

CONSOL Energy Inc  
Form 10-K  
February 08, 2017

UNITED STATES  
SECURITIES AND EXCHANGE COMMISSION  
Washington, D.C. 20549

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FORM 10-K

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(Mark One)

ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934.  
For the fiscal year ended December 31, 2016

OR  
 TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF  
1934

For the transition period from \_\_\_\_\_ to \_\_\_\_\_  
Commission file number: 001-14901

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CONSOL Energy Inc.  
(Exact name of registrant as specified in its charter)

Delaware 51-0337383  
(State or other jurisdiction of (I.R.S. Employer  
incorporation or organization) Identification No.)

1000 CONSOL Energy Drive  
Canonsburg, PA 15317-6506  
(724) 485-4000

(Address, including zip code, and telephone number, including area code, of registrant's principal executive offices)

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

Title of each class	Name of exchange on which registered
Common Stock (\$.01 par value)	New York Stock Exchange
Preferred Share Purchase Rights	New York Stock Exchange

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

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

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

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

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

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§229.405) 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.

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

Large accelerated filer  Accelerated filer  Non-accelerated filer  Smaller Reporting Company

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act).

Yes  No

The aggregate market value of voting stock held by nonaffiliates of the registrant as of June 30, 2016, the last business day of the registrant's most recently completed second fiscal quarter, based on the closing price of the common stock on the New York Stock Exchange on such date was \$1,829,987,445.

The number of shares outstanding of the registrant's common stock as of January 20, 2017 is 229,443,008 shares.

**DOCUMENTS INCORPORATED BY REFERENCE:**

Portions of CONSOL Energy's Proxy Statement for the Annual Meeting of Shareholders to be held on May 9, 2017, are incorporated by reference in Items 10, 11, 12, 13 and 14 of Part III.

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## GLOSSARY OF CERTAIN OIL AND GAS TERMS

The following are certain terms and abbreviations commonly used in the oil and gas industry and included within this Form 10-K:

Bbl - One stock tank barrel, or 42 U.S. gallons liquid volume, used in reference to oil or other liquid hydrocarbons.

Bcf - One billion cubic feet of natural gas.

Bcfe - One billion cubic feet of natural gas equivalents, with one barrel of oil being equivalent to 6,000 cubic feet of gas.

Btu - One British Thermal unit.

Mbbls - One thousand barrels of oil or other liquid hydrocarbons.

Mcf - One thousand cubic feet of natural gas.

Mcfe - One thousand cubic feet of natural gas equivalents, with one barrel of oil being equivalent to 6,000 cubic feet of gas.

MMbtu - One million British Thermal units.

MMcfe - One million cubic feet of natural gas equivalents, with one barrel of oil being equivalent to 6,000 cubic feet of gas.

NGL - Natural gas liquids - those hydrocarbons in natural gas that are separated from the gas as liquids through the process.

net - "net" natural gas or "net" acres are determined by adding the fractional ownership working interests the Company has in gross wells or acres.

proved reserves - quantities of oil, natural gas, and NGLs which, by analysis of geological and engineering data, can be estimated with reasonable certainty to be economically producible from a given date forward, from known reservoirs, and under existing economic conditions, operating methods and government regulations prior to the time at which contracts providing the right to operate expire, unless evidence indicates that renewal is reasonably certain, regardless of whether deterministic or probabilistic methods are used for the estimation.

proved developed reserves - proved reserves which can be expected to be recovered through existing wells with existing equipment and operating methods.

proved undeveloped reserves (PUDs) - proved reserves that can be estimated with reasonable certainty to be recovered from new wells on undrilled proved acreage or from existing wells where a relatively major expenditure is required for completion.

reservoir - a porous and permeable underground formation containing a natural accumulation of producible natural gas and/or oil that is confined by impermeable rock or water barriers and is separate from other reservoirs.

Tcfe - One trillion cubic feet of natural gas equivalents, with one barrel of oil being equivalent to 6,000 cubic feet of gas.

## FORWARD-LOOKING STATEMENTS

We are including the following cautionary statement in this Annual Report on Form 10-K to make applicable and take advantage of the safe harbor provisions of the Private Securities Litigation Reform Act of 1995 for any forward-looking statements made by, or on behalf of us. With the exception of historical matters, the matters discussed in this Annual Report on Form 10-K are forward-looking statements (as defined in Section 21E of the Exchange Act) that involve risks and uncertainties that could cause actual results to differ materially from projected results. Accordingly, investors should not place undue reliance on forward-looking statements as a prediction of actual results. The forward-looking statements may include projections and estimates concerning the timing and success of specific projects and our future production, revenues, income and capital spending. When we use the words “believe,” “intend,” “expect,” “may,” “should,” “anticipate,” “could,” “estimate,” “plan,” “predict,” “project,” “will,” or their negatives, or similar expressions, the statements which include those words are usually forward-looking statements. When we describe strategy that involves risks or uncertainties, we are making forward-looking statements. The forward-looking statements in this Annual Report on Form 10-K speak only as of the date of this Annual Report on Form 10-K; we disclaim any obligation to update these statements unless required by securities law, and we caution you not to rely on them unduly. We have based these forward-looking statements on our current expectations and assumptions about future events. While our management considers these expectations and assumptions to be reasonable, they are inherently subject to significant business, economic, competitive, regulatory and other risks, contingencies and uncertainties, most of which are difficult to predict and many of which are beyond our control. These risks, contingencies and uncertainties relate to, among other matters, the following:

