

VALERO ENERGY CORP/TX
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UNITED STATES
SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

FORM 11-K

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

For the fiscal year ended December 31, 2012

Commission File Number 1-13175

VALERO ENERGY CORPORATION THRIFT PLAN

VALERO ENERGY CORPORATION
One Valero Way
San Antonio, Texas 78249

VALERO ENERGY CORPORATION THRIFT PLAN

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All other supplemental schedules required by the Department of Labor's Rules and Regulations for Reporting and Disclosure under the Employee Retirement Income Security Act of 1974 are omitted because they are not applicable or not required.

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

Valero Energy Corporation Benefit Plans Administrative Committee:

We have audited the accompanying statements of net assets available for benefits of the Valero Energy Corporation Thrift Plan (the Plan) as of December 31, 2012 and 2011, and the related statements of changes in net assets available for benefits for the years then ended. These financial statements are the responsibility of the Plan's management. Our responsibility is to express an opinion on these financial statements based on our audits.

We conducted our audits in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the financial statements referred to above present fairly, in all material respects, the net assets available for benefits of the Plan as of December 31, 2012 and 2011, and the changes in net assets available for benefits for the years then ended in conformity with U.S. generally accepted accounting principles.

Our audits were performed for the purpose of forming an opinion on the basic financial statements taken as a whole. The supplemental Schedule H, Line 4i-Schedule of Assets (Held at End of Year) as of December 31, 2012 is presented for the purpose of additional analysis and is not a required part of the basic financial statements but is supplementary information required by the Department of Labor's Rules and Regulations for Reporting and Disclosure under the Employee Retirement Income Security Act of 1974. This supplemental schedule is the responsibility of the Plan's management. The supplemental schedule has been subjected to the auditing procedures applied in the audits of the basic financial statements and, in our opinion, is fairly stated in all material respects in relation to the basic financial statements taken as a whole.

/s/ KPMG LLP

San Antonio, Texas
June 18, 2013

VALERO ENERGY CORPORATION THRIFT PLAN
STATEMENTS OF NET ASSETS AVAILABLE FOR BENEFITS

	December 31, 2012	2011
Assets		
Investments:		
Valero Energy Corporation common stock	\$311,959,328	\$210,411,936
Common/collective trusts	397,102,421	356,106,483
Mutual funds	431,996,117	369,156,932
Money market security	20,456,634	13,919,315
Self-directed investments	238,331,584	206,219,886
Total investments at fair value	1,399,846,084	1,155,814,552
Receivables:		
Participant loans	40,712,543	40,266,390
Due from brokers for securities sold	321,351	158,544
Total receivables	41,033,894	40,424,934
Cash	363,049	969,122
Total assets reflecting all investments at fair value	1,441,243,027	1,197,208,608
Adjustment from fair value to contract value for fully benefit-responsive investment contracts	(2,772,542) (3,338,993
Net assets available for benefits	\$1,438,470,485	\$1,193,869,615

See Notes to Financial Statements.

VALERO ENERGY CORPORATION THRIFT PLAN
STATEMENTS OF CHANGES IN NET ASSETS AVAILABLE FOR BENEFITS

	Years Ended December 31,	
	2012	2011
Investment income (loss):		
Interest income	\$2,019,424	\$1,956,755
Dividend income	28,605,224	19,788,578
Net appreciation (depreciation) in fair value of investments	213,450,972	(56,543,729)
Total investment income (loss)	244,075,620	(34,798,396)
Contributions:		
Participant	68,847,860	64,531,637
Employer	37,253,947	34,486,318
Total contributions	106,101,807	99,017,955
Total additions	350,177,427	64,219,559
Deductions:		
Withdrawals by participants	(105,625,601)	(138,693,891)
Total deductions	(105,625,601)	(138,693,891)
Asset transfers in from Valero Energy Corporation Savings Plan	49,497	50,616
Asset transfers out to Valero Energy Corporation Savings Plan	(453)	—
Net increase (decrease) in net assets available for benefits	244,600,870	(74,423,716)
Net assets available for benefits:		
Beginning of year	1,193,869,615	1,268,293,331
End of year	\$1,438,470,485	\$1,193,869,615

See Notes to Financial Statements.

VALERO ENERGY CORPORATION THRIFT PLAN
NOTES TO FINANCIAL STATEMENTS

1. DESCRIPTION OF THE PLAN

General

The Valero Energy Corporation Thrift Plan (Thrift Plan) is a qualified profit-sharing plan covering certain of Valero Energy Corporation's employees in the United States (U.S.). (See "Eligibility and Participation" below for a description of employees eligible for participation in the Thrift Plan.) The Thrift Plan is subject to the provisions of the Employee Retirement Income Security Act of 1974, as amended (ERISA). As used in this report, the term "Valero" may refer, depending upon the context, to Valero Energy Corporation, one or more of its consolidated subsidiaries, or all of them taken as a whole.

