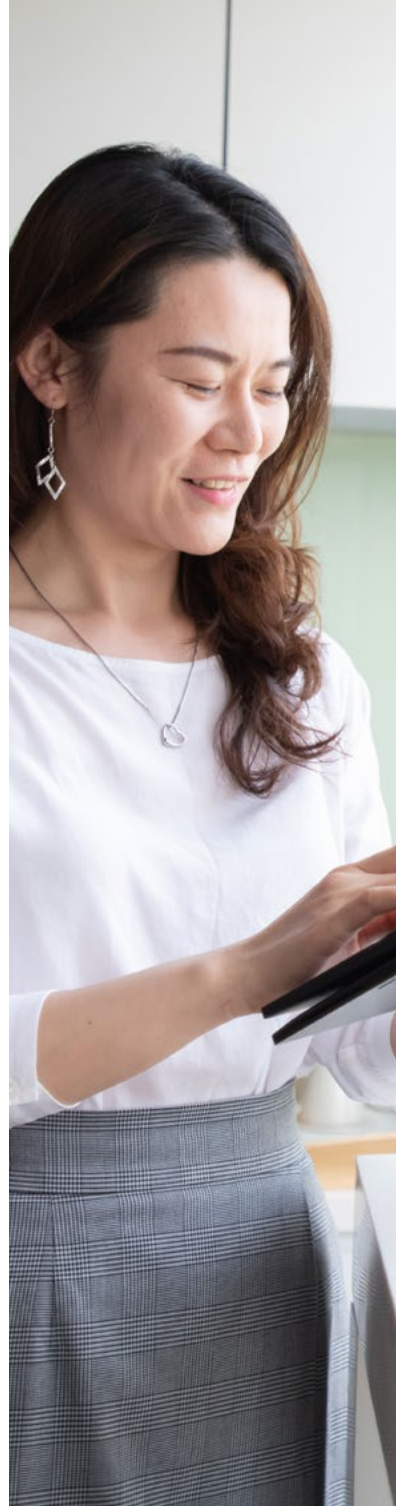


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ANNUAL 20
REPORT 19

lyondellbasell
Advancing Possible



Rotterdam, the Netherlands

2019 FINANCIAL HIGHLIGHTS

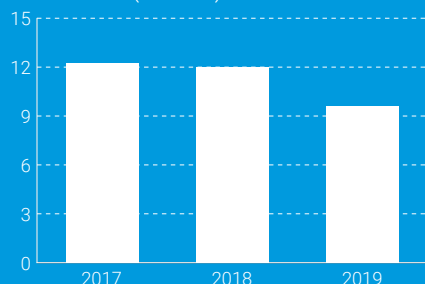
HIGHLIGHTS OF CONSOLIDATED FINANCIAL STATEMENTS (\$ IN MILLIONS)¹

	2017	2018	2019
Sales and other operating revenues	\$34,484	\$39,004	\$34,727
Operating income	\$5,460	\$5,231	\$4,116
Income from equity investments	\$321	\$289	\$225
Net income	\$4,877	\$4,690	\$3,397
Diluted weighted average share count (millions)	399	389	353
Diluted EPS (\$/share)	\$12.23	\$12.01	\$9.58
EBITDA ¹	\$7,134	\$6,867	\$5,692
Cash from operating activities	\$5,206	\$5,471	\$4,961
Capital expenditures	\$1,547	\$2,105	\$2,694

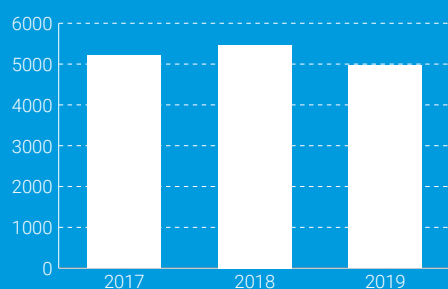
In 2019, LyondellBasell's businesses extended our outstanding track record of cash generation by delivering **\$5 billion** of cash from operating activities. Over the past six years, our resilient business portfolio has steadily produced \$5 billion to \$6 billion of cash from operating activities each year under a variety of oil prices and macroeconomic conditions.

TRENDS IN PROFITABILITY AND CAPITAL RETURNS

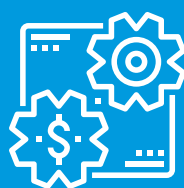
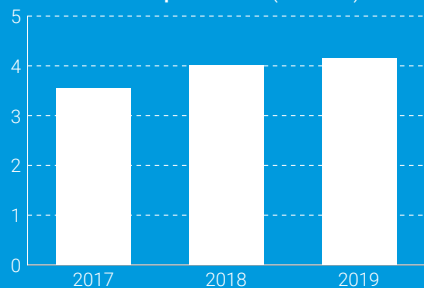
Diluted EPS (\$/share)



Cash from Operating Activities (\$ in millions)



Annual Dividend per Share (\$/share)



Competitive advantage across a range of business climates

Our company's focus on operational excellence, cost management and technology-driven growth has proven that we have a competitive advantage across a range of business climates.

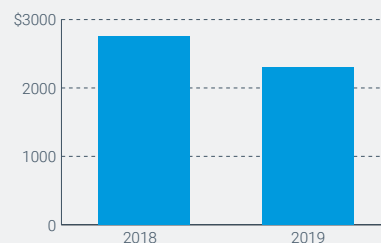
¹ Reconciliations for our non-GAAP measures can be found beginning on page 150.

FINANCIAL RESULTS BY SEGMENT

EBITDA BY OPERATING SEGMENT (\$ IN MILLIONS)*

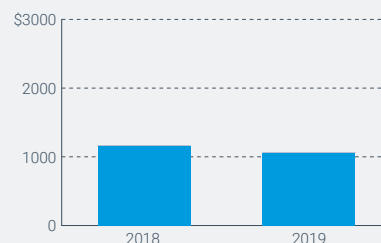
Olefins & Polyolefins – Americas (O&P – Americas)

O&P-Americas produces and markets olefins and co-products, polyethylene and polypropylene. We are the largest polypropylene producer in North America. We are also the third-largest producer of ethylene in North America.



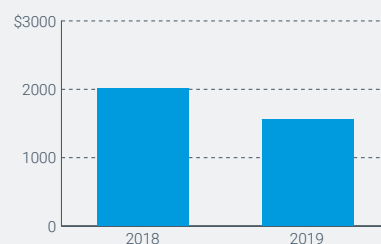
Olefins & Polyolefins – Europe, Asia and International (O&P – EAI)

O&P-EAI produces and markets olefins and co-products, polyethylene and polypropylene. We are the largest producer of polyethylene and polypropylene in Europe.



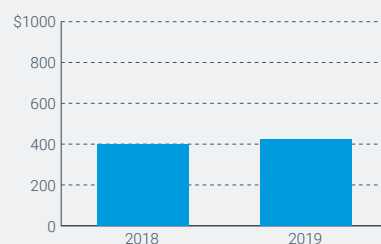
Intermediates & Derivatives (I&D)

I&D produces and markets propylene oxide and its derivatives, oxyfuels and related products, and intermediate chemicals, such as styrene monomer, acetyls, ethylene oxide and ethylene glycol. We are the world's second-largest producer of propylene oxide and oxyfuels.



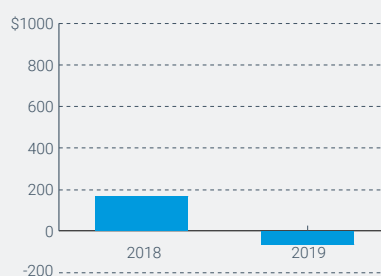
Advanced Polymer Solutions (APS)

APS produces and markets compounding and solutions, such as polypropylene compounds, engineered plastics, masterbatches, colors and powders, engineered composites and advanced polymers, which includes *Catalloy* and polybutene-1. This segment was created after LyondellBasell's acquisition of A. Schulman, Inc. in August 2018. We are the world's largest manufacturer of polypropylene compounds.



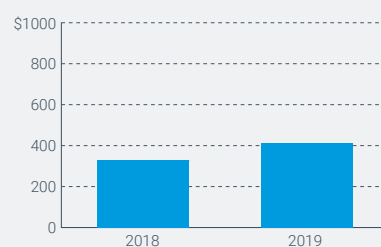
Refining

The Houston Refinery, strategically located on the U.S. Gulf Coast, refines heavy, high-sulfur crude oil, and other crude oils of varied types and sources, into refined products, including gasoline and distillates. Our significant hydrotreating and coking capacity positions us well in a market with more stringent sulfur regulations.



Technology

Our Technology segment develops and licenses chemical and polyolefin process technologies, and manufactures and sells polyolefin catalysts. We are the global leader in the development and licensing of polyolefin processes and related catalysts for the production of polyethylene and polypropylene. In 2019 this segment achieved record EBITDA of \$411 million.



*Rankings based upon our capacity and our proportionate share of our joint venture capacity. Polypropylene includes *Catalloy* capacity reported within our APS segment.

Message from the CEO



Bhavesh V. (Bob) Patel

Chief Executive Officer



**we find ourselves
well positioned to
succeed in a range
of market conditions by
maximizing cash flow and
continuing our tradition of
delivering for shareholders.”**

To the owners of our company,

We find ourselves in the midst of an extraordinary, unprecedented period in history. Global events, the coronavirus and a low oil price have challenged nearly every company to rethink assumptions and adapt strategies to a new and very different operating environment. In response to the pandemic, LyondellBasell activated its global response plan. Because there is no higher priority than the health and safety of our employees, this plan prioritized actions to minimize the spread of the virus while maintaining business continuity.

Like the rest of the petrochemical industry, in 2019 LyondellBasell experienced more challenging market conditions. Despite these headwinds, through our operating model, which prioritizes cost management, maintaining leading product positions, feedstock flexibility, operational agility and disciplined capital allocation, and, our dedicated team of 19,100 employees around the globe, LyondellBasell delivered \$5.7 billion of EBITDA, \$9.58 diluted earnings per share and \$5 billion of cash from operating activities.

In May, we increased our quarterly dividend to \$1.05 per share, the 11th dividend increase since 2011. This increase places LyondellBasell's dividend yield in the top quartile of the S&P 500. In addition, we repurchased 43 million shares for a total of \$3.8 billion. Together with dividends, we returned a total of \$5.2 billion to shareholders in 2019.

Today, with a strong balance sheet and a balanced, resilient portfolio we find ourselves well positioned to succeed in a range of market conditions by maximizing cash flow and continuing our tradition of delivering for shareholders.

As we look to the future, we have a clear strategy and priorities.

Well positioned for a range of market environments

First and foremost, we remain focused on delivering top quartile safety performance. This was evidenced in 2019 as we integrated the employees, contractors and assets from A. Schulman. Among this population we were able to reduce the injury rate at these facilities by more than 50 percent relative to the prior year. Additionally, in the United States, our manufacturing facilities achieved the lowest injury rate in our history. Our goal remains zero injuries and we will continue to work diligently to ensure everyone at our facilities finishes the day in the same condition as they started.

We also remain committed to the projects and initiatives that will position the company for the future. The commissioning of our state-of-the-art *Hyperzone* PE plant near Houston, Texas began in the fourth quarter, and progress on the world's largest next generation technology propylene oxide (PO) and tertiary butyl alcohol (TBA) plant continued. Today, the *Hyperzone* PE plant is producing product and we are moving toward demonstration of a full grade slate later this year.

During our investor day in September, we provided an update on the integration efforts underway in our Advanced Polymer Solutions segment. The acquisition of A. Schulman, which closed in August of 2018, is on track to create significant value. In 2019, our team continued to make progress on the integration efforts, and we have been able to increase our forward annual run-rate synergy target from \$150 million to \$200 million.

While the global economy experienced a slowdown in the early part of 2020, all indicators suggest that the Chinese economy will continue to grow at a greater rate than global GDP over the longer-term. To further position the company in this market, at the end of 2019, we signed two significant memoranda of understanding (MoU) for the development of 50/50 joint ventures that will use LyondellBasell's industry-leading technology to serve the growing Chinese market with local production.

The first MoU, with the Liaoning Bora Enterprise Group, is for a 1.1 million ton ethylene cracker to produce olefins and polyolefins for construction and consumer products, including pipe, durable plastic containers and agricultural films. The cracker, set for start-up in the second half of 2020, will employ our *Hostalen* ACP polyethylene and both *Spheripol* and *Spherizone* polypropylene technologies.

The second MoU further builds upon an existing joint venture with Sinopec. The joint venture, which will use our *Spherizone* and *Hostalen* ACP technologies, will construct a new propylene oxide and styrene monomer unit in Zhenhai, Ningbo, China. Construction of the facility is expected to begin in early 2020 with start-up anticipated in 2022.

Value-driven sustainability and focused innovation

We recognize that our industry is facing a period of disruption posed by the challenge of plastic waste in the environment. During 2019, our company advanced a proactive, multi-prong approach that seeks to address the challenge and create value for our shareholders. In our view, sustainability cannot be about generating good public relations; it must be substantive and lead to economic models that allow us to deliver value and reinvest.

To this end, we have been moving in parallel on several fronts, including:

Mechanical recycling: In 2019, our industry-leading mechanical recycling partnership in the Netherlands with SUEZ, called Quality Circular Polymers (QCP), produced materials that were used in consumer applications. Examples include packaging for Unilever's Dove and Axe personal care products, Samsonite's S'Cure ECO suitcase, and Mauser Packaging Solutions' medical waste containers.

Molecular recycling technology: Through our partnership with Germany's Karlsruhe Institute of Technology we are developing a recycling process for converting plastic waste into feedstock. In October, we announced that we are building a pilot plant to test this technology on a larger scale at our Ferrara, Italy site.

Bio-based feedstocks: In June, we introduced grades of bio-based polypropylene and low-density polyethylene under the *Circulen* brand name. *Circulen* materials are made from bio-based waste materials such as vegetable oil and offer the same high quality properties as virgin plastics in terms of mechanical and product performance as well as regulatory approvals.

The Alliance to End Plastic Waste: I am very proud to serve as the vice chairman of the Alliance to End Plastic Waste. Launched in January 2019, the Alliance is already making significant progress. Because 10 rivers in Asia and Africa transport more than 90 percent of the waste to the ocean, we are focused in areas where we can have the greatest impact. During the year, the Alliance announced several on-the-ground waste cleanup efforts, including a project to remove plastic waste from the Ganges River in India; a partnership with Project STOP in Bali designed to support the development and launch of a waste management recycling system; and a partnership with Plug and Play, a global innovation accelerator that will run an initiative focused on identifying and bringing startups together as they seek to lower the impact of plastic waste in the environment.

Taken together, these accomplishments tell the story of a company **leading** our industry, with **advantaged** technology and assets, while maintaining a **disciplined** approach to investment and value creation. With several growth projects well underway or nearing completion, LyondellBasell is positioned to increase free cash flow, creating even more value for our shareholders in the coming years.

As we close the chapter on 2019 and navigate an unprecedented social and business environment in 2020 resulting from the COVID-19 pandemic, I remain convinced that the companies who effectively navigate the most challenging of times are those focused on fundamentals, disciplined about capitalizing on opportunities that arise, and do so with integrity and humility. I believe the economic uncertainties associated with COVID-19 will be formidable, but I am very confident that our team of 19,100 employees is well-suited to meet those challenges.

Because of the work that has taken place over the past 10 years, I continue to believe that our company is well-positioned, despite a more challenging business climate in the coming year.

Thank you for your continued confidence in us.

Most sincerely,



Bhavesh V. (Bob) Patel
Chief Executive Officer

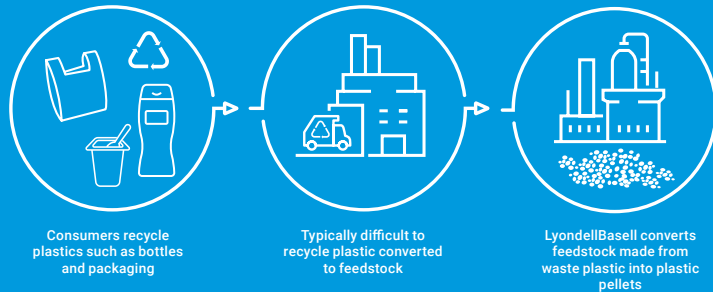
Advancing Sustainable and Circular Solutions

MECHANICAL RECYCLING

In 2019, we continued to add innovative products to Lyondellbasell's Quality Circular Polymers (QCP) product portfolio, used to make luggage's for example, like the Samsonite's S'Curve ECO suitcase. Our goal is to increase the recycling capacity of our joint venture QCP plant to 50,000 tons by 2022, and expand the number of end-use applications. We are seeking opportunities to grow mechanical recycling in other parts of the world.

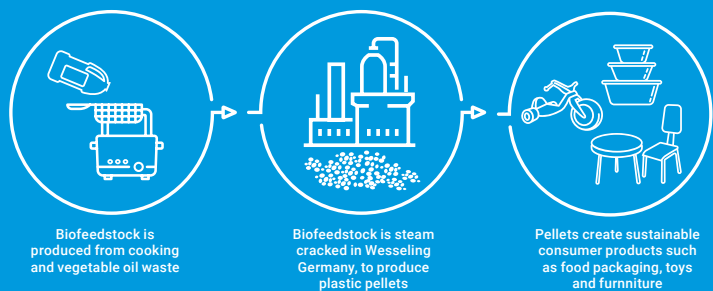
MOLECULAR RECYCLING

We are collaborating with the Karlsruhe Institute of Technology in Germany to advance the efficiency and scalability of molecular recycling. In October 2019, we announced the latest step in our progress of building a pilot plant at our research center in Ferrara, Italy to develop our proprietary *MoReTec* technology to convert mixed plastic waste into polymers. This emerging technology enables new plastic to be made from waste plastic instead of fossil fuel. by 2021 is develop optimum process conditions to make the *MoReTec* technology scalable to a semi-industrial proof-of-concept plant.



BIO-BASED FEEDSTOCKS

In 2018, we began developing bio-based feedstocks as an alternative to feedstocks from non-renewable, fossil-derived resources. In June 2019, LyondellBasell introduced *Circulen Plus* grades of bio-based polypropylene and low density polyethylene made from renewable biomass.



Geleen, the Netherlands



Promoting a Sustainable Future



We are one of the founding members of the Alliance to End Plastic Waste (AEPW), the first global, cross-value chain initiative dedicated to developing waste infrastructure, advancing new recovery and recycling technologies, educating and mobilizing communities, and cleaning-up plastic that is already in the environment.

The AEPW has a vision to end plastic waste in the environment. The mission is to develop, accelerate and deploy solutions, catalyze investment and engage communities to help end plastic waste in the environment. The AEPW is working across four action areas that address the range of the challenge rather than a single issue.

The four action areas are:

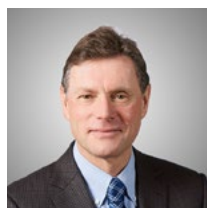
- Infrastructure development to collect and manage plastic waste and increase recycling in areas of greatest need.
- Innovation to minimize waste and advance and bring to scale technologies that make recycling and recovering plastics easier and create value from post-use plastics.
- Education and engagement of governments, businesses and communities to mobilize action.
- Clean up of areas where plastic waste is concentrated today, identifying and helping end the flow of waste at the source, particularly major rivers that carry plastic waste to the ocean.

Our goal is to achieve a 15% reduction in CO₂e emissions per ton of product produced by 2030 compared with 2015 levels.



We are investing in projects to improve reliability and reduce energy consumption at our manufacturing sites. In 2018, we reduced energy use by a total of 3.5 million gigajoules. Through our joint venture with Covestro, we are investing in a circular steam project at the Maasvlakte site in the Netherlands that will result in an overall reduction of approximately 140,000 tons CO₂ and 0.9 petajoule of energy annually.

BOARD OF DIRECTORS



2, 5, 6

Jacques Aigrain

*Chair of the Board of Directors
Senior Advisor at Warburg Pincus
LLC*



2, 5, 6

Lincoln Benet

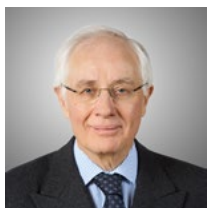
CEO of Access Industries



1, 4, 6

Jagjeet S. Bindra

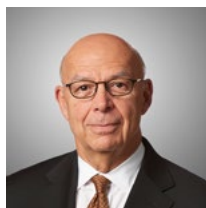
*Former President of Chevron
Global Manufacturing*



2, 3

Robin W. T. Buchanan

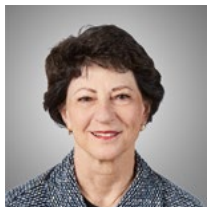
*Former Chair of PageGroup plc
and Former Dean of London
Business School*



4

Stephen F. Cooper

*CEO and Director of Warner
Music Group*



3, 5, 6

Nance K. Dicciani

*Former President and CEO of
Honeywell Specialty Materials LLC*



2, 3, 6

Claire S. Farley

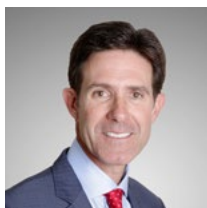
Vice Chair of KKR Energy Group



1, 3

Bella D. Goren

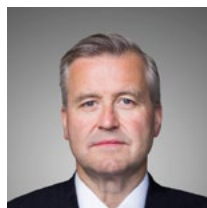
*Former Chief Financial Officer of
AMR Corporation and American
Airlines Inc.*



1, 4, 6

Michael S. Hanley

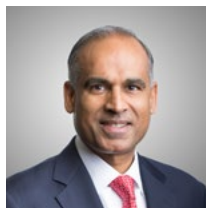
*Former Chief Financial Officer of
Alcan and Senior Vice President,
Operations and Strategy at the
National Bank of Canada*



1, 5

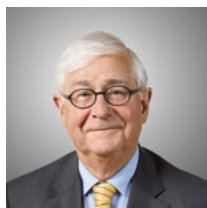
Albert J. Manifold

CEO and Director of CRH plc



Bhavesh V. (Bob) Patel

*Chief Executive Officer of
LyondellBasell Industries N.V.*

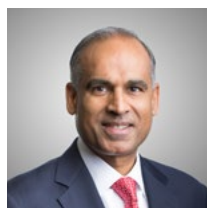


2, 4

Rudy M.J. van der Meer

*Former CEO of Coatings of
AzkoNobel N.V.*

LEADERSHIP TEAM



Bhavesh V. (Bob) Patel

Chief Executive Officer



Daniel Coombs

*Executive Vice President,
Global Manufacturing, Projects
and Refining*



Kimberly Foley

*Vice President,
Health, Safety and Environment*



Dale Friedrichs

*Senior Vice President,
Human Resources*



Jean Gadbois

*Senior Vice President,
Europe, Asia and International
Manufacturing*



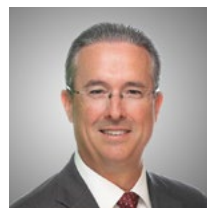
James Guilfoyle

*Executive Vice President,
Advanced Polymer Solutions &
Global Supply Chain*



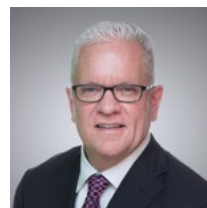
Jeffrey Kaplan

*Executive Vice President
and Chief Legal Officer*



Kenneth Lane

*Executive Vice President, Global
Olefins & Polyolefins*



Michael McMurray

*Executive Vice President and
Chief Financial Officer*



Torkel Rhenman

*Executive Vice President, Global
Intermediates & Derivatives*



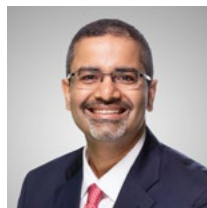
Richard Roudeix

*Senior Vice President,
Olefins & Polyolefins,
Europe, Asia and International*



James Seward

*Senior Vice President,
R&D, Technology and
Sustainability*



Anup Sharma

*Senior Vice President,
Global Business Services*



Michael VanDerSnick

*Senior Vice President,
Americas Manufacturing*

Key

- 1. Audit Committee
- 2. Nominating and Governance Committee
- 3. Compensation Committee
- 4. Health, Safety, Environmental & Operations Committee
- 5. Finance Committee
- 6. Executive Committee

Numbers in orange denote committee chairperson

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549
Form 10-K

(Mark One)

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

For the fiscal year ended December 31, 2019

OR

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

For the transition period from

to

Commission file number: 001-34726

LyondellBasell Industries N.V.

(Exact name of registrant as specified in its charter)

Netherlands
(State or other jurisdiction of
incorporation or organization)

98-0646235
(I.R.S. Employer
Identification No.)

1221 McKinney St.,
Suite 300
Houston, Texas
USA 77010

4th Floor, One Vine Street
London
W1J0AH
United Kingdom

Delftseplein 27E
3013AA Rotterdam
Netherlands

(Address of principal executive offices) (Zip Code)

(713) 309-7200

+44 (0) 207 220 2600

+31 (0) 10 2755 500

(Registrant's telephone numbers, including area codes)

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

<u>Title of Each Class</u>	<u>Trading Symbol</u>	<u>Name of Each Exchange On Which Registered</u>
Ordinary Shares, €0.04 Par Value	LYB	New York Stock Exchange

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

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

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

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

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes No

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

Large accelerated filer
Non-accelerated filer

Accelerated filer
Smaller reporting company
Emerging growth company

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

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

The aggregate market value of common stock held by non-affiliates of the registrant on June 28, 2019, the last business day of the registrant's most recently completed second fiscal quarter, based on the closing price on that date of \$86.13, was \$25.3 billion. For purposes of this disclosure, in addition to the registrant's executive officers and members of its Board of Directors, the registrant has included Access Industries, LLC and its affiliates as "affiliates."

The registrant had 333,554,886 shares outstanding at February 18, 2020 (excluding 6,490,742 treasury shares).

Documents incorporated by reference:

Portions of the Notice of the 2020 Annual Meeting of Shareholders and 2020 Proxy Statement, in connection with the Company's 2020 Annual Meeting of Shareholders (in Part III), as indicated herein.

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CAUTIONARY STATEMENT FOR THE PURPOSES OF THE “SAFE HARBOR” PROVISIONS OF THE PRIVATE SECURITIES LITIGATION REFORM ACT OF 1995

This report includes “forward-looking statements” within the meaning of Section 27A of the Securities Act of 1933 and Section 21E of the Securities Exchange Act of 1934 (the “Exchange Act”). You can identify our forward-looking statements by the words “anticipate,” “estimate,” “believe,” “continue,” “could,” “intend,” “may,” “plan,” “potential,” “predict,” “should,” “will,” “expect,” “objective,” “projection,” “forecast,” “goal,” “guidance,” “outlook,” “effort,” “target” and similar expressions.

We based forward-looking statements on our current expectations, estimates and projections of our business and the industries in which we operate. We caution you that these statements are not guarantees of future performance. They involve assumptions about future events that, while made in good faith, may prove to be incorrect and involve risks and uncertainties we cannot predict. Our actual outcomes and results may differ materially from what we have expressed or forecast in the forward-looking statements. Any differences could result from a variety of factors, including the following:

- the cost of raw materials represents a substantial portion of our operating expenses and energy costs generally follow price trends of crude oil, natural gas liquids and/or natural gas; price volatility can significantly affect our results of operations and we may be unable to pass raw material and energy cost increases on to our customers due to the significant competition that we face, the commodity nature of our products and the time required to implement pricing changes;
- our operations in the United States (“U.S.”) have benefited from low-cost natural gas and natural gas liquids; decreased availability of these materials (for example, from their export or regulations impacting hydraulic fracturing in the U.S.) could reduce the current benefits we receive;
- if crude oil prices fall materially, or decrease relative to U.S. natural gas prices, we would see less benefit from low-cost natural gas and natural gas liquids and it could have a negative effect on our results of operations;
- industry production capacities and operating rates may lead to periods of oversupply and low profitability; for example, substantial capacity expansions are underway in the U.S. olefins industry;
- we may face unplanned operating interruptions (including leaks, explosions, fires, weather-related incidents, mechanical failures, unscheduled downtime, supplier disruptions, labor shortages, strikes, work stoppages or other labor difficulties, transportation interruptions, spills and releases and other environmental incidents) at any of our facilities, which would negatively impact our operating results; for example, because the Houston refinery is our only refining operation, we would not have the ability to increase production elsewhere to mitigate the impact of any outage at that facility;
- changes in general economic, business, political and regulatory conditions in the countries or regions in which we operate could increase our costs, restrict our operations and reduce our operating results;
- our ability to execute our organic growth plans may be negatively affected by our ability to complete projects on time and on budget;
- our ability to acquire new businesses and assets and integrate those operations into our existing operations and make cost-saving changes in operations;
- uncertainties associated with worldwide economies could create reductions in demand and pricing, as well as increased counterparty risks, which could reduce liquidity or cause financial losses resulting from counterparty default;
- the negative outcome of any legal, tax and environmental proceedings or changes in laws or regulations regarding legal, tax and environmental matters may increase our costs, reduce demand for our products, or otherwise limit our ability to achieve savings under current regulations;
- any loss or non-renewal of favorable tax treatment under tax agreements or tax treaties, or changes in tax laws, regulations or treaties, may substantially increase our tax liabilities;

- we may be required to reduce production or idle certain facilities because of the cyclical and volatile nature of the supply-demand balance in the chemical and refining industries, which would negatively affect our operating results;
- we rely on continuing technological innovation, and an inability to protect our technology, or others' technological developments, could negatively impact our competitive position;
- we have significant international operations, and fluctuations in exchange rates, valuations of currencies and our possible inability to access cash from operations in certain jurisdictions on a tax-efficient basis, if at all, could negatively affect our liquidity and our results of operations;
- we are subject to the risks of doing business at a global level, including wars, terrorist activities, political and economic instability and disruptions and changes in governmental policies, which could cause increased expenses, decreased demand or prices for our products and/or disruptions in operations, all of which could reduce our operating results;
- if we are unable to comply with the terms of our credit facilities, indebtedness and other financing arrangements, those obligations could be accelerated, which we may not be able to repay; and
- we may be unable to incur additional indebtedness or obtain financing on terms that we deem acceptable, including for refinancing of our current obligations; higher interest rates and costs of financing would increase our expenses.

Any of these factors, or a combination of these factors, could materially affect our future results of operations and the ultimate accuracy of the forward-looking statements. Our management cautions against putting undue reliance on forward-looking statements or projecting any future results based on such statements or present or prior earnings levels.

All subsequent written and oral forward-looking statements attributable to us or any person acting on our behalf are expressly qualified in their entirety by the cautionary statements contained or referred to in this section and any other cautionary statements that may accompany such forward-looking statements. Except as otherwise required by applicable law, we disclaim any duty to update any forward-looking statements. Additional factors that could cause results to differ materially from those described in the forward-looking statements can be found in the "Risk Factors" section of this report.

PART I

Items 1 and 2. Business and Properties.

OVERVIEW

LyondellBasell Industries N.V. is a global, independent chemical company and was incorporated, as a *Naamloze Vennootschap*, under Dutch law on October 15, 2009. Unless otherwise indicated, the “Company,” “we,” “our,” “us” and “LyondellBasell” are used in this report to refer to the businesses of LyondellBasell Industries N.V. and its consolidated subsidiaries. We are one of the world’s top independent chemical companies based on revenues.

We participate globally across the petrochemical value chain and are an industry leader in many of our product lines. Our chemicals businesses consist primarily of large processing plants that convert large volumes of liquid and gaseous hydrocarbon feedstocks into plastic resins and other chemicals. Our chemical products tend to be basic building blocks for other chemicals and plastics. Our plastic products are used in large volumes as well as smaller specialty applications. Our customers use our plastics and chemicals to manufacture a wide range of products that people use in their everyday lives including food packaging, home furnishings, automotive components, paints and coatings. Our refining business consists of our Houston refinery, which processes crude oil into refined products such as gasoline, diesel and jet fuel. We also develop and license chemical and polyolefin process technologies and manufacture and sell polyolefin catalysts.

Our financial performance is influenced by the supply and demand for our products, the cost and availability of feedstocks and commodity products, global and regional production capacity, our operational efficiency and our ability to control costs. We have a strong operational focus and, as a producer of large volume commodities, continuously strive to differentiate ourselves through safe, reliable and low-cost operations in all our businesses. We purchase large quantities of natural gas, electricity and steam which we use as energy to fuel our facilities. We also purchase large quantities of natural gas liquids and crude oil derivatives which we use as feedstocks. During recent years, the relatively low cost of natural gas-derived raw materials in the U.S. versus the global cost of crude oil-derived raw materials has had a significant positive influence on the profitability of our North American operations. While increased supply has reduced the North American feedstock advantage, improved product supply and demand fundamentals in several businesses, notably global polyolefins products, have partially offset the decline.

SEGMENTS

We manage our operations through six operating segments. Our reportable segments are:

- *Olefins and Polyolefins—Americas* (“O&P—Americas”). Our O&P—Americas segment produces and markets olefins and co-products, polyethylene and polypropylene.
- *Olefins and Polyolefins—Europe, Asia, International* (“O&P—EAI”). Our O&P—EAI segment produces and markets olefins and co-products, polyethylene and polypropylene.
- *Intermediates and Derivatives* (“I&D”). Our I&D segment produces and markets propylene oxide and its derivatives; oxyfuels and related products; and intermediate chemicals, such as styrene monomer, acetyls, ethylene oxide and ethylene glycol.
- *Advanced Polymer Solutions* (“APS”). Our APS segment produces and markets compounding and solutions, such as polypropylene compounds, engineered plastics, masterbatches, colors and powders, engineered composites and advanced polymers, which includes *Catalloy* and polybutene-1.
- *Refining*. Our Refining segment refines heavy, high-sulfur crude oil and other crude oils of varied types and sources available on the U.S. Gulf Coast into refined products, including gasoline and distillates.
- *Technology*. Our Technology segment develops and licenses chemical and polyolefin process technologies and manufactures and sells polyolefin catalysts.

Financial information about our business segments and geographical areas can be found in Note 22 to the Consolidated Financial Statements. Information about the locations where we produce our primary products can be found under “Description of Properties.” No single customer accounted for 10% or more of our total revenues in 2019, 2018 and 2017.

Olefins and Polyolefins Segments Generally

We are one of the leading worldwide producers of olefins and polyethylene (“PE”) and we are the world’s second largest producer of polypropylene (“PP”). We manage our olefin and polyolefin business in two reportable segments, O&P–Americas and O&P–EAI.

Olefins & Co-products—Ethylene is the most significant petrochemical in terms of worldwide production volume and is the key building block for PE and many other chemicals and plastics. Ethylene is produced by steam cracking hydrocarbons such as ethane, propane, butane and naphtha. This production results in co-products such as aromatics and other olefins, including propylene and butadiene. Ethylene and its co-products are fundamental to many parts of the economy, including the production of consumer products, packaging, housing and automotive components and other durable and nondurable goods.

Polyolefins—Polyolefins such as PE and PP are polymers derived from olefins including ethylene and propylene. Polyolefins are the most widely used thermoplastics in the world and are found in applications and products that enhance the everyday quality of life. Our products are used in consumer, automotive and industrial applications ranging from food and beverage packaging to housewares and construction materials.

Polyethylene—We produce high density polyethylene (“HDPE”), low density polyethylene (“LDPE”) and linear low density polyethylene. PE sales accounted for approximately 17%, 19% and 21% of our total revenues in 2019, 2018 and 2017, respectively.

Polypropylene—We produce PP homopolymers and copolymers. PP sales accounted for approximately 14%, 15% and 17% of our total revenues in 2019, 2018 and 2017, respectively.

Olefins and Polyolefins—Americas Segment

Overview

Our O&P–Americas segment produces and markets olefins and co-products, polyethylene and polypropylene.

Sales & Marketing / Customers

Most of the ethylene we produce is consumed internally as a raw material in the production of PE and other derivatives, with the balance sold to third party customers, primarily under multi-year contracts.

We use all the propylene we produce in the production of PP, propylene oxide and other derivatives of those products. We also purchase propylene from third parties. In addition to purchases of propylene, we purchase ethylene for resale, when necessary, to satisfy customer demand above our own production levels. Volumes of any of these products purchased for resale can vary significantly from period to period and are typically most significant during extended outages of our own production, such as during planned maintenance. However, purchased volumes have not historically had a significant impact on profits, except to the extent that they replace lower-cost production.

Most of the ethylene and propylene production from our Channelview, Corpus Christi and La Porte, Texas facilities is shipped via a pipeline system, which has connections to numerous U.S. Gulf Coast consumers. This pipeline extends from Corpus Christi to Mont Belvieu, Texas. In addition, exchange agreements with other ethylene and co-products producers allow access to customers who are not directly connected to this pipeline system. Some ethylene is shipped by railcar from our Clinton, Iowa facility to our Morris, Illinois facility and some is shipped directly to customers. Propylene from Clinton and Morris is generally shipped by marine vessel, barge, railcar or truck.

In 2019, we added a total of 85 thousand tons of PP capacity at our facilities in North America. Our PP and PE production is typically sold through our sales organization to an extensive base of established customers and distributors servicing both the domestic and export markets either under annual contracts or on a spot basis. We have sales offices in various locations in North America and our polyolefins are primarily transported in North America by railcar or truck. Export sales are primarily to customers in Latin America, with sales to Asia expected to increase in the coming years as global supply and demand balances shift. We also consume PP in our PP compounds business, which is managed worldwide by our APS segment. In addition, we expect additional capacity from our *Hyperzone* polyethylene plant in 2020.

Joint Venture Relationships

We participate in a joint venture in Mexico, which provides us with capacity of approximately 290 thousand tons of PP production per year. The capacity is based on our percentage ownership of the joint venture's total capacity. We do not hold a majority interest in or have operational control of this joint venture.

Raw Materials

Raw material cost is the largest component of the total cost to produce ethylene and its co-products. The primary raw materials used in our Americas olefin facilities are natural gas liquids ("NGLs") and heavy liquids. Heavy liquids include crude oil-based naphtha and other refined products, as well as condensate, a very light crude oil resulting from natural gas production. NGLs include ethane, propane and butane. The use of heavy liquid raw materials results in the production of significant volumes of co-products such as propylene, butadiene and benzene, as well as gasoline blending components, while the use of NGLs results in the production of a smaller volume of co-products.

Our ability to pass on raw material price increases to our customers is dependent on market-driven demand for olefins and polyolefins. Sales prices for products sold in the spot market are determined by market forces. Our contract prices are influenced by product supply and demand conditions, spot prices, indices published in industry publications and, in some instances, cost recovery formulas.

We can manufacture olefins by utilizing a variety of feedstocks, including heavy liquids and NGLs. Technological advances for extracting shale-based oil and gas have led to an increased supply of NGLs, providing a cost advantage over heavy liquids, particularly in the U.S. A plant's flexibility to consume a wide range of raw materials generally provides an advantage over plants that are restricted in their processing capabilities. Our Americas' facilities can process significant quantities of either heavy liquids or NGLs. We estimate that in the U.S. we can produce up to approximately 90% of our total ethylene output using NGLs. Changes in the raw material feedstock mix utilized in the production process will result in variances in production capacities among products. We believe our raw material flexibility in the U.S. is a key advantage in our production of ethylene and its co-products.

Industry Dynamics / Competition

With respect to olefins and polyolefins, competition is based on price and, to a lesser extent, on product quality, product delivery, reliability of supply, product performance and customer service. Profitability is affected not only by supply and demand for olefins and polyolefins, but also by raw material costs and price competition among producers, which may intensify due to, among other things, the addition of new capacity. In general, demand is a function of worldwide demographic and economic growth, including the regional dynamics that underlie global growth trends.

We compete in North America with other large marketers and producers, including global chemical companies, chemical divisions of large oil companies and regional marketers and producers.

Based on published capacity data, we believe as of December 31, 2019, we were:

- the third largest producer of ethylene in North America, with ethylene capacity of 5.4 million tons per year;

- the fourth largest producer of PE in North America with 2.9 million tons per year of capacity; and
- the largest producer of PP in North America, with 1.9 million tons per year, including our share of our Mexican joint venture capacity and approximately 280 thousand tons of *Catalloy* capacity reported within our Advanced Polymer Solutions segment.

Olefins and Polyolefins—Europe, Asia, International Segment

Overview

Our O&P–EAI segment produces and markets olefins and co-products, polyethylene and polypropylene.

Sales & Marketing / Customers

Our ethylene production is primarily consumed internally as a raw material in the production of polyolefins, and we purchase additional ethylene as needed to meet our production needs. Our propylene production is used as a raw material in the production of PP and propylene oxide and derivatives of those products, and we regularly purchase propylene from third parties because our internal needs exceed our internal production.

With respect to PP and PE, our production is typically sold through our sales organization to an extensive base of established customers under annual contracts or on a spot basis and is also sold through distributors. Our polyolefins are primarily transported in Europe by railcar or truck. In 2019, we added a total of 85 thousand tons of PP capacity at our wholly-owned and joint venture facilities. This capacity is based on our percentage ownership interest in the joint ventures' total capacities.

Our regional sales offices are in various locations, including The Netherlands, Hong Kong, China, India, Australia and the United Arab Emirates. We also operate through a worldwide network of local sales and representative offices in Europe, Asia and Africa. Our joint ventures described below typically manage their domestic sales and marketing efforts independently, and we typically operate as their agent or distributor for all or a portion of their exports.

Joint Venture Relationships

We participate in several manufacturing joint ventures in Saudi Arabia, Poland, South Korea, Thailand and The Netherlands. We do not hold majority interests in any of these joint ventures, nor do we have operational control. These ventures provide us with additional annual production capacity of approximately 1.1 million tons of PP, approximately 640 thousand tons of olefins and approximately 420 thousand tons of PE. These capacities are based on our percentage ownership interest in the joint ventures' total capacities. We realize profits or losses from these ventures as income or loss on the equity basis of accounting.

We generally license our polyolefin process technologies and supply catalysts to our joint ventures through our Technology segment. Some of our joint ventures are able to source cost advantaged raw materials from their local shareholders.

Raw Materials

Raw material cost is the largest component of the total cost for the production of olefins and co-products. Historically, the primary raw material used in our European olefin facilities was naphtha; however, in recent years we increased our use of advantaged NGLs. For our Saudi Arabian joint venture facilities, locally sourced and cost advantaged NGLs, including ethane, propane and butane are used. The principal raw materials used in the production of polyolefins are propylene and ethylene. In Europe, we have the capacity to produce approximately 50% of the propylene requirements for our European PP production and all of the ethylene requirements for our European PE production. Propylene and ethylene requirements that are not produced internally are generally

acquired pursuant to long-term contracts with third party suppliers or via spot purchases. Some of our joint ventures receive propylene and ethylene from their local shareholders under long-term contracts.

Our ability to pass through the increased cost of raw materials to customers is dependent on global market demand for olefins and polyolefins. In general, the pricing for purchases and sales of most products is determined by global market forces, including the impacts of foreign exchange relative to the pricing of the underlying naphtha raw materials, most of which are priced in U.S. dollars. There can be a lag between naphtha raw material price changes and contract product price changes that will cause volatility in our product margins.

Industry Dynamics / Competition

With respect to olefins and polyolefins, competition is based on price, product quality, product delivery, reliability of supply, product performance and customer service. We compete with regional and multinational chemical companies and divisions of large oil companies. The petrochemical market in the European Union (“EU”) has been affected by the price volatility of naphtha, the primary feedstock for olefins in the region, as well as fluctuating demand as a result of changing European and global economic conditions.

Based on published capacity data and including our proportionate share of our joint ventures, we believe as of December 31, 2019, we were:

- the fifth largest producer of ethylene in Europe with an ethylene capacity of 1.9 million tons per year;
- the largest producer of PE in Europe with 2.2 million tons per year of capacity, including our share of our joint ventures in Poland and The Netherlands; and
- the largest producer of PP in Europe with 2.7 million tons per year of capacity, including our share of our joint ventures in Poland and The Netherlands, approximately 265 thousand tons of *Catalloy* capacity reported within our Advanced Polymer Solutions segment.

Intermediates and Derivatives Segment

Overview

Our I&D segment produces and markets propylene oxide (“PO”) and its derivatives, oxyfuels and related products, and intermediate chemicals such as styrene monomer (“SM”), acetyls, and ethylene oxides and derivatives.

PO and Derivatives—We produce PO through two distinct technologies, one of which yields tertiary butyl alcohol (“TBA”) as the co-product and the other of which yields SM as the co-product. The two technologies are mutually exclusive with dedicated assets for manufacturing either PO/TBA or PO/SM. PO is an intermediate commodity chemical and is a precursor of polyols, propylene glycol, propylene glycol ethers and butanediol. PO and derivatives are used in a variety of durable and consumable items with key applications such as polyurethanes used for insulation, automotive/furniture cushioning, coatings, surfactants, synthetic resins and several other household usages.

Oxyfuels and Related Products—We produce two distinct ether-based oxyfuels, methyl tertiary butyl ether (“MTBE”) and ethyl tertiary butyl ether (“ETBE”). These oxyfuels are produced by converting the TBA co-product of PO into isobutylene and reacting with methanol or ethanol to produce either MTBE or ETBE. Both are used as high-octane gasoline components that help gasoline burn cleaner and reduce automobile emissions. Other TBA derivatives, which we refer to as “C4 chemicals,” are largely used to make synthetic rubber and other gasoline additives.

Intermediate Chemicals—We produce other commodity chemicals that utilize ethylene as a key component feedstock, including SM, acetyls and ethylene oxide derivatives. SM is utilized in various applications such as plastics, expandable polystyrene for packaging, foam cups and containers, insulation products and durables and engineering resins. Our acetyls products comprise methanol, glacial acetic acid (“GAA”) and vinyl acetate monomer

("VAM"). Natural gas (methane) is the feedstock for methanol, some of which is converted to GAA, and a portion of the GAA is reacted with ethylene to create VAM. VAM is an intermediate chemical used in fabric or wood treatments, pigments, coatings, films and adhesives. Ethylene oxide is an intermediate chemical that is used to produce ethylene glycol, glycol ethers and other derivatives. Ethylene oxide and its derivatives are used in the production of polyester, antifreeze fluids, solvents and other chemical products.

Sales & Marketing / Customers

We sell our PO and derivatives through multi-year sales and processing agreements as well as spot sales. Some of our contract sales agreements have cost plus pricing terms. PO and derivatives are transported by barge, marine vessel, pipeline, railcar and tank truck.

We sell our oxyfuels and related products under market and cost-based sales agreements and in the spot market. Oxyfuels are transported by barge, marine vessel and tank truck and are used as octane blending components worldwide outside of the United States due to their blending characteristics and emission benefits. C4 chemicals, such as high-purity isobutylene, are sold to producers of synthetic rubber and other chemical products primarily in the United States and Europe, and are transported by railcar, tank truck, pipeline and marine shipments.

Intermediate chemicals are shipped by barge, marine vessel, pipeline, railcar and tank truck. SM is sold globally into regions such as North America, Europe, Asia and South America export markets through spot sales and commercial contracts. Within acetyls, methanol is consumed internally to make GAA, used as a feedstock for oxyfuels and related products and also sold directly into the merchant commercial market. GAA is converted with ethylene to produce VAM which is sold worldwide under multi-year commercial contracts and on a spot basis.

Sales of our PO and derivatives, oxyfuels and related products, and intermediate chemicals are made by our marketing and sales personnel, and also through distributors and independent agents in the Americas, Europe, the Middle East, Africa and the Asia-Pacific region.

