ADVANCING POSSIBLE

Annual Report 2017

lyondellbasell

www.lyondellbasell.com

Giulio Natta Research Center, Ferrara, Italy

2017 Snapshot

FINANCIAL HIGHLIGHTS

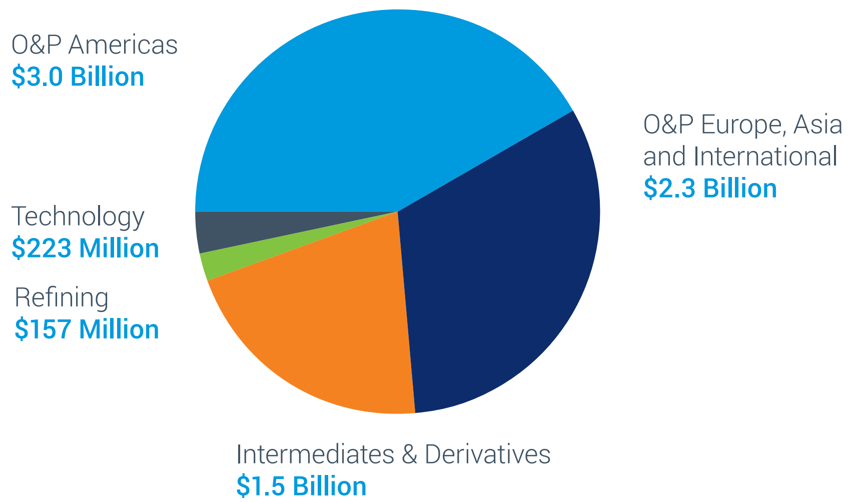
$12.28
Diluted EPS from continuing operations[1]

$4.9B
Income from continuing operations[1]

$7.1B
EBITDA

$5.2B
Cash from operating activities

EBITDA by Segment



Improved EBITDA year-over-year in

4 out of 5

segments

KEY ACCOMPLISHMENTS

23 sites set production records in 2017

Our global fleet of crackers produced **13% more** ethylene in 2017

Refining volumes increased by **35,000** barrels/day

Our employees had **fewer injuries** than any prior year in company history

[1] *Income from continuing operations of $4,895 million and diluted EPS from continuing operations of $12.28 per share reflect a fourth quarter one-time, non-cash benefit of $819 million ($2.05 per share) from the reduction of net deferred tax liabilities due to U.S. tax reform.*

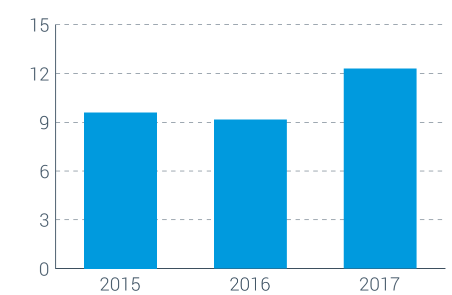
2017 Financial Highlights

Highlights of Consolidated Financial Statements ($ in Millions)[1]

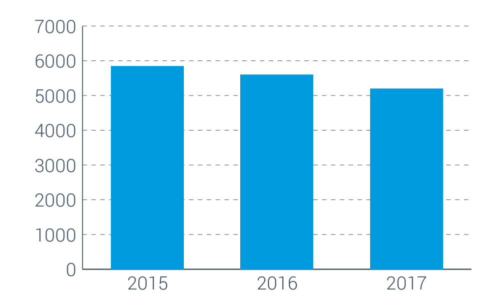
	2015	2016	2017
Sales and other operating revenues	$32,735	$29,183	$34,484
Operating income	$6,122	$5,060	$5,460
Income from equity investments	$339	$367	$321
Income from continuing operations[2]	$4,479	$3,847	$4,895
Diluted EPS from continuing operations ($/share)[2]	$9.60	$9.15	$12.28
Diluted weighted average share count (millions)	466	420	399
Cash flow from operations	$5,842	$5,606	$5,206
Capital expenditures	$1,440	$2,243	$1,547
EBITDA	$7,533	$6,602	$7,134
LCM adjustment	$548	$29	$-
EBITDA excluding LCM	$8,081	$6,631	$7,134
Diluted EPS from continuing operations excluding LCM ($/share)[2]	$10.35	$9.20	$12.28

Trends in Profitability and Capital Returns

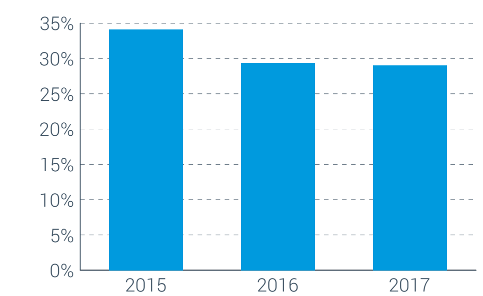
Diluted EPS from Continuing Operations
($/share)[2]



Cash Flow from Operating Activities
($ in Millions)



Return on
Invested Capital



[1] *Reconciliations for our non-GAAP measures, including a discussion concerning our "lower of cost or market," or LCM adjustments, can be found beginning on page 149.*
[2] *Income from continuing operations of $4,895 million and diluted EPS from continuing operations of $12.28 per share reflect a fourth quarter one-time, non-cash benefit of $819 million ($2.05 per share) from the reduction of net deferred tax liabilities due to U.S. tax reform.*

Advancing
Possible

Bhavesh V. (Bob) Patel
Chief Executive Officer ▸

A message from the CEO

To the owners of our company:

As we begin 2018, I write with a sense of pride about all that has been accomplished by our team over the past year and to express real excitement for our company's future.

In so many ways, 2017 was a remarkable year for LyondellBasell. On Dec. 20, we proudly celebrated the 10-year anniversary of the merger of Basell AF S.C.A. and Lyondell Chemical Company, a transaction that created one of the largest plastics, chemicals and refining companies in the world. Despite having to navigate some choppy waters early on in our history, we emerged from that period as a better, stronger and more efficient organization. Our continued focus is on being the best operated, most valued company in our industry not just today, but in the future. Today, building on this strong foundation, we maintain a clear vision of where we want to be decades from now.

In 2017, guided by our global values of excellence, ownership and teamwork, our company generated $4.9 billion in income from continuing operations, EBITDA of $7.1 billion and $12.28 diluted earnings per share. In addition, last May we increased our quarterly dividend to $0.90 per share, the ninth dividend increase since 2011, placing LyondellBasell in the top 15 percent for dividend yield among the S&P 500. Over the past five years our shareholders have seen a total return of 129 percent, exceeding the 87 percent delivered by the S&P 500.

Safe, reliable operations underpin our business results, so I'm also proud to report that LyondellBasell further improved upon our already top-decile safety performance during 2017, experiencing the fewest number of total recordable injuries per hours worked in our company's history. This is undoubtedly one of our most important successes for the year and a testament to the focus and dedication of our team around the globe. To put this accomplishment into perspective, we had fewer than half of the injuries per hours worked than our industry average and reduced the number of process safety incidents from already low 2016 levels. This discipline around safety translates to strong performance in all parts of our business.

In addition to a relentless focus on safety, reliability and cost at our existing assets, we advanced our growth plan to further position the company to capitalize on feedstock advantages and emerging global trends in population growth, transportation and sustainability.

To this end:

- In May, we broke ground on our industry-leading *Hyperzone* high density polyethylene (HDPE) plant in La Porte, Texas. We are very excited to introduce this innovative technology that can be used to produce a wide range of products, including large and small part blow molded goods, HDPE film and pressure pipe. The *Hyperzone* HDPE technology is a collaborative innovation from our global research and development teams in Ferrara, Italy; Frankfurt, Germany; Cincinnati, Ohio; and Houston, Texas. We expect this plant to come online in 2019.
- In July, we announced the final investment decision for the world's largest propylene oxide (PO) and tertiary butyl alcohol (TBA) plant in Channelview, Texas. This is the largest facility of its kind and we expect to begin operations in 2021.
- In September, we began operations at our new polypropylene compounding facility in Dalian, China. Our Dalian plant is our third polypropylene compounding site in China and is strategically located to serve the rapidly growing automotive industry in the region.
- In November, we announced our participation in a 50 / 50 joint venture called Quality Circular Polymers (QCP), a plastics recycling business in the Netherlands with SUEZ S.A., a French company specializing in water and waste management. This acquisition expands our product portfolio into recycled materials.

Beyond these current projects, we continue to develop a robust pipeline of growth opportunities that will create additional value for our shareholders. To accomplish this objective, we are investing in our in-house project planning and execution capabilities, as well as our corporate development capabilities.

In the midst of this activity, Hurricane Harvey made landfall on the U.S. Gulf Coast in late August. The unprecedented flooding from the hurricane caused disruption to businesses and the displacement of thousands of people. Throughout this challenging situation, our local team of more than 5,000 people remained focused on the safety of our colleagues, plants and communities. Universally, our team demonstrated acts of heroism and professionalism that allowed us to effectively weather the storm and restart operations quickly and safely while supporting recovery within our communities. I believe this resilience and flexibility is truly a hallmark of our dedicated team.

As we look to 2018 and what could be a more challenging market environment, I firmly believe we have the right strategy in place to deliver strong performance for our stakeholders. Although no one can predict exactly what will happen, I can say with certainty that we enter this period from a position of strength. We have a terrific set of assets, a strong balance sheet, a thoughtful approach to long-term growth, enhanced capabilities and a seasoned team that has operated successfully through past cycles. In short, we are focused and ready for whatever lies ahead.

Our 2017 performance underscores that we are a company with a very strong foundation, a deliberate, consistent and thoughtful approach to our strategy, a culture of excellence and an outstanding team. Together, we remain focused on activities that will continue to create differential shareholder value.

It is an honor to lead this great team that continues to accomplish so much. I hope you're as proud of our company as I am.

Most sincerely,

Bhavesh V. (Bob) Patel
Chief Executive Officer

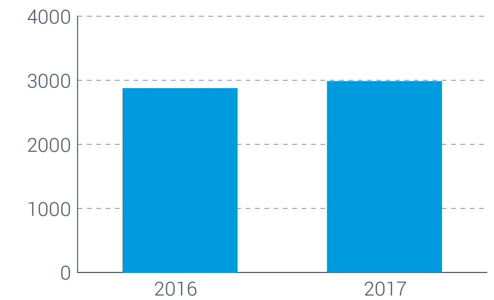
◂ *New York Stock Exchange Opening Bell*

New York, NY, USA
April 5, 2017

Sinnar, India

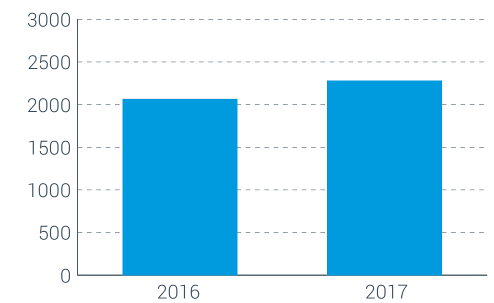
Financial Results by Segment

EBITDA by Operating Segment
($ in Millions)



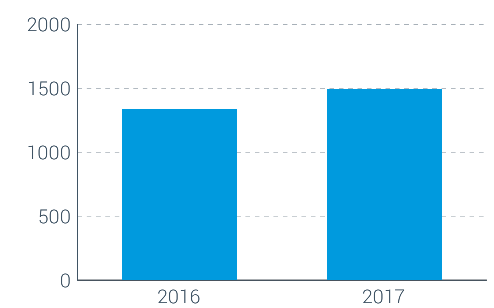
Olefins & Polyolefins – Americas

O&P – Americas produces and markets olefins and co-products, polyethylene and polypropylene. We are the second largest producer of ethylene in North America. In 2016-2017, we added a total of 880 million pounds of ethylene capacity. We are also the largest polypropylene producer and third largest polyethylene producer in North America.



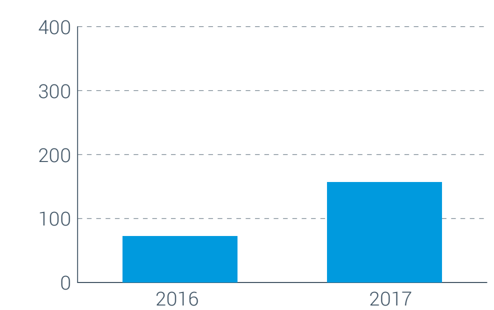
Olefins & Polyolefins – Europe, Asia and International (EAI)

O&P – EAI produces and markets olefins and co-products, polyethylene and polypropylene, including polypropylene compounds. We are the largest producer of polyethylene and polypropylene in Europe. During 2017, our European assets in this segment delivered record performance for the fourth consecutive year.



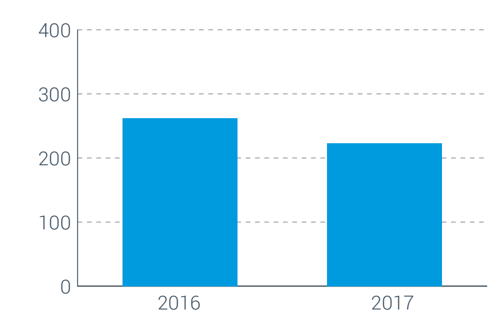
Intermediates & Derivatives

I&D produces and markets propylene oxide and its derivatives, oxyfuels and related products, and intermediate chemicals such as styrene monomer, acetyls, and ethylene oxide and derivatives. In 2017, EBITDA returned to the historical levels typically seen for the business of approximately $1.5 billion. We are the world's second largest producer of both propylene oxide and oxyfuels.



Refining

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



Technology

Our Technology segment develops and licenses chemical and polyolefin process technologies and manufactures and sells polyolefin catalysts. We are the global leader in the development and licensing of polyolefin processes and related catalyst for the production of polyethylene and polypropylene.

Advancing Shareholder Value

The core of our strategy is a deep commitment to operational excellence, cost discipline and prudent financial stewardship. This approach has created significant value for our shareholders.

Channelview, TX, USA

LyondellBasell was listed on the New York Stock Exchange on Oct. 14, 2010, with an opening price of $26.97 per share.

As of Dec. 31, 2017, we have had

9 dividend increases
since 2011

We have paid out
$12 billion
in dividends since 2010

We have returned
$28.3 billion
to shareholders through dividend and share repurchases since 2010

DECEMBER 31 **2011** — **$21.6 billion** Enterprise Value

DECEMBER 31 **2012** — **$34.5 billion** Enterprise Value

DECEMBER 31 **2013** — **$45.4 billion** Enterprise Value

DECEMBER 31 **2014** — **$43.1 billion** Enterprise Value

DECEMBER 31 **2015** — **$44.3 billion** Enterprise Value

DECEMBER 31 **2016** — **$41.6 billion** Enterprise Value

DECEMBER 31 **2017** — **$49.3 billion** Enterprise Value

Key Indicators

Over the past 5 years we have funded
$8.3 billion
in capital investments

45 %
of capital investments were allocated to profit-generating growth projects

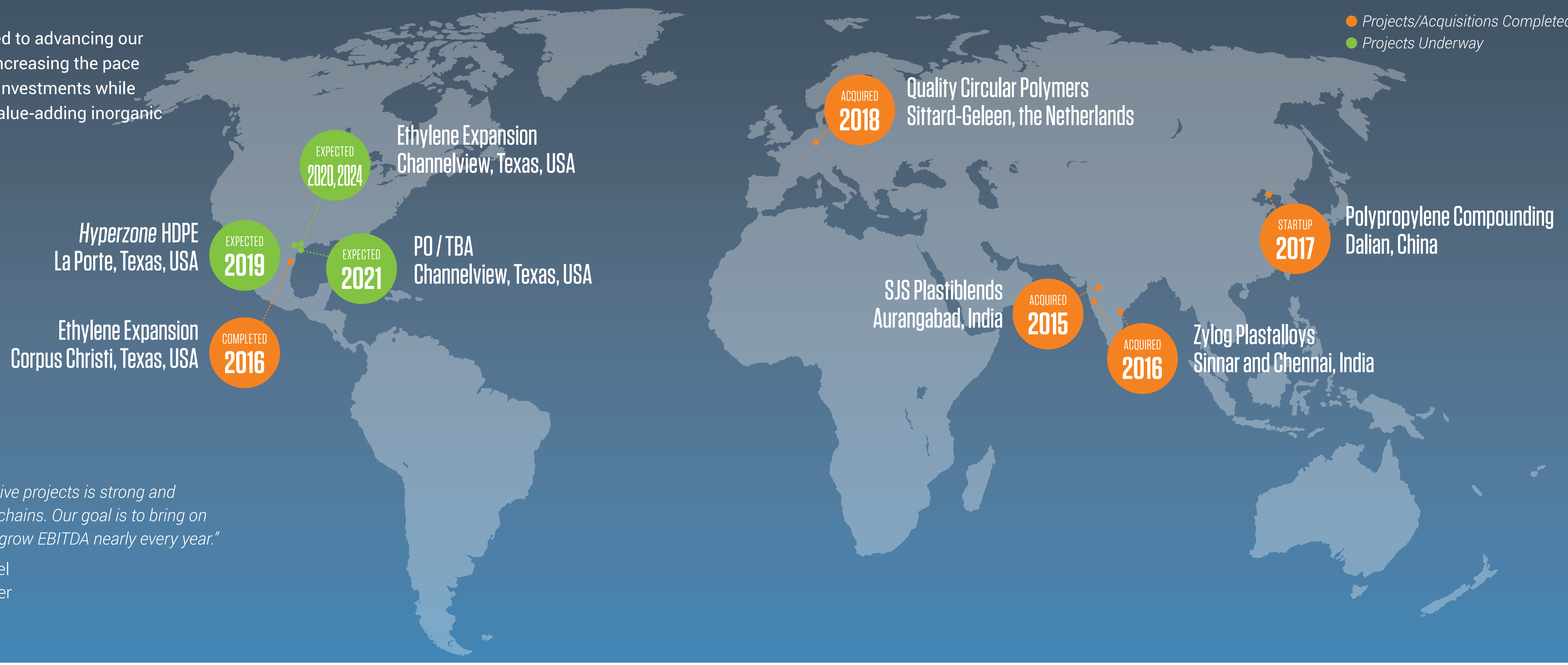
We have delivered a total shareholder return of
129 %
over the past 5 years

Our dividend yield is now in the top
15 %
of the S&P 500

**Note: Enterprise Value calculated by taking Common Shares Outstanding multiplied by Closing Share Price for the year; adding Current Maturities of Long Term Debt, Short Term Debt, and Long Term Debt; subtracting Cash and Short Term Investments and adding Non-Controlling Interests.*

Advancing Growth

We remain committed to advancing our growth strategy by increasing the pace of organic business investments while diligently pursuing value-adding inorganic opportunities.



"Our pipeline of attractive projects is strong and targets multiple value chains. Our goal is to bring on new capacity that will grow EBITDA nearly every year."

Bhavesh V. (Bob) Patel
Chief Executive Officer

Timeline of Organic Projects

Capacity (MM lbs.)
Estimated EBITDA[1] ($MM/year)

PROJECTS UNDERWAY

Project	Capacity (MM lbs.)	Estimated EBITDA[1] ($MM/year)	Timing
La Porte *Hyperzone* HDPE	1,100	$150 - 200	EXPECTED 2019
Channelview Ethylene	550	$100 - 150	EXPECTED 2020, 2024
Channelview PO/TBA	1,000/2,200	$350 - 450	EXPECTED 2021

POTENTIAL PROJECTS

Project	Capacity (MM lbs.)	Estimated EBITDA[1] ($MM/year)	Timing
North America PP	1,100	$150 - 250	2022-2023
North America PDH	1,600	$250 - 400	2022-2023
Europe PP	1,100	$150 - 200	2023-2024
North America PE	1,100	$150 - 250	2024-2025

[1] EBITDA is estimated as volume times 2015 – 17 average margins.

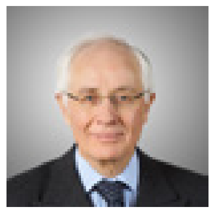
Supervisory Board

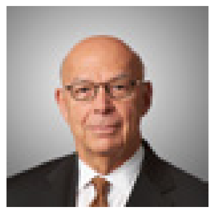

6
Robert G. Gwin
Chairman of the Supervisory Board Executive Vice President, Finance, and CFO of Anadarko Petroleum Corporation

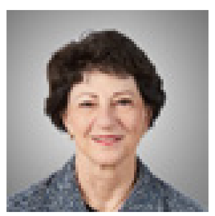

3, 5, 6
Jacques Aigrain
Senior Advisor at Warburg Pincus LLC

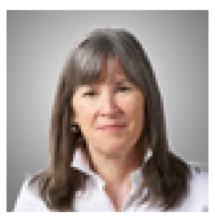

2, 5, 6
Lincoln Benet
CEO of Access Industries

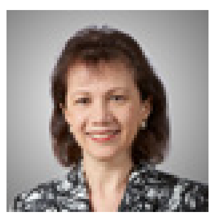

1, 4, 6
Jagjeet S. Bindra
Former President of Chevron Global Manufacturing

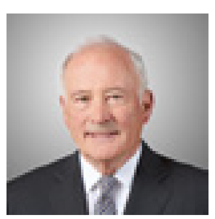

2, 3
Robin W. T. Buchanan
Senior Advisor at Bain & Company Inc.

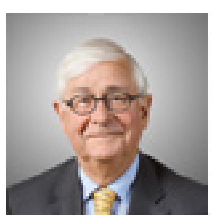

4
Stephen F. Cooper
CEO and Director of Warner Music Group


4, 5
Nance K. Dicciani
Former President and CEO of Honeywell Specialty Materials LLC


1, 2, 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, 5, 6
Bruce A. Smith
CEO of One Cypress Energy LLC and Former Chairman of the Board, President and CEO of Tesoro Corporation


2, 4
Rudy M.J. van der Meer
Former CEO of Coatings of AzkoNobel N.V.

Key
1. Audit Committee
2. Nominating and Governance Committee
3. Compensation Committee
4. Health, Safety, Environment & Operations Committee
5. Finance Committee
6. Executive Committee
Numbers in orange denote committee chairperson

Leadership Team


1
Bhavesh V. (Bob) Patel
Chief Executive Officer

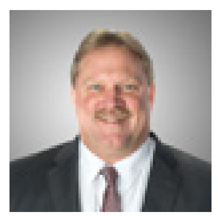

1
Thomas Aebischer
Executive Vice President and Chief Financial Officer

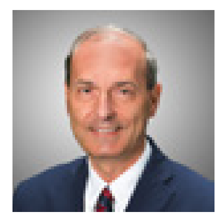

1
Daniel Coombs
Executive Vice President, Global Manufacturing, Projects, Refining and Technology

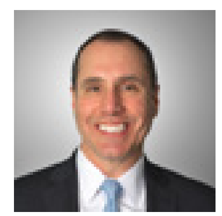

1
James Guilfoyle
Senior Vice President, Global Intermediates & Derivatives and Global Supply Chain


1
Jeffrey Kaplan
Executive Vice President and Chief Legal Officer


Darleen Caron
Executive Vice President and Chief Human Resources Officer

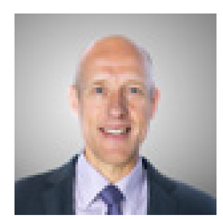

Paul Augustowski
Senior Vice President, Olefins & Polyolefins, Americas

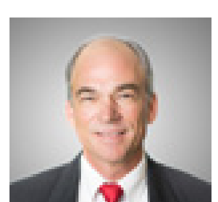

Massimo Covezzi
Senior Vice President, Research & Development


Stephen Doktycz
Senior Vice President, Strategic Planning & Transactions


Jean Gadbois
Senior Vice President, Europe, Asia and International Manufacturing


Richard Roudeix
Senior Vice President, Olefins & Polyolefins, Europe, Asia and International


Michael VanDerSnick
Senior Vice President, Americas Manufacturing


Dale Friedrichs
Vice President, Health, Safety, Environment and Security

Key
1. Management Board

Shareholder Information

Stock Exchange
LyondellBasell's common stock is listed on the New York Stock Exchange under the symbol "LYB."

Website
Shareholders and other interested parties can learn about LyondellBasell by visiting www.lyondellbasell.com.

Investor Relations Contact
David Kinney +1 713 309 7141

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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Canton, MA 02021
+1 877 456 7920 (U.S. Toll-Free)
+1 781 575 4337 (U.S. Toll/International)

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 1 of LyondellBasell's Form 10-K for the fiscal year ended Dec. 31, 2017, should be read in conjunction with such statements.

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, 2017

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)

The Netherlands	**98-0646235**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification No.)**

1221 McKinney St., Suite 300 Houston, Texas USA 77010	**4th Floor, One Vine Street London W1J0AH The United Kingdom**	**Delftseplein 27E 3013 AA Rotterdam The Netherlands**

(Address of principal executive offices) (Zip Code)

(713) 309-7200	**+44 (0) 207 220 2600**	**+31 (0)10 275 5500**

(Registrant's telephone numbers, including area codes)

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

Title of Each Class	Name of Each Exchange On Which Registered
Ordinary Shares, €0.04 Par Value	**New York Stock Exchange**

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

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

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

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

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate website, if any, every Interactive Data File required to be submitted and posted 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 and post such files). ☑ Yes ☐ No

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

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

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

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

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

The aggregate market value of common stock held by non-affiliates of the registrant on June 30, 2017, the last business day of the registrant's most recently completed second fiscal quarter, based on the closing price on that date of $84.39, was $27.3 billion. For purposes of this disclosure, in addition to the registrant's executive officers and members of its Supervisory Board, the registrant has included Access Industries, LLC and its affiliates as "affiliates."

The registrant had 394,556,328 shares outstanding at February 20, 2018 (excluding 183,883,835 treasury shares).

Documents incorporated by reference:

Portions of the Notice of the 2018 Annual Meeting of Shareholders and 2018 Proxy Statement, in connection with the Company's 2018 Annual Meeting of Shareholders (in Part III), as indicated herein.

PART I

PART II

PART III

PART IV

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

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

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

- the cost of raw materials represents a substantial portion of our operating expenses, and energy costs generally follow price trends of crude oil, natural gas liquids and/or natural gas; price volatility can significantly affect our results of operations and we may be unable to pass raw material and energy cost increases on to our customers due to the significant competition that we face, the commodity nature of our products and the time required to implement pricing changes;
- our operations in the United States ("U.S.") have benefited from low-cost natural gas and natural gas liquids; decreased availability of these materials (for example, from their export or regulations impacting hydraulic fracturing in the U.S.) could reduce the current benefits we receive;
- if crude oil prices fall materially, or decrease relative to U.S. natural gas prices, we would see less benefit from low-cost natural gas and natural gas liquids and it could have a negative effect on our results of operations;
- industry production capacities and operating rates may lead to periods of oversupply and low profitability; for example, substantial capacity expansions are underway in the U.S. olefins industry;
- we may face unplanned operating interruptions (including leaks, explosions, fires, weather-related incidents, mechanical failures, unscheduled downtime, supplier disruptions, labor shortages, strikes, work stoppages or other labor difficulties, transportation interruptions, spills and releases and other environmental incidents) at any of our facilities, which would negatively impact our operating results; for example, because the Houston refinery is our only refining operation, we would not have the ability to increase production elsewhere to mitigate the impact of any outage at that facility;
- changes in general economic, business, political and regulatory conditions in the countries or regions in which we operate could increase our costs, restrict our operations and reduce our operating results;
- our ability to execute our organic growth plans may be negatively affected by our ability to complete projects on time and on budget;
- uncertainties associated with worldwide economies could create reductions in demand and pricing, as well as increased counterparty risks, which could reduce liquidity or cause financial losses resulting from counterparty default;
- the negative outcome of any legal and environmental proceedings or changes in laws or regulations regarding legal and environmental matters may increase our costs 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 on page 16.

PART I

Items 1 and 2. Business and Properties

OVERVIEW

LyondellBasell Industries N.V. is a global, independent chemical company and was incorporated 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, while our plastic products are typically used in large volume 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.

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

SEGMENTS

We manage our operations through five 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, including polypropylene compounds.
- *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.
- *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 21, *Segment and Related Information*, to the Consolidated Financial Statements. Information about the locations where we produce our primary products can be found under “Description of Properties.”

In 2017, 2016 and 2015, no single customer accounted for 10% or more of our total revenues.

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, 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%, 24% and 21% of our total revenues in 2017, 2016 and 2015, respectively.

Polypropylene—We produce PP homopolymers and copolymers. PP compounds are produced from blends of polyolefins and additives and are sold mainly to the automotive and home appliances industries. PP sales accounted for approximately 17% of our total revenues in 2017, 2016 and 2015.

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. In 2016 and 2017, we added a total of 880 million pounds of ethylene capacity at our facilities in North America.

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

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

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 primarily are 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 O&P—EAI segment.

Joint Venture Relationships

We participate in a joint venture in Mexico, which provides us with capacity for approximately 640 million pounds of PP production. The capacity is based on our percentage ownership of the joint venture's total capacity. We do not hold a majority interest in or have operational control of this joint venture.

Raw Materials

Raw material cost is the largest component of the total cost to produce ethylene and its co-products. The primary raw materials used in our Americas olefin facilities are heavy liquids and natural gas liquids ("NGLs"). 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.

Prior to 2010, olefins facilities using heavy liquids as feedstock generated higher margins than those using NGLs. However, 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. With reductions in oil prices since 2014, the cost advantage has declined, but is still significant. A plant's flexibility to consume a wide range of raw materials generally will provide 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. Industry consolidation in North America has led to fewer, although larger, competitors. Profitability is affected not only by supply and demand for olefins and polyolefins, but also by raw material costs and price competition among producers, which may intensify due to, among other things, the addition of new capacity. In general, demand is a function of worldwide economic growth, including the regional dynamics that underlie global growth trends.

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

Based on published capacity data, we believe as of December 31, 2017 we were:

- the second largest producer of ethylene in North America, with ethylene capacity of 11.8 billion pounds per year;
- the third largest producer of PE in North America with 6.4 billion pounds per year of capacity; and
- the largest producer of PP in North America, with 3.9 billion pounds, including our share of our Mexican joint venture capacity.

Olefins and Polyolefins—Europe, Asia, International Segment

Overview

Our O&P—EAI segment produces and markets olefins and co-products, polyethylene and polypropylene, including PP compounds.

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.

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

Joint Venture Relationships

We participate in several manufacturing joint ventures in Saudi Arabia, Thailand, Poland, Australia and South Korea. We do not hold majority interests in any of these joint ventures, nor do we have operational control. These ventures provide us with additional production capacity of approximately 2.4 billion pounds of PP, approximately 1.4 billion pounds of olefins, approximately 0.9 billion pounds of PE and approximately 100 million pounds of PP compounds. These capacities are based on our percentage ownership interest in the joint ventures' total capacities. We realize profits or losses from these ventures as income or loss on the equity basis of accounting.

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

Raw Materials

Raw material cost is the largest component of the total cost for the production of olefins and co-products. The primary raw material used in our European olefin facilities is naphtha; however, in recent years we have sourced increased amounts of advantaged NGLs when the opportunity arises. For our Saudi joint venture facilities, locally sourced and cost advantaged NGLs, including ethane, propane and butane are used. The principal raw materials used in the production of polyolefins are propylene and ethylene. In Europe, we have the capacity to produce approximately 50% of the propylene requirements for our European PP production and all of the ethylene requirements for our European PE production. Propylene and ethylene requirements that are not produced internally are generally acquired pursuant to long-term contracts with third party suppliers or via spot purchases.

Our PP compounds facilities receive the majority of their PP raw materials from one of our wholly owned or joint venture facilities. Some of our joint ventures receive propylene and ethylene from their local shareholders under long-term contracts.

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

Industry Dynamics / Competition

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

Based on published capacity data and including our proportionate share of our joint ventures, we believe as of December 31, 2017 we were:

- the fifth largest producer of ethylene in Europe with an ethylene capacity in Europe of 4.3 billion pounds per year;
- the largest producer of PP in Europe with 5.7 billion pounds per year of capacity, including our share of the Poland joint venture; and
- the largest producer of PE in Europe with 4.8 billion pounds per year of capacity, including our share of the Poland joint venture.

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 urethane foams used for insulation, automotive/furniture cushioning, coatings, surfactants, synthetic resins and several other household usages.

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

Intermediate Chemicals—We produce other commodity chemicals that utilize ethylene as a key component feedstock, including SM, acetyls and ethylene oxide derivatives. SM is utilized in various applications such as plastics, expandable polystyrene for packaging, foam cups and containers, insulation products and durables and engineering resins. Our acetyls products comprise methanol, glacial acetic acid ("GAA") and vinyl acetate monomer ("VAM"). Natural gas (methane) is the feedstock for methanol, some of which is converted to GAA, and a portion of the GAA is reacted with ethylene to create VAM. VAM is an intermediate chemical used in fabric or wood treatments, pigments, coatings, films and adhesives. Ethylene oxide is an intermediate chemical that is used to produce ethylene glycol, glycol ethers and other derivatives. Ethylene oxide and its derivatives are used in the production of polyester, antifreeze fluids, solvents and other chemical products.