- deterioration in economic conditions in any of the industries in which our customers operate may decrease demand for our products, impair our ability to collect customer receivables and impair our ability to access capital;
- prices for natural gas, natural gas liquids and coal are volatile and can fluctuate widely based upon a number of factors beyond our control including oversupply relative to the demand available for our products, weather and the price and availability of alternative fuels;
- an extended decline in the prices we receive for our natural gas, natural gas liquids and coal affecting our operating results and cash flows;
- foreign currency fluctuations could adversely affect the competitiveness of our coal and natural gas liquids abroad;
- our customers extending existing contracts or entering into new long-term contracts for coal on favorable terms;
- our reliance on major customers;
- our inability to collect payments from customers if their creditworthiness declines or if they fail to honor their contracts;
- the disruption of rail, barge, gathering, processing and transportation facilities and other systems that deliver our natural gas, natural gas liquids and coal to market;
- a loss of our competitive position because of the competitive nature of the natural gas and coal industries, or a loss of our competitive position because of overcapacity in these industries impairing our profitability;
- coal users switching to other fuels in order to comply with various environmental standards related to coal combustion emissions;
- the impact of potential, as well as any adopted environmental regulations including any relating to greenhouse gas emissions on our operating costs as well as on the market for natural gas and coal and for our securities;
- the risks inherent in natural gas and coal operations, including our reliance upon third party contractors, being subject to unexpected disruptions, including geological conditions, equipment failure, timing of completion of significant construction or repair of equipment, fires, explosions, accidents and weather conditions which could impact financial results;
- decreases in the availability of, or increases in, the price of commodities or capital equipment used in our coal mining and natural gas operations;
-

obtaining and renewing governmental permits and approvals for our natural gas and coal operations;

the effects of government regulation on the discharge into the water or air, and the disposal and clean-up of, hazardous substances and wastes generated during our natural gas and coal operations;

our ability to find adequate water sources for our use in natural gas drilling, or our ability to dispose of water used or removed from strata in connection with our gas operations at a reasonable cost and within applicable environmental rules;

the effects of stringent federal and state employee health and safety regulations, including the ability of regulators to shut down our operations;

the potential for liabilities arising from environmental contamination or alleged environmental contamination in connection with our past or current gas and coal operations;

the effects of mine closing, reclamation, gas well closing and certain other liabilities;

uncertainties in estimating our economically recoverable natural gas, oil and coal reserves;

defects may exist in our chain of title and we may incur additional costs associated with perfecting title for natural gas rights on some of our properties or failing to acquire these additional rights may result in a reduction of our estimated reserves;

the outcomes of various legal proceedings, including those which are more fully described in our reports filed under the Securities Exchange Act of 1934;

- exposure to employee-related long-term liabilities;
- divestitures and acquisitions we anticipate may not occur or produce anticipated benefits;
- joint ventures that we are party to now or in the future may restrict our flexibility, actions taken by our joint ventures may impact our financial position and operational results;
- risks associated with our debt;
- replacing our natural gas and oil reserves, which if not replaced, will cause our natural gas and oil reserves and production to decline;
- declines in our borrowing base could occur for a variety of reasons, including lower natural gas or oil prices, declines in natural gas and oil proved reserves, and lending regulations requirements or regulations;
- our hedging activities may prevent us from benefiting from near-term price increases and may expose us to other risks;
- changes in federal or state income tax laws, particularly in the area of percentage depletion and intangible drilling costs, could cause our financial position and profitability to deteriorate;
- failure to appropriately allocate capital and other resources among our strategic opportunities may adversely affect our financial condition;
- failure by Murray Energy to satisfy liabilities it acquired from us, or failure to perform its obligations under various arrangements, which we guaranteed, could materially or adversely affect our results of operations, financial position, and cash flows;
- information theft, data corruption, operational disruption and/or financial loss resulting from a terrorist attack or cyber incident;
- operating in a single geographic area;
- certain provisions in our multi-year coal sales contracts may provide limited protection during adverse economic conditions, and may result in economic penalties or permit the customer to terminate the contract;
- the majority of our common units in CNX Coal Resources LP and CONE Midstream Partners LP are subordinated, and we may not receive distributions from CNX Coal Resources LP or CONE Midstream Partners LP;
- with respect to the sale of the Buchanan and Amonate mines and other coal assets to Coronado IV LLC, any disruption to our business, including customer, employee and supplier relationships resulting from this transaction, and the impact of the transaction on our future operating results;
- there is no assurance that the potential drop-downs, spin-off or sale of the coal business will occur, or if it does occur that we will be able to negotiate favorable terms;
- with respect to the termination of the joint venture with NOBLE, any disruption to our business, including customer and supplier relationships from this transaction, and the impact of the transaction on our future operating and financial results and liquidity; and
- other factors discussed in this 2016 Form 10-K under “Risk Factors,” as updated by any subsequent Forms 10-Q, which are on file at the Securities and Exchange Commission.

## PART I

### ITEM 1. Business

#### General

CONSOL Energy Inc., (CONSOL Energy or the Company) is an integrated energy company operated through two primary divisions, oil and natural gas exploration and production (E&P) and Pennsylvania (PA) Mining Operations. The E&P division is focused on Appalachian area natural gas and liquids activities, including production, gathering, processing and acquisition of natural gas properties in the Appalachian Basin. The PA Mining Operations division is focused on the extraction and preparation of coal, also in the Appalachian Basin.