Joint Venture Relationships

We have two PO joint ventures with Covestro AG, one in the U.S. and one in Europe. We operate four of the U.S. PO production facilities for the U.S. PO joint venture. Covestro's interest represents ownership of an in-kind portion of the PO production of 680 thousand tons per year. We take, in-kind, the remaining PO production and all co-product production. The parties' rights in the joint venture are based on off-take volumes related to actual production of PO as opposed to ownership percentages. Covestro also has the right to 50% of the PO and SM production of our European PO joint venture. Our proportional production capacity provided through this venture is approximately 155 thousand tons of PO and approximately 340 thousand tons of SM. We do not share marketing or product sales with Covestro under either of these PO joint ventures.

We also have a joint venture manufacturing relationship in China. This venture provides us with additional production capacity of approximately 50 thousand tons of PO. This capacity is based on our operational share of the joint venture's total capacity.

Raw Materials

The cost of raw materials is the largest component of total production cost for PO, its co-products and its derivatives. Propylene, isobutane or mixed butane, ethylene and benzene are the primary raw materials used in the production of PO and its co-products. The market prices of these raw materials historically have been related to the price of crude oil, NGLs and natural gas, as well as supply and demand for the raw materials.

In the U.S., we obtain a large portion of our propylene, benzene and ethylene raw materials needed for the production of PO and its co-products from our O&P—Americas segment and to a lesser extent from third parties. Raw materials for the non-U.S. production of PO and its co-products are obtained from our O&P—EAI segment and

from third parties. We consume a significant portion of our internally-produced PO in the production of PO derivatives.

The raw material requirements not sourced internally are purchased at market-based prices from numerous suppliers in the U.S. and Europe with which we have established contractual relationships, as well as in the spot market.

For the production of oxyfuels, we purchase our ethanol feedstock requirements from third parties, and obtain our methanol from both internal production and external sources. Carbon monoxide and methanol are the primary raw materials required for the production of GAA. We source carbon monoxide from internal production, which can be complemented by purchases from external sources as needed. The methanol required for our downstream production of acetyls is internally sourced from our methanol plants in La Porte, Texas, and Channelview, Texas. Natural gas is the primary raw material required for the production of methanol.

In addition to ethylene, acetic acid is a primary raw material for the production of VAM. We obtain all our requirements for acetic acid and ethylene from our internal production. Historically, we have used a large percentage of our acetic acid production to produce VAM.

Industry Dynamics / Competition

With respect to product competition, the market is influenced and based on a variety of factors, including product quality, price, reliability of supply, technical support, customer service and potential substitute materials. Profitability is affected by the worldwide level of demand along with price competition, which may intensify due to, among other things, new industry capacity and industry outages. Demand growth could be impacted by further development of alternative bio-based methodologies. Our major worldwide competitors include other multinational chemical and refining companies as well as some regional marketers and producers.

Based on published capacity data, excluding our partners' shares of joint venture capacity, we believe as of December 31, 2019, we were:

- the second largest producer of PO worldwide; and
- the second largest producer of oxyfuels worldwide.

Advanced Polymer Solutions Segment

Overview

We formed the APS segment following our acquisition of A. Schulman, Inc. ("A. Schulman") in August 2018. Our APS segment produces and markets compounding and solutions, such as polypropylene compounds, engineered plastics, masterbatches, colors and powders, engineered composites and advanced polymers, which includes *Catalloy* and polybutene-1 polyolefin resins.

Compounding and Solutions—Our polypropylene compounds are produced from blends of polyolefins and additives and are largely focused on automotive applications. Engineered plastics and engineered composites add value for more specialized high-performance applications used across a variety of industries. Masterbatches are compounds that provide differentiated properties when combined with commodity plastics used in packaging, agriculture and durable goods applications. Specialty powders are largely used to mold toys, industrial tanks and sporting goods such as kayaks. Performance colors provide powdered, pelletized and liquid color concentrates for the plastics industry.

Advanced Polymers—*Catalloy* and polybutene-1 are unique polymers that can be used within the APS segment for downstream compounding or can be sold as raw materials to third parties. *Catalloy* is a line of differentiated propylene-based polymers that add value in packaging applications and construction materials such as the white membranes used in the commercial roofing market. Polybutene-1 is used in both specialty piping and packaging applications.

Sales & Marketing / Customers

Our products are sold through our global sales organization to a broad base of established customers and distributors under contract or on a spot basis. These products are transported to our customers primarily by either truck or bulk rail.

Joint Venture Relationships

We participate in several manufacturing joint ventures in Saudi Arabia, Australia, Indonesia, Malaysia, Thailand, China and Argentina. We hold majority interests and have operational control of the joint ventures in Argentina and Indonesia. We do not hold majority interests in any of the remaining joint ventures, nor do we have operational control. These ventures provide us with additional production capacity of approximately 140 thousand tons of compounding and solutions. These capacities are based on our percentage ownership interest in the joint ventures' total capacities.

Raw Materials

The principal materials used in the production of our compounding and solutions products are polypropylene, polyethylene, polystyrene, nylon and titanium dioxide. Raw materials required for the production of our compounding and solutions products are obtained from our wholly owned or joint venture facilities and from a number of major plastic resin producers or other suppliers at market-based prices.

The principal raw materials used in the production of advanced polymers are ethylene, propylene and butene-1. Ethylene and propylene requirements that are not produced internally and externally-supplied butene-1 are acquired through long-term contracts with third party suppliers or via spot purchases.

Our ability to pass through the increased cost of raw materials to customers is dependent on global market demand. In general, the pricing for purchases and sales of most products is determined by global market forces.

Industry Dynamics / Competition

With respect to product competition, the market is influenced and based on a variety of factors, including price, product quality, product delivery, reliability of supply, product performance and customer service. We compete with regional and multinational marketers and producers of plastic resins and compounds.

Based on published capacity data and including our proportionate share of our joint ventures, we believe as of December 31, 2019, we were the largest global producer of polypropylene compounds.

Refining Segment

Overview

The primary products of our Refining segment are refined products made from heavy, high-sulfur crude oil and other crude oils of varied types and sources available on the U.S. Gulf Coast. These refined products include gasoline and other distillates.

Sales & Marketing / Customers

The Houston refinery's products are primarily sold in bulk to other refiners, marketers, distributors and wholesalers at market-related prices. Most of the Houston refinery's products are sold under contracts with a term of one year or less or are sold in the spot market. The Houston refinery's products generally are transported to customers via pipelines and terminals owned and operated by other parties. The sales of refined products accounted for approximately 22%, 21% and 18% of our total revenues in 2019, 2018 and 2017, respectively.

Raw Materials

Our Houston refinery, which is located on the Houston Ship Channel in Houston, Texas, has a heavy, high-sulfur crude oil processing capacity of approximately 268 thousand barrels per day on a calendar day basis (normal operating basis), or approximately 292 thousand barrels per day on a stream day basis (maximum achievable over a 24-hour period). The Houston refinery is a full conversion refinery designed to refine heavy, high-sulfur crude oil. This crude oil is more viscous and denser than traditional crude oil and contains higher concentrations of sulfur and heavy metals, making it more difficult to refine into gasoline and other high-value fuel products. While heavy, high-sulfur crude oil has historically been less costly to purchase than light, low-sulfur crude oil, in recent years the price difference has narrowed. U.S. production is predominantly light sweet crude and much of the heavy crude has generally been imported from Canada, Venezuela and other global producers, which has at times been subject to supply disruptions.

We purchase the crude oil used as a raw material for the Houston refinery on the open market on a spot basis and under a number of supply agreements with regional producers, generally with terms varying from one to two years.

Industry Dynamics / Competition

Our refining competitors are major integrated oil companies, refineries owned or controlled by foreign governments and independent domestic refiners. Based on published data, as of January 2019, there were 135 operable crude oil refineries in the U.S., and total U.S. refinery capacity was approximately 18.8 million barrels per day. During 2019, the Houston refinery processed an average of approximately 263 thousand barrels per day of heavy crude oil.

Our refining operations compete for the purchases of crude oil based on price and quality. Supply disruptions could impact the availability and pricing. We compete in gasoline and distillate markets as a bulk supplier of fungible products satisfying industry and government specifications. Competition is based on price and location.

The markets for fuel products tend to be volatile as well as cyclical due to supply and demand fundamentals and changing crude oil and refined product prices. Crude oil prices are impacted by worldwide political events, the economics of exploration and production and refined products demand. Prices and demand for fuel products are influenced by seasonal and short-term factors such as weather and driving patterns, as well as by longer term issues such as the economy, energy conservation and alternative fuels. Industry fuel products supply is dependent on short-term industry operating capabilities and on long-term refining capacity.

A crack spread is a benchmark indication of refining margins based on the processing of a specific type of crude oil into an assumed selection of major refined products. The Houston refinery generally tracks the Maya 2-1-1 crack spread, which represents the difference between the current month Gulf Coast price of two barrels of Maya crude oil as set by Petróleos Mexicanos ("Pemex") and one barrel each of U.S. Gulf Coast Reformulated Gasoline Blendstock for Oxygen Blending ("RBOB") Gasoline and of U.S. Gulf Coast Ultra Low Sulfur Diesel ("ULSD"). While these benchmark refining spreads are generally indicative of the level of profitability at the Houston refinery and similarly configured refineries, there are many other factors specific to each refinery and the industry in general, such as the value of refinery by-products, which influence operating results. Refinery by-products are products other than gasoline and distillates that represent about one-third of the total product volume, and include coke, sulfur, and lighter materials such as NGLs and crude olefins streams. The cost of Renewable Identification Numbers ("RINs"), which are renewable fuel credits mandated by the U.S. Environmental Protection Agency (the "EPA"), can also affect profitability.

Technology Segment

Overview

Our Technology segment develops and licenses chemical and polyolefin process technologies and manufactures and sells polyolefin catalysts. We market our process technologies and our polyolefin catalysts to external customers and also use them in our own manufacturing operations. Over the past three years, approximately 15% to 25% of our catalyst sales were intercompany.

Our polyolefin process licenses are structured to provide a standard core technology, with individual customer needs met by adding customized modules that provide the required capabilities to produce the defined production grade slate and plant capacity. In addition to the basic license agreement, a range of services can also be provided, including project assistance, training, assistance in starting up the plant and ongoing technical support after start-up. We may also offer marketing and sales services. In addition, licensees may continue to purchase polyolefin catalysts that are consumed in the production process, generally under long-term catalyst supply agreements with us.

Research and Development

Our research and development (“R&D”) activities are designed to improve our existing products and processes, and discover and commercialize new materials, catalysts and processes. These activities focus on product and application development, process development, catalyst development and fundamental polyolefin-focused research.

In 2019, 2018 and 2017, our R&D expenditures were \$111 million, \$115 million and \$106 million, respectively. A portion of these expenses are related to technical support and customer service and are allocated to the other business segments. In 2019, approximately 50% of all R&D costs were allocated to business segments other than Technology, while in 2018 and 2017, the allocation approximated 45%.

GENERAL

Intellectual Property

We maintain an extensive patent portfolio and continue to file new patent applications in the U.S. and other countries. As of December 31, 2019, we owned over 6,000 patents and patent applications worldwide. Our patents and trade secrets cover our processes, products and catalysts and are significant to our competitive position, particularly with regard to PO, intermediate chemicals, petrochemicals, polymers and our process technologies. We own globally registered and unregistered trademarks including marks for “LyondellBasell,” “Lyondell,” “Basell,” “Equistar” and “A. Schulman.” While we believe that our intellectual property provides competitive advantages, we do not regard our businesses as being materially dependent upon any single patent, trade secret or trademark. Some of our production capacity operates under licenses from third parties.

Environmental

Most of our operations are affected by national, state, regional and local environmental laws. Matters pertaining to the environment are discussed in Part I, Item 1A. *Risk Factors*; Part I, Item 3. *Legal Proceedings*; Part II, Item 7. *Management’s Discussion and Analysis of Financial Condition and Results of Operations*; and Notes 2 and 19 to the Consolidated Financial Statements.

We have made, and intend to continue to make, the expenditures necessary for compliance with applicable laws and regulations relating to environmental, health and safety matters. We incurred capital expenditures of \$195 million in 2019 for health, safety and environmental compliance purposes and improvement programs, and estimate such expenditures to be approximately \$275 million in 2020 and \$290 million in 2021.

While capital expenditures or operating costs for environmental compliance, including compliance with potential legislation and potential regulation related to climate change, cannot be predicted with certainty, we do not believe they will have a material effect on our competitive position.

While there can be no assurance that physical risks to our facilities and supply chain due to climate change will not occur in the future, we do not believe these risks are material in the near term.

Employee Relations

As of December 31, 2019, we employed approximately 19,100 full-time and part-time employees around the world. Of this total, 8,900 were located in North America and another 8,200 were located in Europe. The remainder of our employees are in other global locations.

As of December 31, 2019, approximately 900 of our employees in North America were represented by labor unions. The vast majority of our employees in Europe and South America are subject to staff council or works council coverage or collective bargaining agreements.

In addition to our own employees, we use the services of contractors in the routine conduct of our businesses.

INFORMATION ABOUT OUR EXECUTIVE OFFICERS

Our executive officers as of February 20, 2020 were as follows:

<u>Name and Age</u>	<u>Significant Experience</u>
Bhavesh V. (“Bob”) Patel, 53	<p>Chief Executive Officer since January 2015 and member of the Board of Directors since June 2018.</p> <p>Executive Vice President, Olefins and Polyolefins–EAI and Technology from October 2013 to January 2015.</p> <p>Senior Vice President, Olefins and Polyolefins–EAI and Technology from November 2010 to October 2013.</p> <p>Senior Vice President, Olefins and Polyolefins–Americas from March 2010 to June 2011.</p>
Michael C. McMurray, 55	<p>Executive Vice President and Chief Financial Officer since November 2019.</p> <p>Senior Vice President and Chief Financial Officer at Owens Corning, a global manufacturer of insulation, roofing and fiberglass composites, from August 2012 to November 2019.</p>
Daniel Coombs, 63	<p>Executive Vice President, Global Manufacturing, Projects and Refining since October 2018.</p> <p>Executive Vice President, Global Manufacturing, Projects, Refining and Technology from February 2017 to October 2018.</p> <p>Executive Vice President, Global Olefins and Polyolefins and Technology from January 2016 to February 2017.</p> <p>Executive Vice President, Intermediates and Derivatives from May 2015 to January 2016.</p> <p>Senior Vice President of Manufacturing for Chevron Phillips Chemical, a global chemical company, from December 2013 to May 2015.</p>
James Guilfoyle, 49	<p>Executive Vice President, Advanced Polymer Solutions & Global Supply Chain since July 2018.</p> <p>Senior Vice President, Global Intermediates & Derivatives and Global Supply Chain from February 2017 to July 2018.</p> <p>Senior Vice President, Global Intermediates and Derivatives from June 2015 to February 2017.</p> <p>Vice President of Global Propylene Oxide and Co-Products from March 2015 to May 2015.</p> <p>Director of Polymer Sales Americas from January 2012 to February 2015.</p>

<u>Name and Age</u>	<u>Significant Experience</u>
Jeffrey Kaplan, 51	Executive Vice President and Chief Legal Officer since March 2015. Deputy General Counsel from December 2009 to March 2015.
Kenneth (“Ken”) Lane, 51	Executive Vice President, Global Olefins and Polyolefins since July 2019. President, Monomers Division at BASF, a German chemical company, from January 2019 to July 2019. President, Global Catalysts at BASF from June 2013 to December 2018.
Torkel Rhenman, 56	Executive Vice President, Intermediates & Derivatives since July 2019. Chief Executive Officer and Director of Lhoist Group, a privately held minerals and mining company, from 2012 to 2017.
Dale Friedrichs, 56	Senior Vice President, Human Resources since October 2019. Vice President, Health, Safety, Environment and Security from February 2017 to October 2019. Site Manager of various facilities from January 1995 to February 2017.
James Seward, 52	Senior Vice President, Research & Development, Technology and Sustainability since July 2019. Senior Vice President, Technology Business, Sustainability, and Olefins & Polyolefins, Europe, Asia and International Joint Venture Management from September 2018 to July 2019. Vice President, Joint Ventures and International Marketing from May 2014 to August 2018.
Anup Sharma, 45	Senior Vice President, Global Business Services since February 2019. Vice President and GE corporate officer at GE Digital, a software company for industrial businesses, from May 2016 to February 2019. Global Chief Information Officer at GE Oil & Gas, a division of General Electric that owned investments in the petroleum industry, from 2011 to 2016.
Kim Foley, 53	Vice President, Health, Safety and Environment since October 2019. Site Manager at Channelview from May 2017 to October 2019. Senior Director, Global Supply Chain from January 2016 to May 2017. Director, Supply Chain, Americas from August 2010 to January 2016.

Description of Properties

Our principal manufacturing facilities as of December 31, 2019 are set forth below and are identified by the principal segment or segments using the facility. All of the facilities are wholly owned, except as otherwise noted.

<u>Location</u>	<u>Segment</u>
Americas	
Bayport (Pasadena), Texas	I&D
Bayport (Pasadena), Texas ⁽¹⁾	I&D
Bayport (Pasadena), Texas	O&P–Americas
Channelview, Texas ⁽²⁾	O&P–Americas
Channelview, Texas ⁽¹⁾⁽²⁾	I&D
Chocolate Bayou, Texas†	O&P–Americas
Clinton, Iowa	O&P–Americas
Corpus Christi, Texas	O&P–Americas
Edison, New Jersey	O&P–Americas
Houston, Texas	Refining
La Porte, Texas ⁽³⁾	O&P–Americas
La Porte, Texas ⁽³⁾	I&D
Lake Charles, Louisiana	O&P–Americas
Matagorda, Texas	O&P–Americas
Morris, Illinois	O&P–Americas
Tuscola, Illinois	O&P–Americas
Victoria, Texas†	O&P–Americas

<u>Location</u>	<u>Segment</u>
Europe	
Berre l'Etang, France	O&P-EAI
Botlek, Rotterdam, The Netherlands†	I&D
Brindisi, Italy	O&P-EAI
Carrington, UK†	O&P-EAI
Ferrara, Italy	O&P-EAI Technology
Fos-sur-Mer, France†	I&D
Frankfurt, Germany†	O&P-EAI Technology
Knapsack, Germany†	O&P-EAI APS
Kerpen, Germany	APS
Ludwigshafen, Germany†	Technology
Maasvlakte, The Netherlands ⁽⁴⁾	I&D
Moerdijk, The Netherlands†	APS
Münchsmünster, Germany	O&P-EAI
Tarragona, Spain ⁽⁵⁾ †	O&P-EAI APS
Wesseling, Germany	O&P-EAI
Asia-Pacific	
Geelong, Australia†	O&P-EAI

† The facility is located on leased land.

- (1) The Bayport PO/TBA plants and the Channelview PO/SM I plant are held by the U.S. PO joint venture between Covestro and Lyondell Chemical Company. These plants are located on land leased by the U.S. PO joint venture.
- (2) Equistar Chemicals, LP operates a styrene maleic anhydride unit and a polybutadiene unit, which are owned by an unrelated party and are located within the Channelview facility on property leased from Equistar Chemicals, LP.
- (3) The La Porte facilities are on contiguous property.
- (4) The Maasvlakte plant is owned by the European PO joint venture and is located on land leased by the European PO joint venture.
- (5) The Tarragona PP facility is located on leased land; the compounds facility is located on co-owned land.

Other Locations and Properties

We maintain executive offices in London, the United Kingdom; Rotterdam, The Netherlands; and Houston, Texas. We maintain research facilities in Lansing, Michigan; Channelview, Texas; Cincinnati, Ohio; Ferrara, Italy and Frankfurt, Germany. Our Asia-Pacific headquarters are in Hong Kong. We also have technical support centers in Bayreuth, Germany; Geelong, Australia and Tarragona, Spain. We have various sales facilities worldwide.

Website Access to SEC Reports

Our Internet website address is <http://www.LyondellBasell.com>. Information contained on our Internet website is not part of this report on Form 10-K.

Our Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K and any amendments to these reports filed or furnished pursuant to Section 13(a) or 15(d) of the Securities Exchange Act of 1934 are available on our website, free of charge, as soon as reasonably practicable after such reports are filed with, or furnished to, the U.S. Securities and Exchange Commission. Alternatively, you may access these reports at the SEC's website at <http://www.sec.gov>.

Item 1A. Risk Factors.

You should carefully consider the following risk factors in addition to the other information included in this Annual Report on Form 10-K. Each of these risk factors could adversely affect our business, operating results and financial condition, as well as adversely affect the value of an investment in our common stock.

Our business, including our results of operations and reputation, could be adversely affected by safety or product liability issues.

Failure to appropriately manage safety, human health, product liability and environmental risks associated with our products, product life cycles and production processes could adversely impact employees, communities, stakeholders, our reputation and our results of operations. Public perception of the risks associated with our products and production processes could impact product acceptance and influence the regulatory environment in which we operate. While we have procedures and controls to manage safety risks, issues could be created by events outside of our control, including natural disasters, severe weather events and acts of sabotage.

The cyclical and volatility of the industries in which we participate may cause significant fluctuations in our operating results.

Our business operations are subject to the cyclical and volatile nature of the supply-demand balance in the chemical and refining industries. Our future operating results are expected to continue to be affected by this cyclical and volatility. The chemical and refining industries historically have experienced alternating periods of capacity shortages, causing prices and profit margins to increase, followed by periods of excess capacity, resulting in oversupply, declining capacity utilization rates and declining prices and profit margins.

In addition to changes in the supply and demand for products, changes in energy prices and other worldwide economic conditions can cause volatility. These factors result in significant fluctuations in profits and cash flow from period to period and over business cycles.

New capacity additions in Asia, the Middle East and North America may lead to periods of oversupply and lower profitability. A sizable number of expansions have recently started up in North America. The timing and extent of any changes to currently prevailing market conditions are uncertain and supply and demand may be unbalanced at any time. As a consequence, we are unable to accurately predict the extent or duration of future industry cycles or their effect on our business, financial condition or results of operations.

Our operations are subject to risks inherent in chemical and refining businesses, and we could be subject to liabilities for which we are not fully insured or that are not otherwise mitigated.

We maintain property, business interruption, product, general liability, casualty and other types of insurance that we believe are appropriate for our business and operations as well as in line with industry practices. However, we are not fully insured against all potential hazards incident to our business, including losses resulting from natural disasters, wars or terrorist acts. Changes in insurance market conditions have caused, and may in the future cause, premiums and deductibles for certain insurance policies to increase substantially and, in some instances, for certain insurance to become unavailable or available only for reduced amounts of coverage. If we were to incur a significant liability for which we were not fully insured, we might not be able to finance the amount of the uninsured liability on terms acceptable to us or at all, and might be obligated to divert a significant portion of our cash flow from normal business operations.

Further, because a part of our business involves licensing polyolefin process technology, our licensees are exposed to similar risks involved in the manufacture and marketing of polyolefins. Hazardous incidents involving our licensees, if they do result or are perceived to result from use of our technologies, may harm our reputation, threaten our relationships with other licensees and/or lead to customer attrition and financial losses. Our policy of covering these risks through contractual limitations of liability and indemnities and through insurance may not always be

effective. As a result, our financial condition and results of operation would be adversely affected, and other companies with competing technologies may have the opportunity to secure a competitive advantage.

A sustained decrease in the price of crude oil may adversely impact the results of our operations, primarily in North America.

Energy costs generally follow price trends of crude oil and natural gas. These price trends may be highly volatile and cyclical. In the past, raw material and energy costs have experienced significant fluctuations that adversely affected our business segments' results of operations. For example, we have benefited from the favorable ratio of U.S. crude oil prices to natural gas prices in recent years. If the price of crude oil remains lower relative to U.S. natural gas prices or if the demand for natural gas and NGLs increases, this may have a negative impact on our results of operations.

Costs and limitations on supply of raw materials and energy may result in increased operating expenses.

The costs of raw materials and energy represent a substantial portion of our operating expenses. Due to the significant competition we face and the commodity nature of many of our products we are not always able to pass on raw material and energy cost increases to our customers. When we do have the ability to pass on the cost increases, we are not always able to do so quickly enough to avoid adverse impacts on our results of operations.

Cost increases for raw materials also may increase working capital needs, which could reduce our liquidity and cash flow. Even if we increase our sales prices to reflect rising raw material and energy costs, demand for products may decrease as customers reduce their consumption or use substitute products, which may have an adverse impact on our results of operations. In addition, producers in natural gas cost-advantaged regions, such as the Middle East and North America, benefit from the lower prices of natural gas and NGLs. Competition from producers in these regions may cause us to reduce exports from Europe and elsewhere. Any such reductions may increase competition for product sales within Europe and other markets, which can result in lower margins in those regions.

For some of our raw materials and utilities there are a limited number of suppliers and, in some cases, the supplies are specific to the particular geographic region in which a facility is located. It is also common in the chemical and refining industries for a facility to have a sole, dedicated source for its utilities, such as steam, electricity and gas. Having a sole or limited number of suppliers may limit our negotiating power, particularly in the case of rising raw material costs. Any new supply agreements we enter into may not have terms as favorable as those contained in our current supply agreements.

Additionally, there is growing concern over the reliability of water sources, including around the Texas Gulf Coast where several of our facilities are located. The decreased availability or less favorable pricing for water as a result of population growth, drought or regulation could negatively impact our operations, including by impacting our ability to produce or transport our products.

If our raw material or utility supplies were disrupted, our businesses may incur increased costs to procure alternative supplies or incur excessive downtime, which would have a negative impact on plant operations. Disruptions of supplies may occur as a result of transportation issues resulting from natural disasters, water levels, and interruptions in marine water routes, among other causes, that can affect the operations of vessels, barges, rails, trucks and pipeline traffic. These risks are particularly prevalent in the U.S. Gulf Coast area. Additionally, increasing exports of NGLs and crude oil from the U.S. or greater restrictions on hydraulic fracturing could restrict the availability of our raw materials, thereby increasing our costs.

With increased volatility in raw material costs, our suppliers could impose more onerous terms on us, resulting in shorter payment cycles and increasing our working capital requirements.

Our ability to source raw materials may be adversely affected by political instability, civil disturbances or other governmental actions.

We obtain a portion of our principal raw materials from sources in the Middle East and Central and South America that may be less politically stable than other areas in which we conduct business, such as the U.S. or Europe. Political instability, civil disturbances and actions by governments in these areas are more likely to substantially increase the price and decrease the supply of raw materials necessary for our operations, which could have a material adverse effect on our results of operations.

Increased incidents of civil unrest, including terrorist attacks and demonstrations that have been marked by violence, have occurred in a number of countries in the Middle East and South America. Some political regimes in these countries are threatened or have changed as a result of such unrest. Political instability and civil unrest could continue to spread in the region and involve other areas. Such unrest, if it continues to spread or grow in intensity, could lead to civil wars, regional conflicts or regime changes resulting in governments that are hostile to countries in which we conduct substantial business, such as in the U.S., Europe or their respective trading partners.

Economic disruptions and downturns in general, and particularly continued global economic uncertainty or economic turmoil in emerging markets, could have a material adverse effect on our business, prospects, operating results, financial condition and cash flows.

Our results of operations can be materially affected by adverse conditions in the financial markets and depressed economic conditions generally. Economic downturns in the businesses and geographic areas in which we sell our products could substantially reduce demand for our products and result in decreased sales volumes and increased credit risk. Recessionary environments adversely affect our business because demand for our products is reduced, particularly from our customers in industrial markets generally and the automotive and housing industries specifically, and may result in higher costs of capital. A significant portion of our revenues and earnings are derived from our business in Europe, including southern Europe. In addition, most of our European transactions and assets, including cash reserves and receivables, are denominated in euros.

We also derive significant revenues from our business in emerging markets, particularly the emerging markets in Asia and South America. Any broad-based downturn in these emerging markets, or in a key market such as China, could require us to reduce export volumes into these markets and could also require us to divert product sales to less profitable markets. Any of these conditions could ultimately harm our overall business, prospects, operating results, financial condition and cash flows.

We sell products in highly competitive global markets and face significant price pressures.

We sell our products in highly competitive global markets. Due to the commodity nature of many of our products, competition in these markets is based primarily on price and, to a lesser extent, on product performance, product quality, product deliverability, reliability of supply and customer service. Often, we are not able to protect our market position for these products by product differentiation and may not be able to pass on cost increases to our customers due to the significant competition in our business.

In addition, we face increased competition from companies that may have greater financial resources and different cost structures or strategic goals than us. These include large integrated oil companies (some of which also have chemical businesses), government-owned businesses, and companies that receive subsidies or other government incentives to produce certain products in a specified geographic region. Continuing competition from these companies, especially in our olefin and refining businesses, could limit our ability to increase product sales prices in response to raw material and other cost increases, or could cause us to reduce product sales prices to compete effectively, which would reduce our profitability. Competitors with different cost structures or strategic goals than we have may be able to invest significant capital into their businesses, including expenditures for research and development. In addition, specialty products we produce may become commoditized over time. Increased competition could result in lower prices or lower sales volumes, which would have a negative impact on our results of operations.

Interruptions of operations at our facilities may result in increased liabilities or lower operating results.

We own and operate large-scale facilities. Our operating results are dependent on the continued operation of our various production facilities and the ability to complete construction and maintenance projects on schedule. Interruptions at our facilities may materially reduce the productivity and profitability of a particular manufacturing facility, or our business as a whole, during and after the period of such operational difficulties. In the past, we have had to shut down plants on the U.S. Gulf Coast, including the temporary shutdown of a portion of our Houston refinery, as a result of hurricanes striking the Texas coast. In addition, because the Houston refinery is our only refining operation, an outage at the refinery could have a particularly negative impact on our operating results as we do not have the ability to increase refining production elsewhere.

Although we take precautions to enhance the safety of our operations and minimize the risk of disruptions, our operations are subject to hazards inherent in chemical manufacturing and refining and the related storage and transportation of raw materials, products and wastes. These potential hazards include:

- pipeline leaks and ruptures;
- explosions;
- fires;
- severe weather and natural disasters;
- mechanical failure;
- unscheduled downtimes;
- supplier disruptions;
- labor shortages or other labor difficulties;
- transportation interruptions;
- remediation complications;
- increased restrictions on, or the unavailability of, water for use at our manufacturing sites or for the transport of our products or raw materials;
- chemical and oil spills;
- discharges or releases of toxic or hazardous substances or gases;
- shipment of incorrect or off-specification product to customers;
- storage tank leaks;
- other environmental risks; and
- terrorist acts.

Some of these hazards may cause severe damage to or destruction of property and equipment or personal injury and loss of life and may result in suspension of operations or the shutdown of affected facilities.

Large capital projects can take many years to complete, and market conditions could deteriorate significantly between the project approval date and the project startup date, negatively impacting project returns. If we are unable to complete capital projects at their expected costs and in a timely manner, or if the market conditions assumed in our project economics deteriorate, our business, financial condition, results of operations and cash flows could be materially and adversely affected.

Delays or cost increases related to capital spending programs involving engineering, procurement and construction of facilities could materially adversely affect our ability to achieve forecasted internal rates of return and operating results. Delays in making required changes or upgrades to our facilities could subject us to fines or penalties as well

as affect our ability to contract with our customers and supply certain products we produce. Such delays or cost increases may arise as a result of unpredictable factors, many of which are beyond our control, including:

- denial of or delay in receiving requisite regulatory approvals and/or permits; unplanned increases in the cost of construction materials or labor;
- disruptions in transportation of components or construction materials;
- adverse weather conditions, natural disasters or other events (such as equipment malfunctions, explosions, fires or spills) affecting our facilities, or those of vendors or suppliers;
- shortages of sufficiently skilled labor, or labor disagreements resulting in unplanned work stoppages; and
- nonperformance by, or disputes with, vendors, suppliers, contractors or subcontractors.

Any one or more of these factors could have a significant impact on our ongoing capital projects. If we were unable to make up the delays associated with such factors or to recover the related costs, or if market conditions change, it could materially and adversely affect our business, financial condition, results of operations and cash flows.

Increased IT security threats and more sophisticated and targeted computer crime could pose a risk to our systems, networks, products, facilities and services.

Increased global information security threats and more sophisticated, targeted computer crime pose a risk to the confidentiality, availability and integrity of our data, operations and infrastructure. While we attempt to mitigate these risks by employing a number of measures, including security measures, employee training, comprehensive monitoring of our networks and systems, and maintenance of backup and protective systems, our employees, systems, networks, products, facilities and services remain potentially vulnerable to sophisticated espionage or cyber-assault. Depending on their nature and scope, such threats could potentially lead to the compromise of confidential information, improper use of our systems and networks, manipulation and destruction of data, defective products, production downtimes and operational disruptions, which in turn could adversely affect our reputation, competitiveness and results of operations.

We operate internationally and are subject to exchange rate fluctuations, exchange controls, political risks and other risks relating to international operations.

We operate internationally and are subject to the risks of doing business on a global level. These risks include fluctuations in currency exchange rates, economic instability and disruptions, restrictions on the transfer of funds and the imposition of trade restrictions or duties and tariffs, and increasingly complex regulations concerning privacy and data security. Additional risks from our multinational business include transportation delays and interruptions, war, terrorist activities, epidemics, pandemics, political instability, import and export controls, sanctions, changes in governmental policies, labor unrest and current and changing regulatory environments.

We generate revenues from export sales and operations that may be denominated in currencies other than the relevant functional currency. Exchange rates between these currencies and functional currencies in recent years have fluctuated significantly and may do so in the future. It is possible that fluctuations in exchange rates will result in reduced operating results. Additionally, we operate with the objective of having our worldwide cash available in the locations where it is needed, including the United Kingdom for our parent company's significant cash obligations as a result of dividend and interest payments. It is possible that we may not always be able to provide cash to other jurisdictions when needed or that such transfers of cash could be subject to additional taxes, including withholding taxes.

Our operating results could be negatively affected by the laws, rules and regulations, as well as political environments, in the jurisdictions in which we operate. There could be reduced demand for our products, decreases in the prices at which we can sell our products and disruptions of production or other operations. Trade protection measures such as quotas, duties, tariffs, safeguard measures or anti-dumping duties imposed in the countries in which we operate could negatively impact our business. Additionally, there may be substantial capital and other

costs to comply with regulations and/or increased security costs or insurance premiums, any of which could reduce our operating results.

We obtain a portion of our principal raw materials from international sources that are subject to these same risks. Our compliance with applicable customs, currency exchange control regulations, transfer pricing regulations or any other laws or regulations to which we may be subject could be challenged. Furthermore, these laws may be modified, the result of which may be to prevent or limit subsidiaries from transferring cash to us.

Furthermore, we are subject to certain existing, and may be subject to possible future, laws that limit or may limit our activities while some of our competitors may not be subject to such laws, which may adversely affect our competitiveness.

Changes in tax laws and regulations could affect our tax rate and our results of operations.

We are a tax resident in the United Kingdom and are subject to the United Kingdom corporate income tax system. LyondellBasell Industries N.V. has little or no taxable income of its own because, as a holding company, it does not conduct any operations. Through our subsidiaries, we have substantial operations world-wide. Taxes are primarily paid on the earnings generated in various jurisdictions, including the U.S., The Netherlands, Germany, France and Italy.

We closely monitor tax law changes and the potential impact to our results of operations. There continues to be increased attention to the tax practices of multinational companies, including certain provisions of H.R.1, also known as the U.S. Tax Cuts and Jobs Act (the “Tax Act”), the European Union’s state aid investigations, proposals by the Organization for Economic Cooperation and Development with respect to base erosion and profit shifting, and European Union tax directives and their implementation. Management does not believe that recent changes in income tax laws will have a material impact on our business, financial condition, or results of operations, although new or proposed changes to tax laws could affect our tax liabilities in the future.

Many of our businesses depend on our intellectual property. Our future success will depend in part on our ability to protect our intellectual property rights, and our inability to do so could reduce our ability to maintain our competitiveness and margins.

We have a significant worldwide patent portfolio of issued and pending patents. These patents and patent applications, together with proprietary technical know-how, are significant to our competitive position, particularly with regard to PO, intermediate chemicals, polyolefins, licensing and catalysts. We rely on the patent, copyright and trade secret laws of the countries in which we operate to protect our investment in research and development, manufacturing and marketing. We operate plants, sell catalysts and products, participate in joint ventures, and license our process technology in many foreign jurisdictions, including those having heightened risks for intellectual property. In some of these instances, we must disclose at least a portion of our technology to third parties or regulatory bodies. In these cases, we rely primarily on contracts and trade secret laws to protect the associated trade secrets. However, we may be unable to prevent third parties from using our intellectual property without authorization. Proceedings to protect these rights could be costly, and we may not prevail.

The failure of our patents or confidentiality agreements to protect our processes, apparatuses, technology, trade secrets or proprietary know-how could result in significantly lower revenues, reduced profit margins and cash flows and/or loss of market share. We also may be subject to claims that our technology, patents or other intellectual property infringes on a third party’s intellectual property rights. Unfavorable resolution of these claims could result in restrictions on our ability to deliver the related service or in a settlement that could be material to us.

Shared control or lack of control of joint ventures may delay decisions or actions regarding our joint ventures.

A portion of our operations are conducted through joint ventures, where control may be exercised by or shared with unaffiliated third parties. We cannot control the actions of our joint venture partners, including any nonperformance,

default or bankruptcy of joint venture partners. The joint ventures that we do not control may also lack financial reporting systems to provide adequate and timely information for our reporting purposes.

Our joint venture partners may have different interests or goals than we do and may take actions contrary to our requests, policies or objectives. Differences in views among the joint venture participants also may result in delayed decisions or in failures to agree on major matters, potentially adversely affecting the business and operations of the joint ventures and in turn our business and operations. We may develop a dispute with any of our partners over decisions affecting the venture that may result in litigation, arbitration or some other form of dispute resolution. If a joint venture participant acts contrary to our interest, it could harm our brand, business, results of operations and financial condition.

We cannot predict with certainty the extent of future costs under environmental, health and safety and other laws and regulations, and cannot guarantee they will not be material.

We may face liability arising out of the normal course of business, including alleged personal injury or property damage due to exposure to chemicals or other hazardous substances at our current or former facilities or chemicals that we manufacture, handle or own. In addition, because our products are components of a variety of other end-use products, we, along with other members of the chemical industry, are subject to potential claims related to those end-use products. Any substantial increase in the success of these types of claims could negatively affect our operating results.

We are subject to extensive national, regional, state and local environmental laws, regulations, directives, rules and ordinances concerning:

- emissions to the air;
- discharges onto land or surface waters or into groundwater; and
- the generation, handling, storage, transportation, treatment, disposal and remediation of hazardous substances and waste materials.

Many of these laws and regulations provide for substantial fines and potential criminal sanctions for violations. Some of these laws and regulations are subject to varying and conflicting interpretations. In addition, some of these laws and regulations require us to meet specific financial responsibility requirements. Any substantial liability for environmental damage could have a material adverse effect on our financial condition, results of operations and cash flows.

Although we have compliance programs and other processes intended to ensure compliance with all such regulations, we are subject to the risk that our compliance with such regulations could be challenged. Non-compliance with certain of these regulations could result in the incurrence of additional costs, penalties or assessments that could be material.

Our industry is subject to extensive government regulation, and existing, or future regulations may restrict our operations, increase our costs of operations or require us to make additional capital expenditures.

Compliance with regulatory requirements will result in higher operating costs, such as regulatory requirements relating to emissions, the security of our facilities, and the transportation, export or registration of our products. We generally expect that regulatory controls worldwide will become increasingly more demanding, but cannot accurately predict future developments.

Increasingly strict environmental laws and inspection and enforcement policies, could affect the handling, manufacture, use, emission or disposal of products, other materials or hazardous and non-hazardous waste. Stricter environmental, safety and health laws, regulations and enforcement policies could result in increased operating costs or capital expenditures to comply with such laws and regulations. Additionally, we are required to have permits for our businesses and are subject to licensing regulations. These permits and licenses are subject to renewal,

modification and in some circumstances, revocation. Further, the permits and licenses are often difficult, time consuming and costly to obtain and could contain conditions that limit our operations.

We may incur substantial costs to comply with climate change legislation and related regulatory initiatives.

There has been a broad range of proposed or promulgated international, national and state laws focusing on greenhouse gas (“GHG”) reduction. These proposed or promulgated laws apply or could apply in countries where we have interests or may have interests in the future. Laws and regulations in this field continue to evolve and, while they are likely to be increasingly widespread and stringent, at this stage it is not possible to accurately estimate either a timetable for implementation or our future compliance costs relating to implementation. Under the 2015 Paris Agreement, parties to the United Nations Framework Convention on Climate Change agreed to undertake ambitious efforts to reduce GHG emissions and strengthen adaptation to the effects of climate change. While the U.S. notified the United Nations in August 2017 that it will be withdrawing from the Agreement, other regions in which we operate, including in particular the European Union, are preparing national legislation and protection plans to implement their emission reduction commitments under the Agreement. Furthermore, the European Union is considering accelerating its own commitments and achieve carbon neutrality by 2050. These actions could result in increased cost of purchased energy and increased costs of compliance for impacted locations.

Within the framework of the EU emissions trading scheme (“ETS”), we were allocated certain allowances of carbon dioxide for the affected plants of our European sites for the period from 2008 to 2012 (“ETS II period”). The ETS II period did not bring additional cost to us as the allowance allocation was sufficient to cover the actual emissions of the affected plants. We were able to build an allowance surplus during the ETS II period which was banked to the scheme for the period from 2013 to 2020 (“ETS III period”). We have incurred additional costs for the ETS III period, despite the allowance surplus accrued over the ETS II period, as allowance allocations were reduced for the ETS III period and more of our plants are affected by the scheme. We expect to incur additional costs in relation to future carbon or GHG emission trading schemes.

In the U.S., the EPA has promulgated federal GHG regulations under the Clean Air Act affecting certain sources. The EPA has issued mandatory GHG reporting requirements, requirements to obtain GHG permits for certain industrial plants and GHG performance standards for some facilities. Although the EPA recently proposed to repeal and replace certain GHG requirements, additional GHG regulation may be forthcoming at the U.S. federal or state level that could result in the creation of additional costs in the form of taxes or required acquisition or trading of emission allowances.

Compliance with these or other changes in laws, regulations and obligations that create a GHG emissions trading scheme or GHG reduction policies generally could significantly increase our costs or reduce demand for products we produce. Additionally, compliance with these regulations may result in increased permitting necessary for the operation of our business or for any of our growth plans. Difficulties in obtaining such permits could have an adverse effect on our future growth. Therefore, any future potential regulations and legislation could result in increased compliance costs, additional operating restrictions or delays in implementing growth projects or other capital investments, and could have a material adverse effect on our business and results of operations. In addition, climate changes, such as drought conditions or increased frequency and severity of hurricanes and floods, could have an adverse effect on our assets and operations.

We may be required to record material charges against our earnings due to any number of events that could cause impairments to our assets.

We may be required to reduce production or idle facilities for extended periods of time or exit certain businesses as a result of the cyclical nature of our industry. Specifically, oversupplies of or lack of demand for particular products or high raw material prices may cause us to reduce production. We may choose to reduce production at certain facilities because we have off-take arrangements at other facilities, which make any reductions or idling unavailable at those facilities. Any decision to permanently close facilities or exit a business likely would result in impairment and other charges to earnings.

Temporary outages at our facilities can last for several quarters and sometimes longer. These outages could cause us to incur significant costs, including the expenses of maintaining and restarting these facilities. In addition, even though we may reduce production at facilities, we may be required to continue to purchase or pay for utilities or raw materials under take-or-pay supply agreements.

Increased regulation or deselection of plastic could lead to a decrease in demand growth for some of our products.

In 2018, the European Union adopted a strategy for plastics in a circular economy that aims to increase significantly the recycling of plastic and target the plastic products most often found on beaches and in seas. In addition, local and other governments have increasingly proposed or implemented bans on plastic items such as disposable bags and straws, as well as other food packaging. Additionally, plastics have recently faced increased public backlash and scrutiny. Increased regulation of, or prohibition on, the use of plastics could increase the costs incurred by our customers to use such products or otherwise limit the use of these products, and could lead to a decrease in demand for PE, PP, and other products we make. Such a decrease in demand could adversely affect our business, operating results and financial condition.

Our business is capital intensive and we rely on cash generated from operations and external financing to fund our growth and ongoing capital needs. Limitations on access to external financing could adversely affect our operating results.

We require significant capital to operate our current business and fund our growth strategy. Moreover, interest payments, dividends and the expansion of our business or other business opportunities may require significant amounts of capital. We believe that our cash from operations currently will be sufficient to meet these needs. However, if we need external financing, our access to credit markets and pricing of our capital is dependent upon maintaining sufficient credit ratings from credit rating agencies and the state of the capital markets generally. There can be no assurances that we would be able to incur indebtedness on terms we deem acceptable, and it is possible that the cost of any financings could increase significantly, thereby increasing our expenses and decreasing our net income. If we are unable to generate sufficient cash flow or raise adequate external financing, including as a result of significant disruptions in the global credit markets, we could be forced to restrict our operations and growth opportunities, which could adversely affect our operating results.

We may use our \$2.5 billion revolving credit facility, which backs our commercial paper program, to meet our cash needs, to the extent available. As of December 31, 2019, we had no borrowings or letters of credit outstanding under the facility and \$262 million, net of discount, outstanding under our commercial paper program, leaving an unused and available credit capacity of \$2,229 million. We may also meet our cash needs by selling receivables under our \$900 million U.S. Receivables Facility. As of December 31, 2019, subject to a borrowing base of eligible receivables, we had availability of \$690 million under this facility. In the event of a default under our credit facility or any of our senior notes, we could be required to immediately repay all outstanding borrowings and make cash deposits as collateral for all obligations the facility supports, which we may not be able to do. Any default under any of our credit arrangements could cause a default under many of our other credit agreements and debt instruments. Without waivers from lenders party to those agreements, any such default could have a material adverse effect on our ability to continue to operate.

Legislation and regulatory initiatives could lead to a decrease in demand for our products.

New or revised governmental regulations and independent studies relating to the effect of our products on health, safety and the environment may affect demand for our products and the cost of producing our products. Initiatives by governments and private interest groups will potentially require increased toxicological testing and risk assessments of a wide variety of chemicals, including chemicals used or produced by us. For example, in the United States, the National Toxicology Program (“NTP”) is a federal interagency program that seeks to identify and select for study chemicals and other substances to evaluate potential human health hazards. In the European Union, the Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals (“REACH”) is regulation

designed to identify the intrinsic properties of chemical substances, assess hazards and risks of the substances, and identify and implement the risk management measures to protect humans and the environment.

Assessments under NTP, REACH or similar programs or regulations in other jurisdictions may result in heightened concerns about the chemicals we use or produce and may result in additional requirements being placed on the production, handling, labeling or use of those chemicals. Such concerns and additional requirements could also increase the cost incurred by our customers to use our chemical products and otherwise limit the use of these products, which could lead to a decrease in demand for these products. Such a decrease in demand could have an adverse impact on our business and results of operations.

Adverse results of legal proceedings could materially adversely affect us.

We are subject to and may in the future be subject to a variety of legal proceedings and claims that arise out of the ordinary conduct of our business. Results of legal proceedings cannot be predicted with certainty. Irrespective of its merits, litigation may be both lengthy and disruptive to our operations and may cause significant expenditure and diversion of management attention. We may be faced with significant monetary damages or injunctive relief against us that could have an adverse impact on our business and results of operations should we fail to prevail in certain matters.