Sales & Marketing / Customers

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

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

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

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

Joint Venture Relationships

We have two PO joint ventures with Covestro AG, one in the U.S. and one in Europe. We operate four of the U.S. PO production facilities for the U.S. PO joint venture. Covestro's interest represents ownership of an in-kind portion of the PO production of 1.5 billion pounds 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 340 million pounds of PO and approximately 750 million pounds of SM. We do not share marketing or product sales with Covestro under either of these PO joint ventures.

We also have joint venture manufacturing relationships in China. These ventures provide us with additional production capacity of approximately 115 million pounds of PO. This capacity is based on our operational share of the joint ventures' total capacities.

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 purchase carbon monoxide pursuant to a long-term contract with pricing primarily based on the cost of production. The methanol required for our downstream production of acetyls is internally sourced from a partnership and from our methanol plant at Channelview, Texas. Natural gas is the primary raw material required for the production of methanol.

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

Industry Dynamics / Competition

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

Based on published capacity data, excluding our partners' shares of joint venture capacity, we believe as of December 31, 2017 we were:

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

Refining Segment

Overview

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

Sales & Marketing / Customers

The Houston refinery's products are primarily sold in bulk to other refiners, marketers, distributors and wholesalers at market-related prices. Most of the Houston refinery's products are sold under contracts with a term of one year or less or are sold in the spot market. The Houston refinery's products generally are transported to customers via pipelines and terminals owned and operated by other parties. The sales of refined products accounted for approximately 18%, 16% and 19% of our total revenues in 2017, 2016 and 2015, 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 268,000 barrels per day on a calendar day basis (normal operating basis), or approximately 292,000 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 dense 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. However, this crude oil has historically been less costly to purchase than light, low-sulfur crude oil such as Brent.

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 2017, there were 141 operable crude oil refineries in the U.S., and total U.S. refinery capacity was approximately 18.3 million barrels per day. During 2017, the Houston refinery processed an average of approximately 236,000 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 as a result of the changing global economy and changing crude oil and refined product prices. Crude oil prices are impacted by worldwide political events, the economics of exploration and production and refined products demand. Prices and demand for fuel products are influenced by seasonal and short-term factors such as weather and driving patterns, as well as by longer term issues such as the economy, energy conservation and alternative fuels. Industry fuel products supply is dependent on short-term industry operating capabilities and on long-term refining capacity.

A crack spread is a benchmark indication of refining margins based on the processing of a specific type of crude oil into an assumed selection of major refined products. The Houston refinery generally tracks the Maya 2-1-1 crack spread, which represents the difference between the current month Gulf Coast price of two barrels of

Maya crude oil as set by Petróleos Mexicanos ("Pemex") and one barrel each of U.S. Gulf Coast Reformulated Gasoline Blendstock for Oxygen Blending ("RBOB") Gasoline and of U.S. Gulf Coast Ultra Low Sulfur Diesel ("ULSD"). While these benchmark refining spreads are generally indicative of the level of profitability at the Houston refinery and similarly configured refineries, there are many other factors specific to each refinery and the industry in general, such as the value of refinery by-products, which influence operating results. Refinery by-products are products other than gasoline and distillates that represent about one-third of the total product volume, and include coke, sulfur, and lighter materials such as NGLs and crude olefins streams. The cost of Renewable Identification Numbers ("RINs"), which are renewable fuel credits mandated by the U.S. Environmental Protection Agency (the "EPA"), can also affect profitability.

Technology Segment

Overview

Our Technology segment develops and licenses chemical and polyolefin process technologies and manufactures and sells polyolefin catalysts. We market our process technologies and our polyolefin catalysts to external customers and also use them in our own manufacturing operations. Approximately 25% of our catalyst sales are 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 2017, 2016 and 2015, our R&D expenditures were $106 million, $99 million and $102 million, respectively. A portion of these expenses are related to technical support and customer service and are allocated to the other business segments. In 2017, 2016 and 2015, approximately 45% 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, 2017, we owned approximately 5,580 patents and patent applications worldwide. Our patents and trade secrets cover our processes, products and catalysts and are significant to our competitive position, particularly with regard to PO, intermediate chemicals, petrochemicals, polymers and our process technologies. We own globally registered and unregistered trademarks including marks for "LyondellBasell," "Lyondell," "Basell" and "Equistar." 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 heritage 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 Operation*s; and Notes 2 and 18 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 $279 million in 2017 for health, safety and environmental compliance purposes and improvement programs, and estimate such expenditures to be approximately $210 million in 2018 and $230 million in 2019.

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

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

Employee Relations

As of December 31, 2017, we employed approximately 13,400 full-time and part-time employees around the world. Of this total, 6,400 were located in North America and another 5,900 were located in Europe. The remainder of our employees are in other global locations.

As of December 31, 2017, approximately 850 of our employees in North America were represented by labor unions. The vast majority of our employees in Europe and South America are subject to staff council or works council coverage or collective bargaining agreements.

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

EXECUTIVE OFFICERS OF THE REGISTRANT

Our executive officers as of February 1, 2018 were as follows:

Name and Age	Significant Experience
Bhavesh V. ("Bob") Patel, 51	Chief Executive Officer and Chairman of the Management Board since January 2015.
	Executive Vice President, Olefins and Polyolefins—EAI and Technology from October 2013 and member of the Management Board from April 2014 to January 2015.
	Senior Vice President, Olefins and Polyolefins—EAI and Technology from November 2010 to October 2013.
	Senior Vice President, Olefins and Polyolefins—Americas from March 2010 to June 2011.
Thomas Aebischer, 56	Executive Vice President and Chief Financial Officer since January 2016. Chief Financial Officer of LafargeHolcim from July 2015 to December 2015.
	Chief Financial Officer of Holcim Ltd. from January 2011 to June 2015.
Paul Augustowski, 57	Senior Vice President, Olefins and Polyolefins—Americas since January 2016.
	Vice President, Polymer Sales—Americas from January 2015 to January 2016.
	Director, Polypropylene and Catalloy—Americas from November 2011 to January 2015.
Darleen Caron, 53	Executive Vice President and Chief Human Resources Officer since October 2017.
	Executive Vice President of Global Human Resources and Member of The Office of The President at SNC Lavalin Group, Inc. from December 2010 to December 2015.
Daniel Coombs, 61	Executive Vice President, Global Manufacturing, Projects, Refining and Technology since February 2017.
	Executive Vice President, Global Olefins and Polyolefins, and Technology from January 2016 to February 2017.
	Executive Vice President, Intermediates and Derivatives from May 2015 to January 2016.
	Senior Vice President of Manufacturing for Chevron Phillips Chemical from December 2013 to May 2015.

Name and Age	Significant Experience
	Senior Vice President for Specialties, Aromatics and Styrenics for Chevron Phillips Chemical from December 2011 to November 2013.
	Vice President of Corporate Planning and Development for Chevron Phillips Chemical from September 2011 to November 2011.
Massimo Covezzi, 60	Senior Vice President, Research and Development since January 2008.
Stephen Doktycz, 56	Senior Vice President, Strategic Planning and Transactions since March 2017.
	Corporate Director and Executive Project Lead at The Dow Chemical Company from 2013 to March 2017.
	Global Director, Corporate and Strategic Development at The Dow Chemical Company from 2011 to 2013.
Dale Friedrichs, 54	Vice President, Health, Safety, Environment and Security since February 2017.
	Site Manager of various facilities from January 1995 to February 2017.
James Guilfoyle, 47	Senior Vice President, Global Intermediates & Derivatives and Global Supply Chain since February 2017
	Senior Vice President, Global Intermediates and Derivatives from June 2015 to February 2017.
	Vice President of Global Propylene Oxide and Co-Products from March 2015 to May 2015.
	Director of Polymer Sales Americas from January 2012 to February 2015.
Jeffrey Kaplan, 49	Executive Vice President and Chief Legal Officer since March 2015.
	Deputy General Counsel from December 2009 to March 2015.
Richard Roudeix, 55	Senior Vice President, Olefins & Polyolefins, Europe, Asia and International since February 2017.
	Senior Vice President, Olefins & Polyolefins, Europe from March 2015 to February 2017.
	Director, Olefins Europe from May 2009 to March 2015.

Description of Properties

Our principal manufacturing facilities as of December 31, 2017 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.

Location	Segment
Americas	
Bayport (Pasadena), Texas	I&D
Bayport (Pasadena), Texas(1)	I&D
Bayport (Pasadena), Texas	O&P—Americas
Channelview, Texas(2)	O&P—Americas
Channelview, Texas(1)(2)	I&D
Chocolate Bayou, Texas	O&P—Americas
Clinton, Iowa	O&P—Americas
Corpus Christi, Texas	O&P—Americas
Edison, New Jersey	O&P—Americas
Houston, Texas	Refining
La Porte, Texas(3)	O&P—Americas
La Porte, Texas(3)(4)	I&D
Lake Charles, Louisiana	O&P—Americas
Matagorda, Texas	O&P—Americas
Morris, Illinois	O&P—Americas
Tuscola, Illinois	O&P—Americas
Victoria, Texas†	O&P—Americas
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
Ludwigshafen, Germany†	Technology
Maasvlakte, The Netherlands(5)	I&D
Moerdijk, The Netherlands†	O&P—EAI
Münchsmünster, Germany	O&P—EAI
Tarragona, Spain(6)	O&P—EAI
Wesseling, Germany	O&P—EAI
Asia Pacific	
Geelong, Australia	O&P—EAI

† The facility is located on leased land.

(1) The Bayport PO/TBA plants and the Channelview PO/SM I plant are held by the U.S. PO joint venture between Covestro and Lyondell Chemical Company. These plants are located on land leased by the U.S. PO joint venture.

(2) Equistar Chemicals, LP operates a styrene maleic anhydride unit and a polybutadiene unit, which are owned by an unrelated party and are located within the Channelview facility on property leased from Equistar Chemicals, LP.

(3) The La Porte facilities are on contiguous property.

(4) The La Porte methanol facility is owned by La Porte Methanol Company, a partnership owned 85% by us.

(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.

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.lyb.com*. Information contained on our Internet website is not part of this report on Form 10-K.

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

Item 1A. Risk Factors.

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

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

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

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

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

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

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

Energy costs generally follow price trends of crude oil and natural gas. These price trends may be highly volatile and cyclical. In the past, raw material and energy costs have experienced significant fluctuations that adversely affected our business segments' results of operations. For example, we have benefitted from the favorable ratio of U.S. crude oil prices to natural gas prices in recent years. This advantage was reduced as oil prices declined beginning in 2014. If the price of crude oil remains lower relative to U.S. natural gas prices or if the demand for natural gas and NGLs increases, this may have a negative impact on our results of operations.

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

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

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

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

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

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 direct 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 North Africa, the Middle East, and Central and South America that may be less politically stable than other areas in which we conduct business, such as Europe or the U.S. 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 will have a material adverse effect on our results of operations.

Increased incidents of civil unrest, including terrorist attacks and demonstrations that have been marked by violence, have occurred in a number of countries in North Africa and the Middle East. 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 Europe, the U.S., or their respective trading partners.

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

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

If a sustained financial crisis in Europe leads to a significant devaluation of the euro, the value of our financial assets that are denominated in euros would be significantly reduced when translated to U.S. dollars for financial reporting purposes. 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.

The cyclicality 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 cyclicality and volatility. The chemical and refining industries historically have experienced alternating periods of capacity shortages, causing prices and profit margins to increase, followed by periods of excess capacity, resulting in oversupply, declining capacity utilization rates and declining prices and profit margins.

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

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

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

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

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

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

We own and operate large-scale facilities. Our operating results are dependent on the continued operation of our various production facilities and the ability to complete construction and maintenance projects on schedule. Interruptions at our facilities may materially reduce the productivity and profitability of a particular manufacturing facility, or our business as a whole, during and after the period of such operational difficulties. In the past, we had to shut down plants on the U.S. Gulf Coast, including the temporary shutdown of our Houston refinery, as a result of hurricanes striking the Texas coast.

In addition, because the Houston refinery is our only refining operation, an outage at the refinery could have a particularly negative impact on our operating results. Unlike our chemical and polymer production facilities, which may have sufficient excess capacity to mitigate the negative impact of lost production at other facilities, we do not have the ability to increase refining production elsewhere in the U.S.

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

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

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

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

Delays or cost increases related to capital spending programs involving engineering, procurement and construction of facilities could materially adversely affect our ability to achieve forecasted internal rates of return and operating results. Delays in making required changes or upgrades to our facilities could subject us to fines or penalties as well as affect our ability to supply certain products we produce. Such delays or cost increases may arise as a result of unpredictable factors, many of which are beyond our control, including:

- denial of or delay in receiving requisite regulatory approvals and/or permits;

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

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

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

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

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

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

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

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

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

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

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

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

A portion of our interest income from internal financing is either untaxed or taxed at rates substantially lower than the U.S. statutory rate. In September 2016, the United Kingdom enacted provisions (the so called "anti-hybrid provisions"), effective for years beginning January 1, 2017, that resulted in changes to our internal financing structure which did not materially impact our Consolidated Financial Statements. In addition, in October 2016 the U.S. Treasury issued final Section 385 debt-equity regulations that could impact our internal financings in future years. Pursuant to a recent Executive Order, the Treasury Department reviewed these regulations and determined to delay but retain these regulations, subject to further review after the enactment of U.S. tax reform. In December 2017, the U.S. enacted "H.R.1," also known as the "Tax Cuts and Jobs Act" (the "Tax Act"), materially impacting our 2017 Consolidated Financial Statements and significantly affecting future periods. We are awaiting Treasury's review of the existing Section 385 debt-equity regulations which could impact our internal financings in future years as well as any new regulations pursuant to Treasury's expanded regulatory authority under the Tax Act.

We monitor income tax developments in countries where we conduct business. Recently, there has been an increase in attention, both in the U.S. and globally, to the tax practices of multinational companies, including the European Union's state aid investigations and proposals by the Organization for Economic Cooperation and Development with respect to base erosion and profit shifting. Such attention may result in additional legislative changes that could adversely affect our tax rate. Other than the recently enacted Tax Act, management does not believe that recent changes in income tax laws will have a material impact on our Consolidated Financial Statements, although new or proposed changes to tax laws could affect our tax liabilities in the future.

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, performance chemicals, petrochemicals and polymers. 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. However, we may be unable to prevent third parties from using our intellectual property without authorization. Proceedings to protect these rights could be costly, and we may not prevail.

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

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

A portion of our operations are conducted through joint ventures, where control may be exercised by or shared with unaffiliated third parties. We cannot control the actions of our joint venture partners, including any nonperformance, default or bankruptcy of joint venture partners. The joint ventures that we do not control may also lack financial reporting systems to provide adequate and timely information for our reporting purposes.

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

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

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

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

In the U.S., the Environmental Protection Agency (the "EPA") has promulgated federal GHG regulations under the Clean Air Act affecting certain sources. The EPA has issued mandatory GHG reporting requirements, requirements to obtain GHG permits for certain industrial plants and proposals for GHG performance standards for some facilities. The recent EPA action could be a precursor to further federal regulation of carbon dioxide emissions and other greenhouse gases, and may affect the outcome of other climate change lawsuits pending in U.S. courts in a manner unfavorable to our industry. In any event, additional regulation may be forthcoming at the U.S. federal or state level with respect to GHG emissions, and such regulation could result in the creation of additional costs in the form of taxes or required acquisition or trading of emission allowances.

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

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

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

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

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

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

We may use our five-year, $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, 2017, we had no borrowings or letters of credit outstanding under the facility and no borrowings under our commercial paper program, leaving an unused and available credit capacity of $2,500 million. We may also meet our cash needs by selling receivables under our $900 million U.S. accounts receivable securitization facility. In the event of a default under our credit facility or any of our senior notes, we could be required to immediately repay all outstanding borrowings and make cash deposits as collateral for all obligations the facility supports, which we may not be able to do. Any default under any of our credit arrangements could cause a default under many of our other credit agreements and debt instruments. Without waivers from lenders party to those agreements, any such default could have a material adverse effect on our ability to continue to operate.

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

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

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

Adverse results of legal proceedings could materially adversely affect us.

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

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

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

Nearly all of our current pension plans have projected benefit obligations that exceed the fair value of the plan assets. As of December 31, 2017, the aggregate deficit was $903 million. Any declines in the fair values of the pension plans' assets could require additional payments by us in order to maintain specified funding levels.

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

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

We may make acquisitions in order to enhance our business. On February 15, 2018, we entered into a definitive agreement to acquire A. Schulman. Acquisitions involve numerous risks, including 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 or other benefits associated with our acquisitions if we do not manage and operate the acquired business up to our expectations. If we are unable to efficiently operate as a combined organization utilizing common information and communication systems, operating procedures, financial controls, and human resources practices, our business, financial condition, and results of operations may be adversely affected.

Item 1B. Unresolved Staff Comments.

None.

Item 3. Legal Proceedings.

Environmental Matters

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

In September 2013, the Louisiana Department of Environmental Quality (the "LDEQ") issued a Compliance Order and Notice of Potential Penalty to Equistar Chemicals, LP pertaining to self-reported deviations arising from our Lake Charles, Louisiana polyolefins plant and relating to certain Clean Air Act Title V permit conditions, limits and other requirements. The matter involves deviations reported by us to the LDEQ in semi-annual reports covering 2007 through June 2011. We reasonably believe that LDEQ may assert an administrative penalty demand in this matter in excess of $100,000.

In September 2013, the EPA Region V issued a Notice and Finding of Violation alleging violations at our Morris, Illinois facility related to flaring activity. The Notice generally alleges failures to monitor steam usage and improper flare operations. Region V indicated at a December 2017 meeting that it intends to issue an administrative enforcement order in 2018. We reasonably believe that EPA Region V may assert a penalty demand in excess of $100,000.

In June 2014, EPA Region V issued a Notice and Finding of Violation alleging violations at our Tuscola, Illinois facility related to flaring activity. The Notice generally alleges failure to conduct a valid performance test and improper flare operations. Region V indicated at a December 2017 meeting that it intends to issue an administrative enforcement order in 2018. We reasonably believe that EPA Region V may assert a penalty demand in excess of $100,000.

In August 2015 the Victoria plant experienced a hexane leak into the cooling water system which resulted in estimated emissions of 154,000 pounds of hexane over a 12-day period from the cooling water pond operated by the site host, Invista. In November 2017, the Texas Commission on Environmental Quality (the "TCEQ") issued a proposed agreed order to both Invista and Equistar assessing a proposed penalty of $300,000. We are currently in discussions with TCEQ.

In March 2017, the TCEQ issued a proposed Agreed Order to Houston Refining LP. The proposed Agreed Order stems from agency record reviews conducted from May to July 2016 and September to October 2016 and an agency investigation conducted in April 2016. In June 2017, TCEQ issued a revised Agreed Order that carries a total administrative penalty of $77,626. The Agreed Order is currently awaiting final TCEQ approval.

Litigation and Other Matters

Information regarding our litigation and other legal proceedings can be found in Note 18, *Commitments and Contingencies*, to the Consolidated Financial Statements.

Item 4. Mine Safety Disclosures.

Not applicable.

PART II

Item 5. Market for Registrant's Common Equity, Related Stockholder 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 high and low sales prices for our ordinary shares and the cash dividends per share declared for the two most recent fiscal years are shown in the table below.

	High	Low	Cash Dividends Declared
2017			
First Quarter	$ 97.64	$85.66	$0.85
Second Quarter	92.03	78.01	0.90
Third Quarter	100.69	82.54	0.90
Fourth Quarter	111.62	96.20	0.90
2016			
First Quarter	$ 89.99	$69.10	$0.78
Second Quarter	93.75	69.82	0.85
Third Quarter	81.75	71.48	0.85
Fourth Quarter	92.68	76.71	0.85

The payment of dividends or distributions in the future will be subject to the requirements of Dutch law and the discretion of our Management Board and our Supervisory Board. 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 20, 2018, there were approximately 6,100 record holders of our shares, including Cede & Co. as nominee of the Depository Trust Company.

United Kingdom Tax Considerations

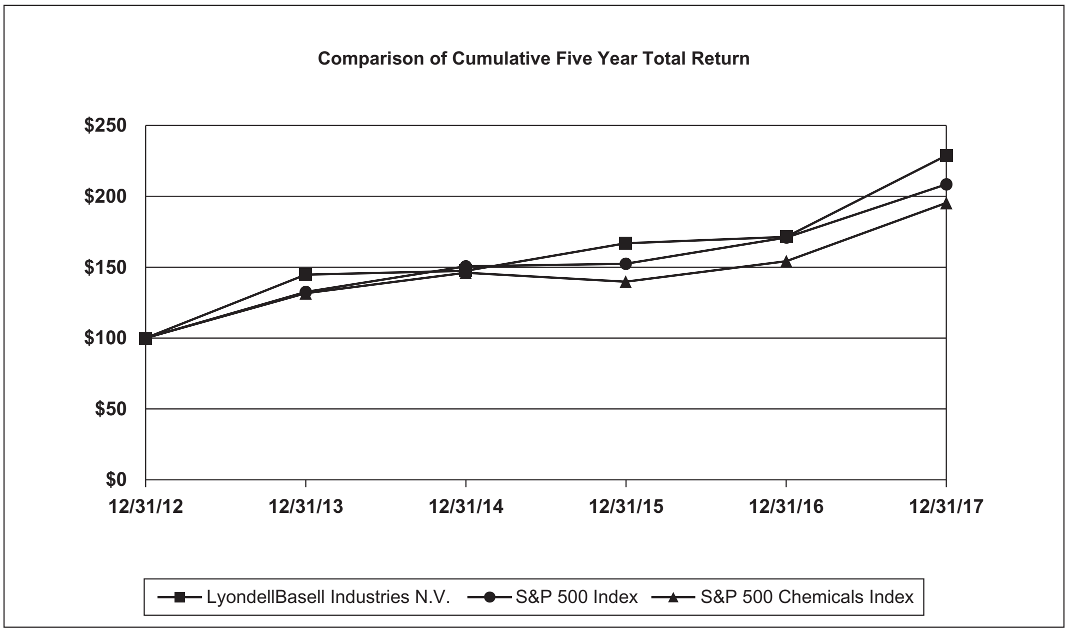
In May 2013, we announced the planned migration of the tax domicile of LyondellBasell Industries N.V. from The Netherlands, where LyondellBasell Industries N.V. is incorporated, to the United Kingdom. On August 28, 2013, the Dutch and the United Kingdom competent authorities completed a mutual agreement procedure and issued a ruling that retroactively as of July 1, 2013 LyondellBasell Industries N.V. should be treated solely as a tax resident in the United Kingdom and is subject to the United Kingdom corporate income tax system.

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, 2012. The graph assumes that $100 was invested on December 31, 2012 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.



	12/31/2012	12/31/2013	12/31/2014	12/31/2015	12/31/2016	12/31/2017
LyondellBasell Industries N.V.	$100.00	$144.73	$147.38	$166.73	$171.33	$228.66
S&P 500 Index	$100.00	$132.39	$150.51	$152.59	$170.84	$208.14
S&P 500 Chemicals Index	$100.00	$131.80	$145.91	$139.81	$154.01	$195.08

Issuer Purchases of Equity Securities

2017 Period	Total Number of Shares Purchased	Average Price Paid per Share	Total Number of Shares Purchased as Part of Publicly Announced Plans or Programs	Maximum Number of Shares That May Yet Be Purchased Under the Plans or Programs
October 1—October 31	—	$—	—	33,570,716
November 1—November 30	—	$—	—	33,570,716
December 1—December 31	—	$—	—	33,570,716
Total	—	$—	—	33,570,716

On May 24, 2017, we announced a share repurchase program of up to 40,087,633 of our ordinary shares through November 23, 2018. The maximum number of shares that may yet be purchased is not necessarily an indication of the number of shares that will ultimately be purchased.

Item 6. Selected Financial Data.

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

In millions of dollars, except per share data	Year Ended December 31, 2017	2016	2015	2014	2013
Results of operations data:					
Sales and other operating revenues	$34,484	$29,183	$32,735	$45,608	$44,062
Operating income(a)	5,460	5,060	6,122	5,736	5,102
Interest expense(b)	(491)	(322)	(310)	(352)	(309)
Income from equity investments	321	367	339	257	203
Income from continuing operations(a)(b)(c)	4,895	3,847	4,479	4,172	3,860
Earnings per share from continuing operations:					
Basic	12.28	9.17	9.63	8.04	6.81
Diluted	12.28	9.15	9.60	8.00	6.76
Loss from discontinued operations, net of tax	(18)	(10)	(5)	(4)	(7)
Loss per share from discontinued operations:					
Basic	(0.05)	(0.02)	(0.01)	(0.01)	(0.01)
Diluted	(0.05)	(0.02)	(0.01)	(0.01)	(0.01)
Balance sheet data:					
Total assets	26,206	23,442	22,757	24,221	27,230
Short-term debt	68	594	353	346	58
Long-term debt(d)	8,551	8,387	7,675	6,699	5,709
Cash and cash equivalents	1,523	875	924	1,031	4,450
Short-term investments	1,307	1,147	1,064	1,593	—
Accounts receivable	3,539	2,842	2,517	3,448	4,030
Inventories	4,217	3,809	4,051	4,517	5,279
Working capital	4,861	4,122	4,386	4,901	5,737
Cash flow data:					
Cash provided by (used in):					
Operating activities	5,206	5,606	5,842	6,048	4,835
Investing activities	(1,756)	(2,301)	(1,046)	(3,539)	(1,597)
Expenditures for property, plant and equipment	(1,547)	(2,243)	(1,440)	(1,499)	(1,561)
Financing activities	(2,859)	(3,349)	(4,850)	(5,907)	(1,589)
Dividends declared per share	3.55	3.33	3.04	2.70	2.00

(a) Operating income and Income from continuing operations in 2017 include a pretax gain of $108 million ($103 million, after tax) on the sale of our 27% interest in Geosel, a joint venture in France; a pretax gain of $31 million ($20 million, after tax) on the sale of our Lake Charles, Louisiana site; and a pretax, non-cash gain related to the elimination of an obligation associated with a lease of $ 21 million ($14 million, after tax). In 2016, they also included a pretax and after-tax gain of $78 million on the sale of our wholly owned Argentine subsidiary and a pretax charge of $58 million ($37 million, after tax) for a pension settlement. Operating income and Income from continuing operations in 2016, 2015 and 2014 included pretax, non-cash charges of $29 million ($18 million, after tax), $548 million ($351 million, after tax) and $760 million ($483 million, after tax), respectively, related to lower of cost or market ("LCM") inventory valuation adjustments.

(b) Interest expense and Income from continuing operations in 2017 includes pretax charges of $113 million ($106 million, after tax) related to the redemption of $1,000 million aggregate principal amount of our outstanding 5% senior notes due 2019.

(c) 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 newly enacted U.S. Tax Cuts and Jobs Act. In 2016, it included $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. Income from continuing operations in 2013 included a $353 million benefit related to the release of valuation allowances primarily associated with tax losses in our French group.

(d) Long-term debt includes current maturities of long-term debt.

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. When we use the terms "we," "us," "our" or similar words in this discussion, unless the context otherwise requires, we are referring to LyondellBasell Industries N.V. and its consolidated subsidiaries.

OVERVIEW

We demonstrated the strength of our earnings performance under dynamic market conditions in 2017 with increased volumes, improved EBITDA and higher earnings relative to 2016. The complementary performance of our O&P—Americas and O&P—EAI segments combined with the relative stability of our I&D segment's portfolio provided a resilient platform for profitability in 2017. Global operating rates remained strong in 2017 due to delays in new capacity, a volume shortfall from Hurricane Harvey and an improving market in China. Our reliable performance during the year positioned us to capture market opportunities as they arose. We also advanced our growth program by commencing construction on our new Hyperzone high-density polyethylene plant in La Porte, Texas and reaching a final investment decision for a world-scale PO/TBA plant.

Significant items that affected 2017 results include:

- Improved Olefins and Polyolefins—Americas ("O&P—Americas") results driven by the impact of higher olefins volumes relative to 2016 following completion of our Corpus Christi expansion in late 2016;
- Higher Olefins and Polyolefins—Europe, Asia, International ("O&P—EAI") segment results on higher olefins margins and increased volumes on most products, partly offset by lower polyethylene margins;
- Higher Intermediates and Derivatives ("I&D") segment results driven mainly by higher intermediate chemicals margins; and
- Better crude processing rates, with a less unfavorable impact from planned and unplanned maintenance at our Houston refinery, and higher industry refining margins relative to 2016.

Other noteworthy items during 2017 include the following:

- Non-cash benefit of $819 million recognized in the fourth quarter of 2017 related to the lower federal income tax rate resulting from the newly enacted U.S. Tax Cuts and Jobs Act;
- Senior unsecured debt rating raised to BBB+ from BBB by Standard and Poor's Rating Services in September 2017, matching our corporate investment-grade rating;
- Final investment decision announced in July 2017 to build a world-scale PO/TBA plant in Texas with a capacity of 1 billion pounds of PO and 2.2 billion pounds of TBA. Construction is expected to commence in the second half of 2018;
- Increased quarterly dividend from $0.85 to $0.90 in May 2017;
- Issued $1,000 million of 3.5% guaranteed notes due 2027 in March 2017, used to redeem $1,000 million aggregate principal amount of our outstanding 5% senior notes due 2019; and
- Repurchased approximately 10 million of our ordinary shares during 2017.

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

Millions of dollars	Year Ended December 31, 2017	2016	2015
Sales and other operating revenues	$34,484	$29,183	$32,735
Cost of sales	28,059	23,191	25,683
Selling, general and administrative expenses	859	833	828
Research and development expenses	106	99	102
Operating income	5,460	5,060	6,122
Interest expense	(491)	(322)	(310)
Interest income	24	17	33
Other income, net	179	111	25
Income from equity investments	321	367	339
Provision for income taxes	598	1,386	1,730
Income from continuing operations	4,895	3,847	4,479
Loss from discontinued operations, net of tax	(18)	(10)	(5)
Net income	$ 4,877	$ 3,837	$ 4,474

RESULTS OF OPERATIONS

Revenues—We had revenues of $34,484 million in 2017, $29,183 million in 2016 and $32,735 million in 2015.

2017 versus 2016—Revenues increased by $5,301 million, or 18%, in 2017 compared to 2016.

Average sales prices in 2017 were higher across most products as sales prices generally correlate with crude oil and natural gas prices, which on average, increased compared to the corresponding period in 2016. These higher prices led to increases in revenues of 15%. Higher sales volumes in our O&P—Americas, O&P-EAI and Refining segments, which were partly offset by lower I&D segment volumes, led to a revenue increase in 2017 of 2%. Favorable foreign exchange impacts were responsible for a 1% revenue increase in 2017.

2016 versus 2015—Revenues decreased $3,552 million, or 11%, in 2016 compared to 2015.

Lower average sales prices driven by decreases in the prices of crude oil and other feedstocks led to revenue declines of 10% in 2016. Lower sales volumes in our Refining segment due to turnaround activities and unplanned outages, which were substantially offset by higher I&D segment sales volumes, led to a 1% volume-driven decline in revenues. The decline in revenues includes a $290 million impact from the sale of our wholly owned Argentine subsidiary. Revenues for each of our business segments are reviewed further in the “Segment Analysis” section below.

Cost of Sales—Cost of sales were $28,059 million in 2017, $23,191 million in 2016 and $25,683 million in 2015.

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

2017 versus 2016—Cost of sales increased by $4,868 million, or 21%, in 2017 compared to 2016. This increase was primarily due to higher feedstock and energy costs. Costs for crude oil, heavy liquids and natural gas liquids (“NGLs”) and other feedstocks were higher in 2017 relative to 2016.

2016 versus 2015—Cost of sales decreased by $2,492 million, or 10%, in 2016 compared to 2015.

The decrease in cost of sales in 2016 was primarily due to lower feedstock and energy costs. Raw material costs for crude oil, heavy liquids and NGLs and other feedstocks were lower in 2016 compared to 2015. The sale of our wholly owned Argentine subsidiary in 2016 also contributed approximately $230 million to the decline in 2016 cost of sales.

Cost of sales in 2016 and 2015 also included non-cash, pretax LCM inventory valuation charges totaling $29 million and $548 million, respectively. The 2016 adjustment is related to a drop in polypropylene prices in our O&P—Americas segment and the adjustments in 2015 affected all of our segments except Technology. The 2015 adjustments were driven mainly by declines in the prices for crude oil, ethylene, propylene, benzene and ETBE. During 2015, cost of sales also included $35 million of amortization expense associated with the expiration of emission allowance credits in our Refining and I&D segments.

Operating Income—Our operating income was $5,460 million, $5,060 million and $6,122 million in 2017, 2016 and 2015, respectively.

2017 versus 2016—Operating income increased by $400 million in 2017.

This improvement over 2016 was primarily due to increases of $144 million, $140 million, $77 million and $68 million in operating income for our I&D, O&P—EAI, Refining and O&P—Americas segments, respectively.

2016 versus 2015—Operating income decreased by $1,062 million in 2016.

