

A large offshore oil rig is illuminated at night, with its lights reflecting on the water. The rig's complex steel structure, including tall derrick masts, is silhouetted against a dark blue sky. The water in the foreground is dark, with bright, colorful reflections of the rig's lights.

# **US oil and gas reserves and production study**

**2018**



**Building a better  
working world**

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# Study overview

The *US oil and gas reserves and production study* is a compilation and analysis of oil and gas reserve disclosure information as reported by publicly traded companies in their annual reports filed with the United States Securities and Exchange Commission (SEC). This report presents the US exploration and production (E&P) results for the five-year period from 2013 through 2017 for the largest 50 companies based on 2017 end-of-year US oil and gas reserve estimates. The study companies cover approximately 44% of the US combined oil and gas production for 2017 (45% for 2016). Activities related to acquisitions have also been reflected as described in the appendix.

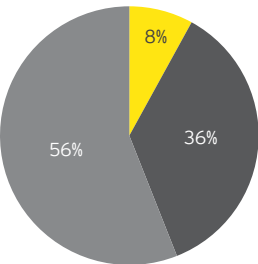
## Study companies

Due to the significance of oil and gas reserves attributable to the study companies, the results of these companies are generally representative of the US E&P industry as a whole. Total US production is fast approaching a leading global position, giving this study's findings an impact beyond the US borders, but it should be noted that results for these companies and for the E&P industry as a whole may be significantly different in other regions of the world.

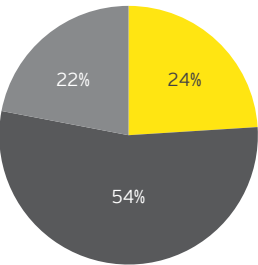
The study companies have been classified into three peer groups: integrated companies (integrateds), large independents and independents. Integrateds are those that have oil-refining and marketing activities, in addition to E&P activities. Independents do not have oil-refining and marketing activities, but may have midstream operations in addition to their E&P activities. The independents were classified as "large" if their 2017 worldwide ending reserves exceeded 1 billion barrels of oil equivalent (BOE).

### Peer group analysis

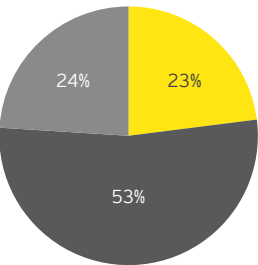
Number of companies



End-of-year oil and gas reserves, 2017



US combined oil and gas production, 2017



- Integrateds
- Large independents
- Independents



# Study highlights

Sustained high oil prices were initially required to unleash the unconventional revolution seen in the United States, but the shale patch has been the most resilient in response to downward price pressures beginning in mid-2014. Because of this resilience, US oil production posted an average 4% annual growth during the 2013-17 study period, even accounting for a modest decline in output in 2016.

Overall, total US crude oil production averaged 9.3 million barrels per day (b/d) in 2017. The Energy Information Administration (EIA) projects that US crude oil production will average 10.8 million b/d in 2018, which would mark the highest annual average US crude oil production level, surpassing the previous record of 9.6 million b/d set in 1970. The EIA forecasts that 2019 crude oil production will again increase, averaging 11.8 million b/d.

US dry natural gas production averaged 73.6 billion cubic feet per day (Bcf/d) in 2017. The EIA forecasts dry natural gas production will average 81.2 Bcf/d in 2018, establishing a new record. The EIA expects natural gas production will rise by 2.9 Bcf/d in 2019 to 83.8 Bcf/d.

## Price improvement and outlook

While the study period began with strong West Texas Intermediate (WTI) oil prices, the latter half of 2014 saw a drastic drop, followed by continual monthly price declines. Between 2013 and the middle of 2014, average monthly WTI prices were in the US\$92 to US\$107 per barrel range. Following improvement starting in 2016, WTI reached US\$58 per barrel in December 2017 and US\$70 per barrel in May 2018 – the highest level since December 2014.

Throughout the study period, natural gas prices were generally weak, with 2015 and 2016 being extremely low. Monthly average US Benchmark Henry Hub prices languished below US\$2.00 per million British thermal units (MMBtu) during the early part of 2016, but recovered in the latter part of 2016 and averaged around US\$3.00 MMBtu for the rest of the study period.

The EIA June 2018 Short-Term Energy Outlook projects average annual WTI prices of US\$64.5 per barrel for 2018 and US\$62 per barrel for 2019, which, on average, is 24% higher than 2017 WTI prices of US\$51 per barrel. Projections for average annual Henry Hub prices are US\$3.00 per MMBtu for 2018 and US\$3.1 per MMBtu for 2019, consistent with 2017 spot prices. Some of the downside price risk producers face may be limited through hedging activity. Reuters reported at the end of 2017 that the top 30 US shale producers executed hedging programs covering 27% of expected 2018 production levels. This will likely, combined with other factors, contribute to the record levels of production in 2018.

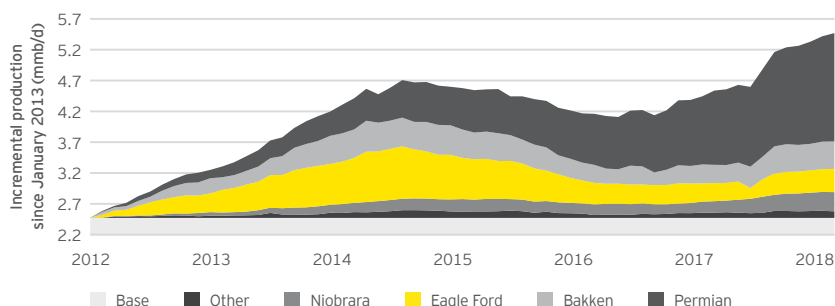
## Reserves replacement cost and production overview

Acute pressure was felt in the US upstream in 2015-16 as companies struggled with increasing debt burdens and sustained lower revenues. Capital investment fell during the 2015-16 down cycle, and reserve additions fell almost in lockstep. In 2017, reserve additions increased dramatically, with an improved price environment. Although spending rose, capital expenditure levels far below the 2014 spending peak were sufficient to maintain production at near-record levels. Sustaining the surge were dramatic improvements in cost efficiency: between the spending peak in 2014 and 2017, the number of capital dollars required to add a barrel of reserves fell by more than half, from US\$16.79/BOE to US\$6.62/BOE for the study group. Some of that reduction is due to efficiency improvement and is sustainable; however, some of the reduction is due to service cost reduction and cannot be sustained without continued stress on the service sector due to increasing costs of labor and services.

Existing drilled but uncompleted (DUC) wells inventory will contribute significantly to completions and new production in the coming months, as well as insulate short-term production from some cost pressure as activity ramps up further. According to EIA data for seven key US regions, DUC inventory reached a record high of 7,692 wells in March 2018. DUC inventory has grown steadily with the improvement in the price outlook and drilling activity: DUCs stood at 5,549 at year-end 2016, rising to 7,361 (up 33%) at the conclusion of December 2017. Permian and Eagle Ford DUC inventory accounted for the largest portion of DUC inventory – 59% as of March 2018, reflecting the overall emphasis on these two plays.

Based on DUC wells inventory and recent trends, it's expected that increased production from Permian will account for the major portion of the US oil production increase. Incremental production from Permian increased by 282% from the beginning of 2015 to March 2018 and dominated the tight oil production. This is significantly higher than any other tight oil play as demonstrated in the incremental tight oil production chart below for 2013 through 2018. However, this increase has started facing pipeline constraints. As production grows beyond the capacity of existing pipeline infrastructure, producers must use other forms of transportation, including rail and trucks. As a result, WTI Midland price spreads widened to the largest discount to Brent since 2014: US \$17.69 per barrel on 3 May 2018 (Source: EIA Short-Term Energy Outlook May 2018). The sharp increase in Permian production also has impacted labor, rigs, equipment and oilfield services costs. Even though these may be short-term challenges, the impact on production will likely have immediate impact on crude supply given the significance of the play.

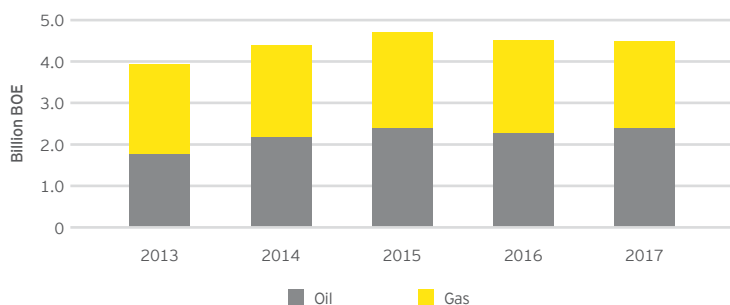
Incremental tight oil production 2013-2018\*



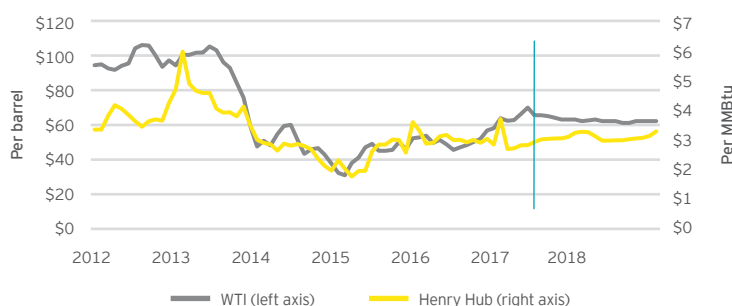
Source: EIA.

\*Incremental production is calculated by subtracting the minimum monthly value for each time series over the chart interval. Total minimum monthly values are presented as base production in the chart.

### Combined oil and gas production



### Crude and natural gas spot prices (US\$)



Source: EY analysis of EIA data.

**US oil and gas production is expected to reach historic highs in 2018.**

**Permian will play a major role in US oil production growth.**



## Study highlights

Commodity prices improved in 2017 increasing revenues and results of operations. The studied companies continued to optimize their portfolio and cost structure in order to respond to the cyclical nature of commodity prices.

### Capital expenditures

- Expenditures totaled US\$114.5 billion, 32% higher than 2016 and 2% lower than 2015.
- Growth is observed in all categories of spend. Development and exploration spend increased the most by 49% and 30% respectively.
- The companies drilled 30% and 23% more development and exploration wells, respectively, compared to 2016.

### Revenues and results of operations

- Revenues were US\$135.9 billion, up 32% from 2016 and the highest since 2014 as a result of improved commodity prices.
- Impairments were US\$10.2 billion, a 47% reduction from 2016 and the lowest since 2013 as the study companies' outlook of future prices further stabilized.
- Depreciation, depletion and amortization (DD&A) expenses decreased, mainly due to lower unit-of-production rates, which resulted from reserve revisions and dispositions as well as higher impairments in prior periods.
- After-tax earnings of US\$17.2 billion were recognized, a substantial improvement from US\$33.8 billion in net losses in 2016 and the first combined net income position since 2014.

### Oil production and reserves

- Production was 2.4 billion barrels, a 5% increase from 2016.
- The companies reported 1.7 billion net upward revisions, the first net positive result for the study period.
- The companies reported 76% more extensions and discoveries in 2017 when compared to 2016.

### Gas production and reserves

- Production was 12.5 trillion cubic feet (tcf), a 7% decline from 2016, primarily due to sales of gas assets to companies outside the study group.
- The companies reported 9.9 tcf net upward revisions, the first net positive result for the study period.
- The companies reported 63% more combined extensions and discoveries and improved recovery for 2017 when compared to 2016.



