VALERO ENERGY CORP/TX
Form 10-K
February 28, 2019
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, 2018
OR
o 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 1-13175
VALERO ENERGY CORPORATION
(Exact name of registrant as specified in its charter)

| | |
|---|---|
| Delaware | 74-1828067 |
| (State or other jurisdiction of incorporation or organization) | (I.R.S. Employer Identification No.) |
| One Valero Way San Antonio, Texas (Address of principal executive offices) | 78249 (Zip Code) |

Registrant's telephone number, including area code: (210) 345-2000

Securities registered pursuant to Section 12(b) of the Act: Common stock, $0.01 par value per share listed on the New York Stock Exchange.
Securities registered pursuant to Section 12(g) of the Act: None.
Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act.
Yes þ No o
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 o No þ
Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes þ No o
Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for

such shorter period that the registrant was required to submit such files). Yes þ No o

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§229.405 of this chapter) is not contained herein, and will not be contained, to the best of 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. o

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

Large accelerated filer þ Accelerated filer o Non-accelerated filer o

Smaller reporting company o Emerging growth company o

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

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

The aggregate market value of the voting and non-voting common stock held by non-affiliates was approximately $47.5 billion based on the last sales price quoted as of June 29, 2018 on the New York Stock Exchange, the last business day of the registrant's most recently completed second fiscal quarter.

As of January 31, 2019, 417,614,487 shares of the registrant's common stock were outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

We intend to file with the Securities and Exchange Commission a definitive Proxy Statement for our Annual Meeting of Stockholders scheduled for April 30, 2019, at which directors will be elected. Portions of the 2019 Proxy Statement are incorporated by reference in Part III of this Form 10-K and are deemed to be a part of this report.

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CROSS-REFERENCE SHEET

The following table indicates the headings in the 2019 Proxy Statement where certain information required in Part III of this Form 10-K may be found.

| Form 10-K Item No. and Caption | | Heading in 2019 Proxy Statement |
|---|---|---|
| 10. | Directors, Executive Officers and Corporate Governance | Information Regarding the Board of Directors, Independent Directors, Audit Committee, Proposal No. 1 Election of Directors, Information Concerning Nominees and Other Directors, Identification of Executive Officers, Section 16(a) Beneficial Ownership Reporting Compliance, and Governance Documents and Codes of Ethics |
| 11. | Executive Compensation | Compensation Committee, Compensation Discussion and Analysis, Executive Compensation, Director Compensation, Pay Ratio Disclosure, and Certain Relationships and Related Transactions |
| 12. | Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters | Beneficial Ownership of Valero Securities and Equity Compensation Plan Information |
| 13. | Certain Relationships and Related Transactions, and Director Independence | Certain Relationships and Related Transactions and Independent Directors |
| 14. | Principal Accountant Fees and Services | KPMG LLP Fees and Audit Committee Pre-Approval Policy |

Copies of all documents incorporated by reference, other than exhibits to such documents, will be provided without charge to each person who receives a copy of this Form 10-K upon written request to Valero Energy Corporation, Attn: Secretary, P.O. Box 696000, San Antonio, Texas 78269-6000.

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The terms “Valero,” “we,” “our,” and “us,” as used in this report, may refer to Valero Energy Corporation, to one or more of its consolidated subsidiaries, or to all of them taken as a whole. In this Form 10-K, we make certain forward-looking statements, including statements regarding our plans, strategies, objectives, expectations, intentions, and resources under the safe harbor provisions of the Private Securities Litigation Reform Act of 1995. You should read our forward-looking statements together with our disclosures beginning on page 25 of this report under the heading: “CAUTIONARY STATEMENT FOR THE PURPOSE OF SAFE HARBOR PROVISIONS OF THE PRIVATE SECURITIES LITIGATION REFORM ACT OF 1995.”

PART I

ITEMS 1. and 2. BUSINESS AND PROPERTIES

OVERVIEW

We are a Fortune 500 company based in San Antonio, Texas. Our corporate offices are at One Valero Way, San Antonio, Texas, 78249, and our telephone number is (210) 345-2000. We were incorporated in Delaware in 1981 under the name Valero Refining and Marketing Company. We changed our name to Valero Energy Corporation on August 1, 1997. Our common stock trades on the New York Stock Exchange (NYSE) under the trading symbol “VLO.” On January 31, 2019, we had 10,261 employees.

We own 15 petroleum refineries located in the United States (U.S.), Canada, and the United Kingdom (U.K.) with a combined throughput capacity of approximately 3.1 million barrels per day (BPD). Our refineries produce conventional gasolines, premium gasolines, gasoline meeting the specifications of the California Air Resources Board (CARB), diesel, low-sulfur diesel, ultra-low-sulfur diesel, CARB diesel, other distillates, jet fuel, asphalt, petrochemicals, lubricants, and other refined petroleum products. We sell our refined petroleum products in both the wholesale rack and bulk markets, and approximately 7,000 outlets carry our brand names in the U.S., Canada, the U.K., and Ireland. We also own 14 ethanol plants in the Mid-Continent region of the U.S. with a combined production capacity of approximately 1.73 billion gallons per year. We sell our ethanol in the wholesale bulk market.

On January 10, 2019, we completed our acquisition of all of the outstanding publicly held common units of Valero Energy Partners LP (VLP) as described in Note 2 of Notes to Consolidated Financial Statements, which is incorporated herein by reference.

AVAILABLE INFORMATION

Our website address is www.valero.com. Information on our website is not part of this report. Our annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K, and other reports, as well as any amendments to those reports, filed with (or furnished to) the U.S. Securities and Exchange Commission (SEC) are available on our website (under “Investors”) free of charge, soon after we file or furnish such material. In this same location, we also post our corporate governance guidelines and other governance policies, codes of ethics, and the charters of the committees of our board of directors. These documents are available in print to any stockholder that makes a written request to Valero Energy Corporation, Attn: Secretary, P.O. Box 696000, San Antonio, Texas 78269-6000.

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VALERO'S OPERATIONS

As of December 31, 2018, we had three reportable segments as follows:

- Refining segment includes our refining operations, the associated marketing activities, and certain logistics assets, which are not owned by VLP, that support our refining operations;

- Ethanol segment includes our ethanol operations, the associated marketing activities, and logistics assets that support our ethanol operations; and

- VLP segment includes the operations of VLP, which is a limited partnership that owns logistics assets that provide transportation and terminaling services to our refining segment.

Financial information about these segments is presented in Note 17 of Notes to Consolidated Financial Statements, which is incorporated herein by reference.

Effective January 1, 2019, we revised our reportable segments to align with certain changes in how our chief operating decision maker manages and allocates resources to our business. Accordingly, we created a new reportable segment — renewable diesel — because of the growing importance of renewable fuels in the market and the growth of our investments in renewable fuels production. The renewable diesel segment includes the operations of Diamond Green Diesel Holdings LLC (DGD), our consolidated joint venture as discussed in Note 12 of Notes to Consolidated Financial Statements. The operations of DGD have been included in the refining segment through December 31, 2018, but were transferred from that segment on January 1, 2019. Also effective January 1, 2019, we no longer have a VLP segment, and we include the operations of VLP in our refining segment. This change was made because of the Merger Transaction with VLP, as defined and discussed in Note 2 of Notes to Consolidated Financial Statements, and the resulting change in how we manage VLP's operations. We no longer manage VLP as a business but as logistics assets that support the operations of our refining segment.

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REFINING

Refining Operations

As of December 31, 2018, our refining operations included 15 petroleum refineries in the U.S., Canada, and the U.K., with a combined total throughput capacity of approximately 3.1 million BPD. The following table presents the locations of these refineries and their approximate feedstock throughput capacities as of December 31, 2018.

| Refinery | Location | Throughput Capacity (a) (BPD) |
|---|---|---|
| U.S. Gulf Coast: | | |
| Port Arthur | Texas | 395,000 |
| Corpus Christi (b) | Texas | 370,000 |
| St. Charles | Louisiana | 340,000 |
| Texas City | Texas | 260,000 |
| Houston | Texas | 250,000 |
| Meraux | Louisiana | 135,000 |
| Three Rivers | Texas | 100,000 |
| | | 1,850,000 |
| U.S. Mid-Continent: | | |
| McKee | Texas | 200,000 |
| Memphis | Tennessee | 195,000 |
| Ardmore | Oklahoma | 90,000 |
| | | 485,000 |
| North Atlantic: | | |
| Pembroke | Wales, U.K. | 270,000 |
| Quebec City | Quebec, Canada | 235,000 |
| | | 505,000 |
| U.S. West Coast: | | |
| Benicia | California | 170,000 |
| Wilmington | California | 135,000 |
| | | 305,000 |
| Total | | 3,145,000 |

(a) "Throughput capacity" represents estimated capacity for processing crude oil, inter-mediates, and other feedstocks. Total estimated crude oil capacity is approximately 2.6 million BPD.

(b) Represents the combined capacities of two refineries – the Corpus Christi East and Corpus Christi West Refineries.

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Total Refining System

The following table presents the percentages of principal charges and yields (on a combined basis) for all of our refineries for 2018, during which period our total combined throughput volumes averaged approximately 3.0 million BPD.

| Combined Total Refining System Charges and Yields | |
|---|---|
| Charges: | |
| sour crude oil | 30% |
| sweet crude oil | 47% |
| residual fuel oil | 8 % |
| other feedstocks | 4 % |
| blendstocks | 11% |
| Yields: | |
| gasolines and blendstocks | 48% |
| distillates | 37% |
| other products (primarily includes petrochemicals, gas oils, No. 6 fuel oil, petroleum coke, sulfur and asphalt) | 15% |

U.S. Gulf Coast

The following table presents the percentages of principal charges and yields (on a combined basis) for the eight refineries in the U.S. Gulf Coast region for 2018, during which period total throughput volumes averaged approximately 1.8 million BPD.

| Combined U.S. Gulf Coast Region Charges and Yields | |
|---|---|
| Charges: | |
| sour crude oil | 40% |
| sweet crude oil | 33% |
| residual fuel oil | 11% |
| other feedstocks | 5 % |
| blendstocks | 11% |
| Yields: | |
| gasolines and blendstocks | 45% |
| distillates | 38% |
| other products (primarily includes petrochemicals, gas oils, No. 6 fuel oil, petroleum coke, sulfur and asphalt) | 17% |

Port Arthur Refinery. Our Port Arthur Refinery is located on the Texas Gulf Coast approximately 90 miles east of Houston. The refinery processes heavy sour crude oils and other feedstocks into gasoline, diesel, and jet fuel. The refinery receives crude oil by rail, marine docks, and pipelines. Finished products are distributed into the Colonial, Explorer, and other pipelines and across the refinery docks into ships and barges.

Corpus Christi East and West Refineries. Our Corpus Christi East and West Refineries are located on the Texas Gulf Coast along the Corpus Christi Ship Channel. The East Refinery processes sour crude oil, and the West Refinery processes sweet crude oil, sour crude oil, and residual fuel oil. The feedstocks are delivered by tanker and barge via deepwater docking facilities along the Corpus Christi Ship Channel, and West Texas or South Texas crude oil is delivered via pipelines. The refineries' physical locations allow for the transfer

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of various feedstocks and blending components between them. The refineries produce gasoline, aromatics, jet fuel, diesel, and asphalt. Truck racks service local markets for gasoline, diesel, jet fuels, liquefied petroleum gases, and asphalt. These and other finished products are also distributed by ship and barge across docks and third-party pipelines.

St. Charles Refinery. Our St. Charles Refinery is located approximately 25 miles west of New Orleans along the Mississippi River. The refinery processes sour crude oils and other feedstocks into gasoline and diesel. The refinery receives crude oil over docks and has access to the Louisiana Offshore Oil Port. Finished products are shipped over these docks and through our Parkway pipeline and the Bengal pipeline, which ultimately provide access to the Plantation and Colonial pipeline networks.

Texas City Refinery. Our Texas City Refinery is located southeast of Houston on the Houston Ship Channel. The refinery processes crude oils into gasoline, diesel, and jet fuel. The refinery receives its feedstocks by pipeline and by ship or barge via deepwater docking facilities along the Houston Ship Channel. The refinery uses ships and barges, as well as the Colonial, Explorer, and other pipelines for distribution of its products.

Houston Refinery. Our Houston Refinery is located on the Houston Ship Channel. It processes a mix of crude and intermediate oils into gasoline, jet fuel, and diesel. The refinery receives its feedstocks by tankers and barges at deepwater docking facilities along the Houston Ship Channel and by various interconnecting pipelines. The majority of its finished products are delivered to local, mid-continent U.S., and northeastern U.S. markets through various pipelines, including the Colonial and Explorer pipelines.

Meraux Refinery. Our Meraux Refinery is located approximately 15 miles southeast of New Orleans along the Mississippi River. The refinery processes sour and sweet crude oils into gasoline, diesel, jet fuel, and high sulfur fuel oil. The refinery receives crude oil at its dock and has access to the Louisiana Offshore Oil Port. Finished products are shipped from the refinery’s dock and through the Colonial pipeline. The refinery is located about 40 miles from our St. Charles Refinery, allowing for integration of feedstocks and refined petroleum product blending.

Three Rivers Refinery. Our Three Rivers Refinery is located in South Texas between Corpus Christi and San Antonio. It processes sweet crude oils into gasoline, distillates, and aromatics. The refinery has access to crude oil from West Texas and South Texas through third-party pipelines and trucks. The refinery distributes its refined petroleum products primarily through third-party pipelines.

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U.S. Mid-Continent

The following table presents the percentages of principal charges and yields (on a combined basis) for the three refineries in the U.S. Mid-Continent region for 2018, during which period total throughput volumes averaged approximately 466,000 BPD.

| Combined U.S. Mid-Continent Region Charges and Yields | |
|---|---|
| Charges: | |
| sour crude oil | 1 % |
| sweet crude oil | 91% |
| blendstocks | 8 % |
| Yields: | |
| gasolines and blendstocks | 55% |
| distillates | 36% |
| other products (primarily includes petrochemicals, gas oils, No. 6 fuel oil, and asphalt) | 9 % |

McKee Refinery. Our McKee Refinery is located in the Texas Panhandle. It processes primarily sweet crude oils into gasoline, diesel, jet fuels, and asphalt. The refinery has access to local and Permian Basin crude oil sources via third-party pipelines. Refined petroleum products are transported primarily via third-party pipelines and rail to markets in Texas, New Mexico, Arizona, Colorado, Oklahoma, and Mexico.

Memphis Refinery. Our Memphis Refinery is located in Tennessee along the Mississippi River. It processes primarily sweet crude oils. Most of its production is gasoline, diesel, and jet fuels. Crude oil supply is primarily from Cushing, Oklahoma over the Diamond pipeline, which began operations in November 2017. Crude oil can be received, along with other feedstocks, via barge. Most of the refinery's products are distributed via truck rack and barges.

Ardmore Refinery. Our Ardmore Refinery is located in Oklahoma, approximately 100 miles south of Oklahoma City. It processes sour and sweet crude oils into gasoline, diesel, and asphalt. The refinery predominantly receives Permian Basin and Cushing-sourced crude oil via third-party pipelines. Refined petroleum products are transported via rail, trucks, and the Magellan pipeline system.

North Atlantic

The following table presents the percentages of principal charges and yields (on a combined basis) for the two refineries in the North Atlantic region for 2018, during which period total throughput volumes averaged approximately 466,000 BPD.

| Combined North Atlantic Region Charges and Yields | |
|---|---|
| Charges: | |
| sweet crude oil | 81% |
| residual fuel oil | 7 % |
| blendstocks | 12% |
| Yields: | |
| gasoline and blendstocks | 45% |
| distillates | 42% |
| other products (primarily includes petrochemicals, gas oils, and No. 6 fuel oil) | 13% |

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Pembroke Refinery. Our Pembroke Refinery is located in the County of Pembrokeshire in southwest Wales, U.K. The refinery processes primarily sweet crude oils into gasoline, diesel, jet fuel, heating oil, and low-sulfur fuel oil. The refinery receives all of its feedstocks and delivers some of its products by ship and barge via deepwater docking facilities along the Milford Haven Waterway, with its remaining products being delivered through our Mainline pipeline system and by trucks.

Quebec City Refinery. Our Quebec City Refinery is located in Lévis, Canada (near Quebec City). It processes sweet crude oils into gasoline, diesel, jet fuel, heating oil, and low-sulfur fuel oil. The refinery receives crude oil by ship at its deepwater dock on the St. Lawrence River and by pipeline and ship from western Canada. The refinery transports its products through our pipeline from Quebec City to our terminal in Montreal and to various other terminals throughout eastern Canada by rail, ships, trucks, and third-party pipelines.

U.S. West Coast

The following table presents the percentages of principal charges and yields (on a combined basis) for the two refineries in the U.S. West Coast region for 2018, during which period total throughput volumes averaged approximately 282,000 BPD.

| Combined U.S. West Coast Region Charges and Yields | |
|---|---|
| Charges: | |
| sour crude oil | 66% |
| sweet crude oil | 9 % |
| other feedstocks | 12% |
| blendstocks | 13% |
| Yields: | |
| gasolines and blendstocks | 60% |
| distillates | 26% |
| other products (primarily includes gas oil, No. 6 fuel oil, petroleum coke, sulfur and asphalt) | 14% |

Benicia Refinery. Our Benicia Refinery is located northeast of San Francisco on the Carquinez Straits of San Francisco Bay. It processes sour crude oils into gasoline, diesel, jet fuel, and asphalt. Gasoline production is primarily California Reformulated Blendstock Gasoline for Oxygenate Blending (CARBOB), which meets CARB specifications when blended with ethanol. The refinery receives crude oil feedstocks via a marine dock and crude oil pipelines connected to a southern California crude oil delivery system. Most of the refinery's products are distributed via pipeline and truck rack into northern California markets.

Wilmington Refinery. Our Wilmington Refinery is located near Los Angeles, California. The refinery processes a blend of heavy and high-sulfur crude oils. The refinery produces CARBOB gasoline, diesel, CARB diesel, jet fuel, and asphalt. The refinery is connected by pipeline to marine terminals and associated dock facilities that move and store crude oil and other feedstocks. Refined petroleum products are distributed via pipeline systems to various third-party terminals in southern California, Nevada, and Arizona.

Feedstock Supply

Our crude oil feedstocks are purchased through a combination of term and spot contracts. Our term supply agreements are at market-related prices and are purchased directly or indirectly from various national oil companies as well as international and U.S. oil companies. The contracts generally permit the parties to amend the contracts (or terminate them), effective as of the next scheduled renewal date, by giving the other party proper notice within a prescribed period of time (e.g., 60 days, 6 months) before expiration of the

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current term. The majority of the crude oil purchased under our term contracts is purchased at the producer's official stated price (i.e., the "market" price established by the seller for all purchasers) and not at a negotiated price specific to us.

Marketing

Overview

We sell refined petroleum products in both the wholesale rack and bulk markets. These sales include refined petroleum products that are manufactured in our refining operations, as well as refined petroleum products purchased or received on exchange from third parties. Most of our refineries have access to marine transportation facilities and interconnect with common-carrier pipeline systems, allowing us to sell products in the U.S., Canada, the U.K., and other countries.

Wholesale Rack Sales

We sell our gasoline and distillate products, as well as other products, such as asphalt, lube oils, and natural gas liquids (NGLs), on a wholesale basis through an extensive rack marketing network. The principal purchasers of our refined petroleum products from terminal truck racks are wholesalers, distributors, retailers, and truck-delivered end users throughout the U.S., Canada, the U.K., Ireland, and Latin America through our operations in Peru and Mexico.

The majority of our rack volume is sold through unbranded channels. The remainder is sold to distributors and dealers that are members of the Valero-brand family that operate 5,335 branded sites in the U.S., 907 branded sites in the U.K. and Ireland, and 792 branded sites in Canada as of December 31, 2018. These sites are independently owned and are supplied by us under multi-year contracts. For branded sites, products are sold under the Valero®, Beacon®, Diamond Shamrock®, and Shamrock® brands in the U.S., the Texaco® brand in the U.K. and Ireland, and the Ultramar® brand in Canada.

Bulk Sales

We also sell our gasoline and distillate products, as well as other products, such as asphalt, petrochemicals, and NGLs, through bulk sales channels in the U.S. and international markets. Our bulk sales are made to various oil companies, traders, and bulk end-users, such as railroads, airlines, and utilities. Our bulk sales are transported primarily by pipeline, barges, and tankers to major tank farms and trading hubs.

We also enter into refined petroleum product exchange and purchase agreements. These agreements help minimize transportation costs, optimize refinery utilization, balance refined petroleum product availability, broaden geographic distribution, and provide access to markets not connected to our refined product pipeline systems. Exchange agreements provide for the delivery of refined petroleum products by us to unaffiliated companies at our and third-parties' terminals in exchange for delivery of a similar amount of refined petroleum products to us by these unaffiliated companies at specified locations. Purchase agreements involve our purchase of refined petroleum products from third parties with delivery occurring at specified locations.

Logistics

We own logistics assets (crude oil pipelines, refined petroleum product pipelines, terminals, tanks, marine docks, truck rack bays, and other assets) that support our refining operations, and these assets are not owned by VLP. See discussion of the VLP segment on page 10.

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ETHANOL

We own 14 ethanol plants with a combined ethanol production capacity of 1.73 billion gallons per year. Our ethanol plants are dry mill facilities[(a)] that process corn to produce ethanol, distillers grains, and corn oil[(b)]. We source our corn supply from local farmers and commercial elevators. Our facilities receive corn primarily by rail and truck. We publish on our website a corn bid for local farmers and cooperative dealers to facilitate corn supply transactions.

We sell our ethanol primarily to refiners and gasoline blenders under term and spot contracts in bulk markets such as New York, Chicago, the U.S. Gulf Coast, Florida, and the U.S. West Coast. We also export our ethanol into the global markets. We ship our dry distillers grains (DDGs) by truck or rail primarily to animal feed customers in the U.S. and Mexico. We also sell modified distillers grains locally at our plant sites, and corn oil by truck and rail. We distribute our ethanol through logistics assets, which include railcars owned by us.

The following table presents the locations of our ethanol plants, their approximate annual production capacities for ethanol (in millions of gallons) and DDGs (in tons), and their approximate annual corn processing capacities (in millions of bushels).

| State | City | Ethanol Production Capacity | Production of DDGs | Corn Processed |
|---|---|---|---|---|
| Indiana | Bluffton[(c)] | 115 | 302,000 | 40 |
| | Linden | 135 | 355,000 | 47 |
| | Mount Vernon | 100 | 263,000 | 35 |
| Iowa | Albert City | 135 | 355,000 | 47 |
| | Charles City | 140 | 368,000 | 49 |
| | Fort Dodge | 140 | 368,000 | 49 |
| | Hartley | 140 | 368,000 | 49 |
| | Lakota[(c)] | 110 | 289,000 | 38 |
| Michigan | Riga[(c)] | 55 | 145,000 | 19 |
| Minnesota | Welcome | 140 | 368,000 | 49 |
| Nebraska | Albion | 135 | 355,000 | 47 |
| Ohio | Bloomingburg | 135 | 355,000 | 47 |
| South Dakota | Aurora | 140 | 368,000 | 49 |
| Wisconsin | Jefferson | 110 | 352,000 | 41 |
| Total | | 1,730 | 4,611,000 | 606 |

The combined production of ethanol from our plants averaged 4.1 million gallons per day for 2018.

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(a) Ethanol is commercially produced using either the wet mill or dry mill process. Wet milling involves separating the grain kernel into its component parts (germ, fiber, protein, and starch) prior to fermentation. In the dry mill process, the entire grain kernel is ground into flour. The starch in the flour is converted to ethanol during the fermentation process, creating carbon dioxide and distillers grains.

(b) During fermentation, nearly all of the starch in the grain is converted into ethanol and carbon dioxide, while the remaining nutrients (proteins, fats, minerals, and vitamins) are concentrated to yield corn oil, modified distillers grains, or, after further drying, dried distillers grains. Distillers grains generally are an economical partial replacement for corn and soybeans in feeds for cattle, swine, and poultry. Corn oil is produced as fuel grade and feed grade (not for human consumption), and is sold primarily as a feedstock for biodiesel or renewable diesel production with a smaller percentage sold into animal feed markets.

(c) The Bluffton, Lakota, and Riga plants were acquired from two subsidiaries of Green Plains Inc. in November 2018. The annual ethanol, DDG production, and corn processing capacities for these ethanol plants were only applicable for November and December of 2018.

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VLP

VLP is a limited partnership that owns and operates crude oil and refined petroleum products pipeline and terminal systems in the U.S. Gulf Coast and U.S. Mid-Continent regions that provide transportation and terminaling services to our refining segment and are integral to the operations of our Ardmore, Corpus Christi East and West, Houston, McKee, Memphis, Meraux, Port Arthur, St. Charles, and Three Rivers Refineries.

The following table summarizes information with respect to VLP's pipelines:

| Pipeline | Diameter (inches) | Length (miles) | Throughput Capacity (thousand BPD) | Commodity | Associated Valero Refinery | Significant Third-party System Connections |
|---|---|---|---|---|---|---|
| Ardmore logistics system | | | | | | |
| Hewitt segment of Red River crude oil pipeline | 16 | 138 | 60[a] | crude oil | Ardmore | Plains Red River, Plains Cushing |
| Wynnewood refined products pipeline | 12 | 30 | 90 | refined petroleum products | Ardmore | Magellan Central |
| McKee logistics system | | | | | | |
| McKee crude system | multiple segments | 145 | 72 | crude oil | McKee | — |
| McKee products system | | | | | | |
| McKee to El Paso pipeline | 10 | 408 | 21[b] | refined petroleum products | McKee | — |
| SFPP pipeline connection | 16, 8 | 12 | 33[c] | refined petroleum products | McKee | Kinder Morgan SFPP System |
| Memphis logistics system[d] | | | | | | |
| Collierville crude system | | | | | | |
| Collierville pipeline | 10-20 | 52 | 210 | crude oil | Memphis | Capline; Diamond [e] |
| Memphis products system | | | | | | |
| Memphis Airport pipeline system | 6 | 11 | 20 | jet fuel | Memphis | Memphis International Airport |
| Shorthorn pipeline system | 14, 12 | 9 | 120 | refined petroleum products | Memphis | Exxon Memphis |
| Port Arthur logistics system | | | | | | |
| Lucas crude system | | | | | | |
| Lucas pipeline | 30 | 12 | 400 | crude oil | Port Arthur | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | Sunoco Logistics Nederland; Enterprise Beaumont; Cameron Highway; TransCanada Cushing MarketLink; Seaway |
| Nederland pipeline | 32 | 5 | 600 | crude oil | Port Arthur | Sunoco Logistics Nederland |
| Port Arthur products system | | | | | | |
| 12-10 pipeline | 12, 10 | 13 | 60 | refined petroleum products | Port Arthur | Sunoco Logistics MagTex; Enterprise TE Products, Enterprise Beaumont |
| 20-inch diesel pipeline | 20 | 3 | 216 | diesel | Port Arthur | Explorer; Colonial |
| 20-inch gasoline pipeline | 20 | 4 | 144 | gasoline | Port Arthur | Explorer; Colonial |
| St. Charles logistics system | | | | | | |
| Parkway pipeline | 16 | 140 | 110 | refined petroleum products | St. Charles | Plantation; Colonial |
| Three Rivers logistics system | | | | | | |
| Three Rivers crude system | 12 | 3 | 110 | crude oil | Three Rivers | Harvest Arrowhead; Plains Gardendale; EOG Eagle Ford West |

See notes on page 12.

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The following table summarizes information with respect to VLP's terminals:

| Terminal | Tank Storage Capacity (thousands of barrels) | Throughput Capacity (thousand BPD) | Commodity | Associated Valero Refinery | Significant Third-party System Connections |
|---|---|---|---|---|---|
| Ardmore logistics system | | | | | |
| Hewitt Station tanks | 300 | — | crude oil | Ardmore | Plains Red River |
| Wynnewood terminal | 180 | — | refined petroleum products | Ardmore | Magellan Central |
| Corpus Christi logistics system | | | | | |
| Corpus Christi East terminal | 6,241 | — | crude oil and refined petroleum products | Corpus Christi East | Eagle Ford Pipeline LLC; NuStar North Beach terminal, Eagle Ford pipelines & South Texas pipeline network |
| Corpus Christi West terminal | 3,835 | — | crude oil and refined petroleum products | Corpus Christi West | (same as Corpus Christi East terminal) |
| Houston logistics system | | | | | |
| Houston terminal | 3,642 | — | crude oil and refined petroleum products | Houston | HFOTCO; Magellan crude; Seaway; Kinder Morgan Pasadena & Galena Park; Magellan East Houston & Galena Park |
| McKee logistics system | | | | | |
| McKee crude system | | | | | |
| Various terminals | 240 | — | crude oil | McKee | — |
| McKee products system | | | | | |
| El Paso terminal | 166 [f] | — | refined petroleum products | McKee | Kinder Morgan SFPP System |
| El Paso terminal truck rack | — | 10 [g] | refined petroleum products | McKee | — |
| McKee terminal | 4,400 | — | crude oil and refined petroleum products | McKee | NuStar (several); NuStar/Phillips Denver |
| Memphis logistics system | | | | | |
| Collierville crude system | | | | | |
| Collierville terminal | 975 | — | crude oil | Memphis | Capline |
| St. James crude tank | 330 | — | crude oil | Memphis | Capline |
| Memphis products system | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| Memphis truck rack | 8 | 110 | refined petroleum products | Memphis | — |
| West Memphis terminal | 1,080 | — | refined petroleum products | Memphis | Exxon Memphis; Enterprise TE Products |
| West Memphis terminal dock | — | 4 (h) | refined petroleum products | Memphis | — |
| West Memphis terminal truck rack | — | 50 | refined petroleum products | Memphis | — |
| Meraux logistics system | | | | | |
| Meraux terminal | 3,900 | — | crude oil and refined petroleum products | Meraux | LOOP; CAM; Plantation; Colonial |

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See notes on page 12.

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| Terminal | Tank Storage Capacity (thousands of barrels) | Throughput Capacity (thousand BPD) | Commodity | Associated Valero Refinery | Significant Third-party System Connections |
|---|---|---|---|---|---|
| Port Arthur logistics system | | | | | |
| Lucas crude system | | | | | |
| Lucas terminal | 1,915 | — | crude oil | Port Arthur | Sunoco Logistics Nederland; Enterprise Beaumont; Cameron Highway; TransCanada Cushing MarketLink; Seaway |
| Seaway connection | — | 750 | crude oil | Port Arthur | Seaway |
| TransCanada connection | — | 400 | crude oil | Port Arthur | TransCanada Cushing MarketLink |
| Port Arthur products system | | | | | |
| El Vista terminal | 1,210 | — | gasoline | Port Arthur | Explorer; Colonial |
| PAPS terminal | 1,144 | — | diesel | Port Arthur | Explorer; Colonial |
| Port Arthur terminal | 8,500 | — | crude oil and refined petroleum products | Port Arthur | Sunoco Logistics Nederland; Explorer; Colonial; Sunoco Logistics MagTex; Cameron Highway; TransCanada Cushing MarketLink; Enterprise Beaumont |
| St. Charles logistics system | | | | | |
| St. Charles terminal | 10,004 | — | crude oil and refined petroleum products | St. Charles | LOOP; CAM; Plantation; Colonial |
| Diamond Green Diesel tank | 180 | | renewable diesel | n/a | n/a |
| Three Rivers logistics system | | | | | |
| Three Rivers terminal | 2,250 | — | crude oil and refined petroleum products | Three Rivers | NuStar South Texas; Harvest Arrowhead; Plains Gardendale; EOG Eagle Ford West |

(a) Capacity shown represents VLP's 40 percent undivided interest in the pipeline segment. Total capacity for the pipeline segment is 150,000 BPD.

(b) Capacity shown represents VLP's 33 percent undivided interest in the pipeline. Total capacity for the pipeline is 63,000 BPD.

(c) Capacity shown represents VLP's 33 percent undivided interest in the pipeline connection. Total capacity for the pipeline connection is 98,400 BPD.

(d)

Portions of VLP's Memphis logistics system pipelines are owned by Memphis Light, Gas and Water (MLGW), but they are operated and maintained exclusively by VLP under long-term arrangements with MLGW.

(e) The Diamond pipeline is owned 50 percent by Valero and 50 percent by Plains All American Pipeline, L.P.

(f) Capacity shown represents VLP's 33 percent undivided interest in the terminal. Total storage capacity is 499,000 barrels.

(g) Capacity shown represents VLP's 33 percent undivided interest in the truck rack. Total capacity is 30,000 BPD.

(h) Dock throughput is reflected in thousands of barrels per hour.

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ENVIRONMENTAL MATTERS

We incorporate by reference into this Item the environmental disclosures contained in the following sections of this report:

- Item 1A, “Risk Factors”—Compliance with and changes in environmental laws, including proposed climate change laws and regulations, could adversely affect our performance;
- Item 1A, “Risk Factors”—Compliance with the U.S. Environmental Protection Agency Renewable Fuel Standard could adversely affect our performance;
- Item 1A, “Risk Factors”—We may incur additional costs as a result of our use of rail cars for the transportation of crude oil and the products that we manufacture;
- Item 3, “Legal Proceedings” under the caption “Environmental Enforcement Matters,” and;
- Item 8, “Financial Statements and Supplementary Data” in Note 8 of Notes to Consolidated Financial Statements and Note 10 of Notes to Consolidated Financial Statements under the caption “Environmental Matters.”

Capital Expenditures Attributable to Compliance with Environmental Regulations. In 2018, our capital expenditures attributable to compliance with environmental regulations were $270 million, and they are currently estimated to be $170 million for 2019 and $15 million for 2020. The estimates for 2019 and 2020 do not include amounts related to capital investments at our facilities that management has deemed to be strategic investments. These amounts could materially change as a result of governmental and regulatory actions.

PROPERTIES

Our principal properties are described above under the caption “Valero’s Operations,” and that information is incorporated herein by reference. We believe that our properties and facilities are generally adequate for our operations and that our facilities are maintained in a good state of repair. As of December 31, 2018, we were the lessee under a number of cancelable and noncancelable leases for certain properties. Our leases are discussed in Notes 9 and 10 of Notes to Consolidated Financial Statements. Financial information about our properties is presented in Note 6 of Notes to Consolidated Financial Statements and is incorporated herein by reference.

Our patents relating to our refining operations are not material to us as a whole. The trademarks and tradenames under which we conduct our branded wholesale business — Valero®, Diamond Shamrock®, Shamrock®, Ultramar®, Beacon®, and Texaco®— and other trademarks employed in the marketing of refined petroleum products are integral to our wholesale rack marketing operations.

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ITEM 1A. RISK FACTORS

You should carefully consider the following risk factors in addition to the other information included in this report. Each of these risk factors could adversely affect our business, operating results, and/or financial condition, as well as adversely affect the value of an investment in our common stock.

Our financial results are affected by volatile refining margins, which are dependent upon factors beyond our control, including the price of crude oil and the market price at which we can sell refined petroleum products.

Our financial results are primarily affected by the relationship, or margin, between refined petroleum product prices and the prices for crude oil and other feedstocks. Historically, refining margins have been volatile, and we believe they will continue to be volatile in the future. Our cost to acquire feedstocks and the price at which we can ultimately sell refined petroleum products depend upon several factors beyond our control, including regional and global supply of and demand for crude oil, gasoline, diesel, and other feedstocks and refined petroleum products. These in turn depend on, among other things, the availability and quantity of imports, the production levels of U.S. and international suppliers, levels of refined petroleum product inventories, productivity and growth (or the lack thereof) of U.S. and global economies, U.S. relationships with foreign governments, political affairs, and the extent of governmental regulation.

Some of these factors can vary by region and may change quickly, adding to market volatility, while others may have longer-term effects. The longer-term effects of these and other factors on refining and marketing margins are uncertain. We do not produce crude oil and must purchase all of the crude oil we refine. We may purchase our crude oil and other refinery feedstocks long before we refine them and sell the refined petroleum products. Price level changes during the period between purchasing feedstocks and selling the refined petroleum products from these feedstocks could have a significant effect on our financial results. A decline in market prices may negatively impact the carrying value of our inventories.

Economic turmoil and political unrest or hostilities, including the threat of future terrorist attacks, could affect the economies of the U.S. and other countries. Lower levels of economic activity could result in declines in energy consumption, including declines in the demand for and consumption of our refined petroleum products, which could cause our revenues and margins to decline and limit our future growth prospects.

Refining margins are also significantly impacted by additional refinery conversion capacity through the expansion of existing refineries or the construction of new refineries. Worldwide refining capacity expansions may result in refining production capability exceeding refined petroleum product demand, which would have an adverse effect on refining margins.

A significant portion of our profitability is derived from the ability to purchase and process crude oil feedstocks that historically have been cheaper than benchmark crude oils, such as Louisiana Light Sweet (LLS) and Brent crude oils. These crude oil feedstock differentials vary significantly depending on overall economic conditions and trends and conditions within the markets for crude oil and refined petroleum products, and they could decline in the future, which would have a negative impact on our results of operations.

Compliance with and changes in environmental laws, including proposed climate change laws and regulations, could adversely affect our performance.

The principal environmental risks associated with our operations are emissions into the air and releases into the soil, surface water, or groundwater. Our operations are subject to extensive environmental laws and regulations, including those relating to the discharge of materials into the environment, waste management,

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pollution prevention measures, greenhouse gas (GHG) emissions, and characteristics and composition of fuels, including gasoline and diesel. Certain of these laws and regulations could impose obligations to conduct assessment or remediation efforts at our facilities as well as at formerly owned properties or third-party sites where we have taken wastes for disposal or where our wastes have migrated. Environmental laws and regulations also may impose liability on us for the conduct of third parties, or for actions that complied with applicable requirements when taken, regardless of negligence or fault. If we violate or fail to comply with these laws and regulations, we could be fined or otherwise sanctioned.

Because environmental laws and regulations are becoming more stringent and new environmental laws and regulations are continuously being enacted or proposed, such as those relating to GHG emissions and climate change, the level of expenditures required for environmental matters could increase in the future. Current and future legislative action and regulatory initiatives could result in changes to operating permits, material changes in operations, increased capital expenditures and operating costs, increased costs of the goods we sell, and decreased demand for our products that cannot be assessed with certainty at this time. We may be required to make expenditures to modify operations, discontinue use of certain process units, or install pollution control equipment that could materially and adversely affect our business, financial condition, results of operations, and liquidity.

For example, the International Maritime Organization (IMO) will be implementing a new regulation for a global sulphur cap for marine bunker fuels by the year 2020 (IMO 2020). Under the IMO 2020 cap, vessels will be required to use marine fuels with a sulphur content of no more than 0.50 percent beginning in January 2020, versus the current sulphur limit of 3.50 percent. While there are many uncertainties, IMO 2020 could affect our business by creating the continued need for new and updated process units necessary to produce the low sulphur marine fuel, and could increase the costs of our products.

In addition, in 2015, the U.S., Canada, and the U.K. participated in the United Nations Conference on Climate Change, which led to the creation of the Paris Agreement. The Paris Agreement, which was signed by the U.S. in April 2016, requires countries to review and “represent a progression” in their intended nationally determined contributions (which set GHG emission reduction goals) every five years beginning in 2020. While the current U.S. administration announced its intent to withdraw from the Paris Agreement in June 2017, under the agreement’s terms the earliest the U.S. can withdraw is 2020. There are no guarantees that the agreement will not be re-implemented in the U.S., or re-implemented in part by specific U.S. states or local governments. However, the Paris Agreement could still affect our operations in Canada, the U.K., Ireland, and Latin America. Restrictions on emissions of methane or carbon dioxide that have been or may be imposed in various U.S. states, at the U.S. federal level, or in other countries could adversely affect the oil and gas industry.

Severe weather events may have an adverse effect on our assets and operations.

Some members within the scientific community believe that the increasing concentrations of greenhouse gas emissions in the Earth’s atmosphere, among other reasons, may produce climate changes that have significant physical effects, such as increased frequency and severity of storms, droughts and floods and other climatic events. If any such climatic events were to occur, they could have an adverse effect on our assets and operations.

Compliance with the U.S. Environmental Protection Agency Renewable Fuel Standard could adversely affect our performance.

The U.S. Environmental Protection Agency (EPA) has implemented a Renewable Fuel Standard (RFS) pursuant to the Energy Policy Act of 2005 and the Energy Independence and Security Act of 2007. The RFS program sets annual quotas for the quantity of renewable fuels (such as ethanol) that must be blended into

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transportation fuels consumed in the U.S. A Renewable Identification Number (RIN) is assigned to each gallon of renewable fuel produced in or imported into the U.S. As a producer of petroleum-based transportation fuels, we are obligated to blend renewable fuels into the products we produce at a rate that is at least commensurate to the U.S. EPA's quota and, to the extent we do not, we must purchase RINs in the open market to satisfy our obligation under the RFS program.