A portion of the Thrift Plan is designated as an employee stock ownership plan (ESOP), as defined in Section 4975(e)(7) of the Internal Revenue Code of 1986, as amended (the Code), and Department of Labor Regulation §2550.407d-6. The Thrift Plan is comprised of an ESOP portion and a non-ESOP portion. The ESOP portion consists only of investments in Valero common stock. A dividend payout feature allows participants to elect to receive dividends from Valero common stock in cash as taxable distributions or to continue to have such dividends reinvested in the Thrift Plan. The designation as an ESOP has no other effect on benefits under the Thrift Plan.

The description of the Thrift Plan included in these notes to financial statements provides only general information. Participants should refer to the plan document for a complete description of the Thrift Plan's provisions.

Plan Administration

Valero is the plan sponsor. Valero is a publicly held independent petroleum refining and marketing company with approximately 22,000 employees. Valero owned 16 refineries with a combined total throughput capacity of approximately 3.0 million barrels per day. Valero markets branded and unbranded refined products on a wholesale basis in the U.S., Canada, the United Kingdom (U.K.), and Ireland through an extensive bulk and rack marketing network, and sells refined products through a network of approximately 5,500 branded wholesale sites that Valero neither owns nor operates in the U.S., Canada, the U.K., Aruba, and Ireland. Through April 30, 2013, Valero also sold refined products through a network of company-owned and leased retail sites in the U.S. and Canada. As further described under "Separation of the Retail Business," Valero completed the separation of its retail business on May 1, 2013. Refined products are marketed under various brand names including Valero®, Diamond Shamrock®, Shamrock®, Ultramar®, Beacon®, and Texaco®. Valero also produces ethanol and operates ten ethanol plants in the U.S. with a combined nameplate production capacity of approximately 1.1 billion gallons per year.

Valero's common stock trades on the New York Stock Exchange under the symbol "VLO."

The Valero Energy Corporation Benefit Plans Administrative Committee (Administrative Committee), consisting of persons selected by Valero, administers the Thrift Plan. The members of the Administrative Committee serve without compensation for services in that capacity. Bank of America, N.A. (BANA) is the trustee under the Thrift Plan and has custody of the securities and investments of the Thrift Plan through a trust. Merrill Lynch, Pierce, Fenner & Smith Incorporated, an affiliate of BANA, is the record keeper for the Thrift Plan.

VALERO ENERGY CORPORATION THRIFT PLAN
NOTES TO FINANCIAL STATEMENTS (Continued)

Eligibility and Participation

Valero's U.S. employees are immediately eligible to participate in the Thrift Plan, except for ethanol plant employees, retail store employees, and certain other retail employees. These employees are eligible to participate in the Valero Energy Corporation Savings Plan (the Savings Plan), another plan sponsored by Valero. In addition, employees at the Port Arthur and Memphis Refineries represented by the United Steel, Paper and Forestry, Rubber, Manufacturing, Energy, Allied Industrial and Service Workers International Union and its Local 13-423, and the United Steel, Paper and Forestry, Rubber, Manufacturing, Energy, Allied Industrial and Service Workers International Union and its Local 9-00631, respectively, are eligible to participate in the Premcor Retirement Savings Plan, another plan sponsored by Valero. Participation in the Thrift Plan is voluntary.

In June 2011, Valero acquired two product terminal facilities in Louisville and Lexington, Kentucky from a subsidiary of Chevron Corporation (Chevron). Effective June 25, 2011, former Chevron employees at the Louisville and Lexington terminals who became employees of Valero in connection with the acquisition became eligible to participate in the Thrift Plan. On October 1, 2011, Valero acquired the Meraux Refinery, located in Meraux, Louisiana, from Murphy Oil Corporation (Murphy). Former Murphy employees who became employees of Valero in connection with the acquisition became eligible to participate in the Thrift Plan on the acquisition date.

Asset Transfers

From time to time, asset transfers occur between the Savings Plan and the Thrift Plan due to the transfer or reemployment of employees to or from retail store or ethanol plant positions.

