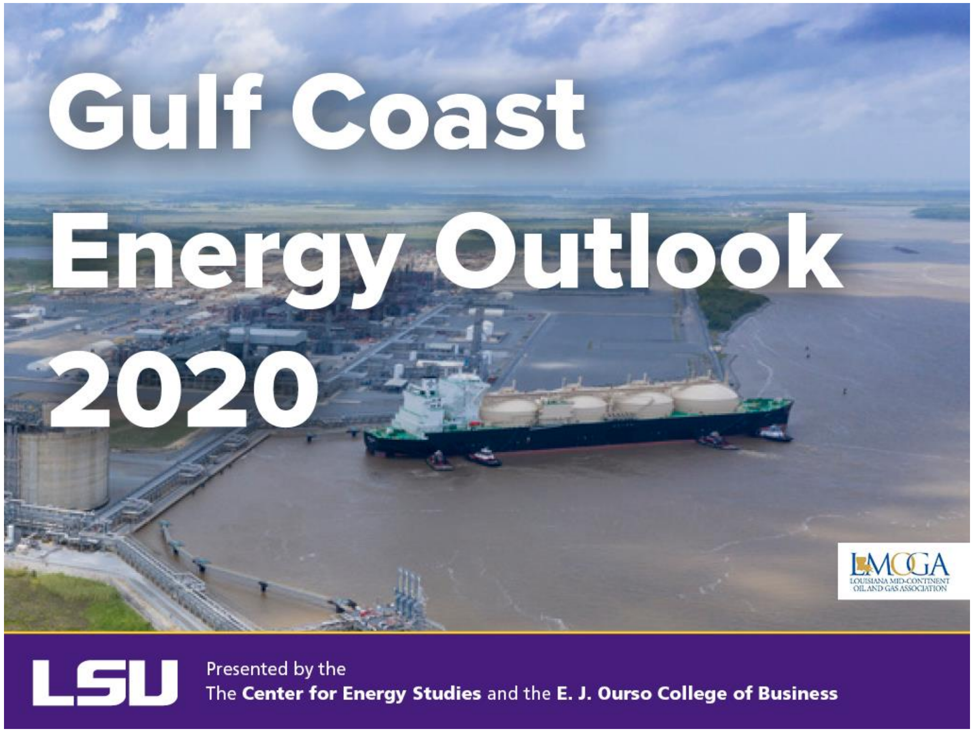
LSU | Center for Energy Studies

# 2020 Louisiana business climate outlook: the view from the energy sector.

*American Council of Engineering Companies Fall Conference, Baton Rouge, LA, November 21, 2019.*

David E. Dismukes, Ph.D.
Center for Energy Studies
Louisiana State University

## Gulf Coast Energy Outlook




### Platinum

LMOGA
LOUISIANA MID-CONTINENT OIL AND GAS ASSOCIATION

### Gold

PHILLIPS 66

### Silver

ENVERUS

### Bronze

Entergy

TJC GROUP

CAMERON PARISH
Port, Harbor & Terminal District

### Contributor

LED | LOUISIANA ECONOMIC DEVELOPMENT

## Takeaways....Challenges

- **Continued opportunities** for regional capital formation, resource development and investment at all aspects of the energy value chain.
- Large number of headwinds that are **creating uncertainty that is chilling economic activity** and could result in **substantial unanticipated negative outcomes for the energy sector**.

### UNCERTAINTIES FOR UPSTREAM ACTIVITY

- Current supply/demand balance and prices.
- Capital structure/finance.
- Drilling/price/output relationships

