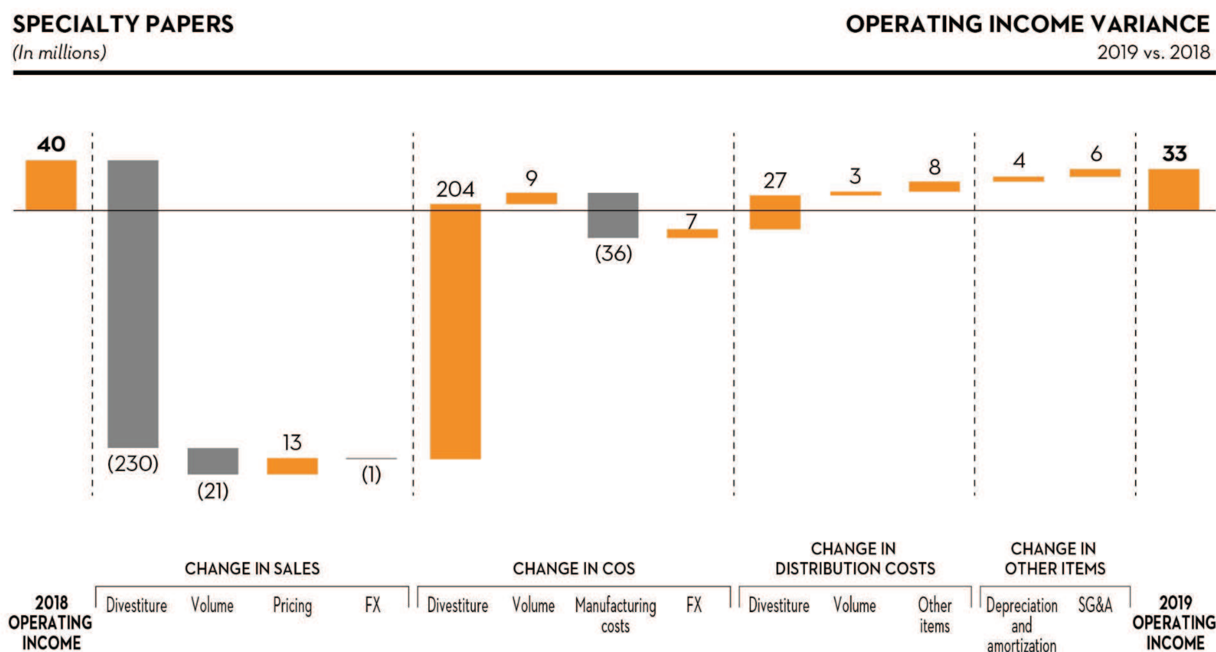




North American demand for uncoated mechanical papers contracted by 15.8% in 2019 compared to last year, reflecting a 20.6% drop in standard grades, and an 11.1% decrease in supercalendered (or, "*SC*") grades. Compared to 2018, the shipment-to-capacity ratio for all uncoated mechanical papers decreased from 92% to 82%.

2019 vs. 2018

Operating income variance analysis



Sales

Specialty paper sales decreased by $239 million, or 29%, to $572 million in 2019. The average transaction price increased by $21 per short ton, or 3%, compared to the prior year, as the realization of previously announced price increases was mostly offset by weaker market conditions. Shipments decreased by 356,000 short tons, mainly due to the Catawba mill divestiture.

Cost of sales, excluding depreciation, amortization and distribution costs

After removing the effect of lower volume, the COS related to the Catawba mill divestiture, and the Canadian dollar fluctuation, manufacturing costs increased by $36 million, mainly due to:

- higher maintenance costs ($10 million), in part due to planned outages;
- higher wood fiber costs ($10 million), mostly due to wood shortages;
- lower contribution from our hydroelectric facilities ($8 million), largely due to scheduled maintenance;
- unfavorable chemical costs ($4 million); and
- an increase in labor costs ($3 million);

partly offset by lower power and steam costs ($2 million).

Distribution costs

After removing the distribution costs related to the Catawba mill, the effect of lower volume, and the Canadian dollar fluctuation, distribution costs decreased by $7 million, reflecting improved freight rates and transportation optimization.

Depreciation and amortization

Depreciation and amortization was $4 million lower in the current year, mainly due to the divestiture of the Catawba facility.

Selling, general & administrative expenses

SG&A expenses improved by $6 million in the year, mainly due to lower allocated expenses as a result of capacity reductions, and lower incentive plan expense, which is based on company performance.

2018 vs. 2017

For a variance analysis of our 2018 vs. 2017 results of operations, see Part II, Item 7, "Management's Discussion and Analysis of Financial Condition and Results of Operations – Results of Operations – Segment Earnings – Specialty Papers – 2018 vs. 2017," of our 2018 Annual Report.