We are exposed to the volatility in the market price of RINs. We cannot predict the future prices of RINs. RINs prices are dependent upon a variety of factors, including U.S. EPA regulations, the availability of RINs for purchase, and levels of transportation fuels produced, which can vary significantly from quarter to quarter. If sufficient RINs are unavailable for purchase or if we have to pay a significantly higher price for RINs, or if we are otherwise unable to meet the U.S. EPA's RFS mandates, our results of operations and cash flows could be adversely affected.

Disruption of our ability to obtain crude oil could adversely affect our operations.

A significant portion of our feedstock requirements is satisfied through supplies originating in the Middle East, Africa, Asia, North America, and South America. We are, therefore, subject to the political, geographic, and economic risks attendant to doing business with suppliers located in, and supplies originating from, these areas. If one or more of our supply contracts were terminated, or if political events disrupt our traditional crude oil supply, we believe that adequate alternative supplies of crude oil would be available, but it is possible that we would be unable to find alternative sources of supply. If we are unable to obtain adequate crude oil volumes or are able to obtain such volumes only at unfavorable prices, our results of operations could be materially adversely affected, including reduced sales volumes of refined petroleum products or reduced margins as a result of higher crude oil costs.

In addition, the U.S. government can prevent or restrict us from doing business in or with other countries. These restrictions, and those of other governments, could limit our ability to gain access to business opportunities in various countries. Actions by both the U.S. and other countries have affected our operations in the past and will continue to do so in the future.

Any attempt by the U.S. government to withdraw from or materially modify existing international trade agreements could adversely affect our business, financial condition and results of operations.

The current U.S. administration has questioned certain existing and proposed trade agreements. For example, the administration has withdrawn the U.S. from the Trans-Pacific Partnership, and has indicated that the administration may withdraw the U.S. from the North American Free Trade Agreement (NAFTA) in order to encourage the U.S. Congress to vote on ratification of the United States-Mexico-Canada Agreement (USMCA), which was signed in November 2018 and is intended to be the successor to NAFTA. In addition, the administration has implemented and proposed various trade tariffs, which have resulted in foreign governments responding with tariffs on U.S. goods.

Changes in U.S. social, political, regulatory and economic conditions or in laws and policies governing foreign trade, manufacturing, development and investment could adversely affect our business. For example, the imposition of tariffs or other trade barriers with other countries could affect our ability to obtain feedstocks from international sources, increase our costs and reduce the competitiveness of our products.

While there is currently a lack of certainty around the likelihood, timing, and details of any such policies and reforms, if the current U.S. administration takes action to withdraw from, or materially modify, existing international trade agreements, our business, financial condition and results of operations could be adversely affected.

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We are subject to interruptions and increased costs as a result of our reliance on third-party transportation of crude oil and the products that we manufacture.

We use the services of third parties to transport feedstocks to our facilities and to transport the products we manufacture to market. If we experience prolonged interruptions of supply or increases in costs to deliver our products to market, or if the ability of the pipelines, vessels, or railroads to transport feedstocks or products is disrupted because of weather events, accidents, derailment, collision, fire, explosion, governmental regulations, or third-party actions, it could have a material adverse effect on our financial position, results of operations, and liquidity.

We may incur additional costs as a result of our use of rail cars for the transportation of crude oil and the products that we manufacture.

We currently use rail cars for the transportation of some feedstocks to certain of our facilities and for the transportation of some of the products we manufacture to their markets. We own and lease rail cars for our operations. Rail transportation is subject to a variety of federal, state, and local regulations. New laws and regulations, and changes in existing laws and regulations, are frequently enacted or proposed, and could result in increased expenditures for compliance, either directly through costs for our owned and leased rail assets, or as passed along to us by rail carriers and operators. For example, in the past several years, the Department of Transportation, the Pipeline and Hazardous Materials Safety Administration, and the Federal Railroad Administration have issued orders and rules, pursuant to the Rail Safety Improvement Act of 2008, Fixing America's Surface Transportation Act of 2015 and other statutory authorities, concerning such matters as enhanced tank car standards, operational controls, safety training programs, and notification requirements. While some recent actions have provided some regulatory relief, the general trend has been toward greater regulation. We do not believe these orders and rules will have a material impact on our financial position, results of operations, and liquidity, although further changes in law, regulations or industry standards could require us to incur additional costs to the extent they are applicable to us.

Competitors that produce their own supply of feedstocks, own their own retail sites, have greater financial resources, or provide alternative energy sources may have a competitive advantage.

The refining and marketing industry is highly competitive with respect to both feedstock supply and refined petroleum product markets. We compete with many companies for available supplies of crude oil and other feedstocks and for sites for our refined petroleum products. We do not produce any of our crude oil feedstocks and, following the separation of our retail business in 2013, we do not have a company-owned retail network. Many of our competitors, however, obtain a significant portion of their feedstocks from company-owned production and some have extensive retail sites. Such competitors are at times able to offset losses from refining operations with profits from producing or retailing operations, and may be better positioned to withstand periods of depressed refining margins or feedstock shortages.

Some of our competitors also have materially greater financial and other resources than we have. Such competitors have a greater ability to bear the economic risks inherent in all phases of our industry. In addition, we compete with other industries that provide alternative means to satisfy the energy and fuel requirements of our industrial, commercial, and individual consumers.

Uncertainty and illiquidity in credit and capital markets can impair our ability to obtain credit and financing on acceptable terms, and can adversely affect the financial strength of our business partners.

Our ability to obtain credit and capital depends in large measure on capital markets and liquidity factors that we do not control. Our ability to access credit and capital markets may be restricted at a time when we would like, or need, to access those markets, which could have an impact on our flexibility to react to changing economic and business conditions. In addition, the cost and availability of debt and equity financing may

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be adversely impacted by unstable or illiquid market conditions. Protracted uncertainty and illiquidity in these markets also could have an adverse impact on our lenders, commodity hedging counterparties, or our customers, causing them to fail to meet their obligations to us. In addition, decreased returns on pension fund assets may also materially increase our pension funding requirements.

Our access to credit and capital markets also depends on the credit ratings assigned to our debt by independent credit rating agencies. We currently maintain investment-grade ratings by Standard & Poor's Ratings Services, Moody's Investors Service, and Fitch Ratings on our senior unsecured debt. Ratings from credit agencies are not recommendations to buy, sell, or hold our securities. Each rating should be evaluated independently of any other rating. We cannot provide assurance that any of our current ratings will remain in effect for any given period of time or that a rating will not be lowered or withdrawn entirely by a rating agency if, in its judgment, circumstances so warrant. Specifically, if ratings agencies were to downgrade our long-term rating, particularly below investment grade, our borrowing costs would increase, which could adversely affect our ability to attract potential investors and our funding sources could decrease. In addition, we may not be able to obtain favorable credit terms from our suppliers or they may require us to provide collateral, letters of credit, or other forms of security, which would increase our operating costs. As a result, a downgrade below investment grade in our credit ratings could have a material adverse impact on our financial position, results of operations, and liquidity.

From time to time, our cash needs may exceed our internally generated cash flow, and our business could be materially and adversely affected if we were unable to obtain necessary funds from financing activities. From time to time, we may need to supplement our cash generated from operations with proceeds from financing activities. We have existing revolving credit facilities, committed letter of credit facilities, and an accounts receivable sales facility to provide us with available financing to meet our ongoing cash needs. In addition, we rely on the counterparties to our derivative instruments to fund their obligations under such arrangements. Uncertainty and illiquidity in financial markets may materially impact the ability of the participating financial institutions and other counterparties to fund their commitments to us under our various financing facilities or our derivative instruments, which could have a material adverse effect on our financial position, results of operations, and liquidity.

A significant interruption in one or more of our refineries could adversely affect our business.

Our refineries are our principal operating assets. As a result, our operations could be subject to significant interruption if one or more of our refineries were to experience a major accident or mechanical failure, be damaged by severe weather or other natural or man-made disaster, such as an act of terrorism, or otherwise be forced to shut down. If any refinery were to experience an interruption in operations, earnings from the refinery could be materially adversely affected (to the extent not recoverable through insurance) because of lost production and repair costs. Significant interruptions in our refining system could also lead to increased volatility in prices for crude oil feedstocks and refined petroleum products, and could increase instability in the financial and insurance markets, making it more difficult for us to access capital and to obtain insurance coverage that we consider adequate.

A significant interruption related to our information technology systems could adversely affect our business.

Our information technology systems and network infrastructure may be subject to unauthorized access or attack, which could result in (i) a loss of intellectual property, proprietary information, or employee, customer or vendor data; (ii) public disclosure of sensitive information; (iii) increased costs to prevent, respond to, or mitigate cybersecurity events, such as deploying additional personnel and protection technologies, training employees, and engaging third-party experts and consultants; (iv) systems interruption; (v) disruption of our business operations; (vi) remediation costs for repairs of system damage; (vii) reputational damage that

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adversely affects customer or investor confidence; and (viii) damage to our competitiveness, stock price, and long-term stockholder value. A breach could also originate from, or compromise, our customers' and vendors' or other third-party networks outside of our control. A breach may also result in legal claims or proceedings against us by our shareholders, employees, customers, vendors, and governmental authorities (U.S. and non-U.S.). There can be no assurance that our infrastructure protection technologies and disaster recovery plans can prevent a technology systems breach or systems failure, which could have a material adverse effect on our financial position or results of operations. Furthermore, the continuing and evolving threat of cyber-attacks has resulted in increased regulatory focus on prevention. To the extent we face increased regulatory requirements, we may be required to expend significant additional resources to meet such requirements.

In addition, new laws and regulations governing data privacy and the unauthorized disclosure of confidential information, including the European Union General Data Protection Regulation and recent California legislation, pose increasingly complex compliance challenges and potentially elevate our costs. Any failure by us to comply with these laws and regulations, including as a result of a security or privacy breach, could result in significant penalties and liabilities for us. Additionally, if we acquire a company that has violated or is not in compliance with applicable data protection laws, we may incur significant liabilities and penalties as a result.

Our business may be negatively affected by work stoppages, slowdowns or strikes by our employees, as well as new labor legislation issued by regulators.

Workers at some of our refineries are covered by collective bargaining or similar agreements. To the extent we are in negotiations for labor agreements expiring in the future, there is no assurance an agreement will be reached without a strike, work stoppage, or other labor action. Any prolonged strike, work stoppage, or other labor action could have an adverse effect on our financial condition or results of operations. In addition, future federal, state, or foreign labor legislation could result in labor shortages and higher costs, especially during critical maintenance periods.

We are subject to operational risks and our insurance may not be sufficient to cover all potential losses arising from operating hazards. Failure by one or more insurers to honor its coverage commitments for an insured event could materially and adversely affect our financial position, results of operations, and liquidity.

Our operations are subject to various hazards common to the industry, including explosions, fires, toxic emissions, maritime hazards, and natural catastrophes. As protection against these hazards, we maintain insurance coverage against some, but not all, potential losses and liabilities. We may not be able to maintain or obtain insurance of the type and amount we desire at reasonable rates. As a result of market conditions, premiums and deductibles for certain of our insurance policies could increase substantially. In some instances, certain insurance could become unavailable or available only for reduced amounts of coverage. For example, coverage for hurricane damage is very limited, and coverage for terrorism risks includes very broad exclusions. If we were to incur a significant liability for which we were not fully insured, it could have a material adverse effect on our financial position, results of operations, and liquidity.

Our insurance program includes a number of insurance carriers. Significant disruptions in financial markets could lead to a deterioration in the financial condition of many financial institutions, including insurance companies. We can make no assurances that we will be able to obtain the full amount of our insurance coverage for insured events.

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Large capital projects can take many years to complete, and market conditions could deteriorate over time, negatively impacting project returns.

We may engage in capital projects based on the forecasted project economics and level of return on the capital to be employed in the project. Large-scale projects take many years to complete, and market conditions can change from our forecast. As a result, we may be unable to fully realize our expected returns, which could negatively impact our financial condition, results of operations, and cash flows.

Compliance with and changes in tax laws could adversely affect our performance.

We are subject to extensive tax liabilities imposed by multiple jurisdictions, including income taxes, indirect taxes (excise/duty, sales/use, gross receipts, and value-added taxes), payroll taxes, franchise taxes, withholding taxes, and ad valorem taxes. New tax laws and regulations and changes in existing tax laws and regulations are continuously being enacted or proposed that could result in increased expenditures for tax liabilities in the future. Many of these liabilities are subject to periodic audits by the respective taxing authority. Subsequent changes to our tax liabilities as a result of these audits may subject us to interest and penalties.

On December 22, 2017, tax legislation commonly known as the Tax Cuts and Jobs Act of 2017 (Tax Reform) was enacted. Among other things, Tax Reform reduces the U.S. corporate income tax rate from 35 percent to 21 percent and implements a new system of taxation for non-U.S. earnings, including by imposing a one-time tax on the deemed repatriation of undistributed earnings of non-U.S. subsidiaries. Tax Reform also generally will (i) limit our annual deductions for interest expense to no more than 30 percent of our “adjusted taxable income” (plus 100 percent of our business interest income) for the year and (ii) permit us to offset only 80 percent (rather than 100 percent) of our taxable income with any net operating losses we generate after 2017. We have evaluated the effects of Tax Reform, including the one-time deemed repatriation tax and the re-measurement of our deferred tax assets and liabilities, and the provisions of Tax Reform, taken as a whole, did not have an adverse impact on our cash tax liabilities, results of operations, or financial condition. We have used reasonable interpretations and assumptions in applying Tax Reform, but it is possible that the Internal Revenue Service (IRS) could issue subsequent guidance or take positions on audit that differ from our prior interpretations and assumptions, which could adversely impact our cash tax liabilities, results of operations, and financial condition.

We may incur losses and additional costs as a result of our forward-contract activities and derivative transactions.

We currently use commodity derivative instruments, and we expect to continue their use in the future. If the instruments we use to hedge our exposure to various types of risk are not effective, we may incur losses. In addition, we may be required to incur additional costs in connection with future regulation of derivative instruments to the extent it is applicable to us.

Changes in the method of determining the London Interbank Offered Rate (LIBOR), or the replacement of LIBOR with an alternative reference rate, may adversely affect interest rates.

On July 27, 2017, the Financial Conduct Authority (FCA) in the U.K. announced that it would phase out LIBOR as a benchmark by the end of 2021. It is unclear whether new methods of calculating LIBOR will be established such that it continues to exist after 2021, or whether different benchmark rates used to price indebtedness will develop. In the future, we may need to renegotiate our revolving credit facility (the Valero Revolver) or incur other indebtedness, and the phase-out of LIBOR may negatively impact the terms of such indebtedness. In addition, the overall financial market may be disrupted as a result of the phase-out or replacement of LIBOR. Disruption in the financial market could have a material adverse effect on our financial position, results of operations, and liquidity.

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Changes in the U.K.'s economic and other relationships with the European Union could adversely affect us.
In June 2016, the U.K. elected to withdraw from the European Union in a national referendum (Brexit). Withdrawal negotiations have yet to produce an overall structure for an ongoing relationship between the U.K. and the European Union following Brexit. The ongoing uncertainty and potential imposition of border controls and customs duties on trade as a result of Brexit could negatively impact our competitive position, supplier and customer relationships, and financial performance. The ultimate effects of Brexit will depend on the specific terms of any agreement reached by the U.K. and the European Union.

ITEM 1B. UNRESOLVED STAFF COMMENTS
None.
ITEM 3. LEGAL PROCEEDINGS

LITIGATION

We incorporate by reference into this Item our disclosures made in Part II, Item 8 of this report included in Note 1 of Notes to Consolidated Financial Statements under the caption "Legal Contingencies."

ENVIRONMENTAL ENFORCEMENT MATTERS

While it is not possible to predict the outcome of the following environmental proceedings, if any one or more of them were decided against us, we believe that there would be no material effect on our financial position, results of operations, or liquidity. We are reporting these proceedings to comply with SEC regulations, which require us to disclose certain information about proceedings arising under federal, state, or local provisions regulating the discharge of materials into the environment or protecting the environment if we reasonably believe that such proceedings will result in monetary sanctions of $100,000 or more.

U.S. EPA (Fuels). We have an outstanding Notice of Violation (NOV) from the U.S. EPA related to violations from a 2015 Mobile Source Inspection. We are working with the EPA to resolve this matter.

Bay Area Air Quality Management District (BAAQMD) (Benicia Refinery). We have outstanding Violation Notices (VNs) issued by the BAAQMD from 2017 to present. These VNs are for various alleged air regulation and air permit violations at our Benicia Refinery and asphalt plant. We are working with the BAAQMD to resolve the VNs.

South Coast Air Quality Management District (SCAQMD) (Wilmington Refinery). We have outstanding NOVs issued by the SCAQMD. These NOVs are for alleged reporting violations and excess emissions at our Wilmington Refinery. We are working with the SCAQMD to resolve these NOVs.

Texas Commission on Environmental Quality (TCEQ) (McKee Refinery). We have a proposed Agreed Order in the amount of $121,314 from the TCEQ as an administrative penalty for alleged excess emissions at our McKee Refinery. We are working with the TCEQ to resolve this matter.

TCEQ (Port Arthur). We have an outstanding Notice of Enforcement (NOE) from the TCEQ alleging unauthorized emissions associated with a November 18, 2017 release of crude oil from the 24-inch fill pipe of Tank T-285. We are working with the TCEQ to resolve this matter.

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TCEQ and Harris County Pollution Control Services Department (HCPCS) (Houston Terminal). We have an outstanding NOE from the TCEQ and an outstanding VN from the HCPCS alleging excess emissions from Tank 003 that occurred during Hurricane Harvey. We are working with the pertinent authorities to resolve these matters.

ITEM 4. MINE SAFETY DISCLOSURES
None.

PART II

ITEM 5. MARKET FOR REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES

Our common stock trades on the NYSE under the trading symbol "VLO."

As of January 31, 2019, there were 5,271 holders of record of our common stock.

Dividends are considered quarterly by the board of directors, may be paid only when approved by the board, and will depend on our financial condition, results of operations, cash flows, prospects, industry conditions, capital requirements, and other factors and restrictions our board deems relevant. There can be no assurance that we will pay a dividend at the rates we have paid historically, or at all, in the future.

The following table discloses purchases of shares of our common stock made by us or on our behalf during the fourth quarter of 2018.

| Period | Total Number of Shares Purchased | Average Price Paid per Share | Total Number of Shares Not Purchased as Part of Publicly Announced Plans or Programs (a) | Total Number of Shares Purchased as Part of Publicly Announced Plans or Programs | Approximate Dollar Value of Shares that May Yet Be Purchased Under the Plans or Programs (b) |
|---|---|---|---|---|---|
| October 2018 | 939,957 | $ 87.23 | 8,826 | 931,131 | $2.7 billion |
| November 2018 | 3,655,945 | $ 87.39 | 216,469 | 3,439,476 | $2.4 billion |
| December 2018 | 3,077,364 | $ 73.43 | 4,522 | 3,072,842 | $2.2 billion |
| Total | 7,673,266 | $ 81.77 | 229,817 | 7,443,449 | $2.2 billion |

(a) The shares reported in this column represent purchases settled in the fourth quarter of 2018 relating to (i) our purchases of shares in open-market transactions to meet our obligations under stock-based compensation plans and (ii) our purchases of shares from our employees and non-employee directors in connection with the exercise of stock options, the vesting of restricted stock, and other stock compensation transactions in accordance with the terms of our stock-based compensation plans.

(b) On January 23, 2018, we announced that our board of directors authorized our purchase of up to $2.5 billion of our outstanding common stock (the 2018 Program), with no expiration date, which was in addition to the remaining amount available under a $2.5 billion program authorized on September 21, 2016 (the 2016 Program). During the fourth quarter of 2018, we completed our purchases under the 2016 Program. As of December 31, 2018, we had $2.2 billion remaining available for purchase under the 2018 Program.

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The following performance graph is not "soliciting material," is not deemed filed with the SEC, and is not to be incorporated by reference into any of Valero's filings under the Securities Act of 1933 or the Securities Exchange Act of 1934, as amended, respectively.

This performance graph and the related textual information are based on historical data and are not indicative of future performance. The following line graph compares the cumulative total return[(a)] on an investment in our common stock against the cumulative total return of the S&P 500 Composite Index and an index of peer companies (that we selected) for the five-year period commencing December 31, 2013 and ending December 31, 2018. Our peer group comprises the following eight companies: BP plc; CVR Energy, Inc.; Delek US Holdings, Inc.; HollyFrontier Corporation; Marathon Petroleum Corporation; PBF Energy Inc.; Phillips 66; and Royal Dutch Shell plc.

COMPARISON OF 5 YEAR CUMULATIVE TOTAL RETURN[(a)]
Among Valero Energy Corporation, the S&P 500 Index,
and Peer Group

| | As of December 31, | | | | | |
|---|---|---|---|---|---|---|
| | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
| Valero Common Stock | $100.00 | $100.24 | $147.15 | $148.30 | $207.60 | $174.97 |
| S&P 500 | 100.00 | 113.69 | 115.26 | 129.05 | 157.22 | 150.33 |
| Peer Group | 100.00 | 91.36 | 80.82 | 97.00 | 122.98 | 114.59 |

(a) Assumes that an investment in Valero common stock and each index was $100 on December 31, 2013. "Cumulative total return" is based on share price appreciation plus reinvestment of dividends from December 31, 2013 through December 31, 2018.

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ITEM 6. SELECTED FINANCIAL DATA

The selected financial data for the five-year period ended December 31, 2018 was derived from our audited financial statements. The following table should be read together with Item 7, “Management’s Discussion and Analysis of Financial Condition and Results of Operations” and with the historical financial statements and accompanying notes included in Item 8, “Financial Statements and Supplementary Data.”

The following summaries are in millions of dollars, except for per share amounts:

| | Year Ended December 31, | | | | |
|---|---|---|---|---|---|
| | 2018 | 2017 (a) | 2016 (b) | 2015 (c) | 2014 |
| Revenues | $117,033 | $93,980 | $75,659 | $87,804 | $130,844 |
| Income from continuing operations | 3,353 | 4,156 | 2,417 | 4,101 | 3,775 |
| Earnings per common share from continuing operations – assuming dilution | 7.29 | 9.16 | 4.94 | 7.99 | 6.97 |
| Dividends per common share | 3.20 | 2.80 | 2.40 | 1.70 | 1.05 |
| Total assets | 50,155 | 50,158 | 46,173 | 44,227 | 45,355 |
| Debt and capital lease obligations, less current portion | 8,871 | 8,750 | 7,886 | 7,208 | 5,747 |

(a) Includes the impact of Tax Reform that was enacted on December 22, 2017 and resulted in a net income tax benefit of $1.9 billion as described in Note 15 of Notes to Consolidated Financial Statements.

(b) Includes a noncash lower of cost or market inventory valuation reserve adjustment that resulted in a net benefit to our results of operations of $747 million as described in Note 5 of Notes to Consolidated Financial Statements.

(c) Includes a noncash lower of cost or market inventory valuation reserve adjustment that resulted in a net charge to our results of operations of $790 million.

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

The following review of our results of operations and financial condition should be read in conjunction with Item 1A, "Risk Factors," and Item 8, "Financial Statements and Supplementary Data," included in this report.

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

This report, including without limitation our disclosures below under the heading "OVERVIEW AND OUTLOOK," 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. You can identify our forward-looking statements by the words "anticipate," "believe," "expect," "plan," "intend," "scheduled," "estimate," "project," "projection," "predict," "budget," "forecast," "goal," "could," "would," "should," "will," "may," and similar expressions.

These forward-looking statements include, among other things, statements regarding:

- future refining segment margins, including gasoline and distillate margins;
- future ethanol segment margins;
- expectations regarding feedstock costs, including crude oil differentials, and operating expenses;
- anticipated levels of crude oil and refined petroleum product inventories;
- our anticipated level of capital investments, including deferred costs for refinery turnarounds and catalyst, capital expenditures for environmental and other purposes, and joint venture investments, and the effect of those capital investments on our results of operations;
- anticipated trends in the supply of and demand for crude oil and other feedstocks and refined petroleum products in the regions where we operate, as well as globally;
- expectations regarding environmental, tax, and other regulatory initiatives; and
- the effect of general economic and other conditions on refining, ethanol, and midstream industry fundamentals.

We based our forward-looking statements on our current expectations, estimates, and projections about ourselves and our industry. We caution that these statements are not guarantees of future performance and involve risks, uncertainties, and assumptions that we cannot predict. In addition, we based many of these forward-looking statements on assumptions about future events that may prove to be inaccurate. Accordingly, our actual results may differ materially from the future performance that we have expressed or forecast in the forward-looking statements. Differences between actual results and any future performance suggested in these forward-looking statements could result from a variety of factors, including the following:

- acts of terrorism aimed at either our facilities or other facilities that could impair our ability to produce or transport refined petroleum products or receive feedstocks;
- political and economic conditions in nations that produce crude oil or consume refined petroleum products;
- demand for, and supplies of, refined petroleum products such as gasoline, diesel, jet fuel, petrochemicals, and ethanol;
- demand for, and supplies of, crude oil and other feedstocks;
- the ability of the members of the Organization of Petroleum Exporting Countries to agree on and to maintain crude oil price and production controls;
- the level of consumer demand, including seasonal fluctuations;

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- refinery overcapacity or undercapacity;
- our ability to successfully integrate any acquired businesses into our operations;
- the actions taken by competitors, including both pricing and adjustments to refining capacity in response to market conditions;
- the level of competitors' imports into markets that we supply;
- accidents, unscheduled shutdowns, or other catastrophes affecting our refineries, machinery, pipelines, equipment, and information systems, or those of our suppliers or customers;
- changes in the cost or availability of transportation for feedstocks and refined petroleum products;
- the price, availability, and acceptance of alternative fuels and alternative-fuel vehicles;
- the levels of government subsidies for alternative fuels;
- the volatility in the market price of biofuel credits (primarily RINs needed to comply with the RFS) and GHG emission credits needed to comply with the requirements of various GHG emission programs;
- delay of, cancellation of, or failure to implement planned capital projects and realize the various assumptions and benefits projected for such projects or cost overruns in constructing such planned capital projects;
- earthquakes, hurricanes, tornadoes, and irregular weather, which can unforeseeably affect the price or availability of natural gas, crude oil, grain and other feedstocks, and refined petroleum products and ethanol;
- rulings, judgments, or settlements in litigation or other legal or regulatory matters, including unexpected environmental remediation costs, in excess of any reserves or insurance coverage;
- legislative or regulatory action, including the introduction or enactment of legislation or rulemakings by governmental authorities, including tariffs and tax and environmental regulations, such as those implemented under the California cap-and-trade system (also known as AB 32) and similar programs, and the U.S. EPA's regulation of GHGs, which may adversely affect our business or operations;
- changes in the credit ratings assigned to our debt securities and trade credit;
- changes in currency exchange rates, including the value of the Canadian dollar, the pound sterling, the euro, the Mexican peso, and the Peruvian sol relative to the U.S. dollar;
- overall economic conditions, including the stability and liquidity of financial markets; and
- other factors generally described in the "Risk Factors" section included in Item 1A, "Risk Factors" in this report.

Any one of these factors, or a combination of these factors, could materially affect our future results of operations and whether any forward-looking statements ultimately prove to be accurate. Our forward-looking statements are not guarantees of future performance, and actual results and future performance may differ materially from those suggested in any forward-looking statements. We do not intend to update these statements unless we are required by the securities laws to do so.

All subsequent written and oral forward-looking statements attributable to us or persons acting on our behalf are expressly qualified in their entirety by the foregoing. We undertake no obligation to publicly release any revisions to any such forward-looking statements that may be made to reflect events or circumstances after the date of this report or to reflect the occurrence of unanticipated events.

This report includes references to financial measures that are not defined under U.S. generally accepted accounting principles (GAAP). These non-GAAP financial measures include adjusted net income attributable to Valero stockholders, adjusted operating income (including adjusted operating income for each of our reportable segments), and refining and ethanol segment margin. We have included these non-GAAP financial measures to help facilitate the comparison of operating results between years. See the accompanying financial tables in "RESULTS OF OPERATIONS" and note (h) to the accompanying tables for reconciliations of

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these non-GAAP financial measures to the most directly comparable U.S. GAAP financial measures. Also in note (h), we disclose the reasons why we believe our use of the non-GAAP financial measures provides useful information.

OVERVIEW AND OUTLOOK

Overview

For 2018, we reported net income attributable to Valero stockholders of $3.1 billion compared to $4.1 billion for 2017, which represents a decrease of $943 million. This decrease is primarily due to a $1.9 billion tax benefit in 2017 resulting from Tax Reform, which is discussed in Note 15 of Notes to Consolidated Financial Statements, partially offset by a $1.0 billion increase in income before income tax expense. The increase in income before income tax expense is primarily due to higher operating income between the years as described below.

Operating income was $4.6 billion for 2018 compared to $3.6 billion for 2017, which represents an increase of $1.0 billion. Excluding the adjustments to operating income reflected in the tables on page 32, adjusted operating income increased by $931 million in 2018 compared to 2017.

The $931 million increase in adjusted operating income is primarily due to the following:

- Refining segment. Refining segment adjusted operating income increased $961 million primarily due to improved distillate margins, favorable crude oil discounts, and lower costs of biofuel credits, partially offset by lower gasoline margins. This is more fully described on pages 36 through 37.

- Ethanol segment. Ethanol segment operating income decreased by $90 million primarily due to lower ethanol prices and higher corn prices, partially offset by higher corn related co-products prices. This is more fully described on pages 37 through 38.

- VLP segment. VLP segment adjusted operating income increased by $50 million primarily due to incremental revenues, partially offset by higher cost of sales, generated from transportation and terminaling services associated with a terminal and a product pipeline system acquired by VLP in November 2017 that were formerly a part of the refining segment. This is more fully described on page 38.

- Corporate and eliminations. Adjusted corporate and eliminations decreased by $10 million primarily due to expenses in 2017 associated with the termination of the acquisition of certain assets from Plains All American Pipeline, L.P. (Plains). This is more fully described on page 38.

Additional details and analysis for the changes in operating income and adjusted operating income for our reportable business segments and other components of net income and adjusted net income attributable to Valero stockholders, including a reconciliation of non-GAAP financial measures used in this Overview to their most comparable measures reported under U.S. GAAP, are provided below under “RESULTS OF OPERATIONS”.

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Outlook

Below are several factors that have impacted or may impact our results of operations during the first quarter of 2019:

- Refining and ethanol margins are expected to remain near current levels.

- Medium and heavy sour crude oil discounts are expected to remain weaker than their five-year averages as supplies of sour crude oils available in the market remain suppressed.

- Sweet crude oil discounts are expected to remain near current levels as export demand remains strong and freight costs continue to rise. U.S. inland sweet crude oil discounts are also expected to remain wide with higher production and limited pipeline capacity to transport crude oil out of the Permian Basin and other producing regions in the U.S.

- Our refining operations in the U.K. could be adversely affected by Brexit, which is currently scheduled to occur on March 29, 2019. The U.K. and the European Union have yet to finalize the terms of Brexit, and the U.K.'s exit from the European Union without an agreement on an overall structure for an ongoing relationship with the European Union could result in the imposition of border controls and customs duties on trade that could negatively impact the operations of our Pembroke Refinery. While we do not believe that Brexit will have a material impact on us, we are taking steps to minimize the impact of possible delays on importing certain materials critical to our refining operations. The ultimate effect of Brexit will depend on the specific terms of any agreement reached by the U.K. and the European Union. See Item 1A "Risk Factors"—Changes in the U.K.'s economic and other relationships with the European Union could adversely affect us.

RESULTS OF OPERATIONS

The following tables highlight our results of operations, our operating performance, and market reference prices that directly impact our operations. In addition, these tables include financial measures that are not defined under U.S. GAAP and represent non-GAAP financial measures. These non-GAAP financial measures are reconciled to their most comparable U.S. GAAP financial measures and include adjusted net income attributable to Valero stockholders, adjusted operating income, and refining and ethanol segment margin. In note (h) to these tables, we disclose the reasons why we believe our use of non-GAAP financial measures provides useful information.

On January 10, 2019, we completed our acquisition of all the outstanding publicly held common units of VLP pursuant to the Merger Agreement with VLP as defined and discussed in Note 2 of Notes to Consolidated Financial Statements. Upon completion of the Merger Transaction, VLP became an indirect wholly owned subsidiary of Valero.

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2018 Compared to 2017

Financial Highlights by Segment and Total Company
(millions of dollars)

| | Year Ended December 31, 2018 | | | | |
|---|---|---|---|---|---|
| | Refining | Ethanol | VLP | Corporate and Eliminations | Total |
| Revenues: | | | | | |
| Revenues from external customers | $113,601 | $3,428 | $— | $ 4 | $117,033 |
| Intersegment revenues | 14 | 210 | 546 | (770) | — |
| Total revenues | 113,615 | 3,638 | 546 | (766) | 117,033 |
| Cost of sales: | | | | | |
| Cost of materials and other (a) | 102,489 | 3,008 | — | (765) | 104,732 |
| Operating expenses (excluding depreciation and amortization expense reflected below) | 4,099 | 470 | 125 | (4) | 4,690 |
| Depreciation and amortization expense | 1,863 | 78 | 76 | — | 2,017 |
| Total cost of sales | 108,451 | 3,556 | 201 | (769) | 111,439 |
| Other operating expenses | 45 | — | — | — | 45 |
| General and administrative expenses (excluding depreciation and amortization expense reflected below) (b) | — | — | — | 925 | 925 |
| Depreciation and amortization expense | — | — | — | 52 | 52 |
| Operating income by segment | $5,119 | $82 | $345 | $ (974) | 4,572 |
| Other income, net (c) | | | | | 130 |
| Interest and debt expense, net of capitalized interest | | | | | (470) |
| Income before income tax expense | | | | | 4,232 |
| Income tax expense (d) (e) | | | | | 879 |
| Net income | | | | | 3,353 |
| Less: Net income attributable to noncontrolling interests (a) | | | | | 231 |
| Net income attributable to Valero Energy Corporation stockholders | | | | | $3,122 |

See note references on pages 45 through 48.

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Financial Highlights by Segment and Total Company (continued)
(millions of dollars)

| | Year Ended December 31, 2017 | | | | |
|---|---|---|---|---|---|
| | Refining | Ethanol | VLP | Corporate and Eliminations | Total |
| Revenues: | | | | | |
| Revenues from external customers | $90,651 | $3,324 | $— | $ 5 | $93,980 |
| Intersegment revenues | 6 | 176 | 452 | (634) | — |
| Total revenues | 90,657 | 3,500 | 452 | (629) | 93,980 |
| Cost of sales: | | | | | |
| Cost of materials and other | 80,865 | 2,804 | — | (632) | 83,037 |
| Operating expenses (excluding depreciation and amortization expense reflected below) | 3,959 | 443 | 104 | (2) | 4,504 |
| Depreciation and amortization expense | 1,800 | 81 | 53 | — | 1,934 |
| Total cost of sales | 86,624 | 3,328 | 157 | (634) | 89,475 |
| Other operating expenses | 58 | — | 3 | — | 61 |
| General and administrative expenses (excluding depreciation and amortization expense reflected below) | — | — | — | 829 | 829 |
| Depreciation and amortization expense | — | — | — | 52 | 52 |
| Operating income by segment | $3,975 | $172 | $292 | $ (876) | 3,563 |
| Other income, net | | | | | 112 |
| Interest and debt expense, net of capitalized interest | | | | | (468) |
| Income before income tax expense | | | | | 3,207 |
| Income tax benefit (d) (e) | | | | | (949) |
| Net income | | | | | 4,156 |
| Less: Net income attributable to noncontrolling interests | | | | | 91 |
| Net income attributable to Valero Energy Corporation stockholders | | | | | $4,065 |

See note references on pages 45 through 48.

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Financial Highlights by Segment and Total Company (continued)
(millions of dollars)

| | Year Ended December 31, | |
|---|---|---|
| | 2018 | 2017 |
| Reconciliation of net income attributable to Valero Energy Corporation stockholders to adjusted net income attributable to Valero Energy Corporation stockholders (h) | | |
| Net income attributable to Valero Energy Corporation stockholders | $ 3,122 | $ 4,065 |
| Exclude adjustments: | | |
| Blender's tax credit attributable to Valero Energy Corporation stockholders (a) | 90 | — |
| Income tax expense related to the blender's tax credit | (11) | — |
| Blender's tax credit attributable to Valero Energy Corporation stockholders, net of taxes | 79 | — |
| Texas City Refinery fire expenses | (17) | — |
| Income tax benefit related to Texas City Refinery fire expenses | 4 | — |
| Texas City Refinery fire expenses, net of taxes | (13) | — |
| Environmental reserve adjustments (b) | (108) | — |
| Income tax benefit related to the environmental reserve adjustments | 24 | — |
| Environmental reserve adjustments, net of taxes | (84) | — |
| | (38) | — |

| | | | | |
|---|---|---|---|---|
| Loss on early redemption of debt (c) | | | | |
| Income tax benefit related to the loss on early redemption of debt | 9 | | — | |
| Loss on early redemption of debt, net of taxes | (29 | ) | — | |
| Income tax benefit from Tax Reform (d) | 12 | | 1,862 | |
| Total adjustments | (35 | ) | 1,862 | |
| Adjusted net income attributable to Valero Energy Corporation stockholders | $ | 3,157 | $ | 2,203 |

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See note references on pages 45 through 48.

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Financial Highlights by Segment and Total Company (continued)
(millions of dollars)

| | Year Ended December 31, 2018 | | | | |
|---|---|---|---|---|---|
| | Refining | Ethanol | VLP | Corporate and Eliminations | Total |
| Reconciliation of operating income to adjusted operating income (h) | | | | | |
| Operating income by segment | $5,119 | $ 82 | $345 | $ (974) | $4,572 |
| Exclude: | | | | | |
| Blender's tax credit (a) | 170 | — | — | — | 170 |
| Other operating expenses | (45) | — | — | — | (45) |
| Environmental reserve adjustments (b) | — | — | — | (108) | (108) |
| Adjusted operating income | $4,994 | $ 82 | $345 | $ (866) | $4,555 |

| | Year Ended December 31, 2017 | | | | |
|---|---|---|---|---|---|
| | Refining | Ethanol | VLP | Corporate and Eliminations | Total |
| Reconciliation of operating income to adjusted operating income (h) | | | | | |
| Operating income by segment | $3,975 | $ 172 | $292 | $ (876) | $3,563 |
| Exclude: | | | | | |
| Other operating expenses | (58) | — | (3) | — | (61) |
| Adjusted operating income | $4,033 | $ 172 | $295 | $ (876) | $3,624 |

See note references on pages 45 through 48.

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Refining Segment Operating Highlights
(millions of dollars, except per barrel amounts)

| | Year Ended December 31, | | |
|---|---|---|---|
| | 2018 | 2017 | Change |
| Throughput volumes (thousand barrels per day (BPD)) | | | |
| Feedstocks: | | | |
| Heavy sour crude oil | 469 | 469 | — |
| Medium/light sour crude oil | 418 | 458 | (40) |
| Sweet crude oil | 1,410 | 1,323 | 87 |
| Residuals | 232 | 219 | 13 |
| Other feedstocks | 127 | 148 | (21) |
| Total feedstocks | 2,656 | 2,617 | 39 |
| Blendstocks and other | 330 | 323 | 7 |
| Total throughput volumes | 2,986 | 2,940 | 46 |
| | | | |
| Yields (thousand BPD) | | | |
| Gasolines and blendstocks | 1,443 | 1,423 | 20 |
| Distillates | 1,133 | 1,127 | 6 |
| Other products (i) | 449 | 428 | 21 |
| Total yields | 3,025 | 2,978 | 47 |
| | | | |
| Operating statistics (j) | | | |
| Refining segment margin (h) | $10,956 | $9,792 | $1,164 |
| Adjusted refining segment operating income (see page 32) (h) | $4,994 | $4,033 | $961 |
| Throughput volumes (thousand BPD) | 2,986 | 2,940 | 46 |
| | | | |
| Refining segment margin per barrel of throughput | $10.05 | $9.12 | $0.93 |
| Less: | | | |
| Operating expenses (excluding depreciation and amortization expense reflected below) per barrel of throughput | 3.76 | 3.69 | 0.07 |
| Depreciation and amortization expense per barrel of throughput | 1.71 | 1.67 | 0.04 |
| Adjusted refining segment operating income per barrel of throughput | $4.58 | $3.76 | $0.82 |

See note references on pages 45 through 48.