Separation of the Retail Business

On May 1, 2013, Valero completed the separation of its retail business, creating an independent public company named CST Brands, Inc. (CST). In accordance with the separation and distribution agreement, the separation occurred by way of a pro rata distribution of 80 percent of the outstanding shares of CST common stock to Valero's stockholders on May 1, 2013. Each Valero stockholder received one share of CST stock for every nine shares of Valero stock held at the close of business on the record date of April 19, 2013. The CST stock held by the Thrift Plan as a result of this distribution is frozen to new contributions.

Participants in the Thrift Plan who became employees of CST on May 1, 2013 were 100 percent vested in their employer contributions in the Thrift Plan and their participant account balances were transferred to the CST Brands, Inc. Savings Plan (Safe Harbor Plan) on May 1, 2013. The total value of the investments transferred was \$67,123,960.

Contributions

Participants can make contributions of not less than 1 percent or more than 30 percent of their annual total salary immediately upon commencement of participation. Participants may change their contributions at any time. Annual total salary represents a participant's annual base salary together with overtime pay, commissions, and all other forms of cash compensation other than annual performance bonus payments, bonus payments to employees represented by a collective bargaining agreement, and unused vacation pay.

VALERO ENERGY CORPORATION THRIFT PLAN
NOTES TO FINANCIAL STATEMENTS (Continued)

Participants elect to make pre-tax, after-tax and/or designated Roth 401(k) contributions to the Thrift Plan. Any employee may make rollover contributions and eligible Roth 401(k) rollover contributions to the Thrift Plan. For the years ended December 31, 2012 and 2011, rollover contributions totaled \$2,982,878 and \$3,681,603, respectively, and are included in participant contributions.

The Code establishes an annual limitation on the amount of individual pre-tax and/or Roth 401(k) salary deferral contributions. This limit was \$17,000 and \$16,500 for the years ended December 31, 2012 and 2011, respectively. Participants who attained age 50 before the end of the year are eligible to make catch-up contributions of up to \$5,500 for each of the years ended December 31, 2012 and 2011. All or any portion of an eligible participant's catch-up contribution can be designated as a Roth 401(k) catch-up contribution.

Valero makes an employer contribution equal to \$1.00 for every \$1.00 of a participant's contributions up to 6 percent of annual total salary. Effective January 1, 2013, the Thrift Plan's maximum contribution limit increased from 30 percent to 50 percent. Effective July 1, 2013, Valero will increase the employer contribution to equal \$1.00 for every \$1.00 of a participant's contributions up to 7 percent of annual total salary. All employer contributions are made in cash and are invested according to the investment options elected for the participant contributions.

Participant Accounts

Individual accounts are maintained for each participant. Each participant's account is adjusted to reflect participant contributions, employer contributions, withdrawals, income, expenses, gains, and losses attributable to the participant's account.

Vesting

Participants are vested 100 percent in their participant account at all times. Participants vest in their employer account at the rate of 20 percent per year and are 100 percent vested after five years of continuous service.

Continuous service begins the first day for which an employee is paid and terminates on the date of the employee's retirement, death, or other termination from service. If an employee's employment is terminated and the employee is subsequently reemployed within 12 months, the period between the severance from service and the date of reemployment is generally included in continuous service for vesting purposes. If the employee is not reemployed within one year after a severance from service date, the employee is deemed to have incurred a break in service.

Forfeitures

The Thrift Plan provides that if a participant incurs a break in service prior to becoming vested in any part of his employer account, the participant's prior continuous service will not be disregarded for purposes of the Thrift Plan until the break in service equals or exceeds five successive years. Upon a participant's termination of employment for other than death, total and permanent disability, or retirement, the nonvested portion of the participant's employer account is forfeited upon distribution. In the event the participant is reemployed prior to incurring a break in service of five successive years, any amounts forfeited under this provision may be reinstated.

Valero's employer contributions are reduced by any forfeited nonvested accounts of terminated participants and increased by the value of prior forfeited nonvested accounts for participants who are rehired within five

VALERO ENERGY CORPORATION THRIFT PLAN
NOTES TO FINANCIAL STATEMENTS (Continued)

years from date of termination. Employer contributions for the years ended December 31, 2012 and 2011 were reduced by \$250,000 and \$150,000, respectively, from forfeited nonvested accounts. As of December 31, 2012 and 2011, forfeited nonvested accounts available to reduce future employer contributions were \$22,316 and \$50,523, respectively.

Investment Options

Participants direct the investment of 100 percent of their participant contributions and may transfer existing account balances into any of the investment options offered. These investment options include Valero common stock, common/collective trusts, mutual funds, a money market security, and other self-directed investments.

Participants may not designate more than 20 percent of their contributions to be invested in Valero common stock. Transfers into Valero common stock will not be permitted to the extent a transfer would result in more than 50 percent of the aggregate value of the participant's account being invested in Valero common stock.