Operating income for 2016 reflects the impacts of the LCM inventory valuation adjustment discussed above and a $58 million pension settlement charge. Operating income for 2015 reflects the LCM inventory valuation adjustment and the emission credit allowance amortization discussed above. Including these impacts, 2016 operating income declined relative to 2015 by $863 million, $243 million and $166 million in our O&P—Americas, Refining and I&D segments, respectively. These lower results were partially offset by a $185 million improvement in operating income for our O&P—EAI segment.

Operating results for each of our business segments are reviewed further in the “Segment Analysis” section below.

Interest Expense—Interest expense was $491 million in 2017, $322 million in 2016 and $310 million in 2015.

2017 versus 2016—We recognized charges totaling $113 million related to the March 2017 redemption of $1,000 million of our outstanding 5% senior notes due 2019. These charges include $65 million of prepayment premiums, $44 million for adjustments associated with fair value hedges and $4 million for the write-off of associated unamortized debt issuance costs.

Compared to 2016 and excluding the effects of fair value hedges and the charges described above, interest expense decreased $39 million in 2017 due to the redemption of our 5% senior notes due 2019 in the first quarter of 2017, and increased $35 million as a result of the related to debt issuances in March 2017 of our 3.5% guaranteed notes due 2027 and in March 2016 of our 1.875% guaranteed notes due 2022. A reduction in the amount of interest capitalized during 2017 and increased charges from our fair value hedges resulted in incremental increases in interest expense of $13 million and $45 million respectively, relative to 2016.

2016 versus 2015—Debt issuances of our 1.875% guaranteed notes due 2022 in March 2016 and our 4.625% senior notes due 2055 in March 2015 and reduced benefits from our fixed-for-floating interest rate swaps resulted in $42 million of higher interest expense in 2016. This increase was partially offset by a $22 million increase in capitalized interest and $7 million of lower bank and other fees.

For additional information related to our fair value hedges and fixed-for-floating interest rate swaps, see Notes 12 and 14.

Other Income, Net—Other income, net, was $179 million in 2017, $111 million in 2016 and $25 million in 2015.

2017 versus 2016—The $68 million increase in Other income, net, is primarily due to gains recognized on the 2017 sales of a joint venture interest and other assets, and the elimination of a non-cash obligation in 2017, as compared to the gain on the 2016 sale of our wholly owned subsidiary in Argentina.

In 2017, we recognized gains of $108 million on the sale of our O&P—EAI segment's 27% interest in its Geosel joint venture and $31 million on the sale of our O&P—Americas segment's Lake Charles, Louisiana site. We also recognized a $21 million non-cash gain in our O&P—EAI segment related to the elimination of an obligation associated with a lease.

In 2016, we recognized a $78 million gain related to the sale of our wholly owned Argentine subsidiary. We allocated $57 million and $21 million of this gain to our O&P—Americas and O&P—EAI segments, respectively.

2016 versus 2015—The $86 million increase in Other income, net, is largely due to the $78 million gain on the sale of our wholly owned subsidiary mentioned above.

Income from Equity Investments—Our income from equity investments was $321 million in 2017, $367 million in 2016 and $339 million in 2015.

2017 versus 2016—Income from our equity investments decreased in 2017 mainly due to lower results for our joint ventures in Poland, Asia and Mexico.

2016 versus 2015—The $28 million increase in Income from equity investments in 2016 is largely due to improved results for our joint ventures in Mexico, Saudi Arabia, Poland and Thailand.

Income Taxes—Our effective income tax rates of 10.9% in 2017, 26.5% in 2016 and 27.9% in 2015 resulted in tax provisions of $598 million, $1,386 million and $1,730 million, respectively.

On December 22, 2017, the U.S. enacted "H.R.1," also known as the "Tax Cuts and Jobs Act" (the "Tax Act"), materially impacting our 2017 Consolidated Financial Statements. This change in U.S. tax law included a reduction in the federal corporate tax rate from 35% to 21% for years beginning after 2017, which resulted in the remeasurement of our U.S. net deferred income tax liabilities. Based upon a preliminary assessment of the expected impact of the Tax Act, we recorded a provisional tax benefit of $819 million as a result of the remeasurement of our deferred tax liabilities. In addition, excluding the impact of any discrete items, we expect our effective income tax rate for 2018 to be approximately 21%, which includes an estimated (-5.5%) benefit because of the Tax Act's enactment. Some components of the Tax Act's impact on 2018 were taken into consideration provisionally based upon reasonable estimates of future tax positions. We will continue to analyze the Tax Act to determine the full effects of the new law, including any further Treasury regulations as they are issued, but we believe the future impact on the effective income tax rate will be positive. The ultimate impact of the Tax Act on our effective tax rate will largely depend on the percentage of pretax income generated in the U.S. as compared to the rest of the world.

In September 2016, the United Kingdom enacted provisions (the so called "anti-hybrid provisions"), effective for years beginning January 1, 2017, that resulted in changes to our internal financing structure which did not materially impact our consolidated financial statements. In addition, in October 2016 the U.S. Treasury issued final Section 385 debt-equity regulations that may impact our internal financings in future years. Pursuant to a recent Executive Order, the Treasury Department reviewed these regulations and determined to delay but retain these regulations, subject to further review after enactment of U.S tax reform.

Our effective income tax rate fluctuates based on, among other factors, changes in pretax income in countries with varying statutory tax rates, the U.S. domestic production activity deduction, changes in valuation allowances, changes in foreign exchange gains/losses, the amount of exempt income, and changes in unrecognized tax benefits associated with uncertain tax positions. Our exempt income primarily includes interest income, export incentives, and equity earnings of joint ventures. The interest income is earned by certain of our European subsidiaries through intercompany financings and is either untaxed or taxed at rates substantially lower than the U.S. statutory rate. The export incentives relate to tax benefits derived from elections and structures available for U.S. exports. The equity earnings are attributable to our joint ventures and these earnings when paid through dividends to certain European subsidiaries are eligible for participation exemptions, which exempt the dividend payments from all or portions of normal statutory income tax rates. We currently anticipate the favorable treatment for the interest income and dividends to continue in the near term; however, this treatment is based on current law and tax rulings, which could change. The foreign exchange gains/losses have a permanent impact on our effective income tax rate that can cause unpredictable movement in our effective income tax rate. We continue to maintain valuation allowances in various jurisdictions totaling $96 million, which could impact our effective income tax rate in the future.

2017—The 2017 effective income tax rate, which was lower than the U.S. statutory tax rate of 35%, was favorably impacted by the remeasurement of U.S. net deferred tax liabilities due to the enactment of the Tax Act (-14.9%), exempt income (-7.0%), earnings in various countries (notably in Europe) with lower statutory tax rates (-3.0%), and the U.S. domestic production activity deduction (-1.0%). These favorable items were partially offset by the effects of U.S. state and local income taxes (0.7%) and changes in uncertain tax positions (0.5%). Although the Tax Act lowered the U.S. statutory federal income tax rate to 21% for tax years beginning after 2017, the reconciliation uses the 35% rate in effect for the year ended December 31, 2017.

2016—The 2016 effective income tax rate, which was lower than the U.S. statutory tax rate of 35%, was favorably impacted by exempt income (-6.7%), earnings in various countries (notably in Europe) with lower statutory tax rates (-3.0%), the impact of a change in non-U.S. tax law on our deferred tax liabilities (-1.0%) and the U.S. domestic production activity deduction (-0.8%). These favorable items were partially offset by the effects of non-cash out-of-period adjustments (2.5%) and U.S. state and local income taxes (0.5%).

Our 2016 income tax provision includes $135 million of non-cash out of period adjustments from prior years. For further information on these adjustments, please see Note 17.

2015—The 2015 effective income tax rate, which was lower than the U.S. statutory tax rate of 35%, was favorably impacted by exempt income (-5.1%), earnings in various countries (notably in Europe) with lower statutory tax rates (-2.1%), and the U.S. domestic production activity deduction (-1.4%). These favorable items were partially offset by the effects of U.S. state and local income taxes (1.0%).

Comprehensive Income—We had comprehensive income of $5,105 million in 2017, $3,763 million in 2016 and $4,064 million in 2015.

2017 versus 2016—The $1,342 million increase in Comprehensive income in 2017 relative to 2016 reflects higher net income, the net favorable impacts of unrealized net changes in foreign currency translation adjustments and actuarial losses related to our defined benefit pension and other postretirement benefit plans. These increases were offset by an unfavorable impact of financial derivative instruments recognized in 2017.

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 2017 resulting in net gains as reflected in the Consolidated Statements of Comprehensive Income. These net gains in 2017 include pretax losses of $288 million, which represent the effective portion of our net investment hedges.

We recognized net actuarial gains of $74 million in 2017 and net actuarial losses of $188 million in 2016. The $74 million net gain in 2017 reflects $74 million of gains due to changes in pension and other postretirement benefit discount rate assumptions and $6 million of gains due to favorable postretirement liability experience and other immaterial items. These gains were partly offset by $7 million of losses due to pension asset experience (actual asset return compared to expected return). In 2016, the $188 million net loss was primarily attributable to $279 million of losses due to pension and other postretirement benefit discount rate decreases, which was offset by $79 million of gains related to pension asset experience and $10 million due to favorable postretirement liability experience and other immaterial items. In 2016, we also recognized a $61 million reclassification adjustment related primarily to a voluntary lump sum program offered to certain former employees in select U.S. pension plans. Total lump sum payments from these plans exceeded annual service and interest cost in 2016 resulting in this loss.

The cumulative effects of our derivatives designated as cash flow hedges were losses of $323 million. The euro strengthened against the U.S. dollar in 2017 resulting in pretax losses of $287 million in 2017 related to our cross-currency swaps. Pretax gains of $264 million related to our cross-currency swaps were reclassification adjustments included in 2017 net income. Unrealized pretax losses of $25 million in 2017 related to forward-starting interest rate swaps were driven by increases in benchmark interest rates during those periods.

2016 versus 2015—In 2016, comprehensive income decreased on lower net income, the unfavorable impacts of financial derivative adjustments and the increase in actuarial losses related to our defined benefit pension and other postretirement benefit plans recognized in 2016. These decreases were offset in part by the net favorable impact of unrealized net changes in foreign currency translation adjustments.

In 2016, we had a pretax gain of $43 million related to the effective portion of the unrealized gains of our financial instruments designated as net investment hedges. The cumulative effect of our derivatives designated as cash flow hedges in 2016 was a loss of $29 million. In 2016, cumulative losses associated with the strengthening of the euro versus the U.S. dollar in the first half of the year resulted in a pretax loss of $15 million related to our cross-currency swaps. An unrealized loss of $17 million in 2016 related to forward-starting interest rate swaps was driven by decreases in benchmark interest rates during that period.

A pretax loss of $63 million related to our cross-currency swaps was a reclassification adjustment included in net income in 2016.

In 2016 and 2015, we recognized net actuarial losses of $188 million and $8 million, respectively. The $188 million net loss in 2016 reflects $279 million of losses due to pension and other postretirement benefit discount rate decreases, offset by $79 million of gains related to pension asset experience and $10 million due to favorable postretirement liability experience and other immaterial items. In 2015, the $8 million net loss was primarily attributable to $133 million of actual asset return less than the expected return. This loss was offset by gains due to $73 million of discount rate increases and, $50 million of gains due to favorable liability experience and healthcare assumptions. In 2016, we also recognized a $61 million reclassification adjustment related primarily to a voluntary lump sum program offered to certain former employees in select U.S. pension plans.

Total lump sum payments from these plans exceeded annual service and interest cost in 2016 resulting in this loss.

See "Critical Accounting Policies" below and Note 15 to the Consolidated Financial Statements for additional information on the key assumptions included in calculating the discount rate and expected return on plan assets.

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 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 21, *Segment and Related Information*, to our Consolidated Financial Statements.

Our continuing operations are divided into five reportable segments: O&P—Americas, O&P—EAI, I&D, Refining and Technology. The following tables reflect selected financial information for our reportable segments.

Millions of dollars	Year Ended December 31, 2017	2016	2015
Sales and other operating revenues:			
O&P—Americas segment	$10,400	$ 9,077	$ 9,964
O&P—EAI segment	12,263	10,579	11,576
I&D segment	8,472	7,226	7,772
Refining segment	6,848	5,135	6,557
Technology segment	450	479	465
Other, including intersegment eliminations	(3,949)	(3,313)	(3,599)
Total	$34,484	$29,183	$32,735
Operating income:			
O&P—Americas segment	$ 2,461	$ 2,393	$ 3,256
O&P—EAI segment	1,634	1,494	1,309
I&D segment	1,202	1,058	1,224
Refining segment	(22)	(99)	144
Technology segment	183	221	197
Other, including intersegment eliminations	2	(7)	(8)
Total	$ 5,460	$ 5,060	$ 6,122
Depreciation and amortization:			
O&P—Americas segment	$ 439	$ 362	$ 353
O&P—EAI segment	239	229	219
I&D segment	279	269	233
Refining segment	177	163	196
Technology segment	40	41	46
Total	$ 1,174	$ 1,064	$ 1,047
Income from equity investments:			
O&P—Americas segment	$ 42	$ 59	$ 42
O&P—EAI segment	271	302	283
I&D segment	8	6	14
Total	$ 321	$ 367	$ 339
Other income (expense), net			
O&P—Americas segment	$ 40	$ 63	$ 10
O&P—EAI segment	138	42	14
I&D segment	1	—	4
Refining segment	2	8	2
Other, including intersegment eliminations	(2)	(2)	(5)
Total	$ 179	$ 111	$ 25
EBITDA:			
O&P—Americas segment	$ 2,982	$ 2,877	$ 3,661
O&P—EAI segment	2,282	2,067	1,825
I&D segment	1,490	1,333	1,475
Refining segment	157	72	342
Technology segment	223	262	243
Other, including intersegment eliminations	—	(9)	(13)
Total	$ 7,134	$ 6,602	$ 7,533

Olefins and Polyolefins—Americas Segment

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

2017 versus 2016—EBITDA improved in 2017 due to higher olefins volumes stemming from the expansion of our Corpus Christi, Texas olefins facility in late 2016. Higher olefins and polyethylene margins in 2017 were offset by lower polypropylene margins. EBITDA for 2017 also included a $31 million gain on the sale of our Lake Charles, Louisiana, site. EBITDA for 2016 included a $57 million gain on the first quarter sale of our wholly owned Argentine subsidiary and a $29 million non-cash LCM inventory valuation charge recognized in the fourth quarter due primarily to a reduction in polypropylene prices.

2016 versus 2015—EBITDA in 2016 reflects lower olefins and polyethylene results, partially offset by improved polypropylene results.

EBITDA in 2016 also reflects the net benefit arising from the gain on sale of our Argentine subsidiary and the non-cash LCM inventory valuation charge discussed above. In 2015, volatility in the benchmark prices for heavy liquids and natural gas and certain correlated products, particularly ethylene and propylene, which continued during most of the year, led to net non-cash LCM inventory valuation adjustments totaling $160 million.

Ethylene Raw Materials—Benchmark crude oil and natural gas prices generally have been indicators of the level and direction of the movement of raw material and energy costs for ethylene and its co-products in the O&P—Americas segment. Ethylene and its co-products are produced from two major raw material groups:

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

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

As in recent years, strong supplies from the U.S. shale gas/oil boom resulted in ethane being a preferred feedstock in our U.S. plants in 2017. We produced 75% of our ethylene from ethane. Despite generally higher liquid feedstock prices, strong propylene and butadiene coproduct prices at various points in the year also brought liquids into our feedslate.

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.

	Year Ended December 31,		
Millions of dollars	**2017**	**2016**	**2015**
Sales and other operating revenues	$10,400	$9,077	$9,964
Income from equity investments	42	59	42
EBITDA	2,982	2,877	3,661

Revenues—Revenues increased by $1,323 million, or 15%, in 2017 compared to 2016 and decreased by $887 million, or 9%, in 2016 compared to 2015.

2017 versus 2016—Average sales prices for most products increased in 2017, consistent with feedstock prices that are correlated with crude oil and natural gas prices, which on average increased relative to 2016. These higher sales prices were responsible for a 14% increase in 2017 revenues.

Operating rates and product volumes improved in 2017 due to turnaround activities and the expansion at our Corpus Christi, Texas facility during 2016. These increased volumes were responsible for a revenue increase of 1% in 2017.

2016 versus 2015—Average sales prices for ethylene and polyethylene declined in 2016, consistent with feedstock prices that are correlated to the price of natural gas, which declined relative to 2015. These lower average sales prices led to a revenue decrease of 11% in that period. A 2% revenue increase resulted from the improvement in 2016 product sales volumes as higher olefins sales volume, supported by an increase in the level of purchases for resale during turnaround activities, were only partly offset by lower polyolefins volumes. The sale of our Argentine subsidiary reduced 2016 revenues by $230 million.

EBITDA—EBITDA increased by $105 million, or 4%, in 2017 compared to 2016 and decreased by $784 million, or 21%, in 2016 compared to 2015.

2017 versus 2016—Increased volumes in 2017 due largely to the expansion of our Corpus Christi, Texas olefins facility was responsible for a 5% improvement in EBITDA. Margins were relatively unchanged in 2017 compared to 2016 due to an approximate 5 cents per pound decrease in polypropylene spreads that offset per pound increases in olefins and polyethylene spreads of a half cent and 2 cents, respectively. Polypropylene margins declined from the high levels in 2016 on the higher cost of propylene feedstocks, while the increase in olefins and polyethylene margins was attributable to higher average sales prices that more than offset the increased cost of ethylene. Lower income from our joint venture relative to the prior year led to a 1% decline in EBITDA. The net impact to EBITDA of the gain on sale of our wholly owned Argentine subsidiary in the first quarter of 2016 and the fourth quarter LCM inventory valuation adjustment mentioned above was offset by the first quarter 2017 gain on sale of our Lake Charles, Louisiana site.

2016 versus 2015—Lower olefin and polyethylene margins in 2016 were partially offset by higher polypropylene margins. The decline in olefins margins reflected a 2 cents per pound decrease in average ethylene sales prices and an approximate 4 cents per pound increase in the cost of ethylene production driven by lower co-product prices and an increase in the cost of NGL feedstocks. Polyethylene margins declined 4 cents per pound from very high levels in 2015 as average polyethylene sales prices caught up with the overall decline in the cost of ethylene feedstock, after lagging feedstock cost declines in 2015. A 4 cents per pound improvement in 2016 polypropylene margins reflects the benefits of lower propylene feedstock costs and tight market conditions. These olefin and polyethylene margin impacts led to a 17% decrease in EBITDA during 2016. An additional 10% decline in 2016 EBITDA is attributed to the impact of lower volumes related to lower ethylene production during the turnaround and expansion-related activities at our Corpus Christi, Texas ethylene facility and a site-wide outage related to turnaround activities at our Morris, Illinois site.

These negative impacts were partially offset by a 6% increase in 2016 EBITDA primarily due to a $131 million reduction in the unfavorable LCM inventory valuation adjustment recognized in 2016 versus 2015 and to the $57 million gain on the 2016 sale of our Argentine subsidiary.

Olefins and Polyolefins—Europe, Asia, International Segment

Overview—In calculating the impact of margin and volume on EBITDA, consistent with industry practice, management offsets revenues and volumes related to ethylene co-products against the cost to produce ethylene.

Volume and price impacts of ethylene co-products are reported in margin. Ethylene is a major building block of our olefins and polyolefins and as such management assesses the performance of the segment based on ethylene sales volumes and prices and our internal cost of ethylene production.

2017 versus 2016—EBITDA increased in 2017 compared to 2016. This improvement was driven by higher olefins margins and the impact of higher volumes across most products, partly offset by lower polyethylene margins and lower income from our equity investments.

EBITDA for 2017 also includes a $108 million gain on the third quarter sale of our 27% interest in Geosel and a $21 million beneficial impact related to the elimination of an obligation associated with a lease. In 2016, EBITDA reflected gains totaling $11 million from the sales of our joint venture in Japan and idled assets in Australia and a $21 million gain from the sale of our wholly owned Argentine subsidiary.

2016 versus 2015—Higher EBITDA in 2016 was largely the result of higher polyolefin margins, offset in part by lower olefins results and reductions in polyolefins volumes due to turnaround activity and unplanned downtime.

EBITDA in 2016 reflects the benefit of a $21 million gain from the sale of our wholly owned Argentine subsidiary and $11 million of gains from the sales of our joint venture in Japan and idled assets in Australia. EBITDA in 2015 included a $30 million non-cash LCM inventory valuation adjustment driven by a decline in the prices of naphtha and polyolefins.

Ethylene Raw Materials—In Europe, heavy liquids are the primary raw materials for our ethylene production. In recent years, we have sourced advantaged NGLs when the opportunity has arisen. In 2017, we benefited less from advantaged feedstocks than in recent years as prices for NGLs increased relative to oil-based naphtha feedstock prices.

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.

	Year Ended December 31,		
Millions of dollars	**2017**	**2016**	**2015**
Sales and other operating revenues	$12,263	$10,579	$11,576
Income from equity investments	271	302	283
EBITDA	2,282	2,067	1,825

Revenues—Revenues in 2017 increased by $1,684 million, or 16%, compared to 2016 and decreased by $997 million, or 9%, in 2016 compared to 2015.

2017 versus 2016—Average sales prices in 2017 were higher across most products as sales prices generally correlate with crude oil prices, which on average, increased compared to 2016. These higher average sales prices were responsible for a revenue increase of 11% in 2017. Better product availability compared to 2016, which was affected by turnaround activity and inventory requirements, led to higher sales volumes across most products. These increased volumes resulted in a revenue increase of 3% in 2017.

Foreign exchange impacts that, on average, were favorable for 2017 resulted in a revenue increase of 2% compared to the prior year.

2016 versus 2015—The decline in 2016 revenues comprises a 7% decrease related to lower average sales prices, and a 2% reduction of sales volumes stemming from turnaround activities and unplanned outages.

In 2016, average sales prices for olefins and polyolefins fell following feedstock prices that declined in conjunction with the price of crude oil.

EBITDA—EBITDA increased by $215 million, or 10%, in 2017 compared to 2016 and by $242 million, or 13%, in 2016 compared to 2015.

2017 versus 2016—An increase in olefin margins driven largely by a 6 cents per pound increase in ethylene sales prices was partly offset in 2017 by a 3 cents per pound decrease in European polyethylene spreads due to a more balanced European market compared to the prior year. This net increase resulted in a 1% improvement in 2017 EBITDA compared to 2016. The higher 2017 volumes discussed above added another 5% to EBITDA. Favorable foreign exchange impacts in 2017 also contributed an additional 1% to EBITDA. The net beneficial impact of the transactions in 2016 and 2017 discussed above related to the sales of our wholly owned subsidiary, joint venture interests and idled assets, and the elimination of a lease-related obligation, resulted in an additional 5% increase in EBITDA. These increases were partially offset by a 2% decrease in EBITDA driven by a reduction in income from equity investments in Poland and Asia in 2017 relative to very strong 2016 results.

2016 versus 2015—In 2016, higher European polyolefins margins stemming from declining ethylene and propylene feedstock costs outpaced falling product prices and led to an 11% increase in EBITDA. This margin improvement in 2016 was partially offset by a 2% decrease in EBITDA due largely to lower polyolefin volumes.

A 3% increase in 2016 EBITDA is attributed to gains associated with the sales of a joint venture, idled assets and our wholly owned Argentine subsidiary, as well as the absence of the 2015 LCM inventory valuation adjustment discussed above. Income from our equity investments also led to a 1% increase in EBITDA in 2016 due to higher polyolefin margins in our European joint venture and strong operating rates in our Saudi joint ventures.

Intermediates and Derivatives Segment

Overview—Improvements in 2017 EBITDA for intermediate chemicals and PO & derivatives were partly offset by lower results for oxyfuels and related products. EBITDA in 2017 also reflected an approximate $50 million unfavorable impact of charges related to precious metals catalyst financings relative to 2016.

2017 versus 2016—EBITDA was higher for our I&D segment in 2017 relative to 2016 due to stronger margins for intermediate chemicals products supported by reduced market supply stemming from industry outages and increased demand in Asia.

2016 versus 2015—Operating results for 2016 were lower than in 2015, as margin compression for most products related to declining energy prices, higher industry production rates and additional industry capacity was only partly offset by the impact of higher volumes.

EBITDA in 2015 was negatively impacted by the recognition of $181 million of LCM inventory valuation adjustments driven by the continued decline in prices for feedstocks, certain oxyfuels and related products, and intermediate chemical products to levels that were lower than the carrying value of our related inventories at reporting dates throughout the year.

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, 2017	2016	2015
Sales and other operating revenues	$8,472	$7,226	$7,772
Income from equity investments	8	6	14
EBITDA	1,490	1,333	1,475

Revenues—Revenues for 2017 increased by $1,246 million, or 17%, compared to 2016 and decreased by $546 million, or 7%, in 2016 compared to 2015.

2017 versus 2016—Higher average sales prices in 2017 for most products, which reflect the impacts of higher feedstock and energy costs and industry supply constraints, were responsible for revenue increases of 17%. Favorable foreign exchange impacts also led to a 1% revenue increase in 2017. These increases were partially offset by a revenue decrease of 1% in 2017, primarily due to lower sales volumes for intermediate chemicals and oxyfuels and related products. This volume-driven decline was largely due to reduced production associated with two major turnarounds at our Botlek, Netherlands, and Channelview, Texas, facilities.

2016 versus 2015—Lower average sales prices in 2016 reflected the impacts of lower crude oil, lower gasoline prices and the decline in various feedstock prices. Additional industry supply also negatively impacted the average sales prices for certain products during 2016. These lower sales prices in 2016 were responsible for an 11% revenue decrease.

This price driven decrease was offset in part by a 4% volume-related revenue increase in 2016 resulting from fewer planned and unplanned production outages relative to 2015.

EBITDA—EBITDA increased by $157 million, or 12%, in 2017 compared to 2016 and decreased by $142 million, or 10%, in 2016 compared to 2015.

2017 versus 2016—Higher intermediate chemicals and PO and derivative product margins driven by higher average sales prices resulted in a 19% increase in EBITDA. This increase was offset in part by a 2% decline in margins for oxyfuels and related products primarily due to higher butane pricing. This margin improvement was partly offset by decreases in EBITDA of 4% and 1%, respectively, stemming from the unfavorable impacts associated with charges related to precious metals catalyst financings and the lower volumes discussed above.

2016 versus 2015—Lower margins in most I&D products in 2016 resulted in a 30% decrease in EBITDA. Weaker gasoline markets drove oxyfuels and related product values lower relative to butane feedstock costs, and lower product prices in propylene oxide and derivatives and intermediate chemicals were driven largely by increased industry supply. Lower income from our equity investments in 2016 also resulted in a 1% decrease in EBITDA during that period.

An EBITDA increase in 2016 of 9% related to the higher volumes discussed above, partially offset the negative margin impact. EBITDA in 2016 also reflected an increase of 12% related to the absence of the LCM inventory valuation adjustment recognized in the 2015 comparison period.

Refining Segment

Overview

2017 versus 2016—EBITDA for our Refining segment benefited from higher crude processing rates in 2017 as the impacts of planned and unplanned maintenance outages were less than in 2016. Higher industry margins were offset by higher maintenance-related fixed costs in 2017.

2016 versus 2015—Lower margins and reduced production due to planned and unplanned outages in 2016 as described below resulted in significantly lower results for our Refining segment in 2016 as compared to 2015. EBITDA in 2015 included charges totaling $177 million related to non-cash charges associated with LCM inventory valuation adjustments driven by a decline of nearly $20 per barrel in crude oil prices and corresponding reductions in refined product prices.

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

	Year Ended December 31,		
Millions of dollars	**2017**	**2016**	**2015**
Sales and other operating revenues	$6,848	$5,135	$6,557
EBITDA	157	72	342
Heavy crude oil processing rates, thousands of barrels per day	236	201	238
Market margins, dollars per barrel			
Light crude oil—2-1-1	$13.54	$10.73	$14.04
Light crude oil—Maya differential	7.02	8.51	8.26
Total Maya 2-1-1	$20.56	$19.24	$22.30

Revenues—Revenues increased by $1,713 million, or 33% in 2017 compared to 2016 and decreased by $1,422 million, or 22%, in 2016 compared to 2015.

2017 versus 2016—Higher product prices in 2017 largely driven by an increase in average crude oil prices of approximately $10 per barrel led to a revenue increase of 26% relative to 2016. Heavy crude oil processing rates increased by 17% in 2017, leading to a volume driven revenue increase of 7%, as the impacts of planned and unplanned outages and the effects of Hurricane Harvey in 2017 had less of an impact on processing rates than the unplanned outages in 2016 referenced below. In 2017, we completed planned turnarounds on one of our crude units and our fluid catalytic converter.

2016 versus 2015—Major refined product prices declined due to lower crude oil prices and to weakness relative to crude oil. The average per barrel price of benchmark Maya crude oil declined $7.59 in 2016 compared to 2015. A 16% price-related revenue decline in 2016 versus 2015 reflected per barrel price declines of approximately $10.51 and $10.77 for gasoline and distillates, respectively.

The remaining 6% revenue decrease in 2016 is attributed to reduced processing rates. Processing declines resulted from several unplanned outages, including a coker unit fire, downtime at crude units with reduced processing and several utility interruptions. Planned turnaround activity on a crude unit and a coker unit processing train early in 2016 also contributed to lower throughput during 2016.

EBITDA—EBITDA increased by $85 million, or 118%, in 2017 compared to 2016 and decreased by $270 million, or 79%, in 2016 compared to 2015.

2017 versus 2016—Increased production accounted for approximately 90% of the improvement in 2017 EBITDA. Crude oil processing rates in 2017 were higher than 2016 as discussed above. Higher refining margins, which were partly offset by higher maintenance-related fixed costs, accounted for the remaining 10% improvement in 2017 EBITDA.

2016 versus 2015—A decline in refining margins in 2016 led to a 90% decrease in EBITDA. The Maya 2-1-1 benchmark refining spread declined in 2016 by approximately $3.10 per barrel relative to 2015. This decrease was driven by per barrel declines of approximately $3.15 and $3.40 in gasoline and diesel spreads, respectively, and an approximate $1.00 reduction in the price differential between Brent and Maya crude oils. The operating issues that drove lower crude throughput in 2016 also negatively impacted margins due to a less favorably priced crude oil mix and higher variable costs per barrel.

Lower production stemming from a reduction in average heavy crude oil processing rates relative to 2015 led to a decrease in EBITDA in 2016 of 41%. This reduction in rates was attributable to the unplanned outages, crude unit operating limitations and planned turnaround activities discussed above.

The absence of the $177 million LCM inventory valuation adjustment recognized in 2015 resulted in an EBITDA increase of 52% in 2016 as compared to 2015.

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 2017, 2016 and 2015, our Technology segment incurred approximately 55% of all R&D costs.

2017 versus 2016—A decline in 2017 EBITDA reflects lower licensing revenues, partially offset by higher catalyst sales volumes, compared to 2016.

2016 versus 2015—EBITDA in 2016 improved with higher catalyst margins. A small increase in licensing and services revenue was mostly offset by slightly lower catalyst sales volumes.

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

	Year Ended December 31,		
Millions of dollars	**2017**	**2016**	**2015**
Sales and other operating revenues	$450	$479	$465
EBITDA	223	262	243

Revenues—Revenues decreased by $29 million, or 6%, in 2017 compared to 2016 and increased by $14 million, or 3%, in 2016 compared to 2015.

2017 versus 2016—Lower licensing revenues were responsible for a revenue decrease of 12% in 2017 relative to 2016. This decrease was partially offset by revenue increases of 3% and 1%, respectively, related to increased catalyst sales volumes and higher average sales prices. Favorable foreign exchange impacts were responsible for an additional 2% increase in EBITDA.

2016 versus 2015—Higher average catalyst sales prices and higher revenues recognized on process licenses each led to a 2% increase in 2016 revenues. These increases were partly offset by a 1% revenue decrease resulting from lower catalyst sales volumes.

EBITDA—EBITDA in 2017 decreased by $39 million, or 15%, compared to 2016 and increased by $19 million, or 8%, in 2016 compared to 2015.

2017 versus 2016—Lower licensing and services revenues in 2017 were largely responsible for a 20% decrease in 2017 EBITDA. This decline was partly offset by a 5% improvement in EBITDA resulting from an increase in catalyst volumes during 2017.

2016 versus 2015—A 10% improvement in EBITDA during 2016 due to higher catalyst margins and an increase in licensing and services revenue was partly offset by a 2% decrease in EBITDA resulting from lower catalyst volumes.

FINANCIAL CONDITION

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

	Year Ended December 31,		
Millions of dollars	**2017**	**2016**	**2015**
Source (use) of cash:			
Operating activities	$ 5,206	$ 5,606	$ 5,842
Investing activities	(1,756)	(2,301)	(1,046)
Financing activities	(2,859)	(3,349)	(4,850)

Operating Activities—Cash of $5,206 million generated in 2017 primarily reflected earnings adjusted for non-cash items partly offset by $593 million of cash used by the main components of working capital—accounts receivable, inventories and accounts payable. Higher sales prices across all of our segments in the fourth quarter of 2017 and brief delays in the receipt of payments for products in our Refining and I&D segments led to the increase in accounts receivable. Inventories increased for most products in our O&P—EAI and O&P—Americas segments and included an inventory build in our O&P–Americas segment in anticipation of first quarter 2018 turnaround activities These increases were partly offset by an increase in feedstock pricing in the fourth quarter of 2017 in our O&P—Americas, O&P—EAI and Refining segments which led to an increase in accounts payable.

