

EMERGING STRONGER

Annual Report 2020



Hyperzone HDPE Plant
Houston, Texas, U.S.



Bhavesh V. (Bob) Patel

Chief Executive Officer



**LyondellBasell's
Value-Driven
Growth
Strategy**

LyondellBasell is focused on long-term value-driven growth. Our strategy is to increase free cash flow by moderating capital expenditures while harvesting new sources of EBITDA generation.

- ▮ Reducing capex to \$2B/yr between 2020-2023
- ▮ \$1.3 billion of annual estimated EBITDA by 2023:
 - ▮ 2020: *Hyperzone* HDPE ~\$170 mm/yr
 - ▮ 2020 Bora integrated cracker JV ~\$150 mm/yr
 - ▮ 2020 APS synergies ~\$200 mm/yr
 - ▮ 2020 Louisiana Integrated PE JV ~\$330 mm/yr
 - ▮ 2022 Sinopec PO/SM JV ~\$45 mm/yr
 - ▮ 2023 PO/TBA ~\$450 mm/yr

Estimated EBITDA for projects and joint ventures is nameplate capacity multiplied by 2017-2019 average cash margins assuming 40% of the PE, PO and MTBE from U.S. production exported to Asia. The results or returns of growth projects are presented for illustrative purposes only and not intended to be a guarantee or representation of the Company's expectations for future performance.

Message from the CEO

To the owners of our company,

Without a doubt, the past year has been one of the most challenging periods in recent memory: a global pandemic; a dramatic decline in oil prices; a rapidly accelerating energy transition; civil unrest around the world; and a weakened global economy that continues to impact millions of individuals and families. As I write, the seasons have changed and the calendar has turned, yet many of the challenges that began in 2020 remain in front of us in 2021.

Early in 2020, as the virus became more widespread, our leadership team established three principles to guide our company's actions in the short term. These were to:

- ▮ **Protect our employees**, both from the virus in the workplace and also from widespread layoffs;
- ▮ **Prioritize cash flow** and keep our commitments to our shareholders; and,
- ▮ Take action to **strengthen the company** for the future.

As I look back on 2020, I'm extraordinarily grateful for how our team embraced this approach, demonstrated resilience, and ultimately, delivered results. Today, as vaccines begin to roll out and we continue to combat the virus, our team's resolve and focus on results has not diminished.

While 2020 was remarkable in so many ways, the benefits of our strong safety culture were particularly evident during this period. In the early days of the pandemic, we moved quickly to implement a comprehensive global approach to help prevent the spread of the virus in the workplace. I'm proud to say across 2020, we experienced zero cases of workplace transmission. While the challenges of 2020 had the potential to create distraction in other areas of safety performance, I'm also proud to say our team also reduced in our workplace injury rate, further improving upon our already industry-leading performance in this area.

Delivering for our shareholders

To ensure our competitiveness in a range of market environments, for the past decade our team has prioritized a lean cost structure, maintaining leading product positions, feedstock flexibility, excellent operational performance and a disciplined approach to capital allocation. If 2020 proved anything, it's that this strategy

continues to serve us well allowing us to deliver on our three priorities.

In addition to leveraging these historical strengths, we have been further expanding our core competencies to include M&A execution and a focus on extracting value from integration activities. Altogether, our asset base, existing operational models and expanded skillsets position us well to benefit from an economic recovery.

Like our industry peers, in 2020 we were not immune to the challenges of the macro-environment. Yet, because of our very deliberate approach, we were able to deliver \$1.4 billion of net income, \$3.9 billion of EBITDA excluding LCM and impairment¹, \$5.61 diluted earnings per share excluding LCM and impairment¹ and \$3.4 billion of cash from operating activities. Through the year, we took action to reduce capital expenditures, aggressively manage working capital and further enhance liquidity by accessing the debt capital markets. In addition, we were able to fund our 2020 dividend from operating cash flow.

Maintaining focus on the longer term

As we responded to the situation at hand, we also remained focused on our strategy to build value for the longer-term.

During the past several years, we have thoughtfully planted the seeds for profit-generating growth that should meaningfully enhance EBITDA and cash flow while creating a structural advantage for the future. These include:

- ▮ **Exceeding synergy targets in our Advanced Polymer Solutions segment:** At our investor day in September 2019, we increased our target for run rate synergies from the A. Schulman acquisition from \$150 million to \$200 million per year.
- ▮ **Harvesting new sources of cash flow from organic growth:** In the first quarter of 2020, we began operations at our 500 thousand ton per year *Hyperzone* HDPE plant in Houston, Texas.

In addition, we continue to make progress on our PO/TBA plant currently under construction in Houston, Texas. To help prevent the spread of the virus at the construction site and conserve capital, we slowed this project in the first part of the year, but were able to return to full pace in the fall. We continue to anticipate start-up in the fall of 2022.

¹ Reconciliations and other information concerning our non-GAAP financial measures can be found beginning on page 153.

Strategic expansion in growing markets: In China, we formed a 50/50 joint venture with the Liaoning Bora Enterprise Group which recorded a positive contribution to earnings in its first month of operation. In addition, we are expanding our existing relationship with Sinopec through the formation of a 50/50 joint venture, which will build a new propylene oxide (PO) and styrene monomer (SM) unit. Both joint ventures will serve the rapidly growing Chinese market.

Finding opportunities during industry cycles: In the fourth quarter, we completed a new 50/50 joint venture with Sasol which includes a newly-constructed ethylene cracker, two polyethylene units and the associated utilities and infrastructure located in Lake Charles, Louisiana. This investment represents a unique opportunity to create deep, long-term value while immediately realizing the many benefits of new, strategically-located, world-scale asset in a feedstock-advantaged region.

Together, the Bora and Sasol JVs represent the full capacity and immediate financial benefits of a new and operational world-scale integrated cracker complex with minimal exposure to the project completion risks that are typically associated with the multi-year construction of these facilities.

A commitment to sustainability

We also made meaningful progress in the area of sustainability over the course of the year. In September, we announced comprehensive goals that focus on action in the areas of plastic waste, climate change and supporting a thriving society. As we consider the decade ahead, we have committed to a number of actions including:

Setting one of the most ambitious targets for recycled and renewable-based polymers: To help address the issue of plastic waste in the environment, our goal is to produce and market two million metric tons of recycled and renewable-based polymers annually by 2030.

Expanding mechanical recycling capacity: To help meet our ambitious goal for recycled plastics, we announced the expansion of our Quality Circular Polymers (QCP) joint venture in Europe with our partner SUEZ. Through the acquisition of a Belgium-based plastics recycler, QCP's processing capacity is increasing from approximately 35,000 tons of material to approximately 55,000 tons of material per year.

Advancing next-generation recycling technologies: In September, we started up our *MoReTec* molecular recycling pilot

plant in Ferrara, Italy to advance work in this regard. Our goal is to return mixed post-consumer plastic waste into feedstocks for new polymers.

Reducing our carbon footprint: We recognize the challenge of climate change. We set a target to reduce our 2030 CO2 emissions by 15 percent per ton of product, relative to 2015 levels.

Enhancing diversity, equity and inclusion

Over the course of the year, we saw people around the world express their desire for a more just, fair and equitable society. While our diversity and inclusion efforts were already underway, the volume and passion of these voices motivated us to accelerate our progress.

To this end, we named our company's first Diversity and Inclusion Officer, established a company-wide diversity council and are focused on meaningful action in the areas of company policy, recruiting, workforce planning, and leadership development.

Well positioned for the future

Today, with vaccines being distributed and economic conditions improving, I can say that I am very optimistic about the future. As a result of our diverse global business portfolio, proven operating model and disciplined financial strategy, our company demonstrated extraordinary resiliency throughout 2020's extremely challenging conditions.

Looking forward, we are confident that the projects we have completed, those that are underway and the strategic partnerships we have formed will increase cash flow and further strengthen our platform for the future. These new sources of earnings, continued disciplined investment and focus on cash flow will further strengthen LyondellBasell's ability to capture significant upside in an improving economy.

All of these accomplishments would not be possible without our incredibly committed team around the world.

I hope you are as proud of all that our company has been able to accomplish as I am.

Sincerely,



Bhavesh V. (Bob) Patel
Chief Executive Officer

SUSTAINABILITY FOCUS AREAS



Plastic waste



Climate change



Supporting a thriving society

LYONDELLBASELL'S SUSTAINABILITY GOALS

2 million metric tons of recycled or renewable-based polymers by 2030

Zero pellet loss from manufacturing and transportation

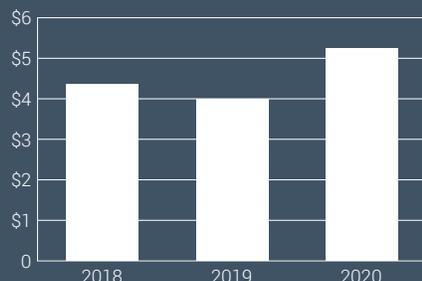
By 2030, **15 percent reduction** in CO2 emissions per ton of product relative to 2015



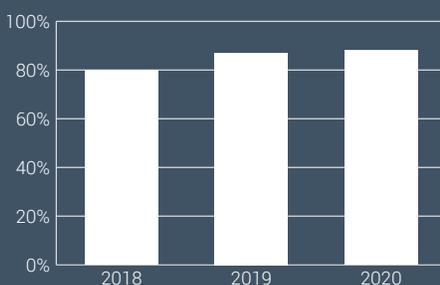
Houston, Texas, U.S.

TRENDS IN FINANCIAL RESILIENCY

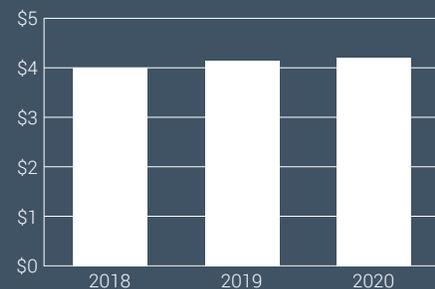
Liquidity (Billions)



Cash Conversion



Annual Dividend per Share



2020 FINANCIAL HIGHLIGHTS

HIGHLIGHTS OF CONSOLIDATED FINANCIAL STATEMENTS (\$ IN BILLIONS)

	2018	2019	2020
Sales and other operating revenues	\$39.0	\$34.7	\$27.8
Operating income	\$5.2	\$4.1	\$1.6
Net income	\$4.7	\$3.4	\$1.4
Diluted weighted average share count (millions)	389	353	334
Diluted EPS (\$/share)	\$12.01	\$9.58	\$4.24
Diluted EPS excluding LCM and impairment (\$/share)	\$12.01	\$9.65	\$5.61
EBITDA excluding LCM and impairment	\$6.9	\$5.7	\$3.9
Cash from operating activities	\$5.5	\$5.0	\$3.4
Capital expenditures	\$2.1	\$2.7	\$1.9

In 2020, LyondellBasell's businesses extended our outstanding track record of cash generation by converting 88% of our EBITDA (excluding LCM and impairment) into **\$3.4 billion** of cash from operating activities. Through rapid access to debt capital markets and aggressive working capital management, we ended the year with over \$5 billion in available liquidity. During the year, we paid \$4.20 per share in dividends; our 10th consecutive year of quarterly dividends.



Clear path forward

LyondellBasell has captured opportunities through disciplined and profitable growth investments, whether building, acquiring or partnering on assets. We remain focused on meeting our commitments and pursuing a disciplined financial strategy.

ADDRESSING GLOBAL CHALLENGES

PLASTIC WASTE

CLIMATE CHANGE

THRIVING SOCIETY

OUR SUSTAINABILITY PROGRAM PILLARS

End plastic waste in the environment



We believe that ending plastic waste in the environment is a critical issue of our time. We are committed to helping eliminate plastic waste and are engaged in collaborative efforts across the value-chain to direct action where it is needed most.

Advance the circular economy



We believe that transitioning to a circular economy will reduce resource use and enable a more sustainable future. We are advancing technologies and innovations that will help conserve finite resources and retain their value for as long as possible.

Address climate change



We believe that climate change is one of the most important global challenges both now and for future generations. We support the ambitions of the Paris Agreement and are reducing greenhouse gas emissions intensity from our operations to deliver solutions that help advance a low-carbon economy.

Grow sustainable solutions



We believe growing our portfolio of sustainable solutions will help address society's most pressing challenges. By doing so, we will continue to reliably produce products and offer solutions that are critical to improving the quality of life for billions around the world.

Enhance our workplace, operations and communities



We believe the health and safety of our people and the communities where we operate are our highest priorities. We are committed to operating our company sustainably to deliver industry-leading performance, and enhancing our workplace and communities through the power of many.

SUSTAINABILITY HIGHLIGHTS



In December of 2020, we joined the United Nations (U.N.) Global Compact, the world's largest corporate sustainability initiative. Under the U.N. Global Compact, signatories are encouraged to align their operations and strategies with key principles on human rights, labor and anti-corruption.



Also in December of 2020, we announced the acquisition of TIVACO, a plastics recycling company located in Blandain, Belgium. The company became part of QCP, LyondellBasell's existing 50/50 plastics recycling joint venture with SUEZ. With this transaction, QCP will increase its production capacity for recycled materials to approximately 55,000 tonnes per year.



In September of 2020, we successfully started up the *MoReTec* molecular recycling facility at the Ferrara, Italy, site. LyondellBasell's proprietary *MoReTec* advanced recycling technology aims to return post-consumer plastic waste to its molecular form for use as a feedstock for new plastic materials.

BOARD OF DIRECTORS



2, 5, 6

Jacques Aigrain

*Chair of the Board of Directors
Former 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

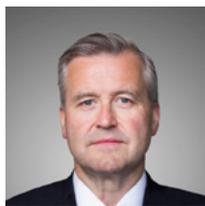
*Former Chief Financial Officer of
AMR Corporation and American
Airlines Inc.*



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, 4, 5

Albert J. Manifold

CEO and Director of CRH plc

**Bhavesh V. (Bob) Patel**

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

LEADERSHIP TEAM

**Bhavesh V. (Bob) Patel**

Chief Executive Officer

**James Guilfoyle**

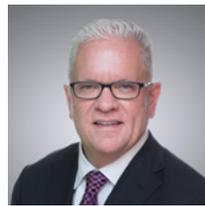
*Executive Vice President,
Advanced Polymer Solutions &
Global Supply Chain*

**Jeffrey Kaplan**

*Executive Vice President,
Legal & Public Affairs*

**Kenneth Lane**

*Executive Vice President,
Global Olefins & Polyolefins (O&P)*

**Michael McMurray**

*Executive Vice President and
Chief Financial Officer*

**Torkel Rhenman**

*Executive Vice President,
Intermediates & Derivatives, and
Refining*

**Kimberly Foley**

*Senior Vice President,
HSE, Global Engineering and
Turnarounds*

**Dale Friedrichs**

*Senior Vice President,
Human Resources and
Global Projects*

**Jean Gadbois**

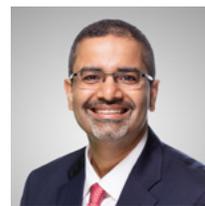
*Senior Vice President,
Europe Manufacturing*

**Richard Roudeix**

*Senior Vice President,
Olefins & Polyolefins, Europe*

**James Seward**

*Senior Vice President,
Research & Development,
Technology & 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 and Talent Development 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, 2020

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

(713) 309-7200

+44 (0) 207 220 2600

+31 (0) 10 2755 500

(Address of principal executive offices) (Zip Code)
(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 Accelerated filer Non-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 has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report.

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 30, 2020, the last business day of the registrant's most recently completed second fiscal quarter, based on the closing price on that date of \$65.72, was \$16.8 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 334,132,558 shares outstanding at February 23, 2021 (excluding 5,913,070 treasury shares).

Documents incorporated by reference:

Portions of the 2021 Proxy Statement, in connection with the Company's 2021 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 (the “Securities Act”) 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 remain low 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;
- 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;
- uncertainties related to the extent and duration of the pandemic-related decline in demand, or other impacts due to the pandemic in geographic regions or markets served by us, or where our operations are located, including the risk of prolonged recession;

- 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 and purchase large quantities of natural gas liquids and crude oil derivatives which we use as feedstocks. 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.

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 20 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 2020, 2019 or 2018.

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 (“LLDPE”). PE sales accounted for approximately 21%, 17% and 19% of our consolidated revenues in 2020, 2019 and 2018, respectively.

Polypropylene—We produce PP homopolymers and copolymers. PP sales accounted for approximately 16%, 14% and 15% of our consolidated revenues in 2020, 2019 and 2018, 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 our 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 system 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 2020, we added a total of 785 thousand tons of olefins and 1,170 thousand tons of PE capacity at our wholly-owned and joint venture facilities in North America. This capacity is based on our percentage ownership interest in the joint ventures' total capacities. 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.

Joint Venture Relationships

In December 2020, we formed a 50/50 joint venture in Louisiana, which provides us with capacity of approximately 770 thousand tons of ethylene and 445 thousand tons of low density and linear-low density PE production per year. We operate the joint venture assets and market all the production on behalf of the joint venture.

We participate in a joint venture in Mexico, which provides us with capacity of approximately 290 thousand tons of PP production per year. We do not hold a majority interest in or have operational control of this joint venture.

The capacities are based on our percentage ownership of the joint venture's total capacity.

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 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 and including our proportionate share of joint ventures, we believe as of December 31, 2020, we were:

- the second largest producer of ethylene in North America, with ethylene capacity of 6.2 million tons per year, including our share of our Louisiana-based joint venture capacity;
- the third largest producer of PE in North America with 4.1 million tons per year including our share of our Louisiana-based joint venture 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 2020, we added a total of 550 thousand tons of olefins, 400 thousand tons of PE and 310 thousand tons of PP 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 and Asia. Our joint ventures described below typically manage their domestic sales and marketing efforts independently, and we typically operate as their agent for all or a portion of their exports.

Joint Venture Relationships

On September 1, 2020, we established and started-up a 50/50 joint venture in China, which provides us with capacity of 550 thousand tons of ethylene, 400 thousand tons of linear-low density PE and 300 thousand tons of PP capacity. The materials produced at the joint venture facility are expected to be sold in China.

We participate in several manufacturing joint ventures in Saudi Arabia, China, 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 1.5 million tons of PP, approximately 1.2 million tons of olefins and approximately 820 thousand tons of PE. These capacities are based on our percentage ownership interest in the joint ventures' total capacities.

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. The primary raw material used in our European olefin facilities is naphtha; however, we also use advantaged NGLs. We have flexibility to vary the raw material mix and process conditions in our plants in order to maximize profitability as market prices for both feedstocks and products change. 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.

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 rates relative to the pricing of the underlying raw materials, most of which are priced in U.S. dollars. There can be a lag between 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 has been affected by the price volatility of naphtha, the primary feedstock for olefins in the region.

Based on published capacity data and including our proportionate share of our joint ventures, we believe as of December 31, 2020, 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, Belgium 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 U.S. 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 U.S. 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 160 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 and including our proportionate share of our joint ventures, we believe as of December 31, 2020, 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 include *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 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. The sales of compounding and solutions products accounted for approximately 12% of our consolidated revenues in each of 2020 and 2019 and 8% of consolidated revenue in 2018.

Joint Venture Relationships

We participate in several manufacturing joint ventures in Saudi Arabia, Indonesia, 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 90 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, 2020, 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 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 16%, 22% and 21% of our total revenues in 2020, 2019 and 2018, 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, Mexico 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 2020, there were 135 operable crude oil refineries in the U.S., and total U.S. refinery capacity was approximately 19 million barrels per day. During 2020, the Houston refinery processed an average of approximately 223 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, environmental concerns, 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 U.S. 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 20% 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 2020, 2019 and 2018, our R&D expenditures were \$113 million, \$111 million and \$115 million, respectively. A portion of these expenses are related to technical support and customer service and are allocated to the other business segments. In 2020, 2019 and 2018, approximately 45%, 50% and 45%, respectively, of all R&D costs were allocated to business segments other than Technology.

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, 2020, 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. 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 17 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 2020 for health, safety and environmental compliance purposes and improvement programs, and estimate such expenditures to be approximately \$260 million in 2021 and \$250 million in 2022.

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.

Human Capital

Our success as a company is tied to the passion, knowledge and talent of our global team. We believe in integrity, diversity and fairness, and we focus on creating a work environment that is safe, respectful and inspires employees to strive for excellence. We recognize that individuals cannot succeed alone; we believe in the power of many and place a strong emphasis on teamwork.

We reward performance based on personal, team and company results. We engage in open and ongoing dialogue with employees and their representatives to ensure a proper balance between the best interests of the Company and its employees. At a minimum, we provide all workers with fair wages and uphold all applicable fair wage laws, wherever we work. We never use child, forced, bonded or involuntary labor, and we do not knowingly work with subcontractors or suppliers who use child or forced labor or engage in human trafficking practices. In several of our locations, we partner with employee representatives on initiatives such as health and safety. We use the services of contractors, primarily to assist with non-core business functions, and we require that all contractors adhere to our operational excellence standards and GoalZERO, a comprehensive program to protect the health and safety of our employees and contractors.

Our Code of Conduct sets out our expectations on topics such as respecting fellow employees, anti-corruption, conflicts of interest, trade compliance, anti-trust and competition law, insider trading, sanctions, misconduct and political donations. It is available in 18 languages on our company website. New employees are trained on the Code and all employees complete annual refresher training. In 2020, we adopted a human rights policy that established our standards for workforce health and safety; prevention of discrimination, harassment and retaliation; diversity and inclusion; workplace security; working conditions and fair wages; freedom of association; freely chosen employment; and child labor protections.

Demographics

As of December 31, 2020, we employed approximately 19,200 full-time and part-time employees around the world. Of this total, approximately 8,600 were in the U.S. and Canada and another 8,100 were in Europe. The remainder of our employees are in other global locations.

As of December 31, 2020, approximately 900 of our employees in the U.S. were represented by labor unions. Most of our employees in Europe and Latin America, and some of our employees in Asia Pacific, are subject to staff council or works council coverage or collective bargaining agreements.

Some examples of key programs and initiatives that are focused to attract, develop and retain our diverse workforce include:

Talent Development and Engagement

We believe in building an engaged, talented workforce by developing skill sets, supporting diversity and ensuring fair employment and work practices. In July 2020, we accelerated our efforts in the area of diversity, equity, and inclusion (“DEI”) with the appointment of a Chief Talent & Diversity Officer, the establishment of a DEI Leadership Council, the development of a multi-year DEI strategy, and the implementation of activities focused on listening to our employees and obtaining their perspectives on DEI.

Employee growth and development are key elements supporting our vision of superior performance. We provide development opportunities for our employees through on-the-job experiences, learning from others, and in-class and online learning. In 2020, we offered more than 308,000 hours of training to our employees through both in-person classes and our online learning management system. We continue the investment in our leadership through Leadership Development programs, including accelerated development academies and robust development planning targeted at our high potential leaders. We encourage high performance and alignment with business goals through our performance management system which includes annual goal setting, continuous performance conversations throughout the year, and a year-end process to measure performance against goals. Employees are measured not only on results delivered, but how they are delivered based on established enterprise-wide competencies.

Safety

We are committed to providing a safe workplace, free from recognized hazards, and we comply with all applicable health and safety laws and recognized standards. Information on occupational health services is provided globally throughout the new hire on-boarding process and offered in various languages dependent on the site location. GoalZERO is our commitment to operating safely and with a goal of zero incidents, zero injuries and zero accidents. We cultivate a GoalZERO mindset with clear standards, regular communication, training, and targeted campaigns and events, including our annual Global Safety Day.

As the COVID-19 pandemic spread around the globe, we continued to operate with three key objectives: protecting the health and safety of our people; ensuring the safety and security of our work locations; and maintaining business continuity with our customers and suppliers. We quickly mobilized to develop a globally coordinated, locally implemented plan to protect our workforce at the beginning of the pandemic, which we have regularly updated as new developments occurred. Among the numerous safety measures and protocols we developed were: strict social distancing and facial coverage, critical personal protective equipment, thoughtful procedures for return to workplaces, and several initiatives to support our employees' mental health.

Health, wellness, welfare and family resources

Full-time employees at our major offices and manufacturing sites receive competitive benefits which may include, depending on location, the following: basic health and welfare benefits, which include medical coverage; life and accident insurance; business travel accident insurance; disability protection; retirement, savings and pension plans; share programs; and paid time off. Employees at our large sites have access to health services at an on-site clinic on paid work-time. We have defined benefit pension plans that cover employees in the U.S. and various non-U.S. countries. In addition, we provide other post-employment benefits such as early retirement and deferred compensation severance benefits to employees of certain non-U.S. countries.

In 2020, we implemented family-friendly policies that expanded the availability of paid parental leave, provided financial reimbursement for certain adoption expenses, and ensured all employees globally have a minimum of ten paid vacation or personal leave days.