In November 2011, BANA announced that the Merrill Lynch Equity Index Trust would be discontinued. As a result, the Administrative Committee selected the SSgA S&P 500 Index Fund, a collective trust managed by State Street Global Advisors, to replace the Merrill Lynch Equity Index Trust as an investment option in the Thrift Plan, effective March 22, 2012.

Effective January 1, 2012, if a participant wishes to transfer assets from the Federated Capital Preservation Fund to the money market security or to any self-directed investment options, then the proceeds from the sale of the Federated Capital Preservation Fund will be transferred into another of the Thrift Plan's core investment options for 90 days before purchasing shares of the money market security or directing the proceeds into self-directed investment options.

Withdrawals and Distributions

Participants may make the following types of withdrawals of all or part of their respective accounts:

- one withdrawal during any six-month period from a participant's after-tax account and rollover contribution account with no suspension of future contributions;
- upon completion of five years of participation in the Thrift Plan, one withdrawal from a participant's after-tax account and employer account, with a similar withdrawal allowed 36 months after the date of a previous withdrawal under this provision, with no suspension of future contributions;
- upon reaching age 59½, one withdrawal during any six-month period from a participant's account and employer account; or
- upon furnishing proof of financial necessity, one withdrawal during any six-month period from a participant's account and the vested portion of the employer account, but, for withdrawals of pre-tax amounts, not to exceed the aggregate amount of the participant's pre-tax contributions. Individuals who receive a withdrawal for financial necessity will be suspended from making contributions to the Thrift Plan for a period of at least six months.

Upon a participant's death, total and permanent disability, or retirement, the participant or the beneficiary of a deceased participant is entitled to a distribution of the entire value of the participant's account and employer account regardless of whether or not the accounts are fully vested. Upon a participant's termination for any other reason, the participant is entitled to a distribution of only the value of the participant's account

VALERO ENERGY CORPORATION THRIFT PLAN
NOTES TO FINANCIAL STATEMENTS (Continued)

and the vested portion of the participant's employer account. Distributions resulting from any of these occurrences may be received in a single sum in whole shares of Valero common stock and cash, or entirely in cash. Alternatively, a participant or beneficiary may elect to receive this distribution in the form of equal monthly installments over a period not exceeding the lesser of (i) five years or (ii) the participant's life expectancy or the joint life expectancy of the participant and the participant's designated beneficiary. In addition, when the value of a distribution to a participant exceeds \$1,000, the distribution may be made prior to the participant attaining age 65 only with the participant's consent.

Terminated participants may elect to have the Thrift Plan trustee hold their accounts for distribution to them at a date not later than April 1 of the calendar year after which they attain age 70½. In this event, terminated participants continue to share in the income, expenses, gains, and losses of the Thrift Plan until their accounts are distributed.

The Thrift Plan allows participants who are called to active duty military service and who are on military leave for a period of 179 days or more to make withdrawals of all or any portion of their account.

Participant Loans

Participants may borrow a minimum of \$500. The maximum loan amount a participant may have outstanding is restricted to the lesser of:

- \$50,000, reduced by the excess of (i) the highest outstanding balance of the participant's loans during a one-year (a) period over (ii) the participant's then currently outstanding loan balance of all participant loans on the day any new loan is made, or
- (b) one-half of the current value of the participant's vested interest in his Thrift Plan accounts.

The term of any loan may not exceed five years unless the loan is for the purchase of a participant's principal residence, in which case the term of the loan shall not exceed 15 years. The balance of the participant's account and vested portion of his employer account serve as security for the loan. Loans bear interest at a reasonable rate as established by the Administrative Committee, presently at prime plus 1%. As of December 31, 2012, interest rates on outstanding participant loans ranged from 4.25% to 10.5% and maturity dates ranged from January 2013 to January 2028. Loan repayments of principal and interest are made through payroll deductions or as otherwise determined. Participants may have two loans outstanding under the Thrift Plan at any time.

Plan Expenses

Plan administrative expenses are paid by Valero, which totaled \$29,153 and \$120,052 for the years ended December 31, 2012 and 2011, respectively. Valero also provides certain other services at no cost to the Thrift Plan. Investment expenses relating to individual participant accounts, such as investment management expenses, have been deducted from interest income or dividend income. Individual participant transaction fees, such as overnight delivery fees and redemption fees, are deducted from the respective participant's account and are included in withdrawals by participants.