Cash of $5,606 million generated in 2016 primarily reflected earnings adjusted for non-cash items and cash generated by the main components of working capital. The non-cash items in 2016 included a $78 million gain related to the sale of our wholly owned Argentine subsidiary with adjustments for related working capital and gains totaling $11 million related to sales of our joint venture in Japan and idled assets in Australia.

The main components of working capital generated cash of $123 million in 2016. Higher product sales prices in the fourth quarter of 2016 across all segments combined with the impact of higher fourth quarter 2016 sales volumes in our O&P—Americas, Refining and I&D segments led to an increase in accounts receivable. This increase in accounts receivable was offset by higher accounts payable, which was driven by the higher cost of crude oil and other feedstocks. The level of inventories fell in our O&P—Americas segment following the completion of turnaround activities in the fourth quarter of 2016 and in our Refining segment, which had higher crude oil inventories at the end of 2015 due to operational issues during the fourth quarter.

Cash of $5,842 million generated in 2015 primarily reflected earnings adjusted for non-cash items and cash used by the main components of working capital. The main components of working capital consumed cash of

$246 million in 2015. The lower cost of crude oil and other feedstocks in 2015 led to a decline in accounts payable. Preparation for the turnaround in 2016 at our Corpus Christi, Texas facility and the unplanned maintenance outage at our Houston refinery, which resulted in higher levels of U.S. olefins and crude oil inventories at year end, led to the increase in consolidated inventories in 2015. Accounts receivable decreased on lower average product sales prices, reflective of the drop in 2015 crude oil prices.

Investing Activities—We invested cash of $1,756 million, $2,301 million and $1,046 million in 2017, 2016 and 2015, respectively.

We invest 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. In 2017, 2016 and 2015, we invested $653 million, $764 million and $2,073 million, respectively, in securities that are classified as Short-term investments. We also invested $512 million, $674 million and $397 million in tri-party repurchase agreements in 2017, 2016 and 2015, respectively. We received proceeds upon the sale and maturity of certain of our Short-term investments and tri-party purchase agreements of $574 million and $381 million, respectively, in 2017; $674 million and $685 million, respectively, in 2016; and $2,489 million and $350 million, respectively, in 2015. See Note 14 to the Consolidated Financial Statements for additional information regarding these investments.

Joint Venture Activity—In September 2017, we sold our 27% interest in our Geosel joint venture and received proceeds of $155 million.

In April 2017, we increased our interest in the entity that holds our equity interest in Al Waha Petrochemicals Ltd. from 83.79% to 100% by paying $21 million to exercise a call option to purchase the remaining 16.21% interest held by a third party.

In September 2016, we purchased a net additional interest in our joint venture in Korea for $36 million. In February 2016, we received proceeds of $72 million for the sale of our joint venture in Japan.

Financial Instruments Activity—Upon expiration in 2017 and 2016, we settled foreign currency contracts with a notional value of €550 million and €1,200 million, respectively, which were designated as net investment hedges of our investments in foreign subsidiaries. Payments to and proceeds from our counterparties resulted in a net cash outflows of $49 million and $61 million during 2017 and 2016, respectively. See Note 14 to the Consolidated Financial Statements for additional information regarding these foreign currency contracts.

Sale of Wholly Owned Subsidiary—In February 2016, we received net cash proceeds of $137 million for the sale of our wholly owned Argentine subsidiary.

The following table summarizes our capital expenditures for continuing operations for the periods from 2015 through 2017:

	Year Ended December 31,		
Millions of dollars	**2017**	**2016**	**2015**
Capital expenditures by segment:			
O&P—Americas	$ 753	$1,376	$ 668
O&P—EAI	206	261	186
I&D	332	333	441
Refining	213	224	108
Technology	32	36	24
Other	11	13	13
Consolidated capital expenditures of continuing operations	$1,547	$2,243	$1,440

In 2018, we expect to spend approximately $2.4 billion, which includes contributions to our PO joint ventures. The higher level of expected capital expenditures in 2018 versus 2017 is largely driven by construction related to our new Hyperzone polyethylene plant at our La Porte, Texas facility and construction related to our new PO/TBA plant in Texas.

In 2017 and 2016, capital expenditures included construction related to our new Hyperzone polyethylene plant, construction related to our new PO/TBA, debottlenecks of certain assets to enhance production, turnaround activities at several sites as well as other plant improvement projects. The lower level of capital expenditures in 2017 versus 2016 for our O&P—Americas segment is largely due to the completion of the 800 million pound ethylene expansion at our Corpus Christi, Texas facility in the fourth quarter of 2016.

Financing Activities—Financing activities used cash of $2,859 million, $3,349 million and $4,850 million in 2017, 2016 and 2015, respectively.

We made payments totaling $866 million, $2,938 million and $4,656 million in 2017, 2016 and 2015, respectively, to acquire a portion of our outstanding ordinary shares. We also made dividend payments totaling $1,415 million, $1,395 million and $1,410 million to our shareholders in 2017, 2016 and 2015, respectively. For additional information related to these share repurchases and dividend payments, see Note 19 to the Consolidated Financial Statements.

Through the issuance and repurchase of commercial paper instruments under our commercial paper program, we made net repayments of $493 million in 2017 and received net proceeds of $177 million and $61 million in 2016 and 2015, respectively.

In March 2017, we issued $1,000 million of 3.5% guaranteed notes due 2027 and received net proceeds of $990 million. The proceeds from these notes, together with available cash, were used to repay $1,000 million of our outstanding 5% senior notes due 2019. We paid $65 million in premiums in connection with this prepayment.

In March 2016, we issued €750 million of 1.875% guaranteed notes due 2022 and received net proceeds of $812 million. In March 2015, we issued $1,000 million of 4.625% senior notes due 2055 and received net proceeds of $984 million.

Additional information related to our commercial paper program and the issuance and repayment of debt can be found in the Liquidity and Capital Resources section below and in Note 12 to the Consolidated Financial Statements.

Liquidity and Capital Resources—As of December 31, 2017, we had $2,830 million of unrestricted cash and cash equivalents and marketable securities classified as Short-term investments. We also held $570 million of tri-party repurchase agreements classified as Prepaid expenses and other current assets at December 31, 2017. For additional information related to our purchases of marketable securities, which currently include time deposits, certificates of deposit, commercial paper, bonds and limited partnership investments, and our investments in tri-party repurchase agreements, see "Investing Activities" above and Note 14 to the Consolidated Financial Statements.

At December 31, 2017, we held $557 million of cash in jurisdictions outside the U.S., principally in the United Kingdom. There are currently no material legal or economic restrictions that would impede our transfers of cash.

We also had total unused availability under our credit facilities of $3,400 million at December 31, 2017, which included the following:

- $2,500 million under our $2,500 million 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, 2017, we had no outstanding commercial paper, no outstanding letters of credit and no outstanding borrowings under the facility; and
- $900 million under our $900 million U.S. accounts receivable securitization facility. Availability under this facility is subject to a borrowing base of eligible receivables, which is reduced by outstanding borrowings and letters of credit, if any. This facility had no outstanding borrowings or letters of credit at December 31, 2017.

We have $413 million of outstanding letters of credit, bank guarantees, and surety bonds issued under uncommitted credit facilities at December 31, 2017. At December 31, 2017, we had total debt, including current maturities, of $8,619 million.

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 variable rate debt to fixed rate debt. For information related to our Senior Notes and Guaranteed Notes and credit facilities, including terms of redemption, see Note 12 to the Consolidated Financial Statements.

In May 2017, our shareholders approved a proposal to authorize us to repurchase up to an additional 10%, or approximately 40 million, of our shares outstanding through November 2018 ("May 2017 Share Repurchase Program"). As a result, the authorization of the remaining unpurchased shares under the share repurchase program approved by our shareholders in May 2016 ("May 2016 Share Repurchase Program") was suspended. Our share repurchase program 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. In 2017, we have purchased approximately 10 million shares under these programs for approximately $845 million. As of February 20, 2018, we had approximately 34 million shares remaining under the current authorization. The timing and amount of additional shares repurchased will be determined by our Management Board based on its evaluation of market conditions and other factors. For additional information related to our share repurchase programs, see Note 19 to the Consolidated Financial Statements.

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

In July 2017, we announced our final investment decision to build a world-scale PO/TBA plant in Texas with a capacity of 1 billion pounds of PO and 2.2 billion pounds of TBA. The project is estimated to cost approximately $2.4 billion, with construction estimated to commence in the second half of 2018. We anticipate the project to be completed in the middle of 2021.

We plan to fund our ongoing working capital, capital expenditures, debt service and other funding requirements with cash from operations, which could be affected by general economic, financial, competitive, legislative, regulatory, business and other factors, many of which are beyond our control. Cash and cash equivalents, cash from our short-term investments and tri-party repurchase agreements, 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 program.

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.

As discussed in Note 23 of the Notes to the Consolidated Financial Statements, subsequent to our 2017 fiscal year end we entered into a definitive agreement to acquire A. Schulman. We plan to use cash-on-hand to fund the acquisition.

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.

Contractual and Other Obligations—The following table summarizes, as of December 31, 2017, our minimum payments for long-term debt, including current maturities, short-term debt, and contractual and other obligations for the next five years and thereafter:

		Payments Due By Period					
Millions of dollars	**Total**	**2018**	**2019**	**2020**	**2021**	**2022**	**Thereafter**
Total debt	$ 8,788	$ 70	$1,005	$ 5	$1,004	$ 903	$ 5,801
Interest on total debt	5,566	408	383	358	358	298	3,761
Advances from customers	105	61	15	6	3	3	17
Other	2,157	1,227	491	35	34	15	355
Deferred income taxes	1,655	296	105	104	91	107	952
Other obligations:							
Purchase obligations:							
Take-or-pay contracts	16,958	2,846	2,898	2,981	2,994	2,718	2,521
Other contracts	9,803	4,561	2,026	1,047	618	293	1,258
Operating leases	1,445	311	232	194	165	26	517
Total	$46,477	$9,780	$7,155	$4,730	$5,267	$4,363	$15,182

Total Debt—Our debt includes unsecured senior notes, guaranteed notes and various other U.S. and non-U.S. loans. See Note 12 to the Consolidated Financial Statements for a discussion of covenant requirements under the credit facilities and indentures and additional information regarding our debt facilities.

Interest on Total Debt—Our debt and related party debt agreements contain provisions for the payment of monthly, quarterly or semi-annual interest at a stated rate of interest over the term of the debt.

Pension and other Postretirement Benefits—We maintain several defined benefit pension plans, as described in Note 15 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 2018 are not expected to be materially different than the expected 2018 contributions disclosed in Note 15 to the Consolidated Financial Statements. At December 31, 2017, the projected benefit obligation for our pension plans exceeded the fair value of plan assets by $903 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 $903 million in future years. We contributed $103 million, $114 million and $107 million to our pension plans in 2017, 2016 and

2015, respectively. We provide other postretirement benefits, primarily medical benefits to eligible participants, as described in Note 15 to the Consolidated Financial Statements. We pay other unfunded postretirement benefits as incurred.

Advances from Customers—We are obligated to deliver products in connection with long-term sales agreements under which advances from customers were received in prior years. These advances are treated as deferred revenue and will be amortized to earnings as product is delivered over the remaining terms of the respective contracts, which range predominantly from 1 to 15 years. The unamortized long-term portion of such advances totaled $44 million as of December 31, 2017.

Other—Other primarily consists of accruals for environmental remediation costs, obligations under deferred compensation arrangements, and anticipated asset retirement obligations. See "Critical Accounting Policies" below for a discussion of obligations for environmental remediation costs.

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 17 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 assure 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, 2017.

Operating Leases—We lease various facilities and equipment under noncancelable lease arrangements for various periods. See Note 13 to the Consolidated Financial Statements for related lease disclosures.

CURRENT BUSINESS OUTLOOK

Over the past several months, strong global demand and delays in capacity additions across the industry have improved the outlook for 2018. We look forward to realizing the benefits of strong operating rates across our broad portfolio of assets. and continuing the improvement in the reliability and profitability of our Houston refinery.

Unusually cold weather on the U.S. Gulf Coast in the third week of January caused industry disruptions. The impact of these disruptions, which also affected our assets, is currently expected to negatively impact our EBITDA by approximately $45 million. About two thirds of this impact is expected to be borne by our O&P—Americas segment with the remaining impact negatively affecting our I&D segment. Planned maintenance scheduled for one cracker at our Channelview Texas facility is also expected to negatively impact our O&P—Americas EBITDA by approximately $50 million in each of the first and second quarters of 2018. Our I&D segment is expected to benefit from continued strength in the market for oxyfuels and related products We expect to continue the improvement in reliability and profitability of our Houston refinery in 2018.

Over the coming years, we will advance our growth by increasing the pace of organic business investments while diligently pursuing value-adding inorganic opportunities.

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

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

Inventory—We account for our inventory 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 benchmark 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 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 2015 and 2016 we incurred LCM inventory adjustments of $548 million and $29 million respectively. In 2015 the LCM adjustments were driven by declines in the prices of crude oil, ethylene, propylene, benzene and ETBE. The 2016 adjustment, which occurred in the fourth quarter was driven by a decline in the price of propylene. As a result of the impairments charges taken in 2014, 2015 and 2016 all of our inventory pools are valued at 2015 or 2016 year-end market prices prior to indexation. While prices for our products and raw materials are inherently volatile and therefore no prediction can be given with certainty, we do not believe any of our inventory is at risk for impairment at this time.

Goodwill—Goodwill of $570 million at December 31, 2017 represents the tax effect of the differences between the tax and book bases of our assets and liabilities resulting from the revaluation of those assets and liabilities to fair value in connection with the Company's emergence from bankruptcy and adoption of fresh-start accounting. 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 is compared to its carrying value, including goodwill. For the quantitative impairment test, the fair value of the reporting unit is calculated using a discounted cash-flow model. Such a 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 goodwill exceeds its fair value, an impairment charge equal to the excess would be recognized.

For 2017 and 2016, 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. Accordingly, a quantitative goodwill impairment test was not required. Accordingly, no goodwill impairment was recognized in 2017 or 2016.

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. It also is management's responsibility to review those assumptions periodically to reflect changes in economic or other factors that affect those assumptions.

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, 2017, we used a weighted average discount rate of 3.73% 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, 2017 was 2.13%, reflecting market interest rates. The discount rates in effect at December 31, 2017 will be used to measure net periodic benefit cost during 2018.

The benefit obligation and the periodic cost of other postretirement medical benefits are also measured based on assumed rates of future increase in the per capita cost of covered health care benefits. As of December 31, 2017, the assumed rate of increase for our U.S. plans was 6.7%, decreasing to 4.5% in 2038 and thereafter. A one hundred basis point change in the health care cost trend rate assumption as of December 31, 2017 would have resulted in a $18 million increase or $12 million decrease in the accumulated other postretirement benefit liability, for our non-U.S. plans and would have resulted in an increase or decrease of less than $1 million for U.S. plans. Due to limits on our maximum contribution level under the medical plan, there would have been no significant effect on either our benefit liability or net periodic cost.

The net periodic cost of pension benefits included in expense also 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, for us, 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 8.00% is based on the average level of earnings that our independent pension investment advisor had advised could be expected to be earned over time and 2.15%, for our non-U.S. plan assets is based on an expectation and asset allocation that varies by region. In 2018, the average expected long-term rate of return on assets in our U.S. plans is expected to be 7.50%. The asset allocations are summarized in Note 15 to the Consolidated Financial Statements. The actual returns in 2017 were gains of 14.45% and 8.82% for our U.S. and non-U.S. plan assets, respectively.

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

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

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

	Effects on Benefit Obligations in 2017		Effects on Net Periodic Pension Costs in 2018	
Millions of dollars	**U.S.**	**Non-U.S.**	**U.S.**	**Non-U.S.**
Projected benefit obligations at December 31, 2017	$1,924	$1,511	$—	$—
Projected net periodic pension costs in 2018			11	54
Discount rate increases by 100 basis points	(177)	(190)	(7)	(7)
Discount rate decreases by 100 basis points	215	231	12	12

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

	Effects on Benefit Obligations in 2017		Effects on Net Periodic Benefit Costs in 2018	
Millions of dollars	**U.S.**	**Non-U.S.**	**U.S.**	**Non-U.S.**
Projected benefit obligations at December 31, 2017	$280	$ 62	$—	$—
Projected net periodic benefit costs in 2018			11	4
Discount rate increases by 100 basis points	(24)	—	(2)	—
Discount rate decreases by 100 basis points	29	—	(2)	—

Additional information on the key assumptions underlying these benefit costs appears in Note 15 to the Consolidated Financial Statements.

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

Deferred tax assets and liabilities are determined based on temporary differences between the financial statement carrying amounts of existing assets and liabilities and their respective tax bases, and are measured using enacted tax rates expected to apply to taxable income in the years in which those temporary differences are expected to reverse. At December 31, 2017, the measurement of our deferred tax balances was materially affected by the U.S. enactment of "H.R.1," also known as the Tax Act, as explained in Note 17 to the Consolidated Financial Statements.

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 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. For a position that is likely to be sustained, the benefit recognized in the financial statements is measured at the largest cumulative amount that is greater than 50 percent likely of being realized.

For further information related to our income taxes, see Note 17 to the Consolidated Financial Statements.

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 14 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

A substantial portion of our products and raw materials are commodities whose prices fluctuate as market supply and demand fundamentals change. Accordingly, product margins and the level of our profitability tend to fluctuate with changes in the business cycle. We try to protect against such instability through various business strategies. These include provisions in sales contracts allowing us to pass on higher raw material costs through timely price increases, formula price contracts to transfer or share commodity price risk, and increasing the depth and breadth of our product portfolio.

In addition, we use commodity swap and futures contracts with various terms to manage a small portion of the volatility related to raw materials and product purchases and sales. Such contracts are generally limited to durations of one year or less. Hedge accounting has been elected for some of our commodity contracts in the periods presented. Market risks created by these derivative instruments and the mark-to-market valuations of open positions are considered by management prior to execution and monitored regularly.

The estimated fair value and notional amounts of our open commodity futures contracts and swap contracts are shown in the table below:

	December 31, 2017				
		Notional Amounts			
Millions of dollars	Fair Value	Value	Volumes	Volume Unit	Maturity Dates
Futures and swaps not designated as hedges:					
Heating oil	$ (1)	$ 8	4	million gallons	January 2018 - February 2018
Crude oil	16	48	35	million gallons	January 2018 - March 2018
Gasoline	(15)	9	40	million gallons	January 2018 - February 2018
Naphtha	2	57	100	million kilograms	January 2018
Swaps designated as cash-flow hedges:					
Ethane	(8)	102	375	million gallons	January 2018 - December 2019
	$ (6)	$224			

	December 31, 2016				
		Notional Amounts			
Millions of dollars	Fair Value	Value	Volumes	Volume Unit	Maturity Dates
Futures and swaps not designated as hedges:					
Heating oil	$ 1	$ 20	12	million gallons	February 2017
Crude oil	(1)	30	23	million gallons	February 2017 - March 2017
Naptha	1	48	100	million kilograms	January 2017
Swaps designated as cash-flow hedges:					
Ethane	3	58	184	million gallons	January 2017 - December 2019
	$ 4	$156			

We use value at risk ("VAR"), stress testing and scenario analysis for risk measurement and control purposes.

VAR estimates the maximum potential loss in fair market values, given a certain move in prices over a certain period of time, using specified confidence levels.

Using sensitivity analysis and hypothetical changes in market prices ranging from 9% to 13%, which represent a three-month volatility range of the underlying products noted in the table above, the effect on our pretax income would be approximately $1 million. The quantitative information about market risk is necessarily limited because it does not take into account the effects of the underlying operating transactions.

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 ("AOCI") 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 stockholders' equity resulting from foreign currency fluctuation associated with our net investments in foreign operations. The table below illustrates the impact on Other comprehensive loss of a 10% fluctuation in the foreign currency rate associated with each net investment hedge and the EURIBOR and LIBOR rates associated with basis swaps are shown in the table below:

December 31, 2017			
Net Investment Hedges	**Notional Amount**	**10% Variance on Foreign Currency Rate**	**Impact on Other Comprehensive Loss**
Basis Swaps	€742 million	euro/U.S. dollar rate	$91 million
		EURIBOR and LIBOR rates	Less than $1 million
Guaranteed Euro Notes Due 2022	€750 million	euro/U.S. dollar rate	$90 million

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

We maintain risk management control practices to monitor the foreign currency risk attributable to our inter-company and third party outstanding foreign currency balances. These practices involve the centralization of our exposure to underlying currencies that are not subject to central bank and/or country specific restrictions. By centralizing most of our foreign currency exposure into one subsidiary, we are able to take advantage of any natural offsets thereby reducing the overall impact of changes in foreign currency rates on our earnings. At December 31, 2017, a 10% fluctuation compared to the U.S. dollar in the underlying currencies that have no central bank or other currency restrictions related to non-hedged monetary net assets would have had a resulting additional impact to earnings of approximately $2 million.

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

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

We have entered into $2,300 million of non-cancellable cross-currency swaps, which we designated as foreign currency cash flow hedges, to reduce the variability in the functional currency equivalent cash flows of certain foreign currency denominated intercompany notes. At December 31, 2017, these foreign currency contracts have maturity dates ranging from 2021 to 2027 and their fair value was a net liability of $4 million. A 10% fluctuation compared to the U.S. dollar would have had a resulting additional impact to Other comprehensive income (loss) of approximately $265 million.

Other income, net in the Consolidated Statements of Income reflected losses of $1 million, $4 million and $7 million for 2017, 2016 and 2015, respectively, in net exchange rate gains and losses. 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 contracts are reported in the Consolidated Statements of Income and offset the currency exchange results recognized on the assets and liabilities. At December 31, 2017, these foreign currency contracts, which will mature in January 2018, had an aggregated notional amount of $1,014 million and the fair value was a net liability of $11 million. A 10% fluctuation compared to the U.S. dollar would have had a resulting additional impact to earnings of approximately $10 million.

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 tradeoff.

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 pretax earnings stemming from interest expense on variable-rate debt. To minimize earnings at risk, we target to maintain 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. As part of our interest rate risk management strategy we also enter into interest rate swaps.

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 transpires. In March 2015 we entered into forward-starting interest rate swaps to mitigate the risk of adverse changes in the benchmark interest rates on the anticipated refinancing of our senior notes due 2019. These interest rate swaps will be terminated upon debt issuance. At December 31, 2017, the total notional amount of these interest rate contracts designated as cash flow hedges was $1,000 million and its fair value was a net liability of $41 million. We estimate that a 10% change in market interest rates as of December 31, 2017 would change the fair value of our forward-starting interest rate swap outstanding and would have had a resulting impact on Other comprehensive income (loss) of approximately $47 million.

Fixed-rate debt—We entered into interest rate swaps as part of our interest rate risk management strategy. At December 31, 2017, the total notional amount of interest rate swaps designated as fair value hedges, which have maturity dates ranging from 2019 to 2027, was $3,000 million and their fair value was a net liability of $1 million.

At December 31, 2017, after giving consideration to the $3,000 million of fixed-rate debt that we have effectively converted to floating through these U.S. dollar fixed-for-floating interest rate swaps, approximately 66% of our debt portfolio, on a gross basis, incurred interest at a fixed-rate and the remaining 34% of the portfolio incurred interest at a variable-rate. We estimate that a 10% change in market interest rates as of December 31, 2017 would change the fair value of our interest rate swaps outstanding and would have had a resulting impact on our pretax income of approximately $29 million.

Variable-rate debt—Our variable rate debt consists of our $2,500 million Senior Revolving Credit Facility, our $900 million U.S. Receivables Securitization Facility and our Commercial Paper Program. At December 31, 2017, there were no outstanding borrowings under our Senior Revolving Credit Facility, U.S. Receivables Securitization facility or our Commercial Paper Program. We estimate that a 10% change in interest rates would have had less than a $1 million impact on earnings based on our average variable-rate debt outstanding per year.

Item 8. Financial Statements and Supplementary Data.

Index to the Consolidated Financial Statements

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, 2017 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, 2017.

The effectiveness of our internal control over financial reporting as of December 31, 2017 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 Supervisory Board of Directors and Stockholders 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 as of December 31, 2017 and 2016, and the related consolidated statements of income, comprehensive income, stockholders' equity and cash flows for each of the three years in the period ended December 31, 2017, 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, 2017, 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, 2017 and 2016, and the results of their operations and their cash flows for each of the three years in the period ended December 31, 2017 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, 2017, based on criteria established in *Internal Control—Integrated Framework (2013)* issued by the COSO.

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.

/s/ PricewaterhouseCoopers LLP
Houston, Texas
February 22, 2018

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, 2017	2016	2015
Sales and other operating revenues:			
Trade	$33,705	$28,454	$31,930
Related parties	779	729	805
	34,484	29,183	32,735
Operating costs and expenses:			
Cost of sales	28,059	23,191	25,683
Selling, general and administrative expenses	859	833	828
Research and development expenses	106	99	102
	29,024	24,123	26,613
Operating income	5,460	5,060	6,122
Interest expense	(491)	(322)	(310)
Interest income	24	17	33
Other income, net	179	111	25
Income from continuing operations before equity investments and income taxes	5,172	4,866	5,870
Income from equity investments	321	367	339
Income from continuing operations before income taxes	5,493	5,233	6,209
Provision for income taxes	598	1,386	1,730
Income from continuing operations	4,895	3,847	4,479
Loss from discontinued operations, net of tax	(18)	(10)	(5)
Net income	4,877	3,837	4,474
Net (income) loss attributable to non-controlling interests	2	(1)	2
Net income attributable to the Company shareholders	$ 4,879	$ 3,836	$ 4,476
Earnings per share:			
Net income (loss) attributable to the Company shareholders —			
Basic:			
Continuing operations	$ 12.28	$ 9.17	$ 9.63
Discontinued operations	(0.05)	(0.02)	(0.01)
	$ 12.23	$ 9.15	$ 9.62
Diluted:			
Continuing operations	$ 12.28	$ 9.15	$ 9.60
Discontinued operations	(0.05)	(0.02)	(0.01)
	$ 12.23	$ 9.13	$ 9.59

See Notes to the Consolidated Financial Statements.

LYONDELLBASELL INDUSTRIES N.V.

CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME

Millions of dollars	Year Ended December 31, 2017	2016	2015
Net income	$4,877	$3,837	$4,474
Other comprehensive income (loss), net of tax—			
Financial derivatives	(45)	4	1
Unrealized gains (losses) on available-for-sale securities	(3)	6	(5)
Unrealized gains on available-for-sale securities held by equity investees	19	—	—
Defined pension and other postretirement benefit plans	77	(70)	21
Foreign currency translations	178	(13)	(429)
Total other comprehensive income (loss), net of tax	226	(73)	(412)
Comprehensive income	5,103	3,764	4,062
Comprehensive (income) loss attributable to non-controlling interests	2	(1)	2
Comprehensive income attributable to the Company shareholders	$5,105	$3,763	$4,064

See Notes to the Consolidated Financial Statements.

LYONDELLBASELL INDUSTRIES N.V.

CONSOLIDATED BALANCE SHEETS

Millions of dollars	December 31, 2017	December 31, 2016
ASSETS		
Current assets:		
Cash and cash equivalents	$ 1,523	$ 875
Restricted cash	5	3
Short-term investments	1,307	1,147
Accounts receivable:		
Trade, net	3,359	2,716
Related parties	180	126
Inventories	4,217	3,809
Prepaid expenses and other current assets	1,147	923
Total current assets	11,738	9,599
Property, plant and equipment, net	10,997	10,137
Investments and long-term receivables:		
Investment in PO joint ventures	420	415
Equity investments	1,635	1,575
Other investments and long-term receivables	17	20
Goodwill	570	528
Intangible assets, net	568	550
Other assets	261	618
Total assets	$26,206	$23,442

See Notes to the Consolidated Financial Statements.

LYONDELLBASELL INDUSTRIES N.V.

CONSOLIDATED BALANCE SHEETS

Millions of dollars, except shares and par value data	December 31, 2017	December 31, 2016
LIABILITIES AND EQUITY		
Current liabilities:		
Current maturities of long-term debt	$ 2	$ 2
Short-term debt	68	594
Accounts payable:		
Trade	2,258	2,028
Related parties	637	501
Accrued liabilities	1,812	1,415
Total current liabilities	4,777	4,540
Long-term debt	8,549	8,385
Other liabilities	2,275	2,113
Deferred income taxes	1,655	2,331
Commitments and contingencies		
Stockholders' equity:		
Ordinary shares, €0.04 par value, 1,275 million shares authorized, 394,512,054 and 404,046,331 shares outstanding, respectively	31	31
Additional paid-in capital	10,206	10,191
Retained earnings	15,746	12,282
Accumulated other comprehensive loss	(1,285)	(1,511)
Treasury stock, at cost, 183,928,109 and 174,389,139 ordinary shares, respectively	(15,749)	(14,945)
Total Company share of stockholders' equity	8,949	6,048
Non-controlling interests	1	25
Total equity	8,950	6,073
Total liabilities and equity	$ 26,206	$ 23,442

See Notes to the Consolidated Financial Statements.

LYONDELLBASELL INDUSTRIES N.V.

CONSOLIDATED STATEMENTS OF CASH FLOWS

Millions of dollars	Year Ended December 31, 2017	2016	2015
Cash flows from operating activities:			
Net income	$ 4,877	$ 3,837	$ 4,474
Adjustments to reconcile net income to net cash provided by operating activities:			
Depreciation and amortization	1,174	1,064	1,047
Amortization of debt-related costs	15	16	16
Charges related to repayment of debt	49	—	—
Share-based compensation	55	38	53
Inventory valuation adjustment	—	29	548
Equity investments—			
Equity income	(321)	(367)	(339)
Distribution of earnings, net of tax	309	385	285
Deferred income taxes	(587)	357	181
Gain on sales of business and equity method investments	(108)	(84)	—
Changes in assets and liabilities that provided (used) cash:			
Accounts receivable	(521)	(383)	780
Inventories	(237)	123	(240)
Accounts payable	165	383	(786)
Other, net	336	208	(177)
Net cash provided by operating activities	5,206	5,606	5,842
Cash flows from investing activities:			
Expenditures for property, plant and equipment	(1,547)	(2,243)	(1,440)
Payments for repurchase agreements	(512)	(674)	(397)
Proceeds from repurchase agreements	381	685	350
Purchases of available-for-sale securities	(653)	(688)	(2,073)
Proceeds from sales and maturities of available-for-sale securities	499	674	2,489
Purchases of held-to-maturity securities	—	(76)	—
Proceeds from maturities of held-to-maturity securities	75	—	—
Purchases of business, equity method investment and non-controlling interest	(21)	(65)	—
Net proceeds from sales of business and equity method investments	155	209	—
Proceeds from settlement of net investment hedges	609	1,295	—
Payments for settlement of net investment hedges	(658)	(1,356)	—
Other, net	(84)	(62)	25
Net cash used in investing activities	(1,756)	(2,301)	(1,046)

See Notes to the Consolidated Financial Statements.

LYONDELLBASELL INDUSTRIES N.V.

CONSOLIDATED STATEMENTS OF CASH FLOWS — Continued

Millions of dollars	Year Ended December 31, 2017	2016	2015
Cash flows from financing activities:			
Repurchases of Company ordinary shares	(866)	(2,938)	(4,656)
Dividends paid	(1,415)	(1,395)	(1,410)
Issuance of long-term debt	990	812	984
Repayment of long-term debt	(1,000)	—	—
Debt extinguishment costs	(65)	—	—
Net (repayments of) proceeds from commercial paper	(493)	177	61
Payments of debt issuance costs	(8)	(5)	(16)
Other, net	(2)	—	187
Net cash used in financing activities	(2,859)	(3,349)	(4,850)
Effect of exchange rate changes on cash	59	(9)	(48)
Increase (decrease) in cash and cash equivalents and restricted cash	650	(53)	(102)
Cash and cash equivalents and restricted cash at beginning of period	878	931	1,033
Cash and cash equivalents and restricted cash at end of period	$ 1,528	$ 878	$ 931
Supplemental Cash Flow Information:			
Interest paid, net of capitalized interest	$ 333	$ 313	$ 299
Net income taxes paid	$ 1,044	$ 741	$ 1,417

See Notes to the Consolidated Financial Statements.

LYONDELLBASELL INDUSTRIES N.V.

CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY

Millions of dollars	Ordinary Shares Issued	Ordinary Shares Treasury	Additional Paid-in Capital	Retained Earnings	Accumulated Other Comprehensive Income (Loss)	Company Share of Stockholders' Equity	Non-Controlling Interests
Balance, December 31, 2014	$ 31	$ (7,853)	$10,387	$ 6,775	$(1,026)	$ 8,314	$ 30
Net income (loss)	—	—	—	4,476	—	4,476	(2)
Other comprehensive loss	—	—	—	—	(412)	(412)	—
Share-based compensation	—	382	(205)	—	—	177	—
Dividends ($3.04 per share)	—	—	—	(1,410)	—	(1,410)	—
Repurchases of Company ordinary shares	—	(4,615)	—	—	—	(4,615)	—
Settlement from partner on exit from partnership	—	—	20	—	—	20	(4)
Balance, December 31, 2015	$ 31	$(12,086)	$10,202	$ 9,841	$(1,438)	$ 6,550	$ 24
Net income	—	—	—	3,836	—	3,836	1
Other comprehensive loss	—	—	—	—	(73)	(73)	—
Share-based compensation	—	55	(11)	—	—	44	—
Dividends ($3.33 per share)	—	—	—	(1,395)	—	(1,395)	—
Repurchases of Company ordinary shares	—	(2,914)	—	—	—	(2,914)	—
Balance, December 31, 2016	$ 31	$(14,945)	$10,191	$12,282	$(1,511)	$ 6,048	$ 25
Net income (loss)	—	—	—	4,879	—	4,879	(2)
Other comprehensive income	—	—	—	—	226	226	—
Share-based compensation	—	41	14	—	—	55	—
Dividends ($3.55 per share)	—	—	—	(1,415)	—	(1,415)	—
Repurchases of Company ordinary shares	—	(845)	—	—	—	(845)	—
Purchase of non-controlling interest	—	—	1	—	—	1	(22)
Balance, December 31, 2017	$ 31	$(15,749)	$10,206	$15,746	$(1,285)	$ 8,949	$ 1

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

The following significant accounting policies were applied in the preparation of these Consolidated Financial Statements:

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 U.S. ("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.

The Consolidated Financial Statements have been prepared under the historical cost convention, as modified for the accounting of certain financial assets and financial liabilities (including derivative instruments) at fair value through profit or loss. Consolidated financial information, including subsidiaries, equity investments, has been prepared using uniform accounting policies for similar transactions and other events in similar circumstances.

Cash and Cash Equivalents

Cash equivalents consist of highly liquid debt instruments such as certificates of deposit, commercial paper and money market accounts. Cash equivalents include instruments with maturities of three months or less when acquired. Cash equivalents are stated at cost, which approximates fair value. Cash and cash equivalents exclude restricted cash. Our cash equivalents are placed in certificates of deposit, high-quality commercial paper and money market accounts with major international banks and financial institutions.

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

Short-Term Investments

We have investments in marketable securities classified as available-for-sale and held-to-maturity. These securities are included in Short-term investments on the Consolidated Balance Sheets. Investments classified as available-for-sale are carried at estimated fair value with unrealized gains and losses recorded as a component of Accumulated other comprehensive income ("AOCI"). Investments classified as held-to-maturity are carried at amortized cost. We periodically review our available-for-sale and held-to-maturity securities for other-than-temporary declines in fair value below the cost basis, and when events or changes in circumstances indicate the carrying value of an asset may not be recoverable, the investment is written down to fair value, establishing a new cost basis.

Trade Receivables

Trade receivables are amounts due from customers for merchandise sold or services performed in the ordinary course of business.

We calculate provisions for doubtful accounts receivable based on our estimates of amounts that we believe are unlikely to be collected. Collectability of receivables is reviewed and the provision calculated for doubtful accounts is adjusted at least quarterly, based on aging of specific accounts and other available information about the associated customers. Provisions for doubtful accounts are included in Selling, general and administrative expenses.

Loans Receivable

We invest in tri-party repurchase agreements. Under these agreements, we make cash purchases of securities according to a pre-agreed profile from our counterparties. The counterparties have an obligation to repurchase, and we have an obligation to sell, the same or substantially the same securities at a pre-defined date for a price equal to the purchase price plus interest. These securities, which pursuant to our internal policies are held by a third-party custodian and must generally have a minimum collateral value of 102%, secure the counterparty's obligation to repurchase the securities. Depending upon maturity, these tri-party repurchase agreements are treated as short-term loans receivable and are reflected in Prepaid expenses and other current assets or as long-term loans receivable reflected in Other investments and long-term receivables on our Consolidated Balance Sheets.

Inventories

Cost of our raw materials, work-in-progress and finished goods inventories is determined using the last-in, first-out ("LIFO") method and is carried at the lower of current market value or cost. 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 or major projects exceeding one year, costs of major maintenance arising from turnarounds of major units and committed decommission costs. Routine maintenance costs are expensed as incurred. Land is not depreciated. Depreciation is computed using the straight-line method over the estimated useful asset lives to their residual values.

The assets' residual values and useful lives are reviewed, and adjusted if appropriate, at the end of each reporting period.

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). When it is probable 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.

Upon retirement or sale, we remove the cost of the asset and the related accumulated depreciation from the accounts and reflect any resulting gain or loss in the Consolidated Statements of Income.

Equity Investments

We account for 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 method investments, net of income taxes, in the Consolidated Statements of Income. When our share of losses in an equity investment equals or exceeds our interest in the equity investment, including any other unsecured receivables, we do not recognize further losses, unless we have incurred obligations or made payments on behalf of the equity investment.

We evaluate our equity method investments for impairment when events or changes in circumstances indicate, in management's judgment, that the carrying value of such investments may have experienced an other-than-temporary decline in value. When evidence of loss in value has occurred, management compares the estimated fair value of investment to the carrying value of investment to determine whether an impairment has occurred. If the estimated fair value is less than the carrying value and management considers the decline in value to be other-than temporary, the excess of the carrying value over the estimated fair value is recognized in the Consolidated Financial Statements as an impairment.

Goodwill

We recorded goodwill upon our application of fresh-start accounting on May 1, 2010. Goodwill is not amortized, but is tested annually for impairment. We assess the recoverability of the carrying value of goodwill during the fourth quarter of each year or whenever events or changes in circumstances indicate that the carrying amount of the goodwill of a reporting unit may not be fully recoverable.

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.

In 2017 and 2016, 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. Accordingly, a quantitative goodwill impairment test was not required and no goodwill impairment was recognized.

Intangible Assets

Intangible Assets—Intangible assets consist of emission allowances, various contracts, in-process research and development 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 for impairment whenever events or changes in circumstances indicate that the carrying value of the asset may not be recoverable.

Research and Development—Research and development ("R&D") costs are expensed when incurred. Subsidies for research and development are included in Other income (expense), net. Depreciation expense related to R&D assets 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.

Other Provisions

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

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

Foreign Currency Translation

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 reporting currency through Other comprehensive income.

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

In the Consolidated Financial Statements, the results and financial position of all subsidiaries that have a functional currency different from the presentation currency are translated into the reporting currency as follows:

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

Revenue Recognition

Substantially all of the Company's revenue is derived from product sales. Revenues are recognized when sales are realized or realizable, and the earnings process is complete. Revenue from product sales is recognized when the price is fixed or determinable, collectability is reasonably assured, and the customer has an obligation to pay at the time of transfer of title and risk of loss to the customer, which usually occurs at the time of shipment. Revenue is recognized at the time of delivery if we retain the risk of loss during shipment.

Share-Based Compensation

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

Contingent share awards are recognized ratably over the vesting period as a liability and re-measured, at fair value, at the balance sheet date, see Note 16 to the Consolidated Financial Statements.

Leases

We lease land and other assets for use in our operations. All lease agreements are evaluated and classified as either an operating lease or a capital lease. A lease is classified as a capital lease if any of the following criteria are met: transfer of ownership to the lessee by the end of the lease term; the lease contains a bargain purchase option; the lease term is equal to 75% or greater of the asset's useful economic life; or the present value of the future minimum lease payments is equal to or greater than 90% of the asset's fair market value. Capital leases are recorded at the lower of the net present value of the total amount of rent payable under the leasing agreement (excluding finance charges) or fair market value of the leased asset. Capital lease assets are depreciated on a straight-line basis, over a period consistent with our normal depreciation policy for tangible fixed assets, but generally not exceeding the lease term. Operating lease expense is recognized ratably over the entire 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. For derivatives designated as net investment hedges and cash flow hedges, the effective portion of the gains and losses is recorded in Other comprehensive income (loss) and the ineffective portion is recorded in earnings. For derivatives designated as net investment hedges, gains or losses resulting from its settlement are reflected in foreign currency translations adjustments in Other comprehensive income (loss). For derivatives that have been designated as fair value hedges, the gains and losses of the derivatives and hedged instruments are recorded in earnings.

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

For our basis swaps, we use the long-haul method to assess hedge effectiveness using a regression analysis approach under the hypothetical derivative method. We perform the regression analysis at least on a quarterly basis over an observation period of three years, utilizing data that is relevant to the hedge duration. We use the forward method to measure ineffectiveness.

For our forward exchange contracts and our euro denominated notes payable, we use the critical terms match to assess both prospective and retrospective hedge effectiveness by comparing the spot rate change in the hedging instrument and the spot rate change in the designated net investment. We use the forward method to measure ineffectiveness.

Cash flows related to our foreign currency contracts designated as net investment hedges are reported in Cash flows from investing activities and related interest payments are reported in Cash flows from operating activities in the Consolidated Statement of Cash Flows. Cash flows related to our foreign currency denominated debt designated as net investment hedges are reported in Cash flows from financing activities and related interest payments are reported in Cash flows from operating activities in the Consolidated Statement of Cash Flows.

Cash Flow Hedges—Our cash flow hedges include cross currency swaps, forward starting interest rate swaps and commodity swaps.

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 the anticipated refinancing of our senior notes due 2019.

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

We use the long-haul method to assess hedge effectiveness of these cash flow hedges using a regression analysis approach under the hypothetical derivative method. We perform the regression analysis at least on a quarterly basis. We use the dollar offset method under the hypothetical derivative method to measure ineffectiveness.

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.

These payments are classified as Other, net, in the Cash flows from operating activities section of the Consolidated Statements of Cash Flows. We use the long-haul method to assess hedge effectiveness using a regression analysis approach. We perform the regression analysis over an observation period of three years, utilizing data that is relevant to the hedge duration. We use the dollar offset method to measure ineffectiveness.

We evaluate the effectiveness of the hedging relationship at least on quarterly basis and calculate the changes in the fair value of the derivatives and the underlying hedged items separately.

Fair Value Measurements

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

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

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

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

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

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

We use the following inputs and valuation techniques to estimate the fair value of our financial instruments disclosed in Note 14:

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

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

Forward-Starting Interest Rate Swaps—The fair value of our forward-starting interest rate swaps is calculated using the present value of future cash flows method and based on observable inputs such as benchmark interest rates.

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

Commodity and Embedded Derivatives—The fair values of our commodity derivatives classified as Level 1 and embedded 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 Securities—The fair value of our available-for-sale securities is calculated using observable market data for similar securities and broker quotes from recognized purveyors of market data or the net asset value for limited partnership investments provided by the fund administrator. Our limited partnership investments include investments in, among other things, equities and equity related securities, debt securities, credit instruments, global interest rate products, currencies, commodities, futures, options, warrants and swaps. These investments, which include both long and short positions, may be redeemed at least monthly with advance notice ranging up to ninety days.

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—Fair values of short-term borrowings related to precious metal financing arrangements are determined based on the current market price of the associated precious metal.

Long-Term Debt—Fair value is calculated using pricing data obtained from well-established and recognized vendors of market data for debt valuations.

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

We use the following inputs and valuation techniques to estimate the fair value of our pension assets disclosed in Note 15:

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

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

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

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

Use of Estimates

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

Recently Adopted Guidance

Intangibles-Goodwill and Other—In January 2017, the Financial Accounting Standards Board ("FASB") issued Accounting Standards Update ("ASU") 2017-04, *Intangibles—Goodwill and other (Topic 350): Simplifying the Test for Goodwill Impairment* to simplify the accounting for goodwill impairment. The guidance removes Step 2 of the goodwill impairment test, which requires a hypothetical purchase price allocation. Goodwill impairment will now be measured as amount by which a reporting unit's carrying value exceeds its fair value; however, the loss recognized should not exceed the total amount of goodwill allocated to that reporting unit. Entities will continue to have the option to perform a qualitative assessment to determine if a quantitative impairment test is necessary. The early adoption of this amendment in the first quarter of 2017 did not have a material impact on our Consolidated Financial Statements.

Inventories—In July 2015, the FASB issued ASU 2015-11, *Inventory (Topic 330): Simplifying the Measurement of Inventory.* Under this new guidance, entities that measure inventory using any method other than last-in, first-out or the retail inventory method will be required to measure inventory at the lower of cost and net realizable value. The amendments in this ASU, which should be applied prospectively, were effective for annual and interim periods beginning after December 15, 2016. The adoption of this amendment in the first quarter of 2017 did not have a material impact on our Consolidated Financial Statements.

Compensation—In March 2016, the FASB issued ASU 2016-09, *Compensation—Stock Compensation (Topic 718): Improvements to Employee Share-Based Payment Accounting*. This ASU simplifies several aspects of the accounting for share-based payment transactions, including the income tax consequences, classification of awards as either equity or liabilities, and classification on the statement of cash flows. The amendments in this ASU were effective for public entities for annual and interim periods beginning after December 15, 2016. Adoption of the amendments in this guidance in the first quarter of 2017 did not have a material impact on our Consolidated Financial Statements.

Statement of Cash Flows—In August 2016, the FASB issued ASU 2016-15, *Statement of Cash Flows (Topic 230): Classification of Certain Cash Receipts and Cash Payments*. The updated accounting requirement is intended to reduce diversity in practice in the classification of certain transactions in the statement of cash flows. Such transactions include, but are not limited to, debt prepayment or debt extinguishment costs, settlement of zero coupon debt instruments, contingent consideration payments made after a business combination and distributions received from equity method of investments. The amendments in this ASU are effective for annual and interim periods beginning after December 15, 2017, with early adoption permitted. Early adoption of the amendments in this guidance in the second quarter of 2017 resulted in a reclassification of cash flows related to debt extinguishment costs incurred in March 2017 of $65 million from operating to financing activity cash flows. Other aspects of the amendment did not have a material impact on our Consolidated Statements of Cash Flows.

Statement of Cash Flows—In November 2016, the FASB issued ASU 2016-18, *Statement of Cash Flows: Restricted Cash*. The ASU requires entities to include restricted cash and restricted cash equivalents in their cash and cash-equivalent balances in the statement of cash flows. Early retrospective adoption of this amendment in the second quarter of 2017 did not have a material impact on our Consolidated Statements of Cash Flows.

Compensation—Stock Compensation—In May 2017, the FASB issued ASU 2017-09, *Stock Compensation: Scope of Modification Accounting*. The amendments in this update provide guidance about which changes to the terms or conditions of a share-based payment award require an entity to apply modification accounting in *Topic 718, Compensation–Stock Compensation*. Early adoption of this amendment in the third quarter of 2017 did not have a material impact on our Consolidated Financial Statements.

Accounting Guidance Issued But Not Adopted as of December 31, 2017

Revenue Recognition—In May 2014, the FASB issued ASU 2014-09, *Revenue from Contracts with Customers (Topic 606)*, which supersedes the current revenue recognition requirements in Accounting Standard Codification ("ASC") 606, *Revenue Recognition.* Under this guidance, entities should recognize revenues to depict the transfer of promised goods or services to customers in an amount that reflects the consideration the entity expects to receive in exchange for those goods or services. This ASU also requires enhanced disclosures. In August 2015, the FASB issued ASU 2015-14, *Revenue from Contracts with Customers (Topic 606): Deferral of the Effective Date*, which deferred the original effective date for one year to annual and interim periods beginning after December 15, 2017. We will adopt this standard as of January 1, 2018 following the modified retrospective method.

Amendments to Revenue Recognition—In 2016 the FASB issued several amendments to *Topic 606, Revenue from Contracts with Customers.* ASU 2016-08, *Principal versus Agent Considerations,* contains amendments that clarify the implementation guidance on principal versus agent considerations. ASU 2016-10, *Identifying Performance Obligations and Licensing* clarifies the guidance on identifying performance obligations and accounting for licenses of intellectual property. The FASB also issued ASU 2016-12, *Narrow-Scope Improvements and Practical Expedients,* which further clarifies accounting for collectability, noncash consideration, presentation of sales tax, and transition. The FASB also issued ASU 2016-20 *Technical Corrections and Improvements to Topic 606*, which provides numerous improvements related to the Topic 606. All amendments are effective with the same date as ASU 2014-09. We have completed any required changes to our systems and processes, including updating our internal controls. We do not expect that adoption of this guidance and amendments to have a material impact on our Consolidated Financial Statements.

Financial Instruments—In January 2016, the FASB issued ASU 2016-01, *Financial Instruments-Overall (Subtopic 825-10): Recognition and Measurement of Financial Assets and Financial Liabilities*. The new guidance in this ASU includes a requirement for equity investments (except those accounted for under the equity method of accounting or those that result in consolidation of the investee) to be measured at fair value with changes in fair value recognized in net income. Prospective application of this ASU is required for public entities for annual and interim periods beginning on or after December 15, 2017. We do not expect the adoption of this guidance to have a material impact on our Consolidated Financial Statements.

Leases—In February 2016, the FASB issued ASU 2016-02, *Leases (Topic 842)* which supersedes the existing guidance for lease accounting in ASC 840, *Leases*. Under the new guidance, for leases with a term longer than 12 months a lessee should recognize a lease liability and a right-of-use asset representing its right to use the underlying asset for the lease term. Topic 842 retains a classification distinction between finance leases and operating leases, with the classification affecting the pattern of expense recognition in the income statement. This ASU also requires enhanced disclosures. A modified retrospective transition approach is required for annual and interim periods beginning on or after December 15, 2018. Early adoption is permitted. We are currently assessing the impact of this new guidance on our Consolidated Financial Statements via review of existing lease contracts and other purchase obligations that contain embedded lease features, which are generally classified as operating leases under the existing guidance. In 2018, the FASB also issued ASU 2018-01, *Land Easement Practical Expedient for Transition to Topic 842*. Under this guidance, an optional transition practical expedient is available whereby existing or expired land easements that were not previously accounted for as leases under Topic 840 are not required to be evaluated under Topic 842. We will evaluate the application of this ASU together with the overall assessment of Topic 842.

Financial Instruments—In June 2016, the FASB issued ASU 2016-13, *Financial Instruments—Credit Losses (Topic 326)*: *Measurement of Credit Losses on Financial Instruments*. This amendment requires financial assets measured at amortized cost basis to be presented at the net amount expected to be collected, resulting in the use of a current expected credit loss ("CECL") model when measuring an impairment of financial instruments. Credit losses related to available-for-sale securities should be recorded in the consolidated income statement through an allowance for credit losses. Estimated credit losses utilizing the CECL model are based on historical experience, current conditions and forecasts that affect the collectability. This ASU also modifies the impairment model for available-for-sale debt securities by eliminating the concept of "other than temporary" as well as providing a simplified accounting model for purchased financial assets with credit deterioration since their origination. The guidance will be effective for annual and interim periods beginning after December 15, 2019. Early adoption is permitted. We are currently assessing the impact of the amendment on our Consolidated Financial Statements.

Income Taxes—In October 2016, the FASB issued ASU 2016-16, *Accounting for Income Taxes: Intra-Entity Asset Transfers of Assets Other than Inventory*. Under current GAAP, the tax effects of intra-entity asset transfers (intercompany sales) are deferred until the transferred asset is sold to a third party or otherwise recovered through use. The new guidance eliminates the exception for all intra-entity sales of assets other than inventory, and a reporting entity would recognize tax expense from the sale of assets in the seller's tax jurisdiction when the transfer occurs, even though the pretax effects of that transaction are eliminated in consolidation. The new guidance will be effective for public entities for annual periods beginning after December 15, 2017. We do not expect the adoption of this new guidance to have a material impact on our Consolidated Financial Statements.

Business Combinations—In January 2017, the FASB issued ASU 2017-01, *Clarifying the Definition of a Business*. This ASU clarifies the definition of a business in evaluating whether a transaction should be accounted for as an acquisition (or disposal) of an asset or a business. The amendments will be effective for public entities for annual and interim periods beginning after December 15, 2017. Early adoption is permitted. We do not expect the adoption of this guidance to have a material impact on our Consolidated Financial Statements.

Other Income—Gains and Losses from the Derecognition of Nonfinancial Assets—In February 2017, the FASB issued ASU 2017-05, *Clarifying the Scope of Asset Derecognition Guidance and Accounting for Partial Sales of Nonfinancial Assets*. The guidance provides clarification about the term *in substance nonfinancial asset*, other aspects of the scope of Subtopic 610-20 *Other Income*, and how an entity should account for partial sales of nonfinancial assets once the amendments in Update 2014-09 become effective. The amendments will be effective for annual and interim periods beginning after December 15, 2017. We do not expect the adoption of this guidance to have a material impact on our Consolidated Financial Statements.

Compensation—Retirement Benefits—In March 2017, the FASB issued ASU 2017-07, *Improving the Presentation of Net Periodic Pension Cost and Net Periodic Postretirement Benefit Cost*. The guidance will require changes in presentation of current service cost and other components of net benefit cost. This amendment will be effective for public entities for annual and interim periods beginning after December 15, 2017. We do not expect the adoption of this new guidance to have a material impact on our Consolidated Financial Statements.

Receivables–Nonrefundable Fees and Other Costs—In March 2017, the FASB issued ASU 2017-08, *Premium Amortization on Purchased Callable Debt Securities*. This guidance requires the premium on callable debt securities to be amortized to the earliest call date. Under current requirements, premiums on callable debt securities are generally amortized over the contractual life of the security. The amendments will be effective for annual and interim periods beginning after December 15, 2018. Early adoption is permitted. We do not expect the adoption of this guidance to have a material impact on our Consolidated Financial Statements.

Derivatives and Hedging—In August 2017, the FASB issued ASU 2017-12, *Targeted Improvements to Accounting for Hedging Activities.* The guidance will make more financial and nonfinancial hedging strategies eligible for hedge accounting and amends the presentation and disclosure requirements while changing how companies assess hedge effectiveness. The amendments will be effective for annual and interim periods beginning after December 15, 2018. Early adoption is permitted and the Company will adopt the guidance effective January 1, 2018. We do not expect the adoption of this guidance to have a material impact on our Consolidated Financial Statements.

Accumulated Other Comprehensive Income—In February 2018, the FASB issued ASU 2018-02, *Income Statement—Reporting Comprehensive Income (Topic 220): Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income*. The guidance will permit entities to reclassify tax effects stranded in accumulated other comprehensive income as a result of the Tax Act to retained earnings. The amendment will be effective for annual and interim periods beginning after December 15, 2018. Early adoption is permitted. We are currently assessing the impact of the amendment on our Consolidated Financial Statements.

3. Discontinued Operations and Dispositions

Discontinued Operations—We began reporting the Berre refinery as a discontinued operation in the second quarter of 2012. The impact of this discontinued operation is immaterial to our consolidated results.

Cash outflows for exit and disposal costs were incurred through the end of 2017. Payments to severed employees are expected to be substantially complete by 2019.

In May 2016, we received a notice pertaining to the final closure of our Berre refinery from the Prefect of Bouches du Rhone. This notice outlines the requirements to dismantle the refinery facilities. At this time, the estimated cost and associated cash flows to fulfill these requirements are not deemed to be material.

Dispositions—Upon the sale of our wholly owned subsidiary, Petroken Petroquimica Ensenada S.A. in February 2016, we received net proceeds of $137 million, which is reflected in Cash flows from investing activities in the Consolidated Statement of Cash Flows. In connection with the sale, we recognized a pretax and after-tax gain of $78 million, which is reflected in Other Income, net in the Consolidated Income Statements.

4. Related Party Transactions

We have related party transactions with affiliates of one of our major shareholders, Access Industries ("Access") and with the Company's joint venture partners (see Notes 8 and 9).

Access—In December 2010, one of our subsidiaries received demand letters from affiliates of Access demanding (i) indemnity for losses, including attorney's fees and expenses, arising out of a pending lawsuit and (ii) payment of (a) $100 million in management fees under a 2007 management agreement between an Access affiliate and the predecessor of LyondellBasell AF S.C.A. ("LyondellBasell AF") and (b) other unspecified amounts related to advice purportedly given in connection with financing and other strategic transactions. For additional information related to this matter, see Note 18.

Joint Venture Partners—We have related party transactions with our equity investees. 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 $21 million of the indebtedness of one of our joint ventures as of December 31, 2017. In 2015, we received a $19 million payment for a loan made to our joint venture, Al-Waha Petrochemicals Ltd. in 2010.

Related party transactions are summarized as follows:

	Year Ended December 31,		
Millions of dollars	2017	2016	2015
The Company billed related parties for:			
Sales of products—			
Joint venture partners	$ 779	$ 729	$ 805
Shared service agreements—			
Joint venture partners	16	18	19
Related parties billed the Company for:			
Sales of products—			
Joint venture partners	2,759	2,402	2,831
Shared service agreements—			
Joint venture partners	75	71	73

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 allowance for doubtful accounts receivable, which is reflected in the Consolidated Balance Sheets as a reduction of accounts receivable, was $17 million and $16 million at December 31, 2017 and 2016, respectively. We recorded provisions for doubtful accounts receivable, which are reflected in the Consolidated Statements of Income, of less than $1 million in 2017, 2016 and 2015.

6. Inventories

Inventories consisted of the following components at December 31:

Millions of dollars	2017	2016
Finished goods	$2,932	$2,575
Work-in-process	142	154
Raw materials and supplies	1,143	1,080
Total inventories	$4,217	$3,809

At December 31, 2017 and 2016, approximately 86% 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, 2017 and 2016, 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 charges was approximately $1,194 million and $499 million at December 31, 2017 and 2016, respectively.

For information related to lower of cost or market ("LCM") inventory valuation charges recognized during 2016 and 2015, see Note 21.

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:

Millions of dollars	Estimated Useful Lives (in Years)	2017	2016
Land		$ 313	$ 278
Major manufacturing equipment	25	10,029	9,061
Buildings	30	826	682
Light equipment and instrumentation	5-20	2,141	1,932
Office furniture	15	16	14
Major turnarounds	4-7	1,765	1,528
Information system equipment	3-5	59	58
Construction in progress		1,421	1,082
Total property, plant and equipment		16,570	14,635
Less accumulated depreciation		(5,573)	(4,498)
Property, plant and equipment, net		$10,997	$10,137

Capitalized Interest—We capitalize interest costs incurred on funds used to construct property, plant and equipment. In 2017, 2016 and 2015, we capitalized interest of $20 million, $33 million and $11 million, respectively.

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

	2017			2016		
Millions of dollars	**Cost**	**Accumulated Amortization**	**Net**	**Cost**	**Accumulated Amortization**	**Net**
In-process research and development costs	$ 117	$ (70)	$ 47	$ 106	$ (54)	$ 52
Emission allowances	786	(468)	318	697	(421)	276
Various contracts	552	(356)	196	518	(306)	212
Software costs	73	(66)	7	70	(60)	10
Total intangible assets	$1,528	$(960)	$568	$1,391	$(841)	$550

Amortization of these identifiable intangible assets for the next five years is expected to be $103 million in 2018, $102 million in 2019, $86 million in 2020, $35 million in 2021 and $29 million in 2022.

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

	Year Ended December 31,		
Millions of dollars	**2017**	**2016**	**2015**
Property, plant and equipment	$1,023	$ 920	$ 875
Investment in PO joint ventures	41	40	28
Emission allowances	67	62	97
Various contracts	27	27	32
In-process research and development costs	9	8	8
Software costs	7	7	7
Total depreciation and amortization	$1,174	$1,064	$1,047

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:

	Year Ended December 31,	
Millions of dollars	**2017**	**2016**
Beginning balance	$ 77	$83
Payments	(3)	(4)
Changes in estimates	(26)	(1)
Accretion expense	2	3
Effects of exchange rate changes	8	(4)
Ending balance	$ 58	$77

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.

Goodwill—Goodwill was $570 million at December 31, 2017 and $528 million at December 31, 2016. All movements were due to foreign exchange impacts.

8. Investment in PO Joint Ventures

We, together with Covestro PO LLC, a subsidiary of Covestro AG (collectively "Covestro"), share ownership in a U.S. propylene oxide ("PO") manufacturing joint venture (the "U.S. PO joint venture"). The U.S. PO joint venture owns a PO/styrene monomer ("SM" or "styrene") and a PO tertiary butyl alcohol ("TBA") manufacturing facility. Covestro's ownership interest represents an undivided interest in certain U.S. PO joint venture assets with correlative PO capacity reservation that resulted in ownership of annual in-kind cost-based PO production of approximately 1.5 billion pounds in 2017 and 2016. We take in kind the remaining cost-based PO and co-product production.

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

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

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

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

Our product offtake was 6,189 million, 6,024 million and 6,270 million pounds of PO and its co-products for the years ended December 31, 2017, 2016 and 2015, respectively.

Changes in our investments in the U.S. and European PO joint ventures for 2017 and 2016 are summarized below:

Millions of dollars	U.S. PO Joint Venture	European PO Joint Venture	Total PO Joint Ventures
Investments in PO joint ventures—January 1, 2017	$316	$ 99	$415
Cash contributions	26	6	32
Depreciation and amortization	(32)	(9)	(41)
Effect of exchange rate changes	—	14	14
Investments in PO joint ventures—December 31, 2017	$310	$110	$420
Investments in PO joint ventures—January 1, 2016	$296	$101	$397
Cash contributions	52	9	61
Depreciation and amortization	(32)	(8)	(40)
Effect of exchange rate changes	—	(3)	(3)
Investments in PO joint ventures—December 31, 2016	$316	$ 99	$415

9. Equity Investments

Our PO joint ventures, which are also accounted for using the equity method of accounting, are discussed in Note 8 to the accompanying Consolidated Financial Statements and are, therefore, not included in the following discussion.

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

Percent of Ownership	2017	2016
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%	20.95%
Polymirae Co. Ltd.	50.00%	50.00%
HMC Polymers Company Ltd.	28.56%	28.56%
Indelpro S.A. de C.V.	49.00%	49.00%
Ningbo ZRCC Lyondell Chemical Co. Ltd.	26.65%	26.65%
Ningbo ZRCC Lyondell Chemical Marketing Co.	50.00%	50.00%
NOC Asia Ltd.	40.00%	40.00%
Geosel	—%	27.00%

The changes in our equity investments are as follows:

Millions of dollars	Year Ended December 31, 2017	2016
Beginning balance	$1,575	$1,608
Income from equity investments	321	367
Distribution of earnings, net of tax	(309)	(385)
Purchase of equity method investment	—	38
Sale of equity method investment	(35)	(58)
Unrealized gain on available-for-sale securities	19	—
Currency exchange effects	68	8
Other	(4)	(3)
Ending balance	$1,635	$1,575

In September 2017, we sold our 27% interest in our Geosel joint venture and received proceeds of $155 million. In September 2016, we received proceeds of $72 million from the sale of our ownership interest in SunAllomer Ltd., our joint venture in Japan. Also in September 2016, we purchased a net additional 7.41% interest in Polymirae Co. Ltd., our joint venture in Korea, for $36 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	Year Ended December 31, 2017	2016
Current assets	$2,844	$2,436
Noncurrent assets	4,541	4,687
Total assets	7,385	7,123
Current liabilities	1,607	2,008
Noncurrent liabilities	1,418	1,668
Net assets	$4,360	$3,447

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, 2017	2016	2015
Revenues	$ 6,632	$ 6,608	$ 8,017
Cost of sales	(5,119)	(4,933)	(6,370)
Gross profit	1,513	1,675	1,647
Net operating expenses	(223)	(229)	(196)
Operating income	1,290	1,446	1,451
Interest income	7	8	7
Interest expense	(74)	(79)	(66)
Foreign currency translation	11	(13)	(29)
Other income, net	11	23	44
Income before income taxes	1,245	1,385	1,407
Provision for income taxes	(153)	(303)	(299)
Net income	$ 1,092	$ 1,082	$ 1,108

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

10. 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	2017	2016
Loans receivable	$ 570	$369
Renewable identification numbers	117	123
Advances to suppliers	35	37
Income taxes	29	82
VAT receivables	184	95
Prepaid insurance	25	28
Financial derivatives	66	61
Other taxes	14	9
Other	107	119
Total prepaid expenses and other current assets	$1,147	$923

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

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

Millions of dollars	2017	2016
Deferred tax assets	$ 90	$192
Debt issuance costs	15	19
Company-owned life insurance	56	55
Financial derivatives	26	296
Pension assets	33	13
Other	41	43
Total other assets	$261	$618

11. Accrued Liabilities

Accrued liabilities consisted of the following components at December 31:

Millions of dollars	2017	2016
Payroll and benefits	$ 442	$ 334
Renewable identification numbers	130	136
Product sales rebates	166	147
Taxes other than income taxes	199	177
Income taxes	386	311
Interest	151	142
Share repurchases	—	21
Deferred revenues	61	22
Restructuring	14	12
Other	263	113
Total accrued liabilities	$1,812	$1,415

12. Debt

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

Millions of dollars	2017	2016
Senior Notes due 2019, $2,000 million, 5.0% ($3 million of debt issuance cost)	$ 961	$1,906
Senior Notes due 2021, $1,000 million, 6.0% ($7 million of debt issuance cost)	981	988
Senior Notes due 2024, $1,000 million, 5.75% ($8 million of debt issuance cost)	992	991
Senior Notes due 2055, $1,000 million, 4.625% ($16 million of discount; $11 million of debt issuance cost)	973	972
Guaranteed Notes due 2044, $1,000 million, 4.875% ($11 million of discount; $10 million of debt issuance cost)	979	979
Guaranteed Notes due 2043, $750 million, 5.25% ($21 million of discount; $7 million of debt issuance cost)	722	721
Guaranteed Notes due 2023, $750 million, 4.0% ($6 million of discount; $4 million of debt issuance cost)	740	739
Guaranteed Notes due 2027, $300 million, 8.1%	300	300
Guaranteed Notes due 2022, €750 million, 1.875% ($2 million of discount; $3 million of debt issuance cost)	894	785
Guaranteed Notes due 2027, $1,000 million, 3.5% ($9 million of discount; $8 million of debt issuance cost)	984	—
Other	25	6
Total	8,551	8,387
Less current maturities	(2)	(2)
Long-term debt	$8,549	$8,385

Gains (losses) related to fair value adjustments associated with the fair value hedge accounting of our fixed-for-floating interest rate swaps for the applicable periods are as follows:

Millions of dollars	Inception Year	Year Ended December 31, 2017	Year Ended December 31, 2016	Cumulative Amount Since Inception
Senior Notes due 2019, 5.0%	2014	$(48)	$ 42	$36
Senior Notes due 2021, 6.0%	2016	9	3	12
Guaranteed Notes due 2027, 3.5%	2017	(1)	—	(1)

These fair value adjustments are recognized in Interest expense in the Consolidated Statements of Income.

