LyondellBasell Industries N.V.
Form 10-K
February 16, 2016
Table of Contents

UNITED STATES

SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

Form 10-K

(Mark One)

þ **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**
For the fiscal year ended December 31, 2015

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

(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. þ 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 þ 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. þ 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). þ 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 þ	Accelerated filer ¨
Non-accelerated filer ¨ (Do not check if a smaller reporting company)	Smaller reporting company ¨

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

The aggregate market value of common stock held by non-affiliates of the registrant on June 30, 2015, the last business day of the registrant s most recently completed second fiscal quarter, based on the closing price on that date of $103.52, was $41.8 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 432,200,532 shares outstanding at February 11, 2016 (excluding 146,234,738 treasury shares).

Documents incorporated by reference:

Portions of the Notice of the 2016 Annual General Meeting of Shareholders and 2016 Proxy Statement, in connection with the Company s 2016 Annual General Meeting of Shareholders (in Part III), as indicated herein.

Table of Contents

Table of Contents

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, target and similar expressions.

We based the forward-looking statements on our current expectations, estimates and projections about ourselves and the industries in which we operate in general. We caution you that these statements are not guarantees of future performance as 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. Accordingly, 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 U.S. operations 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 continue to fall materially, or continue to 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, there has been substantial capacity expansions announced 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;

- regulations may negatively impact our business by, among other things, restricting our operations, increasing costs of operations or requiring significant capital expenditures;

- we may not be able to protect our market position or otherwise pass on cost increases to our customers due to the significant competition we face as a result of the commodity nature of many of our products;

- 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 implement business strategies and execute our organic growth plans may be negatively affected or restricted by, among other things, our ability to complete projects on time and on budget and other events that may affect our ability to execute projects and strategies;

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;

Table of Contents

- the negative outcome of any legal, tax and environmental proceedings or changes in laws or regulations regarding legal, tax and environmental matters may increase our costs or otherwise limit our ability to achieve savings under current regulations;

- any loss or non-renewal of favorable tax treatment under agreements or treaties, or changes in 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 continued economic uncertainties, 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. These forward-looking statements are not guarantees of future performance, and our actual results and future developments may differ materially from those projected in 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 22.

Table of Contents

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 Industr N.V. and its consolidated subsidiaries. We are one of the world s top five 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 products such as gasoline, diesel and jet fuel.

Our financial performance is influenced in general by the supply and demand for the products that we produce, the cost and availability of feedstocks, global and regional competitor 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. During recent years the 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 the North American feedstock advantage declined with lower oil prices in 2015, improved product supply and demand fundamentals in several businesses, notably global polyolefins products, more than offset the decline. To a lesser extent, our differentiated assets and technology also positively influence our performance as compared to our peers and competitors. These include our propylene oxide and polypropylene technologies; flexible feedstock olefins plants in the U.S.; joint venture olefins and polyolefins plants with access to low-cost feedstock, particularly in Saudi Arabia; and our Houston refinery, which is capable of processing heavy, high-sulfur crude.

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, including ethylene and ethylene co-products, and polyolefins.

Olefins and Polyolefins Europe, Asia, International (O&P EAI). Our O&P EAI segment produces and markets olefins, including ethylene and ethylene co-products, polyolefins and specialty products, including polybutene-1 and polypropylene compounds.

Intermediates and Derivatives (I&D). Our I&D segment produces and markets propylene oxide and its co-products, including isobutylene and styrene monomer, and derivatives, acetyls including methanol, ethylene oxide and its derivatives, ethanol and oxygenated fuels, or oxyfuels.

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 fuel products including gasoline and distillates (diesel and jet fuels).

Technology. Our Technology segment develops and licenses chemical and polyolefin process technologies and manufactures and sells polyolefin catalysts.

Table of Contents

We regularly review our segments and the approach used by management to evaluate performance and resource allocation. At the beginning of 2014, management began using EBITDA (earnings before interest, taxes and depreciation and amortization) as the primary measure for reviewing our segments profitability. Our comparisons to the prior periods presented were revised to reflect this change.

Financial information about our business segments and geographical areas can be found in Note 22, *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 2015, 2014 and 2013, 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, including ethylene and propylene, and polyethylene (PE). We are the world s largest producer of polypropylene (PP) and PP compounds. We manage our olefin and polyolefin business in two reportable segments, O&P Americas and O&P EAI.

Olefins Ethylene is the most significant petrochemical in terms of worldwide production volume and is the key building block for PE and a large number of other chemicals, plastics and synthetics. The production of ethylene 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. In 2015, we completed an expansion project at our Channelview, Texas facility that added 250 million pounds to our annual ethylene capacity, and we further benefited from an 800 million pound per year expansion of our La Porte, Texas ethylene facility that was completed in 2014.

Polyolefins Polyolefins are thermoplastics and comprise approximately two-thirds of worldwide thermoplastics demand. Since their industrial commercialization, thermoplastics have been used in wide-ranging applications and products that improve safety and comfort and 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. We produce high density polyethylene (HDPE), low density polyethylene (LDPE) and linear low density polyethylene (LLDPE). We also produce PP homopolymers, PP impact copolymers and PP random copolymers. We produce and market several specialty product lines, including PP compounds, *Catalloy* process resins and polybutene-1 (PB-1), focusing on unique polyolefins and compounds that offer a wide range of performance characteristics. Typical properties of such specialty polyolefins and compounds include impact-stiffness balance, scratch resistance, soft touch and heat sealability. End uses include automotive and industrial products and materials. PP compounds are produced from blends of polyolefins and additives and are sold mainly to the automotive and home appliances industries. The *Catalloy* process is proprietary technology that is not licensed to third parties. As a result, we are the only manufacturer of *Catalloy* process resins, which are used primarily in roofing, packaging and automotive applications. PB-1 is a family of butane-based polymers and is mainly used in pipe applications and under-floor heating systems and sanitary water heating systems.

PE sales, including HDPE, LDPE and LLDPE, accounted for approximately 21%, 18% and 17% of our total revenues in 2015, 2014 and 2013, respectively. In 2014, we completed an expansion project at our Matagorda plant in Texas, which added 220 million pounds of HDPE production. PP sales, including *Catalloy*, accounted for approximately 17%, 16% and 16% of our total revenues in 2015, 2014 and 2013, respectively.

Table of Contents

The following table outlines the primary products of our O&P segments, annual processing capacity as of December 31, 2015, and the primary uses for those products. Capacities, which are presented in pounds unless otherwise indicated, include 100% of the capacity of our joint venture facilities. The joint ventures proportional share of capacity is shown in the footnote to the table, below.

Product	Annual Capacity(1)			Primary Uses
	Americas	EAI	Total	
Olefins:				
Ethylene	10.9 billion	6.5 billion	17.4 billion	Ethylene is used as a raw material to manufacture polyethylene, ethylene oxide, ethanol, ethylene dichloride, styrene, vinyl acetate monomer (VAM) and other products.
Propylene	5.5 billion	6.0 billion	11.5 billion	Propylene is used to produce PP, acrylonitrile, propylene oxide (PO) and other products.
Butadiene	1.1 billion	670 million	1.7 billion	Butadiene is used to manufacture styrene-butadiene rubber and polybutadiene rubber, which are used in the manufacture of tires, hoses, gaskets and other rubber products. Butadiene is also used in the production of paints, adhesives, nylon clothing, carpets, paper coatings and engineered plastics.
Polyolefins:				
HDPE	3.6 billion	4.2 billion	7.8 billion	HDPE is used to manufacture grocery, merchandise and trash bags; food containers for items from frozen desserts to margarine; plastic caps and closures; liners for boxes of cereal and crackers; plastic drink cups and toys; dairy crates; bread trays; pails for items from paint to fresh fruits and vegetables; safety equipment, such as hard hats; house wrap for insulation; bottles for household and industrial chemicals and motor oil; milk, water, and juice bottles; large tanks for storing liquids such as agricultural and lawn care chemicals; and pipe.
LDPE	1.3 billion	2.8 billion	4.1 billion	LDPE is used to manufacture food packaging films; plastic bottles for packaging food and personal care items; dry cleaning bags; ice bags; pallet shrink wrap; heavy-duty bags for mulch and potting soil; boil-in-bags; coatings on flexible packaging products; and coatings on paper board such as milk cartons.