INFORMATION ABOUT OUR EXECUTIVE OFFICERS

Our executive officers as of February 25, 2021 were as follows:

<u>Name and Age</u>	<u>Significant Experience</u>
Bhavesh V. (“Bob”) Patel, 54	<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, with responsibility for EAI Manufacturing, 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, 56 ..	<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>
James Guilfoyle, 50	<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>
Jeffrey Kaplan, 52	<p>Executive Vice President and Chief Legal Officer since March 2015.</p> <p>Deputy General Counsel from December 2009 to March 2015.</p>
Kenneth (“Ken”) Lane, 52 ..	<p>Executive Vice President, Global Olefins and Polyolefins since July 2019.</p> <p>President, Monomers Division at BASF, a German chemical company, from January 2019 to July 2019.</p> <p>President, Global Catalysts at BASF from June 2013 to December 2018.</p>

<u>Name and Age</u>	<u>Significant Experience</u>
Torkel Rhenman, 57	<p>Executive Vice President, Intermediates and Derivatives, and Refining since August 2020.</p> <p>Executive Vice President, Intermediates & Derivatives from July 2019 to July 2020.</p> <p>Chief Executive Officer and Director of Lhoist Group, a privately held minerals and mining company, from 2012 to 2017.</p>
Kim Foley, 54	<p>Senior Vice President, HSE, Global Engineering and Turnarounds since August 2020.</p> <p>Vice President, Health, Safety and Environment from October 2019 to July 2020.</p> <p>Site Manager at Channelview from May 2017 to October 2019.</p> <p>Senior Director, Global Supply Chain from January 2016 to May 2017.</p> <p>Director, Supply Chain, Americas from August 2010 to January 2016.</p>
Dale Friedrichs, 57	<p>Senior Vice President, Human Resources and Global Projects since August 2020.</p> <p>Vice President, Human Resources from October 2019 to July 2020.</p> <p>Vice President, Health, Safety, Environment and Security from February 2017 to October 2019.</p> <p>Site Manager of various facilities from January 1995 to February 2017.</p>
James Seward, 53	<p>Senior Vice President, Research & Development, Technology and Sustainability since August 2020.</p> <p>Senior Vice President, Technology Business, Sustainability, and Olefins & Polyolefins, Europe, Asia and International Joint Venture Management from September 2018 to July 2020.</p> <p>Vice President, Joint Ventures and International Marketing from May 2014 to August 2018.</p>
Anup Sharma, 46	<p>Senior Vice President, Global Business Services since February 2019.</p> <p>Vice President and GE corporate officer at GE Digital, a software company for industrial businesses, from May 2016 to February 2019.</p> <p>Global Chief Information Officer at GE Oil & Gas, a division of General Electric that owned investments in the petroleum industry, from 2011 to 2016.</p>

Description of Properties

Our principal manufacturing facilities as of December 31, 2020 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	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
Lake Charles, Louisiana ⁽⁴⁾	O&P–Americas
Matagorda, Texas	O&P–Americas
Morris, Illinois	O&P–Americas
Tuscola, Illinois	O&P–Americas
Victoria, Texas†	O&P–Americas

Location	Segment
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 ⁽⁵⁾ †	I&D
Moerdijk, The Netherlands†	APS
Münchsmünster, Germany	O&P-EAI
Tarragona, Spain ⁽⁶⁾ †	O&P-EAI
	APS
Wesseling, Germany	O&P-EAI
Asia-Pacific	
Geelong, Australia†	O&P-EAI
Panjin, China ⁽⁷⁾ †	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 Lake Charles site is owned by the Louisiana joint venture and is located on land leased by the Louisiana joint venture.
- (5) The Maasvlakte plant is owned by the European PO joint venture and is located on land leased by the European PO joint venture.
- (6) The Tarragona PP facility is located on leased land; the compounds facility is located on co-owned land.
- (7) The Panjin facility is owned by the Bora LyondellBasell Petrochemical Co. Ltd joint venture and is located on land leased by the joint venture.

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 (“SEC”). Alternatively, these reports may be accessed 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.

Risks Related to our Business and Industry

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 around the world may lead to periods of oversupply and lower profitability. 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.

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 the past. 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 U.S. 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. 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.

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.

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 current 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, 2020, we had no borrowings or letters of credit outstanding under the facility and \$500 million, net of discount, outstanding under our commercial paper program, leaving an unused and available credit capacity of \$2,020 million. We may also meet our cash needs by selling receivables under our \$900 million U.S. Receivables Facility. As of December 31, 2020, subject to a borrowing base of eligible receivables, we had availability of \$757 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.

Risks Related to our 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.

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.

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.

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 recent years, 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 various hurricanes striking Texas and Louisiana. 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. For example, higher costs arising from the delayed construction of our world-scale PO/TBA plant in Houston, due to COVID-19, more extensive civil construction, and unexpected tariffs on materials are expected to add approximately 40 to 50% to our original cost estimate for the project, impacting our projected rate of return on the project. 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.

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 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 would likely result in impairment and other charges to earnings. For example, in the third quarter of 2020, our Refining segment recognized a non-cash impairment charge of \$582 million related to our Houston refinery driven by the expectation of a prolonged reduction in travel and associated transportation fuels consumption resulting from the pandemic which created an oversupply in global fuel markets that will pressure refining profitability for an extended period of time.

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, we have significant obligations under take-or-pay agreements. Even though we may reduce production at facilities, we may be required to continue to purchase or pay for utilities or raw materials under these arrangements.

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.

Risks related to the Global Economy and Multinational Operations

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. 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.

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 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 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 where our subsidiaries operate, including the U.S., The Netherlands, Germany, France and Italy.

There continues to be increased attention 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. 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.

Risks Related to Health, Safety, and the Environment

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. In February 2021, the U.S. recommitted to the Agreement after having withdrawn in August 2017. 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. In December 2020, European Union leadership agreed to cut GHG emissions by at least 55 percent by 2030, a step toward achieving the European Union’s goal of carbon neutrality by 2050. These actions could result in increased cost of purchased energy and increased costs of compliance for impacted locations.

Our operations in Europe participate in the European Union Emissions Trading System (“ETS”) and we purchase annual emission allowances to meet our obligations. In light of changes resulting from the commencement of ETS Phase IV in 2021, we expect to incur additional costs in relation to future carbon or GHG emission trading schemes.

In the U.S., the EPA promulgated federal GHG regulations under the Clean Air Act affecting certain sources. The EPA 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 scaled back certain GHG requirements, addressing climate change is a stated priority of President Biden and as such additional regulations and legislation are likely to be forthcoming at the U.S. federal or state level that could result in increased operating costs for compliance, or required acquisition or trading of emission allowances. Additionally, demand for the products we produce may be reduced.

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 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.

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.

The physical impacts of climate change can negatively impact our facilities and operations.

Potential physical impacts of climate change include increased frequency and severity of hurricanes and floods as well as drought conditions, and global sea level rise. Although we have preparedness plans in place designed to minimize impacts and enhance safety, should an event occur, it could have the potential to disrupt our supply chain and operations. A number of our facilities are located on the Gulf Coast, which has been impacted by hurricanes that have required us to temporarily shut down operations at those sites. In addition, our sites rely on rivers for transportation that may experience restrictions in times of drought or other unseasonal weather variation.

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

There is a growing concern with the accumulation of plastic, including microplastics, and other packaging waste in the environment. Additionally, plastics have recently faced increased public backlash and scrutiny. Policy measures to address this concern are being discussed or implemented by governments at all levels. In 2019, the international treaty governing transboundary shipments of waste, the Basel Convention, was amended to clarify its applicability to plastic waste. The European Commission has been undertaking a series of actions under its Strategy for Plastics in a Circular Economy, including adoption of the Single Use Plastics Directive in 2019, which introduced policy measures for single use plastics including bans, product design requirements, extended producer responsibility obligations, and labeling requirements. Member states are required to transpose these measures into national law by July 2021. In addition, a host of single-use plastic bans and taxes have been passed by countries around the world and counties and municipalities throughout the U.S. Increased regulation of, or prohibition on, the use of certain plastic products 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.

General Risk Factors

The novel coronavirus (COVID-19) pandemic could continue to materially adversely affect our financial condition and results of operations.

In early 2020, the COVID-19 pandemic spread to countries worldwide and resulted in governments and other authorities implementing numerous measures to try to contain the disease, such as travel bans and restrictions, social distancing, quarantines, shelter-in-place orders and business shutdowns, among others. These measures caused significant economic disruption and adversely impacted the global economy, leading to reduced consumer spending and volatility in the global financial and commodities markets. Many of our facilities and employees are located in areas impacted by the virus. As a result of these measures and the general economic disruption, we experienced a decline in our financial results primarily in the second and third quarters of 2020, particularly in our Advanced Polymer Solutions and Refining segments. A return to more ordinary course of economic activity is dependent on the duration and severity of the COVID-19 pandemic, including the severity and transmission rate of the virus, the extent and effectiveness of containment efforts, including the spread of virus variants, the availability of vaccines, and future policy decisions made by governments across the globe as they react to evolving local and global conditions.

We continue to work with our stakeholders (including customers, employees, suppliers, business partners, and local communities) to attempt to mitigate the impact of the global pandemic on our business, including by implementing policies and procedures to promote the safety of our employees, proactively reducing costs intended to allow us to protect against further risk, and investing in initiatives to support our long-term growth, while also focusing on maintaining liquidity. However, we cannot assure that these mitigation efforts will continue to be effective or successful. An extended period of global supply chain and economic disruption as a result of the COVID-19 pandemic could have a material negative impact on our business, results of operations, access to sources of liquidity and financial condition. To the extent that the COVID-19 pandemic adversely impacts our business, results of operations, liquidity or financial condition, it may also have the effect of increasing many of the other risks described in “Risk Factors” set forth in this Annual Report on Form 10-K.

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

Increased global information cybersecurity 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.

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.

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, 2020, the aggregate deficit was \$1,482 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.

See Note 14 to the Consolidated Financial Statements for additional information regarding pensions and other postretirement benefits.

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. U.S. Securities and Exchange Commission rules require 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 \$300,000. The matters below are disclosed solely pursuant to that requirement and we do not believe that any of these proceeding will have a material impact on the company's Consolidated Financial Statements.

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.

The U.S. Environmental Protection Agency (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, and entered into discussions with EPA and the Department of Justice (DOJ). In December 2020, we reached a settlement agreement with EPA and DOJ to resolve claims related to alleged improper operation and maintenance of flares at the four facilities. The Company has agreed to pay a penalty of \$4,100,000, and make investments in equipment at the facilities. The complaint and consent decree are expected to be filed in the U.S. District Court for the Southern District of Texas.

In February 2020, the State of Texas filed suit against Houston Refining, LP, a subsidiary of LyondellBasell, in Travis County District Court seeking civil penalties and injunctive relief for violations of the Texas Clean Air Act related to several emission events. In July 2020, Harris County, Texas petitioned to intervene in the lawsuit and the State added additional claims to its petition relating to self-reported deviations of Houston Refining's air operating permit. We reasonably believe resolution of this matter could result in payment of a penalty in excess of \$300,000.

Litigation and Other Matters

Information regarding our litigation and other legal proceedings can be found in Note 17 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 23, 2021, there were approximately 5,400 record holders of our shares, including Cede & Co. as nominee of the Depository Trust Company.

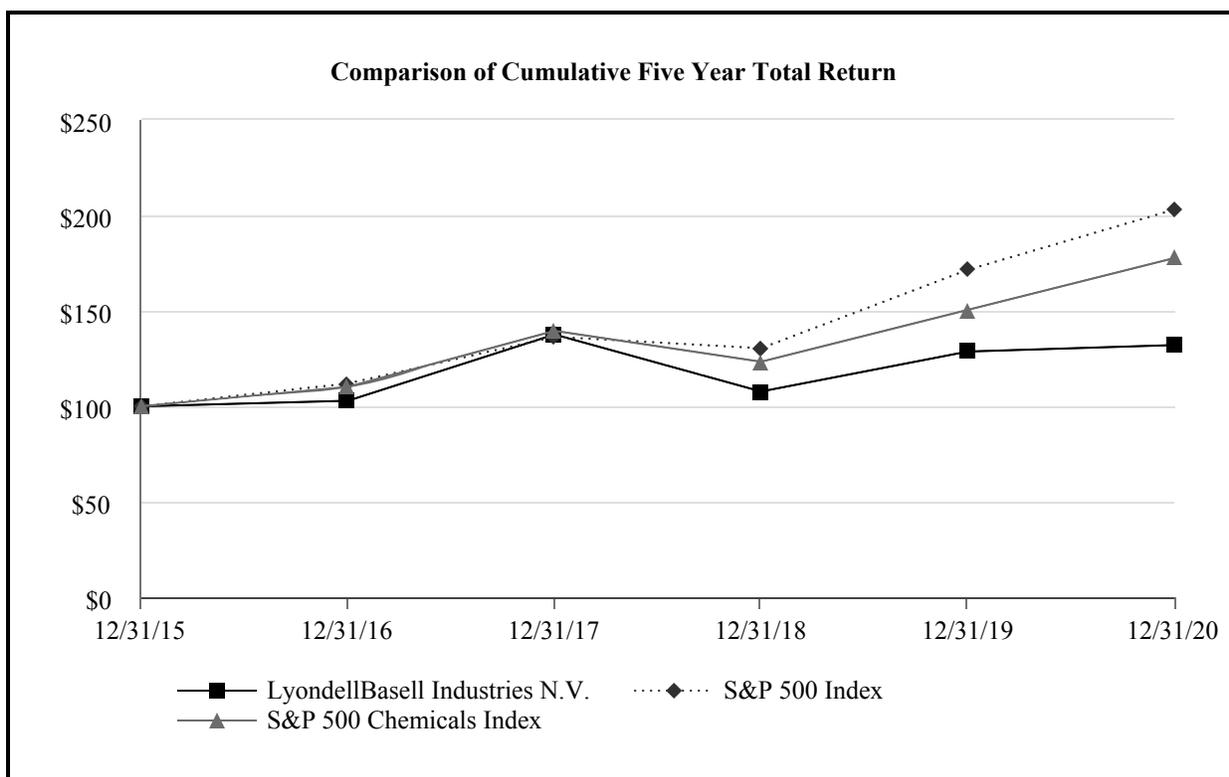
United Kingdom Tax Considerations

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, 2015. The graph assumes that \$100 was invested on December 31, 2015 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.



	12/31/2015	12/31/2016	12/31/2017	12/31/2018	12/31/2019	12/31/2020
LyondellBasell Industries N.V.	\$100.00	\$102.90	\$137.61	\$107.75	\$128.67	\$132.07
S&P 500 Index	\$100.00	\$111.96	\$136.40	\$130.42	\$171.49	\$203.04
S&P 500 Chemicals Index	\$100.00	\$110.16	\$139.53	\$123.34	\$150.49	\$177.64

Issuer Purchases of Equity Securities

On May 29, 2020, we announced a share repurchase authorization of up to 34,004,563 of our ordinary shares through November 29, 2021, which superseded any prior repurchase authorizations and represents the maximum number of shares that may be purchased as of December 31, 2020. 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. In August 2018, we acquired all of the outstanding common stock of A. Schulman, Inc. (“A. Schulman”). As such, amounts below incorporate the businesses acquired from A. Schulman beginning August 2018. 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,				
	2020	2019	2018	2017	2016
Results of operations data:					
Sales and other operating revenues	\$ 27,753	\$ 34,727	\$ 39,004	\$ 34,484	\$ 29,183
Operating income ^(a)	1,559	4,116	5,231	5,460	5,060
Interest expense ^(b)	(526)	(347)	(360)	(491)	(322)
Income from equity investments	256	225	289	321	367
Income from continuing operations ^{(a)(b)(c)}	1,429	3,404	4,698	4,895	3,847
Earnings per share from continuing operations:					
Basic	4.25	9.61	12.06	12.28	9.17
Diluted	4.25	9.60	12.03	12.28	9.15
Loss from discontinued operations, net of tax	(2)	(7)	(8)	(18)	(10)
Loss per share from discontinued operations:					
Basic	(0.01)	(0.02)	(0.02)	(0.05)	(0.02)
Diluted	(0.01)	(0.02)	(0.02)	(0.05)	(0.02)
Balance sheet data:					
Total assets	\$ 35,403	\$ 30,435	\$ 28,278	\$ 26,206	\$ 23,442
Short-term debt	663	445	885	68	594
Long-term debt ^(d)	15,294	11,617	8,502	8,551	8,387
Cash and cash equivalents	1,763	858	332	1,523	875
Short-term investments	702	196	892	1,307	1,147
Accounts receivable	3,441	3,102	3,503	3,539	2,842
Inventories	4,344	4,588	4,515	4,217	3,809
Working capital ^(e)	4,837	4,762	4,931	4,861	4,122
Cash flow data:					
Cash provided by (used in):					
Operating activities	\$ 3,404	\$ 4,961	\$ 5,471	\$ 5,206	\$ 5,606
Investing activities	(4,906)	(1,635)	(3,559)	(1,756)	(2,301)
Expenditures for property, plant and equipment	(1,947)	(2,694)	(2,105)	(1,547)	(2,243)
Financing activities	2,271	(2,835)	(3,008)	(2,859)	(3,349)
Dividends - common stock declared per share	\$ 4.20	\$ 4.15	\$ 4.00	\$ 3.55	\$ 3.33

- (a) Operating income and Income from continuing operations in 2020 include pre-tax charges of \$37 million (\$27 million, after tax) for integration costs associated with our acquisition of A. Schulman and a pre-tax non-cash charge of \$582 million (\$446 million, after tax), related to impairment of long-lived assets at our Houston refinery. Integration activities related to our acquisition of A. Schulman were substantially completed by the third quarter of 2020.

In 2019, we had pre-tax charges of \$116 million (\$89 million, after tax) for integration costs associated with our acquisition of A. Schulman.

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 2016, we had a pre-tax charge of \$58 million (\$37 million, after tax) for a pension settlement.

- (b) Interest expense and Income from continuing operations in 2020 include pre-tax charges of \$69 million (\$53 million, after tax) related to the redemption of \$1,000 million aggregate principal amount of our then outstanding 6% senior notes due 2021 and €750 million aggregate principal amount of our then outstanding 1.875% guaranteed notes due 2022.

In 2017, we had 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 2018 is 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, 2018, 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, 2019, which was filed with the Securities and Exchange Commission on February 20, 2020, of which Item 7 is incorporated herein by reference.

OVERVIEW

During 2020, we demonstrated financial and operational resilience against the challenging backdrop of a global pandemic, the associated recession, volatile oil prices and significant capacity additions in our industry.

Early in 2020, as the virus became more widespread, our leadership team established three principles to guide our actions in the short term. These were to (i) protect our employees, both from the virus in the workplace and also from widespread layoffs; (ii) prioritize cash flow and keep our commitments to our shareholders; and (iii) take action to strengthen the company for the future.

Our manufacturing operations have been designated as an essential industry to support society’s needs during the pandemic in the majority of the regions in which we operate. Our performance was supported by consumer-driven demand for many of our products and the recovery in demand for durable goods during the second half of the year. Our Refining and Oxyfuels & Related Products businesses suffered from the unprecedented decline in demand for transportation fuels that began during March 2020 due to the pandemic. During the year, we advanced our growth agenda through the formation of joint ventures in China and on the U.S. Gulf Coast.

Our strengths in operational excellence, cost management and capital discipline served us well as we quickly adapted to dynamic conditions by minimizing working capital and bolstering liquidity by rapidly accessing capital markets and efficiently generating cash. We honored commitments to maintain an investment grade credit rating and continued to fund dividends and capital investments with cash from operations.

Significant items that affected results in 2020 relative to 2019 include:

- Olefins and Polyolefins—Americas (“O&P—Americas”) and Olefins and Polyolefins—Europe, Asia, International (“O&P—EAI”) segment results declined primarily due to lower olefin and polyolefins margins;
- Intermediates and Derivatives (“I&D”) segment results declined due to margin decreases primarily driven by our intermediate chemicals and oxyfuels and related products businesses; and
- Refining segment results declined due to lower refining margins and a \$582 million non-cash impairment charge which was recognized during the third quarter of 2020.

Other noteworthy items include the following:

- Launched production at our U.S. Gulf Coast high-density polyethylene plant using LyondellBasell's next-generation *Hyperzone* technology during the first quarter of 2020;
- In April 2020, issued \$2,000 million of Guaranteed Notes to bolster liquidity. Net proceeds from the sale of the notes totaled \$1,974 million;
- In April 2020, repaid \$500 million outstanding under our Senior Revolving Credit Facility and \$500 million outstanding under our U.S. Receivables Facility, which were borrowed in March 2020;
- In August 2020, invested \$472 million in our new 50 percent owned joint venture polyolefin complex in China with Liaoning Bora Enterprise Group using our polyolefin technologies;
- In October 2020, issued \$3,900 million of Guaranteed Notes to be used to repay certain outstanding borrowings and fund a portion of the Louisiana Integrated PolyEthylene JV LLC (“Louisiana Joint Venture”) purchase. Net proceeds from the sale of the notes totaled \$3,848 million;
- In the fourth quarter of 2020, repaid \$500 million outstanding under our Term Loan due 2022 and all amounts outstanding on our Senior Notes due 2021 and Guaranteed Notes due 2022;
- In December 2020, invested \$2 billion to purchase a 50 percent interest in the newly formed Louisiana Joint Venture with Sasol Chemicals (USA) LLC;
- In January 2021, signed an agreement to form a 50 percent owned joint venture with the China Petroleum & Chemical Corporation (“Sinopec”) which will construct a new PO and SM unit in China; and
- In January 2021, repaid an additional \$500 million outstanding under our Term Loan due 2022.

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

Millions of dollars	Year Ended December 31,	
	2020	2019
Sales and other operating revenues	\$ 27,753	\$ 34,727
Cost of sales	24,359	29,301
Impairment of long-lived assets	582	—
Selling, general and administrative expenses	1,140	1,199
Research and development expenses	113	111
Operating income	1,559	4,116
Interest expense	(526)	(347)
Interest income	12	19
Other income, net	85	39
Income from equity investments	256	225
Income from continuing operations before income taxes	1,386	4,052
(Benefit from) provision for income taxes	(43)	648
Income from continuing operations	1,429	3,404
Loss from discontinued operations, net of tax	(2)	(7)
Net income	\$ 1,427	\$ 3,397

RESULTS OF OPERATIONS

Revenues—Revenues decreased \$6,974 million, or 20%, in 2020 compared to 2019. Average sales prices in 2020 were lower for most of our products as sales prices generally correlate with crude oil prices, which decreased relative to 2019. These lower prices led to a 19% decrease in revenue in 2020. Lower sales volumes resulted in a revenue decrease of 2% relative to 2019. Favorable foreign exchange impacts resulted in a revenue increase of 1% during 2020.

Cost of Sales—Cost of sales decreased \$4,942 million, or 17%, in 2020 compared to 2019. This decrease primarily related to lower feedstock and energy costs. Costs for crude oil, heavy liquid feedstocks and natural gas liquids (“NGLs”) and other feedstocks were lower in 2020 relative to 2019. 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 70% 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 20% in each annual period.

Impairment of Long-Lived Assets—In the third quarter of 2020, our Refining segment recognized a non-cash impairment charge of \$582 million related to our Houston refinery driven by the expectation of a prolonged reduction of travel and associated transportation fuels consumption resulting from the pandemic which created an oversupply in global fuel markets that will pressure refining profitability for an extended period of time.

SG&A Expense—Selling, general and administrative (“SG&A”) expense decreased \$59 million, or 5% in 2020 compared to 2019 primarily due to lower integration costs related to the acquisition of A. Schulman. Integration activities related to our acquisition of A. Schulman were substantially completed by the third quarter of 2020.

Operating Income—Operating income decreased by \$2,557 million or 62% in 2020 compared to 2019. Operating income includes the effect of the non-cash long-lived asset impairment charge in our Refining segment as noted above.

In 2020, Operating income declined across all of our segments by \$784 million, \$748 million, \$607 million, \$261 million, \$87 million and \$64 million for our Refining, I&D, O&P—Americas, O&P—EAI, Technology and APS segments, respectively, as compared to 2019.

Interest Expense—Interest expense increased \$179 million or 52% in 2020 compared to 2019 primarily due to an increase in long-term debt and the recognition of \$69 million in charges related to the redemption of certain long-term notes in 2020. See Note 11 to the Consolidated Financial Statements for additional details.

Income Taxes—Our effective income tax rates of -3.1% in 2020 and 16.0% in 2019 resulted in a tax benefit of \$43 million and a tax provision of \$648 million, respectively.

Our effective income tax rate fluctuates based on, among other factors, changes in pre-tax income in countries with varying statutory tax rates, changes in valuation allowances, changes in foreign exchange gains/losses, the amount of exempt income, changes in unrecognized tax benefits associated with uncertain tax positions and changes in tax laws. We continue to maintain valuation allowances in various jurisdictions totaling \$132 million as of 2020, which could impact our effective income tax rate in the future.

On March 27, 2020, the U.S. enacted the Coronavirus Aid, Relief, and Economic Security Act, also known as the “CARES Act,” which contains numerous income tax provisions and other stimulus measures. In 2020 we recorded an overall tax benefit in relation to the CARES Act of approximately \$300 million which reflects the impact of our expected 2020 U.S. tax losses which we intend to carryback to tax years with a higher tax rate and a cash refund of approximately \$900 million. For additional information, see Note 16 to our Consolidated Financial Statements.

The 2020 effective income tax rate of -3.1%, which is lower than the U.S. statutory tax rate of 21%, was favorably impacted by tax law changes including the CARES Act (-21.5%) coupled with exempt income (-10.4%), partially offset by changes in unrecognized tax benefits associated with uncertain tax positions (7.0%).

The 2019 effective income tax rate of 16%, 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.

Comprehensive Income—We had comprehensive income of \$1,268 million in 2020 and \$2,976 million in 2019. Comprehensive income decreased by \$1,708 million in 2020 compared to 2019, primarily due to lower net income and net unfavorable impacts of financial derivative instruments primarily driven by periodic changes in benchmark interest rates. These decreases were partially offset by net favorable impacts of unrealized changes in foreign currency translation adjustments and improved changes in defined pension and other postretirement benefits.

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 increased during 2020 resulting in net gains as reflected in the Consolidated Statements of Comprehensive Income. The gains related to unrealized changes in foreign currency translation impacts were partially offset by pre-tax losses of \$166 million in 2020, which represent the effective portion of our net investment hedges.