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

Millions of dollars	2017	2016
$2,500 million Senior Revolving Credit Facility	$—	$—
$900 million U.S. Receivables Securitization Facility	—	—
Commercial paper	—	500
Precious metal financings	64	90
Other	4	4
Total short-term debt	$ 68	$594

Aggregate maturities of debt during the next five years are $70 million in 2018, $1,005 million in 2019, $5 million in 2020, $1,004 million in 2021, $903 million in 2022 and $5,801 million thereafter.

Long-Term Debt

Guaranteed Notes due 2027—In March 2017, LYB International Finance II B.V. ("LYB Finance II"), a direct, 100% owned finance subsidiary of LyondellBasell Industries N.V., as defined in Rule 3-10(b) of Regulation S-X, issued $1,000 million of 3.5% guaranteed notes due 2027 at a discounted price of 98.968%. In March 2017, the net proceeds from these notes, together with available cash, were used to redeem $1,000 million aggregate principal amount of our outstanding 5% senior notes due 2019.

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

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

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

Senior Notes due 2019, 2021 and 2024—In March 2017, we redeemed $1,000 million aggregate principal amount of the $2,000 million aggregate principal amount outstanding of our 5% senior notes due 2019, and paid $65 million in make-whole premiums. In conjunction with the redemption of these notes, we recognized non-cash charges of $4 million for the write-off of unamortized debt issuance costs and $44 million for the write-off of the cumulative fair value hedge accounting adjustment related to the redeemed notes.

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

The indentures governing the 5%, 5.75% and 6% Senior Notes contain limited covenants, including those restricting our ability and the ability of our subsidiaries to incur indebtedness secured by any property or assets, enter into certain sale and lease-back transactions with respect to any assets or enter into consolidations, mergers or sales of all or substantially all of our assets.

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

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

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

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

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

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

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

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

Guaranteed Notes due 2044—In February 2014, LYB International Finance B.V. ("LYB Finance"), a direct, 100% 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%.

These unsecured notes, which are fully and unconditionally guaranteed by LyondellBasell Industries N.V., rank equally in right of payment to all of LYB Finance's existing and future unsecured indebtedness and to all of

LyondellBasell's existing and future unsubordinated indebtedness. There are no significant restrictions that would impede the Guarantor from obtaining funds by dividend or loan from its subsidiaries. Subsidiaries are generally prohibited from entering into arrangements that would limit their ability to make dividends to or enter into loans with the Guarantor.

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

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

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

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

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

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

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

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

Short-Term Debt

Senior Revolving Credit Facility—In June 2017, the term of our $2,500 million revolving credit facility was extended for one year to June 2022 pursuant to a consent agreement. All other material terms of the revolving credit facility remained unchanged.

The revolving credit facility may be used for dollar and euro denominated borrowings, has a $500 million sublimit for dollar and euro denominated letters of credit, a $1,000 million uncommitted accordion feature, and supports our commercial paper program. The aggregate balance of outstanding borrowings and letters of credit under the facility may not exceed $2,500 million at any given time. Borrowings under the facility bear interest at a Base Rate or LIBOR, 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. In addition, we are required to maintain a leverage ratio at the end of every quarter of 3.50 to 1.00 or less for the period covering the most recent four quarters. We are in compliance with these covenants as of December 31, 2017.

At December 31, 2017, we had no outstanding commercial paper, no outstanding letters of credit and no outstanding borrowings 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"). The 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.

U.S. Receivables Securitization Facility—Our $900 million U.S. accounts receivable securitization facility, which expires in August 2018, 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. In the event of liquidation, the bankruptcy-remote subsidiary's assets will be used to satisfy the claims of its creditors prior to any assets or value in the bankruptcy-remote subsidiary becoming available to us. We are responsible for servicing the receivables. This facility also provides for the issuance of letters of credit up to $200 million. The term of the securitization facility may be extended in accordance with the provisions of the agreement. The facility is also subject to customary warranties and covenants, including limits and reserves and the maintenance of specified financial ratios. We are required to maintain a leverage ratio at the end of every fiscal quarter of 3.50 to 1.00 or less for the period covering the most recent four quarters. Performance obligations under the facility are guaranteed by our parent company. Additional fees are incurred for the average daily unused commitments.

At December 31, 2017, there were no borrowings or letters of credit outstanding under the facility.

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

Weighted Average Interest Rate—At December 31, 2017 and 2016, our weighted average interest rates on outstanding short-term debt were 1.8% and 0.9%, respectively.

Debt Discount and Issuance Costs—Amortization of debt discount and debt issuance costs resulted in amortization expense of $15 million for the year ended December 31, 2017, and $16 million for each year ended December 31, 2016 and 2015, which is included in Interest expense in the Consolidated Statements of Income.

13. Lease Commitments

We lease office facilities, railcars, vehicles, and other equipment under operating leases. Some leases contain renewal provisions, purchase options and escalation clauses.

The aggregate future estimated payments under these commitments are:

Millions of dollars	
2018	$ 311
2019	232
2020	194
2021	165
2022	26
Thereafter	517
Total minimum lease payments	$1,445

Rental expense for the years ended December 31, 2017, 2016 and 2015 was $440 million, $426 million and $422 million, respectively.

14. Financial Instruments and Fair Value Measurements

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

Commodity Prices—We are exposed to commodity price volatility related to purchases of natural gas liquids, crude oil and other raw materials 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.

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 estimating of expected impacts of changes in foreign currency rates on our earnings. We enter into foreign currency forward contracts to reduce the effects of our net currency exchange exposures.

For forward contracts that economically hedge recognized monetary assets and liabilities in foreign currencies and that are not designated as net investment hedges, hedge accounting is not applied. Changes in the fair value of foreign currency forward contracts, which are reported in the Consolidated Statements of Income, are offset in part by the currency translation results recognized on the assets and liabilities.

Foreign Currency Gain (Loss)—Other income, net, in the Consolidated Statements of Income reflected foreign currency losses of $1 million in 2017, $4 million in 2016, and $7 million in 2015.

Financial Instruments Measured at Fair Value on a Recurring Basis—The following table summarizes financial instruments outstanding as of December 31, 2017 and 2016 that are measured at fair value on a recurring basis:

	December 31, 2017		December 31, 2016		
Millions of dollars	Notional Amount	Fair Value	Notional Amount	Fair Value	Balance Sheet Classification
Assets—					
Derivatives designated as hedges:					
Commodities	$ —	$ —	$ 4	$ —	Prepaid expenses and other current assets
Commodities	—	—	54	3	Other assets
Foreign currency	—	26	604	49	Prepaid expenses and other current assets
Foreign currency	2,000	25	2,439	282	Other assets
Interest rates	—	20	—	6	Prepaid expenses and other current assets
Interest rates	650	1	2,200	11	Other assets
Derivatives not designated as hedges:					
Commodities	77	20	85	3	Prepaid expenses and other current assets
Foreign currency	19	—	11	—	Prepaid expenses and other current assets
Non-derivatives:					
Available-for-sale securities	1,310	1,307	1,069	1,073	Short-term investments
Total	$4,056	$1,399	$6,466	$1,427	
Liabilities—					
Derivatives designated as hedges:					
Commodities	$ 97	$ 8	$ —	$ —	Accrued liabilities
Commodities	5	—	—	—	Other liabilities
Foreign currency	139	29	—	15	Accrued liabilities
Foreign currency	950	140	—	—	Other liabilities
Interest rates	—	5	—	1	Accrued liabilities
Interest rates	3,350	58	1,400	20	Other liabilities
Derivatives not designated as hedges:					
Commodities	108	29	103	11	Accrued liabilities
Foreign currency	995	11	28	1	Accrued liabilities
Non-derivatives:					
Performance share awards	23	23	19	19	Accrued liabilities
Performance share awards	27	27	22	22	Other liabilities
Total	$5,694	$ 330	$1,572	$ 89	

All derivatives and available-for-sale securities in the tables above are classified as Level 2, except our limited partnership investments included in our available-for-sale securities discussed below, that are measured at fair value using the net asset value per share (or its equivalent) practical expedient and have not been classified in the fair value hierarchy.

At December 31, 2017, our outstanding foreign currency and commodity contracts not designated as hedges mature in January 2018 and from January 2018 to June 2018, respectively.

Financial Instruments Not Measured at Fair Value on a Recurring Basis—The following table presents the carrying value and estimated fair value of our financial instruments that are not measured at fair value on a recurring basis as of December 31, 2017 and 2016. Short-term and long-term loans receivable, which represent our repurchase agreements, and short-term and long-term debt are recorded at amortized cost in the Consolidated Balance Sheets. The carrying and fair values of short-term and long-term debt exclude capital leases and commercial paper.

	December 31, 2017		December 31, 2016	
Millions of dollars	**Carrying Value**	**Fair Value**	**Carrying Value**	**Fair Value**
Non-derivatives:				
Assets:				
Short-term loans receivable	$ 570	$ 570	$ 369	$ 369
Liabilities:				
Short-term debt	$ 64	$ 75	$ 90	$ 98
Long-term debt	8,526	9,442	8,382	9,147
Total	$8,590	$9,517	$8,472	$9,245

All financial instruments in the table above are classified as Level 2. There were no transfers between Level 1 and Level 2 for any of our financial instruments during the years ended December 31, 2017 and 2016.

Net Investment Hedges—In 2017 and 2016, we entered into €617 million and €275 million, respectively, of foreign currency contracts that were designated as net investment hedges. In 2017 and 2016, foreign currency contracts with an aggregate notional value of €550 million and €1,200 million, respectively, expired. Upon settlement of these foreign currency contracts in 2017, we paid €550 million ($658 million at the expiry spot rate) to our counterparties and received $609 million from our counterparties. In 2016, we paid €1,200 million ($1,356 million at the expiry spot rate) to our counterparties and received $1,295 million from our counterparties.

In 2016, we also issued euro denominated notes payable due 2022 with notional amounts totaling €750 million that were designated as a net investment hedge.

At December 31, 2017 and December 31, 2016, we had outstanding foreign currency contracts with an aggregate notional value of €742 million ($789 million) and €675 million ($743 million), respectively, designated as net investment hedges. In addition, at December 31, 2017 and December 31, 2016, we had outstanding foreign-currency denominated debt, with notional amounts totaling €750 million ($899 million) and €750 million ($791 million), respectively, designated as a net investment hedge.

There was no ineffectiveness recorded for any of these net investment hedging relationships during the years ended December 31, 2017, 2016 and 2015.

Cash Flow Hedges—The following table summarizes our cash flow hedges outstanding at December 31, 2017 and December 31, 2016:

	December 31, 2017	December 31, 2016	
Millions of dollars	**Notional Value**	**Notional Value**	**Expiration Date**
Foreign currency	$2,300	$2,300	2021 to 2027
Interest rates	1,000	1,000	2019
Commodities	102	58	2018 to 2019

In 2015 we recognized a gain of $15 million in Accumulated other comprehensive loss related to the settlement of our forward-starting interest rate swap agreements. In 2017 and 2016, there was no settlement of our forward-starting swap agreements.

The ineffectiveness recorded for these hedging relationships were less than $1 million during each of the years ended December 31, 2017, 2016 and 2015.

As of December 31, 2017, less than $1 million (on a pretax basis) and $8 million (on a pretax basis) is scheduled to be reclassified as a decrease to interest expense and cost of sales respectively over the next twelve months.

Fair Value Hedges—In February 2017, we entered into U.S. dollar fixed-for-floating interest rate swaps to mitigate changes in fair value of our $1,000 million 3.5% guaranteed notes due 2027 associated with the risk of variability in the 3 Month USD LIBOR rate. The fixed-rate and variable-rate are settled semi-annually and quarterly, respectively.

In the third quarter of 2014, we entered into U.S. dollar fixed-for-floating interest rate swaps to mitigate changes in the fair value of our $2,000 million 5% senior notes due 2019. In March 2017, concurrent with the redemption of $1,000 million of our outstanding 5% senior notes due 2019, we dedesignated the related $2,000 million fair value hedge and terminated swaps in the notional amount of $1,000 million. At the same time, we redesignated the remaining $1,000 million notional amount of swaps as a fair value hedge of the remaining $1,000 million of 5% senior notes outstanding.

In 2016 and 2017, we entered into U.S. dollar fixed-for-floating interest rate swaps with aggregate notional value of $600 million and $400 million, respectively, to mitigate changes in the fair value of our $1,000 million 6% senior notes due 2021 associated with the risk of variability in the 1 Month USD LIBOR rate. The fixed and variable payments for the interest rate swaps related to our 6% senior notes due 2021 are settled semi-annually and monthly, respectively.

At December 31, 2017 and December 31, 2016, we had outstanding interest rate contracts with aggregate notional amounts of $3,000 million and $2,600 million, respectively, designated as fair value hedges. Our interest rate contracts outstanding at December 31, 2017 mature from 2019 to 2027.

We recognized a net loss of $16 million during the year ended December 31, 2017 and net gains of $32 million and $44 million during the years ended December 31, 2016 and 2015, respectively, related to the ineffectiveness of our hedging relationships.

Impact on Earnings and Other Comprehensive Income—The following tables summarize the pretax effect of derivative instruments and non-derivative instruments on Other comprehensive income and earnings for the years ended December 31, 2017, 2016 and 2015:

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

	Effect of Financial Instruments			
	Year Ended December 31, 2016			
Millions of dollars	Gain (Loss) Recognized in AOCI	Gain (Loss) Reclassified from AOCI to Income	Additional Gain (Loss) Recognized in Income	Income Statement Classification
Derivatives designated as hedges:				
Commodities	$ 3	$—	$—	Cost of sales
Foreign currency	(30)	(63)	46	Other income, net; Interest expense
Interest rates	(17)	—	8	Interest expense
Derivatives not designated as hedges:				
Commodities	—	—	12	Sales and other operating revenues
Commodities	—	—	6	Cost of sales
Foreign currency	—	—	16	Other income, net
Non-derivatives designated as hedges:				
Long-term debt	58	—	—	Other income, net
Total	$ 14	$ (63)	$ 88	

	Effect of Financial Instruments			
	Year Ended December 31, 2015			
Millions of dollars	Gain (Loss) Recognized in AOCI	Gain (Loss) Reclassified from AOCI to Income	Additional Gain (Loss) Recognized in Income	Income Statement Classification
Derivatives designated as hedges:				
Foreign currency	$257	$(207)	$ 45	Other income, net; Interest expense
Interest rates	17	—	38	Interest expense
Derivatives not designated as hedges:				
Commodities	—	—	(14)	Sales and other operating revenues
Commodities	—	—	50	Cost of sales
Foreign currency	—	—	(24)	Other income, net
Total	$274	$(207)	$ 95	

For the years ended December 31, 2017, 2016 and 2015, the pretax effect of the periodic receipt of fixed interest and payment of variable interest associated with our fixed-for-floating interest rate swaps resulted in an additional gain (loss) recognized in Interest expense of $23 million, $21 million and $29 million, respectively.

Investments in Marketable Securities—The following table summarizes the amortized cost, gross unrealized gains and losses, and fair value of our available-for-sale and held-to-maturity securities that are outstanding as of December 31, 2017 and 2016:

	December 31, 2017			
Millions of dollars	Cost	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value
Available-for-sale securities:				
Commercial paper	$ 180	$—	$—	$ 180
Bonds	630	—	—	630
Certificates of deposit	150	—	—	150
Limited partnership investments	350	2	(5)	347
Total available-for-sale securities	$1,310	$ 2	$ (5)	$1,307

	December 31, 2016			
Millions of dollars	Cost	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value
Available-for-sale securities:				
Commercial paper	$ 232	$—	$—	$ 232
Bonds	141	—	—	141
Certificates of deposit	347	1	—	348
Limited partnership investments	350	2	—	352
Total available-for-sale securities	$1,070	$ 3	$—	$1,073
Held-to-maturity securities:				
Time deposits	$ 74	$—	$—	$ 74

At December 31, 2017 and 2016, we had marketable securities classified as Cash and cash equivalents of $1,035 million and $351 million, respectively.

Our limited partnership investments include investments in, among other things, equities and equity related securities, debt securities, credit instruments, global interest rate products, currencies, commodities, futures, options, warrants and swaps. These investments, which include both long and short positions, may be redeemed at least monthly with advance notice ranging up to ninety days. The fair value of these funds is estimated using the net asset value ("NAV") per share of the respective pooled fund investment.

No losses related to other-than-temporary impairments of our available-for-sale and held-to-maturity investments have been recorded in Accumulated other comprehensive loss during the years ended December 31, 2017, 2016 and 2015.

As of December 31, 2017, our available-for-sale securities had the following maturities: commercial paper securities held by the Company had maturities between two and three months; bonds had maturities between four and thirty-four months; certificates of deposit mature in three months; and limited partnership investments mature between one and three months.

The proceeds from maturities and sales of our available-for-sale securities during the years ended December 31, 2017, 2016 and 2015 are summarized in the following table:

	Year Ended December 31,		
Millions of dollars	**2017**	**2016**	**2015**
Proceeds from maturities of securities	$499	$674	$2,288
Proceeds from sales of securities	—	—	201

We recognized realized gains of less than $1 million in connection with the sale of securities during the year ended December 31, 2015. No gain or loss was realized in connection with the sales of our available-for-sale securities during the years ended December 31, 2017 and 2016, respectively.

The specific identification method was used to identify the cost of the securities sold and the amounts reclassified out of Accumulated other comprehensive loss into earnings.

During the year ended December 31, 2017, we had maturities of our held-to-maturity securities of $75 million and had no transfers of investments classified as held-to-maturity to available-for-sale.

The following table summarizes the fair value and unrealized losses related to available-for-sale and held-to-maturity securities that were in a continuous unrealized loss position for less than and greater than twelve months as of December 31, 2017, 2016 and 2015:

	December 31, 2017			
	Less than 12 months		Greater than 12 months	
Millions of dollars	Fair Value	Unrealized Loss	Fair Value	Unrealized Loss
Available-for-sale securities:				
Limited partnership investments	$117	$ (5)	$ —	$—

	December 31, 2016			
	Less than 12 months		Greater than 12 months	
Millions of dollars	Fair Value	Unrealized Loss	Fair Value	Unrealized Loss
Available-for-sale securities:				
Limited partnership investments	$ —	$—	$105	$ (3)

	December 31, 2015			
	Less than 12 months		Greater than 12 months	
Millions of dollars	Fair Value	Unrealized Loss	Fair Value	Unrealized Loss
Available-for-sale securities:				
Limited partnership investments	$345	$ (5)	$ —	$—

15. 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.

For 2017, the actual returns on the assets of our U.S. and non-U.S. defined benefit pension plans were a gain of 14.45% and 8.82%, respectively.

The following table provides a reconciliation of projected benefit obligations, plan assets and the funded status of our U.S. and non-U.S. defined benefit pension plans:

	Year Ended December 31,			
	2017		2016	
Millions of dollars	U.S.	Non-U.S.	U.S.	Non-U.S.
Change in benefit obligation:				
Benefit obligation, beginning of period	$1,846	$1,491	$2,066	$1,317
Service cost	47	39	44	32
Interest cost	60	23	88	32
Actuarial loss (gain)	104	(174)	15	254
Plan amendments	—	12	—	(4)
Benefits paid	(133)	(31)	(79)	(33)
Participant contributions	—	1	—	1
Settlement	—	(30)	(288)	(25)
Business divestiture	—	—	—	(11)
Foreign exchange effects	—	180	—	(72)
Benefit obligation, end of period	1,924	1,511	1,846	1,491
Change in plan assets:				
Fair value of plan assets, beginning of period	1,571	824	1,789	723
Actual return on plan assets	195	(60)	100	146
Company contributions	47	56	49	65
Benefits paid	(133)	(31)	(79)	(33)
Participant contributions	—	1	—	1
Settlement	—	(30)	(288)	(25)
Foreign exchange effects	—	92	—	(53)
Fair value of plan assets, end of period	1,680	852	1,571	824
Funded status of continuing operations,end of period	$ (244)	$ (659)	$ (275)	$ (667)

	December 31, 2017		December 31, 2016	
Millions of dollars	U.S.	Non-U.S.	U.S.	Non-U.S.
Amounts recognized in the Consolidated Balance Sheets consist of:				
Prepaid benefit cost, long-term	$ 8	$ 25	$ 3	$ 10
Accrued benefit liability, current	—	(24)	—	(18)
Accrued benefit liability, long-term	(252)	(660)	(278)	(659)
Funded status, end of period	$ (244)	$ (659)	$ (275)	$ (667)

	December 31, 2017		December 31, 2016	
Millions of dollars	U.S.	Non-U.S.	U.S.	Non-U.S.
Amounts recognized in Accumulated other comprehensive loss:				
Actuarial and investment loss	$ 385	$ 234	$ 376	$ 346
Prior service cost (credit)	2	8	2	(1)
Balance, end of period	$ 387	$ 242	$ 378	$ 345

The following additional information is presented for our U.S. and non-U.S. pension plans as of December 31:

	December 31, 2017		December 31, 2016	
Millions of dollars	U.S.	Non-U.S.	U.S.	Non-U.S.
Accumulated benefit obligation for defined benefit plans	$1,887	$1,406	$1,816	$1,382

Pension plans with projected benefit obligations in excess of the fair value of assets are summarized as follows at December 31:

	December 31, 2017		December 31, 2016	
Millions of dollars	U.S.	Non-U.S.	U.S.	Non-U.S.
Projected benefit obligations	$1,776	$1,285	$1,703	$943
Fair value of assets	1,524	601	1,425	265

Pension plans with accumulated benefit obligations in excess of the fair value of assets are summarized as follows at December 31:

	December 31, 2017		December 31, 2016	
Millions of dollars	U.S.	Non-U.S.	U.S.	Non-U.S.
Accumulated benefit obligations	$1,742	$1,190	$1,676	$725
Fair value of assets	1,524	601	1,425	135

The following table provides the components of net periodic pension costs:

	U.S. Plans		
	Year Ended December 31,		
Millions of dollars	2017	2016	2015
Net Periodic Pension Cost:			
Service cost	$ 47	$ 44	$ 45
Interest cost	60	88	85
Actual return on plan assets	(195)	(100)	27
Less—return in excess of (less than) expected return	74	(39)	(175)
Expected return on plan assets	(121)	(139)	(148)
Settlement loss	—	58	2
Prior service cost amortization	1	1	—
Actuarial and investment loss amortization	20	20	13
Net periodic benefit cost (credit)	$ 7	$ 72	$ (3)

	Non-U.S. Plans		
	Year Ended December 31,		
Millions of dollars	2017	2016	2015
Net Periodic Pension Cost:			
Service cost	$ 39	$ 32	$ 32
Interest cost	23	32	37
Actual return on plan assets	60	(146)	(63)
Less—return in excess of (less than) expected return	(79)	122	39
Expected return on plan assets	(19)	(24)	(24)
Settlement loss	2	3	—
Prior service cost amortization	2	—	2
Actuarial and investment loss amortization	16	8	8
Net periodic benefit cost	$ 63	$ 51	$ 55

Lump sum benefit payments of $288 million were made from existing plan assets in 2016. These payments in total exceeded annual service and interest cost, resulting in pension settlement expense of $58 million. A significant portion of the lump sum payments were due to a voluntary lump sum program to certain former employees in select U.S. pension plans.

Our goal is to manage pension investments over the longer term to achieve optimal returns with an acceptable level of risk and volatility. The assets are externally managed by professional investment firms and performance is evaluated continuously against specific benchmarks.

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

	2017		2016	
Millions of dollars	Actual	Target	Actual	Target
Canada				
Equity securities	50%	50%	49%	50%
Fixed income	50%	50%	51%	50%
United Kingdom—Lyondell Chemical Plans				
Equity securities	49%	50%	50%	50%
Fixed income	51%	50%	50%	50%
United Kingdom—Basell Plans				
Equity securities	49%	50%	58%	60%
Fixed income	51%	50%	42%	40%
United States				
Equity securities	36%	32%	33%	32%
Fixed income	37%	38%	47%	38%
Alternatives	27%	30%	20%	30%
Netherlands—Lyondell Chemical Plans				
Fixed income	N/A	N/A	100%	100%
Netherlands—Basell Plans				
Equity securities	N/A	N/A	7%	10%
Fixed income	N/A	N/A	93%	90%

During 2017, Netherlands Defined Benefits pension plans modified their insurance arrangements. As a result, the plan assets were transferred to the insurer for investment in its pooled asset portfolio, and treated as a nonparticipating insurance contract. The associated plan assets of $527 million 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. The transfer of plan assets resulted in a change in classification in the fair value hierarchy from Level 2 in 2016 for fixed income securities to Level 3 in 2017. Furthermore, changes in the underlying discount rate assumption (1.93%), resulted in an $83 million reduction reported in actual return on plan assets and a loss in Other Comprehensive Income. This other comprehensive loss was effectively offset by a corresponding gain due to the change in the discount rate used to measure the related plan benefit obligation.

We estimate the following contributions to our pension plans in 2018:

Millions of dollars	U.S.	Non-U.S.
Defined benefit plans	$ 44	$63
Multi-employer plans	—	7
Total	$ 44	$70

As of December 31, 2017, 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.
2018	$153	$ 59
2019	151	55
2020	146	53
2021	142	52
2022	137	54
2023 through 2027	641	292

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 assumptions used in determining the net benefit liabilities for our pension plans were as follows at December 31:

	2017		2016	
	U.S.	Non-U.S.	U.S.	Non-U.S.
Weighted average assumptions:				
Discount rate	3.73%	2.13%	4.20%	1.52%
Rate of compensation increase	4.00%	2.94%	4.00%	2.93%

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

	Year Ended December 31,					
	2017		2016		2015	
	U.S.	Non-U.S.	U.S.	Non-U.S.	U.S.	Non-U.S.
Weighted average assumptions for the year:						
Discount rate	4.20%	1.52%	4.38%	2.70%	4.04%	2.84%
Expected return on plan assets	8.00%	2.15%	8.00%	3.37%	8.00%	3.63%
Rate of compensation increase	4.00%	2.93%	4.00%	3.15%	4.00%	3.19%

The discount rate assumptions reflect the rates at which the benefit obligations could be effectively settled, based on the yields of high quality long-term bonds where the term closely matches the term of the benefit obligations. At the beginning of 2017, we changed the approach used to measure service and interest costs for pension and other postretirement benefits under significant U.S. plans. For 2016, we measured service and interest costs utilizing a single weighted-average discount rate derived from the yield curve used to measure the plan obligations. For 2017, we measured service and interest costs by applying the specific spot rates along that same yield curve to the plans' projected cash flows. We believe the new approach provides a more precise measurement of service and interest costs. This change did not affect the measurement of our plan obligations. We will account for this change as a change in accounting estimate and, accordingly, will account for it on a prospective basis. The weighted average expected long-term rate of return on assets in our U.S. plans of 8.00% is based on the average level of earnings that our independent pension investment advisor had advised could be expected to be earned over a fifteen to twenty year time period consistent with the plans' target asset allocation, historical capital market performance, historical plan performance (since the 1997 inception of the U.S. Master Trust) and a forecast of expected future asset returns. The weighted average expected long-term rate of return on assets in our non-U.S. plans of 2.15% is based on expectations and asset allocations that vary by region. We review these long-term assumptions on a periodic basis.

In the U.S. plans, the expected rate of return was derived based on the target asset allocation of 32% equity securities (8.3% expected return), 38% fixed income securities (5.6% expected return), and 30% alternative investments (9.5% expected return). In the non-U.S. plans, the investments consist primarily of fixed income securities whose expected rates of return range from 2.45% to 5.75%.

The following table reflects the actual annualized total returns for the periods ended December 31, 2017:

		Annualized			
	December 31, 2017	One Year	Three Years	Five Years	Ten Years
U.S. plan assets	14.45%	14.45%	6.78%	8.01%	5.30%
Non-U.S. plan assets	8.82%	8.82%	9.40%	10.68%	7.82%

Actual rates of return may differ from the expected rate due to the volatility normally experienced in capital markets. The goal is to manage the investments 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 as of December 31, 2017 and 2016 are summarized below:

	December 31, 2017			
Millions of dollars	Fair Value	Level 1	Level 2	Level 3
U.S.				
Common and preferred stock	$ 410	$410	$—	$—
Commingled funds measured at net asset value	410	—	—	—
Fixed income securities	225	—	225	—
Real estate measured at net asset value	102			
Hedge funds measured at net asset value	253			
Private equity measured at net asset value	94			
U.S. government securities	148	148	—	—
Cash and cash equivalents	34	34	—	—
Total U.S. Pension Assets	$1,676	$592	$225	$—

	December 31, 2017			
Millions of dollars	Fair Value	Level 1	Level 2	Level 3
Non-U.S.				
Common stock	$ —	$—	$—	$—
Commingled funds measured at net asset value	297			
Fixed income securities	—	—	—	—
Insurance arrangements	549	—	—	549
Cash and cash equivalents	5	5	—	—
Total Non-U.S. Pension Assets	$ 851	$ 5	$—	$549

	December 31, 2016			
Millions of dollars	Fair Value	Level 1	Level 2	Level 3
U.S.				
Common and preferred stock	$ 394	$394	$—	$—
Commingled funds measured at net asset value	215			
Fixed income securities	215	—	215	—
Real estate measured at net asset value	100			
Hedge funds measured at net asset value	126			
Private equity measured at net asset value	77			
U.S. government securities	138	136	2	—
Cash and cash equivalents	294	294	—	—
Total U.S. Pension Assets	$1,559	$824	$217	$—

Millions of dollars	December 31, 2016 Fair Value	Level 1	Level 2	Level 3
Non-U.S.				
Common stock	$ 2	$ 2	$—	$—
Commingled funds measured at net asset value	337			
Fixed income securities	463	—	463	—
Cash and cash equivalents	21	21	—	—
Total Non-U.S. Pension Assets	$823	$ 23	$463	$—

The fair value measurements of the investments in certain entities that calculate net asset value per share as of December 31, 2017 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	$106	$—	N/A	daily	1 to 3 days	3 to 4 days
Commingled fund investing in International Equity	61	—	N/A	daily	1 to 3 days	3 days
Commingled fund investing in Fixed Income	243	—	N/A	daily	1 to 3 days	3 to 7 days
Real Estate	102	12	10 years	quarterly	15 to 25 days	45 to 90 days
Hedge Funds	253	—	N/A	quarterly	10 to 30 days	20 to 90 days
Private Equity	94	92	10 years	Not eligible	N/A	N/A
Total U.S.	$859	$104				

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	$ 29	$—	N/A	1 to 7 days	1 to 3 days	1 to 3 days
Commingled fund investing in International Equity	119	—	N/A	1 to 7 days	1 to 3 days	1 to 3 days
Commingled fund investing in Fixed Income	149	—	N/A	daily	1 to 3 days	3 days
Total Non-U.S.	$297	$—				

The fair value measurements of the investments in certain entities that calculate net asset value per share as of December 31, 2016 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	$ 78	$—	N/A	daily	1 to 3 days	3 to 4 days
Commingled fund investing in International Equity	47	—	N/A	daily	1 to 3 days	3 days
Commingled fund investing in Fixed Income	90	—	N/A	daily	1 to 3 days	3 to 7 days
Real Estate	100	9	10 years	quarterly	15 to 25 days	45 to 90 days
Hedge Funds	126	—	N/A	quarterly	10 to 30 days	20 to 90 days
Private Equity	77	96	10 years	Not eligible	N/A	N/A
Total U.S.	$518	$105				

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	$ 27	$—	N/A	1 to 7 days	1 to 3 days	1 to 3 days
Commingled fund investing in International Equity	125	—	N/A	1 to 7 days	1 to 3 days	1 to 3 days
Commingled fund investing in Fixed Income	185	—	N/A	daily	1 to 3 days	3 days
Total Non-U.S.	$337	$—				

The preceding methods described may produce a fair value calculation that may not be indicative of net realizable value or reflective of future fair values. The redemption frequency may be subject to market conditions and/or contractual obligations. Furthermore, although the Company believes its valuation methods are appropriate and consistent with other market participants, the use of different methodologies or assumptions to determine the fair value of certain financial instruments could result in a different fair value measurement at the reporting date.

