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Highlights from EY's US oil and gas reserves study

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The background of the slide is a photograph of an oil field at sunset. Several pumpjacks are silhouetted against a bright orange and yellow sky. The sun is visible on the right side, creating a lens flare effect. The ground is dark and flat, with some industrial structures and power lines visible in the distance. A red and white striped barrier is in the foreground.

Highlights from EY's US oil and gas reserves study

26 September 2017

Presenter



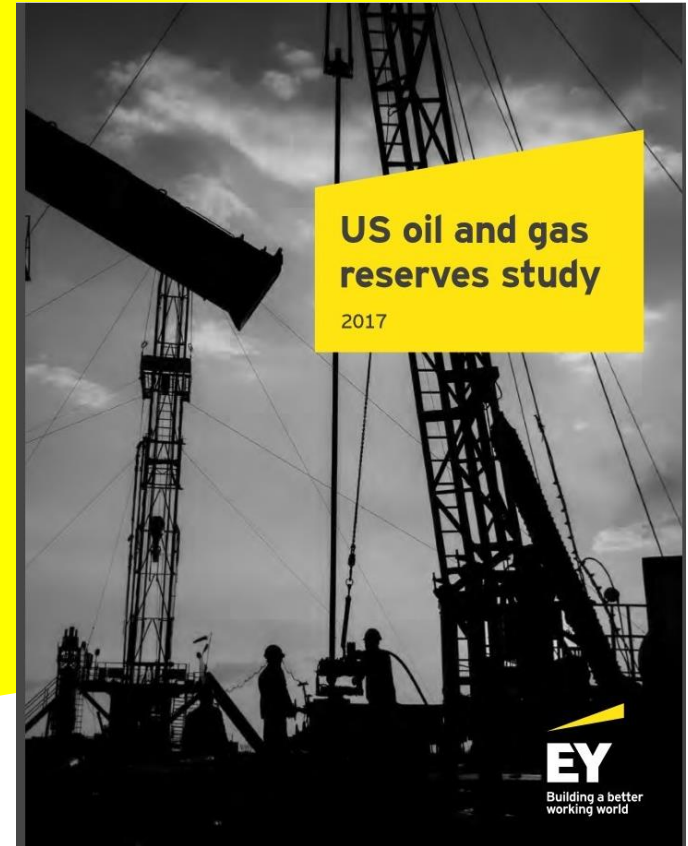
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Agenda

- **Overview**
- Reserves and production
- Revenue and results
- Capital expenditures
- Outlook

Study overview

Presents the US Exploration and Production (E&P) results for our study companies during the five-year period from 2012 - 2016

Capital expenditures (capex)

- ▶ Proved reserve acquisition costs (PRAC)
- ▶ Finding and development costs (FDC)
- ▶ Reserve replacement costs (RRC)

Revenues and results of operations

- ▶ Production costs per BOE
- ▶ Plowback percentage

Oil reserves

- ▶ Reserve roll-forward
- ▶ Production replacement rates

Gas reserves

- ▶ Reserve roll-forward
- ▶ Production replacement rates

Not good, but a little “less bad”

Study highlights

	2015	2016
Decline in capex ⁽¹⁾	(42%)	(27%)
Decline in revenue ⁽¹⁾	(41%)	(21%)
Property impairments ⁽²⁾	\$121.0 billion	\$20.0 billion
Downward oil reserve revisions	4.2 billion bbls	0.9 billion bbls
Decline in end-of-year oil reserves	(11.9%)	(2.0%)
Downward gas reserve revisions	41.0 Tcf	5.9 Tcf
Decline in end-of-year gas reserves	(20.6%)	(1.4%)