In 2020, the cumulative after-tax effect of our derivatives designated as cash flow hedges was a net loss of \$226 million. The strengthening of the euro against the U.S. dollar in 2020 and periodic changes in benchmark interest rates resulted in a pre-tax loss of \$129 million related to our cross-currency swaps. A \$170 million pre-tax gain related to our cross-currency swaps was reclassified to Other income, net in 2020. In 2020, a pre-tax loss of \$347 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 \$51 million and \$361 million in 2020 and 2019, respectively, 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 14 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 20 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. The following tables reflect selected financial information for our reportable segments.

Millions of dollars	Year Ended December 31,	
	2020	2019
Sales and other operating revenues:		
O&P—Americas	\$ 7,275	\$ 8,435
O&P—EAI	8,367	9,504
I&D	6,269	7,834
APS	3,913	4,850
Refining	4,727	8,251
Technology	659	663
Other, including segment eliminations	(3,457)	(4,810)
Total	\$ 27,753	\$ 34,727
Operating income (loss):		
O&P—Americas	\$ 1,170	\$ 1,777
O&P—EAI	412	673
I&D	501	1,249
APS	226	290
Refining	(1,024)	(240)
Technology	287	374
Other, including segment eliminations	(13)	(7)
Total	\$ 1,559	\$ 4,116
Depreciation and amortization:		
O&P—Americas	\$ 525	\$ 470
O&P—EAI	214	208
I&D	305	295
APS	152	133
Refining	152	169
Technology	37	37
Total	\$ 1,385	\$ 1,312
Income (loss) from equity investments:		
O&P—Americas	\$ 45	\$ 46
O&P—EAI	186	172
I&D	26	7
APS	(1)	—
Total	\$ 256	\$ 225

Millions of dollars	Year Ended December 31,	
	2020	2019
Other income (loss), net:		
O&P—Americas	\$ 70	\$ 9
O&P—EAI	14	9
I&D	1	6
APS	1	1
Refining	1	6
Other, including intersegment eliminations	(2)	8
Total	<u>\$ 85</u>	<u>\$ 39</u>
EBITDA:		
O&P—Americas	\$ 1,810	\$ 2,302
O&P—EAI	826	1,062
I&D	833	1,557
APS	378	424
Refining	(871)	(65)
Technology	324	411
Other, including intersegment eliminations	(15)	1
Total	<u>\$ 3,285</u>	<u>\$ 5,692</u>

Olefins and Polyolefins—Americas Segment

Overview—EBITDA declined in 2020 relative to 2019 primarily due to lower margins in challenging market conditions arising from a low oil price environment and the impact of COVID-19.

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 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.

We have flexibility to vary the raw material mix and process conditions in our U.S. olefins plants in order to maximize profitability as market prices fluctuate for both feedstocks and products. Although prices of crude-based liquids and natural gas liquids are generally related to crude oil and natural gas prices, during specific periods the relationships among these materials and benchmarks may vary significantly. In 2020 and 2019, approximately 55-60% of the raw materials used in our North American crackers was 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>2020</u>	<u>2019</u>
Sales and other operating revenues	\$ 7,275	\$ 8,435
Income from equity investments	45	46
EBITDA	1,810	2,302

Revenues—Revenues decreased by \$1,160 million, or 14%, in 2020 compared to 2019. Average sales prices were lower in 2020 compared to 2019 due to the lower oil price environment and other impacts of COVID-19. These lower sales prices were responsible for a revenue decrease of 18% in 2020. Volume increases resulted in a revenue increase of 4% in 2020, primarily due to high demand for polyethylene.

EBITDA—EBITDA decreased by \$492 million, or 21%, in 2020 compared to 2019. Lower olefin results led to a 10% decline in EBITDA in 2020, primarily due to lower co-product prices outpacing reduced feedstock costs. Polyethylene results declined resulting in a 5% decrease in EBITDA in 2020. This decrease was driven by a \$77 per ton reduction in price spreads over ethylene in 2020. Polypropylene results led to a 4% decrease in EBITDA in 2020, largely due to a decline in margins attributed to lower price spreads over propylene of \$84 per ton in 2020.

Olefins and Polyolefins—Europe, Asia, International Segment

Overview—EBITDA decreased in 2020 compared to 2019 mainly as a result of lower olefin and polypropylene margins.

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 Raw Materials—In Europe, heavy liquids are the primary raw materials for our ethylene production. In 2020 and 2019, we continued to benefit from 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>2020</u>	<u>2019</u>
Sales and other operating revenues	\$ 8,367	\$ 9,504
Income from equity investments	186	172
EBITDA	826	1,062

Revenues—Revenues in 2020 decreased by \$1,137 million, or 12%, compared to 2019. Average sales prices in 2020 were lower across most products as sales prices generally correlate with crude oil prices, which on average, decreased compared to 2019. These lower average sales prices were responsible for revenue decreases of 19% in 2020. Volume improvements resulted in revenue increases of 6% in 2020 driven by strong polymer demand in Europe and Asia. Foreign exchange impacts, which on average, were favorable resulted in a revenue increase of 1% in 2020.

EBITDA—EBITDA decreased by \$236 million, or 22%, in 2020 compared to 2019. Lower olefins results led to a 13% decrease in EBITDA in 2020, primarily driven by lower margins driven by a decline in ethylene prices outpacing lower feedstock costs. Polypropylene results led to a 10% decrease in EBITDA in 2020, largely due to a decline in margins attributed to a reduction in price spreads over propylene by \$29 per ton in 2020. Favorable foreign exchange impacts resulted in an EBITDA benefit of 2%. Planned maintenance in 2021 is expected to reduce EBITDA by approximately \$25 million.

Intermediates and Derivatives Segment

Overview—EBITDA for our I&D segment was lower in 2020 compared to 2019, largely driven by margin erosion due to the impacts of COVID-19.

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

Millions of dollars	Year Ended December 31,	
	2020	2019
Sales and other operating revenues	\$ 6,269	\$ 7,834
Income from equity investments	26	7
EBITDA	833	1,557

Revenues—Revenues decreased by \$1,565 million, or 20%, in 2020 compared to 2019. Lower average sales prices in 2020 for most products, which reflect the impacts of lower feedstock and energy costs, were responsible for a revenue decrease of 21%. Favorable foreign exchange impacts increased revenue by 1% in 2020.

EBITDA—EBITDA decreased \$724 million, or 46%, in 2020 compared to 2019 primarily driven by lower margins across most businesses. Oxyfuels and related products results declined, resulting in a 30% decrease in EBITDA in 2020. The decline was a result of a significant decrease in margins driven by lower gasoline prices and octane premiums. Declines in intermediate chemicals results led to an EBITDA decrease of 11% in 2020. This decrease was a result of lower margins as demand weakened due to the impacts of COVID-19 and additional market supply derived from competitors in 2020. Planned maintenance in 2021 is expected to reduce EBITDA by approximately \$145 million.

Advanced Polymer Solutions Segment

Overview—EBITDA for our APS segment decreased in 2020 compared to 2019, primarily due to lower compounding and solutions volumes.

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

Millions of dollars	Year Ended December 31,	
	2020	2019
Sales and other operating revenues	\$ 3,913	\$ 4,850
Loss from equity investments	(1)	—
EBITDA	378	424

Revenues—Revenues decreased in 2020 by \$937 million, or 19%, compared to 2019. Sales volumes declined in 2020 stemming from lower market demand for compounding and solutions, including lower automotive and appliance demand, which led to a 15% decrease in revenue in 2020. Lower average sales prices resulted in a 6% decrease in revenue. Favorable foreign exchange impacts increased revenue by 2% in 2020.

EBITDA—EBITDA decreased in 2020 by \$46 million, or 11%, compared to 2019. Compounding and solutions results declined resulting in a 18% decrease of EBITDA. This decrease was attributable to lower volumes driven by reduced demand for our products utilized in the automotive and appliance sectors which were impacted by COVID-19. Advanced Polymers results reduced EBITDA by 8% largely due to lower margins driven by reduced construction market demand. This decrease was offset by an increase in EBITDA of approximately \$80 million, or 19%, in 2020 due to lower integration costs related to the acquisition of A. Schulman. Integration activities related to our 2018 acquisition of A. Schulman Inc. were substantially completed by the third quarter of 2020.

Refining Segment

Overview—EBITDA for our Refining segment decreased in 2020 relative to 2019 primarily due to lower margins and a non-cash impairment charge of \$582 million recognized during the third quarter of 2020.

The following table sets forth selected financial information and heavy crude oil processing rates for the Refining segment and the U.S. refining market margins for the applicable periods. “Brent” is a light sweet crude oil and is one of the main benchmark prices for purchases of oil worldwide. “Maya” is a heavy sour crude oil grade produced in Mexico that is a relevant benchmark for heavy sour crude oils in the U.S. Gulf Coast market. References to industry benchmarks for refining market margins are to industry prices reported by Platts, a division of S&P Global.

Millions of dollars	Year Ended December 31,	
	2020	2019
Sales and other operating revenues	\$ 4,727	\$ 8,251
EBITDA	(871)	(65)
Thousands of barrels per day		
Heavy crude oil processing rates	223	263
Market margins, dollars per barrel		
Brent - 2-1-1	\$ 5.74	\$ 10.94
Brent - Maya differential	6.89	6.58
Total Maya 2-1-1	\$ 12.63	\$ 17.52

Revenues—Revenues decreased by \$3,524 million, or 43%, in 2020 compared to 2019. Lower product prices led to a revenue decrease of 34% relative to 2019 due to an average crude oil price decrease of approximately \$21 per barrel in 2020. Heavy crude oil processing rates decreased during 2020 due to reduced demand for refined products as a result of COVID-19, leading to a decrease in overall sales volumes of 9%. Rates on conversion units were lower due to an unplanned outage at our fluid catalytic cracking unit during the first two quarters of 2020, as well as crude selection and the optimization of refinery operations.

EBITDA—EBITDA decreased by \$806 million in 2020 compared to 2019. During the third quarter of 2020, we recognized a non-cash impairment charge of \$582 million relating to our Houston refinery’s asset group as a result of an expected prolonged period of reduced demand and compressed margins that will decrease profitability for transportation fuels produced by our Houston refinery. The lower profitability is primarily a result of the impacts of COVID-19 and associated reductions in mobility affecting the global economy. In addition, the refinery is expected to continue to be adversely affected by lower discounts for the heavy crude oil feedstocks that we utilize. Of the remaining decrease, approximately two-thirds relates to a decline in margins, which reflect a 28% decrease in the Maya 2-1-1 market margin in 2020 relative to 2019, driven primarily by lower refined product cracks, and one-third relates to lower heavy crude oil processing rates driven by lower demand for refined products.

In efforts to manage costs within the segment we deferred non-safety related discretionary activities and reduced the employee workforce by approximately 10% through early retirements and worker re-deployments to our other facilities. We plan to continue to operate the refinery at approximately 80% of nameplate capacity during the first quarter of 2021 and continue to evaluate options with regard to procuring crude oil and optimizing production from the asset.

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 2020 and 2019, our Technology segment incurred approximately half of all R&D costs. EBITDA for our Technology segment decreased in 2020 compared to 2019 largely due to lower 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>2020</u>	<u>2019</u>
Sales and other operating revenues	\$ 659	\$ 663
EBITDA	324	411

Revenues—Revenues decreased by \$4 million, or 1%, in 2020 compared to 2019. Lower licensing revenues resulted in a revenue decrease of 9% in 2020 compared to 2019. Higher catalyst volumes resulted in a 2% increase in revenue in 2020 driven by increased orders as customers were likely securing inventory during the pandemic. Increases in average catalyst sales prices resulted in revenue increases of 4% in 2020 driven by the growth of high yield catalyst. Foreign exchange impacts, which on average, were favorable led to a revenue increase of 2% in 2020.

EBITDA—EBITDA in 2020 decreased by \$87 million, or 21%, compared to 2019. This decrease was primarily driven by lower licensing revenues due to lower average contract values in 2020 compared to 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>2020</u>	<u>2019</u>
Source (use) of cash:		
Operating activities	\$ 3,404	\$ 4,961
Investing activities	(4,906)	(1,635)
Financing activities	2,271	(2,835)

Operating Activities—Cash of \$3,404 million generated by operating activities in 2020 reflected earnings adjusted for non-cash items, payments for employee related expenses, income taxes, and cash provided by the main components of working capital—Accounts receivable, Inventories and Accounts payable.

In 2020, the main components of working capital provided \$311 million of cash driven by a decrease in Inventories and an increase in Accounts payable, partially offset by an increase in Accounts receivable. The decrease in Inventory was primarily driven by company-wide inventory reduction initiatives to maximize liquidity. The increase in Accounts payable was primarily driven by increased raw material purchases during the fourth quarter of 2020. The increase in Accounts receivable was driven by higher sales in the fourth quarter 2020 for our O&P—Americas, O&P—EAI, and I&D segments resulting from demand recovery.

Other operating activities in 2020 includes the effects of changes in tax accruals, primarily driven by a tax refund of \$900 million. For additional information see Note 16 to our Consolidated Financial Statements.

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. A \$113 million non-cash reduction in unrecognized tax benefits is reflected in Other operating activities in 2019.

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.

Investing Activities

Acquisition of Equity Method Investments—In 2020, we invested \$2,440 million in cash for 50% equity interests in the Bora LyondellBasell Petrochemical Co. Ltd joint venture and the Louisiana Joint Venture. For additional information related to our Equity investments, see Note 8 to the Consolidated Financial Statements.

Investments—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 \$114 million and \$511 million in 2020 and 2019, respectively, upon the sale and maturity of certain of our available-for-sale debt securities. Additionally, in 2020 and 2019, we received proceeds of \$313 million and \$332 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 2020 and 2019 we invested \$270 million and \$108 million, respectively, in debt securities that are deemed available-for-sale. We also invested \$608 million and \$33 million in equity securities in 2020 and 2019, respectively. Our investments in available-for-sale debt securities and equity securities are classified as Short-term investments.

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

<u>Millions of dollars</u>	<u>Year Ended December 31,</u>	
	<u>2020</u>	<u>2019</u>
Capital expenditures by segment:		
O&P—Americas	\$ 543	\$ 1,099
O&P—EAI	166	213
I&D	880	1,064
APS	63	59
Refining	63	149
Technology	111	94
Other	121	16
Consolidated capital expenditures of continuing operations	<u>\$ 1,947</u>	<u>\$ 2,694</u>

As a result of COVID-19 and current market conditions, during 2020 the Company postponed select growth projects and planned maintenance, including slowing certain construction activities, allowing us to prevent the spread of the virus at the construction site and conserve capital as we prepared for an uncertain economic environment caused by the pandemic. These actions resulted in a \$500 million, or 20% reduction in our 2020 capital expenditures compared to what was forecasted at the beginning of year.

Capital expenditures decreased by \$747 million, or 28%, in 2020 compared to 2019. The decrease was primarily due to lower spending within our O&P—Americas segment which resulted in a decline of 21% primarily due to the completed construction of our *Hyperzone* polyethylene plant in La Porte, Texas and postponement of maintenance projects. Additionally, lower spending within our I&D segment resulted in a 7% decline primarily as a result of the slowed construction activities at our PO/TBA plant at our Houston, Texas facility.

Financing Activities—In 2020 and 2019, we made payments of \$4 million and \$3,752 million to acquire approximately 0.1 million and 42.7 million, respectively, of our outstanding ordinary shares. We also made dividend payments totaling \$1,405 million and \$1,462 million in 2020 and 2019, respectively. For additional information related to our share repurchases and dividend payments, see Note 18 to the Consolidated Financial Statements.

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.

In May 2020, we terminated and cash settled \$2,000 million in notional value of our cross-currency interest rate swaps, designated as cash flows hedges, maturing in 2021 and 2024. Upon termination of the swaps, we received \$346 million from our counterparties.

In November 2020, we paid \$882 million to our counterparties and received €750 million (\$887 million at the expiry spot rate) from our counterparties upon expiration and settlement of the foreign currency contracts entered to economically hedge the redemption of €750 million aggregate principal amount of our 1.875% guaranteed notes originally due in 2022.

For additional information related to our swaps and currency contracts, see Note 13 to the Consolidated Financial Statements.

During 2019 and 2020 we entered into various financing transactions. See Note 11 to the Consolidated Financial Statements.

In 2020 and 2019, we made payments of \$30 million and \$63 million related to the acquisition of additional non-controlling interests in our POSM II Limited Partnership joint venture and our subsidiary that holds our La Porte, Texas methanol facility, respectively.

Liquidity and Capital Resources

Overview

As a result of COVID-19, we continue to take actions to manage our financial risk. In 2020, we increased our liquidity through the issuance of guaranteed notes and we continue to focus on cost savings while minimizing working capital. In April 2020, we announced that we reduced our budgeted 2020 capital expenditures by \$500 million, to improve liquidity. 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 remain committed to funding our dividends while maintaining a strong investment grade balance sheet. In the near term, we are prioritizing debt reduction on our balance sheet.

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. 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. Further, we believe the current economic environment will not have an adverse effect on our ability to be in compliance with our debt covenants.

Cash and Liquid Investments

As of December 31, 2020, we had Cash and cash equivalents and marketable securities classified as Short-term investments totaling \$2,465 million, which included \$1,329 million of cash in jurisdictions outside of the U.S., principally in the United Kingdom. There are currently no legal or economic restrictions that would materially impede our transfers of cash.

Credit Arrangements

At December 31, 2020, we had total debt, including current maturities, of \$15,957 million, and \$205 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 \$2,777 million at December 31, 2020, which included the following:

- \$2,020 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, 2020, we had \$500 million of outstanding commercial paper, net of discount, no borrowings or letters of credit outstanding under this facility; and
- \$757 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. At December 31, 2020 we had no borrowings or letters of credit outstanding under this facility.

In October 2020, we amended some of our credit agreements. See Note 11 to the Consolidated Financial Statements.

In January 2021, we repaid \$500 million outstanding under our Term Loan due 2022.

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, 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.

Share Repurchases

In May 2020, our shareholders approved a proposal to authorize us to repurchase up to 34.0 million of our ordinary shares through November 29, 2021, which superseded our prior repurchase authorization. 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 2020, we purchased approximately 0.1 million shares under our share repurchase authorizations for approximately \$4 million.

As of February 23, 2021, we had approximately 34.0 million shares remaining under the current authorization. The timing and amounts of additional shares repurchased, if any, will be determined based on our evaluation of market conditions and other factors, including any additional authorizations approved by our shareholders. In addition, 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. In the near term, we are prioritizing debt reduction over share repurchases. For additional information related to our share repurchase authorization, see Note 18 to the Consolidated Financial Statements.

Capital Budget

In 2021, we expect our capital budget spend to remain flat at approximately \$2 billion, which includes approximately \$63 million for investments in our U.S. and European PO joint ventures. Approximately half of the 2021 budget is planned for profit-generating growth projects, primarily our PO/TBA plant, with the remaining budget supporting sustaining maintenance. We expect a similar level of capital expenditures for 2022 followed by a modest reduction in 2023, after completion of the PO/TBA facility.

Once completed, our world-scale PO/TBA plant in Houston, Texas will have the capacity to produce 470 thousand tons of PO and 1.0 million tons of tertiary butyl alcohol. Earlier in 2020, we slowed construction activities on our PO/TBA plant to ensure worksite safety and preserve liquidity during the pandemic. During the fourth quarter we resumed activity. The project is approximately 50% complete and expected to be completed in the fourth quarter of 2022, approximately one year later than originally estimated. The delayed timing of the startup should provide benefits from a more fully recovered global economy as well as another year of global demand growth for the products. Higher costs arising from the delayed project execution due to COVID-19, more extensive civil construction and unexpected tariffs on materials are expected to add approximately 40 to 50% to our original cost estimate of \$2.4 billion.

Equity Investment

On January 25, 2021 we signed an agreement with China Petroleum & Chemical Corporation to form Ningbo ZRCC LyondellBasell New Material Company Limited, a 50/50 joint venture. The joint venture will construct a new PO/SM unit in Zhenhai Ningbo, China. The unit will use LyondellBasell's leading PO/SM technology and will have the capacity to produce 275 thousand tons of PO and 600 thousand tons of SM per year. Products produced by the joint venture will be marketed equally by both partners, expanding our respective participation in the Chinese market. The formation of the joint venture is subject to approvals by relevant government authorities, including antitrust review by the State Administration for Market Regulation. We expect to make an equity contribution of approximately \$100 million to the joint venture during the first half of 2021 and startup is expected at the end of 2021. The joint venture will be included within our I&D segment.

Contractual and Other Obligations—The following table summarizes, as of December 31, 2020, our future minimum payments for long-term debt, including current maturities, short-term debt, and contractual and other obligations:

Millions of dollars	Total	Payments Due By Period			
		Less than 1 Year	1-3 Years	3-5 Years	More than 5 Years
Total debt	\$ 16,063	\$ 671	\$ 2,861	\$ 2,009	\$ 10,522
Interest on total debt	9,712	538	1,041	866	7,267
Contract liabilities	194	157	37	—	—
Other	2,313	1,243	248	304	518
Deferred income taxes	2,332	552	408	367	1,005
Purchase obligations:					
Take-or-pay contracts	22,304	2,273	4,571	4,648	10,812
Other contracts	15,318	5,171	3,215	1,363	5,569
Operating leases	2,506	534	599	429	944
Total	\$ 70,742	\$ 11,139	\$ 12,980	\$ 9,986	\$ 36,637

Total Debt—Our debt includes unsecured senior notes, guaranteed notes and various other U.S. and non-U.S. loans. See Note 11 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, semi-annual, and 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, 2020.

Pension and other Postretirement Benefits—We maintain several defined benefit pension plans, as described in Note 14 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 2021 are not expected to be materially different than the expected 2021 contributions disclosed in Note 14 to the Consolidated Financial Statements. At December 31, 2020, the projected benefit obligation for our pension plans exceeded the fair value of plan assets by \$1,482 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 \$1,482 million in future years. We contributed \$74 million and \$97 million to our pension plans in 2020 and 2019, respectively. We provide other postretirement

benefits, primarily medical benefits to eligible participants, as described in Note 14 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. The long-term portion of such advances totaled \$37 million as of December 31, 2020.

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 16 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, 2020.

Operating Leases—We lease various facilities and equipment under noncancelable lease arrangements for various periods. See Note 12 to the Consolidated Financial Statements for related lease disclosures.

CURRENT BUSINESS OUTLOOK

Improving trends seen in the closing weeks of December 2020 are continuing into the first quarter of 2021 and providing a bridge to the seasonal upticks typically seen in our businesses during the second and third quarters. Elevated export demand to China and Latin America combined with tight markets are supporting strong margins for our Olefins and Polyolefins businesses. In early 2021 we expect increased demand from automotive and construction markets to benefit our Advanced Polymer Solutions segment. With wider deployment of coronavirus vaccines, we anticipate that increasing mobility and transportation fuel demand could provide upside for our oxyfuels and refining businesses during the latter half of 2021. In February 2021, unusually cold temperatures and associated electrical power outages led to shutdowns of the majority of the petrochemical and refining capacity along the United States Gulf Coast, including LyondellBasell's facilities in the region. The majority of our capacity in the region was down for at least one week. At this time, we are continuing to assess the impact of the weather event and develop timelines for the restart of each of our affected facilities.

In the near term, we are prioritizing debt reduction on our balance sheet.

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 4 to the Consolidated Financial Statements for additional related party disclosures.

CRITICAL ACCOUNTING POLICIES AND ESTIMATES

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. Inherent in such policies are certain key assumptions and estimates made by management and updated periodically based on its latest assessment of the current and projected business and general economic environment.

Management believes the following accounting policies and estimates, and the judgments and uncertainties affecting them, are critical in understanding our reported operating results and financial condition.

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 2020, commodity price volatility resulted in a large LCM inventory charge during the first quarter which was substantially reversed by the end of the year, resulting in an LCM inventory valuation charges of \$16 million for the year.

In the first quarter of 2020, we recognized LCM inventory valuation charges of \$419 million which was driven by a decline in pricing for many of our raw material and finished goods inventories. During the second, third and fourth quarters of 2020, we recognized an LCM inventory valuation benefit of \$96 million, \$160 million and \$147 million, respectively, as market prices began to recover subsequent to the first quarter of 2020.

Market price volatility for crude oil, heavy liquids and ethylene were the primary contributors to the LCM inventory valuation charges, and representative prices used to determine the LCM inventory valuation charges recognized during the year ranged from \$12.14 to \$41.75 per barrel for crude oil, \$13.50 to \$51.07 per barrel for heavy liquids and \$205 to \$767 per ton for ethylene.

Currently, four out of our eleven LIFO inventory pools are “at-risk” for further adjustment as each impacted LIFO pool has been reduced to, or close to, the calculated market value at the last balance sheet measurement date. “At-risk” inventory accounts for \$1.5 billion of our total inventory carrying value as of December 31, 2020. Sustained price declines in our finished goods and raw materials could result in future LCM inventory valuation charges, the extent to which further adjustment may occur is dependent on the pool specific product prices and composition within each individual dollar value LIFO pool at the balance sheet date.

Long-Lived Assets Impairment Assessment—The need to test for impairment can be based on several indicators, including a significant reduction in prices of or demand for products produced, a weakened outlook for profitability, a significant reduction in margins, other changes to contracts or changes in the regulatory environment. If the sum of the undiscounted estimated pre-tax cash flows for an asset group is less than the asset group’s carrying value, fair value is calculated for the asset group, and the carrying value is written down to the calculated fair value. For purposes of impairment evaluation, long-lived assets including finite-lived intangible assets must be grouped at the lowest level for which independent cash flows can be identified.