CONSOL Energy was incorporated in Delaware in 1991, but its predecessors had been mining coal, primarily in the Appalachian Basin, since 1864. CONSOL Energy entered the natural gas business in the 1980s initially to increase the safety and efficiency of our coal mines by capturing methane from coal seams prior to mining, which makes the mining process safer and more efficient. Over the past ten years, CONSOL Energy's natural gas business has grown by approximately 617% to produce 394.4 net Bcfe in 2016. This business has grown from coalbed methane production in Virginia into other unconventional production, including hydraulic fracturing in the Marcellus Shale and Utica Shale, in the Appalachian Basin. This growth was accelerated with the 2010 asset acquisition of the Appalachian Exploration & Production business of Dominion Resources, Inc. Subsequently, on December 5, 2013, we sold Consolidation Coal Company and certain subsidiaries, including five active coal mines in West Virginia.

Our E&P division operates, develops and explores for natural gas primarily in Appalachia (Pennsylvania, West Virginia, Ohio, Virginia and Tennessee). Currently, our primary focus is the continued development of our Marcellus Shale acreage and the delineation and development of our Utica Shale acreage. We believe that our concentrated operating area, our legacy surface acreage position, our regional operating expertise, our extensive data set from development, joint ventures, non-operated participation wells, our held by production acreage position and our ability to coordinate gas drilling with coal mining activity gives us a significant operating advantage over our competitors.

Our land holdings in the Marcellus Shale and Utica Shale plays cover large areas, provide multi-year drilling opportunities and, collectively, have sustainable lower risk growth profiles. We currently control approximately 413,000 net acres in the Marcellus Shale and approximately 683,000 net acres that have Utica Shale potential in Ohio, West Virginia, and Pennsylvania. We also have approximately 2.2 million net acres in our coalbed methane play.

Highlights of our 2016 production include the following:

- Total average production of 1,080,512 Mcfe per day, an increase of 20% over 2015;
- 88% Natural Gas, 12% Liquids; and
- 54% Marcellus, 23% Utica, 17% coalbed methane, and 6% other.

At December 31, 2016, our proved natural gas, NGL, condensate and oil reserves (collectively, "natural gas reserves") had the following characteristics:

- 6.3 Tcfe of proved reserves;
- 93.2% natural gas;
- 58.9% proved developed;
- 87.6% operated; and
- A reserve life ratio of 15.85 years (based on 2016 production).

Highlights of coal activities in 2016 include the following:

- Production of 24.6 million tons of coal;



Coal reserve holdings of 2.4 billion tons; and  
75% of coal sales to domestic utilities.

Additionally, we provide energy services, including coal terminal services (the Baltimore Terminal), water services and land resource management services.

The following map provides the location of CONSOL Energy's E&P and coal operations by region:  
CONSOL Energy defines itself through its core values which are:

• Safety,  
• Compliance, and  
• Continuous Improvement.

These values are the foundation of CONSOL Energy's identity and are the basis for how management defines continued success. We believe CONSOL Energy's rich resource base, coupled with these core values, allows management to create value for the long-term. The electric power industry generates approximately two-thirds of its output by burning natural gas or coal, the two fuels we produce. We believe that the use of natural gas and coal will continue for many years as the principal fuel sources for electricity in the United States. Additionally, we believe that as worldwide economies grow, the demand for electricity from fossil fuels will grow as well, resulting in expansion of worldwide demand for our coal and potentially for our natural gas.

#### CONSOL Energy's Strategy

CONSOL Energy's strategy is to increase shareholder value through the development and growth of its existing natural gas assets, selective acquisition of natural gas and natural gas liquid acreage leases within its footprint, and through the participation in global coal markets. Ultimately, we intend to separate our E&P division and our PA Mining Operations division and to focus on the growth of our E&P division. We also will continue to focus on monetization of assets to accelerate value creation and to minimize the shortfall between operating cash flows and our growth capital requirements.

We expect natural gas to become a more significant contributor to the domestic electric generation mix, as well as fueling industrial growth in the U.S. economy. With the recent growth of natural gas exports to Mexico and Canada and the United States becoming a net exporter of natural gas in 2016, we expect new markets to open up in the coming years. We feel that our significant increases in natural gas production, our reductions in drilling and operating costs and our vast acreage position will allow CONSOL Energy to take advantage of these markets.

CONSOL Energy's coal assets align with the PA Mining Operations division's long-term strategic objectives. The production, which include the Bailey, Enlow Fork, and Harvey mines, can be sold domestically or abroad, as either thermal coal or high volatile metallurgical coal. These low-cost mines, with five longwalls, produce a high-Btu Pittsburgh-seam coal that is lower in sulfur than many Northern Appalachian coals.

These mines, along with our 100%-owned Baltimore Terminal, will continue to allow CONSOL Energy to participate in the world's thermal and metallurgical coal markets. The ability to serve both domestic and international markets with premium thermal and metallurgical coal provides tremendous optionality.

#### CONSOL Energy's E&P Capital Expenditure Budget

In 2017, the E&P division expects capital expenditures of approximately \$555 million. The E&P division capital expenditures are comprised of the following: \$465 million for drilling and completion activity; \$40 million for midstream, including capital contributions to CONE Midstream Partners, LP; and \$50 million for other activities related to land, permitting, and business development.

#### DETAIL E&P OPERATIONS

Our E&P operations are located throughout Appalachia and include the following plays:

##### Marcellus Shale

We have the rights to extract natural gas in Pennsylvania, West Virginia, and Ohio from approximately 413,000 net Marcellus Shale acres at December 31, 2016.

The Upper Devonian Shale formation, which includes both the Burkett Shale and Rhinestreet Shale, lies above the Marcellus Shale formation in southwestern Pennsylvania and northern West Virginia. The company holds a large number of acres that have Upper Devonian potential; these acres have not been disclosed separately as they coincide with our Marcellus acreage.