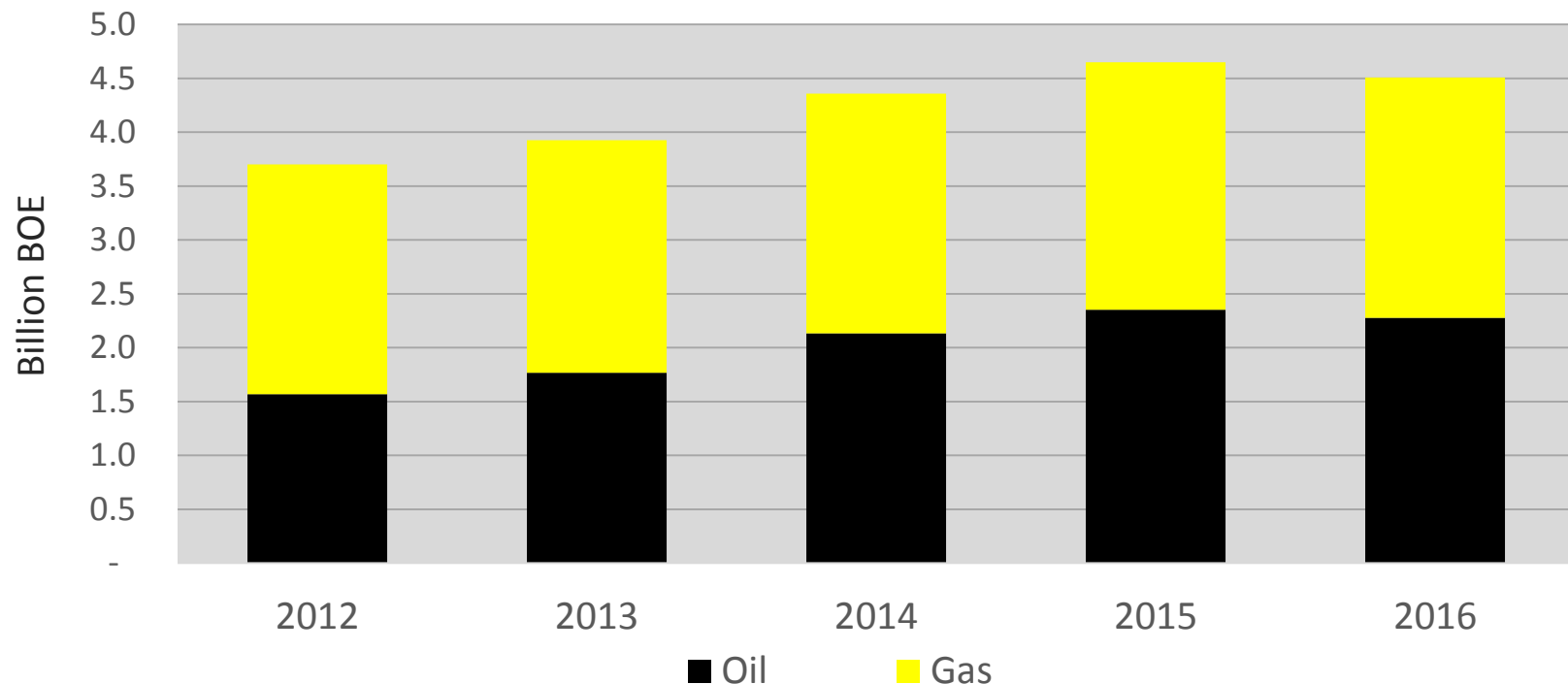
⁽¹⁾ Decline percentages are compared with the prior year. ⁽²⁾ Includes ceiling test charges.

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Production growth*

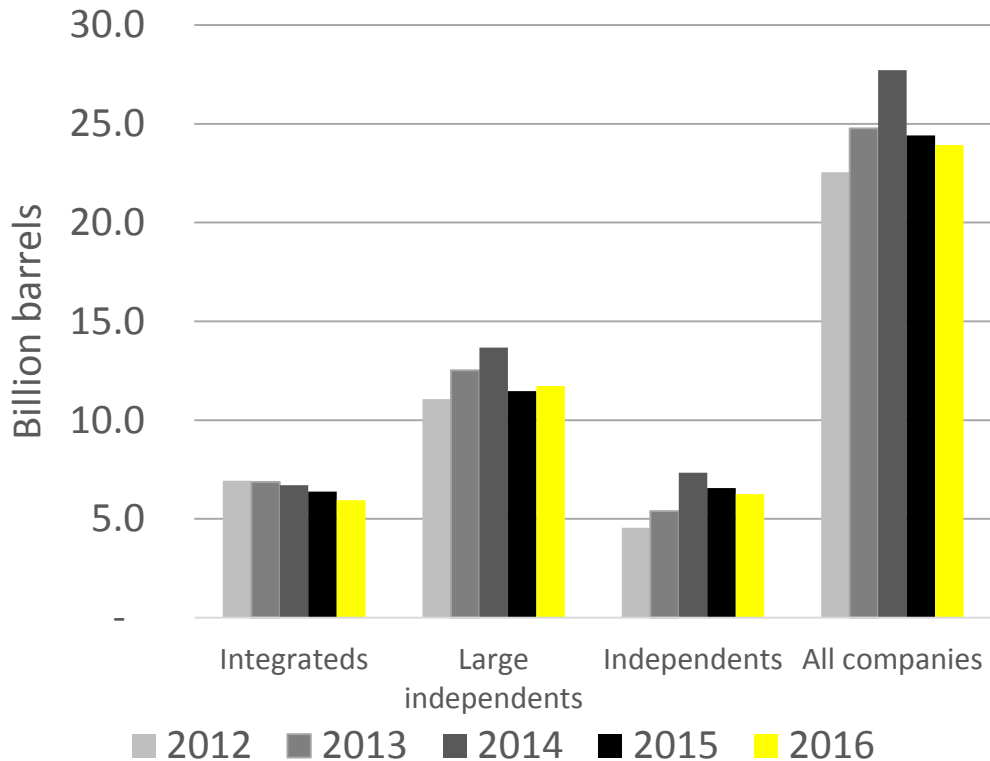
Despite a slight year-over-year decline in 2016, combined oil and gas production for our study companies grew an average of 5% per annum over the five-year period (2012-2016)



*Includes the 50 largest companies based on US end-of-year oil and gas reserve estimates. Activity related to acquired companies has also been included.