Table of Contents

Product	Annual Capacity(1)			Primary Uses
	Americas	EAI	Total	
LLDPE	1.3 billion		1.3 billion	LLDPE is used to manufacture garbage and lawn-leaf bags; industrial can liners; housewares; lids for coffee cans and margarine tubs; dishpans, home plastic storage containers, and kitchen trash containers; large toys like outdoor gym sets; drip irrigation tubing; insulating resins and compounds used to insulate copper and fiber optic wiring; shrink wrap for multi-packaging canned food, bag-in-box bags, produce bags, and pallet stretch wrap.
PP	4.4 billion	12.6 billion	17.0 billion	PP is primarily used to manufacture fibers for carpets, rugs and upholstery; housewares; medical products; automotive interior trim, fascia, running boards, battery cases, and bumpers; toys and sporting goods; fishing tackle boxes; and bottle caps and closures.
Specialty Polyolefins:				
PP compounds		2.8 billion	2.8 billion	PP compounds are used to manufacture automotive interior and exterior trims, dashboards, bumpers and under-hood applications; base material for products and parts used in appliances; anti-corrosion coatings for steel piping, wire and cable.
Catalloy process resins	600 million	600 million	1.2 billion	*Catalloy* process resins are used primarily in modifying polymer properties in film applications and molded products; for specialty films, geomembrane liners, and roofing materials; in bitumen modification for roofing and asphalt applications; and for automotive bumpers.
PB-1 resins		110 million	110 million	PB-1 resins are used in flexible pipes, resins for seal-peel film, film modification, hot melt applications, consumer packaging and adhesives.
Aromatics:				
Benzene (in gallons)	195 million		195 million	Benzene is used to produce styrene, phenol and cyclohexane. These products are used in the production of nylon, plastics, synthetic rubber and polystyrene. Polystyrene is used in insulation, packaging and drink cups.

Table of Contents

(1) Represents total annual nameplate capacity, which includes approximately 1,650 million pounds of ethylene; approximately 2,500 million pounds of propylene; approximately 1,010 million pounds of HDPE; approximately 780 million pounds of LDPE; approximately 670 million pounds (O&P Americas) and 4,960 million pounds (O&P EAI) of PP; and approximately 200 million pounds of PP compounds of nameplate capacity owned by third parties either through joint venture arrangements or other contractual relationships. In some situations, the Company and the third parties may have access to the other s capacity through certain arrangements.

Olefins and Polyolefins Americas Segment

Overview

Our O&P Americas segment produces and markets olefins, polyolefins, aromatics, specialty products and ethylene co-products. In addition, we produce specialty products including *Catalloy* and *Plexar* resins.

Sales & Marketing / Customers

Our ethylene production is consumed internally as a raw material in the production of polymers and other derivatives, with the balance sold to third party customers under multi-year contracts or on a spot basis. In 2015 we completed a 250 million pound per year expansion at our Channelview, Texas facility, following an 800 million pound per year expansion of our La Porte, Texas facility completed in mid-2014. We have also announced ethylene expansion projects for our Corpus Christi, Texas facility in 2016.

We are a net purchaser of propylene, a raw material used in the production of PO, PP and other derivatives. Our butadiene production is sold to the external market under multi-year contracts. All of our benzene production is used as a raw material in the production of styrene by our I&D segment.

In addition to purchases of propylene, at times we purchase ethylene and butadiene 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. However, purchased volumes have not historically had a significant impact on profits.

In the U.S., most of the ethylene and propylene production of 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 rail car from Clinton, Iowa to Morris, Illinois and some is shipped directly to customers. A pipeline owned and operated by an unrelated party is used to transport ethylene from Morris, Illinois to Tuscola, Illinois where it is used as a raw material in the production of ethanol. Some propylene is shipped by ocean going vessel. Butadiene, benzene, toluene and other products are distributed by pipeline, rail car, truck, barge or ocean going vessel.

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 regional sales offices in various locations in North America and our polyolefins primarily are transported in North America by railcar or truck. Export sales are generally to customers in Central and South America. We also sell PP to our PP compounds business, which is managed worldwide by our O&P EAI segment.

Joint Venture Relationships

We participate in a joint venture arrangement 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 ventures total capacity. We do not hold a majority interest in or have operational control of this joint venture.

Table of Contents

Raw Materials

Raw material cost is the largest component of the total cost for the production of ethylene and its co-products. The primary raw materials that can be 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 domestically sourced condensate, a very light crude oil resulting from natural gas production (collectively referred to as heavy liquids). NGLs include ethane, propane and butane. The use of heavy liquid raw materials results in the production of a significant amount 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 amount of co-products.

Our ability to pass through raw material price increases to our customers is dependent upon 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 spot prices, indices published in industry publications and cost recovery formulas in the contracts.

Prior to 2010, facilities using heavy liquids as feedstock usually generated higher margins than those using NGLs. However, in recent years NGLs, particularly in the United States, have had a significant cost advantage over heavy liquids due to technological advances for extracting shale gas which have led to an increased supply of NGLs. This cost advantage was lower in 2015 than in prior years, but was 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 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.

In North America, we also purchase large amounts of natural gas that is used primarily as an energy source in our business and as the primary feedstock for methanol production by our I&D segment. The purchases are generally market-based contractual arrangements with multiple suppliers.

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. 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 data, we believe we were, as of December 31, 2015:

- the second largest producer of ethylene in North America, with ethylene rated capacity of 10.9 billion pounds per year, or approximately 14% of total North American ethylene production capacity;
- the third largest producer of PE in North America with 6.2 billion pounds per year of capacity, or approximately 14% of North American capacity; and
- the largest producer of PP in North America, including our share of our Indelpro joint venture capacity, with 3.3 billion pounds, or approximately 18% of the North American capacity.

Table of Contents

Olefins and Polyolefins Europe, Asia, International Segment

Overview

Our O&P EAI segment produces and markets olefins, including ethylene and ethylene co-products, and polyolefins. In addition, we produce significant quantities of specialty products such as *Catalloy* process resins and PB-1. Our O&P EAI segment manages our worldwide PP compound business (including our PP compounds facilities in North and South America), our worldwide PB-1 business, and our *Catalloy* process resins produced in Europe.

Sales & Marketing / Customers

Our ethylene production is primarily consumed internally as a raw material in the production of polymers and we purchase additional ethylene to meet our production needs. Our propylene production is used as a raw material in the production of PO and PP, and we purchase propylene because our internal needs exceed our internal production. European ethylene production is generally fully integrated with our downstream facilities in Europe.

We produce and sell butadiene to external customers under multi-year contracts and on a spot basis.

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 transported in Europe primarily by railcar or truck. We believe that, over a business cycle, average sales prices and profit margins for specialty polymers tend to be higher than average sales prices and profit margins for higher-volume commodity polyolefins or polymers.

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, Japan 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 2,630 million pounds of PP, approximately 810 million pounds of propylene, approximately 550 million pounds of ethylene, approximately 570 million pounds of HDPE, approximately 340 million pounds of LDPE and approximately 160 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 ethylene and its co-products. The primary raw materials used in our European olefin facilities are naphtha streams, which are heavier than NGLs; 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

Table of Contents

ethane, propane and butane are used. The principal raw materials used by our polyolefin and *Catalloy* process resin businesses are propylene and ethylene. In Europe, we have the capacity to produce approximately 50% of the propylene requirements of our European PP business and all of the ethylene requirements of our European PE business. 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 generally receive their PP and other polymer raw materials from one of our wholly owned or joint venture facilities. PB-1 raw materials are sourced solely from external supply. 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 on the pricing of the underlying heavy liquid raw materials, most of which are priced in U.S. dollars. There can be a lag between observed naphtha raw material price changes in a given month and contract product price changes that were settled prior to the beginning of that month. In such cases, volatility in our product margins may occur.

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 uncertain European and global economic conditions.

Based on published data and including our proportionate share of our joint ventures, we believe we were, as of December 31, 2015:

- the fifth largest producer of ethylene in Europe with an ethylene rated capacity in Europe of 4.3 billion pounds per year, or approximately 8% of total European ethylene capacity;
- the largest producer of PP in Europe with 5.2 billion pounds per year of capacity, or approximately 22% of European PP capacity;
- the largest producer of PE in Europe with 4.8 billion pounds per year of capacity, or approximately 22% of HDPE and 13% of LDPE European capacity; and
- the largest PP compounds producer in the world with 2.6 billion pounds per year of capacity, with approximately 51% of that capacity in Europe, 21% in North America, and 27% in the rest of the world.

Intermediates and Derivatives Segment

Overview

Our I&D segment produces and markets PO and its co-products and derivatives; acetyls including methanol, ethylene oxide (EO) and its derivatives; ethanol; and oxyfuels (methyl tertiary butyl ether (MTBE) and ethyl tertiary butyl ether (ETBE)). PO co-products include styrene monomer (SM) and tertiary butyl alcohol (TBA), most of which is used to make oxyfuels, isobutylene and tertiary butyl hydro peroxide (TBHP). TBA and its products other than oxyfuels are sometimes referred to as C4 chemicals. PO derivatives include propylene glycol (PG), propylene glycol ethers (PGE) and butanediol (BDO). We believe that our proprietary PO and acetyls production process technologies provide us with a cost advantaged position for these products and their derivatives.

Table of Contents

We produce PO through two distinct technologies, one of which yields TBA as the co-product and the other of which yields SM as the co-product. The two technologies are mutually exclusive, meaning that a manufacturing facility must be dedicated to either PO/TBA or to PO/SM.

The following table outlines the primary products, annual capacities, and primary uses for the I&D segment s products. Capacities, which are presented in pounds unless otherwise indicated, include 100% of the capacity of joint venture facilities. The joint ventures proportional share of capacity is shown in the footnote to the table, below.