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Ethanol Segment Operating Highlights
(millions of dollars, except per gallon amounts)

| | Year Ended December 31, | | |
|---|---|---|---|
| | 2018 | 2017 | Change |
| Operating statistics (j) | | | |
| Ethanol segment margin (h) | $630 | $696 | $(66 ) |
| Ethanol segment operating income (see page 32) | $82 | $172 | $(90 ) |
| Production volumes (thousand gallons per day) | 4,109 | 3,972 | 137 |
| | | | |
| Ethanol segment margin per gallon of production | $0.42 | $0.48 | $(0.06) |
| Less: | | | |
| Operating expenses (excluding depreciation and amortization expense reflected below) per gallon of production | 0.31 | 0.31 | — |
| Depreciation and amortization expense per gallon of production | 0.06 | 0.05 | 0.01 |
| Ethanol segment operating income per gallon of production | $0.05 | $0.12 | $(0.07) |

VLP Segment Operating Highlights
(millions of dollars, except per barrel amounts)

| | Year Ended December 31, | | |
|---|---|---|---|
| | 2018 | 2017 | Change |
| Operating statistics (j) | | | |
| Pipeline transportation revenue | $124 | $101 | $23 |
| Terminaling revenue | 415 | 348 | 67 |
| Storage and other revenue | 7 | 3 | 4 |
| Total VLP segment revenues | $546 | $452 | $94 |
| | | | |
| Pipeline transportation throughput (thousand BPD) | 1,092 | 964 | 128 |
| Pipeline transportation revenue per barrel of throughput | $0.31 | $0.29 | $0.02 |
| | | | |
| Terminaling throughput (thousand BPD) | 3,594 | 2,889 | 705 |
| Terminaling revenue per barrel of throughput | $0.32 | $0.33 | $(0.01) |

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See note references on pages 45 through 48.

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Average Market Reference Prices and Differentials
(dollars per barrel, except as noted)

| | Year Ended December 31, | | |
|---|---|---|---|
| | 2018 | 2017 | Change |
| Feedstocks | | | |
| Brent crude oil | $71.62 | $54.82 | $16.80 |
| Brent less West Texas Intermediate (WTI) crude oil | 6.71 | 3.92 | 2.79 |
| Brent less Alaska North Slope (ANS) crude oil | 0.31 | 0.26 | 0.05 |
| Brent less Louisiana Light Sweet (LLS) crude oil | 1.72 | 0.69 | 1.03 |
| Brent less Argus Sour Crude Index (ASCI) crude oil | 5.20 | 4.18 | 1.02 |
| Brent less Maya crude oil | 9.22 | 7.74 | 1.48 |
| LLS crude oil | 69.90 | 54.13 | 15.77 |
| LLS less ASCI crude oil | 3.48 | 3.49 | (0.01) |
| LLS less Maya crude oil | 7.50 | 7.05 | 0.45 |
| WTI crude oil | 64.91 | 50.90 | 14.01 |
| Natural gas (dollars per million British thermal units (MMBtu)) | 3.23 | 2.98 | 0.25 |
| Products | | | |
| U.S. Gulf Coast: | | | |
| CBOB gasoline less Brent | 4.81 | 10.50 | (5.69) |
| Ultra-low-sulfur diesel less Brent | 14.02 | 13.26 | 0.76 |
| Propylene less Brent | (2.86) | 0.48 | (3.34) |
| CBOB gasoline less LLS | 6.53 | 11.19 | (4.66) |
| Ultra-low-sulfur diesel less LLS | 15.74 | 13.95 | 1.79 |
| Propylene less LLS | (1.14) | 1.17 | (2.31) |
| U.S. Mid-Continent: | | | |
| CBOB gasoline less WTI | 13.70 | 15.65 | (1.95) |
| Ultra-low-sulfur diesel less WTI | 22.82 | 18.50 | 4.32 |
| North Atlantic: | | | |
| CBOB gasoline less Brent | 7.59 | 12.57 | (4.98) |
| Ultra-low-sulfur diesel less Brent | 16.29 | 14.75 | 1.54 |
| U.S. West Coast: | | | |
| CARBOB 87 gasoline less ANS | 13.05 | 18.12 | (5.07) |
| CARB diesel less ANS | 18.13 | 17.11 | 1.02 |
| CARBOB 87 gasoline less WTI | 19.45 | 21.78 | (2.33) |
| CARB diesel less WTI | 24.53 | 20.77 | 3.76 |
| New York Harbor corn crush (dollars per gallon) | 0.15 | 0.26 | (0.11) |

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Total Company, Corporate, and Other

Revenues increased $23.1 billion in 2018 compared to 2017 primarily due to increases in refined petroleum product prices associated with sales made by our refining segment. This improvement in revenues was partially offset by higher cost of sales of $22 billion primarily due to increases in crude oil and other feedstock costs, and an increase of $96 million in general and administrative expenses (excluding depreciation and amortization expense), resulting in an increase in operating income of $1.0 billion in 2018 compared to 2017.

Excluding the adjustments to operating income reflected in the tables on page 32, adjusted operating income increased by $931 million in 2018 compared to 2017. Details regarding the $931 million increase in adjusted operating income between the years are discussed by segment below.

Other income, net increased $18 million in 2018 compared to 2017 primarily due to higher equity in earnings associated with our Diamond pipeline joint venture of $39 million and higher interest income of $29 million, partially offset by a $38 million charge from the early redemption of debt as described in note (c) to the accompanying tables (see page 45).

Income tax expense increased $1.8 billion in 2018 compared to 2017 primarily due to the effect from a $1.9 billion income tax benefit in 2017 resulting from Tax Reform, which is described in Note 15 of Notes to Consolidated Financial Statements. Excluding the income tax adjustments reflected in the table on page 31 from both years, the effective tax rate for 2018 was 22 percent compared to 28 percent for 2017. The decrease in our effective tax rate is primarily due to the reduction in the U.S. statutory income tax rate from 35 percent to 21 percent effective January 1, 2018 as a result of Tax Reform.

Net income attributable to noncontrolling interests increased $140 million in 2018 compared to 2017 primarily due to higher earnings associated with DGD, our consolidated joint venture, which includes a benefit of $80 million for the blender's tax credit, as described in note (a) to the accompanying tables (see page 45).

Refining Segment Results

Refining segment revenues increased $23.0 billion in 2018 compared to 2017 primarily due to increases in refined petroleum product prices. This improvement in refining segment revenues was partially offset by higher cost of sales of $21.8 billion due primarily to increases in crude oil and other feedstock costs, resulting in an increase in refining segment operating income of $1.1 billion in 2018 compared to 2017.

Excluding the adjustments to refining segment operating income reflected in the tables on page 32, refining segment adjusted operating income increased by $961 million in 2018 compared to 2017. The components of this increase, along with reasons for the changes in these components, are outlined below.

Refining segment margin, as defined in note (h) to the accompanying tables (see page 46), increased $1.2 billion in 2018 compared to 2017, primarily due to the following:

- Increase in distillate margins. We experienced improved distillate margins throughout all of our regions in 2018 compared to 2017. For example, the Brent-based benchmark reference margin for U.S. Gulf Coast ultra-low-sulfur diesel was $14.02 per barrel for 2018 compared to $13.26 per barrel for 2017, representing a favorable increase of $0.76 per barrel. Another example is the WTI-based benchmark reference margin for U.S. Mid-Continent ultra-low-sulfur diesel that was $22.82 per barrel for 2018 compared to $18.50 per barrel for 2017, representing a favorable increase of $4.32 per barrel. We estimate that the increase in distillate margins per barrel in 2018 compared to 2017 had a favorable impact to our refining segment margin of approximately $1.3 billion.

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- Higher discounts on crude oils. The market prices for refined petroleum products generally track the price of Brent crude oil, which is a benchmark sweet crude oil, and we benefit when we process crude oils that are priced at a discount to Brent crude oil. We benefitted from processing these types of crude oils in 2018 and that benefit improved compared to 2017. For example, WTI crude oil, a light sweet crude oil, sold at a discount to Brent of $6.71 per barrel for 2018 compared to a discount of $3.92 per barrel for 2017, representing a favorable increase of $2.79 per barrel. Another example is Maya crude oil, a sour crude oil processed in our U.S. Gulf Coast region, which sold at a discount to Brent of $9.22 per barrel for 2018 compared to $7.74 per barrel for 2017, representing a favorable increase of $1.48 per barrel. We estimate that the increase in the discounts for crude oils that we processed during 2018 compared to 2017 had a favorable impact to our refining segment margin of approximately $561 million.

- Lower costs of biofuel credits. As described in Note 20 of Notes to Consolidated Financial Statements, we purchase biofuel credits in order to meet our biofuel blending obligation under various government and regulatory compliance programs. The cost of these credits (primarily RINs in the U.S.) was $536 million in 2018 compared to $942 million in 2017, a decrease of $406 million.

- Higher throughput volumes. Refining segment throughput volumes increased by 46,000 BPD in 2018. We estimate that the increase in refining throughput volumes had a positive impact on our refining segment margin of approximately $153 million.

- Decrease in gasoline margins. We experienced a decrease in gasoline margins throughout all of our regions in 2018 compared to 2017. For example, the Brent-based benchmark reference margin for U.S. Gulf Coast CBOB gasoline was $4.81 per barrel for 2018 compared to $10.50 per barrel for 2017, representing an unfavorable decrease of $5.69 per barrel. Another example is the ANS-based benchmark reference margin for U.S. West Coast CARBOB 87 gasoline, which was $13.05 per barrel for 2018 compared to $18.12 per barrel for 2017, representing an unfavorable decrease of $5.07 per barrel. We estimate that the decrease in gasoline margins per barrel in 2018 compared to 2017 had an unfavorable impact to our refining segment margin of approximately $1.3 billion.

Refining segment operating expenses (excluding depreciation and amortization expense) increased $140 million primarily due to higher employee-related expenses of $33 million, an increase in energy costs driven by higher natural gas prices ($3.23 per MMBtu in 2018 compared to $2.98 per MMBtu in 2017) of $28 million, higher chemicals and catalyst costs of $24 million, the effect from a favorable insurance settlement of $20 million in 2017 for our McKee Refinery, and higher maintenance expense of $12 million.

Refining segment depreciation and amortization expense associated with our cost of sales increased $63 million due to an increase in refinery turnaround amortization expense of $41 million primarily due to costs incurred in the latter part of 2017 and early 2018 in connection with significant turnaround projects at our Corpus Christi and McKee Refineries, along with the write-off of assets that were idled or demolished in 2018 of $15 million.

Ethanol Segment Results

Ethanol segment revenues increased $138 million in 2018 compared to 2017 primarily due to an increase in ethanol sales volumes and increases in corn related co-product prices along with the revenue contribution associated with three ethanol plants acquired from Green Plains, Inc. (Green Plains) on November 15, 2018, which is described in Note 2 of Notes to Consolidated Financial Statements. This increase is partially offset by lower ethanol prices. This improvement in ethanol segment revenue was more than offset by higher cost of sales of $228 million primarily due to higher corn prices, resulting in a decrease in ethanol segment

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operating income of $90 million in 2018 compared to 2017. The components of this decrease, along with reasons for the changes in these components, are outlined below.

Ethanol segment margin, as defined in note (h) to the accompanying tables (see page 46), decreased $66 million in 2018 compared to 2017, primarily due to the following:

- Lower ethanol prices. Ethanol prices were lower in 2018 compared to 2017 primarily due to an increase in production. For example, the New York Harbor ethanol price was $1.48 per gallon for 2018 compared to $1.56 per gallon for 2017, representing an unfavorable decrease of $0.08 per gallon. We estimate that the decrease in the price of ethanol had an unfavorable impact to our ethanol segment margin of approximately $159 million.

- Higher corn prices. Corn prices were higher in 2018 compared to 2017. For example, the Chicago Board of Trade (CBOT) corn price was $3.68 per bushel for 2018 compared to $3.59 per bushel for 2017, representing an unfavorable increase of $0.09 per bushel. We estimate that the increase in the price of corn had an unfavorable impact to our ethanol segment margin of approximately $36 million.

- Higher co-product prices. An increase in protein values, as compared to soybean meal, had a favorable effect on the prices received for the corn related co-products that we produced. We estimate the increase in corn related co-product prices had a favorable impact to our ethanol segment margin of approximately $101 million.

- Higher production volumes. Ethanol segment margin was favorably impacted by increased production volumes of 137,000 gallons per day in 2018 compared to 2017 primarily due to reliability improvements at our ethanol plants and the additional production volumes associated with the three plants acquired from Green Plains in November 2018. We estimate that the increase in production volumes had a favorable impact to our ethanol segment margin of approximately $26 million.

Ethanol segment operating expenses (excluding depreciation and amortization expense) increased $27 million primarily due to costs to operate the three plants acquired from Green Plains in November 2018 of $14 million, coupled with higher chemicals and catalysts expenses of $8 million.

VLP Segment Results

VLP segment revenues increased $94 million in 2018 compared to 2017 primarily due to $75 million of incremental revenues generated from transportation and terminaling services associated with the Port Arthur terminal and the Parkway pipeline acquired by VLP in November 2017 that were formerly a part of the refining segment. The increase in VLP segment revenues was partially offset by higher cost of sales of $44 million primarily due to the costs to operate the acquired terminal and pipeline, resulting in an increase in VLP segment operating income of $53 million in 2018 compared to 2017. Excluding the adjustment reflected in the table on page 32, VLP adjusted operating income increased $50 million.

Corporate and Eliminations

Corporate and eliminations, which consists primarily of general and administrative expenses and related depreciation and amortization expense, increased by $98 million in 2018 compared to 2017. Excluding the environmental reserve adjustments of $108 million from 2018 reflected in the table on page 32, adjusted corporate and eliminations decreased by $10 million in 2018 primarily due to the effect from expenses incurred in 2017 associated with the termination of the acquisition of certain assets from Plains.

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2017 Compared to 2016

Financial Highlights by Segment and Total Company
(millions of dollars)

| | Year Ended December 31, 2017 | | | | |
|---|---|---|---|---|---|
| | Refining | Ethanol | VLP | Corporate and Eliminations | Total |
| Revenues: | | | | | |
| Revenues from external customers | $90,651 | $3,324 | $— | $ 5 | $93,980 |
| Intersegment revenues | 6 | 176 | 452 | (634) | — |
| Total revenues | 90,657 | 3,500 | 452 | (629) | 93,980 |
| Cost of sales: | | | | | |
| Cost of materials and other | 80,865 | 2,804 | — | (632) | 83,037 |
| Operating expenses (excluding depreciation and amortization expense reflected below) | 3,959 | 443 | 104 | (2) | 4,504 |
| Depreciation and amortization expense | 1,800 | 81 | 53 | — | 1,934 |
| Total cost of sales | 86,624 | 3,328 | 157 | (634) | 89,475 |
| Other operating expenses | 58 | — | 3 | — | 61 |
| General and administrative expenses (excluding depreciation and amortization expense reflected below) | — | — | — | 829 | 829 |
| Depreciation and amortization expense | — | — | — | 52 | 52 |
| Operating income by segment | $3,975 | $172 | $292 | $ (876) | 3,563 |
| Other income, net | | | | | 112 |
| Interest and debt expense, net of capitalized interest | | | | | (468) |
| Income before income tax expense | | | | | 3,207 |
| Income tax expense (benefit) (d) (e) | | | | | (949) |
| Net income | | | | | 4,156 |
| Less: Net income attributable to noncontrolling interests | | | | | 91 |
| Net income attributable to Valero Energy Corporation stockholders | | | | | $4,065 |

See note references on pages 45 through 48.

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Financial Highlights by Segment and Total Company (continued)
(millions of dollars)

| | Year Ended December 31, 2016 | | | | |
|---|---|---|---|---|---|
| | Refining | Ethanol | VLP | Corporate and Eliminations | Total |
| Revenues: | | | | | |
| Revenues from external customers | $71,968 | $3,691 | $— | $ — | $75,659 |
| Intersegment revenues | — | 210 | 363 | (573) | — |
| Total revenues | 71,968 | 3,901 | 363 | (573) | 75,659 |
| Cost of sales: | | | | | |
| Cost of materials and other | 63,405 | 3,130 | — | (573) | 65,962 |
| Operating expenses (excluding depreciation and amortization expense reflected below) | 3,740 | 415 | 96 | — | 4,251 |
| Depreciation and amortization expense | 1,734 | 66 | 46 | — | 1,846 |
| Lower of cost or market inventory valuation adjustment (f) | (697) | (50) | — | — | (747) |
| Total cost of sales | 68,182 | 3,561 | 142 | (573) | 71,312 |
| General and administrative expenses (excluding depreciation and amortization expense reflected below) | — | — | — | 709 | 709 |
| Depreciation and amortization expense | — | — | — | 48 | 48 |
| Asset impairment loss (g) | 56 | — | — | — | 56 |
| Operating income by segment | $3,730 | $340 | $221 | $ (757) | 3,534 |
| Other income, net | | | | | 94 |
| Interest and debt expense, net of capitalized interest | | | | | (446) |
| Income before income tax expense | | | | | 3,182 |
| Income tax expense (g) | | | | | 765 |
| Net income | | | | | 2,417 |
| Less: Net income attributable to noncontrolling interests | | | | | 128 |
| Net income attributable to Valero Energy Corporation stockholders | | | | | $2,289 |

See note references on pages 45 through 48.

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Financial Highlights by Segment and Total Company (continued)
(millions of dollars)

| | Year Ended December 31, | |
|---|---|---|
| | 2017 | 2016 |
| Reconciliation of net income attributable to Valero Energy Corporation stockholders to adjusted net income attributable to Valero Energy Corporation stockholders (h) | | |
| Net income attributable to Valero Energy Corporation stockholders | $4,065 | $2,289 |
| Exclude adjustments: | | |
| Lower of cost or market inventory valuation adjustment (f) | — | 747 |
| Income tax expense related to the lower of cost or market inventory valuation adjustment | — | (168) |
| Lower of cost or market inventory valuation adjustment, net of taxes | — | 579 |
| Asset impairment loss (g) | — | (56) |
| Income tax benefit on Aruba Disposition (g) | — | 42 |
| Income tax benefit from Tax Reform (d) (e) | 1,862 | — |
| Total adjustments | 1,862 | 565 |
| Adjusted net income attributable to Valero Energy Corporation stockholders | $2,203 | $1,724 |

| | Year Ended December 31, 2017 | | | | |
|---|---|---|---|---|---|
| | Refining | Ethanol | VLP | Corporate and Eliminations | Total |
| Reconciliation of operating income to adjusted operating income (h) | | | | | |
| Operating income by segment | $3,975 | $ 172 | $292 | $ (876) | $3,563 |
| Exclude: | | | | | |
| Other operating expenses | (58) | — | (3) | — | (61) |
| Adjusted operating income | $4,033 | $ 172 | $295 | $ (876) | $3,624 |

| | Year Ended December 31, 2016 | | | | |
|---|---|---|---|---|---|
| | Refining | Ethanol | VLP | Corporate and Eliminations | Total |
| Reconciliation of operating income to adjusted operating income (h) | | | | | |
| Operating income by segment | $3,730 | $ 340 | $221 | $ (757) | $3,534 |
| Exclude: | | | | | |
| Lower of cost or market inventory valuation adjustment (f) | 697 | 50 | — | — | 747 |
| Asset impairment loss (g) | (56) | — | — | — | (56) |
| Adjusted operating income | $3,089 | $ 290 | $221 | $ (757) | $2,843 |

See note references on pages 45 through 48.

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Refining Segment Operating Highlights
(millions of dollars, except per barrel amounts)

| | Year Ended December 31, | | |
|---|---|---|---|
| | 2017 | 2016 | Change |
| Throughput volumes (thousand BPD) | | | |
| Feedstocks: | | | |
| Heavy sour crude oil | 469 | 396 | 73 |
| Medium/light sour crude oil | 458 | 526 | (68) |
| Sweet crude oil | 1,323 | 1,193 | 130 |
| Residuals | 219 | 272 | (53) |
| Other feedstocks | 148 | 152 | (4) |
| Total feedstocks | 2,617 | 2,539 | 78 |
| Blendstocks and other | 323 | 316 | 7 |
| Total throughput volumes | 2,940 | 2,855 | 85 |
| | | | |
| Yields (thousand BPD) | | | |
| Gasolines and blendstocks | 1,423 | 1,404 | 19 |
| Distillates | 1,127 | 1,066 | 61 |
| Other products (i) | 428 | 421 | 7 |
| Total yields | 2,978 | 2,891 | 87 |
| | | | |
| Operating statistics (j) | | | |
| Refining segment margin (h) | $9,792 | $8,563 | $1,229 |
| Adjusted refining segment operating income (see page 41) (h) | $4,033 | $3,089 | $944 |
| Throughput volumes (thousand BPD) | 2,940 | 2,855 | 85 |
| | | | |
| Refining segment margin per barrel of throughput | $9.12 | $8.20 | $0.92 |
| Less: | | | |
| Operating expenses (excluding depreciation and amortization expense reflected below) per barrel of throughput | 3.69 | 3.58 | 0.11 |
| Depreciation and amortization expense per barrel of throughput | 1.67 | 1.66 | 0.01 |
| Adjusted refining segment operating income per barrel of throughput | $3.76 | $2.96 | $0.80 |

See note references on pages 45 through 48.

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Ethanol Segment Operating Highlights
(millions of dollars, except per gallon amounts)

| | Year Ended December 31, | | |
|---|---|---|---|
| | 2017 | 2016 | Change |
| Operating statistics (j) | | | |
| Ethanol segment margin (h) | $696 | $771 | $(75 ) |
| Adjusted ethanol segment operating income (see page 41) (h) | $172 | $290 | $(118 ) |
| Production volumes (thousand gallons per day) | 3,972 | 3,842 | 130 |
| Ethanol segment margin per gallon of production | $0.48 | $0.55 | $(0.07) |
| Less: | | | |
| Operating expenses (excluding depreciation and amortization expense reflected below) per gallon of production | 0.31 | 0.30 | 0.01 |
| Depreciation and amortization expense per gallon of production | 0.05 | 0.04 | 0.01 |
| Adjusted ethanol segment operating income per gallon of production | $0.12 | $0.21 | $(0.09) |

VLP Segment Operating Highlights
(millions of dollars, except per barrel amounts)

| | Year Ended December 31, | | |
|---|---|---|---|
| | 2017 | 2016 | Change |
| Operating statistics (j) | | | |
| Pipeline transportation revenue | $101 | $78 | $23 |
| Terminaling revenue | 348 | 284 | 64 |
| Storage and other revenue | 3 | 1 | 2 |
| Total VLP segment revenues | $452 | $363 | $89 |
| Pipeline transportation throughput (thousand BPD) | 964 | 829 | 135 |
| Pipeline transportation revenue per barrel of throughput | $0.29 | $0.26 | $0.03 |
| Terminaling throughput (thousand BPD) | 2,889 | 2,265 | 624 |
| Terminaling revenue per barrel of throughput | $0.33 | $0.34 | $(0.01) |

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See note references on pages 45 through 48.

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Average Market Reference Prices and Differentials
(dollars per barrel, except as noted)

| | Year Ended December 31, | | |
|---|---|---|---|
| | 2017 | 2016 | Change |
| Feedstocks | | | |
| Brent crude oil | $54.82 | $45.02 | $9.80 |
| Brent less WTI crude oil | 3.92 | 1.83 | 2.09 |
| Brent less ANS crude oil | 0.26 | 1.25 | (0.99) |
| Brent less LLS crude oil | 0.69 | 0.15 | 0.54 |
| Brent less ASCI crude oil | 4.18 | 5.18 | (1.00) |
| Brent less Maya crude oil | 7.74 | 8.63 | (0.89) |
| LLS crude oil | 54.13 | 44.87 | 9.26 |
| LLS less ASCI crude oil | 3.49 | 5.03 | (1.54) |
| LLS less Maya crude oil | 7.05 | 8.48 | (1.43) |
| WTI crude oil | 50.90 | 43.19 | 7.71 |
| | | | |
| Natural gas (dollars per MMBtu) | 2.98 | 2.46 | 0.52 |
| | | | |
| Products | | | |
| U.S. Gulf Coast: | | | |
| CBOB gasoline less Brent | 10.50 | 9.17 | 1.33 |
| Ultra-low-sulfur diesel less Brent | 13.26 | 10.21 | 3.05 |
| Propylene less Brent | 0.48 | (6.68) | 7.16 |
| CBOB gasoline less LLS | 11.19 | 9.32 | 1.87 |
| Ultra-low-sulfur diesel less LLS | 13.95 | 10.36 | 3.59 |
| Propylene less LLS | 1.17 | (6.53) | 7.70 |
| U.S. Mid-Continent: | | | |
| CBOB gasoline less WTI | 15.65 | 11.82 | 3.83 |
| Ultra-low-sulfur diesel less WTI | 18.50 | 13.03 | 5.47 |
| North Atlantic: | | | |
| CBOB gasoline less Brent | 12.57 | 11.99 | 0.58 |
| Ultra-low-sulfur diesel less Brent | 14.75 | 11.57 | 3.18 |
| U.S. West Coast: | | | |
| CARBOB 87 gasoline less ANS | 18.12 | 17.04 | 1.08 |
| CARB diesel less ANS | 17.11 | 14.52 | 2.59 |
| CARBOB 87 gasoline less WTI | 21.78 | 17.62 | 4.16 |
| CARB diesel less WTI | 20.77 | 15.10 | 5.67 |
| New York Harbor corn crush (dollars per gallon) | 0.26 | 0.30 | (0.04) |

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The following notes relate to references on pages 29 through 34 and pages 39 through 43.

(a) Cost of materials and other for the year ended December 31, 2018 includes a benefit of $170 million for the biodiesel blender's tax credit attributable to volumes blended during 2017. The benefit was recognized in February 2018 because the legislation authorizing the credit was passed and signed into law in that month. The $170 million pre-tax benefit is included in the refining segment and includes $80 million attributable to noncontrolling interest and $90 million attributable to Valero Energy Corporation stockholders.

(b) General and administrative expenses (excluding depreciation and amortization expense) for the year ended December 31, 2018 includes a charge of $108 million for an environmental reserve adjustment associated with certain non-operating sites.

(c) Other income, net for the year ended December 31, 2018 includes a $38 million charge from the early redemption of $750 million of our 9.375 percent senior notes due March 15, 2019.

(d) On December 22, 2017, Tax Reform was enacted, resulting in the remeasurement of our U.S. deferred taxes and the recognition of a liability for taxes on the deemed repatriation of our foreign earnings and profits. In addition, Tax Reform lowered the U.S. statutory income tax rate from 35 percent to 21 percent, beginning January 1, 2018. Under U.S. GAAP we are required to recognize the effect of Tax Reform in the period of enactment. As a result, we recognized a $1.9 billion income tax benefit in December 2017, which represented our initial estimate of the impact of Tax Reform in accordance with Staff Accounting Bulletin No. 118 (SAB 118). We finalized our estimates in December 2018 and have recorded an additional benefit of $12 million for the year ended December 31, 2018.

(e) Excluding the income tax benefits discussed in note (d) from both years and the other adjustments to income tax reflected in the table on page 31 from 2018, the effective tax rates for the years ended December 31, 2018 and 2017 were 22 percent and 28 percent, respectively. The decrease in the effective rate is primarily due to the decline in the U.S. statutory income tax rate from 35 percent to 21 percent as a result of Tax Reform (see note (d)).

(f) In accordance with U.S. GAAP, we are required to state our inventories at the lower of cost or market. When the market price of our inventory falls below cost, we record a lower of cost or market inventory valuation adjustment to write down the value to market. In subsequent periods, the value of our inventory is reassessed and a lower of cost or market inventory valuation adjustment is recorded to reflect the net change in the lower of cost or market inventory valuation reserve between the periods. As of December 31, 2018 and December 31, 2017, the market price of our inventory was above cost; therefore we did not have a lower of cost or market inventory valuation reserve as of those dates. During the year ended December 31, 2016, we recorded a change in our inventory valuation reserve that was established on December 31, 2015, resulting in a noncash benefit of $747 million, of which $697 million and $50 million were attributable to our refining segment and ethanol segment, respectively.

(g) Effective October 1, 2016 we (i) transferred ownership of all our assets in Aruba, other than certain hydrocarbon inventories and working capital, to Refineria di Aruba N.V. (RDA), an entity wholly-owned by the Government of Aruba (GOA), (ii) settled our obligations under various agreements with the GOA, including agreements that required us to dismantle our leasehold improvements under certain conditions, and (iii) sold the working capital of our Aruba operations, including hydrocarbon inventories, to the GOA, CITGO Aruba Refining N.V. (CAR), and CITGO Petroleum Corporation (together with CAR and certain other affiliates, collectively, CITGO). We refer to this transaction as the "Aruba Disposition."

In June 2016, we recognized an asset impairment loss of $56 million representing all of the remaining carrying value of the long-lived assets of our crude oil and refined petroleum products terminal and transshipment facility in Aruba (collectively, the Aruba Terminal). We recognized the impairment loss at that time because we concluded that it was

more likely than not that we would ultimately transfer ownership of these assets to the GOA as a result of agreements entered into in June 2016 between the GOA and CITGO for the GOA's lease of those assets to CITGO.

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In September 2016 and in connection with the Aruba Disposition, our U.S. subsidiaries cancelled all outstanding debt obligations owed to them by our Aruba subsidiaries, which resulted in the recognition by us of an income tax benefit of $42 million during the year ended December 31, 2016.

(h) We use certain financial measures (as noted below) that are not defined under U.S. GAAP and are considered to be non-GAAP measures.

We have defined these non-GAAP measures and believe they are useful to the external users of our financial statements, including industry analysts, investors, lenders, and rating agencies. We believe these measures are useful to assess our ongoing financial performance because, when reconciled to their most comparable U.S. GAAP measures, they provide improved comparability between periods through the exclusion of certain items that we believe are not indicative of our core operating performance and that may obscure our underlying business results and trends. These non-GAAP measures should not be considered as alternatives to their most comparable U.S. GAAP measures nor should they be considered in isolation or as a substitute for an analysis of our results of operations as reported under U.S. GAAP. In addition, these non-GAAP measures may not be comparable to similarly titled measures used by other companies because we may define them differently, which diminishes the utility of these measures.

Non-GAAP measures are as follows:

Adjusted net income attributable to Valero Energy Corporation stockholders is defined as net income attributable to Valero Energy Corporation stockholders excluding the items noted below, along with their related income tax effect. We have excluded these items because we believe that they are not indicative of our core operating performance and that their exclusion results in an important measure of our ongoing financial performance to better assess our underlying business results and trends. The basis for our belief with respect to each excluded item is provided below.

- Blender's tax credit attributable to Valero Energy Corporation stockholders - The blender's tax credit is attributable to volumes blended during 2017 and is not related to 2018 activities, as described in note (a).
- Lower of cost or market inventory valuation adjustment - The noncash benefit recorded during 2016 to adjust our inventory valuation reserve, as described in note (f).
- Asset impairment loss - The impairment loss of $56 million in 2016 associated with the Aruba Disposition, as described in note (g).
- Texas City Refinery fire expenses - The costs incurred to respond to and assess the damage caused by the fire that occurred at the Texas City Refinery on April 19, 2018 are specific to that event and are not ongoing costs incurred in our operations.
- Environmental reserve adjustments - The environmental reserve adjustments are attributable to sites that were shut down by prior owners and subsequently acquired by us (referred to by us as non-operating sites), as described in note (b).
- Loss on early redemption of debt - The penalty and other expenses incurred in connection with the early redemption of our 9.375 percent senior notes due March 15, 2019 (see note (c)) are not associated with the ongoing costs of our borrowing and financing activities.
- Income tax benefit from Tax Reform - Income tax benefit from Tax Reform (see note (d)) is associated with changes in U.S. tax legislation and is not indicative of our core performance.
- Income tax benefit from Aruba Disposition - The income tax benefit in 2016 resulting from the cancellation of outstanding debt obligations associated with the Aruba Disposition, as described in note (g).

Refining margin is defined as refining operating income excluding the blender's tax credit, the lower of cost or market inventory valuation adjustment, the asset impairment loss, operating expenses (excluding depreciation and amortization expense), other operating expenses, and depreciation and amortization expense, as reflected in the table below.

Ethanol margin is defined as ethanol operating income excluding the lower of cost or market inventory valuation adjustment, operating expenses (excluding depreciation and amortization expense), and depreciation and amortization expense, as reflected in the table below.

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| | Year Ended December 31, | | |
|---|---|---|---|
| | 2018 | 2017 | 2016 |
| Reconciliation of refining segment operating income to refining margin | | | |
| Operating income | $5,119 | $3,975 | $3,730 |
| Add back: | | | |
| Blender's tax credit (a) | (170) | — | — |
| Lower of cost or market inventory valuation adjustment (f) | — | — | (697) |
| Asset impairment loss (g) | — | — | 56 |
| Operating expenses (excluding depreciation and amortization expense) | 4,099 | 3,959 | 3,740 |
| Depreciation and amortization expense | 1,863 | 1,800 | 1,734 |
| Other operating expenses | 45 | 58 | — |
| Refining margin | $10,956 | $9,792 | $8,563 |

| | Year Ended December 31, | | |
|---|---|---|---|
| | 2018 | 2017 | 2016 |
| Reconciliation of ethanol segment operating income to ethanol margin | | | |
| Operating income | $82 | $172 | $340 |
| Add back: | | | |
| Lower of cost or market inventory valuation adjustment (f) | — | — | (50) |
| Operating expenses (excluding depreciation and amortization expense) | 470 | 443 | 415 |
| Depreciation and amortization expense | 78 | 81 | 66 |
| Ethanol margin | $630 | $696 | $771 |

Adjusted refining operating income is defined as refining segment operating income excluding the blender's tax credit, lower of cost or market inventory valuation adjustment, asset impairment loss, and other operating expenses.
Adjusted ethanol operating income is defined as ethanol segment operating income excluding the lower of cost or market inventory valuation adjustment.
Adjusted VLP operating income is defined as VLP segment operating income excluding other operating expenses.
Adjusted corporate and eliminations is defined as corporate and eliminations excluding the environmental reserve adjustments associated with certain non-operating sites (see note (b)).

(i) Other products primarily include petrochemicals, gas oils, No. 6 fuel oil, petroleum coke, sulfur, and asphalt.

(j) Valero uses certain operating statistics (as noted below) to evaluate performance between comparable periods. Different companies may calculate them in different ways.

Refining segment margin per barrel of throughput and adjusted refining segment operating income per barrel of throughput represents refining segment margin and adjusted refining segment operating income (each as defined in note (h) above) divided by the respective throughput volumes. Ethanol segment margin per gallon of production and adjusted ethanol segment operating income per gallon of production represent ethanol segment margin and

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adjusted ethanol segment operating income (each as defined in note (h) above) divided by production volumes. Pipeline transportation revenue per barrel of throughput and terminaling revenue per barrel of throughput represent pipeline transportation revenue and terminaling revenue for our VLP segment divided by pipeline transportation throughput and terminaling throughput volumes, respectively. Throughput and production volumes are calculated by multiplying production throughput and production volumes per day (as provided in the accompanying tables) by the number of days in the applicable period.

Total Company, Corporate, and Other

Revenues increased $18.3 billion in 2017 compared to 2016 primarily due to increases in refined petroleum products prices associated with sales made by our refining segment. This improvement in revenues was mostly offset by higher cost of sales of $18.2 billion primarily due to increases in crude oil and other feedstock costs, and an increase of $120 million in general and administrative expenses (excluding depreciation and amortization expense), resulting in an increase in operating income of $29 million in 2017 compared to 2016.

Excluding the adjustments to operating income reflected in the tables on page 41, adjusted operating income increased by $781 million in 2017 compared to 2016. Details regarding the $781 million increase in adjusted operating income between the years are discussed by segment below.

Income tax expense decreased $1.7 billion in 2017 compared to 2016 primarily due to the effect from a $1.9 billion income tax benefit in 2017 resulting from Tax Reform, which is described in Note 15 of Notes to Consolidated Financial Statements. Excluding the income tax adjustments reflected in the table on page 41 from both years, the effective tax rate for 2017 was 28 percent compared to 26 percent for 2016. The effective tax rates are lower than the U.S. statutory rate of 35 percent that was in effect through December 31, 2017, primarily because income from our international operations was taxed at statutory rates that were lower than in the U.S. The effective tax rate for 2016 was lower than the effective tax rate for 2017 due to a benefit in 2016 of $35 million resulting from the favorable resolution of an income tax audit.

Refining Segment Results

Refining segment revenues increased $18.7 billion in 2017 compared to 2016 primarily due to increases in refined petroleum product prices. This improvement in refining segment revenues was partially offset by higher cost of sales of $18.4 million primarily due to increases in crude oil and other feedstock costs, resulting in an increase in operating income of $245 million in 2017 compared to 2016.

Excluding the adjustments to refining segment operating income reflected in the tables on page 41, refining segment adjusted operating income increased by $944 million in 2017 compared to 2016. The components of this increase, along with the reasons for the changes in these components, are outlined below.

Refining segment margin, as defined in note (h) to the accompanying tables (see page 46), increased $1.2 billion, primarily due to the following:

- Increase in distillate margins. We experienced improved distillate margins throughout all our regions in 2017 compared to 2016. For example, the Brent-based benchmark reference margin for U.S. Gulf Coast ultra-low-sulfur diesel was $13.26 per barrel for 2017 compared to $10.21 per barrel for 2016, representing a favorable increase of $3.05 per barrel. Another example is the WTI-based benchmark reference margin for U.S. Mid-Continent ultra-low-sulfur diesel that was $18.50 per barrel for 2017 compared to $13.03 per barrel for 2016, representing a favorable increase of $5.47 per barrel. We estimate that the increase in distillate margins per barrel in 2017 compared to 2016 had a favorable impact to our refining segment margin of approximately $1.2 billion.

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- Increase in gasoline margins. We also experienced improved gasoline margins throughout all our regions in 2017 compared to 2016. For example, the WTI-based benchmark reference margin for U.S. Mid-Continent CBOB gasoline was $15.65 per barrel for 2017 compared to $11.82 per barrel for 2016, representing a favorable increase of $3.83 per barrel. Another example is the Brent-based reference margin for U.S. Gulf Coast CBOB gasoline, which was $10.50 per barrel for 2017 compared to $9.17 per barrel for 2016, representing a favorable increase of $1.33 per barrel. We estimate that the increase in gasoline margins per barrel in 2017 compared to 2016 had a favorable impact to our refining segment margin of approximately $577 million.

- Higher throughput volumes. Refining segment throughput volumes increased by 85,000 BPD in 2017. We estimate that the increase in refining throughput volumes had a positive impact on our refining segment margin of approximately $283 million.

- Lower discounts on sour crude oils. The market prices for refined petroleum products generally track the price of Brent crude oil, which is a benchmark sweet crude oil, and we benefit when we process sour crude oils that are priced at a discount to Brent crude oil. While we benefitted from processing these sour crude oils in 2017, that benefit declined compared to 2016. For example, ASCI crude oil processed in our U.S. Gulf Coast region sold at a discount to Brent of $4.18 per barrel for 2017 compared to a discount of $5.18 per barrel for 2016, representing an unfavorable decrease of $1.00 per barrel. Another example is Maya crude oil which sold at a discount to Brent of $7.74 per barrel for 2017 compared to $8.63 per barrel for 2016, representing an unfavorable decrease of $0.89 per barrel. We estimate that the reduction in discounts for sour crude oils that we processed in 2017 had an unfavorable impact to our refining segment margin of approximately $305 million.

- Lower discounts on other feedstocks. In addition to crude oil, we utilize other feedstocks such as residuals, in certain of our refining processes. We benefit when we process these other feedstocks that are priced at a discount to Brent crude oil. While we benefitted from processing these types of feedstocks in 2017, that benefit declined compared to 2016. We estimate that the reduction in the discounts for the other feedstocks that we processed in 2017 had an unfavorable impact to our refining segment margin of approximately $203 million.

- Higher costs of biofuel credits. As described in Note 20 of Notes to Consolidated Financial Statements, we purchase biofuel credits in order to meet our biofuel blending obligation under various government and regulatory compliance programs. The cost of these credits (primarily RINs in the U.S.) was $942 million in 2017 compared to $749 million in 2016, an increase of $193 million.

- Increase in charges from VLP. Charges from the VLP segment for transportation and terminaling services increased $89 million in 2017 compared to 2016 primarily due to additional services provided by terminals and a product pipeline system acquired by VLP in 2017 and 2016 that were formerly a part of the refining segment, as well as an undivided interest in crude system assets acquired by VLP in 2017. Details regarding the increase in charges from VLP are discussed in the VLP segment analysis below.

Refining segment operating expenses (excluding depreciation and amortization expense) increased $219 million primarily due to an increase in energy costs driven by higher natural gas prices ($2.98 per MMBtu for 2017 compared to $2.46 per MMBtu for 2016).

Refining segment depreciation and amortization expense associated with our cost of sales increased $66 million due to an increase in refinery turnaround and catalyst amortization expense primarily due to

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costs incurred in the latter part of 2016 in connection with significant turnaround projects at our Port Arthur and Texas City Refineries.

Ethanol Segment Results

Ethanol segment revenues decreased $401 million in 2017 compared to 2016 primarily due to lower ethanol and corn related co-product prices. This decline in ethanol segment revenue was partially offset by lower cost of sales of $233 million primarily due to lower corn prices, resulting in a decrease in ethanol segment operating income of $168 million in 2017 compared to 2016.

Excluding the adjustment reflected in the table on page 41, ethanol segment adjusted operating income was $172 million for 2017 compared to $290 million for 2016, a decrease of $118 million. The components of this decrease, along with the reasons for the changes in these components, are outlined below.