2. BASIS OF PRESENTATION AND SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Basis of Presentation

The financial statements of the Thrift Plan are prepared on the accrual basis of accounting in accordance with U.S. generally accepted accounting principles (GAAP).

VALERO ENERGY CORPORATION THRIFT PLAN
NOTES TO FINANCIAL STATEMENTS (Continued)

Investment contracts held by a defined contribution plan are required to be reported at fair value. However, contract value is the relevant measurement attribute for that portion of the net assets available for benefits of a defined contribution plan attributable to fully benefit-responsive investment contracts because contract value is the amount participants would receive if they were to initiate permitted transactions under the terms of the Thrift Plan. The statement of net assets available for benefits presents the fair value of the investment contracts as well as the adjustment of the fully benefit-responsive investment contracts from fair value to contract value. The statement of changes in net assets available for benefits is prepared on a contract value basis.

Management has evaluated events that occurred after December 31, 2012 through the date these financial statements were available to be issued on June 18, 2013. Any material subsequent events that occurred during this time have been properly recognized or disclosed in these financial statements.

Significant Accounting Policies

Use of Estimates

The preparation of financial statements in conformity with U.S. GAAP requires management to make estimates that affect the amounts of assets and changes therein reported in the financial statements and disclosure of contingent assets and liabilities. Actual results could differ from those estimates.

Valuation of Investments

The Thrift Plan's investments are stated at fair value as described in Note 4.

Income Recognition

Purchases and sales of investments are recorded on a trade-date basis. Interest income is recorded on the accrual basis. Dividends are recorded on the ex-dividend date.

Net appreciation (depreciation) in fair value of investments consists of net realized gains and losses on the sale of investments and net unrealized appreciation (depreciation) of investments.

Participant Loans

Participant loans are measured at their unpaid principal balance plus any accrued but unpaid interest. Interest income is recorded on the accrual basis. Related fees are expensed when they are incurred and are reflected in withdrawals by participants. No allowance for credit losses has been recorded as of December 31, 2012 or 2011. A participant loan that has been defaulted upon and not cured within a reasonable period of time may be deemed a distribution from the Thrift Plan. The participant loan balance is reduced and withdrawals to participants are increased after the participant makes final withdrawal from the Thrift Plan.

Withdrawals by Participants

Withdrawals by participants are recorded when paid.

Risks and Uncertainties

The Thrift Plan's investments, in general, are exposed to various risks, such as interest rate, credit, and overall market volatility risk. Due to the level of risk associated with certain investments, it is reasonably possible that changes in the values of investments will occur in the near term and that such changes could materially

VALERO ENERGY CORPORATION THRIFT PLAN
NOTES TO FINANCIAL STATEMENTS (Continued)

affect participants' account balances and the amounts reported in the statement of net assets available for benefits.

3. INVESTMENTS

Investments that represent 5 percent or more of the Thrift Plan's net assets available for benefits are as follows:

	December 31, 2012	2011
Valero Energy Corporation common stock	\$311,959,328	\$210,411,936
Federated Capital Preservation Fund (contract value of \$157,351,761 and \$153,618,476)	160,124,303	156,957,469
American Funds EuroPacific Growth Fund	99,534,894	85,739,853
American Funds Growth Fund of America	83,086,821	68,341,999
Pioneer Bond Fund *	76,728,856	57,767,775

* As of December 31, 2011, this investment was less than 5 percent of the Plan's net assets available for benefits but is shown in this table for comparative purposes only.

The Thrift Plan's investment in shares of Valero common stock represents 22.3 percent and 18.2 percent of total investments at fair value as of December 31, 2012 and 2011, respectively. The closing price for Valero common stock was \$34.12 and \$21.05 on December 31, 2012 and 2011, respectively. As of June 14, 2013, the closing price for Valero common stock was \$38.01.

During the years ended December 31, 2012 and 2011, the Thrift Plan's investments (including gains and losses on investments bought and sold, as well as held during the year) appreciated (depreciated) in value as follows:

	Years Ended December 31,	
	2012	2011
Valero Energy Corporation common stock	\$125,807,516	\$(17,259,821)
Mutual funds	44,157,876	(26,869,560)
Common/collective trusts	26,979,329	545,116
Self-directed investments:		
Common stock	12,464,551	(10,915,666)
Mutual funds	3,494,437	(1,952,975)
Corporate bonds	524,938	(5,494)
Preferred stock	19,683	(45,754)
Government bonds	2,642	(39,575)
Net appreciation (depreciation) in fair value of investments	\$213,450,972	\$(56,543,729)

VALERO ENERGY CORPORATION THRIFT PLAN
NOTES TO FINANCIAL STATEMENTS (Continued)

For the years ended December 31, 2012 and 2011, dividend income included \$6,277,542 and \$3,019,813, respectively, of dividends paid on Valero common stock.