Product	Annual Capacity(1)	Primary Uses
Propylene Oxide	5.1 billion	PO is a key component of polyols, PG, PGE and BDO.
PO Co-Products:		
Styrene Monomer	5.9 billion	SM is used to produce plastics, such as expandable polystyrene for packaging, foam cups and containers, insulation products and durables and engineering resins.
Tertiary Butyl Alcohol	6.1 billion	TBA is a precursor to isobutylene, MTBE and ETBE. Isobutylene is used in the manufacture of synthetic rubber and lubricant additives as well as gasoline blending components. MTBE and ETBE are high octane gasoline blending components; ETBE incorporates agriculturally produced ethanol.
PO Derivatives:		
Propylene Glycol	1.0 billion	PG is used to produce unsaturated polyester resins for bathroom fixtures and boat hulls; antifreeze, coolants and aircraft deicers; and cosmetics and cleaners.
Propylene Glycol Ethers	540 million	PGE are used as solvents for paints, coatings, cleaners and a variety of electronics applications.
Butanediol	465 million	BDO is used in the manufacture of engineering resins, films, personal care products, pharmaceuticals, coatings, solvents and adhesives.
Acetyls:		
Methanol (in gallons)	480 million	Methanol is a raw material used to produce acetic acid, MTBE, formaldehyde and several other products, including adhesives, foams, plywood subfloors, solvents and windshield washer fluid.
Acetic Acid	1.2 billion	Acetic acid is a raw material used to produce VAM, terephthalic acid (used to produce polyester for textiles and plastic bottles), industrial solvents and a variety of other chemicals.
Vinyl Acetate Monomer	700 million	VAM is used to produce a variety of polymers, products used in adhesives, water-based paint, textile coatings and paper coatings.

Table of Contents

Product	Annual Capacity(1)	Primary Uses
Ethylene Derivatives:		
Ethylene Oxide	850 million EO equivalents; 400 million as pure EO	EO is used to produce surfactants, industrial cleaners, cosmetics, emulsifiers, paint, heat transfer fluids and ethylene glycol.
Ethylene Glycol (EG)	650 million	EG is used to produce polyester fibers and film, polyethylene terephthalate resin, heat transfer fluids and automobile antifreeze.
Ethylene Glycol Ethers	300 million	Ethylene glycol ethers are used to produce paint and coatings, polishes, solvents and chemical intermediates.
Ethanol (in gallons)	50 million	Ethanol is used as a fuel and a fuel additive and in the production of solvents as well as household, medicinal and personal care products.

(1) The annual capacities include approximately 2,300 million pounds of PO; approximately 2,750 million pounds of SM; approximately 110 million pounds of PGE; and approximately 40 million gallons of methanol production owned by third parties through joint venture or other contractual relationships.

Sales & Marketing / Customers

We sell our PO and its co-products 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. We sell most of our SM production into the North American, European, Asian, and South American export markets through spot sales and contracts. We purchase SM for resale when necessary to satisfy customer demand that exceeds our production levels. Volumes of SM purchases made for resale can vary significantly from period to period. However, purchased volumes have not historically had a significant impact on profits. PO and its derivatives and SM are transported by barge, ocean going vessel, pipeline, railcar, and tank truck.

Our I&D segment converts most of its TBA, which is produced as a co-product of the PO process, to isobutylene. Over half of the isobutylene is reacted with methanol or ethanol to produce either MTBE or ETBE. The remaining isobutylene is sold into the external market as high-purity grade isobutylene.

In August of 2014, we announced our intention to build a world scale PO/TBA plant on the U.S. Gulf Coast with an annual capacity of 1 billion pounds of PO and 2 billion pounds of TBA and its derivatives. The preliminary timetable is to have the plant operational in 2020.

We sell our MTBE and ETBE production under market and cost-based sales agreements and in the spot market. MTBE and ETBE are transported by barge, ocean going vessel and tank truck. MTBE and ETBE are widely used octane gasoline blending components worldwide outside of the United States due to their blending characteristics and environmental benefits. For example, Japan has elected to use ETBE as a means of meeting its carbon dioxide reduction commitments under the Kyoto Protocol, and we source a significant portion of Japan s bio-fuels needs. The majority of our plants have the flexibility to produce either MTBE or ETBE to accommodate market needs.

Sales of MTBE, ETBE, acetyls, PO and PO co-products and derivatives 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.

Acetyls, including acetic acid and VAM, are consumed internally and sold worldwide under multi-year contracts and on a spot basis. Acetic acid and VAM are shipped by barge, ocean going vessel, pipeline, railcar

Table of Contents

and tank truck. Sales are made through a direct sales force, agents and distributors. Our acetyls business uses methanol, which we produce internally, as a raw material for our production of acetic acid, solvents and MTBE. We also sell methanol under annual contracts and on a spot basis to large U.S. customers. Methanol is shipped by barge, railcar and pipeline.

EO and EG typically are sold under multi-year contracts and on a spot basis, with market and cost-based pricing. Ethylene glycol ethers are EO derivatives sold primarily into the solvent and distributor segments at market prices. The vast majority of EO and its derivative products are sold in North America, Europe and Asia, primarily through our sales organizations. EO is shipped by railcar or consumed on site. The derivatives are shipped by railcar, truck, isotank, and ocean going vessel.

Joint Venture Relationships

We have two PO joint ventures with Covestro AG (the new holding company under which Bayer AG consolidated its polymer activities), one in the U.S. and one in Europe. We operate four of our U.S. operating units 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 generally 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 a lesser amount 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.

We purchase our ethanol requirements for the production of ETBE from third parties; the methanol for our MTBE production comes from internal production. Carbon monoxide and methanol are the primary raw materials required for the production of acetic acid. We purchase carbon monoxide pursuant to a long-term contract with pricing primarily based on the cost of production. All methanol required for our production of acetyls is internally sourced. 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. For the production of VAM, we obtain our entire 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.

Table of Contents

Industry Dynamics / Competition

With respect to PO, its co-products and derivatives, competition is 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. PO demand growth could be impacted by further development of alternative bio-based PO derivatives. It is not possible to predict accurately the changes in raw material costs, market conditions and other factors that will affect industry profitability in the future. Our major worldwide competitors for sales of PO, its co-products and derivatives include other multinational chemical companies as well as some regional marketers and producers.

Based on published data, excluding our partners shares of joint venture capacity, we believe as of December 31, 2015 we were:

- the second largest producer of PO worldwide, with approximately 13% of total worldwide capacity;
- the largest producer of MTBE/ETBE worldwide, with approximately 10% of total worldwide production capacity for these combined oxyfuels;
- the fifth largest producer of SM worldwide, with approximately 5% of total worldwide capacity; and
- the ninth and eighth largest producer of acetic acid and VAM, respectively, each with approximately 3% and 4% of total worldwide capacity.

Refining Segment

Overview

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 has a Nelson Complexity Index, a relative measure of the construction costs of a particular refinery based on its crude and upgrading capacity, of 12.5. 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. In the recent past, certain domestic crude oils such as West Texas Intermediate (WTI) and West Texas Sour (WTS) have been priced lower than normal trends due to transportation constraints; however, since 2014 these price differentials have narrowed.

On January 4, 2012, we ceased refinery operations at our Berre refinery in France. The cessation of operations was in accordance with an agreement executed in the fourth quarter of 2011 by certain of our French subsidiaries and union representatives. Additional information about the cessation of operations can be found in Management s Discussion and Analysis of Financial Condition and Results of Operations and Note 3, *Discontinued Operations*, to the Consolidated Financial Statements.

Table of Contents

The following table outlines the primary products of our Refining segment, annual processing capacities as of as of December 31, 2015, and the primary uses for those products. Capacities are presented in barrels per day.

Product	Capacity(1)	Primary Uses
Gasoline and components	120,000	Automotive fuel
Ultra Low Sulfur Diesel	95,000	Diesel fuel for cars and trucks
Jet Fuel	25,000	Aviation fuel
Lube Oils	4,000	Naphthenic industrial oils and white oils for food-grade applications
Aromatics	7,000	Intermediate chemicals

(1) Only key products for the Houston refinery are identified and, therefore, the sum of capacities shown does not equal the facility s total capacity.

Sales & Marketing / Customers

The Houston refinery s products primarily are 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.

Raw Materials

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 2016, there were 140 operable crude oil refineries in the U.S., and total U.S. refinery capacity was approximately 18.0 million barrels per day. During 2015, the Houston refinery processed an average of approximately 243,000 barrels per day of crude oil, representing approximately 1.4% of all U.S. crude processing capacity.

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

Table of Contents

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 Ultralow-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, which influence operating results such as the value of refinery by-products (products other than gasoline and distillates that represent about one third of the total product volume, such as coke, sulfur, and lighter materials such as NGLs and crude olefins streams) and the cost of Renewable Identification Numbers (RINs).

Technology Segment

Overview

Our Technology segment develops and licenses chemical, polyolefin and other process technologies and provides associated engineering and other services. Our Technology segment also develops, 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.

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.

Process Technology Licensing

We are a leading licensor of polyolefin process technologies. We also license a selective portfolio of chemical process technologies in the fields of olefin recovery, olefin conversion, aromatics extraction and acetyls.

Polyolefin Catalysts

We are a leading manufacturer and supplier of polyolefin catalysts. Approximately 25% of our catalyst sales are intercompany as we are a large polyolefin producer.