# Capital expenditures

## US – capital expenditures (US\$ millions) (a)

	2013	2014	2015	2016	2017
Proved properties acquired	\$ 8,616	\$ 25,575	\$ 5,403	\$ 12,263	\$ 13,006
Unproved properties acquired	13,348	26,843	10,810	23,493	27,745
Exploration	21,701	22,567	16,368	10,606	13,771
Development	103,927	122,748	84,094	40,226	59,857
Other	358	370	301	42	165
<b>Total</b>	<b>\$ 147,950</b>	<b>\$ 198,103</b>	<b>\$ 116,976</b>	<b>\$ 86,630</b>	<b>\$ 114,544</b>

(a) This includes the 50 largest companies based on 2017 end-of-year oil and gas reserve estimates. Activity related to acquired companies has also been reflected as described in the appendix.

As commodity prices improved in 2017, the study companies increased capital expenditures for the first time since 2014. Total capital expenditures were US\$114.5 billion in 2017, representing a 32% increase from 2016 versus the 26% cut from 2015 to 2016 and the 41% cut from 2014 to 2015.

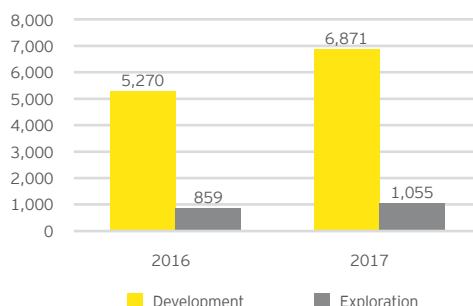
EQT Corporation was the leading purchaser in 2017 with total property acquisition costs of US\$8.6 billion primarily due to the acquisition of Rice Energy Inc. This merger brought together two of the top Marcellus and Utica producers.

Exxon Mobil Corporation followed with total property acquisition costs of US\$6.3 billion, primarily related to the acquisition of a number of companies from the Bass family in Fort Worth, Texas, that indirectly own oil and gas properties in the Permian Basin. The acquisition doubled Exxon Mobil's Permian Basin resources in this dominant US growth area.

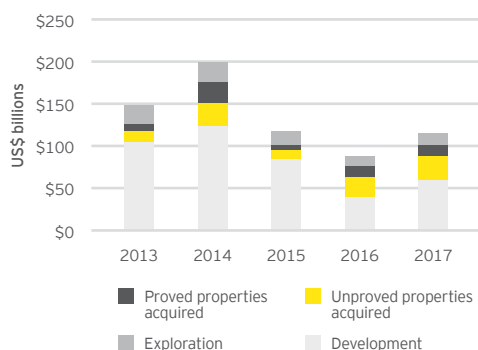
While the increase is observed in all four categories of capital expenditures, exploration and development expenditures increased significantly from 2016 to 2017 – 30% and 49% respectively. The survey companies drilled 30% more net development wells and 23% more net exploration wells in 2017 compared with 2016.

Exploration spending was US\$13.8 billion in 2017 compared with US\$10.6 billion in 2016. The independents saw the largest percentage increase in exploration spending with a 62% increase, while the large independents' spending increased 19%. Integrations' exploration spending stayed largely the same and decreased by only 5%. Pioneer Natural Resources reported the largest exploration spend for 2017 (US\$2 billion) and the largest increase from prior year (US\$0.6 billion).

### Net wells drilled



### Capital expenditures



Development spending increased from US\$40.2 billion in 2016 to US\$59.9 billion in 2017. As in exploration spending, independents led the increase in development drilling with an 87% increase from 2016. Large independents and integrations followed with a 57% and 12% increase respectively.

### Capital expenditures, 2017 top-ranked companies (US\$ millions)

<b>Proved properties acquired</b>	
EQT Corporation	\$ 5,252
Gulfport Energy Corporation <sup>1</sup>	1,951
Occidental Petroleum Corporation	880
Noble Energy, Inc.	839
Parsley Energy, Inc.	482
<b>Unproved properties acquired</b>	
Exxon Mobil Corporation <sup>2</sup>	\$ 6,167
EQT Corporation	3,311
Parsley Energy, Inc.	2,893
Diamondback Energy, Inc.	2,692
Noble Energy, Inc.	1,817
<b>Exploration</b>	
Pioneer Natural Resources Company	\$ 2,033
Royal Dutch Shell plc	1,354
Concho Resources Inc.	1,021
Marathon Oil Corporation	882
Diamondback Energy, Inc.	780
<b>Development</b>	
Chevron Corporation	\$ 4,346
Royal Dutch Shell plc	4,123
Exxon Mobil Corporation <sup>2</sup>	3,889
EOG Resources, Inc.	3,541
BP p.l.c.	2,776

<sup>1-2</sup> See company endnotes on page 28.

# Revenues and results of operations

## US – revenues and results of operations (US\$ millions) (a)

	2013	2014	2015	2016	2017
Revenues	\$ 194,526	\$ 217,985	\$ 129,608	\$ 102,941	\$ 135,853
Production costs (b)	58,353	63,206	55,866	48,637	49,014
Exploration expense	8,091	11,415	14,764	5,634	6,266
DD&A	63,423	71,986	80,333	76,377	61,499
Impairments	7,331	19,911	118,199	19,266	10,234
Other net expenses (c)	7,225	6,309	7,372	3,496	5,015
Pretax results of operations	50,103	45,158	(146,926)	(50,469)	3,825
Income tax expense (benefit) (d)	16,828	15,137	(48,566)	(16,834)	(13,340)
<b>Results of operations</b>	<b>\$ 33,275</b>	<b>\$ 30,021</b>	<b>\$ (98,360)</b>	<b>\$ (33,635)</b>	<b>\$ 17,165</b>

## US – revenues and results of operations (US\$ per BOE)

	2013	2014	2015	2016	2017
Revenues	\$ 49.80	\$ 50.23	\$ 27.93	\$ 22.87	\$ 30.36
Production costs (b)	14.94	14.56	12.04	10.80	10.95
Exploration expense	2.07	2.63	3.18	1.25	1.40
DD&A	16.24	16.59	17.31	16.97	13.74
Impairments	1.88	4.59	25.47	4.28	2.29
Other net expenses (c)	1.85	1.45	1.59	0.78	1.12
Pretax results of operations	12.82	10.41	(31.66)	(11.21)	0.86
Income tax expense (benefit) (d)	4.31	3.49	(10.47)	(3.74)	(2.98)
<b>Results of operations</b>	<b>\$ 8.51</b>	<b>\$ 6.92</b>	<b>\$ (21.19)</b>	<b>\$ (7.47)</b>	<b>\$ 3.84</b>

(a) This includes the 50 largest companies based on 2017 end-of-year oil and gas reserves. Activity related to acquired companies has also been reflected as described in the appendix.

(b) This includes production taxes and transportation costs for companies that separately disclose these expenses.

(c) This includes asset retirement obligation accretion and production-related general and administrative costs for companies that separately disclose these expenses.

(d) Income taxes are presented for informational purposes only. The study is focused on pretax results of operations as a more meaningful comparative metric. Facts and circumstances underlying an individual company's tax results might not be representative of the study group as a whole and as such are not discussed in further details.

The study companies reported combined pre-tax earnings for the first time since 2014. Pre-tax earnings for 2017 was US\$3.8 billion in comparison with pre-tax loss of US\$50.5 billion in 2016, mainly due to improved revenue, and lower DD&A and impairment charges."

While combined oil and gas production stayed largely stable from the prior year, average realized revenue per BOE increased by 33% in 2017, which resulted in a similar 32% increase in total revenues.

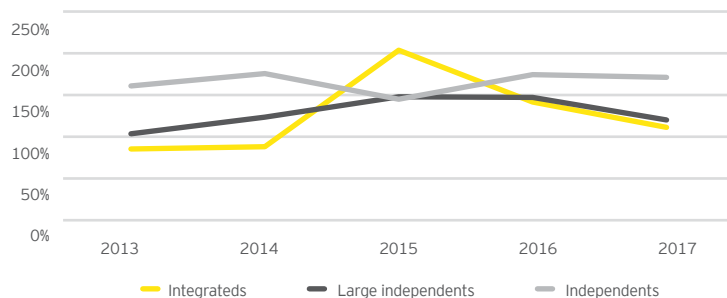
Production costs increased by only 1.4% on a US\$ per BOE basis, reflecting the effort by the producers to optimize their cost structure in response to the lower and cyclical prices. DD&A per barrel decreased as a result of increase in proved oil and gas reserves and prior-year impairments. Oil and gas property impairments totaled US\$10.2 billion, down 47% from 2016 and 91% from 2015 following general stabilization of commodity price outlook. ConocoPhillips and Hess Corporation accounted for 57% or US\$5.8 billion of total impairment charges for the study group in 2017.

Revenues on a per BOE-of-production basis were US\$30.36 per BOE in 2017, 33% higher than 2016 and the highest since 2014. Pretax income for 2017 was US\$0.86 per BOE; if adjusted for noncash DD&A and impairment charges, pretax income would have been US\$16.89 per BOE in 2017 compared with US\$10.04 per BOE in 2016, a 68% increase largely attributable to higher prices during 2017.

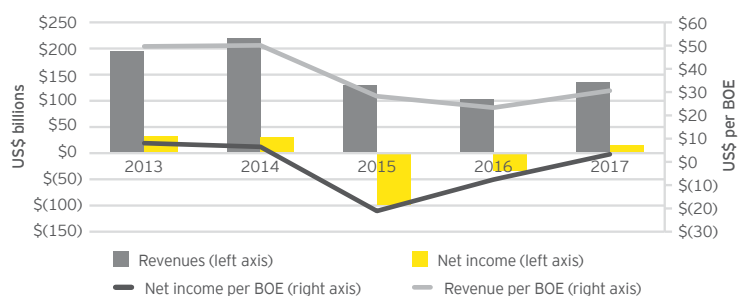


The study companies posted a 132% plowback percentage in 2017, while the five-year average was 136%. The plowback percentage represents total capital expenditures as a percentage of netback (revenues less production costs). Independents posted the highest plowback percentage with a 2017 rate of 172%. The large independents had a rate of 120%, while the integrateds followed closely at 110%.

#### Plowback percentage



#### Revenues and results of operations





# Oil reserves

## US – proved oil reserves (million barrels) (a) (b)

	2013	2014	2015	2016	2017
Beginning of year (c)	22,431	24,624	27,550	24,291	23,939
Additions:					
Extensions and discoveries	4,000	4,089	3,204	2,836	4,982
Improved recovery	370	432	153	187	202
Revisions	(449)	(63)	(4,199)	(922)	1,714
Production	(1,777)	(2,174)	(2,401)	(2,284)	(2,398)
Purchases	481	1,386	568	910	1,264
Sales	(432)	(750)	(583)	(964)	(717)
Other (d)	0	6	(1)	(115)	(26)
<b>End of year</b>	<b>24,624</b>	<b>27,550</b>	<b>24,291</b>	<b>23,939</b>	<b>28,960</b>

(a) This includes the 50 largest companies based on 2017 end-of-year oil and gas reserve estimates. Activity related to acquired companies has also been reflected as described in the appendix.

(b) This includes condensate and natural gas liquids.

(c) Opening amounts for 2016 include the 2015 reported amounts for Linn Energy, Inc. prior to deconsolidation of a former subsidiary, which has been reflected as an “other” adjustment.