Significant changes in pension fund investment performance or assumptions relating to pension costs may adversely affect the valuation of pension obligations, the funded status of pension plans, and our pension cost.

Our pension cost is materially affected by the discount rates used to measure pension obligations, the level of plan assets available to fund those obligations at the measurement date and the expected long-term rates of return on plan assets. Significant changes in investment performance or a change in the portfolio mix of invested assets may result in corresponding increases and decreases in the value of plan assets, particularly equity securities, or in a change of the expected rate of return on plan assets. Any changes in key actuarial assumptions, such as the discount rate or mortality rate, would impact the valuation of pension obligations, affecting the reported funded status of our pension plans as well as the net periodic pension cost in the following fiscal years.

Nearly all of our current pension plans have projected benefit obligations that exceed the fair value of the plan assets. As of December 31, 2019, the aggregate deficit was \$1,287 million. Any declines in the fair values of the pension plans' assets could require additional payments by us in order to maintain specified funding levels.

Our pension plans are subject to legislative and regulatory requirements of applicable jurisdictions, which could include, under certain circumstances, local governmental authority to terminate the plan.

Integration of acquisitions could disrupt our business and harm our financial condition and stock price.

We have made and may continue to make acquisitions in order to enhance our business. Acquisitions involve numerous risks, including meeting our standards for compliance, problems combining the purchased operations, technologies or products, unanticipated costs and liabilities, diversion of management's attention from our core businesses, and potential loss of key employees.

There can be no assurance that we will be able to integrate successfully any businesses, products, technologies, or personnel that we might acquire. The integration of businesses that we may acquire is likely to be a complex, time-consuming, and expensive process and we may not realize the anticipated revenues, synergies, or other benefits associated with our acquisitions if we do not manage and operate the acquired business up to our expectations. If we are unable to efficiently operate as a combined organization utilizing common information and communication systems, operating procedures, financial controls, and human resources practices, our business, financial condition, and results of operations may be adversely affected.

Item 1B. Unresolved Staff Comments.

None.

Item 3. Legal Proceedings.

Environmental Matters

From time to time we and our joint ventures receive notices or inquiries from government entities regarding alleged violations of environmental laws and regulations pertaining to, among other things, the disposal, emission and storage of chemical and petroleum substances, including hazardous wastes. Item 103 of the SEC's Regulation S-K requires disclosure of certain environmental matters when a governmental authority is a party to the proceedings and the proceedings involve potential monetary sanctions that we reasonably believe could exceed \$100,000. The matters below are disclosed solely pursuant to that requirement.

In September 2013, the Environmental Protection Agency ("EPA") Region V issued a Notice and Finding of Violation alleging violations at our Morris, Illinois facility related to flaring activity. The Notice generally alleges failures to monitor steam usage and improper flare operations. We reasonably believe that EPA Region V may assert a penalty demand in excess of \$100,000.

The EPA has been conducting an enforcement initiative regarding flare emissions at petrochemical plants. In July 2014, we received a Clean Air Act section 114 information request regarding flares at four U.S. facilities. In response to the information we provided and subsequent discussions, the EPA and Department of Justice (the "DOJ") have indicated that they are seeking a consent decree that would require certain corrective measures. We reasonably believe that resolution of this matter will involve payment of a monetary sanction in excess of \$100,000. We continue to work with the EPA and DOJ to resolve this matter.

In March 2018, the Cologne, Germany local court issued a regulatory fine notice of €1,800,000 arising from a pipeline leak near our Wesseling, Germany facility. We expect the Cologne prosecutor to issue a corresponding payment request, which will resolve the matter.

In September 2019, the Illinois Environmental Protection Agency referred three emission events that occurred at our Tuscoal facility in August and September 2018 to the Illinois Attorney General's Office ("IAG") for enforcement. In October 2019, IAG made a \$225,000 civil penalty demand. The parties are currently engaged in settlement discussions.

In November 2019, the Channelview facility received a Proposed Agreed Order from the Texas Commission on Environmental Quality alleging violations of leak detection and repair requirements, and assessing an administrative penalty in the amount of \$279,336. We are currently engaged in discussions with the commission to resolve this matter.

Litigation and Other Matters

Information regarding our litigation and other legal proceedings can be found in Note 19 to the Consolidated Financial Statements.

Item 4. Mine Safety Disclosures.

Not applicable.

PART II

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

Market and Dividend Information

Our shares were listed on the New York Stock Exchange (“NYSE”) on October 14, 2010 under the symbol “LYB.”

The payment of dividends or distributions in the future will be subject to the requirements of Dutch law and the discretion of our Board of Directors. The declaration of any future cash dividends and, if declared, the amount of any such dividends, will depend upon general business conditions, our financial condition, our earnings and cash flow, our capital requirements, financial covenants and other contractual restrictions on the payment of dividends or distributions.

There can be no assurance that any dividends or distributions will be declared or paid in the future.

Holders

As of February 18, 2020, there were approximately 5,300 record holders of our shares, including Cede & Co. as nominee of the Depository Trust Company.

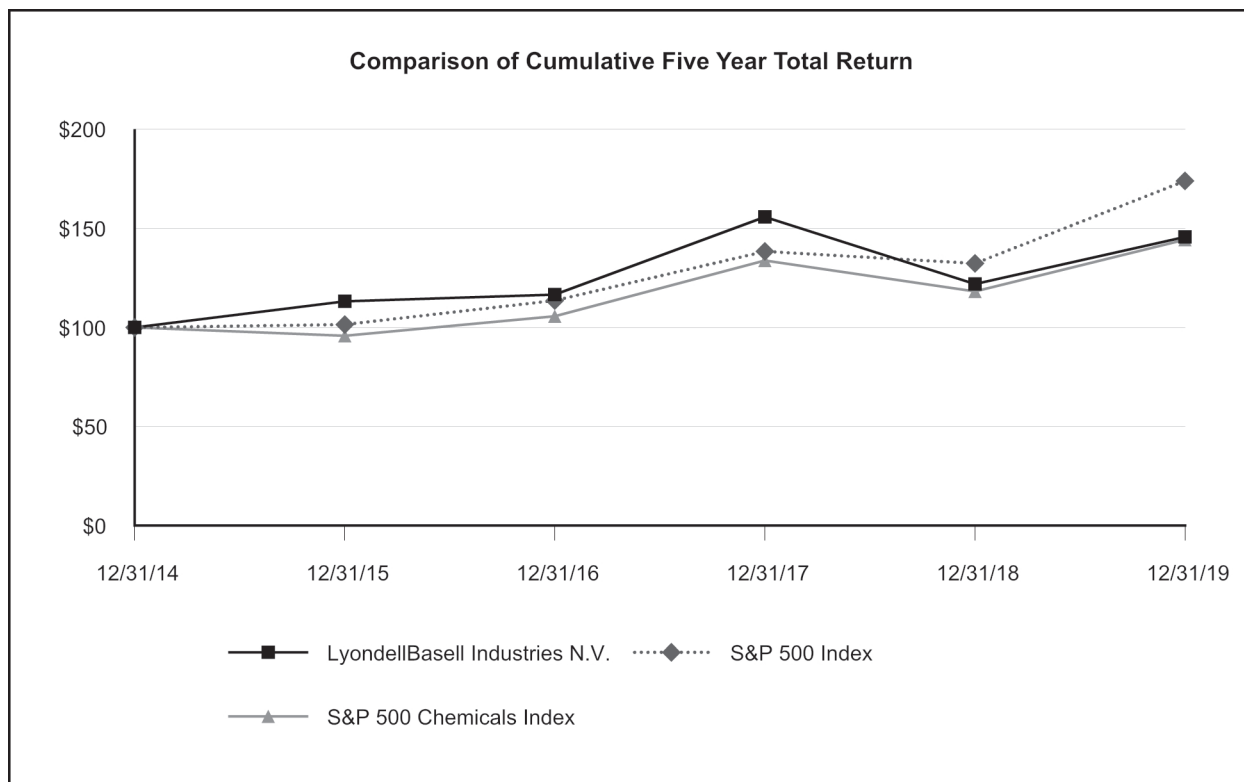
United Kingdom Tax Considerations

As a result of its United Kingdom tax residency, dividend distributions by LyondellBasell Industries N.V. to its shareholders are not subject to withholding tax, as the United Kingdom currently does not levy a withholding tax on dividend distributions.

Performance Graph

The performance graph and the information contained in this section is not “soliciting material,” is being furnished, not filed, with the SEC and is not to be incorporated by reference into any of our filings under the Securities Act or the Exchange Act whether made before or after the date hereof and irrespective of any general incorporation language contained in such filing.

The graph below shows the relative investment performance of LyondellBasell Industries N.V. shares, the S&P 500 Index and the S&P 500 Chemicals Index since December 31, 2014. The graph assumes that \$100 was invested on December 31, 2014 and any dividends paid were reinvested at the date of payment. The graph is presented pursuant to SEC rules and is not meant to be an indication of our future performance.



	12/31/2014	12/31/2015	12/31/2016	12/31/2017	12/31/2018	12/31/2019
LyondellBasell Industries N.V.	\$100.00	\$113.15	\$116.44	\$155.70	\$121.92	\$145.58
S&P 500 Index	\$100.00	\$101.38	\$113.51	\$138.29	\$132.23	\$173.86
S&P 500 Chemicals Index	\$100.00	\$95.82	\$105.56	\$133.70	\$118.18	\$144.20

Issuer Purchases of Equity Securities

On May 31, 2019, we announced a share repurchase authorization of up to 37,032,594 of our ordinary shares, which was fully utilized during the third quarter. On September 12, 2019, we announced a share repurchase authorization of up to 33,336,067 of our ordinary shares through March 12, 2021, which superseded any prior repurchase authorizations and represents the maximum number of shares that may be purchased as of December 31, 2019. The maximum number of shares that may yet be purchased is not necessarily an indication of the number of shares that will ultimately be purchased.

Item 6. Selected Financial Data.

The following selected financial data was derived from our consolidated financial statements, which were prepared from our books and records. This data should be read in conjunction with the Consolidated Financial Statements and related notes thereto and “Management’s Discussion and Analysis of Financial Condition and Results of Operations,” below, which includes a discussion of factors that will enhance an understanding of this data.

In millions of dollars, except per share data	Year Ended December 31,				
	2019	2018	2017	2016	2015
Results of operations data:					
Sales and other operating revenues	\$ 34,727	\$ 39,004	\$ 34,484	\$ 29,183	\$ 32,735
Operating income ^(a)	4,116	5,231	5,460	5,060	6,122
Interest expense ^(b)	(347)	(360)	(491)	(322)	(310)
Income from equity investments	225	289	321	367	339
Income from continuing operations ^{(a)(b)(c)}	3,404	4,698	4,895	3,847	4,479
Earnings per share from continuing operations:					
Basic	9.61	12.06	12.28	9.17	9.63
Diluted	9.60	12.03	12.28	9.15	9.60
Loss from discontinued operations, net of tax	(7)	(8)	(18)	(10)	(5)
Loss per share from discontinued operations:					
Basic	(0.02)	(0.02)	(0.05)	(0.02)	(0.01)
Diluted	(0.02)	(0.02)	(0.05)	(0.02)	(0.01)
Balance sheet data:					
Total assets	\$ 30,435	\$ 28,278	\$ 26,206	\$ 23,442	\$ 22,757
Short-term debt	445	885	68	594	353
Long-term debt ^(d)	11,617	8,502	8,551	8,387	7,675
Cash and cash equivalents	858	332	1,523	875	924
Short-term investments	196	892	1,307	1,147	1,064
Accounts receivable	3,102	3,503	3,539	2,842	2,517
Inventories	4,588	4,515	4,217	3,809	4,051
Working capital ^(e)	4,762	4,931	4,861	4,122	4,386
Cash flow data:					
Cash provided by (used in):					
Operating activities	\$ 4,961	\$ 5,471	\$ 5,206	\$ 5,606	\$ 5,842
Investing activities	(1,635)	(3,559)	(1,756)	(2,301)	(1,046)
Expenditures for property, plant and equipment	(2,694)	(2,105)	(1,547)	(2,243)	(1,440)
Financing activities	(2,835)	(3,008)	(2,859)	(3,349)	(4,850)
Dividends - common stock declared per share	\$ 4.15	\$ 4.00	\$ 3.55	\$ 3.33	\$ 3.04

- (a) Operating income and Income from continuing operations in 2019 include pre-tax charges of \$116 million (\$89 million, after tax) for integration costs associated with our acquisition of A. Schulman and a pretax, non-cash charge of \$33 million (\$25 million, after tax), related to lower of cost or market (“LCM”) inventory valuation.

In 2018, we had pre-tax acquisition-related transaction and integration costs of \$73 million (\$57 million, after tax) associated with the acquisition of A. Schulman.

In 2017, we had a pre-tax, non-cash gain of \$21 million (\$14 million, after tax) related to the elimination of an obligation associated with a lease.

In 2016, we had a pre-tax charge of \$58 million (\$37 million, after tax) for a pension settlement. Operating income and Income from continuing operations in 2016 and 2015 included pre-tax, non-cash charges of \$29 million (\$18 million, after tax) and \$548 million (\$351 million, after tax), respectively, related to LCM inventory valuation adjustments.

- (b) Interest expense and Income from continuing operations in 2017 include pre-tax charges of \$113 million (\$106 million, after tax) related to the redemption of \$1,000 million aggregate principal amount of our then outstanding 5% senior notes due 2019.
- (c) Income from continuing operations in 2019 and 2018 includes a non-cash tax benefit of \$113 million and \$358 million, respectively, from the previously unrecognized tax benefits and the release of associated accrued interest. Also included in 2019 is a gain of \$5 million on the sale of a joint venture interest in Asia in the fourth quarter of 2019. In 2018, we recognized a \$34 million after tax gain on the sale of our carbon black subsidiary in France.

Income from continuing operations in 2017 includes an \$819 million non-cash tax benefit related to the lower federal income tax rate resulting from the enactment of the U.S. Tax Cuts and Jobs Act, an after tax gain \$103 million on the sale of our 27% interest in Geosel, a joint venture in France and a \$20 million after tax gain on the sale of property in Lake Charles, Louisiana.

Income from continuing operations in 2016 includes \$135 million of out-of-period adjustments related to taxes on our cross-currency swaps and deferred liabilities related to some of our consolidated subsidiaries. Also included in 2016, is an after tax gain of \$78 million on the sale of our wholly owned Argentine subsidiary.

- (d) Includes Long-term debt and Current maturities of long-term debt.
- (e) We define working capital as the sum of Accounts receivable and Inventories less Accounts payable.

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

GENERAL

This discussion should be read in conjunction with the information contained in our Consolidated Financial Statements, and the accompanying notes elsewhere in this report. Unless otherwise indicated, the “Company,” “we,” “us,” “our” or similar words are used to refer to LyondellBasell Industries N.V. together with its consolidated subsidiaries (“LyondellBasell N.V.”).

The discussion summarizing the significant factors affecting the results of operations and financial condition for the year ended December 31, 2017, can be found in Part II, “Item 7. Management’s Discussion and Analysis of Financial Condition and Results of Operations” of our Annual Report on Form 10-K for the year ended December 31, 2018, which was filed with the Securities and Exchange Commission on February 21, 2019, of which Item 7 is incorporated herein by reference.

OVERVIEW

During 2019 LyondellBasell continued to exhibit strong cash generation and remained committed to our disciplined capital allocation strategy. Over each of the past six years, we have consistently delivered \$5 billion to \$6 billion in cash from operating activities. We affirmed our commitment to a strong and progressive dividend during 2019 by increasing our quarterly dividend for the eleventh time and returning a total of \$5.2 billion in dividends and share repurchases to shareholders. Our businesses benefited from abundant and low-cost natural gas liquid feedstocks throughout the year, and we demonstrated our capability to derive value from mergers and acquisitions through the integration of the A. Schulman acquisition.

During the fourth quarter, margins within most of our businesses were impacted by slow industrial demand and typical seasonality. Refining margins improved on a higher Maya 2-1-1 crack spread and relatively strong prices for naphtha and coke. Our Technology segment achieved record licensing revenues, contributing to the most profitable year in the Company’s history for the segment.

In 2019, we developed opportunities to expand into new markets by leveraging our technologies to strengthen our position in Asia. In June, we announced new polypropylene capacity through our Thailand joint venture, HMC Polymers. In September, we signed a joint venture Memorandum of Understanding (“MoU”) with Liaoning Bora Enterprise Group to build an integrated cracker and polyolefins project expanding our footprint in the rapidly growing Chinese market. Recently, we announced our intention to expand our existing partnership with Sinopec to build a second propylene oxide and styrene monomer plant in China utilizing our advantaged technology.

Significant items that affected results in 2019 relative to 2018 include:

- Lower Olefins and Polyolefins—Americas (“O&P—Americas”) segment results due to a decline in polyethylene margins while olefins margins improved;
- Olefins and Polyolefins—Europe, Asia, International (“O&P—EAI”) segment results decreased due to unfavorable foreign exchange impacts and lower income from equity investments;
- Intermediates and Derivatives (“I&D”) segment results declined due to margin and volume decreases primarily driven by intermediate chemicals;
- Higher Advanced Polymer Solutions (“APS”) segment results primarily due to the contribution of results from A. Schulman product lines;
- Lower Refining segment results due to a decline in margins; and
- Higher Technology segment results due to increased licensing revenue.

Other noteworthy items in 2019 include the following:

- Redeemed \$1,000 million of our 5% senior notes due 2019;
- Executed a three-year, \$4,000 million senior unsecured delayed draw term loan credit facility, of which \$1,950 million was outstanding as of December 31, 2019;
- Issued €1,000 million of long-term guaranteed notes used to refinance \$1,000 million of long-term debt and repay a portion of our outstanding short-term debt;
- Issued \$1,000 million of long-term guaranteed notes used to repay our indebtedness outstanding under our Term Loan due 2020;
- Repurchased \$3.8 billion of shares, primarily through the completion of a tender offer;
- Increased quarterly dividend from \$1.00 per share to \$1.05 per share in the second quarter;
- Commenced commissioning of our *Hyperzone* high density polyethylene plant; and
- Continued construction of our new PO/TBA plant at our Channelview, Texas facility, which is on track to be completed in late 2021.

Results of operations for the periods discussed are presented in the table below.

<u>Millions of dollars</u>	Year Ended December 31,	
	2019	2018
Sales and other operating revenues	\$ 34,727	\$ 39,004
Cost of sales	29,301	32,529
Selling, general and administrative expenses	1,199	1,129
Research and development expenses	111	115
Operating income	4,116	5,231
Interest expense	(347)	(360)
Interest income	19	45
Other income, net	39	106
Income from equity investments	225	289
Provision for income taxes	648	613
Income from continuing operations	3,404	4,698
Loss from discontinued operations, net of tax	(7)	(8)
Net income	\$ 3,397	\$ 4,690

RESULTS OF OPERATIONS

Revenues—Revenues decreased \$4,277 million, or 11%, in 2019 compared to 2018. Average sales prices were lower for most of our products as sales prices generally correlate with crude oil prices, which decreased relative to 2018. These lower prices led to a revenue decrease of 10% in 2019. Lower sales volumes resulted in a revenue decrease of 2% relative to 2018. Unfavorable foreign exchange impacts in 2019 resulted in a revenue decrease of 2% relative to the prior period. These decreases were partially offset by the acquired operations of A. Schulman, which contributed an additional 3%, or \$1,304 million, of revenues in 2019 compared to 2018.

Cost of Sales—Cost of sales decreased \$3,228 million, or 10%, in 2019 compared to 2018. This decrease in cost of sales is primarily due to lower feedstock and energy costs. Costs for crude oil, heavy liquid feedstocks and natural gas liquids (“NGLs”) and other feedstocks were lower in 2019 relative to 2018. This decrease corresponds with the decrease in revenues as discussed above.

Fluctuations in our cost of sales are generally driven by changes in feedstock and energy costs. Feedstock and energy related costs generally represent approximately 75% to 80% of cost of sales, other variable costs account for approximately 10% of cost of sales on an annual basis and fixed operating costs, consisting primarily of expenses associated with employee compensation, depreciation and amortization, and maintenance, range from approximately 10% to 15% in each annual period.

In 2019, our O&P—Americas segment and APS segment recognized lower of cost or market (“LCM”) inventory valuation charges of \$25 million and \$8 million, respectively, primarily due to a decline in domestic polyethylene prices. Cost of sales also includes \$23 million related to A. Schulman integration costs incurred during 2019.

Depreciation and amortization increased \$71 million, or 6%, in 2019 compared to 2018. This increase is primarily due to the addition of A. Schulman assets acquired in August 2018. In 2020, we estimate depreciation and amortization charges will increase approximately 15% due to the completion of various capital projects, including our *Hyperzone* project.

SG&A Expense—Selling, general and administrative (“SG&A”) expenses increased \$70 million in 2019 compared to 2018. Higher SG&A costs related to operating the A. Schulman assets acquired in August 2018 for a full year which resulted in a \$115 million, or 10%, increase. Additionally, integration costs increased by \$20 million compared to 2018. These increased costs were partially offset by a 5% decline in evaluation and pre-project planning costs of certain growth projects and a 2% decline in employee-related expenses, relative to 2018.

Operating Income—Operating income decreased \$1,115 million in 2019 compared to 2018. Operating income for our O&P—Americas, I&D, Refining, APS and O&P—EAI segments declined by \$474 million, \$467 million, \$212 million, \$39 million and \$9 million, respectively, relative to 2018. These decreases were partially offset by an increase in operating income in our Technology segment of \$90 million. Operating results for each of our business segments are reviewed further in the “Segment Analysis” section below.

Other Income, Net—Other income, net decreased \$67 million in 2019 compared to 2018, which included a \$36 million gain on the sale of our carbon black subsidiary in France. In addition, foreign currency exchange rate fluctuations and pension and other postretirement benefits decreased Other income by \$15 million and \$13 million, respectively, relative to 2018.

Income from Equity Investments—Our income from equity investments decreased \$64 million in 2019 primarily due to reduced polyolefin spreads for our joint ventures in our O&P—EAI segment.

Income Taxes—Our effective income tax rates of 16.0% in 2019 and 11.5% in 2018 resulted in tax provisions of \$648 million and \$613 million, respectively.

We monitor tax law changes and the potential impact to our results of operations. There continues to be increased attention to the tax practices of multinational companies, including certain provisions of H.R. 1, also known as the U.S. Tax Cuts and Jobs Act (the “Tax Act”), the European Union’s state aid investigations, proposals by the Organization for Economic Cooperation and Development with respect to base erosion and profit shifting, and European Union tax directives and their implementation. Management does not believe that recent changes in income tax laws, other than those disclosed and reflected in our financial statements, will have a material impact on our Consolidated Financial Statements, although new or proposed changes to tax laws could affect our tax liabilities in the future.

Our effective income tax rate fluctuates based on, among other factors, changes in pre-tax income in countries with varying statutory tax rates, the U.S. domestic production activity deduction that applied to periods prior to 2018, changes in valuation allowances, changes in foreign exchange gains/losses, the amount of exempt income and changes in unrecognized tax benefits associated with uncertain tax positions.

Our exempt income primarily includes interest income, export incentives, and equity earnings of our joint ventures. Interest income earned by certain of our European subsidiaries through intercompany financings is either untaxed or taxed at rates substantially lower than the U.S. statutory rate. Export incentives relate to tax benefits derived from elections and structures available for U.S. exports. Equity earnings attributable to the earnings of our joint ventures, when paid through dividends to certain European subsidiaries, are exempt from all or portions of normal statutory income tax rates. We currently anticipate the favorable treatment for interest income, dividends, and export incentives to continue in the near term; however, this treatment is based on current law and tax rulings, which could change, including changes with respect to proposed Treasury regulations under the Tax Act if finalized. Foreign exchange gains/losses have a permanent impact on our effective income tax rate that can cause unpredictable movement in our effective income tax rate. We continue to maintain valuation allowances in various jurisdictions totaling \$85 million as of 2019, which could impact our effective income tax rate in the future. We believe our effective income tax rate for 2020 will be approximately 20%.

The 2019 effective income tax rate of 16.0%, which was lower than the U.S. statutory tax rate of 21%, was favorably impacted by exempt income (-4.5%), a tax benefit related to a patent box ruling (-1.6%), a loss on the liquidation of an entity (-1.3%), and changes in unrecognized tax benefits associated with uncertain tax positions (-1.0%). These favorable items were partially offset by the effects of earnings in various countries, notably in Europe, with higher statutory tax rates (1.6%) and U.S. state and local income taxes (0.7%).

During 2019, we recognized a \$113 million non-cash benefit to our effective tax rate primarily as a result of the expiration of certain statutes of limitations. This amount consists of the recognition of \$100 million of previously unrecognized tax benefits and the release of \$13 million of previously accrued interest.

The 2018 effective income tax rate of 11.5%, which was lower than the U.S. statutory tax rate of 21%, was favorably impacted by changes in unrecognized tax benefits associated with uncertain tax positions (-6.0%) and exempt income (-5.6%). These favorable items were partially offset by the effects of earnings in various countries, notably in Europe, with higher statutory tax rates (1.7%) and U.S. state and local income taxes (1.0%).

During 2018, we entered into various audit settlements impacting specific uncertain tax positions. These audit settlements resulted in a \$358 million non-cash benefit to our effective tax rate consisting of the recognition of \$299 million of previously unrecognized tax benefits as a reduction for tax positions of prior years and the release of \$59 million of previously accrued interest.

Comprehensive Income

We had comprehensive income of \$2,976 million in 2019 and \$4,682 million in 2018. Comprehensive income decreased by \$1,706 million in 2019 compared to 2018, primarily due to lower net income, net unfavorable changes in defined pension and other postretirement benefits, and net unfavorable impacts of financial derivative instruments primarily driven by periodic changes in benchmark interest rates. These decreases were partially offset by net less unfavorable impacts of unrealized changes in foreign currency translation adjustments.

The predominant functional currency for our operations outside of the U.S. is the euro. Relative to the U.S. dollar, the value of the euro decreased during 2019 resulting in net losses as reflected in the Consolidated Statements of Comprehensive Income. These net losses include pre-tax gains of \$26 million in 2019, which represent the effective portion of our net investment hedges.

In 2019, the cumulative after-tax effect of our derivatives designated as cash flow hedges was a net loss of \$132 million. The strengthening of the U.S. dollar against the euro in 2019 and periodic changes in benchmark interest rates resulted in a pre-tax gain of \$109 million related to our cross-currency swaps. A \$40 million pre-tax loss related to our cross-currency swaps was reclassified to Other income, net in 2019. In 2019, a pre-tax loss of \$223 million related to forward-starting interest rate swaps was driven by changes in benchmark interest rates. The remaining change relates to our commodity cash flow hedges.

We recognized defined benefit pension and other post-retirement benefit plans pre-tax losses of \$361 million in 2019 and pre-tax gains of \$41 million in 2018, primarily due to the fluctuations in the discount rate assumption used in determining the net benefit liabilities for our pension and other post-retirement benefit plans. See Note 16 to the Consolidated Financial Statements for additional information regarding net actuarial losses.

Segment Analysis

We use earnings before interest, income taxes, and depreciation and amortization (“EBITDA”) as our measure of profitability for segment reporting purposes. This measure of segment operating results is used by our chief operating decision maker to assess the performance of and allocate resources to our operating segments. Intersegment eliminations and items that are not directly related or allocated to business operations, such as foreign exchange gains (losses) and components of pension and other postretirement benefit costs other than service cost, are included in “Other.” For additional information related to our operating segments, as well as a reconciliation of EBITDA to its nearest generally accepted accounting principles (“GAAP”) measure, Income from continuing operations before income taxes, see Note 22 to our Consolidated Financial Statements.

Our continuing operations are managed through six reportable segments: O&P—Americas, O&P—EAI, I&D, APS, Refining and Technology. Results for our APS segment incorporates the businesses acquired from A. Schulman beginning August 21, 2018. The following tables reflect selected financial information for our reportable segments.

<u>Millions of dollars</u>	<u>Year Ended December 31,</u>	
	<u>2019</u>	<u>2018</u>
Sales and other operating revenues:		
O&P—Americas	\$ 8,435	\$ 10,408
O&P—EAI	9,504	10,838
I&D	7,834	9,588
APS	4,850	4,024
Refining	8,251	9,157
Technology	663	583
Other, including segment eliminations	(4,810)	(5,594)
Total	<u>\$ 34,727</u>	<u>\$ 39,004</u>
Operating income (loss):		
O&P—Americas	\$ 1,777	\$ 2,251
O&P—EAI	673	682
I&D	1,249	1,716
APS	290	329
Refining	(240)	(28)
Technology	374	284
Other, including segment eliminations	(7)	(3)
Total	<u>\$ 4,116</u>	<u>\$ 5,231</u>

<u>Millions of dollars</u>	<u>Year Ended December 31,</u>	
	<u>2019</u>	<u>2018</u>
Depreciation and amortization:		
O&P–Americas	\$ 470	\$ 442
O&P–EAI	208	208
I&D	295	287
APS	133	69
Refining	169	192
Technology	37	43
Total	<u>\$ 1,312</u>	<u>\$ 1,241</u>
Income from equity investments:		
O&P—Americas	\$ 46	\$ 58
O&P—EAI	172	225
I&D	7	6
Total	<u>\$ 225</u>	<u>\$ 289</u>
Other income, net:		
O&P—Americas	\$ 9	\$ 11
O&P—EAI	9	48
I&D	6	2
APS	1	2
Refining	6	3
Technology	—	1
Other, including intersegment eliminations	8	39
Total	<u>\$ 39</u>	<u>\$ 106</u>
EBITDA:		
O&P—Americas	\$ 2,302	\$ 2,762
O&P—EAI	1,062	1,163
I&D	1,557	2,011
APS	424	400
Refining	(65)	167
Technology	411	328
Other, including intersegment eliminations	1	36
Total	<u>\$ 5,692</u>	<u>\$ 6,867</u>

Olefins and Polyolefins—Americas Segment

Overview—EBITDA declined in 2019 relative to 2018 primarily due to lower polyethylene results, partially offset by improved olefin results.

In calculating the impact of margin and volume on EBITDA, consistent with industry practice, management offsets revenues and volumes related to ethylene co-products against the cost to produce ethylene. Volume and price impacts of ethylene co-products are reported in margin. Ethylene is a major building block of olefins and polyolefins and as such, ethylene sales volumes and prices and our internal cost of ethylene production are included in management's assessment of the segment's performance.

Ethylene Raw Materials—Ethylene and its co-products are produced from two major raw material groups:

- NGLs, principally ethane and propane, the prices of which are generally affected by natural gas prices; and
- crude oil-based liquids (“liquids” or “heavy liquids”), including naphtha, condensates and gas oils, the prices of which are generally related to crude oil prices.

Although prices of these raw materials are generally related to crude oil and natural gas prices, during specific periods the relationships among these materials and benchmarks may vary significantly. We have significant flexibility to vary the raw material mix and process conditions in our U.S. olefins plants in order to maximize profitability as market prices for both feedstocks and products change.

Strong supplies from the U.S. shale gas/oil boom resulted in ethane being a preferred feedstock in our U.S. plants in 2019. Ethane remained the preferred U.S. feedstock for ethylene despite higher prices driven by increased demand from newly-constructed U.S. olefins units and supply constraints in the Gulf Coast NGL fractionation and pipeline systems. In 2019 and 2018, we produced approximately 80% of our ethylene from ethane.

The following table sets forth selected financial information for the O&P—Americas segment including Income from equity investments, which is a component of EBITDA.

<u>Millions of dollars</u>	<u>Year Ended December 31,</u>	
	<u>2019</u>	<u>2018</u>
Sales and other operating revenues	\$ 8,435	\$ 10,408
Income from equity investments	46	58
EBITDA	2,302	2,762

Revenues—Revenues decreased by \$1,973 million, or 19%, in 2019 compared to 2018. Average olefins and polyethylene sales prices were lower in 2019 compared to 2018 due to increased market supply stemming from new industry capacity additions and, to a lesser extent, a lower oil price environment. Polypropylene sales prices decreased with declining propylene feedstock prices. These lower sales prices were responsible for a revenue decrease of 18% in 2019. Lower sales volumes, driven mainly by planned downtime at our Matagorda, Texas and Clinton, Iowa facilities, accompanied by softer demand, also led to a revenue decrease of 1% in 2019.

EBITDA—EBITDA decreased by \$460 million, or 17%, in 2019 compared to 2018. Polyethylene results declined resulting in a 27% decrease in EBITDA driven by a \$261 per ton reduction in price spreads over ethylene as a result of increased market supply. An offsetting increase in olefin results increased EBITDA by 8% as ethylene margins increased by approximately \$75 per ton primarily due to lower feedstock costs partially offset by a lower propylene price. The segment recognized LCM charges of \$25 million in 2019 primarily due to a decline in domestic polyethylene prices.

Planned maintenance during the first and second quarters of 2020 is expected to reduce EBITDA by approximately \$25 million and \$30 million, respectively. In addition, we expect additional capacity from our *Hyperzone* polyethylene plant in 2020.

Olefins and Polyolefins—Europe, Asia, International Segment

Overview—EBITDA declined in 2019 compared to 2018 mainly as a result of lower combined polyolefin results, lower income from equity investments and unfavorable foreign exchange impacts, partially offset by higher olefin results.

In calculating the impact of margin and volume on EBITDA, consistent with industry practice, management offsets revenues and volumes related to ethylene co-products against the cost to produce ethylene. Volume and price impacts of ethylene co-products are reported in margin. Ethylene is a major building block of our olefins and polyolefins and as such, ethylene sales volumes and prices and our internal cost of ethylene production are included in management's assessment of the segment's performance.

Ethylene Raw Materials—In Europe, heavy liquids are the primary raw materials for our ethylene production. In 2019 and 2018, we continued to benefit by sourcing advantaged NGLs as market opportunities arose.

The following table sets forth selected financial information for the O&P—EAI segment including Income from equity investments, which is a component of EBITDA.

<u>Millions of dollars</u>	<u>Year Ended December 31,</u>	
	<u>2019</u>	<u>2018</u>
Sales and other operating revenues	\$ 9,504	\$ 10,838
Income from equity investments	172	225
EBITDA	1,062	1,163

Revenues—Revenues in 2019 decreased by \$1,334 million, or 12%, compared to 2018. Average sales prices in 2019 were lower across most products as sales prices generally correlate with crude oil prices, which on average, decreased compared to 2018. These lower average sales prices were responsible for revenue decreases of 10%. Higher sales volumes in 2019 resulted in 2% higher revenue driven by an absence of planned maintenance compared to 2018. Foreign exchange impacts, on average, were unfavorable and led to a revenue decrease of 4% in 2019.

EBITDA—EBITDA decreased by \$101 million, or 9%, in 2019 compared to 2018. Decreased polyethylene results led to a 5% decrease in EBITDA largely due to a decline in margins attributed to lower price spreads over ethylene of \$35 per ton. A decline in polypropylene results decreased EBITDA by 4% as price spreads over propylene decreased \$48 per ton. Joint venture equity income decreased largely due to reduced polyolefin spreads resulting in a 5% decrease in EBITDA. These decreases were partially offset by higher olefins results which led to a 5% increase of EBITDA. This increase was primarily due to increased volumes driven by improved reliability with planned and unplanned maintenance impacting 2018 results. In addition, unfavorable foreign exchange impacts reduced EBITDA by 5% in 2019.

Fourth quarter 2019 results decreased \$147 million, or 51%, versus the third quarter 2019. This change was primarily driven by a decline in olefin results as ethylene margins decreased due to higher feedstock costs and a lower propylene price.

Planned maintenance during the third and fourth quarters of 2020 is expected to reduce EBITDA by approximately \$15 million in each of the two quarters.

Intermediates and Derivatives Segment

Overview—EBITDA for our I&D segment was lower in 2019 compared to 2018, largely driven by margin and volume decreases primarily in our intermediate chemicals business.

The following table sets forth selected financial information for the I&D segment including Income from equity investments, which is a component of EBITDA.

<u>Millions of dollars</u>	<u>Year Ended December 31,</u>	
	<u>2019</u>	<u>2018</u>
Sales and other operating revenues	\$ 7,834	\$ 9,588
Income from equity investments	7	6
EBITDA	1,557	2,011

Revenues—Revenues for 2019 decreased by \$1,754 million, or 18%, compared to 2018. Lower average sales prices in 2019 for most products, which reflect the impacts of lower feedstock and energy costs, were responsible for a revenue decrease of 12% compared to 2018 which benefited from an elevated level of planned and unplanned industry outages. Lower sales volumes resulted in a 4% decrease in revenues in 2019. Foreign exchange impacts, on average, were unfavorable and led to a revenue decrease of 2%.

EBITDA—EBITDA decreased by \$454 million, or 23%, in 2019 compared to 2018. Decreased Intermediate Chemicals results led to an EBITDA decrease of 25%. This decrease was a result of lower margins across most businesses, in particular styrene, as demand weakened in 2019. Lower Propylene Oxide and Derivatives results decreased EBITDA by 5% largely due to lower volumes as demand declined. These declines in EBITDA were partially offset by higher Oxyfuels and Related Products results mainly due to improved margins driven by price improvements and low-cost butane, resulting in a 8% increase in EBITDA. Unfavorable foreign exchange impacts also reduced EBITDA by an additional 2% in 2019.

In 2020, we have planned maintenance that is expected to reduce EBITDA by approximately \$10 million in each of the first and second quarters and \$25 million in each of the third and fourth quarters.

Advanced Polymer Solutions Segment

Overview—EBITDA for our APS segment increased in 2019 compared to 2018, primarily due to the contribution of EBITDA stemming from the August 2018 acquisition of A. Schulman, partly offset by integration costs and lower volumes across most products.

The following table sets forth selected financial information for the APS segment:

<u>Millions of dollars</u>	<u>Year Ended December 31,</u>	
	<u>2019</u>	<u>2018</u>
Sales and other operating revenues	\$ 4,850	\$ 4,024
EBITDA	424	400

Revenues—Revenues increased in 2019 by \$826 million, or 21%, compared to 2018. Excluding the impacts of the August 2018 acquisition of A. Schulman, sales volumes declined in 2019 stemming from lower market demand for advanced polymer products, including lower automotive and roofing demand, which led to a 7% decrease in revenue in 2019. Lower average sales prices, as well as unfavorable foreign exchange impacts, each resulted in a 4% decrease in revenue. These declines were offset by \$1,304 million of additional revenues in the APS segment due to a full year of operating the A. Schulman assets in 2019 compared to a partial year in 2018 following the acquisition in August 2018.

EBITDA—EBITDA increased in 2019 by \$24 million, or 6%, compared to 2018. Compounding and Solutions results improved resulting in a 27% increase of EBITDA. This increase was largely due to an additional \$108 million of EBITDA contributed by the operations of A. Schulman in 2019. Advanced Polymers results reduced EBITDA by 9% largely due to lower volumes driven by reduced automotive and roofing demand. Further, transaction and integration costs related to the acquisition of A. Schulman were \$47 million higher in 2019 which reduced EBITDA by 12% relative to 2018. Unfavorable foreign exchange impacts also reduced EBITDA by an additional 3% in 2019.

Refining Segment

Overview—EBITDA for our Refining segment decreased due to lower industry margins driven by a compressed Maya differential, lower gasoline crack spreads and lower byproduct margins compared to 2018.

The following table sets forth selected financial information and heavy crude processing rates for the Refining segment and the U.S. refining market margins for the applicable periods. Light Louisiana Sweet “LLS” is a light crude oil, while “Maya” is a heavy crude oil.

<u>Millions of dollars</u>	<u>Year Ended December 31,</u>	
	<u>2019</u>	<u>2018</u>
Sales and other operating revenues	\$ 8,251	\$ 9,157
EBITDA	(65)	167
<u>Thousands of barrels per day</u>		
Heavy crude oil processing rates	263	231
<u>Market margins, dollars per barrel</u>		
Light crude oil—2-1-1	\$ 12.44	\$ 12.35
Light crude oil—Maya differential	5.14	7.50
Total Maya 2-1-1	<u>\$ 17.58</u>	<u>\$ 19.85</u>

Revenues—Revenues decreased by \$906 million, or 10%, in 2019 compared to 2018. Lower product prices led to a revenue decrease of 7% relative to 2018, due to an average crude oil price decrease of approximately \$6 per barrel in 2019. Although heavy crude oil processing rates increased during 2019, overall sales volumes decreased, driven by reduced rates on conversion units, due to crude selection and the optimization of refinery operations. This reduction in conversion rates resulted in a further revenue decrease of 3% during 2019.

EBITDA—EBITDA decreased by \$232 million, or 139%, in 2019 compared to 2018. Lower refining margins resulted in a 200% decrease in EBITDA relative to 2018. Unusually low discounts for heavy sour crude oils on the U.S. Gulf Coast led to a lower light-to-heavy crude price differential and compression in the benchmark Maya 2-1-1 market margin. This compression, combined with the Houston refinery’s configuration which limits the amount of light sweet crude that can be processed, created a challenging market for our Refining segment. Margins were further compressed by a negative byproduct impact largely driven by weakness in Naphtha and refinery grade propylene. This margin-driven decrease in EBITDA was partly offset by a 61% increase associated with the rise in heavy crude oil processing rates due to the completion of planned maintenance in 2018.

Fourth quarter 2019 EBITDA improved \$106 million, or 126%, representing a significant improvement compared to the fourth quarter 2018, which experienced a loss of \$84 million. Margin improvements resulted in a 76% increase in EBITDA as the Maya 2-1-1 crack spread increased by \$8.55 per barrel to \$19.44 per barrel. Heavy crude oil processing rates increased by 83 thousand barrels per day in the fourth quarter of 2019 due to the completion of planned maintenance in the second half of 2018. This volume driven improvement resulted in a 50% increase in EBITDA in the fourth quarter of 2019.

We anticipate improvements in our refining results in 2020 associated with the global adoption of International Maritime Organization (“IMO”) 2020.

Technology Segment

Overview—The Technology segment recognizes revenues related to the sale of polyolefin catalysts and the licensing of chemical and polyolefin process technologies. These revenues are offset in part by the costs incurred in the production of catalysts, licensing and services activities and research and development (“R&D”) activities. In 2019 and 2018, our Technology segment incurred approximately 50% and 55%, respectively, of all R&D costs. EBITDA for our Technology segment improved in 2019 compared to 2018 largely due to higher licensing revenues.

The following table sets forth selected financial information for the Technology segment.

<u>Millions of dollars</u>	<u>Year Ended December 31,</u>	
	<u>2019</u>	<u>2018</u>
Sales and other operating revenues	\$ 663	\$ 583
EBITDA	411	328

Revenues—Revenues increased by \$80 million, or 14%, in 2019 compared to 2018. Higher licensing revenues resulted in an increase of 18% in 2019 compared to 2018. Increases in average catalyst sales prices resulted in revenue increases of 4% in 2019. Lower catalyst sales volumes, driven by the timing of customer orders, resulted in a 3% decrease in revenue in 2019. Foreign exchange impacts that, on average, were unfavorable led to a revenue decrease of 5%.

EBITDA—EBITDA in 2019 increased by \$83 million, or 25%, compared to 2018. This increase was mainly driven by higher licensing revenues as several licensing agreements signed in 2018, primarily in China, were recognized in revenue during 2019.

FINANCIAL CONDITION

Operating, investing and financing activities of continuing operations, which are discussed below, are presented in the following table:

<u>Millions of dollars</u>	<u>Year Ended December 31,</u>	
	<u>2019</u>	<u>2018</u>
Source (use) of cash:		
Operating activities	\$ 4,961	\$ 5,471
Investing activities	(1,635)	(3,559)
Financing activities	(2,835)	(3,008)

Operating Activities—Cash of \$4,961 million generated by operating activities in 2019 reflected earnings adjusted for non-cash items, payments for employee bonuses, income taxes, and cash consumed by the main components of working capital—Accounts receivable, Inventories and Accounts payable. A \$113 million non-cash reduction in unrecognized tax benefits is reflected in Other operating activities in 2019. For additional information on this matter, see Note 18 to the Consolidated Financial Statements.

In 2019, the main components of working capital consumed \$13 million of cash driven by a decrease in Accounts payable and an increase in Inventories, partially offset by a decrease in Accounts receivable. The decrease in Accounts payable was primarily driven by weaker demand in our APS segment and a decrease in certain raw material costs in our I&D segment. The increase in Inventories was a result of inventory builds as a result of planned and unplanned maintenance in our O&P—EAI segment. The decrease in Accounts receivable was driven by decreases in our APS, I&D and O&P—Americas segments as a result of unfavorable market conditions.

Cash of \$5,471 million generated by operating activities in 2018 reflected earnings adjusted for non-cash items and net cash provided by the main components of working capital. A \$358 million non-cash reduction in unrecognized tax benefits is reflected in Other operating activities in 2018. For additional information on this matter, see Note 18 to the Consolidated Financial Statements.

In 2018, the main components of working capital provided \$93 million of cash. Lower Accounts receivable due primarily to lower sales volumes in our O&P—Americas, O&P—EAI and I&D segments at year end and higher Accounts payable due to higher feedstock prices were partially offset by an increase in Inventories primarily due to the lower sales volumes at year end.

Investing Activities—We invest cash in investment-grade and other high-quality instruments that provide adequate flexibility to redeploy funds as needed to meet our cash flow requirements while maximizing yield.

We received proceeds of \$511 million and \$423 million in 2019 and 2018, respectively, upon the sale and maturity of certain of our available-for-sale debt securities. Additionally, in 2019 and 2018, we received proceeds of \$332 million and \$97 million, respectively, on the sale of our investments in equity securities. In 2019, we received proceeds of \$527 million upon the maturity of certain of our repurchase agreements.

In 2019 and 2018 we invested \$108 million and \$50 million, respectively, in debt securities that are deemed available-for-sale. We also invested \$33 million and \$64 million in equity securities in 2019 and 2018, respectively. Our investments in available-for-sale debt securities and equity securities are classified as Short-term investments.

Upon expiration in 2018, we settled foreign currency contracts with notional values totaling €925 million which were designated as net investment hedges of our investments in foreign subsidiaries. Payments to and proceeds from our counterparties resulted in a net cash inflow of \$30 million.

In August 2018, we acquired A. Schulman for \$1,776 million, which is net of \$81 million of cash acquired and a liability deemed as a component of the purchase price.

In October 2018, we received net cash proceeds of \$37 million for the sale of our carbon black subsidiary in France.

Capital Expenditures—The following table summarizes capital expenditures for the periods presented:

<u>Millions of dollars</u>	<u>Year Ended December 31,</u>	
	<u>2019</u>	<u>2018</u>
Capital expenditures by segment:		
O&P—Americas	\$ 1,099	\$ 1,079
O&P—EAI	213	248
I&D	1,064	409
APS	59	62
Refining	149	250
Technology	94	48
Other	16	9
Consolidated capital expenditures of continuing operations	<u>\$ 2,694</u>	<u>\$ 2,105</u>

In 2019 and 2018, our capital expenditures included construction related to our PO/TBA plant at our Channelview, Texas facility and our *Hyperzone* polyethylene plant at our La Porte, Texas facility, turnaround activities at several sites and other plant improvement projects. The higher level of capital expenditures for our I&D segment in 2019 compared to 2018 is largely due to the construction of our PO/TBA plant.

In 2020, we expect to spend approximately \$2.4 billion for capital expenditures and investment in our U.S. and European PO joint ventures. The lower level of expected capital expenditures in 2020 relative to 2019 is primarily due to the reduction in spend related to our *Hyperzone* polyethylene plant. We will complete construction of our *Hyperzone* project in early 2020. See Note 9 to the Consolidated Financial Statements for additional information regarding our U.S. and European PO joint ventures.