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 2015, 2014 and 2013, our research and development expenditures were $102 million, $127 million and $150 million, respectively. A portion of these expenses are related to technical support and customer service and are allocated to the other business segments. In 2015, approximately 45% of all R&D costs were allocated to business segments, other than Technology, while in 2014 and 2013, the allocations approximated 35% and 30%, respectively.

Table of Contents

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, 2015, we owned approximately 5,200 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 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 19 to the Consolidated Financial Statements.

We have made, and intend to continue to make, the expenditures necessary for compliance with applicable laws and regulations relating to environmental, health and safety matters. We incurred capital expenditures of $177 million in 2015 for health, safety and environmental compliance purposes and improvement programs, and estimate such expenditures to be approximately $291 million in 2016 and $408 million in 2017.

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 have reviewed the potential for these risks and have concluded that, because of our facility locations and our existing distribution networks, we do not believe these risks are material in the near term.

Employee Relations

As of December 31, 2015, we employed approximately 13,000 full-time and part-time employees around the world. Of this total, 6,000 were located in North America and another 6,000 were located in Europe. The remainder of our employees are in other global locations.

As of December 31, 2015, approximately 820 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.

Table of Contents

EXECUTIVE OFFICERS OF THE REGISTRANT

Our executive officers as of February 15, 2016 were as follows:

Name and Age	Significant Experience
Bhavesh V. (Bob) Patel, 49	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.
	General Manager, Olefins and NGLs of Chevron Phillips Chemical Company from 2009 to 2010.
Thomas Aebischer, 54	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.
Kevin W. Brown, 58	Executive Vice President, Manufacturing and Refining since January 2015 and member of the Management Board since May 2015.
	Senior Vice President, Refining from October 2009 to January 2015.
	Director of Sinclair Oil from January 2006 to September 2009.

	Executive Vice President, Operations of Sinclair Oil from June 2004 to September 2009.
Dan M. Coombs, 59	Executive Vice President, Global Olefins and Polyolefins, and Technology since January 2016.
	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.
	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.
	Deputy General Manager for Qatar Chemical Company Limited Development and Vice President Qatar for Chevron Phillips Chemical from April 2010 to September 2011.

Table of Contents

Name and Age	Significant Experience
Jeffrey A Kaplan, 47	Executive Vice President and Chief Legal Officer since March 2015 and member of the Management Board since May 2015.
	Deputy General Counsel from December 2009 to March 2015.
Massimo Covezzi, 58	Senior Vice President, Research and Development since January 2008.
James Guilfoyle, 45	Senior Vice President, Global Intermediates and Derivatives since June 2015.
	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.
	Director of High Density Polyethylene from November 2006 to December 2011.
Michael VanDerSnick, 51	Senior Vice President, Health, Safety, Security and Environment since June 2015.
	Senior Vice President, Manufacturing EAI from July 2012 to June 2015 2015.
	Site manager of the Company s Channelview, Matagorda, Chocolate Bayou and Bayport, Texas plants from 2004 to 2012.
Sergey Vasnetsov, 52	Senior Vice President, Strategic Planning & Transactions since August 2010.
	Managing Director of Equity Research at Barclays Capital from 1999 to 2010.
Jacquelyn H. Wolf, 54	Senior Vice President and Chief Human Resources Officer since September 2012.
	Senior Vice President and Chief Human Resources Officer for Celanese, Inc. from December 2009 to July 2012.
	Executive Vice President and Chief Human Resources Officer for Comerica Bank from January 2006 to December 2009.

19

Table of Contents

Description of Properties

Our principal manufacturing facilities as of December 31, 2015 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	Principal Products
Americas		
Bayport (Pasadena), Texas	I&D	EO, Ethylene Glycol and other EO derivatives
Bayport (Pasadena), Texas(1)	I&D	PO, PG, PGE, TBA and Isobutylene
Bayport (Pasadena), Texas	O&P Americas	PP and *Catalloy* process resins
Channelview, Texas(2)	O&P Americas	Ethylene, Propylene, Butadiene, Benzene, Toluene and Alkylate
Channelview, Texas(1)(2)(3)	I&D	Isopropyl Alcohol, PO, BDO, SM, Isobutylene, Methanol, ETBE and MTBE
Chocolate Bayou, Texas	O&P Americas	PE (HDPE)
Clinton, Iowa	O&P Americas	Ethylene and Propylene PE (LDPE and HDPE)
Corpus Christi, Texas	O&P Americas	Ethylene and Propylene
Edison, New Jersey	Technology	Polyolefin Catalysts
Ensenada, Argentina	O&P Americas	PP
	O&P EAI	PP compounds
Houston, Texas	Refining	Gasoline, Diesel, Jet Fuel and Lube Oils
La Porte, Texas(4)	O&P Americas	Ethylene and Propylene
		PE (LDPE and LLDPE)
La Porte, Texas(4)(5)	I&D	VAM, Acetic Acid and Methanol
Lake Charles, Louisiana	O&P Americas	PP and *Catalloy* process resins
Matagorda, Texas	O&P Americas	PE (HDPE)
Morris, Illinois	O&P Americas	Ethylene, Propylene, and PE (LDPE and LLDPE)
Tuscola, Illinois	I&D	Ethanol
Victoria, Texas	O&P Americas	PE (HDPE)
Europe		
Berre l Etang, France	O&P EAI	Ethylene, Propylene, Butadiene, PP and PE (LDPE)
Botlek, Rotterdam, The Netherlands	I&D	PO, PG, PGE, TBA, Isobutylene, BDO, MTBE and ETBE
Brindisi, Italy	O&P EAI	PP
Carrington, UK	O&P EAI	PP
Ferrara, Italy	O&P EAI	PP and *Catalloy* process resins
	Technology	Polyolefin catalysts
Fos-sur-Mer, France	I&D	PO, PG, TBA, MTBE and ETBE
Frankfurt, Germany	O&P EAI	PE (HDPE)
	Technology	Polyolefin catalysts

Table of Contents

Location	Segment	Principal Products
Knapsack, Germany	O&P EAI	PP and PP compounds
Ludwigshafen, Germany	Technology	Polyolefin catalysts
Maasvlakte, The Netherlands(6)	I&D	PO and SM
Moerdijk, The Netherlands	O&P EAI	*Catalloy* process resins and PB-1
Münchsmünster, Germany	O&P EAI	Ethylene, Propylene, PE (HDPE)
Tarragona, Spain(7)	O&P EAI	PP and PP compounds
Wesseling, Germany	O&P EAI	Ethylene, Propylene and Butadiene
		PP and PE (HDPE and LDPE)
Asia Pacific		
Geelong, Australia	O&P EAI	PP

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. 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) Unrelated equity investors hold a minority interest in the PO/SM II plant at the Channelview facility.

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

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

(6) The Maasvlakte plant is owned by the European PO joint venture and is located on land leased by the European PO joint venture.

(7) 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*.

Table of Contents

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 in accordance with customary 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.

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

We obtain a substantial portion of our principal raw materials from sources in North Africa, the Middle East, Mexico 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 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 allies.

Table of Contents

A continued 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. natural gas prices to crude oil prices in recent years. This advantage was reduced as oil prices declined beginning in 2014. If the price of crude oil continues to decrease and it 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 including, but not limited to, as a result of natural disasters and water levels 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, the export of NGLs from the U.S., greater restrictions on hydraulic fracturing or the lifting by the U.S. government of the ban on U.S. crude oil exports 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.

Table of Contents

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.

Europe s recovery from the economic crisis has continued to be uneven, slow and modest. If the crisis re-emerges or meaningful recovery does not materialize across Europe, there will likely be a continued negative effect on our European business, as well as the businesses of our European customers, suppliers and partners. In addition, if such a crisis re-emerges and leads to a further 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 Brazil. 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. Generally, 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

Table of Contents

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, increased 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 could reduce our profitability. Competitors that have greater financial resources than us 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;

Table of Contents

- 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;
- 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 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 continual 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

Table of Contents

of funds and the imposition of 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. 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 substantial 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 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 United States, The Netherlands, Germany, France, and Italy. We monitor income tax legislative developments in countries where we conduct business, including the United Kingdom. Recently, there has been an increase in attention, both in the U.K. and globally to the tax practices of multinational companies, including proposals by the Organization for Economic Cooperation and Development (OECD) with respect to base erosion and profit shifting. Such attention may result in legislative changes that could affect our tax rate. 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.

Failure to comply with the Foreign Corrupt Practices Act and similar worldwide anti-bribery laws may have an adverse effect on us.

Our international operations require us to comply with a number of U.S. and international laws and regulations, including those involving anti-bribery and anti-corruption. In order to effectively operate in certain foreign jurisdictions, circumstances may require that we establish joint ventures with local operators or find strategic partners. As an issuer with securities listed on a United States stock exchange, we are subject to the regulations imposed by the Foreign Corrupt Practices Act (FCPA), which generally prohibits issuers and their

Table of Contents

intermediaries (including strategic or local partners or agents, even if those partners or agents are not themselves subject to the FCPA or other similar laws) from making improper payments to foreign officials for the purpose of obtaining or keeping business or obtaining an improper business benefit. We have an ongoing program to promote compliance with the FCPA and other similar anti-bribery and anti-corruption laws. Any determination that we have violated the FCPA or other similar laws could have a material effect on our business, results of operations, and cash flows.