Fair value calculated for the purpose of testing our long-lived assets for impairment is estimated using a discounted cash flow model and comparative market prices when appropriate. Significant judgment is involved in performing these fair value estimates since the results are based on forecasted financial information prepared using significant assumptions which may include, among other things, projected changes in supply and demand fundamentals (including industry-wide capacity, our planned utilization rate and end-user demand), new technological developments, capital expenditures, new competitors with significant raw material or other cost advantages, changes associated with world economies, the cyclical nature of the chemical and refining industries, uncertainties associated with governmental actions and other economic conditions. Such estimates are consistent with those used in our planning and capital investment and business performance reviews.

The cash flows are discounted using a rate that is based on a variety of factors, including market and economic conditions, operational risk, regulatory risk and political risk. This discount rate is also compared to recent observable market transactions, if possible.

Houston Refinery Impairment—During the third quarter of 2020, we identified impairment triggers relating to our Houston refinery’s asset group which resulted in a \$582 million impairment charge recognized during the third quarter of 2020. Refer to Note 7 to our Consolidated Financial Statements.

The estimates of the Houston refinery’s undiscounted pre-tax cash flows and estimated fair value utilized significant assumptions including management’s best estimates of the expected future cash flows, the estimated useful lives of the asset group, and the residual value of the refinery. These estimates required considerable judgment and are sensitive to changes in underlying assumptions such as future commodity prices, margins on refined products, operating rates and capital expenditures including repairs and maintenance. As a result, there can be no assurance that the estimates and assumptions made for purposes of our impairment determination will prove to be an accurate prediction of the future. Should our estimates and assumptions significantly change in future periods, it is possible that we may determine future impairment charges. In addition, assumptions about the effects of COVID-19 and the macroeconomic environment are inherently subjective and contingent upon the duration of the pandemic and its impact on the macroeconomic environment, which is difficult to forecast. We base our fair value estimates on projected financial information which we believe to be reasonable. However, actual results may differ from these projections.

An estimate of the sensitivity to net income resulting from impairment calculations is not practicable, given the numerous assumptions, including pricing, volumes and discount rates, that can materially affect our estimates. That is, unfavorable adjustments to some of the above listed assumptions may be offset by favorable adjustments in other assumptions.

Equity Method Investments Impairment—Investments in nonconsolidated entities accounted for under the equity method are assessed for impairment when there are indicators of a loss in value, such as a lack of sustained earnings capacity or a current fair value less than the investment’s carrying amount.

When it is determined such a loss in value is other than temporary, an impairment charge is recognized for the difference between the investment's carrying value and its estimated fair value. When determining whether a decline in value is other than temporary, management considers factors such as the length of time and extent of the decline, the investee's financial condition and near-term prospects, and our ability and intention to retain our investment for a period that will be sufficient to allow for any anticipated recovery in the value of the investment. Management's estimate of fair value of an investment is based on the income approach and/or market approach. For the income approach, the fair value is typically based on the present value of expected future cash flows using discount rates believed to be consistent with those used by principal market participants. For the market approach, since quoted market prices are usually not available, we utilize market multiples of revenue and earnings derived from comparable publicly-traded industrial gases companies.

Goodwill—As of December 31, 2020, we have goodwill of \$1,953 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, 2020, primarily represents the tax effect of the differences between the tax and book basis 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 7 and Note 20 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 2020 and 2019, management performed a qualitative impairment assessment 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 in 2020 or 2019.

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, 2020, we used a weighted average discount rate of 2.54% 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, 2020, was 0.99%, reflecting market interest rates. The discount rates in effect at December 31, 2020 will be used to measure net periodic benefit cost during 2021.

The benefit obligation and the net periodic benefit 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, 2020, the assumed rate of increase for our U.S. plans was 6.5%, decreasing to 4.5% in 2029 and thereafter.

The net periodic benefit 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 7.25% 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 1.79% is based on expectations and asset allocations that vary by region. The asset allocations are summarized in Note 14 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 greater of the projected benefit obligation or the market related value of the plan assets 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:

Millions of dollars	Effects on Benefit Obligations in 2020		Effects on Net Periodic Pension Costs in 2021	
	U.S.	Non-U.S.	U.S.	Non-U.S.
Projected benefit obligations at December 31, 2020	\$ 2,039	\$ 2,159	\$ —	\$ —
Projected net periodic pension costs in 2021	—	—	29	68
Discount rate increases by 100 basis points	(185)	(292)	(7)	(5)
Discount rate decreases by 100 basis points	220	381	8	24

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

Millions of dollars	Effects on Benefit Obligations in 2020		Effects on Net Periodic Benefit Costs in 2021	
	U.S.	Non-U.S.	U.S.	Non-U.S.
Projected benefit obligations at December 31, 2020	\$ 211	\$ 86	\$ —	\$ —
Projected net periodic benefit costs in 2021	—	—	(1)	5
Discount rate increases by 100 basis points	(19)	—	(1)	—
Discount rate decreases by 100 basis points	20	—	2	—

Additional information on the key assumptions underlying these benefit costs appears in Note 14 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 basis, 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 13 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.

At December 31, 2020 and 2019, an instantaneous parallel shift up or down in the underlying commodity price of 10% and no corresponding change in the underlying implied volatilities of those prices, would have resulted in an additional impact to Other comprehensive loss of approximately \$11 million and less than \$1 million, respectively.

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 the cross-currency basis swaps at December 31:

Net Investment Hedges	2020	2019	10% Variance on Foreign Currency Rate	2020	2019
	Notional Amount			Impact on Other Comprehensive Loss	
Cross Currency Basis Swaps	€617 million	€617 million	euro/U.S. dollar rate EURIBOR and LIBOR rates	\$77 million Less than \$1 million	\$70 million Less than \$1 million
Cross Currency Swaps	€750 million	—	euro/U.S. dollar rate	\$101 million	—
Forward Exchange Contracts	€300 million	—	euro/U.S. dollar rate	\$37 million	—
Guaranteed Euro Notes due 2022	—	€750 million	euro/U.S. dollar rate	—	\$84 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.

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 exchange contracts and 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 maintain risk management control practices to monitor the foreign currency risk attributable to our intercompany 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, 2020 and 2019, 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 resulted in an additional impact to earnings of approximately \$4 million and \$2 million, respectively.

At December 31, 2020, non-cancellable cross-currency swaps with an aggregated notional of \$2,005 million, were 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. These foreign currency contracts have maturity dates ranging from 2021 to 2027 and their fair value was a net liability of \$259 million. A 10% fluctuation compared to the U.S. dollar would have resulted in an additional impact to Other comprehensive loss of approximately \$250 million and \$238 million in 2020 and 2019, respectively.

Other income, net, in the Consolidated Statements of Income reflected net exchange rate foreign currency losses of \$7 million, gains of \$9 million and \$24 million in 2020, 2019 and 2018, respectively. 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, 2020, these foreign currency contracts, which will mature between January 2021 and June 2021, inclusively, had an aggregated notional amount of \$225 million and the fair value was a net liability of \$1 million. A 10% fluctuation compared to the U.S. dollar would have resulted in an additional impact to earnings of approximately \$5 million and \$31 million in 2020 and 2019, 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 and issuance of floating rate debt, 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, 2020, the total notional amount of our interest rate contracts designated as cash flow hedges, which have maturity dates ranging from 2023 to 2024, was \$1,000 million and the fair value was a net liability of \$343 million. We estimate that a 10% change in market interest rates as of December 31, 2020 and 2019, would change the fair value of our forward-starting interest rate swaps outstanding and would have resulted in an impact on Other comprehensive loss of approximately \$44 million and \$66 million, respectively.

Fixed-rate debt—We enter into interest rate swaps as part of our interest rate risk management strategy. At December 31, 2020, the total notional amount of an interest rate swap designated as a fair value hedge, which matures in 2026, was \$122 million and their fair value was a net asset of \$2 million.

At December 31, 2020, after giving consideration to the \$122 million of fixed-rate debt that we have effectively converted to floating through these fixed-for-floating interest rate swaps, approximately 83% of our debt portfolio, on a gross basis, incurred interest at a fixed-rate and the remaining 17% of the portfolio incurred interest at a variable-rate. We estimate that a 10% change in market interest rates as of December 31, 2020 and 2019, would change the fair value of our interest rate swaps outstanding and would have resulted in an impact on our pre-tax income of approximately less than \$1 million and \$15 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, our Term Loan due 2022, our Guaranteed Floating Rate Notes due 2023 and our Commercial Paper Program. At December 31, 2020, there were no outstanding borrowings under our Senior Revolving Credit Facility and our U.S. Receivables Facility. At December 31, 2020, our Term Loan due 2022, Guaranteed Floating Rate Notes due 2023 and Commercial Paper Program had carrying values of \$1,448 million, \$646 million and \$500 million, respectively. Based on our average variable-rate debt outstanding per year, we estimate that a 10% change in market interest rates would have had \$3 million and \$1 million impact on earnings in 2020 and 2019, 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, 2020 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, 2020.

The effectiveness of our internal control over financial reporting as of December 31, 2020 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, 2020 and 2019, 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, 2020, 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, 2020, 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, 2020 and 2019, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2020 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, 2020, 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 matters communicated below are matters arising from the current period audit of the consolidated financial statements that were communicated or required to be communicated to the audit committee and that (i) relate 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 matters below, providing separate opinions on the critical audit matters or on the accounts or disclosures to which they relate.

Taxation - Provisions for unrecognized tax benefits

As described in Notes 2, 9, 10, and 16 to the consolidated financial statements, as of December 31, 2020, the Company has recorded an income tax provision benefit of \$43 million, income tax receivables of \$890 million, income tax payables of \$67 million, and net deferred tax liabilities of \$2,293 million related to which they have reported \$339 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 the significant judgment by management when determining provisions for unrecognized tax benefits, 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 tax uncertainties. Also, the audit effort involved the use of professionals with specialized skill and knowledge.

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.

Impairment of Long-Lived Assets – Houston refinery

As described in Notes 2 and 7 to the consolidated financial statements, the Company's property, plant and equipment, net balance was \$14,386 million as of December 31, 2020, and the impairment charge relating to the Houston refinery's asset group was \$582 million. As disclosed by management, management identifies the need to test for impairment based on several indicators, including a significant reduction in prices of or demand for products produced, a weakened outlook for profitability, a significant reduction in margins, other changes to contracts or changes in the regulatory environment. If the sum of the undiscounted estimated pre-tax cash flows for an asset group is less than the asset group's carrying value, fair value is calculated for the asset group, and the carrying value is written down to the calculated fair value. As disclosed in Note 7, in 2020 management concluded that due to prolonged reduction of travel and associated transportation fuels consumption resulting from the COVID-19 pandemic, a triggering event existed related to the Company's Houston refinery's asset group. As a result, management assessed the Houston refinery for impairment and recognized a non-cash impairment charge of \$582 million. As disclosed by management, fair value is estimated using a discounted cash flow model. Management applied significant judgment in estimating the expected future cash flows for the Houston refinery's asset group including the use of significant assumptions with respect to the margins on refined products and operating rates.

The principal considerations for our determination that performing procedures relating to the impairment of the long-lived assets in the Houston refinery's asset group is a critical audit matter are the significant judgment by management when developing the fair value measurement of the asset group, which led to a high degree of auditor judgment, subjectivity, and effort in performing procedures and evaluating management's significant assumptions related to the margins on refined products and operating rates. Also, the audit effort involved the use of professionals with specialized skill and knowledge.

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 management's long-lived asset impairment assessment, including controls over the valuation of the Houston refinery's asset group. These procedures also included, among others; (i) testing management's process for developing the fair value estimate of the Houston refinery's asset group, (ii) evaluating the appropriateness of the undiscounted and discounted cash flow models; (iii) testing the completeness and accuracy of underlying data used in the models; and (iv) evaluating the reasonableness of the significant assumptions used by management related to the margins on refined products and operating rates. Evaluating management's assumptions related to the margins on refined products and operating rates involved evaluating whether the assumptions used by management were reasonable considering the current and past performance of the Houston refinery, the outlook of analysts with respect to projected spreads on refined products, and whether the assumptions were consistent with evidence obtained in other areas of the audit. Professionals with specialized skill and knowledge were used to assist in the evaluation of the Company's undiscounted and discounted cash flow models and the terminal growth rate and discount rate assumptions.

/s/ PricewaterhouseCoopers LLP
Houston, Texas
February 25, 2021

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

LYONDELLBASELL INDUSTRIES N.V.
CONSOLIDATED STATEMENTS OF INCOME

Millions of dollars, except earnings per share	Year Ended December 31,		
	2020	2019	2018
Sales and other operating revenues:			
Trade	\$ 26,995	\$ 33,908	\$ 38,126
Related parties	758	819	878
	<u>27,753</u>	<u>34,727</u>	<u>39,004</u>
Operating costs and expenses:			
Cost of sales	24,359	29,301	32,529
Impairment of long-lived assets	582	—	—
Selling, general and administrative expenses	1,140	1,199	1,129
Research and development expenses	113	111	115
	<u>26,194</u>	<u>30,611</u>	<u>33,773</u>
Operating income	1,559	4,116	5,231
Interest expense	(526)	(347)	(360)
Interest income	12	19	45
Other income, net	85	39	106
Income from continuing operations before equity investments and income taxes	1,130	3,827	5,022
Income from equity investments	256	225	289
Income from continuing operations before income taxes	1,386	4,052	5,311
(Benefit from) provision for income taxes	(43)	648	613
Income from continuing operations	1,429	3,404	4,698
Loss from discontinued operations, net of tax	(2)	(7)	(8)
Net income	1,427	3,397	4,690
Dividends on redeemable non-controlling interests	(7)	(7)	(2)
Net income attributable to the Company shareholders	<u>\$ 1,420</u>	<u>\$ 3,390</u>	<u>\$ 4,688</u>
Earnings per share:			
Net income (loss) attributable to the Company shareholders —			
Basic:			
Continuing operations	\$ 4.25	\$ 9.61	\$ 12.06
Discontinued operations	(0.01)	(0.02)	(0.02)
	<u>\$ 4.24</u>	<u>\$ 9.59</u>	<u>\$ 12.04</u>
Diluted:			
Continuing operations	\$ 4.25	\$ 9.60	\$ 12.03
Discontinued operations	(0.01)	(0.02)	(0.02)
	<u>\$ 4.24</u>	<u>\$ 9.58</u>	<u>\$ 12.01</u>

See Notes to the Consolidated Financial Statements.

LYONDELLBASELL INDUSTRIES N.V.
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME

Millions of dollars	Year Ended December 31,		
	2020	2019	2018
Net income	\$ 1,427	\$ 3,397	\$ 4,690
Other comprehensive income (loss), net of tax—			
Financial derivatives	(226)	(132)	54
Unrealized gains on available-for-sale debt securities	1	—	—
Defined benefit pension and other postretirement benefit plans	(41)	(269)	30
Foreign currency translations	107	(20)	(92)
Total other comprehensive loss, net of tax	(159)	(421)	(8)
Comprehensive income	1,268	2,976	4,682
Dividends on redeemable non-controlling interests	(7)	(7)	(2)
Comprehensive income attributable to the Company shareholders	<u>\$ 1,261</u>	<u>\$ 2,969</u>	<u>\$ 4,680</u>

See Notes to the Consolidated Financial Statements.

**LYONDELLBASELL INDUSTRIES N.V.
CONSOLIDATED BALANCE SHEETS**

Millions of dollars	December 31,	
	2020	2019
ASSETS		
Current assets:		
Cash and cash equivalents	\$ 1,763	\$ 858
Restricted cash	2	30
Short-term investments	702	196
Accounts receivable:		
Trade, net	3,291	2,981
Related parties	150	121
Inventories	4,344	4,588
Prepaid expenses and other current assets	1,382	736
Total current assets	11,634	9,510
Operating lease assets	1,492	1,468
Property, plant and equipment, net	14,386	14,130
Equity investments	4,729	2,106
Goodwill	1,953	1,891
Intangible assets, net	751	869
Other assets	458	461
Total assets	<u>\$ 35,403</u>	<u>\$ 30,435</u>

See Notes to the Consolidated Financial Statements.

**LYONDELLBASELL INDUSTRIES N.V.
CONSOLIDATED BALANCE SHEETS**

<u>Millions of dollars, except shares and par value data</u>	December 31,	
	2020	2019
LIABILITIES, REDEEMABLE NON-CONTROLLING INTERESTS AND EQUITY		
Current liabilities:		
Current maturities of long-term debt	\$ 8	\$ 3
Short-term debt	663	445
Accounts payable:		
Trade	2,398	2,516
Related parties	550	412
Accrued liabilities	1,883	1,822
Total current liabilities	5,502	5,198
Long-term debt	15,286	11,614
Operating lease liabilities	1,222	1,216
Other liabilities	2,957	2,213
Deferred income taxes	2,332	2,015
Commitments and contingencies		
Redeemable non-controlling interests	116	116
Shareholders' equity:		
Ordinary shares, €0.04 par value, 1,275 million shares authorized, 334,015,220 and 333,476,883 shares outstanding, respectively	19	19
Additional paid-in capital	5,986	5,954
Retained earnings	4,440	4,435
Accumulated other comprehensive loss	(1,943)	(1,784)
Treasury stock, at cost, 6,030,408 and 6,568,745 ordinary shares, respectively	(531)	(580)
Total Company share of shareholders' equity	7,971	8,044
Non-controlling interests	17	19
Total equity	7,988	8,063
Total liabilities, redeemable non-controlling interests and equity	\$ 35,403	\$ 30,435

See Notes to the Consolidated Financial Statements.

LYONDELLBASELL INDUSTRIES N.V.
CONSOLIDATED STATEMENTS OF CASH FLOWS

Millions of dollars	Year Ended December 31,		
	2020	2019	2018
Cash flows from operating activities:			
Net income	\$ 1,427	\$ 3,397	\$ 4,690
Adjustments to reconcile net income to net cash provided by operating activities:			
Depreciation and amortization	1,385	1,312	1,241
Impairment of long-lived assets	582	—	—
Amortization of debt-related costs	21	11	14
Share-based compensation	55	48	39
Inventory valuation charges	16	33	—
Equity investments—			
Equity income	(256)	(225)	(289)
Distributions of earnings, net of tax	159	247	307
Deferred income taxes	331	209	260
Loss (gain) on sales of business and equity investments	3	(5)	(36)
Changes in assets and liabilities that provided (used) cash:			
Accounts receivable	(246)	367	433
Inventories	340	(129)	(141)
Accounts payable	217	(251)	(199)
Other, net	(630)	(53)	(848)
Net cash provided by operating activities	3,404	4,961	5,471
Cash flows from investing activities:			
Expenditures for property, plant and equipment	(1,947)	(2,694)	(2,105)
Acquisition of A. Schulman, net of cash acquired	—	—	(1,776)
Proceeds from repurchase agreements	—	527	—
Purchases of available-for-sale debt securities	(270)	(108)	(50)
Proceeds from sales and maturities of available-for-sale debt securities	114	511	423
Purchases of equity securities	(608)	(33)	(64)
Proceeds from sales of equity securities	313	332	97
Net proceeds from sales of business and equity investments	15	5	37
Acquisition of equity method investment	(2,440)	—	(17)
Proceeds from settlement of net investment hedges	—	—	1,108
Payments for settlement of net investment hedges	—	—	(1,078)
Other, net	(83)	(175)	(134)
Net cash used in investing activities	(4,906)	(1,635)	(3,559)

See Notes to the Consolidated Financial Statements.

LYONDELLBASELL INDUSTRIES N.V.
CONSOLIDATED STATEMENTS OF CASH FLOWS

Millions of dollars	Year Ended December 31,		
	2020	2019	2018
Cash flows from financing activities:			
Repurchases of Company ordinary shares	(4)	(3,752)	(1,854)
Dividends paid - common stock	(1,405)	(1,462)	(1,554)
Purchase of non-controlling interest	(30)	(63)	—
Issuance of long-term debt	6,378	5,031	—
Repayments of long-term debt	(2,880)	(2,974)	(394)
Debt extinguishment costs	(77)	—	—
Payments of debt issuance costs	(63)	(22)	—
Issuance of short-term debt	521	2,500	—
Repayments of short-term debt	(506)	(1,526)	—
Net proceeds from (repayments of) commercial paper	239	(549)	810
Payments on forward starting interest rate swaps that include financing elements	(238)	—	—
Proceeds from settlement of cash flow hedges	346	—	—
Proceeds from settlement of foreign currency contract	887	—	—
Payments for settlement of foreign currency contract	(882)	—	—
Other, net	(15)	(18)	(16)
Net cash provided by (used in) financing activities	<u>2,271</u>	<u>(2,835)</u>	<u>(3,008)</u>
Effect of exchange rate changes on cash	108	(4)	(31)
Increase (decrease) in cash and cash equivalents and restricted cash	877	487	(1,127)
Cash and cash equivalents and restricted cash at beginning of period	888	401	1,528
Cash and cash equivalents and restricted cash at end of period	<u>\$ 1,765</u>	<u>\$ 888</u>	<u>\$ 401</u>
Supplemental Cash Flow Information:			
Interest paid, net of capitalized interest	<u>\$ 498</u>	<u>\$ 318</u>	<u>\$ 333</u>
Net income taxes paid	<u>\$ 176</u>	<u>\$ 403</u>	<u>\$ 1,209</u>

See Notes to the Consolidated Financial Statements.

LYONDELLBASELL INDUSTRIES N.V.
CONSOLIDATED STATEMENTS OF SHAREHOLDERS' EQUITY

Millions of dollars	Ordinary Shares		Additional Paid-in Capital	Retained Earnings	Accumulated Other Comprehensive Loss	Company Share of Shareholders' Equity	Non- Controlling Interests
	Issued	Treasury					
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
Net income	—	—	—	1,427	—	1,427	—
Other comprehensive loss	—	—	—	—	(159)	(159)	—
Share-based compensation	—	53	25	(10)	—	68	—
Dividends - common stock (\$4.20 per share)	—	—	—	(1,405)	—	(1,405)	—
Dividends - redeemable non-controlling interests (\$60.00 per share)	—	—	—	(7)	—	(7)	—
Repurchases of Company ordinary shares	—	(4)	—	—	—	(4)	—
Purchase of non-controlling interests	—	—	7	—	—	7	—
Distributions to non-controlling interests	—	—	—	—	—	—	(2)
Balance, December 31, 2020	<u>\$ 19</u>	<u>\$ (531)</u>	<u>\$ 5,986</u>	<u>\$ 4,440</u>	<u>\$ (1,943)</u>	<u>\$ 7,971</u>	<u>\$ 17</u>

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.

LYONDELLBASELL INDUSTRIES N.V.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

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 assets 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.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

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 the carrying amount of our investment including advances made by us, 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.

Investments in PO Joint Ventures and the Louisiana Joint Venture—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 in Series A partnership units 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 2020 and 2019. Our ownership interest in Series A and Series B partnership units conveys us an undivided interest in certain U.S. PO Joint Venture assets with correlative PO and co-product capacity, respectively, resulting in the ownership of annual in-kind cost-based PO and co-product production.

In addition, each partner has 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 resulting in ownership of annual in-kind cost-based PO and SM production.

We 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 off-take.

During the fourth quarter of 2020, we executed joint venture agreement with Sasol Chemicals (USA) LLC (“Sasol”) to form the Louisiana Integrated PolyEthylene JV LLC joint venture (the “Louisiana Joint Venture”). Under this arrangement, we acquired a 50% ownership interest in an ethane cracker, a low-density and linear-low density polyethylene plants, and associated infrastructure. Under the terms of the joint venture agreement, each partner provides their pro-rata share of ethane feedstocks and off-takes their pro-rata shares of cracker and polyethylene products. We operate the Louisiana Joint Venture assets and market all the polyethylene off-take through our global sales team.

We account for the PO Joint Ventures and the Louisiana Joint Venture using the equity method. We report the cost of our product off-take as inventory and the 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.

LYONDELLBASELL INDUSTRIES N.V.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

Our equity investment in the PO Joint Ventures and the Louisiana Joint Venture represents our share of the manufacturing plants and is decreased by recognition of our share of equity loss, which is equal to the depreciation of the assets of these joint ventures. Other changes in the investment balance are principally due to our additional capital contributions to these 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 off-take of PO and its co-products from the PO Joint Ventures was 2,569 thousand tons in 2020, 2,431 thousand tons in 2019 and 2,623 thousand tons in 2018. Our product off-take of ethylene and polyethylene produced from the Louisiana Joint Venture in December 2020, the period subsequent to the formation of the joint venture, was representative of our proportionate share of production and not material for the year ended December 31, 2020.

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 on 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, to reflect new information obtained about facts and circumstances that existed at the acquisition date. Thereafter, 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.

For 2020 and 2019, 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. Based on this assessment, our historical assessment for impairment and forecasted demand for our products, a quantitative goodwill impairment test was not required and no goodwill impairment was recognized.

LYONDELLBASELL INDUSTRIES N.V.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

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 certain post-remediation monitoring costs, the timing of which can be determined with reasonable certainty, are discounted to present value.

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”) 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 adjustments).

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 earnings.

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.

We have marketing arrangements to off-take and sell the production of some of our joint ventures in return for a percentage of the price realized on the sales to the end customer. In such arrangements, when we obtain control of the product, revenue and cost of sales are presented on a gross basis. Otherwise, we recognize revenue, net of amounts due to the joint venture, which represents commissions earned.

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.

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 15 to the Consolidated Financial Statements for additional information.

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. 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 derived from usage or market-based indices, such as the consumer price index. Variable lease payments may fluctuate for a variety of reasons including usage, output, insurance or taxes. These variable amounts are expensed as incurred and not included in the lease assets or lease liabilities. 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. 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. Cash flows related to economic hedges are classified consistent with the cash flows of the economic hedged items.