(d) This includes transfers, reclassifications and others (as discussed in (c) above). For 2016 and 2017, this also includes the effect of deconsolidation of a subsidiaries no longer controlled by Linn Energy, Inc.

Oil reserves for the study companies increased 21% in 2017 due to significant extensions and discoveries, net upward revisions and purchases partially offset by production and sales. As a result, the study companies reported the highest oil reserves for the five-year study period.

Extensions and discoveries increased by 76% in 2017 and, at 5.0 billion barrels, was the highest of the study period following the lowest level reported last year. The largest extensions and discoveries were recorded by Southwestern Energy Company (488 million barrels), Chevron Corporation (458 million barrels) and ConocoPhillips (322 million barrels).

Study companies reported net upward reserve revisions for the first time in the last five years of 1.7 billion barrels. Upward revisions for 2017 were 2.1 billion barrels, and downward revisions were 0.4 billion barrels.

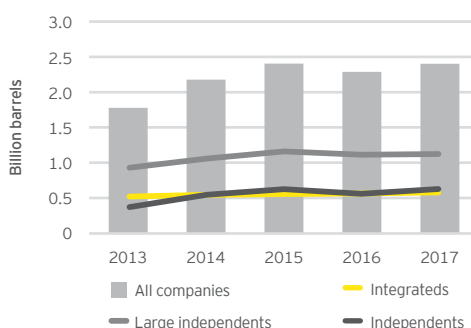
The largest upward revisions were reported by Chevron Corporation (280 million barrels), Royal Dutch Shell (235 million barrels), ConocoPhillips (211 million barrels), BP p.l.c. (164 million barrels) and EOG Resources (105 million barrels). Revisions by these five companies accounted for 47% of all upward revisions in 2017. Chesapeake Energy Corporation contributed the most to the downward revision (199 million barrels).

Oil production increased 5% from 2.3 billion barrels in 2016 to 2.4 billion barrels in 2017. The largest increases were posted by EOG Resources (22 million barrels), Pioneer Natural Resources (13 million barrels) and BP p.l.c. (11 million barrels). The largest decreases came from BHP Billiton Group (17 million barrels), ConocoPhillips (14 million barrels) and Devon Energy (11 million barrels).

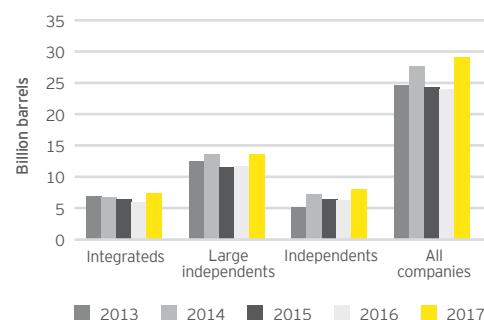
Oil production increased by 35% from 2013 to 2017, with the independents' production growing 88%, compared with 25% growth for the large independents and 20% growth for the integrations.

Purchases of oil reserves for 2017 were 1,264 million barrels while sales were 717 million barrels. Exxon Mobil Corporation recorded 428 million barrels in purchases (34% of total purchases), largely due to its acquisition of certain properties in the Permian Basin.

### Oil production



### End-of-year oil reserves



### Oil reserves, 2017 – top-ranked companies (million barrels)

Ending reserves	
Exxon Mobil Corporation <sup>2</sup>	2,940
ConocoPhillips	1,974
Chevron Corporation	1,916
EOG Resources, Inc.	1,808
BP p.l.c.	1,669
Production	
Chevron Corporation	190
BP p.l.c.	155
EOG Resources, Inc.	154
ConocoPhillips	153
Exxon Mobil Corporation <sup>2</sup>	152

<sup>2</sup> See company endnotes on page 28.

**Oil and gas  
reserves achieved  
their highest level  
since 2014.**



# Gas reserves

## US – proved gas reserves (Bcf) (a)

	2013	2014	2015	2016	2017
Beginning of year (b)	159,043	173,475	187,681	148,863	147,843
Additions:					
Extensions and discoveries	28,879	29,480	19,091	19,223	31,039
Improved recovery	945	982	558	609	1,246
Revisions	(349)	(786)	(40,905)	(5,483)	9,882
Production	(12,879)	(13,271)	(13,732)	(13,358)	(12,451)
Purchases	1,582	7,063	1,846	7,934	12,593
Sales	(3,957)	(9,267)	(5,675)	(9,556)	(14,407)
Other (c)	211	5	(1)	(389)	(10)
<b>End of year</b>	<b>173,475</b>	<b>187,681</b>	<b>148,863</b>	<b>147,843</b>	<b>175,735</b>

(a) This includes the 50 largest companies based on 2017 end-of-year oil and gas reserve estimates. Activity related to acquired companies has also been reflected as described in the appendix.

(b) Opening amounts for 2016 include the 2015 reported amounts for Linn Energy, Inc. prior to deconsolidation of a former subsidiary and opening amounts for 2014 include the 2013 reported amounts (the earliest available data) for WildHorse Resource Development Corporation, which has been reflected as an "other" adjustment.

(c) This includes transfers, reclassifications and others (as discussed in (c) above). For 2016 and 2017, this also includes the effect of deconsolidation of a subsidiaries no longer controlled by Linn Energy, Inc.

End-of-year gas reserves for the study companies increased 19% in 2017 to 176 tcf, marking the highest level of gas reserves since 2014. The increase is mainly due to extensions and discoveries, upward revisions and purchases, partially offset by sales of proved gas reserves and production.

Southwestern Energy Company (5.2 tcf), Chesapeake Energy Corporation (3.7 tcf), Range Resources Corporation (2.9 tcf), EQT Corporation (2.2 tcf) and CNX Resources Corporation (1.8 tcf) posted the largest extensions and discoveries, accounting for 50% of the total extensions and discoveries for the study group.

Study companies recorded net upward revision of 9.9 tcf – the first net upward revision for the study period. The study companies reported 13.3 tcf upward revisions and 3.4 tcf downward revisions. The large independents posted the biggest portion of 2017 revisions (46%), which was followed by the independents (31%) and the integrateds (23%).

The large independents accounted for 91% of the total downward revisions. EQT Corporation (2.8 tcf) and Chesapeake Energy Corporation (0.3 tcf) recorded the largest downward revisions in 2017 on an absolute basis. Thirty-six of 50 study companies posted net positive gas reserve revisions with 5 companies capturing the 45% of total upward revisions: Southwestern Energy Company (1.9 tcf), BHP Billiton Group (1.3 tcf), Royal Dutch Shell plc (1.0 tcf), Cabot Oil & Gas Corporation (0.9 tcf) and Ultra Petroleum Corp (0.9 tcf).

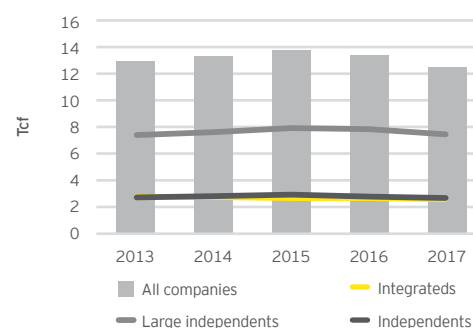
Gas production decreased by 7% from 13.4 tcf in 2016 to 12.5 tcf in 2017. The largest declines were attributable to Anadarko Petroleum Corporation (305 bcf), Chesapeake Energy Corporation (172 bcf) and ConocoPhillips (158 bcf). These were offset by increases, led by Gulfport Energy Corporation (122 bcf), Range Resources Corporation (115 bcf) and EQT Corporation (94 bcf).

From 2013 to 2017, the large independents led the way and increased production by 10%. The integrateds decreased by 17%; independents decreased by 1%.

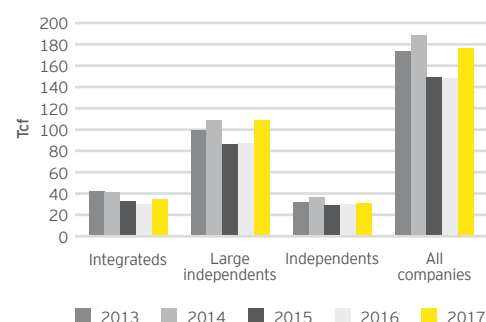
Purchases of gas reserves were 12.6 tcf in 2017, led by EQT Corporation (8.9 tcf, including Rice Energy Inc. acquisition), Gulfport Energy Corporation (1.1 tcf) and Exxon Mobil Corporation (1.0 tcf, including Permian Basin acquisitions).

Sales of gas reserves were 14.4 tcf in 2017, including the acquisition of Rice Energy Inc. (4.0 tcf) by EQT Corporation.\* The other most significant sales were reported by ConocoPhillips (2.9 tcf), Anadarko Petroleum Corporation (1.5 tcf) and Noble Energy, Inc. (1.3 tcf).

## Gas production



## End-of-year gas reserves



## Gas reserves, 2017 – top-ranked companies (bcf)

Ending reserves	
EQT Corporation	19,830
Exxon Mobil Corporation <sup>2</sup>	19,256
Southwestern Energy Company	11,126
Antero Resources Corporation	11,098
Range Resources Corporation	10,264

\*Refer to the appendix for information on acquired companies.

Production	
Exxon Mobil Corporation <sup>2</sup>	1,181
Chesapeake Energy Corporation	878
Southwestern Energy Company	797
EQT Corporation	795
BP p.l.c.	664

<sup>2</sup> See company endnotes on page 28.



# Performance measures

## Proved reserve acquisition costs, finding and development costs, and reserve replacement costs

**US – proved reserve acquisition costs (PRACs), finding and development costs (FDCs) and reserve replacement costs (RRCs) (a)**  
**US\$ per BOE**

	2013	2014	2015	2016	2017	Three year	Five year
PRACs	\$ 11.78	\$ 10.11	\$ 6.55	\$ 5.35	\$ 3.87	\$ 4.71	\$ 6.62
FDCs including revisions	15.71	18.52	(24.69)	17.28	7.28	20.73	18.70
FDCs excluding revisions	14.89	18.05	16.98	12.03	9.60	12.30	14.17
RRCs	15.42	16.79	(31.67)	13.36	6.62	15.72	15.95

(a) This includes the 50 largest companies based on 2017 end-of-year oil and gas reserve estimates. Activity related to acquired companies has also been reflected as described in the appendix.

PRACs were US\$3.87 per BOE in 2017, the lowest of the study period. The seven companies accounting for 78% of proved properties acquisition costs achieved PRACs between US\$3.36 per BOE (EQT Corporation) and US\$14.55 per BOE (Noble Energy, Inc.).

Noble Energy, Inc.'s high PRAC primarily resulted from acquisition of assets in Delaware Basin as a result of the Clayton Williams Energy acquisition. Noble Energy, Inc. allocated approximately 26% of the total purchase price of US\$3.8 billion (including liabilities assumed) to proved properties with 87% oil and natural gas liquid (NGL) weighted proved reserves.

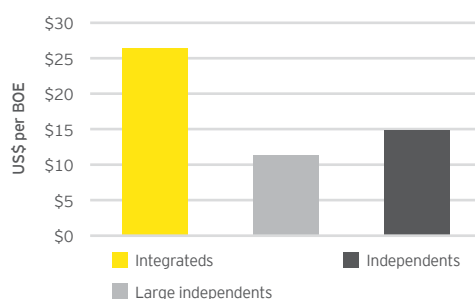
EQT Corporation's low PRAC is related to US\$5.3 billion proved acquisition costs, which include US\$3.7 billion for the purchase of Marcellus wells and leases and US\$1.2 billion for the purchase of Utica wells and leases. These acquisitions include Rice Energy Inc. acquisition and added properties with 95% gas-weighted proved reserves.