Certain events could limit the ability of the Thrift Plan to transact at contract value with the issuers of the contracts held by the Federated Capital Preservation Fund. These events include, but are not limited to, layoffs, bankruptcy, plant closings, plan termination, mergers, and early retirement incentives. These events may cause liquidation of all or a portion of a contract at a market value adjustment. As of December 31, 2012, the occurrence of any of these events, which could limit the Thrift Plan's ability to transact at contract value with participants, is not considered probable.

4. FAIR VALUE MEASUREMENTS

A fair value hierarchy (Level 1, Level 2, or Level 3) is used to categorize fair value amounts based on the quality of inputs used to measure fair value. Accordingly, fair values determined by Level 1 inputs utilize unadjusted quoted prices in active markets for identical assets or liabilities. Fair values determined by Level 2 inputs are based on quoted prices for similar assets or liabilities in active markets, and inputs other than quoted prices that are observable for the asset or liability. Level 3 inputs are unobservable inputs for the asset or liability for which there is little, if any, market activity at the measurement date. The Thrift Plan uses appropriate valuation techniques based on the available inputs to measure the fair values of its applicable assets and liabilities. When available, the Thrift Plan measures fair value using Level 1 inputs because they generally provide the most reliable evidence of fair value.

The valuation methods used to measure the Thrift Plan's financial instruments at fair value are as follows:

Valero Energy Corporation common stock, mutual funds, and self-directed investments are measured at fair value using a market approach based on quotations from national securities exchanges and are categorized in Level 1 of the fair value hierarchy.

The money market security represents interest-bearing cash and is therefore categorized in Level 1 of the fair value hierarchy.

Common/collective trusts are stated at fair value as determined by the issuers of the funds based on the fair values of the underlying assets and are categorized in Level 2 of the fair value hierarchy. The fair value of the Thrift Plan's investments in the LifePath Index Funds, the KeyBank Employee Benefit Small Cap Value Trust, SSgA S&P 500 Index Fund, and the Merrill Lynch Equity Index Trust are based on the fair values of the underlying assets. The fair value of the Federated Capital Preservation Fund, which primarily holds investments in fully benefit-responsive contracts, is calculated by the issuer using a discounted cash flow model, which considers (i) recent fee bids as determined by recognized dealers, (ii) discount rate, and (iii) the duration of the underlying portfolio securities. The fair value of the Thrift Plan's investment in the Federated Capital Preservation Fund is based on its proportionate ownership of the underlying investments. There are no imposed restrictions as to the redemption of these investments.

VALERO ENERGY CORPORATION THRIFT PLAN
NOTES TO FINANCIAL STATEMENTS (Continued)

The tables below present information about the Thrift Plan's assets measured at fair value on a recurring basis and indicate the fair value hierarchy of the inputs utilized to determine the fair values as of December 31, 2012 and 2011.

	Fair Value Measurements Using			Total as of December 31, 2012
	Quoted Prices in Active Markets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)	
Valero Energy Corporation common stock	\$311,959,328	\$—	\$—	\$311,959,328
Common/collective trusts:				
LifePath Index Funds	—	169,149,414	—	169,149,414
KeyBank Employee Benefit Small Cap Value Trust	—	9,697,163	—	9,697,163
SSgA S&P 500 Index Fund	—	58,131,541	—	58,131,541
Federated Capital Preservation Fund	—	160,124,303	—	160,124,303
Mutual funds:				
Foreign funds	99,534,894	—	—	99,534,894
Large-cap funds	195,401,253	—	—	195,401,253
Mid-cap funds	36,392,830	—	—	36,392,830
Small-cap funds	23,938,284	—	—	23,938,284
Bond funds	76,728,856	—	—	76,728,856
Money market security:				
Retirement Bank Account	20,456,634	—	—	20,456,634
Self-directed investments:				
Common stock:				
Domestic	103,482,672	—	—	103,482,672
Foreign American depository receipts (ADRs)	6,843,788	—	—	6,843,788
Other common stock	36,911,539	—	—	36,911,539
Mutual funds:				
Equity	20,787,612	—	—	20,787,612
Debt	11,816,698	—	—	11,816,698
Other	179,172	—	—	179,172
Money market securities	54,329,271	—	—	54,329,271
Other self-directed investments	3,980,832	—	—	3,980,832
Investments at fair value	\$1,002,743,663	\$397,102,421	\$—	\$1,399,846,084