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, including process technologies such as *Spheripol*, *Spherizone*, *Hostalen*, *Spherilene*, *Lupotech T* and *Avant* catalyst family technology rights. 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 protection afforded by patents varies from country to country and depends upon the type of patent and its scope of coverage. While a presumption of validity may exist with respect to patents issued to us, our patents may be challenged, invalidated, circumvented or rendered unenforceable. As patents expire, the products and processes described and claimed under those patents become generally available for use by competitors.

Our continued growth strategy may bring us to regions of the world where intellectual property protection may be limited and difficult to enforce. In addition, patent rights may not prevent our competitors from developing, using or selling products that are similar or functionally equivalent to our products. Moreover, our competitors or other third parties may obtain patents that restrict or preclude our ability to lawfully produce or sell our products in a competitive manner, which could result in significantly lower revenues, reduced profit margins or loss of market share.

We also rely upon unpatented proprietary know-how and continuing technological innovation and other trade secrets to develop and maintain our competitive position. While it is our policy to enter into confidentiality agreements with our employees and third parties to protect our intellectual property, these confidentiality agreements may be breached, may not always be executed, may not provide meaningful protection or adequate remedies may not be available. Additionally, others could obtain knowledge of our trade secrets through independent development or other access by legal or illegal means.

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 adequate internal controls systems or financial reporting systems to provide adequate and timely information for our reporting purposes.

Table of Contents

In the event that any of our joint venture partners do not observe their obligations, it is possible that the affected joint venture would not be able to operate in accordance with our business plans. As a result, we could be required to increase our level of commitment in order to give effect to such plans. 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 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.

Table of Contents

We may incur substantial costs to comply with climate change legislation and 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 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 at 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.

Table of Contents

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 billion revolving credit facility, which backs our commercial paper program, to meet our cash needs, to the extent available. As of December 31, 2015, we had no borrowings or letters of credit outstanding under the facility and $323 million outstanding under our commercial paper program, leaving an unused and available credit capacity of $1,631 million. We may also meet our cash needs by selling receivables under our $900 million U.S. accounts receivable securitization facility or our 450 million European 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

Table of Contents

damages or injunctive relief against us that could materially adversely affect a portion of our business operations or materially and adversely affect our financial position and our 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 rate used to measure pension obligations, the level of plan assets available to fund those obligations at the measurement date and the expected long-term rate 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 change in key actuarial assumptions, such as the discount 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.

Certain of our current pension plans could have projected benefit obligations that exceed the fair value of the plan assets. As of December 31, 2015, the aggregate deficit was $871 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.

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

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. We reasonably believe that EPA Region V may assert a penalty demand in excess of $100,000.

Table of Contents

In July 2015, the Texas Commission on Environmental Quality (TCEQ) issued a proposed Agreed Order to Houston Refining LP pertaining to a Clean Air Act Title V air permit inspection covering the years 2013 and 2014. TCEQ has asserted an administrative penalty demand for this matter of $118,127 and we are currently awaiting the approval of the Agreed Order by the TCEQ Commissioners.

Also in July 2015, the TCEQ issued a proposed Agreed Order to Houston Refining LP pertaining to an emissions event which occurred in August 2014. TCEQ has asserted an administrative penalty demand for this matter of $100,000, which was approved by the Commissioners in January 2016.

Litigation and Other Matters

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

Item 4. Mine Safety Disclosures.

Not applicable.

Table of Contents

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
2015			
First Quarter	$ 91.99	$ 71.74	$ 0.70
Second Quarter	107.32	87.03	0.78
Third Quarter	104.66	72.76	0.78
Fourth Quarter	98.25	83.22	0.78
2014			
First Quarter	$ 91.94	$ 74.37	$ 0.60
Second Quarter	102.63	85.40	0.70
Third Quarter	115.40	97.09	0.70
Fourth Quarter	107.79	70.06	0.70

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 11, 2016, there were approximately 5,800 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.

Table of Contents

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, 2010. The graph assumes that $100 was invested on December 31, 2010 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.

	12/31/2010	12/31/2011	12/31/2012	12/31/2013	12/31/2014	12/31/2015
LyondellBasell Industries N.V.	$100	$109.05	$208.70	$302.06	$307.58	$347.97
S&P 500 Index	$100	$102.11	$188.45	$156.82	$178.29	$180.75
S&P 500 Chemicals Index	$100	$ 98.74	$122.05	$160.87	$178.09	$170.65

Table of Contents

Issuer Purchases of Equity Securities

2015 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	5,166,910	$ 92.30	5,166,910	22,869,056
November 1 November 30	3,820,849	$ 94.20	3,820,849	19,048,207
December 1 December 31	3,745,500	$ 89.20	3,745,500	15,302,707
Total	12,733,259	$ 91.96	12,733,259	15,302,707

On May 6, 2015, we announced a share repurchase program of up to 47,250,519 of our ordinary shares through November 6, 2016. 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.

Table of Contents

Item 6. Selected Financial Data.

The following selected financial data was derived from LyondellBasell s consolidated financial statements, which were prepared from its 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. Management s Discussion and Analysis of Financial Condition and Results of Operations includes a discussion of factors that will enhance an understanding of this data.

	Year Ended December 31,				
In millions of dollars, except per share data	**2015**	**2014**	**2013**	**2012**	**2011**
Results of operations data:					
Sales and other operating revenues	$ 32,735	$ 45,608	$ 44,062	$ 45,352	$ 48,183
Operating income(a)	6,122	5,736	5,102	4,676	4,337
Interest expense(b)	(310)	(352)	(309)	(655)	(1,044)
Income from equity investments	339	257	203	143	216
Income from continuing operations(a)(c)	4,479	4,172	3,860	2,858	2,472
Earnings per share from continuing operations:					
Basic	9.63	8.04	6.81	5.01	4.34
Diluted	9.60	8.00	6.76	4.96	4.32
Loss from discontinued operations, net of tax	(5)	(4)	(7)	(24)	(332)
Loss per share from discontinued operations:					
Basic	(0.01)	(0.01)	(0.01)	(0.04)	(0.58)
Diluted	(0.01)	(0.01)	(0.01)	(0.04)	(0.58)
Balance sheet data:					
Total assets	22,757	24,221	27,230	24,167	22,803
Short-term debt	353	346	58	95	48
Long-term debt(d)	7,675	6,699	5,709	4,252	3,948
Cash and cash equivalents	924	1,031	4,450	2,732	1,065
Short-term investments	1,064	1,593			
Accounts receivable	2,517	3,448	4,030	3,904	3,778
Inventories	4,051	4,517	5,279	5,075	5,499
Working capital	4,386	4,901	5,737	5,694	5,863
Cash flow data:					
Cash provided by (used in):					
Operating activities	5,842	6,048	4,835	4,787	2,860
Investing activities	(1,051)	(3,531)	(1,602)	(1,013)	(1,021)
Expenditures for property, plant and equipment	(1,440)	(1,499)	(1,561)	(1,060)	(1,050)
Financing activities	(4,850)	(5,907)	(1,589)	(2,145)	(4,955)
Dividends declared per share	3.04	2.70	2.00	4.20	5.05

(a) Includes pretax, non-cash charges in 2015 and 2014 of $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. These LCM inventory valuation adjustments were primarily associated with a decline in the price of crude oil and a related decline in the prices of heavy liquids and other correlated products.

(b) Interest expense in 2012 included charges of $294 million for premiums related to the refinancing of notes bearing interest rates of 8% and 11% per annum with lower coupon notes. In 2011, interest expense included $443 million of prepayment premiums and unamortized debt issuance cost write-offs.

(c) Income from continuing operations for the year ended December 31, 2013 included a $353 million benefit related to the release of valuation allowances primarily associated with tax losses in our French group. For the years ended December 31, 2012 and 2011, income from continuing operations included after-tax charges of $210 million and $279 million, respectively, for premiums and charges on the early repayment of debt.

(d) Includes current maturities of long-term debt.

Table of Contents

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.

References to industry benchmark prices or costs, including the weighted average cost of ethylene production, are generally to industry prices and costs from third-party consulting data. References to industry benchmarks for refining and oxyfuels market margins are to industry prices reported by Platts, a reporting service of The McGraw-Hill Companies. References to industry benchmark prices for crude oil and natural gas are to Bloomberg.

OVERVIEW

Our performance is driven by, among other things, global economic conditions generally and their impact on demand for our products, raw material and energy prices, as well as industry-specific issues, such as production capacity. Our businesses are generally subject to the cyclicality and volatility seen in the chemicals and refining industries.

During 2015, we generated record earnings. Our performance remained focused and steady despite the challenging environment of declining crude oil and natural gas prices. The impact of lower oil prices, which reduced the U.S. cost advantage for olefins and TBA products, was offset by stronger polyolefins results in the U.S. and Europe and in other businesses, such as styrene. Lower prices for crude oil and correlated products also led to significant lower of cost or market inventory valuation charges during the year. We believe our performance indicates our capability to deliver strong results under a wide range of operating environments. During 2015, we continued to execute and expand our strategic growth program with expansions of our ethylene and PP compounds capacities. We also moved forward additional growth projects during the year.