FDCs, including reserve revisions (the traditional measure), for 2017 were US\$7.28 per BOE, lower than what was reported for 2013, 2014 and 2016. FDCs including reserve revisions were non-meaningful for 2015 due to significant downward reserve revisions for both oil and gas. The three- and five-year averages for FDCs including reserve revisions are not meaningful due to the significant negative reserve revisions from 2015, which result in inflated FDC calculations.

Excluding reserve revisions in order to adjust for the significant 2015 downward revisions, FDCs were US\$9.60 per BOE in 2017, the lowest of the study period. The three- and five-year averages were US\$12.30 per BOE and US\$14.17 per BOE respectively. Over the five-year study period, the integrated average FDCs excluding revisions was US\$26.29 per BOE, compared with US\$11.34 per BOE for the large independents and US\$14.82 per BOE for the independents.

RRCs were US\$6.62 per BOE in 2017, lower than the study period except for 2015. Similar to FDCs, RRC amounts for 2015 are not meaningful due to the significant downward reserve revisions. Related three- and five-year averages are also not meaningful due to the effects of the significant downward revisions in 2015. For 2017, integrated experienced RRCs of US\$6.96 per BOE, while large independents and independents had a RRCs of US\$5.23 per BOE and US\$9.25 per BOE respectively.

### FDCs excluding revisions – five-year (2013-17) averages



### Three-year (2015-17) PRACs, FDCs and RRCs – leading companies (US\$ per BOE)

PRACs (b)	
Exxon Mobil Corporation <sup>2</sup>	\$ 0.11
PDC Energy, Inc.	1.24
Antero Resources Corporation	1.86
Sanchez Energy Corporation	2.12
Anadarko Petroleum Corporation	2.38
FDCs including reserve revisions (c)	
Cabot Oil & Gas Corporation	\$ 2.51
Range Resources Corporation	2.54
Southwestern Energy Company	3.52
Eclipse Resources Corporation	3.62
Gulfport Energy Corporation <sup>1</sup>	3.69
FDCs excluding reserve revisions	
National Fuel Gas Company	\$ 5.21
Eclipse Resources Corporation	6.08
EQT Corporation	7.39
Continental Resources, Inc.	7.67
WildHorse Resource Development Corporation	8.04
RRCs (c)	
Cabot Oil & Gas Corporation	\$ 2.53
CNX Resources Corporation <sup>3</sup>	3.47
Southwestern Energy Company	3.53
Eclipse Resources Corporation	3.61
Range Resources Corporation	4.48

(b) This is based on companies with proved acquisition costs of at least US\$50 million for the three-year period.

(c) This excludes entities with a negative FDC.

<sup>1-3</sup> See company endnotes on page 28.

## Production replacement rates

### Oil

#### US – all sources and finding and development (F&D) gas production replacement rates (a)

	2013	2014	2015	2016	2017	Three year	Five year
All sources	223%	233%	(31%)	98%	310%	128%	164%
F&D including revisions	222%	210%	(35%)	92%	288%	116%	151%
F&D excluding revisions	247%	213%	143%	132%	216%	164%	187%

(a) This includes the 50 largest companies based on 2017 end-of-year oil and gas reserve estimates. Activity related to acquired companies has also been reflected as described in the appendix.

Significant increases in extensions and discoveries and purchases, coupled with net positive upward revisions for the first time in the study period, resulted in 2017 oil production replacement rates to be significantly higher than in prior periods. As a result, the study companies posted an above 100% replacement rate for the three-year and five-year periods in all three categories of the replacement rates analysis.

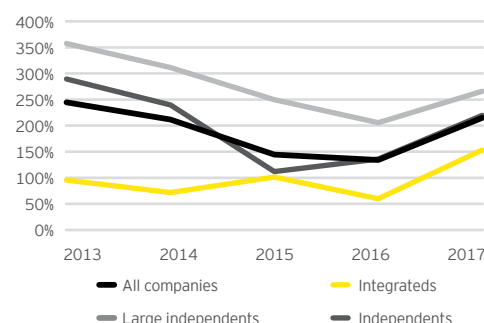
Following poor replacement rates in 2016, integrateds led the increase level in 2017 for all replacement categories and achieved 345% replacement for all sources, 284% for F&D including revisions and 156% for F&D excluding revisions.

In 2017, only four companies reported negative replacement from all sources and four companies reported positive replacement less than 100% for this category. Only two companies reported negative replacement from all F&D sources, and five companies reported positive replacement less than 100% in the same category. There was no negative replacement reported for F&D sources excluding revisions. In this category, 12 companies reported positive replacement less than 100%. In average, 41 study companies reported more than 100% replacement in all three replacement categories, in comparison with 29 companies in 2016.

#### Oil production replacement rates by peer group, 2017

	All sources	F&D including revisions	F&D excluding revisions
Integrateds	345%	284%	156%
Large independents	262%	273%	220%
Independents	363%	315%	265%

#### Oil F&D excluding revisions production replacement rates



#### Three-year (2015–17) oil production replacement rates – top-ranked companies

All sources	
WildHorse Resource Development Corporation	2,989%
Southwestern Energy Company	1,124%
Antero Resources Corporation	887%
Parsley Energy, Inc.	795%
RSP Permian, Inc.	794%
F&D including revisions	
WildHorse Resource Development Corporation	2,139%
Southwestern Energy Company	1,118%
Antero Resources Corporation	841%
Parsley Energy, Inc.	655%
RSP Permian, Inc.	531%
F&D excluding revisions	
WildHorse Resource Development Corporation	1,494%
Southwestern Energy Company	1,156%
Parsley Energy, Inc.	682%
RSP Permian, Inc.	577%
Diamondback Energy, Inc.	499%

## Production replacement rates

### Gas

#### US – all sources and finding and development (F&D) gas production replacement rates (a)

	2013	2014	2015	2016	2017	Three year	Five year
All sources	209%	200%	(186%)	88%	356%	80%	129%
F&D including revisions	228%	219%	(162%)	97%	339%	85%	140%
F&D excluding revisions	230%	227%	140%	139%	259%	178%	198%

(a) This includes the 50 largest companies based on 2017 US end-of-year oil and gas reserve estimates. Activity related to acquired companies has also been reflected as described in the appendix.

Similar to oil replacement rates, significant increase in extensions and discoveries, purchases, doubled improved recoveries and positive upward revisions for the first time in the study period resulted in 2017 gas production replacement rates to be the highest rates in the study period. Study companies achieved above 100% replacement rate for the five-year periods in all three categories of replacement analysis.

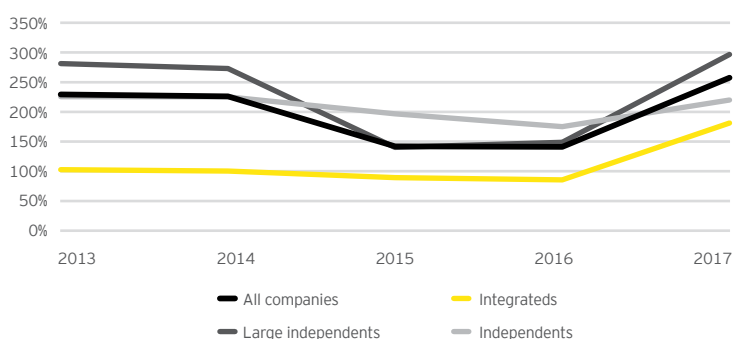
Following very poor replacement rates in 2016, integrateds lead the increase level in 2017 for all replacement categories and achieved 299% replacement for all sources, 274% for F&D including revisions and 183% for F&D excluding revisions.

In 2017, eight companies reported negative replacement from all sources and one company reported positive replacement less than 100% for this category. Only three companies reported negative replacement from all F&D sources and three companies reported positive replacement less than 100% in the same category. There was no negative replacement reported for F&D sources excluding revisions. In this category, 11 companies reported positive replacement less than 100%. In average, 41 study companies reported more than 100% replacement in all three replacement categories, in comparison with 29 in 2016.

#### Gas production replacement rates by peer group, 2016

	All sources	F&D including revisions	F&D excluding revisions
Integrateds	299%	274%	183%
Large independents	394%	361%	298%
Independents	304%	338%	221%

#### Gas F&D excluding revisions production replacement rates



#### Three-year (2015-17) gas production replacement rates – leading companies

<b>All sources</b>	
WildHorse Resource Development Corporation	905%
RSP Permian, Inc.	842%
Extraction Oil & Gas, Inc.	825%
Parsley Energy, Inc.	796%
Gulfport Energy Corporation <sup>1</sup>	660%
<b>F&amp;D including revisions</b>	
WildHorse Resource Development Corporation	819%
Parsley Energy, Inc.	637%
Extraction Oil & Gas, Inc.	598%
RSP Permian, Inc.	549%
Eclipse Resources Corporation	522%
<b>F&amp;D excluding revisions</b>	
WildHorse Resource Development Corporation	857%
RSP Permian, Inc.	639%
Parsley Energy, Inc.	634%
Diamondback Energy, Inc.	582%
Extraction Oil & Gas, Inc.	531%

<sup>1</sup> See company endnotes on page 28.



## Production costs

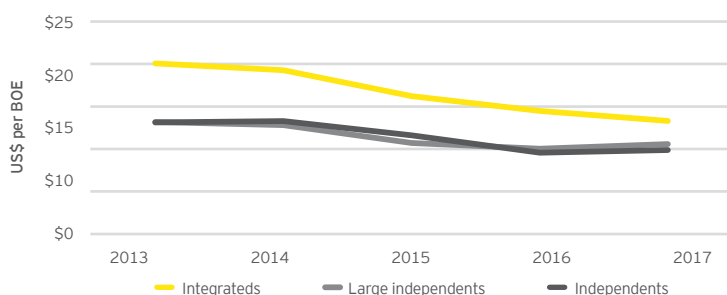
### US – production costs (US\$ per BOE) (a)

	2013	2014	2015	2016	2017	Three year	Five year
Integrations	\$ 20.14	\$ 19.34	\$ 16.19	\$ 14.41	\$ 13.22	\$ 14.60	\$ 16.64
Large independents	13.25	12.89	10.67	9.94	10.51	10.37	11.39
Independents	13.20	13.38	11.61	9.47	9.80	10.30	11.36
<b>All companies</b>	<b>\$ 15.01</b>	<b>\$ 14.53</b>	<b>\$ 12.10</b>	<b>\$ 10.86</b>	<b>\$ 10.95</b>	<b>\$ 11.31</b>	<b>\$ 12.61</b>

(a) This includes the 50 largest companies based on 2017 end-of-year oil and gas reserve estimates. Activity related to acquired companies has also been reflected as described in the appendix.

Production costs per BOE stayed largely the same in comparison with the prior year as the companies optimized their cost profiles as a result of adapting to a low and cyclical prices environment. Changes from 2016 for all peer group companies were below 10%.

### Production costs per BOE



### Three-year (2015-17), production costs top-ranked companies (US\$ per BOE)

PDC Energy, Inc.	\$ 5.46
Cabot Oil & Gas Corporation	5.63
Gulfport Energy Corporation <sup>1</sup>	5.72
Southwestern Energy Company	5.94
Continental Resources, Inc.	6.08

<sup>1</sup> See company endnotes on page 28.