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:

	Company Contributions		
Millions of dollars	2017	2016	2015
Pensionskasse[(a)]	$27	$7	$7

(a) 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, 2016 and 2015 indicated total assets of $7,897 million and $7,560 million, respectively; total actuarial present value of accumulated plan benefits of $7,559 million and $7,232 million, respectively; and total contributions for all participating employers of $246 million and $244 million, respectively. Our plan contributions did not exceed 5 percent of the total contributions in 2017, 2016 or 2015.

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 table provides a reconciliation of benefit obligations of our unfunded other postretirement benefit plans:

	Year Ended December 31,			
	2017		2016	
Millions of dollars	U.S.	Non-U.S.	U.S.	Non-U.S.
Change in benefit obligation:				
Benefit obligation, beginning of period	$ 276	$ 67	$ 285	$ 56
Service cost	3	2	3	2
Interest cost	9	1	11	2
Actuarial loss (gain)	6	(15)	(7)	9
Benefits paid	(21)	(1)	(23)	(1)
Participant contributions	7	—	7	—
Foreign exchange effects	—	8	—	(1)
Benefit obligation, end of period	280	62	276	67
Change in plan assets:				
Fair value of plan assets, beginning of period	—	—	—	—
Employer contributions	14	1	16	1
Participant contributions	7	—	7	—
Benefits paid	(21)	(1)	(23)	(1)
Fair value of plan assets, end of period	—	—	—	—
Funded status, end of period	$(280)	$ (62)	$(276)	$ (67)

	December 31, 2017		December 31, 2016	
Millions of dollars	U.S.	Non-U.S.	U.S.	Non-U.S.
Amounts recognized in the Consolidated Balance Sheets consist of:				
Accrued benefit liability, current	$ (18)	$ (1)	$ (18)	$ (1)
Accrued benefit liability, long-term	(262)	(61)	(258)	(66)
Funded status, end of period	$(280)	$(62)	$(276)	$(67)

	December 31, 2017		December 31, 2016	
Millions of dollars	U.S.	Non-U.S.	U.S.	Non-U.S.
Amounts recognized in Accumulated other comprehensive loss:				
Actuarial and investment income (loss)	$19	$(19)	$25	$(37)
Balance, end of period	$19	$(19)	$25	$(37)

The following table provides the components of net periodic other postretirement benefit costs:

	U.S. Plans		
	Year Ended December 31,		
Millions of dollars	2017	2016	2015
Net Periodic Other Postretirement Cost:			
Service cost	$ 3	$ 3	$ 4
Interest cost	9	11	13
Actuarial loss amortization	—	—	2
Net periodic benefit cost	$ 12	$ 14	$19

	Non-U.S. Plans		
	Year Ended December 31,		
Millions of dollars	2017	2016	2015
Net Periodic Other Postretirement Cost:			
Service cost	$ 2	$ 2	$ 1
Interest cost	1	2	2
Actuarial loss amortization	3	2	3
Net periodic benefit cost	$ 6	$ 6	$ 6

The following table sets forth the assumed health care cost trend rates:

	U.S. Plans	
	December 31,	
	2017	2016
Assumed health care trend rate:		
Immediate trend rate	6.7%	7.0%
Ultimate trend rate (the rate to which the cost trend rate is assumed to decline)	4.5%	4.5%
Year that the rate reaches the ultimate trend rate	2038	2038

	Non-U.S. Plans			
	Canada		France	
	December 31,		December 31,	
	2017	2016	2017	2016
Assumed health care trend rate:				
Immediate trend rate	6.0%	6.0%	4.7%	4.6%
Ultimate trend rate (the rate to which the cost trend rate is assumed to decline)	4.5%	4.5%	4.7%	4.6%
Year that the rate reaches the ultimate trend rate	2021	2021	—	—

The health care cost trend rate assumption does not typically have a significant effect on the amounts reported due to limits on maximum contribution levels to the medical plans. However, changing the assumed health care cost trend rates by one percentage point in each year would increase or decrease the accumulated other postretirement benefit liability as of December 31, 2017 by $18 million and $12 million, respectively, for non-U.S. plans and by less than $1 million for U.S. plans and would not have a material effect on the aggregate service and interest cost components of the net periodic other postretirement benefit cost for the year then ended.

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

	December 31,			
	2017		2016	
	U.S.	Non-U.S.	U.S.	Non-U.S.
Weighted average assumptions:				
Discount rate	3.66%	2.48%	4.07%	1.69%
Rate of compensation increase	4.00%	—	4.00%	—

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

	Year Ended December 31,					
	2017		2016		2015	
	U.S.	Non-U.S.	U.S.	Non-U.S.	U.S.	Non-U.S.
Weighted average assumptions for the year:						
Discount rate	4.07%	1.69%	4.23%	2.69%	3.85%	2.92%
Rate of compensation increase	4.00%	—	4.00%	—	4.00%	—

As of December 31, 2017, future expected benefit payments by our other postretirement benefit plans, which reflect expected future service, as appropriate, were as follows:

Millions of dollars	U.S.	Non-U.S.
2018	$19	$1
2019	20	1
2020	20	1
2021	21	1
2022	21	1
2023 through 2027	98	8

Accumulated Other Comprehensive Loss—The following pretax amounts were recognized in Accumulated other comprehensive loss as of and for the years ended December 31, 2017 and 2016:

	Pension Benefits		Other Benefits	
Millions of dollars	**Actuarial (Gain) Loss**	**Prior Service Cost (Credit)**	**Actuarial (Gain) Loss**	**Prior Service Cost (Credit)**
December 31, 2015	$625	$ 6	$ 12	$—
Arising during the period	186	(4)	2	—
Amortization	(28)	(1)	(2)	—
Settlement loss	(61)	—	—	—
December 31, 2016	722	1	12	—
Arising during the period	(65)	12	(9)	—
Amortization	(36)	(3)	(3)	—
Settlement loss	(2)	—	—	—
December 31, 2017	$619	$ 10	$—	$—

In 2017, $65 million of pension benefits actuarial gain primarily reflects $72 million of gains due to changes in discount rate assumption offset by $7 million of losses due to asset experience. There were $9 million of other postretirement benefits actuarial gains primarily due to $2 million of discount rate assumption changes and $6 million of changes due to favorable liability experience, and other immaterial items. In 2016, $186 million of pension benefits actuarial loss primarily reflects $265 million of losses due to changes in discount rate assumption offset by $79 million of gains due to asset experience (actual asset return compared to expected return). There were $2 million of other postretirement benefits actuarial losses due to $14 million of discount rate assumption changes, offset by a gain of $10 million of changes due to favorable liability experience, and other immaterial items.

Deferred income taxes related to amounts in Accumulated other comprehensive income (loss) include provisions of $208 million and $237 million as of December 31, 2017 and 2016, respectively.

At December 31, 2017, Accumulated other comprehensive income (loss) of $10 million represents net actuarial and investment losses related to non-U.S. pension plans that are expected to be recognized as a component of net periodic benefit cost in 2018. There are $21 million of net actuarial and investment losses and $1 million of prior service cost in AOCI at December 31, 2017 for U.S. pension plans expected to be recognized in net periodic benefit cost in 2018. At December 31, 2017, AOCI included $1 million of net actuarial loss related to non-U.S. other postretirement benefits that is expected to be recognized in net periodic benefit cost in 2018.

Defined Contribution Plans—Most employees in the U.S. and certain non-U.S. countries are eligible to participate in defined contribution plans by contributing a portion of their compensation. We also make employer contributions, such as matching contributions, to certain of these plans. The Company has a nonqualified deferred compensation plan that covers senior management in the U.S. The 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:

	Company Contributions					
	2017		2016		2015	
Millions of dollars	U.S.	Non-U.S.	U.S.	Non-U.S.	U.S.	Non-U.S.
Employee Savings Plans	$36	$5	$35	$7	$32	$4

16. 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 determines the recipients of the equity awards, 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. As of December 31, 2017, there were 5,806,969 shares remaining available for issuance assuming maximum payout for PSUs. Upon share exercise or payment, shares are issued from our treasury shares.

Total share-based compensation expense and the associated tax benefits are as follows for the years ended December 31:

Millions of dollars	2017	2016	2015
Compensation Expense:			
Restricted stock units	$ 13	$10	$11
Stock options	7	7	6
Qualified performance awards	—	(3)	25
Performance share units	35	24	11
Total	$ 55	$38	$53
Tax Benefit:			
Restricted stock units	$ 5	$ 4	$ 4
Stock options	2	2	2
Qualified performance awards	—	(1)	9
Performance share units	12	8	4
Total	$ 19	$13	$19

Beginning in 2017, we elected to recognize forfeitures as they occur for stock-based compensation.

Restricted Stock Unit Awards (“RSUs”)—RSUs generally entitle the recipient to be paid out an equal number of ordinary shares on the third anniversary of the grant date. RSUs, which are subject to customary accelerated vesting or forfeiture in the event of certain termination events, are accounted for as an equity award with compensation cost recognized in the income statement ratably over the vesting period.

In 2015, 190,399 RSUs were granted to the Chief Executive Officer (“CEO”) and three other executive officers. These RSUs vest in annual tranches with 10% vested after one year and an additional 15% vested after two years and the remaining vesting in equal tranches after each of the third, fourth, and fifth years. Compensation cost for these awards is recognized using the graded vesting method.

The holders of all RSUs are entitled to dividend equivalents to be settled no later than March 15, following the year in which dividends are paid, as long as the participant is in full employment at the time of the dividend payment. See the “Dividend Distribution” section of Note 19 for the per share amount of dividend equivalent payments made to the holders of RSUs during 2017, 2016 and 2015. Total dividend equivalent payments were $1 million in each of 2017 and 2016, and $2 million in 2015.

RSUs are valued at 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, 2017, 2016 and 2015 was $91.14, $79.77 and $83.31, respectively. The total fair value of RSUs vested during 2017, 2016 and 2015 was $8 million, $16 million and $120 million, respectively.

The following table summarizes RSU activity for the year ended December 31, 2017:

Thousands of units, except per share amounts	Number of Units	Weighted Average Grant Date Fair Value (per share)
Outstanding at January 1, 2017	295	$79.03
Granted	205	91.14
Vested	(95)	78.97
Forfeited	(28)	85.20
Outstanding at December 31, 2017	377	$85.17

As of December 31, 2017, the unrecognized compensation cost related to RSUs was $15 million, which is expected to be recognized over a weighted average period of 2 years.

Stock Options—Stock options are granted with an exercise price equal to the market price of our ordinary shares 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. The awards have a contractual term of ten years, subject to customary accelerated vesting or forfeiture in the event of certain termination events. The stock options are accounted for as equity awards with compensation cost recognized using the graded vesting method.

In 2015, 457,555 stock options were granted to the CEO and three other executive officers. These stock options vest in annual tranches with 10% vested after one year and an additional 15% vested after two years and the remaining vesting in equal tranches after each of the third, fourth, and fifth years.

The fair value of each stock option award 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 life of the option).

The expected term of all options granted is estimated based on a simplified approach. In 2010, when the majority of our options were granted, we determined that the simplified method was appropriate because of the life of LyondellBasell N.V. and its relative stage of development. Similarly, we did not possess exercise patterns similar to our situation. The option grants that have been made since 2010 have been limited in number and have occurred during periods of substantial share price volatility.

Weighted average fair values of stock options granted in each respective year and the assumptions used in estimating those fair values are as follows:

	2017	2016	2015
Weighted average fair value	$ 21.55	$ 20.39	$ 22.71
Fair value assumptions:			
Dividend yield	4.0%	3.0-4.0%	3.0%
Expected volatility	34.9%-35.1%	35.3-36.0%	35.9-37.0%
Risk-free interest rate	2.10%-2.29%	1.14-1.93%	1.48-1.93%
Weighted average expected term, in years	6.0	6.0	6.0-6.7

The following table summarizes stock option activity for the year ended December 31, 2017 for the non-qualified stock options:

	Number of Shares (in thousands)	Weighted Average Exercise Price	Weighted Average Remaining Term	Aggregate Intrinsic Value (millions of dollars)
Outstanding at January 1, 2017	927	$74.19		
Granted	313	92.73		
Exercised	(134)	44.76		
Forfeited	(45)	83.34		
Expired	(42)	84.57		
Outstanding at December 31, 2017	1,019	$82.93	7.6 years	$28
Exercisable at December 31, 2017	324	$78.47	6.3 years	$10

The range of exercise prices for stock options outstanding as of December 31, 2017, 2016 and 2015 was $13.11 to $113.03, $12.61 to $113.03 and $12.61 to $113.03, respectively.

The aggregate intrinsic value of stock options exercised during the years ended December 31, 2017, 2016 and 2015 was $6 million, $1 million and $280 million, respectively.

As of December 31, 2017, the unrecognized compensation cost related to non-qualified stock options was $5 million, which is expected to be recognized over a one-year period. During 2017, cash received from the exercise of stock options was $6 million. There was $2 million tax benefit associated with these exercises.

Performance Share Units (“PSUs”), Qualified Performance Awards (“QPAs”), Medium-Term Incentive Program (“MTI”)—Shares issued in satisfaction of PSU and QPA awards are granted under our LTIP. The target number of share awards is established at the beginning of a three-calendar year performance period. Each unit is equivalent to one share of our common stock. Beginning in 2017, the final number of shares payable is determined based on LyondellBasell N.V.’s Total Shareholder Return (TSR) relative to a group of peer companies, and are classified as equity awards. Compensation expense during the three-calendar year performance period is accrued on a straight- line basis. PSUs are valued using a Monte-Carlo simulation payout value on grant date. These share awards are subject to customary accelerated vesting and forfeiture in the event of certain termination events.

PSU awards granted prior to 2017 and QPA awards are similar. The final number of shares payable related to pre-2017 PSUs and QPAs are determined at the end of the three-calendar year performance period by our Compensation Committee. Since the service-inception date precedes the grant date, these share awards are treated as a liability award until the grant date and compensation expense during the three-calendar year performance period is accrued on a straight-line basis subject to fair value adjustments. Pre-2017 PSU awards are valued based on the market price of the underlying stock on the date of payment.

Beginning January 1, 2016, the holders of PSUs are entitled to accrue dividend equivalent units. These dividend equivalent units will be converted to shares upon payment at the end of the three-year performance cycle and are classified in Accrued and Other liabilities on the Consolidated Balance Sheets. PSU dividend equivalent units on liability awards are recorded in compensation expense while PSU dividend equivalent units on equity awards are recorded in retained earnings.

The following table summarizes PSU activity for the year ended December 31, 2017:

Thousands of units, except per share amounts	Number of Units	Weighted Average Grant Date Fair Value (per share)
Outstanding at January 1, 2017	—	$ —
Granted	237	93.28
Vested	—	—
Forfeited	(13)	93.28
Outstanding at December 31, 2017	224	$93.28

The number of PSUs are based on the target number of share awards. The assumptions used in the Monte Carlo simulation to estimate the fair value of PSUs granted in 2017 are as follows:

	2017
Expected volatility of LyondellBasell N.V. common stock	30.98%
Expected volatility of peer companies	16.98-39.89%
Average correlation coefficient of peer companies	0.51
Risk-free interest rate	1.46%

As of December 31, 2017, the unrecognized compensation cost related to PSUs and dividend equivalents assuming target payout was $27 million, which is expected to be recognized over a weighted average period of 2 years.

For grants made in 2013, eligible employees other than executive officers could elect to receive share-based awards (QPAs) or cash-based awards (MTI) while executive officers were only eligible for the share-based awards (QPAs). Awards under the MTI are accounted for as a liability and classified in Other liabilities on the Consolidated Balance Sheets. We recorded compensation expense for cash MTI awards of $1 million and $10 million for the years ended December 31, 2016 and 2015, respectively, based on the expected achievement of performance results.

The weighted average grant date fair value for QPAs granted during the years ended December 31, 2016 and 2015 was $77.93 and $89.94, respectively. The total fair value of QPAs vested during 2016 and 2015 was $20 million and $33 million, respectively.

Employee Stock Purchase Plan

We have an Employee Share Purchase Plan ("ESPP") which includes a 10% discount and a look-back provision. These provisions allow participants to purchase our stock at a discount on the lower of the fair market value at 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.

17. 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.

Through our subsidiaries, we have substantial operations world-wide and earn significant income in the United States. Taxes are primarily paid on the earnings generated in various jurisdictions, including the United States, The Netherlands, Germany, France, Italy and other countries. LyondellBasell Industries N.V. has little or no taxable income of its own because, as a holding company, it does not conduct any operations. Instead, the subsidiaries through which we operate incur tax obligations in the jurisdictions in which they operate.

We monitor income tax developments in countries where we conduct business. On December 22, 2017, the U.S. enacted "H.R.1", also known as the "Tax Cuts and Jobs Act" (the "Tax Act") with some provisions effective as early as 2017 while others are delayed until 2018. This change in U.S. tax law included a reduction in the federal corporate tax rate from 35% to 21% for years beginning after 2017, which resulted in the remeasurement of our U.S. net deferred income tax liabilities. Our 2017 income tax provision includes an $819 million income tax benefit related to the remeasurement of our U.S. net deferred income tax liabilities. Although the $819 million income tax benefit represents a reasonable estimate of the impact of the Tax Act on our Consolidated Financial Statements as of December 31, 2017, it should be considered provisional. The impact of the Tax Act may differ from this reasonable estimate due to additional guidance that may be issued, changes in assumptions made, and the finalization of certain U.S. income tax positions with the filing of our 2017 U.S. income tax return which will allow for the ability to conclude whether any further adjustments are necessary to our deferred tax assets and liabilities. Any adjustments to these provisional amounts will be reported as a component of income tax expense in the reporting period in which any such adjustments are identified which will be no later than the fourth quarter of 2018. We will continue to analyze the Tax Act to determine the full effects of the new law.

In September 2016, the United Kingdom enacted provisions (the so called "anti-hybrid provisions"), effective for years beginning January 1, 2017, that resulted in changes to our internal financing structure which did not materially impact our Consolidated Financial Statements. In addition, in October 2016 the U.S. Treasury issued final Section 385 debt-equity regulations that may impact our internal financings in future years. Pursuant to a recent Executive Order, the Treasury Department reviewed these regulations and determined to delay but retain these regulations, subject to further review after enactment of U.S. tax reform. There has been an increase in attention, both in the U.S. and globally, to the tax practices of multinational companies, including the European Union's state aid investigations and proposals by the Organization for Economic Cooperation and Development with respect to base erosion and profit shifting. Such attention may result in additional legislative changes that could adversely affect our tax rate. Other than the recently enacted Tax Act, Management does not believe that recent changes in income tax laws will have a material impact on our Consolidated Financial Statements, although new or proposed changes to tax laws could affect our tax liabilities in the future.

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

	Year Ended December 31,		
Millions of dollars	**2017**	**2016**	**2015**
Current:			
U.S. federal	$ 543	$ 421	$1,009
Non-U.S.	595	557	468
State	47	51	72
Total current	1,185	1,029	1,549
Deferred:			
U.S. federal	(637)	339	66
Non-U.S.	22	20	104
State	28	(2)	11
Total deferred	(587)	357	181
Provision for income taxes before tax effects of other comprehensive income	598	1,386	1,730
Tax effects of elements of other comprehensive income:			
Pension and postretirement liabilities	29	(21)	4
Financial derivatives	(14)	(96)	71
Foreign currency translation	(33)	(7)	(5)
Unrealized gains (losses) from available-for-sale securities	(3)	1	(1)
Total income tax expense in comprehensive income	$ 577	$1,263	$1,799

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 35% as opposed to the United Kingdom statutory rate of 20% to provide a more meaningful insight into those differences. Since the Tax Act lowered the U.S. statutory federal income tax rate to 21% for tax years beginning after 2017, the reconciliation uses the 35% rate in effect for the year ended December 31, 2017. Our effective tax rate for the year ended December 31, 2017 is 10.9%. This summary is shown below:

	Year Ended December 31,		
Millions of dollars	**2017**	**2016**	**2015**
Income before income taxes:			
U.S.	$2,438	$2,511	$3,691
Non-U.S.	3,055	2,722	2,518
Total	$5,493	$5,233	$6,209
Income tax at U.S. statutory rate	$1,923	$1,832	$2,173
Increase (reduction) resulting from:			
Non-U.S. income taxed at lower statutory rates	(164)	(159)	(130)
Remeasurement of U.S. net deferred tax liability	(819)	—	—
State income taxes, net of federal benefit	40	24	59
Exempt income	(385)	(349)	(319)
U.S. manufacturing deduction	(57)	(42)	(88)
Other, net	60	80	35
Income tax provision	$ 598	$1,386	$1,730

Our 2016 income tax provision included a charge of $135 million for non-cash out of period adjustments from prior years which is reflected in Other, net in the table above. $74 million of the charge relates to a correction for the tax effects on our cross-currency swaps with the remainder relating primarily to adjustments for deferred tax liabilities associated with some of our consolidated subsidiaries. Management concluded that these adjustments were immaterial to all periods presented.

The deferred tax effects of tax loss and credit 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. The 2017 impact of re-measurement of the U.S. net deferred tax liability resulting from the U.S. enactment of the Tax Act is included in the various components of deferred income taxes.

	December 31,	
Millions of dollars	**2017**	**2016**
Deferred tax liabilities:		
Accelerated tax depreciation	$1,523	$1,910
Investment in joint venture partnerships	214	304
Intangible assets	48	140
Inventory	266	379
Other liabilities	26	41
Total deferred tax liabilities	2,077	2,774
Deferred tax assets:		
Tax attributes	196	255
Employee benefit plans	315	404
Other assets	97	72
Total deferred tax assets	608	731
Deferred tax asset valuation allowances	(96)	(96)
Net deferred tax assets	512	635
Net deferred tax liabilities	$1,565	$2,139

	December 31,	
Millions of dollars	**2017**	**2016**
Balance sheet classifications:		
Deferred tax assets—long-term	$ 90	$ 192
Deferred tax liability—long-term	1,655	2,331
Net deferred tax liabilities	$1,565	$2,139

At December 31, 2017 and 2016, we had total tax attributes available in the amount of $784 million and $968 million, respectively, for which a deferred tax asset was recognized at December 31, 2017 and 2016 of $196 million and $255 million, respectively.

The scheduled expiration of the tax attributes and the related deferred tax assets, before valuation allowance, as of December 31, 2017 are as follows:

Millions of dollars	Tax Attributes	Deferred Tax on Tax Attributes
2018	$ 26	$ 6
2019	35	9
2020	—	—
2021	29	2
2022	15	1
Thereafter	147	33
Indefinite	532	145
	$784	$196

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

	December 31,		
Millions of dollars	2017	2016	2015
France	$ 92	$140	$197
Canada	31	29	31
United Kingdom	17	16	17
Spain	32	33	38
The Netherlands	13	19	23
United States	10	16	15
Other	1	2	1
	$196	$255	$322

To fully realize these net deferred tax assets, we will need to generate sufficient future taxable income in the countries where these tax attributes exist during the periods in which the attributes can be utilized. Based upon projections of future taxable income over the periods in which the attributes can be utilized and/or temporary differences can be reversed, management believes it is more likely than not that only $101 million of these deferred tax assets at December 31, 2017 will be realized.

Prior to the close of each reporting period, management considers the weight of all evidence, both positive and negative, to determine if a valuation allowance is necessary for each jurisdictions' net deferred tax assets. We place greater weight on historical evidence over future predictions of our ability to utilize net deferred tax assets. We consider future reversals of existing taxable temporary differences, future taxable income exclusive of reversing temporary differences, and taxable income in prior carryback year(s) if carryback is permitted under applicable law, as well as available prudent and feasible tax planning strategies that would, if necessary, be implemented to ensure realization of the net deferred tax asset.

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.

	December 31,		
Millions of dollars	**2017**	**2016**	**2015**
France	$ 25	$ 22	$ 27
Canada	32	30	33
United Kingdom	17	16	11
Spain	—	—	19
The Netherlands	12	12	20
United States	10	16	14
Other	—	—	1
	$ 96	$ 96	$125

During 2017, the valuation allowance decreased in the U.S. due to the remeasurement of our U.S. net deferred income tax liability. This reduction was offset by increases in the valuation allowances of other jurisdictions due primarily to currency translation adjustments.

During 2016, we released $19 million of our valuation allowance related to Spanish net deferred tax assets associated with operating losses, as Spanish operations were no longer in a three-year cumulative loss position and our projections indicated and management expected the operating losses to be fully utilized within the next nine years.

During 2015, the reduction in our valuation allowances were primarily attributable to currency translation adjustments.

French tax law provides for an indefinite carryforward of tax losses; however, losses allowed in any particular year may not exceed fifty percent of taxable income. With respect to our French operations, we have a total net deferred tax asset of $62 million, against which we retain a valuation allowance of $25 million for losses that we do not expect to realize a future benefit due to limitations imposed by French tax law. The remaining portion of the net deferred tax asset of $37 million, primarily related to French tax losses, is expected to be fully realized.

We continue to maintain a full valuation allowance against the net deferred tax asset in Canada. Given our operational structure in Canada and the relevant Canadian loss utilization rules, we do not expect to realize a future benefit related to the net deferred tax asset.

Deferred taxes on the unremitted earnings of certain equity joint ventures and subsidiaries of $51 million and $47 million at December 31, 2017 and 2016, respectively, have been provided.

Tax benefits totaling $544 million, $546 million and $521 million relating to uncertain tax positions, which are reflected in Other liabilities, were unrecognized as of December 31, 2017, 2016 and 2015, respectively. The following table presents a reconciliation of the beginning and ending amounts of unrecognized tax benefits:

	Year Ended December 31,		
Millions of dollars	**2017**	**2016**	**2015**
Balance, beginning of period	$546	$521	$534
Additions for tax positions of current year	15	16	9
Additions for tax positions of prior years	3	11	5
Reductions for tax positions of prior years	(20)	(2)	(24)
Settlements (payments/refunds)	—	—	(3)
Balance, end of period	$544	$546	$521

The majority of the 2017, 2016 and 2015 balances, 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. We may settle or appeal positions challenged by the tax authorities. 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 $110 million. We are no longer subject to any significant income tax examinations by tax authorities for the years prior to 2016 in the Netherlands, prior to 2013 in Italy, prior to 2010 in Germany, prior to 2009 in France, prior to 2016 in the United Kingdom, and prior to 2011 in the U.S., our principal tax jurisdictions.

We recognize interest accrued related to unrecognized tax benefits in income tax expense. Income tax expense included interest and penalties totaling $16 million in each of the years ended December 31, 2017 and 2016 and $5 million in the year ended December 31, 2015. We had accrued approximately $63 million, $47 million and $31 million for interest and penalties as of December 31, 2017, 2016 and 2015, respectively.

18. Commitments and Contingencies

Commitments—We have various purchase commitments for materials, supplies and services incident 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. At December 31, 2017, we had commitments of approximately $820 million primarily related to building our new Hyperzone high-density polyethylene plant in La Porte, Texas and a world-scale PO/TBA plant on the Texas Gulf Coast. Our other capital expenditure commitments at December 31, 2017 were in the normal course of business.

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 $102 million and $95 million as of December 31, 2017 and 2016, respectively. At December 31, 2017, the accrued liabilities for individual sites range from less than $1 million to $19 million. The remediation expenditures are expected to occur over a number of years, and not to be 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.

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

	Year Ended December 31,	
Millions of dollars	**2017**	**2016**
Beginning balance	$ 95	$106
Additional provisions	—	5
Changes in estimates	11	15
Amounts paid	(13)	(29)
Foreign exchange effects	9	(2)
Ending balance	$102	$ 95

Access Indemnity Demand—In December 2010, one of our subsidiaries received demand letters from affiliates of Access Industries (collectively, “Access Entities”), a more than five percent shareholder of the Company, demanding indemnity for losses, including attorney’s fees and expenses, arising out of a pending lawsuit styled *Edward S. Weisfelner, as Litigation Trustee of the LB Litigation Trust v. Leonard Blavatnik, et al.,* Adversary Proceeding No. 09-1375 (REG), in the United States Bankruptcy Court, Southern District of New York. In the *Weisfelner* lawsuit, the plaintiffs seek to recover from Access the return of all amounts earned by the Access Entities related to their purchase of shares of Lyondell Chemical Company (“Lyondell Chemical”) prior to its acquisition by Basell AF S.C.A.; distributions by Basell AF S.C.A. to its shareholders before it acquired Lyondell Chemical; and management and transaction fees and expenses. Trial of the lawsuit was held in October 2016. In April 2017, the court awarded $7.2 million to the plaintiffs and denied all other relief, and in May 2017 the court issued its Final Judgment reflecting this ruling. With prejudgment interest included, the total Final Judgment is $12.6 million. The plaintiffs filed an appeal to the Federal District Court for the Southern District of New York, which largely affirmed the Final Judgement on January 24, 2018.

The Access Entities have also demanded $100 million in management fees under a 2007 management agreement between an Access affiliate and the predecessor of LyondellBasell AF, as well as other unspecified amounts relating to advice purportedly given in connection with financing and other strategic transactions. In June 2009, an Access affiliate filed a proof of claim in Bankruptcy Court against LyondellBasell AF seeking “no less than” $723 thousand for amounts allegedly owed under the 2007 management agreement. In April 2011, Lyondell Chemical filed an objection to the claim and brought a declaratory judgment action for a determination that the demands are not valid. The declaratory judgment action is stayed pending the outcome of the *Weisfelner* lawsuit.

We do not believe that the 2007 management agreement is in effect or that the Company or any Company-affiliated entity owes any obligations under the management agreement, including for management fees or for indemnification. We intend to vigorously defend our position in any proceedings and against any claims or demands that may be asserted.

Although the court issued its Final Judgment in *Weisfelner* in May 2017 as noted above, it remains subject to further potential appeal by the parties. Accordingly, we cannot at this time estimate whether there is a reasonably possible loss or range of loss that may be incurred.

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, 2017, 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 five to ten years.

19. Stockholders' Equity

Dividend Distributions—The following table summarizes the dividends paid in the periods presented:

Millions of dollars, except per share amounts	Dividend Per Ordinary Share	Aggregate Dividends Paid	Date of Record
For the year 2017:			
March	$0.85	$ 343	March 6, 2017
June	0.90	361	June 5, 2017
September	0.90	356	September 6, 2017
December	0.90	355	December 5, 2017
	$3.55	$1,415	
For the year 2016:			
March	$0.78	$ 336	February 29, 2016
June	0.85	362	May 24, 2016
September	0.85	351	August 16, 2016
December	0.85	346	November 29, 2016
	$3.33	$1,395	

Share Repurchase Program—In May 2017, our shareholders approved a proposal to authorize us to repurchase up to an additional 10% of our outstanding ordinary shares through November 2018 ("May 2017 Share Repurchase Program"). As a result, the authorization of the remaining unpurchased shares under the share repurchase program approved by our shareholders in May 2016 ("May 2016 Share Repurchase Program") was superseded. We completed the repurchase of shares under our share repurchase programs authorized by our shareholders in May 2015 ("May 2015 Share Repurchase Program") and April 2014 ("April 2014 Share Repurchase Program") in 2016 and 2015, respectively.

These repurchases, which are determined at the discretion of our Management Board, may be executed from time to time through open market or privately negotiated transactions. The repurchased shares, which are recorded at cost, are classified as Treasury stock and may be retired or used for general corporate purposes, including for various employee benefit and compensation plans.

The following table summarizes our share repurchase activity for the periods presented:

Millions of dollars, except shares and per share amounts	Shares Repurchased	Average Purchase Price	Total Purchase Price, Including Commissions
For the year 2017:			
May 2016 Share Repurchase Program	3,501,084	$85.71	$ 300
May 2017 Share Repurchase Program	6,516,917	83.54	545
	10,018,001	$84.30	$ 845
For the year 2016:			
May 2015 Share Repurchase Program	15,302,707	$80.15	$1,226
May 2016 Share Repurchase Program	21,316,627	79.18	1,688
	36,619,334	$79.58	$2,914
For the year 2015:			
April 2014 Share Repurchase Program	19,892,101	$86.40	$1,719
May 2015 Share Repurchase Program	31,947,812	90.66	2,896
	51,839,913	$89.03	$4,615

Due to the timing of settlements, total cash paid for share repurchases for the years ended December 31, 2017, 2016 and 2015 was $866 million, $2,938 million and $4,656 million, respectively.