CORPORATE AND OTHER

Highlights

	Years Ended December 31,		
(In millions)	**2019**	2018	2017
Cost of sales, excluding depreciation, amortization and distribution costs	**$ (23)**	$ (12)	$ (53)
Depreciation and amortization	**(20)**	(25)	(24)
Selling, general and administrative expenses	**(23)**	(33)	(41)
Closure costs, impairment and other related charges	**(18)**	(121)	(82)
Net gain on disposition of assets	**2**	145	15
Operating loss	**(82)**	(46)	(185)
Interest expense	**(31)**	(47)	(49)
Non-operating pension and other postretirement benefit credits	**47**	50	7
Other (expense) income, net	**(22)**	5	6
Income tax provision	**(58)**	(152)	(84)
Net loss including noncontrolling interests	**$ (146)**	$ (190)	$ (305)

The table below shows the reconciliation of net loss including noncontrolling interests to EBITDA and adjusted EBITDA, which are non-GAAP financial measures. For more information on the calculation and reasons we include these measures, see note 1 under "Results of Operations – Consolidated Results – Selected annual financial information" above.

	Years Ended December 31,		
(In millions)	**2019**	2018	2017
Net loss including noncontrolling interests	**$ (146)**	$ (190)	$ (305)
Interest expense	**31**	47	49
Income tax provision	**58**	152	84
Depreciation and amortization	**20**	25	24
EBITDA	**(37)**	34	(148)
Closure costs, impairment and other related charges	**18**	121	82
Inventory write-downs related to closures	**13**	(1)	24
Start-up costs	**—**	8	27
Net gain on disposition of assets	**(2)**	(145)	(15)
Non-operating pension and other postretirement benefit credits	**(47)**	(50)	(7)
Other expense (income), net	**22**	(5)	(6)
Adjusted EBITDA	**$ (33)**	$ (38)	$ (43)

2019 vs. 2018

Cost of sales, excluding depreciation, amortization and distribution costs

COS was $23 million in 2019, mainly reflecting:

- write-downs of mill stores and other supplies inventory ($13 million) related to the indefinite idling of our paper mill at Augusta; and
- asset preservation costs ($5 million), mainly related to our indefinitely idled Thorold (Ontario) paper mill and our permanently closed Fort Frances (Ontario) mill.

In 2018, we incurred COS of $12 million, which included:

- start-up costs ($7 million) for the Calhoun tissue manufacturing and converting facility in the first quarter of 2018; and
- asset preservation costs ($6 million), primarily related to our indefinitely idled Thorold paper mill and our permanently closed Fort Frances mill.

Depreciation and amortization

Depreciation and amortization was $5 million lower in 2019, mostly attributable to the inclusion of Calhoun's results in our tissue segment since April 1, 2018.

Selling, general and administrative expenses

SG&A expenses decreased by $10 million in 2019, mainly due to lower stock-based compensation expense.

Closure costs, impairment and other related charges

In 2019, we recorded closure costs, impairment and other related charges of $18 million, related to the indefinite idling of our paper mill at Augusta, including: severance and other costs of $10 million; and accelerated depreciation charges of $8 million.

This compares to closure costs, impairment and other related charges of $121 million in 2018, mostly reflecting impairment charges of $120 million related to the assets from the 2015 acquisition of Atlas, including: a goodwill impairment charge of $81 million; fixed assets impairment charges of $29 million; and intangible assets impairment charges of $10 million.

Net gain on disposition of assets

In 2019, we recorded a net gain on disposition of assets of $2 million, compared to $145 million in 2018, which reflected: the sale of the paper and pulp mill at Catawba for total cash consideration of $280 million, resulting in a net gain of $101 million; and the sale of the RBK pulp mill at Fairmont for total cash consideration of $62 million, resulting in a net gain of $40 million.

2018 vs. 2017

For a variance analysis of our 2018 vs. 2017 results of operations, see Part II, Item 7, "Management's Discussion and Analysis of Financial Condition and Results of Operations – Results of Operations – Corporate and Other – 2018 vs. 2017," of our 2018 Annual Report.

LIQUIDITY AND CAPITAL RESOURCES

Capital Resources

We rely on cash and cash equivalents, cash flows provided by operations, and our credit facilities to fund our operations, make pension contributions, and finance our working capital, capital expenditures, and duty cash deposits. In addition, from time to time we may use available cash to reduce debt and to return capital to shareholders, including through share repurchases or special dividends. As of December 31, 2019, we had cash and cash equivalents of $3 million and availability of $580 million under our credit facilities.

Based on our current projections, we expect to have sufficient financial resources available to finance our business plan, make pension contributions, meet working capital and duty cash deposit requirements, and maintain an appropriate level of capital spending.

Based on market conditions, we may seek to repay or refinance our outstanding indebtedness, including under the 2023 Notes and credit facilities, as we continue to focus on reducing costs and enhancing our flexibility.

The 2023 Notes

The 2023 Notes, issued on May 8, 2013, are unsecured and are guaranteed by substantially all of our U.S. subsidiaries. The 2023 Notes bear interest at a rate of 5.875%; they were sold at an offering price of 99.062% of the $600 million aggregate principal amount and began paying interest semi-annually on November 15, 2013. On January 3, 2019, we repurchased $225 million in aggregate principal amount of the 2023 Notes, pursuant to a notes purchase agreement entered into on December 21, 2018, with certain noteholders, at a purchase price equal to 100% of the principal amount thereof, plus accrued and unpaid interest. As a result of the repurchase, we recorded a net loss on extinguishment of debt of $3 million in "Other (expense) income, net" in our Consolidated Statement of Operations for the year ended December 31, 2019.