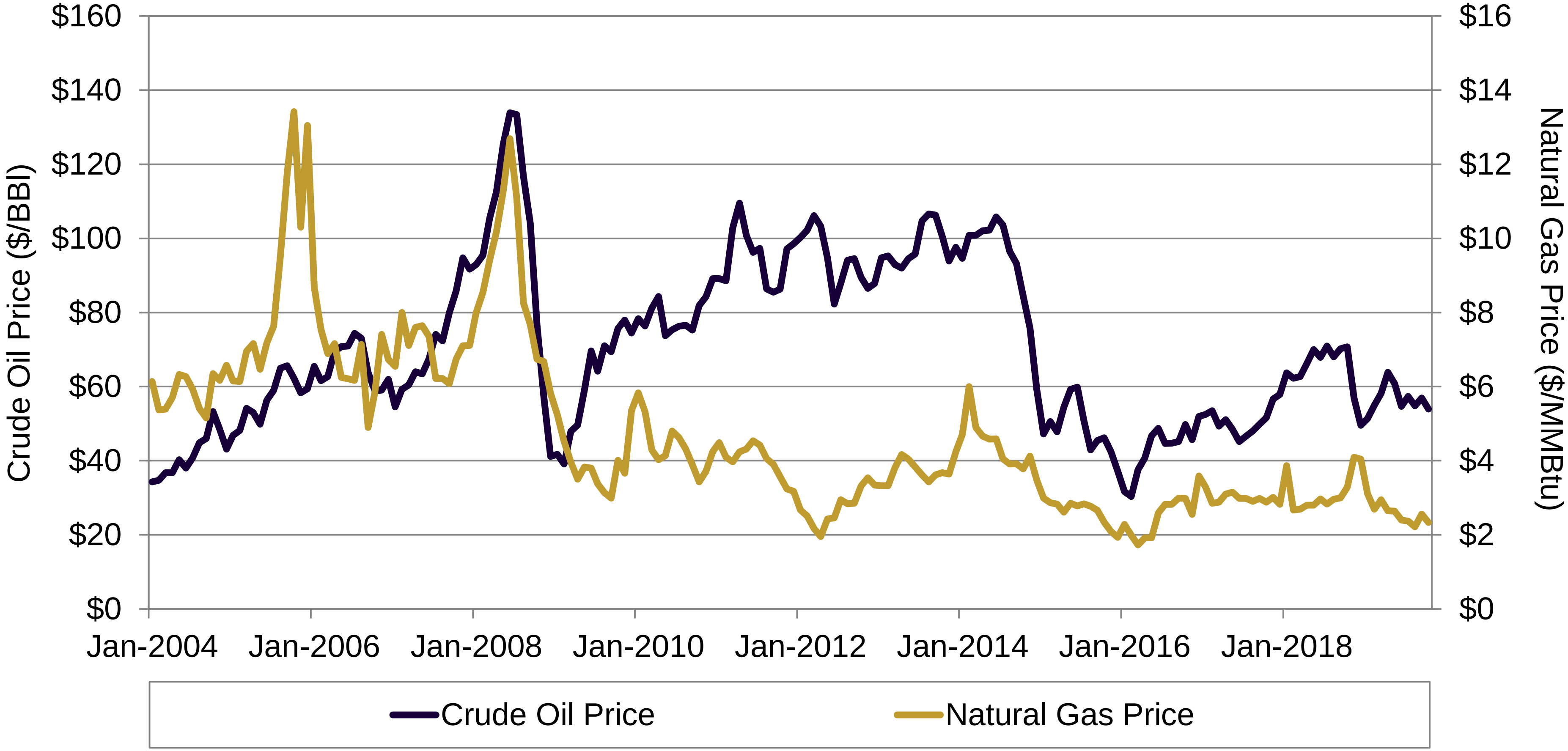
### UNCERTAINTIES FOR REFINING, PROCESSING AND EXPORT

- Trade disputes and economic growth.
- Exchange rates (U.S. monetary policy)
- Geopolitical issues
  - Iran instability and nuclear treaty
  - Saudi attacks and retaliation.
  - Hong Kong
  - Latin America

# Upstream challenges

## Natural gas and crude oil prices

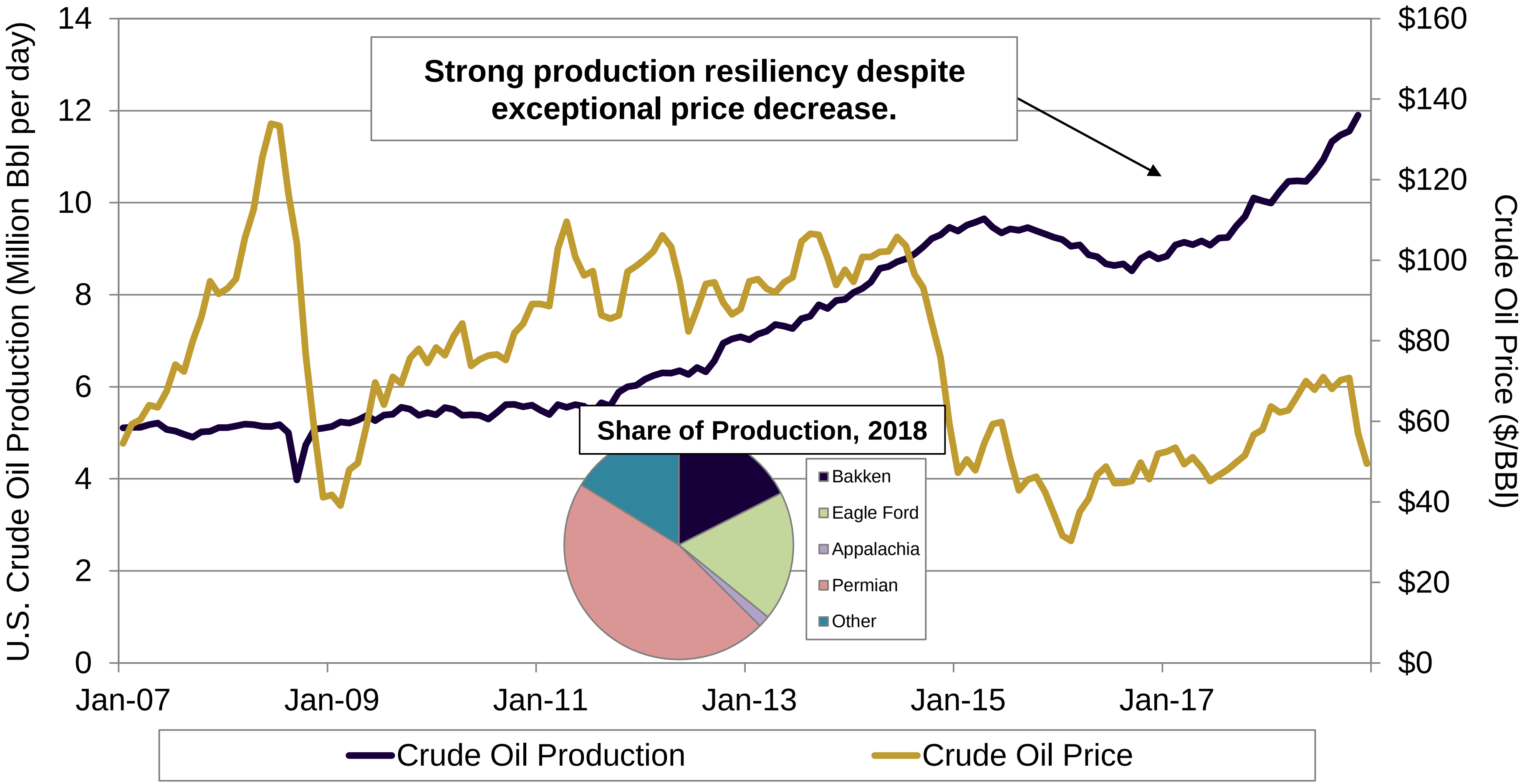
**Prices are starting to encroach on their 2014-2015 lows despite brief run up from summer 2017 to October 2018.**




Source: U.S. Energy Information Administration.