US – oil reserves*

End-of-year oil reserves

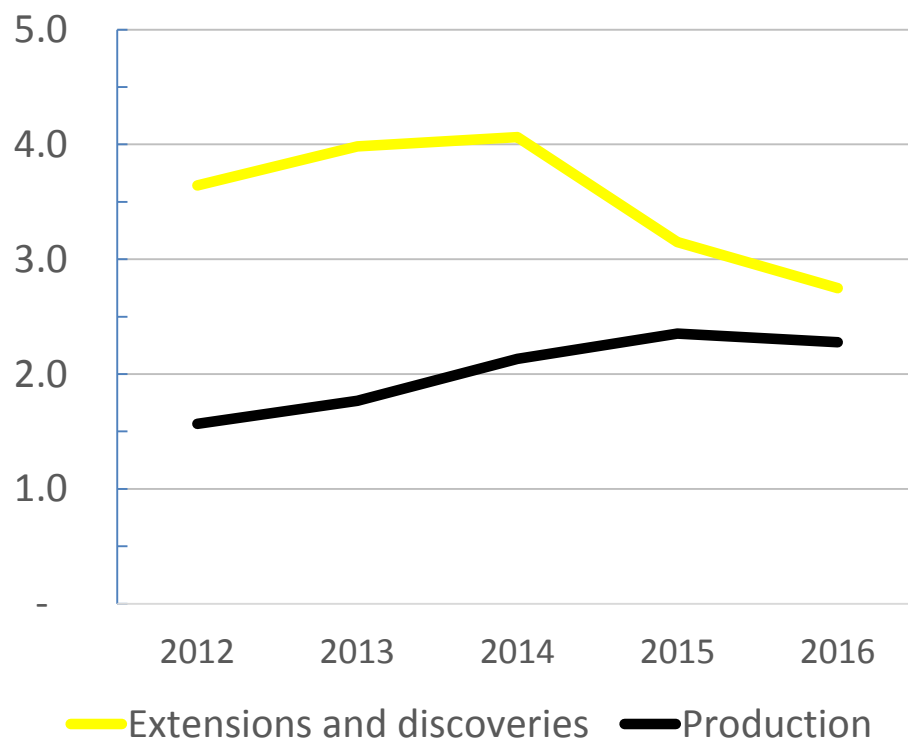


(million barrels)	2016
Beginning of year	24,414.9
Additions:	
Extensions and discoveries	2,747.8
Improved recovery	170.0
Revisions	(930.1)
Production	(2,276.8)
Purchases	862.3
Sales	(960.5)
Other	(110.9)
End of year	23,916.7

*Includes the 50 largest companies based on 2016 US end-of-year oil and gas reserve estimates. Activity related to acquired companies has also been included.