Ethanol segment margin, as defined in note (h) to the accompanying tables (see page 46), decreased $75 million in 2017 compared to 2016 primarily due to the following:

- Lower ethanol prices. Ethanol prices were lower in 2017 compared to 2016 primarily due to higher industry production, which resulted in higher domestic inventories. For example, the New York Harbor ethanol price was $1.56 per gallon for 2017 compared to $1.60 per gallon for 2016. We estimate that the decrease in the price of ethanol had an unfavorable impact to our ethanol segment margin of approximately $73 million.

- Lower co-product prices. A decrease in export demand for corn related co-products, primarily distiller's grains, had an unfavorable effect on the prices we received. We estimate that the decrease in the price for corn related co-products had an unfavorable impact to our ethanol segment margin of approximately $52 million.

- Lower corn prices. Despite a slight increase in the CBOT corn price from $3.58 per bushel for 2016 to $3.59 per bushel for 2017, we acquired corn at lower prices due to favorable location differentials, resulting in a decrease in the price we paid for corn in 2017 compared to 2016. We estimate that the decrease in the price we paid for corn had a favorable impact to our ethanol segment margin of approximately $25 million.

- Higher production volumes. Ethanol segment margin was favorably impacted by increased production volumes of 130,000 gallons per day in 2017 compared to 2016 primarily due to reliability improvements. We estimate that the increase in production volumes had a favorable impact to our ethanol segment margin of approximately $25 million.

Ethanol segment operating expenses (excluding depreciation and amortization expense) increased $28 million primarily due to an increase in energy costs driven by higher natural gas prices ($2.98 per MMBtu for 2017 compared to $2.46 per MMBtu for 2016).

Ethanol segment depreciation and amortization expense associated with our cost of sales increased $15 million primarily due to the write-off of assets that were idled in 2017.

VLP Segment Results

VLP segment revenues increased $89 million in 2017 compared to 2016 primarily due to $61 million of incremental revenues generated from transportation and terminaling services associated with the Port Arthur terminal and the Parkway pipeline acquired by VLP in 2017 and the McKee, Meraux, and Three Rivers

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terminals acquired by VLP in 2016 that were formerly a part of the refining segment. In addition, incremental revenues of $10 million were generated from an undivided interest in the Red River crude system acquired in January 2017. The increase in VLP segment revenues was partially offset by higher cost of sales of $15 million primarily due to the costs to operate the acquired terminals, pipeline and crude system, resulting in an increase in VLP segment operating income of $71 million in 2017 compared to 2016. Excluding the adjustment reflected in the table on page 41, VLP adjusted operating income increased $74 million.

Corporate and Eliminations

Corporate and eliminations, which consists primarily of general and administrative expenses and related depreciation and amortization expense, increased $119 million in 2017 compared to 2016 primarily due to higher employee related costs of $50 million, an increase in legal and environmental reserves of $21 million, expenses associated with the termination of certain assets from Plains of $16 million, and an increase in charitable contributions of $10 million.

## LIQUIDITY AND CAPITAL RESOURCES

### Overview

We believe that we have sufficient funds from operations and from borrowings under our credit facilities to fund our ongoing operating requirements and other commitments. We expect that, to the extent necessary, we can raise additional funds from time to time through equity or debt financings in the public and private capital markets or the arrangement of additional credit facilities. However, there can be no assurances regarding the availability of any future financings or additional credit facilities or whether such financings or additional credit facilities can be made available on terms that are acceptable to us.

Our liquidity consisted of the following as of December 31, 2018 (in millions):

| | |
|---|---|
| Available borrowing capacity from committed facilities: | |
| Valero Revolver | $2,943 |
| Canadian Revolver | 107 |
| Accounts receivable sales facility | 1,200 |
| Letter of credit facility | 100 |
| Total available borrowing capacity | 4,350 |
| Cash and cash equivalents[(a)] | 2,747 |
| Total liquidity | $7,097 |

(a) Excludes $235 million of cash and cash equivalents related to our variable interest entities (VIEs) that is available for use only by our VIEs.

Information about our outstanding borrowings, letters of credit issued, and availability under our credit facilities is reflected in Note 9 of Notes to Consolidated Financial Statements.

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Cash Flows Summary

Components of our cash flows are set forth below (in millions):

| | Year Ended December 31, | | |
|---|---|---|---|
| | 2018 | 2017 | 2016 |
| Cash flows provided by (used in): | | | |
| Operating activities | $4,371 | $5,482 | $4,820 |
| Investing activities | (3,928) | (2,382) | (2,006) |
| Financing activities | (3,168) | (2,272) | (2,012) |
| Effect of foreign exchange rate changes on cash | (143) | 206 | (100) |
| Net increase (decrease) in cash and cash equivalents | $(2,868) | $1,034 | $702 |

Cash Flows for the Year Ended December 31, 2018

Our operations generated $4.4 billion of cash in 2018, driven primarily by net income of $3.4 billion and noncash charges to income of $2.3 billion, partially offset by a negative change in working capital of $1.3 billion. Noncash charges included $2.1 billion of depreciation and amortization expense and $203 million of deferred income tax expense. See “RESULTS OF OPERATIONS” for further discussion of our operations. The change in our working capital is detailed in Note 18 of Notes to Consolidated Financial Statements. The use of cash resulting from the $1.3 billion change in working capital was mainly due to:

- an increase in receivables resulting from an increase in sales volumes, partially offset by a decrease in commodity prices;
- an increase in inventory primarily due to higher inventory levels;
- a decrease in income taxes payable primarily resulting from (i) $527 million of payments in early 2018 related to 2017 tax liabilities and (ii) $181 million of payments in late 2018 that will be applied to 2019 tax liabilities;
- a decrease in accrued expenses mainly due to the timing of payments on our environmental compliance program obligations; partially offset by
- an increase in accounts payable due to an increase in crude oil and other feedstock volumes purchased, partially offset by a decrease in commodity prices.

The $4.4 billion of cash generated by our operations, along with (i) $1.3 billion in proceeds from debt issuances and borrowings and $109 million in proceeds from borrowings of certain VIEs (as discussed in Note 9 of Notes to Consolidated Financial Statements) and (ii) $2.9 billion from available cash on hand, were used mainly to:

- fund $2.7 billion in capital investments, which include capital expenditures, deferred turnaround and catalyst costs, and investments in joint ventures;
- fund (i) $468 million for the Peru Acquisition (as defined and discussed in Note 2 of Notes to Consolidated Financial Statements) in May 2018; (ii) $320 million for the acquisition of three ethanol plants in November 2018; and (iii) $88 million for other minor acquisitions;
- fund $124 million of capital expenditures of certain VIEs;
- acquire undivided interests in pipeline and terminal assets for $212 million;
- redeem our 9.375 percent Senior Notes due March 15, 2019 for $787 million (or 104.9 percent of stated value);
- make payments on debt and capital lease obligations of $435 million, of which $410 million related to the repayment of all outstanding borrowings under VLP’s $750 million senior unsecured revolving credit facility (the VLP Revolver);

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- retire $137 million of debt assumed in connection with the Peru Acquisition;
- purchase common stock for treasury of $1.7 billion;
- pay common stock dividends of $1.4 billion; and
- pay distributions to noncontrolling interests of $116 million.

Cash Flows for the Year Ended December 31, 2017

Our operations generated $5.5 billion of cash in 2017. Net income of $4.2 billion, net of the $1.9 billion noncash benefit from Tax Reform and other noncash charges of $2.1 billion, and a positive change in working capital of $1.3 billion were the primary drivers of the cash generated by our operations in 2017. Other noncash charges included $2.0 billion of depreciation and amortization expense. See “RESULTS OF OPERATIONS” for further discussion of our operations. The Tax Reform benefit and the change in our working capital are detailed in Notes 15 and 18, respectively, of Notes to Consolidated Financial Statements. The source of cash resulting from the $1.3 billion change in working capital was mainly due to:

- an increase in accounts payable primarily as a result of an increase in commodity prices; and
- an increase in income taxes payable resulting from deferring the payment of our fourth quarter 2017 estimated taxes to January 2018, as allowed by tax relief authorization from the IRS; partially offset by
- an increase in receivables primarily as a result of an increase in commodity prices; and
- an increase in inventory due to higher volumes held combined with an increase in commodity prices.

The $5.5 billion of cash generated by our operations, along with borrowings of $380 million under the VLP Revolver as discussed in Note 9 of Notes to Consolidated Financial Statements, were used mainly to:

- fund $2.3 billion in capital investments, which include capital expenditures, deferred turnaround and catalyst costs, and investments in joint ventures;
- acquire an undivided interest in crude system assets for $72 million;
- purchase common stock for treasury of $1.4 billion;
- pay common stock dividends of $1.2 billion;
- pay distributions to noncontrolling interests of $67 million; and
- increase available cash on hand by $1.0 billion.

Cash Flows for the Year Ended December 31, 2016

Our operations generated $4.8 billion of cash in 2016, driven primarily by net income of $2.4 billion, net noncash charges to income of $1.4 billion, and a positive change in working capital of $976 million. Noncash charges included $1.9 billion of depreciation and amortization expense, $56 million for the asset impairment loss associated with our Aruba Terminal, and $230 million of deferred income tax expense, partially offset by a benefit of $747 million from a lower of cost or market inventory valuation adjustment. See “RESULTS OF OPERATIONS” for further discussion of our operations. The change in our working capital is detailed in Note 18 of Notes to Consolidated Financial Statements. The source of cash resulting from the $976 million change in working capital was mainly due to:

- an increase in accounts payable primarily as a result of higher commodity prices;
- a reduction of our inventories; and
- a reduction in prepaid expenses and other related to income taxes receivable due to utilization in 2016 of our 2015 overpayment of taxes; partially offset by
- an increase in receivables primarily as a result of higher commodity prices.

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The $4.8 billion of cash generated by our operations, along with $2.2 billion in proceeds from debt issuances and borrowings (as discussed in Note 9 of Notes to Consolidated Financial Statements), were used mainly to:

- fund $2.0 billion in capital investments, which include capital expenditures, deferred turnaround and catalyst costs, and investments in joint ventures;
- redeem our 6.125 percent Senior Notes due June 15, 2017 for $778 million (or 103.70 percent of stated value) and our 7.2 percent Senior Notes due October 15, 2017 for $213 million (or 106.27 percent of stated value);
- make payments on debt and capital lease obligations of $525 million, of which $494 million related to borrowings under the VLP Revolver, $9 million related to capital lease obligations, and $22 million related to other debt;
- pay off a long-term liability of $137 million owed to a joint venture partner for an owner-method joint venture investment;
- purchase common stock for treasury of $1.3 billion;
- pay common stock dividends of $1.1 billion;
- pay distributions to noncontrolling interests of $65 million; and
- increase available cash on hand by $702 million.

Capital Investments

We define capital investments as capital expenditures for purchases of, additions to, and improvements in our property, plant, and equipment; turnaround and catalyst costs; and investments in joint ventures. Capital expenditures include the capital expenditures of our consolidated subsidiaries and consolidated VIEs in which we hold an ownership interest.

Our operations, especially those of our refining segment, are highly capital intensive. Each of our refineries comprises a large base of property assets, consisting of a series of interconnected, highly integrated and interdependent crude oil processing facilities and supporting logistical infrastructure (Units), and these Units are improved continuously. The cost of improvements, which consist of the addition of new Units and betterments of existing Units, can be significant. We have historically acquired our refineries at amounts significantly below their replacement costs, whereas our improvements are made at full replacement value. As such, the costs for improving our refinery assets increase over time and are significant in relation to the amounts we paid to acquire our refineries. We plan for these improvements by developing a multi-year capital program that is updated and revised based on changing internal and external factors.

We make improvements to our refineries in order to maintain and enhance their operating reliability, to meet environmental obligations with respect to reducing emissions and removing prohibited elements from the products we produce, or to enhance their profitability. Reliability and environmental improvements generally do not increase the throughput capacities of our refineries. Improvements that enhance refinery profitability may increase throughput capacity, but many of these improvements allow our refineries to process different types of crude oil and to refine crude oil into products with higher market values. Therefore, many of our improvements do not increase throughput capacity significantly.

For both 2019 and 2020, we expect to incur approximately $2.5 billion for capital investments, consisting of approximately 60 percent for sustaining capital and 40 percent for growth strategies. However, we continuously evaluate our capital budget and make changes as conditions warrant. This capital investment estimate excludes potential strategic acquisitions, including acquisitions of undivided interests.

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In addition to our capital investments noted above, we separately reflect in our statements of cash flows the capital expenditures of certain VIEs that we consolidate even though we do not hold an ownership interest in them. These expenditures are not included in our $2.5 billion estimate of capital investments for 2019 or 2020. See Note 12 of Notes to Consolidated Financial Statements for a description of our VIEs.

Other Matters Impacting Liquidity and Capital Resources

Merger with VLP

On January 10, 2019, we completed our acquisition of all of the outstanding publicly held common units of VLP pursuant to the Merger Transaction with VLP. Upon completion of the Merger Transaction, each outstanding publicly held common unit was converted into the right to receive $42.25 per common unit in cash without any interest thereon, and all such publicly traded common units were automatically canceled and ceased to exist. Upon completion of the Merger Transaction, we paid aggregate merger consideration of $950 million, which was funded with available cash on hand. See Note 2 of Notes to Consolidated Financial Statements for a discussion of the Merger Transaction.

Stock Purchase Programs

On January 23, 2018, our board of directors authorized the 2018 Program, which authorized our purchase of up to an additional $2.5 billion of our outstanding common stock with no expiration date. This authorization was in addition to the remaining amount available under a $2.5 billion program authorized under the 2016 Program. During the fourth quarter of 2018, we completed our purchases under the 2016 Program. As of December 31, 2018, we had $2.2 billion remaining available for purchase under the 2018 Program. We have no obligation to make purchases under this program.

Pension Plan Funding

We plan to contribute approximately $35 million to our pension plans and $21 million to our other postretirement benefit plans during 2019. See Note 13 of Notes to Consolidated Financial Statements for a discussion of our employee benefit plans.

Environmental Matters

Our operations are subject to extensive environmental regulations by governmental authorities relating to the discharge of materials into the environment, waste management, pollution prevention measures, GHG emissions, and characteristics and composition of gasolines and distillates. Because environmental laws and regulations are becoming more complex and stringent and new environmental laws and regulations are continuously being enacted or proposed, the level of future expenditures required for environmental matters could increase in the future. In addition, any major upgrades in any of our operating facilities could require material additional expenditures to comply with environmental laws and regulations. See Notes 8 and 10 of Notes to Consolidated Financial Statements for a discussion of our environmental matters.

Tax Matters

The IRS has ongoing audits related to our U.S. federal income tax returns from 2010 through 2015. We have received Revenue Agent Reports in connection with the 2010 and 2011 combined audit. We have made significant progress in resolving this audit, which we believe will be settled within the next 12 months. Upon settlement, we anticipate receiving a refund; therefore, we have a receivable of $336 million associated with this audit as of December 31, 2018. We do not expect to have a significant change to our uncertain tax positions upon the settlement of our ongoing audits, and we believe that the ultimate settlement of our audits will not be material to our financial position, results of operations, or liquidity.

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Cash Held by Our International Subsidiaries

In conjunction with our implementation of the provisions under Tax Reform, as described in Note 15 of Notes to Consolidated Financial Statements, we recorded a liability of $740 million for the estimated U.S. federal tax due on the deemed repatriation of the accumulated earnings and profits of our international subsidiaries not previously distributed to us, and we will pay this liability over the eight-year period permitted by the provisions under Tax Reform. Because of the deemed repatriation of these accumulated earnings and profits, there are no longer any U.S. federal income tax consequences associated with the repatriation of any of the $2.4 billion of cash and cash equivalents held by our international subsidiaries as of December 31, 2018. However, certain countries in which our international subsidiaries are organized impose withholding taxes on cash distributed outside of those countries. We have accrued for withholding taxes on the portion of the cash held by one of our international subsidiaries that we have deemed not to be permanently reinvested in our operations in that country. The remaining cash held by that subsidiary, as well as our other international subsidiaries, will be permanently reinvested in our operations in those countries.

Concentration of Customers

Our operations have a concentration of customers in the refining industry and customers who are refined petroleum product wholesalers and retailers. These concentrations of customers may impact our overall exposure to credit risk, either positively or negatively, in that these customers may be similarly affected by changes in economic or other conditions. However, we believe that our portfolio of accounts receivable is sufficiently diversified to the extent necessary to minimize potential credit risk. Historically, we have not had any significant problems collecting our accounts receivable.

OFF-BALANCE SHEET ARRANGEMENTS

We have not entered into any transactions, agreements, or other contractual arrangements that would result in off-balance sheet liabilities.

CONTRACTUAL OBLIGATIONS

Our contractual obligations as of December 31, 2018 are summarized below (in millions).

| | Payments Due by Year | | | | | | |
|---|---|---|---|---|---|---|---|
| | 2019 | 2020 | 2021 | 2022 | 2023 | Thereafter | Total |
| Debt and capital lease obligations (a) | $283 | $920 | $77 | $69 | $85 | $ 8,431 | $9,865 |
| Operating lease obligations | 359 | 245 | 178 | 146 | 123 | 514 | 1,565 |
| Purchase obligations | 14,853 | 2,309 | 1,630 | 1,407 | 1,320 | 4,333 | 25,852 |
| Other long-term liabilities | — | 249 | 232 | 235 | 261 | 1,890 | 2,867 |
| Total | $15,495 | $3,723 | $2,117 | $1,857 | $1,789 | $ 15,168 | $40,149 |

(a) Debt obligations exclude amounts related to unamortized discounts and debt issuance costs. Capital lease obligations include related interest expense.

Debt and Capital Lease Obligations

Our debt and capital lease obligations are described in Note 9 of Notes to Consolidated Financial Statements.

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Our debt and financing agreements do not have rating agency triggers that would automatically require us to post additional collateral. However, in the event of certain downgrades of our senior unsecured debt by the ratings agencies, the cost of borrowings under some of our bank credit facilities and other arrangements would increase. All of our ratings on our senior unsecured debt as of December 31, 2018 are at or above investment grade level as follows:

| | Rating | |
|---|---|---|
| Rating Agency | Valero | VLP |
| Moody's Investors Service | Baa2 (stable outlook) | Baa3 (no outlook) |
| Standard & Poor's Ratings Services | BBB (stable outlook) | BBB- (no outlook) |
| Fitch Ratings | BBB (stable outlook) | BBB- (no outlook) |

In January 2019, after the completion of the Merger Transaction as described in Note 2 of Notes to Consolidated Financial Statements, each of the rating agencies upgraded its rating of VLP's senior unsecured debt to our rating. The rating change follows the full and unconditional guarantee by us of VLP's senior notes.

We cannot provide assurance that these ratings will remain in effect for any given period of time or that one or more of these ratings will not be lowered or withdrawn entirely by a rating agency. We note that these credit ratings are not recommendations to buy, sell, or hold our securities. Each rating should be evaluated independently of any other rating. Any future reduction below investment grade or withdrawal of one or more of our credit ratings could have a material adverse impact on our ability to obtain short- and long-term financing and the cost of such financings.

Operating Lease Obligations

Our long-term operating lease commitments include leases for land and office facilities; time charters for ocean-going tankers and coastal vessels; railcars; facilities and equipment related to industrial gases and power used in our operations; machinery and equipment used in our refining and ethanol operations; and various facilities and equipment used in the storage, transportation, production, and sale of refinery feedstock, refined petroleum product and corn inventories. Operating lease obligations include all operating leases that have initial or remaining noncancelable terms in excess of one year, and are not reduced by minimum rentals to be received by us under subleases.

Purchase Obligations

A purchase obligation is an enforceable and legally binding agreement to purchase goods or services that specifies significant terms, including (i) fixed or minimum quantities to be purchased, (ii) fixed, minimum, or variable price provisions, and (iii) the approximate timing of the transaction. We have various purchase obligations under certain crude oil and other feedstock supply arrangements, industrial gas supply arrangements (such as hydrogen supply arrangements), natural gas supply arrangements, and various throughput, transportation and terminaling agreements. We enter into these contracts to ensure an adequate supply of feedstock and utilities and adequate storage capacity to operate our refineries and ethanol plants. Substantially all of our purchase obligations are based on market prices or adjustments based on market indices. Certain of these purchase obligations include fixed or minimum volume requirements, while others are based on our usage requirements. The purchase obligation amounts shown in the preceding table include both short- and long-term obligations and are based on (i) fixed or minimum quantities to be purchased and (ii) fixed or estimated prices to be paid based on current market conditions.

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Other Long-Term Liabilities
Our other long-term liabilities are described in Note 8 of Notes to Consolidated Financial Statements. For purposes of reflecting amounts for other long-term liabilities in the preceding table, we made our best estimate of expected payments for each type of liability based on information available as of December 31, 2018.

NEW ACCOUNTING PRONOUNCEMENTS

As discussed in Note 1 of Notes to Consolidated Financial Statements, certain new financial accounting pronouncements became effective January 1, 2019, or will become effective in the future. The effect on our financial statements upon adoption of these pronouncements is discussed in the above-referenced note.

CRITICAL ACCOUNTING POLICIES INVOLVING CRITICAL ACCOUNTING ESTIMATES

The preparation of financial statements in accordance with U.S. GAAP requires us to make estimates and assumptions that affect the amounts reported in the financial statements and accompanying notes. Actual results could differ from those estimates. The following summary provides further information about our critical accounting policies that involve critical accounting estimates, and should be read in conjunction with Note 1 of Notes to Consolidated Financial Statements, which summarizes our significant accounting policies. The following accounting policies involve estimates that are considered critical due to the level of subjectivity and judgment involved, as well as the impact on our financial position and results of operations. We believe that all of our estimates are reasonable. Unless otherwise noted, estimates of the sensitivity to earnings that would result from changes in the assumptions used in determining our estimates is not practicable due to the number of assumptions and contingencies involved, and the wide range of possible outcomes.

Environmental Matters
Our operations are subject to extensive environmental regulations by governmental authorities relating primarily to the discharge of materials into the environment, waste management, and pollution prevention measures. Future legislative action and regulatory initiatives could result in changes to required operating permits, additional remedial actions, or increased capital expenditures and operating costs that cannot be assessed with certainty at this time.

Accruals for environmental liabilities are based on best estimates of probable undiscounted future costs over a 20-year time period using currently available technology and applying current regulations, as well as our own internal environmental policies. However, environmental liabilities are difficult to assess and estimate due to uncertainties related to the magnitude of possible remediation, the timing of such remediation, and the determination of our obligation in proportion to other parties. Such estimates are subject to change due to many factors, including the identification of new sites requiring remediation, changes in environmental laws and regulations and their interpretation, additional information related to the extent and nature of remediation efforts, and potential improvements in remediation technologies.

The amount of our accruals for environmental matters as of December 31, 2018 and 2017 are included in Note 8 of Notes to Consolidated Financial Statements.

Unrecognized Tax Benefits
We take tax positions in our tax returns from time to time that may not be ultimately allowed by the relevant taxing authority. When we take such positions, we evaluate the likelihood of sustaining those positions and determine the amount of tax benefit arising from such positions, if any, that should be recognized in our financial statements. Tax benefits not recognized by us are recorded as a liability in our balance sheets and

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that liability represents our potential future obligation to the taxing authorities if the tax position is not sustained.

The evaluation of tax positions and the determination of the benefit arising from such positions that are recognized in our financial statements requires us to make significant judgments and estimates based on an analysis of complex tax laws and regulations and related interpretations. These judgments and estimates are subject to change due to many factors, including the progress of ongoing tax audits, case law, and changes in legislation.

Our unrecognized tax benefits as of December 31, 2018 and 2017, along with other information about our unrecognized tax benefits, are included in Note 15 of Notes to Consolidated Financial Statements.

Pension and Other Postretirement Benefit Obligations

We have significant pension and other postretirement benefit liabilities and costs that are developed from actuarial valuations. Inherent in these valuations are key assumptions including discount rates, expected return on plan assets, future compensation increases, and health care cost trend rates. These assumptions are disclosed and described in Note 13 of Notes to Consolidated Financial Statements. Changes in these assumptions are primarily influenced by factors outside of our control. For example, the discount rate assumption represents a yield curve comprised of various long-term bonds that have an average rating of double-A when averaging all available ratings by the recognized rating agencies, while the expected return on plan assets is based on a compounded return calculated assuming an asset allocation that is representative of the asset mix in our pension plans. To determine the expected return on plan assets, we utilized a forward-looking model of asset returns. The historical geometric average return over the 10 years prior to December 31, 2018 was 9.38 percent. The actual return on assets for the years ended December 31, 2018, 2017, and 2016 was (5.53) percent, 19.31 percent, and 7.77 percent, respectively. These assumptions can have a significant effect on the amounts reported in our financial statements. The following sensitivity analysis shows the effects on the projected benefit obligation as of December 31, 2018 and net periodic benefit cost for the year ending December 31, 2019 (in millions):

| | Pension Benefits | Other Postretirement Benefits |
|---|---|---|
| Increase in projected benefit obligation resulting from: | | |
| Discount rate decrease of 0.25% | $ 104 | $ 8 |
| Compensation rate increase of 0.25% | 12 | n/a |
| Increase in expense resulting from: | | |
| Discount rate decrease of 0.25% | 9 | 1 |
| Expected return on plan assets decrease of 0.25% | 6 | n/a |
| Compensation rate increase of 0.25% | 3 | n/a |

Our net periodic benefit cost is determined using the spot-rate approach. Under this approach, our net periodic benefit cost is impacted by the spot rates of the corporate bond yield curve used to calculate our liability discount rate. If the yield curve were to flatten entirely and our liability discount rate remained unchanged, our net periodic benefit cost would increase by $10 million for pension benefits and $1 million for other postretirement benefits in 2019.

See Note 13 of Notes to Consolidated Financial Statements for a discussion of our pension and other postretirement benefit obligations.

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Inventory Valuation

The cost of our inventories is principally determined under the last-in, first-out (LIFO) method using the dollar-value LIFO approach. Our LIFO inventories are carried at the lower of cost or market value and our non-LIFO inventories are carried at the lower of cost or net realizable value. The market value of our LIFO inventories is determined based on the net realizable value of the inventories.

We compare the market value of inventories to their cost on an aggregate basis, excluding materials and supplies. In determining the market value of our inventories, we assume our refinery and ethanol feedstocks are converted into refined petroleum products, which requires us to make estimates regarding the refined petroleum products expected to be produced from those feedstocks and the conversion costs required to convert those feedstocks into refined petroleum products. We also estimate the usual and customary transportation costs required to move the inventory from our refineries and ethanol plants to the appropriate points of sale. We then apply an estimated selling price to our inventories. If the aggregate market value is less than cost, we recognize a loss for the difference in our statements of income.

The lower of cost or market inventory valuation adjustment for the year ended December 31, 2016 is discussed in Note 5 of Notes to Consolidated Financial Statements.

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

COMMODITY PRICE RISK

We are exposed to market risks related to the volatility in the price of crude oil, refined petroleum products (primarily gasoline and distillate), grain (primarily corn), soybean oil, and natural gas used in our operations. To reduce the impact of price volatility on our results of operations and cash flows, we use commodity derivative instruments, including futures and options to manage the volatility of:

- inventories and firm commitments to purchase inventories generally for amounts by which our current year inventory levels (determined on a LIFO basis) differ from our previous year-end LIFO inventory levels; and
- forecasted feedstock and refined petroleum product purchases, refined petroleum product sales, natural gas purchases, and corn purchases to lock in the price of those forecasted transactions at existing market prices that we deem favorable.

Our positions in commodity derivative instruments are monitored and managed on a daily basis by our risk control group to ensure compliance with our stated risk management policy that has been approved by our board of directors.

The following sensitivity analysis includes all of our derivative instruments entered into for purposes other than trading with which we have market risk (in millions):

| | December 31, 2018 | 2017 |
|---|---|---|
| Gain (loss) in fair value resulting from: | | |
| 10% increase in underlying commodity prices | $2 | $(43) |
| 10% decrease in underlying commodity prices | (6) | 45 |

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See Note 20 of Notes to Consolidated Financial Statements for notional volumes associated with these derivative contracts as of December 31, 2018.

COMPLIANCE PROGRAM PRICE RISK

We are exposed to market risk related to the volatility in the price of credits needed to comply with various governmental and regulatory environmental compliance programs. To manage this risk, we enter into contracts to purchase these credits when prices are deemed favorable. Some of these contracts are derivative instruments; however, we elect the normal purchase exception and do not record these contracts at their fair values. As of December 31, 2018 and 2017, the amount of gain or loss in the fair value of derivative instruments that would have resulted from a 10 percent increase or decrease in the underlying price of the contracts was not material. See Note 20 of Notes to Consolidated Financial Statements for a discussion about these compliance programs.

INTEREST RATE RISK

The following table provides information about our debt instruments (dollars in millions), the fair values of which are sensitive to changes in interest rates. Principal cash flows and related weighted-average interest rates by expected maturity dates are presented.

| | December 31, 2018 Expected Maturity Dates | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 2019 | 2020 | 2021 | 2022 | 2023 | There-after | Total (a) | Fair Value |
| Fixed rate | $— | $850 | $10 | $— | $— | $7,474 | $8,334 | $8,737 |
| Average interest rate | — % | 6.1 % | 5 % | — % | — % | 5.4 % | 5.5 % | |
| Floating rate (b) | $214 | $5 | $5 | $5 | $20 | $— | $249 | $249 |
| Average interest rate | 4.6 % | 4.7 % | 4.7 % | 4.7% | 4.7 % | — % | 4.6 % | |

| | December 31, 2017 Expected Maturity Dates | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 2018 | 2019 | 2020 | 2021 | 2022 | There-after | Total (a) | Fair Value |
| Fixed rate | $— | $750 | $850 | $— | $— | $6,224 | $7,824 | $9,236 |
| Average interest rate | — % | 9.4 % | 6.1 % | — % | — % | 5.6 % | 6.0 % | |
| Floating rate (b) | $106 | $6 | $416 | $6 | $6 | $19 | $559 | $559 |
| Average interest rate | 2.1 % | 3.8 % | 2.9 % | 3.8% | 3.8% | 3.8 % | 2.8 % | |

(a) Excludes unamortized discounts and debt issuance costs.

(b) As of December 31, 2018 and 2017, we had an interest rate swap associated with $40 million and $49 million, respectively, of our floating rate debt resulting in an effective interest rate of 3.85 percent as of each of those reporting dates. The fair value of the swap was immaterial for all periods presented.

FOREIGN CURRENCY RISK

As of December 31, 2018, we had commitments to purchase $441 million of U.S. dollars. Our market risk was minimal on these contracts, as all of them matured on or before January 31, 2019.

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ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

MANAGEMENT'S REPORT ON INTERNAL CONTROL OVER FINANCIAL REPORTING

Our management is responsible for establishing and maintaining adequate "internal control over financial reporting" (as defined in Rule 13a-15(f) under the Securities Exchange Act of 1934) for Valero Energy Corporation. Our management evaluated the effectiveness of Valero's internal control over financial reporting as of December 31, 2018. In its evaluation, management used the criteria established in Internal Control – Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). Management believes that as of December 31, 2018, our internal control over financial reporting was effective based on those criteria.

Our independent registered public accounting firm has issued an attestation report on the effectiveness of our internal control over financial reporting, which begins on page 64 of this report.

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REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

The Board of Directors and Stockholders
Valero Energy Corporation and subsidiaries:

Opinion on the Consolidated Financial Statements

We have audited the accompanying consolidated balance sheets of Valero Energy Corporation and subsidiaries (the Company) as of December 31, 2018 and 2017, the related consolidated statements of income, comprehensive income, equity, and cash flows for each of the years in the three-year period ended December 31, 2018, and the related notes (collectively, the consolidated financial statements). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2018 and 2017, and the results of its operations and its cash flows for each of the years in the three-year period ended December 31, 2018, in conformity with U.S. generally accepted accounting principles.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of December 31, 2018, based on criteria established in Internal Control – Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission, and our report dated February 28, 2019 expressed an unqualified opinion on the effectiveness of the Company's internal control over financial reporting.

Basis for Opinion

These consolidated financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these consolidated financial statements based on our audits. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that our audits provide a reasonable basis for our opinion.

/s/ KPMG LLP

We have served as the Company's auditor since 2004.

San Antonio, Texas
February 28, 2019

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REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

The Board of Directors and Stockholders
Valero Energy Corporation and subsidiaries:

Opinion on Internal Control Over Financial Reporting

We have audited Valero Energy Corporation's (the Company) internal control over financial reporting as of December 31, 2018, based on criteria established in Internal Control – Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission. In our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2018, based on criteria established in Internal Control – Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated balance sheets of the Company as of December 31, 2018 and 2017, the related consolidated statements of income, comprehensive income, equity, and cash flows for each of the years in the three-year period ended December 31, 2018, and the related notes (collectively, the consolidated financial statements), and our report dated February 28, 2019 expressed an unqualified opinion on those consolidated financial statements.

Basis for Opinion

The Company's management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management's Report on Internal Control over Financial Reporting. Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audit also included performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

Definition and Limitations of Internal Control Over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial

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statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

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

/s/ KPMG LLP

San Antonio, Texas
February 28, 2019

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VALERO ENERGY CORPORATION
CONSOLIDATED BALANCE SHEETS
(millions of dollars, except par value)

| | December 31, | |
|---|---|---|
| | 2018 | 2017 |
| ASSETS | | |
| Current assets: | | |
| Cash and cash equivalents | $2,982 | $5,850 |
| Receivables, net | 7,345 | 6,922 |
| Inventories | 6,532 | 6,384 |
| Prepaid expenses and other | 816 | 156 |
| Total current assets | 17,675 | 19,312 |
| Property, plant, and equipment, at cost | 42,473 | 40,010 |
| Accumulated depreciation | (13,625 ) | (12,530 ) |
| Property, plant, and equipment, net | 28,848 | 27,480 |
| Deferred charges and other assets, net | 3,632 | 3,366 |
| Total assets | $50,155 | $50,158 |
| LIABILITIES AND EQUITY | | |
| Current liabilities: | | |
| Current portion of debt and capital lease obligations | $238 | $122 |
| Accounts payable | 8,594 | 8,348 |
| Accrued expenses | 630 | 712 |
| Taxes other than income taxes payable | 1,213 | 1,321 |
| Income taxes payable | 49 | 568 |
| Total current liabilities | 10,724 | 11,071 |
| Debt and capital lease obligations, less current portion | 8,871 | 8,750 |
| Deferred income tax liabilities | 4,962 | 4,708 |
| Other long-term liabilities | 2,867 | 2,729 |
| Commitments and contingencies | | |
| Equity: | | |
| Valero Energy Corporation stockholders' equity: | | |
| Common stock, $0.01 par value; 1,200,000,000 shares authorized; 673,501,593 and 673,501,593 shares issued | 7 | 7 |
| Additional paid-in capital | 7,048 | 7,039 |
| Treasury stock, at cost; 255,905,051 and 239,603,534 common shares | (14,925 ) | (13,315 ) |
| Retained earnings | 31,044 | 29,200 |
| Accumulated other comprehensive loss | (1,507 ) | (940 ) |
| Total Valero Energy Corporation stockholders' equity | 21,667 | 21,991 |
| Noncontrolling interests | 1,064 | 909 |
| Total equity | 22,731 | 22,900 |
| Total liabilities and equity | $50,155 | $50,158 |

See Notes to Consolidated Financial Statements.

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VALERO ENERGY CORPORATION
CONSOLIDATED STATEMENTS OF INCOME
(millions of dollars, except per share amounts)

| | Year Ended December 31, | | |
|---|---|---|---|
| | 2018 | 2017 | 2016 |
| Revenues (a) | $117,033 | $93,980 | $75,659 |
| Cost of sales: | | | |
| Cost of materials and other | 104,732 | 83,037 | 65,962 |
| Operating expenses (excluding depreciation and amortization expense reflected below) | 4,690 | 4,504 | 4,251 |
| Depreciation and amortization expense | 2,017 | 1,934 | 1,846 |
| Lower of cost or market inventory valuation adjustment | — | — | (747) |
| Total cost of sales | 111,439 | 89,475 | 71,312 |
| Other operating expenses | 45 | 61 | — |
| General and administrative expenses (excluding depreciation and amortization expense reflected below) | 925 | 829 | 709 |
| Depreciation and amortization expense | 52 | 52 | 48 |
| Asset impairment loss | — | — | 56 |
| Operating income | 4,572 | 3,563 | 3,534 |
| Other income, net | 130 | 112 | 94 |
| Interest and debt expense, net of capitalized interest | (470) | (468) | (446) |
| Income before income tax expense (benefit) | 4,232 | 3,207 | 3,182 |
| Income tax expense (benefit) | 879 | (949) | 765 |
| Net income | 3,353 | 4,156 | 2,417 |
| Less: Net income attributable to noncontrolling interests | 231 | 91 | 128 |
| Net income attributable to Valero Energy Corporation stockholders | $3,122 | $4,065 | $2,289 |
| | | | |
| Earnings per common share | $7.30 | $9.17 | $4.94 |
| Weighted-average common shares outstanding (in millions) | 426 | 442 | 461 |
| | | | |
| Earnings per common share – assuming dilution | $7.29 | $9.16 | $4.94 |
| Weighted-average common shares outstanding – assuming dilution (in millions) | 428 | 444 | 464 |

Supplemental information:

| | | | |
|---|---|---|---|
| (a) Includes excise taxes on sales by certain of our international operations | $5,626 | $5,573 | $5,493 |

See Notes to Consolidated Financial Statements.

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VALERO ENERGY CORPORATION
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME
(millions of dollars)

| | Year Ended December 31, | | |
|---|---|---|---|
| | 2018 | 2017 | 2016 |
| Net income | $3,353 | $4,156 | $2,417 |
| Other comprehensive income (loss): | | | |
| Foreign currency translation adjustment | (517) | 514 | (415) |
| Net gain (loss) on pension and other postretirement benefits | 49 | (65) | (98) |
| Other comprehensive income (loss) before income tax expense (benefit) | (468) | 449 | (513) |
| Income tax expense (benefit) related to items of other comprehensive income (loss) | 10 | (21) | (37) |
| Other comprehensive income (loss) | (478) | 470 | (476) |
| Comprehensive income | 2,875 | 4,626 | 1,941 |
| Less: Comprehensive income attributable to noncontrolling interests | 229 | 91 | 129 |
| Comprehensive income attributable to Valero Energy Corporation stockholders | $2,646 | $4,535 | $1,812 |

See Notes to Consolidated Financial Statements.

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VALERO ENERGY CORPORATION
CONSOLIDATED STATEMENTS OF EQUITY
(millions of dollars)

| | Valero Energy Corporation Stockholders' Equity | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Common Stock | Additional Paid-in Capital | Treasury Stock | Retained Earnings | Accumulated Other Comprehensive Loss | Total | Non-controlling Interests | Total Equity |
| Balance as of December 31, 2015 | $7 | $ 7,064 | $(10,799) | $25,188 | $ (933) | $20,527 | $ 827 | $21,354 |
| Net income | — | — | — | 2,289 | — | 2,289 | 128 | 2,417 |
| Dividends on common stock ($2.40 per share) | — | — | — | (1,111) | — | (1,111) | — | (1,111) |
| Stock-based compensation expense | — | 68 | — | — | — | 68 | — | 68 |
| Transactions in connection with stock-based compensation plans | — | (89) | 34 | — | — | (55) | — | (55) |
| Stock purchases under purchase program | — | — | (1,262) | — | — | (1,262) | — | (1,262) |
| Issuance of Valero Energy Partners LP common units | — | — | — | — | — | — | 11 | 11 |
| Distributions to noncontrolling interests | — | — | — | — | — | — | (65) | (65) |
| Other | — | 45 | — | — | — | 45 | (72) | (27) |
| Other comprehensive income (loss) | — | — | — | — | (477) | (477) | 1 | (476) |
| Balance as of December 31, 2016 | 7 | 7,088 | (12,027) | 26,366 | (1,410) | 20,024 | 830 | 20,854 |
| Net income | — | — | — | 4,065 | — | 4,065 | 91 | 4,156 |
| Dividends on common stock ($2.80 per share) | — | — | — | (1,242) | — | (1,242) | — | (1,242) |
| Stock-based compensation expense | — | 68 | — | — | — | 68 | — | 68 |
| Transactions in connection with stock-based compensation plans | — | (82) | 19 | — | — | (63) | — | (63) |
| Stock purchases under purchase programs | — | — | (1,307) | — | — | (1,307) | — | (1,307) |
| Issuance of Valero Energy Partners LP common units | — | — | — | — | — | — | 33 | 33 |
| Contributions from noncontrolling interests | — | — | — | — | — | — | 30 | 30 |
| Distributions to noncontrolling interests | — | — | — | — | — | — | (67) | (67) |
| Other | — | (35) | — | 11 | — | (24) | (8) | (32) |
| Other comprehensive income | — | — | — | — | 470 | 470 | — | 470 |
| Balance as of December 31, 2017 | 7 | 7,039 | (13,315) | 29,200 | (940) | 21,991 | 909 | 22,900 |
| Reclassification of stranded income tax effects of Tax Reform per ASU 2018-02 (see Note 1) | — | — | — | 91 | (91) | — | — | — |
| Net income | — | — | — | 3,122 | — | 3,122 | 231 | 3,353 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Dividends on common stock ($3.20 per share) | — | — | — | (1,369) | — | (1,369) | — | (1,369) |
| Stock-based compensation expense | — | 82 | — | — | — | 82 | — | 82 |
| Transactions in connection with stock-based compensation plans | — | (70) | (99) | — | — | (169) | — | (169) |
| Stock purchases under purchase programs | — | — | (1,511) | — | — | (1,511) | — | (1,511) |
| Contributions from noncontrolling interests | — | — | — | — | — | — | 32 | 32 |
| Distributions to noncontrolling interests | — | — | — | — | — | — | (116) | (116) |
| Other | — | (3) | — | — | — | (3) | 10 | 7 |
| Other comprehensive loss | — | — | — | — | (476) | (476) | (2) | (478) |
| Balance as of December 31, 2018 | $7 | $7,048 | $(14,925) | $31,044 | $(1,507) | $21,667 | $1,064 | $22,731 |

See Notes to Consolidated Financial Statements.