## Monthly U.S. crude oil production.

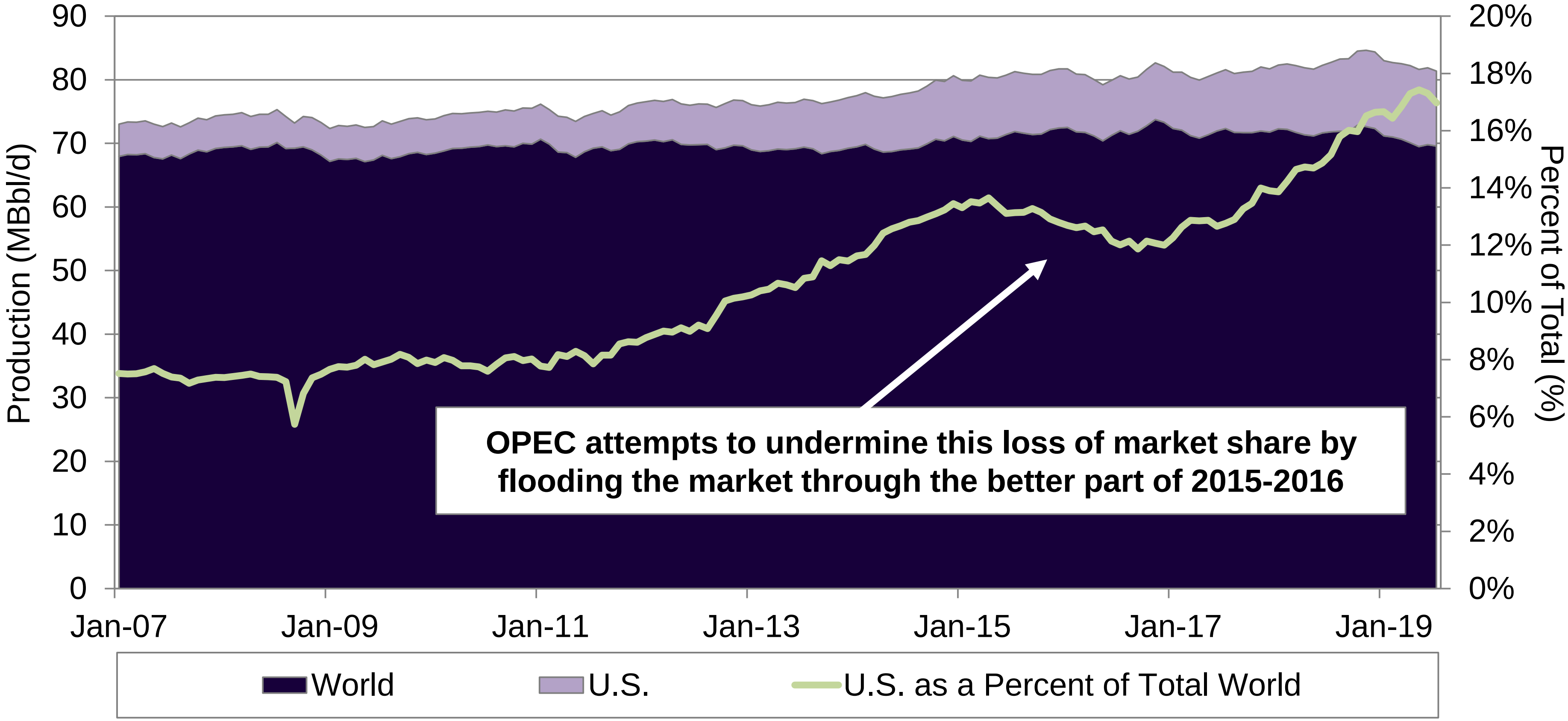
**U.S. crude oil production volumes are up by over 100 percent relative to historic trends.**




Source: U.S. Energy Information Administration.