# Company statistics

## US – capital expenditures for the latest fiscal year

US\$ millions

	Proved properties	Unproved properties	Exploration	Development	Other	Total capital expenditures
Anadarko Petroleum Corporation	\$ (17)	\$ 490	\$ 654	\$ 2,610	\$ –	\$ 3,737
Antero Resources Corporation	176	204	385	897	–	1,662
Apache Corporation	3	136	602	1,118	–	1,859
BHP Billiton Group	–	12	471	1,034	–	1,517
BP p.l.c.	22	13	102	2,776	–	2,913
Cabot Oil & Gas Corporation	–	102	41	618	–	761
California Resources Corporation	–	–	25	357	–	382
Carrizo Oil & Gas, Inc.	303	525	91	570	–	1,489
Chesapeake Energy Corporation	23	271	21	2,146	–	2,461
Chevron Corporation	64	77	729	4,346	–	5,216
Cimarex Energy Co.	1	136	12	1,141	9	1,299
CNX Resources Corporation <sup>3</sup>	16	32	48	545	–	641
Concho Resources Inc.	303	905	1,021	653	–	2,882
ConocoPhillips	35	285	473	2,295	–	3,088
Continental Resources, Inc.	8	221	123	1,696	–	2,048
Denbury Resources Inc.	75	16	–	274	–	365
Devon Energy Corporation	2	50	590	1,036	–	1,678
Diamondback Energy, Inc.	453	2,692	780	145	3	4,073
Eclipse Resources Corporation	–	57	19	257	–	333
Encana Corporation	2	21	4	1,354	–	1,381
Energen Corporation	10	273	676	235	–	1,194
EOG Resources, Inc.	73	424	144	3,541	50	4,232
EP Energy Corporation	7	27	6	544	–	584
EQT Corporation	5,252	3,311	16	1,366	–	9,945
Extraction Oil & Gas, Inc.	139	382	17	894	–	1,432
Exxon Mobil Corporation <sup>2</sup>	88	6,167	191	3,889	–	10,335
Gulfport Energy Corporation <sup>1</sup>	1,951	–	–	1,009	42	3,002
Hess Corporation	–	46	94	1,160	–	1,300

<sup>1-3</sup> See company endnotes on page 28.

	Proved properties	Unproved properties	Exploration	Development	Other	Total capital expenditures
Linn Energy, Inc. <sup>4</sup>	\$ -	\$ -	\$ 119	\$ 120	\$ 2	\$ 241
Marathon Oil Corporation	191	1,746	882	1,122	-	3,941
Murphy Oil Corporation	8	50	14	471	38	581
National Fuel Gas Company	9	-	41	201	(9)	242
Newfield Exploration Company	104	98	704	430	-	1,336
Noble Energy, Inc.	839	1,817	59	1,870	-	4,585
Oasis Petroleum Inc.	62	5	12	512	(3)	588
Occidental Petroleum Corporation	880	32	163	1,981	-	3,056
Parsley Energy, Inc.	482	2,893	-	1,207	-	4,582
PDC Energy, Inc.	-	19	84	688	-	791
Pioneer Natural Resources Company	8	128	2,033	628	-	2,797
QEP Resources, Inc.	270	532	33	1,189	13	2,037
Range Resources Corporation	18	62	56	1,193	20	1,349
Royal Dutch Shell plc	-	141	1,354	4,123	-	5,618
RSP Permian, Inc.	340	1,253	-	676	-	2,269
Sanchez Energy Corporation	327	734	6	562	-	1,629
SM Energy Company	2	91	272	676	-	1,041
Southwestern Energy Company	-	194	22	1,024	-	1,240
Ultra Petroleum Corp.	9	1	511	36	-	557
Whiting Petroleum Corporation	4	18	50	799	-	871
WildHorse Resource Development Corporation	269	387	16	795	-	1,467
WPX Energy, Inc.	195	669	5	1,048	-	1,917
<b>All companies</b>	<b>\$ 13,006</b>	<b>\$ 27,745</b>	<b>\$ 13,771</b>	<b>\$ 59,857</b>	<b>\$ 165</b>	<b>\$ 114,544</b>
<b>Integrateds</b>	<b>\$ 174</b>	<b>\$ 6,398</b>	<b>\$ 2,376</b>	<b>\$ 15,134</b>	<b>\$ -</b>	<b>\$ 24,082</b>
<b>Large independents</b>	<b>7,499</b>	<b>9,435</b>	<b>4,844</b>	<b>27,252</b>	<b>70</b>	<b>49,100</b>
<b>Independents</b>	<b>5,333</b>	<b>11,912</b>	<b>6,551</b>	<b>17,471</b>	<b>95</b>	<b>41,362</b>

<sup>4</sup> See company endnotes on page 28.



## US – revenues and results of operations for the latest fiscal year (a)

US\$ millions

	Revenues	Production costs (b)	Exploration expense	DD&A	Impairments	Other income (expense) (c)	Income tax benefit (expense)	Results of operations
Anadarko Petroleum Corporation	\$ 7,175	\$ (2,251)	\$ (1,699)	\$ (3,260)	\$ (229)	\$ 414	\$ (55)	\$ 95
Antero Resources Corporation	2,748	(1,279)	(9)	(694)	(160)	–	(228)	378
Apache Corporation	2,271	(824)	(363)	(924)	–	(31)	(45)	84
BHP Billiton Group	3,479	(1,519)	(242)	(2,592)	–	(32)	386	(520)
BP p.l.c.	9,841	(2,308)	(282)	(4,258)	–	(1,742)	1,811	3,062
Cabot Oil & Gas Corporation	1,726	(617)	(22)	(569)	(483)	(12)	329	352
California Resources Corporation	1,931	(986)	(22)	(510)	–	(60)	(115)	238
Carrizo Oil & Gas, Inc.	754	(180)	–	(261)	–	(2)	(4)	307
Chesapeake Energy Corporation	4,985	(2,122)	–	(913)	–	–	(768)	1,182
Chevron Corporation	9,158	(3,563)	(299)	(5,092)	(204)	368	(88)	280
Cimarex Energy Co.	1,874	(607)	–	(399)	–	(16)	(311)	541
CNX Resources Corporation <sup>3</sup>	1,386	(501)	(48)	(412)	(138)	(53)	349	583
Concho Resources Inc.	2,665	(607)	(59)	(1,146)	–	(8)	75	920
ConocoPhillips	8,145	(3,953)	(667)	(3,415)	(4,148)	(170)	3,102	(1,106)
Continental Resources, Inc.	2,983	(532)	(12)	(1,652)	(237)	–	504	1,054
Denbury Resources Inc.	1,090	(527)	–	(184)	–	(117)	(99)	163
Devon Energy Corporation	3,746	(1,232)	(346)	(1,050)	–	173	–	1,291
Diamondback Energy, Inc.	1,186	(213)	–	(322)	–	(1)	20	670
Eclipse Resources Corporation	378	(157)	(50)	(119)	–	(45)	–	7
Encana Corporation	1,714	(438)	–	(530)	–	–	(161)	585
Energen Corporation	961	(243)	(10)	(480)	–	(6)	(80)	142
EOG Resources, Inc.	7,652	(2,183)	(113)	(3,157)	(477)	–	(626)	1,096
EP Energy Corporation	1,025	(354)	(12)	(476)	–	–	(66)	117
EQT Corporation	2,651	(1,338)	(25)	(988)	–	–	(118)	182
Extraction Oil & Gas, Inc.	604	(163)	(36)	(312)	–	–	(36)	57
Exxon Mobil Corporation <sup>2</sup>	10,103	(4,970)	(163)	(7,009)	–	–	8,066	6,027
Gulfport Energy Corporation <sup>1</sup>	1,320	(350)	–	(359)	–	–	–	611
Hess Corporation	2,335	(768)	(106)	(1,819)	(1,700)	(751)	47	(2,762)

<sup>1-3</sup> See company endnotes on page 28.

	Revenues	Production costs (b)	Exploration expense	DD&A	Impairments	Other income (expense) (c)	Income tax benefit (expense)	Results of operations
Linn Energy, Inc. <sup>4</sup>	\$ 1,004	\$ (459)	\$ (3)	\$ (141)	\$ –	\$ 825	\$ –	\$ 1,226
Marathon Oil Corporation	3,124	(985)	(153)	(2,105)	–	(28)	(1)	(148)
Murphy Oil Corporation	954	(241)	(8)	(606)	–	(99)	3	3
National Fuel Gas Company	526	(181)	–	(108)	–	(6)	(87)	144
Newfield Exploration Company	1,679	(552)	–	(443)	–	–	(180)	504
Noble Energy, Inc.	3,156	(1,199)	(102)	(1,739)	(63)	(2,379)	814	(1,512)
Oasis Petroleum Inc.	1,035	(321)	(12)	(516)	(7)	–	(67)	112
Occidental Petroleum Corporation	4,047	(1,747)	(28)	(2,549)	(397)	(585)	695	(564)
Parsley Energy, Inc.	983	(162)	(40)	(352)	–	(25)	(6)	398
PDC Energy, Inc.	909	(183)	(47)	(462)	(286)	(5)	47	(27)
Pioneer Natural Resources Company	3,592	(806)	(106)	(1,400)	(285)	(55)	524	1,464
QEP Resources, Inc.	1,548	(675)	(22)	(735)	(72)	–	(16)	28
Range Resources Corporation	2,189	(938)	(54)	(625)	(333)	24	251	514
Royal Dutch Shell plc	6,199	(2,656)	(868)	(3,410)	–	(114)	(363)	(1,212)
RSP Permian, Inc.	804	(172)	(8)	(280)	(59)	(1)	118	402
Sanchez Energy Corporation	740	(281)	–	(177)	(40)	–	–	242
SM Energy Company	1,275	(508)	(56)	(557)	(16)	(131)	183	190
Southwestern Energy Company	2,086	(891)	–	(440)	–	–	–	755
Ultra Petroleum Corp.	892	(292)	–	(162)	–	–	(168)	270
Whiting Petroleum Corporation	1,490	(490)	(36)	(949)	(900)	(388)	(483)	(1,756)
WildHorse Resource Development Corporation	427	(76)	(37)	(168)	–	(56)	39	129
WPX Energy, Inc.	1,308	(414)	(101)	(673)	–	99	148	367
<b>All companies</b>	<b>\$ 135,853</b>	<b>\$ (49,014)</b>	<b>\$ (6,266)</b>	<b>\$ (61,499)</b>	<b>\$ (10,234)</b>	<b>\$ (5,015)</b>	<b>\$ 13,340</b>	<b>\$ 17,165</b>
<b>Integrated</b>	<b>\$ 35,301</b>	<b>\$ (13,497)</b>	<b>\$ (1,612)</b>	<b>\$ (19,769)</b>	<b>\$ (204)</b>	<b>\$ (1,488)</b>	<b>\$ 9,426</b>	<b>\$ 8,157</b>
<b>Large independents</b>	<b>65,884</b>	<b>(24,879)</b>	<b>(3,989)</b>	<b>(28,903)</b>	<b>(8,365)</b>	<b>(3,430)</b>	<b>4,636</b>	<b>954</b>
<b>Independents</b>	<b>34,668</b>	<b>(10,638)</b>	<b>(665)</b>	<b>(12,827)</b>	<b>(1,665)</b>	<b>(97)</b>	<b>(722)</b>	<b>8,054</b>

(a) Amounts are determined from the results of the operations table if it is provided; otherwise, amounts are determined from the income statement. Revenues determined from the income statement include oil and gas sales and realized derivatives gains or losses.