Financing Activities—In 2019 and 2018, we made payments of \$3,752 million and \$1,854 million to acquire approximately 42.7 million and 19.2 million, respectively, of our outstanding ordinary shares. We also made dividend payments totaling \$1,462 million and \$1,554 million in 2019 and 2018, respectively. For additional information related to our share repurchases and dividend payments, see Note 20 to the Consolidated Financial Statements.

In September 2018, we repaid the \$375 million 6.875% Senior Notes due June 2023 assumed in the acquisition of A. Schulman for a price of 105.156% of par.

In February 2019, LYB Americas Finance Company LLC (“LYB Americas Finance”), a wholly owned subsidiary of LyondellBasell N.V., entered into a 364-day, \$2,000 million senior unsecured term loan credit agreement and borrowed the entire amount. The proceeds of this term loan, which is fully and unconditionally guaranteed by LyondellBasell N.V. were used for general corporate purposes and to redeem the remaining \$1,000 million outstanding of our 5% Senior Notes due 2019 at par.

In March 2019, LYB Americas Finance, a wholly owned subsidiary of LyondellBasell N.V., entered into a three-year \$4,000 million senior unsecured delayed draw term loan credit facility that matures in March 2022 (“Term Loan due 2022”). Proceeds under this credit agreement, which is fully and unconditionally guaranteed by LyondellBasell N.V., were used for general corporate purposes. In July 2019, we borrowed \$1,000 million under this facility along with \$500 million from our U.S. Receivables Facility to partially fund the share repurchase price paid pursuant to a modified Dutch Auction tender offer (“tender offer”). In December 2019, we borrowed \$1,950 million from our Term Loan due 2022 to repay amounts outstanding under our commercial paper program and \$500 million outstanding under our U.S. Receivables Facility.

In September 2019, LYB International Finance II B.V. (“LYB Finance II”), a wholly owned finance subsidiary of LyondellBasell N.V., issued €500 million of 0.875% guaranteed notes due 2026 (the “2026 Notes”) at a discounted price of 99.642% and €500 million of 1.625% guaranteed notes due 2031 (the “2031 Notes”) at a discounted price of 98.924%. We used the net proceeds from the 2026 Notes and the 2031 Notes to repay \$1,000 million outstanding under our Term Loan due 2022, and a portion of borrowings from our commercial paper program.

In October 2019, LYB International Finance III LLC (“LYB Finance III”), a wholly owned finance subsidiary of LyondellBasell N.V., issued \$1,000 million of 4.2% guaranteed notes due 2049 (the “2049 Notes”) at a discounted price of 98.488%. Net proceeds from the sale of the notes of \$974 million, along with commercial paper and operating cash, was used to repay \$2,000 million of the indebtedness outstanding under our Term Loan due 2020.

Through the issuance and repurchase of commercial paper instruments under our commercial paper program, we made net repayments of \$549 million in 2019 and received net proceeds of \$810 million in 2018.

Additional information related to commercial paper and debt activity can be found in the Liquidity and Capital Resources section below and in Note 13 to the Consolidated Financial Statements.

In February 2019, we purchased the non-controlling interest in our subsidiary that holds our La Porte, Texas methanol facility for \$63 million.

In January 2020, we amended the terms of certain forward-starting interest rate swaps to extend their maturities. Concurrently with the amendment of the swaps, we posted collateral of \$238 million related to the liability position held with our counterparties as of the amendment date. For additional information see Note 15 to the Consolidated Financial Statements.

Liquidity and Capital Resources

Overview

We plan to fund our ongoing working capital, capital expenditures, debt service and other funding requirements with cash from operations, which could be affected by general economic, financial, competitive, legislative, regulatory, business and other factors, many of which are beyond our control. Cash and cash equivalents, cash from our short-term investments, cash from operating activities, proceeds from the issuance of debt, or a combination thereof, may be used to fund the purchase of shares under our share repurchase authorization.

We intend to continue to declare and pay quarterly dividends, with the goal of increasing the dividend over time, after giving consideration to our cash balances and expected results from operations.

We believe that our current liquidity availability and cash from operating activities provide us with sufficient financial resources to meet our anticipated capital requirements and obligations as they come due.

Cash and Liquid Investments

As of December 31, 2019, we had \$1,054 million of unrestricted cash and cash equivalents as well as marketable securities classified as Short-term investments. At December 31, 2019, we held \$363 million of cash in jurisdictions outside of the U.S., principally in the United Kingdom and China. There are currently no legal or economic restrictions that would materially impede our transfers of cash.

Credit Arrangements

At December 31, 2019, we had total debt, including current maturities, of \$12,062 million, and \$200 million of outstanding letters of credit, bank guarantees and surety bonds issued under uncommitted credit facilities.

We had total unused availability under our credit facilities of \$2,919 million at December 31, 2019, which included the following:

- \$2,229 million under our \$2,500 million senior revolving credit facility, which backs our \$2,500 million commercial paper program. Availability under this facility is net of outstanding borrowings, outstanding letters of credit provided under the facility and notes issued under our commercial paper program. A small portion of our availability under this facility is impacted by changes in the euro/U.S. dollar exchange rate. At December 31, 2019, we had \$262 million of outstanding commercial paper, net of discount, no outstanding letters of credit and no outstanding borrowings under the facility; and
- \$690 million under our \$900 million U.S. Receivables Facility. Availability under this facility is subject to a borrowing base of eligible receivables, which is reduced by outstanding borrowings and letters of credit, if any. This facility had no outstanding borrowings or letters of credit at December 31, 2019.

Our \$2,500 million senior revolving credit facility contains customary covenants and warranties, including specified restrictions on indebtedness and liens. In addition, we are required to maintain a leverage ratio at the end of every fiscal quarter of 3.50 to 1.00, or less, for the period covering the most recent four quarters.

The U.S. Receivables Facility is subject to customary warranties and covenants, including limits and reserves and the maintenance of specified financial ratios. We are required to maintain a leverage ratio at the end of every fiscal quarter of 3.50 to 1.00, or less, for the period covering the most recent four quarters. Performance obligations under the facility are guaranteed by LyondellBasell N.V.

In March 2019, we entered into the Term Loan due 2022. Borrowings under the credit agreement bear interest at either a base rate or LIBOR rate, as defined, plus in each case, an applicable margin determined by reference to LyondellBasell N.V.'s current credit ratings. The credit agreement contains customary representations and warranties and contains certain restrictive covenants regarding, among other things, secured indebtedness, subsidiary indebtedness, mergers and sales of assets. In addition, we are required to maintain a leverage ratio at the end of every fiscal quarter of 3.50 to 1.00, or less, for the period covering the most recent four quarters.

In September 2019, we issued the 2026 Notes and the 2031 Notes. The 2026 Notes and 2031 Notes may be redeemed before the date that is three months prior to the scheduled maturity date at a redemption price equal to the greater of 100% of the principal amount of the notes redeemed and the sum of the present values of the remaining scheduled payments of principal and interest (discounted at the applicable comparable government bond rate plus 30 basis points in the case of the 2026 Notes and plus 35 basis points in the case of the 2031 Notes) on the notes to be redeemed. The notes may also be redeemed on or after the date that is three months prior to the scheduled maturity date of the notes at a redemption price equal to 100% of the principal amount of the notes redeemed plus accrued and unpaid interest. The notes are also redeemable upon certain tax events.

In October 2019, we issued the 2049 Notes. The 2049 Notes may be redeemed before the date that is six months prior to the scheduled maturity date at a redemption price equal to the greater of 100% of the principal amount of the notes redeemed and the sum of the present values of the remaining scheduled payments of principal and interest (discounted at the applicable treasury yield plus 35 basis points) on the notes to be redeemed. The notes may also be redeemed on or after the date that is six months prior to the final maturity date of the notes at a redemption price equal to 100% of the principal amount of the notes redeemed plus accrued and unpaid interest. The notes are also redeemable upon certain tax events.

We may repay or redeem our debt, including purchases of our outstanding bonds in the open market, using cash and cash equivalents, cash from our short-term investments and tri-party repurchase agreements, cash from operating activities, proceeds from the issuance of debt, proceeds from asset divestitures, or a combination thereof. In connection with any repayment or redemption of our debt, we may incur cash and non-cash charges, which could be material in the period in which they are incurred.

In accordance with our current interest rate risk management strategy and subject to management's evaluation of market conditions and the availability of favorable interest rates among other factors, we may from time to time enter into interest rate swap agreements to economically convert a portion of our fixed rate debt to variable rate debt or convert a portion of our variable rate debt to fixed rate debt.

For additional information, see Note 13 to our Consolidated Financial Statements.

Share Repurchases

Upon completion of the tender offer in July 2019, we repurchased 35.1 million ordinary shares at a tender offer price of \$88.00 per share for a total of \$3,099 million, including \$6 million of fees and expenses related to the tender offer. In conjunction with the tender offer, we financed the share repurchase by borrowing \$1,000 million from our Term Loan due 2022, \$500 million from our U.S. Receivables Facility, and \$1,280 million from our commercial paper program, with the remainder funded by operating cash.

In September 2019, our shareholders approved a proposal to authorize us to repurchase up to 33.3 million of our ordinary shares through March 12, 2021, which superseded any prior repurchase authorizations. Our share repurchase authorization does not have a stated dollar amount, and purchases may be made through open market purchases, private market transactions or other structured transactions. Repurchased shares could be retired or used for general corporate purposes, including for various employee benefit and compensation plans. The maximum number of shares that may yet be purchased is not necessarily an indication of the number of shares that will ultimately be purchased. In 2019, we purchased approximately 42.7 million shares under our share repurchase authorizations for approximately \$3,728 million.

As of February 18, 2020, we had approximately 33.3 million shares remaining under the current authorization. The timing and amounts of additional shares repurchased will be determined based on our evaluation of market conditions and other factors, including any additional authorizations approved by our shareholders. For additional information related to our share repurchase authorization, see Note 20 to the Consolidated Financial Statements.

Capital Budget

In 2020, we expect to spend approximately \$2.4 billion in our capital budget, which includes approximately \$75 million for investments in our U.S. and European PO joint ventures. Our capital budget includes investment to build our world-scale PO/TBA plant in Channelview, Texas which will have the capacity to produce 470 thousand tons of PO and 1.0 million tons of tertiary butyl alcohol. We broke ground on this project in August 2018 and anticipate the project will be completed in late 2021. See Note 9 to the Consolidated Financial Statements for additional information regarding our U.S. and European PO joint ventures.

Contractual and Other Obligations—The following table summarizes, as of December 31, 2019, our future minimum payments for long-term debt, including current maturities, short-term debt, and contractual and other obligations:

<u>Millions of dollars</u>	<u>Total</u>	<u>Payments Due By Period</u>			
		<u>Less than 1 Year</u>	<u>1-3 Years</u>	<u>3-5 Years</u>	<u>More than 5 Years</u>
Total debt	\$ 12,167	\$ 448	\$ 3,795	\$ 1,751	\$ 6,173
Interest on total debt	6,306	468	841	616	4,381
Contract liabilities	124	103	18	—	3
Other	1,801	1,235	115	33	418
Deferred income taxes	2,015	371	279	250	1,115
Other obligations:					
Purchase obligations:					
Take-or-pay contracts	26,004	3,019	5,568	5,434	11,983
Other contracts	22,065	6,650	6,260	2,727	6,428
Operating leases	2,422	479	549	423	971
Total	\$ 72,904	\$ 12,773	\$ 17,425	\$ 11,234	\$ 31,472

Total Debt—Our debt includes unsecured senior notes, guaranteed notes and various other U.S. and non-U.S. loans. See Note 13 to the Consolidated Financial Statements for a discussion of covenant requirements under our credit facilities and indentures and additional information regarding our debt facilities.

Interest on Total Debt—Our debt and related party debt agreements contain provisions for the payment of monthly, quarterly or semi-annual interest at a stated or variable rate of interest over the term of the debt. Interest on variable rate debt is calculated based on the rate in effect as of December 31, 2019.

Pension and other Postretirement Benefits—We maintain several defined benefit pension plans, as described in Note 16 to the Consolidated Financial Statements. Many of our U.S. and non-U.S. plans are subject to minimum funding requirements; however, the amounts of required future contributions for all our plans are not fixed and can vary significantly due to changes in economic assumptions, liability experience and investment return on plan assets. As a result, we have excluded pension and other postretirement benefit obligations from the Contractual and Other Obligations table above. Our annual contributions may include amounts in excess of minimum required funding levels. Contributions to our non-U.S. plans in years beyond 2020 are not expected to be materially different than the expected 2020 contributions disclosed in Note 16 to the Consolidated Financial Statements. At December 31, 2019, the projected benefit obligation for our pension plans exceeded the fair value of plan assets by \$1,287 million. Subject to future actuarial gains and losses, as well as future asset earnings, we, together with our consolidated subsidiaries, will be required to fund the discounted obligation of \$1,287 million in future years. We contributed \$97 million and \$100 million to our pension plans in 2019 and 2018, respectively. We provide other postretirement benefits, primarily medical benefits to eligible participants, as described in Note 16 to the Consolidated Financial Statements. We pay other unfunded postretirement benefits as incurred.

Contract Liabilities—We are obligated to deliver products or services in connection with sales agreements under which customer payments were received before transfer of control to the customers occurs. These contract liabilities will be recognized in earnings when control of the product or service is transferred to the customer, which range from 1 to 20 years. The long-term portion of such advances totaled \$21 million as of December 31, 2019.

Other—Other primarily consists of accruals for taxes and employee-related expenses.

Deferred Income Taxes—The scheduled settlement of the deferred tax liabilities shown in the table is based on the scheduled reversal of the underlying temporary differences. Actual cash tax payments will vary depending upon future taxable income. See Note 18 to the Consolidated Financial Statements for additional information related to our deferred tax liabilities.

Purchase Obligations—We are party to various obligations to purchase products and services, principally for raw materials, utilities and industrial gases. These commitments are designed to ensure sources of supply and are not expected to be in excess of normal requirements. The commitments are segregated into take-or-pay contracts and other contracts. Under the take-or-pay contracts, we are obligated to make minimum payments whether or not we take the product or service. Other contracts include contracts that specify minimum quantities; however, in the event that we do not take the contractual minimum, we are only obligated for any resulting economic loss suffered by the vendor. The payments shown for the other contracts assume that minimum quantities are purchased. For contracts with variable pricing terms, the minimum payments reflect the contract price at December 31, 2019.

Operating Leases—We lease various facilities and equipment under noncancelable lease arrangements for various periods. See Note 14 to the Consolidated Financial Statements for related lease disclosures.

CURRENT BUSINESS OUTLOOK

Our foundations of operational excellence, cost management and disciplined capital allocation continue to serve us well in the current challenging environment. We anticipate typical seasonal improvements for our businesses as we progress through the second and third quarters of 2020. Favorable resolution of trade policies and a rebound in industrial demand could provide significant upside for our industry. We expect benefits from the IMO 2020 regulations for our Houston Refinery and the completion of our new *Hyperzone* project in 2020.

RELATED PARTY TRANSACTIONS

We have related party transactions with our joint venture partners. We believe that such transactions are effected on terms substantially no more or less favorable than those that would have been agreed upon by unrelated parties on an arm's length basis. See Note 5 to the Consolidated Financial Statements for additional related party disclosures.

CRITICAL ACCOUNTING POLICIES

Management applies those accounting policies that it believes best reflect the underlying business and economic events, consistent with accounting principles generally accepted in the U.S. (see Note 2 to the Consolidated Financial Statements). Our more critical accounting policies include those related to the valuation of inventories, goodwill, accruals for long-term employee benefit costs such as pension and other postretirement costs, and accruals for taxes based on income. Inherent in such policies are certain key assumptions and estimates made by management. Management periodically updates its estimates used in the preparation of the financial statements based on its latest assessment of the current and projected business and general economic environment.

Inventories—We account for our raw materials, work-in-progress and finished goods inventories using the last-in, first-out (“LIFO”) method of accounting.

The cost of raw materials, which represents a substantial portion of our operating expenses, and energy costs generally follow price trends for crude oil and/or natural gas. Crude oil and natural gas prices are subject to many factors, including changes in economic conditions.

Since our inventory consists of manufactured products derived from crude oil, natural gas, natural gas liquids and correlated materials, as well as the associated feedstocks and intermediate chemicals, our inventory market values are generally influenced by changes in the benchmark of crude oil and heavy liquid values and prices for manufactured finished goods. The degree of influence of a particular benchmark may vary from period to period, as the composition of the dollar value LIFO pools change. Due to natural inventory composition changes, variation in pricing from period to period does not necessarily result in a linear lower of cost or market (“LCM”) impact.

Additionally, an LCM condition may arise due to a volumetric decline in a particular material that had previously provided a positive impact within a pool. As a result, market valuations and LCM conditions are dependent upon the composition and mix of materials on hand at the balance sheet date. In the measurement of an LCM adjustment, the numeric input value for determining the crude oil market price includes pricing that is weighted by volume of inventories held at a point in time, including WTI, Brent and Maya crude oils.

As indicated above, fluctuation in the prices of crude oil, natural gas and correlated products from period to period may result in the recognition of charges to adjust the value of inventory to the lower of cost or market in periods of falling prices and the reversal of those charges in subsequent interim periods as market prices recover. Accordingly, our cost of sales and results of operations may be affected by such fluctuations.

During the fourth quarter of 2019, EBITDA for our O&P—Americas segment and APS segment results include a non-cash, LCM inventory valuation charges of \$25 million and \$8 million, respectively, primarily due to a decline in domestic polyethylene prices.

Goodwill—As of December 31, 2019, we have goodwill of \$1,891 million. Of this amount, \$1,357 million is related to the acquisition of A. Schulman in 2018, which is included in our APS segment, and is mainly attributed to acquired workforce and expected synergies. The remaining goodwill at December 31, 2019, primarily represents the tax effect of the differences between the tax and book bases of our assets and liabilities resulting from the revaluation of those assets and liabilities to fair value in connection with the Company's emergence from bankruptcy and fresh-start accounting in 2010. Additional information on the amount of goodwill allocated to our reporting units appears in Note 8 and Note 22 to the Consolidated Financial Statements.

We evaluate the recoverability of the carrying value of goodwill annually or more frequently if events or changes in circumstances indicate that the carrying amount of the goodwill of a reporting unit may not be fully recoverable. We have the option to first assess qualitative factors to determine whether it is more likely than not that the fair value of a reporting unit is less than its carrying value. Qualitative factors assessed for each of the reporting units include, but are not limited to, changes in long-term commodity prices, discount rates, competitive environments, planned capacity, cost factors such as raw material prices, and financial performance of the reporting units. If the qualitative assessment indicates that it is more likely than not that the carrying value of a reporting unit exceeds its estimated fair value, a quantitative test is required.

We also have the option to proceed directly to the quantitative impairment test. Under the quantitative impairment test, the fair value of each reporting unit, calculated using a discounted cash flow model, is compared to its carrying value, including goodwill. The discounted cash flow model inherently utilizes a significant number of estimates and assumptions, including operating margins, tax rates, discount rates, capital expenditures and working capital changes. If the carrying value of the reporting unit including goodwill exceeds its fair value, an impairment charge equal to the excess would be recognized, up to a maximum amount of goodwill allocated to that reporting unit.

For 2019 and 2018, management performed a qualitative impairment assessment of our reporting units, which indicated that the fair value of our reporting units was more likely than not greater than their carrying value including goodwill. Accordingly, a quantitative goodwill impairment test was not required, and no goodwill impairment was recognized in 2019 or 2018.

Long-Term Employee Benefit Costs—Our costs for long-term employee benefits, particularly pension and other postretirement medical and life insurance benefits, are incurred over long periods of time, and involve many uncertainties over those periods. The net periodic benefit cost attributable to current periods is based on several assumptions about such future uncertainties and is sensitive to changes in those assumptions. It is management's responsibility, often with the assistance of independent experts, to select assumptions that in its judgment represent its best estimates of the future effects of those uncertainties and to review those assumptions periodically to reflect changes in economic or other factors.

The current benefit service costs, as well as the existing liabilities, for pensions and other postretirement benefits are measured on a discounted present value basis. The discount rate is a current rate, related to the rate at which the liabilities could be settled. Our assumed discount rate is based on yield information for high-quality corporate bonds with durations comparable to the expected cash settlement of our obligations. For the purpose of measuring the benefit obligations at December 31, 2019, we used a weighted average discount rate of 3.16% for the U.S. plans, which reflects the different terms of the related benefit obligations. The weighted average discount rate used to measure obligations for non-U.S. plans at December 31, 2019, was 1.03%, reflecting market interest rates. The discount rates in effect at December 31, 2019, will be used to measure net periodic benefit cost during 2020.

The benefit obligation and the periodic cost of other postretirement medical benefits are also measured based on assumed rates of future increase in the per capita cost of covered health care benefits. As of December 31, 2019, the assumed rate of increase for our U.S. plans was 6.1%, decreasing to 4.5% in 2038 and thereafter. However, changing the assumed health care cost trend rates by one percentage point in each year would increase or decrease the accumulated other postretirement benefit liability as of December 31, 2019, by \$24 million and \$15 million, respectively, for non-U.S. plans and by less than \$1 million for U.S. plans. A one percentage point change would not have a material effect on the aggregate service and interest cost components of the net periodic other postretirement benefit cost for the year then ended.

The net periodic cost of pension benefits included in expense is affected by the expected long-term rate of return on plan assets assumption. Investment returns that are recognized currently in net income represent the expected long-term rate of return on plan assets applied to a market-related value of plan assets, which is defined as the market value of assets. The expected rate of return on plan assets is a longer-term rate and is expected to change less frequently than the current assumed discount rate, reflecting long-term market expectations, rather than current fluctuations in market conditions.

The weighted average expected long-term rate of return on assets in our U.S. plans of 7.50% is based on the average level of earnings that our independent pension investment advisor advised could be expected to be earned over time. The weighted average expected long-term rate of return on assets in our non-U.S. plans of 2.79% is based on expectations and asset allocations that vary by region. The asset allocations are summarized in Note 16 to the Consolidated Financial Statements.

The actual rate of return on plan assets may differ from the expected rate due to the volatility normally experienced in capital markets. Management's goal is to manage the investments over the long term to achieve optimal returns with an acceptable level of risk and volatility.

Net periodic pension cost recognized each year includes the expected asset earnings, rather than the actual earnings or loss. Along with other gains and losses, this unrecognized amount, to the extent it cumulatively exceeds 10% of the projected benefit obligation for the respective plan, is recognized as additional net periodic benefit cost over the average remaining service period of the participants in each plan.

The following table reflects the sensitivity of the benefit obligations and the net periodic benefit costs of our pension plans to changes in the actuarial assumptions:

<u>Millions of dollars</u>	Effects on Benefit Obligations in 2019		Effects on Net Periodic Pension Costs in 2020	
	U.S.	Non-U.S.	U.S.	Non-U.S.
Projected benefit obligations at December 31, 2019	\$ 1,965	\$ 2,017	\$ —	\$ —
Projected net periodic pension costs in 2020	—	—	29	73
Discount rate increases by 100 basis points	(180)	(286)	(6)	(8)
Discount rate decreases by 100 basis points	219	353	7	23

The sensitivity of our postretirement benefit plans obligations and net periodic benefit costs to changes in actuarial assumptions are reflected in the following table:

<u>Millions of dollars</u>	Effects on Benefit Obligations in 2019		Effects on Net Periodic Benefit Costs in 2020	
	U.S.	Non-U.S.	U.S.	Non-U.S.
Projected benefit obligations at December 31, 2019	\$ 251	\$ 79	\$ —	\$ —
Projected net periodic benefit costs in 2020	—	—	6	7
Discount rate increases by 100 basis points	(22)	—	(2)	—
Discount rate decreases by 100 basis points	26	—	1	—

Additional information on the key assumptions underlying these benefit costs appears in Note 16 to the Consolidated Financial Statements.

Accruals for Taxes Based on Income—The determination of our provision for income taxes and the calculation of our tax benefits and liabilities is subject to management’s estimates and judgments due to the complexity of the tax laws and regulations in the tax jurisdictions in which we operate. Uncertainties exist with respect to interpretation of these complex laws and regulations.

Deferred tax assets and liabilities are determined based on temporary differences between the financial statement carrying amounts of existing assets and liabilities and their respective tax bases, and are measured using enacted tax rates expected to apply to taxable income in the years in which those temporary differences are expected to reverse.

We recognize future tax benefits to the extent that the realization of these benefits is more likely than not. Our current provision for income taxes is impacted by the recognition and release of valuation allowances related to net deferred tax assets in certain jurisdictions. Further changes to these valuation allowances may impact our future provision for income taxes, which will include no tax benefit with respect to losses incurred and no tax expense with respect to income generated in these countries until the respective valuation allowance is eliminated.

We recognize the financial statement benefits with respect to an uncertain income tax position that we have taken or may take on an income tax return when we believe it is more likely than not that the position will be sustained with the tax authorities.

ACCOUNTING AND REPORTING CHANGES

For a discussion of the potential impact of new accounting pronouncements on our Consolidated Financial Statements, see Note 2 to the Consolidated Financial Statements.

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

See Note 15 to the Consolidated Financial Statements for discussion of LyondellBasell Industries N.V.'s management of commodity price risk, foreign currency exposure and interest rate risk through its use of derivative instruments and hedging activities.

Commodity Price Risk

Our products and raw materials are subject to changes in market price as supply and demand fundamentals change. Natural gas, crude oil and refined products, along with feedstocks for ethylene and propylene production, constitute the main commodity exposures. We try to protect against such instability through various business strategies including provisions in sales contracts which allows us to pass on higher raw material costs to our customers through timely price increases and through the use of commodity swap and futures contracts.

We use Value at Risk ("VaR"), stress testing and scenario analysis for risk measurement and control purposes. VaR estimates the maximum potential loss in fair market values for our commodity derivative instruments, given a certain move in prices over a certain period of time, using specified confidence levels. Utilizing a Monte Carlo simulation with a 95 percent confidence level over a three-day time horizon, the effect on our pre-tax income and cash flows for the years ended December 31, 2019 and 2018 would be immaterial.

Foreign Exchange Risk

We manufacture and market our products in many countries throughout the world and, as a result, are exposed to changes in foreign currency exchange rates.

A significant portion of our reporting entities use the euro as their functional currency. Our reporting currency is the U.S. dollar. The translation gains or losses that result from the process of translating the euro denominated financial statements to U.S. dollars are deferred in Accumulated other comprehensive income until such time as those entities may be liquidated or sold. Changes in the value of the U.S. dollar relative to the euro can therefore have a significant impact on comprehensive income.

We have entered into hedging arrangements designated as net investment hedges to reduce the volatility in shareholders' equity resulting from foreign currency fluctuation associated with our net investments in foreign operations. The table below illustrates the impact on Other comprehensive loss of a 10% fluctuation in the foreign currency rate associated with each net investment hedge and the EURIBOR and LIBOR rates associated with basis swaps as of December 31, 2019 and 2018:

<u>Net Investment Hedges</u>	<u>2019 and 2018</u>		<u>2019</u>	<u>2018</u>
	<u>Notional Amount</u>	<u>10% Variance on Foreign Currency Rate</u>	<u>Impact on Other Comprehensive Loss</u>	
Basis Swaps	€617 million	euro/U.S. dollar rate EURIBOR and LIBOR rates	\$70 million Less than \$1 million	\$69 million Less than \$1 million
Guaranteed Euro Notes Due 2022	€750 million	euro/U.S. dollar rate	\$84 million	\$86 million

Some of our operations enter into transactions that are not denominated in their functional currency. This results in exposure to foreign currency risk for financial instruments, including, but not limited to, third party and intercompany receivables and payables and intercompany loans.

We maintain risk management control practices to monitor the foreign currency risk attributable to our inter-company and third party outstanding foreign currency balances. These practices involve the centralization of our

exposure to underlying currencies that are not subject to central bank and/or country specific restrictions. By centralizing most of our foreign currency exposure into one subsidiary, we are able to take advantage of any natural offsets thereby reducing the overall impact of changes in foreign currency rates on our earnings. At December 31, 2019 and 2018, a 10% fluctuation compared to the U.S. dollar in the underlying currencies that have no central bank or other currency restrictions related to non-hedged monetary net assets would have had a resulting additional impact to earnings of approximately \$2 million and \$3 million, respectively.

Our policy is to maintain a balanced position in foreign currencies to minimize exchange gains and losses arising from changes in exchange rates. To minimize the effects of our net currency exchange exposures, we enter into foreign currency spot and forward contracts and, in some cases, cross-currency swaps.

We also engage in short-term foreign exchange swaps in order to roll certain hedge positions and to make funds available for intercompany financing. Our net position in foreign currencies is monitored daily.

We entered into \$2,300 million of non-cancellable cross-currency swaps, which we designated as foreign currency cash flow hedges, to reduce the variability in the functional currency equivalent cash flows of certain foreign currency denominated intercompany notes. At December 31, 2019, these foreign currency contracts have maturity dates ranging from 2021 to 2027 and their fair value was a net asset of \$205 million. A 10% fluctuation compared to the U.S. dollar would have had a resulting additional impact to Other comprehensive loss of approximately \$238 million and \$243 million in 2019 and 2018, respectively.

Other income, net, in the Consolidated Statements of Income reflected net exchange rate foreign currency gains of \$9 million and \$24 million in 2019 and 2018, respectively, and foreign currency losses of \$1 million in 2017. For forward contracts, including swap transactions, that economically hedge recognized monetary assets and liabilities in foreign currencies, no hedge accounting is applied. Changes in the fair value of foreign currency forward and swap contracts are reported in the Consolidated Statements of Income and offset the currency exchange results recognized on the assets and liabilities. At December 31, 2019, these foreign currency contracts, which will mature between January 2020 and September 2020, inclusively, had an aggregated notional amount of \$780 million and the fair value was a net asset of \$4 million. A 10% fluctuation compared to the U.S. dollar would have had a resulting additional impact to earnings of approximately \$31 million and \$96 million in 2019 and 2018, respectively.

Interest Rate Risk

Interest rate risk management is viewed as a trade-off between cost and risk. The cost of interest is generally lower for short-term debt and higher for long-term debt, and lower for floating rate debt and higher for fixed rate debt. However, the risk associated with interest rates is inversely related to the cost, with short-term debt carrying a higher refinancing risk and floating rate debt having higher interest rate volatility. Our interest rate risk management strategy attempts to optimize this cost/risk/reward trade-off.

We are exposed to interest rate risk with respect to our fixed and variable rate debt. Fluctuations in interest rates impact the fair value of fixed-rate debt as well as pre-tax earnings stemming from interest expense on variable-rate debt. To minimize earnings at risk as part of our interest rate risk management strategy, we target to maintain floating rate debt, through the use of interest rate swaps, equal to our cash and cash equivalents, marketable securities and tri-party repurchase agreements, as those assets are invested in floating rate instruments.

Pre-issuance interest rate—A pre-issuance interest rate strategy is utilized to mitigate the risk that benchmark interest rates (i.e. U.S. Treasury, mid-swaps, etc.) will increase between the time a decision has been made to issue debt and when the actual debt offering is issued. At December 31, 2019, the total notional amount of our interest rate contracts designated as cash flow hedges, which have maturity dates ranging from 2020 to 2021, was \$1,500 million and the fair value was a net liability of \$225 million. We estimate that a 10% change in market interest rates as of December 31, 2019 and 2018, would change the fair value of our forward-starting interest rate swaps outstanding and would have had a resulting impact on Other comprehensive loss of approximately \$66 million and \$71 million, respectively.

Fixed-rate debt—We enter into interest rate swaps as part of our interest rate risk management strategy. At December 31, 2019, the total notional amount of interest rate swaps designated as fair value hedges, which have maturity dates ranging from 2021 to 2027, was \$2,140 million and their fair value was a net asset of \$41 million.

At December 31, 2019, after giving consideration to the \$2,140 million of fixed-rate debt that we have effectively converted to floating through these U.S. dollar fixed-for-floating interest rate swaps, approximately 64% of our debt portfolio, on a gross basis, incurred interest at a fixed-rate and the remaining 36% of the portfolio incurred interest at a variable-rate. We estimate that a 10% change in market interest rates as of December 31, 2019 and 2018, would change the fair value of our interest rate swaps outstanding and would have had a resulting impact on our pre-tax income of approximately \$15 million and \$26 million, respectively.

Variable-rate debt—Our variable rate debt consists of our \$2,500 million Senior Revolving Credit Facility, our \$900 million U.S. Receivables Facility and our Commercial Paper Program. At December 31, 2019, there were no outstanding borrowings under our Senior Revolving Credit Facility nor our U.S. Receivables Facility. Our Commercial Paper Program had outstanding borrowings of \$262 million at December 31, 2019. Based on our average variable-rate debt outstanding per year, we estimate that a 10% change in interest rates would have had a \$1 million and \$2 million impact on earnings in 2019 and 2018, respectively.

Item 8. Financial Statements and Supplementary Data.

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MANAGEMENT’S REPORT ON INTERNAL CONTROL OVER FINANCIAL REPORTING

Management of the Company, including the Chief Executive Officer and the Chief Financial Officer, is responsible for establishing and maintaining adequate internal control over financial reporting, as defined in Rules 13a-15(f) and 15d-15(f) of the Securities Exchange Act of 1934, as amended. Internal control over financial reporting is a process designed by, or under the supervision of, our Chief Executive Officer and Chief Financial Officer, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. Our internal control over financial reporting includes those policies and procedures that (i) pertain to the maintenance of records that in reasonable detail accurately and fairly reflect the transactions and dispositions of our assets; (ii) provide reasonable assurance that transactions are recorded as necessary to permit the preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures are being made only in accordance with authorizations of our management and directors; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of our assets that could have a material effect on the financial statements.

We conducted an evaluation of the effectiveness of our internal control over financial reporting as of December 31, 2019 based on the Internal Control—Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission in 2013. Based on our evaluation, management has concluded that our internal control over financial reporting was effective as of December 31, 2019.

The effectiveness of our internal control over financial reporting as of December 31, 2019 has been audited by PricewaterhouseCoopers LLP, an independent registered public accounting firm, as stated in their report which is included herein.

Report of Independent Registered Public Accounting Firm

To the Board of Directors and Shareholders of LyondellBasell Industries N.V.:

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of LyondellBasell Industries N.V. and its subsidiaries (the “Company”) as of December 31, 2019 and 2018, and the related consolidated statements of income, of comprehensive income, of shareholders’ equity and of cash flows for each of the three years in the period ended December 31, 2019, including the related notes (collectively referred to as the “consolidated financial statements”). We also have audited the Company's internal control over financial reporting as of December 31, 2019, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of the Company as of December 31, 2019 and 2018, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2019 in conformity with accounting principles generally accepted in the United States of America. Also in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2019, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the COSO.

Change in Accounting Principle

As discussed in Note 2 to the consolidated financial statements, the Company changed the manner in which it accounts for leases in 2019.

Basis for Opinions

The Company's management is responsible for these consolidated financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management’s Report on Internal Control over Financial Reporting. Our responsibility is to express opinions on the Company’s consolidated financial statements and on the Company's internal control over financial reporting based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audits of the consolidated financial statements included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

Definition and Limitations of Internal Control over Financial Reporting

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

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

Critical Audit Matters

The critical audit matter communicated below is a matter arising from the current period audit of the consolidated financial statements that was communicated or required to be communicated to the audit committee and that (i) relates to accounts or disclosures that are material to the consolidated financial statements and (ii) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matter below, providing a separate opinion on the critical audit matter or on the accounts or disclosures to which it relates.

Taxation - Provisions for unrecognized tax benefits

As described in Notes 2, 11, 12, and 18 to the consolidated financial statements, as of December 31, 2019, the Company has recorded income taxes from continuing operations of \$648 million, income tax receivables of \$175 million, income tax payables of \$66 million, and net deferred tax liabilities of \$1,977 million related to which they have reported \$238 million of unrecognized tax benefits. The Company operates in multiple jurisdictions throughout the world, and its tax returns are periodically audited or subjected to review by tax authorities. As a result, there is an uncertainty in income taxes recognized in the Company's consolidated financial statements. Management recognizes uncertain income tax positions when it is more likely than not, based on the technical merits, that the position or a portion thereof will be sustained upon examination. As disclosed by management, there has been increased attention, both in the U.S. and globally, to the tax practices of multinational companies, including the European Union's state aid investigations, proposals by the Organization for Economic Cooperation and Development with respect to base erosion and profit shifting, and European Union tax directives and their implementation.

The principal considerations for our determination that performing procedures relating to the provision for unrecognized tax benefits is a critical audit matter are there was significant judgment by management when determining provisions for tax uncertainties, including a high degree of estimation uncertainty relative to the complexity of tax laws, frequency of tax audits, and potential for adjustments as a result of such tax audits. This in turn led to a high degree of auditor judgment, subjectivity and effort in performing procedures to evaluate the timely identification of provisions for tax uncertainties. Also, the audit effort involved the use of professionals with specialized skill and knowledge to assist in performing these procedures and evaluating the audit evidence obtained.

Addressing the matter involved performing procedures and evaluating audit evidence in connection with forming our overall opinion on the consolidated financial statements. These procedures included testing the effectiveness of controls relating to the identification and recognition of the liabilities for unrecognized tax benefits and controls addressing completeness of the uncertain tax positions. These procedures also included, among others, testing management's assessment of the technical merits of tax positions and estimates of the amount of tax benefit

expected to be sustained, testing the completeness of management's assessment of both the identification and possible outcomes of uncertain tax positions, and evaluating the status and results of tax audits with the relevant tax authorities. Professionals with specialized skill and knowledge were used to assist in evaluating the completeness of the Company's uncertain tax positions, including evaluating the reasonableness of management's assessment of whether tax positions are more likely than not of being sustained and the amount of potential benefit to be realized, as well as the determination and the application of relevant tax laws.

/s/ PricewaterhouseCoopers LLP
Houston, Texas
February 20, 2020

We have served as the Company's auditor since 2008.

LYONDELLBASELL INDUSTRIES N.V.
CONSOLIDATED STATEMENTS OF INCOME
(In millions of dollars, except earnings per share)

	Year Ended December 31,		
	2019	2018	2017
Sales and other operating revenues:			
Trade	\$ 33,908	\$ 38,126	\$ 33,705
Related parties	819	878	779
	<u>34,727</u>	<u>39,004</u>	<u>34,484</u>
Operating costs and expenses:			
Cost of sales	29,301	32,529	28,059
Selling, general and administrative expenses	1,199	1,129	859
Research and development expenses	111	115	106
	<u>30,611</u>	<u>33,773</u>	<u>29,024</u>
Operating income	4,116	5,231	5,460
Interest expense	(347)	(360)	(491)
Interest income	19	45	24
Other income, net	39	106	179
	<u>3,827</u>	<u>5,022</u>	<u>5,172</u>
Income from continuing operations before equity investments and income taxes	3,827	5,022	5,172
Income from equity investments	225	289	321
Income from continuing operations before income taxes	4,052	5,311	5,493
Provision for income taxes	648	613	598
Income from continuing operations	3,404	4,698	4,895
Loss from discontinued operations, net of tax	(7)	(8)	(18)
Net income	3,397	4,690	4,877
Net loss attributable to non-controlling interests	—	—	2
Net income attributable to LyondellBasell Industries N.V.	3,397	4,690	4,879
Dividends on redeemable non-controlling interests	(7)	(2)	—
Net income attributable to the Company shareholders	<u>\$ 3,390</u>	<u>\$ 4,688</u>	<u>\$ 4,879</u>
Earnings per share:			
Net income (loss) attributable to the Company shareholders —			
Basic:			
Continuing operations	\$ 9.61	\$ 12.06	\$ 12.28
Discontinued operations	(0.02)	(0.02)	(0.05)
	<u>\$ 9.59</u>	<u>\$ 12.04</u>	<u>\$ 12.23</u>
Diluted:			
Continuing operations	\$ 9.60	\$ 12.03	\$ 12.28
Discontinued operations	(0.02)	(0.02)	(0.05)
	<u>\$ 9.58</u>	<u>\$ 12.01</u>	<u>\$ 12.23</u>

See Notes to the Consolidated Financial Statements.

LYONDELLBASELL INDUSTRIES N.V.
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME
(In millions of dollars)

	Year Ended December 31,		
	2019	2018	2017
Net income	\$ 3,397	\$ 4,690	\$ 4,877
Other comprehensive income (loss), net of tax—			
Financial derivatives	(132)	54	(45)
Unrealized losses on available-for-sale debt securities	—	—	(1)
Unrealized gains on equity securities and equity securities held by equity investees	—	—	17
Defined benefit pension and other postretirement benefit plans	(269)	30	77
Foreign currency translations	(20)	(92)	178
Total other comprehensive income (loss), net of tax	(421)	(8)	226
Comprehensive income	2,976	4,682	5,103
Dividends on redeemable non-controlling interests	(7)	(2)	—
Comprehensive loss attributable to non-controlling interests	—	—	2
Comprehensive income attributable to the Company shareholders	<u>\$ 2,969</u>	<u>\$ 4,680</u>	<u>\$ 5,105</u>

See Notes to the Consolidated Financial Statements.

LYONDELLBASELL INDUSTRIES N.V.
CONSOLIDATED BALANCE SHEETS
(In millions of dollars)

	December 31,	
	2019	2018
ASSETS		
Current assets:		
Cash and cash equivalents	\$ 858	\$ 332
Restricted cash	30	69
Short-term investments	196	892
Accounts receivable:		
Trade, net	2,981	3,355
Related parties	121	148
Inventories	4,588	4,515
Prepaid expenses and other current assets	736	1,255
Total current assets	<u>9,510</u>	<u>10,566</u>
Operating lease assets	1,468	—
Property, plant and equipment, net	14,130	12,477
Investments and long-term receivables:		
Investment in PO joint ventures	504	469
Equity investments	1,602	1,611
Other investments and long-term receivables	22	23
Goodwill	1,891	1,814
Intangible assets, net	869	965
Other assets	439	353
Total assets	<u>\$ 30,435</u>	<u>\$ 28,278</u>

See Notes to the Consolidated Financial Statements.

LYONDELLBASELL INDUSTRIES N.V.
CONSOLIDATED BALANCE SHEETS
(In millions of dollars, except shares and par value data)

	December 31,	
	2019	2018
LIABILITIES, REDEEMABLE NON-CONTROLLING INTERESTS AND EQUITY		
Current liabilities:		
Current maturities of long-term debt	\$ 3	\$ 5
Short-term debt	445	885
Accounts payable:		
Trade	2,516	2,560
Related parties	412	527
Accrued liabilities	1,822	1,536
Total current liabilities	<u>5,198</u>	<u>5,513</u>
Long-term debt	11,614	8,497
Operating lease liabilities	1,216	—
Other liabilities	2,213	1,897
Deferred income taxes	2,015	1,975
Commitments and contingencies		
Redeemable non-controlling interests	116	116
Shareholders' equity:		
Ordinary shares, €0.04 par value, 1,275 million shares authorized, 333,476,883 and 375,696,661 shares outstanding, respectively	19	22
Additional paid-in capital	5,954	7,041
Retained earnings	4,435	6,763
Accumulated other comprehensive loss	(1,784)	(1,363)
Treasury stock, at cost, 6,568,745 and 24,513,619 ordinary shares, respectively	(580)	(2,206)
Total Company share of shareholders' equity	<u>8,044</u>	<u>10,257</u>
Non-controlling interests	19	23
Total equity	<u>8,063</u>	<u>10,280</u>
Total liabilities, redeemable non-controlling interests and equity	<u>\$ 30,435</u>	<u>\$ 28,278</u>

See Notes to the Consolidated Financial Statements.

LYONDELLBASELL INDUSTRIES N.V.
CONSOLIDATED STATEMENTS OF CASH FLOWS
(In millions of dollars)

	Year Ended December 31,		
	2019	2018	2017
Cash flows from operating activities:			
Net income	\$ 3,397	\$ 4,690	\$ 4,877
Adjustments to reconcile net income to net cash provided by operating activities:			
Depreciation and amortization	1,312	1,241	1,174
Amortization of debt-related costs	11	14	15
Charges related to repayment of debt	—	—	49
Share-based compensation	48	39	55
Inventory valuation adjustment	33	—	—
Equity investments—			
Equity income	(225)	(289)	(321)
Distribution of earnings, net of tax	247	307	309
Deferred income taxes	209	260	(587)
Gain on sales of business and equity investments	(5)	(36)	(108)
Changes in assets and liabilities that provided (used) cash:			
Accounts receivable	367	433	(521)
Inventories	(129)	(141)	(237)
Accounts payable	(251)	(199)	165
Other, net	(53)	(848)	336
Net cash provided by operating activities	<u>4,961</u>	<u>5,471</u>	<u>5,206</u>
Cash flows from investing activities:			
Expenditures for property, plant and equipment	(2,694)	(2,105)	(1,547)
Acquisition of A. Schulman, net of cash acquired	—	(1,776)	—
Payments for repurchase agreements	—	—	(512)
Proceeds from repurchase agreements	527	—	381
Purchases of available-for-sale debt securities	(108)	(50)	(653)
Proceeds from sales and maturities of available-for-sale debt securities	511	423	499
Proceeds from maturities of held-to-maturity securities	—	—	75
Purchases of equity securities	(33)	(64)	—
Proceeds from sales of equity securities	332	97	—
Net proceeds from sales of business and equity investments	5	37	155
Proceeds from settlement of net investment hedges	—	1,108	609
Payments for settlement of net investment hedges	—	(1,078)	(658)
Other, net	(175)	(151)	(105)
Net cash used in investing activities	<u>(1,635)</u>	<u>(3,559)</u>	<u>(1,756)</u>

See Notes to the Consolidated Financial Statements.

LYONDELLBASELL INDUSTRIES N.V.
CONSOLIDATED STATEMENTS OF CASH FLOWS
(In millions of dollars)

	Year Ended December 31,		
	2019	2018	2017
Cash flows from financing activities:			
Repurchases of Company ordinary shares	(3,752)	(1,854)	(866)
Dividends paid - common stock	(1,462)	(1,554)	(1,415)
Purchase of non-controlling interest	(63)	—	—
Issuance of long-term debt	5,031	—	990
Repayments of long-term debt	(2,974)	(394)	(1,000)
Debt extinguishment costs	—	—	(65)
Payments of debt issuance costs	(22)	—	(8)
Issuance of short-term debt	2,500	—	—
Repayments of short-term debt	(1,526)	—	—
Net (repayments of) proceeds from commercial paper	(549)	810	(493)
Other, net	(18)	(16)	(2)
Net cash used in financing activities	<u>(2,835)</u>	<u>(3,008)</u>	<u>(2,859)</u>
Effect of exchange rate changes on cash	(4)	(31)	59
Increase (decrease) in cash and cash equivalents and restricted cash	487	(1,127)	650
Cash and cash equivalents and restricted cash at beginning of period	401	1,528	878
Cash and cash equivalents and restricted cash at end of period	<u>\$ 888</u>	<u>\$ 401</u>	<u>\$ 1,528</u>
Supplemental Cash Flow Information:			
Interest paid, net of capitalized interest	<u>\$ 318</u>	<u>\$ 333</u>	<u>\$ 333</u>
Net income taxes paid	<u>\$ 403</u>	<u>\$ 1,209</u>	<u>\$ 1,044</u>

See Notes to the Consolidated Financial Statements.