VALERO ENERGY CORPORATION THRIFT PLAN
NOTES TO FINANCIAL STATEMENTS (Continued)

	Fair Value Measurements Using			Total as of December 31, 2011
	Quoted Prices in Active Markets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)	
Valero Energy Corporation common stock	\$210,411,936	\$—	\$—	\$210,411,936
Common/collective trusts:				
LifePath Index Funds	—	143,771,820	—	143,771,820
KeyBank Employee Benefit Small Cap Value Trust	—	8,469,988	—	8,469,988
Merrill Lynch Equity Index Trust	—	46,907,206	—	46,907,206
Federated Capital Preservation Fund	—	156,957,469	—	156,957,469
Mutual funds:				
Foreign funds	85,739,853	—	—	85,739,853
Large-cap funds	174,579,538	—	—	174,579,538
Mid-cap funds	30,834,485	—	—	30,834,485
Small-cap funds	20,235,281	—	—	20,235,281
Bond funds	57,767,775	—	—	57,767,775
Money market security:				
Retirement Bank Account	13,919,315	—	—	13,919,315
Self-directed investments:				
Common stock:				
Domestic	84,987,725	—	—	84,987,725
Foreign ADRs	6,047,036	—	—	6,047,036
Other common stock	32,002,491	—	—	32,002,491
Mutual funds:				
Equity	18,053,015	—	—	18,053,015
Debt	10,559,248	—	—	10,559,248
Other	506,433	—	—	506,433
Money market securities	48,430,782	—	—	48,430,782
Other self-directed investments	5,633,156	—	—	5,633,156
Investments at fair value	\$799,708,069	\$356,106,483	\$—	\$1,155,814,552

During the years ended December 31, 2012 and 2011, there were no transfers between assets classified as Level 1 and Level 2.

VALERO ENERGY CORPORATION THRIFT PLAN
NOTES TO FINANCIAL STATEMENTS (Continued)

5. PARTY-IN-INTEREST TRANSACTIONS

Certain Thrift Plan investments are shares of common/collective trusts managed by an affiliate of BANA, the trustee of the Thrift Plan and a party-in-interest with respect to the Thrift Plan. In addition, the Thrift Plan allows for loans to participants and investment in Valero's common stock. Valero, the sponsor of the Thrift Plan and a party-in-interest with respect to the Thrift Plan, provides accounting and administrative services at no cost to the Thrift Plan. These transactions are covered by an exemption from the "prohibited transactions" provisions of ERISA and the Code.

6. PLAN TERMINATION

Although it has not expressed any intent to do so, Valero has the right under the Thrift Plan to terminate the Thrift Plan at any time subject to the provisions of ERISA. In the event of any termination of the Thrift Plan or complete discontinuance of employer contributions, participants would become 100 percent vested in their employer accounts. If the Thrift Plan were terminated, the Administrative Committee would direct the trustee to distribute the remaining assets, after payment of all Thrift Plan expenses, to participants and beneficiaries in proportion to their respective balances.

7. TAX STATUS

The Internal Revenue Service (IRS) has determined and informed the plan sponsor by a letter dated March 24, 2009, that the Thrift Plan is designed in accordance with applicable sections of the Code. Although the Thrift Plan has been amended since receiving the determination letter, the plan sponsor believes that the Thrift Plan is designed and is currently being operated in compliance with the applicable requirements of the Code, and therefore believes that the Thrift Plan is qualified and the related trust is tax-exempt. The plan sponsor submitted an application to the IRS in January 2013 requesting an updated determination letter. The application is currently under review by the IRS; however, the plan sponsor expects to receive a favorable determination related to the Thrift Plan. The plan sponsor believes the Thrift Plan is not subject to tax examinations for plan years prior to 2009.

VALERO ENERGY CORPORATION THRIFT PLAN
NOTES TO FINANCIAL STATEMENTS (Continued)

8. RECONCILIATION OF FINANCIAL STATEMENTS TO FORM 5500

Fully benefit-responsive investment contracts are recorded on the Form 5500 at fair value but are adjusted to contract value for financial statement presentation. Amounts allocated to withdrawing participants are recorded on the Form 5500 for benefit requests that have been processed and approved for payment prior to December 31, but not paid as of that date. Deemed distributions of participant loans are recorded on the Form 5500 upon default by participants; such amounts continue to be reported as participant loans in the financial statements until the participants' termination and actual distribution from the Thrift Plan.