(b) This includes production taxes and transportation costs.

(c) This includes asset retirement obligations accretion and production-related general and administrative expenses for those companies that separately disclose these expenses.

<sup>4</sup> See company endnotes on page 28.

## US – oil reserves for the latest fiscal year (a)

Million barrels

	Beginning	Extensions and discoveries	Improved recovery	Revisions	Production	Purchases	Sales	Other(b)	Ending
Anadarko Petroleum Corporation	809	88	–	92	(131)	2	(127)	–	733
Antero Resources Corporation	995	67	–	(11)	(38)	14	–	–	1,027
Apache Corporation	494	82	–	14	(51)	–	(3)	–	536
BHP Billiton Group	289	136	–	40	(66)	–	(1)	–	398
BP p.l.c.	1,620	12	27	164	(155)	1	–	–	1,669
Cabot Oil & Gas Corporation	49	16	–	2	(5)	–	–	–	62
California Resources Corporation	464	26	–	54	(36)	–	(8)	–	500
Carrizo Oil & Gas, Inc.	152	64	–	(21)	(15)	30	(1)	–	209
Chesapeake Energy Corporation	626	108	–	(199)	(54)	–	(2)	–	479
Chevron Corporation	1,412	458	9	280	(190)	4	(57)	–	1,916
Cimarex Energy Co.	237	96	–	(3)	(38)	–	–	–	292
CNX Resources Corporation <sup>3</sup>	71	20	–	(4)	(7)	–	(3)	–	77
Concho Resources Inc.	428	115	–	(20)	(43)	22	(2)	–	500
ConocoPhillips	1,728	322	6	211	(153)	–	(140)	–	1,974
Continental Resources, Inc.	643	130	–	(78)	(51)	1	(4)	–	641
Denbury Resources Inc.	247	–	2	14	(21)	11	–	–	253
Devon Energy Corporation	619	153	–	40	(78)	–	(4)	–	730
Diamondback Energy, Inc.	176	121	–	(9)	(25)	27	(2)	–	288
Eclipse Resources Corporation	14	22	–	30	(4)	–	–	–	62
Encana Corporation	212	111	–	(20)	(36)	1	(9)	–	259
Energen Corporation	258	89	–	23	(22)	–	–	–	348
EOG Resources, Inc.	1,585	282	–	105	(154)	2	(11)	–	1,809
EP Energy Corporation	310	17	–	(8)	(22)	–	(14)	–	283
EQT Corporation	196	10	–	(1)	(19)	83	–	–	269
Extraction Oil & Gas, Inc.	153	35	–	1	(13)	12	–	–	188
Exxon Mobil Corporation <sup>2</sup>	2,417	158	–	99	(152)	428	(10)	–	2,940
Gulfport Energy Corporation <sup>1</sup>	26	6	–	3	(8)	69	–	–	96
Hess Corporation	441	177	–	69	(56)	–	(27)	–	604

<sup>1-3</sup> See company endnotes on page 28.

	Beginning	Extensions and discoveries	Improved recovery	Revisions	Production	Purchases	Sales	Other (b)	Ending
Linn Energy, Inc. <sup>4</sup>	203	9	-	4	(16)	-	(77)	(26)	97
Marathon Oil Corporation	733	64	-	46	(65)	23	(2)	-	799
Murphy Oil Corporation	251	34	-	(3)	(20)	5	-	-	267
National Fuel Gas Company	29	1	-	3	(3)	-	-	-	30
Newfield Exploration Company	280	49	-	99	(34)	1	(1)	-	394
Noble Energy, Inc.	503	136	-	60	(62)	50	(50)	-	637
Oasis Petroleum Inc.	237	36	-	(28)	(19)	-	(1)	-	225
Occidental Petroleum Corporation	1,179	-	120	77	(93)	91	(20)	-	1,354
Parsley Energy, Inc.	185	133	-	4	(21)	45	(5)	-	341
PDC Energy, Inc.	202	4	-	36	(20)	39	(1)	-	260
Pioneer Natural Resources Company	515	196	-	65	(78)	1	(6)	-	693
QEP Resources, Inc.	306	70	-	1	(25)	55	(21)	-	386
Range Resources Corporation	700	104	-	73	(40)	-	(3)	-	834
Rice Energy Inc. <sup>5</sup>	-	-	-	0	0	-	-	-	-
Royal Dutch Shell plc	491	242	38	235	(109)	2	-	-	899
RSP Permian, Inc.	207	81	-	14	(18)	42	-	-	326
Sanchez Energy Corporation	123	29	-	(5)	(17)	106	(3)	-	233
SM Energy Company	211	113	-	6	(24)	1	(52)	-	255
Southwestern Energy Company	64	488	-	72	(17)	-	-	-	607
Ultra Petroleum Corp.	31	1	-	(3)	(3)	-	-	-	26
Whiting Petroleum Corporation	496	45	-	19	(36)	-	(47)	-	477
WildHorse Resource Development Corporation	98	116	-	68	(8)	66	-	-	340
WPX Energy, Inc.	224	110	-	4	(27)	30	(3)	-	338
<b>All companies</b>	<b>23,939</b>	<b>4,982</b>	<b>202</b>	<b>1,714</b>	<b>(2,398)</b>	<b>1,264</b>	<b>(717)</b>	<b>(26)</b>	<b>28,960</b>
<b>Integrates</b>	<b>5,940</b>	<b>870</b>	<b>74</b>	<b>778</b>	<b>(606)</b>	<b>435</b>	<b>(67)</b>	<b>-</b>	<b>7,424</b>
<b>Large independents</b>	<b>11,724</b>	<b>2,383</b>	<b>126</b>	<b>608</b>	<b>(1,140)</b>	<b>266</b>	<b>(397)</b>	<b>-</b>	<b>13,570</b>
<b>Independents</b>	<b>6,275</b>	<b>1,729</b>	<b>2</b>	<b>328</b>	<b>(652)</b>	<b>563</b>	<b>(253)</b>	<b>(26)</b>	<b>7,966</b>

(a) This includes condensate and natural gas liquids.

(b) This includes transfers, reclassifications and others.

<sup>4-5</sup> See company endnotes on page 28.



## US – gas reserves for the latest fiscal year

Bcf

	Beginning	Extensions and discoveries	Improved recovery	Revisions	Production	Purchases	Sales	Other (a)	Ending
Anadarko Petroleum Corporation	4,399	119	–	644	(461)	6	(1,514)	–	3,193
Antero Resources Corporation	9,414	1,309	–	677	(591)	289	–	–	11,098
Apache Corporation	1,432	379	–	(5)	(144)	4	(21)	–	1,645
BHP Billiton Group	1,311	217	–	1,307	(288)	–	(1)	–	2,546
BP p.l.c.	8,014	10	1,002	(38)	(664)	–	–	–	8,324
Cabot Oil & Gas Corporation	8,281	1,138	–	917	(655)	–	(328)	–	9,353
California Resources Corporation	626	45	–	104	(66)	–	(3)	–	706
Carrizo Oil & Gas, Inc.	287	99	–	28	(28)	95	(170)	–	311
Chesapeake Energy Corporation	6,496	3,694	–	(315)	(878)	21	(418)	–	8,600
Chevron Corporation	3,676	1,361	3	670	(354)	1	(177)	–	5,180
Cimarex Energy Co.	1,471	364	–	(40)	(187)	1	(1)	–	1,608
CNX Resources Corporation <sup>3</sup>	5,828	1,769	–	(29)	(365)	–	(82)	–	7,121
Concho Resources Inc.	1,752	351	–	38	(161)	72	(9)	–	2,043
ConocoPhillips	6,816	584	–	747	(409)	–	(2,885)	–	4,853
Continental Resources, Inc.	3,790	662	–	(25)	(228)	7	(65)	–	4,141
Denbury Resources Inc.	44	–	–	3	(4)	–	–	–	43
Devon Energy Corporation	5,615	403	–	398	(433)	–	(9)	–	5,974
Diamondback Energy, Inc.	175	109	–	(10)	(21)	35	(2)	–	286
Eclipse Resources Corporation	386	274	–	515	(87)	2	–	–	1,090
Encana Corporation	1,093	144	–	(27)	(97)	2	(729)	–	386
Energen Corporation	352	156	–	102	(34)	–	–	–	576
EOG Resources, Inc.	3,021	619	–	603	(293)	5	(56)	–	3,899
EP Energy Corporation	732	44	–	(56)	(46)	–	(22)	–	652
EQT Corporation	12,332	2,165	–	(2,760)	(795)	8,890	(1)	–	19,831
Extraction Oil & Gas, Inc.	508	130	–	9	(32)	11	–	–	626
Exxon Mobil Corporation <sup>2</sup>	17,997	956	–	674	(1,181)	982	(172)	–	19,256
Gulfport Energy Corporation <sup>1</sup>	2,167	1,595	–	315	(350)	1,099	–	–	4,826
Hess Corporation	590	219	–	171	(82)	–	(18)	–	880

<sup>1-3</sup> See company endnotes on page 28.

	Beginning	Extensions and discoveries	Improved recovery	Revisions	Production	Purchases	Sales	Other (a)	Ending
Linn Energy, Inc. <sup>4</sup>	2,300	90	–	(102)	(147)	–	(754)	(10)	1,377
Marathon Oil Corporation	1,288	204	–	(33)	(127)	36	(44)	–	1,324
Murphy Oil Corporation	219	32	–	(16)	(16)	4	–	–	223
National Fuel Gas Company	1,675	387	–	91	(157)	–	(22)	–	1,974
Newfield Exploration Company	1,366	151	–	318	(130)	2	(3)	–	1,704
Noble Energy, Inc.	2,838	299	–	124	(222)	46	(1,264)	–	1,821
Oasis Petroleum Inc.	411	89	–	55	(32)	1	(1)	–	523
Occidental Petroleum Corporation	1,045	0	167	197	(108)	50	(146)	–	1,205
Parsley Energy, Inc.	224	162	–	32	(23)	64	(7)	–	452
PDC Energy, Inc.	834	12	–	96	(72)	289	(5)	–	1,154
Pioneer Natural Resources Company	1,265	266	–	365	(143)	4	(5)	–	1,752
QEP Resources, Inc.	2,554	102	–	13	(169)	126	(831)	–	1,795
Range Resources Corporation	7,870	2,866	–	70	(491)	8	(60)	–	10,263
Rice Energy Inc. <sup>5</sup>	4,005	–	–	0	–	–	(4,005)	–	–
Royal Dutch Shell plc	675	1,163	74	958	(293)	3	(11)	–	2,569
RSP Permian, Inc.	177	74	–	26	(15)	34	–	–	296
Sanchez Energy Corporation	417	93	–	26	(55)	292	(2)	–	771
SM Energy Company	1,111	369	–	64	(123)	3	(144)	–	1,280
Southwestern Energy Company	4,866	5,159	–	1,898	(797)	–	–	–	11,126
Ultra Petroleum Corp.	2,322	50	–	911	(260)	22	(89)	–	2,956
Whiting Petroleum Corporation	716	82	–	108	(41)	–	(18)	–	847
WildHorse Resource Development Corporation	325	279	–	72	(20)	28	–	–	684
WPX Energy, Inc.	735	195	–	(8)	(76)	59	(313)	–	592
<b>All companies</b>	<b>147,843</b>	<b>31,039</b>	<b>1,246</b>	<b>9,882</b>	<b>(12,451)</b>	<b>12,593</b>	<b>(14,407)</b>	<b>(10)</b>	<b>175,735</b>
<b>Integrates</b>	<b>30,362</b>	<b>3,490</b>	<b>1,079</b>	<b>2,264</b>	<b>(2,492)</b>	<b>986</b>	<b>(360)</b>	<b>–</b>	<b>35,329</b>
<b>Large independents</b>	<b>87,232</b>	<b>21,805</b>	<b>167</b>	<b>4,586</b>	<b>(7,367)</b>	<b>9,362</b>	<b>(6,912)</b>	<b>–</b>	<b>108,873</b>
<b>Independents</b>	<b>30,249</b>	<b>5,744</b>	<b>–</b>	<b>3,032</b>	<b>(2,592)</b>	<b>2,245</b>	<b>(7,135)</b>	<b>(10)</b>	<b>31,533</b>

(a) This includes transfers, reclassifications and others.