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 contracts and forward exchange contracts.

LYONDELLBASELL INDUSTRIES N.V.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

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 cross-currency 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, options 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.

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, options 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 and options 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 inputs are quoted prices for identical instruments in active markets. Level 2 inputs are 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 inputs are 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.

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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

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 13 to the Consolidated Financial Statements:

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 such as known notional value amounts, yield curves, basis curves, as applicable, and with the foreign currency leg revalued using published spot and forward 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.

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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

We use the following inputs and valuation techniques to estimate the fair value of our pension assets disclosed in Note 14 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.

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.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

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.

Events surrounding the COVID-19 pandemic continue to evolve and negatively impact global markets and demand for our products. We continue to assess the potential financial statement impacts of COVID-19 and commodity price volatility throughout the duration of the pandemic. The extent of the impact of the pandemic on our operational and financial performance will depend on future developments which are uncertain and cannot be predicted. An extended period of economic disruption could have a material adverse impact on our business, results of operations, access to sources of liquidity and financial condition.

Recently Adopted Guidance

Reference Rate Reform—In March 2020, the FASB issued Accounting Standards Update (“ASU”) 2020-04, *Reference Rate Reform (Topic 848): Facilitation of the Effects of Relief of Reference Rate Reform on Financial Reporting*. In addition, in January 2021, FASB issued ASU 2021-01, *Reference Rate Reform (Topic 848)* which clarifies the scope of Topic 848. This guidance provides optional expedients and exceptions in accounting for contract modifications, hedging relationships and other transactions that reference London Inter-Bank Offered Rate (“LIBOR”), or another reference rate, expected to be discontinued as a result of reference rate reform, if certain criteria are met. The expedients and exceptions provided by this guidance are available from January 1, 2020, prospectively, and do not apply to contract modifications made and hedging relationships entered into or evaluated after December 31, 2022, except for hedging relationships existing as of December 31, 2022, that the entity has elected certain optional expedients for and that are retained through the end of the hedging relationship.

The adoption of this guidance prospectively from January 1, 2020 did not have a material impact on our Consolidated Financial Statements and will enable us to update our assessments of effectiveness, probability, and hedged risk in order to continue hedge accounting for the designated hedges that reference a rate expected to be discontinued as a result of the reference rate reform without requiring de-designation of current hedging relationships. The Company will continue to evaluate the guidance to determine the timing and extent to which we will apply other accounting relief provided by the guidance.

Codification Improvements—In March 2020, the FASB issued ASU 2020-03, *Codification Improvements to Financial Instruments*. This guidance makes various narrow-scope changes that are intended to improve the guidance on fair value option measurement and disclosures, applicability of portfolio exception to non-financial items, evolving-debt arrangements and allowance for credit losses related to leases. Effective dates vary with certain amendments being effective upon issuance of the guidance or from January 1, 2020 on a modified-retrospective basis by means of a cumulative-effect adjustment to opening retained earnings.

The adoption of this guidance did not have a material impact on our Consolidated Financial Statements.

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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

Income Taxes—In December 2019, the FASB issued ASU No. 2019-12, *Income Taxes (Topic 740)*. 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 intra-period 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. Depending on the amendment, the guidance may be adopted on a retrospective, modified retrospective or prospective basis. Early adoption is permitted.

The early adoption of this guidance from January 1, 2020 did not have a material impact on our Consolidated Financial Statements.

Intangibles—In August 2018, the FASB issued ASU 2018-15, *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 prospectively from January 1, 2020 did not have a material impact on our Consolidated Financial Statements.

Compensation—In August 2018, the FASB issued ASU 2018-14, *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 and adds more pertinent disclosures.

The adoption of guidance as of December 31, 2020 on a retrospective basis did not have a material impact on our Consolidated Financial Statements.

Fair Value Measurement—In August 2018, the FASB issued ASU 2018-13, *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 disclosure of transfers 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. Certain amendments in this guidance are required to be applied prospectively, and others are to be applied retrospectively.

The adoption of this guidance from January 1, 2020 did not have a material impact on our Consolidated Financial Statements.

Accounting Guidance Issued But Not Adopted as of December 31, 2020

Codification Improvements—In October 2020, the FASB issued ASU 2020-08, *Codification Improvements to (Subtopic 310-20): Receivables—Nonrefundable Fees and Other Costs*. This guidance requires that at each reporting period, to the extent that the amortized cost of an individual callable debt security exceeds the amount repayable by the issuer at the next call date, the excess premium should be amortized to the next call date.

The guidance is effective for annual and interim periods starting after December 15, 2020 and early adoption is not permitted. The adoption of the new guidance will not have a material impact on our Consolidated Financial Statements.

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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

Debt—In August 2020, the FASB issued ASU 2020-06, *Debt with Conversion and Other Options (Subtopic 470-20) and Derivatives and Hedging—Contracts in Entity’s Own Equity (Subtopic 815-40)*. This guidance simplifies the accounting for convertible instruments and the application of the derivatives scope exception for contracts in an entity’s own equity. The standard also amends the accounting for convertible instruments in the diluted earnings per share calculation and requires enhanced disclosures of convertible instruments and contracts in an entity’s own equity. The guidance is effective for fiscal years beginning after December 15, 2021 and may be applied on a modified or fully retrospective basis.

The new guidance is not expected to have a material impact on our Consolidated Financial Statements.

In October 2020, the FASB issued ASU 2020-09, *Debt (Topic 470): Amendments to SEC Paragraphs Pursuant to SEC Release No. 33-10762* which amends and supersedes SEC paragraphs in the Accounting Standards Codification to reflect the issuance of SEC Release No. 33-10762 related to financial disclosure requirements for subsidiary issuers and guarantors of registered debt securities and affiliates whose securities are pledged as collateral for registered securities. The guidance is effective for annual and interim periods ending after January 4, 2021.

We are currently assessing the impact of this guidance on our Consolidated Financial Statements.

3. Revenues

Contract Balances—Contract liabilities were \$194 million and \$124 million at December 31, 2020 and 2019, 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.

Revenues disaggregated by key products are summarized below:

<u>Millions of dollars</u>	<u>Year Ended December 31,</u>		
	<u>2020</u>	<u>2019</u>	<u>2018</u>
<i>Sales and other operating revenues:</i>			
Olefins & co-products	\$ 2,432	\$ 2,957	\$ 3,679
Polyethylene	5,842	6,070	7,439
Polypropylene	4,525	5,010	5,703
Propylene oxide and derivatives	1,714	1,924	2,378
Oxyfuels and related products	2,278	3,116	3,399
Intermediate chemicals	2,080	2,516	3,568
Compounding and solutions	3,223	4,096	3,091
Advanced polymers	680	750	930
Refined products	4,346	7,599	8,221
Other	633	689	596
Total	<u>\$ 27,753</u>	<u>\$ 34,727</u>	<u>\$ 39,004</u>

LYONDELLBASELL INDUSTRIES N.V.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

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

<u>Millions of dollars</u>	<u>Year Ended December 31,</u>		
	<u>2020</u>	<u>2019</u>	<u>2018</u>
Sales and other operating revenues:			
United States	\$ 12,113	\$ 16,349	\$ 18,671
Germany	2,113	2,708	2,949
China	1,474	1,225	1,137
Mexico	1,197	1,634	2,308
Italy	1,175	1,435	1,582
Poland	926	960	984
Japan	876	1,039	1,257
France	875	1,345	1,460
The Netherlands	785	929	1,050
Other	6,219	7,103	7,606
Total	<u>\$ 27,753</u>	<u>\$ 34,727</u>	<u>\$ 39,004</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.

4. Related Party Transactions

We have related party transactions with our joint venture partners, which are classified as equity investees (see Note 8 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, 2020.

LYONDELLBASELL INDUSTRIES N.V.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

Related party transactions are summarized as follows:

Millions of dollars	Year Ended December 31,		
	2020	2019	2018
The Company billed related parties for:			
Sales of products—			
Joint venture partners	\$ 758	\$ 819	\$ 878
Shared service agreements—			
Joint venture partners	6	8	9
Related parties billed the Company for:			
Sales of products—			
Joint venture partners	\$ 2,682	\$ 2,830	\$ 2,999
Shared service agreements—			
Joint venture partners	75	71	70

5. 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 \$15 million and \$16 million as of December 31, 2020 and 2019, respectively. We recorded provisions for credit losses for receivables, which are reflected in the Consolidated Statements of Income, of \$2 million in 2020 and less than \$1 million in 2019 and 2018.

6. Inventories

Inventories consisted of the following components at December 31:

Millions of dollars	2020	2019
Finished goods	\$ 2,816	\$ 3,083
Work-in-process	144	130
Raw materials and supplies	1,384	1,375
Total inventories	<u>\$ 4,344</u>	<u>\$ 4,588</u>

At December 31, 2020 and 2019, approximately 81% and 85%, respectively, 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, 2020 and 2019, 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 \$601 million and \$670 million at December 31, 2020 and 2019, respectively. We recognized LIFO inventory charges of \$103 million and \$115 million in 2020 and 2018, respectively, and a LIFO inventory benefit of \$63 million in 2019. The amounts for 2020 and 2019 include an increase in Cost of sales of \$95 million and a decrease in Cost of sales of \$3 million, respectively, related to the liquidation of LIFO inventory layers.

During 2020, we recognized an LCM inventory valuation charge of \$16 million related to the decline in pricing for our raw material and finished goods inventories. We recognized an LCM inventory valuation charge of \$33 million during 2019 primarily related to a decline in domestic polyethylene prices.

LYONDELLBASELL INDUSTRIES N.V.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

7. 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>2020</u>	<u>2019</u>
Land		\$ 376	\$ 359
Major manufacturing equipment	25	11,698	11,572
Buildings	30	1,241	1,090
Light equipment and instrumentation	5 - 20	3,279	2,968
Office furniture	15	24	26
Major turnarounds	4 - 7	1,697	1,866
Information system equipment	3 - 5	66	69
Construction in progress		3,103	3,310
Total property, plant and equipment		21,484	21,260
Less accumulated depreciation		(7,098)	(7,130)
Property, plant and equipment, net		<u>\$ 14,386</u>	<u>\$ 14,130</u>

Capitalized Interest—We capitalize interest costs incurred on funds used to construct property, plant and equipment. In 2020, 2019 and 2018, we capitalized interest of \$40 million, \$87 million and \$45 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>2020</u>			<u>2019</u>		
	<u>Cost</u>	<u>Accumulated Amortization</u>	<u>Net</u>	<u>Cost</u>	<u>Accumulated Amortization</u>	<u>Net</u>
Emission allowances	\$ 846	\$ (611)	\$ 235	\$ 874	\$ (593)	\$ 281
Various contracts	456	(351)	105	506	(359)	147
Customer relationships	308	(51)	257	299	(32)	267
In-process research and development costs	117	(96)	21	109	(82)	27
Trade name and trademarks	108	(88)	20	102	(37)	65
Know-how	86	(27)	59	84	(15)	69
Software costs	122	(68)	54	74	(61)	13
Total intangible assets	<u>\$ 2,043</u>	<u>\$ (1,292)</u>	<u>\$ 751</u>	<u>\$ 2,048</u>	<u>\$ (1,179)</u>	<u>\$ 869</u>

Amortization of these identifiable intangible assets for the next five years is expected to be \$90 million in 2021, \$85 million in 2022, \$79 million in 2023, \$69 million in 2024 and \$68 million in 2025.

LYONDELLBASELL INDUSTRIES N.V.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

Impairment of Long-Lived Assets—During the third quarter of 2020, we identified impairment triggers relating to our Houston refinery’s asset group as a result of significant negative impacts to the Refining segment forecasted cash flows. Expected prolonged reduction of travel and associated transportation fuels consumption resulting from the COVID-19 pandemic which created an oversupply in global fuel markets that will pressure refining profitability for an extended period of time. In addition, the refinery is expected to continue to be adversely affected by lower discounts for the heavy crude oil feedstocks that we utilize. Due to these trends, we assessed the Houston refinery for impairment and determined that the asset group carrying value exceeded its undiscounted estimated pre-tax cash flows. As of September 30, 2020, we estimated the fair value of the Houston refinery’s property, plant and equipment to be \$550 million, and fair value of intangible assets to be \$10 million, which was less than the carrying value. As a result, we recognized a non-cash impairment charge in the third quarter of 2020 of \$582 million, which includes a \$570 million impairment of property, plant and equipment and a \$12 million impairment of intangible assets. The fair value measurement for the asset group is a Level 3.

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

Millions of dollars	Year Ended December 31,		
	2020	2019	2018
Property, plant and equipment	\$ 1,143	\$ 1,092	\$ 1,075
Investments in PO Joint Ventures and Louisiana Joint Venture	72	49	41
Emission allowances	58	63	63
Various contracts	20	32	31
Customer relationships	20	24	8
In-process research and development costs	8	8	7
Trade name and trademarks	45	30	7
Know-how	11	12	4
Software costs	8	2	5
Total depreciation and amortization	<u>\$ 1,385</u>	<u>\$ 1,312</u>	<u>\$ 1,241</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:

Millions of dollars	Year Ended December 31,	
	2020	2019
Beginning balance	\$ 65	\$ 58
Payments	(6)	—
Changes in estimates	(2)	7
Accretion expense	2	1
Effects of exchange rate changes	5	(1)
Ending balance	<u>\$ 64</u>	<u>\$ 65</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.

LYONDELLBASELL INDUSTRIES N.V.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

Discontinued Operations—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.

Goodwill—The changes in the carrying amount of goodwill in each of the Company’s reportable segments for the years ended December 31, 2020 and 2019 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, 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	162	112	228	1,380	9	1,891
Foreign currency translation adjustments	—	30	31	(1)	2	62
December 31, 2020	<u>\$ 162</u>	<u>\$ 142</u>	<u>\$ 259</u>	<u>\$ 1,379</u>	<u>\$ 11</u>	<u>\$ 1,953</u>

The measurement period adjustments were related to the August 2018 acquisition of A. Schulman Inc (“A. Schulman”).

8. Equity Investments

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

<u>Percent of Ownership</u>	<u>2020</u>	<u>2019</u>
PO Joint Ventures—		
European PO Joint Venture	50.00 %	50.00 %
U.S. PO Joint Venture - Series A	23.71 %	23.71 %
U.S. PO Joint Venture - Series B	100.00 %	100.00 %
Louisiana Joint Venture	50.00 %	— %
Bora LyondellBasell Petrochemical Co. Ltd.	50.00 %	— %
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 %

LYONDELLBASELL INDUSTRIES N.V.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

The changes in our equity investments are as follows at December 31:

Millions of dollars	2020	2019
Beginning balance	\$ 2,106	\$ 2,080
Capital contributions	96	86
Income from equity investments	256	225
Acquisition of equity investments	2,438	—
Distribution of earnings, net of tax	(159)	(247)
Depreciation of PO Joint Ventures and Louisiana Joint Venture	(72)	(49)
Currency exchange effects	62	11
Other	2	—
Ending balance	<u>\$ 4,729</u>	<u>\$ 2,106</u>

Capital contributions in 2020 and 2019 include \$83 million and \$86 million, respectively, related to our PO Joint Ventures.

During the third quarter of 2020, we executed a joint venture agreement with the Liaoning Bora Enterprise Group (“Bora”) to form the Bora LyondellBasell Petrochemical Co. Ltd (“BLYB”) joint venture. We contributed \$472 million for a 50% equity interest in the joint venture. This joint venture is included in our Olefins and Polyolefins—Europe, Asia, International segment. Production began at the BLYB complex during the third quarter of 2020.

BLYB’s manufacturing facility located in Panjin, China includes a 1.1 million tons per annum flexible naphtha / liquefied petroleum gas cracker and associated polyethylene production capacity of 0.8 million tons per annum and 0.6 million tons per annum of polypropylene. The materials produced at the facility serve various industries in China, including packaging, transportation, building and construction, healthcare and hygiene. The complex utilizes LyondellBasell’s *Spheripol* and *Spherizone* polypropylene technologies along with the company’s *Hostalen ACP* polyethylene technology. We market all the polypropylene and high-density polyethylene produced.

In December 2020 we executed a joint venture agreement with Sasol to form the Louisiana Joint Venture, acquiring a 50% equity interest of the 1.5 million ton ethane cracker, 0.9 million ton low and linear-low density polyethylene plants and associated infrastructure located in Lake Charles, Louisiana, for total consideration of \$2 billion. This joint venture is included within our Olefins and Polyolefins—Americas segment. Under the terms of the arrangement, each joint venture partner will provide pro-rata shares of ethane feedstocks and will off-take pro-rata shares of cracker and polyethylene products. We operate the Louisiana Joint Venture assets and market all the polyethylene off-take through our global sales team.

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	2020	2019
Current assets	\$ 4,396	\$ 2,716
Noncurrent assets	11,613	5,167
Total assets	16,009	7,883
Current liabilities	3,081	1,764
Noncurrent liabilities	2,562	1,067
Net assets	<u>\$ 10,366</u>	<u>\$ 5,052</u>

LYONDELLBASELL INDUSTRIES N.V.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

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,		
	2020	2019	2018
Revenues	\$ 9,172	\$ 9,222	\$ 10,977
Cost of sales	(7,799)	(7,921)	(9,394)
Gross profit	1,373	1,301	1,583
Net operating expenses	(404)	(367)	(420)
Operating income	969	934	1,163
Interest income	1	5	6
Interest expense	(70)	(64)	(70)
Foreign currency translation	5	4	1
Other income (expense), net	2	(24)	24
Income before income taxes	907	855	1,124
Provision for income taxes	(183)	(194)	(260)
Net income	<u>\$ 724</u>	<u>\$ 661</u>	<u>\$ 864</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 included in Income from equity investments in the Consolidated Statements of Income for the years ended December 31, 2020, 2019 and 2018, was \$5 million, \$4 million and \$5 million, respectively.

On January 25, 2021 we signed an agreement with China Petroleum & Chemical Corporation to form Ningbo ZRCC LyondellBasell New Material Company Limited, a 50/50 joint venture. The joint venture will construct a new PO and SM unit in Zhenhai Ningbo, China. The unit will use LyondellBasell's leading PO/SM technology and will have the capacity to produce 275 thousand tons of PO and 600 thousand tons of SM per year. Products produced by the joint venture will be marketed equally by both partners, expanding our respective participation in the Chinese market. The formation of the joint venture is subject to approvals by relevant government authorities, including anti-trust review by the State Administration for Market Regulation. We expect to make an equity contribution of approximately \$100 million to the joint venture during the first half of 2021 and startup is expected at the end of 2021. The joint venture will be included within our Intermediates & Derivatives segment.

9. Prepaid Expenses, Other Current Assets and Other Assets

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

Millions of dollars	2020	2019
Income tax receivable	\$ 890	\$ 175
VAT receivables	158	178
Renewable identification numbers	63	39
Advances to suppliers	61	54
Financial derivatives	41	54
Prepaid insurance	28	26
Other	141	210
Total prepaid expenses and other current assets	<u>\$ 1,382</u>	<u>\$ 736</u>

LYONDELLBASELL INDUSTRIES N.V.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

For additional information regarding Income tax receivables, see Note 16 to our Consolidated Financial Statements.

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

Millions of dollars	2020	2019
Derivative contracts	\$ 244	\$ 255
Company-owned life insurance	61	61
Deferred tax assets	39	38
Pension assets	23	22
Debt issuance costs	10	11
Other	81	74
Total other assets	<u>\$ 458</u>	<u>\$ 461</u>

10. Accrued Liabilities

Accrued liabilities consisted of the following components at December 31:

Millions of dollars	2020	2019
Payroll and benefits	\$ 370	\$ 385
Operating lease liabilities	310	273
Taxes other than income taxes	232	202
Interest	169	161
Financial derivatives	139	183
Product sales rebates	149	142
Contract liabilities	157	103
Renewable identification numbers	95	46
Income taxes	67	66
Other	195	261
Total accrued liabilities	<u>\$ 1,883</u>	<u>\$ 1,822</u>

LYONDELLBASELL INDUSTRIES N.V.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

11. Debt

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

<u>Millions of dollars</u>	<u>2020</u>	<u>2019</u>
Senior Notes due 2021, \$1,000 million, 6.0%	\$ —	\$ 998
Senior Notes due 2024, \$1,000 million, 5.75% (\$4 million of debt issuance cost)	996	995
Senior Notes due 2055, \$1,000 million, 4.625% (\$15 million of discount; \$11 million of debt issuance cost)	974	973
Term Loan due 2022, \$4,000 million (\$2 million of debt issuance costs)	1,448	1,950
Guaranteed Notes due 2022, €750 million, 1.875%	—	841
Guaranteed Notes due 2023, \$750 million, 4.0% (\$3 million of discount; \$2 million of debt issuance cost)	745	744
Guaranteed Floating Rate Notes due 2023, \$650 million (\$4 million of debt issuance cost)	646	—
Guaranteed Notes due 2025, \$500 million, 2.875% (\$4 million of debt issuance cost)	496	—
Guaranteed Notes due 2025, \$500 million, 1.25% (\$1 million of discount; \$4 million of debt issuance cost)	495	—
Guaranteed Notes due 2026, €500 million, 0.875% (\$2 million of discount; \$3 million of debt issuance cost)	608	555
Guaranteed Notes due 2027, \$1,000 million 3.5% (\$7 million of discount; \$5 million of debt issuance cost)	1,090	1,023
Guaranteed Notes due 2027, \$300 million, 8.1%	300	300
Guaranteed Notes due 2030, \$500 million, 3.375% (\$1 million of discount; \$4 million of debt issuance cost)	495	—
Guaranteed Notes due 2030, \$500 million, 2.25% (\$4 million of discount; \$4 million of debt issuance cost)	492	—
Guaranteed Notes due 2031, €500 million, 1.625% (\$5 million of discount; \$4 million of debt issuance cost)	602	552
Guaranteed Notes due 2040, \$750 million, 3.375% (\$2 million of discount; \$8 million of debt issuance cost)	740	—
Guaranteed Notes due 2043, \$750 million, 5.25% (\$20 million of discount; \$7 million of debt issuance cost)	723	723
Guaranteed Notes due 2044, \$1,000 million, 4.875% (\$10 million of discount; \$9 million of debt issuance cost)	981	980
Guaranteed Notes due 2049, \$1,000 million, 4.2% (\$15 million of discount; \$10 million of debt issuance cost)	975	975
Guaranteed Notes due 2050, \$1,000 million, 4.2% (\$6 million of discount; \$10 million of debt issuance cost)	984	—
Guaranteed Notes due 2051, \$1,000 million, 3.625% (\$3 million of discount; \$11 million of debt issuance cost)	986	—
Guaranteed Notes due 2060, \$500 million, 3.8% (\$4 million of discount; \$6 million of debt issuance cost)	490	—
Other	28	8
Total	15,294	11,617
Less current maturities	(8)	(3)
Long-term debt	<u>\$ 15,286</u>	<u>\$ 11,614</u>

LYONDELLBASELL INDUSTRIES N.V.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

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>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>
Senior Notes due 2019, 5.0%	2014	\$ —	\$ (11)	\$ —	\$ —
Senior Notes due 2021, 6.0%	2016	1	(21)	—	(1)
Guaranteed Notes due 2027, 3.5%	2017	(65)	(58)	(102)	(37)
Guaranteed Notes due 2022, 1.875%	2018	2	(1)	—	(2)
Guaranteed Notes due 2026, 0.875%	2020	(2)	—	(2)	—
Total		<u>\$ (64)</u>	<u>\$ (91)</u>	<u>\$ (104)</u>	<u>\$ (40)</u>

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 at December 31:

<u>Millions of dollars</u>	<u>2020</u>	<u>2019</u>
Commercial paper	\$ 500	\$ 262
Precious metal financings	140	181
Other	23	2
Total Short-term debt	<u>\$ 663</u>	<u>\$ 445</u>

Aggregate maturities of debt during the next five years are \$671 million in 2021, \$1,456 million in 2022, \$1,405 million in 2023, \$1,005 million in 2024, \$1,004 million in 2025 and \$10,522 million thereafter.

Long-Term Debt

Senior Revolving Credit Facility—Our \$2,500 million Senior Revolving Credit Facility which may be used for dollar and euro denominated borrowings, has a \$500 million sub-limit for dollar and euro denominated letters of credit, a \$1,000 million uncommitted accordion feature, and supports our commercial paper program. 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. The facility contains customary covenants and warranties, including specified restrictions on indebtedness and liens. See Credit Agreements section below for additional details regarding our leverage ratio covenant. At December 31, 2020, we had no borrowings or letters of credit outstanding and \$2,020 million of unused availability under this facility.

In October 2020, we amended our Senior Revolving Credit Facility to extend the term of \$2,440 million of the \$2,500 million for one year until June 2023, the remainder expires in June 2022. The amendment also included LIBOR replacement language. All other material terms of the Credit Agreement remain unchanged.

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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

Term Loan due 2022—In March 2019, LYB Americas Finance Company LLC (“LYB Americas Finance”), a wholly owned subsidiary of LyondellBasell Industries N.V., entered into a \$4,000 million senior unsecured delayed draw term loan credit facility that matures in March 2022. In 2019, we borrowed \$2,950 million under this facility to partially fund the share repurchase price paid pursuant to a modified Dutch Auction tender offer, to repay amounts outstanding under our commercial paper program and \$500 million outstanding under our U.S. Receivables Facility which we borrowed during the year. Additionally, repayments of \$1,000 million were made in 2019, using the net proceeds from the guaranteed notes due 2026 and 2031 discussed below. Borrowings under the credit agreement were available through December 31, 2019, subsequent to which no further borrowings may be made under the agreement. In October 2020 we repaid \$500 million of the indebtedness outstanding under this Term Loan, using the proceeds from guaranteed notes issued in October 2020 as discussed below.