In December 2016, CONSOL Energy terminated the 50-50 Joint Venture that was formed in 2011, with Noble Energy, Inc., for the exploration, development, and operation of primarily Marcellus Shale properties in Pennsylvania and West Virginia. As a result of the termination, each party now owns and operates a 100% interest in its properties and wells in two separate operating areas; and each party will now have independent control and flexibility with respect to the scope and timing of future development over its operating area.

We also hold a 50% interest in an entity that constructs and operates the gathering system for most of our Marcellus shale production. As of September 30, 2011, we contributed our existing Marcellus Shale gathering assets to this company. In September of 2014, the majority of these assets were contributed to CONE Midstream Partners LP. See "Midstream Gas Services" for a more detailed explanation.

##### Utica Shale

We have the rights to extract natural gas in Pennsylvania, West Virginia, and Ohio from approximately 683,000 net Utica Shale acres at December 31, 2016. Approximately 305,000 Utica acres coincide with Marcellus Shale acreage in Pennsylvania, West Virginia, and Ohio.

##### Coalbed Methane (CBM)

We have the rights to extract CBM in Virginia from approximately 268,000 net CBM acres, which cover a portion of our coal reserves in Central Appalachia. We produce CBM natural gas primarily from the Pocahontas #3 seam.

We also have the rights to extract CBM in West Virginia, southwestern Pennsylvania, and Ohio from approximately 912,000 net CBM acres. In central Pennsylvania we have the right to extract CBM from approximately 260,000 net CBM acres. In addition, we control approximately 584,000 net CBM acres in Illinois, Kentucky, Indiana, and Tennessee. We also have the right to extract CBM on approximately 139,000 net acres in the San Juan Basin in New Mexico. We have no plans to drill CBM wells in these areas in 2017.

## Other Gas

## Shallow Oil and Gas

We have the rights to extract natural gas from shallow oil and gas positions in Illinois, Indiana, Kentucky, Pennsylvania, West Virginia, Virginia and New York from approximately 766,000 net acres at December 31, 2016. The majority of our shallow oil and gas leasehold position is held by production and all of it is extensively overlain by existing third-party gas gathering and transmission infrastructure.

## Chattanooga

We have the rights to extract natural gas in Tennessee from approximately 95,000 net Chattanooga Shale acres at December 31, 2016.

## Huron

We have approximately 503,000 net acres of Huron Shale potential in Kentucky, West Virginia, and Virginia; a portion of this acreage has tight sands potential.

Summary of Properties as of December 31, 2016

	Marcellus Segment	Utica Segment	CBM Segment	Other Gas Segment	Total
Estimated Net Proved Reserves (MMcfe)	3,137,336	1,371,978	1,254,633	487,701	6,251,648
Percent Developed	60	% 28	% 75	% 100	% 59
Net Producing Wells (including oil and gob wells)	283	54	4,359	8,180	12,876
Net Acreage Position:					
Net Proved Developed Acres	30,737	9,649	257,019	243,877	541,282
Net Proved Undeveloped Acres	11,763	12,836	5,439	—	30,038
Net Unproved Acres(1)	370,263	355,332	1,900,260	1,119,678	3,745,533
Total Net Acres(2)	412,763	377,817	2,162,718	1,363,555	4,316,853

(1) Net acres include acreage attributable to our working interests in the properties. Additional adjustments (either increases or decreases) may be required as we further develop title to and further confirm our rights with respect to our various properties in anticipation of development. We believe that our assumptions and methodology in this regard are reasonable. See Risk Factors in Section 1A of this Form 10-K.

(2) Acreage amounts are only included under the target strata CONSOL Energy expects to produce with the exception of certain CBM acres governed by separate leases, although the reported acres may include rights to multiple gas seams (e.g. we have rights to Marcellus segment that are disclosed under the Utica segment and we have rights to Utica segment that are disclosed under the Marcellus segment). We have reviewed our drilling plans, our acreage rights and used our best judgment to reflect the acres in the strata we expect to primarily produce. As more information is obtained or circumstances change, the acreage classification may change.

## Producing Wells and Acreage

Most of our development wells and proved acreage are located in Virginia, West Virginia and Pennsylvania. Some leases are beyond their primary term, but these leases are extended in accordance with their terms as long as certain drilling commitments or other term commitments are satisfied.



The following table sets forth, at December 31, 2016, the number of producing wells, developed acreage and undeveloped acreage:

	Gross	Net(1)
Producing Gas Wells (including gob wells)	17,314	12,846
Producing Oil Wells	189	30
Net Acreage Position:		
Proved Developed Acreage	549,816	541,282
Proved Undeveloped Acreage	34,467	30,038
Unproved Acreage	4,804,804	3,745,533
Total Acreage	5,389,087	4,316,853

(1) Net acres include acreage attributable to our working interests in the properties. Additional adjustments (either increases or decreases) may be required as we further develop title to and further confirm our rights with respect to our various properties in anticipation of development. We believe that our assumptions and methodology in this regard are reasonable. See Risk Factors in Section 1A of this Form 10-K.

The following table represents the terms under which we hold these acres:

	Net Unproved Acres	Net Proved Undeveloped Acres
Held by production/fee	3,644,799	13,967
Expiration within 2 years	68,084	9,347
Expiration beyond 2 years	32,650	6,724
Total Acreage	3,745,533	30,038

The leases reflected above as Net Unproved Acres with expiration dates are included in our current drill plan or active land program. Leases with expiration dates within two years represent approximately 2% of our total acres in the above categories and leases with expiration dates beyond two years represent approximately 1% of our total acres in the above categories. In each case, we deemed this acreage to not be material to our overall acreage position. Additionally, based on our current drill plans and lease management we do not anticipate any material impact to our consolidated financial statements from the expiration of such leases.