For more information, see Note 12, "Long-Term Debt – Debt instruments – 2023 Notes," to our Consolidated Financial Statements.

Senior Secured Credit Facility

On September 7, 2016, we entered into a senior secured credit facility for up to $185 million. This senior secured credit facility provided a term loan of $46 million with a maturity date of September 7, 2025, and a revolving credit facility of up to $139 million with a maturity date of September 7, 2022. On October 28, 2019, we entered into an amended and restated senior secured credit facility (or, the "*Senior Secured Credit Facility*") for up to $360 million, replacing our existing $185 million senior secured credit facility. The Senior Secured Credit Facility provides a term loan facility of up to $180 million with a delayed draw period of up to three years, and the choice of maturities of six to ten years from the date of drawing (or, the "*Term Loan Facility*"), and a six-year revolving credit facility of up to $180 million with a maturity date of October 28, 2025 (or, the "*Revolving Credit Facility*"). There is also an uncommitted option to increase the Senior Secured Credit Facility by up to an additional $360 million, subject to certain terms and conditions. On October 28, 2019, we repaid our $46 million term loan by borrowing under the Revolving Credit Facility.

The obligations under the Senior Secured Credit Facility are guaranteed by certain material U.S. subsidiaries of the Company and are secured by a first priority mortgage on the real property of our Calhoun facility and a first priority security interest on the fixtures and equipment located therein.

As of December 31, 2019, we had $180 million of availability under the Term Loan Facility and $134 million of availability under the Revolving Credit Facility, net of $46 million of borrowings.

For more information, see Note 12, "Long-Term Debt – Debt instruments – Senior Secured Credit Facility," to our Consolidated Financial Statements.

ABL Credit Facility

On May 14, 2019, we entered into an amendment to the five-year credit agreement dated May 22, 2015, for our ABL Credit Facility. The amended credit agreement provides for an extension of the maturity date to May 14, 2024, with an aggregate lender commitment of up to $500 million at any time outstanding, subject to borrowing base availability based on specified advance rates, eligibility criteria and customary reserves.

The aggregate lender commitment under the facility includes a $60 million swingline sub-facility and a $200 million letter of credit sub-facility, and we may convert up to $50 million of the commitments under the facility to a first-in last-out facility, subject to the consent of each converting lender. The ABL Credit Facility also provides for an uncommitted ability to increase the revolving credit facility by up to $500 million, subject to certain terms and conditions set forth in the agreement.

The obligations under the credit agreement are guaranteed by certain material subsidiaries of the Company and are secured by first priority liens on and security interests in accounts receivable, inventory and related assets.

As of December 31, 2019, we had $266 million of availability under the ABL Credit Facility, net of $25 million of borrowings and $51 million of ordinary course letters of credit outstanding.

For more information, see Note 12, "Long-Term Debt – Debt instruments – ABL Credit Facility," to our Consolidated Financial Statements.

Credit rating risk

Although our debt agreements do not include any provision that would require material changes in payment schedules or terminations as a result of a credit rating downgrade, we believe our access to capital markets at a reasonable cost is determined in part by credit quality. A credit rating downgrade could impact our ability to access capital markets at a reasonable cost.

	December 31,		
	2019	2018	2017
Standard & Poor's			
Senior unsecured debt	**B+**	B+	B+
Long-term corporate credit rating	**BB-**	BB-	BB-
Outlook	**Stable**	Stable	Negative
Moody's Investors Service			
Senior unsecured debt	**B1**	B1	B2
Corporate family rating	**Ba3**	Ba3	B1
Outlook	**Stable**	Stable	Stable
Liquidity rating	**SGL-1**	SGL-1	SGL-1

Subject to other factors affecting the credit markets as a whole, we believe our current ratings should provide a significant degree of flexibility in obtaining funds on competitive terms. These ratings reflect the views of the rating agencies only. An explanation of the significance of these ratings can be obtained from each rating agency. The ratings are not a recommendation to buy, sell or hold securities. Any rating can be revised upward or downward or withdrawn at any time by a rating agency.

Flow of Funds

Summary of cash flows

A summary of cash flows for the years ended December 31, 2019, 2018 and 2017 was as follows:

	Years Ended December 31,		
(In millions)	**2019**	2018	2017
Net cash provided by operating activities	**$ 85**	$ 435	$ 158
Net cash (used in) provided by investing activities	**(162)**	146	(191)
Net cash (used in) provided by financing activities	**(228)**	(281)	3
Effect of exchange rate changes on cash and cash equivalents, and restricted cash	**2**	(4)	6
Net (decrease) increase in cash and cash equivalents, and restricted cash	**$ (303)**	$ 296	$ (24)

2019 vs. 2018

Net cash provided by operating activities

We generated $85 million of cash from operating activities in 2019, compared to $435 million last year. The decrease is almost all attributable to lower profitability, partially offset by lower major maintenance payments, interest payments, and pension contributions.