US – oil reserves*

Extensions and discoveries vs. production

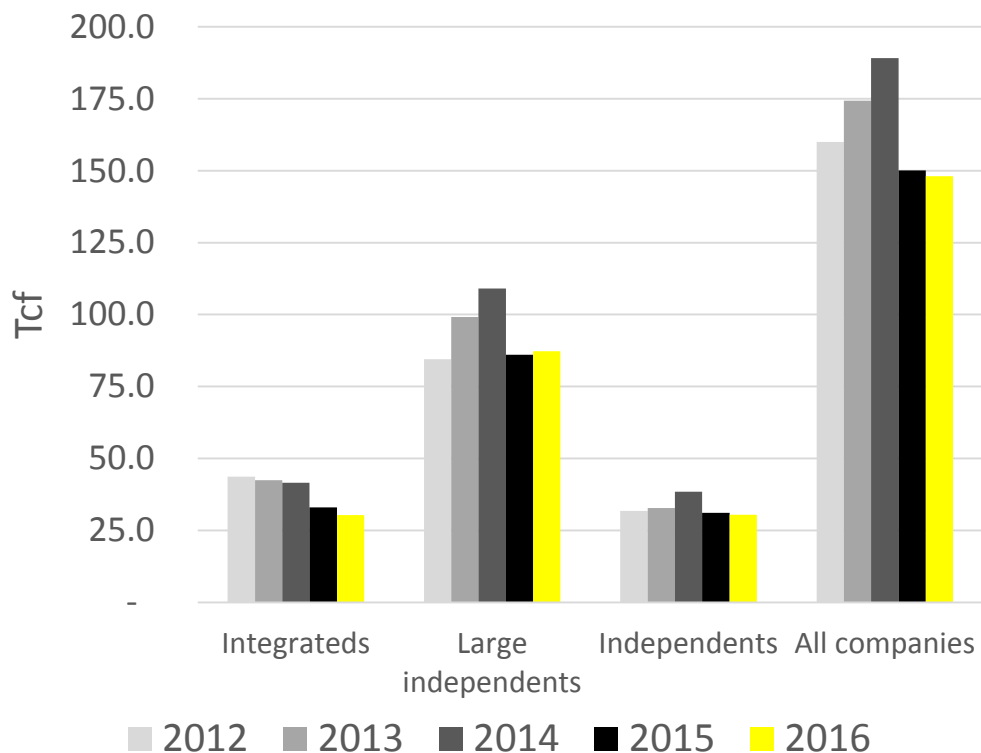


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US – gas reserves*

End-of-year gas reserves



(Bcf)	2016
Beginning of year	150,107.1
Additions:	
Extensions and discoveries	18,762.4
Improved recovery	609.0
Revisions	(5,890.3)
Production	(13,384.8)
Purchases	7,916.2
Sales	(9,685.5)
Other	(388.1)
End of year	148,046.0

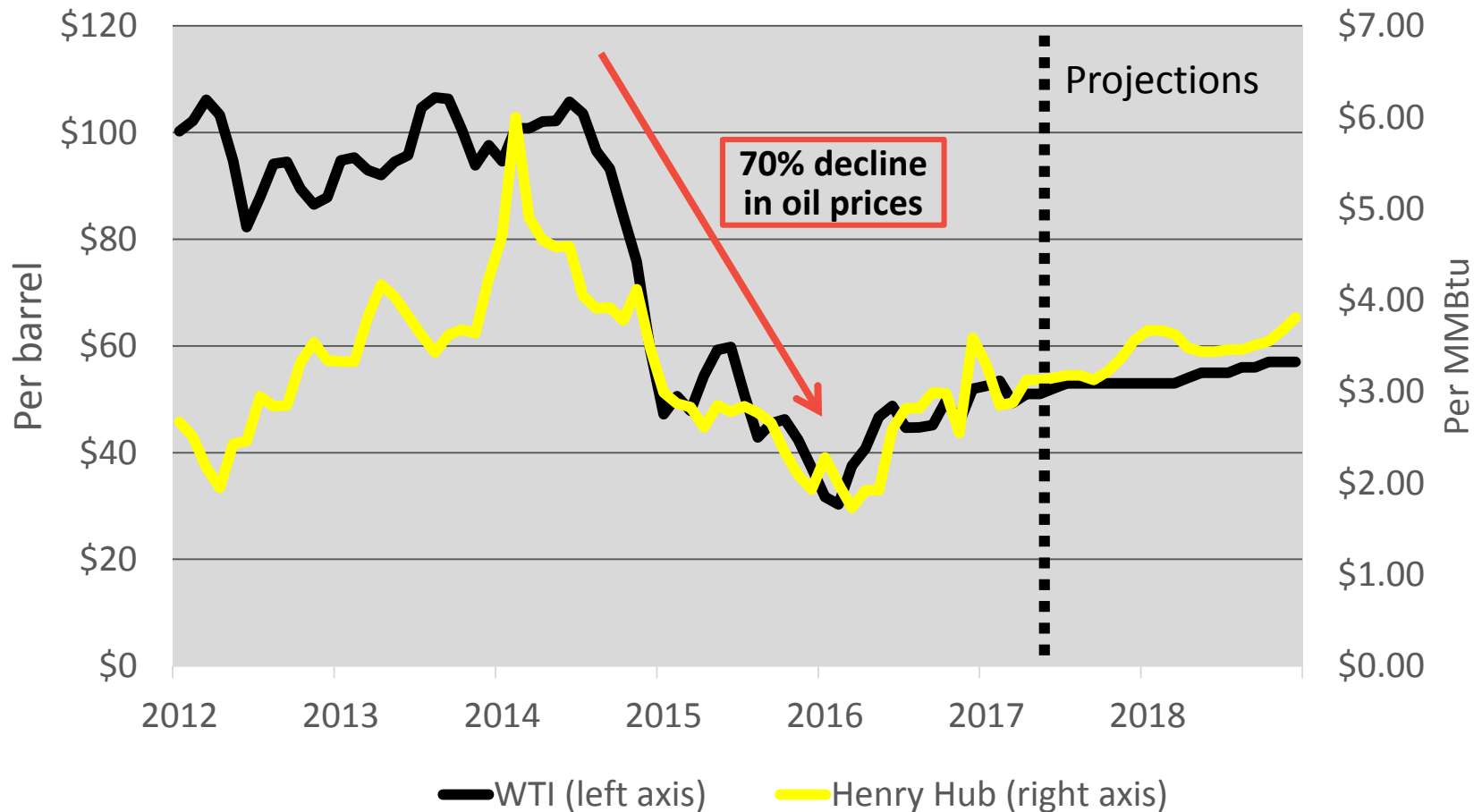
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- **Revenue and results**
- Capital expenditures
- Outlook