LYONDELLBASELL INDUSTRIES N.V.
CONSOLIDATED STATEMENTS OF SHAREHOLDERS' EQUITY
(In millions of dollars)

	Ordinary Shares		Additional Paid-in Capital	Retained Earnings	Accumulated Other Comprehensive Income (Loss)	Company Share of Shareholders' Equity	Non- Controlling Interests
	Issued	Treasury					
Balance, December 31, 2016	\$ 31	\$(14,945)	\$ 10,191	\$ 12,282	\$ (1,511)	\$ 6,048	\$ 25
Net income (loss)	—	—	—	4,879	—	4,879	(2)
Other comprehensive income	—	—	—	—	226	226	—
Share-based compensation	—	41	14	—	—	55	—
Dividends - common stock (\$3.55 per share)	—	—	—	(1,415)	—	(1,415)	—
Repurchases of Company ordinary shares	—	(845)	—	—	—	(845)	—
Purchase of non-controlling interests	—	—	1	—	—	1	(22)
Balance, December 31, 2017	31	(15,749)	10,206	15,746	(1,285)	8,949	1
Adoption of accounting standards	—	—	—	95	(70)	25	—
Net income	—	—	—	4,690	—	4,690	—
Other comprehensive loss	—	—	—	—	(8)	(8)	—
Share-based compensation	—	37	28	(2)	—	63	—
Dividends - common stock (\$4.00 per share)	—	—	—	(1,554)	—	(1,554)	—
Dividends - redeemable non- controlling interests (\$15.00 per share)	—	—	—	(2)	—	(2)	—
Repurchases of Company ordinary shares	—	(1,878)	—	—	—	(1,878)	—
Purchase of non-controlling interests	—	—	(28)	—	—	(28)	—
Cancellation of Treasury shares	(9)	15,384	(3,165)	(12,210)	—	—	—
Acquisition of A. Schulman	—	—	—	—	—	—	22
Balance, December 31, 2018	22	(2,206)	7,041	6,763	(1,363)	10,257	23
Net income	—	—	—	3,397	—	3,397	—
Other comprehensive loss	—	—	—	—	(421)	(421)	—
Share-based compensation	—	42	33	(3)	—	72	—
Dividends - common stock (\$4.15 per share)	—	—	—	(1,462)	—	(1,462)	—
Dividends - redeemable non- controlling interests (\$60.00 per share)	—	—	—	(7)	—	(7)	—
Repurchases of Company ordinary shares	—	(3,728)	—	—	—	(3,728)	—
Purchase of non-controlling interests	—	—	(64)	—	—	(64)	—
Distribution to non-controlling interests	—	—	—	—	—	—	(4)
Cancellation of Treasury shares	(3)	5,312	(1,056)	(4,253)	—	—	—
Balance, December 31, 2019	\$ 19	\$ (580)	\$ 5,954	\$ 4,435	\$ (1,784)	\$ 8,044	\$ 19

See Notes to the Consolidated Financial Statements.

LYONDELLBASELL INDUSTRIES N.V.
NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS

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LYONDELLBASELL INDUSTRIES N.V.
NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS

1. Description of Company and Operations

LyondellBasell Industries N.V. is a limited liability company (*Naamloze Vennootschap*) incorporated under Dutch law by deed of incorporation dated October 15, 2009. Unless otherwise indicated, the “Company,” “we,” “us,” “our” or similar words are used to refer to LyondellBasell Industries N.V. together with its consolidated subsidiaries (“LyondellBasell N.V.”).

LyondellBasell N.V. is a worldwide manufacturer of chemicals and polymers, a refiner of crude oil, a significant producer of gasoline blending components and a developer and licensor of technologies for the production of polymers.

2. Summary of Significant Accounting Policies

Basis of Preparation and Consolidation

The accompanying Consolidated Financial Statements have been prepared from the books and records of LyondellBasell N.V. under accounting principles generally accepted in the United States (“U.S. GAAP”). Subsidiaries are defined as being those companies over which we, either directly or indirectly, have control through a majority of the voting rights or the right to exercise control or to obtain the majority of the benefits and be exposed to the majority of the risks. Subsidiaries are consolidated from the date on which control is obtained until the date that such control ceases. All intercompany transactions and balances have been eliminated in consolidation.

Cash and Cash Equivalents

Our cash equivalents consist of highly liquid debt instruments such as certificates of deposit, commercial paper and money market accounts with major international banks and financial institutions. Cash equivalents include instruments with maturities of three months or less when acquired and exclude restricted cash.

Although, we have no current requirements for compensating balances in a specific amount at a specific point in time, we may maintain compensating balances at our discretion for some of our banking services and products.

Short-Term Investments

Our investments in debt securities are classified as available-for-sale and held-to-maturity on the basis of our intent and ability to hold the investments. Investments classified as available-for-sale are carried at fair value with changes reflected in other comprehensive income. Credit-related impairment, measured using the expected cash flows and limited to the amount by which the amortized cost basis of a security exceeds its fair value, is recognized through an allowance for expected credit losses, and adjusted subsequently if conditions change, with a corresponding impact in earnings. Where there is an intention or a requirement to sell an impaired available-for-sale debt security, the entire impairment is recognized in earnings with a corresponding adjustment to the amortized cost basis of the security.

Investments classified as held-to-maturity are carried at amortized cost less allowance for credit losses recorded through net income.

We account for investments in equity securities at fair value with changes in fair value recognized in net income.

Trade Receivables

Trade receivables are amounts due from customers for merchandise sold or services performed in the ordinary course of business and are carried at transaction price net of allowance for credit losses. Allowance for credit losses is measured using historical loss rates for the respective risk categories and incorporating forward-looking estimates. The corresponding expense for the loss allowance is reflected in Selling, general and administrative expenses.

Loans Receivable

We invest in tri-party repurchase agreements. Under these agreements, we make cash purchases of securities according to a pre-agreed profile from our counterparties. The counterparties have an obligation to repurchase, and we have an obligation to sell, the same or substantially the same securities at a pre-defined date for a price equal to the purchase price plus interest. These securities, which pursuant to our internal policies are held by a third-party custodian and must generally have a minimum collateral value of 102%, secure the counterparty's obligation to repurchase the securities. The investment in tri-party repurchase agreements is carried at amortized cost. We have elected the practical expedient to recognize zero credit losses for the investment in tri-party repurchase agreements given the counterparty's requirement to maintain collateral of fair value equal to or exceeding the amortized cost basis of the investment.

Depending upon maturity, these agreements are treated as short-term loans receivable and are reflected in Prepaid expenses and other current assets or as long-term loans receivable reflected in Other investments and long-term receivables on our Consolidated Balance Sheets.

Inventories

Cost of our raw materials, work-in-progress and finished goods inventories is determined using the last-in, first-out ("LIFO") method and is carried at the lower of cost or market value. Cost of our materials and supplies inventory is determined using the moving average cost method and is carried at the lower of cost and net realizable value.

Inventory exchange transactions, which involve fungible commodities, are not accounted for as purchases and sales. Any resulting volumetric exchange balances are accounted for as inventory, with cost determined using the LIFO method.

Property, Plant and Equipment

Property, plant and equipment are recorded at historical cost. Historical cost includes expenditures that are directly attributable to the acquisition of the items. Costs may also include borrowing costs incurred on debt during construction of major projects exceeding one year, costs of major maintenance arising from turnarounds of major units and committed decommissioning costs. Routine maintenance costs are expensed as incurred.

Depreciation is computed using the straight-line method over the estimated useful lives of assets to their residual values. The residual values and useful lives of assets are reviewed, and adjusted if appropriate, whenever events or circumstances indicate that a revision is warranted. Land is not depreciated.

We evaluate property, plant and equipment for impairment whenever events or changes in circumstances indicate that the carrying amount of an asset may not be recoverable. Long-lived assets are grouped at the lowest level for which there are identifiable cash flows that are largely independent of the cash flows of other groups of assets, which, for us, is generally at the plant group level (or, at times, individual plants in certain circumstances where we have isolated production units with separately identifiable cash flows). If it is determined that an asset or asset group's undiscounted future cash flows will not be sufficient to recover the carrying amount, the asset is written down to its estimated fair value.

Gain or loss on retirement or sale of property, plant and equipment is reflected in the Consolidated Statements of Income.

Equity Investments

We account for equity method investments (“equity investments”) using the equity method of accounting if we have the ability to exercise significant influence over, but not control of, an investee. Significant influence generally exists if we have an ownership interest representing between 20% and 50% of the voting rights. Under the equity method of accounting, investments are stated initially at cost and are adjusted for subsequent additional investments and our proportionate share of profit or losses and distributions.

We record our share of the profits or losses of the equity investments, net of income taxes, in the Consolidated Statements of Income. When our share of losses in an equity investment equals or exceeds our interest in the equity investment, including any other unsecured receivables, we do not recognize further losses, unless we have guaranteed obligations or are otherwise committed to provide further financial support to the investee.

We assess our equity investments for impairment whenever events or changes in circumstances indicate that the carrying amount of the investment may not be recoverable. If the decline in value is considered to be other-than-temporary, the investment is written down to its estimated fair value.

Business Combination

We recognize and measure the assets acquired and liabilities assumed in a business combination based on their estimated fair values at the acquisition date, with any difference compared to the purchase consideration recorded as goodwill or gain from a bargain purchase. Subsequent to the acquisition, and no later than one year from the acquisition date, we may record adjustments to the estimated fair values of assets acquired and liabilities assumed, with the corresponding offset to goodwill. Upon the conclusion of the measurement period, any subsequent adjustments of the estimated fair values are recorded to earnings. Acquisition-related costs are expensed as incurred.

Redeemable Non-controlling Interests

Our redeemable non-controlling interests relate to shares of cumulative perpetual special stock (“redeemable non-controlling interest stock”) issued by our consolidated subsidiary, formerly known as A. Schulman, Inc. (“A. Schulman”). Holders of redeemable non-controlling interest stock are entitled to receive cumulative dividends at the rate of 6% per share on the liquidation preference of \$1,000 per share. Redeemable non-controlling interest stock may be redeemed at any time at the discretion of the holders and is reported in the Consolidated Balance Sheets outside of permanent equity.

The redeemable non-controlling interests were recorded at fair value at the date of acquisition and is subsequently carried at the greater of estimated redemption value at the end of each reporting period or the initial amount recorded at the date of acquisition adjusted for subsequent redemptions. Dividends on these shares are deducted from or added to the amount of Income (loss) attributable to the Company shareholders if and when declared by the Company.

Goodwill

Goodwill is tested for impairment annually in the fourth quarter or whenever events or changes in circumstances indicate that the fair value of a reporting unit with goodwill is below its carrying amount.

We first assess qualitative factors to determine whether it is more likely than not that the fair value of a reporting unit is less than its carrying value. Qualitative factors assessed for each of the reporting units include, but are not limited to, changes in long-term commodity prices, discount rates, competitive environments, planned capacity, cost factors such as raw material prices, and financial performance of the reporting units. If the qualitative assessment indicates that it is more likely than not that the carrying value of a reporting unit exceeds its estimated fair value, a quantitative test is required. If the carrying value of the reporting unit including goodwill exceeds its fair value, an impairment charge equal to the excess would be recognized up to a maximum amount of goodwill allocated to that reporting unit.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

In 2019 and 2018, management performed qualitative impairment assessments of our reporting units which indicated that the fair value of our reporting units was greater than their carrying value including goodwill. Accordingly, a quantitative goodwill impairment test was not required and no goodwill impairment was recognized.

Intangible Assets

Intangible Assets—Intangible assets consist of customer relationships, trade names and trademarks, know-how, emission allowances, various contracts, in-process research and development costs and software costs. These assets are amortized using the straight-line method over their estimated useful lives or over the term of the related agreement. We evaluate definite-lived intangible assets with the associated long-lived asset group for impairment whenever impairment indicators are present.

Research and Development—Research and development (“R&D”) costs are expensed when incurred. Subsidies for R&D are included in Other income (expense), net. Depreciation expense related to assets employed in R&D is included as a cost of R&D.

Income Taxes

The income tax for the period comprises current and deferred tax. Income tax is recognized in the Consolidated Statements of Income, except to the extent that it relates to items recognized in other comprehensive income or directly in equity. In these cases, the applicable tax amount is recognized in other comprehensive income or directly in equity, respectively.

Deferred income taxes reflect the net tax effects of temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts used for income tax purposes, as well as the net tax effects of net operating loss carryforwards. Valuation allowances are provided against deferred tax assets when it is more likely than not that some portion or all of the deferred tax asset will not be realized.

We recognize uncertain income tax positions in our financial statements when we believe it is more likely than not, based on the technical merits, that the position or a portion thereof will be sustained upon examination. For a position that is more likely than not to be sustained, the benefit recognized is measured at the largest cumulative amount that is greater than 50 percent likely of being realized.

Other Provisions

Environmental Remediation Costs—Environmental remediation liabilities include liabilities related to sites we currently own, sites we no longer own, as well as sites where we have operated that belong to other parties. Liabilities for anticipated expenditures related to investigation and remediation of contaminated sites are accrued when it is probable a liability has been incurred and the amount of the liability can be reasonably estimated. Only ongoing operating and monitoring costs, the timing of which can be determined with reasonable certainty, are discounted to present value. Future legal costs associated with such matters, which generally are not estimable, are not included in these liabilities.

Asset Retirement Obligations—At some sites, we are contractually obligated to decommission our plants upon site exit. Asset retirement obligations are recorded at the present value of the estimated costs to retire the asset at the time the obligation is incurred. That cost, which is capitalized as part of the related long-lived asset, is depreciated on a straight-line basis over the remaining useful life of the related asset. Accretion expense in connection with the discounted liability is also recognized over the remaining useful life of the related asset. Such depreciation and accretion expenses are included in Cost of sales.

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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

Foreign Currency Translation and Remeasurement

Functional and Reporting Currency—Items included in the financial information of each of LyondellBasell N.V.’s entities are measured using the currency of the primary economic environment in which the entity operates (“the functional currency”) and then translated to the U.S. dollar (“the reporting currency”) through Other comprehensive income as follows:

- Assets and liabilities for each balance sheet presented are translated at the closing rate at the date of that balance sheet;
- Income and expenses for each income statement are translated at monthly average exchange rates; and
- All resulting exchange differences are recognized as a separate component within Other comprehensive income (foreign currency translation).

Transactions and Balances—Foreign currency transactions are recorded in their respective functional currency using exchange rates prevailing at the dates of the transactions. Exchange gains and losses resulting from the settlement of such transactions and from remeasurement of monetary assets and liabilities denominated in foreign currencies at year-end exchange rates are recognized in the Consolidated Statements of Income.

Revenue Recognition

Substantially all our revenues are derived from contracts with customers. We account for contracts when both parties have approved the contract and are committed to perform, the rights of the parties and payment terms have been identified, the contract has commercial substance and collectability is probable.

Revenue is recognized when obligations under the terms of a contract with our customer are satisfied. This generally occurs at the point in time when performance obligations are fulfilled and control transfers to the customer. In most instances, control transfers upon transfer of risk of loss and title to the customer, which usually occurs when we ship products to the customer from our manufacturing facility. Revenue is measured as the amount of consideration we expect to receive in exchange for transferring goods. Customer incentives are generally based on volumes purchased and recognized over the period earned. Sales, value-added, and other taxes that we collect concurrent with revenue-producing activities are excluded from the transaction price as they represent amounts collected on behalf of third parties. We apply the practical expedient to recognize the incremental costs of obtaining a contract as an expense when incurred if the amortization period of the asset that we otherwise would have recognized is one year or less. Shipping and handling costs are treated as a fulfillment cost and not a separate performance obligation.

Payments are typically required within a short period following the transfer of control of the product to the customer. We occasionally require customers to prepay purchases to ensure collectability. Such prepayments do not represent financing arrangements, since payment and fulfillment of the performance obligation occurs within a short time frame. We apply the practical expedient which permits us not to adjust the promised amount of consideration for the effects of a significant financing component when, at contract inception, we expect that payment will occur in one year or less.

Contract balances typically arise when a difference in timing between the transfer of control to the customer and receipt of consideration occurs. Our contract liabilities, which are reflected in our Consolidated Financial Statements as Accrued liabilities and Other liabilities, consist primarily of customer payments for products or services received before the transfer of control to the customer occurs.

Share-Based Compensation

The Company recognizes compensation expense in the financial statements for equity-classified share-based compensation awards based upon the grant date fair value over the vesting period.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

Compensation expense for liability-classified share-based awards are recognized on a straight-line basis over the vesting period as a liability and re-measured, at fair value, at the balance sheet date. See Note 17 to the Consolidated Financial Statements for additional information.

Leases

At inception of a contract, we determine if the contract contains a lease. When a lease is identified, we recognize a leased asset and a corresponding lease liability based on the present value of the lease payments over the lease term, discounted using our incremental borrowing rate, unless an implicit rate is readily determinable. Lease payments include fixed and variable lease components. Options to extend or terminate a lease are reflected in the lease payments and lease term when it is reasonably certain that we will exercise those options. Variable components are derived from usage or market-based indices, such as the consumer price index. Leases are classified as either finance or operating, with classification affecting the pattern of expense recognition in the Consolidated Statements of Income. The majority of our leases are operating leases for which we recognize lease expense on a straight-line basis over the lease term. We apply the practical expedient to account for lease and associated non-lease components as a single lease component for all asset classes with the exception of utilities and pipeline assets within major manufacturing equipment. For these assets, non-lease components are separated from lease components and accounted for as normal operating expenses. Leases with an initial term of 12 months or less are recognized in the Consolidated Statements of Income on a straight-line basis over the lease term.

Financial Instruments and Hedging Activities

Pursuant to our risk management policies, we selectively enter into derivative transactions to manage market risk volatility associated with changes in commodity pricing, currency exchange rates and interest rates. Derivatives used for this purpose are generally designated as net investment hedges, cash flow hedges or fair value hedges. Derivative instruments are recorded at fair value on the balance sheet. Gains and losses related to changes in the fair value of derivative instruments not designated as hedges are recorded in earnings.

Cash flows from derivatives designated as hedges are reported in our Consolidated Statements of Cash Flows under the same category as the cash flows from the hedged items unless the derivative contract contains a significant financing element. Cash flows for derivatives with a significant financing element are classified as Cash flows from financing activities.

Net Investment Hedges—We enter into foreign currency derivatives and foreign currency denominated debt to reduce the volatility in shareholders' equity resulting from changes in currency exchange rates of our foreign subsidiaries with respect to the U.S. dollar. Our foreign currency derivatives consist of cross-currency basis swap contracts and forward exchange contracts.

We use the critical terms approach through the application of the spot method to assess hedge effectiveness at least quarterly. For derivatives designated as net investment hedges, gains or losses attributable to changes in spot foreign exchange rates over the designation period are reflected in foreign currency translation adjustments within Other comprehensive income (loss). Recognition in earnings is delayed until the net investment is sold or liquidated. At that time, the amount recognized is reported in the same line item as the gain or loss on the liquidation of the hedged foreign operations. For our basis swaps, the associated interest receipts and payments are recorded in Interest expense. For our foreign currency forward contracts, we amortize initial forward point values on a straight-line basis to Interest expense over the life of the hedging instrument. We monitor on a quarterly basis for any over-hedged positions requiring de-designation and re-designation of the hedge to remove such over-hedged condition.

Cash Flow Hedges—We enter into cash flow hedges to manage the variability in cash flows of a future transaction. Our cash flow hedges include cross currency swaps, forward starting interest rate swaps and commodity futures and swaps. For derivatives designated as cash flow hedges, the gains and losses are recorded in Other comprehensive income (loss) and released to earnings in the same line item and in the same period during which the hedged item affects earnings.

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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

We use the critical terms and the quantitative long-haul methods to assess hedge effectiveness and monitor, at least quarterly, any change in effectiveness.

We have cross-currency swap contracts designated as cash flow hedges to reduce our exposure to the foreign currency exchange risk associated with certain intercompany loans. Under the terms of these contracts, we make interest payments in euros and receive interest in U.S. dollars. Upon the maturities of these contracts, we will pay the principal amount of the loans in euros and receive U.S. dollars from our counterparties.

We enter into forward-starting interest rate contracts to mitigate the risk of adverse changes in benchmark interest rates on future anticipated debt issuances.

We also execute commodity futures and swaps to manage the volatility of the commodity price related to anticipated purchases of raw materials and product sales. We enter into over-the-counter commodity swaps with one or more counterparties whereby we pay a predetermined fixed price and receive a price based on the average monthly rate of a specified index for the specified nominated volumes.

Fair Value Hedges—We use interest rate swaps as part of our current interest rate risk management strategy to achieve a desired proportion of variable versus fixed rate debt. Under these arrangements, we exchange fixed-rate for floating-rate interest payments to effectively convert our fixed-rate debt to floating-rate debt. For derivatives that have been designated as fair value hedges, the gains and losses of the derivatives and hedged items are recorded in earnings.

We use the long-haul method to assess hedge effectiveness using a regression analysis approach at least quarterly. We perform the regression analysis over an observation period of three years, utilizing data that is relevant to the hedge duration.

Fair Value Measurements

We categorize assets and liabilities, measured at fair value, into one of three different levels depending on the observability of the inputs employed in the measurement:

Level 1—Quoted prices for identical instruments in active markets.

Level 2—Quoted prices for similar instruments in active markets; quoted prices for identical or similar instruments in markets that are not active; and model-derived valuations in which all significant inputs or significant value-drivers are observable.

Level 3—Model-derived valuations in which one or more significant inputs or significant value-drivers are unobservable.

Fair value measurements are classified according to the lowest level input or value-driver that is significant to the valuation. A measurement may therefore be classified within Level 3 even though there may be significant inputs that are readily observable.

Changes in Fair Value Levels—Management reviews the disclosures regarding fair value measurements at least quarterly. If an instrument classified as Level 1 subsequently ceases to be actively traded, it is transferred out of Level 1. In such cases, instruments are reclassified as Level 2, unless the measurement of its fair value requires the use of significant unobservable inputs, in which case it is reclassified as Level 3.

We use the following inputs and valuation techniques to estimate the fair value of our financial instruments disclosed in Note 15 to the Consolidated Financial Statements:

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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

Basis Swaps—The fair value of our basis swap contracts is calculated using the present value of future cash flows discounted using observable inputs such as known notional value amounts, yield curves, basis curves and spot and forward exchange rates.

Cross-Currency Swaps—The fair value of our cross-currency swaps is calculated using the present value of future cash flows discounted using observable inputs with the foreign currency leg revalued using published spot and future exchange rates on the valuation date.

Forward-Starting and Fixed-for-Floating Interest Rate Swaps—The fair value of our forward-starting and fixed-for-floating interest rate swaps is calculated using the present value of future cash flows using observable inputs such as benchmark interest rates and market yield curves.

Commodity Derivatives—The fair values of our commodity derivatives are measured using closing market prices of public exchanges and from third-party broker quotes and pricing providers.

The fair value of our commodity swaps classified as Level 2 is determined using a combination of observable and unobservable inputs. The observable inputs consist of future market values of various crude and heavy fuel oils, which are readily available through public data sources. The unobservable input, which is the estimated discount or premium used in the market pricing, is calculated using an internally-developed, multi-linear regression model based on the observable prices of the known components and their relationships to historical prices. A significant change in this unobservable input would not have a material impact on the fair value measurement of our Level 2 commodity swaps.

Forward Exchange Contracts—The fair value of our forward exchange contracts is based on forward market rates.

Available-for-Sale Debt Securities—The fair value of our available-for-sale debt securities is calculated using observable market data for similar securities and broker quotes from recognized purveyors of market data.

Equity Securities—The fair value of our investment in equity securities is based on the net asset value provided by the fund administrator.

Loans Receivable—The fair value of our tri-party repurchase agreements are based on discounted cash flows, which consider prevailing market rates for the respective instrument maturity, in addition to corroborative support from the minimum underlying collateral requirements.

Short-Term Debt—The fair value of short-term borrowings related to precious metal financing arrangements accounted for as embedded derivatives are determined based on the market price of the associated precious metal.

Long-Term Debt—The fair value of our senior and guaranteed notes is calculated using pricing data obtained from well-established and recognized vendors of market data for debt valuations. The fair value of our term loan is determined based on a discounted cash flow model using observable inputs such as benchmark interest rates and public information regarding our credit risk.

Due to the short maturity, the fair value of all non-derivative financial instruments included in Current assets and Current liabilities approximates the applicable carrying value. Current assets include Cash and cash equivalents, Restricted cash, Short-term investments and Accounts receivable. Current liabilities include Accounts payable and Short-term debt excluding precious metal financings.

We use the following inputs and valuation techniques to estimate the fair value of our pension assets disclosed in Note 16 to the Consolidated Financial Statements:

Common and Preferred Stock—Valued at the closing price reported on the market on which the individual securities are traded.

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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

Fixed Income Securities—Certain securities that are not traded on an exchange are valued at the closing price reported by pricing services. Other securities are valued based on yields currently available on comparable securities of issuers with similar credit ratings.

Commingled Funds—Valued based upon the unit values of such collective trust funds held at year end by the pension plans. Unit values are based on the fair value of the underlying assets of the fund derived from inputs principally from, or corroborated by, observable market data by correlation or other means.

Real Estate—Valued on the basis of a discounted cash flow approach, which includes the future rental receipts, expenses, and residual values as the highest and best use of the real estate from a market participant view as rental property.

Hedge Funds—Valued based upon the unit values of such alternative investments held at year end by the pension plans. Unit values are based on the fair value of the underlying assets of the fund.

Private Equity—Valued based upon the unit values of such alternative investments held at year end by the pension plans. Unit values are based on the fair value of the underlying assets of the fund. Certain securities held in the fund are valued at the closing price reported on an exchange or other established quotation service for over-the-counter securities. Other assets held in the fund are valued based on the most recent financial statements prepared by the fund manager.

Convertible Securities—Valued at the quoted prices for similar assets or liabilities in active markets.

U.S. Government Securities—Certain securities are valued at the closing price reported on the active market on which the individual securities are traded. Other securities are valued based on yields currently available on comparable securities of issuers with similar credit ratings.

Cash and Cash Equivalents—Valued at the quoted prices for identical assets or liabilities in active markets.

Non-U.S. Insurance Arrangements—Valued based upon the estimated cash surrender value of the underlying insurance contract, which is derived from an actuarial determination of the discounted benefits cash flows.

Employee Benefits

Pension Plans—We have funded and unfunded defined benefit plans and defined contribution plans. For the defined benefit plans, a projected benefit obligation is calculated annually by independent actuaries using the projected unit credit method. Pension costs primarily represent the increase in the actuarial present value of the obligation for pension benefits based on employee service during the year and the interest on this obligation in respect of employee service in previous years, net of expected return on plan assets.

Actuarial gains and losses arising from experience adjustments and changes in actuarial assumptions are charged or credited to equity and are reflected in Accumulated other comprehensive income in the period in which they arise.

Other Post-Employment Obligations—Certain employees are entitled to postretirement medical benefits upon retirement. The entitlement to these benefits is usually conditional on the employee remaining in service up to retirement age and the completion of a minimum service period. The expected costs of these benefits are accrued over the period of employment applying the same accounting methodology used for defined benefit plans.

Termination Benefits—Contractual termination benefits are payable when employment is terminated due to an event specified in the provisions of a social/labor plan or statutory law. A liability is recognized for one-time termination benefits when we are committed to (i) make payments and the number of affected employees and the benefits received are known to both parties, and (ii) terminating the employment of current employees according to a detailed formal plan without possibility of withdrawal and can reasonably estimate such amount. Benefits falling due more than 12 months after the balance sheet date are discounted to present value.

Use of Estimates

The preparation of financial statements in conformity with generally accepted accounting principles requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities, the disclosure of contingent assets and liabilities at the date of the financial statements, and the reported amounts of revenues and expenses during the reporting periods. Actual results could differ from those estimates.

Recently Adopted Guidance

Leases—Effective January 1, 2019, we adopted the Financial Accounting Standards Board’s (“FASB”) Standard, *Leases (Topic 842)* as amended. This guidance establishes a right-of-use model that requires a lessee to recognize a leased asset and lease liability on the balance sheet for all leases with a term longer than 12 months. Leases are classified as finance or operating, with classification affecting the timing and classification of expense recognition.

We used the modified retrospective method and recognized at January 1, 2019, Operating leased assets and Operating lease liabilities of \$1,533 million and \$1,553 million, respectively. We also reduced Accrued liabilities and Other liabilities by \$2 million and \$18 million, respectively. We elected the practical expedients permitted under the transition guidance that allowed us not to reassess our prior conclusions about lease identification, lease classification, initial direct costs and whether existing land easements that were not accounted for as leases under previous accounting standards are, or contain, a lease under the new standard. The adoption of this new guidance did not have a material impact on our Consolidated Statements of Income or Cash Flows. Comparative financial information has not been restated and continues to be reported under the accounting standards in effect for those periods. See Note 14 to the Consolidated Financial Statements for the disclosures related to the adoption of this guidance.

Financial Instruments—Effective January 1, 2019, we early adopted the FASB’s update *Financial Instruments—Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments*. This guidance amends the impairment model to utilize an expected credit loss method in place of the incurred loss method for financial instruments measured at amortized cost, which may result in earlier recognition of credit losses. The expected credit loss is recorded using a valuation allowance and considers the risk of loss over the asset’s contractual life, even if remote, historical experience, current conditions and forecasts. This guidance also modifies the impairment model for available-for-sale debt securities by eliminating the concept of “other than temporary” impairment. Our early adoption of this guidance, including subsequent amendments, did not have a material impact on our Consolidated Financial Statements.

Accounting Guidance Issued But Not Adopted as of December 31, 2019

Intangibles—Effective January 1, 2020, we will adopt FASB update, *Intangibles—Goodwill and Other—Internal-Use Software (Subtopic 350-40): Customer’s Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement That is a Service Contract*. This guidance requires a customer in a hosted, cloud computing arrangement that is a service contract to follow the internal-use software guidance to determine which implementation costs to capitalize as assets or expense as incurred. Capitalized costs are amortized over the term of the hosting arrangement when the recognized asset is ready for its intended use. The adoption of this guidance will not have a material impact on our Consolidated Financial Statements.

Fair Value Measurement—Effective January 1, 2020, we will adopt FASB update, *Fair Value Measurement (Topic 820): Disclosure Framework—Change to the Disclosure Requirements for Fair Value Measurement*. This guidance eliminates, adds and modifies certain disclosure requirements for fair value measurements as part of its disclosure framework project. It removes transfer disclosures between Level 1 and Level 2 of the fair value hierarchy, and adds disclosures for the range and weighted average used to develop significant unobservable inputs for Level 3 fair value measurements. The adoption of this guidance will not have a material impact on our Consolidated Financial Statements.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

Income Taxes—In December 2019, the FASB issued the update, *Income Taxes (Topic 742): Simplifying the Accounting for Income Taxes*. This guidance enhances and simplifies various aspects of income tax accounting by removing exceptions for recognizing deferred taxes for changes from a subsidiary to an equity method investment and vice versa, performing intraperiod allocation and calculating income taxes in interim periods. The new guidance also reduces complexity in certain areas, including the tax basis step-up in goodwill in a transaction that is not a business combination and interim period accounting for enacted changes in tax law. The guidance will be effective for fiscal years and interim periods beginning after December 15, 2020 using a combination of retrospective, modified retrospective and prospective basis. Early adoption is permitted. We are currently evaluating the impact of the new guidance on our Consolidated Financial Statements.

Compensation—In August 2018, FASB issued update, *Compensation—Retirement Benefits—Defined Benefit Plans—General (Subtopic 715-20): Disclosure Framework—Changes to the Disclosure Requirements for Defined Benefit Plans*. This guidance changes disclosure requirements for employers that sponsor defined benefit pension and/or other postretirement benefit plans. It eliminates the requirement of certain disclosures that are no longer considered cost beneficial; however, it adds more pertinent disclosures. This guidance will be effective for public entities for annual periods ending after December 15, 2020. Early adoption is permitted. We are currently evaluating the impact of the new guidance on our Consolidated Financial Statements.

3. Business Combination and Disposition

Business Combination

On August 21, 2018, we acquired all of the outstanding common stock of A. Schulman Inc., a Delaware corporation, for an adjusted aggregate purchase price of \$1,933 million. The purchase price was allocated based on the fair value of the acquired assets and liabilities, redeemable non-controlling interests and non-controlling interests assumed. During 2019, we made certain measurement period adjustments resulting in a \$86 million increase of goodwill with corresponding adjustments to property, plant and equipment, contingencies and deferred taxes. For additional information on the goodwill allocated to our reporting units, see Note 8 and Note 22 to the Consolidated Financial Statements.

Disposition

In October 2018, we received net cash proceeds of \$37 million upon the sale of our carbon black subsidiary in France. The net cash proceeds are reflected in Cash flows from investing activities in the Consolidated Statements of Cash Flows. In connection with the sale, we recognized a pre-tax gain of \$36 million, which is reflected in Other income, net in the Consolidated Income Statements.

4. Revenues

Contract Balances—Contract liabilities were \$124 million and \$138 million at December 31, 2019 and 2018, respectively. Revenue recognized in each reporting period included in the contract liability balance at the beginning of the period was immaterial.

Disaggregation of Revenues—We participate globally across the petrochemical value chain and are an industry leader in many of our product lines. Our chemicals businesses consist primarily of large processing plants that convert large volumes of liquid and gaseous hydrocarbon feedstocks into plastic resins and other chemicals. Our chemical products tend to be basic building blocks for other chemicals and plastics. Our plastic products are used in large volumes as well as smaller specialty applications. Our refining business consists of our Houston refinery, which processes crude oil into refined products such as gasoline, diesel and jet fuel.

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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

Revenues disaggregated by key products are summarized below:

<u>Millions of dollars</u>	Year Ended December 31,		
	2019	2018	2017
Sales and other operating revenues:			
Olefins & co-products	\$ 2,957	\$ 3,679	\$ 4,304
Polyethylene	6,070	7,439	7,368
Polypropylene	5,010	5,703	5,005
Propylene oxide and derivatives	1,924	2,378	2,059
Oxyfuels and related products	3,116	3,399	3,022
Intermediate chemicals	2,516	3,568	3,196
Compounding and solutions	4,096	3,091	2,139
Advanced polymers	750	930	783
Refined products	7,599	8,221	6,165
Other	689	596	443
Total	<u>\$ 34,727</u>	<u>\$ 39,004</u>	<u>\$ 34,484</u>

The following table presents our revenues disaggregated by geography, based upon the location of the customer:

<u>Millions of dollars</u>	Year Ended December 31,		
	2019	2018	2017
Sales and other operating revenues:			
United States	\$ 16,349	\$ 18,671	\$ 16,618
Germany	2,708	2,949	2,746
Mexico	1,634	2,308	1,504
Italy	1,435	1,582	1,352
France	1,345	1,460	1,306
Japan	1,039	1,257	1,185
China	1,225	1,137	1,024
The Netherlands	929	1,050	1,069
Other	8,063	8,590	7,680
Total	<u>\$ 34,727</u>	<u>\$ 39,004</u>	<u>\$ 34,484</u>

Transaction Price Allocated to the Remaining Performance Obligations—We have elected to exclude contracts which have an initial term of one year or less from this disclosure. Our contracts with customers are commodity supply arrangements that settle based on market prices at future delivery dates; therefore, transaction prices are entirely variable. Transaction prices are known at the time revenue is recognized since they are generally determined by the commodity price index at a specific date, at month-end or at the month average once products are shipped to our customers. Future estimates of transaction prices for disclosure purposes are substantially constrained as they are highly susceptible to factors outside our influence, including volatility in commodity markets, industry production capacities and operating rates, planned and unplanned industry operating interruptions, foreign exchange rates and worldwide geopolitical trends.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

5. Related Party Transactions

We have related party transactions with our joint venture partners, which are classified as equity investees (see Notes 9 and 10 to the Consolidated Financial Statements). These related party transactions include the sales and purchases of goods in the normal course of business as well as certain financing arrangements. In addition, under contractual arrangements with certain of our equity investees, we receive certain services, utilities and materials at some of our manufacturing sites, and we provide certain services to our equity investees.

We have guaranteed \$40 million of the indebtedness of two of our joint ventures as of December 31, 2019.

Related party transactions are summarized as follows:

<u>Millions of dollars</u>	Year Ended December 31,		
	2019	2018	2017
The Company billed related parties for:			
Sales of products—			
Joint venture partners	\$ 819	\$ 878	\$ 779
Shared service agreements—			
Joint venture partners	8	9	16
Related parties billed the Company for:			
Sales of products—			
Joint venture partners	\$ 2,830	\$ 2,999	\$ 2,759
Shared service agreements—			
Joint venture partners	71	70	75

6. Accounts Receivable

We sell our products primarily to other industrial concerns in the petrochemicals and refining industries. We perform ongoing credit evaluations of our customers' financial conditions and, in certain circumstances, require letters of credit or corporate guarantees from them. Our Accounts receivable are reflected in the Consolidated Balance Sheets net of allowance for credit losses of \$16 million in each of the years ended December 31, 2019 and 2018. We recorded provisions for credit losses for receivables, which are reflected in the Consolidated Statements of Income, of less than \$1 million in 2019, 2018 and 2017.

7. Inventories

Inventories consisted of the following components at December 31:

<u>Millions of dollars</u>	2019	2018
Finished goods	\$ 3,083	\$ 3,066
Work-in-process	130	138
Raw materials and supplies	1,375	1,311
Total inventories	<u>\$ 4,588</u>	<u>\$ 4,515</u>

At December 31, 2019 and 2018, approximately 85% of our inventories were valued using the last in, first out ("LIFO") method and the remaining inventories, consisting primarily of materials and supplies, were valued at the moving average cost method. At December 31, 2019 and 2018, our LIFO cost exceeded current replacement cost under the first-in first-out method. The excess of our inventories at estimated net realizable value over LIFO cost after lower of cost or market ("LCM") charges was approximately \$670 million and \$798 million at December 31,

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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

2019 and 2018, respectively. For information related to LCM inventory valuation charges recognized during 2019, see Note 22 to the Consolidated Financial Statements.

8. Property, Plant and Equipment, Goodwill and Intangible Assets

Property, Plant and Equipment—The components of property, plant and equipment, at cost, and the related accumulated depreciation are as follows at December 31:

<u>Millions of dollars</u>	<u>Estimated Useful Life (years)</u>	<u>2019</u>	<u>2018</u>
Major manufacturing equipment	25	\$ 11,572	\$ 10,684
Light equipment and instrumentation	5 - 20	2,968	2,639
Construction in progress		3,310	2,255
Major turnarounds	4 - 7	1,866	1,750
Buildings	30	1,090	924
Land		359	364
Information system equipment	3 - 5	69	60
Office furniture	15	26	25
Total property, plant and equipment		21,260	18,701
Less accumulated depreciation		(7,130)	(6,224)
Property, plant and equipment, net		\$ 14,130	\$ 12,477

Capitalized Interest—We capitalize interest costs incurred on funds used to construct property, plant and equipment. In 2019, 2018 and 2017, we capitalized interest of \$87 million, \$45 million and \$20 million, respectively.

Intangible Assets—The components of identifiable intangible assets, at cost, and the related accumulated amortization are as follows at December 31:

<u>Millions of dollars</u>	<u>2019</u>			<u>2018</u>		
	<u>Cost</u>	<u>Accumulated Amortization</u>	<u>Net</u>	<u>Cost</u>	<u>Accumulated Amortization</u>	<u>Net</u>
Emission allowances	\$ 874	\$ (593)	\$ 281	\$ 807	\$ (531)	\$ 276
Various contracts	506	(359)	147	508	(329)	179
Customer relationships	299	(32)	267	300	(8)	292
In-process research and development costs	109	(82)	27	111	(75)	36
Trade name and trademarks	102	(37)	65	104	(7)	97
Know-how	84	(15)	69	84	(4)	80
Software costs	74	(61)	13	64	(59)	5
Total intangible assets	\$ 2,048	\$ (1,179)	\$ 869	\$ 1,978	\$ (1,013)	\$ 965

Amortization of these identifiable intangible assets for the next five years is expected to be \$167 million in 2020, \$76 million in 2021, \$72 million in 2022, \$65 million in 2023 and \$57 million in 2024.

LYONDELLBASELL INDUSTRIES N.V.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

Depreciation and Amortization Expense—Depreciation and amortization expense is summarized as follows:

<u>Millions of dollars</u>	<u>Year Ended December 31,</u>		
	<u>2019</u>	<u>2018</u>	<u>2017</u>
Property, plant and equipment	\$ 1,092	\$ 1,075	\$ 1,023
Investment in PO joint ventures	49	41	41
Emission allowances	63	63	67
Various contracts	32	31	27
Customer relationships	24	8	—
In-process research and development costs	8	7	9
Trade name and trademarks	30	7	—
Know-how	12	4	—
Software costs	2	5	7
Total depreciation and amortization	<u>\$ 1,312</u>	<u>\$ 1,241</u>	<u>\$ 1,174</u>

Asset Retirement Obligations—In certain cases, we are contractually obligated to decommission our plants upon site exit. In such cases, we have accrued the net present value of the estimated costs. The majority of our asset retirement obligations are related to facilities in Europe. The changes in our asset retirement obligations are as follows:

<u>Millions of dollars</u>	<u>Year Ended December 31,</u>	
	<u>2019</u>	<u>2018</u>
Beginning balance	\$ 58	\$ 58
Payments	—	(2)
Changes in estimates	7	2
Accretion expense	1	2
Effects of exchange rate changes	(1)	(2)
Ending balance	<u>\$ 65</u>	<u>\$ 58</u>

Although, we may have asset retirement obligations associated with some of our other facilities, the present value of those obligations is not material in the context of an indefinite expected life of the facilities. We continually review the optimal future alternatives for our facilities. Any decision to retire one or more facilities may result in an increase in the present value of such obligations.

We began reporting the Berre refinery as a discontinued operation in the second quarter of 2012. The estimated cost and associated cash flows pertaining to the final closure and dismantle of our Berre refinery from the Prefect of Bouches du Rhone are not deemed to be material.

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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

Goodwill—The changes in the carrying amount of goodwill in each of the Company’s reportable segments for the years ended December 31, 2019 and 2018 were as follows:

<u>Millions of dollars</u>	<u>O&P – Americas</u>	<u>O&P – EAI</u>	<u>I&D</u>	<u>APS</u>	<u>Technology</u>	<u>Total</u>
December 31, 2017	\$ 162	\$ 121	\$ 237	\$ 41	\$ 9	\$ 570
Acquisition of A. Schulman	—	—	—	1,259	—	1,259
Measurement period adjustments	—	—	—	12	—	12
Foreign currency translation adjustments	—	(7)	(8)	(12)	—	(27)
December 31, 2018	162	114	229	1,300	9	1,814
Measurement period adjustments	—	—	—	86	—	86
Foreign currency translation adjustments	—	(2)	(1)	(6)	—	(9)
December 31, 2019	<u>\$ 162</u>	<u>\$ 112</u>	<u>\$ 228</u>	<u>\$ 1,380</u>	<u>\$ 9</u>	<u>\$ 1,891</u>

For additional information related to the August 2018 acquisition of A. Schulman and related goodwill, see Note 3 to the Consolidated Financial Statements.

9. Investment in PO Joint Ventures

We share ownership with Covestro PO LLC, a subsidiary of Covestro AG (collectively “Covestro”), in a U.S. propylene oxide (“PO”) manufacturing joint venture (the “U.S. PO joint venture”). The U.S. PO joint venture owns a PO/styrene monomer (“SM” or “styrene”) and a PO/tertiary butyl alcohol (“TBA”) manufacturing facility. Covestro’s ownership interest represents an undivided interest in certain U.S. PO joint venture assets with correlative PO capacity reservation that resulted in ownership of annual in-kind cost-based PO production of approximately 680 thousand tons in 2019 and 2018. We take in-kind the remaining cost-based PO and co-product production.

In addition, we and Covestro each have a 50% interest in a separate manufacturing joint venture (the “European PO joint venture”), which owns a PO/SM plant at Maasvlakte near Rotterdam, The Netherlands. In substance, each partner’s ownership interest represents an undivided interest in all of the European PO joint venture assets with correlative capacity reservation that resulted in ownership of annual in-kind cost-based PO and SM production.

We and Covestro do not share marketing or product sales under the U.S. PO joint venture. We operate the U.S. PO joint venture’s and the European PO joint venture’s (collectively the “PO joint ventures”) plants and arrange and coordinate the logistics of product delivery. The partners share in the cost of production and logistics is based on their product offtake.

We account for both the U.S. PO joint venture and the European PO joint venture using the equity method. We report the cost of our product offtake as inventory and equity loss as cost of sales in our Consolidated Financial Statements. Related production cash flows are reported in the operating cash flow section of the Consolidated Statements of Cash Flows.

Our equity investment in the PO joint ventures represents our share of the manufacturing plants and is decreased by recognition of our share of equity loss, which is equal to the depreciation and amortization of the assets of the PO joint ventures. Other changes in the investment balance are principally due to our additional capital contributions to the PO joint ventures to fund capital expenditures. Such contributions are reported in the investing cash flow section of the Consolidated Statements of Cash Flows.

Our product offtake of PO and its co-products was 2,431 thousand tons in 2019, 2,623 thousand tons in 2018 and 2,807 thousand tons in 2017.

LYONDELLBASELL INDUSTRIES N.V.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

Changes in our investments in the U.S. and European PO joint ventures for 2019 and 2018 are summarized below:

Millions of dollars	U.S. PO Joint Venture	European PO Joint Venture	Total PO Joint Ventures
Investments in PO joint ventures—January 1, 2019	\$ 363	\$ 106	\$ 469
Cash contributions	27	59	86
Depreciation and amortization	(41)	(8)	(49)
Effect of exchange rate changes	—	(2)	(2)
Investments in PO joint ventures—December 31, 2019	<u>\$ 349</u>	<u>\$ 155</u>	<u>\$ 504</u>
Investments in PO joint ventures—January 1, 2018	\$ 310	\$ 110	\$ 420
Cash contributions	85	10	95
Depreciation and amortization	(32)	(9)	(41)
Effect of exchange rate changes	—	(5)	(5)
Investments in PO joint ventures—December 31, 2018	<u>\$ 363</u>	<u>\$ 106</u>	<u>\$ 469</u>

10. Equity Investments

Our PO joint ventures, which are also accounted for using the equity method of accounting, are discussed in Note 9 to the accompanying Consolidated Financial Statements and are, therefore, not included in the following discussion.

Our remaining principal direct and indirect equity investments are as follows at December 31:

Percent of Ownership	2019	2018
Basell Orlen Polyolefins Sp. Z.o.o.	50.00%	50.00%
PolyPacific Pty. Ltd.	50.00%	50.00%
Saudi Polyolefins Company	25.00%	25.00%
Saudi Ethylene & Polyethylene Company Ltd.	25.00%	25.00%
Al-Waha Petrochemicals Ltd.	25.00%	25.00%
Polymirae Co. Ltd.	50.00%	50.00%
HMC Polymers Company Ltd.	28.56%	28.56%
Indelpro S.A. de C.V.	49.00%	49.00%
Ningbo ZRCC Lyondell Chemical Co. Ltd.	26.65%	26.65%
Ningbo ZRCC Lyondell Chemical Marketing Co.	50.00%	50.00%
NOC Asia Ltd.	—%	40.00%

The changes in our equity investments are as follows:

Millions of dollars	Year Ended December 31,	
	2019	2018
Beginning balance	\$ 1,611	\$ 1,635
Income from equity investments	225	289
Distribution of earnings, net of tax	(247)	(307)
Business combination	—	16
Currency exchange effects	13	(28)
Other	—	6
Ending balance	<u>\$ 1,602</u>	<u>\$ 1,611</u>

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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

In November 2019, we sold our 40% interest in our NOC Asia Ltd. joint venture and received proceeds of \$5 million.