#### Development Wells (Net)

During the years ended December 31, 2016, 2015 and 2014, we drilled 36.0, 132.8 and 180.3 net development wells, respectively. Gob wells and wells drilled by operators other than our primary joint venture partners at that time, Noble Energy and Hess Corporation, are excluded from net development wells. In 2016, there were 68 gross development wells drilled but uncompleted. There were no dry development wells in 2016, 2015, or 2014. As of December 31, 2016, there are 3.0 gross completed developmental wells ready to be turned in-line. The following table illustrates the net wells drilled by well classification type:

	For the Year Ended December 31,		
	2016	2015	2014
Marcellus segment	—	44.0	84.0
Utica segment	13.0	15.8	18.8
CBM segment	23.0	73.0	75.0
Other Gas segment	—	—	2.5
Total Development Wells (Net)	36.0	132.8	180.3





## Exploratory Wells (Net)

There were no exploratory wells drilled during the year ended December 31, 2016. During the years ended December 31, 2015 and 2014, we drilled, in the aggregate, 2.5, and 8.5 net exploratory wells, respectively. As of December 31, 2016, there are no net exploratory wells in process. The following table illustrates the exploratory wells drilled by well classification type:

	For the Year Ended December 31,							
	2016		2015		2014			
	Producing	Still Eval.	Producing	Still Eval.	Producing	Still Eval.	Producing	Still Eval.
Marcellus segment	—	—	—	—	1.5	—	—	—
Utica segment	—	—	2.5	—	1.0	—	—	—
CBM segment	—	—	—	—	—	—	—	—
Other Gas segment	—	—	—	—	6.0	—	—	—
Total Exploratory Wells (Net)	—	—	2.5	—	8.5	—	—	—

## Reserves

The following table shows our estimated proved developed and proved undeveloped reserves. Reserve information is net of royalty interest. Proved developed and proved undeveloped reserves are reserves that could be commercially recovered under current economic conditions, operating methods and government regulations. Proved developed and proved undeveloped reserves are defined by the Securities and Exchange Commission (SEC).

	Net Reserves (Million cubic feet equivalent) as of December 31,		
	2016	2015	2014
Proved developed reserves	3,683,302	3,697,152	3,198,706
Proved undeveloped reserves	2,568,346	1,945,837	3,628,910
Total proved developed and undeveloped reserves(1)	6,251,648	5,642,989	6,827,616

(1) For additional information on our reserves, see Other Supplemental Information—Supplemental Gas Data (unaudited) to the Consolidated Financial Statements in Item 8 of this Form 10-K.

## Discounted Future Net Cash Flows

The following table shows our estimated future net cash flows and total standardized measure of discounted future net cash flows at 10%:

	Discounted Future Net Cash Flows (Dollars in millions)		
	2016	2015	2014
Future net cash flows	\$2,419	\$2,499	\$9,321
Total PV-10 measure of pre-tax discounted future net cash flows (1)	\$1,559	\$1,659	\$4,884
Total standardized measure of after tax discounted future net cash flows	\$955	\$1,019	\$2,984

(1) We calculate our present value at 10% (PV-10) in accordance with the following table. Management believes that the presentation of the non-Generally Accepted Accounting Principles (GAAP) financial measure of PV-10 provides useful information to investors because it is widely used by professional analysts and sophisticated investors in evaluating oil and gas companies. Because many factors that are unique to each individual company

impact the amount of future income taxes estimated to be paid, the use of a pre-tax measure is valuable when comparing companies based on reserves. PV-10 is not a measure of the financial or operating performance under GAAP. PV-10 should not be considered as an alternative to the

standardized measure as defined under GAAP. We have included a reconciliation of the most directly comparable GAAP measure-after-tax discounted future net cash flows.

Reconciliation of PV-10 to Standardized Measure

	As of December 31,		
	2016	2015	2014
	(Dollars in millions)		
Future cash inflows	\$11,303	\$11,838	\$28,503
Future production costs	(5,851 )	(6,585 )	(10,101 )
Future development costs (including abandonments)	(1,550 )	(1,220 )	(3,369 )
Future net cash flows (pre-tax)	3,902	4,033	15,033
10% discount factor	(2,343 )	(2,374 )	(10,149 )
PV-10 (Non-GAAP measure)	1,559	1,659	4,884
Undiscounted income taxes	(1,483 )	(1,534 )	(5,712 )
10% discount factor	879	894	3,812
Discounted income taxes	(604 )	(640 )	(1,900 )
Standardized GAAP measure	\$955	\$1,019	\$2,984

Gas Production

The following table sets forth net sales volumes produced for the periods indicated:

	For the Year		
	Ended December 31,		
	2016	2015	2014
<b>GAS</b>			
Marcellus Sales Volumes (MMcft)	186,812	145,747	99,370
Utica Sales Volumes (MMcft)	71,277	38,344	10,303
CBM Sales Volumes (MMcft)	68,971	74,910	79,459
Other Sales Volumes (MMcft)	21,693	28,286	27,128
<b>LIQUIDS*</b>			
NGLs Sales Volumes (MMcfe)	40,260	33,180	15,475
Oil Sales Volumes (MMcfe)	410	592	681
Condensate Sales Volumes (MMcfe)	4,964	7,598	3,298
TOTAL (MMcfe)	394,387	328,657	235,714

\*Oil, NGLs, and Condensate are converted to Mcfe at the rate of one barrel equals six Mcf based upon the approximate relative energy content of oil and natural gas.

CONSOL Energy expects 2017 annual gas production to grow to approximately 415 Bcfe and increase to approximately 485 Bcfe in 2018.