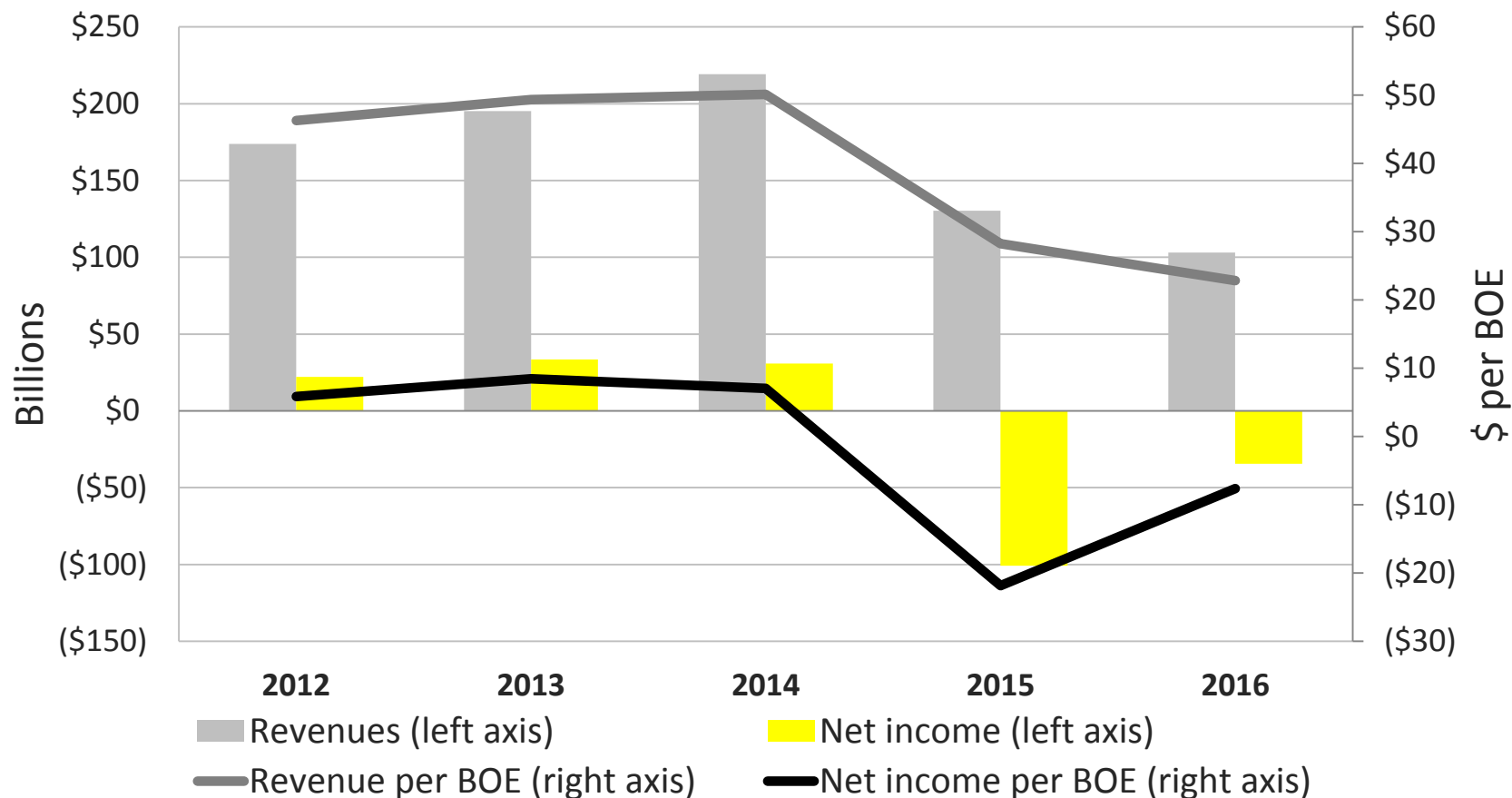
The “new normal”?