Significant items that affected 2015 results include:

- Lower of cost or market (LCM) inventory valuation charges affecting all but the Technology segment in 2015 totaling $548 million, pretax ($351 million, after tax);
- Improved Olefins and Polyolefins Europe, Asia, International (O&P EAI) segment results on higher European polyolefins and olefins margins supplemented by higher European polyolefins volumes;
- Improved refining margins, offset by lower crude processing rates due primarily to unplanned maintenance in the latter part of the year at our Houston refinery;
- Steady Intermediates and Derivatives (I&D) segment results reflecting higher styrene and ethylene oxide (EO) and derivatives results offset in part by lower results for the TBA chain and acetyls; and
- Olefins and Polyolefins Americas (O&P Americas) results declined on lower olefins margins, partially offset by higher olefins volumes and improved polyolefins results.

Other noteworthy items during 2015 include the following:

- We repurchased approximately 51.8 million of our ordinary shares during 2015;

We increased our interim dividend in 2015 from $0.70 to $0.78;

We issued $1 billion of 4.625% unsecured notes due 2055 in March 2015; and

We completed a 250 million pounds per year ethylene expansion at our Channelview, Texas facility in the third quarter of 2015 and continued construction of an 800 million pounds per year ethylene expansion at our Corpus Christi, Texas facility to be completed in the second quarter of 2016.

Table of Contents

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

	Year Ended December 31,		
Millions of dollars	**2015**	**2014**	**2013**
Sales and other operating revenues	$ 32,735	$ 45,608	$ 44,062
Cost of sales	25,683	38,939	37,940
Selling, general and administrative expenses	828	806	870
Research and development expenses	102	127	150
Operating income	6,122	5,736	5,102
Interest expense	(310)	(352)	(309)
Interest income	33	33	15
Other income (expense), net	25	38	(15)
Income from equity investments	339	257	203
Provision for income taxes	1,730	1,540	1,136
Income from continuing operations	4,479	4,172	3,860
Loss from discontinued operations, net of tax	(5)	(4)	(7)
Net income	$ 4,474	$ 4,168	$ 3,853

RESULTS OF OPERATIONS

Revenues We had revenues of $32,735 million in 2015, $45,608 million in 2014 and $44,062 million in 2013.

2015 versus 2014 Revenues decreased by $12,873 million, or 28%, in 2015 compared to 2014.

The decline in prices for crude oil and other feedstocks during 2015 was the primary contributing factor for lower average sales prices, which were responsible for 23% of the revenue decline in 2015 versus 2014. Unfavorable translation impacts resulting from a significant decline in the euro/U.S. dollar exchange rate further reduced revenues by 5% during 2015.

Sales volumes during 2015 were relatively unchanged from 2014. A decrease in sales due to lower crude processing rates in our Refining segment was mostly offset by higher sales volumes for other products, including U.S. and European polyolefins in our O&P Americas and O&P EAI segments, respectively; and TBA products, acetyls and styrene in our I&D segment.

Crude processing rates at our Houston refinery were negatively impacted in 2015 primarily as a result of unplanned maintenance outages during the last part of the year. Strong 2015 demand for polyethylene and the completion of an expansion-related turnaround at our Matagorda, Texas facility in the first quarter of 2014 led to the higher U.S. polyethylene sales volumes in 2015. European polyolefins sales volumes increased relative to 2014 on higher demand. European polypropylene sales volumes also benefited from higher operating rates in 2015. TBA product sales volumes benefited from, among other things, strong octane and gasoline demand and a tight market. An increase in methanol sales volumes due to higher operating rates and increased feedstock supply led to the higher acetyls sales volumes. Increased operating rates and industry outages boosted sales volumes during 2015 for PO & derivatives and EO and derivatives.

2014 versus 2013 Revenues increased $1,546 million, or 4%, in 2014 compared to 2013.

Higher sales volumes for acetyls, styrene, PO and derivatives and refined products, which were offset in part by lower volumes for U.S. olefins and EO and derivatives, contributed to 4% higher revenues in 2014 compared to 2013. Higher acetyls sales volumes in 2014 benefited from the restart of our methanol plant at Channelview, Texas in December 2013. Sales volumes for styrene improved in 2014 compared to 2013, which was affected by

Table of Contents

planned maintenance activities in the U.S. and Europe. Industry outages in Europe and Asia in 2014 led to higher volumes for PO and derivatives. An increase in sales volumes of refined products in 2014 reflects higher crude processing rates relative to 2013, which was negatively impacted by planned outages at our Houston refinery. Sales volumes for U.S. polyethylene were favorably affected by firm demand and the completion of an expansion and turnaround of our Matagorda, Texas polyethylene facility. These increases were offset in part by lower U.S. olefin sales volumes as 2014 volumes were impacted by an expansion-related turnaround at our La Porte, Texas facility. Unplanned outages in 2014 resulted in lower EO and derivative volumes during that period.

In 2014, higher average sales prices for U.S. polyethylene, polypropylene (PP), PP compounds, PO and derivatives, except butanediol (BDO), and vinyl acetate monomer (VAM) were offset by lower average sales prices for European polyethylene, butanediol, oxyfuels, C4 chemicals and refining products.

Increased demand and industry supply issues in 2014 led to the increase in U.S. polyethylene prices. The improvements in polypropylene prices reflected more favorable market conditions in 2014 versus 2013. Global industry constraints and limited regional supply led to increased prices for VAM and all of our PO and derivatives products, except butanediol, which declined due to excess industry capacity in Asia and the Middle East. The lower average sales prices for oxyfuels in 2014 reflected the impact of lower Brent crude oil and gasoline prices, which was partially offset by a higher octane blending premium. In 2014, the decline in C4 chemicals prices was driven by the lower energy profile, while the average sales prices for refining products reflected the decline in crude oil prices during the fourth quarter of 2014.

Cost of Sales Cost of sales were $25,683 million in 2015, $38,939 million in 2014 and $37,940 million in 2013.

2015 versus 2014 Cost of sales decreased by $13,256 million in 2015 compared to 2014.

Cost of sales in 2015 includes pre-tax charges totaling $548 million for noncash LCM inventory valuation adjustments in all of our segments except Technology. These adjustments were driven mainly by declines in the prices for crude oil, ethylene, propylene, benzene and ETBE. During 2015, cost of sales also includes $35 million of amortization expense associated with the expiration of emission allowance credits in our Refining and I&D segments. Cost of sales in 2014 included a $760 million charge related to an LCM inventory valuation adjustment driven by a decline in feedstock prices in our O&P Americas segment and a $52 million benefit in our O&P EAI segment associated with a settlement for certain existing and future environmental claims under a 2005 indemnification agreement.

The decrease in cost of sales in 2015 was primarily due to lower feedstock costs. In 2015, the raw material costs for heavy liquids and natural gas liquids (NGLs) used in our O&P Americas segment; naphtha and other feedstocks and propylene used in our O&P EAI segment; benzene, propylene, butane, ethylene and ethanol used in our I&D segment; and crude oil used in our Refining segment were significantly lower relative to 2014.

2014 versus 2013 Cost of sales increased by $999 million in 2014 compared to 2013. Non-cash, LCM charges related to inventories in all but our Technology segment were responsible for $760 million of the $999 million increase in Cost of sales. These charges, which were recognized in the third and fourth quarters of 2014, were primarily driven by declines in the prices of crude oil and products derived from or correlated to crude oil.

Excluding these LCM adjustments, cost of sales increased $239 million in 2014 over 2013 primarily due to the impact of the higher sales volumes discussed above. The volume impact was reduced by the lower cost of crude oil and by the lower cost of ethylene production in the U.S. and Europe in 2014 compared to 2013.

Operating Income Our operating income was $6,122 million, $5,736 million and $5,102 million in 2015, 2014 and 2013, respectively.

Table of Contents

2015 versus 2014 Operating income increased by $386 million in 2015, which includes the impact of the $548 million LCM inventory valuation adjustment and the emission credit allowances amortization discussed above.

Absent the LCM inventory valuation adjustments in 2015 and 2014, the amortization associated with the expiration of emission credit allowances in 2015 and the benefit from the environmental settlement in 2014, operating income was higher by $261 million in 2015, compared to 2014. The improvement in results was primarily driven by the operations of our O&P EAI and Refining segments. The primary drivers of the improvement in operating income were higher margins that benefited from lower feedstock costs and improved supply/demand fundamentals in our European olefins and polyolefins businesses. Higher refining margins also contributed to the increases in operating income. Improvements in polyolefins margins in our O&P Americas segment added to these increases in 2015; however, lower olefin margins in that segment primarily driven by lower ethylene prices more than offset the polyolefins margin benefit. Improved styrene and EO and derivatives margins in our I&D segment, which also added to the improvement in operating income, were substantially offset by lower margins for TBA products and acetyls.