## Monthly global and U.S. crude oil production.

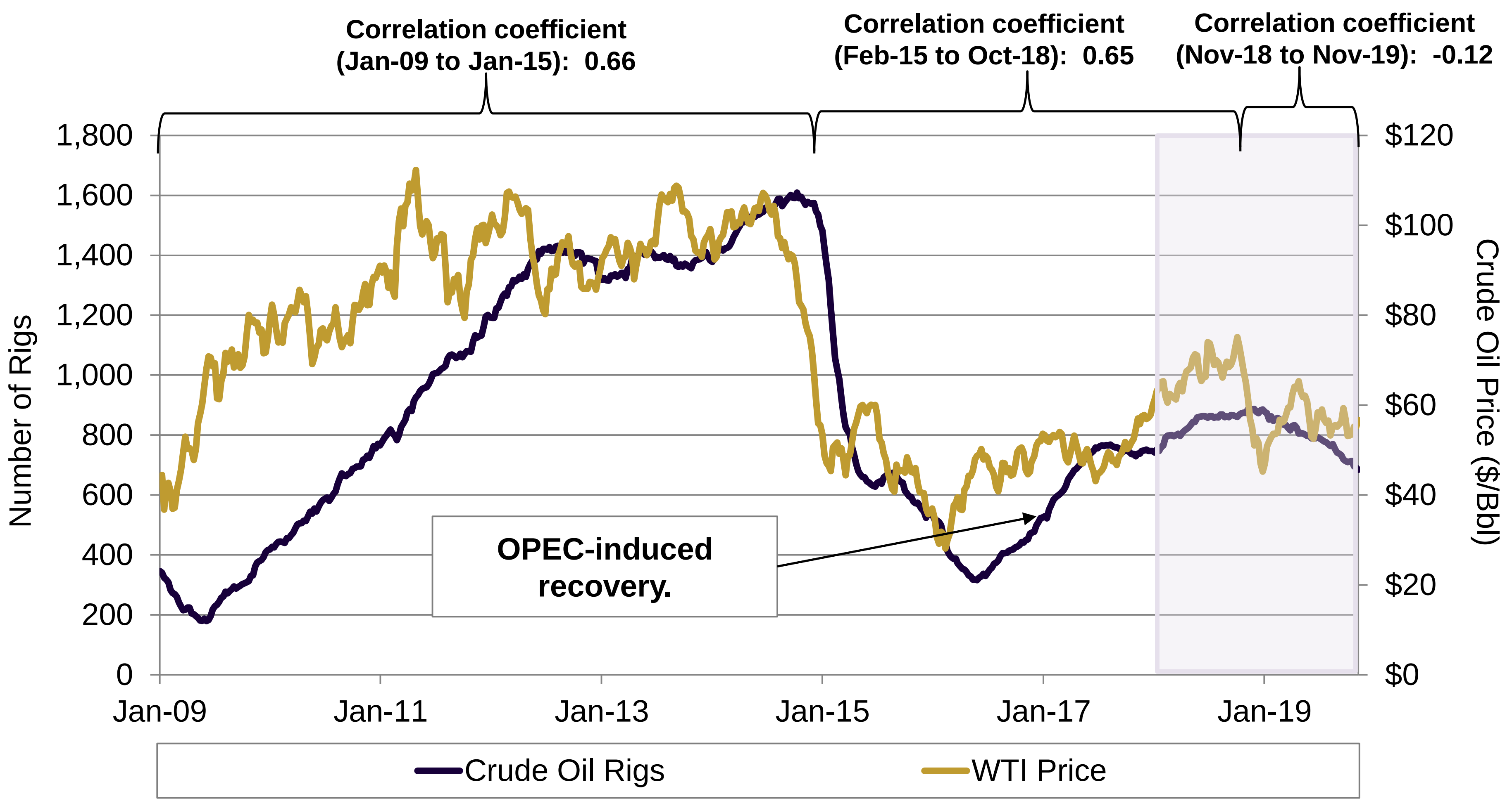
**In the last ten years, global crude oil production has increased at an average annual rate of 0.7 percent. The U.S. share has increased from seven percent to around 17 percent.**




Source: U.S. Energy Information Administration.

## U.S. crude oil prices and rig count

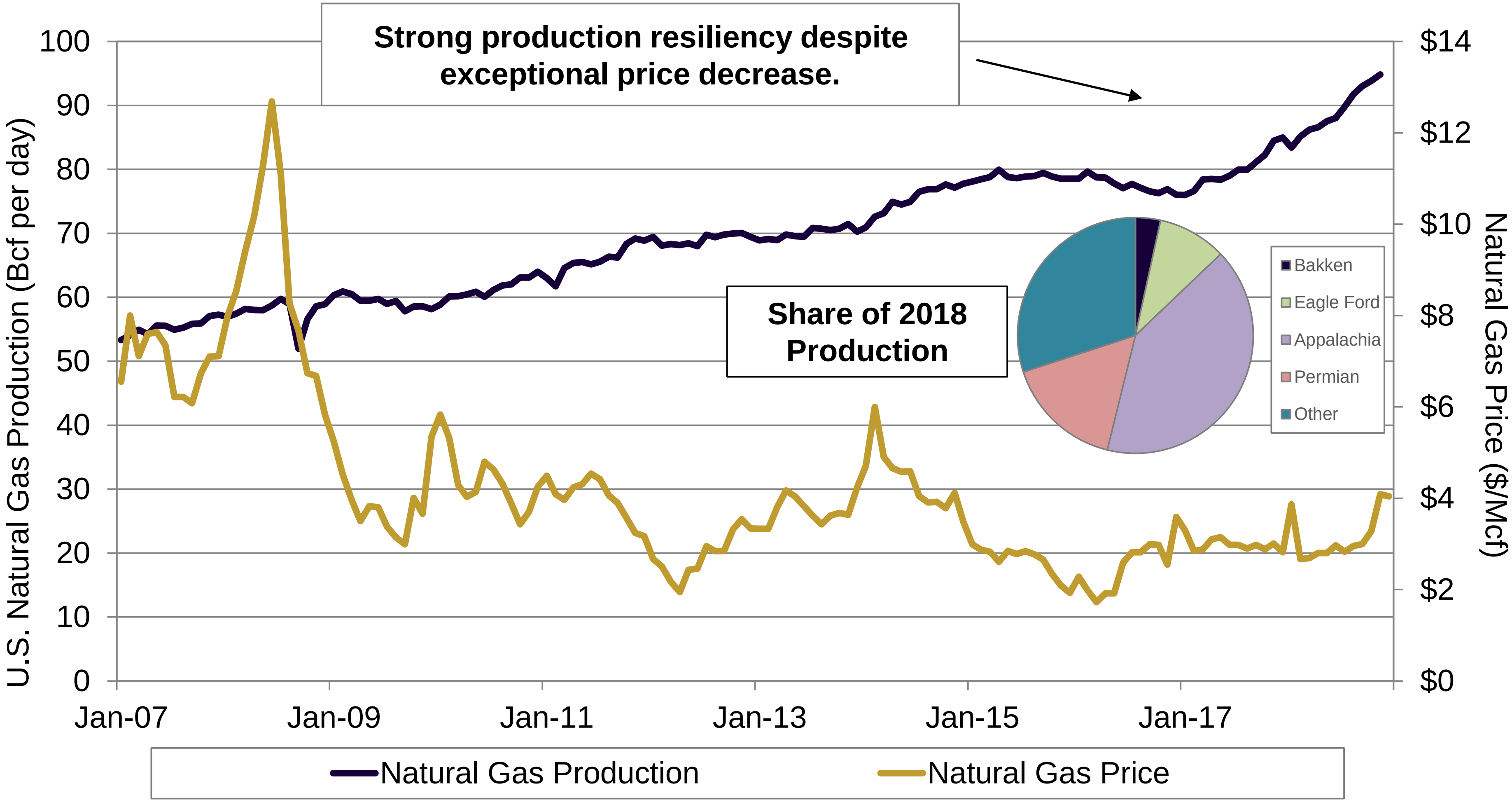
**Price/rig price responsiveness is weakening considerably since mid-year 2017 (shaded area).**