Crude and natural gas spot prices



Source: US Energy Information Agency

Revenues and results of operations*



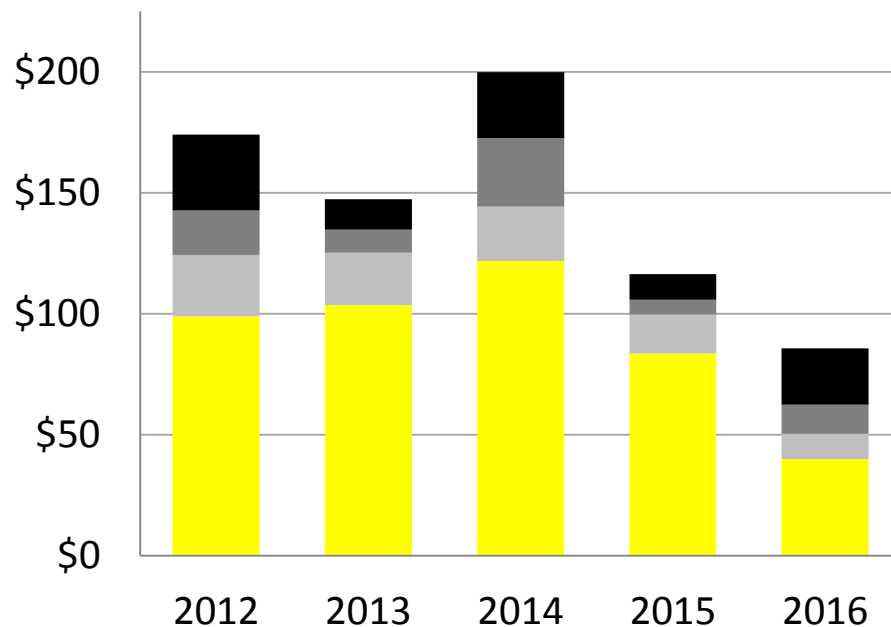
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Upstream capital expenditures*

Total US capital expenditures (\$ in billions)



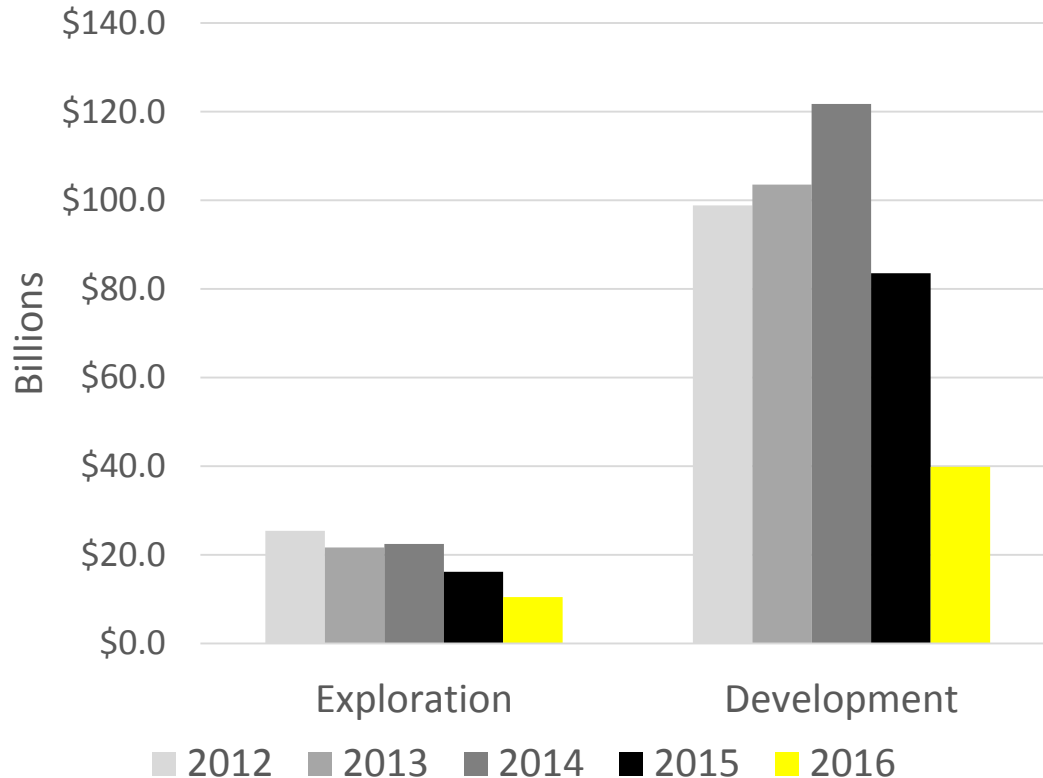
- Unproved properties acquired
- Proved properties acquired
- Exploration
- Development

	2014	2015	2016
Property acquisitions:			
Proved	\$ 28.3	\$ 6.0	\$ 12.0
Unproved	27.3	10.6	23.2
Exploration	22.5	16.2	10.5
Development	121.7	83.5	39.9
Other, rounding	0.4	0.3	0.1
Total	\$200.2	\$116.6	\$ 85.7

*Includes the 50 largest companies based on 2016 US end-of-year oil and gas reserve estimates. Activity related to acquired companies has also been included.