Summarized balance sheet information of the Company's investments accounted for under the equity method are as follows at December 31:

Millions of dollars	2019	2018
Current assets	\$ 2,591	\$ 2,824
Noncurrent assets	4,491	4,625
Total assets	7,082	7,449
Current liabilities	1,640	1,485
Noncurrent liabilities	1,060	1,592
Net assets	<u>\$ 4,382</u>	<u>\$ 4,372</u>

Summarized income statement information of the Company's investments accounted for under the equity method are set forth below:

Millions of dollars	Year Ended December 31,		
	2019	2018	2017
Revenues	\$ 6,753	\$ 7,449	\$ 6,632
Cost of sales	(5,499)	(5,899)	(5,119)
Gross profit	1,254	1,550	1,513
Net operating expenses	(253)	(310)	(223)
Operating income	1,001	1,240	1,290
Interest income	5	6	7
Interest expense	(63)	(70)	(74)
Foreign currency translation	4	1	11
Other income, net	(24)	25	11
Income before income taxes	923	1,202	1,245
Provision for income taxes	(194)	(260)	(153)
Net income	<u>\$ 729</u>	<u>\$ 942</u>	<u>\$ 1,092</u>

The difference between our carrying value and the underlying equity in the net assets of our equity investments are assigned to the assets and liabilities of the investment, based on an analysis of the factors giving rise to the basis difference. The amortization of the basis difference is included in Income from equity investments in the Consolidated Statements of Income.

LYONDELLBASELL INDUSTRIES N.V.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

11. Prepaid Expenses, Other Current Assets and Other Assets

The components of Prepaid expenses and other current assets were as follows at December 31:

<u>Millions of dollars</u>	<u>2019</u>	<u>2018</u>
Loans receivable	\$ —	\$ 544
VAT receivables	178	218
Income tax receivable	175	169
Financial derivatives	54	80
Advances to suppliers	54	57
Renewable identification numbers	39	65
Prepaid insurance	26	25
Other	210	97
Total prepaid expenses and other current assets	<u>\$ 736</u>	<u>\$ 1,255</u>

The renewable identification numbers reflected above represent a U.S. government established credit used to show compliance in meeting the Environmental Protection Agency's Renewable Fuel Standard.

The components of Other assets were as follows at December 31:

<u>Millions of dollars</u>	<u>2019</u>	<u>2018</u>
Derivative contracts	\$ 255	\$ 118
Company-owned life insurance	61	62
Deferred tax assets	38	31
Pension assets	22	39
Debt issuance costs	11	12
Other	52	91
Total other assets	<u>\$ 439</u>	<u>\$ 353</u>

12. Accrued Liabilities

Accrued liabilities consisted of the following components at December 31:

<u>Millions of dollars</u>	<u>2019</u>	<u>2018</u>
Payroll and benefits	\$ 385	\$ 534
Operating lease liabilities	273	—
Taxes other than income taxes	202	186
Financial derivatives	183	30
Interest	161	154
Product sales rebates	142	163
Contract liabilities	103	128
Income taxes	66	16
Renewable identification numbers	46	72
Other	261	253
Total accrued liabilities	<u>\$ 1,822</u>	<u>\$ 1,536</u>

LYONDELLBASELL INDUSTRIES N.V.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

13. Debt

Long-term loans, notes and other debt net of unamortized discount and debt issuance cost consisted of the following as of December 31:

<u>Millions of dollars</u>	<u>2019</u>	<u>2018</u>
Senior Notes due 2019, \$1,000 million, 5.0%	\$ —	\$ 988
Senior Notes due 2021, \$1,000 million, 6.0% (\$3 million of debt issuance cost)	998	975
Senior Notes due 2024, \$1,000 million, 5.75% (\$5 million of debt issuance cost)	995	993
Senior Notes due 2055, \$1,000 million, 4.625% (\$16 million of discount; \$11 million of debt issuance cost)	973	973
Term Loan due 2022, \$4,000 million	1,950	—
Guaranteed Notes due 2022, €750 million, 1.875% (\$1 million of discount; \$2 million of debt issuance cost)	841	855
Guaranteed Notes due 2023, \$750 million, 4.0% (\$4 million of discount; \$2 million of debt issuance cost)	744	742
Guaranteed Notes due 2026, €500 million, 0.875% (\$2 million of discount; \$4 million of debt issuance cost)	555	—
Guaranteed Notes due 2027, \$1,000 million, 3.5% (\$8 million of discount; \$6 million of debt issuance cost)	1,023	964
Guaranteed Notes due 2027, \$300 million, 8.1%	300	300
Guaranteed Notes due 2031, €500 million, 1.625% (\$6 million of discount; \$3 million of debt issuance cost)	552	—
Guaranteed Notes due 2043, \$750 million, 5.25% (\$20 million of discount; \$7 million of debt issuance cost)	723	722
Guaranteed Notes due 2044, \$1,000 million, 4.875% (\$11 million of discount; \$9 million of debt issuance cost)	980	980
Guaranteed Notes due 2049, \$1,000 million, 4.2% (\$15 million of discount; \$10 million of debt issuance cost)	975	—
Other	8	10
Total	11,617	8,502
Less current maturities	(3)	(5)
Long-term debt	<u>\$ 11,614</u>	<u>\$ 8,497</u>

Fair value hedging adjustments associated with the fair value hedge accounting of our fixed-for-floating interest rate swaps for the applicable periods are as follows:

<u>Millions of dollars</u>	<u>Inception Year</u>	<u>Gains (Losses)</u>		<u>Cumulative Fair Value Hedging Adjustments Included in Carrying Amount of Debt</u>	
		<u>Year Ended December 31,</u>		<u>Year Ended December 31,</u>	
		<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
Senior Notes due 2019, 5.0%	2014	\$ (11)	\$ (25)	\$ —	\$ 11
Senior Notes due 2021, 6.0%	2016	(21)	8	(1)	20
Guaranteed Notes due 2027, 3.5%	2017	(58)	22	(37)	21
Guaranteed Notes due 2022, 1.875%	2018	(1)	(1)	(2)	(1)
Total		<u>\$ (91)</u>	<u>\$ 4</u>	<u>\$ (40)</u>	<u>\$ 51</u>

LYONDELLBASELL INDUSTRIES N.V.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

The cumulative fair value hedging adjustments remaining at December 31, 2018 associated with our Senior Notes due 2019 included \$7 million for hedges that have been discontinued. These fair value adjustments are recognized in Interest expense in the Consolidated Statements of Income.

Short-term loans, notes and other debt consisted of the following as of December 31:

<u>Millions of dollars</u>	<u>2019</u>	<u>2018</u>
Senior Revolving Credit Facility, \$2,500 million	\$ —	\$ —
U.S. Receivables Facility, \$900 million	—	—
Commercial paper	262	809
Precious metal financings	181	71
Other	2	5
Total Short-term debt	<u>\$ 445</u>	<u>\$ 885</u>

Aggregate maturities of debt during the next five years are \$448 million in 2020, \$1,002 million in 2021, \$2,793 million in 2022, \$751 million in 2023, \$1,000 million in 2024 and \$6,173 million thereafter.

Long-Term Debt

Guaranteed Notes due 2049—In October 2019, LYB International Finance III, LLC (“LYB Finance III”), a wholly owned finance subsidiary of LyondellBasell N.V., as defined in Rule 3-10(b) of Regulation S-X, issued \$1,000 million of 4.2% guaranteed notes due 2049 at a discounted price of 98.488%. Net proceeds from the sale of the notes which totaled \$974 million were used to repay indebtedness outstanding under our Term Loan due 2020 discussed below.

These unsecured notes, which are fully and unconditionally guaranteed by LyondellBasell N.V., rank equally in right of payment to all of LYB Finance III’s existing and future unsecured indebtedness and to all of LyondellBasell N.V.’s existing and future unsubordinated indebtedness. There are no significant restrictions that would impede LyondellBasell N.V., as guarantor, from obtaining funds by dividend or loan from its subsidiaries.

The indenture governing these notes contains limited covenants, including those restricting our ability and the ability of our subsidiaries to incur indebtedness secured by significant property or by capital stock of subsidiaries that own significant property, enter into certain sale and lease-back transactions with respect to any significant property or enter into consolidations, mergers or sales of all or substantially all of our assets.

The notes may be redeemed before the date that is six months prior to the scheduled maturity date at a redemption price equal to the greater of 100% of the principal amount of the notes redeemed or the sum of the present values of the remaining scheduled payments of principal and interest (discounted at the applicable treasury yield plus 35 basis points) on the notes to be redeemed. The notes may also be redeemed on or after the date that is six months prior to the final maturity date of the notes at a redemption price equal to 100% of the principal amount of the notes redeemed plus accrued and unpaid interest. The notes are also redeemable upon certain tax events.

Guaranteed Notes due 2026 and 2031—In September 2019, LYB International Finance II B.V. (“LYB Finance II”), a wholly owned finance subsidiary of LyondellBasell N.V., as defined in Rule 3-10(b) of Regulation S-X, issued €500 million of 0.875% guaranteed notes due 2026 (the “2026 Notes”) at a discounted price of 99.642%, and €500 million of 1.625% guaranteed notes due 2031 (the “2031 Notes”) at a discounted price of 98.924%. In September 2019, we used the net proceeds from the sale of the notes to repay \$1,000 million of indebtedness outstanding under the \$4,000 million three-year Term Loan due 2022 and a portion of borrowings from our commercial paper program.

LYONDELLBASELL INDUSTRIES N.V.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

These unsecured notes, which are fully and unconditionally guaranteed by LyondellBasell N.V., rank equally in right of payment to all of LYB Finance II's existing and future unsecured indebtedness and to all of LyondellBasell N.V.'s existing and future unsubordinated indebtedness. There are no significant restrictions that would impede LyondellBasell N.V., as guarantor, from obtaining funds by dividend or loan from its subsidiaries.

The indenture governing these notes contains limited covenants, including those restricting our ability and the ability of our subsidiaries to incur indebtedness secured by significant property or by capital stock of subsidiaries that own significant property, enter into certain sale and lease-back transactions with respect to any significant property or enter into consolidations, mergers or sales of all or substantially all of our assets.

The notes may be redeemed before the date that is three months prior to the scheduled maturity date at a redemption price equal to the greater of 100% of the principal amount of the notes redeemed and the sum of the present values of the remaining scheduled payments of principal and interest (discounted at the applicable comparable government bond rate plus 30 basis points in the case of the 2026 Notes and 35 basis points in the case of the 2031 Notes) on the notes to be redeemed. The notes may also be redeemed on or after the date that is three months prior to the scheduled maturity date of the notes at a redemption price equal to 100% of the principal amount of the notes redeemed plus accrued and unpaid interest. The notes are also redeemable upon certain tax events.

Three-Year Term Loan due 2022—In March 2019, LYB Americas Finance Company LLC (“LYB Americas Finance”), a wholly owned subsidiary of LyondellBasell N.V., entered into a three-year \$4,000 million senior unsecured delayed draw term loan credit facility that matures in March 2022. Proceeds under this credit agreement, which is fully and unconditionally guaranteed by LyondellBasell N.V., were used for general corporate purposes.

In July 2019, we borrowed \$1,000 million under this facility to fund a portion of the share repurchase price paid pursuant to a modified Dutch Auction tender offer (“tender offer”). The remainder of the repurchase price was funded through borrowings of \$500 million from our U.S. Receivables Facility, \$1,280 million from our commercial paper program and the remainder from operating cash. See Note 20 to the Consolidated Financial Statements for additional information on the tender offer.

In September 2019, we repaid \$1,000 million with proceeds from the 2026 and 2031 Notes.

In December 2019, we borrowed \$1,950 million from this facility to repay amounts outstanding under our commercial paper program and \$500 million outstanding under our U.S. Receivables Facility.

Borrowings under the credit agreement bear interest at either a base rate or LIBOR rate, as defined, plus in each case, an applicable margin determined by reference to LyondellBasell N.V.'s current credit ratings.

The credit agreement contains customary representations and warranties and contains certain restrictive covenants regarding, among other things, secured indebtedness, subsidiary indebtedness, mergers and sales of assets. In addition, we are required to maintain a leverage ratio at the end of every fiscal quarter of 3.50 to 1.00, or less, for the period covering the most recent four quarters.

Borrowings under the credit agreement were available through December 31, 2019, subsequent to which no further borrowings may be made under the agreement.

Senior Notes due 2019—In February 2019, proceeds from the 364-day term loan due 2020 were used to redeem the remaining \$1,000 million outstanding of our 5% Senior Notes due 2019 at par. In conjunction with the redemption of these notes, we recognized non-cash charges of less than \$1 million for unamortized debt issuance costs and \$8 million for the write-off of the cumulative fair value hedge accounting adjustment related to the redeemed notes.

In March 2017, we redeemed \$1,000 million aggregate principal amount of our outstanding 5% senior notes due 2019, and paid \$65 million in make-whole premiums. In conjunction with the redemption of these notes, we recognized non-cash charges of \$4 million for the write-off of unamortized debt issuance costs and \$44 million for the write-off of the cumulative fair value hedge accounting adjustment related to the redeemed notes.

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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

Guaranteed Notes due 2027, \$1,000 million—In March 2017, LYB Finance II issued \$1,000 million of 3.5% guaranteed notes due 2027 at a discounted price of 98.968%. In March 2017, the net proceeds from these notes, together with available cash, were used to redeem \$1,000 million aggregate principal amount of our outstanding 5% senior notes due 2019.

These unsecured notes, which are fully and unconditionally guaranteed by LyondellBasell N.V., rank equally in right of payment to all of LYB Finance II's existing and future unsecured indebtedness and to all of LyondellBasell N.V.'s existing and future unsubordinated indebtedness. There are no significant restrictions that would impede LyondellBasell N.V., as guarantor, from obtaining funds by dividend or loan from its subsidiaries.

The indenture governing these notes contains limited covenants, including those restricting our ability and the ability of our subsidiaries to incur indebtedness secured by significant property or by capital stock of subsidiaries that own significant property, enter into certain sale and lease-back transactions with respect to any significant property or enter into consolidations, mergers or sales of all or substantially all of our assets.

The notes may be redeemed before the date that is three months prior to the scheduled maturity date at a redemption price equal to the greater of 100% of the principal amount of the notes redeemed and the sum of the present values of the remaining scheduled payments of principal and interest (discounted at the applicable treasury yield plus 20 basis points) on the notes to be redeemed. The notes may also be redeemed on or after the date that is three months prior to the scheduled maturity date of the notes at a redemption price equal to 100% of the principal amount of the notes redeemed plus accrued and unpaid interest.

Senior Notes due 2021 and 2024—We have outstanding \$1,000 million of 6% senior notes due 2021 and \$1,000 million aggregate principal amount of 5.75% senior notes due 2024.

The indentures governing the 5.75% and 6% Senior Notes contain limited covenants, including those restricting our ability and the ability of our subsidiaries to incur indebtedness secured by any property or assets, enter into certain sale and lease-back transactions with respect to any assets or enter into consolidations, mergers or sales of all or substantially all of our assets.

These notes may be redeemed and repaid, in whole or in part, at any time and from time to time prior to the date that is 90 days prior to the scheduled maturity date of the notes at a redemption price equal to 100% of the principal amount of the notes redeemed plus a premium for each note redeemed equal to the greater of 1.00% of the then outstanding principal amount of the note and the excess of: (a) the present value at such redemption date of (i) the principal amount of the note at maturity plus (ii) all required interest payments due on the note through maturity (excluding accrued but unpaid interest), computed using a discount rate equal to the Treasury Rate as of such redemption date plus 50 basis points; over (b) the outstanding principal amount of the note. These notes may also be redeemed, in whole or in part, at any time on or after the date which is 90 days prior to the final maturity date of the notes, at a redemption price equal to 100% of the principal amount of the notes redeemed plus accrued and unpaid interest.

Guaranteed Notes due 2022—In March 2016, LYB Finance II issued €750 million of 1.875% guaranteed notes due 2022 at a discounted price of 99.607%.

These unsecured notes, which are fully and unconditionally guaranteed by LyondellBasell N.V., rank equally in right of payment to all of LYB Finance II's existing and future unsecured indebtedness and to all of LyondellBasell N.V.'s existing and future unsubordinated indebtedness. There are no significant restrictions that would impede LyondellBasell N.V., as guarantor, from obtaining funds by dividend or loan from its subsidiaries.

The indenture governing these notes contains limited covenants, including those restricting our ability and the ability of our subsidiaries to incur indebtedness secured by significant property or by capital stock of subsidiaries that own significant property, enter into certain sale and lease-back transactions with respect to any significant property or enter into consolidations, mergers or sales of all or substantially all of our assets.

LYONDELLBASELL INDUSTRIES N.V.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

The notes may be redeemed before the date that is three months prior to the scheduled maturity date at a redemption price equal to the greater of 100% of the principal amount of the notes redeemed and the sum of the present values of the remaining scheduled payments of principal and interest (discounted at the applicable comparable government bond rate plus 35 basis points) on the notes to be redeemed. The notes may also be redeemed on or after the date that is three months prior to the scheduled maturity date of the notes at a redemption price equal to 100% of the principal amount of the notes redeemed plus accrued and unpaid interest. The notes are also redeemable upon certain tax events.

Senior Notes due 2055—In March 2015, we issued \$1,000 million of 4.625% Notes due 2055 at a discounted price of 98.353%. These unsecured notes rank equally in right of payment to all of LyondellBasell N.V.'s existing and future unsubordinated indebtedness.

The indenture governing these notes contains limited covenants, including those restricting our ability and the ability of our subsidiaries to incur indebtedness secured by significant property or by capital stock of subsidiaries that own significant property, enter into certain sale and lease-back transactions with respect to any significant property or enter into consolidations, mergers or sales of all or substantially all of our assets.

The notes may be redeemed before the date that is six months prior to the scheduled maturity date at a redemption price equal to the greater of 100% of the principal amount of the notes redeemed and the sum of the present values of the remaining scheduled payments of principal and interest (discounted at the applicable treasury yield plus 35 basis points) on the notes to be redeemed. The notes may also be redeemed on or after the date that is six months prior to the final maturity date of the notes at a redemption price equal to 100% of the principal amount of the notes redeemed plus accrued and unpaid interest.

Guaranteed Notes due 2044—In February 2014, LYB International Finance B.V. ("LYB Finance"), a wholly owned finance subsidiary of LyondellBasell N.V., as defined in Rule 3-10(b) of Regulation S-X, issued \$1,000 million of 4.875% guaranteed notes due 2044 at a discounted price of 98.831%.

These unsecured notes, which are fully and unconditionally guaranteed by LyondellBasell N.V., rank equally in right of payment to all of LYB Finance's existing and future unsecured indebtedness and to all of LyondellBasell's existing and future unsubordinated indebtedness. There are no significant restrictions that would impede the Guarantor from obtaining funds by dividend or loan from its subsidiaries. Subsidiaries are generally prohibited from entering into arrangements that would limit their ability to make dividends to or enter into loans with the Guarantor.

The indenture governing these notes contains limited covenants, including those restricting our ability and the ability of our subsidiaries to incur indebtedness secured by significant property or by capital stock of subsidiaries that own significant property, enter into certain sale and lease-back transactions with respect to any significant property or enter into consolidations, mergers or sales of all or substantially all of our assets.

The notes may be redeemed before the date that is six months prior to the scheduled maturity date at a redemption price equal to the greater of 100% of the principal amount of the notes redeemed and the sum of the present values of the remaining scheduled payments of principal and interest (discounted at the applicable treasury yield plus 20 basis points) on the notes to be redeemed. The notes may also be redeemed on or after the date that is six months prior to the final maturity date of the notes at a redemption price equal to 100% of the principal amount of the notes redeemed plus accrued and unpaid interest.

Guaranteed Notes due 2023 and 2043—In July 2013, LYB Finance issued \$750 million of 4% guaranteed notes due 2023 and \$750 million of 5.25% Notes due 2043 at discounted prices of 98.678% and 97.004%, respectively.

These unsecured notes, which are fully and unconditionally guaranteed by LyondellBasell N.V., rank equally in right of payment to all of LYB Finance's existing and future unsecured indebtedness and to all of LyondellBasell's existing and future unsubordinated indebtedness. There are no significant restrictions that would impede the Guarantor from obtaining funds by dividend or loan from its subsidiaries. Subsidiaries are generally prohibited from entering into arrangements that would limit their ability to make dividends to or enter into loans with the Guarantor.

LYONDELLBASELL INDUSTRIES N.V.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

The indenture governing these notes contains limited covenants, including those restricting our ability and the ability of our subsidiaries to incur indebtedness secured by significant property or by capital stock of subsidiaries that own significant property, enter into certain sale and lease-back transactions with respect to any significant property or enter into consolidations, mergers or sales of all or substantially all of our assets.

The notes may be redeemed and repaid, in whole or in part, at any time and from time to time prior to maturity at a redemption price equal to the greater of 100% of the principal amount of the notes redeemed, and the sum of the present values of the remaining scheduled payments of principal and interest on the notes to be redeemed. Such interest will be discounted to the date of redemption on a semi-annual basis at the applicable treasury yield plus 25 basis points in the case of the 4% Notes due 2023 and plus 30 basis points in the case of the 5.25% Notes due 2043.

Guaranteed Notes due 2027, \$300 million—We have outstanding \$300 million aggregate principal amount of 8.1% Guaranteed Notes due 2027. These notes, which are guaranteed by LyondellBasell Industries Holdings B.V., a subsidiary of LyondellBasell N.V., contain certain restrictions with respect to the level of maximum debt that can be incurred and security that can be granted by certain operating companies that are direct or indirect wholly owned subsidiaries of LyondellBasell Industries Holdings B.V.

The 2027 Notes contain customary provisions for default, including, among others, the non-payment of principal and interest, certain failures to perform or observe obligations under the Agreement on the notes, the occurrence of certain defaults under other indebtedness, failure to pay certain indebtedness and the insolvency or bankruptcy of certain LyondellBasell N.V. subsidiaries.

Short-Term Debt

Term Loan due 2020—In February 2019, LYB Americas Finance entered into a 364-day, \$2,000 million senior unsecured term loan credit agreement and borrowed the entire amount. The proceeds of this term loan, which was fully and unconditionally guaranteed by LyondellBasell N.V. were used for general corporate purposes, including the repayment of debt. In October 2019, we repaid the \$2,000 million of indebtedness outstanding under this term loan using \$974 million net proceeds from the sale of the Guaranteed Notes due 2049, \$726 million of borrowings of commercial paper and the remainder from operating cash. This repayment terminated our commitment under the credit agreement.

Senior Revolving Credit Facility—Our \$2,500 million senior revolving credit facility which expires June 2022 may be used for dollar and euro denominated borrowings, has a \$500 million sublimit for dollar and euro denominated letters of credit, a \$1,000 million uncommitted accordion feature, and supports our commercial paper program. The aggregate balance of outstanding borrowings, including amounts outstanding under our commercial paper program, and letters of credit under this facility may not exceed \$2,500 million at any given time. Borrowings under the facility bear interest at either a base rate or LIBOR rate, plus an applicable margin. Additional fees are incurred for the average daily unused commitments. At December 31, 2019, we had no borrowings or letters of credit outstanding under this facility.

The facility contains customary covenants and warranties, including specified restrictions on indebtedness and liens. In addition, we are required to maintain a leverage ratio at the end of every fiscal quarter of 3.50 to 1.00 or less for the period covering the most recent four quarters. We are in compliance with these covenants as of December 31, 2019.

Commercial Paper Program—We have a commercial paper program under which we may issue up to \$2,500 million of privately placed, unsecured, short-term promissory notes (“commercial paper”). This program is backed by our \$2,500 million Senior Revolving Credit Facility. Proceeds from the issuance of commercial paper may be used for general corporate purposes, including dividends and share repurchases. Interest rates on the commercial paper outstanding at December 31, 2019 are based on the terms of the notes and range from 1.87% to 1.99%. At December 31, 2019, we had \$262 million of outstanding commercial paper.

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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

U.S. Receivables Facility—In July 2018, we amended our \$900 million U.S. Receivables Facility to, among other things, extend the term of the facility to July 2021. The facility has a purchase limit of \$900 million in addition to a \$300 million uncommitted accordion feature. This facility provides liquidity through the sale or contribution of trade receivables by certain of our U.S. subsidiaries to a wholly owned, bankruptcy-remote subsidiary on an ongoing basis and without recourse. The bankruptcy-remote subsidiary may then, at its option and subject to a borrowing base of eligible receivables, sell undivided interests in the pool of trade receivables to financial institutions participating in the facility (“Purchasers”). The sale of the undivided interest in the pool of trade receivables is accounted for as a secured borrowing in the Consolidated Balance Sheets. We are responsible for servicing the receivables. We pay variable interest rates on our secured borrowings. In the event of liquidation, the bankruptcy-remote subsidiary’s assets will be used to satisfy the claims of the Purchasers prior to any assets or value in the bankruptcy-remote subsidiary becoming available to us. This facility also provides for the issuance of letters of credit up to \$200 million. The term of the facility may be extended in accordance with the terms of the agreement. The facility is also subject to customary warranties and covenants, including limits and reserves and the maintenance of specified financial ratios. We are required to maintain a leverage ratio at the end of every fiscal quarter of 3.50 to 1.00, or less, for the period covering the most recent four quarters. Performance obligations under the facility are guaranteed by LyondellBasell N.V. Additional fees are incurred for the average daily unused commitments. At December 31, 2019, there were no borrowings or letters of credit outstanding under the facility.

Precious Metal Financings—We enter into lease agreements for precious metals which are used in our production processes. All precious metal borrowings are classified as Short-term debt.

Weighted Average Interest Rate—At December 31, 2019 and 2018, our weighted average interest rates on outstanding Short-term debt were 3.3% and 3.1%, respectively.

Additional Information

Debt Discount and Issuance Costs—Amortization of debt discount and debt issuance costs resulted in amortization expense of \$11 million, \$14 million and \$15 million for the years ended December 31, 2019, 2018 and 2017, respectively, which is included in Interest expense in the Consolidated Statements of Income.

Other Information—LYB International Finance B.V., LYB International Finance II B.V. and LYB International Finance III, LLC are direct, 100% owned finance subsidiaries of LyondellBasell N.V., as defined in Rule 3-10(b) of Regulation S-X. Any debt securities issued by LYB International Finance B.V., LYB International Finance II B.V. and LYB International Finance III, LLC will be fully and unconditionally guaranteed by LyondellBasell N.V.

As of December 31, 2019, we are in compliance with our debt covenants.

14. Leases

Operating Leases—The majority of our leases are operating leases. We lease storage tanks, terminal facilities, land, office facilities, railcars, pipelines, barges, plant equipment and other equipment. As of December 31, 2019, our Operating lease assets were \$1,468 million. Operating lease liabilities totaled \$1,489 million of which \$273 million is current and recorded in Accrued liabilities. These values were derived using a weighted average discount rate of 4.2%.

Our operating leases have remaining lease terms ranging from less than 1 year to 30 years and have a weighted-average remaining lease term of 7 years. While extension clauses included in our leases do not materially impact our Operating lease assets or Operating lease liabilities, certain leases include options to extend the lease for up to 20 years.

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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

Maturities of operating lease liabilities as of December 31, 2019, are as follows:

<u>Millions of dollars</u>	
2020	\$ 326
2021	275
2022	231
2023	198
2024	171
Thereafter	530
Total lease payments	1,731
Less: Imputed interest	(242)
Present value of lease liabilities	<u>\$ 1,489</u>

The following table presents the components of operating lease cost:

<u>Millions of dollars</u>	<u>Year Ended December 31, 2019</u>
Operating lease cost	\$ 366
Short-term lease cost	152
Variable lease cost	61
Net operating lease cost	<u>\$ 579</u>

Cash paid for operating lease liabilities totaled \$363 million for the year ended December 31, 2019. Leased assets obtained in exchange for new operating lease liabilities, including all leases recognized upon adoption of the new lease accounting standard, totaled \$1,833 million for the year ended December 31, 2019.

As of December 31, 2019, we have entered into additional operating leases, with an undiscounted value of \$539 million, primarily for storage tanks related to our new PO/TBA plant at our Channelview, Texas facility. These leases, which will commence between the first quarter of 2020 and 2022, have lease terms ranging from 2 to 20 years.

Lease Commitments—As of December 31, 2018, the undiscounted aggregate future estimated payments for our operating lease commitments, including those which have not commenced, and those with an initial term of 12 months or less, were as follows:

<u>Millions of dollars</u>	
2019	\$ 365
2020	288
2021	256
2022	236
2023	204
Thereafter	1,126
Total minimum lease payments	<u>\$ 2,475</u>

LYONDELLBASELL INDUSTRIES N.V.
NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

15. Financial Instruments and Fair Value Measurements

Market Risks—We are exposed to market risks, such as changes in commodity pricing, interest rates and currency exchange rates. To manage the volatility related to these exposures, we selectively enter into derivative contracts pursuant to our risk management policies.

Commodity Prices—We are exposed to commodity price volatility related to purchases of various feedstocks and sales of our products. We selectively use over-the-counter commodity swaps, options and exchange traded futures contracts with various terms to manage the volatility related to these risks. In addition, we are exposed to volatility on the prices of precious metals to the extent that we have obligations, classified as embedded derivatives, tied to the price of precious metals associated with secured borrowings.

Interest Rates—We are exposed to fluctuations in interest rates through the company's debt portfolio in the form of both floating rate debt instruments and the periodic need to refinance fixed-rate debt. We use interest rate derivative products such as forward-starting and interest rate swaps to manage these exposures.

Foreign Currency Rates—We have significant worldwide operations. The functional currencies of our consolidated subsidiaries through which we operate are primarily the U.S. dollar and the euro. We enter into transactions denominated in currencies other than our designated functional currencies. As a result, we are exposed to foreign currency risk on receivables and payables. We maintain risk management control policies intended to monitor foreign currency risk attributable to our outstanding foreign currency balances. These control policies involve the centralization of foreign currency exposure management, the offsetting of exposures and the estimation of expected impacts of changes in foreign currency rates on our Comprehensive income. We enter into foreign currency forward and swap contracts to reduce the effects of our net currency exchange exposures.

For foreign currency forward and swap contracts that economically hedge recognized foreign currency monetary assets and liabilities, hedge accounting is not applied. Changes in the fair value of such forward and swap contracts, which are reported in the Consolidated Statements of Income, are offset in part by the currency remeasurement results recognized within earnings on the assets and liabilities.

Foreign Currency Gain (Loss)—Other income, net, in the Consolidated Statements of Income reflected foreign currency gains of \$9 million and \$24 million in 2019 and 2018, respectively, and foreign currency losses of \$1 million in 2017.

Cash and Cash Equivalents—At December 31, 2019 and 2018, we had marketable securities classified as Cash and cash equivalents of \$389 million and \$19 million, respectively.

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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

Financial Instruments Measured at Fair Value on a Recurring Basis—The following table summarizes outstanding financial instruments that are measured at fair value on a recurring basis:

<u>Millions of dollars</u>	<u>December 31, 2019</u>		<u>December 31, 2018</u>		<u>Balance Sheet Classification</u>
	<u>Notional Amount</u>	<u>Fair Value</u>	<u>Notional Amount</u>	<u>Fair Value</u>	
Assets—					
Derivatives designated as hedges:					
Commodities	\$ —	\$ —	\$ 472	\$ 12	Prepaid expenses and other current assets
Foreign currency	—	27	—	27	Prepaid expenses and other current assets
Foreign currency	2,000	214	2,000	117	Other assets
Interest rates	—	22	600	33	Prepaid expenses and other current assets
Interest rates	1,940	41	143	1	Other assets
Derivatives not designated as hedges:					
Commodities	3	—	35	5	Prepaid expenses and other current assets
Foreign currency	580	5	599	3	Prepaid expenses and other current assets
Non-derivatives:					
Available-for-sale debt securities	162	162	567	567	Short-term investments
Equity securities	34	34	322	325	Short-term investments
Total	<u>\$ 4,719</u>	<u>\$ 505</u>	<u>\$ 4,738</u>	<u>\$ 1,090</u>	
Liabilities—					
Derivatives designated as hedges:					
Commodities	\$ —	\$ —	\$ 4	\$ —	Accrued liabilities
Foreign currency	—	16	—	17	Accrued liabilities
Foreign currency	950	53	950	75	Other liabilities
Interest rates	1,000	154	1,400	16	Accrued liabilities
Interest rates	700	77	2,500	45	Other liabilities
Derivatives not designated as hedges:					
Commodities	224	34	63	14	Accrued liabilities
Foreign currency	200	1	1,165	7	Accrued liabilities
Non-derivatives:					
Performance share units	—	—	29	29	Accrued liabilities
Total	<u>\$ 3,074</u>	<u>\$ 335</u>	<u>\$ 6,111</u>	<u>\$ 203</u>	

Commodity derivatives designated as hedges are classified as Level 1. All other financial instruments in the tables above, including equity securities held at December 31, 2019, are classified as Level 2. Equity securities at December 31, 2018, are measured at fair value using the net asset value per share, or its equivalent, practical expedient and have not been classified in the fair value hierarchy.

At December 31, 2019, our outstanding foreign currency contracts not designated as hedges mature from January 2020 to September 2020. Our commodity contracts, not designated as hedges, mature from January 2020 to March 2020.

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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

Financial Instruments Not Measured at Fair Value on a Recurring Basis—The following table presents the carrying value and estimated fair value of our financial instruments that are not measured at fair value on a recurring basis as of December 31, 2019 and 2018. Due to the short maturity, the fair value of all non-derivative financial instruments included in Current assets and Current liabilities approximates the applicable carrying value and are excluded from the table below. Short-term loans receivable, which represent our repurchase agreements, and short-term and long-term debt are recorded at amortized cost in the Consolidated Balance Sheets. The carrying and fair values of short-term and long-term debt exclude capital leases and commercial paper.

<u>Millions of dollars</u>	<u>December 31, 2019</u>		<u>December 31, 2018</u>	
	<u>Carrying Value</u>	<u>Fair Value</u>	<u>Carrying Value</u>	<u>Fair Value</u>
Non-derivatives:				
Assets:				
Short-term loans receivable	\$ —	\$ —	\$ 544	\$ 544
Liabilities:				
Short-term debt	\$ 181	\$ 215	\$ 70	\$ 77
Long-term debt	11,609	12,561	8,492	8,476
Total	\$ 11,790	\$ 12,776	\$ 8,562	\$ 8,553

All financial instruments in the table above are classified as Level 2. There were no transfers between Level 1 and Level 2 for any of our financial instruments during the years ended December 31, 2019 and 2018.

Net Investment Hedges—At December 31, 2019 and 2018, we had outstanding foreign currency contracts with an aggregate notional value of €617 million (\$650 million) designated as net investment hedges. We also had outstanding foreign-currency denominated debt designated as a net investment hedge, with notional amounts totaling €750 million (\$842 million) and €750 million (\$858 million), as of December 31, 2019 and 2018, respectively.

In 2018, foreign currency contracts with an aggregate notional value of €925 million expired, related to €800 million entered in 2018 and €125 million entered into prior to 2018, that were designated as net investment hedges. Upon settlement of these foreign currency contracts in 2018, we paid €925 million (\$1,078 million at the expiry spot rate) to our counterparties and received \$1,108 million from our counterparties.

Cash Flow Hedges—The following table summarizes our outstanding cash flow hedges:

<u>Millions of dollars</u>	<u>December 31, 2019</u>	<u>December 31, 2018</u>	<u>Expiration Date</u>
	<u>Notional Value</u>	<u>Notional Value</u>	
Foreign currency	\$ 2,300	\$ 2,300	2021 to 2027
Interest rates	1,500	1,500	2020 to 2021
Commodities	—	476	2019

In February 2019, we entered into forward-starting interest rate swaps with a total notional amount of \$1,000 million expiring in February 2020 (the “Swaps”). As of December 31, 2019, the Swaps were designated as cash flow hedges to mitigate the risk of variability in interest rates of future expected debt issuance by July 2023 and April 2024. In January 2020, we amended the terms of the Swaps to extend their maturities to July 2023 and April 2024. Concurrently with the amendment of the Swaps, we posted collateral of \$238 million related to the liability position held with our counterparties as of the amendment date.

LYONDELLBASELL INDUSTRIES N.V.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

In February 2019, concurrent with the redemption of \$1,000 million of our then outstanding 5% senior notes due 2019, we received \$4 million in settlement of \$1,000 million of forward-starting interest rate swaps that we designated as cash flow hedges of forecasted interest payments. There were no other settlements of our forward-starting swap agreements in 2019, 2018 or 2017.

In 2018, we entered into forward-starting interest rate swaps with a total notional amount of \$500 million to mitigate the risk of variability in interest rates for an expected debt issuance by November 2021. These swaps were designated as cash flow hedges and will be terminated upon debt issuance.

As of December 31, 2019, on a pre-tax basis, \$3 million is scheduled to be reclassified from Accumulated other comprehensive loss as an increase to interest expense over the next twelve months.

In 2019 and 2018, we entered into commodity futures contracts to mitigate the risk of variability in feedstock and product sales prices. During the year ended December 31, 2019, we paid \$20 million in settlement of commodity futures contracts that hedge the risk of variability in feedstock prices with a total notional amount of \$336 million. Additionally, we received \$26 million in settlement of commodity futures contracts that hedge the risk of variability in product sales prices with a total notional amount of \$437 million. As of December 31, 2019, we had no commodity futures contracts outstanding and designated as cash flow hedges.

Fair Value Hedges—We had outstanding interest rate contracts with aggregate notional amounts of \$2,140 million and \$3,143 million at December 31, 2019 and December 31, 2018, respectively. These fair value hedges have maturities ranging from 2021 to 2027 as of December 31, 2019.

In February 2019, concurrent with the redemption of \$1,000 million of our outstanding 5% senior notes due 2019, we paid \$5 million in settlement of \$1,000 million of fixed-for-floating interest rate swaps.

In 2018, we entered into a euro fixed-for-floating interest rate swap to mitigate the change in the fair value of €125 million (\$147 million) of our €750 million notes payable due 2022 associated with the risk of variability in the 6-month EURIBOR rate (the benchmark interest rate). The fixed-rate and variable-rate are settled annually and semi-annually, respectively.

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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

Impact on Earnings and Other Comprehensive Income—The following tables summarize the pre-tax effect of derivative and non-derivative instruments recorded in Accumulated other comprehensive loss (“AOCI”), the gains (losses) reclassified from AOCI to earnings and additional gains (losses) recognized directly in earnings:

<u>Millions of dollars</u>	Effect of Financial Instruments			Income Statement Classification
	Year Ended December 31, 2019			
	Gain (Loss) Recognized in AOCI	Gain (Loss) Reclassified from AOCI to Income	Additional Gain (Loss) Recognized in Income	
Derivatives designated as hedges:				
Commodities	\$ (34)	\$ (26)	\$ —	Sales and other operating revenues
Commodities	28	20	—	Cost of sales
Foreign currency	119	(40)	65	Other income, net; Interest expense
Interest rates	(223)	(4)	75	Interest expense
Derivatives not designated as hedges:				
Commodities	—	—	3	Sales and other operating revenues
Commodities	—	—	(34)	Cost of sales
Foreign currency	—	—	33	Other income, net
Non-derivatives designated as hedges:				
Long-term debt	16	—	—	Other income, net
Total	<u>\$ (94)</u>	<u>\$ (50)</u>	<u>\$ 142</u>	

<u>Millions of dollars</u>	Effect of Financial Instruments			Income Statement Classification
	Year Ended December 31, 2018			
	Gain (Loss) Recognized in AOCI	Gain (Loss) Reclassified from AOCI to Income	Additional Gain (Loss) Recognized in Income	
Derivatives designated as hedges:				
Commodities	\$ 60	\$ —	\$ —	Sales and other operating revenues
Commodities	(30)	(11)	—	Cost of sales
Foreign currency	190	(100)	68	Other income, net; Interest expense
Interest rates	43	(1)	(30)	Interest expense
Derivatives not designated as hedges:				
Commodities	—	—	3	Sales and other operating revenues
Commodities	—	—	1	Cost of sales
Foreign currency	—	—	43	Other income, net
Non-derivatives designated as hedges:				
Long-term debt	41	—	—	Other income, net
Total	<u>\$ 304</u>	<u>\$ (112)</u>	<u>\$ 85</u>	

LYONDELLBASELL INDUSTRIES N.V.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

<u>Millions of dollars</u>	Effect of Financial Instruments				Income Statement Classification
	Year Ended December 31, 2017				
	Gain (Loss) Recognized in AOCI	Gain (Loss) Reclassified from AOCI to Income	Additional Gain (Loss) Recognized in Income		
Derivatives designated as hedges:					
Commodities	\$ (11)	\$ —	\$ —		Cost of sales
Foreign currency	(466)	265	42		Other income, net; Interest expense
Interest rates	(25)	(1)	2		Interest expense
Derivatives not designated as hedges:					
Commodities	—	—	(18)		Sales and other operating revenues
Commodities	—	—	(23)		Cost of sales
Foreign currency	—	—	(23)		Other income, net
Non-derivatives designated as hedges:					
Long-term debt	(109)	—	—		Other income, net
Total	<u>\$ (611)</u>	<u>\$ 264</u>	<u>\$ (20)</u>		

The derivative amounts excluded from the assessment of effectiveness for foreign currency contracts designated as net investment hedges recognized in other comprehensive income for the years ended December 31, 2019 and 2018 were gains of \$3 million and \$19 million, respectively. The derivative amounts excluded from the assessment of effectiveness for foreign currency contracts designated as net investment hedges recognized in interest expense for the years ended December 31, 2019 and 2018 were gains of \$19 million and \$27 million, respectively.

The pre-tax effect of the periodic receipt of fixed interest and payment of variable interest associated with our fixed-for-floating interest rate swaps resulted in a \$6 million and \$5 million increase in interest expense for the years ended December 31, 2019 and 2018, respectively, and reduced interest expense by \$23 million for the year ended December 31, 2017.

Investments in Available-for-Sale Debt Securities—The following table summarizes the amortized cost, gross unrealized gains and losses, and fair value of our outstanding available-for-sale debt securities:

<u>Millions of dollars</u>	Cost	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value
Available-for-sale debt securities:				
Bonds at December 31, 2019	\$ 162	\$ —	\$ —	\$ 162
Bonds at December 31, 2018	567	—	—	567

No allowance for credit losses related to our available-for-sale debt securities was recorded for the year ended December 31, 2019. No losses related to other-than-temporary impairments of our available-for-sale debt securities were recorded in Accumulated other comprehensive loss during the years ended December 31, 2018 and 2017.

As of December 31, 2019, bonds classified as available-for-sale debt securities had maturities between 3 months and 45 months.

LYONDELLBASELL INDUSTRIES N.V.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

The proceeds from maturities and sales of our available-for-sale debt securities are summarized in the following table:

<u>Millions of dollars</u>	Year Ended December 31,		
	2019	2018	2017
Proceeds from maturities of available-for-sale debt securities	\$ 331	\$ 423	\$ 499
Proceeds from sales of available-for-sale debt securities	180	—	—

The gross realized gains and losses associated with the sale of available-for-sale debt securities during the year ended December 31, 2019, were less than \$1 million. No gain or loss was realized in connection with the sales of our available-for-sale debt securities during the years ended December 31, 2018, and 2017, respectively. We use the specific identification method to identify the cost of the securities we sell and the amounts we reclassify out of Accumulated other comprehensive loss into earnings.

We had no available-for-sale debt securities which were in a continuous unrealized loss position for less than or greater than twelve months as of December 31, 2019. The following table summarizes the fair value and unrealized losses related to available-for-sale debt securities that were in a continuous unrealized loss position for less than and greater than twelve months as of December 31, 2018:

<u>Millions of dollars</u>	December 31, 2018			
	Less than 12 months		Greater than 12 months	
	Fair Value	Unrealized Loss	Fair Value	Unrealized Loss
Available-for-sale debt securities:				
Bonds	\$ 118	\$ (1)	\$ 45	\$ —

Investments in Equity Securities— Our equity securities primarily consist of limited partnership investments, which include investments in, among other things, equities and equity related securities, debt securities, credit instruments, supply chain finance, global interest rate products, currencies, commodities, futures, options, warrants and swaps. At December 31, 2019, we had investments in equity securities with a notional amount and a fair value of \$34 million. These investments may be redeemed on a weekly basis. At December 31, 2018, we had investments in equity securities with a notional amount of \$322 million and a fair value of \$325 million.

We received proceeds of \$332 million and \$97 million related to the sale of our investments in equity securities during the years ended December 31, 2019 and 2018, respectively. No proceeds were received related to the sale of our investments in equity securities during the year ended December 31, 2017.

The following table summarizes the portion of unrealized gains and losses for the equity securities that were outstanding as of December 31, 2019 and 2018:

<u>Millions of dollars</u>	2019	2018
Net gains recognized during the period	\$ 9	\$ 11
Less: Net gains recognized during the period on securities sold	9	5
Unrealized gains recognized during the period	\$ —	\$ 6

LYONDELLBASELL INDUSTRIES N.V.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

16. Pension and Other Postretirement Benefits

We have defined benefit pension plans which cover employees in the U.S. and various non-U.S. countries. We also sponsor postretirement benefit plans other than pensions that provide medical benefits to certain of our U.S., Canadian and French employees. In addition, we provide other postemployment benefits such as early retirement and deferred compensation severance benefits to employees of certain non-U.S. countries. We use a measurement date of December 31 for all of our benefit plans.