The following is a reconciliation of net assets available for benefits per the financial statements to the Form 5500 Annual Return/Report of Employee Benefit Plan:

	December 31,	
	2012	2011
Net assets available for benefits per the financial statements	\$1,438,470,485	\$1,193,869,615
Adjustment from contract value to fair value for fully benefit-responsive investment contracts	2,772,542	3,338,993
Amounts allocated to withdrawing participants	(362,926) (467,347
Deemed distributions of participant loans	(1,227,748) (1,012,352
Net assets available for benefits per the Form 5500	\$1,439,652,353	\$1,195,728,909

The following is a reconciliation of withdrawals by participants per the financial statements to the Form 5500 Annual Return/Report of Employee Benefit Plan:

	Years Ended December 31,	
	2012	2011
Withdrawals by participants per the financial statements	\$105,625,601	\$138,693,891
Amounts allocated to withdrawing participants as of end of year	362,926	467,347
Amounts allocated to withdrawing participants as of beginning of year	(467,347) (475,783
Benefits paid to participants per the Form 5500	\$105,521,180	\$138,685,455

VALERO ENERGY CORPORATION THRIFT PLAN
NOTES TO FINANCIAL STATEMENTS (Continued)

The following is a reconciliation of investment income (loss) per the financial statements to the Form 5500 Annual Return/Report of Employee Benefit Plan:

	Years Ended December 31,	
	2012	2011
Investment income (loss) per the financial statements	\$244,075,620	\$(34,798,396)
Adjustment from contract value to fair value for fully benefit-responsive investment contracts as of end of year	2,772,542	3,338,993
Adjustment from contract value to fair value for fully benefit-responsive investment contracts as of beginning of year	(3,338,993)	—
Investment income (loss) per the Form 5500	\$243,509,169	\$(31,459,403)

The following is a reconciliation of deemed distributions of participant loans per the financial statements to the Form 5500 Annual Return/Report of Employee Benefit Plan:

	Years Ended December 31,	
	2012	2011
Deemed distributions of participant loans per the financial statements	\$—	\$—
Deemed distributions of participant loans as of end of year	1,227,748	1,012,352
Deemed distributions of participant loans as of beginning of year	(1,012,352)	(792,100)
Deemed distributions of participant loans per the Form 5500	\$215,396	\$220,252

VALERO ENERGY CORPORATION THRIFT PLAN

EIN: 74-1828067

Plan No. 002

Schedule H, Line 4i—Schedule of Assets (Held at End of Year)

As of December 31, 2012

Identity of Issue/Description of Investment	Current Value
Common stock:	
* Valero Energy Corporation	\$311,959,328
Common/collective trusts:	
Federated Capital Preservation Fund	160,124,303
KeyBank Employee Benefit Small Cap Value Trust	9,697,163
LifePath Index 2015 Fund	12,977,731
LifePath Index 2020 Fund	28,067,878
LifePath Index 2025 Fund	36,658,832
LifePath Index 2030 Fund	30,623,800
LifePath Index 2035 Fund	21,521,820
LifePath Index 2040 Fund	16,715,706
LifePath Index 2045 Fund	9,577,613
LifePath Index 2050 Fund	5,443,476
LifePath Index 2055 Fund	1,447,256
LifePath Index Retirement Fund	6,115,302
SSgA S&P 500 Index Fund	58,131,541
Total common/collective trusts	397,102,421
Mutual funds:	
American Funds EuroPacific Growth Fund	99,534,894
American Funds Growth Fund of America	83,086,821
BlackRock Basic Value Fund, Inc.	53,102,261
BlackRock Small Cap Growth Equity Fund	23,938,284
Pioneer Bond Fund	76,728,856
Vanguard Mid-Cap Index Fund (Investor Class)	36,392,830
Vanguard PRIMECAP Fund (Admiral Class)	59,212,171
Total mutual funds	431,996,117
Money market security:	
* Retirement Bank Account	20,456,634
Self-directed investments	238,331,584
* Participant loans (interest rates range from 4.25% to 10.5%; maturity dates range from January 2013 to January 2028)	40,712,543
	\$1,440,558,627

* Party-in-interest to the Thrift Plan.

See accompanying report of independent registered public accounting firm.

SIGNATURE

Pursuant to the requirements of the Securities Exchange Act of 1934, the Valero Energy Corporation Benefit Plans Administrative Committee has duly caused this annual report to be signed on its behalf by the undersigned hereunto duly authorized.

VALERO ENERGY CORPORATION THRIFT PLAN

By /s/ Donna M. Titzman
Donna M. Titzman
Chairman of the Valero Energy Corporation
Benefit Plans Administrative Committee
Senior Vice President and Treasurer,
Valero Energy Corporation

Date: June 18, 2013