Exploration and development*

US exploration and development capex (\$ billions)



Net wells drilled

Exploratory

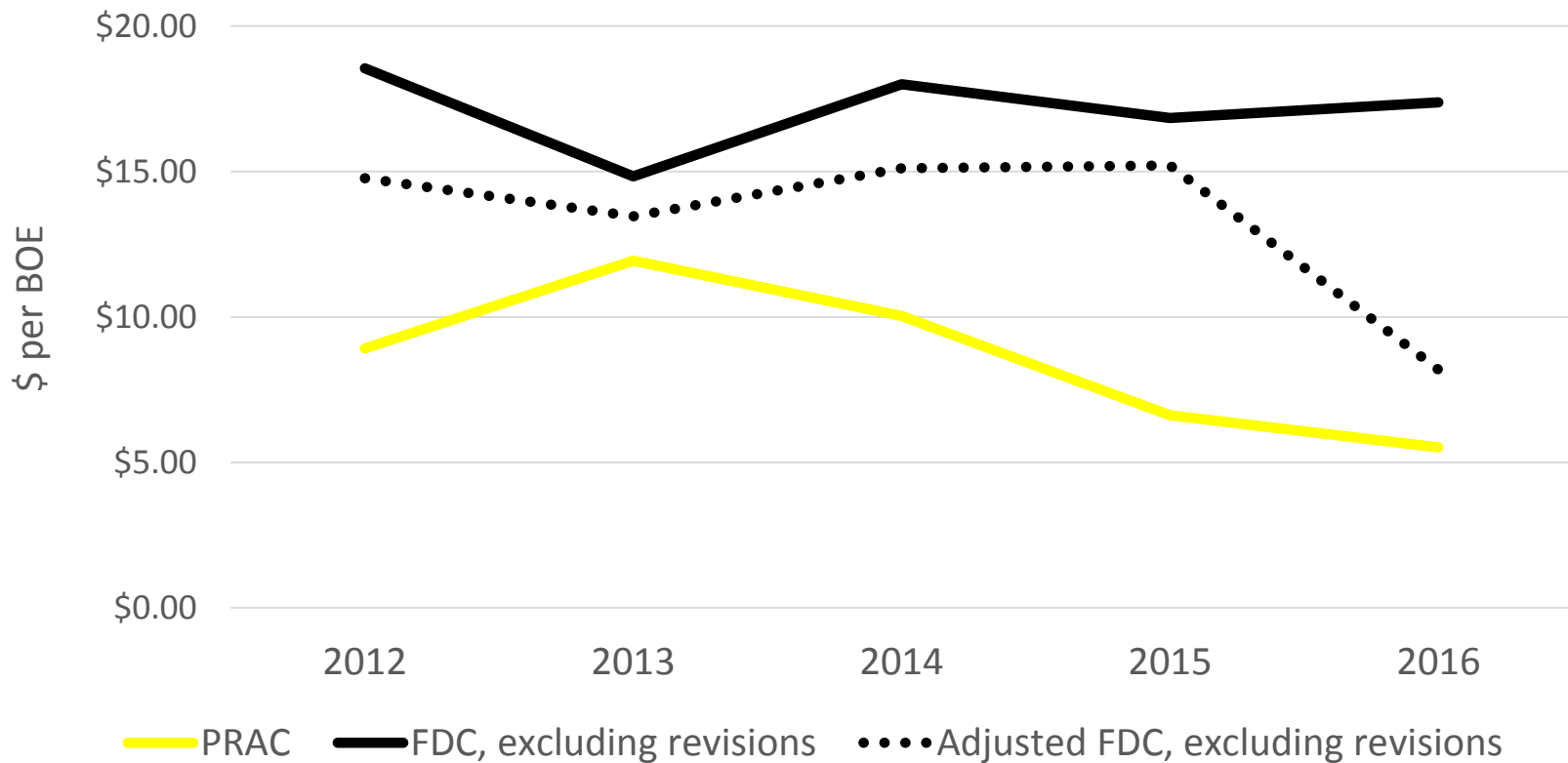
2015	1,005
2016	859
Decline	(15)%

Development

2015	10,579
2016	5,194
Decline	(51)%

*Includes the 50 largest companies based on 2016 US end-of-year oil and gas reserve estimates. Activity related to acquired companies has also been included.