Average Sales Price and Average Lifting Cost

The following table sets forth the total average sales price and the total average lifting cost for all of our natural gas and liquids production for the periods indicated, including intersegment transactions. Total lifting cost is the cost of raising gas to the gathering system and does not include depreciation, depletion or amortization. See Part II Item 7 Management's Discussion and Analysis of Financial Condition and Results of Operations in this Form 10-K for a breakdown by segment.



	For the Year Ended December 31,		
	2016	2015	2014
Average Sales Price - Gas (Mcf)	\$1.92	\$2.17	\$4.02
Gain on Commodity Derivative Instruments - Cash Settlement- Gas (Mcf)	\$0.70	\$0.68	\$0.11
Average Sales Price - NGLs (Mcf)*	\$2.42	\$2.05	\$5.95
Average Sales Price - Oil (Mcf)*	\$6.15	\$7.99	\$14.85
Average Sales Price - Condensate (Mcf)*	\$4.58	\$4.42	\$11.16
Total Average Sales Price (per Mcfe)	\$2.63	\$2.81	\$4.37
Average Lifting Costs excluding ad valorem and severance taxes (per Mcfe)	\$0.24	\$0.37	\$0.59

\*Oil, NGLs, and Condensate are converted to Mcfe at the rate of one barrel equals six Mcf based upon the approximate relative energy content of oil and natural gas.

Sales of NGLs, condensates, and oil enhance our reported natural gas equivalent sales price. Across all volumes, when excluding the impact of hedging, sales of liquids added \$0.09 per Mcfe, \$0.05 per Mcfe, and \$0.25 per Mcfe for 2016, 2015, and 2014, respectively, to average gas sales prices. CONSOL Energy expects to continue to realize a liquids uplift benefit as additional wells are brought online in the liquid-rich areas of the Marcellus and Utica shales. We continue to sell the majority of our NGLs through the large midstream companies that process our natural gas. This approach allows us to take advantage of the processors' transportation efficiencies and diversified markets. CONSOL Energy's processing contracts provide for the ability to take our NGLs "in kind" and market them directly if desired. The processed purity products are ultimately sold to industrial, commercial, and petrochemical markets.

We enter into physical natural gas sales transactions with various counterparties for terms varying in length. Reserves and production estimates are believed to be sufficient to satisfy these obligations. In the past, we have delivered quantities required under these contracts. We also enter into various natural gas swap transactions. These gas swap transactions exist parallel to the underlying physical transactions and represented approximately 264.9 Bcf of our produced gas sales volumes for the year ended December 31, 2016 at an average price of \$3.04 per Mcf. The notional volumes associated with these gas swaps represented approximately 173.1 Bcf of our produced gas sales volumes for the year ended December 31, 2015 at an average price of \$3.68 per Mcf. As of January 17, 2017, we expect these transactions will represent approximately 311.3 Bcf of our estimated 2017 production at an average price of \$2.61 per Mcf, 220.6 Bcf of our estimated 2018 production at an average price of \$2.75 per Mcf, 161.7 Bcf of our estimated 2019 production at an average price of \$2.76 per Mcf, approximately 85 Bcf of our estimated 2020 production at an average price of \$2.91 per Mcf, and approximately 6.8 Bcf of our estimated 2021 production at an average price of \$3.08 per Mcf.

The hedging strategy and information regarding derivative instruments used are outlined in Part II, Item 7A Qualitative and Quantitative Disclosures About Market Risk and in Note 21 - Derivative Instruments in the Notes to the Audited Consolidated Financial Statements in Item 8 of this Form 10-K.

#### Midstream Gas Services

CONSOL Energy has traditionally designed, built and operated natural gas gathering systems to move gas from the wellhead to interstate pipelines or other local sales points. In addition, CONSOL Energy has acquired extensive gathering assets. CONSOL Energy now owns or operates approximately 5,000 miles of natural gas gathering pipelines as well as 250,000 horsepower of compression, of which, approximately 75% is wholly owned with the balance being leased. Along with this compression capacity, CONSOL Energy owns and operates a number of natural gas processing facilities. This infrastructure is capable of delivering approximately 750 billion cubic feet per year of pipeline quality gas.

CONSOL Energy owns 50% of CONE Gathering LLC ("CONE" or "CONE Gathering") along with Noble Energy owning the other 50% interest. CONE Gathering develops, operates and owns substantially all of Noble Energy's and CONSOL Energy's Marcellus Shale gathering systems. CONSOL Energy operates this equity affiliate. We believe that the network of right-of-ways, vast surface holdings and experience in building and operating gathering systems in the Appalachian basin will give CONE Gathering an advantage in building the midstream assets required to develop our Marcellus Shale position. On September 30, 2014, CONE Midstream Partners LP (the Partnership) closed its initial public offering. See Note 25 - Related Party Transactions in the Notes to Audited Consolidated Financial Statements in Item 8 of this Form 10-K for more information.

In the Utica Shale, we and our joint venture partner, Hess, primarily contract with third-parties for gathering services.