Outstanding borrowings 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. See Credit Agreements section below for additional details regarding our leverage ratio covenant.

In January 2021, we repaid an additional \$500 million outstanding under our Term Loan due 2022.

In October 2020, LYB International Finance III, LLC (“LYB Finance III”), a wholly owned finance subsidiary of LyondellBasell Industries N.V., as defined in Rule 3-10(b) of Regulation S-X, issued the following:

Guaranteed Floating Rate Notes due 2023—LYB Finance III issued \$650 million of guaranteed floating rate notes due 2023 (the “Floating Rate Notes”). The floating rate notes will bear interest equal to the three-month LIBOR rate, plus 1.000% per annum. These notes may be redeemed on or after the date that is two years 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.

1.25% Guaranteed Notes due 2025—LYB Finance III issued \$500 million of 1.25% guaranteed notes due 2025 (the “1.25% 2025 Notes”) at a discounted price of 99.683%. These notes may be redeemed before the date that is one month prior to the scheduled maturity date at a redemption price equal to the greater of (i) 100% of the principal amount of the notes redeemed and (ii) the sum of the present values of the remaining scheduled payments of principal and interest (discounted at the applicable treasury yield plus 15 basis points) on the notes to be redeemed. These notes may also be redeemed on or after the date that is one month 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.

2.25% Guaranteed Notes due 2030—LYB Finance III issued \$500 million of 2.25% guaranteed notes due 2030 (the “2.25% 2030 Notes”) at a discounted price of 99.203%. These 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 (i) 100% of the principal amount of the notes redeemed and (ii) the sum of the present values of the remaining scheduled payments of principal and interest (discounted at the applicable treasury yield plus 25 basis points) on the notes to be redeemed. These notes may also be redeemed on or after the date that is three 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 2040—LYB Finance III issued \$750 million of 3.375% guaranteed notes due 2040 (the “2040 Notes”) at a discounted price of 99.77%. These 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 (i) 100% of the principal amount of the notes redeemed and (ii) the sum of the present values of the remaining scheduled payments of principal and interest (discounted at the applicable treasury yield plus 30 basis points) on the notes to be redeemed. These 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.

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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

Guaranteed Notes due 2051—LYB Finance III issued \$1,000 million of 3.625% guaranteed notes due 2051 (the “2051 Notes”) at a discounted price of 99.707%. These 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 (i) 100% of the principal amount of the notes redeemed and (ii) 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. These 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 2060—LYB Finance III issued \$500 million of 3.8% guaranteed notes due 2060 (the “2060 Notes”) at a discounted price of 99.166%. These 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 (i) 100% of the principal amount of the notes redeemed and (ii) 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. These 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 net proceeds of the Floating Rate Notes, 1.25% 2025 Notes, 2.25% 2030 Notes, 2040 Notes, 2051 Notes and 2060 Notes (collectively, the “October Notes”) were \$3,848 million. In October 2020, we used \$500 million of the net proceeds to repay a portion of the indebtedness outstanding under our Term Loan due 2022. In November 2020, we used \$2 billion to redeem \$1 billion aggregate principal amount of our 6.0% senior notes due 2021, and €750 million aggregate principal amount of our 1.875% guaranteed notes due 2022. In conjunction with the redemption of these notes, we recognized \$69 million of debt extinguishment costs which are reflected in Interest expense in the Consolidated Statements of Income. The debt extinguishment costs include \$77 million paid for make-whole premiums, fees and expenses related to the redemption of the notes and non-cash charges of \$4 million for the write-off of unamortized debt discount and issuance costs, partially offset by \$12 million in gains resulting from the write-off of the cumulative fair value hedge accounting adjustments. The remaining proceeds were used to fund a portion of the purchase price for the Louisiana Joint Venture.

Guaranteed Notes due 2025, 2030 and 2050—In April 2020, LYB Finance III issued \$500 million of 2.875% guaranteed notes due 2025 (the “2025 Notes”) at a discounted price of 99.911%, \$500 million of 3.375% guaranteed notes due 2030 (the “2030 Notes”) at a discounted price of 99.813% and \$1,000 million of 4.2% guaranteed notes due 2050 (the “2050 Notes”) at a discounted price of 99.373%. Net proceeds from the sale of the notes totaled \$1,974 million. We used the net proceeds from the sale of the notes for general corporate purposes, including to increase our liquidity and manage short-term debt maturities.

The 2025 Notes, 2030 Notes and 2050 Notes may be redeemed before the date that is one month, three months, or six months, respectively, prior to the scheduled maturity date at a redemption price equal to the greater of (i) 100% of the principal amount of the notes redeemed and (ii) the sum of the present values of the remaining scheduled payments of principal and interest (discounted at the applicable treasury yield plus 40 basis points in the case of the 2025 Notes or 45 basis points in the case of the 2030 Notes and 2050 Notes) on the notes to be redeemed. The 2025 Notes, 2030 Notes and 2050 Notes may also be redeemed on or after the date that is one month, three months, or six months, respectively, 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.

Guaranteed Notes due 2049—In October 2019, LYB Finance III issued \$1,000 million of 4.2% guaranteed notes due 2049 at a discounted price of 98.488%. We used net proceeds of \$974 million from the notes, along with commercial paper and operating cash, to repay \$2,000 million outstanding under our Term Loan due 2020.

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 (i) 100% of the principal amount of the notes redeemed and (ii) 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

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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 Industries 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%. We used the net proceeds from the notes to repay \$1,000 million outstanding under our Term Loan due 2022, and a portion of borrowings from our commercial paper program.

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 (i) 100% of the principal amount of the notes redeemed and (ii) 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.

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%.

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 (i) 100% of the principal amount of the notes redeemed and (ii) 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.

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%. In November 2020, proceeds from the October Notes were used to redeem €750 million aggregate principal amount of our 1.875% guaranteed notes due 2022. In conjunction with the redemption of these notes, we paid \$22 million in make-whole premiums, fees and expenses related to the redemption. Additionally, non-cash charges of \$2 million for the write-off of unamortized debt discount and issuance costs and \$1 million in gains resulting from the write-off of the cumulative fair value hedge accounting adjustment were recognized.

Senior Notes due 2055—In March 2015, LyondellBasell Industries N.V. issued \$1,000 million of 4.625% Notes due 2055 at a discounted price of 98.353%.

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 (i) 100% of the principal amount of the notes redeemed and (ii) 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 Industries 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%.

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 (i) 100% of the principal amount of the notes redeemed and (ii) 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

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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

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.

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 (i) 100% of the principal amount of the notes redeemed, and (ii) 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.

Senior Notes due 2021 and 2024—In November 2011 and April 2012, LyondellBasell Industries N.V. issued \$1,000 million of 6% senior notes due 2021 and \$1,000 million aggregate principal amount of 5.75% senior notes due 2024, respectively. In November 2020, proceeds from the October Notes were used to redeem \$1,000 million aggregate principal amount of our 6% senior notes due 2021. In conjunction with the redemption of these notes, we paid \$55 million for make-whole premiums, fees and expenses related to the redemption. Additionally, non-cash charges of \$2 million for the write-off of unamortized debt discount and issuance costs and \$11 million in gains resulting from the write-off of the cumulative fair value hedge accounting adjustment were recognized.

The Senior Notes due 2024 may be redeemed and repaid, in whole at any time or in part 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.

The indentures governing all of the above 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.

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 wholly owned subsidiary of LyondellBasell Industries 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. These 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 Industries N.V. subsidiaries.

Short-Term Debt

Term Loan due 2020—In February 2019, LYB Americas Finance entered into our Term Loan due 2020, 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 Industries 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.

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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

U.S. Receivables Facility—Our U.S. Receivables Facility, which expires in July 2021, 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. Additional fees are incurred for the average daily unused commitments. 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. Performance obligations under the facility are guaranteed by LyondellBasell Industries N.V. 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. See Credit Agreements section below for additional details regarding our leverage ratio covenant. At December 31, 2020, there were no borrowings or letters of credit outstanding and \$757 million unused availability under the facility.

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, 2020 are based on the terms of the notes and range from 0.21% to 0.30%. At December 31, 2020, we had \$500 million of outstanding commercial paper.

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, 2020 and 2019, our weighted average interest rates on outstanding Short-term debt were 0.9% and 3.3%, respectively.

Additional Information

Debt Discount and Issuance Costs—Amortization of debt discount and debt issuance costs resulted in amortization expense of \$21 million, \$11 million and \$14 million for the years ended December 31, 2020, 2019 and 2018, 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, and LYB Americas Finance Company LLC are 100% owned finance subsidiaries of LyondellBasell Industries 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 Industries N.V. Our unsecured notes rank equally in right of payment to each respective finance subsidiary’s existing and future unsecured indebtedness and to all of LyondellBasell Industries N.V.’s existing and future unsubordinated indebtedness. There are no significant restrictions that would impede LyondellBasell Industries N.V., as guarantor, from obtaining funds by dividend or loan from its subsidiaries.

Credit Agreements—In April 2020, we entered into amendments and related documents (collectively, the “Amendments”) to our Senior Revolving Credit Facility, Term Loan due 2022, and U.S. Receivables Facility (collectively, as amended, the “Credit Agreements”). The Amendments amended each Credit Agreement’s leverage ratio covenant to permit netting of unrestricted cash and cash equivalents in excess of \$300 million (with certain restrictions on non-U.S. cash) and, in respect of the Senior Revolving Credit Facility and Term Loan due 2022, restrict certain dividends and other specified restricted payments.

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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

In October 2020, we entered into amendments and related documents (collectively, the “October Amendments”) to our Credit Agreements. Among other things, the October Amendments amended each Credit Agreement’s maximum leverage ratio (calculated as the ratio of total net funded debt to consolidated earnings before interest, taxes and depreciation and amortization, both as defined in our Credit Agreements) financial covenant to (i) 5.00 to 1.00 for the fiscal quarters ending December 31, 2020 and March 31, 2021; (ii) 4.75 to 1.00 for the fiscal quarter ending June 30, 2021; (iii) 4.50 to 1.00 for the fiscal quarters ending September 30, 2021 and December 31, 2021; (iv) 4.00 to 1.00 for the fiscal quarter ending March 2022; and (v) 3.50 to 1.00 for the fiscal quarter ending June 30, 2022 and thereafter. In addition, with respect to the Senior Revolving Credit Facility and the Term Loan due 2022, the October Amendments further restrict certain dividends and other specified restricted payments.

As of December 31, 2020, we are in compliance with our debt covenants.

12. 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, 2020 and 2019, our Operating lease assets were \$1,492 million and \$1,468 million, respectively. As of December 31, 2020 and 2019, Operating lease liabilities totaled \$1,532 million and \$1,489 million of which \$310 million and \$273 million, respectively, are current and recorded in Accrued liabilities. These values were derived using a weighted average discount rate of 3.9% and 4.2% as of December 31, 2020 and 2019, respectively.

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. Certain lease agreements include options to renew the lease, at our discretion, for up to 20 years and do not materially impact our operating lease assets or operating lease liabilities.

Maturities of operating lease liabilities as of December 31, 2020, are as follows:

Millions of dollars	
2021	\$ 360
2022	295
2023	237
2024	198
2025	169
Thereafter	511
Total lease payments	1,770
Less: Imputed interest	(238)
Present value of lease liabilities	<u>\$ 1,532</u>

The following table presents the components of operating lease cost:

Millions of dollars	Year Ended December 31,	
	2020	2019
Operating lease cost	\$ 393	\$ 366
Short-term lease cost	154	152
Variable lease cost	50	61
Net operating lease cost	<u>\$ 597</u>	<u>\$ 579</u>

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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

Cash paid for amounts included in the measurement of operating lease liabilities totaled \$383 million and \$363 million for the years ended December 31, 2020 and 2019, respectively. Leased assets obtained in exchange for new operating lease liabilities totaled \$351 million for the year ended December 31, 2020. 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, 2020, we have entered into additional operating leases, with an undiscounted value of \$583 million, primarily for storage tanks related to our new PO/TBA plant in Houston, TX. These leases, which will commence between the first quarter of 2021 and 2022, have lease terms ranging from 1 to 20 years.

13. 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 contracts 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.

In October 2020, we entered into €750 million of foreign currency contracts to economically hedge the redemption of €750 million aggregate principal amount of our 1.875% guaranteed notes originally due in 2022 which were redeemed in November 2020. These foreign currency contracts were not designated as hedges. In November 2020, upon settlement of these foreign currency contracts, we paid \$882 million to our counterparties and received €750 million (\$887 million at the expiry spot rate) from our counterparties.

Foreign Currency Gain (Loss)—Other income, net, in the Consolidated Statements of Income reflected foreign currency losses of \$7 million, gains of \$9 million and \$24 million in 2020, 2019 and 2018, respectively.

Cash and Cash Equivalents—At December 31, 2020 and 2019, we had marketable securities classified as Cash and cash equivalents of \$682 million and \$389 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:

Millions of dollars	December 31, 2020		December 31, 2019		Balance Sheet Classification
	Notional Amount	Fair Value	Notional Amount	Fair Value	
Assets—					
Derivatives designated as hedges:					
Commodities	\$ 19	\$ 3	\$ —	\$ —	Prepaid expenses and other current assets
Commodities	41	4	—	—	Other assets
Foreign currency	—	26	—	27	Prepaid expenses and other current assets
Foreign currency	—	—	2,000	214	Other assets
Interest rates	—	—	—	22	Prepaid expenses and other current assets
Interest rates	122	2	1,940	41	Other assets
Derivatives not designated as hedges:					
Commodities	71	2	3	—	Prepaid expenses and other current assets
Foreign currency	149	—	580	5	Prepaid expenses and other current assets
Non-derivatives:					
Available-for-sale debt securities	348	349	162	162	Short-term investments
Equity securities	353	353	34	34	Short-term investments
Total	<u>\$ 1,103</u>	<u>\$ 739</u>	<u>\$ 4,719</u>	<u>\$ 505</u>	
Liabilities—					
Derivatives designated as hedges:					
Commodities	\$ —	\$ 2	\$ —	\$ —	Accrued liabilities
Foreign currency	1,213	146	—	16	Accrued liabilities
Foreign currency	2,682	302	950	53	Other liabilities
Interest rates	—	—	1,000	154	Accrued liabilities
Interest rates	1,000	343	700	77	Other liabilities
Derivatives not designated as hedges:					
Commodities	113	14	224	34	Accrued liabilities
Foreign currency	76	1	200	1	Accrued liabilities
Total	<u>\$ 5,084</u>	<u>\$ 808</u>	<u>\$ 3,074</u>	<u>\$ 335</u>	

All financial instruments in the tables above are classified as Level 2. We present the gross assets and liabilities of our derivative financial instruments on the Consolidated Balance Sheets.

At December 31, 2020, our outstanding foreign currency contracts not designated as hedges mature from January 2021 to June 2021. Our commodity contracts, not designated as hedges, mature on January 2021.

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 for the periods presented. Due to the short maturity, the fair value of all non-derivative financial instruments included in Current assets and Current liabilities for which the carrying value approximates fair value are excluded from the table below. 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 of long-term debt exclude commercial paper and other miscellaneous debt.

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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

Millions of dollars	December 31, 2020		December 31, 2019	
	Carrying Value	Fair Value	Carrying Value	Fair Value
Non-derivatives:				
Liabilities:				
Short-term debt	\$ 140	\$ 154	\$ 181	\$ 215
Long-term debt	15,266	17,290	11,609	12,561
Total	<u>\$ 15,406</u>	<u>\$ 17,444</u>	<u>\$ 11,790</u>	<u>\$ 12,776</u>

All financial instruments in the table above are classified as Level 2.

Net Investment Hedges—The following table summarizes our net investment hedges outstanding for the periods presented:

Millions of euro/dollars	December 31, 2020		December 31, 2019		Expiration Date
	Notional Value		Notional Value		
	Equivalent US\$	Equivalent US\$	Equivalent US\$	Equivalent US\$	
Foreign currency	€ 1,667	\$ 1,890	€ 617	\$ 650	2021 to 2030
Foreign-currency denominated debt	€ —	\$ —	€ 750	\$ 842	2022

In September 2020, we entered into €300 million of foreign currency contracts that were designated as net investment hedges.

In October 2020, euro denominated debt due 2022 with notional amounts totaling €750 million previously designated as net investment hedge, were dedesignated. Concurrent with the dedesignation of the 2022 euro denominated debt, we entered into €750 million of cross currency interest rate swaps that were designated as net investment hedges.

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

Millions of dollars	December 31, 2020		December 31, 2019		Expiration Date
	Notional Value		Notional Value		
Foreign currency	\$	2,005	\$	2,300	2021 to 2027
Interest rates		1,000		1,500	2023 to 2024
Commodities		60		—	2021 to 2022

In January 2020, we amended existing forward-starting interest rate swaps entered into in February 2019, with a total notional amount of \$1,000 million (the “Swaps”) to extend their maturities to July 2023 and April 2024. As of December 31, 2020 and 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. Other assets as of December 31, 2020 includes \$238 million of collateral held with our counterparties related to our forward-starting interest rate swaps; this amount represents the maximum amount of collateral required in accordance with the Swap agreements. Related cash flows are included in financing activities in the Consolidated Statements of Cash Flows.

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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

In May 2020, we terminated and cash settled \$2,000 million in notional value of our cross-currency interest rate swaps, designated as cash flows hedges, maturing in 2021 and 2024. Upon termination of the swaps, we received \$346 million from our counterparties. Concurrent with the settlement of the swaps, we entered into \$1,705 million cross-currency interest rate swaps with euro notional amounts and maturity dates matching the original swaps. The swaps are designated as cash flow hedges to reduce the variability in the functional currency equivalent cash flows of certain foreign currency denominated intercompany loans.

In October 2020, we terminated and cash settled \$500 million in notional value of our forward-starting interest rate swaps which were designated as cash flow hedges originally set to expire in 2021. Upon termination of the forward-starting interest rate swaps, we paid \$229 million to our counterparties.

In 2020, we entered into over-the-counter commodity swaps with a total notional amount of \$60 million. During 2020, we also entered into costless collars, which are a combination of a purchased call option with an aggregate notional volume of 27 million MMBtu and a sold put option with an aggregate notional volume of 27 million MMBtu. These transactions were designated as cash flow hedges to manage the volatility of commodity prices related to anticipated purchases of feedstock for the years 2021 and 2022.

As of December 31, 2020, on a pre-tax basis, \$5 million is scheduled to be reclassified from Accumulated other comprehensive loss as an increase to interest expense over the next twelve months.

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.

In 2019, we entered into commodity futures contracts to mitigate the risk of variability in feedstock and product sales prices. During 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 contracts outstanding and designated as cash flow hedges.

Fair Value Hedges—The following table summarizes our fair value hedges outstanding for the periods presented:

<u>Millions of dollars</u>	<u>December 31, 2020</u>	<u>December 31, 2019</u>		<u>Expiration Date</u>
	<u>Notional Value</u>	<u>Notional Value</u>	<u>Notional Value</u>	
Interest rates	\$ 122	\$ 2,140		2026

In January 2020, we entered into a euro fixed-for-floating interest rate swap to mitigate the change in the fair value of €100 million of our €500 million guaranteed notes due 2026 associated with the risk of variability in the 6-month EURIBOR rate, the benchmark interest rate. The fixed-rate and variable-rate components are settled annually and semi-annually, respectively.

In April 2020, we terminated \$2,000 million in notional value of our fixed-for-floating interest rate swaps which were designated as fair value hedges originally set to expire in 2021 and 2027. Upon termination of the fixed-for-floating interest rate swaps, we received \$147 million from our counterparties.

In November 2020, concurrent with the redemption of €750 million of our outstanding 1.875% guaranteed notes due 2022, we terminated €125 million in notional value of our fixed-for-floating interest rate swap previously designated as fair value hedge originally set to expire in 2022. Upon termination of the fixed-for-floating interest rate swap, we received \$3 million from our counterparty.

LYONDELLBASELL INDUSTRIES N.V.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

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.

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:

	Effect of Financial Instruments			Income Statement Classification
	Year Ended December 31, 2020			
Millions of dollars	Gain (Loss) Recognized in AOCI	Gain (Loss) Reclassified from AOCI to Income	Additional Gain (Loss) Recognized in Income	
Derivatives designated as hedges:				
Commodities	\$ 5	\$ —	\$ —	Cost of sales
Foreign currency	(253)	170	46	Interest expense
Interest rates	(347)	5	95	Interest expense
Derivatives not designated as hedges:				
Commodities	—	—	4	Sales and other operating revenues
Commodities	—	—	115	Cost of sales
Foreign currency	—	—	(14)	Other income, net
Non-derivatives designated as hedges:				
Long-term debt	(42)	—	—	Other income, net
Total	<u>\$ (637)</u>	<u>\$ 175</u>	<u>\$ 246</u>	

	Effect of Financial Instruments			Income Statement Classification
	Year Ended December 31, 2019			
Millions of dollars	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	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>	

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, 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	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>	

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, 2020, 2019 and 2018 were losses of \$1 million, 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, 2020, 2019 and 2018 were gains of \$10 million, \$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 \$4 million decrease in interest expense for the year ended December 31, 2020, \$6 million and \$5 million increase in interest expense for the years ended December 31, 2019 and 2018, respectively.

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
Debt securities at December 31, 2020	\$ 348	\$ 1	\$ —	\$ 349
Debt securities at December 31, 2019	162	—	—	162

The fair value of our available-for-sale debt securities is reflected in Short-term investments on our Consolidated Balance Sheets.

No allowance for credit losses related to our available-for-sale debt securities was recorded for the years ended December 31, 2020 and 2019. No losses related to other-than-temporary impairments of our available-for-sale debt securities were recorded during the year ended December 31, 2018.

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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

As of December 31, 2020, bonds classified as available-for-sale debt securities had maturities between 1 month and 6 months.

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

Millions of dollars	Year Ended December 31,		
	2020	2019	2018
Proceeds from maturities of available-for-sale debt securities	\$ 24	\$ 331	\$ 423
Proceeds from sales of available-for-sale debt securities	90	180	—

The gross realized gains and losses associated with the sale of available-for-sale debt securities during the years ended December 31, 2020 and 2019, were less than \$1 million, respectively. No gain or loss was realized in connection with the sales of our available-for-sale debt securities during the year ended December 31, 2018.

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, 2020 and 2019.

Investments in Equity Securities—Our equity securities primarily consist of limited partnership investments, reflected in Short-term investments on our Consolidated Balance Sheets. At December 31, 2020, we had investments in equity securities with a notional amount and a fair value of \$353 million. These investments may be redeemed within 7 days following written notice from the Company. At December 31, 2019, we had investments in equity securities with a notional amount and a fair value of \$34 million.

We received proceeds of \$313 million, \$332 million and \$97 million related to the sale of our investments in equity securities during the years ended December 31, 2020, 2019 and 2018, respectively.

The following table summarizes the portion of unrealized gains and losses for the equity securities that were outstanding for the periods presented:

Millions of dollars	Year Ended December 31,		
	2020	2019	2018
Net gains (losses) recognized during the period	\$ —	\$ 9	\$ 11
Less: Net gains (losses) recognized during the period on securities sold	—	9	5
Unrealized gains (losses) recognized during the period	<u>\$ —</u>	<u>\$ —</u>	<u>\$ 6</u>

14. 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.