Pension Benefits—The following tables provide a reconciliation of projected benefit obligations, plan assets and the funded status of our U.S. and non-U.S. defined benefit pension plans:

<u>Millions of dollars</u>	Year Ended December 31,			
	2019		2018	
	U.S.	Non-U.S.	U.S.	Non-U.S.
Change in benefit obligation:				
Benefit obligation, beginning of period	\$ 1,752	\$ 1,659	\$ 1,924	\$ 1,511
Service cost	53	36	51	35
Interest cost	70	33	60	32
Actuarial loss (gain)	241	331	(147)	23
Plan amendments	—	24	—	4
Benefits paid	(151)	(43)	(129)	(38)
Participant contributions	—	2	—	1
Settlement	—	(10)	(10)	(20)
Curtailement	—	(2)	—	—
Business combination	—	—	3	192
Foreign exchange effects	—	(13)	—	(81)
Benefit obligation, end of period	1,965	2,017	1,752	1,659
Change in plan assets:				
Fair value of plan assets, beginning of period	1,548	871	1,680	852
Actual return on plan assets	194	186	(37)	18
Company contributions	46	51	44	56
Benefits paid	(151)	(43)	(129)	(38)
Participant contributions	—	2	—	1
Settlement	—	(10)	(10)	(20)
Business combination	—	—	—	48
Foreign exchange effects	—	1	—	(46)
Fair value of plan assets, end of period	1,637	1,058	1,548	871
Funded status of continuing operations, end of period	\$ (328)	\$ (959)	\$ (204)	\$ (788)

LYONDELLBASELL INDUSTRIES N.V.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

Amounts recognized in the Consolidated Balance Sheets consists of the following:

<u>Millions of dollars</u>	<u>December 31, 2019</u>		<u>December 31, 2018</u>	
	<u>U.S.</u>	<u>Non-U.S.</u>	<u>U.S.</u>	<u>Non-U.S.</u>
Prepaid benefit cost, long-term	\$ 4	\$ 18	\$ 10	\$ 29
Accrued benefit liability, current	—	(28)	—	(27)
Accrued benefit liability, long-term	(332)	(949)	(214)	(790)
Funded status of continuing operations, end of period	\$ (328)	\$ (959)	\$ (204)	\$ (788)

Amounts recognized in Accumulated other comprehensive loss include the following:

<u>Millions of dollars</u>	<u>December 31, 2019</u>		<u>December 31, 2018</u>	
	<u>U.S.</u>	<u>Non-U.S.</u>	<u>U.S.</u>	<u>Non-U.S.</u>
Actuarial and investment loss	\$ 516	\$ 405	\$ 374	\$ 251
Prior service cost	1	32	2	11
Balance, end of period	\$ 517	\$ 437	\$ 376	\$ 262

The following additional information is presented for our U.S. and non-U.S. pension plans:

<u>Millions of dollars</u>	<u>December 31, 2019</u>		<u>December 31, 2018</u>	
	<u>U.S.</u>	<u>Non-U.S.</u>	<u>U.S.</u>	<u>Non-U.S.</u>
Accumulated benefit obligation for defined benefit plans	\$ 1,899	\$ 1,859	\$ 1,708	\$ 1,528

Pension plans with projected benefit obligations in excess of the fair value of assets are summarized as follows:

<u>Millions of dollars</u>	<u>December 31, 2019</u>		<u>December 31, 2018</u>	
	<u>U.S.</u>	<u>Non-U.S.</u>	<u>U.S.</u>	<u>Non-U.S.</u>
Projected benefit obligations	\$ 1,915	\$ 1,778	\$ 1,618	\$ 1,456
Fair value of assets	1,583	801	1,404	639

Pension plans with accumulated benefit obligations in excess of the fair value of assets are summarized as follows:

<u>Millions of dollars</u>	<u>December 31, 2019</u>		<u>December 31, 2018</u>	
	<u>U.S.</u>	<u>Non-U.S.</u>	<u>U.S.</u>	<u>Non-U.S.</u>
Accumulated benefit obligations	\$ 1,765	\$ 1,079	\$ 1,578	\$ 904
Fair value of assets	1,493	243	1,404	198

LYONDELLBASELL INDUSTRIES N.V.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

Components of net periodic pension costs for our U.S. and Non-U.S Plans are as follows:

<u>Millions of dollars</u>	U.S. Plans		
	Year Ended December 31,		
	2019	2018	2017
Service cost	\$ 53	\$ 51	\$ 47
Interest cost	70	60	60
Expected return on plan assets	(112)	(122)	(121)
Settlement loss	—	2	—
Prior service cost amortization	—	—	1
Actuarial loss amortization	18	21	20
Net periodic benefit cost	<u>\$ 29</u>	<u>\$ 12</u>	<u>\$ 7</u>

<u>Millions of dollars</u>	Non-U.S. Plans		
	Year Ended December 31,		
	2019	2018	2017
Service cost	\$ 36	\$ 35	\$ 39
Interest cost	33	32	23
Expected return on plan assets	(24)	(24)	(19)
Settlement loss	1	1	2
Prior service cost amortization	2	1	2
Actuarial loss amortization	12	10	16
Net periodic benefit cost	<u>\$ 60</u>	<u>\$ 55</u>	<u>\$ 63</u>

The actual and target asset allocations for our plans are as follows:

	2019		2018	
	Actual	Target	Actual	Target
Canada				
Equity securities	50%	50%	49%	50%
Fixed income	50%	50%	51%	50%
United Kingdom—Lyondell Chemical Plans				
Equity securities	36%	37%	49%	50%
Fixed income	64%	63%	51%	50%
United Kingdom—Basell Plans				
Equity securities	40%	40%	49%	50%
Fixed income	60%	60%	51%	50%
United Kingdom—A. Schulman Plans				
Growth assets	91%	89%	94%	89%
Matching assets	9%	11%	6%	11%
United States				
Equity securities	34%	32%	32%	32%
Fixed income	38%	38%	39%	38%
Alternatives	28%	30%	29%	30%

LYONDELLBASELL INDUSTRIES N.V.
NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

We estimate the following contributions to our pension plans in 2020:

<u>Millions of dollars</u>	<u>U.S.</u>	<u>Non-U.S.</u>
Defined benefit plans	\$ 46	\$ 71
Multi-employer plans	—	8
Total	<u>\$ 46</u>	<u>\$ 79</u>

As of December 31, 2019, future expected benefit payments by our pension plans which reflect expected future service, as appropriate, are as follows:

<u>Millions of dollars</u>	<u>U.S.</u>	<u>Non-U.S.</u>
2020	\$ 145	\$ 59
2021	144	58
2022	145	59
2023	144	62
2024	143	64
2025 through 2029	676	339

The following tables set forth the principal assumptions on discount rates, projected rates of compensation increase and expected rates of return on plan assets, where applicable. These assumptions vary for the different plans, as they are determined in consideration of local conditions.

The weighted average assumptions used in determining the net benefit liabilities for our pension plans were as follows at December 31:

	<u>2019</u>		<u>2018</u>	
	<u>U.S.</u>	<u>Non-U.S.</u>	<u>U.S.</u>	<u>Non-U.S.</u>
Discount rate	3.16%	1.03%	4.51%	2.07%
Rate of compensation increase	4.83%	2.59%	4.83%	2.54%

The weighted average assumptions used in determining net benefit costs for our pension plans were as follows:

	<u>Year Ended December 31,</u>					
	<u>2019</u>		<u>2018</u>		<u>2017</u>	
	<u>U.S.</u>	<u>Non-U.S.</u>	<u>U.S.</u>	<u>Non-U.S.</u>	<u>U.S.</u>	<u>Non-U.S.</u>
Discount rate	4.51%	2.07%	3.73%	2.13%	4.20%	1.52%
Expected return on plan assets	7.50%	2.79%	7.50%	2.92%	8.00%	2.15%
Rate of compensation increase	4.83%	2.54%	4.00%	2.94%	4.00%	2.93%

LYONDELLBASELL INDUSTRIES N.V.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

The discount rate assumptions reflect the rates at which the benefit obligations could be effectively settled, based on the yields of high quality long-term bonds where the term closely matches the term of the benefit obligations. At the beginning of 2017, we changed the approach used to measure service and interest costs for pension and other postretirement benefits under significant U.S. plans. We measure service and interest costs by applying the specific spot rates along that same yield curve to the projected cash flows of the plans. This approach provides a more precise measurement of service and interest costs. This change did not affect the measurement of our plan obligations. The weighted average expected long-term rate of return on assets in our U.S. plans of 7.50% is based on the average level of earnings that our independent pension investment adviser had advised could be expected to be earned over a fifteen to twenty year time period consistent with the target asset allocation of the plans, historical capital market performance, historical plan performance (since the 1997 inception of the U.S. Master Trust) and a forecast of expected future asset returns. The weighted average expected long-term rate of return on assets in our non-U.S. plans of 2.79% is based on expectations and asset allocations that vary by region. We review these long-term assumptions on a periodic basis.

Actual rates of return may differ from the expected rate due to the volatility normally experienced in capital markets. Assets are externally managed by professional investment firms over the long term to achieve optimal returns with an acceptable level of risk and volatility in order to meet the benefit obligations of the plans as they come due.

Our pension plans have not directly invested in securities of LyondellBasell N.V., and there have been no significant transactions between any of the pension plans and the Company or related parties thereof.

The pension investments that are measured at fair value are summarized below:

<u>Millions of dollars</u>	December 31, 2019			
	Fair Value	Level 1	Level 2	Level 3
<u>U.S.</u>				
Common and preferred stock	\$ 338	\$ 338	\$ —	\$ —
Commingled funds measured at net asset value	446			
Fixed income securities	218	—	218	—
Real estate measured at net asset value	106			
Hedge funds measured at net asset value	219			
Private equity measured at net asset value	130			
U.S. government securities	149	149	—	—
Cash and cash equivalents	33	33	—	—
Total U.S. Pension Assets	<u>\$ 1,639</u>	<u>\$ 520</u>	<u>\$ 218</u>	<u>\$ —</u>

LYONDELLBASELL INDUSTRIES N.V.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

<u>Millions of dollars</u>	December 31, 2019			
	Fair Value	Level 1	Level 2	Level 3
<u>Non-U.S.</u>				
Insurance arrangements	\$ 722	\$ —	\$ —	\$ 722
Commingled funds measured at net asset value	332			
Cash and cash equivalents	3	3	—	—
Total Non-U.S. Pension Assets	<u>\$ 1,057</u>	<u>\$ 3</u>	<u>\$ —</u>	<u>\$ 722</u>

<u>Millions of dollars</u>	December 31, 2018			
	Fair Value	Level 1	Level 2	Level 3
<u>U.S.</u>				
Common and preferred stock	\$ 330	\$ 330	\$ —	\$ —
Commingled funds measured at net asset value	411			
Fixed income securities	204	—	204	—
Real estate measured at net asset value	107			
Hedge funds measured at net asset value	241			
Private equity measured at net asset value	108			
U.S. government securities	133	133	—	—
Cash and cash equivalents	26	26	—	—
Total U.S. Pension Assets	<u>\$ 1,560</u>	<u>\$ 489</u>	<u>\$ 204</u>	<u>\$ —</u>

<u>Millions of dollars</u>	December 31, 2018			
	Fair Value	Level 1	Level 2	Level 3
<u>Non-U.S.</u>				
Insurance arrangements	\$ 570	\$ —	\$ —	\$ 570
Commingled funds measured at net asset value	298			
Cash and cash equivalents	2	2	—	—
Total Non-U.S. Pension Assets	<u>\$ 870</u>	<u>\$ 2</u>	<u>\$ —</u>	<u>\$ 570</u>

The Netherlands Defined Benefits pension plans has investments in a pooled asset portfolio which are treated as a nonparticipating insurance contract. The associated plan assets underlying the insurance arrangement are measured at the cash surrender value, which is derived primarily from an actuarial determination of the discounted benefits cash flows. As such, these assets are considered as using significant unobservable inputs (Level 3). The plan assets at December 31, 2018 were valued at \$524 million and has increased to \$675 million at December 31, 2019. The change is due primarily to a decrease of the discount rate from 2018 to 2019.

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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

The fair value measurements of the investments in certain entities that calculate net asset value per share as of December 31, 2019 are as follows:

<u>Millions of dollars</u>	<u>Fair Value</u>	<u>Unfunded Commitments</u>	<u>Remaining Life</u>	<u>Redemption Frequency (if currently eligible)</u>	<u>Trade to Settlement Terms</u>	<u>Redemption Notice Period</u>
U.S.						
Commingled fund investing in Domestic Equity	\$ 132	\$ —	N/A	daily	1 to 3 days	3 to 4 days
Commingled fund investing in International Equity	65	—	N/A	daily	1 to 3 days	3 days
Commingled fund investing in Fixed Income	249	—	N/A	daily	1 to 3 days	3 to 7 days
Real Estate	106	8	10 years	quarterly	15 to 25 days	45 to 90 days
Hedge Funds	219	—	N/A	quarterly	10 to 30 days	20 to 90 days
Private Equity	130	72	10 years	Not eligible	N/A	N/A
Total U.S.	<u>\$ 901</u>	<u>\$ 80</u>				

<u>Millions of dollars</u>	<u>Fair Value</u>	<u>Unfunded Commitments</u>	<u>Remaining Life</u>	<u>Redemption Frequency (if currently eligible)</u>	<u>Trade to Settlement Terms</u>	<u>Redemption Notice Period</u>
Non-U.S.						
Commingled fund investing in Domestic Equity	\$ 36	\$ —	N/A	1 to 7 days	1 to 3 days	1 to 3 days
Commingled fund investing in International Equity	110	—	N/A	1 to 7 days	1 to 3 days	1 to 3 days
Commingled fund investing in Fixed Income	186	—	N/A	daily	1 to 3 days	3 days
Total Non-U.S.	<u>\$ 332</u>	<u>\$ —</u>				

LYONDELLBASELL INDUSTRIES N.V.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

The fair value measurements of the investments in certain entities that calculate net asset value per share as of December 31, 2018 are as follows:

<u>Millions of dollars</u>	<u>Fair Value</u>	<u>Unfunded Commitments</u>	<u>Remaining Life</u>	<u>Redemption Frequency (if currently eligible)</u>	<u>Trade to Settlement Terms</u>	<u>Redemption Notice Period</u>
U.S.						
Commingled fund investing in Domestic Equity	\$ 112	\$ —	N/A	daily	1 to 3 days	3 to 4 days
Commingled fund investing in International Equity	58	—	N/A	daily	1 to 3 days	3 days
Commingled fund investing in Fixed Income	241	—	N/A	daily	1 to 3 days	3 to 7 days
Real Estate	107	8	10 years	quarterly	15 to 25 days	45 to 90 days
Hedge Funds	241	—	N/A	quarterly	10 to 30 days	20 to 90 days
Private Equity	108	76	10 years	Not eligible	N/A	N/A
Total U.S.	<u>\$ 867</u>	<u>\$ 84</u>				

<u>Millions of dollars</u>	<u>Fair Value</u>	<u>Unfunded Commitments</u>	<u>Remaining Life</u>	<u>Redemption Frequency (if currently eligible)</u>	<u>Trade to Settlement Terms</u>	<u>Redemption Notice Period</u>
Non-U.S.						
Commingled fund investing in Domestic Equity	\$ 33	\$ —	N/A	1 to 7 days	1 to 3 days	1 to 3 days
Commingled fund investing in International Equity	122	—	N/A	1 to 7 days	1 to 3 days	1 to 3 days
Commingled fund investing in Fixed Income	143	—	N/A	daily	1 to 3 days	3 days
Total Non-U.S.	<u>\$ 298</u>	<u>\$ —</u>				

Multi-employer Plan—The Company participates in a multi-employer arrangement with Pensionskasse der BASF WaG V.VaG (“Pensionskasse”) which provides for benefits to the majority of our employees in Germany. Up to a certain salary level, the benefit obligations are covered by contributions of the Company and the employees to the plan. Contributions made to the multi-employer plan are expensed as incurred.

The following table provides disclosure related to the Company’s multi-employer plan:

<u>Millions of dollars</u>	<u>Company Contributions</u>		
	<u>2019</u>	<u>2018</u>	<u>2017</u>
Pensionskasse	\$ 8	\$ 8	\$ 27

The Company-specific plan information for the Pensionskasse is not publicly available and the plan is not subject to a collective-bargaining agreement. The plan provides fixed, monthly retirement payments on the basis of the credits earned by the participating employees. To the extent that the Pensionskasse is underfunded, the future contributions to the plan may increase and may be used to fund retirement benefits for employees related to other employers. The Pensionskasse financial statements for the years ended December 31, 2018 and 2017 indicated total assets of

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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

\$9,456 million and \$9,093 million, respectively; total actuarial present value of accumulated plan benefits of \$9,061 million and \$8,747 million, respectively; and total contributions for all participating employers of \$258 million and \$653 million, respectively. Our plan contributions did not exceed 5 percent of the total contributions in 2019, 2018 or 2017.

Other Postretirement Benefits—We sponsor unfunded health care and life insurance plans covering certain eligible retired employees and their eligible dependents. Generally, the medical plans pay a stated percentage of medical expenses reduced by deductibles and other coverage. Life insurance benefits are generally provided by insurance contracts. We retain the right, subject to existing agreements, to modify or eliminate these benefits.

The following tables provide a reconciliation of benefit obligations of our unfunded other postretirement benefit plans:

<u>Millions of dollars</u>	Year Ended December 31,			
	2019		2018	
	U.S.	Non-U.S.	U.S.	Non-U.S.
Change in benefit obligation:				
Benefit obligation, beginning of period	\$ 234	\$ 59	\$ 280	\$ 62
Service cost	1	2	2	2
Interest cost	9	1	9	1
Actuarial (gain) loss	20	18	(46)	(3)
Benefits paid	(19)	—	(26)	(1)
Participant contributions	6	—	6	—
Business combination	—	—	9	—
Foreign exchange effects	—	(1)	—	(2)
Benefit obligation, end of period	251	79	234	59
Change in plan assets:				
Fair value of plan assets, beginning of period	—	—	—	—
Employer contributions	13	—	21	1
Participant contributions	6	—	5	—
Benefits paid	(19)	—	(26)	(1)
Fair value of plan assets, end of period	—	—	—	—
Funded status, end of period	\$ (251)	\$ (79)	\$ (234)	\$ (59)

Amounts recognized in the Consolidated Balance Sheets are as follows:

<u>Millions of dollars</u>	December 31, 2019		December 31, 2018	
	U.S.	Non-U.S.	U.S.	Non-U.S.
Accrued benefit liability, current	\$ (17)	\$ (1)	\$ (18)	\$ (1)
Accrued benefit liability, long-term	(234)	(78)	(216)	(58)
Funded status, end of period	\$ (251)	\$ (79)	\$ (234)	\$ (59)

Amounts recognized in Accumulated other comprehensive loss are as follows:

<u>Millions of dollars</u>	December 31, 2019		December 31, 2018	
	U.S.	Non-U.S.	U.S.	Non-U.S.
Actuarial and investment income (loss)	\$ 40	\$ (32)	\$ 65	\$ (15)
Balance, end of period	\$ 40	\$ (32)	\$ 65	\$ (15)

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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

The components of net periodic other postretirement costs are as follows:

<u>Millions of dollars</u>	U.S. Plans		
	Year Ended December 31,		
	2019	2018	2017
Service cost	\$ 1	\$ 2	\$ 3
Interest cost	9	9	9
Actuarial gain amortization	(5)	—	—
Net periodic benefit cost	<u>\$ 5</u>	<u>\$ 11</u>	<u>\$ 12</u>

<u>Millions of dollars</u>	Non-U.S. Plans		
	Year Ended December 31,		
	2019	2018	2017
Service cost	\$ 2	\$ 2	\$ 2
Interest cost	1	1	1
Actuarial loss amortization	1	1	3
Net periodic benefit cost	<u>\$ 4</u>	<u>\$ 4</u>	<u>\$ 6</u>

The following tables set forth the assumed health care cost trend rates for our U.S. and Non-U.S. Plans:

	U.S. Plans	
	December 31,	
	2019	2018
Immediate trend rate	6.1%	6.4%
Ultimate trend rate (the rate to which the cost trend rate is assumed to decline)	4.5%	4.5%
Year that the rate reaches the ultimate trend rate	2038	2038

	Non-U.S. Plans			
	Canada		France	
	December 31,		December 31,	
	2019	2018	2019	2018
Immediate trend rate	5.0%	5.5%	4.5%	4.5%
Ultimate trend rate (the rate to which the cost trend rate is assumed to decline)	4.5%	4.5%	4.5%	4.5%
Year that the rate reaches the ultimate trend rate	2021	2021	—	—

The health care cost trend rate assumption does not typically have a significant effect on the amounts reported due to limits on maximum contribution levels to the medical plans. However, changing the assumed health care cost trend rates by one percentage point in each year would increase or decrease the accumulated other postretirement benefit liability as of December 31, 2019 by \$24 million or \$15 million, respectively, for non-U.S. plans and by less than \$1 million for U.S. plans. A one percentage point change would not have a material effect on the aggregate service and interest cost components of the net periodic other postretirement benefit cost for the year then ended.

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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

The weighted average assumptions used in determining the net benefit liabilities for our other postretirement benefit plans were as follows:

	December 31,			
	2019		2018	
	U.S.	Non-U.S.	U.S.	Non-U.S.
Discount rate	3.12%	1.20%	4.47%	2.30%
Rate of compensation increase	4.50%	—	4.50%	—

The weighted average assumptions used in determining the net benefit costs for our other postretirement benefit plans were as follows:

	Year Ended December 31,					
	2019		2018		2017	
	U.S.	Non-U.S.	U.S.	Non-U.S.	U.S.	Non-U.S.
Discount rate	4.47%	2.30%	3.66%	2.48%	4.07%	1.69%
Rate of compensation increase	4.50%	—	4.00%	—	4.00%	—

As of December 31, 2019, future expected benefit payments by our other postretirement benefit plans, which reflect expected future service, as appropriate, were as follows:

<u>Millions of dollars</u>	U.S.	Non-U.S.
2020	\$ 17	\$ 1
2021	17	1
2022	17	1
2023	17	1
2024	17	1
2025 through 2029	81	8

Accumulated Other Comprehensive Loss—The following pre-tax amounts were recognized in Accumulated other comprehensive loss as of and for the years ended December 31, 2019 and 2018:

<u>Millions of dollars</u>	Pension Benefits		Other Benefits	
	Actuarial (Gain) Loss	Prior Service Cost (Credit)	Actuarial (Gain) Loss	Prior Service Cost (Credit)
December 31, 2017	\$ 619	\$ 10	\$ —	\$ —
Arising during the period	40	4	(49)	—
Actuarial loss amortization	(31)	(1)	(1)	—
Settlement loss	(3)	—	—	—
December 31, 2018	625	13	(50)	—
Arising during the period	327	22	38	—
Actuarial (loss) gain amortization	(30)	(2)	4	—
Settlement loss	(1)	—	—	—
December 31, 2019	\$ 921	\$ 33	\$ (8)	\$ —

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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

In 2019, pension benefits actuarial loss and other postretirement benefits actuarial loss of \$327 million and \$38 million, respectively, are primarily due to changes in discount rate assumption. In 2018, pension benefits actuarial loss of \$40 million are primarily attributable to return on plan asset losses. Other postretirement benefits actuarial gains of \$49 million are primarily due to favorable liability experience.

Deferred income taxes related to amounts in Accumulated other comprehensive loss include provisions of \$236 million and \$144 million as of December 31, 2019 and 2018, respectively.

At December 31, 2019, Accumulated other comprehensive loss of \$22 million represents net actuarial and investment losses and \$3 million of prior service cost related to non-U.S. pension plans that are expected to be recognized as a component of net periodic benefit cost in 2020. There are \$29 million of net actuarial and investment losses in Accumulated other comprehensive loss at December 31, 2019 for U.S. pension plans expected to be recognized in net periodic benefit cost in 2020. At December 31, 2019, Accumulated other comprehensive loss included \$3 million of net actuarial loss related to non-U.S. other postretirement benefits and \$2 million net actuarial gain related to U.S. other post-retirement benefits that is expected to be recognized in net periodic benefit cost in 2020.

Defined Contribution Plans—Most employees in the U.S. and certain non-U.S. countries are eligible to participate in defined contribution plans (“Employee Savings Plan”) by contributing a portion of their compensation. We make employer contributions, such as matching contributions, to certain of these plans. The Company also has a nonqualified deferred compensation plan that covers senior management in the U.S. This plan was amended in April 2013 to provide for Company contributions on behalf of certain eligible employees who earn base pay above the IRS annual compensation limit.

The following table provides the Company contributions to the Employee Savings Plans:

<u>Millions of dollars</u>	Company Contributions					
	2019		2018		2017	
	U.S.	Non-U.S.	U.S.	Non-U.S.	U.S.	Non-U.S.
Employee Savings Plans	\$ 46	\$ 7	\$ 40	\$ 5	\$ 36	\$ 5

17. Incentive and Share-Based Compensation

We are authorized to grant restricted stock units, stock options, performance share units, and other cash and stock awards under our Long-Term Incentive Plan (“LTIP”). The Compensation Committee oversees our equity award grants, the type of awards, the required performance measures and the timing and duration of each grant. The maximum number of shares of our common stock reserved for issuance under the LTIP is 22,000,000 shares. As of December 31, 2019, there were 4,034,158 shares remaining available for issuance assuming maximum payout for performance share units awards.

Our share-based compensation awards, which are subject to customary partial or accelerated vesting or forfeiture in the event of certain termination events, are accounted for as equity awards with compensation cost recognized over the vesting period in the income statement. We use a straight-line vesting method for cliff-vested awards and a graded vesting method for step-vested awards. We have elected to recognize forfeitures as they occur for stock-based compensation. When options are exercised and awards are paid out, shares are issued from our treasury shares.

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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

Total share-based compensation expense and the associated tax benefits are as follows:

<u>Millions of dollars</u>	<u>Year Ended December 31,</u>		
	<u>2019</u>	<u>2018</u>	<u>2017</u>
Compensation Expense:			
Restricted stock units	\$ 21	\$ 15	\$ 13
Stock options	7	7	7
Performance share units	20	17	35
Total	<u>\$ 48</u>	<u>\$ 39</u>	<u>\$ 55</u>
Tax Benefit:			
Restricted stock units	\$ 5	\$ 4	\$ 5
Stock options	2	2	2
Performance share units	4	4	12
Total	<u>\$ 11</u>	<u>\$ 10</u>	<u>\$ 19</u>

Restricted Stock Unit Awards (“RSUs”)—RSUs entitle the recipient to be paid out an equal number of ordinary shares upon vesting. RSUs generally cliff vest on the third anniversary of the grant date.

The holders of RSUs are entitled to nonforfeitable dividend equivalents settled in the form of cash payments. Total dividend equivalent payments for RSUs were \$2 million in 2019 and 2018 and \$1 million in 2017 and are recognized as dividends in Retained earnings.

The fair value of RSUs is based on the market price of the underlying stock on the date of grant. The weighted average grant date fair value for RSUs granted during the years ended December 31, 2019, 2018 and 2017 was \$87.36, \$108.52 and \$91.14, respectively. The total fair value of RSUs vested during 2019 and 2018 was \$13 million and during 2017 was \$8 million.

The following table summarizes RSU activity:

	<u>Number of Units (in thousands)</u>	<u>Weighted Average Grant Date Fair Value (per share)</u>
Outstanding at January 1, 2019	462	\$ 95.69
Granted	338	87.36
Vested	(147)	86.22
Forfeited	(40)	95.67
Outstanding at December 31, 2019	<u>613</u>	<u>\$ 93.37</u>

As of December 31, 2019, the unrecognized compensation cost related to RSUs was \$26 million, which is expected to be recognized over a weighted average period of 2 years.

Stock Option Awards (“Stock Options”)—Stock Options allow employees the opportunity in the future to purchase ordinary shares of stock at an exercise price equal to the market price at the date of grant. The awards generally have a three-year vesting period that vests in equal increments on the first, second and third anniversary of the grant date and have a contractual term of ten years. None of the Stock Options are designed to qualify as incentive Stock Options as defined in Section 422 of the Internal Revenue Code.

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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

The fair value of each Stock Option is estimated, based on several assumptions, on the date of grant using the Black-Scholes option valuation model. The principal assumptions utilized in valuing Stock Options include the expected stock price volatility (based on our historical stock price volatility over the expected term); the expected dividend yield; and the risk-free interest rate (an estimate based on the yield of a United States Treasury zero coupon bond with a maturity equal to the expected term of the option).

The expected term of all Stock Options granted is estimated based on a simplified approach. In 2010, when the majority of our Stock Options were granted, we determined that the simplified method was appropriate because of the life of LyondellBasell N.V. and its relative stage of development. Similarly, we did not possess exercise patterns similar to our situation. The Stock Options that have been granted since 2010 have been limited in number and have occurred during periods of substantial share price volatility.

Weighted average fair values of Stock Options granted and the assumptions used in estimating those fair values are as follows:

	Year Ended December 31,		
	2019	2018	2017
Weighted average fair value	\$ 15.76	\$ 21.58	\$ 21.55
Fair value assumptions:			
Dividend yield	4.2%	4.0%	4.0%
Expected volatility	27.2-28.1%	27.8-29.0%	34.9-35.1%
Risk-free interest rate	1.5-2.6%	2.6-2.9%	2.1-2.3%
Weighted average expected term, in years	6.0	6.0	6.0

The following table summarizes Stock Option activity:

	Number of Shares (in thousands)	Weighted Average Exercise Price	Weighted Average Remaining Term	Aggregate Intrinsic Value (millions of dollars)
Outstanding at January 1, 2019	1,281	\$ 90.30		
Granted	604	89.78		
Exercised	(18)	70.33		
Forfeited	(64)	94.39		
Expired	(21)	98.82		
Outstanding at December 31, 2019	1,782	\$ 90.08	7.3 years	\$ 13
Exercisable at December 31, 2019	942	\$ 87.25	6.2 years	\$ 9

The aggregate intrinsic value of Stock Options exercised during the years ended December 31, 2019, 2018 and 2017 was less than \$1 million, \$3 million and \$6 million, respectively.

As of December 31, 2019, the unrecognized compensation cost related to Stock Options was \$6 million, which is expected to be recognized over a two-year period. During 2019, cash received from the exercise of Stock Options was \$1 million and the tax benefit associated with these exercises was less than \$1 million.

Performance Share Units Awards (“PSUs”)—A target number of PSUs are granted to participants at the beginning of each performance period. These awards cliff vest after a three-year performance cycle and are settled in shares of common stock, where the ultimate payout can be between 0% and 200% of the target shares granted. Each unit is equivalent to one share of our common stock.

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For PSUs granted beginning in 2017, the final number of shares payable is determined after the performance period based on the relative Total Shareholder Return (“TSR”). TSR is an objective calculation that takes into account our TSR rank within its peer group and whether our specific TSR is positive or negative. The fair value of PSUs is estimated on the grant date using a Monte-Carlo simulation.

For PSUs granted prior to 2017, the final number of shares payable was determined at the end of the performance period by the Compensation Committee based generally on subjective criteria established at the beginning of the performance period. These share awards were treated as liability awards and fair value adjustments were based on the market price of the underlying stock on the date of payment.

Outstanding PSUs accrue dividend equivalent units, which will be converted to shares upon payment at the end of the performance period and are classified as Accrued liabilities and Other liabilities on the Consolidated Balance Sheets. Dividend equivalents for PSUs granted in 2016 were recorded as compensation expense while PSUs granted beginning in 2017 were recorded in Retained earnings.

The weighted average fair value of PSUs granted in each respective year and the assumptions used in the Monte Carlo simulation to estimate those fair value are as follows:

	<u>2019</u>	<u>2018</u>	<u>2017</u>
Weighted average fair value	\$ 76.35	\$ 89.32	\$ 93.28
Fair value assumptions:			
Expected volatility of LyondellBasell N.V. common stock	24.11%	27.15%	30.98%
Expected volatility of peer companies	14.57-40.55%	17.45-42.99%	16.98-39.89%
Average correlation coefficient of peer companies	0.50	0.50	0.51
Risk-free interest rate	2.48%	2.40%	1.46%

The following table summarizes PSU activity, which assumes target payout at 100%:

	<u>Equity Awards</u>		<u>Liability Awards</u>	
	<u>Number of Units (in thousands)</u>	<u>Weighted Average Grant Date Fair Value (per share)</u>	<u>Number of Units (in thousands)</u>	<u>Weighted Average Grant Date Fair Value (per share)</u>
Outstanding at January 1, 2019	430	\$ 91.33	349	\$ 78.01
Granted	307	76.35	—	—
Vested	—	—	(349)	78.01
Forfeited	(54)	82.27	—	—
Outstanding at December 31, 2019	<u>683</u>	<u>\$ 85.32</u>	<u>—</u>	<u>\$ —</u>

The total fair value of PSUs vested during 2019, 2018 and 2017 was \$22 million, \$25 million, and \$21 million, respectively. As of December 31, 2019, the unrecognized compensation cost related to PSUs was \$23 million, which is expected to be recognized over a weighted average period of 2 years.

Employee Stock Purchase Plan—We have an Employee Share Purchase Plan (“ESPP”) which includes a 10% discount and a look-back provision. These provisions allow participants to purchase our stock at a discount on the lower of the fair market value at either the beginning or end of the purchase period. As a result of the 10% discount and the look-back provision, the ESPP is considered a compensatory plan under generally accepted accounting principles.

18. Income Taxes

LyondellBasell Industries N.V. is tax resident in the United Kingdom pursuant to a mutual agreement procedure determination ruling between the Dutch and United Kingdom competent authorities and therefore subject solely to the United Kingdom corporate income tax system.

LyondellBasell Industries N.V. has little or no taxable income of its own because, as a holding company, it does not conduct any operations. Through our subsidiaries, we have substantial operations world-wide. Taxes are paid on the earnings generated in various jurisdictions where our subsidiaries operate, including primarily the U.S., the Netherlands, Germany, France, and Italy.

We monitor income tax developments and the potential impact to our results of operations. In 2017, the U.S. enacted “H.R.1”, also known as the “Tax Cuts and Jobs Act” (the “Tax Act”) materially impacting our Consolidated Financial Statements by, among other things, decreasing the tax rate, and significantly affecting future periods. The Tax Act reduced the federal corporate tax rate from 35% to 21% for years beginning after 2017, which resulted in the remeasurement of our U.S. net deferred income tax liabilities. As a result, we recognized a tax benefit of \$819 million in 2017. Following adjustments made in 2018, the cumulative impact of the remeasurement of our U.S. net deferred income tax liabilities and tax accruals was an \$814 million income tax benefit. Adjustments to the 2017 provisional amount were reported as a component of income tax expense in the reporting period in which the adjustments were identified.

In 2019, as a result of the U.S. Section 245A temporary regulations following the Tax Act, the Company intends to permanently reinvest approximately \$550 million of our non-U.S. earnings. Repatriation of these earnings to the U.S. in the future could result in a tax impact of approximately \$60 million. Prior to the issuance of the retroactive temporary regulations, the non-U.S. earnings could have been distributed tax free. In prior years, the Company did not assert permanent reinvestment of our foreign earnings.

Under the Tax Act, U.S. Treasury was provided expanded regulatory authority. Based on regulations proposed to date, we do not believe there will be further material impact to our financial statements. However, we will continue to analyze the effects of the new law as additional regulations are proposed and finalized.

Interest income earned by certain of our European subsidiaries through intercompany financings is either untaxed or taxed at rates substantially lower than the U.S. statutory rate. In 2016, the U.S. Treasury issued final Section 385 debt-equity regulations that impact our internal financings beginning in 2017. In October 2019 the US Treasury announced that it intended to propose modifying these debt-equity regulations, but the scope of such changes is uncertain and new regulations could impact our internal financings in future years. In addition, there has been increased attention, both in the U.S. and globally, to the tax practices of multinational companies, including the European Union’s state aid investigations, proposals by the Organization for Economic Cooperation and Development with respect to base erosion and profit shifting, and European Union tax directives and their implementation. Other than the Tax Act, management does not believe that recent changes in income tax laws will have a material impact on our Consolidated Financial Statements, although new or proposed changes to tax laws could affect our tax liabilities in the future.

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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

The significant components of the provision for income taxes are as follows:

<u>Millions of dollars</u>	<u>Year Ended December 31,</u>		
	<u>2019</u>	<u>2018</u>	<u>2017</u>
Current:			
U.S. federal	\$ 122	\$ (89)	\$ 543
Non-U.S.	296	404	595
State	21	38	47
Total current	<u>439</u>	<u>353</u>	<u>1,185</u>
Deferred:			
U.S. federal	124	197	(637)
Non-U.S.	75	48	22
State	10	15	28
Total deferred	<u>209</u>	<u>260</u>	<u>(587)</u>
Provision for income taxes before tax effects of other comprehensive income	648	613	598
Tax effects of elements of other comprehensive income:			
Pension and postretirement liabilities	(92)	63	29
Financial derivatives	(38)	16	(14)
Foreign currency translation	8	18	(33)
Unrealized gains (losses) from available-for-sale debt securities	—	—	(3)
Total income tax expense in comprehensive income	<u><u>\$ 526</u></u>	<u><u>\$ 710</u></u>	<u><u>\$ 577</u></u>

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Since the proportion of U.S. revenues, assets, operating income and associated tax provisions is significantly greater than any other single taxing jurisdiction within the worldwide group, the reconciliation of the differences between the provision for income taxes and the statutory rate is presented on the basis of the U.S. statutory federal income tax rate of 21% as opposed to the United Kingdom statutory rate of 19%. Our effective tax rate for the year ended December 31, 2019 is 16.0%. This summary is shown below:

<u>Millions of dollars</u>	Year Ended December 31,		
	2019	2018	2017
Income before income taxes:			
U.S.	\$ 1,581	\$ 2,795	\$ 2,438
Non-U.S.	2,471	2,516	3,055
Total	<u>\$ 4,052</u>	<u>\$ 5,311</u>	<u>\$ 5,493</u>
Income tax at U.S. statutory rate	\$ 851	\$ 1,115	\$ 1,923
Increase (reduction) resulting from:			
Non-U.S. income taxed at different statutory rates	64	89	(164)
Remeasurement of U.S. net deferred tax liability	—	—	(819)
State income taxes, net of federal benefit	29	53	40
Exempt income	(182)	(296)	(385)
Liquidation loss	(51)	—	—
Patent box ruling	(65)	—	—
Uncertain tax positions	(42)	(320)	28
U.S. manufacturing deduction	—	—	(57)
Other, net	44	(28)	32
Income tax provision	<u>\$ 648</u>	<u>\$ 613</u>	<u>\$ 598</u>

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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

The deferred tax effects of tax loss, credit and interest carryforwards (“tax attributes”) and the tax effects of temporary differences between the tax basis of assets and liabilities and their reported amounts in the Consolidated Financial Statements, reduced by a valuation allowance where appropriate, are presented below.

<u>Millions of dollars</u>	<u>December 31,</u>	
	<u>2019</u>	<u>2018</u>
Deferred tax liabilities:		
Accelerated tax depreciation	\$ 1,973	\$ 1,809
Investment in joint venture partnerships	141	147
Intangible assets	116	151
Inventory	319	285
Operating lease asset	322	—
Other liabilities	45	22
Total deferred tax liabilities	2,916	2,414
Deferred tax assets:		
Tax attributes	\$ 168	\$ 180
Employee benefit plans	397	334
Operating lease liability	326	—
Other assets	133	76
Total deferred tax assets	1,024	590
Deferred tax asset valuation allowances	(85)	(120)
Net deferred tax assets	939	470
Net deferred tax liabilities	\$ 1,977	\$ 1,944

<u>Millions of dollars</u>	<u>December 31,</u>	
	<u>2019</u>	<u>2018</u>
Balance sheet classifications:		
Deferred tax assets—long-term	\$ 38	\$ 31
Deferred tax liabilities—long-term	2,015	1,975
Net deferred tax liabilities	\$ 1,977	\$ 1,944

Deferred taxes on the unremitted earnings of certain equity joint ventures and subsidiaries of \$95 million and \$96 million at December 31, 2019 and 2018, respectively, have been provided.

At December 31, 2019 and 2018, we had total tax attributes available in the amount of \$877 million and \$938 million, respectively, for which a deferred tax asset was recognized at December 31, 2019 and 2018 of \$168 million and \$180 million, respectively.

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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

The scheduled expiration of the tax attributes and the related deferred tax assets, before valuation allowance, as of December 31, 2019 are as follows:

<u>Millions of dollars</u>	<u>Tax Attributes</u>	<u>Deferred Tax on Tax Attributes</u>
2020	\$ 28	\$ 1
2021	16	1
2022	28	2
2023	9	1
2024	4	1
Thereafter	152	16
Indefinite	640	146
Total	<u>\$ 877</u>	<u>\$ 168</u>

The tax attributes are primarily related to operations in the United States, United Kingdom and France. The related deferred tax assets by primary jurisdictions are shown below:

<u>Millions of dollars</u>	<u>December 31,</u>		
	<u>2019</u>	<u>2018</u>	<u>2017</u>
United States	\$ 68	\$ 14	\$ 10
United Kingdom	36	36	17
France	30	64	92
Spain	8	11	32
The Netherlands	4	12	13
Canada	—	28	31
Other	22	15	1
Total	<u>\$ 168</u>	<u>\$ 180</u>	<u>\$ 196</u>

To fully realize these net deferred tax assets, we will need to generate sufficient future taxable income in the countries where these tax attributes exist during the periods in which the attributes can be utilized. Based upon projections of future taxable income over the periods in which the attributes can be utilized and/or temporary differences can be reversed, management believes it is more likely than not that \$83 million of these deferred tax assets at December 31, 2019 will be realized.

Prior to the close of each reporting period, management considers the weight of all evidence, both positive and negative, to determine if a valuation allowance is necessary for each jurisdictions' net deferred tax assets. We place greater weight on historical evidence over future predictions of our ability to utilize net deferred tax assets. We consider future reversals of existing taxable temporary differences, future taxable income exclusive of reversing temporary differences, and taxable income in prior carryback year(s) if carryback is permitted under applicable law, as well as available prudent and feasible tax planning strategies that would, if necessary, be implemented to ensure realization of the net deferred tax asset.

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A summary of the valuation allowances by primary jurisdiction is shown below, reflecting the valuation allowances for all the net deferred tax assets, including deferred tax assets for tax attributes and other temporary differences.

<u>Millions of dollars</u>	December 31,		
	2019	2018	2017
United Kingdom	\$ 36	\$ 33	\$ 17
France	23	23	25
United States	13	13	10
The Netherlands	3	12	12
Canada	—	28	32
Other	10	11	—
	<u>\$ 85</u>	<u>\$ 120</u>	<u>\$ 96</u>

Historically, we have maintained a full valuation allowance against the net deferred tax asset in Canada. In 2019, we liquidated this Canadian entity resulting in the write-off of both the deferred tax asset and the associated valuation allowance.

During 2018, the valuation allowance increased in the United Kingdom due to disallowed interest deductions where we do not expect to realize a future benefit. This increase also includes the addition of valuation allowances associated with A. Schulman entities acquired in 2018 where management assessed that deferred tax attributes are not likely to be realized.

During 2017, the valuation allowance decreased in the U.S. due to the remeasurement of our U.S. net deferred income tax liability. This reduction was offset by increases in the valuation allowances of other jurisdictions due primarily to currency translation adjustments.

Tax benefits totaling \$238 million, \$269 million and \$544 million relating to uncertain tax positions, which are reflected in Other liabilities, were unrecognized as of December 31, 2019, 2018 and 2017, respectively. The following table presents a reconciliation of the beginning and ending amounts of unrecognized tax benefits:

<u>Millions of dollars</u>	Year Ended December 31,		
	2019	2018	2017
Balance, beginning of period	\$ 269	\$ 544	\$ 546
Additions for tax positions of current year	49	16	15
Additions for tax positions of prior years	20	23	3
Reductions for tax positions of prior years	(100)	(299)	(20)
Settlements (payments/refunds)	—	(15)	—
Balance, end of period	<u>\$ 238</u>	<u>\$ 269</u>	<u>\$ 544</u>

The majority of the uncertain tax positions, if recognized, will affect the effective tax rate. We operate in multiple jurisdictions throughout the world, and our tax returns are periodically audited or subjected to review by tax authorities. We are currently under examination in a number of tax jurisdictions. As a result, there is an uncertainty in income taxes recognized in our financial statements. Positions challenged by the tax authorities may be settled or appealed by us. During 2019, we recognized a \$113 million non-cash benefit to our effective tax rate consisting of \$100 million of previously unrecognized tax benefits as a reduction for tax positions of a prior year and the release of \$13 million of previously accrued interest. These benefits were largely due to the expiration of certain statutes of limitations. During 2018, we entered into various audit settlements impacting specific uncertain tax positions. These audit settlements resulted in a \$358 million non-cash benefit to our effective tax rate consisting of the recognition of

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

\$299 million of previously unrecognized tax benefits as a reduction for tax positions of prior years and the release of \$59 million of previously accrued interest. These non-cash reductions in unrecognized tax benefits are reflected on our Consolidated Balance Sheets in Other liabilities and on our Consolidated Statements of Cash Flows in Other operating activities.

We are no longer subject to any significant income tax examinations by tax authorities for the years prior to 2017 in the Netherlands, prior to 2014 in Italy, prior to 2005 in Germany, prior to 2010 in France, prior to 2016 in the United Kingdom, and prior to 2016 in the U.S., our principal tax jurisdictions. It is reasonably possible that, within the next twelve months, due to the settlement of uncertain tax positions with various tax authorities and the expiration of statutes of limitations, unrecognized tax benefits could decrease by up to approximately \$100 million.

We recognize interest associated with unrecognized tax benefits in income tax expense. Income tax expense includes a benefit of interest and penalties totaling \$1 million and \$47 million in 2019 and 2018, respectively, and interest expense totaling \$16 million in 2017.

We had accrued approximately \$15 million, \$16 million and \$63 million for interest and penalties as of December 31, 2019, 2018 and 2017, respectively.

19. Commitments and Contingencies

Commitments—We have various purchase commitments for materials, supplies and services incidental to the ordinary conduct of business, generally for quantities required for our businesses and at prevailing market prices. These commitments are designed to assure sources of supply and are not expected to be in excess of normal requirements. As of December 31, 2019, we had capital expenditure commitments which we incurred in our normal course of business, including commitments of approximately \$449 million related to building our new PO/TBA plant on the Texas Gulf Coast.

Financial Assurance Instruments—We have obtained letters of credit, performance and surety bonds and have issued financial and performance guarantees to support trade payables, potential liabilities and other obligations. Considering the frequency of claims made against the financial instruments we use to support our obligations, and the magnitude of those financial instruments in light of our current financial position, management does not expect that any claims against or draws on these instruments would have a material adverse effect on our Consolidated Financial Statements. We have not experienced any unmanageable difficulty in obtaining the required financial assurance instruments for our current operations.

Environmental Remediation—Our accrued liability for future environmental remediation costs at current and former plant sites and other remediation sites totaled \$132 million and \$90 million as of December 31, 2019 and 2018, respectively. At December 31, 2019, the accrued liabilities for individual sites range from less than \$1 million to \$17 million. The remediation expenditures are expected to occur over a number of years, and not concentrated in any single year. In our opinion, it is reasonably possible that losses in excess of the liabilities recorded may have been incurred. However, we cannot estimate any amount or range of such possible additional losses. New information about sites, new technology or future developments such as involvement in investigations by regulatory agencies, could require us to reassess our potential exposure related to environmental matters.

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The following table summarizes the activity in our accrued environmental liability included in “Accrued liabilities” and “Other liabilities.”

<u>Millions of dollars</u>	<u>Year Ended December 31,</u>	
	<u>2019</u>	<u>2018</u>
Beginning balance	\$ 90	\$ 102
Additional provisions	44	—
Changes in estimates	15	4
Amounts paid	(16)	(13)
Foreign exchange effects	(1)	(3)
Ending balance	<u>\$ 132</u>	<u>\$ 90</u>

Additional provisions recognized during the year ended December 31, 2019 are primarily associated with our acquisition of A. Schulman in August 2018.

Indemnification—We are parties to various indemnification arrangements, including arrangements entered into in connection with acquisitions, divestitures and the formation and dissolution of joint ventures. Pursuant to these arrangements, we provide indemnification to and/or receive indemnification from other parties in connection with liabilities that may arise in connection with the transactions and in connection with activities prior to completion of the transactions. These indemnification arrangements typically include provisions pertaining to third party claims relating to environmental and tax matters and various types of litigation. As of December 31, 2019, we had not accrued any significant amounts for our indemnification obligations, and we are not aware of other circumstances that would likely lead to significant future indemnification obligations. We cannot determine with certainty the potential amount of future payments under the indemnification arrangements until events arise that would trigger a liability under the arrangements.