2014 versus 2013 Operating income increased by $634 million in 2014, which includes the impact of the $760 million LCM inventory valuation adjustment discussed above. This increase primarily reflects the impact of the higher sales volumes discussed above and margins that benefited from lower feedstock costs.

Apart from the LCM adjustment, margins were higher in 2014 across all businesses in our O&P Americas and O&P EAI segments, for PO and derivatives, acetyls and oxyfuels in our I&D segment and for refining products in our Refining segment. These higher margins were offset in part by lower margins for C4 chemicals, styrene and EO and derivatives in our I&D segment. Our higher margins generally reflected our lower cost of ethylene production and the lower cost of crude oil, but in some cases were driven by average sales prices that increased relative to the related feedstock costs. Lower margins for styrene and EO and derivatives reflected lower average sales prices compounded by higher feedstock costs and the lower C4 chemicals margins are attributed to falling energy prices.

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

Interest Expense Interest expense was $310 million in 2015, $352 million in 2014 and $309 million in 2013.

2015 versus 2014 The decrease in interest expense in 2015 relative to 2014 was primarily due to favorable impacts of $85 million related to our fixed-for-floating interest rate swaps and cross-currency swaps. This decrease was offset in part by higher interest charges related to the issuance of our 4.875% guaranteed notes due 2044 in February 2014 and our 4.625% senior notes due 2055 in March 2015.

2014 versus 2013 The increase in interest expense in 2014 compared to 2013 was primarily due to interest related to the July 2013 issuances of our 4% guaranteed notes due 2023 and 5.25% guaranteed notes due 2043 and the February 2014 issuance of our 4.875% guaranteed notes due 2044. These increases were partially offset by a $28 million net favorable adjustment related to our fixed-for-floating interest rate swaps.

See Note 14 to the Consolidated Financial Statements for additional information related to our fixed-for-floating interest rate swaps and cross-currency swaps.

Income from Equity Investments Our income from equity investments was $339 million in 2015, $257 million in 2014 and $203 million in 2013.

2015 versus 2014 Our 2015 Income from equity investments increased by $82 million over 2014 largely due to improved margins in certain joint ventures as a result of favorable market prices during 2015 and strong operating rates.

Table of Contents

2014 versus 2013 Income from equity investments increased by $54 million over 2013. This improvement includes higher margins for some of our joint ventures in the Middle East, Europe and Asia, the impact of better operating rates at two of our joint ventures in Asia and one of our joint ventures in the Middle East that experienced significant unplanned maintenance in 2013. In 2014, an improved supply of feedstock at one our Asian joint ventures also contributed to the higher operating rates relative to 2013.

Income Taxes Our effective income tax rates of 27.9% in 2015, 27.0% in 2014 and 22.7% in 2013 resulted in tax provisions of $1,730 million, $1,540 million and $1,136 million, respectively. 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. The Company s exempt income primarily includes interest income 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 equity earnings are attributable to our joint ventures and these earnings when paid (dividended) 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 $125 million, which could impact our effective tax rate in the future.

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, earnings in various countries with lower statutory tax rates, (notably in Europe) and the U.S. domestic production activity deduction. These favorable items were partially offset by the effects of U.S. state and local income taxes.

2014 The 2014 effective income tax rate, which was lower than the U.S. statutory tax rate of 35%, was favorably impacted by exempt income, the U.S. domestic production activity deduction, foreign exchange losses, and earnings in various countries with lower statutory tax rates, (notably in Europe). These favorable items were partially offset by the effects of U.S. state and local income taxes.

2013 The 2013 effective income tax rate, which was lower than the U.S. statutory tax rate of 35%, was favorably impacted by the release of certain valuation allowances, exempt income, the U.S. domestic production activity deduction, and earnings in various countries with lower statutory tax rates (notably in Europe), partially offset by the effects of U.S. state and local taxes and foreign exchange gains. In 2013, we released valuation allowances primarily associated with tax losses in our French tax group resulting in an overall benefit of $353 million.

For further information related to our income taxes, see Note 18 to the Consolidated Financial Statements.

Comprehensive Income We had comprehensive income of $4,064 million in 2015, $3,052 million in 2014 and $4,364 million in 2013.

2015 versus 2014 In 2015, Comprehensive income increased on higher net income, the reduction in actuarial losses related to our defined benefit pension and other postretirement benefit plans recognized in 2015, the favorable impact of unrealized net changes in foreign currency translation adjustments and to a lesser extent, the benefit of favorable financial derivative adjustments.

In 2015 and 2014, we recognized net actuarial losses of $8 million and $493 million, respectively. The $493 million net loss in the prior year was caused primarily by pension and other postretirement benefit discount rate decreases and mortality assumption changes. 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.

Table of Contents

The predominant functional currency for our operations outside of the U.S. is the euro. Relative to the U.S. dollar, the value of the euro decreased during 2015 and 2014, resulting in losses as reflected in the Consolidated Statements of Comprehensive Income.

2014 versus 2013 Comprehensive income decreased by $1,312 million in 2014 compared to 2013 primarily due to foreign currency translation losses and actuarial losses related to our defined benefit pension and other postretirement benefit plans that were recognized during the period. These losses were offset in part by the increase in 2014 net income over 2013. The predominant functional currency for our operations outside of the U.S. is the euro. Relative to the U.S. dollar, the value of the euro decreased in 2014 versus 2013, resulting in foreign currency translation losses, which decreased Comprehensive income by $958 million. In 2014, we recognized net actuarial losses of $493 million, which compares to a net actuarial gain of $411 million recognized in 2013. This $904 million decline in 2014 reflects $663 million related to discount rate assumption changes and other immaterial liability experience gains and losses and $241 million primarily related to actual asset return in excess of the expected return compared to 2013.

See Critical Accounting Policies below and Note 16 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 22, *Segment and Related Information*, to our Consolidated Financial Statements.

Table of Contents

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.

	Year Ended December 31,		
Millions of dollars	**2015**	**2014**	**2013**
Sales and other operating revenues:			
O&P Americas segment	$ 9,964	$ 13,948	$ 13,089
O&P EAI segment	11,576	15,203	14,685
I&D segment	7,772	10,130	9,472
Refining segment	6,557	11,710	11,698
Technology segment	465	497	532
Other, including intersegment eliminations	(3,599)	(5,880)	(5,414)
Total	$ 32,735	$ 45,608	$ 44,062
Income (loss) from equity investments:			
O&P Americas segment	$ 42	$ 21	$ 25
O&P EAI segment	283	229	174
I&D segment	14	7	4
Total	$ 339	$ 257	$ 203
EBITDA:			
O&P Americas segment	$ 3,661	$ 3,911	$ 3,573
O&P EAI segment	1,825	1,366	839
I&D segment	1,475	1,459	1,492
Refining segment	342	65	182
Technology segment	243	232	232
Other, including intersegment eliminations	(13)	17	(7)
Total	$ 7,533	$ 7,050	$ 6,311

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 our olefins and polyolefins businesses and as such management assesses the performance of the segment based on ethylene sales volumes and prices and our internal cost of ethylene production.

2015 versus 2014 Segment results were lower in 2015 primarily due to a decline in olefins results partially offset by improved polyolefin results relative to 2014. Olefins results in 2015 reflect lower margins, offset in part by higher sales volumes due partly to the completion of an 800 million pound ethylene expansion at our La Porte, Texas facility in September 2014. The decrease in olefins margins was driven by the decline in U.S. ethylene prices due to the impact of lower oil prices on global ethylene markets and increased U.S. ethylene supply. Margin improvements and higher sales volumes in 2015 led to the increased polyethylene and polypropylene results over 2014.

Margins in our olefins business in 2015 continued to benefit from low-cost ethylene produced from NGLs in North America, but to a lesser extent than in 2014 and 2013. The cost advantage for this ethylene, compared to that produced from naphtha and other crude oil-based liquids in the rest of the world, declined due to the lower crude oil prices in 2015. Higher U.S. polyethylene margins and volumes reflected continued strong global market conditions. Polypropylene margins expanded on significant strengthening of supply/demand balances.

Table of Contents

Prices for heavy liquids, NGLs and olefins have declined significantly since the third quarter of 2014 to levels that have not been seen in recent years. These declines resulted in the recognition of the non-cash, LCM inventory adjustments totaling $279 million in 2014 discussed below. Volatility in the benchmark prices for heavy liquids and natural gas and certain correlated products, particularly ethylene and propylene, which continued during most of 2015, led to net non-cash LCM inventory valuation adjustments totaling $548 million during 2015.

2014 versus 2013 Segment results were higher in 2014, primarily due to improved polyethylene and olefins results and, to a lesser extent, better polypropylene margins. Margin improvements and an increase in 2014 sales volumes contributed to the improved polyethylene results over 2013. Our 2014 olefins results reflected higher margins relative to 2013, offset in part by a decrease in sales volumes from the outage at our La Porte, Texas facility prior to the completion of the ethylene expansion discussed above. Our segment results were negatively impacted by a $279 million non-cash, LCM inventory valuation adjustment, most of which was recognized in the fourth quarter.

As mentioned above, the significant decline in prices for heavy liquids, NGLs and olefins in December 2014 to levels lower than the carrying value of our related inventories as of December 31, 2014 required us to record the LCM inventory valuation adjustment discussed above.