CONSOL Energy has developed a diversified portfolio of firm transportation capacity options to support its production growth plan. CONSOL Energy plans to selectively acquire as needed firm capacity while minimizing transportation costs and long-term financial obligations and, in the near term if appropriate, plans to optimize and/or release firm transportation to others. CONSOL Energy also benefits from the strategic location of our primary production areas in Southwest Pennsylvania, Northern West Virginia, and Eastern Ohio. These areas are currently served by a large concentration of major pipelines that provide us with the capacity to move our production to the major gas markets, and it is expected that recently-approved pipeline projects will increase the take-away capacity from our region. In addition to firm transportation capacity, CONSOL Energy has developed a processing portfolio to support the projected volumes from its wet production areas and has operational and contractual flexibility to potentially convert a portion of currently processed wet gas volumes to be marketed as dry gas volumes. CONSOL Energy has the advantage of having gas production from CBM, which can be lower Btu than pipeline specification, as well as higher Btu Marcellus and Utica shale production. These types of gas can be complementary by reducing and in some cases eliminating the need for the costly processing of CBM. In addition, our lower Btu CBM and dry Marcellus and Utica production offer an opportunity to blend ethane back into the gas stream when pricing or capacity in ethane markets dictate. In developing a diversified approach to managing ethane, CONSOL Energy has entered into ethane supply agreements and is also discussing future outlet opportunities with ethane customers and midstream companies. These different gas types allow us more flexibility in bringing Marcellus and Utica shale wells on-line at qualities that meet interstate pipeline specifications.

#### Natural Gas Competition

The United States natural gas industry is highly competitive. CONSOL Energy competes with other large producers, as well as a myriad of smaller producers and marketers. CONSOL Energy also competes for pipeline and other services to deliver its products to customers. According to data from the Natural Gas Supply Association and the Energy Information Agency (EIA), the five largest U.S. producers of natural gas produced about 16% of dry natural gas production during the first nine months of 2016. The EIA reported 554,201 producing natural gas wells in the United States at December 31, 2015 (the latest year for which government statistics are available), which is approximately two percent lower than 2014.

CONSOL Energy expects natural gas to be a significant contributor to the domestic electric generation mix in the long-term, as well as to fuel industrial growth in the U.S. economy. According to the EIA, based on preliminary results, natural gas represented 34% of U.S. electricity generation during 2016 compared with 33% in 2015. With the recent growth of natural gas exports to Mexico and Canada and increased liquefied natural gas exports, the U.S. became a net exporter of gas in 2016. CONSOL expects the high level of U.S. gas exports to continue in the future. In addition, there is potential for natural gas to become a significant contributor to the transportation market. Our increasing gas production will allow CONSOL Energy to participate in these growing markets.

CONSOL Energy's gas operations are primarily located in the eastern United States. The gas market is highly fragmented and not dominated by any single producer. We believe that competition within our market is based primarily on natural gas commodity trading fundamentals and pipeline transportation availability to the various markets.

Continued demand for CONSOL Energy's natural gas and the prices that CONSOL Energy obtains are affected by natural gas use in the production of electricity, pipeline capacity, U.S. manufacturing and the overall strength of the economy, environmental and government regulation, technological developments, the availability and price of competing alternative fuel supplies, and national and regional supply/demand dynamics.

## DETAIL COAL OPERATIONS

### Coal Reserves

At December 31, 2016, CONSOL Energy had an estimated 2.4 billion tons of proven and probable coal reserves. Reserves are the portion of the proven and probable tonnage that meet CONSOL Energy's economic criteria regarding mining height, preparation plant recovery, depth of overburden and stripping ratio. Generally, these reserves would be commercially mineable at year-end price and cost levels.

Spacing of points of observation for confidence levels in reserve calculations is based on guidelines in U.S. Geological Survey Circular 891 (Coal Resource Classification System of the U.S. Geological Survey). Our estimates for proved reserves have the highest degree of geologic assurance. Estimates for proved reserves are based on points of observation that are equal to or less than 0.5 miles apart. Estimates for probable reserves have a moderate degree of geologic assurance and are computed from points of observation that are between 0.5 to 1.5 miles apart.

An exception is made concerning spacing of observation points with respect to our Pittsburgh coal seam reserves. Because of the well-known continuity of this seam, spacing requirements are 3,000 feet or less for proved reserves and between 3,000 and 8,000 feet for probable reserves.

CONSOL Energy's estimates of proven and probable coal reserves do not rely on isolated points of observation. Small pods of reserves based on a single observation point are not considered; continuity between observation points over a large area is necessary for proved or probable reserves.

CONSOL Energy's proven and probable coal reserves fall within the range of commercially marketed coals in the United States. The marketability of coal depends on its value-in-use for a particular application, and this is affected by coal quality, such as sulfur content, ash and heating value. Modern power plant boiler design aspects can compensate for coal quality differences that occur. Therefore, any of CONSOL Energy's coals can be marketed for the electric power generation industry. Additionally, the growth in worldwide demand for metallurgical coal allows some of our proven and probable coal reserves, currently classified as thermal coals, that possess certain qualities to be sold as metallurgical coal. The addition of this cross-over market adds additional assurance to CONSOL Energy that all of its proven and probable coal reserves are commercially marketable.

CONSOL Energy assigns coal reserves to our mining complex. The amount of coal we assign to the mining complex generally is sufficient to support mining through the duration of our current mining permit. Under federal law, we must renew our mining permits every five years. All assigned reserves have their required permits or governmental approvals, or there is a high probability that these approvals will be secured.

In addition, our mining complex may have access to additional reserves that have not yet been assigned. We refer to these reserves as accessible. Accessible reserves are proven and probable coal reserves that can be accessed by an existing mining complex, utilizing the existing infrastructure of the complex to mine and to process the coal in this area. Mining an accessible reserve does not require additional capital spending beyond that required to extend or to continue the normal progression of the mine, such as the sinking of airshafts or the construction of portal facilities.

Some reserves may be accessible by more than one mine because of the proximity of many of our mines to one another. In the table below, the accessible reserves indicated for a mine are based on our review of current mining plans and reflect our best judgment as to which mine is most likely to utilize the reserve.