Net cash (used in) provided by investing activities

Investing activities used $162 million of cash in 2019, compared to cash provided of $146 million in the prior year. The difference reflects:

- the disposition of the assets of the Catawba and Fairmont mills for total net proceeds of $333 million in the prior year; and
- a higher net refund in 2018 of the cash deposits made on our U.S. imports of SC paper produced at our Canadian mills ($47 million);

offset in part by:

- lower cash invested in fixed assets ($42 million), mainly due to payments made in the prior year for the strategic investment plan at Saint-Félicien and the tissue distribution center at Calhoun;
- lower countervailing and anti-dumping duty cash deposits on our imports of softwood lumber products to the U.S. from our Canadian sawmills ($18 million); and
- the full refund in 2019 of the $6 million in countervailing duty cash deposits that we made in 2018 on our U.S. imports of uncoated groundwood paper produced at our Canadian mills.

Net cash used in financing activities

Financing activities used $228 million of cash in 2019, compared to $281 million in 2018. The difference reflects:

- borrowings of $71 million under our revolving credit facilities in the current year, compared to repayments of $144 million in the prior year; and
- a special dividend of $1.50 per share, or $136 million, on our common stock in 2018;

partly offset by:

- the repurchase of $225 million in aggregate principal amount of our 2023 Notes in the first quarter of 2019;
- the repayment of our $46 million term loan, following an amended and restated senior secured credit agreement in the fourth quarter of 2019; and
- the repurchase of $24 million of shares in the current year, as described below.

2018 vs. 2017

For a variance analysis of our 2018 vs. 2017 cash flows, see Part II, Item 7, "Management's Discussion and Analysis of Financial Condition and Results of Operations – Liquidity and Capital Resources – Flow of Funds – 2018 vs. 2017," of our 2018 Annual Report.

2020 outlook

As further discussed above under "Overview – 2019 Overview – Business acquisition," on February 1, 2020, we acquired the U.S. Sawmill Business from Conifex Timber Inc., for a cash consideration of $175 million, subject to post-closing working capital adjustments. We financed the acquisition by borrowing $175 million under our revolving credit facilities. For more information, see Note 21, "Subsequent Event," to our Consolidated Financial Statements.

For 2020, we expect to invest $115 million in capital expenditures, net of funding under existing business development programs, including: $5 million for the recently acquired U.S. Sawmill Business; and investments for the cellulose filament plant in Kénogami, and for the improvement of productivity and yields at our sawmills.

Countervailing duty and anti-dumping investigations of softwood lumber

We became required to pay cash deposits for estimated countervailing duties and anti-dumping duties on our U.S. imports of softwood lumber products produced at our Canadian sawmills, since April 28, 2017, and June 30, 2017, respectively. As of December 31, 2019, the rates for these estimated countervailing duties and anti-dumping duties were 14.7% and 3.2%, respectively. Based on our current operating parameters, the cash deposits could be as high as $60 million per year.

For additional information, see Part I, Item 1A, "Risk Factors – Legal and Compliance Risk – We are subject to countervailing and anti-dumping duties on the vast majority of our U.S. imports of softwood lumber products produced at our Canadian sawmills, which could materially affect our operations and cash flows," of this Form 10‑K, and Note 15, "Commitments and Contingencies – Legal matters – Countervailing duty and anti-dumping investigations of softwood lumber," to our Consolidated Financial Statements.

Employee Benefit Plans

Pension and OPEB plans

In 2019, we contributed $81 million to our defined benefit pension plans and $18 million to our defined contribution pension plans, while recognizing a $3 million credit in aggregate, before special events. We also made payments of $12 million to OPEB plans, while recognizing an $11 million credit to the net periodic benefit credit, before special events.

For 2020, we expect to make approximately $95 million of contributions to our defined benefit pension plans, $17 million to our defined contribution pension plans, and $13 million to OPEB plans. We expect to expense approximately $17 million of defined contribution pension plan costs, with a defined benefit pension cost of $32 million and an $18 million credit for our defined benefit OPEB plans. Included in these amounts are an OPEB curtailment credit of $13 million and a pension special termination benefit cost of $3 million related to the indefinite idling of our Augusta mill.

The expected $14 million increase in defined benefit pension plan contributions in 2020 is mainly due to a $16 million increase to our U.S. pension plan, which is partially offset by lower contributions for past capacity reductions. The contribution increase in the U.S. pension plan is mainly due to reductions to U.S. funding interest rates.

We fund our pension and OPEB plans as required by applicable laws and regulations; we could, from time to time, make additional contributions.

Canadian pension funding

Quebec plans

The funding of our Quebec pension plans is subject to Quebec's *Supplemental Pension Plans Act* (or, the "*SPPA*"), which is the pension plan funding regime generally applicable to pension plans in that province. Our contributions to our Quebec plans are determined on a going concern basis under the Quebec's SPPA. Refer to Note 13, "Pension and Other Postretirement Benefit Plans," to our Consolidated Financial Statements.