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VALERO ENERGY CORPORATION
CONSOLIDATED STATEMENTS OF CASH FLOWS
(millions of dollars)

| | Year Ended December 31, | | |
|---|---|---|---|
| | 2018 | 2017 | 2016 |
| Cash flows from operating activities: | | | |
| Net income | $3,353 | $4,156 | $2,417 |
| Adjustments to reconcile net income to net cash provided by operating activities: | | | |
| Depreciation and amortization expense | 2,069 | 1,986 | 1,894 |
| Lower of cost or market inventory valuation adjustment | — | — | (747) |
| Asset impairment loss | — | — | 56 |
| Deferred income tax expense (benefit) | 203 | (2,543) | 230 |
| Changes in current assets and current liabilities | (1,297) | 1,289 | 976 |
| Changes in deferred charges and credits and other operating activities, net | 43 | 594 | (6) |
| Net cash provided by operating activities | 4,371 | 5,482 | 4,820 |
| Cash flows from investing activities: | | | |
| Capital expenditures | (1,628) | (1,353) | (1,278) |
| Deferred turnaround and catalyst costs | (915) | (523) | (718) |
| Investments in joint ventures | (181) | (406) | (4) |
| Capital expenditures of certain variable interest entities (VIEs) | (124) | (26) | — |
| Peru Acquisition, net of cash acquired | (468) | — | — |
| Acquisition of ethanol plants | (320) | — | — |
| Acquisitions of undivided interests | (212) | (72) | — |
| Minor acquisitions | (88) | — | — |
| Other investing activities, net | 8 | (2) | (6) |
| Net cash used in investing activities | (3,928) | (2,382) | (2,006) |
| Cash flows from financing activities: | | | |
| Proceeds from debt issuances and borrowings (excluding borrowings of certain VIEs) | 1,258 | 380 | 2,153 |
| Proceeds from borrowings of certain VIEs | 109 | — | — |
| Repayments of debt and capital lease obligations | (1,359) | (21) | (1,475) |
| Purchases of common stock for treasury | (1,708) | (1,372) | (1,336) |
| Common stock dividends | (1,369) | (1,242) | (1,111) |
| Contributions from noncontrolling interests | 32 | 30 | — |
| Distributions to noncontrolling interests | (116) | (67) | (65) |
| Other financing activities, net | (15) | 20 | (178) |
| Net cash used in financing activities | (3,168) | (2,272) | (2,012) |
| Effect of foreign exchange rate changes on cash | (143) | 206 | (100) |
| Net increase (decrease) in cash and cash equivalents | (2,868) | 1,034 | 702 |
| Cash and cash equivalents at beginning of year | 5,850 | 4,816 | 4,114 |
| Cash and cash equivalents at end of year | $2,982 | $5,850 | $4,816 |

See Notes to Consolidated Financial Statements.

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VALERO ENERGY CORPORATION
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

## 1. DESCRIPTION OF BUSINESS, BASIS OF PRESENTATION, AND SIGNIFICANT ACCOUNTING POLICIES

### Description of Business

The terms “Valero,” “we,” “our,” and “us,” as used in this report, may refer to Valero Energy Corporation, one or more of its consolidated subsidiaries, or all of them taken as a whole.

We are an independent petroleum refiner and ethanol producer. We own 15 petroleum refineries located in the United States (U.S.), Canada, and the United Kingdom (U.K.) with a combined throughput capacity of approximately 3.1 million barrels per day as of December 31, 2018. We sell our refined petroleum products in both the wholesale rack and bulk markets, and approximately 7,000 outlets carry our brand names in the U.S., Canada, the U.K., and Ireland. Most of our logistics assets support our refining operations, and some of these assets are owned by Valero Energy Partners LP (VLP). See Note 12 for further information about VLP. We also own 14 ethanol plants in the Mid-Continent region of the U.S. with a combined production capacity of approximately 1.73 billion gallons per year as of December 31, 2018. We sell our ethanol in the wholesale bulk market, and some of our logistics assets support our ethanol operations.

### Basis of Presentation

#### General

These consolidated financial statements were prepared in accordance with U.S. generally accepted accounting principles (GAAP) and with the rules and regulations of the U.S. Securities and Exchange Commission (SEC).

#### Reclassifications

Certain prior year amounts have been reclassified to conform to the 2018 presentation. The changes were primarily due to our retrospective adoption on January 1, 2018 of Accounting Standards Update (ASU) No. 2017-07, “Compensation—Retirement Benefits (Topic 715): Improving the Presentation of Net Periodic Pension Cost and Net Periodic Postretirement Benefit Cost.” This ASU requires employers to report the service cost component of net periodic pension cost and net periodic postretirement benefit cost in the same line item as other compensation costs arising from services rendered by the pertinent employees during the period. It also requires the other components of net periodic pension cost and net periodic postretirement benefit cost (non-service cost components) to be presented in the income statement separately from the service cost component and outside a subtotal of income from operations. The adoption of this ASU did not affect our financial position or results of operations, but resulted in the reclassification of the non-service components of pension and postretirement benefit costs from operating expenses (excluding depreciation and amortization expense) and general and administrative expenses (excluding depreciation and amortization expense) to other income, net. This resulted in an increase of $42 million and $44 million in operating expenses (excluding depreciation and amortization expense) and a decrease of $6 million and $6 million in general and administrative expenses (excluding depreciation and amortization expense) for the years ended December 31, 2017 and 2016, respectively.

### Significant Accounting Policies

#### Principles of Consolidation

These financial statements include those of Valero, our wholly owned subsidiaries, and VIEs in which we have a controlling interest. Our VIEs are described in Note 12. The ownership interests held by others in the VIEs are recorded as noncontrolling interests. Intercompany items and transactions have been eliminated in

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consolidation. Investments in less than wholly owned entities where we have significant influence are accounted for using the equity method.

Use of Estimates
The preparation of financial statements in conformity with U.S. GAAP requires us to make estimates and assumptions that affect the amounts reported in the financial statements and accompanying notes. Actual results could differ from those estimates. On an ongoing basis, we review our estimates based on currently available information. Changes in facts and circumstances may result in revised estimates.

Cash Equivalents
Our cash equivalents are short-term, highly liquid investments that are readily convertible to known amounts of cash and have a maturity of three months or less when acquired.

Receivables
Trade receivables are carried at original invoice amount. We maintain an allowance for doubtful accounts, which is adjusted based on management's assessment of our customers' historical collection experience, known credit risks, and industry and economic conditions.

Inventories
The cost of refinery feedstocks, refined petroleum products, and grain and ethanol inventories is determined under the last-in, first-out (LIFO) method using the dollar-value LIFO approach, with any increments valued based on average purchase prices during the year. Our LIFO inventories are carried at the lower of cost or market. The cost of products purchased for resale and the cost of materials and supplies are determined principally under the weighted-average cost method. Our non-LIFO inventories are carried at the lower of cost or net realizable value. If the aggregate market value of our LIFO inventories or the aggregate net realizable value of our non-LIFO inventories is less than the related aggregate cost, we recognize a loss for the difference in our statements of income.

Property, Plant, and Equipment
The cost of property, plant, and equipment (property assets) purchased or constructed, including betterments of property assets, is capitalized. However, the cost of repairs to and normal maintenance of property assets is expensed as incurred. Betterments of property assets are those that extend the useful life, increase the capacity or improve the operating efficiency of the asset, or improve the safety of our operations. The cost of property assets constructed includes interest and certain overhead costs allocable to the construction activities.

Our operations, especially those of our refining segment, are highly capital intensive. Each of our refineries comprises a large base of property assets, consisting of a series of interconnected, highly integrated and interdependent crude oil processing facilities and supporting logistical infrastructure (Units), and these Units are continuously improved. Improvements consist of the addition of new Units and betterments of existing Units. We plan for these improvements by developing a multi-year capital program that is updated and revised based on changing internal and external factors.

Depreciation of property assets used in our refining segment is recorded on a straight-line basis over the estimated useful lives of these assets primarily using the composite method of depreciation. We maintain a

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VALERO ENERGY CORPORATION
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

separate composite group of property assets for each of our refineries. We estimate the useful life of each group based on an evaluation of the property assets comprising the group, and such evaluations consist of, but are not limited to, the physical inspection of the assets to determine their condition, consideration of the manner in which the assets are maintained, assessment of the need to replace assets, and evaluation of the manner in which improvements impact the useful life of the group. The estimated useful lives of our composite groups range primarily from 25 to 30 years.

Under the composite method of depreciation, the cost of an improvement is added to the composite group to which it relates and is depreciated over that group's estimated useful life. We design improvements to our refineries in accordance with engineering specifications, design standards, and practices accepted in our industry, and these improvements have design lives consistent with our estimated useful lives. Therefore, we believe the use of the group life to depreciate the cost of improvements made to the group is reasonable because the estimated useful life of each improvement is consistent with that of the group.

Also under the composite method of depreciation, the historical cost of a minor property asset (net of salvage value) that is retired or replaced is charged to accumulated depreciation and no gain or loss is recognized in income. However, a gain or loss is recognized in income for a major property asset that is retired, replaced, sold, or for an abnormal disposition of a property asset (primarily involuntary conversions). Gains and losses are reflected in depreciation and amortization expense, unless such amounts are reported separately due to materiality.

Depreciation of property assets used in our ethanol segment is recorded on a straight-line basis over the estimated useful lives of the related assets.

Leasehold improvements are amortized on a straight-line basis over the shorter of the lease term or the estimated useful life of the related asset. Assets acquired under capital leases are amortized on a straight-line basis over (i) the lease term if transfer of ownership does not occur at the end of the lease term or (ii) the estimated useful life of the asset if transfer of ownership does occur at the end of the lease term.

Deferred Charges and Other Assets
"Deferred charges and other assets, net" primarily include the following:

- turnaround costs, which are incurred in connection with planned major maintenance activities at our refineries and ethanol plants and which are deferred when incurred and amortized on a straight-line basis over the period of time estimated to lapse until the next turnaround occurs;

- fixed-bed catalyst costs, representing the cost of catalyst that is changed out at periodic intervals when the quality of the catalyst has deteriorated beyond its prescribed function, which are deferred when incurred and amortized on a straight-line basis over the estimated useful life of the specific catalyst;

- income taxes receivable;

- investments in joint ventures accounted for under the equity method;

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VALERO ENERGY CORPORATION
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

- intangible assets; and

- goodwill.

Impairment of Assets
Long-lived assets are tested for recoverability whenever events or changes in circumstances indicate that the carrying amount of the asset may not be recoverable. A long-lived asset is not recoverable if its carrying amount exceeds the sum of the undiscounted cash flows expected to result from its use and eventual disposition. If a long-lived asset is not recoverable, an impairment loss is recognized for the amount by which the carrying amount of the long-lived asset exceeds its fair value, with fair value determined based on discounted estimated net cash flows or other appropriate methods.

We evaluate our equity method investments for impairment when there is evidence that we may not be able to recover the carrying amount of our investments or the investee is unable to sustain an earnings capacity that justifies the carrying amount. A loss in the value of an investment that is other than a temporary decline is recognized currently in income, and is based on the difference between the estimated current fair value of the investment and its carrying amount.

Asset Retirement Obligations
We record a liability, which is referred to as an asset retirement obligation, at fair value for the estimated cost to retire a tangible long-lived asset at the time we incur that liability, which is generally when the asset is purchased, constructed, or leased. We record the liability when we have a legal obligation to incur costs to retire the asset and when a reasonable estimate of the fair value of the liability can be made. If a reasonable estimate cannot be made at the time the liability is incurred, we record the liability when sufficient information is available to estimate the liability's fair value.

We have obligations with respect to certain of our assets related to our refining and ethanol segments to clean and/or dispose of various component parts of the assets at the time they are retired. However, these component parts can be used for extended and indeterminate periods of time as long as they are properly maintained and/or upgraded. It is our practice and current intent to maintain all our assets and continue making improvements to those assets based on technological advances. As a result, we believe that our assets related to our refining and ethanol segments have indeterminate lives for purposes of estimating asset retirement obligations because dates or ranges of dates upon which we would retire such assets cannot reasonably be estimated at this time. We will recognize a liability at such time when sufficient information exists to estimate a date or range of potential settlement dates that is needed to employ a present value technique to estimate fair value.

Environmental Matters
Liabilities for future remediation costs are recorded when environmental assessments and/or remedial efforts are probable and the costs can be reasonably estimated. Other than for assessments, the timing and magnitude of these accruals generally are based on the completion of investigations or other studies or a commitment to a formal plan of action. Amounts recorded for environmental liabilities have not been reduced by possible recoveries from third parties and have not been measured on a discounted basis.

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VALERO ENERGY CORPORATION
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

Legal Contingencies
We are subject to legal proceedings, claims, and liabilities that arise in the ordinary course of business. We accrue losses associated with legal claims when such losses are probable and reasonably estimable. If we determine that a loss is probable and cannot estimate a specific amount for that loss but can estimate a range of loss, the best estimate within the range is accrued. If no amount within the range is a better estimate than any other, the minimum amount of the range is accrued. Estimates are adjusted as additional information becomes available or circumstances change. Legal defense costs associated with loss contingencies are expensed in the period incurred.

Foreign Currency Translation
Generally, our international subsidiaries use their local currency as their functional currency. Balance sheet amounts are translated into U.S. dollars using exchange rates in effect as of the balance sheet date. Income statement amounts are translated into U.S. dollars using the exchange rates in effect at the time the underlying transactions occur. Foreign currency translation adjustments are recorded as a component of accumulated other comprehensive loss.

Revenue Recognition
Our revenues are primarily generated from contracts with customers. We generate revenue from contracts with customers from the sale of products by our refining and ethanol segments. Our VLP segment generates intersegment revenues from transportation and terminaling activities provided to our refining segment that are eliminated in consolidation. Revenues are recognized when we satisfy our performance obligation to transfer products to our customers, which typically occurs at a point in time upon shipment or delivery of the products, and for an amount that reflects the transaction price that is allocated to the performance obligation.

The customer is able to direct the use of, and obtain substantially all of the benefits from, the products at the point of shipment or delivery. As a result, we consider control to have transferred upon shipment or delivery because we have a present right to payment at that time, the customer has legal title to the asset, we have transferred physical possession of the asset, and the customer has significant risks and rewards of ownership of the asset.

Our contracts with customers state the final terms of the sale, including the description, quantity, and price for goods sold. Payment is typically due in full within two to ten days of delivery. In the normal course of business, we generally do not accept product returns.

The transaction price is the consideration that we expect to be entitled to in exchange for our products. The transaction price for substantially all of our contracts is generally based on commodity market pricing (i.e., variable consideration). As such, this market pricing may be constrained (i.e., not estimable) at the inception of the contract but will be recognized based on the applicable market pricing, which will be known upon transfer of the goods to the customer. Some of our contracts also contain variable consideration in the form of sales incentives to our customers, such as discounts and rebates. For contracts that include variable consideration, we estimate the factors that determine the variable consideration in order to establish the transaction price.

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VALERO ENERGY CORPORATION
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

We have elected to exclude from the measurement of the transaction price all taxes assessed by governmental authorities that are both imposed on and concurrent with a specific revenue-producing transaction and collected by us from a customer (e.g., sales tax, use tax, value-added tax, etc.). We continue to include in the transaction price excise taxes that are imposed on certain inventories in our international operations. The amount of such taxes is provided in supplemental information in a footnote on the statements of income.

There are instances where we provide shipping services in relation to the goods sold to our customer. Shipping and handling costs that occur before the customer obtains control of the goods are deemed to be fulfillment activities and are included in cost of materials and other. We have elected to account for shipping and handling activities that occur after the customer has obtained control of a good as fulfillment activities rather than as a promised service and we have included these activities in cost of materials and other.

We enter into certain purchase and sale arrangements with the same counterparty that are deemed to be made in contemplation of one another. We combine these transactions and present the net effect in cost of materials and other. We also enter into refined petroleum product exchange transactions to fulfill sales contracts with our customers by accessing refined petroleum products in markets where we do not operate our own refineries. These refined petroleum product exchanges are accounted for as exchanges of nonmonetary assets, and no revenues are recorded on these transactions.

Cost Classifications
“Cost of materials and other” primarily includes the cost of materials that are a component of our products sold. These costs include (i) the direct cost of materials (such as crude oil and other refinery feedstocks, refined petroleum products and blendstocks, and ethanol feedstocks and products) that are a component of our products sold; (ii) costs related to the delivery (such as shipping and handling costs) of products sold; (iii) costs related to our environmental credit obligations to comply with various governmental and regulatory programs (such as the cost of Renewable Identification Numbers (RINs) as required by the U.S. Environmental Protection Agency’s (EPA) Renewable Fuel Standard and emission credits under various cap-and-trade systems, as defined in Note 19); (iv) gains and losses on our commodity derivative instruments; and (v) certain excise taxes.

“Operating expenses (excluding depreciation and amortization expense)” include costs to operate our refineries, ethanol plants, and logistics assets, except for depreciation and amortization expense. These costs primarily include employee-related expenses, energy and utility costs, catalysts and chemical costs, and repair and maintenance expenses.

“Depreciation and amortization expense” associated with our operations is separately presented in our statement of income as a component of cost of sales and general and administrative expenses and is disclosed by reportable segment in Note 17.

“Other operating expenses” include costs, if any, incurred by our reportable segments that are not associated with our cost of sales.

Environmental Compliance Program Costs
We purchase credits in the open market to meet our obligations under various environmental compliance programs. We purchase biofuel credits (primarily RINs in the U.S.) to comply with government regulations

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that require us to blend a certain percentage of biofuels into the products we produce. To the degree that we are unable to blend biofuels at the required percentage, we must purchase biofuel credits to meet our obligation. We purchase greenhouse gas (GHG) emission credits to comply with government regulations concerning various GHG emission programs, including cap-and-trade systems. These programs are described in Note 20 under “Environmental Compliance Program Price Risk.”

The costs of purchased biofuel credits and GHG emission credits are charged to cost of materials and other as such credits are needed to satisfy our obligation. To the extent we have not purchased enough credits to satisfy our obligation as of the balance sheet date, we charge cost of materials and other for such deficiency based on the market price of the credits as of the balance sheet date, and we record a liability for our obligation to purchase those credits. See Note 19 for disclosure of our fair value liability.

Stock-Based Compensation
Compensation expense for our share-based compensation plans is based on the fair value of the awards granted and is recognized in income on a straight-line basis over the shorter of (i) the requisite service period of each award or (ii) the period from the grant date to the date retirement eligibility is achieved if that date is expected to occur during the vesting period established in the award.

Income Taxes
Income taxes are accounted for under the asset and liability method. Under this method, deferred tax assets and liabilities are recognized for the future tax consequences attributable to differences between the financial statement carrying amounts of existing assets and liabilities and their respective tax bases. Deferred amounts are measured using enacted tax rates expected to apply to taxable income in the year those temporary differences are expected to be recovered or settled. Deferred tax assets are reduced by unrecognized tax benefits, if such items may be available to offset the unrecognized tax benefit. Stranded income tax effects are released from accumulated other comprehensive loss to retained earnings on an individual item basis as those items are reclassified into income.

We have elected to classify any interest expense and penalties related to the underpayment of income taxes in income tax expense.
We have elected to treat the global intangible low-taxed income (GILTI) tax as a period expense.

Earnings per Common Share
Earnings per common share is computed by dividing net income attributable to Valero stockholders by the weighted-average number of common shares outstanding for the year. Participating securities are included in the computation of basic earnings per share using the two-class method. Earnings per common share – assuming dilution is computed by dividing net income attributable to Valero stockholders by the weighted-average number of common shares outstanding for the year increased by the effect of dilutive securities. Potentially dilutive securities are excluded from the computation of earnings per common share – assuming dilution when the effect of including such shares would be antidilutive.

Financial Instruments
Our financial instruments include cash and cash equivalents, receivables, payables, debt, capital lease obligations, commodity derivative contracts, and foreign currency derivative contracts. The estimated fair

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values of these financial instruments approximate their carrying amounts, except for certain debt as discussed in Note 19.

Derivatives and Hedging

All derivative instruments, not designated as normal purchases or sales, are recorded in the balance sheet as either assets or liabilities measured at their fair values with changes in fair value recognized currently in income. To manage commodity price risk, we use economic hedges, which are derivative instruments not designated as fair value or cash flow hedges, and we also use fair value and cash flow hedges from time to time. The cash flow effects of all of our derivative instruments are reflected in operating activities in the statements of cash flows.

Accounting Pronouncements Adopted During 2018

Topic 606

On January 1, 2018, we adopted the provisions of Accounting Standards Codification (ASC) Topic 606, “Revenue from Contracts with Customers,” (Topic 606). This standard clarifies the principles for recognizing revenue and supersedes previous revenue recognition requirements under “Revenue Recognition (Topic 605).” We adopted the provisions of Topic 606 using the modified retrospective method of adoption as permitted by the standard. Under this method, the cumulative effect of initially applying the standard is recognized as an adjustment to the opening balance of retained earnings, and revenues reported in the periods prior to the date of adoption are not changed. We elected to apply the transition guidance for Topic 606 only to contracts that were not completed as of the date of adoption. There was no material impact to our financial position as a result of adopting Topic 606; therefore, there was no cumulative-effect adjustment to retained earnings as of January 1, 2018, and there was no material impact to our financial statements as of and for the year ended December 31, 2018. Our revenue recognition accounting policy described above has been updated in conjunction with our adoption of Topic 606, but our previous policy has been omitted because the adoption of Topic 606 had no material impact to us as previously described.

ASU No. 2016-01

On January 1, 2018, we adopted the provisions of ASU No. 2016-01, “Financial Instruments—Overall (Subtopic 825-10): Recognition and Measurement of Financial Assets and Financial Liabilities.” This ASU enhances the reporting model for financial instruments regarding certain aspects of recognition, measurement, presentation, and disclosure. We adopted the provisions of this ASU using the cumulative-effect method of adoption as required by the ASU. The adoption of this ASU did not affect our financial position or our results of operations as of or for the year ended December 31, 2018, but resulted in reduced disclosures as it eliminated the requirement to disclose the methods and significant assumptions used to estimate the fair value of financial instruments.

ASU No. 2017-04

Effective October 1, 2018, we early adopted the provisions of ASU No. 2017-04, “Intangibles—Goodwill and Other (Topic 350): Simplifying the Test for Goodwill Impairment.” This ASU simplifies the subsequent measurement of goodwill by eliminating Step 2 from the goodwill impairment test. Under the provisions of this ASU, an entity should perform its annual, or interim, goodwill impairment test by comparing the fair value of a reporting unit with its carrying amount, including goodwill, and should recognize an impairment charge for the amount by which the carrying amount exceeds the reporting unit’s fair value. However, the impairment charge should not exceed the carrying amount of goodwill allocated to that reporting unit. An

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entity still has the option to perform the qualitative assessment for a reporting unit to determine if the quantitative impairment test is necessary. The adoption of this ASU did not affect our financial position or results of operations and did not result in additional disclosures because it is applied prospectively to impairment tests performed after the date of adoption.

ASU No. 2017-09
On January 1, 2018, we adopted the provisions of ASU No. 2017-09, “Compensation—Stock Compensation (Topic 718): Scope of Modification Accounting.” This ASU reduces diversity in practice, as well as reduces cost and complexity regarding a change to the terms or conditions of a share-based payment award. The adoption of this ASU did not have an immediate effect on our financial position or results of operations as it is applied prospectively to an award modified on or after adoption.

ASU No. 2018-02
On January 1, 2018, we adopted the provisions of ASU No. 2018-02, “Income Statement—Reporting Comprehensive Income (Topic 220): Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income,” (ASU No. 2018-02). This ASU allows for the stranded tax effects resulting from the Tax Cuts and Jobs Act of 2017 (Tax Reform) to be reclassified from accumulated other comprehensive income to retained earnings. We elected to reclassify the stranded income tax effects resulting from Tax Reform from accumulated other comprehensive income to retained earnings as of the beginning of the interim period of adoption. The adoption of this ASU did not affect our financial position or results of operations but resulted in the reclassification of $91 million of income tax benefits related to Tax Reform from accumulated other comprehensive loss to retained earnings as of January 1, 2018 as presented in our statement of equity and in Note 11 under “Accumulated Other Comprehensive Loss.”

ASU No. 2018-05
In March 2018, the Financial Accounting Standards Board (FASB) issued ASU No. 2018-05, “Income Taxes (Topic 740): Amendments to SEC Paragraphs Pursuant to SEC Staff Accounting Bulletin No. 118,” (ASU No. 2018-05) to amend certain SEC material in Topic 740 for the income tax accounting implications of the recently issued Tax Reform. This guidance clarifies the application of Topic 740 in situations where a registrant does not have the necessary information available, prepared, or analyzed in reasonable detail to complete the accounting under Topic 740 for certain income tax effects of Tax Reform for the reporting period in which Tax Reform was enacted. See Note 15 for a discussion of the impact of this ASU.

ASU No. 2018-13
Effective October 1, 2018, we adopted all of the provisions of ASU No. 2018-13, “Fair Value Measurement (Topic 820): Disclosure Framework—Changes to the Disclosure Requirements for Fair Value Measurement.” This ASU improves the effectiveness of disclosures in the notes to financial statements by removing, modifying, and adding certain disclosure requirements for fair value measurements. We are no longer required to disclose the amount of and reasons for transfers between Level 1 and Level 2 of the fair value hierarchy, but are required to disclose the range and weighted average of significant unobservable inputs used to develop Level 3 fair value measurements. Certain provisions of this ASU, primarily related to disclosures, require the prospective method of adoption, with the remaining provisions applied retrospectively. The early adoption of this ASU did not affect our financial position or results of operations, but resulted in revised disclosures as discussed above.

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VALERO ENERGY CORPORATION
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

ASU No. 2018-14
Effective December 31, 2018, we adopted the provisions of ASU No. 2018-14, "Compensation—Retirement Benefits—Defined Benefit Plans—General (Subtopic 715-20): Disclosure Framework—Changes to the Disclosure Requirements for Defined Benefit Plans." This ASU improves the effectiveness of disclosures in the notes to financial statements by removing, modifying, and adding certain disclosure requirements for employers that sponsor defined benefit pension or other postretirement plans. We are no longer required to disclose the amounts in accumulated other comprehensive income expected to be recognized as components of net periodic benefit cost over the next fiscal year, but we are required to (i) disclose the weighted-average interest crediting rates for cash balance plans and other plans with promised interest crediting rates and (ii) provide an explanation of the reasons for significant gains and losses related to changes in the benefit obligation for the period. The early adoption of this ASU did not affect our financial position or results of operations, but resulted in revised disclosures as discussed above.

Accounting Pronouncements Adopted on January 1, 2019
Topic 842
In February 2016, the FASB issued ASC Topic 842, "Leases," (Topic 842) to increase the transparency and comparability among organizations by recognizing lease assets and lease liabilities on the balance sheet and disclosing key information about leasing arrangements. This new standard is effective for annual reporting periods beginning after December 15, 2018, and interim reporting periods within those annual reporting periods, with early adoption permitted. We adopted this new standard on January 1, 2019 using the optional transition method; however, we did not have a cumulative-effect adjustment to the opening balance of retained earnings at the date of adoption as noted below, but we will apply the new disclosure requirements beginning in 2019.

The new standard provides a number of optional practical expedients and we elected the following:

- Transition Elections. We elected the package of practical expedients that permits us to not reassess our prior conclusions about lease identification, lease classification, and initial direct costs under the new standard, as well as the practical expedient that permits us to not assess existing land easements under the new standard.

- Lessee Accounting Policy Elections. We elected the short-term lease recognition exemption whereby right-of-use (ROU) assets and lease liabilities are not recognized for leasing arrangements with terms less than one year, and the practical expedient to not separate lease and non-lease components for all classes of underlying assets other than the marine transportation asset class.

In preparation for the adoption of Topic 842, we enhanced our contracting and lease evaluation systems and related processes, and we developed a new lease accounting system to capture our leases and support the required disclosures. We have integrated our lease accounting system with our general ledger and modified our related procurement and payment processes.

Adoption of this standard resulted in (i) the recognition of ROU assets and lease liabilities for our operating leases of approximately $1.3 billion, (ii) the derecognition of existing assets under construction of approximately $539 million related to a build-to-suit lease arrangement (see Note 10 under "Other Commitments—MVP Terminal"), and (iii) the presentation of new disclosures about our leasing activities

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beginning in the first quarter of 2019. Adoption of this standard did not impact our results of operations or liquidity and our accounting for finance leases is substantially unchanged.

ASU No. 2017-12

In August 2017, the FASB issued ASU No. 2017-12, “Derivatives and Hedging (Topic 815): Targeted Improvements to Accounting for Hedging Activities,” (ASU No. 2017-12) to improve and simplify accounting guidance for hedge accounting. The provisions of this ASU are effective for annual reporting periods beginning after December 15, 2018, and interim reporting periods within those annual reporting periods, with early adoption permitted. Certain provisions of this ASU, primarily related to disclosures, require the prospective method of adoption, with the remaining provisions applied through a cumulative-effect adjustment to retained earnings as of the adoption date. The adoption of ASU No. 2017-12 effective January 1, 2019 did not affect our financial position or results of operations.

Accounting Pronouncements Not Yet Adopted

ASU No. 2016-13

In June 2016, the FASB issued “Financial Instruments—Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments,” (ASU No. 2016-13) to improve financial reporting by requiring the immediate recognition of credit losses on financial instruments held by a reporting entity. This ASU requires the measurement of all expected credit losses for financial assets held at the reporting date based on historical experience, current conditions, and reasonable and supportable forecasts. It also requires enhanced disclosures, including qualitative and quantitative requirements that provide additional information about the amounts recorded in the financial statements. In November 2018, the FASB issued “Codification Improvements to Topic 326, Financial Instruments—Credit Losses,” (ASU 2018-19), which clarified that this guidance does not apply to receivables arising from operating leases. The provisions of this ASU are effective for annual reporting periods beginning after December 15, 2019, and interim periods within those annual reporting periods, with early adoption permitted for annual periods beginning after December 15, 2018. The provisions of this ASU should be applied through a cumulative-effect adjustment to retained earnings as of the beginning of the first reporting period in which this ASU is effective (i.e., the modified-retrospective approach). We expect to adopt ASU No. 2016-13 effective January 1, 2020, and we do not expect such adoption to materially affect our financial position or our results of operations.

ASU No. 2018-17

In October 2018, the FASB issued ASU No. 2018-17, “Consolidation (Topic 810): Targeted Improvements to Related Party Guidance for Variable Interest Entities,” (ASU No. 2018-17) to reduce the cost and complexity of financial reporting associated with consolidation of VIEs. One of the provisions of this ASU amends how a decision maker or service provider determines whether its fee is a variable interest. This guidance requires reporting entities to consider indirect interests held through related parties under common control on a proportional basis rather than as the equivalent of a direct interest in its entirety (as currently required by U.S. GAAP). The provisions of this ASU are effective for annual reporting periods beginning after December 15, 2019, and interim reporting periods within those annual reporting periods, with early adoption permitted. The provisions of this ASU should be applied on a retrospective basis with a cumulative-effect adjustment to retained earnings as of the beginning of the earliest period presented. We expect to adopt ASU No. 2018-17 effective January 1, 2020, and we do not expect such adoption to materially affect our financial position or our results of operations.

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VALERO ENERGY CORPORATION
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

## 2. ACQUISITIONS AND MERGER

Peru Acquisition

On May 14, 2018, we acquired 100 percent of the issued and outstanding equity interests in Pure Biofuels del Peru S.A.C. (Pure Biofuels) from Pegasus Capital Advisors L.P. and various minority equity holders. Pure Biofuels markets refined petroleum products through its logistics assets in Peru. Pure Biofuels owns a terminal at the Port of Callao, near Lima, with approximately 1 million barrels of storage capacity for refined petroleum and renewable products. Through one of its subsidiaries, Pure Biofuels also owns a 180,000 -barrel storage terminal in Paita, in northern Peru, which is scheduled to commence operations in the second half of 2019, pending regulatory approvals. We paid $468 million from available cash on hand, of which $132 million was for working capital. This acquisition, which is referred to as the Peru Acquisition, is consistent with our general business strategy and broadens the geographic diversity of our refining segment. This acquisition was accounted for as a business acquisition.

The following table summarizes the fair values of the assets acquired and liabilities assumed at the acquisition date, based on an independent appraisal that was completed in the fourth quarter of 2018 (in millions). During the third and fourth quarters of 2018, we recognized immaterial adjustments to the preliminary amounts recorded for the Peru Acquisition with a corresponding adjustment to goodwill due to the completion of the independent appraisal. These adjustments did not have a material effect on our results of operations for the year ended December 31, 2018.

| | |
|---|---|
| Current assets, net of cash acquired | $158 |
| Property, plant, and equipment | 102 |
| Deferred charges and other assets | 466 |
| Current liabilities, excluding current portion of debt | (26 ) |
| Debt assumed, including current portion | (137 ) |
| Deferred income tax liabilities | (62 ) |
| Other long-term liabilities | (27 ) |
| Noncontrolling interest | (6 ) |
| Total consideration, net of cash acquired | $468 |

Deferred charges and other assets primarily include identifiable intangible assets of $200 million and goodwill of $260 million. Identifiable intangible assets, which consist of customer contracts and relationships, are amortized on a straight-line basis over ten years. Goodwill is calculated as the excess of the consideration transferred over the estimated fair values of the underlying tangible and identifiable intangible assets acquired and liabilities assumed. Goodwill represents the future economic benefits expected to be recognized from our expansion into the Latin American refined petroleum products markets arising from other assets acquired that were not individually identified and separately recognized. We determined that the entire balance of goodwill is related to the refining segment. None of the goodwill is deductible for tax purposes.

Our statements of income include the results of operations of Pure Biofuels since the date of acquisition, and such results are reflected in the refining segment. Results of operations since the date of acquisition, supplemental pro forma financial information, and acquisition-related costs have not been presented for the Peru Acquisition as such information is not material to our results of operations.

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VALERO ENERGY CORPORATION
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

Acquisition of Ethanol Plants
On November 15, 2018, we acquired three ethanol plants from two subsidiaries of Green Plains Inc. for total cash consideration of $320 million including working capital of $20 million. The ethanol plants are located in Bluffton, Indiana; Lakota, Iowa; and Riga, Michigan with a combined ethanol production capacity of 280 million gallons per year. This acquisition was accounted for as an asset acquisition.

Merger with VLP
On January 10, 2019, we completed our acquisition of all of the outstanding publicly held common units of VLP pursuant to a definitive Agreement and Plan of Merger (Merger Agreement, and together with the transactions contemplated thereby, the Merger Transaction) with VLP. Upon completion of the Merger Transaction, each outstanding publicly held common unit was converted into the right to receive $42.25 per common unit in cash without any interest thereon, and all such publicly traded common units were automatically canceled and ceased to exist. Upon completion of the Merger Transaction, we paid aggregate merger consideration of $950 million, which was funded with available cash on hand.

We consolidate the financial statements of VLP (see Note 12) and we reflect noncontrolling interests on our balance sheet for the portion of VLP's partners' capital held by VLP's public common unitholders. However, upon completion of the Merger Transaction, VLP became our indirect wholly owned subsidiary and, as a result, we will no longer reflect noncontrolling interests on our balance sheet with respect to VLP. In addition, we will no longer attribute a portion of VLP's net income to noncontrolling interests. Because we had a controlling financial interest in VLP before the merger and retained our controlling financial interest in VLP after the merger, the change in our ownership interest in VLP as a result of the merger was accounted for as an equity transaction. Accordingly, we did not recognize a gain or loss on the merger.

3. ARUBA DISPOSITION

Effective October 1, 2016, we (i) transferred ownership of all of our assets in Aruba, other than certain hydrocarbon inventories and working capital, to Refineria di Aruba N.V., an entity wholly-owned by the Government of Aruba (GOA), (ii) settled our obligations under various agreements with the GOA, including agreements that required us to dismantle our leasehold improvements under certain conditions, and (iii) sold the working capital of our Aruba operations, including hydrocarbon inventories, to the GOA and CITGO (defined below). We refer to this transaction as the "Aruba Disposition." The agreements associated with the Aruba Disposition were finalized in September 2016, including approval of such agreements by the Aruba Parliament. We no longer own any assets or have any operations in Aruba.

In September 2016 and in connection with the Aruba Disposition, our U.S. subsidiaries were unable to collect outstanding debt obligations owed to them by our Aruba subsidiaries, which resulted in the recognition by us of an income tax benefit in the U.S. of $42 million during the year ended December 31, 2016. We had no income tax effect in Aruba from the cancellation of debt or other effects of the Aruba Disposition because of net operating loss carryforwards associated with our operations in Aruba against which we had previously recorded a full valuation allowance.

Prior to the Aruba Disposition, we recognized an asset impairment loss of $56 million in June 2016 representing all of the remaining carrying value of our long-lived assets in Aruba. These assets were primarily related to our crude oil

and refined petroleum products terminal and transshipment facility in Aruba (collectively, the Aruba Terminal), which were included in our refining segment. We recognized the

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VALERO ENERGY CORPORATION
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

impairment loss at that time because we concluded that it was more likely than not that we would ultimately transfer ownership of these assets to the GOA as a result of agreements entered into in June 2016 between the GOA, CITGO Aruba Refining N.V. (CAR), and CITGO Petroleum Corporation (together with CAR and certain other affiliates, collectively, CITGO) providing for, among other things, the GOA's lease of those assets to CITGO. (See Note 19 for disclosure related to the method to determine fair value.)

## 4. RECEIVABLES

Receivables consisted of the following (in millions):

| | December 31, | |
|---|---|---|
| | 2018 | 2017 |
| Receivables from contracts with customers | $4,673 | $5,686 |
| Receivables from certain purchase and sale arrangements | 2,311 | 1,098 |
| Commodity derivative and foreign currency contract receivables | 229 | 102 |
| Other receivables | 166 | 69 |
| Total receivables | 7,379 | 6,955 |
| Allowance for doubtful accounts | (34) | (33) |
| Receivables, net | $7,345 | $6,922 |

There were no significant changes in our allowance for doubtful accounts during the years ended December 31, 2018, 2017, and 2016.

## 5. INVENTORIES

Inventories consisted of the following (in millions):

| | December 31, | |
|---|---|---|
| | 2018 | 2017 |
| Refinery feedstocks | $2,292 | $2,427 |
| Refined petroleum products and blendstocks | 3,678 | 3,459 |
| Ethanol feedstocks and products | 298 | 242 |
| Materials and supplies | 264 | 256 |
| Inventories | $6,532 | $6,384 |

As of December 31, 2018 and 2017, the replacement cost (market value) of LIFO inventories exceeded their LIFO carrying amounts by $1.5 billion and $3.0 billion, respectively, and our non-LIFO inventories accounted for $1.1 billion and $1.0 billion, respectively, of our total inventories.

During the year ended December 31, 2016, we recorded a change in our lower of cost or market inventory valuation reserve that resulted in a net benefit to our results of operations of $747 million.

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VALERO ENERGY CORPORATION
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

## 6. PROPERTY, PLANT, AND EQUIPMENT

Major classes of property, plant, and equipment, including assets held under capital leases, consisted of the following (in millions):

| | December 31, | |
|---|---|---|
| | 2018 | 2017 |
| Land | $416 | $411 |
| Crude oil processing facilities | 30,721 | 30,109 |
| Transportation and terminaling facilities | 4,935 | 4,335 |
| Grain processing equipment | 1,212 | 903 |
| Administrative buildings | 953 | 910 |
| Other | 2,276 | 2,068 |
| Construction in progress | 1,960 | 1,274 |
| Property, plant, and equipment, at cost | 42,473 | 40,010 |
| Accumulated depreciation | (13,625 ) | (12,530 ) |
| Property, plant, and equipment, net | $28,848 | $27,480 |

Our assets under capital leases are presented in the table above within “Other” and consist of various types of assets that primarily support our refining operations and totaled $711 million and $635 million as of December 31, 2018 and 2017, respectively. Accumulated amortization on assets under capital leases was $106 million and $72 million as of December 31, 2018 and 2017, respectively.