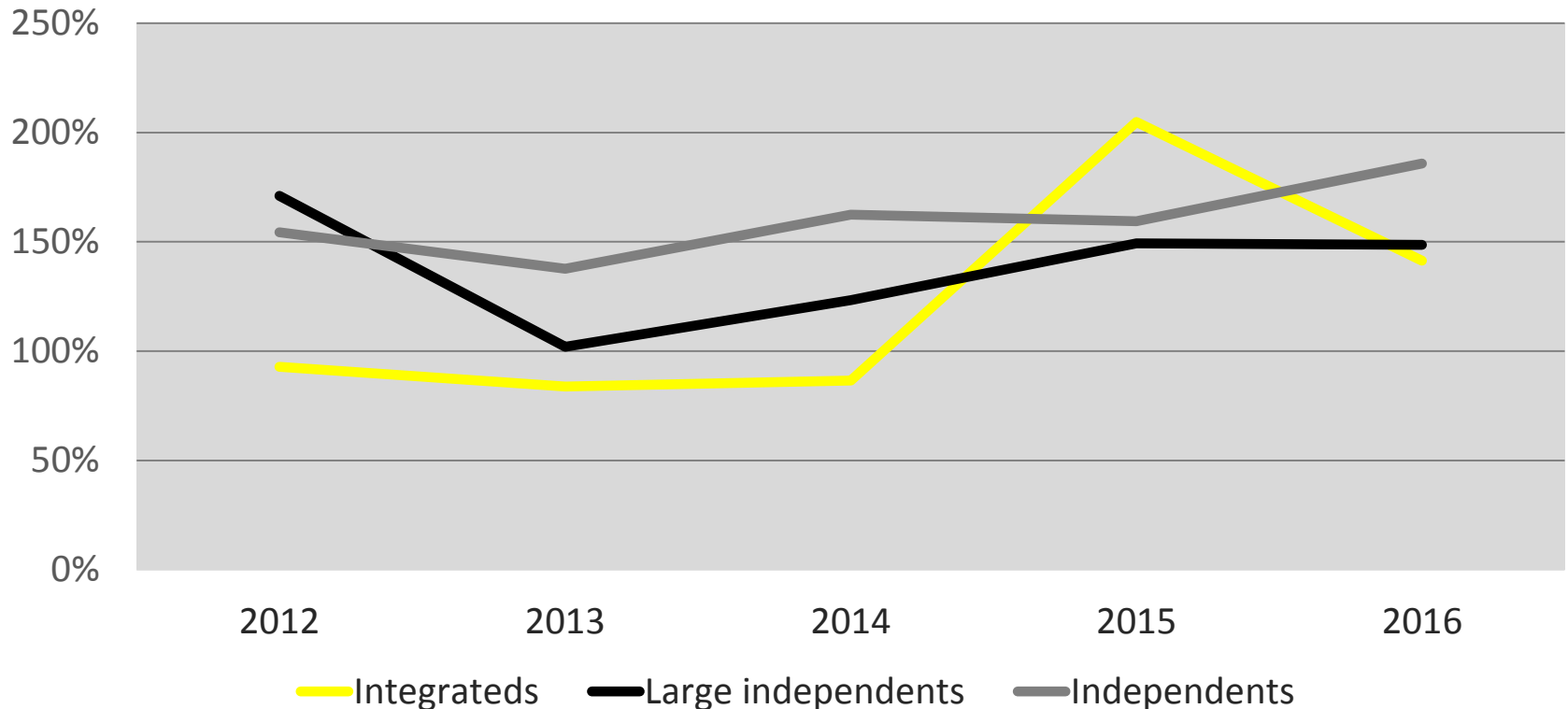
US proved reserve acquisition costs and finding and development costs per BOE*



*Includes the 50 largest companies based on 2016 US end-of-year oil and gas reserve estimates. Activity related to acquired companies has also been included.

US – plowback percentage*

Plowback percentage for all study companies was 158% in 2016.



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Industry outlook

Where are we now, and where are we going?

Quarterly oil spot prices (WTI) ⁽¹⁾

	2016	2017	% change
1Q	\$33.35	\$51.62	55%
2Q	\$45.46	\$48.10	6%
3Q	\$44.85	–	–
4Q	\$49.13	–	–

Half year oil spot prices (WTI) ⁽¹⁾

	Price	1H 2017 % change
1H 2017	\$49.85	–
2H 2016	\$46.98	6%
1H 2016	\$39.55	26%

Overall industry projections⁽¹⁾

Oil prices (per barrel)	\$49 (2017); \$50 (2018)
Oil production	4% growth (2017 compared with 2016)
Natural gas prices (per MMBtu)	\$3.10 (2017); \$3.40 (2018)
Gas production	1% growth (2017 compared with 2016)

⁽¹⁾Source: U.S. Energy Information Agency, spot prices for West Texas Intermediate crude and July 2017 *Short –Term Energy Outlook*

Key takeaways

“Down but not out”

- US tight oil and shale gas has been transformational.
- US producers are a critical part of the global story.
 - Despite lower capex, US producers remain committed.
- In the “era of abundance”, prices trend lower than recent history, and volatility is somewhat subdued, leading to the “new normal”.
 - Despite cutbacks, US production is still on the rise over the study period, and expected to surpass previous records.
 - Increases in demand or drops in other regional oil supply can be quickly met by US producers.
- Increasing efficiency to exploit resources is key.
 - Improving technology and techniques help cut costs.
 - Strategic site development is critical.