Ontario plans

The funding of our Ontario pension plans is subject to the *Ontario Pension Benefits Act* (or, the "*PBA*"), which is the pension plan funding regime generally applicable to pension plans in that province. Prior to December 31, 2018, the funding of our material Ontario pension plans was governed by regulations specific to us, adopted by the province of Ontario. Since January 1, 2019, all of our Ontario pension plans have been subject to the PBA, which provides for funding pension fund deficits on a going concern basis. Refer to Note 13, "Pension and Other Postretirement Benefit Plans," to our Consolidated Financial Statements.

Funding deficit calculation

The assumptions used to calculate the pension funding deficit are materially different from the assumptions used to determine the net pension obligations for purposes of our Consolidated Financial Statements.

The funding deficit calculation of our Quebec pension plans is subject to Quebec's SPPA, which provides for the funding of pension deficits on a going concern basis, or on a solvency basis if the solvency funded status of a multi-jurisdictional pension plan is below 75%. The funding deficit calculation of our Ontario pension plans is subject to Ontario's PBA, which provides for the funding of pension fund deficits on a going concern basis, or on a solvency basis if the solvency funded status of a pension plan is below 85%. Under a going concern basis, the liabilities are calculated on the assumption that the plans will continue to operate indefinitely, and the liabilities are discounted using a rate determined by a model that develops an expected long-term return on assets, based on the asset mix of the plans as of the actuarial valuation date. The liabilities also include a provision for adverse deviation. Under a solvency basis, the liabilities are calculated on the assumption that the plans are terminated at the measurement date (each December 31), and the liabilities are discounted primarily using a specified annuity purchase rate, which is the spot interest rate on government securities in Canada plus a prescribed margin at the measurement date.

The funding of our U.S. pension plan is governed by the Employee Retirement Income Security Act of 1974, as amended, and the Internal Revenue Code, and is also subject to the Moving Ahead for Progress in the 21st Century Act, the Highway and Transportation Funding Act of 2014, and the Bipartisan Budget Act of 2015. Under these regulations, the liabilities are discounted using 25-year average corporate bond rates within a specified corridor. The corridor will be maintained at 10% through 2020, will widen to 15% in 2021, and will widen an additional 5% each year to 30% in 2024 and beyond.

By contrast, for purposes of our Consolidated Financial Statements, the discount rate is determined with a model that develops a hypothetical high-quality bond portfolio, where the bonds are theoretically purchased to settle the expected benefit payments of the plans.

The weighted-average discount rate, funded ratio, and deficit of the pension plans for both accounting and funding purposes for the years ended December 31, 2019 and 2018, were as follows:

	Accounting		**Funding**	
	December 31,		**December 31,**	
(*In millions, except percentages*)	**2019**	2018	**2019** [(1)]	2018 [(2)]
Discount rate	**3.0%**	3.8%	**5.6%**	5.7%
Funded ratio	**74%**	76%	**88%**	87%
Deficit	**$ (1,326)**	$ (1,122)	**$ (497)**	$ (550)

(1) Determined on a going concern basis for Canadian plans, and on a 25-year average interest rate basis for U.S. plans, and assuming actuarial valuations performed for all plans on December 31, 2019.

(2) Determined on a going concern basis for Canadian plans, and on a 25-year average interest rate basis for U.S. plans.

Additional undertakings

Our principal Canadian subsidiaries had entered into certain undertakings with the Government of Ontario and Quebec, which expired in 2015 and 2016, respectively. The expiration of those undertakings did not eliminate ongoing obligations we incurred under the terms of those undertakings prior to their expiration, including the undertaking requiring us to make an additional solvency deficit reduction contribution to our pension plans of C$75, payable over four years, for each metric ton of capacity reduced in Quebec or Ontario, in the event of downtime of more than six consecutive months or nine cumulative months over a period of 18 months. Accordingly, we made additional contributions for past capacity reductions of C$12 million and C$4 million in 2018 and 2019, respectively, and will also be required to make our final remaining contributions for past capacity reductions of approximately C$2 million in 2020.

Partial wind-ups of pension plans

On June 12, 2012, we filed a motion for directives with the Quebec Superior Court, the court with jurisdiction in the creditor protection proceedings under the *Companies' Creditors Arrangement Act* (Canada) (or, the "*CCAA Creditor Protection Proceedings*"), seeking an order to prevent pension regulators in each of Quebec, New Brunswick, and Newfoundland and Labrador from declaring partial wind-ups of pension plans relating to employees of former operations in New Brunswick, and Newfoundland and Labrador, or a declaration that any claim for accelerated reimbursements of deficits arising from a partial wind-up is a barred claim under the CCAA Creditor Protection Proceedings. We contend, among other things, that any such declaration, if issued, would be inconsistent with the Quebec Superior Court's sanction order confirming the CCAA debtors' CCAA Plan of Reorganization and Compromise, as amended, and the terms of our emergence from the CCAA Creditor Protection Proceedings. A partial wind-up would likely shorten the period in which any deficit within those plans, which could reach up to C$150 million ($115 million), would have to be funded if we do not obtain the relief sought. The hearing in this matter could occur in 2020.