Source: U.S. Energy Information Administration; and Baker Hughes.

## Monthly U.S. natural gas production.

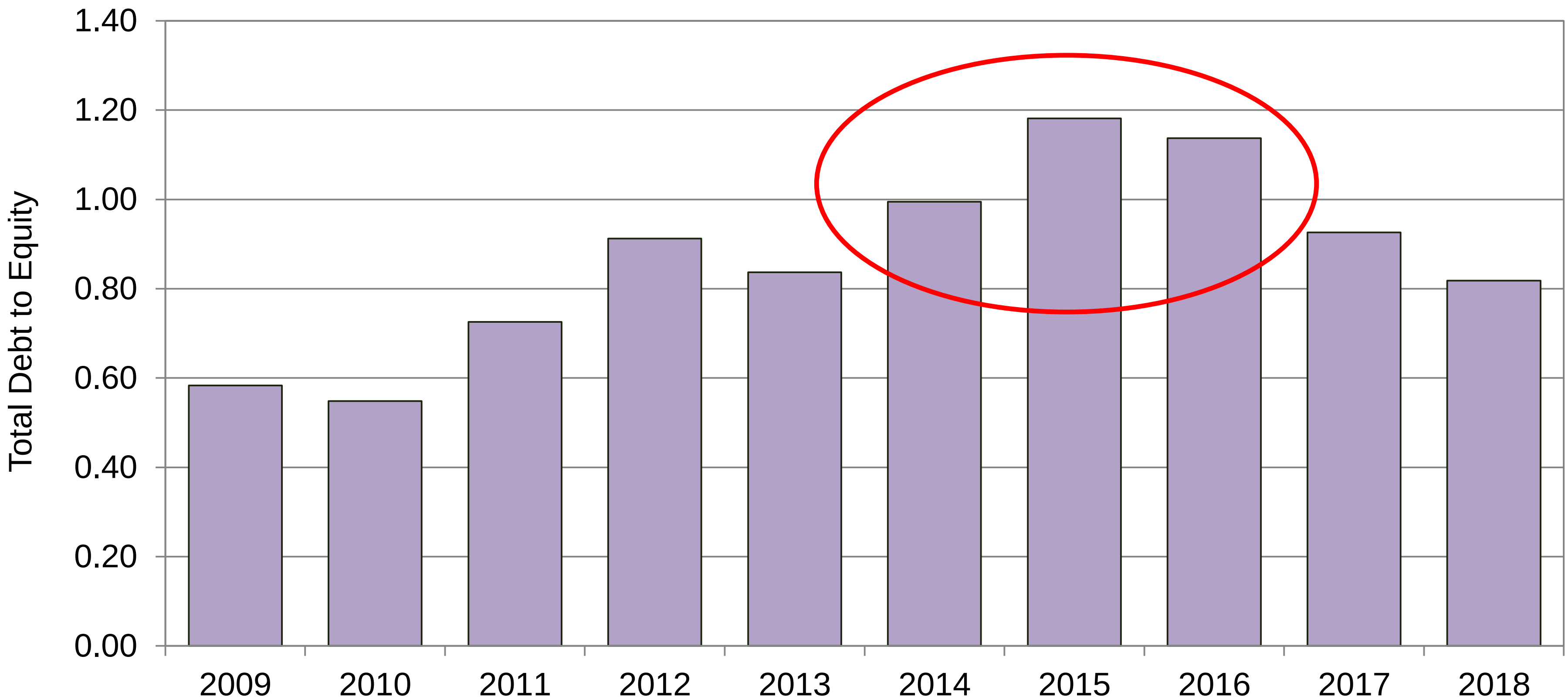
**U.S. natural gas production has increased 62 percent in the last 10 years.**




Source: U.S. Energy Information Administration.