<sup>4-5</sup> See company endnotes on page 28.

## US – performance measures (three-year averages)

Costs in US\$ per BOE; production replacement rates in %

					Production replacement rates						
	PRAC	FDC including revisions	FDC excluding revisions	RRC	All sources	F&D including revisions	F&D excluding revisions	All sources	F&D including revisions	F&D excluding revisions	Production costs
Anadarko Petroleum Corporation	\$ 2.38	\$ 53.99	\$ 72.94	\$ 38.57	(12%)	48%	35%	(163%)	15%	11%	\$ 8.73
Antero Resources Corporation	1.86	5.62	4.38	5.05	887%	841%	329%	137%	88%	362%	8.96
Apache Corporation	3.94	(29.0)1	21.47	(29.21)	(91%)	(89%)	70%	(23%)	(19%)	142%	10.36
BHP Billiton Group	–	(28.34)	21.14	(28.34)	12%	13%	96%	(179%)	(162%)	69%	12.89
BP p.l.c.	12.62	161.41	25.55	105.99	(4%)	(6%)	17%	34%	27%	98%	10.44
Cabot Oil & Gas Corporation	87.23	2.51	4.01	2.53	159%	170%	215%	225%	244%	147%	5.63
California Resources Corporation	12.16	110.57	9.78	67.59	(15%)	(12%)	64%	62%	60%	47%	19.45
Carrizo Oil & Gas, Inc.	7.54	16.72	12.92	14.18	367%	272%	403%	218%	308%	253%	8.66
Chesapeake Energy Corporation	7.34	17.47	5.03	16.30	(15%)	24%	268%	30%	80%	210%	11.79
Chevron Corporation	21.31	10.92	15.56	10.95	187%	203%	134%	181%	243%	194%	16.03
Cimarex Energy Co.	9.29	12.64	10.28	12.60	147%	148%	169%	89%	92%	128%	8.92
CNX Resources Corporation <sup>3</sup>	0.07	6.96	2.77	3.47	59%	130%	237%	180%	124%	323%	7.90
Concho Resources Inc.	12.81	23.95	15.20	20.99	217%	161%	266%	212%	166%	242%	9.03
ConocoPhillips	–	31.48	15.85	31.60	34%	65%	113%	(192%)	12%	52%	16.99
Continental Resources, Inc.	8.27	22.51	7.67	22.42	(49%)	(41%)	240%	310%	322%	388%	6.08
Denbury Resources Inc.	9.02	(8.42)	418.08	(10.48)	(59%)	(71%)	3%	(2,194%)	(2,169%)	0%	22.51
Devon Energy Corporation	14.73	45.95	19.61	41.80	28%	47%	110%	(10%)	24%	56%	8.32
Diamondback Energy, Inc.	13.89	23.26	19.26	21.88	486%	420%	499%	545%	430%	582%	8.17
Eclipse Resources Corporation	–	3.62	6.08	3.61	458%	464%	254%	522%	522%	320%	8.50
Encana Corporation	13.35	26.27	12.10	25.05	78%	113%	251%	(282%)	41%	80%	11.39
Energen Corporation	40.39	10.76	9.21	10.80	262%	349%	442%	(35%)	416%	364%	10.12
EOG Resources, Inc.	12.91	19.68	16.83	18.86	150%	146%	153%	(7%)	61%	120%	11.19
EP Energy Corporation	10.97	(26.50)	14.44	(31.88)	(82%)	(74%)	155%	(228%)	(108%)	152%	10.97
EQT Corporation	2.89	40.11	7.39	6.40	366%	119%	122%	589%	45%	309%	7.27
Extraction Oil & Gas, Inc.	6.31	14.85	14.32	11.83	570%	354%	403%	825%	598%	531%	7.94
Exxon Mobil Corporation <sup>2</sup>	0.11	(50.63)	16.94	46.38	214%	71%	163%	(90%)	(119%)	89%	14.30
Gulfport Energy Corporation <sup>1</sup>	9.29	3.69	3.33	5.68	379%	55%	105%	660%	459%	501%	5.72
Hess Corporation	–	18.65	16.53	18.65	85%	100%	135%	189%	196%	135%	11.74

<sup>1-3</sup> See company endnotes on page 28.

	Production replacement rates										
	Oil							Gas			Production costs
	PRAC	FDC including revisions	FDC excluding revisions	RRC	All sources	F&D including revisions	F&D excluding revisions	All sources	F&D including revisions	F&D excluding revisions	
Linn Energy, Inc. <sup>4</sup>	\$ -	\$ (2.62)	\$ 8.15	\$ (2.66)	(300%)	(179%)	57%	(336%)	(201%)	65%	\$ 12.44
Marathon Oil Corporation	7.44	22.66	12.09	20.31	102%	123%	242%	149%	159%	259%	12.08
Murphy Oil Corporation	1.31	21.61	18.09	20.59	151%	150%	177%	96%	90%	121%	11.16
National Fuel Gas Company	-	6.23	5.21	6.01	5%	6%	20%	166%	230%	274%	6.54
Newfield Exploration Company	5.81	17.57	18.27	15.92	142%	146%	151%	125%	132%	111%	9.59
Noble Energy, Inc.	7.40	23.60	20.06	16.21	279%	178%	180%	(23%)	81%	131%	10.15
Oasis Petroleum Inc.	12.43	29.52	10.47	18.87	79%	(12%)	172%	563%	422%	244%	12.93
Occidental Petroleum Corporation	7.24	81.77	18.41	28.75	49%	35%	130%	(29%)	2%	108%	15.30
Parsley Energy, Inc.	9.37	20.07	19.43	17.80	795%	655%	682%	796%	637%	634%	7.04
PDC Energy, Inc.	1.24	64.55	25.72	13.95	331%	56%	195%	494%	120%	209%	5.46
Pioneer Natural Resources Company	14.90	15.98	13.63	16.01	188%	189%	228%	119%	118%	123%	8.93
QEP Resources, Inc.	4.62	18.05	11.27	11.96	254%	108%	256%	1%	131%	138%	11.91
Range Resources Corporation	14.73	2.54	2.77	4.48	379%	328%	185%	372%	391%	413%	7.28
Royal Dutch Shell plc	0.07	24.50	34.77	23.69	159%	160%	100%	213%	198%	167%	19.75
RSP Permian, Inc.	6.38	19.58	17.86	15.17	794%	531%	577%	842%	549%	639%	8.42
Sanchez Energy Corporation	2.12	14.31	10.33	8.13	421%	194%	325%	515%	307%	322%	9.91
SM Energy Company	11.87	25.95	12.61	24.87	46%	135%	286%	58%	127%	252%	11.15
Southwestern Energy Company	4.26	3.52	2.69	3.53	1,124%	1,118%	1,156%	153%	157%	238%	5.94
Ultra Petroleum Corp.	2.35	(5.89)	22.39	(6.03)	(579%)	(580%)	58%	(136%)	(128%)	40%	6.58
Whiting Petroleum Corporation	20.89	18.49	11.70	18.49	(71%)	80%	203%	386%	490%	297%	11.53
WildHorse Resource Development Corporation	5.65	6.26	8.04	6.10	2,989%	2,139%	1,494%	905%	819%	857%	6.28
WPX Energy, Inc.	9.01	38.70	17.33	23.58	300%	233%	305%	(443%)	(33%)	112%	8.81
<b>All companies</b>	<b>\$ 4.71</b>	<b>\$ 20.73</b>	<b>\$ 12.30</b>	<b>\$ 15.72</b>	<b>128%</b>	<b>116%</b>	<b>164%</b>	<b>80%</b>	<b>85%</b>	<b>178%</b>	<b>\$ 11.31</b>
<b>Integrateds</b>	<b>\$ 0.70</b>	<b>\$ 33.20</b>	<b>\$ 20.46</b>	<b>\$ 22.96</b>	<b>141%</b>	<b>110%</b>	<b>106%</b>	<b>19%</b>	<b>12%</b>	<b>117%</b>	<b>\$ 14.60</b>
<b>Large independents</b>	<b>4.63</b>	<b>17.43</b>	<b>9.92</b>	<b>13.25</b>	<b>97%</b>	<b>103%</b>	<b>154%</b>	<b>99%</b>	<b>96%</b>	<b>192%</b>	<b>10.37</b>
<b>Independents</b>	<b>7.05</b>	<b>20.30</b>	<b>12.73</b>	<b>16.49</b>	<b>173%</b>	<b>148%</b>	<b>240%</b>	<b>82%</b>	<b>127%</b>	<b>197%</b>	<b>10.30</b>

(a) This includes transfers, reclassifications and others.

<sup>4</sup> See company endnotes on page 28.



## US – rankings and accounting method

	Total capital expenditures	Rankings for the latest fiscal year				Accounting method
		Oil reserves		Gas reserves		
		Beginning	Ending	Beginning	Ending	
Anadarko Petroleum Corporation	10	8	11	12	16	Successful efforts
Antero Resources Corporation	24	7	7	3	4	Successful efforts
Apache Corporation	22	17	18	24	26	Successful efforts
BHP Billiton Group	26	24	23	26	19	Successful efforts
BP p.l.c.	14	3	5	5	8	Successful efforts
Cabot Oil & Gas Corporation	40	46	47	4	6	Successful efforts
California Resources Corporation	46	19	19	37	37	Successful efforts
Carrizo Oil & Gas, Inc.	27	41	42	45	46	Full cost
Chesapeake Energy Corporation	17	12	21	8	7	Full cost
Chevron Corporation	4	5	3	14	11	Successful efforts
Cimarex Energy Co.	34	30	31	23	27	Full cost
CNX Resources Corporation <sup>3</sup>	41	44	46	9	9	Successful efforts
Concho Resources Inc.	15	21	20	21	20	Successful efforts
ConocoPhillips	11	2	2	7	12	Successful efforts
Continental Resources, Inc.	19	11	14	13	14	Successful efforts
Denbury Resources Inc.	47	28	39	50	50	Full cost
Devon Energy Corporation	23	13	12	10	10	Successful efforts
Diamondback Energy, Inc.	8	39	32	49	48	Full cost
Eclipse Resources Corporation	48	50	48	42	33	Successful efforts
Encana Corporation	30	32	37	30	45	Full cost
Energen Corporation	36	26	26	43	42	Successful efforts
EOG Resources, Inc.	7	4	4	15	15	Successful efforts
EP Energy Corporation	43	22	33	34	39	Successful efforts
EQT Corporation	2	37	34	2	1	Successful efforts
Extraction Oil & Gas, Inc.	29	40	43	39	40	Successful efforts
Exxon Mobil Corporation <sup>2</sup>	1	1	1	1	2	Successful efforts

<sup>2-3</sup> See company endnotes on page 28.