Share Repurchase Program

With our repurchase of 4.8 million shares at a cost of $24 million during the year ended December 31, 2019, we completed our $150 million share repurchase program, which was launched in 2012. We did not repurchase any shares during 2018 and 2017.

On March 2, 2020, we announced the adoption of a new $100 million share repurchase program.

Dividends

We declared and paid a special dividend of $1.50 per share ($136 million) on our common stock in 2018. We did not declare or pay any dividends on our common stock during the years ended December 31, 2019 and 2017.

Contractual Obligations

As of December 31, 2019, the Company's contractual obligations, including payments due by period, were as follows:

(In millions)	Total	2020	2021-2022	2023-2024	Thereafter
Long-term debt [1]	$ 545	$ 26	$ 51	$ 418	$ 50
Non-cancelable operating lease obligations [2]	84	11	19	14	40
Purchase obligations [2]	296	77	137	52	30
	$ 925	$ 114	$ 207	$ 484	$ 120

(1) Long-term debt obligations primarily represent interest payments and the payment of the remaining principal balance at maturity of our 2023 Notes, assuming no prior redemptions. Interest on our credit facility borrowings is assumed to remain unchanged from the rates in effect as of December 31, 2019, assuming no additional borrowings or repayments until maturity. Information on our long-term debt can be found in "Note 12, "Long-Term Debt," to our Consolidated Financial Statements.

(2) Information on our operating leases and purchase obligations can be found in Note 10, "Operating Leases" and Note 15, "Commitments and Contingencies – Commitments," to our Consolidated Financial Statements.

The above table excludes the future obligations under our pension and OPEB plans due to the uncertainty in the timing and amount of future payments. Information on our pension and OPEB plans can be found in "Note 13, "Pension and Other Postretirement Benefit Plans," to our Consolidated Financial Statements.

Recent accounting Guidance

New accounting pronouncements adopted in 2019

See Note 2, "Summary of Significant Accounting Policies – New accounting pronouncements adopted in 2019," to our Consolidated Financial Statements for more information.

Accounting pronouncements not yet adopted as of December 31, 2019

See Note 2, "Summary of Significant Accounting Policies – Accounting pronouncements not yet adopted as of December 31, 2019," to our Consolidated Financial Statements for more information.

Critical Accounting Estimates

The preparation of financial statements in conformity with GAAP requires us to make accounting estimates based on assumptions, judgments and projections of future results of operations and cash flows. These estimates and assumptions affect the reported amounts of revenues and expenses during the periods presented and the reported amounts of assets and liabilities and the disclosure of contingent assets and liabilities as of the date of the financial statements.

We base our estimates, assumptions and judgments on a number of factors, including historical experience, recent events, existing conditions, internal budgets and forecasts, projections obtained from industry research firms, and other data that we believe are reasonable under the circumstances. We believe that our accounting estimates are appropriate and that the resulting financial statement amounts are reasonable. Due to the inherent uncertainties in making estimates, actual results could differ materially from these estimates, requiring adjustments to financial statement amounts in future periods.

A summary of our significant accounting policies is disclosed in Note 2, "Summary of Significant Accounting Policies," to our Consolidated Financial Statements. Based upon a review of our significant accounting policies, we believe the following accounting policies require us to make accounting estimates that can significantly affect the results reported in our Consolidated Financial Statements. We have reported the development, selection and disclosures of our critical accounting estimates to the audit committee of our board of directors, and the audit committee has reviewed the disclosures relating to these estimates.

Pension and OPEB obligations

Description of accounts impacted by the accounting estimates

We record pension and OPEB obligations, net of pension plan assets that may be considered material to our financial position. We also record net periodic benefit (credits) costs associated with these net obligations as our employees render service. As of December 31, 2019, we had pension and OPEB obligations aggregating $5,335 million and accumulated pension plan assets at fair value of $3,862 million. In 2019, we recorded a net periodic benefit credit of $32 million.

Judgments and uncertainties involved in the accounting estimates

The following inputs are used to determine our net obligations and our net periodic benefit (credit) cost each year and the determination of these inputs requires judgment:

- discount rate – used to determine the net present value of our pension and OPEB obligations and to determine the interest cost component of our net periodic benefit (credit) cost. The discount rate for our domestic and foreign plans was determined with a model that develops a hypothetical high-quality bond portfolio, where the bonds are theoretically purchased to settle the expected benefit payments of the plans. The discount rate reflects the single rate that produces the same discounted values as the value of the theoretical high-quality bond portfolio;
- return on assets – used to estimate the growth in the value of invested assets that are available to satisfy pension benefit obligations and to determine the expected return on plan assets component of our net periodic pension benefit (credit) cost. In determining the expected return on assets, we considered the historical returns and the future expectations for returns for each asset class, as well as the target asset allocation of the pension portfolio;
- life expectancy rate – used to estimate the impact of life expectancy on our pension and OPEB obligations. In determining the life expectancy rate of our domestic and foreign plans, we used the most recent actuarially-determined mortality tables and improvement scales. For the foreign plans, the mortality tables were adjusted with the result of our historical mortality experience study. The rates used are consistent with our future expectations of life expectancy for the employees who participate in our pension and OPEB plans;
- rate of compensation increase – used to calculate the impact future pay increases will have on our pension obligations. In determining the rate of compensation increase, we reviewed historical salary increases and promotions, while considering current industry conditions, the terms of collective bargaining agreements with our employees and the outlook for our industry; and
- health care cost trend rate – used to calculate the impact of future health care costs on our OPEB obligations. For the health care cost trend rate, we considered historical trends for these costs, as well as recently enacted healthcare legislation.