## S&P Oil & Gas E&P Select Industry Index, total debt to equity

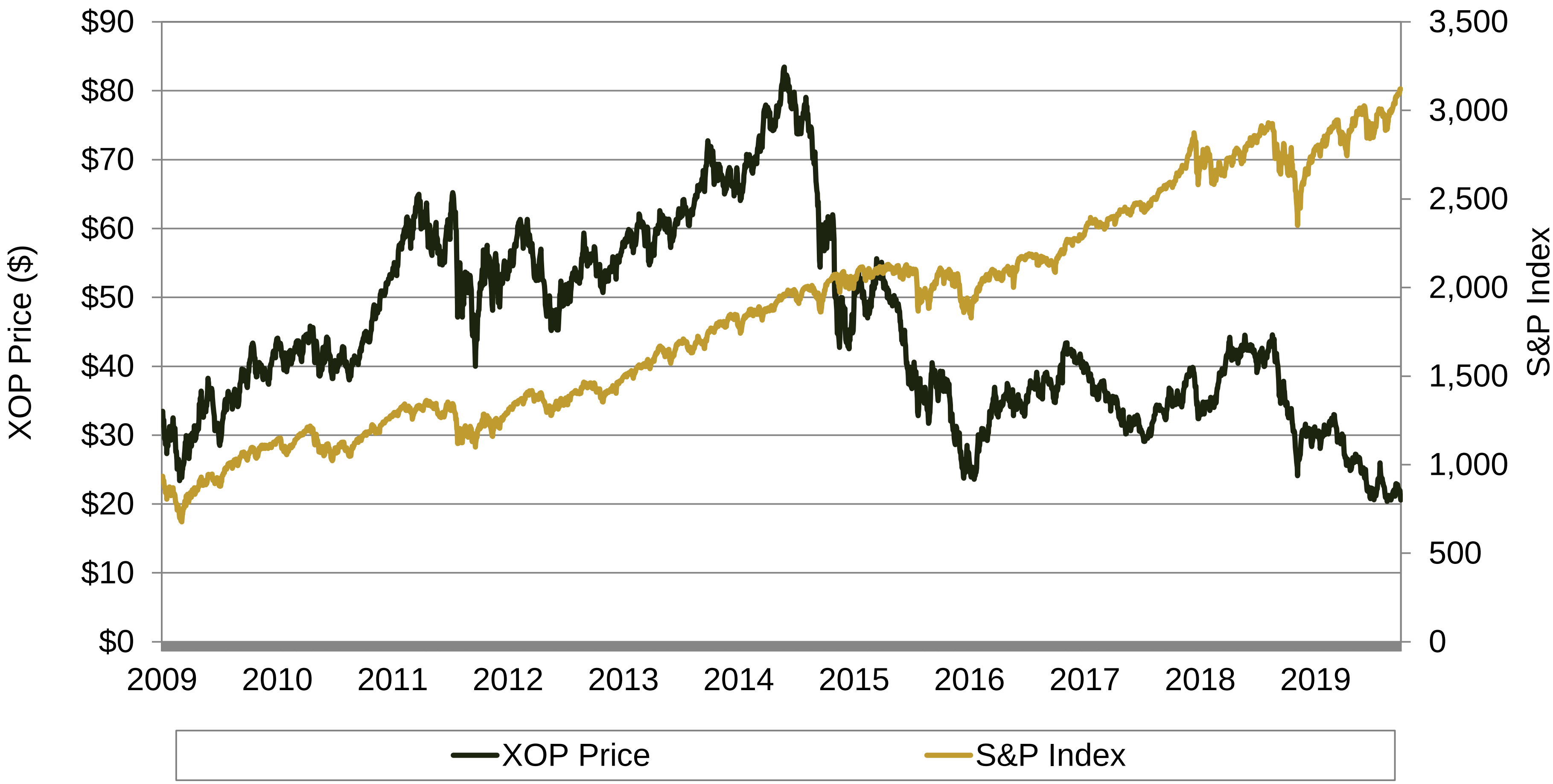
**Independent oil and gas sector D/E ratios have been building since 2009 and reached exceptionally high levels after the 2014 price crash.**




Note:
Source: S&P Global Capital IQ.