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

	Year Ended December 31,		
	2017	2016	2015
Ordinary shares outstanding:			
Beginning balance	404,046,331	440,150,069	486,969,402
Share-based compensation	371,980	418,892	4,972,908
Warrants exercised	4,184	200	1,989
Employee stock purchase plan	107,560	96,504	45,683
Purchase of ordinary shares	(10,018,001)	(36,619,334)	(51,839,913)
Ending balance	394,512,054	404,046,331	440,150,069

Treasury Shares—The changes in the amounts of treasury shares held by the Company are as follows:

	Year Ended December 31,		
	2017	2016	2015
Ordinary shares held as treasury shares:			
Beginning balance	174,389,139	138,285,201	91,463,729
Share-based compensation	(371,980)	(418,892)	(4,972,908)
Warrants exercised	509	—	150
Employee stock purchase plan	(107,560)	(96,504)	(45,683)
Purchase of ordinary shares	10,018,001	36,619,334	51,839,913
Ending balance	183,928,109	174,389,139	138,285,201

Accumulated Other Comprehensive Income (Loss)—The components of, and after-tax changes in, Accumulated other comprehensive loss as of and for the years ended December 31, 2017, 2016 and 2015 are presented in the following table:

Millions of dollars	Financial Derivatives	Net Unrealized Holding Gains (Losses) on Investments	Net Unrealized Holding Gains (Losses) on Equity Investees	Defined Benefit Pension and Other Postretirement Benefit Plans	Foreign Currency Translation Adjustments	Total
Balance—January 1, 2017	$ (75)	$ 1	$—	$(498)	$(939)	$(1,511)
Other comprehensive income (loss) before reclassifications	(323)	(6)	19	62	145	(103)
Tax (expense) benefit before reclassifications	86	3	—	(15)	33	107
Amounts reclassified from accumulated other comprehensive income (loss)	264	—	—	44	—	308
Tax (expense) benefit	(72)	—	—	(14)	—	(86)
Net other comprehensive income (loss)	(45)	(3)	19	77	178	226
Balance—December 31, 2017	$(120)	$ (2)	$ 19	$(421)	$(761)	$(1,285)
Balance—January 1, 2016	$ (79)	$ (5)	$—	$(428)	$(926)	$(1,438)
Other comprehensive income (loss) before reclassifications	(29)	7	—	(184)	(27)	(233)
Tax (expense) benefit before reclassifications	7	(1)	—	37	7	50
Amounts reclassified from accumulated other comprehensive income (loss)	(63)	—	—	93	7	37
Tax (expense) benefit	89	—	—	(16)	—	73
Net other comprehensive income (loss)	4	6	—	(70)	(13)	(73)
Balance—December 31, 2016	$ (75)	$ 1	$—	$(498)	$(939)	$(1,511)

Millions of dollars	Financial Derivatives	Net Unrealized Holding Gains (Losses) on Investments	Net Unrealized Holding Gains (Losses) on Equity Investees	Defined Benefit Pension and Other Postretirement Benefit Plans	Foreign Currency Translation Adjustments	Total
Balance—January 1, 2015	$ (80)	$—	$—	$(449)	$(497)	$(1,026)
Other comprehensive income (loss) before reclassifications	279	(6)	—	(8)	(434)	(169)
Tax (expense) benefit before reclassifications	(71)	1	—	2	5	(63)
Amounts reclassified from accumulated other comprehensive income (loss)	(207)	—	—	33	—	(174)
Tax (expense) benefit	—	—	—	(6)	—	(6)
Net other comprehensive income (loss)	1	(5)	—	21	(429)	(412)
Balance—December 31, 2015	$ (79)	$ (5)	$—	$(428)	$(926)	$(1,438)

The amounts reclassified out of each component of Accumulated other comprehensive loss are as follows:

Millions of dollars	Year Ended December 31, 2017	2016	2015	Affected Line Items on the Consolidated Statements of Income
Reclassification adjustments for:				
Financial derivatives	$264	$ (63)	$(207)	Other income, net
Income tax expense (benefit)	72	(89)	—	Provision for income taxes
Financial derivatives, net of tax	192	26	(207)	
Amortization of defined pension items:				
Prior service cost	3	1	5	
Actuarial loss	39	31	28	
Settlement loss	2	61	—	
Income tax expense	14	16	6	
Defined pension items, net of tax	30	77	27	
Foreign currency translations adjustments	—	7	—	Other income, net
Income tax expense (benefit)	—	—	—	Provision for income taxes
Foreign currency translations adjustments, net of tax	—	7	—	
Total reclassifications, before tax	308	37	(174)	
Income tax expense (benefit)	86	(73)	6	Provision for income taxes
Total reclassifications, after tax	$222	$110	$(180)	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 15).

Non-Controlling Interests—In April 2017, we increased our interest in the entity that holds our equity interest in Al Waha Petrochemicals Ltd. from 83.79% to 100% by paying $21 million to exercise a call option to purchase the remaining 16.21% interest held by a third party.

20. Per Share Data

Basic earnings per share are based upon the weighted average number of shares of common stock outstanding during the periods. Diluted earnings per share includes the effect of certain stock options awards and other equity-based compensation awards. We have unvested restricted stock units that are considered participating securities for earnings per share.

Earnings per share data and dividends declared per share of common stock are as follows:

	Year Ended December 31,					
	2017		2016		2015	
Millions of dollars	Continuing Operations	Discontinued Operations	Continuing Operations	Discontinued Operations	Continuing Operations	Discontinued Operations
Net income (loss)	$4,895	$ (18)	$3,847	$ (10)	$4,479	$ (5)
Less: net (income) loss attributable to non-controlling interests	2	—	(1)	—	2	—
Net income (loss) attributable to the Company shareholders	4,897	(18)	3,846	(10)	4,481	(5)
Net income attributable to participating securities	(5)	—	(4)	—	(8)	—
Net income (loss) attributable to ordinary shareholders—basic and diluted	$4,892	$ (18)	$3,842	$ (10)	$4,473	$ (5)
Millions of shares, except per share amounts						
Basic weighted average common stock outstanding	398	398	419	419	465	465
Effect of dilutive securities:						
Stock options	1	1	—	—	—	—
QPA and PSU awards	—	—	1	1	1	1
Potential dilutive shares	399	399	420	420	466	466
Earnings (loss) per share:						
Basic	$12.28	$(0.05)	$ 9.17	$(0.02)	$ 9.63	$(0.01)
Diluted	$12.28	$(0.05)	$ 9.15	$(0.02)	$ 9.60	$(0.01)
Participating securities	0.4	0.4	0.3	0.3	0.4	0.4
Dividends declared per share of common stock	$ 3.55	$ —	$ 3.33	$ —	$ 3.04	$ —

21. Segment and Related Information

Our operations are managed through five operating segments, as shown below. We disclose the results of each of our operating segments in accordance with ASC 280, *Segment Reporting*. Each of the operating segments is managed by a senior executive reporting directly 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, including polypropylene compounds.
- 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.
- 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 our segments’ profitability and therefore, in accordance with ASC 280, *Segment Reporting*, we have presented EBITDA for all segments. We define EBITDA as earnings before interest, taxes and depreciation and amortization.

Intersegment eliminations and items that are not directly related or allocated to business operations are included in “Other.” Sales between segments are made primarily at prices approximating prevailing market prices.

Summarized financial information concerning reportable segments is shown in the following table for the periods presented:

	Year Ended December 31, 2017						
Millions of dollars	O&P – Americas	O&P – EAI	I&D	Refining	Technology	Other	Total
Sales and other operating revenues:							
Customers	$ 7,592	$12,040	$8,346	$6,165	$341	$ —	$34,484
Intersegment	2,808	223	126	683	109	(3,949)	—
	10,400	12,263	8,472	6,848	450	(3,949)	34,484
Depreciation and amortization expense	439	239	279	177	40	—	1,174
Other income (expense), net	40	138	1	2	—	(2)	179
Income from equity investments	42	271	8	—	—	—	321
Capital expenditures	753	206	332	213	32	11	1,547
EBITDA	2,982	2,282	1,490	157	223	—	7,134

Millions of dollars	Year Ended December 31, 2016 O&P – Americas	O&P – EAI	I&D	Refining	Technology	Other	Total
Sales and other operating revenues:							
Customers	$6,757	$10,404	$7,085	$4,559	$378	$ —	$29,183
Intersegment	2,320	175	141	576	101	(3,313)	—
	9,077	10,579	7,226	5,135	479	(3,313)	29,183
Depreciation and amortization expense	362	229	269	163	41	—	1,064
Other income (expense), net	63	42	—	8	—	(2)	111
Income from equity investments	59	302	6	—	—	—	367
Capital expenditures	1,376	261	333	224	36	13	2,243
EBITDA	2,877	2,067	1,333	72	262	(9)	6,602

Millions of dollars	Year Ended December 31, 2015 O&P – Americas	O&P – EAI	I&D	Refining	Technology	Other	Total
Sales and other operating revenues:							
Customers	$7,344	$11,371	$7,596	$6,059	$365	$ —	$32,735
Intersegment	2,620	205	176	498	100	(3,599)	—
	9,964	11,576	7,772	6,557	465	(3,599)	32,735
Depreciation and amortization expense	353	219	233	196	46	—	1,047
Other income (expense), net	10	14	4	2	—	(5)	25
Income from equity investments	42	283	14	—	—	—	339
Capital expenditures	668	186	441	108	24	13	1,440
EBITDA	3,661	1,825	1,475	342	243	(13)	7,533

In 2017, our O&P—Americas results include a $31 million gain on the first quarter sale of our Lake Charles, Louisiana site. EBITDA for our O&P—EAI segment includes a $108 million gain on the sale of our 27% interest in Geosel and also includes a $21 million non-cash gain stemming from the elimination of an obligation associated with a lease.

In 2016, operating results for our O&P—Americas segment includes a non-cash, LCM inventory valuation charge of $29 million due mainly to the drop in polypropylene prices. Our O&P—Americas and O&P—EAI segments' results benefited from gains of $57 million and $21 million, respectively, related to the 2016 sale of our wholly owned subsidiary, Petroken Petroquimica Ensenada S.A.

In 2015, operating results for the O&P—Americas, O&P—EAI, I&D and Refining segments included non-cash charges of $160 million, $30 million, $181 million and $177 million, respectively, related to LCM inventory valuation adjustments. Declines in the prices of ethylene, propylene and other products correlated with crude oil were the primary drivers of the LCM inventory valuation adjustment for the O&P—Americas segment while the LCM inventory valuation adjustment recognized by our O&P—EAI segment is mainly related to polyolefins. Declines in the prices of various chemicals, notably benzene and ETBE, within our I&D segment's inventory pools led to the LCM inventory valuation adjustment recognized by the I&D segment in 2015. The LCM inventory valuation adjustment recognized by the Refining segment in 2015 was driven primarily by declines in the price of crude oil.

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, 2017	2016	2015
EBITDA:			
Total segment EBITDA	$ 7,134	$ 6,611	$ 7,546
Other EBITDA	—	(9)	(13)
Less:			
Depreciation and amortization expense	(1,174)	(1,064)	(1,047)
Interest expense	(491)	(322)	(310)
Add:			
Interest income	24	17	33
Income from continuing operations before income taxes	$ 5,493	$ 5,233	$ 6,209

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	Refining	Technology	Other	Total
December 31, 2017							
Property, plant and equipment, net	$5,092	$2,077	$2,457	$1,130	$241	$—	$10,997
Investment in PO joint ventures	—	—	420	—	—	—	420
Equity investments	187	1,366	82	—	—	—	1,635
Goodwill	162	162	237	—	9	—	570
December 31, 2016							
Property, plant and equipment, net	$4,688	$1,881	$2,288	$1,067	$213	$—	$10,137
Investment in PO joint ventures	—	—	415	—	—	—	415
Equity investments	164	1,332	79	—	—	—	1,575
Goodwill	162	139	219	—	8	—	528

The following geographic data for revenues are based upon the location of the customer and for long-lived assets, the location of the assets:

Millions of dollars	Year Ended December 31, 2017	2016	2015
Sales and other operating revenues:			
United States	$16,618	$13,962	$16,101
Germany	2,746	2,474	2,697
Italy	1,352	1,203	1,349
France	1,306	1,055	1,201
Mexico	1,504	1,026	951
The Netherlands	1,069	727	856
Other	9,889	8,736	9,580
Total	$34,484	$29,183	$32,735

Millions of dollars	Year Ended December 31, 2017	2016
Long-lived assets:		
United States	$ 8,761	$ 8,230
Germany	1,417	1,276
The Netherlands	779	657
France	551	530
Italy	329	309
Mexico	198	175
Other	1,585	1,500
Total	$13,620	$12,677

Long-lived assets include Property, plant and equipment, net, Intangible assets, net, Equity investments, and Investments in PO joint ventures (see Notes 7, 8 and 9).

Revenues by key product are summarized in the following table:

Millions of dollars	Year Ended December 31, 2017	2016	2015
Sales and other operating revenues:			
Olefins & co-products	$ 4,304	$ 3,215	$ 3,446
Polyethylene	7,368	6,903	7,536
Polypropylene	7,824	6,917	7,616
PO & derivatives	2,204	1,852	2,149
Oxyfuels and related products	3,022	2,676	2,906
Intermediate chemicals	3,051	2,483	2,541
Refined products	6,165	4,559	6,059
Other	546	578	482
Total	$34,484	$29,183	$32,735

22. Unaudited Quarterly Results

The following table presents selected financial data for the quarterly periods in 2017 and 2016:

Millions of dollars, except per share amounts	For the Quarter Ended March 31	June 30	September 30	December 31
2017				
Sales and other operating revenues	$8,430	$8,403	$8,516	$9,135
Gross profit[a]	1,439	1,802	1,577	1,607
Operating income[b]	1,210	1,577	1,332	1,341
Income from equity investments	81	78	81	81
Income from continuing operations[b] [c]	805	1,134	1,058	1,898
Loss from discontinued operations, net of tax	(8)	(4)	(2)	(4)
Net income[b] [c]	797	1,130	1,056	1,894
Earnings per share:				
Basic	1.98	2.82	2.67	4.80
Diluted	1.98	2.81	2.67	4.79

	For the Quarter Ended			
Millions of dollars, except per share amounts	**March 31**	**June 30**	**September 30**	**December 31**
2016				
Sales and other operating revenues	$6,743	$7,328	$7,365	$7,747
Gross profit[(a)]	1,577	1,626	1,462	1,327
Operating income[(b)]	1,360	1,403	1,249	1,048
Income from equity investments	91	117	81	78
Income from continuing operations[(b)]	1,030	1,092	955	770
Loss from discontinued operations, net of tax	—	(1)	(2)	(7)
Net income[(b)]	1,030	1,091	953	763
Earnings per share:				
Basic	2.38	2.57	2.30	1.87
Diluted	2.37	2.56	2.30	1.87

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

(b) The three months ended March 31, 2017 includes a gain of $31 million ($20 million after tax) on the sale of our Lake Charles, Louisiana site currently used as a logistic terminal. The three months ended June 30, 2017 includes a $21 million non-cash gain ($14 million after tax) stemming from the elimination of an obligation associated with a lease. The three months ended September 30, 2017 includes a $108 million gain ($103 million after tax) on the sale of our 27% interest in Geosel.

The three months ended March 31, 2016 included charges of $40 million related to out-of-period adjustments for deferred tax liabilities associated with some of our subsidiaries. We also recognized a pretax LCM inventory valuation charge of $68 million ($47 million after tax) in the three months ended March 31, 2016, which was reversed in the three months ended June 30, 2016. The three months ended March 31, 2016 also included a pretax and after-tax gain of $78 million on the sale of our wholly owned Argentine subsidiary.

The three months ended June 30, 2016 included charges of $21 million related to out-of-period adjustments for deferred tax liabilities associated with some of our subsidiaries.

The three months ended December 31, 2016 included a charge of $61 million for out-of-period tax corrections related to tax effects on our cross-currency swaps, a pretax LCM inventory valuation charge of $29 million ($18 million after tax) and a pension settlement charge of $58 million ($37 million after tax). For additional information related to these adjustments, see Note 21.

(c) The three months ended March 31, 2017 includes total charges to interest expense of $113 million ($106 million after tax) related to the redemption of $1,000 million aggregate principal amount of our outstanding 5% senior notes due 2019. The three months ended December 31, 2017 includes an $819 million non-cash tax benefit related to the lower federal income tax rate resulting from the newly enacted U.S. Tax Act.

23. Subsequent Events

On February 15, 2018, we reached a definitive agreement to acquire A. Schulman, a global supplier of high-performance plastic compounds, composites and powders. The acquisition builds upon our already existing platform in this space to create a premier Advanced Polymer Solutions business with broad geographic reach, leading technologies and a diverse product portfolio. Under the terms of the agreement, we will acquire A. Schulman for total consideration of $2.25 billion. We will purchase 100 percent of A. Schulman common stock for $42 per share and one contingent value right per share, and assume outstanding debt and certain other obligations. The contingent value rights generally will provide a holder with an opportunity to receive certain net proceeds, if any are recovered, from certain ongoing litigation and government investigations relating to A. Schulman's Citadel and Lucent acquisitions.

The proposed acquisition, which has been unanimously approved by the respective boards of LyondellBasell N.V. and A. Schulman, is subject to customary closing conditions, including regulatory approvals and approval by A. Schulman shareholders. The acquisition is expected to close in the second half of 2018. We are using cash-on-hand to finance the acquisition.

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, 2017, 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 2017 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.lyb.com (within the Investor Relations section). Any waivers of the codes must be approved, in advance, by our Supervisory Board. 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 "Executive Officers of the Registrant" 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 2018 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 2018 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 2018 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 2018 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 2018 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 2018 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, which appears on page 61, are filed as part of this annual report.

(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
2.1	Agreement and Plan of Merger, dated as of February 15, 2018, among LyondellBasell Industries N.V., LYB Americas Holdco Inc., and A. Schulman, Inc. (incorporated by reference to Exhibit 2.1 to our Current Report on Form 8-K filed with the SEC February 15, 2018)
3	Amended and Restated Articles of Association of LyondellBasell Industries N.V., dated as of May 22, 2013 (incorporated by reference to Exhibit 3 to Form 8-K filed with the SEC on May 29, 2013)
4.1	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)
4.2	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)
4.3	Amended and Restated Nomination Agreement dated March 10, 2015 (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed with the SEC on March 16, 2015)
4.4	Indenture relating to 6.0% Senior Notes due 2021, among the Company, as issuer, each of the Guarantors named therein, as guarantors, Wells Fargo National Association, as trustee, registrar and paying agent, dated as of November 14, 2011 (including form of 6.0% Senior Note due 2021) (incorporated by reference to Exhibit 4.1 to Form 8-K filed with the SEC on November 17, 2011)
4.5	First Supplemental Indenture, dated as of December 10, 2015, to Indenture dated as of November 14, 2011, between the Company and Wells Fargo Bank, National Association, as trustee (incorporated by reference to Exhibit 4.2 to our Current Report on Form 8-K filed with the SEC on December 14, 2015)
4.6	Indenture relating to 5% Senior Notes due 2019 and 5.75% 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 5.000% Senior Note due 2019 and form of 5.750% Senior Note due 2024) (incorporated by reference to Exhibit 4.3 to Form 8-K filed with the SEC on April 10, 2012)
4.7	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)

Exhibit Number	Description
4.8	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)
4.9	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)
4.10	Officer's Certificate of LYB International Finance II B.V. relating to the Notes, dated as of March 2, 2016 (incorporated by reference to Exhibit 4.2 to our Current Report on Form 8-K filed with the SEC on March 2, 2016)
4.11	Form of LYB International Finance II B.V.'s 1.875% Guaranteed Notes due 2022 (incorporated by reference to Exhibit 4.3 to our Current Report on Form 8-K filed with the SEC on March 2, 2016 and included in Exhibit 4.2 thereto)
4.12	Officer's Certificate of LYB International Finance II B.V. relating to the Notes, 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)
4.13	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)
10.1+	Employment Agreement by and among Bhavesh V. Patel, Lyondell Chemical Company and LyondellBasell Industries, N.V., dated as of December 18, 2014 (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed with the SEC on December 22, 2014)
10.2+	Amendment to Employment Agreement by and among Lyondell Chemical Company, LyondellBasell Industries N.V. and Bhavesh V. Patel (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed with the SEC on March 9, 2017)
10.3+	Employment Agreement dated November 6, 2015, between Basell Service Company, B.V. and Thomas Aebischer (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed with the SEC on November 9, 2015).
10.4+	Letter Agreement dated November 6, 2015 between Thomas Aebischer and Lyondell Chemical Company (incorporated by reference to Exhibit 10.2 to our Current Report on Form8-K filed with the SEC on November 9, 2015)
10.5+	Employment Agreement by and among Kevin Brown, Lyondell Chemical Company and LyondellBasell AFGP, dated as of March 19, 2010 (incorporated by reference to Exhibit 10.4 to our Form 10 filed with the SEC on April 28, 2010)
10.6+	First Amendment to Employment Agreement by and among Kevin Brown, Lyondell Chemical Company and LyondellBasell Industries N.V., dated as of January 22, 2015 (incorporated by reference to Exhibit 10.8 to our Annual Report on Form 10-K filed with the SEC on February 17, 2015)
10.7+	LyondellBasell Industries Amended and Restated 2010 Long-Term Incentive Plan (incorporated by reference to Appendix A to our definitive proxy statement filed with the SEC on March 29, 2012)
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)

Exhibit Number	Description
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 June 5, 2015)
10.11+	Form of Officer and Director Indemnification Agreement (incorporated by reference to Exhibit 10.14 to Amendment No. 2 to our Form 10 filed with the SEC on July 26, 2010)
10.12+	Form of Non-Qualified Stock Option Award Agreement (incorporated by reference to Exhibit 10.12 to our Annual Report on Form 10-K filed with the SEC on February 12, 2013)
10.13+	Form of Restricted Stock Unit Award Agreement (incorporated by reference to Exhibit 10.13 to our Annual Report on Form 10-K filed with the SEC on February 12, 2013)
10.14+	Form of Qualified Performance Award Agreement (incorporated by reference to Exhibit 10.16 to our Annual Report on Form 10-K filed with the SEC on February 29, 2012)
10.15+	Form of Performance Share Unit Award Agreement (incorporated by reference to Exhibit 10.15 to our Annual Report on Form 10-K filed with the SEC on February 16, 2016)
10.16	Amended and Restated Credit Agreement, dated June 5, 2014, among LyondellBasell Industries N.V. and LYB Americas Finance Company, as Borrowers, the Lenders, Bank of America, N.A., as Administrative Agent, Swing Line Lender and L/C Issuer, Deutsche Bank Securities Inc., as Syndication Agent and the other parties thereto (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed with the SEC on June 6, 2014)
10.17	Amendment No. 1 to the Amended and Restated Credit Agreement, dated June 3, 2016, among LyondellBasell Industries N.V. and LYB Americas Finance Company, as Borrowers, the Lenders, Bank of America, N.A., as Administrative Agent, Swing Line Lender and L/C Issuer, Citibank, N.A. and Deutsche Bank Securities Inc., as Syndication Agents and the other parties thereto (incorporated by reference to Exhibit 10.2 to our Current Report on Form 8-K filed with the SEC on June 6, 2016)
10.18	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)
10.19	Receivables Purchase Agreement, dated September 11, 2012, by and among Lyondell Chemical Company, as initial servicer, and LYB Receivables LLC, a bankruptcy-remote special purpose entity that is a wholly owned subsidiary of the Company, PNC National Association, as Administrator and LC Bank, certain conduit purchasers, committed purchasers, LC participants and purchaser agents that are parties thereto from time to time (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed with the SEC on September 14, 2012)
10.20	Second Amendment to Receivables Purchase Agreement, dated as of August 26, 2015, among Lyondell Chemical Company, as servicer, LYB Receivables LLC, as seller, the conduit purchasers, related committed purchasers, LC participants and purchaser agents party thereto, the other parties thereto and Mizuho Bank, Ltd., as Administrator and LC Bank (incorporated by reference to Exhibit 10 to our Current Report on Form 8-K filed with the SEC on August 28, 2015)

Exhibit Number	Description
10.21	Purchase and Sale Agreement, dated September 11, 2012, by and among Lyondell Chemical Company, Equistar Chemicals, LP and LyondellBasell Acetyls, LLC, the other originators from time to time parties thereto, Lyondell Chemical Company, as initial servicer and LYB Receivables LLC, a bankruptcy-remote special purpose entity that is a wholly owned subsidiary of the Company (incorporated by reference to Exhibit 10.2 to our Current Report on Form 8-K filed with the SEC on September 14, 2012)
10.22	Master Receivables Purchase Agreement (as amended and restated on April 23,2013) among Basell Sales and Marketing Company B.V., Lyondell Chemie Nederland B.V., Basell Polyolefins Collections Limited, Citicorp Trustee Company Limited and Citibank, N.A., London Branch (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed with the SEC on April 29, 2013)
10.23	Consent Agreement, dated June 5, 2015, among LyondellBasell Industries N.V. and LYB Americas Finance Company, as Borrowers, Bank of America, N.A., as Administrative Agent and the lender parties thereto (incorporated by reference to Exhibit 10 to our Current Report on Form 8-K filed with the SEC on June 9, 2015)
10.24	LyondellBasell Industries 2017 Long Term Incentive Plan (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed with the SEC on February 23, 2017)
10.25	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)
10.26	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)
10.27	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)
10.28	Corporate Governance Guidelines (incorporated by reference to Exhibit 10.5 to our Current Report on Form 8-K filed with the SEC on February 23, 2017)
10.29	Rules of the Supervisory Board (incorporated by reference to Exhibit 10.6 to our Current Report on Form 8-K filed with the SEC on February 23, 2017)
10.30	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)
10.31	Form of the Contingent Value Rights Agreement, among A. Schulman, Inc., LyondellBasell Industries N.V., members of the committee and a paying agent to be specified (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K filed with the SEC February 15, 2018)
12.1*	Computation of Ratio of Earnings to Fixed Charges
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

Exhibit Number	Description
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

+ 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 22, 2018

/s/ Bhavesh V. Patel

Name: **Bhavesh V. Patel**

Title: ***Chairman of the Management Board***

Signature	Title	Date
/s/ Bhavesh V. Patel **Bhavesh V. Patel**	Chief Executive Officer and Chairman of the Management Board (Principal Executive Officer)	February 22, 2018
/s/ Thomas Aebischer **Thomas Aebischer**	Executive Vice President and Chief Financial Officer (Principal Financial Officer)	February 22, 2018
/s/ Jacques Aigrain **Jacques Aigrain**	Director	February 22, 2018
/s/ Lincoln Benet **Lincoln Benet**	Director	February 22, 2018
/s/ Jagjeet S. Bindra **Jagjeet S. Bindra**	Director	February 22, 2018
/s/ Robin Buchanan **Robin Buchanan**	Director	February 22, 2018
/s/ Stephen F. Cooper **Stephen F. Cooper**	Director	February 22, 2018
/s/ Nance K. Dicciani **Nance K. Dicciani**	Director	February 22, 2018
/s/ Claire S. Farley **Claire S. Farley**	Director	February 22, 2018
/s/ Bella D. Goren **Bella D. Goren**	Director	February 22, 2018
/s/ Robert G. Gwin **Robert G. Gwin**	Chairman of the Supervisory Board and Director	February 22, 2018
/s/ Bruce A. Smith **Bruce A. Smith**	Director	February 22, 2018
/s/ Rudy M.J. van der Meer **Rudy M.J. van der Meer**	Director	February 22, 2018

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 (benefit from) income taxes, and depreciation and amortization. EBITDA, income from continuing operations, diluted earnings per share (EPS) and certain other measures presented have been adjusted for LCM. LCM stands for “lower of cost or market,” which is an accounting rule consistent with GAAP related to the valuation of inventory. Our inventories are stated at the lower of cost or market. These measures have been adjusted to remove a non-cash LCM charge of \$548 million pretax (\$351 million after tax) for 2015 and \$29 million pretax (\$18 million after tax) in 2016.

We have also included calculations for other measures included herein, including LyondellBasell N.V.’s enterprise value and return on invested capital.

Reconciliation of Net Income To EBITDA

	For the Years Ended December 31,		
In Millions of Dollars	**2015**	**2016**	**2017**
Net Income	$ 4,474	$ 3,837	$ 4,877
Loss from Discontinued Operations	5	10	18
LCM Adjustments, After Tax	351	18	—
Income from Continuing Operations Excluding LCM Adjustments	4,830	3,865	4,895
Less:			
LCM Adjustments, After Tax	(351)	(18)	—
Income from Continuing Operations	4,479	3,847	4,895
Provision for Income Taxes	1,730	1,386	598
Depreciation and Amortization	1,047	1,064	1,174
Interest Expense, Net	277	305	467
LCM Adjustments, Pre Tax	548	29	—
EBITDA Excluding LCM Adjustments	8,081	6,631	7,134
LCM Adjustments, Pre Tax	(548)	(29)	—
EBITDA	$ 7,533	$ 6,602	$ 7,134

Reconciliation of EBITDA Excluding LCM Adjustments to EBITDA

In Millions of Dollars	For the Years Ended December 31, 2015	2016	2017
EBITDA Excluding LCM Adjustments:			
Olefins & Polyolefins—Americas	$ 3,821	$ 2,906	$ 2,982
Olefins & Polyolefins—EAI	1,855	2,067	2,282
Intermediates & Derivatives	1,656	1,333	1,490
Refining	519	72	157
Technology	243	262	223
Other	(13)	(9)	—
Total	8,081	6,631	7,134
Less:			
LCM Adjustments:			
Olefins & Polyolefins—Americas	160	29	—
Olefins & Polyolefins—EAI	30	—	—
Intermediates & Derivatives	181	—	—
Refining	177	—	—
Technology	—	—	—
Other	—	—	—
Total	548	29	—
EBITDA:			
Olefins & Polyolefins—Americas	3,661	2,877	2,982
Olefins & Polyolefins—EAI	1,825	2,067	2,282
Intermediates & Derivatives	1,475	1,333	1,490
Refining	342	72	157
Technology	243	262	223
Other	(13)	(9)	—
Total	$ 7,533	$ 6,602	$ 7,134

Reconciliation of Diluted EPS from Continuing Operations Excluding LCM Adjustments to Diluted EPS from Continuing Operations

	For the Years Ended December 31,		
	2015	2016	2017
Diluted Earnings Per Share from Continuing Operations Excluding LCM Adjustments	$10.35	$9.20	$12.28
Less:			
LCM Adjustments	0.75	0.05	—
Diluted Earnings Per Share from Continuing Operations	$ 9.60	$9.15	$12.28

Calculation of Return on Invested Capital

	Years Ended December 31,			
In Million of Dollars	2014	2015	2016	2017
Income from Continuing Operations		$ 4,479	$ 3,847	$ 4,895
Less:				
Tax Benefit due to change in tax law from U.S. Tax Cuts and Jobs Act		—	—	819
Add:				
Interest Expense, Net		277	305	467
Effective Tax Rate(1)		27.9%	26.5%	25.8%
Interest Expense, Net, After Tax		200	224	347
Adjusted Income from Continuing Operations		4,679	4,071	4,423
Divided by:				
Average Invested Capital:				
Property, Plant & Equipment, Net	$ 8,758	8,991	10,137	10,997
Current Assets	11,645	9,789	9,599	11,738
Less:				
Current Liabilities	5,437	4,349	4,540	4,777
Cash and Cash Equivalents	1,031	924	875	1,523
	$13,935	13,507	14,321	16,435
Average Invested Capital		$13,721	$13,914	$15,378
Return on Invested Capital		34%	29%	29%

(1) In 2017, excludes the tax benefit due to the change in tax law resulting from the U.S. Tax Cuts and Jobs Act.

Calculation of Enterprise Value

In Million of Dollars, Except Share Data	December 31, 2011	2012	2013	2014	2015	2016	2017
Common Shares Outstanding	573,390,514	575,216,709	548,824,138	486,969,402	440,150,069	404,046,331	394,512,054
Multiplied by:							
Closing Share Price	$ 32.49	$ 57.09	$ 80.28	$ 79.39	$ 86.90	$ 85.78	$ 110.32
Market Capitalization	18,629	32,839	44,060	38,661	38,249	34,659	43,523
Net Debt:							
Current Maturities of Long Term Debt	4	1	1	4	4	2	2
Short-Term Debt	48	95	58	346	353	594	68
Long-Term Debt	3,944	4,251	5,708	6,695	7,671	8,385	8,549
Less:							
Cash and Cash Equivalents	1,065	2,732	4,450	1,031	924	875	1,523
Short-Term Investments	—	—	—	1,593	1,064	1,147	1,307
Net Debt	2,931	1,615	1,317	4,421	6,040	6,959	5,789
Non-Controlling Interests	54	40	36	31	24	25	1
Enterprise Value	$ 21,614	$ 34,494	$ 45,413	$ 43,113	$ 44,313	$ 41,643	$ 49,313
Enterprise Value, in Billions of Dollars	$ 21.6	$ 34.5	$ 45.4	$ 43.1	$ 44.3	$ 41.6	$ 49.3

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