	Rankings for the latest fiscal year					Accounting method
	Total capital expenditures	Oil reserves		Gas reserves		
		Beginning	Ending	Beginning	Ending	
Gulfport Energy Corporation <sup>1</sup>	13	49	45	20	13	Full cost
Hess Corporation	33	20	17	38	34	Successful efforts
Linn Energy, Inc. <sup>4</sup>	50	35	44	19	28	Successful efforts
Marathon Oil Corporation	9	9	10	27	29	Successful efforts
Murphy Oil Corporation	44	27	35	47	49	Successful efforts
National Fuel Gas Company	49	48	49	22	21	Full cost
Newfield Exploration Company	32	25	24	25	25	Full cost
Noble Energy, Inc.	5	15	15	16	22	Successful efforts
Oasis Petroleum Inc.	42	29	41	41	43	Successful efforts
Occidental Petroleum Corporation	12	6	6	31	31	Successful efforts
Parsley Energy, Inc.	6	38	27	46	44	Successful efforts
PDC Energy, Inc.	39	36	36	32	32	Successful efforts
Pioneer Natural Resources Company	16	14	13	28	24	Successful efforts
QEP Resources, Inc.	20	23	25	17	23	Successful efforts
Range Resources Corporation	31	10	9	6	5	Successful efforts
Royal Dutch Shell plc	3	18	8	36	18	Successful efforts
RSP Permian, Inc.	18	34	30	48	47	Successful efforts
Sanchez Energy Corporation	25	42	40	40	36	Successful efforts
SM Energy Company	37	33	38	29	30	Successful efforts
Southwestern Energy Company	35	45	16	11	3	Full cost
Ultra Petroleum Corp.	45	47	50	18	17	Full cost
Whiting Petroleum Corporation	38	16	22	35	35	Successful efforts
WildHorse Resource Development Corporation	28	43	28	44	38	Successful efforts
WPX Energy, Inc.	21	31	29	33	41	Successful efforts

<sup>1,4</sup> See company endnotes on page 28.



# Peer groups

## Integrateds

BP p.l.c.  
Chevron Corporation  
Exxon Mobil Corporation  
Royal Dutch Shell plc

## Large independents

Anadarko Petroleum Corporation  
Antero Resources Corporation  
Apache Corporation  
BHP Billiton Group  
Cabot Oil & Gas Corporation  
Chesapeake Energy Corporation  
CNX Resources Corporation  
ConocoPhillips  
Continental Resources, Inc.  
Devon Energy Corporation  
EOG Resources, Inc.  
EQT Corporation  
Hess Corporation  
Marathon Oil Corporation  
Noble Energy, Inc.  
Occidental Petroleum Corporation  
Range Resources Corporation  
Southwestern Energy Company

## Independents

California Resources Corporation  
Carrizo Oil & Gas, Inc.  
Cimarex Energy Co.  
Concho Resources Inc.  
Denbury Resources Inc.  
Diamondback Energy, Inc.  
Eclipse Resources Corporation  
Encana Corporation  
Energen Corporation  
EP Energy Corporation  
Extraction Oil & Gas, Inc.  
Gulfport Energy Corporation  
Linn Energy, Inc.  
Murphy Oil Corporation  
National Fuel Gas Company  
Newfield Exploration Company  
Oasis Petroleum Inc.  
Parsley Energy, Inc.  
PDC Energy, Inc.  
Pioneer Natural Resources Company  
QEP Resources, Inc.  
RSP Permian, Inc.  
Sanchez Energy Corporation  
SM Energy Company  
Ultra Petroleum Corp.  
Whiting Petroleum Corporation  
WildHorse Resource Development Corporation  
WPX Energy, Inc.

# Appendix

## Acquired companies

Due to the significance of the operations of companies that were acquired during the study period, *Capital expenditures*, *Revenues and results of operations*, *Oil reserves and Gas reserves* schedules for the 2013-2016 period were updated to include activities prior to acquisition. This provides a more meaningful comparison throughout the study period.

In November 2017, Rice Energy Inc. was acquired by EQT Corporation. Rice Energy Inc.'s 2013 through 2016 results have been included in the above-mentioned schedules as applicable. The capital expenditures, revenues and results of operations, oil reserves and gas reserves reported by EQT Corporation for 2017 include activity related to the operations acquired from Rice Energy Inc. Rice Energy Inc.'s end-of-year gas reserves (4,005.3 bcf) have been included in 2017 beginning-of-year reserves with an equal volume included as sales in 2017 to reflect the acquisition.

In September 2016, Memorial Resource Development Corp. was acquired by Range Resources Corporation. Memorial Resource Development's 2012 through 2015 results have been included in the above-mentioned schedules as applicable. The capital expenditures, revenues and results of operations, oil reserves and gas reserves reported by Range Resources for 2016 and 2017 include activity related to the operations acquired from Memorial Resource Development. Memorial Resource Development's end-of-year 2015 oil reserves (201.7 million barrels) and gas reserves (1,435.3 bcf) have been included in 2016 beginning-of-year reserves with an equal volume included as sales in 2016 to reflect the Range Resources transaction.

In July 2015, Rosetta Resources was acquired by Noble Energy, Inc. Rosetta Resources' 2013 through 2014 results have been included in the above-mentioned schedules as applicable. The capital expenditures, revenues and results of operations, oil reserves and gas reserves reported by Noble Energy, Inc. for 2015 include activity related to the operations acquired from Rosetta Resources. Rosetta Resources' end-of-year 2014 oil reserves (172.5 million barrels) and gas reserves (655.1 bcf) have been included in 2015 beginning-of-year reserves with an equal volume included as sales in 2015 to reflect the Noble Energy, Inc. transaction.

For purposes of the peer group analysis, Memorial Resource Development, Rosetta Resources and Rice Energy Inc. are independents.

## Performance measures

The performance measures presented herein were calculated based on the companies' oil and gas reserve disclosure information. EY's methodology for calculating the performance measures is defined below:

- ▶ **Plowback percentage** represents total capital expenditures as a percentage of netback (revenues less production costs).
- ▶ **PRACs** are calculated as proved property acquisition costs divided by proved reserves purchased.
- ▶ **FDCs including revisions** are calculated as the sum of unproved property acquisition costs, exploration costs, development costs and identified related asset retirement obligation costs divided by the sum of extensions and discoveries, revisions and improved recovery of proved reserves. The calculation excludes the effect of proved reserves purchased.
- ▶ **FDCs excluding revisions** are calculated as the sum of unproved property acquisition costs, exploration costs, development costs and identified related asset retirement obligation costs divided by the sum of extensions and discoveries and improved recovery of proved reserves. The calculation excludes the effect of proved reserves purchased.
- ▶ **RRCs** are calculated as total capital expenditures divided by the sum of extensions and discoveries, revisions, improved recovery and purchases of proved reserves.
- ▶ **Production replacement rate (all sources)** is calculated as the sum of extensions and discoveries, improved recovery, revisions, purchases and sales of proved reserves divided by production.
- ▶ **Production replacement rate (F&D including revisions)** is calculated as the sum of extensions and discoveries, improved recovery and revisions of proved reserves divided by production.
- ▶ **Production replacement rate (F&D excluding revisions)** is calculated as the sum of extensions and discoveries and improved recovery of proved reserves divided by production.
- ▶ **Production costs** are calculated as production costs, including production taxes, and transportation costs divided by production.

Many individual companies calculate and report their own performance measures, and companies may use different methods that produce results different from those shown in this study.



## Data limitations

Users of this study should keep in mind the following limitations on the data presented:

- ▶ This study excludes government- and privately owned companies and smaller public companies.
- ▶ Individual companies did not prepare or review the compiled data presented in this report.
- ▶ Oil and gas companies that follow US generally accepted accounting principles (GAAP) are allowed to select either successful efforts accounting or full cost accounting for their oil and gas activities. Some companies included in this study follow US GAAP, while others follow International Financial Reporting Standards (IFRS) as adopted by their applicable country. These variations in standards can result in different results for some companies.
- ▶ Data for all companies may not be comparable because of differing interpretations or applications of reporting requirements.
- ▶ Oil and gas reserve estimates are imprecise and are revised as additional information about reserves becomes known.

## Other

The data included herein is obtained from Evaluate Energy and the individual companies' published annual reports. The study companies generally were determined based on data available from Evaluate Energy as of 15 March 2018. The data includes each year's original disclosures made by the companies. Restatements or other adjustments made to capital expenditures or revenues and results of operations data in subsequent years generally have not been incorporated herein. Unless otherwise indicated (such as in the company endnotes below for Linn Energy, LLC), restatements or other adjustments made to oil and gas reserve data are included in the "Other" component of the reserve tables, but these amounts are not included in the performance measure calculations. However, prior-period information for Apache Corporation for 2013 to 2015 and Sanchez Energy Corporation for 2015 to 2016, including the effects on calculated performance measures, has been revised to reflect its conversion to the successful efforts method from full cost method in 2016 and 2017 respectively.

Totals presented may not add due to rounding. All amounts are reported in US dollars.

Natural gas prices are quoted on an MMBtu basis, while gas reserves in this study are presented in bcf and tcf.

Certain amounts in this study are presented on a per BOE basis. Natural gas volumes are converted to barrels at a ratio of 6,000 cubic feet (mcf) to one barrel of oil. This ratio is generally viewed as being reflective of an approximate thermal equivalence between the two commodities, though some individual companies may use a different ratio for their internal performance metrics.

## Company endnotes

- <sup>1</sup> Gulfport Energy Corporation filings include only acquisition costs without further breakdown between proved and unproved properties. For our study purposes, Gulfport Energy Corporation acquisitions were included in the proved properties acquired category.
- <sup>2</sup> Amounts presented for Exxon Mobil Corporation include investments accounted for by the equity method. Oil rollforwards and computations based on oil volumes exclude NGLs, which are only reported on a worldwide basis.
- <sup>3</sup> In 2017, CNX Resources Corporation completed the spin-off of its coal business resulting in two independent, publicly traded companies: CONSOL Energy, a coal company, and CNX Resources Corporation, a natural gas E&P company. The 2013-2015 data for CNX Resources Corporation were obtained from CONSOL Energy filings.
- <sup>4</sup> Linn Energy, Inc. is the successor entity to Linn Energy, LLC, which declared bankruptcy in 2016. For consistency, the results of Linn Energy, Inc. are included for this entity for prior periods and for three-year average computations for Linn Energy, LLC. In addition, because of a deconsolidation event during 2016, opening 2016 oil and gas reserves have been adjusted to reflect the 2015 closing reserves, with a corresponding downward adjustment in the "Other" column to reduce the reserve volumes to opening reserves reported for 2016. This is intended to adjust for the deconsolidation event.
- <sup>5</sup> All of Rice Energy Inc.'s oil and gas reserves are included as gas reserves, as the company disclosed its reserves on a mcf-equivalent basis. Rice Energy Inc. was acquired by EQT Corporation during 2017. Refer to the note on acquired companies.

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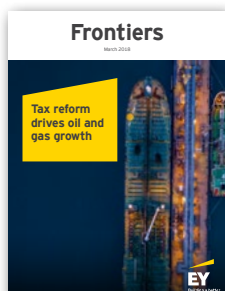
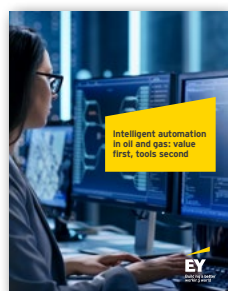
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