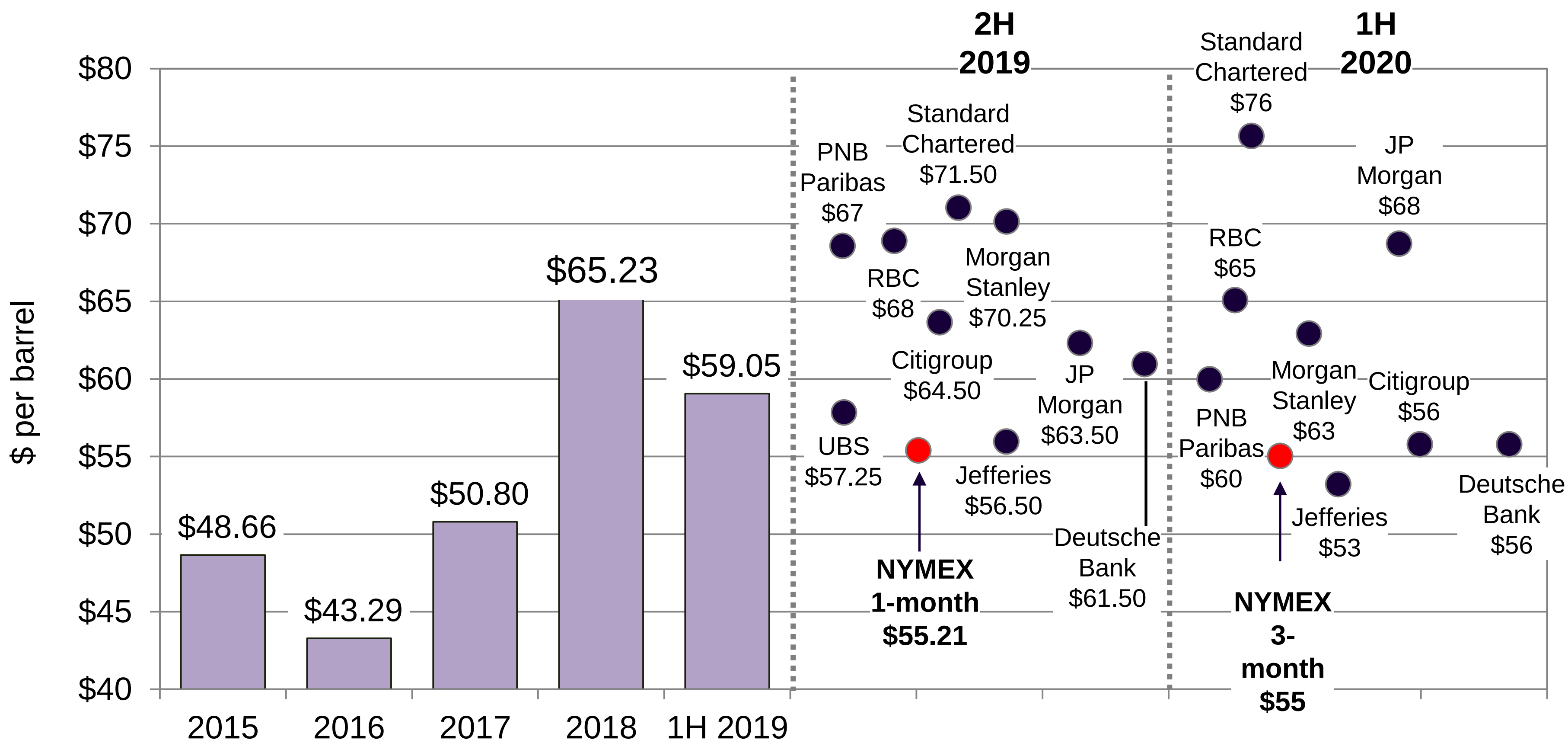
## XOP share price (S&P oil & gas exploration & production select industry index)

**Financial challenges are clearly obvious in these companies share price performance dating back to the price crash of 2014.**



## Crude oil price outlook (WSJ survey).

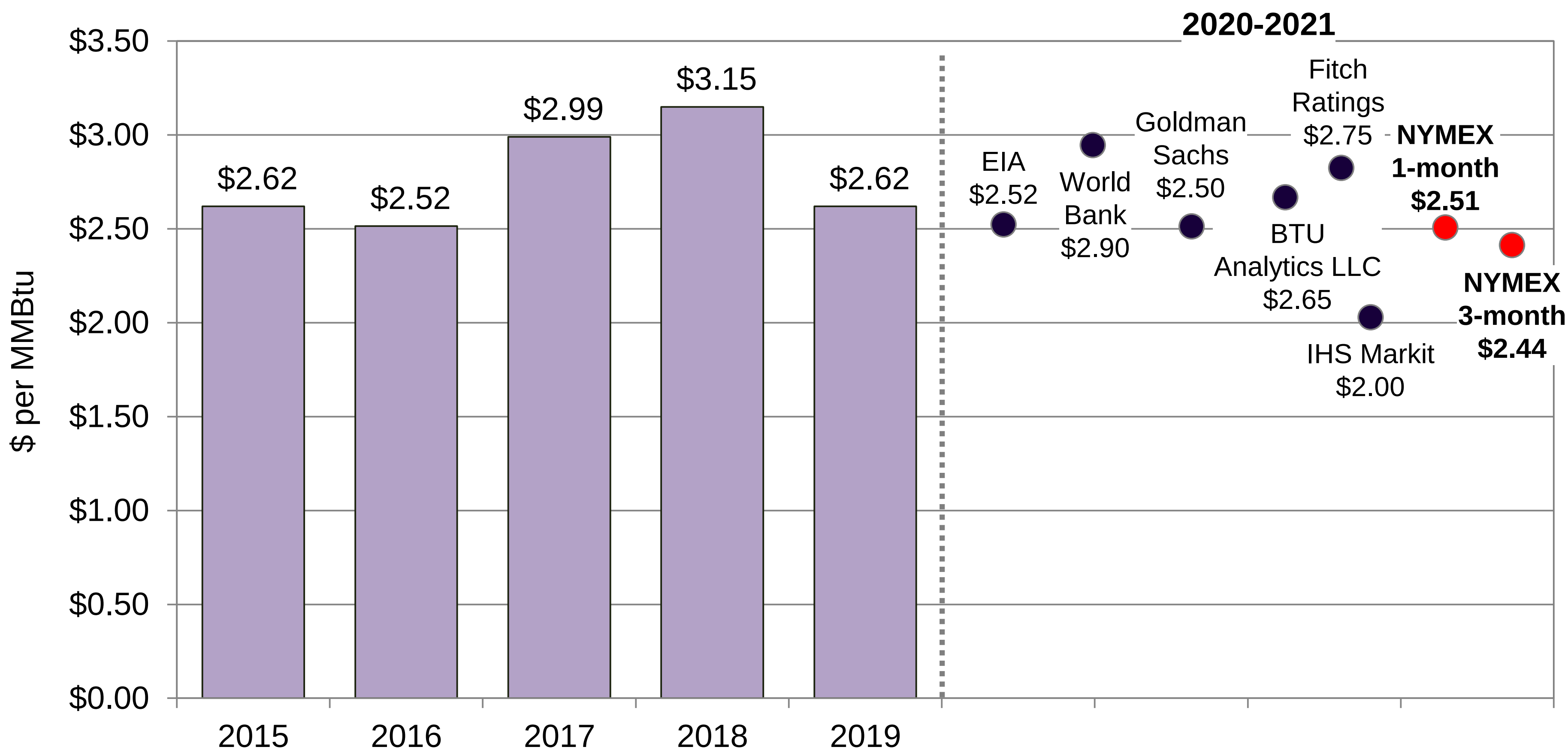
**Most crude oil price projections for the second half of 2019 and first half of 2020 are between $52 and $75 per barrel.**