LYONDELLBASELL INDUSTRIES N.V.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

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:

Millions of dollars	Year Ended December 31,			
	2020		2019	
	U.S.	Non-U.S.	U.S.	Non-U.S.
Change in benefit obligation:				
Benefit obligation, beginning of period	\$ 1,965	\$ 2,017	\$ 1,752	\$ 1,659
Service cost	63	46	53	36
Interest cost	53	21	70	33
Actuarial loss (gain)	133	(21)	241	331
Plan amendments	—	—	—	24
Benefits paid	(140)	(47)	(151)	(43)
Participant contributions	—	2	—	2
Settlement	(35)	(11)	—	(10)
Curtailement	—	(4)	—	(2)
Foreign exchange effects	—	156	—	(13)
Benefit obligation, end of period	2,039	2,159	1,965	2,017
Change in plan assets:				
Fair value of plan assets, beginning of period	1,637	1,058	1,548	871
Actual return on plan assets	76	26	194	186
Company contributions	10	64	46	51
Benefits paid	(140)	(47)	(151)	(43)
Participant contributions	—	2	—	2
Settlement	(35)	(11)	—	(10)
Foreign exchange effects	—	76	—	1
Fair value of plan assets, end of period	1,548	1,168	1,637	1,058
Funded status of continuing operations, end of period	\$ (491)	\$ (991)	\$ (328)	\$ (959)

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

Millions of dollars	December 31, 2020		December 31, 2019	
	U.S.	Non-U.S.	U.S.	Non-U.S.
Prepaid benefit cost, long-term	\$ —	\$ 23	\$ 4	\$ 18
Accrued benefit liability, current	—	(33)	—	(28)
Accrued benefit liability, long-term	(491)	(981)	(332)	(949)
Funded status of continuing operations, end of period	\$ (491)	\$ (991)	\$ (328)	\$ (959)

LYONDELLBASELL INDUSTRIES N.V.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

Amounts recognized in Accumulated other comprehensive loss include the following:

Millions of dollars	December 31, 2020		December 31, 2019	
	U.S.	Non-U.S.	U.S.	Non-U.S.
Actuarial and investment loss	\$ 655	\$ 353	\$ 516	\$ 405
Prior service cost	1	29	1	32
Balance, end of period	<u>\$ 656</u>	<u>\$ 382</u>	<u>\$ 517</u>	<u>\$ 437</u>

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

Millions of dollars	December 31, 2020		December 31, 2019	
	U.S.	Non-U.S.	U.S.	Non-U.S.
Accumulated benefit obligation for defined benefit plans	\$ 1,961	\$ 2,003	\$ 1,899	\$ 1,859

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

Millions of dollars	December 31, 2020		December 31, 2019	
	U.S.	Non-U.S.	U.S.	Non-U.S.
Projected benefit obligations	\$ 1,899	\$ 1,276	\$ 1,915	\$ 1,778
Fair value of assets	1,408	261	1,583	801

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

Millions of dollars	December 31, 2020		December 31, 2019	
	U.S.	Non-U.S.	U.S.	Non-U.S.
Accumulated benefit obligations	\$ 1,826	\$ 1,123	\$ 1,765	\$ 1,079
Fair value of assets	1,408	231	1,493	243

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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:

Millions of dollars	U.S. Plans		
	Year Ended December 31,		
	2020	2019	2018
Service cost	\$ 63	\$ 53	\$ 51
Interest cost	53	70	60
Expected return on plan assets	(115)	(112)	(122)
Settlement loss	4	—	2
Actuarial loss amortization	29	18	21
Net periodic benefit cost	<u>\$ 34</u>	<u>\$ 29</u>	<u>\$ 12</u>

Millions of dollars	Non-U.S. Plans		
	Year Ended December 31,		
	2020	2019	2018
Service cost	\$ 46	\$ 36	\$ 35
Interest cost	21	33	32
Expected return on plan assets	(19)	(24)	(24)
Settlement loss	2	1	1
Curtailment gain	(4)	—	—
Prior service cost amortization	3	2	1
Actuarial loss amortization	23	12	10
Net periodic benefit cost	<u>\$ 72</u>	<u>\$ 60</u>	<u>\$ 55</u>

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

	2020		2019	
	Actual	Target	Actual	Target
Canada				
Equity securities	— %	— %	50 %	50 %
Fixed income	100 %	100 %	50 %	50 %
United Kingdom—Lyondell Chemical Plans				
Equity securities	37 %	37 %	36 %	37 %
Fixed income	63 %	63 %	64 %	63 %
United Kingdom—Basell Plans				
Equity securities	40 %	40 %	40 %	40 %
Fixed income	60 %	60 %	60 %	60 %
United Kingdom—A. Schulman Plans				
Growth assets	76 %	76 %	91 %	89 %
Matching assets	24 %	24 %	9 %	11 %
United States				
Equity securities	37 %	35 %	34 %	32 %
Fixed income	41 %	39 %	38 %	38 %
Alternatives	22 %	26 %	28 %	30 %

LYONDELLBASELL INDUSTRIES N.V.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

We estimate the following contributions to our pension plans in 2021:

Millions of dollars	U.S.	Non-U.S.
Defined benefit plans	\$ 58	\$ 77
Multi-employer plans	—	7
Total	<u>\$ 58</u>	<u>\$ 84</u>

As of December 31, 2020, future expected benefit payments by our pension plans which reflect expected future service, as appropriate, are as follows:

Millions of dollars	U.S.	Non-U.S.
2021	\$ 153	\$ 67
2022	154	66
2023	153	67
2024	148	68
2025	143	70
2026 through 2030	657	364

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:

	2020		2019	
	U.S.	Non-U.S.	U.S.	Non-U.S.
Discount rate	2.54 %	0.99 %	3.16 %	1.03 %
Rate of compensation increase	4.63 %	2.55 %	4.83 %	2.59 %
Cash balance interest credit rate	1.58 %	— %	2.21 %	— %

The weighted average assumptions used in determining net benefit costs for our pension plans were as follows:

	Year Ended December 31,					
	2020		2019		2018	
	U.S.	Non-U.S.	U.S.	Non-U.S.	U.S.	Non-U.S.
Discount rate	3.16 %	1.03 %	4.51 %	2.07 %	3.73 %	2.13 %
Expected return on plan assets	7.25 %	1.79 %	7.50 %	2.79 %	7.50 %	2.92 %
Rate of compensation increase	4.83 %	2.59 %	4.83 %	2.54 %	4.00 %	2.94 %

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. 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 7.25% 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 1.79% 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, 2020			
	Fair Value	Level 1	Level 2	Level 3
<u>U.S.</u>				
Common and preferred stock	\$ 281	\$ 281	\$ —	\$ —
Commingled funds measured at net asset value	555			
Real estate measured at net asset value	100			
Hedge funds measured at net asset value	114			
Private equity measured at net asset value	137			
U.S. government securities	339	339	—	—
Cash and cash equivalents	43	43	—	—
Total U.S. Pension Assets	\$ 1,569	\$ 663	\$ —	\$ —

<u>Millions of dollars</u>	December 31, 2020			
	Fair Value	Level 1	Level 2	Level 3
<u>Non-U.S.</u>				
Insurance arrangements	\$ 825	\$ —	\$ —	\$ 825
Commingled funds measured at net asset value	339			
Cash and cash equivalents	2	2	—	—
Total Non-U.S. Pension Assets	\$ 1,166	\$ 2	\$ —	\$ 825

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.S.				
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>

<u>Millions of dollars</u>	December 31, 2019			
	Fair Value	Level 1	Level 2	Level 3
Non-U.S.				
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>

Certain non-U.S. plans have 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). These defined benefits pension plan assets at December 31, 2019 were valued at \$722 million and has increased to \$825 million at December 31, 2020. The change is due primarily to the appreciation of assets as well as a decrease of the discount rate from 2019 to 2020.

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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, 2020 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	\$ 179	\$ —	N/A	daily	1 to 3 days	3 to 4 days
Commingled fund investing in International Equity	118	—	N/A	daily	1 to 3 days	3 days
Commingled fund investing in Fixed Income	258	—	N/A	daily	1 to 3 days	3 to 7 days
Real Estate	100	19	10 years	quarterly	15 to 25 days	45 to 90 days
Hedge Funds	114	—	N/A	quarterly	10 to 30 days	20 to 90 days
Private Equity	137	79	10 years	Not eligible	N/A	N/A
Total U.S.	<u>\$ 906</u>	<u>\$ 98</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	\$ 24	\$ —	N/A	1 to 7 days	1 to 3 days	1 to 3 days
Commingled fund investing in International Equity	68	—	N/A	1 to 7 days	1 to 3 days	1 to 3 days
Commingled fund investing in Fixed Income	247	—	N/A	daily	1 to 3 days	3 days
Total Non-U.S.	<u>\$ 339</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, 2019 are as follows:

Millions of dollars	Fair Value	Unfunded Commitments	Remaining Life	Redemption Frequency (if currently eligible)	Trade to Settlement Terms	Redemption Notice Period
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>				

Millions of dollars	Fair Value	Unfunded Commitments	Remaining Life	Redemption Frequency (if currently eligible)	Trade to Settlement Terms	Redemption Notice Period
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>				

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:

Millions of dollars	Company Contributions		
	2020	2019	2018
Pensionskasse	\$ 7	\$ 8	\$ 8

LYONDELLBASELL INDUSTRIES N.V.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

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, 2019 and 2018 indicated total assets of \$10,712 million and \$9,456 million, respectively; total actuarial present value of accumulated plan benefits of \$10,259 million and \$9,061 million, respectively; and total contributions for all participating employers of \$260 million and \$258 million, respectively. Our plan contributions did not exceed 5 percent of the total contributions in 2020, 2019 or 2018.

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:

Millions of dollars	Year Ended December 31,			
	2020		2019	
	U.S.	Non-U.S.	U.S.	Non-U.S.
Change in benefit obligation:				
Benefit obligation, beginning of period	\$ 251	\$ 79	\$ 234	\$ 59
Service cost	1	3	1	2
Interest cost	7	1	9	1
Actuarial (gain) loss	(30)	(2)	20	18
Benefits paid	(25)	(1)	(19)	—
Participant contributions	7	—	6	—
Foreign exchange effects	—	6	—	(1)
Benefit obligation, end of period	211	86	251	79
Change in plan assets:				
Fair value of plan assets, beginning of period	—	—	—	—
Employer contributions	18	1	13	—
Participant contributions	7	—	6	—
Benefits paid	(25)	(1)	(19)	—
Fair value of plan assets, end of period	—	—	—	—
Funded status, end of period	\$ (211)	\$ (86)	\$ (251)	\$ (79)

Amounts recognized in the Consolidated Balance Sheets are as follows:

Millions of dollars	December 31, 2020		December 31, 2019	
	U.S.	Non-U.S.	U.S.	Non-U.S.
Accrued benefit liability, current	\$ (14)	\$ (1)	\$ (17)	\$ (1)
Accrued benefit liability, long-term	(197)	(85)	(234)	(78)
Funded status, end of period	\$ (211)	\$ (86)	\$ (251)	\$ (79)

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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

Amounts recognized in Accumulated other comprehensive loss are as follows:

Millions of dollars	December 31, 2020		December 31, 2019	
	U.S.	Non-U.S.	U.S.	Non-U.S.
Actuarial and investment income (loss)	\$ 68	\$ (27)	\$ 40	\$ (32)
Balance, end of period	\$ 68	\$ (27)	\$ 40	\$ (32)

The components of net periodic other postretirement costs are as follows:

Millions of dollars	U.S. Plans		
	Year Ended December 31,		
	2020	2019	2018
Service cost	\$ 1	\$ 1	\$ 2
Interest cost	7	9	9
Actuarial gain amortization	(2)	(5)	—
Net periodic benefit cost	\$ 6	\$ 5	\$ 11

Millions of dollars	Non-U.S. Plans		
	Year Ended December 31,		
	2020	2019	2018
Service cost	\$ 3	\$ 2	\$ 2
Interest cost	1	1	1
Actuarial loss amortization	3	1	1
Net periodic benefit cost	\$ 7	\$ 4	\$ 4

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,	
	2020	2019
Immediate trend rate	6.5 %	6.1 %
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	2029	2038

	Non-U.S. Plans			
	Canada		France	
	December 31,		December 31,	
	2020	2019	2020	2019
Immediate trend rate	4.5 %	5.0 %	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	—	—

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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

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.

The weighted average assumptions used in determining the net benefit liabilities for our other postretirement benefit plans were as follows:

	December 31,			
	2020		2019	
	U.S.	Non-U.S.	U.S.	Non-U.S.
Discount rate	2.48 %	1.10 %	3.12 %	1.20 %
Rate of compensation increase	4.19 %	—	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,					
	2020		2019		2018	
	U.S.	Non-U.S.	U.S.	Non-U.S.	U.S.	Non-U.S.
Discount rate	3.12 %	1.20 %	4.47 %	2.30 %	3.66 %	2.48 %
Rate of compensation increase	4.50 %	—	4.50 %	—	4.00 %	—

As of December 31, 2020, 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.
2021	\$ 14	\$ 1
2022	14	1
2023	14	1
2024	14	1
2025	14	2
2026 through 2030	65	9

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, 2020 and 2019:

<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, 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)	—
Arising during the period	141	—	(32)	—
Actuarial loss amortization	(52)	(3)	(1)	—
Settlement loss	(6)	—	—	—
Curtailement gain	4	—	—	—
December 31, 2020	\$ 1,008	\$ 30	\$ (41)	\$ —

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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

In 2020, pension benefits actuarial loss and other postretirement benefits actuarial gain of \$141 million and \$32 million, respectively, are primarily due to changes in discount rate assumption and updated actuarial assumptions. 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.

Deferred income taxes related to amounts in Accumulated other comprehensive loss include provisions of \$246 million and \$236 million as of December 31, 2020 and December 31, 2019, respectively.

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:

Millions of dollars	Company Contributions					
	2020		2019		2018	
	U.S.	Non-U.S.	U.S.	Non-U.S.	U.S.	Non-U.S.
Employee Savings Plans	\$ 48	\$ 8	\$ 46	\$ 7	\$ 40	\$ 5

15. 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, 2020, there were 2,817,543 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:

Millions of dollars	Year Ended December 31,		
	2020	2019	2018
Compensation Expense:			
Restricted stock units	\$ 26	\$ 21	\$ 15
Stock options	8	7	7
Performance share units	21	20	17
Total	<u>\$ 55</u>	<u>\$ 48</u>	<u>\$ 39</u>
Tax Benefit:			
Restricted stock units	\$ 6	\$ 5	\$ 4
Stock options	2	2	2
Performance share units	5	4	4
Total	<u>\$ 13</u>	<u>\$ 11</u>	<u>\$ 10</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, which is 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, 2020, 2019 and 2018 was \$79.58, \$87.36 and \$108.52, respectively. The total fair value of RSUs vested was \$18 million during 2020 and \$13 million during each of 2019 and 2018.

The following table summarizes RSU activity:

	Number of Units (in thousands)	Weighted Average Grant Date Fair Value (per share)
Outstanding at January 1, 2020	613	\$ 93.37
Granted	335	79.58
Vested	(230)	88.67
Forfeited	(25)	88.25
Outstanding at December 31, 2020	<u>693</u>	<u>\$ 88.45</u>

As of December 31, 2020, the unrecognized compensation cost related to RSUs was \$25 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 which is consistent with the historical exercise pattern.

The weighted average fair value of Stock Options granted and the assumptions used in estimating those fair value are as follows:

	Year Ended December 31,		
	2020	2019	2018
Weighted average fair value	\$ 12.18	\$ 15.76	\$ 21.58
Fair value assumptions:			
Dividend yield	5.0 %	4.2 %	4.0 %
Expected volatility	28.3-38.4%	27.2-28.1%	27.8-29.0%
Risk-free interest rate	0.3-1.4%	1.5-2.6%	2.6-2.9%
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, 2020	1,782	\$ 90.08		
Granted	701	82.92		
Exercised	(16)	44.76		
Forfeited	(53)	85.10		
Expired	(10)	98.32		
Outstanding at December 31, 2020	<u>2,404</u>	<u>\$ 88.36</u>	7.1 years	<u>\$ 14</u>
Exercisable at December 31, 2020	<u>1,357</u>	<u>\$ 89.37</u>	5.9 years	<u>\$ 8</u>

The aggregate intrinsic value of Stock Options exercised during the years ended December 31, 2020, 2019 and 2018 was \$1 million, less than \$1 million and \$3 million, respectively.

As of December 31, 2020, the unrecognized compensation cost related to Stock Options was \$5 million, which is expected to be recognized over one year. During 2020, 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 is 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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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

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 our 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.

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 are 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:

	Year Ended December 31,		
	2020	2019	2018
Weighted average fair value	\$ 82.70	\$ 76.35	\$ 89.32
Fair value assumptions:			
Expected volatility of LyondellBasell N.V. common stock	25.96-41.50%	24.11 %	27.15 %
Expected volatility of peer companies	16.13-50.42%	14.57-40.55%	17.45-42.99%
Average correlation coefficient of peer companies	0.45-0.58	0.50	0.50
Risk-free interest rate	0.23-1.35%	2.48 %	2.40 %

The following table summarizes PSU activity, which assumes payout at target amounts:

	Number of Units (in thousands)	Weighted Average Grant Date Fair Value (per share)
Outstanding at January 1, 2020	683	\$ 85.32
Granted	310	82.70
Vested	(212)	93.28
Forfeited	(32)	82.97
Outstanding at December 31, 2020	<u>749</u>	<u>\$ 82.07</u>

The total fair value of PSUs vested during 2020, 2019 and 2018 was \$9 million, \$22 million, and \$25 million, respectively. As of December 31, 2020, the unrecognized compensation cost related to PSUs was \$24 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 allows participants to purchase our stock at a 10% 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. Total expense related to our ESPP for 2020, 2019 and 2018 was \$4 million, \$2 million and \$2 million, respectively.

16. 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.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

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.

The Company operates in multiple jurisdictions with complex legal and tax regulatory environments and our tax returns are periodically audited or subjected to review by tax authorities. We monitor tax law changes and the potential impact to our results of operations including potential proposals in the U.S. as a result of a new administration.

On March 27, 2020, the U.S. enacted the Coronavirus Aid, Relief, and Economic Security Act, also known as the “CARES Act,” which contains numerous income tax provisions and other stimulus measures. Several of the tax measures favorably impact our income tax provision including the ability to carry back U.S. tax net operating losses (“NOL”) generated in 2018, 2019, or 2020 to tax years with a higher statutory tax rate and options for temporary elections that relax the limitation on deductible interest expense. Based on our analysis as of December 31, 2020, we recorded an overall tax benefit of approximately \$300 million. The 2020 U.S. tax losses include the impact of lower earnings and immediate tax depreciation deductions of fixed assets including the Louisiana Joint Venture which was a deemed asset acquisition for U.S. tax purposes, as well as certain capital projects. We anticipate a cash refund of approximately \$900 million as a result of the NOL carryback which, under normal U.S. IRS procedures would be expected to be received in 2021. However, because of U.S. IRS resource constraints, exacerbated by the impact of COVID-19, the refund may be delayed.

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. 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.

The significant components of the provision for income taxes are as follows:

Millions of dollars	Year Ended December 31,		
	2020	2019	2018
Current:			
U.S. federal	\$ (774)	\$ 122	\$ (89)
Non-U.S.	399	296	404
State	1	21	38
Total current	<u>(374)</u>	<u>439</u>	<u>353</u>
Deferred:			
U.S. federal	415	124	197
Non-U.S.	(76)	75	48
State	(8)	10	15
Total deferred	<u>331</u>	<u>209</u>	<u>260</u>
Provision for income taxes before tax effects of other comprehensive income	(43)	648	613
Tax effects of elements of other comprehensive income:			
Pension and postretirement liabilities	(10)	(92)	63
Financial derivatives	(70)	(38)	16
Foreign currency translation	(30)	8	18
Total income tax expense in comprehensive income	<u><u>\$ (153)</u></u>	<u><u>\$ 526</u></u>	<u><u>\$ 710</u></u>

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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

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, 2020 is -3.1%.

The following table reconciles the expected tax expense (benefit) at the U.S. statutory federal income tax rate to the total income tax provision as calculated:

Millions of dollars	Year Ended December 31,		
	2020	2019	2018
Income before income taxes:			
U.S.	\$ (456)	\$ 1,581	\$ 2,795
Non-U.S.	1,842	2,471	2,516
Total	<u>\$ 1,386</u>	<u>\$ 4,052</u>	<u>\$ 5,311</u>
Income tax at U.S. statutory rate	\$ 291	\$ 851	\$ 1,115
Increase (reduction) resulting from:			
Non-U.S. income taxed at different statutory rates	14	64	89
Changes in tax laws	(298)	1	(14)
Return to accrual adjustments	(50)	9	(47)
State income taxes, net of federal benefit	(2)	29	53
Exempt income	(144)	(182)	(296)
Liquidation loss	—	(51)	—
Patent box ruling	—	(65)	—
Uncertain tax positions	97	(42)	(320)
Other, net	49	34	33
Income tax provision	<u>\$ (43)</u>	<u>\$ 648</u>	<u>\$ 613</u>

Our exempt income primarily includes interest income, export incentives, and equity earnings of joint ventures. Interest income earned by certain of our European subsidiaries through intercompany financings is 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.

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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.

Millions of dollars	December 31,	
	2020	2019
Deferred tax liabilities:		
Accelerated tax depreciation	\$ 1,992	\$ 1,973
Investment in joint venture partnerships	532	141
Intangible assets	75	116
Inventory	323	319
Operating lease assets	335	322
Other liabilities	89	45
Total deferred tax liabilities	3,346	2,916
Deferred tax assets:		
Tax attributes	\$ 242	\$ 168
Employee benefit plans	426	397
Operating lease liabilities	341	326
Other assets	176	133
Total deferred tax assets	1,185	1,024
Deferred tax asset valuation allowances	(132)	(85)
Net deferred tax assets	1,053	939
Net deferred tax liabilities	\$ 2,293	\$ 1,977

Millions of dollars	December 31,	
	2020	2019
Balance sheet classifications:		
Deferred tax assets—long-term	\$ 39	\$ 38
Deferred tax liabilities—long-term	2,332	2,015
Net deferred tax liabilities	\$ 2,293	\$ 1,977

Deferred taxes on the unremitted earnings of certain equity joint ventures and subsidiaries of \$89 million and \$95 million at December 31, 2020 and 2019, respectively, have been provided. The Company intends to permanently reinvest approximately \$590 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.

At December 31, 2020 and 2019, we had total tax attributes available in the amount of \$1,221 million and \$877 million, respectively, for which a deferred tax asset was recognized at December 31, 2020 and 2019 of \$242 million and \$168 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, 2020 are as follows:

Millions of dollars	Tax Attributes	Deferred Tax on Tax Attributes
2021	\$ 18	\$ 1
2022	41	2
2023	37	1
2024	21	1
2025	43	2
Thereafter	468	79
Indefinite	593	156
Total	<u>\$ 1,221</u>	<u>\$ 242</u>

The tax attributes are primarily related to operations in The Netherlands, France, United Kingdom and United States. The related deferred tax assets by primary jurisdictions are shown below:

Millions of dollars	December 31,		
	2020	2019	2018
The Netherlands	\$ 103	\$ 4	\$ 12
France	58	30	64
United Kingdom	30	36	36
United States	25	68	14
Spain	6	8	11
Canada	—	—	28
Other	20	22	15
Total	<u>\$ 242</u>	<u>\$ 168</u>	<u>\$ 180</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 are expected to reverse, management believes it is more likely than not that \$110 million of these deferred tax assets at December 31, 2020 will be realized.

As of each reporting date, 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 assets.

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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

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.

Millions of dollars	December 31,		
	2020	2019	2018
The Netherlands	\$ 57	\$ 3	\$ 12
United Kingdom	30	36	33
France	26	23	23
United States	14	13	13
Canada	—	—	28
Other	5	10	11
	<u>\$ 132</u>	<u>\$ 85</u>	<u>\$ 120</u>

During 2020, the valuation allowance in The Netherlands increased with respect to tax attributes for which we do not expect we can realize the benefit in the foreseeable future or before expiration.

During 2019, we liquidated the Canadian entity which had maintained a full valuation allowance against the net deferred tax asset 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.

Tax benefits totaling \$339 million, \$238 million and \$269 million relating to uncertain tax positions were unrecognized as of December 31, 2020, 2019 and 2018, respectively. The following table presents a reconciliation of the beginning and ending amounts of unrecognized tax benefits:

Millions of dollars	Year Ended December 31,		
	2020	2019	2018
Balance, beginning of period	\$ 238	\$ 269	\$ 544
Additions for tax positions of current year	1	49	16
Additions for tax positions of prior years	113	20	23
Reductions for tax positions of prior years	(12)	(100)	(299)
Settlements (payments/refunds)	(1)	—	(15)
Balance, end of period	<u>\$ 339</u>	<u>\$ 238</u>	<u>\$ 269</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.

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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

During 2020, we accrued a \$113 million non-cash tax expense to our effective tax rate as an addition for tax positions of prior years. 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 \$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 2018 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 an expense of interest and penalties of \$1 million in 2020 and a benefit of interest and penalties totaling \$1 million and \$47 million in 2019 and 2018, respectively.

We had accrued approximately \$16 million, \$15 million and \$16 million for interest and penalties as of December 31, 2020, 2019 and 2018, respectively.

17. 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, 2020, we had capital expenditure commitments, which we incurred in our normal course of business, including commitments of approximately \$305 million related to building our new PO/TBA plant in Houston, Texas.

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 \$133 million and \$132 million as of December 31, 2020 and 2019, respectively. At December 31, 2020, 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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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

The following table summarizes the activity in our accrued environmental liability included in “Accrued liabilities” and “Other liabilities.”

Millions of dollars	Year Ended December 31,	
	2020	2019
Beginning balance	\$ 132	\$ 90
Additional provisions	—	44
Changes in estimates	3	15
Amounts paid	(8)	(16)
Foreign exchange effects	6	(1)
Ending balance	\$ 133	\$ 132

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, 2020, 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 assess 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 Consolidated Financial Statements.

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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

18. 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 2020:			
March	\$ 1.05	\$ 351	March 2, 2020
June	1.05	350	June 8, 2020
September	1.05	352	August 31, 2020
December	1.05	352	November 30, 2020
	<u>\$ 4.20</u>	<u>\$ 1,405</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>	

Share Repurchase Authorization—In May 2020, our shareholders approved a proposal to authorize us to repurchase up to 34.0 million ordinary shares through November 29, 2021 (“May 2020 Share Repurchase Authorization”), which superseded our prior repurchase authorization. The timing and amount of these repurchases, which are determined based on our evaluation of market 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 employer benefit and compensation plans. As of December 31, 2020, there were no repurchases under the May 2020 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 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.

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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 2020:			
September 2019 Share Repurchase Authorization	50,685	\$ 78.93	\$ 4
May 2020 Share Repurchase Authorization	—	—	—
	<u>50,685</u>	<u>\$ 78.93</u>	<u>\$ 4</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>

Due to the timing of settlements, total cash paid for share repurchases for the years ended December 31, 2020, 2019 and 2018 was \$4 million, \$3,752 million and \$1,854 million, respectively.