As part of our technology licensing contracts, we give indemnifications to our licensees for liabilities arising from possible patent infringement claims with respect to certain proprietary licensed technologies. Such indemnifications have a stated maximum amount and generally cover a period of 5 to 10 years.

Legal Proceedings—We are subject to various lawsuits and claims, including but not limited to, matters involving contract disputes, environmental damages, personal injury and property damage. We vigorously defend ourselves and prosecute these matters as appropriate.

Our legal organization applies its knowledge, experience and professional judgment to the specific characteristics of our cases, employing a litigation management process to manage and monitor legal proceedings in which we are a party. Our process facilitates the early evaluation and quantification of potential exposures in individual cases. This process also enables us to track those cases that have been scheduled for trial, mediation or other resolution. We regularly assesses the adequacy of legal accruals based on our professional judgment, experience and the information available regarding our cases.

Based on a consideration of all relevant facts and circumstances, we do not believe the ultimate outcome of any currently pending lawsuit against us will have a material adverse effect upon our operations, financial condition or financial statements.

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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

20. Shareholders' Equity and Redeemable Non-controlling Interests

Shareholders' Equity

Dividend Distributions—The following table summarizes the dividends paid to common shareholders in the periods presented:

<u>Millions of dollars, except per share amounts</u>	<u>Dividend Per Ordinary Share</u>	<u>Aggregate Dividends Paid</u>	<u>Date of Record</u>
For the year 2019:			
March	\$ 1.00	\$ 372	March 4, 2019
June	1.05	388	June 10, 2019
September	1.05	351	September 4, 2019
December	1.05	351	December 2, 2019
	<u>\$ 4.15</u>	<u>\$ 1,462</u>	
For the year 2018:			
March	\$ 1.00	\$ 395	March 5, 2018
June	1.00	392	June 11, 2018
September	1.00	389	September 5, 2018
December	1.00	378	December 10, 2018
	<u>\$ 4.00</u>	<u>\$ 1,554</u>	

Share Repurchase Authorization—In May 2019, our shareholders approved a proposal to authorize us to repurchase up to 37.0 million of our ordinary shares through November 30, 2020 (“May 2019 Share Repurchase Authorization”), which superseded the remaining authorization under our 2018 Share Repurchase Authorization.

Upon the completion of the tender offer in July 2019, we repurchased 35.1 million ordinary shares, under the May 2019 Share Repurchase Authorization, at a tender offer price of \$88.00 per share for a total of \$3,099 million, including \$6 million of fees and expenses related to the tender offer. The remaining 1.9 million shares under the May 2019 Share Repurchase Authorization were repurchased from the open market in August 2019.

In September 2019, our shareholders approved a proposal to authorize us to repurchase up to 33.3 million ordinary shares through March 12, 2021 (“September 2019 Share Repurchase Authorization”), which superseded any prior repurchase authorizations. The timing and amount of these repurchases, which are determined based on our evaluation of market conditions and other factors, may be executed from time to time through open market or privately negotiated transactions. The repurchased shares, which are recorded at cost, are classified as Treasury stock and may be retired or used for general corporate purposes, including for various employee benefit and compensation plans. As of December 31, 2019, there were no repurchases under the September 2019 Share Repurchase Authorization.

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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

The following table summarizes our share repurchase activity for the periods presented:

<u>Millions of dollars, except shares and per share amounts</u>	<u>Shares Repurchased</u>	<u>Average Purchase Price</u>	<u>Total Purchase Price, Including Commissions and Fees</u>
For the year 2019:			
2018 Share Repurchase Authorization	5,648,900	\$ 86.38	\$ 488
May 2019 Share Repurchase Authorization	37,032,594	87.50	3,240
	<u>42,681,494</u>	<u>\$ 87.35</u>	<u>\$ 3,728</u>
For the year 2018:			
2017 Share Repurchase Authorization	4,004,753	\$ 106.05	\$ 425
2018 Share Repurchase Authorization	15,215,966	95.49	1,453
	<u>19,220,719</u>	<u>\$ 97.69</u>	<u>\$ 1,878</u>
For the year 2017:			
2016 Share Repurchase Authorization	3,501,084	\$ 85.71	\$ 300
2017 Share Repurchase Authorization	6,516,917	83.54	545
	<u>10,018,001</u>	<u>\$ 84.30</u>	<u>\$ 845</u>

Due to the timing of settlements, total cash paid for share repurchases for the years ended December 31, 2019, 2018 and 2017 was \$3,752 million, \$1,854 million and \$866 million, respectively.

Ordinary Shares—The changes in the outstanding amounts of ordinary shares are as follows:

	<u>Year Ended December 31,</u>		
	<u>2019</u>	<u>2018</u>	<u>2017</u>
Ordinary shares outstanding:			
Beginning balance	375,696,661	394,512,054	404,046,331
Share-based compensation	295,984	307,335	371,980
Warrants exercised	—	—	4,184
Employee stock purchase plan	165,743	121,398	107,560
Purchase of ordinary shares	(42,681,505)	(19,244,126)	(10,018,001)
Ending balance	<u>333,476,883</u>	<u>375,696,661</u>	<u>394,512,054</u>

Treasury Shares—The changes in the amounts of treasury shares held by the Company are as follows:

	<u>Year Ended December 31,</u>		
	<u>2019</u>	<u>2018</u>	<u>2017</u>
Ordinary shares held as treasury shares:			
Beginning balance	24,513,619	183,928,109	174,389,139
Share-based compensation	(295,984)	(307,335)	(371,980)
Warrants exercised	—	—	509
Employee stock purchase plan	(165,743)	(121,398)	(107,560)
Purchase of ordinary shares	42,681,505	19,244,126	10,018,001
Treasury shares canceled	(60,164,652)	(178,229,883)	—
Ending balance	<u>6,568,745</u>	<u>24,513,619</u>	<u>183,928,109</u>

LYONDELLBASELL INDUSTRIES N.V.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

During 2019 and 2018, following approval by our management and shareholders, we canceled 60,164,652 and 178,229,883 ordinary shares, respectively, held in our treasury account in accordance with cancellation requirements under Dutch law.

Purchase of ordinary shares during 2019 and 2018 includes 11 shares and 23,407 shares, respectively, that were returned to us at no cost resulting from unclaimed distributions to creditors.

Accumulated Other Comprehensive Loss—The components of, and after-tax changes in, Accumulated other comprehensive loss as of and for the years ended December 31, 2019, 2018 and 2017 are presented in the following table:

Millions of dollars	Financial Derivatives	Unrealized Gains (Losses) on Available- for-Sale Debt Securities	Unrealized Gains on Equity Securities and Equity Securities Held by Equity Investees	Defined Benefit Pension and Other Postretirement Benefit Plans	Foreign Currency Translation Adjustments	Total
Balance—January 1, 2017	\$ (75)	\$ 1	\$ —	\$ (498)	\$ (939)	\$ (1,511)
Other comprehensive income (loss) before reclassifications	(323)	(2)	15	62	145	(103)
Tax (expense) benefit before reclassifications	86	1	2	(15)	33	107
Amounts reclassified from accumulated other comprehensive loss	264	—	—	44	—	308
Tax expense	(72)	—	—	(14)	—	(86)
Net other comprehensive income (loss)	(45)	(1)	17	77	178	226
Balance—December 31, 2017	<u>\$ (120)</u>	<u>\$ —</u>	<u>\$ 17</u>	<u>\$ (421)</u>	<u>\$ (761)</u>	<u>\$ (1,285)</u>
Balance—January 1, 2018	\$ (120)	\$ —	\$ 17	\$ (421)	\$ (761)	\$ (1,285)
Adoption of accounting standards	(2)	—	(17)	(51)	—	(70)
Other comprehensive income (loss) before reclassifications	180	—	—	5	(74)	111
Tax (expense) benefit before reclassifications	(43)	—	—	2	(18)	(59)
Amounts reclassified from accumulated other comprehensive loss	(110)	—	—	36	—	(74)
Tax (expense) benefit	27	—	—	(13)	—	14
Net other comprehensive income (loss)	54	—	—	30	(92)	(8)
Balance—December 31, 2018	<u>\$ (68)</u>	<u>\$ —</u>	<u>\$ —</u>	<u>\$ (442)</u>	<u>\$ (853)</u>	<u>\$ (1,363)</u>
Balance—January 1, 2019	\$ (68)	\$ —	\$ —	\$ (442)	\$ (853)	\$ (1,363)
Other comprehensive income (loss) before reclassifications	(120)	—	—	(390)	(12)	(522)
Tax (expense) benefit before reclassifications	25	—	—	98	(8)	115
Amounts reclassified from accumulated other comprehensive loss	(50)	—	—	29	—	(21)
Tax (expense) benefit	13	—	—	(6)	—	7
Net other comprehensive income (loss)	(132)	—	—	(269)	(20)	(421)
Balance—December 31, 2019	<u>\$ (200)</u>	<u>\$ —</u>	<u>\$ —</u>	<u>\$ (711)</u>	<u>\$ (873)</u>	<u>\$ (1,784)</u>

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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

The amounts reclassified out of each component of Accumulated other comprehensive loss are as follows:

<u>Millions of dollars</u>	<u>Year Ended December 31,</u>			<u>Affected Line Items on the Consolidated Statements of Income</u>
	<u>2019</u>	<u>2018</u>	<u>2017</u>	
Reclassification adjustments for:				
Financial derivatives	\$ (50)	\$ (110)	\$ 264	Other income, net
Income tax expense (benefit)	(13)	(27)	72	Provision for income taxes
Financial derivatives, net of tax	(37)	(83)	192	
Amortization of defined pension items:				
Prior service cost	2	1	3	Other income, net
Actuarial loss	26	32	39	Other income, net
Settlement loss	1	3	2	Other income, net
Income tax expense (benefit)	6	13	14	Provision for income taxes
Defined pension items, net of tax	23	23	30	
Total reclassifications, before tax				
	(21)	(74)	308	
Income tax expense (benefit)	(7)	(14)	86	Provision for income taxes
Total reclassifications, after tax	<u>\$ (14)</u>	<u>\$ (60)</u>	<u>\$ 222</u>	Amount included in net income

Amortization of prior service cost and actuarial loss are included in the computation of net periodic pension and other postretirement benefit costs (see Note 16 to the Consolidated Financial Statements).

Non-Controlling Interests—In February 2019, we increased our interest in our subsidiary La Porte Methanol Company, L.P., from 85% to 100%, for cash consideration of \$63 million. In April 2017, we increased our interest in the entity that holds our equity interest in Al Waha Petrochemicals Ltd. from 83.79% to 100% by paying \$21 million to exercise a call option to purchase the remaining 16.21% interest held by a third party.

Redeemable Non-controlling Interests

Our redeemable non-controlling interests relate to shares of cumulative perpetual special stock issued by our consolidated subsidiary, formerly known as A. Schulman. As of December 31, 2019 and 2018, we had 115,374 shares of redeemable non-controlling interest stock outstanding.

In February, May, August and November 2019, we paid a cash dividend of \$15.00 per share to our redeemable non-controlling interest shareholders of record as of January 15, 2019, April 15, 2019, July 15, 2019, and October 15, 2019, respectively. In 2019 and 2018, we paid a total of \$7 million and \$2 million, respectively, related to dividends on redeemable non-controlling interest stock.

LYONDELLBASELL INDUSTRIES N.V.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

21. Per Share Data

Basic earnings per share is based upon the weighted average number of shares of common stock outstanding during the periods. Diluted earnings per share includes the effect of certain stock options awards and other equity-based compensation awards. We have unvested restricted stock units that are considered participating securities for earnings per share.

Earnings per share data and dividends declared per share of common stock are as follows:

	Year Ended December 31,					
	2019		2018		2017	
	Continuing Operations	Discontinued Operations	Continuing Operations	Discontinued Operations	Continuing Operations	Discontinued Operations
Millions of dollars						
Net income (loss)	\$ 3,404	\$ (7)	\$ 4,698	\$ (8)	\$ 4,895	\$ (18)
Less: net loss attributable to non-controlling interests	—	—	—	—	2	—
Net income (loss) attributable to the Company shareholders	3,404	(7)	4,698	(8)	4,897	(18)
Dividends on redeemable non-controlling interest stock	(7)	—	(2)	—	—	—
Net income attributable to participating securities	(6)	—	(6)	—	(5)	—
Net income (loss) attributable to ordinary shareholders—basic	<u>\$ 3,391</u>	<u>\$ (7)</u>	<u>\$ 4,690</u>	<u>\$ (8)</u>	<u>\$ 4,892</u>	<u>\$ (18)</u>
Potential diluted effect of performance share units	—	—	(5)	—	—	—
Net income (loss) attributable to ordinary shareholders—diluted	<u>\$ 3,391</u>	<u>\$ (7)</u>	<u>\$ 4,685</u>	<u>\$ (8)</u>	<u>\$ 4,892</u>	<u>\$ (18)</u>
Millions of shares, except per share amounts						
Basic weighted average common stock outstanding	353	353	389	389	398	398
Effect of dilutive securities:						
Stock options	—	—	—	—	1	1
Potential dilutive shares	<u>353</u>	<u>353</u>	<u>389</u>	<u>389</u>	<u>399</u>	<u>399</u>
Earnings (loss) per share:						
Basic	<u>\$ 9.61</u>	<u>\$ (0.02)</u>	<u>\$ 12.06</u>	<u>\$ (0.02)</u>	<u>\$ 12.28</u>	<u>\$ (0.05)</u>
Diluted	<u>\$ 9.60</u>	<u>\$ (0.02)</u>	<u>\$ 12.03</u>	<u>\$ (0.02)</u>	<u>\$ 12.28</u>	<u>\$ (0.05)</u>

22. Segment and Related Information

Our operations are managed by senior executives who report to our Chief Executive Officer, the chief operating decision maker. Discrete financial information is available for each of the segments, and our Chief Executive Officer uses the operating results of each of the operating segments for performance evaluation and resource allocation. The activities of each of our segments from which they earn revenues and incur expenses are described below:

- *Olefins and Polyolefins—Americas* (“O&P—Americas”). Our O&P—Americas segment produces and markets olefins and co-products, polyethylene and polypropylene.
- *Olefins and Polyolefins—Europe, Asia, International* (“O&P—EAI”). Our O&P—EAI segment produces and markets olefins and co-products, polyethylene, and polypropylene.
- *Intermediates and Derivatives* (“I&D”). Our I&D segment produces and markets propylene oxide and its derivatives; oxyfuels and related products; and intermediate chemicals such as styrene monomer, acetyls, ethylene oxide and ethylene glycol.
- *Advanced Polymer Solutions* (“APS”). Our APS segment produces and markets compounding and solutions, such as polypropylene compounds, engineered plastics, masterbatches, engineered composites, colors and powders, and advanced polymers, which includes *Catalloy* and polybutene-1.
- *Refining*. Our Refining segment refines heavy, high-sulfur crude oil and other crude oils of varied types and sources available on the U.S. Gulf Coast into refined products, including gasoline and distillates.
- *Technology*. Our Technology segment develops and licenses chemical and polyolefin process technologies and manufactures and sells polyolefin catalysts.

Our chief operating decision maker uses EBITDA as the primary measure for reviewing profitability of our segments, and therefore, we have presented EBITDA for all segments. We define EBITDA as earnings before interest, income taxes, and depreciation and amortization.

“Other” includes intersegment eliminations and items that are not directly related or allocated to business operations, such as foreign exchange gains or losses and components of pension and other postretirement benefit costs other than service costs. Sales between segments are made primarily at prices approximating prevailing market prices.

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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

Summarized financial information concerning reportable segments is shown in the following tables for the periods presented:

<u>Millions of dollars</u>	Year Ended December 31, 2019							
	O&P—Americas	O&P—EAI	I&D	APS	Refining	Technology	Other	Total
Sales and other operating revenues:								
Customers	\$ 5,311	\$ 8,764	\$ 7,642	\$ 4,846	\$ 7,599	\$ 565	\$ —	\$ 34,727
Intersegment	3,124	740	192	4	652	98	(4,810)	—
	8,435	9,504	7,834	4,850	8,251	663	(4,810)	34,727
Depreciation and amortization expense	470	208	295	133	169	37	—	1,312
Other income, net	9	9	6	1	6	—	8	39
Income from equity investments	46	172	7	—	—	—	—	225
Capital expenditures	1,099	213	1,064	59	149	94	16	2,694
EBITDA	2,302	1,062	1,557	424	(65)	411	1	5,692

<u>Millions of dollars</u>	Year Ended December 31, 2018							
	O&P—Americas	O&P—EAI	I&D	APS	Refining	Technology	Other	Total
Sales and other operating revenues:								
Customers	\$ 6,883	\$ 9,984	\$ 9,426	\$ 4,022	\$ 8,221	\$ 468	\$ —	\$ 39,004
Intersegment	3,525	854	162	2	936	115	(5,594)	—
	10,408	10,838	9,588	4,024	9,157	583	(5,594)	39,004
Depreciation and amortization expense	442	208	287	69	192	43	—	1,241
Other income, net	11	48	2	2	3	1	39	106
Income from equity investments	58	225	6	—	—	—	—	289
Capital expenditures	1,079	248	409	62	250	48	9	2,105
EBITDA	2,762	1,163	2,011	400	167	328	36	6,867

<u>Millions of dollars</u>	Year Ended December 31, 2017							
	O&P—Americas	O&P—EAI	I&D	APS	Refining	Technology	Other	Total
Sales and other operating revenues:								
Customers	\$ 7,265	\$ 9,445	\$ 8,346	\$ 2,922	\$ 6,165	\$ 341	\$ —	\$ 34,484
Intersegment	2,739	773	126	—	683	109	(4,430)	—
	10,004	10,218	8,472	2,922	6,848	450	(4,430)	34,484
Depreciation and amortization expense	433	210	279	35	177	40	—	1,174
Other income (expense), net	42	138	1	(2)	2	—	(2)	179
Income from equity investments	42	271	8	—	—	—	—	321
Capital expenditures	741	163	332	55	213	32	11	1,547
EBITDA	2,899	1,927	1,490	438	157	223	—	7,134

LYONDELLBASELL INDUSTRIES N.V.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

In 2019, EBITDA for our O&P—Americas segment and APS segment results include non-cash, LCM inventory valuation charges of \$25 million and \$8 million, respectively, primarily due to a decline in domestic polyethylene prices. Additionally, our APS segment results include charges totaling \$116 million for integration costs associated with our acquisition of A. Schulman.

In 2018, EBITDA for our O&P—EAI segment includes a \$36 million gain from the fourth quarter 2018 sale of our carbon black subsidiary in France. Our APS segment results include charges totaling \$69 million for acquisition-related transaction and integration costs associated with our acquisition of A. Schulman.

In 2017, our O&P—Americas results include a \$31 million gain on the first quarter sale of property in Lake Charles, Louisiana. EBITDA for our O&P—EAI segment includes a \$108 million gain on the sale of our 27% interest in Geosel and also includes a \$21 million non-cash gain stemming from the elimination of an obligation associated with a lease.

A reconciliation of EBITDA to Income from continuing operations before income taxes is shown in the following table for each of the periods presented:

Millions of dollars	Year Ended December 31,		
	2019	2018	2017
EBITDA:			
Total segment EBITDA	\$ 5,691	\$ 6,831	\$ 7,134
Other EBITDA	1	36	—
Less:			
Depreciation and amortization expense	(1,312)	(1,241)	(1,174)
Interest expense	(347)	(360)	(491)
Add:			
Interest income	19	45	24
Income from continuing operations before income taxes	<u>\$ 4,052</u>	<u>\$ 5,311</u>	<u>\$ 5,493</u>

The following assets are summarized and reconciled to consolidated totals in the following table:

Millions of dollars	O&P— Americas	O&P— EAI	I&D	APS	Refining	Technology	Total
December 31, 2019							
Property, plant and equipment, net	\$ 6,454	\$ 1,706	\$ 3,640	\$ 806	\$ 1,190	\$ 334	\$ 14,130
Investment in PO joint ventures	—	—	504	—	—	—	504
Equity investments	193	1,335	71	3	—	—	1,602
Goodwill	162	112	228	1,380	—	9	1,891
December 31, 2018							
Property, plant and equipment, net	\$ 5,769	\$ 1,745	\$ 2,663	\$ 818	\$ 1,216	\$ 266	\$ 12,477
Investment in PO joint ventures	—	—	469	—	—	—	469
Equity investments	196	1,326	73	16	—	—	1,611
Goodwill	162	114	229	1,300	—	9	1,814

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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

Long-lived assets include Property, plant and equipment, net, Intangible assets, net, Investments in PO joint ventures, and Equity investments (see Notes 8, 9 and 10 to the Consolidated Financial Statements). The following long-lived assets data is based upon the location of the assets:

<u>Millions of dollars</u>	December 31,	
	2019	2018
Long-lived assets:		
United States	\$ 11,999	\$ 10,346
Germany	1,476	1,527
The Netherlands	814	757
France	540	565
Italy	326	343
Mexico	249	254
Other	1,701	1,730
Total	<u>\$ 17,105</u>	<u>\$ 15,522</u>

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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

23. Unaudited Quarterly Results

The following table presents selected quarterly financial data:

<u>Millions of dollars, except per share amounts</u>	<u>For the 2019 Quarter Ended</u>			
	<u>March 31</u>	<u>June 30</u>	<u>September 30</u>	<u>December 31</u>
Sales and other operating revenues	\$ 8,778	\$ 9,048	\$ 8,722	\$ 8,179
Gross profit ^(a)	1,332	1,506	1,453	1,135
Operating income ^(b)	1,017	1,177	1,124	798
Income from equity investments	64	64	51	46
Income from continuing operations ^{(b)(c)}	817	1,006	969	612
Loss from discontinued operations, net of tax	—	(3)	(4)	—
Net income ^{(b)(c)}	817	1,003	965	612
Earnings per share:				
Basic	2.19	2.70	2.85	1.83
Diluted	2.19	2.70	2.85	1.83

<u>Millions of dollars, except per share amounts</u>	<u>For the 2018 Quarter Ended</u>			
	<u>March 31</u>	<u>June 30</u>	<u>September 30</u>	<u>December 31</u>
Sales and other operating revenues	\$ 9,767	\$ 10,206	\$ 10,155	\$ 8,876
Gross profit ^(a)	1,755	1,916	1,656	1,148
Operating income ^(b)	1,494	1,626	1,317	794
Income from equity investments	96	68	89	36
Income from continuing operations ^{(b)(c)}	1,231	1,655	1,115	697
Loss from discontinued operations, net of tax	—	(1)	(2)	(5)
Net income ^{(b)(c)}	1,231	1,654	1,113	692
Earnings per share:				
Basic	3.12	4.23	2.86	1.81
Diluted	3.11	4.22	2.85	1.79

(a) Represents Sales and other operating revenues less Cost of sales.

(b) The three months ended March, June, September and December 2019 include charges for integration costs associated with our acquisition of A. Schulman of \$16 million, \$19 million, \$43 million and \$38 million (\$12 million, \$15 million, \$33 million and \$29 million, after tax), respectively. Includes a pretax LCM inventory valuation charge of \$33 million (\$25 million, after tax) in the three months ended December 31, 2019.

The three months ended September 30, 2018 includes charges for acquisition-related transaction and integration costs associated with our acquisition of A. Schulman of \$53 million (\$42 million, after tax). The three months ended December 31, 2018 includes charges for integration costs of \$20 million (\$15 million, after tax).

(c) The three months ended September 2019 and June 2018 include a non-cash benefit of \$85 million and \$346 million benefits, respectively, related to previously unrecognized tax benefits and the release of associated accrued interest. The three months ended December 31, 2019 includes an after tax gain of \$5 million on the sale of a joint venture interest in Asia. The three months ended December 31, 2018 includes a \$34 million after tax gain on the sale of our carbon black subsidiary in France.

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

None.

Item 9A. Controls and Procedures.

Effectiveness of Controls and Procedures

Our management, with the participation of our Chief Executive Officer (principal executive officer) and our Chief Financial Officer (principal financial officer) has evaluated the effectiveness of our disclosure controls and procedures in ensuring that the information required to be disclosed in reports that we file or submit under the Securities Exchange Act of 1934, as amended, is recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms, including ensuring that such information is accumulated and communicated to management (including the principal executive and financial officers) as appropriate to allow timely decisions regarding required disclosure. Based on such evaluation, our principal executive and financial officers have concluded that such disclosure controls and procedures were effective as of December 31, 2019, the end of the period covered by this Annual Report on Form 10-K.

Management's Report on Internal Control over Financial Reporting

Management's report on our internal control over financial reporting can be found in Item 8, *Financial Statements and Supplementary Data*, of this report.

Changes in Internal Control over Financial Reporting

There have been no changes in our internal control over financial reporting, as defined in Rule 13a-15(f) of the Act, in our fourth fiscal quarter of 2019 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Item 9B. Other Information.

None.

PART III

Item 10. Directors, Executive Officers and Corporate Governance.

We have a Code of Conduct for all employees and directors, including our principal executive officer, principal financial officer, principal accounting officer and persons performing similar functions. We also have a Financial Code of Ethics specifically for our principal executive officer, principal financial officer, principal accounting officer and persons performing similar functions. We have posted copies of these codes on the “Corporate Governance” section of our website at www.LyondellBasell.com (within the Investor Relations section). Any waivers of the codes must be approved, in advance, by our Board of Directors. Any amendments to, or waivers from, the codes that apply to our executive officers and directors will be posted on the “Corporate Governance” section of our website.

Information regarding our executive officers is reported under the caption “Information about our Executive Officers” in Part I of this report, which is incorporated herein by reference.

All other information required by this Item will be included in our Proxy Statement relating to our 2020 Annual General Meeting of Shareholders and is incorporated herein by reference.*

Item 11. Executive Compensation.

All information required by this Item will be included in our Proxy Statement relating to our 2020 Annual General Meeting of Shareholders and is incorporated herein by reference.*

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

All information required by this Item will be included in our Proxy Statement relating to our 2020 Annual General Meeting of Shareholders and is incorporated herein by reference.*

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

All information required by this Item will be included in our Proxy Statement relating to our 2020 Annual General Meeting of Shareholders and is incorporated herein by reference.*

Item 14. Principal Accounting Fees and Services.

All information required by this Item will be included in our Proxy Statement relating to our 2020 Annual General Meeting of Shareholders and is incorporated herein by reference.*

* *Except for information or data specifically incorporated herein by reference under Items 10 through 14, other information and data appearing in our 2020 Proxy Statement are not deemed to be a part of this Annual Report on Form 10-K or deemed to be filed with the Commission as a part of this report.*

PART IV

Item 15. Exhibits, Financial Statement Schedules.

(a) (1) *Consolidated Financial Statements*: The financial statements and supplementary information listed in the Index to Financial Statements, included in Item 8.

(a) (2) *Consolidated Financial Statement Schedules*: Schedules are omitted because they either are not required or are not applicable or because equivalent information has been included in the financial statements, the notes thereto or elsewhere herein.

(b) Exhibits:

<u>Exhibit Number</u>	<u>Description</u>
3	Articles of Association of LyondellBasell Industries N.V., as amended on June 1, 2018 (incorporated by reference to Exhibit 3.1 of our Current Report on Form 8-K filed with the SEC on June 5, 2018)
4.1*	Description of the Company's Securities Registered Pursuant to Section 12 of the Securities Exchange Act of 1934
4.2	Specimen certificate for Class A ordinary shares, par value €0.04 per share, of LyondellBasell Industries N.V. (incorporated by reference to Exhibit 4.1 to our Annual Report on Form 10-K filed with the SEC on February 16, 2016)
4.3	Registration Rights Agreement by and among LyondellBasell Industries N.V. and the Holders (as defined therein), dated as of April 30, 2010 (incorporated by reference to Exhibit 4.7 to Amendment No. 2 to Form 10 filed with the SEC on July 26, 2010)
4.4	Second Amended and Restated Nomination Agreement, dated June 1, 2018, between AI International Chemicals S.à R.L. and LyondellBasell Industries N.V. (incorporated by reference to Exhibit 10.1 of our Current Report on Form 8-K filed with the SEC on June 5, 2018)
4.5	Indenture relating to 6.0% Senior Notes due 2021, among the Company, as issuer, each of the Guarantors named therein, as guarantors, Wells Fargo National Association, as trustee, registrar and paying agent, dated as of November 14, 2011 (including form of 6.0% Senior Note due 2021) (incorporated by reference to Exhibit 4.1 to Form 8-K filed with the SEC on November 17, 2011)
4.6	First Supplemental Indenture, dated as of December 10, 2015, to Indenture dated as of November 14, 2011, between the Company and Wells Fargo Bank, National Association, as trustee (incorporated by reference to Exhibit 4.2 to our Current Report on Form 8-K filed with the SEC on December 14, 2015)
4.7	Indenture relating to 5.750% Senior Notes due 2024, among LyondellBasell Industries N.V., as issuer, each of the Guarantors named therein, as guarantors, Wells Fargo Bank, National Association, as trustee, registrar and paying agent, dated as of April 9, 2012 (including form of 5.750% Senior Note due 2024) (incorporated by reference to Exhibit 4.3 to our Current Report on Form 8-K filed with the SEC on April 10, 2012)
4.8	First Supplemental Indenture, dated as of December 10, 2015, to Indenture dated as of April 9, 2012, between the Company and Wells Fargo Bank, National Association, as trustee (incorporated by reference to Exhibit 4.1 to our Current Report on Form 8-K filed with the SEC on December 14, 2015)

<u>Exhibit Number</u>	<u>Description</u>
4.9	Indenture, among LYB International Finance B.V., as issuer, LyondellBasell Industries N.V., as guarantor, and Wells Fargo Bank, National Association, as trustee, dated as of July 16, 2013 (incorporated by reference to Exhibit 4.1 to our Form 8-K filed with the SEC on July 16, 2013)
4.10	Officer's Certificate of LYB International Finance B.V. relating to the 2023 Notes, dated as of July 16, 2013 (incorporated by reference to Exhibit 4.2 to our Form 8-K filed with the SEC on July 16, 2013)
4.11	Form of LYB International Finance B.V.'s 4.000% Guaranteed Note due 2023 (incorporated by reference to Exhibit 4.2 to our Form 8-K filed with the SEC on July 16, 2013)
4.12	Officer's Certificate of LYB International Finance B.V. relating to the 2043 Notes, dated as of July 16, 2013 (incorporated by reference to Exhibit 4.3 to our Form 8-K filed with the SEC on July 16, 2013)
4.13	Form of LYB International Finance B.V.'s 5.250% Guaranteed Note due 2043 (incorporated by reference to Exhibit 4.3 to our Form 8-K filed with the SEC on July 16, 2013)
4.14	Officer's Certificate of LYB International Finance B.V. relating to the Notes, dated as of February 28, 2014 (incorporated by reference to Exhibit 4.2 to our Form 8-K filed with the SEC on February 28, 2014)
4.15	Form of LYB International Finance B.V.'s 4.875% Guaranteed Notes due 2044 (incorporated by reference to Exhibit 4.2 to our Form 8-K filed with the SEC on February 28, 2014)
4.16	Indenture, among LYB International Finance II B.V., as Issuer, LyondellBasell Industries N.V., as Guarantor, and Deutsche Bank Trust Company Americas, as Trustee, dated as of March 2, 2016 (incorporated by reference to Exhibit 4.1 to our Current Report on Form 8-K filed with the SEC on March 2, 2016)
4.17	Officer's Certificate of LYB International Finance II B.V. relating to the 1.875% Guaranteed Notes due 2022, dated as of March 2, 2016 (incorporated by reference to Exhibit 4.2 to our Current Report on Form 8-K filed with the SEC on March 2, 2016)
4.18	Form of LYB International Finance II B.V.'s 1.875% Guaranteed Notes due 2022 (incorporated by reference to Exhibit 4.2 to our Current Report on Form 8-K filed with the SEC on March 2, 2016 and included in Exhibit A thereto)
4.19	Officer's Certificate of LYB International Finance II B.V. relating to the 3.500% Guaranteed Notes due 2027, dated as of March 2, 2017 (incorporated by reference to Exhibit 4.2 to our Current Report on Form 8-K filed with the SEC on March 2, 2017)
4.20	Form of LYB International Finance II B.V.'s 3.500% Guaranteed Notes due 2027 (incorporated by reference to Exhibit 4.2 to our Current Report on Form 8-K filed with the SEC on March 2, 2017 and included in Exhibit A thereto)
4.21	Indenture, between LyondellBasell Industries N.V. as Company and Wells Fargo Bank, National Association, as Trustee dated as of March 5, 2015 (incorporated by reference to Exhibit 4.1 to our Current Report on Form 8-K filed with the SEC on March 5, 2015)
4.22	Officer's Certificate of LyondellBasell Industries, N.V. relating to the 4.625% Senior Notes due 2055, dated as of March 5, 2015 (incorporated by reference to Exhibit 4.2 to our Current Report on Form 8-K filed with the SEC on March 5, 2015)

<u>Exhibit Number</u>	<u>Description</u>
4.23	Form of LyondellBasell Industries N.V.'s 4.625% Senior Notes due 2055 (incorporated by reference to Exhibit 4.3 to our Current Report on Form 8-K filed with the SEC on March 5, 2015 and included in Exhibit 4.2 thereto)
4.24	Supplemental Indenture, among LYB International Finance II B.V., as Issuer, LyondellBasell Industries N.V., as Guarantor, and Deutsche Bank Trust Company Americas, as Trustee, dated as of September 17, 2019 (incorporated by reference to Exhibit 4.2 to our Current Report on Form 8-K filed with the SEC on September 17, 2019)
4.25	Form of LYB International Finance II B.V.'s 0.875% Guaranteed Notes due 2026 (incorporated by reference to Exhibit 4.2 to our Current Report on Form 8-K filed with the SEC on September 17, 2019)
4.26	Form of LYB International Finance II B.V.'s 1.625% Guaranteed Notes due 2031 (incorporated by reference to Exhibit 4.2 to our Current Report on Form 8-K filed with the SEC on September 17, 2019)
4.27	Indenture, among LYB International Finance III, LLC, as Issuer, LyondellBasell Industries N.V., as Guarantor, and Wells Fargo Bank, National Association, as Trustee, dated as of October 10, 2019 (incorporated by reference to Exhibit 4.1 to our Current Report on Form 8-K filed with the SEC on October 10, 2019)
4.28	Officer's Certificate of LYB International Finance III, LLC relating to the 4.200% Guaranteed Notes due 2049, dated as of October 10, 2019 (incorporated by reference to Exhibit 4.2 to our Current Report on Form 8-K filed with the SEC on October 10, 2019)
4.29	Form of LYB International Finance III, LLC's 4.200% Guaranteed Notes due 2049 (incorporated by reference to Exhibit 4.2 to our Current Report on Form 8-K filed with the SEC on October 10, 2019)
10.1+	Employment Agreement by and among Bhavesh V. Patel, Lyondell Chemical Company and LyondellBasell Industries, N.V., dated as of December 18, 2014 (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed with the SEC on December 22, 2014)
10.2+	Amendment to Employment Agreement by and among Lyondell Chemical Company, LyondellBasell Industries N.V. and Bhavesh V. Patel (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed with the SEC on March 9, 2017)
10.3+	Amendment No. 2 to Employment Agreement by and among Lyondell Chemical Company, LyondellBasell Industries, N.V., and Bhavesh V. Patel (incorporated by reference to Exhibit 10.3 to our Annual Report on Form 10-K filed with the SEC on February 21, 2019)
10.4+	Employment Transition Agreement effective June 1, 2019, by and between Lyondell Chemical Company and Thomas Aebischer (incorporated by reference to Exhibit 10.2 to our Quarterly Report on Form 10-Q filed with the SEC on August 2, 2019)
10.5+	Offer Letter dated October 10, 2019 between Michael McMurray and Lyondell Chemical Company (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed with the SEC on October 15, 2019)
10.6+*	Offer Letter dated May 17, 2019 between Kenneth T. Lane and Lyondell Chemical Company
10.7+*	Offer Letter dated May 17, 2019 between Torkel Rhenman and Lyondell Chemical Company

<u>Exhibit Number</u>	<u>Description</u>
10.8+	LyondellBasell U.S. Senior Management Deferral Plan dated effective as of May 1, 2012 (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed with the SEC on March 1, 2012)
10.9+	First Amendment to the LyondellBasell U.S. Senior Management Deferral Plan dated effective as of January 1, 2013 (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed with the SEC on April 30, 2013)
10.10+	LyondellBasell Executive Severance Plan, Amended & Restated, Effective as of June 1, 2015 and Form of Participation Agreement (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed with the SEC on June 5, 2015)
10.11+	Form of Officer and Director Indemnification Agreement (incorporated by reference to Exhibit 10.12 to our Annual Report on Form 10-K filed with the SEC on February 21, 2019)
10.12+	LyondellBasell Industries Long Term Incentive Plan (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed with the SEC on May 31, 2019)
10.13+	2017 Form of Restricted Stock Unit Agreement (incorporated by reference to Exhibit 10.2 to our Current Report on Form 8-K filed with the SEC on February 23, 2017)
10.14+	2017 Form of Performance Share Unit Agreement (incorporated by reference to Exhibit 10.3 to our Current Report on Form 8-K filed with the SEC on February 23, 2017)
10.15+	2017 Form of Non-Qualified Stock Option Agreement (incorporated by reference to Exhibit 10.4 to our Current Report on Form 8-K filed with the SEC on February 23, 2017)
10.16+	2019 Form of Restricted Stock Unit Agreement (incorporated by reference to Exhibit 10.17 to our Annual Report on Form 10-K filed with the SEC on February 21, 2019)
10.17+	2019 Form of Performance Share Unit Agreement (incorporated by reference to Exhibit 10.18 to our Annual Report on Form 10-K filed with the SEC on February 21, 2019)
10.18+	2019 Form of Non-Qualified Stock Option Agreement (incorporated by reference to Exhibit 10.19 to our Annual Report on Form 10-K filed with the SEC on February 21, 2019)
10.19+*	2020 Form of Restricted Stock Unit Award Agreement
10.20+*	2020 Form of Performance Share Unit Award Agreement
10.21+*	2020 Form of Non-Qualified Stock Option Award Agreement
10.22	Amended and Restated Credit Agreement, dated June 5, 2014, among LyondellBasell Industries N.V. and LYB Americas Finance Company, as Borrowers, the Lenders, Bank of America, N.A., as Administrative Agent, Swing Line Lender and L/C Issuer, Deutsche Bank Securities Inc., as Syndication Agent and the other parties thereto (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed with the SEC on June 6, 2014)

<u>Exhibit Number</u>	<u>Description</u>
10.23	Amendment No. 1 to the Amended and Restated Credit Agreement, dated June 3, 2016, among LyondellBasell Industries N.V. and LYB Americas Finance Company, as Borrowers, the Lenders, Bank of America, N.A., as Administrative Agent, Swing Line Lender and L/C Issuer, Citibank, N.A. and Deutsche Bank Securities Inc., as Syndication Agents and the other parties thereto (incorporated by reference to Exhibit 10.2 to our Current Report on Form 8-K filed with the SEC on June 6, 2016)
10.24	Consent Agreement, dated June 5, 2015, among LyondellBasell Industries N.V. and LYB Americas Finance Company, as Borrowers, Bank of America, N.A., as Administrative Agent and the lender parties thereto (incorporated by reference to Exhibit 10 to our Current Report on Form 8-K filed with the SEC on June 9, 2015)
10.25	Consent Agreement, dated June 3, 2016, among LyondellBasell Industries N.V. and LYB Americas Finance Company, as Borrowers, Bank of America, N.A., as Administrative Agent and the lender parties thereto (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed with the SEC on June 6, 2016)
10.26	Consent Agreement, dated June 5, 2017, among LyondellBasell Industries N.V. and LYB Americas Finance Company LLC, as Borrowers, Bank of America, N.A., as Administrative Agent and the lender parties thereto (incorporated by reference to Exhibit 10 to our Current Report on Form 8-K filed with the SEC on June 7, 2017)
10.27	Three-Year Credit Agreement, dated March 29, 2019 among LyondellBasell Industries N.V., as guarantor, and LYB Americas Finance Company LLC, as borrower, the lenders party thereto, and Bank of America, N.A., as administrative agent (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed with the SEC on March 29, 2019)
10.28	Receivables Purchase Agreement, dated September 11, 2012, by and among Lyondell Chemical Company, as initial servicer, and LYB Receivables LLC, a bankruptcy-remote special purpose entity that is a wholly owned subsidiary of the Company, PNC National Association, as Administrator and LC Bank, certain conduit purchasers, committed purchasers, LC participants and purchaser agents that are parties thereto from time to time (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed with the SEC on September 14, 2012)
10.29	Second Amendment to Receivables Purchase Agreement, dated as of August 26, 2015, among Lyondell Chemical Company, as servicer, LYB Receivables LLC, as seller, the conduit purchasers, related committed purchasers, LC participants and purchaser agents party thereto, the other parties thereto and Mizuho Bank, Ltd., as Administrator and LC Bank (incorporated by reference to Exhibit 10 to our Current Report on Form 8-K filed with the SEC on August 28, 2015)
10.30	Third Amendment to Receivables Purchase Agreement, dated as of July 24, 2018, among Lyondell Chemical Company, as servicer, LYB Receivables LLC, as seller, the conduit purchasers, related committed purchasers, LC participants and purchaser agents party thereto, the other parties thereto and Mizuho Bank, Ltd., as Administrator and LC Bank (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed with the SEC on July 27, 2018)
10.31	Purchase and Sale Agreement, dated September 11, 2012, by and among Lyondell Chemical Company, Equistar Chemicals, LP and LyondellBasell Acetyls, LLC, the other originators from time to time parties thereto, Lyondell Chemical Company, as initial servicer and LYB Receivables LLC, a bankruptcy-remote special purpose entity that is a wholly owned subsidiary of the Company (incorporated by reference to Exhibit 10.2 to our Current Report on Form 8-K filed with the SEC on September 14, 2012)

<u>Exhibit Number</u>	<u>Description</u>
10.32	Form of the Contingent Value Rights Agreement, among A. Schulman, Inc., LyondellBasell Industries N.V., members of the committee and a paying agent to be specified (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed with the SEC on February 15, 2018)
21*	List of subsidiaries of the registrant
23*	Consent of PricewaterhouseCoopers LLP, Independent Registered Public Accounting Firm
31.1*	Certification of Chief Executive Officer pursuant to Rule 13a-14(a) under the Securities Exchange Act of 1934
31.2*	Certification of Chief Financial Officer pursuant to Rule 13a-14(a) under the Securities Exchange Act of 1934
32*	Certifications pursuant to 18 U.S.C. Section 1350
101.INS*	XBRL Instance Document
101.SCH*	XBRL Schema Document
101.CAL*	XBRL Calculation Linkbase Document
101.DEF*	XBRL Definition Linkbase Document
101.LAB*	XBRL Labels Linkbase Document
101.PRE*	XBRL Presentation Linkbase Document
104*	Cover Page Interactive Data File (formatted as inline XBRL and contained in Exhibit 101)

+ Management contract or compensatory plan, contract or arrangement

* Filed herewith.

Item 16. Form 10-K Summary.

None.

<u>Signature</u>	<u>Title</u>	<u>Date</u>
/s/ BHAVESH V. PATEL <hr/> Bhavesh V. Patel	Chief Executive Officer and Director <i>(Principal Executive Officer)</i>	February 20, 2020
/s/ MICHAEL C. McMURRAY <hr/> Michael C. McMurray	Executive Vice President and Chief Financial Officer <i>(Principal Financial Officer)</i>	February 20, 2020
/s/ JACINTH C. SMILEY <hr/> Jacinth C. Smiley	Vice President and Chief Accounting Officer <i>(Principal Accounting Officer)</i>	February 20, 2020
/s/ JACQUES AIGRAIN <hr/> Jacques Aigrain	Chairman of the Board and Director	February 20, 2020
/s/ LINCOLN BENET <hr/> Lincoln Benet	Director	February 20, 2020
/s/ JAGJEET S. BINDRA <hr/> Jagjeet S. Bindra	Director	February 20, 2020
/s/ ROBIN BUCHANAN <hr/> Robin Buchanan	Director	February 20, 2020
/s/ STEPHEN F. COOPER <hr/> Stephen F. Cooper	Director	February 20, 2020
/s/ NANCE K. DICCIANI <hr/> Nance K. Dicciani	Director	February 20, 2020
/s/ CLAIRE S. FARLEY <hr/> Claire S. Farley	Director	February 20, 2020
/s/ BELLA D. GOREN <hr/> Bella D. Goren	Director	February 20, 2020
/s/ MICHAEL S. HANLEY <hr/> Michael S. Hanley	Director	February 20, 2020
/s/ ALBERT J. MANIFOLD <hr/> Albert J. Manifold	Director	February 20, 2020
/s/ RUDY M.J. VAN DER MEER <hr/> Rudy M.J. van der Meer	Director	February 20, 2020

RECONCILIATIONS FOR NON-GAAP MEASURES

Throughout this publication we use several non-GAAP financial measures, including EBITDA, which means net income from continuing operations plus interest expense (net), provisions for income taxes, and depreciations and amortization.

Reconciliation of Segment EBITDA to Consolidated EBITDA

<u>In Millions of Dollars</u>	<u>For the Years Ended December 31,</u>		
	<u>2017</u>	<u>2018</u>	<u>2019</u>
Segment EBITDA:			
Olefins & Polyolefins—Americas	\$ 2,899	\$ 2,762	\$ 2,302
Olefins & Polyolefins—Europe, Asia, International	1,927	1,163	1,062
Intermediates & Derivatives	1,490	2,011	1,557
Advanced Polymer Solutions	438	400	424
Refining	157	167	(65)
Technology	223	328	411
Other	—	36	1
Total EBITDA	<u>\$ 7,134</u>	<u>\$ 6,867</u>	<u>\$ 5,692</u>

Reconciliation of Net Income to EBITDA

<u>In Millions of Dollars</u>	<u>For the Years Ended December 31,</u>		
	<u>2017</u>	<u>2018</u>	<u>2019</u>
Net income	\$ 4,877	\$ 4,690	\$ 3,397
Loss from discontinued operations, net of tax	18	8	7
Income from continuing operations	4,895	4,698	3,404
Provision for income taxes	598	613	648
Depreciation and amortization	1,174	1,241	1,312
Interest expense, net	467	315	328
EBITDA	<u>\$ 7,134</u>	<u>\$ 6,867</u>	<u>\$ 5,692</u>

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SHAREHOLDER INFORMATION

STOCK EXCHANGE

LyondellBasell's common stock is listed on the New York Stock Exchange under the symbol LYB.

WEBSITE

Shareholders and other interested parties can learn about LyondellBasell by visiting www.lyondellbasell.com.

INVESTOR RELATIONS CONTACT

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CORPORATE GOVERNANCE

LyondellBasell's Corporate Governance Guidelines and related materials are available by selecting "Investors" and then "Corporate Governance" on our website at www.lyondellbasell.com.

ONLINE ANNUAL REPORT

LyondellBasell's Annual Report is available by selecting "Investors" and then "Company Reports" on our website at www.lyondellbasell.com.

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CAUTIONARY STATEMENT

Certain disclosures in this annual report may be considered "forward-looking statements." These are made pursuant to "safe harbor" provisions of the Private Securities Litigation Reform Act of 1995. The "Cautionary Statement" on page 2 of LyondellBasell's Form 10-K for the fiscal year ended December 31, 2019, should be read in conjunction with such statements.



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