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. In the U.S., we have significant capability to change the mix of raw materials used in the production of ethylene and its co-products to take advantage of the relative costs of heavy liquids and NGLs.

Production economics for the industry have favored NGLs in recent years. Although the decline in oil prices significantly reduced the cost of ethylene produced from heavy liquids in 2015, NGL prices also declined and they continued to be preferred feedstocks. Approximately 90% of our U.S. ethylene production was produced from NGLs during the past three years.

Table of Contents

The following table shows the average U.S. benchmark prices for crude oil and natural gas for the applicable periods, as well as benchmark U.S. sales prices for ethylene and propylene, which we produce and sell or consume internally. The table also shows the discounted U.S. benchmark prices for certain polyethylene and polypropylene products. These industry benchmark prices are third party estimates that are indicative of contract sales for some key product grades, but do not necessarily describe price trends for our full olefins or polymers product mixes. The benchmark weighted average cost of ethylene production, which reflects credits for co-product sales, is based on a third party consultant s estimated ratio of heavy liquid raw materials and NGLs used in U.S. ethylene production.

	Average Benchmark Price and Percent Change Versus Prior Year Period Average					
	Year Ended December 31,			Year Ended December 31,		
	2015	2014	Change	2014	2013	Change
Crude oil, dollars per barrel:						
West Texas Intermediate (WTI)	48.71	92.91	(48)%	92.91	98.06	(5)%
Light Louisiana Sweet (LLS)	52.36	96.92	(46)%	96.92	107.31	(10)%
Natural gas (Henry Hub), dollars per million BTUs	2.57	4.51	(43)%	4.51	3.78	19%
United States, cents per pound:						
Weighted average cost of ethylene production	10.1	15.4	(34)%	15.4	16.2	(5)%
Ethylene	31.7	48.0	(34)%	48.0	46.7	3%
Polyethylene (high density)	63.6	77.0	(17)%	77.0	70.5	9%
Propylene polymer grade	39.0	70.9	(45)%	70.9	68.7	3%
Polypropylene	62.8	86.3	(27)%	86.3	82.2	5%

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	2015	2014	2013
Sales and other operating revenues	$ 9,964	$ 13,948	$ 13,089
Income from equity investments	42	21	25
EBITDA	3,661	3,911	3,573

Revenues Revenues decreased by $3,984 million, or 29%, in 2015 compared to 2014 and increased by $859 million, or 7%, in 2014 compared to 2013.

2015 versus 2014 Average sales prices declined for most products in 2015 resulting in a 31% revenue decrease compared to 2014. Lower average olefin prices reflect the significant decline in prices for crude oil and correlated products relative to prices in 2014. The decline in average polyethylene and polypropylene sales prices followed the decline in the 2015 prices of their respective feedstocks, ethylene and propylene.

These decreases in revenues were offset in part by an increase in sales volumes, which gave rise to a 2% revenue increase in 2015, compared to 2014. Ethylene sales volumes were higher due to increased production reflecting higher capacity following the completion of the expansion-related turnaround at our La Porte, Texas facility during 2014 and additional production related to less planned and unplanned downtime at our Channelview, Texas facility. Polyethylene sales volumes improved in 2015, due to the completion of an expansion-related turnaround at our Matagorda, Texas facility in the first quarter of 2014 and continued healthy global demand. Polypropylene sales volumes, which were limited by production in both years, increased slightly in 2015 relative to 2014.

2014 versus 2013 The $859 million increase in revenues in 2014 was the result of an improvement in average sales prices and increased sales volumes, which accounted for 6% and 1%, respectively, of the increase over 2013. Average sales prices in 2014 increased across most products, particularly polyethylene. Higher average polyethylene prices in 2014 reflected increased demand and industry supply issues in the ethylene and polyethylene markets. Average polypropylene prices also improved in 2014, reflecting a market environment that was more favorable than in 2013.

46

Table of Contents

The increase in sales volumes in 2014 was primarily due to higher polyethylene sales volumes offset in part by a decrease in ethylene volumes. The increase in polyethylene sales volumes reflected the completion of an expansion-related turnaround at our Matagorda, Texas facility in the early part of 2014 and strong industry demand. Firm market demand throughout 2014 also contributed to the increase in polyethylene sales volumes over 2013. Ethylene volumes were negatively impacted by production constraints as a result of the turnaround at our La Porte, Texas facility during 2014. Polypropylene sales volumes were relatively unchanged between the 2014 and 2013 periods.

EBITDA EBITDA decreased by $250 million, or 6%, in 2015 compared to 2014 and increased by $338 million, or 9%, in 2014 compared to 2013.

2015 versus 2014 The 6% decrease in EBITDA reflects a 24% net margin decline due to lower olefin margins, offset in part by a 14% increase related to higher volumes and a 3% increase related to the $119 million decline in the non-cash charges related to the LCM inventory valuation adjustments discussed above. Improvements in our income from equity investments accounts for the remaining 1% increase in EBITDA during 2015.

The impact of significantly lower ethylene margins in 2015 was offset in part by increases in polyethylene and polypropylene margins compared to 2014. Olefin margins declined in 2015 as the average sales price of ethylene was driven down by the decline of naphtha feedstock prices, which generally trend with crude oil prices, and by improved market supply due to an improvement in industry operating rates and additional market capacity. A decrease in our cost of ethylene production partially offset the impact of the decline in ethylene sales price in 2015 lessening the impact of lower margins during the year. Lower NGL and heavy liquids feedstock prices in 2015 outpaced the decline in selling prices of our co-products, which resulted in the decrease of our cost of ethylene production compared to the prior year.

Polyethylene margins improved in 2015 as demand remained strong and decreases in the cost of ethylene feedstock more than offset lower average sales prices relative to 2014. Polypropylene margins, which increased in 2015, benefited from lower propylene feedstock costs, which in part reflect the decline in crude oil prices, and higher average sales prices relative to propylene, driven by industry operating issues and increased demand.

Sales volumes in 2015 increased as compared to the prior year as a result of downtime and expansion-related activities in 2014 and the increased demand discussed above.

2014 versus 2013 The 9% improvement in EBITDA during 2014 reflects a 19% increase related to higher margins which was offset in part by a 2% decrease related to volumes and an 8% decrease related to the $279 million lower of cost or market inventory valuation adjustment discussed above.

Margins improved across all products, especially for olefins and polyethylene. The combination of higher ethylene sales prices discussed above, the lower cost of NGLs and heavy liquids, and higher co-product credits resulted in an improvement in olefins margins in 2014 compared to 2013. The increase in 2014 polyethylene margins reflect higher average sales prices as discussed above offset in part by increases in ethylene feedstock costs. Polypropylene margins also improved in 2014 due to the continued strength in pricing that carried over from late 2013.

The decrease in EBITDA attributable to the lower volumes reflects a decline in olefins volumes which was partially offset by increased polyethylene volumes.

Table of Contents

Olefins and Polyolefins Europe, Asia, International Segment

Overview

2015 versus 2014 Operating results in 2015 reflect improved results for our European polyolefins business and, to a lesser extent, higher results for our olefins business and better results for our joint ventures that are accounted for using the equity method. Polyethylene and polypropylene margins improved due to supply constraints as a result of several industry outages and the benefit of a lower price position compared to other regions resulting from the weakness in the euro. An increase in 2015 sales volumes also contributed to the higher polyethylene and polypropylene results relative to 2014. Olefins margins improved in 2015 as the lower cost of ethylene production, which was driven by lower feedstock prices, outpaced the decline in olefin product prices. Margins benefited for most of 2015 from a lag between declining feedstock costs and product prices. Turnaround activities at our Münchsmünster, Germany facility and unplanned outages resulted in a decrease in olefins sales volumes in 2015 relative to 2014.

At the end of the fourth quarter of 2015, lower feedstock and product prices resulted in market prices that were lower than the carrying value of our related inventories. Accordingly, we recorded a $30 million non-cash, LCM inventory valuation charge related to our olefins and polyolefins businesses. This compares to the $44 million non-cash, LCM inventory valuation charge recognized in the fourth quarter of 2014 discussed below.

2014 versus 2013 Operating results in 2014 reflect improved results for our olefins and European polyolefins businesses and, to a lesser extent, better results for our joint ventures that are accounted for using the equity method. Improvements in margins and operating rates, which surpassed European average industry rates, contributed to the higher olefins results in 2014. Higher polyolefins results in 2014 reflected improved margins versus 2013 and increased polyethylene volumes. Although market conditions for European producers remained highly competitive, the increase in European demand for polyolefins was consistent with the modest overall economic recovery that was evidenced in the region.

In the fourth quarter of 2014, the declining price of naphtha resulted in a market price lower than the carrying value of our related inventory necessitating the recognition of a $44 million non-cash, LCM inventory valuation charge related to our olefins business. Despite this charge, our fourth quarter results remained consistent with our prior quarterly results during 2014. The fall of our product prices lagged behind the decline in feedstock prices throughout the latter part of 2014.

Ethylene Raw Materials In Europe, heavy liquids are the pr