Ordinary Shares—The changes in the outstanding amounts of ordinary shares are as follows:

	<u>Year Ended December 31,</u>		
	<u>2020</u>	<u>2019</u>	<u>2018</u>
Ordinary shares outstanding:			
Beginning balance	333,476,883	375,696,661	394,512,054
Share-based compensation	263,786	295,984	307,335
Employee stock purchase plan	325,236	165,743	121,398
Purchase of ordinary shares	(50,685)	(42,681,505)	(19,244,126)
Ending balance	<u>334,015,220</u>	<u>333,476,883</u>	<u>375,696,661</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>2020</u>	<u>2019</u>	<u>2018</u>
Ordinary shares held as treasury shares:			
Beginning balance	6,568,745	24,513,619	183,928,109
Share-based compensation	(263,786)	(295,984)	(307,335)
Employee stock purchase plan	(325,236)	(165,743)	(121,398)
Purchase of ordinary shares	50,685	42,681,505	19,244,126
Treasury shares canceled	—	(60,164,652)	(178,229,883)
Ending balance	<u>6,030,408</u>	<u>6,568,745</u>	<u>24,513,619</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 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, 2020, 2019 and 2018 are presented in the following table:

<u>Millions of dollars</u>	<u>Financial Derivatives</u>	<u>Unrealized Gains (Losses) on Available- for-Sale Debt Securities</u>	<u>Unrealized Gains on Equity Securities and Equity Securities Held by Equity Investees</u>	<u>Defined Benefit Pension and Other Postretirement Benefit Plans</u>	<u>Foreign Currency Translation Adjustments</u>	<u>Total</u>
Balance—December 31, 2017	\$ (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>
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>
Other comprehensive income (loss) before reclassifications	(471)	1	—	(109)	77	(502)
Tax (expense) benefit before reclassifications	110	—	—	25	30	165
Amounts reclassified from accumulated other comprehensive loss	175	—	—	58	—	233
Tax (expense) benefit	(40)	—	—	(15)	—	(55)
Net other comprehensive income (loss)	(226)	1	—	(41)	107	(159)
Balance—December 31, 2020	<u>\$ (426)</u>	<u>\$ 1</u>	<u>\$ —</u>	<u>\$ (752)</u>	<u>\$ (766)</u>	<u>\$ (1,943)</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:

Millions of dollars	Year Ended December 31,			Affected Line Items on the Consolidated Statements of Income
	2020	2019	2018	
Reclassification adjustments for:				
Financial derivatives	\$ 175	\$ (50)	\$ (110)	Other income, net
Income tax expense (benefit)	40	(13)	(27)	Provision for income taxes
Financial derivatives, net of tax	135	(37)	(83)	
Amortization of defined pension items:				
Prior service cost	3	2	1	Other income, net
Actuarial loss	53	26	32	Other income, net
Settlement loss	6	1	3	Other income, net
Curtailement gain	(4)	—	—	Other income, net
Income tax expense (benefit)	15	6	13	Provision for income taxes
Defined pension items, net of tax	43	23	23	
Total reclassifications, before tax	233	(21)	(74)	
Income tax expense (benefit)	55	(7)	(14)	Provision for income taxes
Total reclassifications, after tax	<u>\$ 178</u>	<u>\$ (14)</u>	<u>\$ (60)</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 14 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.

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, 2020 and 2019, we had 115,374 shares of redeemable non-controlling interest stock outstanding.

In February, May, August and November 2020, we paid cash dividends of \$15.00 per share to our redeemable non-controlling interest shareholders of record as of January 15, 2020, April 15, 2020, July 15, 2020, and October 15, 2020, respectively. In 2020, 2019 and 2018, these dividends totaled \$7 million, \$7 million and \$2 million, respectively.

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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

19. 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. Our unvested restricted stock units contain non-forfeitable rights to dividend equivalents, and are considered participating securities. As such, we calculate basic and diluted earnings per share under the two-class method.

Earnings per share data are as follows:

	Year Ended December 31,					
	2020		2019		2018	
	Continuing Operations	Discontinued Operations	Continuing Operations	Discontinued Operations	Continuing Operations	Discontinued Operations
Millions of dollars						
Net income (loss)	\$ 1,429	\$ (2)	\$ 3,404	\$ (7)	\$ 4,698	\$ (8)
Dividends on redeemable non-controlling interests	(7)	—	(7)	—	(2)	—
Net income attributable to participating securities	(3)	—	(6)	—	(6)	—
Net income (loss) attributable to ordinary shareholders—basic	<u>\$ 1,419</u>	<u>\$ (2)</u>	<u>\$ 3,391</u>	<u>\$ (7)</u>	<u>\$ 4,690</u>	<u>\$ (8)</u>
Potential diluted effect of performance share units	—	—	—	—	(5)	—
Net income (loss) attributable to ordinary shareholders—diluted	<u>\$ 1,419</u>	<u>\$ (2)</u>	<u>\$ 3,391</u>	<u>\$ (7)</u>	<u>\$ 4,685</u>	<u>\$ (8)</u>
Millions of shares, except per share amounts						
Basic weighted average common stock outstanding	334	334	353	353	389	389
Effect of dilutive securities	—	—	—	—	—	—
Potential dilutive shares	<u>334</u>	<u>334</u>	<u>353</u>	<u>353</u>	<u>389</u>	<u>389</u>
Earnings (loss) per share:						
Basic	<u>\$ 4.25</u>	<u>\$ (0.01)</u>	<u>\$ 9.61</u>	<u>\$ (0.02)</u>	<u>\$ 12.06</u>	<u>\$ (0.02)</u>
Diluted	<u>\$ 4.25</u>	<u>\$ (0.01)</u>	<u>\$ 9.60</u>	<u>\$ (0.02)</u>	<u>\$ 12.03</u>	<u>\$ (0.02)</u>

20. 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:

		Year Ended December 31, 2020						
Millions of dollars	O&P – Americas	O&P – EAI	I&D	APS	Refining	Technology	Other	Total
Sales and other operating revenues:								
Customers	\$ 5,032	\$ 7,809	\$ 6,144	\$ 3,903	\$ 4,346	\$ 519	\$ —	\$ 27,753
Intersegment	2,243	558	125	10	381	140	(3,457)	—
	7,275	8,367	6,269	3,913	4,727	659	(3,457)	27,753
Depreciation and amortization expense	525	214	305	152	152	37	—	1,385
Other income, net	70	14	1	1	1	—	(2)	85
Income (loss) from equity investments	45	186	26	(1)	—	—	—	256
Capital expenditures	543	166	880	63	63	111	121	1,947
EBITDA	1,810	826	833	378	(871)	324	(15)	3,285

		Year Ended December 31, 2019						
Millions of dollars	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

		Year Ended December 31, 2018						
Millions of dollars	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

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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

Operating results for our O&P–EAI segment include a \$36 million gain from the sale of our carbon black subsidiary in France in 2018.

Operating results for our APS segment include integration costs of \$37 million and \$116 million in 2020 and 2019, respectively, and acquisition-related transaction and integration costs of \$69 million in 2018 associated with our acquisition of A. Schulman in August 2018. Integration activities related to our acquisition of A. Schulman were substantially completed by the third quarter of 2020.

Operating results for our Refining segment include a non-cash impairment charge of \$582 million which was recognized during the third quarter of 2020.

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,		
	2020	2019	2018
EBITDA:			
Total segment EBITDA	\$ 3,300	\$ 5,691	\$ 6,831
Other EBITDA	(15)	1	36
Less:			
Depreciation and amortization expense	(1,385)	(1,312)	(1,241)
Interest expense	(526)	(347)	(360)
Add:			
Interest income	12	19	45
Income from continuing operations before income taxes	\$ 1,386	\$ 4,052	\$ 5,311

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, 2020							
Property, plant and equipment, net	\$ 6,537	\$ 1,820	\$ 4,245	\$ 818	\$ 555	\$ 411	\$ 14,386
Equity investments	2,167	1,929	631	2	—	—	4,729
Goodwill	162	142	259	1,379	—	11	1,953
December 31, 2019							
Property, plant and equipment, net	\$ 6,454	\$ 1,706	\$ 3,640	\$ 806	\$ 1,190	\$ 334	\$ 14,130
Equity investments	193	1,335	575	3	—	—	2,106
Goodwill	162	112	228	1,380	—	9	1,891

LYONDELLBASELL INDUSTRIES N.V.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

Long-lived assets include Property, plant and equipment, net, Intangible assets, net and Equity investments, see Notes 7 and 8 to the Consolidated Financial Statements. The following long-lived assets data is based upon the location of the assets:

<u>Millions of dollars</u>	<u>December 31,</u>	
	<u>2020</u>	<u>2019</u>
Long-lived assets:		
United States	\$ 13,940	\$ 11,999
Germany	1,517	1,476
The Netherlands	921	814
China	697	141
France	594	540
Italy	338	326
Mexico	257	249
Other	1,602	1,560
Total	<u>\$ 19,866</u>	<u>\$ 17,105</u>

21. Unaudited Quarterly Results

The following table presents selected quarterly financial data:

<u>Millions of dollars, except per share amounts</u>	<u>For the 2020 Quarter Ended</u>			
	<u>March 31</u>	<u>June 30</u>	<u>September 30</u>	<u>December 31</u>
Sales and other operating revenues	\$ 7,494	\$ 5,546	\$ 6,776	\$ 7,937
Gross profit ^(a)	626	652	891	1,225
Operating income ^(b)	304	339	23	893
Income from equity investments	—	61	62	133
Income from continuing operations ^{(b)(c)}	143	315	114	857
Income (loss) from discontinued operations, net of tax	1	(1)	—	(2)
Net income ^{(b)(c)}	144	314	114	855
Earnings per share:				
Basic	0.42	0.94	0.33	2.55
Diluted	0.42	0.94	0.33	2.55

LYONDELLBASELL INDUSTRIES N.V.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

Millions of dollars, except per share amounts	For the 2019 Quarter Ended			
	March 31	June 30	September 30	December 31
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

(a) Represents Sales and other operating revenues less Cost of sales.

(b) The three months ended March, June and September 2020 include charges for integration costs associated with our acquisition of A. Schulman of \$14 million, \$16 million and \$7 million (\$13 million, \$11 million and \$3 million, after tax), respectively. Integration activities related to our acquisition of A. Schulman were substantially completed during the third quarter of 2020.

Includes an LCM inventory valuation charge of \$419 million (\$351 million, after tax) in the three months ended March 31, 2020 and LCM valuation benefits in the three months ended June, September and December 2020 of \$96 million, \$160 million and \$147 million (\$88 million, \$133 million and \$119 million, after tax), respectively.

The three months ended September and December 2020 includes LIFO inventory charges of \$80 million and \$23 million (\$62 million and \$16 million, after tax), respectively.

Additionally, the three months ended September 30, 2020 include Impairment of long-lived assets of \$582 million (\$446 million, after tax) related to our Houston refinery.

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. The three months ended December 31, 2019 includes a pre-tax LCM inventory valuation charge of \$33 million (\$25 million, after tax) and a LIFO inventory benefit \$63 million (\$46 million, after tax).

(c) The three months ended December 31, 2020 includes total charges to interest expense of \$69 million (\$53 million, after tax) related to the redemption of \$1,000 million aggregate principal amount of our then outstanding 6% senior notes due 2021 and €750 million aggregate principal amount of our then outstanding 1.875% guaranteed notes due 2022.

The three months ended September 30, 2019 includes a non-cash benefit of \$85 million 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.

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, 2020, 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 2020 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 2021 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 2021 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 2021 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 2021 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 2021 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 2021 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:

Exhibit Number	Description
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 (incorporated by reference to Exhibit 4.1 of our Annual Report on Form 10-K filed with the SEC on February 20, 2020)
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 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)
4.6	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)
4.7	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)
4.8	Officer's Certificate of LYB International Finance B.V. relating to the 4.000% Guaranteed Notes due 2023, 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)
4.9	Form of LYB International Finance B.V.'s 4.000% Guaranteed Notes due 2023 (incorporated by reference to Exhibit 4.2 to our Form 8-K filed with the SEC on July 16, 2013)

<u>Exhibit Number</u>	<u>Description</u>
4.10	Officer's Certificate of LYB International Finance B.V. relating to the 5.250% Guaranteed Notes due 2043, 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)
4.11	Form of LYB International Finance B.V.'s 5.250% Guaranteed Notes due 2043 (incorporated by reference to Exhibit 4.3 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 4.875% Guaranteed Notes due 2044, 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)
4.13	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)
4.14	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)
4.15	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)
4.16	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)
4.17	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)
4.18	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)
4.19	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)
4.20	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)
4.21	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)
4.22	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)

<u>Exhibit Number</u>	<u>Description</u>
4.23	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)
4.24	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)
4.25	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)
4.26	Officer's Certificate of LYB International Finance III, LLC relating to the 2.875% Guaranteed Notes due 2025, 3.375% Guaranteed Notes due 2030, and 4.200% Guaranteed Notes due 2050 dated as of April 20, 2020 (incorporated by reference to Exhibit 4.2 to our Current Report on Form 8-K filed with the SEC on April 21, 2020)
4.27	Form of LYB International Finance III, LLC's 2.875% Guaranteed Notes due 2025 (incorporated by reference to Exhibit 4.2 to our Current Report on Form 8-K filed with the SEC on April 21, 2020)
4.28	Form of LYB International Finance III, LLC's 3.375% Guaranteed Notes due 2030 (incorporated by reference to Exhibit 4.2 to our Current Report on Form 8-K filed with the SEC on April 21, 2020)
4.29	Form of LYB International Finance III, LLC's 4.200% Guaranteed Notes due 2050 (incorporated by reference to Exhibit 4.2 to our Current Report on Form 8-K filed with the SEC on April 21, 2020)
4.30	Officer's Certificate of LYB International Finance III, LLC relating to the Guaranteed Floating Rate Notes due 2023, 1.250% Guaranteed Notes due 2025, 2.250% Guaranteed Notes due 2030, 3.375% Guaranteed Notes due 2040, 3.625% Guaranteed Notes due 2051, and 3.800% Guaranteed Notes due 2060, dated as of October 8, 2020 (incorporated by reference to Exhibit 4.2 to our Current Report on Form 8-K filed with the SEC on October 8, 2020)
4.31	Form of LYB International Finance III, LLC's Guaranteed Floating Rate Notes due 2023 (incorporated by reference to Exhibit 4.2 to our Current Report on Form 8-K filed with the SEC on October 8, 2020)
4.32	Form of LYB International Finance III, LLC's 1.250% Guaranteed Notes due 2025 (incorporated by reference to Exhibit 4.2 to our Current Report on Form 8-K filed with the SEC on October 8, 2020)
4.33	Form of LYB International Finance III, LLC's 2.250% Guaranteed Notes due 2030 (incorporated by reference to Exhibit 4.2 to our Current Report on Form 8-K filed with the SEC on October 8, 2020)
4.34	Form of LYB International Finance III, LLC's 3.375% Guaranteed Notes due 2040 (incorporated by reference to Exhibit 4.2 to our Current Report on Form 8-K filed with the SEC on October 8, 2020)
4.35	Form of LYB International Finance III, LLC's 3.625% Guaranteed Notes due 2051 (incorporated by reference to Exhibit 4.2 to our Current Report on Form 8-K filed with the SEC on October 8, 2020)
4.36	Form of LYB International Finance III, LLC's 3.800% Guaranteed Notes due 2060 (incorporated by reference to Exhibit 4.2 to our Current Report on Form 8-K filed with the SEC on October 8, 2020)
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)

<u>Exhibit Number</u>	<u>Description</u>
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+	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)
10.5+	Offer Letter dated May 17, 2019 between Kenneth T. Lane and Lyondell Chemical Company (incorporated by reference to Exhibit 10.6 of our Annual Report on Form 10-K filed with the SEC on February 20, 2020)
10.6+	Offer Letter dated May 17, 2019 between Torkel Rhenman and Lyondell Chemical Company (incorporated by reference to Exhibit 10.7 of our Annual Report on Form 10-K filed with the SEC on February 20, 2020)
10.7+	Letter to Torkel Rhenman dated July 22, 2020 (incorporated by reference to Exhibit 10.5 to our Quarterly Report on Form 10-Q filed with the SEC on October 30, 2020)
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)

<u>Exhibit Number</u>	<u>Description</u>
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 (incorporated by reference to Exhibit 10.19 of our Annual Report on Form 10-K filed with the SEC on February 20, 2020)
10.20+	2020 Form of Performance Share Unit Award Agreement (incorporated by reference to Exhibit 10.20 of our Annual Report on Form 10-K filed with the SEC on February 20, 2020)
10.21+	2020 Form of Non-Qualified Stock Option Award Agreement (incorporated by reference to Exhibit 10.21 of our Annual Report on Form 10-K filed with the SEC on February 20, 2020)
10.22+*	2021 Form of Restricted Stock Unit Award Agreement
10.23+*	2021 Form of Performance Share Unit Award Agreement
10.24+*	2021 Form of Non-Qualified Stock Option Award Agreement
10.25+	Form of Director Restricted Stock Unit Award Agreement (incorporated by reference to Exhibit 10.1 of our Quarterly Report on Form 10-Q filed with the SEC on July 31, 2020)
10.26	Amended and Restated Credit Agreement, dated June 5, 2014, 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, 2014)
10.27	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, Bank of America, N.A., as Administrative Agent, and the lender 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)
10.28	Amendment No. 2 to the Amended and Restated Credit Agreement, dated April 14, 2020, 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 10.1 of our Current Report on Form 8-K filed with the SEC on April 15, 2020)
10.29	Amendment No. 3 to the Amended and Restated Credit Agreement, dated October 8, 2020, 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 10.1 to our Current Report on Form 8-K filed with the SEC on October 8, 2020)
10.30	Amendment No. 4 to the Amended and Restated Credit Agreement, dated October 14, 2020, 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 10.1 to our Current Report on Form 8-K filed with the SEC on October 16, 2020)
10.31	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)

<u>Exhibit Number</u>	<u>Description</u>
10.32	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)
10.33	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)
10.34	Three-Year Credit Agreement, dated March 29, 2019 among LyondellBasell Industries N.V., as Guarantor, LYB Americas Finance Company LLC, as Borrower, 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 March 29, 2019)
10.35	Amendment No. 1 to the Three-Year Credit Agreement, dated April 14, 2020, among LyondellBasell Industries N.V. as Guarantor, LYB Americas Finance Company LLC, as Borrower, Bank of America, N.A., as Administrative Agent, and the lender parties thereto (incorporated by reference to Exhibit 10.2 of our Current Report on Form 8-K filed with the SEC on April 15, 2020)
10.36	Amendment No. 2 to the Three-Year Credit Agreement, dated October 8, 2020, among LyondellBasell Industries N.V. as Guarantor, LYB Americas Finance Company LLC, as Borrower, and Bank of America, N.A., as Administrative Agent, and the lender parties thereto (incorporated by reference to Exhibit 10.2 to our Current Report on Form 8-K filed with the SEC on October 8, 2020)
10.37	Receivables Purchase Agreement, dated September 11, 2012, by and among Lyondell Chemical Company, as initial servicer, and LYB Receivables LLC, as seller, 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)
10.38	Second Amendment to Receivables Purchase Agreement, dated 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)
10.39	Third Amendment to Receivables Purchase Agreement, dated 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)
10.40	Acknowledgement of Amendment to Receivables Purchase Agreement, dated April 14, 2020, 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 10.3 of our Current Report on Form 8-K filed with the SEC on April 15, 2020)
10.41	Acknowledgement of Amendment to Receivables Purchase Agreement, dated October 8, 2020, 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 10.3 to our Current Report on Form 8-K filed with the SEC on October 8, 2020)

<u>Exhibit Number</u>	<u>Description</u>
10.42	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, as buyer (incorporated by reference to Exhibit 10.2 to our Current Report on Form 8-K filed with the SEC on September 14, 2012)
10.43	Membership Interest Purchase Agreement, dated as of October 1, 2020, among Sasol Chemicals (USA) LLC, Louisiana Integrated PolyEthylene JV LLC, LyondellBasell LC Offtake LLC, and solely for the purposes of Section 2.07, Lyondell Chemical Company, and, solely for the purposes of Section 6.05, Sasol Limited (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed with the SEC on October 2, 2020)
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.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

LYONDELLBASELL INDUSTRIES N.V.

Date: February 25, 2021

/s/ BHAVESH V. PATEL

Name:

Bhavesh V. Patel

Title:

Chief Executive Officer

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

<u>Signature</u>	<u>Title</u>	<u>Date</u>
<u>/s/ BHAVESH V. PATEL</u> Bhavesh V. Patel	Chief Executive Officer and Director <i>(Principal Executive Officer)</i>	February 25, 2021
<u>/s/ MICHAEL C. MCMURRAY</u> Michael C. McMurray	Executive Vice President and Chief Financial Officer <i>(Principal Financial Officer)</i>	February 25, 2021
<u>/s/ JACINTH C. SMILEY</u> Jacinth C. Smiley	Vice President and Chief Accounting Officer <i>(Principal Accounting Officer)</i>	February 25, 2021
<u>/s/ JACQUES AIGRAIN</u> Jacques Aigrain	Chairman of the Board and Director	February 25, 2021
<u>/s/ LINCOLN BENET</u> Lincoln Benet	Director	February 25, 2021
<u>/s/ JAGJEET S. BINDRA</u> Jagjeet S. Bindra	Director	February 25, 2021
<u>/s/ ROBIN W.T. BUCHANAN</u> Robin W.T. Buchanan	Director	February 25, 2021
<u>/s/ STEPHEN F. COOPER</u> Stephen F. Cooper	Director	February 25, 2021
<u>/s/ NANCE K. DICCIANI</u> Nance K. Dicciani	Director	February 25, 2021
<u>/s/ CLAIRE S. FARLEY</u> Claire S. Farley	Director	February 25, 2021
<u>/s/ BELLA D. GOREN</u> Bella D. Goren	Director	February 25, 2021
<u>/s/ MICHAEL S. HANLEY</u> Michael S. Hanley	Director	February 25, 2021
<u>/s/ ALBERT J. MANIFOLD</u> Albert J. Manifold	Director	February 25, 2021

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 depreciation and amortization. We also present EBITDA and diluted EPS exclusive of adjustments for LCM and impairment.

Estimated EBITDA, as presented for future projects is calculated as volume multiplied by average historical margins. Estimated EBITDA cannot be reconciled to net income due to the inherent difficulty in forecasting and quantifying certain amounts that are necessary for such reconciliation, including adjustments that could be made for interest expense (net), provision for (benefit from) income taxes, depreciation & amortization and other changes reflected in the reconciliation of historical numbers, the amounts of which, based on historical experience, could be significant.

Cash conversion is a measure that provides an indicator of a company's operational efficiency and management. Cash conversion, as presented herein, may not be comparable to similarly titled measures reported by other companies due to differences in the way the measures are calculated. For purposes of this presentation, cash conversion means cash from operating activities divided by EBITDA excluding LCM and impairment.

Free cash flow is a measure of profitability commonly used by investors to evaluate performance and may not be comparable to similarly titled measures reported by other companies due to differences in the way the measure is calculated. For the purposes of this release, free cash flow means net cash provided by operating activities minus capital expenditures.

Additionally, liquidity is a measure that provides an indicator of value to investors. For purposes of this release, liquidity includes cash and cash equivalents, restricted cash and restricted cash equivalents, short term investments, and availability under our Senior Revolving Credit Facility and our Receivables Facility.

Reconciliation of Net Income to EBITDA, including and excluding LCM and impairment

<u>Millions of dollars</u>	<u>Year Ended December 31,</u>		
	<u>2018</u>	<u>2019</u>	<u>2020</u>
Net income	\$ 4,690	\$ 3,397	\$ 1,427
Loss from discontinued operations, net of tax	8	7	2
Income from continuing operations	4,698	3,404	1,429
Provision for (benefit from) income taxes	613	648	(43)
Depreciation and amortization	1,241	1,312	1,385
Interest expense, net	315	328	514
add: LCM charges, pre-tax	—	33	16
add: Impairment of long-lived assets, pre-tax	—	—	582
EBITDA excluding LCM and impairment	6,867	5,725	3,883
less: LCM charges, pre-tax	—	(33)	(16)
less: Impairment of long-lived assets, pre-tax	—	—	(582)
EBITDA	<u>\$ 6,867</u>	<u>\$ 5,692</u>	<u>\$ 3,285</u>

Reconciliation of Diluted EPS to Diluted EPS Excluding LCM and impairment

	Year Ended December 31,		
	2018	2019	2020
Diluted earnings per share	\$ 12.01	\$ 9.58	\$ 4.24
Add:			
LCM charges	—	0.07	0.03
Impairment of long-lived assets	—	—	1.34
Diluted earnings per share excluding LCM and impairment	<u>\$ 12.01</u>	<u>\$ 9.65</u>	<u>\$ 5.61</u>

Liquidity

Millions of dollars	December 31, 2018	December 31, 2019	December 31, 2020
Cash and cash equivalents and restricted cash	\$ 401	\$ 888	\$ 1,765
Short-term investments	892	196	702
Repurchase agreements	544	—	—
Cash and liquid investments	1,837	1,084	2,467
Availability under Senior Revolving Credit Facility	1,688	2,229	2,020
Availability under U.S. Receivables Facility	829	690	757
Total liquidity	<u>\$ 4,354</u>	<u>\$ 4,003</u>	<u>\$ 5,244</u>

Cash Conversion

Millions of dollars	Year Ended December 31,		
	2018	2019	2020
Net cash provided by operating activities	\$ 5,471	\$ 4,961	\$ 3,404
Divided by:			
EBITDA excluding LCM and impairment ^(a)	\$ 6,867	\$ 5,725	\$ 3,883
Cash conversion ^(b)	<u>80 %</u>	<u>87 %</u>	<u>88 %</u>

(a) EBITDA excluding LCM and impairment: see Reconciliation of Net Income to EBITDA, including and excluding LCM and impairment.

(b) Cash conversion is the ratio of net cash provided by operating activities to EBITDA excluding LCM and impairment.

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.

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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, 2020, should be read in conjunction with such statements.

lyondellbasell

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