Effect if actual results differ from assumptions

Variations in assumptions could have a significant effect on the net periodic benefit (credit) cost and pension and OPEB obligations reported in our Consolidated Financial Statements. For example, a 25 basis point change in any one of these assumptions would have increased (decreased) our net periodic benefit credit for our pension and OPEB plans and our pension and OPEB obligations as follows:

	2019 Net Periodic Benefit Credit		Pension and OPEB Obligations as of December 31, 2019	
(In millions)	25 Basis Point Increase	25 Basis Point Decrease	25 Basis Point Increase	25 Basis Point Decrease
Assumption:				
Discount rate	$ 1	$ (1)	$ (125)	$ 137
Return on assets	$ 9	$ (9)	$ —	$ —
Rate of compensation increase	$ —	$ —	$ 3	$ (3)
Health care cost trend rate	$ —	$ —	$ 1	$ (1)

As of December 31, 2019, the most significant change in our assumptions affecting our pension and OPEB obligations was a decrease in the discount rate to 3.0% from 3.8% as of December 31, 2018, resulting in an actuarial loss of $382 million and a corresponding increase in our pension and OPEB obligations.

The net periodic benefit credit of our pension plans incorporates an expected return on plan assets and not the actual return on plan assets. The difference between the expected and actual return on plan assets resulted in an actuarial gain of $85 million in 2019.

These net actuarial losses of $302 million in 2019, before tax, were recorded in “accumulated other comprehensive loss” and will be amortized into our Consolidated Statements of Operations in future years, including approximately $85 million in 2020.

Deferred income tax assets

Description of accounts impacted by the accounting estimates

We have net deferred income tax assets of $915 million recorded in our Consolidated Balance Sheet as of December 31, 2019, almost all of which is related to our Canadian operations; a valuation allowance is recorded against virtually all of our U.S. net deferred income tax assets. Our net deferred income tax assets are primarily comprised of:

U.S.:

- deferred income tax assets of $754 million, of which $537 million is for federal and state net operating loss carryforwards expiring between 2020 and 2039; $47 million for federal and state net operating loss carryforwards with no expiry; and $170 million for other temporary differences, mostly related to pension and OPEB plans;
- deferred income tax liabilities of $37 million, mostly related to tax accelerated depreciation on fixed assets; and
- a valuation allowance of $716 million against the net deferred income tax assets, which are not more likely than not to be realized in the future;

Canada:

- deferred income tax assets of $985 million, comprised of $188 million related to undeducted research and development expenditures with no expiry; $75 million for tax credit carryforwards expiring between 2022 and 2039; $18 million for federal and provincial net operating loss carryforwards expiring between 2030 and 2038; as well as $704 million for other temporary differences, mostly related to fixed asset undepreciated capital costs with no expiry, as well as pension and OPEB plans;
- deferred income tax liabilities of $35 million for various temporary differences; and
- a valuation allowance of $36 million, virtually all of which is related to net capital loss carryforwards with no expiry.

Judgments and uncertainties involved in the accounting estimates

At each reporting period, we assess whether it is more likely than not that the deferred income tax assets will be realized, based on the review of all available positive and negative evidence, including future reversals of existing taxable temporary differences, estimates of future taxable income, past operating results, and prudent and feasible tax planning strategies. The carrying value of our deferred income tax assets reflects our expected ability to generate sufficient future taxable income in certain tax jurisdictions to realize these deferred income tax assets.

Following the assessment of our ability to realize the deferred income tax assets of our U.S. operations, we concluded that existing negative evidence outweighed positive evidence. As a result, we recognized a valuation allowance against virtually all of our net U.S. deferred income tax assets. The cumulative loss of our U.S. operations limited our ability to consider other subjective positive evidence. A valuation allowance does not reduce our underlying tax attributes, nor hinders our ability to use them in the future. If, in the future, sufficient objective positive evidence becomes available such that, based on the weight of available evidence, it is determined to be more likely than not that some or all of the deferred income tax assets associated with our U.S. operations can be realized, the valuation allowance will be reduced as appropriate, with the related adjustment being recognized as a decrease to the income tax provision.

The weight of positive evidence, which included a review of historical cumulative earnings and our forecasted future earnings, resulted in the conclusion by management that no significant valuation allowances were required for our deferred income tax assets in Canada, as they were determined to be more likely than not to be realized.

The Company calculates its income tax provision for the period based on estimates and assumptions that could differ from the actual results reflected in income tax returns filed in subsequent years. Adjustments based on actual filed income tax returns are recorded when identified.