Depreciation expense for the years ended December 31, 2018, 2017, and 2016 was $1.4 billion, $1.3 billion, and $1.3 billion, respectively.

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VALERO ENERGY CORPORATION
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

## 7. DEFERRED CHARGES AND OTHER ASSETS

"Deferred charges and other assets, net" consisted of the following (in millions):

| | December 31, | |
|---|---|---|
| | 2018 | 2017 |
| Deferred turnaround and catalyst costs, net | $1,749 | $1,520 |
| Income taxes receivable | 343 | 673 |
| Investments in joint ventures | 542 | 530 |
| Intangible assets, net | 307 | 142 |
| Goodwill | 260 | — |
| Other | 431 | 501 |
| Deferred charges and other assets, net | $3,632 | $3,366 |

Amortization expense for the deferred charges and other assets shown above was $668 million, $650 million, and $575 million for the years ended December 31, 2018, 2017, and 2016, respectively.

The increase in intangible assets, net and goodwill resulted primarily from the Peru Acquisition as described in Note 2.

## 8. ACCRUED EXPENSES AND OTHER LONG-TERM LIABILITIES

Accrued expenses and other long-term liabilities consisted of the following (in millions):

| | Accrued Expenses | | Other Long-Term Liabilities | |
|---|---|---|---|---|
| | December 31, | | December 31, | |
| | 2018 | 2017 | 2018 | 2017 |
| Defined benefit plan liabilities (see Note 13) | $43 | $33 | $654 | $776 |
| Wage and other employee-related liabilities | 302 | 278 | 109 | 111 |
| Uncertain income tax position liabilities (see Note 15) | — | — | 721 | 723 |
| Repatriation tax liability (see Note 15) (a) | — | — | 603 | 597 |
| Environmental liabilities (see Note 10) | 29 | 30 | 327 | 232 |
| Environmental credit obligations (see Note 19) | 34 | 152 | — | — |
| Accrued interest expense | 93 | 105 | — | — |
| Other accrued liabilities | 129 | 114 | 453 | 290 |
| Accrued expenses and other long-term liabilities | $630 | $712 | $2,867 | $2,729 |

(a) The current portion of repatriation tax liability is included in income taxes payable. There was no current portion of repatriation tax liability as of December 31, 2018 and $114 million as of December 31, 2017.

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VALERO ENERGY CORPORATION
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

## 9. DEBT AND CAPITAL LEASE OBLIGATIONS

Debt, at stated values, and capital lease obligations consisted of the following (in millions):

| | Final Maturity | December 31, 2018 | 2017 |
|---|---|---|---|
| Credit facilities: | | | |
| Valero Revolver | 2020 | $— | $— |
| VLP Revolver | 2020 | — | 410 |
| IEnova Revolver | 2028 | 109 | — |
| Canadian Revolver | 2019 | — | — |
| Accounts receivable sales facility | 2019 | 100 | 100 |
| Public debt: | | | |
| Valero Senior Notes | | | |
| 6.625% | 2037 | 1,500 | 1,500 |
| 3.4% | 2026 | 1,250 | 1,250 |
| 6.125% | 2020 | 850 | 850 |
| 4.35 % | 2028 | 750 | — |
| 9.375% | 2019 | — | 750 |
| 7.5% | 2032 | 750 | 750 |
| 4.9% | 2045 | 650 | 650 |
| 3.65% | 2025 | 600 | 600 |
| 10.5% | 2039 | 250 | 250 |
| 8.75% | 2030 | 200 | 200 |
| 7.45% | 2097 | 100 | 100 |
| 6.75% | 2037 | 24 | 24 |
| VLP Senior Notes | | | |
| 4.375% | 2026 | 500 | 500 |
| 4.5% | 2028 | 500 | — |
| Gulf Opportunity Zone Revenue Bonds, Series 2010, 4.0% | 2040 | 300 | 300 |
| Debenture, 7.65% | 2026 | 100 | 100 |
| Other debt | Various | 50 | 49 |
| Net unamortized debt issuance costs and other | | (80) | (73) |
| Total debt | | 8,503 | 8,310 |
| Capital lease obligations | | 606 | 562 |
| Total debt and capital lease obligations | | 9,109 | 8,872 |
| Less current portion | | 238 | 122 |
| Debt and capital lease obligations, less current portion | | $8,871 | $8,750 |

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VALERO ENERGY CORPORATION
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

Credit Facilities

Valero Revolver

We have a $3 billion revolving credit facility (the Valero Revolver) with a group of financial institution lenders that matures in November 2020. The Valero Revolver also provides for the issuance of letters of credit of up to $2.0 billion.

Outstanding borrowings under the Valero Revolver bear interest, at our option, at either (i) the adjusted LIBO rate (as defined in the Valero Revolver) for the applicable interest period in effect from time to time plus the applicable margin or (ii) the alternate base rate (as defined in the Valero Revolver) plus the applicable margin. The Valero Revolver also requires payments for customary fees, including facility fees, letter of credit participation fees, and administrative agent fees. The interest rate and facility fees under the Valero Revolver are subject to adjustment based upon the credit ratings assigned to our senior unsecured debt.

We had no borrowings or repayments under the Valero Revolver during the years ended December 31, 2018, 2017, and 2016.

VLP Revolver

As of December 31, 2018 and 2017, VLP had a $750 million senior unsecured revolving credit facility (the VLP Revolver) with a group of lenders that was scheduled to mature in November 2020. However, on January 10, 2019, in connection with the completion of the Merger Transaction as described in Note 2, the VLP Revolver was terminated.

Outstanding borrowings under the VLP Revolver bore interest, at VLP's option, at either (i) the adjusted LIBO rate (as defined in the VLP Revolver) for the applicable interest period in effect from time to time plus the applicable margin or (ii) the alternate base rate (as defined in the VLP Revolver) plus the applicable margin. As of December 31, 2017, the variable rate was 2.875 percent. The VLP Revolver required payments for customary fees, including commitment fees, letter of credit participation fees, and administrative agent fees.

During the year ended December 31, 2018, VLP repaid the outstanding balance of $410 million on the VLP Revolver using proceeds from its public offering of $500 million 4.5 percent Senior Notes as described in "Public Debt" below. During the year ended December 31, 2017, VLP borrowed $380 million under the revolver and made no repayments. During the year ended December 31, 2016, VLP borrowed $349 million under the revolver and repaid $494 million.

IEnova Revolver

In February 2018, Central Mexico Terminals (as described in Note 12) entered into a combined $340 million unsecured revolving credit facility (IEnova Revolver) with IEnova (defined in Note 12) that matures in February 2028. IEnova may terminate this revolver at any time and demand repayment of all outstanding amounts; therefore, all outstanding borrowings are reflected in current portion of debt. The IEnova Revolver is available only to the operations of Central Mexico Terminals, and the creditors of Central Mexico Terminals do not have recourse against us.

Outstanding borrowings under this revolver bear interest at the three-month LIBO rate for the applicable interest period in effect from time to time plus the applicable margin. The interest rate under this revolver

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is subject to adjustment, with agreement by both parties, based upon changes in market conditions. As of December 31, 2018, the variable rate was 6.046 percent.

During the year ended December 31, 2018, Central Mexico Terminals borrowed $109 million and had no repayments under this revolver.

Canadian Revolver

In November 2018, one of our Canadian subsidiaries amended its committed revolving credit facility (the Canadian Revolver) to increase the borrowing capacity from C$75 million to C$150 million under which it may borrow and obtain letters of credit and to extend the maturity date from November 2018 to November 2019.

We had no borrowings or repayments under this revolver during the years ended December 31, 2018, 2017, and 2016.

Accounts Receivable Sales Facility

We have an accounts receivable sales facility with a group of third-party entities and financial institutions to sell up to $1.3 billion of eligible trade receivables on a revolving basis. In July 2018, we amended our agreement to extend the maturity date to July 2019. Under this program, one of our marketing subsidiaries (Valero Marketing) sells eligible receivables, without recourse, to another of our subsidiaries (Valero Capital), whereupon the receivables are no longer owned by Valero Marketing. Valero Capital, in turn, sells an undivided percentage ownership interest in the eligible receivables, without recourse, to the third-party entities and financial institutions. To the extent that Valero Capital retains an ownership interest in the receivables it has purchased from Valero Marketing, such interest is included in our financial statements solely as a result of the consolidation of the financial statements of Valero Capital with those of Valero Energy Corporation; the receivables are not available to satisfy the claims of the creditors of Valero Marketing or Valero Energy Corporation.

As of December 31, 2018 and 2017, $1.8 billion and $2.3 billion, respectively, of our accounts receivable composed the designated pool of accounts receivable included in the program. All amounts outstanding under the accounts receivable sales facility are reflected as debt on our balance sheets and proceeds and repayments are reflected as cash flows from financing activities on the statements of cash flows. As of December 31, 2018 and 2017, the variable interest rate on the accounts receivable sales facility was 3.0618 percent and 2.0387 percent, respectively. During the years ended December 31, 2018, 2017, and 2016, we had no proceeds from or repayments under the accounts receivable sales facility.

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VALERO ENERGY CORPORATION
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

Summary of Credit Facilities
We had outstanding borrowings, letters of credit issued, and availability under our credit facilities as follows (amounts in millions and currency in U.S. dollars, except as noted):

| | | | December 31, 2018 | | |
|---|---|---|---|---|---|
| | Facility Amount | Maturity Date | Outstanding Borrowings | Letters of Credit Issued | Availability |
| Committed facilities: | | | | | |
| Valero Revolver | $ 3,000 | November 2020 | $ — | $ 57 | $ 2,943 |
| Canadian Revolver | C$150 | November 2019 | C$— | C$5 | C$ 145 |
| Accounts receivable sales facility | $ 1,300 | July 2019 | $ 100 | n/a | $ 1,200 |
| Letter of credit facility | $ 100 | November 2019 | n/a | $ — | $ 100 |
| Committed facilities of VIEs (a): | | | | | |
| VLP Revolver (b) | $ 750 | November 2020 | $ — | $ — | $ 750 |
| IEnova Revolver | $ 340 | February 2028 | $ 109 | n/a | $ 231 |
| Uncommitted facilities: | | | | | |
| Letter of credit facilities | n/a | n/a | n/a | $ 229 | n/a |

(a) Creditors of our VIEs do not have recourse against us.
(b) The VLP Revolver was terminated on January 10, 2019. See “VLP Revolver” above.

In November 2018, our committed letter of credit facility was amended to extend the maturity date from November 2018 to November 2019.

Letters of credit issued as of December 31, 2018 expire at various times in 2019 through 2020.

We are charged letter of credit issuance fees under our various uncommitted short-term bank credit facilities. These uncommitted credit facilities have no commitment fees or compensating balance requirements.

Public Debt
During the year ended December 31, 2018, the following activity occurred:

- We issued $750 million of 4.35 percent Senior Notes due June 1, 2028. Proceeds from this debt issuance totaled $749 million before deducting the underwriting discount and other debt issuance costs. The proceeds were used to redeem our 9.375 percent Senior Notes due March 15, 2019 for $787 million, or 104.9 percent of stated value, which includes an early redemption fee of $37 million that is reflected in other income, net.

- VLP issued $500 million of 4.5 percent Senior Notes due March 15, 2028. Proceeds from this debt issuance totaled $498 million before deducting the underwriting discount and other debt issuance costs. The proceeds were available only to the operations of VLP and were used to repay the outstanding balance of $410 million on the VLP Revolver and $85 million on its notes payable to

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us, which is eliminated in consolidation. On January 10, 2019, in connection with the completion of the Merger Transaction as described in Note 2, Valero entered into a guarantee agreement to fully and unconditionally guarantee the prompt payment, when due, of any amount owed to the holders of these notes.

During the year ended December 31, 2017, there was no issuance or redemption activity related to our public debt.

During the year ended December 31, 2016, the following activity occurred:

- We issued $1.25 billion of 3.4 percent Senior Notes due September 15, 2026. Proceeds from this debt issuance totaled $1.246 billion before deducting the underwriting discount and other debt issuance costs.

- We redeemed our 6.125 percent Senior Notes due June 15, 2017 for $778 million, or 103.70 percent of stated value.

- We redeemed our 7.2 percent Senior Notes due October 15, 2017 for $213 million, or 106.27 percent of stated value.

- VLP issued $500 million of 4.375 percent Senior Notes due December 15, 2026. Proceeds from this debt issuance totaled $500 million before deducting the underwriting discount and other debt issuance costs. The proceeds were available only to the operations of VLP and were used to repay $494 million on the VLP Revolver. On January 10, 2019, in connection with the completion of the Merger Transaction as described in Note 2, Valero entered into a guarantee agreement to fully and unconditionally guarantee the prompt payment, when due, of any amount owed to the holders of these notes.

Other Debt
During the year ended December 31, 2018, we retired $137 million of debt assumed in connection with the Peru Acquisition with available cash on hand.

Capital Lease Obligations
We have capital lease obligations that mature at various dates through 2046 for storage tanks, terminal facilities, and other assets that are used in our refining operations. During the years ended December 31, 2018 and 2017, we recognized capital lease assets and related obligations totaling $63 million and $502 million, respectively. These capital lease agreements were primarily for the lease of storage tanks.

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VALERO ENERGY CORPORATION
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

Other Disclosures
Interest and debt expense, net of capitalized interest is comprised as follows (in millions):

| | Year Ended December 31, | | |
|---|---|---|---|
| | 2018 | 2017 | 2016 |
| Interest and debt expense | $557 | $539 | $511 |
| Less capitalized interest | 87 | 71 | 65 |
| Interest and debt expense, net of capitalized interest | $470 | $468 | $446 |

Our credit facilities and other debt arrangements contain various customary restrictive covenants, including cross-default and cross-acceleration clauses.

Principal maturities for our debt obligations and future minimum rentals on capital lease obligations as of December 31, 2018 were as follows (in millions):

| | Debt | Capital Lease Obligations |
|---|---|---|
| 2019 | $214 | $ 69 |
| 2020 | 855 | 65 |
| 2021 | 15 | 62 |
| 2022 | 5 | 64 |
| 2023 | 20 | 65 |
| Thereafter | 7,474 | 957 |
| Net unamortized debt issuance costs and other | (80 ) | n/a |
| Total minimum lease payments | n/a | 1,282 |
| Less amount representing interest | n/a | 676 |
| Total | $8,503 | $ 606 |

10. COMMITMENTS AND CONTINGENCIES

Operating Leases
We have long-term operating lease commitments for land and office facilities; time charters for ocean-going tankers and coastal vessels (i.e., marine transportation assets); railcars; facilities and equipment related to industrial gases and power used in our operations; machinery and equipment used in our refining and ethanol operations; and various facilities and equipment used in the storage, transportation, production, and sale of refinery feedstock, refined petroleum product and corn inventories.

In addition to minimum lease payments, some arrangements contain provisions for contingent lease payments. Certain leases for the storage and transportation of feedstock and refined petroleum products provide for contingent lease payments based on throughput volumes in excess of a base amount, while other leases for time charters of ocean-going tankers and coastal vessels contain payment provisions that are

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

contingent on usage. Additionally, rental increases that are not scheduled in the lease are considered contingent lease payments. In most cases, we expect that in the normal course of business, our leases will be renewed or replaced by other leases.

As of December 31, 2018, our future minimum rentals for leases having initial or remaining noncancelable lease terms in excess of one year were as follows (in millions):

| | |
|---|---|
| 2019 | $359 |
| 2020 | 245 |
| 2021 | 178 |
| 2022 | 146 |
| 2023 | 123 |
| Thereafter | 514 |
| Total minimum rental payments | $1,565 |

Rental expense, net of sublease rental income was as follows (in millions):

| | Year Ended December 31, | | |
|---|---|---|---|
| | 2018 | 2017 | 2016 |
| Minimum rental expense | $515 | $691 | $739 |
| Contingent rental expense | 19 | 21 | 70 |
| Total rental expense | 534 | 712 | 809 |
| Less sublease rental income | 31 | 54 | 31 |
| Rental expense, net of sublease rental income | $503 | $658 | $778 |

Purchase Obligations

We have various purchase obligations under certain crude oil and other feedstock supply arrangements, industrial gas supply arrangements (such as hydrogen supply arrangements), natural gas supply arrangements, and various throughput, transportation and terminaling agreements. We enter into these contracts to ensure an adequate supply of feedstock and utilities and adequate storage capacity to operate our refineries and ethanol plants. Substantially all of our purchase obligations are based on market prices or adjustments based on market indices. Certain of these purchase obligations include fixed or minimum volume requirements, while others are based on our usage requirements. None of these obligations is associated with suppliers' financing arrangements. These purchase obligations are not reflected as liabilities.

Other Commitments

MVP Terminal

We have a 50 percent membership interest in MVP Terminalling, LLC (MVP), a Delaware limited liability company formed in September 2017 with a subsidiary of Magellan Midstream Partners LP (Magellan), to construct, own, and operate the Magellan Valero Pasadena marine terminal (MVP Terminal) located adjacent to the Houston Ship Channel in Pasadena, Texas. The MVP Terminal will contain (i) approximately 5 million barrels of storage capacity, (ii) a dock with two ship berths, and (iii) a three-bay truck rack facility. In

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connection with our terminaling agreement with MVP, described below, we will have dedicated use of (i) approximately 4 million barrels of storage, (ii) one ship berth, and (iii) the three-bay truck rack facility. Construction of phases one and two of the project began in 2017 with a total estimated cost of approximately $840 million, of which we have committed to contribute 50 percent (approximately $420 million). The project could expand up to four phases with a total project cost of approximately $1.4 billion if warranted by additional demand and agreed to by Magellan and us. Since inception, we have contributed $247 million to MVP, of which $166 million was contributed during the year ended December 31, 2018.

Concurrent with the formation of MVP, we entered into a terminaling agreement with MVP to utilize the MVP Terminal upon completion of phase two, which is expected to occur in early 2020. The terminaling agreement has an initial term of 12 years with two five-year automatic renewals, and year-to-year renewals thereafter.

Due to our membership interest in MVP and because we determined that the terminaling agreement was a capital lease, we are the accounting owner of the MVP Terminal during the construction period. Accordingly, as of December 31, 2018, we recorded an asset of $539 million in property, plant, and equipment representing 100 percent of the construction costs incurred by MVP, as well as capitalized interest incurred by us, and a long-term liability of $292 million payable to Magellan. The amounts recorded for the portion of the construction costs associated with the payable to Magellan are noncash investing and financing items, respectively.

On January 1, 2019, as a result of our adoption of Topic 842 as described in Note 1, we derecognized the asset and liability related to MVP discussed above and recorded our equity investment in MVP of $247 million, which will be included in deferred charges and other assets. We will recognize a finance lease asset and liability upon commencement of our terminaling arrangement with MVP as described above.

Central Texas Pipeline

We have committed to a 40 percent undivided interest in a project with a subsidiary of Magellan to jointly build an estimated 130-mile, 20-inch refined petroleum products pipeline with a capacity of up to 150,000 barrels per day from Houston to Hearne, Texas. The pipeline is expected to be completed in mid-2019. The estimated cost of our 40 percent undivided interest in this pipeline is $170 million. Since inception, expenditures have totaled $80 million, of which $73 million was spent during the year ended December 31, 2018.

Sunrise Pipeline System

Effective January 31, 2018, we entered into a joint ownership agreement with Sunrise Pipeline LLC, a subsidiary of Plains All American Pipeline, L.P. (Plains), that provides us a 20 percent undivided interest in the Sunrise Pipeline System expansion to be constructed by Plains. The Sunrise Pipeline System contains (i) a 262-mile, 24-inch crude oil pipeline (the Sunrise Pipeline) that originates at Plains' terminal in Midland, Texas and terminates at Plains' station in Wichita Falls, Texas with throughput capacity of approximately 500,000 barrels per day, and (ii) two 270,000 shell barrel capacity tanks located at the Colorado City, Texas station. The Sunrise Pipeline System expansion was placed in service in the fourth quarter of 2018. Expenditures totaled $139 million for the year ended December 31, 2018.

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VALERO ENERGY CORPORATION
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

Environmental Matters
We are involved, together with several other companies, in an environmental cleanup in the Village of Hartford, Illinois (the Village) and during 2015, one of these companies assumed the ongoing environmental cleanup in the Village pursuant to a federal court order. We had previously conducted an initial response in the Village, along with other companies, pursuant to an administrative order issued by the U.S. EPA. The parties involved in the initial response may have further claims among themselves for costs already incurred.

We also continue to be engaged in site assessment and interim measures at the shutdown refinery site, which is adjacent to the Village. In 2018, we entered into a consent order with the Illinois EPA that was approved by the Illinois state court on July 26, 2018. In the consent order, we assumed the underlying liability for full cleanup of the shutdown refinery site, and we recorded an adjustment to our existing environmental liability related to this matter, which did not materially affect our financial position or results of operations as of or for the year ended December 31, 2018. We continue to seek contribution under Illinois law in state court and are pursuing claims under the Comprehensive Environmental Response, Compensation and Liability Act in federal court from other potentially responsible parties. Factors underlying the expected cost of the cleanup are subject to change from time to time, and actual results may vary significantly from the current estimate.

Self-Insurance
We are self-insured for certain medical and dental, workers' compensation, automobile liability, general liability, and property liability claims up to applicable retention limits. Liabilities are accrued for self-insured claims, or when estimated losses exceed coverage limits, and when sufficient information is available to reasonably estimate the amount of the loss. These liabilities are included in accrued expenses and other long-term liabilities.

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VALERO ENERGY CORPORATION
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

11. EQUITY

Share Activity
Activity in the number of shares of common stock and treasury stock was as follows (in millions):

| | Common Stock | Treasury Stock |
|---|---|---|
| Balance as of December 31, 2015 | 673 | (200) |
| Transactions in connection with stock-based compensation plans | — | 1 |
| Stock purchases under purchase program | — | (23) |
| Balance as of December 31, 2016 | 673 | (222) |
| Transactions in connection with stock-based compensation plans | — | 1 |
| Stock purchases under purchase programs | — | (19) |
| Balance as of December 31, 2017 | 673 | (240) |
| Stock purchases under purchase programs | — | (16) |
| Balance as of December 31, 2018 | 673 | (256) |

Preferred Stock
We have 20 million shares of preferred stock authorized with a par value of $0.01 per share. No shares of preferred stock were outstanding as of December 31, 2018 or 2017.

Treasury Stock
We purchase shares of our common stock as authorized under our common stock purchase program (described below) and to meet our obligations under employee stock-based compensation plans.

On July 13, 2015, our board of directors authorized us to purchase $2.5 billion of our outstanding common stock with no expiration date, and we completed that program during 2017. On September 21, 2016, our board of directors authorized our purchase of up to an additional $2.5 billion with no expiration date, and we completed that program during 2018. On January 23, 2018, our board of directors authorized our purchase of up to an additional $2.5 billion (the 2018 Program) with no expiration date. During the years ended December 31, 2018, 2017, and 2016, we purchased $1.5 billion, $1.3 billion, and $1.3 billion, respectively, of our common stock under our programs. As of December 31, 2018, we have approval under the 2018 Program to purchase approximately $2.2 billion of our common stock.

Common Stock Dividends
On January 24, 2019, our board of directors declared a quarterly cash dividend of $0.90 per common share payable on March 5, 2019 to holders of record at the close of business on February 13, 2019.

Valero Energy Partners LP Units
On September 16, 2016, VLP entered into an equity distribution agreement pursuant to which VLP offered and sold from time to time their common units having an aggregate offering price of up to $350 million based on amounts, at prices, and on terms determined by market conditions and other factors at the time of

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the offerings (such continuous offering program, or at-the-market program, referred to as the "ATM Program"). There were no issuances of common units under the ATM Program during the year ended December 31, 2018. VLP issued 742,897 and 223,083 common units under the ATM Program and received net proceeds of $35 million and $9 million after deducting offering costs during the years ended December 31, 2017 and 2016, respectively. Simultaneous with the Merger Transaction as described in Note 2, the ATM Program was terminated.

Income Tax Effects Related to Components of Other Comprehensive Income (Loss)
The tax effects allocated to each component of other comprehensive income (loss) were as follows (in millions):

| | Before-Tax Amount | Tax Expense (Benefit) | Net Amount |
|---|---|---|---|
| Year Ended December 31, 2018: | | | |
| Foreign currency translation adjustment | $ (517) | $ — | $ (517) |
| Pension and other postretirement benefits: | | | |
| Gain arising during the year related to: | | | |
| Net actuarial gain | 1 | — | 1 |
| Prior service credit | 7 | 1 | 6 |
| Amounts reclassified into income related to: | | | |
| Net actuarial loss | 63 | 14 | 49 |
| Prior service credit | (29) | (7) | (22) |
| Curtailment and settlement loss | 7 | 2 | 5 |
| Net gain on pension and other postretirement benefits | 49 | 10 | 39 |
| Other comprehensive loss | $ (468) | $ 10 | $ (478) |

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| | Before-Tax Amount | Tax Expense (Benefit) | Net Amount |
|---|---|---|---|
| Year Ended December 31, 2017: | | | |
| Foreign currency translation adjustment | $ 514 | $ — | $ 514 |
| Pension and other postretirement benefits: | | | |
| Loss arising during the year related to: | | | |
| Net actuarial loss | (79) | (29) | (50) |
| Prior service cost | (4) | (1) | (3) |
| Miscellaneous loss | — | 3 | (3) |
| Amounts reclassified into income related to: | | | |
| Net actuarial loss | 50 | 18 | 32 |
| Prior service credit | (36) | (13) | (23) |
| Curtailment and settlement loss | 4 | 1 | 3 |
| Net loss on pension and other postretirement benefits | (65) | (21) | (44) |
| Other comprehensive income | $ 449 | $ (21) | $ 470 |
| Year Ended December 31, 2016: | | | |
| Foreign currency translation adjustment | $(415) | $— | $(415) |
| Pension and other postretirement benefits: | | | |
| Loss arising during the year related to: | | | |
| Net actuarial loss | (110) | (34) | (76) |
| Miscellaneous gain | — | (8) | 8 |
| Amounts reclassified into income related to: | | | |
| Net actuarial loss | 48 | 18 | 30 |
| Prior service credit | (36) | (13) | (23) |
| Net loss on pension and other postretirement benefits | (98) | (37) | (61) |
| Other comprehensive loss | $(513) | $(37) | $(476) |

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Accumulated Other Comprehensive Loss

Changes in accumulated other comprehensive loss by component, net of tax, were as follows (in millions):

| | Foreign Currency Translation Adjustment | Defined Benefit Plan Items | Total |
|---|---|---|---|
| Balance as of December 31, 2015 | $ (605) | $ (328) | $ (933) |
| Other comprehensive loss before reclassifications | (416) | (68) | (484) |
| Amounts reclassified from accumulated other comprehensive loss | — | 7 | 7 |
| Other comprehensive loss | (416) | (61) | (477) |
| Balance as of December 31, 2016 | (1,021) | (389) | (1,410) |
| Other comprehensive income (loss) before reclassifications | 514 | (56) | 458 |
| Amounts reclassified from accumulated other comprehensive loss | — | 12 | 12 |
| Other comprehensive income (loss) | 514 | (44) | 470 |
| Balance as of December 31, 2017 | (507) | (433) | (940) |
| Other comprehensive income (loss) before reclassifications | (515) | 7 | (508) |
| Amounts reclassified from accumulated other comprehensive loss | — | 32 | 32 |
| Other comprehensive income (loss) | (515) | 39 | (476) |
| Reclassification of stranded income tax effects of Tax Reform to retained earnings per ASU 2018-02 (see Note 1) | — | (91) | (91) |
| Balance as of December 31, 2018 | $ (1,022) | $ (485) | $ (1,507) |

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Gains (losses) reclassified out of accumulated other comprehensive loss and into net income were as follows (in millions):

| Details about Accumulated Other Comprehensive Loss Components | Year Ended December 31, | | | Affected Line Item in the Statement of Income |
|---|---|---|---|---|
| | 2018 | 2017 | 2016 | |
| Amortization of items related to defined benefit pension plans: | | | | |
| Net actuarial loss | $ (63 ) | $ (50 ) | $ (48 ) | (a) Other income, net |
| Prior service credit | 29 | 36 | 36 | (a) Other income, net |
| Curtailment and settlement | (7 ) | (4 ) | — | (a) Other income, net |
| | (41 ) | (18 ) | (12 ) | Total before tax |
| | 9 | 6 | 5 | Tax benefit |
| Total reclassifications for the year | $ (32 ) | $ (12 ) | $ (7 ) | Net of tax |

(a) These accumulated other comprehensive loss components are included in the computation of net periodic benefit cost (credit), as discussed in Note 13.

12. VARIABLE INTEREST ENTITIES

Consolidated VIEs

In the normal course of business, we have financial interests in certain entities that have been determined to be VIEs. We consolidate a VIE when we have a variable interest in an entity for which we are the primary beneficiary such that we have (i) the power to direct the activities of the VIE that most significantly impact the VIE's economic performance and (ii) the obligation to absorb losses of or the right to receive benefits from the VIE that could potentially be significant to the VIE. In order to make this determination, we evaluated our contractual arrangements with the VIEs, including arrangements for the use of assets, purchases of products and services, debt, equity, or management of operating activities.

The following discussion summarizes our involvement with our VIEs:

- Prior to the completion of the Merger Transaction with VLP on January 10, 2019 as discussed in Note 2, VLP was a publicly traded master limited partnership whose common limited partner units were traded on the New York Stock Exchange under the trading symbol "VLP." VLP was formed by us to own, operate, develop, and acquire crude oil and refined petroleum products pipelines, terminals, and other transportation and logistics assets. VLP's assets include crude oil and refined petroleum products pipeline and terminal systems in the U.S. Gulf Coast and U.S. Mid-Continent regions that are integral to the operations of ten of our refineries. As of December 31, 2018, we owned a 66.2 percent limited partner interest and a 2.0 percent general partner interest in VLP, and public unitholders owned a 31.8 percent limited partner interest.

We determined VLP was a VIE because the public limited partners of VLP (i.e., parties other than entities under common control with the general partner) lacked the power to direct the activities of VLP that most significantly impacted its economic performance because they did not have

substantive kick-out rights over the general partner or substantive participating rights in VLP. Furthermore, we determined that we were the primary beneficiary of VLP because (i) we were the single decision maker and our general partner interest provides us with the sole power to direct the activities that most significantly impact VLP's economic performance and (ii) our 66.2 percent limited partner interest and 2.0 percent general partner interest provides us with significant economic rights and obligations. Substantially all of VLP's revenues were derived from us; therefore, there was limited risk to us associated with VLP's operations.

- Diamond Green Diesel Holdings LLC (DGD) is a joint venture with Darling Green Energy LLC, a subsidiary of Darling Ingredients Inc., that was formed to construct and operate a biodiesel plant that processes animal fats, used cooking oils, and other vegetable oils into renewable green diesel. The plant is located next to our St. Charles Refinery and began operations in June 2013. Our significant agreements with DGD include an operations agreement that outlines our responsibilities as operator of the plant, a debt agreement whereby we financed approximately 60 percent of the construction costs of the plant, and a marketing agreement.

  As operator, we operate the plant and perform certain day-to-day operating and management functions for DGD as an independent contractor. The operations agreement provides us (as operator) with certain power to direct the activities that most significantly impact DGD's economic performance. Because this agreement conveys such power to us and is separate from our ownership rights, we determined that DGD was a VIE. For this reason and because we hold a 50 percent ownership interest that provides us with significant economic rights and obligations, we determined that we are the primary beneficiary of DGD. DGD has risk associated with its operations because it generates revenues from third-party customers.

- We have terminaling agreements with three subsidiaries of Infraestructura Energetica Nova, S.A.B. de C.V. (IEnova), a Mexican company and subsidiary of Sempra Energy, a U.S. public company. The three subsidiaries are collectively referred to as Central Mexico Terminals and were previously referred to by us as VPM Terminals. The terminaling agreements represent variable interests because we have determined them to be capital leases due to our exclusive use of the terminals. Although we do not have an ownership interest in the entities that own each of the three terminals, the capital leases convey to us (i) the power to direct the activities that most significantly impact the economic performance of all three terminals and (ii) the ability to influence the benefits received or the losses incurred by the terminals because of our use of the terminals. As a result, we determined each of the entities was a VIE and that we are the primary beneficiary of each. Substantially all of Central Mexico Terminals' revenues will be derived from us; therefore, there is limited risk to us associated with Central Mexico Terminals' operations.

- We also have financial interests in other entities that have been determined to be VIEs because the entities' contractual arrangements transfer the power to us to direct the activities that most significantly impact their economic performance or reduce the exposure to operational variability and risk of loss created by the entity that otherwise would be held exclusively by the equity owners. Furthermore, we determined that we are the primary beneficiary of these VIEs because (i) certain contractual arrangements (exclusive of our ownership rights) provide us with the power to direct the activities that most significantly impact the economic performance of these entities and/or (ii) our

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50 percent ownership interests provide us with significant economic rights and obligations. The financial position, results of operations, and cash flows of these VIEs are not material to us.

The VIEs' assets can only be used to settle their own obligations and the VIEs' creditors have no recourse to our assets. We do not provide financial guarantees to our VIEs. Although we have provided credit facilities to some of our VIEs in support of their construction or acquisition activities, these transactions are eliminated in consolidation. Our financial position, results of operations, and cash flows are impacted by our consolidated VIEs' performance, net of intercompany eliminations, to the extent of our ownership interest in each VIE.

The following tables present summarized balance sheet information for the significant assets and liabilities of our VIEs, which are included in our balance sheets (in millions).

| | December 31, 2018 | | | | |
|---|---|---|---|---|---|
| | VLP | DGD | Central Mexico Terminals | Other | Total |
| Assets | | | | | |
| Cash and cash equivalents | $152 | $ 65 | $ — | $ 18 | $235 |
| Other current assets | 2 | 112 | 20 | 64 | 198 |
| Property, plant, and equipment, net | 1,409 | 576 | 156 | 113 | 2,254 |
| Liabilities | | | | | |
| Current liabilities, including current portion of debt and capital lease obligations | $27 | $ 28 | $ 118 | $ 9 | $182 |
| Debt and capital lease obligations, less current portion | 990 | — | — | 34 | 1,024 |

| | December 31, 2017 | | | | |
|---|---|---|---|---|---|
| | VLP | DGD | Central Mexico Terminals | Other | Total |
| Assets | | | | | |
| Cash and cash equivalents | $42 | $123 | $ 1 | $ 13 | $179 |
| Other current assets | 2 | 66 | 4 | — | 72 |
| Property, plant, and equipment, net | 1,416 | 435 | 51 | 127 | 2,029 |
| Liabilities | | | | | |
| Current liabilities, including current portion of debt and capital lease obligations | $27 | $33 | $ 26 | $ 9 | $95 |
| Debt and capital lease obligations, less current portion | 905 | — | — | 43 | 948 |

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Non-Consolidated VIEs
We hold variable interests in VIEs that have not been consolidated because we are not considered the primary beneficiary. These non-consolidated VIEs are not material to our financial position or results of operations and are primarily accounted for as equity investments.

One of our non-consolidated VIEs is MVP, which is described in Note 10. We have a 50 percent membership interest in MVP, which was formed to construct, own, and operate the MVP Terminal. We determined MVP is a VIE because the power to direct the activities that most significantly impact its economic performance is not required to be held by its two members, but is held by Magellan, as operator under a construction, operating, and management agreement with MVP. For this reason and because Magellan holds a 50 percent interest in MVP that provides it with significant economic rights and obligations, we determined that we are not the primary beneficiary. As of December 31, 2018, our maximum exposure to loss was $247 million, which represents our equity investment in MVP. We have not provided any financial support to MVP other than amounts previously required by our membership interest.

13. EMPLOYEE BENEFIT PLANS

Defined Benefit Plans
We have defined benefit pension plans, some of which are subject to collective bargaining agreements, that cover most of our employees. These plans provide eligible employees with retirement income based primarily on years of service and compensation during specific periods under final average pay and cash balance formulas. We fund our pension plans as required by local regulations. In the U.S., all qualified pension plans are subject to the Employee Retirement Income Security Act minimum funding standard. We typically do not fund or fully fund U.S. nonqualified and certain international pension plans that are not subject to funding requirements because contributions to these pension plans may be less economic and investment returns may be less attractive than our other investment alternatives.

We also provide health care and life insurance benefits for certain retired employees through our postretirement benefit plans. Most of our employees become eligible for these benefits if, while still working for us, they reach normal retirement age or take early retirement. These plans are unfunded, and retired employees share the cost with us. Individuals who became our employees as a result of an acquisition became eligible for postretirement benefits under our plans as determined by the terms of the relevant acquisition agreement.

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The changes in benefit obligation related to all of our defined benefit plans, the changes in fair value of plan assets[(a)], and the funded status of our defined benefit plans as of and for the years ended were as follows (in millions):

| | Pension Plans | | Other Postretirement Benefit Plans | |
|---|---|---|---|---|
| | December 31, | | December 31, | |
| | 2018 | 2017 | 2018 | 2017 |
| Changes in benefit obligation: | | | | |
| Benefit obligation as of beginning of year | $2,926 | $2,567 | $306 | $302 |
| Service cost | 133 | 123 | 6 | 6 |
| Interest cost | 91 | 86 | 10 | 10 |
| Participant contributions | — | — | 10 | 9 |
| Benefits paid | (207) | (158) | (28) | (28) |
| Actuarial (gain) loss | (285) | 286 | (9) | 6 |
| Other | (19) | 22 | (3) | 1 |
| Benefit obligation as of end of year | $2,639 | $2,926 | $292 | $306 |
| | | | | |
| Changes in plan assets (a): | | | | |
| Fair value of plan assets as of beginning of year | $2,428 | $2,097 | $— | $— |
| Actual return on plan assets | (130) | 363 | — | — |
| Valero contributions | 156 | 110 | 18 | 19 |
| Participant contributions | — | — | 10 | 9 |
| Benefits paid | (207) | (158) | (28) | (28) |
| Other | (11) | 16 | — | — |
| Fair value of plan assets as of end of year | $2,236 | $2,428 | $— | $— |
| | | | | |
| Reconciliation of funded status (a): | | | | |
| Fair value of plan assets as of end of year | $2,236 | $2,428 | $— | $— |
| Less benefit obligation as of end of year | 2,639 | 2,926 | 292 | 306 |
| Funded status as of end of year | $(403) | $(498) | $(292) | $(306) |
| | | | | |
| Accumulated benefit obligation | $2,492 | $2,746 | n/a | n/a |

(a) Plan assets include only the assets associated with pension plans subject to legal minimum funding standards. Plan assets associated with U.S. nonqualified pension plans are not included here because they are not protected from our creditors and therefore cannot be reflected as a reduction from our obligations under the pension plans. As a result, the reconciliation of funded status does not reflect the effect of plan assets that exist for all of our defined benefit plans. See Note 19 for the assets associated with certain U.S. nonqualified pension plans.

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The actuarial gain for the year ended December 31, 2018 primarily resulted from an increase in the discount rates used to determine our benefit obligations for our pension plans from 3.58 percent in 2017 to 4.25 percent in 2018. The actuarial loss for the year ended December 31, 2017 primarily resulted from a decrease in the discount rates used to determine the benefit obligations for our pension plans from 4.08 percent in 2016 to 3.58 percent in 2017.

The fair value of our plan assets as of December 31, 2018 was unfavorably impacted by the negative return on plan assets resulting primarily from a significant decline in equity market prices for the year. The fair value of our plan assets as of December 31, 2017 was favorably impacted by the return on plan assets resulting primarily from a favorable increase in equity market prices for the year.

Amounts recognized in our balance sheet for our pension and other postretirement benefits plans include (in millions):

| | Pension Plans | | Other Postretirement Benefit Plans | |
|---|---|---|---|---|
| | December 31, | | December 31, | |
| | 2018 | 2017 | 2018 | 2017 |
| Deferred charges and other assets, net | $2 | $5 | $— | $— |
| Accrued expenses | (22) | (14) | (21) | (19) |
| Other long-term liabilities | (383) | (489) | (271) | (287) |
| | $(403) | $(498) | $(292) | $(306) |

The following table presents information for our pension plans with projected benefit obligations in excess of plan assets (in millions).

| | December 31, | |
|---|---|---|
| | 2018 | 2017 |
| Projected benefit obligation | $2,564 | $2,872 |
| Fair value of plan assets | 2,160 | 2,369 |

The following table presents information for our pension plans with accumulated benefit obligations in excess of plan assets (in millions).

| | December 31, | |
|---|---|---|
| | 2018 | 2017 |
| Accumulated benefit obligation | $2,253 | $2,526 |
| Fair value of plan assets | 1,974 | 2,180 |

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Benefit payments that we expect to pay, including amounts related to expected future services that we expect to receive, are as follows for the years ending December 31 (in millions):

| | Pension Benefits | Other Postretirement Benefits |
|---|---|---|
| 2019 | $ 169 | $ 21 |
| 2020 | 193 | 21 |
| 2021 | 175 | 21 |
| 2022 | 180 | 20 |
| 2023 | 194 | 20 |
| 2024-2028 | 1,043 | 95 |

We plan to contribute approximately $35 million to our pension plans and $21 million to our other postretirement benefit plans during 2019.