Assigned and unassigned coal reserves are proven and probable coal reserves which are either owned or leased. The leases have terms extending up to 30 years and generally provide for renewal through the anticipated life of the



associated mine. These renewals are exercisable by the payment of minimum royalties. Under current mining plans, assigned reserves reported will be mined out within the period of existing leases or within the time period of probable lease renewal periods.

Mining Complexes

The following table provides the location of CONSOL Energy's active mining complexes and the coal reserves associated with each of the continuing operations.

CONSOL ENERGY MINING COMPLEXES

Proven and Probable Assigned and Accessible Coal Reserves as of December 31, 2016 and 2015

Mine/Reserve	Preparation Facility Location	Reserve Class	Coal Seam	Average Seam Thickness (feet)	As Received Heat Value(1) Typical Range	Recoverable Reserves(2)		Tons in Millions		
						Owned (%)	Leased (%)	12/31/2016	12/31/2015	
<b>ASSIGNED-OPERATING PA Mining Operations</b>										
Bailey	Enon, PA	Assigned Operating	Pittsburgh	7.5	12,950	12,860-13,030	43%	57%	89.0	101.1
		Accessible	Pittsburgh	7.5	12,910	12,700-13,170	78%	22%	170.7	170.7
Harvey	Enon, PA	Assigned Operating	Pittsburgh	6.3	13,040	12,920-13,160	86%	14%	20.4	23.4
		Accessible	Pittsburgh	7.6	12,900	12,840-13,130	99%	1%	180.1	180.1
Enlow Fork	Enon, PA	Assigned Operating	Pittsburgh	7.8	12,980	12,820-13,190	99%	1%	31.2	10.9
		Accessible	Pittsburgh	7.6	13,040	12,780-13,180	76%	24%	275.3	305.3
Total Assigned Operating and Accessible									766.7	791.5

The heat values shown for Assigned Operating reserves are based on the 2016 actual quality and five-year forecasted quality for each mine/reserve, assuming that the coal is washed to an extent consistent with normal full-capacity operation of the complex's preparation plant. Actual quality is based on laboratory analysis of samples collected from coal shipments delivered in 2016. Forecasted quality is derived from exploration sample analysis results, which have been adjusted to account for anticipated moisture and for the effects of mining and coal preparation. The heat values shown for Accessible Reserves are based on as received, dry values obtained from drill hole analyses, adjusted for moisture, and prorated by the associated Assigned Operating product values to account for similar mining and processing methods.

Recoverable reserves are calculated based on the area in which mineable coal exists, coal seam thickness, and average density determined by laboratory testing of drill core samples. This calculation is adjusted to account for coal that will not be recovered during mining and for losses that occur if the coal is processed after mining.

Reserves tons are reported on an as-received basis, based on the anticipated product moisture. Reserves are reported only for those coal seams that are controlled by ownership or leases.

The following table sets forth our unassigned proven and probable coal reserves by region:

CONSOL Energy UNASSIGNED Recoverable Coal Reserves as of December 31, 2016 and 2015

Coal Producing Region	As Received Heat Value(1) (Btu/lb)	Recoverable Reserves(2) Tons in			Recoverable Reserves (Tons in
		Owned (%)	Leased (%)	Millions	Millions)
Northern Appalachia (Pennsylvania, Ohio, Northern West Virginia) (3)	11,400 – 13,400	85%	15%	1,054.0	1,216.7
Central Appalachia (Virginia, Southern West Virginia)	12,400 – 14,100	77%	23%	157.2	322.2
Illinois Basin (Illinois, Western Kentucky, Indiana)	11,600 – 12,000	79%	21%	348.7	396.1
Total		83%	17%	1,559.9	1,935.0

The heat value (gross calorific values) estimates for Northern Appalachian and Central Appalachian Unassigned coal reserves include adjustments for moisture that may be added during mining or processing as well as for dilution by rock lying above or below the coal seam. The heat value estimates for the Illinois Basin Unassigned reserves are based primarily on exploration drill core data that may not include adjustments for moisture added during mining or processing, or for dilution by rock lying above or below the coal seam.

Recoverable reserves are calculated based on the area in which mineable coal exists, coal seam thickness, and average density determined by laboratory testing of drill core samples. This calculation is adjusted to account for coal that will not be recovered during mining and for losses that occur if the coal is processed after mining.

Reserve calculations do not include adjustment for moisture that may be added during mining or processing, nor do the calculations include adjustments for dilution from rock lying above or below the coal seam. Reserves are reported only for those coal seams that are controlled by ownership or leases.

140.8 Million tons of the Northern Appalachia leased tons are controlled by Consolidation Coal Company, a former subsidiary of CONSOL Energy that was sold in December 2013. As of filing these tons are still controlled by Consolidation Coal Company but are shown in CONSOL Energy's reserves due to a binding agreement that these tons will be released to CONSOL Energy following the change in name of the Lease Holder.



The following table classifies CONSOL Energy coals by rank, projected sulfur dioxide emissions and heating value (British thermal units per pound). The table also classifies bituminous coals as high, medium and low volatile which is based on fixed carbon and volatile matter.

CONSOL Energy Proven and Probable Recoverable Coal Reserves

By Product (In Millions of Tons) as of December 31, 2016

By Region	≤ 1.20 lbs. S02/MMBtu		> 1.20 ≤ 2.50 lbs. S02/MMBtu			> 2.50 lbs. S02/MMBtu			Total	Percent By Product	
	Low	Med	High	Low	Med	High	Low	Med			High
	Btu	Btu	Btu	Btu	Btu	Btu	Btu	Btu			Btu
Metallurgical(1):											
High Vol A Bituminous	—	—	—	—	39.6	—	—	—	39.6	1.7	%
Med Vol Bituminous	—										