Tax benefits related to uncertain tax positions are recorded when it is more likely than not, based on the technical merits, that the position will be sustained upon examination by the relevant tax authority. The amount of tax benefit recognized may differ from the amount taken or expected to be taken on a tax return. These differences represent unrecognized tax benefits and are reviewed at each reporting period based on facts, circumstances and other available evidence. We have unrecognized tax benefits of $29 million as of December 31, 2019. As income tax legislation and regulations are complex and subject to interpretation, our tax positions could be challenged by tax authorities.

Effect if actual results differ from assumptions

Our forecasted future earnings represent important positive evidence in determining the recoverability of our deferred income tax assets. If actual future financial results are not consistent with the assumptions and judgments used, or if additional significant closure-related costs are recorded in future years, we may be required to reduce the carrying value of our net deferred income tax assets by recording additional valuation allowances, resulting in an income tax provision that could be material.

We do not expect a significant change to the amount of unrecognized tax benefits over the next 12 months. However, any adjustments arising from certain ongoing examinations by tax authorities could alter the timing or amount of taxable income or deductions, or the allocation of income among tax jurisdictions, and these adjustments could differ from the amount accrued.

Long-lived assets

Description of accounts impacted by the accounting estimates

We have long-lived assets recorded in our Consolidated Balance Sheet of $1,568 million as of December 31, 2019. These long-lived assets include fixed assets, net, amortizable intangible assets, net, and operating lease right-of-use assets. In 2019, we recorded depreciation and amortization of $167 million and accelerated depreciation charges of $8 million associated with these long-lived assets. Depreciation and amortization and accelerated depreciation charges are based on accounting estimates.

The unit of accounting for impairment testing for long-lived assets is its group (see Note 2, "Summary of Significant Accounting Policies – Impairment of long-lived assets," to our Consolidated Financial Statements). The unit of accounting for the depreciation and amortization of long-lived assets is at a lower level, either as a group of closely-related assets or at an individual asset level. The cost of a long-lived asset is amortized over its estimated remaining useful life, which is subject to change based on events and circumstances or management's intention for the use of the asset.

Losses related to the impairment of long-lived assets to be held and used are recognized when circumstances indicate the carrying value of an asset group may not be recoverable, such as continuing losses in certain businesses. When indicators that the carrying value of an asset group may not be recoverable are triggered, we evaluate the carrying value of the asset group in relation to its expected undiscounted future cash flows. If the carrying value of an asset group is greater than the expected undiscounted future cash flows to be generated by the asset group, an impairment charge is recognized based on the excess of the asset group's carrying value over its fair value. If it is determined that the carrying value of an asset group is recoverable, we review and adjust, as necessary, the estimated useful lives of the assets in the group.

Our long-lived asset impairment and accelerated depreciation charges are disclosed in Note 3, "Closure Costs, Impairment and Other Related Charges," to our Consolidated Financial Statements.

Judgments and uncertainties involved in the accounting estimates

The calculation of depreciation and amortization of long-lived assets requires us to apply judgment in selecting the remaining useful lives of the assets, which must address both physical and economic considerations. The remaining economic life of a long-lived asset is frequently shorter than its physical life. Estimates of future economic conditions for our long-lived assets and therefore, their remaining useful economic lives, require considerable judgment. The paper industry has been characterized by considerable uncertainty in business conditions.

Asset impairment for long-lived assets to be held and used is tested at the lowest asset group level having largely independent cash flows. Determining the asset groups for long-lived assets to be held and used requires management's judgment.

Asset impairment loss calculations require us to apply judgment in estimating asset group fair values and future cash flows, including periods of operation, projections of product pricing, production levels, product costs, market supply and demand, foreign exchange rates, inflation, projected capital spending and, specifically for fixed assets acquired, assigned useful lives, functional obsolescence, asset condition and discount rates. When performing impairment tests, we estimate the fair values of the assets using management's best assumptions, which we believe would be consistent with the assumptions that a

hypothetical marketplace participant would use. Estimates and assumptions used in these tests are evaluated and updated as appropriate. One key assumption, especially for our long-lived assets in Canada, is the foreign exchange rate, which was determined based on our budgeted exchange rates for 2020. The assessment of whether an asset group should be classified as held for sale requires us to apply judgment in estimating the probable timing of the sale, and in testing for impairment loss, judgment is required in estimating the net proceeds from the sale.

Effect if actual results differ from assumptions

If our estimate of the remaining useful life changes, such a change is accounted for prospectively in our determination of depreciation and amortization. Actual depreciation and amortization charges for an individual asset may therefore be significantly accelerated if the outlook for its remaining useful life is shortened considerably.

A number of judgments were made in the determination of our asset groups. If a different conclusion had been reached for any one of those judgments, it could have resulted in the identification of asset groups different from those we actually identified, and consequently, could result in a different conclusion when comparing the expected undiscounted future cash flows or the fair value to the carrying value of the asset group.

Actual asset impairment losses could vary considerably from estimated impairment losses if actual results are not consistent with the assumptions and judgments used in estimating future cash flows and asset fair values. Assets of facilities that are idled have a greater risk of acceleration in depreciation and amortization or additional impairment.