The components of net periodic benefit cost (credit) related to our defined benefit plans were as follows (in millions):

| | Pension Plans | | | Other Postretirement Benefit Plans | | |
|---|---|---|---|---|---|---|
| | Year Ended December 31, | | | Year Ended December 31, | | |
| | 2018 | 2017 | 2016 | 2018 | 2017 | 2016 |
| Service cost | $133 | $123 | $111 | $6 | $6 | $ 7 |
| Interest cost | 91 | 86 | 84 | 10 | 10 | 12 |
| Expected return on plan assets | (163 ) | (150 ) | (139 ) | — | — | — |
| Amortization of: | | | | | | |
| Net actuarial (gain) loss | 65 | 53 | 49 | (2 ) | (3 ) | (1 ) |
| Prior service credit | (18 ) | (20 ) | (20 ) | (11) | (16 ) | (16 ) |
| Special charges (credits) | 7 | 4 | (7 ) | — | — | — |
| Net periodic benefit cost (credit) | $115 | $96 | $78 | $3 | $(3 ) | $ 2 |

The components of net periodic benefit cost (credit) other than the service cost component (i.e., the non-service cost components) are included in other income, net in the statements of income.

Amortization of prior service credit shown in the preceding table was based on a straight-line amortization of the cost over the average remaining service period of employees expected to receive benefits under each respective plan. Amortization of the net actuarial (gain) loss shown in the preceding table was based on the straight-line amortization of the excess of the unrecognized (gain) loss over 10 percent of the greater of the projected benefit obligation or market-related value of plan assets (smoothed asset value) over the average remaining service period of active employees expected to receive benefits under each respective plan.

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Pre-tax amounts recognized in other comprehensive income (loss) were as follows (in millions):

| | Pension Plans | | | Other Postretirement Benefit Plans | | |
|---|---|---|---|---|---|---|
| | Year Ended December 31, | | | Year Ended December 31, | | |
| | 2018 | 2017 | 2016 | 2018 | 2017 | 2016 |
| Net gain (loss) arising during the year: | | | | | | |
| Net actuarial gain (loss) | $(8) | $(73) | $(145) | $9 | $(6) | $35 |
| Prior service (cost) credit | 7 | (4) | — | — | — | — |
| Net (gain) loss reclassified into income: | | | | | | |
| Net actuarial (gain) loss | 65 | 53 | 49 | (2) | (3) | (1) |
| Prior service credit | (18) | (20) | (20) | (11) | (16) | (16) |
| Curtailment and settlement loss | 7 | 4 | — | — | — | — |
| Total changes in other comprehensive income (loss) | $53 | $(40) | $(116) | $(4) | $(25) | $18 |

The pre-tax amounts in accumulated other comprehensive loss that have not yet been recognized as components of net periodic benefit cost (credit) were as follows (in millions):

| | Pension Plans | | Other Postretirement Benefit Plans | |
|---|---|---|---|---|
| | December 31, | | December 31, | |
| | 2018 | 2017 | 2018 | 2017 |
| Net actuarial (gain) loss | $828 | $894 | $(64) | $(57) |
| Prior service credit | (108) | (121) | (31) | (42) |
| Total | $720 | $773 | $(95) | $(99) |

The weighted-average assumptions used to determine the benefit obligations were as follows:

| | Pension Plans | | Other Postretirement Benefit Plans | |
|---|---|---|---|---|
| | December 31, | | December 31, | |
| | 2018 | 2017 | 2018 | 2017 |
| Discount rate | 4.25% | 3.58% | 4.40% | 3.72% |
| Rate of compensation increase | 3.78% | 3.86% | n/a | n/a |
| Interest crediting rate for cash balance plans | 3.04% | 3.04% | n/a | n/a |

The discount rate assumption used to determine the benefit obligations as of December 31, 2018 and 2017 for the majority of our pension plans and other postretirement benefit plans was based on the Aon AA Only Above Median

yield curve and considered the timing of the projected cash outflows under our plans. This curve was designed by Aon to provide a means for plan sponsors to value the liabilities of their pension plans

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or postretirement benefit plans. It is a hypothetical double-A yield curve represented by a series of annualized individual discount rates with maturities from one-half year to 99 years. Each bond issue underlying the curve is required to have an average rating of double-A when averaging all available ratings by Moody's Investors Service, Standard & Poor's Ratings Services, and Fitch Ratings. Only the bonds representing the 50 percent highest yielding issuances among those with average ratings of double-A are included in this yield curve.

We based our discount rate assumption on the Aon AA Only Above Median yield curve because we believe it is representative of the types of bonds we would use to settle our pension and other postretirement benefit plan liabilities as of those dates. We believe that the yields associated with the bonds used to develop this yield curve reflect the current level of interest rates.

The weighted-average assumptions used to determine the net periodic benefit cost were as follows:

| | Pension Plans | | | Other Postretirement Benefit Plans | | |
|---|---|---|---|---|---|---|
| | Year Ended December 31, | | | Year Ended December 31, | | |
| | 2018 | 2017 | 2016 | 2018 | 2017 | 2016 |
| Discount rate | 3.59% | 4.08% | 4.45% | 3.72% | 4.26% | 4.53% |
| Expected long-term rate of return on plan assets | 7.24% | 7.29% | 7.28% | n/a | n/a | n/a |
| Rate of compensation increase | 3.86% | 3.81% | 3.79% | n/a | n/a | n/a |
| Interest crediting rate for cash balance plans | 3.04% | 3.04% | 3.10% | n/a | n/a | n/a |

The assumed health care cost trend rates were as follows:

| | December 31, | |
|---|---|---|
| | 2018 | 2017 |
| Health care cost trend rate assumed for the next year | 7.29 % | 7.30 % |
| Rate to which the cost trend rate was assumed to decline (the ultimate trend rate) | 5.00 % | 5.00 % |
| Year that the rate reaches the ultimate trend rate | 2026 | 2026 |

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The following tables present the fair values of the assets of our pension plans (in millions) as of December 31, 2018 and 2017 by level of the fair value hierarchy. Assets categorized in Level 1 of the hierarchy are measured at fair value using a market approach based on unadjusted quoted prices from national securities exchanges. Assets categorized in Level 2 of the hierarchy are measured at net asset value in a market that is not active. As previously noted, we do not fund or fully fund U.S. nonqualified and certain international pension plans that are not subject to funding requirements, and we do not fund our other postretirement benefit plans.

| | Fair Value Hierarchy | | | Total as of December 31, 2018 |
|---|---|---|---|---|
| | Level 1 | Level 2 | Level 3 | |
| Equity securities: | | | | |
| U.S. companies (a) | $497 | $— | $— | $497 |
| International companies | 159 | 1 | — | 160 |
| Preferred stock | 4 | — | — | 4 |
| Mutual funds: | | | | |
| International growth | 97 | — | — | 97 |
| Index funds (b) | 76 | — | — | 76 |
| Corporate debt instruments | — | 284 | — | 284 |
| Government securities: | | | | |
| U.S. Treasury securities | 45 | — | — | 45 |
| Other government securities | — | 138 | — | 138 |
| Common collective trusts (c) | — | 609 | — | 609 |
| Pooled separate accounts (d) | — | 190 | — | 190 |
| Private funds | — | 87 | — | 87 |
| Insurance contract | — | 18 | — | 18 |
| Interest and dividends receivable | 5 | — | — | 5 |
| Cash and cash equivalents | 40 | — | — | 40 |
| Securities transactions payable, net | (14) | — | — | (14) |
| Total pension plan assets | $909 | $1,327 | $— | $2,236 |

See notes on page 110.

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

| | Fair Value Hierarchy | | | Total as of December 31, 2017 |
|---|---|---|---|---|
| | Level 1 | Level 2 | Level 3 | |
| Equity securities: | | | | |
| U.S. companies (a) | $571 | $— | $— | $571 |
| International companies | 187 | 1 | — | 188 |
| Preferred stock | 4 | — | — | 4 |
| Mutual funds: | | | | |
| International growth | 118 | — | — | 118 |
| Index funds (b) | 85 | — | — | 85 |
| Corporate debt instruments | — | 272 | — | 272 |
| Government securities: | | | | |
| U.S. Treasury securities | 45 | — | — | 45 |
| Other government securities | — | 144 | — | 144 |
| Common collective trusts (c) | — | 621 | — | 621 |
| Pooled separate accounts (d) | — | 192 | — | 192 |
| Private funds | — | 101 | — | 101 |
| Insurance contract | — | 18 | — | 18 |
| Interest and dividends receivable | 5 | — | — | 5 |
| Cash and cash equivalents | 85 | 1 | — | 86 |
| Securities transactions payable, net | (22) | — | — | (22) |
| Total pension plan assets | $1,078 | $1,350 | $— | $2,428 |

(a) Equity securities are held in a wide range of industrial sectors, including consumer goods, information technology, healthcare, industrials, and financial services.

(b) This class includes primarily investments in approximately 60 percent equities and 40 percent bonds as of December 31, 2018. As of December 31, 2017, this class included primarily investments in approximately 70 percent equities and 30 percent bonds.

(c) This class includes primarily investments in approximately 70 percent equities and 30 percent bonds as of December 31, 2018. As of December 31, 2017, this class included primarily investments in approximately 80 percent equities and 20 percent bonds.

(d) This class includes primarily investments in approximately 50 percent equities and 50 percent bonds as of December 31, 2018 and 2017.

The investment policies and strategies for the assets of our pension plans incorporate a well-diversified approach that is expected to earn long-term returns from capital appreciation and a growing stream of current income. This approach recognizes that assets are exposed to risk and the market value of the pension plans' assets may fluctuate from year to year. Risk tolerance is determined based on our financial ability to withstand risk within the investment program and the willingness to accept return volatility. In line with the investment return objective and risk parameters, the pension plans' mix of assets includes a diversified portfolio of equity and fixed-income investments. Equity securities include international stocks and a blend of U.S. growth and value stocks of various sizes of capitalization. Fixed income securities include bonds and notes issued by

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the U.S. government and its agencies, corporate bonds, and mortgage-backed securities. The aggregate asset allocation is reviewed on an annual basis. As of December 31, 2018, the target allocations for plan assets under our primary pension plan are 70 percent equity securities and 30 percent fixed income investments.

The expected long-term rate of return on plan assets is based on a forward-looking expected asset return model. This model derives an expected rate of return based on the target asset allocation of a plan's assets. The underlying assumptions regarding expected rates of return for each asset class reflect Aon's best expectations for these asset classes. The model reflects the positive effect of periodic rebalancing among diversified asset classes. We select an expected asset return that is supported by this model.

Defined Contribution Plans

We have defined contribution plans that cover most of our employees. Our contributions to these plans are based on employees' compensation and/or a partial match of employee contributions to the plans. Our contributions to these defined contribution plans were $74 million, $70 million, and $67 million for the years ended December 31, 2018, 2017, and 2016, respectively.

## 14. STOCK-BASED COMPENSATION

Overview

Under our 2011 Omnibus Stock Incentive Plan (the OSIP), various stock and stock-based awards may be granted to employees and non-employee directors. Awards available under the OSIP include, but are not limited to, (i) restricted stock that vests over a period determined by our compensation committee, (ii) performance awards that vest upon the achievement of an objective performance goal, (iii) options to purchase shares of common stock, (iv) dividend equivalent rights, and (v) stock appreciation rights. The OSIP was approved by our stockholders on April 28, 2011 and re-approved by our stockholders on May 12, 2016. As of December 31, 2018, 8,532,542 shares of our common stock remained available to be awarded under the OSIP.

We also maintain other stock-based compensation plans under which previously granted equity awards remain outstanding. No additional grants may be awarded under these plans.

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VALERO ENERGY CORPORATION
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

The following table reflects activity related to our stock-based compensation arrangements (in millions):

| | Year Ended December 31, | | |
|---|---|---|---|
| | 2018 | 2017 | 2016 |
| Stock-based compensation expense: | | | |
| Restricted stock | $63 | $ 58 | $ 52 |
| Performance awards | 22 | 19 | 15 |
| Stock options and other awards | 1 | — | 1 |
| Total stock-based compensation expense | $86 | $ 77 | $ 68 |
| Tax benefit recognized on stock-based compensation expense | $18 | $ 27 | $ 24 |
| Tax benefit realized for tax deductions resulting from exercises and vestings | 32 | 44 | 33 |
| Effect of tax deductions in excess of recognized stock-based compensation expense | 20 | 24 | 22 |

The following is a discussion of our significant stock-based compensation arrangement.

Restricted Stock
Restricted stock is granted to employees and non-employee directors. Restricted stock granted to employees vests in accordance with individual written agreements between the participants and us, usually in equal annual installments over a period of three years beginning one year after the date of grant. Restricted stock granted to our non-employee directors vests in equal annual installments over a period of three years beginning one year after the date of grant. The fair value of each restricted stock per share is equal to the market price of our common stock. A summary of the status of our restricted stock awards is presented in the following table.

| | Number of Shares | Weighted-Average Grant-Date Fair Value Per Share |
|---|---|---|
| Nonvested shares as of January 1, 2018 | 1,401,040 | $ 69.82 |
| Granted | 628,908 | 92.12 |
| Vested | (843,709 ) | 71.26 |
| Forfeited | (9,661 ) | 69.97 |
| Nonvested shares as of December 31, 2018 | 1,176,578 | 80.70 |

As of December 31, 2018, there was $56 million of unrecognized compensation cost related to outstanding unvested restricted stock awards, which is expected to be recognized over a weighted-average period of approximately two years.

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VALERO ENERGY CORPORATION
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

The following table reflects activity related to our restricted stock:

| | Year Ended December 31, | | |
|---|---|---|---|
| | 2018 | 2017 | 2016 |
| Weighted-average grant-date fair value per share of restricted stock granted | $92.12 | $79.32 | $59.00 |
| Fair value of restricted stock vested (in millions) | 80 | 71 | 46 |

15. INCOME TAXES

Tax Reform

On December 22, 2017, Tax Reform was enacted, which resulted in significant changes to the U.S. Internal Revenue Code of 1986, as amended (the Code) and was effective beginning on January 1, 2018. The most significant changes affecting us are as follows:

- reduction in the statutory income tax rate from 35 percent to 21 percent;
- repeal of the manufacturing deduction;
- deduction for all of the costs to acquire or construct certain business assets in the year they are placed in service through 2022;
- shift from a worldwide system of taxation to a territorial system of taxation, resulting in a minimum tax on the income of international subsidiaries (the GILTI tax) rather than a tax deferral on such earnings in certain circumstances; and
- assessment of a one-time transition tax on deemed repatriated earnings and profits from our international subsidiaries.

The following narrative describes the activity that occurred with respect to Tax Reform for the years ended December 31, 2017 and 2018.

We reflected an overall income tax benefit of $1.9 billion for the year ended December 31, 2017 with respect to Tax Reform as a result of the following:

- We remeasured our U.S. deferred tax assets and liabilities using the 21 percent rate, which resulted in a tax benefit and a reduction to our net deferred tax liabilities of $2.6 billion.
- We recognized a one-time transition tax of $734 million on the deemed repatriation of previously undistributed accumulated earnings and profits of our international subsidiaries based on approximately $4.7 billion of the combined earnings and profits of our international subsidiaries that had not been distributed to us. This transition tax will be remitted to the Internal Revenue Service (IRS) over the eight-year period provided in the Code, with the first annual remittance being paid in 2018.
- We accrued withholding tax of $47 million on a portion of the cash held by one of our international subsidiaries that we have deemed to not be permanently reinvested in our operations in that country.

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VALERO ENERGY CORPORATION
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

Because of the significant and complex changes to the Code from Tax Reform, including the need for regulatory guidance from the IRS to properly account for many of the provisions, the SEC issued Staff Accounting Bulletin No. 118, "Income Tax Accounting Implications of the Tax Cuts and Jobs Act," that was codified through the issuance of ASU No. 2018-05 as described in Note 1. Specifically, ASU No. 2018-05 required that the effects of Tax Reform be recorded for items where the accounting was complete, as well as for items where a reasonable estimate could be made (referred to as provisional amounts). For items where reasonable estimates could not be made, provisional amounts were not recorded and those items continued to be accounted for under the Code prior to changes from Tax Reform until a reasonable estimate could be made. During the fourth quarter of 2018, we completed our accounting for the income tax effects of Tax Reform, and we reflected an overall income tax benefit of $12 million for the year ended December 31, 2018 with respect to Tax Reform.

The following table summarizes the components of our adjustment (in millions) to reflect the effects of Tax Reform for the years ended December 31, 2018 and 2017, including whether such amounts were complete, provisional, or incomplete. The amounts presented for 2018 were completed during the fourth quarter of 2018.

| | Year Ended December 31, | | | | Cumulative |
|---|---|---|---|---|---|
| | 2017 | | 2018 | | Tax |
| | Accounting Status | Amount | Accounting Status | Amount | Reform Adjustment |
| Income tax benefit from the remeasurement of U.S. deferred income tax assets and liabilities | Complete | $(2,643) | Complete | $ — | $ (2,643 ) |
| Tax on the deemed repatriation of the accumulated earnings and profits of our international subsidiaries | Provisional | 734 | Complete | 6 | 740 |
| Recognition of foreign withholding tax, net of U.S. federal tax benefit | Complete | 47 | Complete | — | 47 |
| Deductibility of certain executive compensation expense | Incomplete | — | Complete | 5 | 5 |
| Income tax expense associated with the statutory income tax rate differential on accrual to return adjustments that were identified upon completion of our U.S. federal income tax return in 2018 | Incomplete | — | Complete | 9 | 9 |
| Foreign tax credit available to offset the tax on deemed repatriation of the accumulated earnings and profits of our international subsidiaries | Incomplete | — | Complete | (32 ) | (32 ) |
| Tax Reform benefit | | $(1,862) | | $ (12 ) | $ (1,874 ) |

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VALERO ENERGY CORPORATION
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

Income Statement Components

Income before income tax expense (benefit) was as follows (in millions):

| | Year Ended December 31, | | |
|---|---|---|---|
| | 2018 | 2017 | 2016 |
| U.S. operations | $3,168 | $2,283 | $1,733 |
| International operations | 1,064 | 924 | 1,449 |
| Income before income tax expense (benefit) | $4,232 | $3,207 | $3,182 |

Statutory income tax rates applicable to the countries in which we operate were as follows:

| | Year Ended December 31, | | |
|---|---|---|---|
| | 2018 | 2017 | 2016 |
| U.S. | 21 % | 35 % | 35 % |
| Canada | 15 % | 15 % | 15 % |
| U.K. | 19 % | 19 % | 20 % |
| Ireland | 13 % | 13 % | 13 % |
| Peru | 30 % | n/a | n/a |
| Mexico | 30 % | n/a | n/a |
| Aruba | n/a | n/a | 7 % |

The following is a reconciliation of income tax expense (benefit) computed by applying statutory income tax rates as reflected in the preceding table to actual income tax expense (benefit) related to our operations (in millions):

| | Year Ended December 31, 2018 | | | | | |
|---|---|---|---|---|---|---|
| | U.S. | | International | | Total | |
| | Amount | Percent | Amount | Percent | Amount | Percent |
| Income tax expense at statutory rates | $665 | 21.0 % | $163 | 15.3 % | $828 | 19.6 % |
| U.S. state and Canadian provincial tax expense, net of federal income tax effect | 44 | 1.4 % | 80 | 7.5 % | 124 | 2.9 % |
| Permanent differences | (9 ) | (0.3 )% | — | — | (9 ) | (0.2 )% |
| GILTI tax | 67 | 2.1 % | — | — | 67 | 1.6 % |
| Foreign tax credits | (50 ) | (1.6 )% | — | — | (50 ) | (1.2 )% |
| Effects of Tax Reform | (12 ) | (0.4 )% | — | — | (12 ) | (0.3 )% |
| Tax effects of income associated with noncontrolling interests | (49 ) | (1.5 )% | — | — | (49 ) | (1.2 )% |
| Other, net | (23 ) | (0.7 )% | 3 | 0.3 % | (20 ) | (0.5 )% |
| Income tax expense | $633 | 20.0 % | $246 | 23.1 % | $879 | 20.7 % |

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VALERO ENERGY CORPORATION
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

| | Year Ended December 31, 2017 | | | | | |
|---|---|---|---|---|---|---|
| | U.S. | | International | | Total | |
| | Amount | Percent | Amount | Percent | Amount | Percent |
| Income tax expense at statutory rates | $799 | 35.0 % | $158 | 17.1 % | $957 | 29.8 % |
| U.S. state and Canadian provincial tax expense, net of federal income tax effect | 37 | 1.6 % | 46 | 5.0 % | 83 | 2.6 % |
| Permanent differences: | | | | | | |
| Manufacturing deduction | (42) | (1.8)% | — | — | (42) | (1.3)% |
| Other | (9) | (0.4)% | — | — | (9) | (0.3)% |
| Change in tax law | (1,862) | (81.6)% | — | — | (1,862) | (58.1)% |
| Tax effects of income associated with noncontrolling interests | (31) | (1.4)% | — | — | (31) | (1.0)% |
| Other, net | (52) | (2.3)% | 7 | 0.8 % | (45) | (1.4)% |
| Income tax expense (benefit) | $(1,160) | (50.9)% | $211 | 22.9 % | $(949) | (29.7)% |

| | Year Ended December 31, 2016 | | | | | |
|---|---|---|---|---|---|---|
| | U.S. | | International | | Total | |
| | Amount | Percent | Amount | Percent | Amount | Percent |
| Income tax expense at statutory rates | $606 | 35.0 % | $256 | 17.7 % | $862 | 27.1 % |
| U.S. state and Canadian provincial tax expense, net of federal income tax effect | 5 | 0.3 % | 31 | 2.1 % | 36 | 1.1 % |
| Permanent differences: | | | | | | |
| Manufacturing deduction | (22) | (1.3)% | — | — | (22) | (0.7)% |
| Other | (3) | (0.2)% | (10) | (0.7)% | (13) | (0.4)% |
| Change in tax law | — | — | (7) | (0.5)% | (7) | (0.2)% |
| Tax effects of income associated with noncontrolling interests | (44) | (2.5)% | — | — | (44) | (1.4)% |
| Other, net | (37) | (2.1)% | (10) | (0.7)% | (47) | (1.5)% |
| Income tax expense | $505 | 29.2 % | $260 | 17.9 % | $765 | 24.0 % |

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VALERO ENERGY CORPORATION
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

Components of income tax expense (benefit) related to our operations were as follows (in millions):

| | Year Ended December 31, 2018 | | |
|---|---|---|---|
| | U.S. | International | Total |
| Current: | | | |
| Country | $432 | $ 141 | $573 |
| U.S. state / Canadian provincial | 37 | 66 | 103 |
| Total current | 469 (a) | 207 | 676 |
| Deferred: | | | |
| Country | 145 | 25 | 170 |
| U.S. state / Canadian provincial | 19 | 14 | 33 |
| Total deferred | 164 (b) | 39 | 203 |
| Income tax expense | $633 | $ 246 | $879 |

| | Year Ended December 31, 2017 | | |
|---|---|---|---|
| | U.S. | International | Total |
| Current: | | | |
| Country | $1,305 | $ 194 | $1,499 |
| U.S. state / Canadian provincial | 34 | 61 | 95 |
| Total current | 1,339 (a) | 255 | 1,594 |
| Deferred: | | | |
| Country | (2,522 ) | (29 ) | (2,551 ) |
| U.S. state / Canadian provincial | 23 | (15 ) | 8 |
| Total deferred | (2,499 ) (b) | (44 ) | (2,543 ) |
| Income tax expense (benefit) | $(1,160) | $ 211 | $(949 ) |

(a) Current income tax expense includes a $21 million benefit and a $781 million expense related to our Tax Reform adjustment for the years ended December 31, 2018 and 2017, respectively, as described in “Tax Reform” above.

(b) Deferred income tax expense (benefit) includes a $9 million expense and a $2.6 billion benefit related to our Tax Reform adjustment for the years ended December 31, 2018 and 2017, respectively, as described in “Tax Reform” above.

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VALERO ENERGY CORPORATION
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

| | Year Ended December 31, 2016 | | |
|---|---|---|---|
| | U.S. | International | Total |
| Current: | | | |
| Country | $294 | $ 194 | $488 |
| U.S. state / Canadian provincial | 12 | 35 | 47 |
| Total current | 306 | 229 | 535 |
| Deferred: | | | |
| Country | 203 | 35 | 238 |
| U.S. state / Canadian provincial | (4) | (4) | (8) |
| Total deferred | 199 | 31 | 230 |
| Income tax expense | $505 | $ 260 | $765 |

Income Taxes Paid

Income taxes paid to U.S. and international taxing authorities were as follows (in millions):

| | Year Ended December 31, | | |
|---|---|---|---|
| | 2018 | 2017 | 2016 |
| U.S. | $1,016 | $239 | $241 |
| International | 345 | 171 | 203 |
| Income taxes paid, net | $1,361 | $410 | $444 |

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VALERO ENERGY CORPORATION
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

Deferred Income Tax Assets and Liabilities

The tax effects of significant temporary differences representing deferred income tax assets and liabilities were as follows (in millions):

| | December 31, | |
|---|---|---|
| | 2018 | 2017 |
| Deferred income tax assets: | | |
| Tax credit carryforwards | $644 | $69 |
| Net operating losses (NOLs) | 523 | 492 |
| Inventories | 101 | 135 |
| Compensation and employee benefit liabilities | 175 | 179 |
| Environmental liabilities | 71 | 47 |
| Other | 141 | 112 |
| Total deferred income tax assets | 1,655 | 1,034 |
| Valuation allowance | (1,111 ) | (498 ) |
| Net deferred income tax assets | 544 | 536 |
| | | |
| Deferred income tax liabilities: | | |
| Property, plant, and equipment | 4,589 | 4,545 |
| Deferred turnaround costs | 316 | 272 |
| Inventories | 287 | 243 |
| Investments | 142 | 77 |
| Other | 172 | 107 |
| Total deferred income tax liabilities | 5,506 | 5,244 |
| Net deferred income tax liabilities | $4,962 | $4,708 |

We had the following income tax credit and loss carryforwards as of December 31, 2018 (in millions):

| | Amount | Expiration |
|---|---|---|
| U.S. state income tax credits | $ 80 | 2019 through 2031 |
| U.S. state income tax credits | 6 | Unlimited |
| U.S. foreign tax credits | 575 | 2027 |
| U.S. state NOLs (gross amount) | 10,039 | 2019 through 2038 |

We have recorded a valuation allowance as of December 31, 2018 and 2017 due to uncertainties related to our ability to utilize some of our deferred income tax assets, primarily consisting of U.S. foreign tax credits and certain U.S. state income tax credits and NOLs, before they expire. The valuation allowance is based on our estimates of taxable income in the various jurisdictions in which we operate and the period over which deferred income tax assets will be recoverable. As a part of the completion of the accounting for the income tax effects of Tax Reform as described in “Tax Reform” above, we assessed the ability of our available foreign tax credits to offset the tax on the deemed repatriation of the accumulated earnings and profits of

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our international subsidiaries. The completion of such accounting resulted in U.S. general limitation foreign tax credit carryforwards and a correlating valuation allowance provided on the balance of the deferred income tax asset related to those carryforwards as it is not more likely than not that the deferred income tax asset will be realized. The valuation allowance increased by $613 million, primarily due to approximately $575 million of excess U.S. foreign tax credits. Foreign tax credits as of December 31, 2017 were used to offset the one-time transition tax, and excess tax credits were generated on the transition tax inclusion. Tax Reform imposes certain limits on a company's use of foreign tax credits in the future, including any excess credits generated from the mandatory income inclusion of previously deferred foreign earnings. The realization of net deferred income tax assets related to state income tax credits and NOLs recorded as of December 31, 2018 is primarily dependent upon our ability to generate future taxable income in certain U.S. states.

As described in "Tax Reform" above, one of the most significant changes in Tax Reform was the shift from a worldwide system of taxation to a territorial system. The shift to a territorial system allows us to distribute cash via a dividend from our international subsidiaries with a full dividend received deduction. As a result, we will not recognize U.S. federal deferred taxes for the future tax consequences attributable to differences between financial statement carrying amounts of existing assets and liabilities and the respective tax bases for our international subsidiaries. As of December 31, 2017, we recognized a one-time transition tax of $734 million on approximately $4.7 billion of combined earnings and profits of our international subsidiaries. In the fourth quarter of 2018, the one-time transition tax was increased by $6 million. Also, in the fourth quarter, we recorded a foreign tax credit of $32 million related to the one-time transition tax. Because of the deemed repatriation of these accumulated earnings and profits, there are no longer any U.S. federal income tax consequences associated with the repatriation of any of the $2.4 billion of cash and cash equivalents held by our international subsidiaries as of December 31, 2018. However, certain countries in which our international subsidiaries are organized impose withholding taxes on cash distributed outside of those countries. As of December 31, 2018, the cumulative undistributed earnings of these subsidiaries were approximately $5.3 billion. We have accrued for withholding taxes on a portion of the cash held by one of our international subsidiaries that we have deemed to not be permanently reinvested in our operations in that country. The remaining cash held by that subsidiary as well as our other international subsidiaries will be permanently reinvested in our operations in those countries. It is not practicable to estimate the amount of additional tax that would be payable on those earnings, if distributed.

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VALERO ENERGY CORPORATION
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

Unrecognized Tax Benefits
The following is a reconciliation of the change in unrecognized tax benefits, excluding related penalties and interest, (in millions):

| | Year Ended December 31, | | |
|---|---|---|---|
| | 2018 | 2017 | 2016 |
| Balance as of beginning of year | $941 | $936 | $964 |
| Additions based on tax positions related to the current year | 23 | 33 | 36 |
| Additions for tax positions related to prior years | 28 | 15 | 11 |
| Reductions for tax positions related to prior years | (19) | (42) | (46) |
| Reductions for tax positions related to the lapse of applicable statute of limitations | (1) | (1) | (3) |
| Settlements | (2) | — | (237) |
| Reclassification of uncertain tax receivable to long-term receivable from IRS | — | — | 211 |
| Balance as of end of year | $970 | $941 | $936 |

As of December 31, 2018, the balance in unrecognized tax benefits included $277 million of tax refunds that we intend to claim by amending various of our income tax returns for 2010 through 2016. We intend to propose that incentive payments received from the U.S. federal government for blending biofuels into refined petroleum products be excluded from taxable income during these periods. However, due to the complexity of this matter and uncertainties with respect to the interpretation of the Code, we concluded that the refund claims included in the following table cannot be recognized in our financial statements. As a result, these amounts are not included in our uncertain tax position liabilities as of December 31, 2018, 2017, and 2016 even though they are reflected in the preceding table.

The following is a reconciliation of unrecognized tax benefits reflected in the preceding table to our uncertain tax position liabilities that are presented in our balance sheets (in millions).

| | December 31, | |
|---|---|---|
| | 2018 | 2017 |
| Unrecognized tax benefits | $970 | $941 |
| Tax refund claim not presented in our balance sheets | (277) | (274) |
| Other | 88 | 77 |
| Uncertain tax position liabilities presented in our balance sheets | $781 | $744 |

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VALERO ENERGY CORPORATION
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

Amounts recognized in our balance sheets for uncertain tax positions include (in millions):

| | December 31, | |
|---|---|---|
| | 2018 | 2017 |
| Income taxes payable | $42 | $— |
| Other long-term liabilities | 721 | 723 |
| Deferred tax liabilities | 18 | 21 |
| Uncertain tax position liabilities presented in our balance sheets | $781 | $744 |

As of December 31, 2018 and 2017, there were $807 million and $793 million, respectively, of unrecognized tax benefits that if recognized would affect our annual effective tax rate.

Penalties and interest during the years ended December 31, 2018, 2017, and 2016 were immaterial. Accrued penalties and interest totaled $88 million and $77 million as of December 31, 2018 and 2017, respectively, excluding the U.S. federal and state income tax effects related to interest.

During the next 12 months, it is reasonably possible that tax audit resolutions could reduce unrecognized tax benefits, excluding interest, either because the tax positions are sustained on audit or because we agree to their disallowance. We do not expect these reductions to have a significant impact on our financial statements because such reductions would not significantly affect our annual effective tax rate.

Tax Returns Under Audit

U.S. Federal

As of December 31, 2018, our U.S. federal tax returns for 2010 through 2015 were under audit by the IRS. The IRS has proposed adjustments to our taxable income for certain open years. We are currently contesting the proposed adjustments with the Office of Appeals of the IRS for certain open years and do not expect that the ultimate disposition of these adjustments will result in a material change to our financial position, results of operations, or liquidity. We are continuing to work with the IRS to resolve these matters and we believe that they will be resolved for amounts consistent with recorded amounts of unrecognized tax benefits associated with these matters.

We have amended our U.S federal income tax returns for 2005 through 2009 to exclude from taxable income incentive payments received from the U.S. federal government for blending alcohol fuel mixtures. These amended return claims have been disallowed by the IRS and we are currently protesting the disallowance of these adjustments. An ultimate disallowance of the exclusion from income would not result in a material change to our financial position, results of operations, or liquidity.

U.S. State

As of December 31, 2018, our California tax returns for 2004 through 2008 and 2011 through 2014 were under audit by the state of California. We do not expect the ultimate disposition of these audits will result in a material change to our financial position, results of operations, or liquidity. We believe these audits will be resolved for amounts consistent with our recorded amounts of unrecognized tax benefits associated with these audits.

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VALERO ENERGY CORPORATION
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

International
As of December 31, 2018, our Canadian subsidiary's federal tax returns for 2013 and 2014 were under audit by Canada Revenue Agency (CRA) and our Quebec provincial tax returns for 2013 through 2016 were under audit by Revenue Quebec. We are protesting the proposed adjustments by CRA for 2013 and we do not expect the ultimate disposition of these adjustments will result in a material change to our financial position, results of operations, or liquidity.

16. EARNINGS PER COMMON SHARE

Earnings per common share were computed as follows (dollars and shares in millions, except per share amounts):

| | Year Ended December 31, | | |
|---|---|---|---|
| | 2018 | 2017 | 2016 |
| Earnings per common share: | | | |
| Net income attributable to Valero stockholders | $3,122 | $4,065 | $2,289 |
| Less income allocated to participating securities | 9 | 14 | 7 |
| Net income available to common shareholders | $3,113 | $4,051 | $2,282 |
| Weighted-average common shares outstanding | 426 | 442 | 461 |
| Earnings per common share | $7.30 | $9.17 | $4.94 |
| Earnings per common share – assuming dilution: | | | |
| Net income attributable to Valero stockholders | $3,122 | $4,065 | $2,289 |
| Weighted-average common shares outstanding | 426 | 442 | 461 |
| Effect of dilutive securities | 2 | 2 | 3 |
| Weighted-average common shares outstanding – assuming dilution | 428 | 444 | 464 |
| Earnings per common share – assuming dilution | $7.29 | $9.16 | $4.94 |

Participating securities include restricted stock and performance awards granted under our 2011 Omnibus Stock Incentive Plan. Dilutive securities include participating securities as well as outstanding stock options granted under our 2011 Omnibus Stock Incentive Plan.

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## 17. REVENUES AND SEGMENT INFORMATION

### Revenue from Contracts with Customers

Disaggregation of Revenue

Revenue is presented in the table below under “Segment Information” disaggregated by product because this is the level of disaggregation that management has determined to be beneficial to users of our financial statements.

Receivables from Contracts with Customers

Our receivables from contracts with customers are included in receivables, net as presented in Note 4.

Remaining Performance Obligations

The majority of our contracts with customers are spot contracts and therefore have no remaining performance obligations. Our remaining contracts with customers are primarily term contracts. The transaction price for these term contracts includes an immaterial fixed amount and variable consideration (i.e., a commodity price). The variable consideration is allocated entirely to a wholly unsatisfied promise to transfer a distinct good that forms part of a single performance obligation; therefore, the variable consideration is not included in the remaining performance obligation. As of December 31, 2018, after excluding contracts with an original expected duration of one year or less, the aggregate amount of the transaction price allocated to our remaining performance obligations was not material as the transaction price for these contracts includes only an immaterial fixed amount.

### Segment Information

As of December 31, 2018, we had three reportable segments – refining, ethanol, and VLP. Each segment is a strategic business unit that offers different products and services by employing unique technologies and marketing strategies and whose operations and operating performance are managed and evaluated separately. Operating performance is measured based on the operating income generated by the segment, which includes revenues and expenses that are directly attributable to the management of the respective segment. Intersegment sales are generally derived from transactions made at prevailing market rates. The following is a description of each segment’s business operations.

- The refining segment includes the operations of our 15 petroleum refineries, the associated marketing activities, and certain logistics assets that support our refining operations that are not owned by VLP. The principal products manufactured by our refineries and sold by this segment include gasolines and blendstocks (e.g., conventional gasolines, premium gasolines, and gasoline meeting the specifications of the California Air Resources Board (CARB)), distillates (e.g., diesel, low-sulfur diesel, ultra-low-sulfur diesel, CARB diesel, jet fuel, and other distillates), and other products (e.g., asphalt, petrochemicals, lubricants, and other refined petroleum products).
- The ethanol segment includes the operations of our 14 ethanol plants, the associated marketing activities, and logistics assets that support our ethanol operations. The principal products manufactured by our ethanol plants are ethanol and distillers grains. We sell some ethanol to our refining segment for blending into gasoline, which is sold to that segment’s customers as a finished gasoline product.

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- The VLP segment includes the results of VLP. VLP generates revenue from transportation and terminaling activities provided to our refining segment. All of VLP's revenues are intersegment revenues that are generated under commercial agreements with our refining segment. Revenues generated under these agreements are eliminated in consolidation.

Operations that are not included in any of the reportable segments are included in the corporate category.

The following tables reflect information about our operating income and total expenditures for long-lived assets by reportable segment (in millions):

| | Refining | Ethanol | VLP | Corporate and Eliminations | Total |
|---|---|---|---|---|---|
| Year ended December 31, 2018: | | | | | |
| Revenues: | | | | | |
| Revenues from external customers | $113,601 | $3,428 | $— | $ 4 | $117,033 |
| Intersegment revenues | 14 | 210 | 546 | (770) | — |
| Total revenues | 113,615 | 3,638 | 546 | (766) | 117,033 |
| Cost of sales: | | | | | |
| Cost of materials and other | 102,489 | 3,008 | — | (765) | 104,732 |
| Operating expenses (excluding depreciation and amortization expense reflected below) | 4,099 | 470 | 125 | (4) | 4,690 |
| Depreciation and amortization expense | 1,863 | 78 | 76 | — | 2,017 |
| Total cost of sales | 108,451 | 3,556 | 201 | (769) | 111,439 |
| Other operating expenses | 45 | — | — | — | 45 |
| General and administrative expenses (excluding depreciation and amortization expense reflected below) | — | — | — | 925 | 925 |
| Depreciation and amortization expense | — | — | — | 52 | 52 |
| Operating income by segment | $5,119 | $82 | $345 | $ (974) | $4,572 |
| Total expenditures for long-lived assets (a) | $2,935 | $373 | $24 | $ 44 | $3,376 |

See note on page 126.

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| | Refining | Ethanol | VLP | Corporate and Eliminations | Total |
|---|---|---|---|---|---|
| Year ended December 31, 2017: | | | | | |
| Revenues: | | | | | |
| Revenues from external customers | $90,651 | $3,324 | $— | $ 5 | $93,980 |
| Intersegment revenues | 6 | 176 | 452 | (634) | — |
| Total revenues | 90,657 | 3,500 | 452 | (629) | 93,980 |
| Cost of sales: | | | | | |
| Cost of materials and other | 80,865 | 2,804 | — | (632) | 83,037 |
| Operating expenses (excluding depreciation and amortization expense reflected below) | 3,959 | 443 | 104 | (2) | 4,504 |
| Depreciation and amortization expense | 1,800 | 81 | 53 | — | 1,934 |
| Total cost of sales | 86,624 | 3,328 | 157 | (634) | 89,475 |
| Other operating expenses | 58 | — | 3 | — | 61 |
| General and administrative expenses (excluding depreciation and amortization expense reflected below) | — | — | — | 829 | 829 |
| Depreciation and amortization expense | — | — | — | 52 | 52 |
| Operating income by segment | $3,975 | $172 | $292 | $ (876) | $3,563 |
| Total expenditures for long-lived assets (a) | $1,710 | $84 | $110 | $ 44 | $1,948 |
| | | | | | |
| Year Ended December 31, 2016: | | | | | |
| Revenues: | | | | | |
| Revenues from external customers | $71,968 | $3,691 | $— | $— | $75,659 |
| Intersegment revenues | — | 210 | 363 | (573) | — |
| Total revenues | 71,968 | 3,901 | 363 | (573) | 75,659 |
| Cost of sales: | | | | | |
| Cost of materials and other | 63,405 | 3,130 | — | (573) | 65,962 |
| Operating expenses (excluding depreciation and amortization expense reflected below) | 3,740 | 415 | 96 | — | 4,251 |
| Depreciation and amortization expense | 1,734 | 66 | 46 | — | 1,846 |
| Lower of cost or market inventory valuation adjustment | (697) | (50) | — | — | (747) |
| Total cost of sales | 68,182 | 3,561 | 142 | (573) | 71,312 |
| General and administrative expenses (excluding depreciation and amortization expense reflected below) | — | — | — | 709 | 709 |
| Depreciation and amortization expense | — | — | — | 48 | 48 |
| Asset impairment loss | 56 | — | — | — | 56 |
| Operating income by segment | $3,730 | $340 | $221 | $(757) | $3,534 |
| Total expenditures for long-lived assets (a) | $1,867 | $68 | $23 | $38 | $1,996 |

(a)

Total expenditures for long-lived assets includes amounts related to capital expenditures, deferred turnaround and catalyst costs, and property, plant, and equipment for acquisitions.

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The following table provides a disaggregation of revenues by reportable segment (in millions). Refining and ethanol segment revenues are disaggregated for our principal products, and VLP segment revenues are disaggregated by activity type.

| | Year Ended December 31, | | |
|---|---|---|---|
| | 2018 | 2017 | 2016 |
| Refining: | | | |
| Gasolines and blendstocks | $46,606 | $40,366 | $33,450 |
| Distillates | 55,546 | 42,074 | 32,576 |
| Other product revenues | 11,463 | 8,217 | 5,942 |
| Total refining revenues | 113,615 | 90,657 | 71,968 |
| Ethanol: | | | |
| Ethanol | 2,912 | 2,940 | 3,315 |
| Distillers grains | 726 | 560 | 586 |
| Total ethanol revenues | 3,638 | 3,500 | 3,901 |
| VLP: | | | |
| Pipeline transportation | 124 | 101 | 78 |
| Terminaling | 415 | 348 | 284 |
| Storage and other | 7 | 3 | 1 |
| Total VLP revenues | 546 | 452 | 363 |
| Corporate – other revenues | 4 | 5 | — |
| Elimination of intersegment revenues | (770) | (634) | (573) |
| Revenues | $117,033 | $93,980 | $75,659 |

Revenues by geographic area are shown in the following table (in millions). The geographic area is based on location of customer and no customer accounted for 10 percent or more of our revenues.

| | Year Ended December 31, | | |
|---|---|---|---|
| | 2018 | 2017 | 2016 |
| U.S. | $82,992 | $66,614 | $51,479 |
| Canada | 9,211 | 7,039 | 6,115 |
| U.K. and Ireland | 15,208 | 11,556 | 10,797 |
| Other countries | 9,622 | 8,771 | 7,268 |
| Revenues | $117,033 | $93,980 | $75,659 |

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Long-lived assets include property, plant, and equipment and certain long-lived assets included in "deferred charges and other assets, net." Long-lived assets by geographic area consisted of the following (in millions):

| | December 31, | |
|---|---|---|
| | 2018 | 2017 |
| U.S. | $27,475 | $26,083 |
| Canada | 1,798 | 1,915 |
| U.K. and Ireland | 1,113 | 1,063 |
| Other countries | 266 | — |
| Total long-lived assets | $30,652 | $29,061 |

Total assets by reportable segment were as follows (in millions):

| | December 31, | |
|---|---|---|
| | 2018 | 2017 |
| Refining | $42,673 | $40,382 |
| Ethanol | 1,691 | 1,344 |
| VLP | 1,620 | 1,517 |
| Corporate and eliminations | 4,171 | 6,915 |
| Total assets | $50,155 | $50,158 |

As of December 31, 2018 and 2017, our investments in joint ventures accounted for under the equity method were $542 million and $530 million, respectively, all of which related to the refining segment and are reflected in "deferred charges and other assets, net" as presented in Note 7.

Effective January 1, 2019, we revised our reportable segments to align with certain changes in how our chief operating decision maker manages and allocates resources to our business. Accordingly, we created a new reportable segment — renewable diesel — because of the growing importance of renewable fuels in the market and the growth of our investments in renewable fuels production. The renewable diesel segment includes the operations of DGD, our consolidated joint venture as discussed in Note 12. The operations of DGD have been included in the refining segment through December 31, 2018, but were transferred from that segment on January 1, 2019. Also effective January 1, 2019, we no longer have a VLP segment, and we include the operations of VLP in our refining segment. This change was made because of the Merger Transaction with VLP, as described in Note 2, and the resulting change in how we manage VLP's operations. We no longer manage VLP as a business but as logistics assets that support the operations of our refining segment.

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## 18. SUPPLEMENTAL CASH FLOW INFORMATION

In order to determine net cash provided by operating activities, net income is adjusted by, among other things, changes in current assets and current liabilities as follows (in millions):

| | Year Ended December 31, | | |
|---|---|---|---|
| | 2018 | 2017 | 2016 |
| Decrease (increase) in current assets: | | | |
| Receivables, net | $(457) | $(870) | $(1,531) |
| Inventories | (197) | (516) | 771 |
| Prepaid expenses and other | (77) | 151 | 47 |
| Increase (decrease) in current liabilities: | | | |
| Accounts payable | 304 | 1,842 | 1,556 |
| Accrued expenses | (113) | 21 | 117 |
| Taxes other than income taxes payable | (73) | 172 | 82 |
| Income taxes payable | (684) | 489 | (66) |
| Changes in current assets and current liabilities | $(1,297) | $1,289 | $976 |

Cash flows related to interest and income taxes were as follows (in millions):

| | Year Ended December 31, | | |
|---|---|---|---|
| | 2018 | 2017 | 2016 |
| Interest paid in excess of amount capitalized | $463 | $457 | $427 |
| Income taxes paid, net | 1,361 | 410 | 444 |

Cash flows reflected as “other financing activities, net” for the year ended December 31, 2016 included the payment of a long-term liability of $137 million owed to a joint venture partner associated with an owner-method joint venture investment.

Noncash investing and financing activities for the year ended December 31, 2018 included the recognition of (i) capital lease assets and related obligations totaling $63 million primarily for the lease of storage tanks as described in Note 9 and (ii) terminal assets and related obligation totaling $198 million under owner accounting as described in Note 10.

Noncash investing and financing activities for the year ended December 31, 2017 included the recognition of (i) capital lease assets and related obligations totaling $502 million primarily for the lease of storage tanks as described in Note 9 and (ii) terminal assets and related obligation totaling $94 million under owner accounting as described in Note 10.

There were no significant noncash investing and financing activities for the year ended December 31, 2016.

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## 19. FAIR VALUE MEASUREMENTS

General

U.S. GAAP requires or permits certain assets and liabilities to be measured at fair value on a recurring or nonrecurring basis in our balance sheets, and those assets and liabilities are presented below under “Recurring Fair Value Measurements” and “Nonrecurring Fair Value Measurements.” Assets and liabilities measured at fair value on a recurring basis, such as derivative financial instruments, are measured at fair value at the end of each reporting period. Assets and liabilities measured at fair value on a nonrecurring basis, such as the impairment of property, plant and equipment, are measured at fair value in particular circumstances.

U.S. GAAP also requires the disclosure of the fair values of financial instruments when an option to elect fair value accounting has been provided, but such election has not been made. A debt obligation is an example of such a financial instrument. The disclosure of the fair values of financial instruments not recognized at fair value in our balance sheet is presented below under “Other Financial Instruments.”

U.S. GAAP provides a framework for measuring fair value and establishes a three-level fair value hierarchy that prioritizes inputs to valuation techniques based on the degree to which objective prices in external active markets are available to measure fair value. Following is a description of each of the levels of the fair value hierarchy.

- Level 1 - Observable inputs, such as unadjusted quoted prices in active markets for identical assets or liabilities.

- Level 2 - Inputs other than quoted prices included within Level 1 that are observable for the asset or liability, either directly or indirectly. These include quoted prices for similar assets or liabilities in active markets and quoted prices for identical or similar assets or liabilities in markets that are not active.

- Level 3 - Unobservable inputs for the asset or liability. Unobservable inputs reflect our own assumptions about what market participants would use to price the asset or liability. The inputs are developed based on the best information available in the circumstances, which might include occasional market quotes or sales of similar instruments or our own financial data such as internally developed pricing models, discounted cash flow methodologies, as well as instruments for which the fair value determination requires significant judgment.

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Recurring Fair Value Measurements
The following tables present information (in millions) about our assets and liabilities recognized at their fair values in our balance sheets categorized according to the fair value hierarchy of the inputs utilized by us to determine the fair values as of December 31, 2018 and 2017.

We have elected to offset the fair value amounts recognized for multiple similar derivative contracts executed with the same counterparty, including any related cash collateral assets or obligations as shown below; however, fair value amounts by hierarchy level are presented in the following tables on a gross basis. We have no derivative contracts that are subject to master netting arrangements that are reflected gross on the balance sheet.

| | December 31, 2018 | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Fair Value Hierarchy | | | Total Gross Fair Value | Effect of Counter-party Netting | Effect of Cash Collateral Netting | Net Carrying Value on Balance Sheet | Cash Collateral Paid or Received Not Offset |
| | Level 1 | Level 2 | Level 3 | | | | | |
| Assets: | | | | | | | | |
| Commodity derivative contracts | $2,792 | $ — | $ — | $2,792 | $(2,669) | $ (34 ) | $ 89 | $ — |
| Foreign currency contracts | 4 | — | — | 4 | n/a | n/a | 4 | n/a |
| Investments of certain benefit plans | 60 | — | 9 | 69 | n/a | n/a | 69 | n/a |
| Total | $2,856 | $ — | $ 9 | $2,865 | $(2,669) | $ (34 ) | $ 162 | |
| | | | | | | | | |
| Liabilities: | | | | | | | | |
| Commodity derivative contracts | $2,681 | $ — | $ — | $2,681 | $(2,669) | $ (12 ) | $ — | $ (136 ) |
| Environmental credit obligations | — | 13 | — | 13 | n/a | n/a | 13 | n/a |
| Physical purchase contracts | — | 5 | — | 5 | n/a | n/a | 5 | n/a |
| Foreign currency contracts | 1 | — | — | 1 | n/a | n/a | 1 | n/a |
| Total | $2,682 | $ 18 | $ — | $2,700 | $(2,669) | $ (12 ) | $ 19 | |

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| | December 31, 2017 | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Fair Value Hierarchy | | | Total Gross Fair Value | Effect of Counter-party Netting | Effect of Cash Collateral Netting | Net Carrying Value on Balance Sheet | Cash Collateral Paid or Received Not Offset |
| | Level 1 | Level 2 | Level 3 | | | | | |
| Assets: | | | | | | | | |
| Commodity derivative contracts | $875 | $19 | $ — | $894 | $ (893 ) | $ — | $ 1 | $ — |
| Investments of certain benefit plans | 65 | — | 8 | 73 | n/a | n/a | 73 | n/a |
| Total | $940 | $19 | $ 8 | $967 | $ (893 ) | $ — | $ 74 | |
| | | | | | | | | |
| Liabilities: | | | | | | | | |
| Commodity derivative contracts | $955 | $14 | $ — | $969 | $ (893 ) | $ (76 ) | $ — | $ (102 ) |
| Environmental credit obligations | — | 104 | — | 104 | n/a | n/a | 104 | n/a |
| Physical purchase contracts | — | 6 | — | 6 | n/a | n/a | 6 | n/a |
| Foreign currency contracts | 7 | — | — | 7 | n/a | n/a | 7 | n/a |
| Total | $962 | $124 | $ — | $1,086 | $ (893 ) | $ (76 ) | $ 117 | |

A description of our assets and liabilities recognized at fair value along with the valuation methods and inputs we used to develop their fair value measurements are as follows:

- Commodity derivative contracts consist primarily of exchange-traded futures, which are used to reduce the impact of price volatility on our results of operations and cash flows as discussed in Note 20. These contracts are measured at fair value using the market approach. Exchange-traded futures are valued based on quoted prices from the commodity exchange and are categorized in Level 1 of the fair value hierarchy.

- Physical purchase contracts represent the fair value of fixed-price corn purchase contracts. The fair values of these purchase contracts are measured using a market approach based on quoted prices from the commodity exchange or an independent pricing service and are categorized in Level 2 of the fair value hierarchy.

- Investments of certain benefit plans consist of investment securities held by trusts for the purpose of satisfying a portion of our obligations under certain U.S. nonqualified benefit plans. The plan assets categorized in Level 1 of the fair value hierarchy are measured at fair value using a market approach based on quoted prices from national securities exchanges. The plan assets categorized in Level 3 of the fair value hierarchy represent insurance contracts, the fair value of which is provided by the insurer.

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- Foreign currency contracts consist of foreign currency exchange and purchase contracts entered into for our international operations to manage our exposure to exchange rate fluctuations on transactions denominated in currencies other than the local (functional) currencies of those operations. These contracts are valued based on quoted prices from the exchange and are categorized in Level 1 of the fair value hierarchy.

- Environmental credit obligations represent our liability for the purchase of (i) biofuel credits (primarily RINs in the U.S.) needed to satisfy our obligation to blend biofuels into the products we produce and (ii) emission credits under the California Global Warming Solutions Act (the California cap-and-trade system, also known as AB 32) and similar programs, (collectively, the cap-and-trade systems). To the degree we are unable to blend biofuels (such as ethanol and biodiesel) at percentages required under the biofuel programs, we must purchase biofuel credits to comply with these programs. Under the cap-and-trade systems, we must purchase emission credits to comply with these systems. These programs are described in Note 20 under “Environmental Compliance Program Price Risk.” The liability for environmental credits is based on our deficit for such credits as of the balance sheet date, if any, after considering any credits acquired or under contract, and is equal to the product of the credits deficit and the market price of these credits as of the balance sheet date. The environmental credit obligations are categorized in Level 2 of the fair value hierarchy and are measured at fair value using the market approach based on quoted prices from an independent pricing service.

There were no transfers into or out of Level 3 for assets and liabilities held as of December 31, 2018 and 2017 that were measured at fair value on a recurring basis.

There was no significant activity during the years ended December 31, 2018, 2017, and 2016 related to the fair value amounts categorized in Level 3 as of December 31, 2018 and 2017.

Nonrecurring Fair Value Measurements
As discussed in Note 3, we concluded that the Aruba Terminal was impaired as of June 30, 2016, which resulted in an asset impairment loss of $56 million that was recorded in June 2016. The fair value of the Aruba Terminal was determined using an income approach and was classified in Level 3. We employed a probability-weighted approach to possible future cash flow scenarios, including transferring ownership of the business to the GOA or continuing to operate the business.

There were no assets or liabilities that were measured at fair value on a nonrecurring basis as of December 31, 2018 and 2017.

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Other Financial Instruments
Financial instruments that we recognize in our balance sheets at their carrying amounts are shown in the following table along with their associated fair values (in millions):

| | | December 31, 2018 | | December 31, 2017 | |
|---|---|---|---|---|---|
| | Fair Value Hierarchy | Carrying Amount | Fair Value | Carrying Amount | Fair Value |
| Financial assets: | | | | | |
| Cash and cash equivalents | Level 1 | $2,982 | $2,982 | $5,850 | $5,850 |
| Financial liabilities: | | | | | |
| Debt (excluding capital leases) | Level 2 | 8,503 | 8,986 | 8,310 | 9,795 |

20. PRICE RISK MANAGEMENT ACTIVITIES

We are exposed to market risks primarily related to the volatility in the price of commodities, and foreign currency exchange rates, and the price of credits needed to comply with various government and regulatory programs. We enter into derivative instruments to manage some of these risks, including derivative instruments related to the various commodities we purchase or produce, and foreign currency exchange and purchase contracts, as described below under “Risk Management Activities by Type of Risk.” These derivative instruments are recorded as either assets or liabilities measured at their fair values (see Note 19), as summarized below under “Fair Values of Derivative Instruments,” with changes in fair value recognized currently in income. The effect of these derivative instruments on our income is summarized below under “Effect of Derivative Instruments on Income.”

Risk Management Activities by Type of Risk
Commodity Price Risk
We are exposed to market risks related to the volatility in the price of crude oil, refined petroleum products (primarily gasoline and distillate), grain (primarily corn), soybean oil, and natural gas used in our operations. To reduce the impact of price volatility on our results of operations and cash flows, we use commodity derivative instruments, such as futures and options. Our positions in commodity derivative instruments are monitored and managed on a daily basis by our risk control group to ensure compliance with our stated risk management policy that has been approved by our board of directors.

We primarily use commodity derivative instruments as economic hedges, which are not designated as hedging instruments, and we use fair value and cash flow hedges from time to time. We had no commodity derivative instruments outstanding as of December 31, 2018 and 2017, and no activity during the years ended December 31, 2018, 2017, and 2016 that were designated as fair value or cash flow hedges.

Our objectives for holding economic hedges are to (i) manage price volatility in certain feedstock and refined petroleum product inventories and fixed-price purchase contracts, and (ii) lock in the price of forecasted feedstock, refined petroleum product, or natural gas purchases and refined petroleum product sales at existing market prices that we deem favorable.

As of December 31, 2018, we had the following outstanding commodity derivative instruments that were used as economic hedges, as well as commodity derivative instruments related to the physical purchase of

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corn at a fixed price. The information presents the notional volume of outstanding contracts by type of instrument and year of maturity (volumes in thousands of barrels, except those identified as natural gas contracts that are presented in millions of British thermal units, corn contracts that are presented in thousands of bushels, and soybean oil contracts that are presented in thousands of pounds).

| | Notional Contract Volumes by Year of Maturity | |
|---|---|---|
| Derivative Instrument | 2019 | 2020 |
| Crude oil and refined petroleum products: | | |
| Futures – long | 149,470 | 224 |
| Futures – short | 143,826 | 671 |
| Options – long | 26,500 | — |
| Options – short | 26,500 | — |
| Natural gas: | | |
| Futures – long | 5,000,000 | — |
| Corn: | | |
| Futures – long | 26,025 | — |
| Futures – short | 55,395 | 875 |
| Physical contracts – long | 27,109 | 875 |
| Soybean oil: | | |
| Futures – long | 137,518 | — |
| Futures – short | 285,957 | — |

Foreign Currency Risk

We are exposed to exchange rate fluctuations on transactions entered into by our international operations that are denominated in currencies other than the local (functional) currencies of these operations. To manage our exposure to these exchange rate fluctuations, we use foreign currency exchange and purchase contracts. These contracts are not designated as hedging instruments for accounting purposes and therefore are classified as economic hedges. As of December 31, 2018, we had forward contracts to purchase $441 million of U.S. dollars. All of these commitments matured on or before January 31, 2019.

Environmental Compliance Program Price Risk

We are exposed to market risk related to the volatility in the price of credits needed to comply with various governmental and regulatory environmental compliance programs. To manage this risk, we enter into contracts to purchase these credits when prices are deemed favorable. Some of these contracts are derivative instruments; however, we elect the normal purchase exception and do not record these contracts at their fair values. Certain of these programs require us to blend biofuels into the products we produce, and we are subject to such programs in most of the countries in which we operate. These countries set annual quotas for the percentage of biofuels that must be blended into the motor fuels consumed in these countries. As a producer of motor fuels from petroleum, we are obligated to blend biofuels into the products we produce at a rate that is at least equal to the applicable quota. To the degree we are unable to blend at the applicable rate, we must purchase biofuel credits (primarily RINs in the U.S.). We are exposed to the volatility in the market price of these credits, and we manage that risk by purchasing biofuel

credits when prices are deemed

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favorable. For the years ended December 31, 2018, 2017, and 2016, the cost of meeting our obligations under these compliance programs was $536 million, $942 million, and $749 million, respectively. These amounts are reflected in cost of materials and other.

We are subject to additional requirements under GHG emission programs, including the cap-and-trade systems, as discussed in Note 19. Under these cap-and-trade systems, we purchase various GHG emission credits available on the open market. Therefore, we are exposed to the volatility in the market price of these credits. The cost to implement certain provisions of the cap-and-trade systems are significant; however, we recovered the majority of these costs from our customers for the years ended December 31, 2018, 2017, and 2016 and expect to continue to recover the majority of these costs in the future. For the years ended December 31, 2018, 2017, and 2016, the net cost of meeting our obligations under these compliance programs was immaterial.

Fair Values of Derivative Instruments
The following tables provide information about the fair values of our derivative instruments as of December 31, 2018 and 2017 (in millions) and the line items in the balance sheets in which the fair values are reflected. See Note 19 for additional information related to the fair values of our derivative instruments.

As indicated in Note 19, we net fair value amounts recognized for multiple similar derivative contracts executed with the same counterparty under master netting arrangements, including cash collateral assets and obligations. The following tables, however, are presented on a gross asset and gross liability basis, which results in the reflection of certain assets in liability accounts and certain liabilities in asset accounts.

| | Balance Sheet Location | December 31, 2018 | | December 31, 2017 | |
|---|---|---|---|---|---|
| | | Asset Derivatives | Liability Derivatives | Asset Derivatives | Liability Derivatives |
| Derivatives not designated as hedging instruments | | | | | |
| Commodity contracts: | | | | | |
| Futures | Receivables, net | $2,787 | $ 2,681 | $886 | $ 966 |
| Options | Receivables, net | 5 | — | 8 | 3 |
| Physical purchase contracts | Inventories | — | 5 | — | 6 |
| Foreign currency contracts | Receivables, net | 4 | — | — | — |
| Foreign currency contracts | Accrued expenses | — | 1 | — | 7 |
| Total | | $2,796 | $ 2,687 | $894 | $ 982 |

Market Risk
Our price risk management activities involve the receipt or payment of fixed price commitments into the future. These transactions give rise to market risk, which is the risk that future changes in market conditions may make an instrument less valuable. We closely monitor and manage our exposure to market risk on a daily basis in accordance with policies approved by our board of directors. Market risks are monitored by our risk control group to ensure compliance with our stated risk management policy. We do not require any collateral or other security to support derivative instruments into which we enter. We also do not have any derivative instruments that require us to maintain a minimum investment-grade credit rating.

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VALERO ENERGY CORPORATION
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

Effect of Derivative Instruments on Income

The following tables provide information about the gain or loss recognized in income on our derivative instruments and the line items in the statements of income in which such gains and losses are reflected (in millions).

| Derivatives Used as Economic Hedges | Location of Gain (Loss) Recognized in Income on Derivatives | Year Ended December 31, 2018 | 2017 | 2016 |
|---|---|---|---|---|
| Commodity contracts | Cost of materials and other | $(165) | $(278) | $(86) |
| Commodity contracts | Operating expenses (excluding depreciation and amortization expense) | 7 | — | — |
| Foreign currency contracts | Cost of materials and other | 56 | (40) | 16 |

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VALERO ENERGY CORPORATION
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

21. QUARTERLY FINANCIAL DATA (Unaudited)

The following tables summarize quarterly financial data for the years ended December 31, 2018 and 2017 (in millions, except per share amounts).

| | 2018 Quarter Ended | | | |
|---|---|---|---|---|
| | March 31 | June 30 | September 30 | December 31 |
| Revenues | $26,439 | $31,015 | $ 30,849 | $ 28,730 |
| Gross profit (a) | 1,062 | 1,535 | 1,451 | 1,546 |
| Operating income | 801 | 1,253 | 1,219 | 1,299 |
| Net income | 582 | 875 | 874 | 1,022 |
| Net income attributable to Valero Energy Corporation stockholders | 469 | 845 | 856 | 952 |
| Earnings per common share | 1.09 | 1.96 | 2.01 | 2.26 |
| Earnings per common share – assuming dilution | 1.09 | 1.96 | 2.01 | 2.24 |

| | 2017 Quarter Ended | | | |
|---|---|---|---|---|
| | March 31 | June 30 | September 30 | December 31 (b) |
| Revenues | $21,772 | $22,254 | $ 23,562 | $ 26,392 |
| Gross profit (a) | 732 | 1,049 | 1,614 | 1,110 |
| Operating income | 528 | 860 | 1,332 | 843 |
| Net income | 321 | 572 | 863 | 2,400 |
| Net income attributable to Valero Energy Corporation stockholders | 305 | 548 | 841 | 2,371 |
| Earnings per common share | 0.68 | 1.23 | 1.91 | 5.43 |
| Earnings per common share – assuming dilution | 0.68 | 1.23 | 1.91 | 5.42 |

(a) Gross profit is calculated as revenues less total cost of sales.

(b) During the quarter ended December 31, 2017, we recognized an income tax benefit of $1.9 billion related to Tax Reform as described in Note 15.

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ITEM 9. CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE
None.

ITEM 9A. CONTROLS AND PROCEDURES
Disclosure Controls and Procedures. Our management has evaluated, with the participation of our principal executive officer and principal financial officer, the effectiveness of our disclosure controls and procedures (as defined in Rule 13a-15(e) under the Securities Exchange Act of 1934) as of the end of the period covered by this report, and has concluded that our disclosure controls and procedures were effective as of December 31, 2018.
Internal Control over Financial Reporting.
(a) Management's Report on Internal Control over Financial Reporting.
The management report on Valero's internal control over financial reporting required by Item 9A appears in Item 8 on page 62 of this report, and is incorporated herein by reference.
(b) Attestation Report of the Independent Registered Public Accounting Firm.
KPMG LLP's report on Valero's internal control over financial reporting appears in Item 8 beginning on page 64 of this report, and is incorporated herein by reference.
(c) Changes in Internal Control over Financial Reporting.
There has been no change in our internal control over financial reporting that occurred during our last fiscal quarter that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting. On January 1, 2019, we adopted Topic 842, which we discuss in Note 1 of Notes to Consolidated Financial Statements. As a result, we have made changes affecting our internal control over financial reporting in conjunction with the adoption of this standard. We enhanced our contracting and lease evaluation systems and related processes, and we developed a new lease accounting system to capture our leases and support the required disclosures. We have integrated our lease accounting system with our general ledger and modified our related procurement and payment processes.

ITEM 9B. OTHER INFORMATION
None.

PART III

ITEMS 10-14.
The information required by Items 10 through 14 of Form 10-K is incorporated herein by reference to the definitive proxy statement for our 2019 annual meeting of stockholders. We will file the proxy statement with the SEC on or before March 31, 2019.

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PART IV

ITEM 15. EXHIBITS AND FINANCIAL STATEMENT SCHEDULES

(a) 1. Financial Statements. The following consolidated financial statements of Valero Energy Corporation and its subsidiaries are included in Part II, Item 8 of this Form 10-K:


| | Page |
|---|---|
| Management's report on internal control over financial reporting | 62 |
| Reports of independent registered public accounting firm | 63 |
| Consolidated balance sheets as of December 31, 2018 and 2017 | 66 |
| Consolidated statements of income for the years ended December 31, 2018, 2017, and 2016 | 67 |
| Consolidated statements of comprehensive income for the years ended December 31, 2018, 2017, and 2016 | 68 |
| Consolidated statements of equity for the years ended December 31, 2018, 2017, and 2016 | 69 |
| Consolidated statements of cash flows for the years ended December 31, 2018, 2017, and 2016 | 70 |
| Notes to consolidated financial statements | 71 |


2. Financial Statement Schedules and Other Financial Information. No financial statement schedules are submitted because either they are inapplicable or because the required information is included in the consolidated financial statements or notes thereto.

3. Exhibits. Filed as part of this Form 10-K are the following exhibits:

| | |
|---|---|
| ++2.01 | Agreement and Plan of Merger, dated as of October 18, 2018, by and among Valero Energy Corporation; Forest Merger Sub, LLC; Valero Energy Partners LP; and Valero Energy Partners GP LLC–incorporated by reference to Exhibit 2.1 to Valero's Current Report on Form 8-K dated and filed October 18, 2018 (SEC File No. 1-13175). |
| 3.01 | Amended and Restated Certificate of Incorporation of Valero Energy Corporation, formerly known as Valero Refining and Marketing Company–incorporated by reference to Exhibit 3.1 to Valero's Registration Statement on Form S-1 (SEC File No. 333-27013) filed May 13, 1997. |
| 3.02 | Certificate of Amendment (July 31, 1997) to Restated Certificate of Incorporation of Valero Energy Corporation–incorporated by reference to Exhibit 3.02 to Valero's Annual Report on Form 10-K for the year ended December 31, 2003 (SEC File No. 1-13175). |
| 3.03 | Certificate of Merger of Ultramar Diamond Shamrock Corporation with and into Valero Energy Corporation dated December 31, 2001–incorporated by reference to Exhibit 3.03 to Valero's Annual Report on Form 10-K for the year ended December 31, 2003 (SEC File No. 1-13175). |
| 3.04 | Amendment (effective December 31, 2001) to Restated Certificate of Incorporation of Valero Energy Corporation–incorporated by reference to Exhibit 3.1 to Valero's Current Report on Form 8-K dated December 31, 2001, and filed January 11, 2002 (SEC File No. 1-13175). |
| 3.05 | Second Certificate of Amendment (effective September 17, 2004) to Restated Certificate of Incorporation of Valero Energy Corporation–incorporated by reference to Exhibit 3.04 to Valero's Quarterly Report on Form 10-Q for the quarter ended September 30, 2004 (SEC File No. 1-13175). |
| 3.06 | Certificate of Merger of Premcor Inc. with and into Valero Energy Corporation effective September 1, 2005–incorporated by reference to Exhibit 2.01 to Valero's Quarterly Report on Form 10-Q for the quarter ended September 30, 2005 (SEC File No. 1-13175). |
| 3.07 | — |

Third Certificate of Amendment (effective December 2, 2005) to Restated Certificate of Incorporation of Valero Energy Corporation–incorporated by reference to Exhibit 3.07 to Valero's Annual Report on Form 10-K for the year ended December 31, 2005 (SEC File No. 1-13175).

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| 3.08 | Fourth Certificate of Amendment (effective May 24, 2011) to Restated Certificate of Incorporation of Valero Energy Corporation–incorporated by reference to Exhibit 4.8 to Valero's Current Report on Form 8-K dated and filed May 24, 2011 (SEC File No. 1-13175). |
| 3.09 | Fifth Certificate of Amendment (effective May 13, 2016) to Restated Certificate of Incorporation of Valero Energy Corporation–incorporated by reference to Exhibit 3.02 to Valero's Current Report on Form 8-K dated May 12, 2016, and filed May 18, 2016 (SEC File No. 1-13175). |
| 3.10 | Amended and Restated Bylaws of Valero Energy Corporation–incorporated by reference to Exhibit 3.01 to Valero's Current Report on Form 8-K dated September 20, 2017 and filed September 21, 2017 (SEC File No. 1-13175). |
| 4.01 | Indenture dated as of December 12, 1997 between Valero Energy Corporation and The Bank of New York–incorporated by reference to Exhibit 3.4 to Valero's Registration Statement on Form S-3 (SEC File No. 333-56599) filed June 11, 1998. |
| 4.02 | First Supplemental Indenture dated as of June 28, 2000 between Valero Energy Corporation and The Bank of New York (including Form of 7 3/4% Senior Deferrable Note due 2005)–incorporated by reference to Exhibit 4.6 to Valero's Current Report on Form 8-K dated June 28, 2000, and filed June 30, 2000 (SEC File No. 1-13175). |
| 4.03 | Indenture (Senior Indenture) dated as of June 18, 2004 between Valero Energy Corporation and Bank of New York–incorporated by reference to Exhibit 4.7 to Valero's Registration Statement on Form S-3 (SEC File No. 333-116668) filed June 21, 2004. |
| 4.04 | Form of Indenture related to subordinated debt securities–incorporated by reference to Exhibit 4.8 to Valero's Registration Statement on Form S-3 (SEC File No. 333-116668) filed June 21, 2004. |
| 4.05 | Indenture, dated as of November 30, 2016, between Valero Energy Partners LP, as issuer, and U.S. Bank National Association, as trustee–incorporated by reference to Exhibit 4.1 to Valero Energy Partners LP's Post-Effective Amendment No. 1 to Registration Statement on Form S-3 (Registration File No. 333-208052) filed November 30, 2016. |
| 4.06 | First Supplemental Indenture (with Parent Guarantee), dated as of January 10, 2019, among Valero Energy Partners LP, as issuer; Valero Energy Corporation, as parent guarantor; and U.S. Bank National Association, as trustee–incorporated by reference to Exhibit 4.2 to Valero's Current Report on Form 8-K dated and filed January 10, 2019 (SEC File No. 1-13175). |
| 4.07 | Specimen Certificate of Common Stock–incorporated by reference to Exhibit 4.1 to Valero's Registration Statement on Form S-3 (SEC File No. 333-116668) filed June 21, 2004. |
| +10.01 | Valero Energy Corporation Annual Bonus Plan, amended and restated as of February 28, 2018–incorporated by reference to Exhibit 10.01 to Valero's Annual Report on Form 10-K for the year ended December 31, 2017 (SEC File No. 1-13175). |
| +10.02 | Valero Energy Corporation 2005 Omnibus Stock Incentive Plan, amended and restated as of October 1, 2005–incorporated by reference to Exhibit 10.02 to Valero's Annual Report on Form 10-K for the year ended December 31, 2009 (SEC File No. 1-13175). |

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|---|---|
| +10.03 | Valero Energy Corporation 2011 Omnibus Stock Incentive Plan, amended and restated February 25, 2016–incorporated by reference to Exhibit 10.04 to Valero's Annual Report on Form 10-K for the year ended December 31, 2015 (SEC File No. 1-13175). |
| +10.04 | Valero Energy Corporation Deferred Compensation Plan, amended and restated as of January 1, 2008–incorporated by reference to Exhibit 10.04 to Valero's Annual Report on Form 10-K for the year ended December 31, 2008 (SEC File No. 1-13175). |
| +10.05 | Valero Energy Corporation Amended and Restated Supplemental Executive Retirement Plan, amended and restated as of November 10, 2008–incorporated by reference to Exhibit 10.08 to Valero's Annual Report on Form 10-K for the year ended December 31, 2008 (SEC File No. 1-13175). |
| +10.06 | Valero Energy Corporation Excess Pension Plan, as amended and restated effective December 31, 2011–incorporated by reference to Exhibit 10.10 to Valero's Annual Report on Form 10-K for the year ended December 31, 2011 (SEC File No. 1-13175). |

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| +10.07 | Form of Change of Control Severance Agreement (Tier I) between Valero Energy Corporation and executive officer–incorporated by reference to Exhibit 10.15 to Valero's Annual Report on Form 10-K for the year ended December 31, 2011 (SEC File No. 1-13175). |
| +10.08 | Form of Change of Control Severance Agreement (Tier II) between Valero Energy Corporation and executive officer–incorporated by reference to Exhibit 10.16 to Valero's Annual Report on Form 10-K for the year ended December 31, 2013 (SEC File No. 1-13175). |
| +10.09 | Form of Amendment (dated January 7, 2013) to Change of Control Severance Agreements (to eliminate excise tax gross-up benefit)–incorporated by reference to Exhibit 10.17 to Valero's Annual Report on Form 10-K for the year ended December 31, 2012 (SEC File No. 1-13175). |
| +10.10 | Form of Change of Control Severance Agreement (Tier II-A) between Valero Energy Corporation and executive officer–incorporated by reference to Exhibit 10.02 to Valero's Current Report on Form 8-K dated November 2, 2016, and filed November 7, 2016 (SEC File No. 1-13175). |
| *+10.11 | Schedule of Tier II-A Change of Control Agreements. |
| +10.12 | Form of Amendment (dated January 17, 2017) to Change of Control Severance Agreements, amending Section 9 thereof–incorporated by reference to Exhibit 10.01 to Valero's Current Report on Form 8-K dated and filed January 17, 2017 (SEC File No. 1-13175). |
| +10.13 | Form of Performance Share Award Agreement pursuant to the Valero Energy Corporation 2011 Omnibus Stock Incentive Plan–incorporated by reference to Exhibit 10.18 to Valero's Annual Report on Form 10-K for the year ended December 31, 2017 (SEC File No. 1-13175). |
| +10.14 | Form of Stock Option Agreement pursuant to the Valero Energy Corporation 2011 Omnibus Stock Incentive Plan–incorporated by reference to Exhibit 10.21 to Valero's Annual Report on Form 10-K for the year ended December 31, 2011 (SEC File No. 1-13175). |
| +10.15 | Form of Performance Stock Option Agreement pursuant to the Valero Energy Corporation 2011 Omnibus Stock Incentive Plan–incorporated by reference to Exhibit 10.21 to Valero's Annual Report on Form 10-K for the year ended December 31, 2012 (SEC File No. 1-13175). |
| +10.16 | Form of Restricted Stock Agreement pursuant to the Valero Energy Corporation 2011 Omnibus Stock Incentive Plan–incorporated by reference to Exhibit 10.25 to Valero's Annual Report on Form 10-K for the year ended December 31, 2012 (SEC File No. 1-13175). |
| 10.17 | $3,000,000,000 5-Year Third Amended and Restated Revolving Credit Agreement, dated as of November 12, 2015, among Valero Energy Corporation, as Borrower; JPMorgan Chase Bank, N.A., as Administrative Agent; and the lenders named therein–incorporated by reference to Exhibit 10.1 to Valero's Current Report on Form 8-K dated November 12, 2015, and filed November 13, 2015 (SEC File No. 1-13175). |
| 14.01 | Code of Ethics for Senior Financial Officers–incorporated by reference to Exhibit 14.01 to Valero's Annual Report on Form 10-K for the year ended December 31, 2003 (SEC File No. 1-13175). |
| *21.01 | Valero Energy Corporation subsidiaries. |

| | |
|---|---|
| *23.01 | Consent of KPMG LLP dated February 28, 2019. |
| *24.01 | Power of Attorney dated February 28, 2019 (on the signature page of this Form 10-K). |
| *31.01 | Rule 13a-14(a) Certification (under Section 302 of the Sarbanes-Oxley Act of 2002) of principal executive officer. |
| *31.02 | Rule 13a-14(a) Certification (under Section 302 of the Sarbanes-Oxley Act of 2002) of principal financial officer. |
| **32.01 | Section 1350 Certifications (under Section 906 of the Sarbanes-Oxley Act of 2002). |
| 99.01 | Audit Committee Pre-Approval Policy–incorporated by reference to Exhibit 99.01 to Valero's Annual Report on Form 10-K for the year ended December 31, 2017 (SEC File No. 1-13175). |
| ***101 | Interactive Data Files |

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* Filed herewith.
** Furnished herewith.
*** Submitted electronically herewith.
+ Identifies management contracts or compensatory plans or arrangements required to be filed as an exhibit hereto.
++ Certain schedules have been omitted pursuant to Item 601(b)(2) of Regulation S-K. The registrant agrees to furnish supplementally a copy of any such omitted schedule to the SEC upon request.

Pursuant to paragraph 601(b)(4)(iii)(A) of Regulation S-K, the registrant has omitted from the foregoing listing of exhibits, and hereby agrees to furnish to the SEC upon its request, copies of certain instruments, each relating to debt not exceeding 10 percent of the total assets of the registrant and its subsidiaries on a consolidated basis.

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SIGNATURE

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

VALERO ENERGY
CORPORATION
(Registrant)

By: /s/ Joseph W. Gorder
(Joseph W. Gorder)
Chairman of the Board, President,
and Chief Executive Officer

Date: February 28, 2019

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POWER OF ATTORNEY

KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below hereby constitutes and appoints Joseph W. Gorder, Donna M. Titzman, and Jason W. Fraser, or any of them, each with power to act without the other, his true and lawful attorney-in-fact and agent, with full power of substitution and resubstitution, for him and in his name, place and stead, in any and all capacities, to sign any or all subsequent amendments and supplements to this Annual Report on Form 10-K, and to file the same, or cause to be filed the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto each said attorney-in-fact and agent full power to do and perform each and every act and thing requisite and necessary to be done in and about the premises, as fully to all intents and purposes as he might or could do in person, hereby qualifying and confirming all that said attorney-in-fact and agent or his substitute or substitutes may lawfully do or cause to be done by virtue hereof.

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

| Signature | Title | Date |
|---|---|---|
| /s/ Joseph W. Gorder<br>(Joseph W. Gorder) | Chairman of the Board, President,<br>and Chief Executive Officer<br>(Principal Executive Officer) | February 28, 2019 |
| /s/ Donna M. Titzman<br>(Donna M. Titzman) | Executive Vice President<br>and Chief Financial Officer<br>(Principal Financial and Accounting Officer) | February 28, 2019 |
| /s/ H. Paulett Eberhart<br>(H. Paulett Eberhart) | Director | February 28, 2019 |
| /s/ Kimberly S. Greene<br>(Kimberly S. Greene) | Director | February 28, 2019 |
| /s/ Deborah P. Majoras<br>(Deborah P. Majoras) | Director | February 28, 2019 |
| /s/ Donald L. Nickles<br>(Donald L. Nickles) | Director | February 28, 2019 |
| /s/ Philip J. Pfeiffer<br>(Philip J. Pfeiffer) | Director | February 28, 2019 |
| /s/ Robert A. Profusek<br>(Robert A. Profusek) | Director | February 28, 2019 |
| /s/ Stephen M. Waters<br>(Stephen M. Waters) | Director | February 28, 2019 |
| /s/ Randall J. Weisenburger<br>(Randall J. Weisenburger) | Director | February 28, 2019 |
| /s/ Rayford Wilkins, Jr.<br>(Rayford Wilkins, Jr.) | Director | February 28, 2019 |

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