Source: Wall Street Journal.

## Natural gas price outlook (WSJ survey).

Natural gas prices are **expected to drop below $3 per MMBtu** for the foreseeable future.




Source: Various tradepress articles.

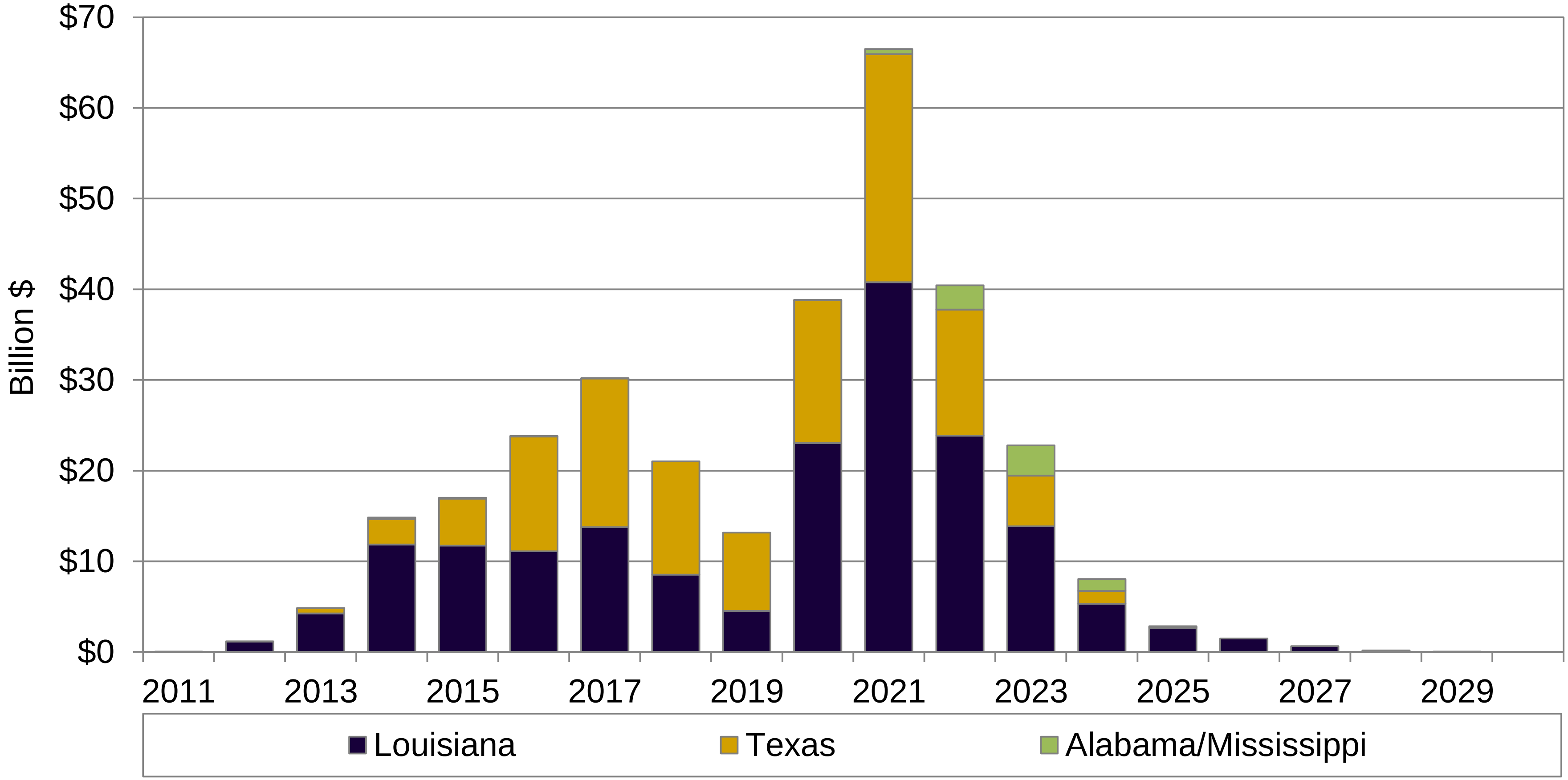
 

# Industrial and export challenges

## GOM energy manufacturing investments by state.

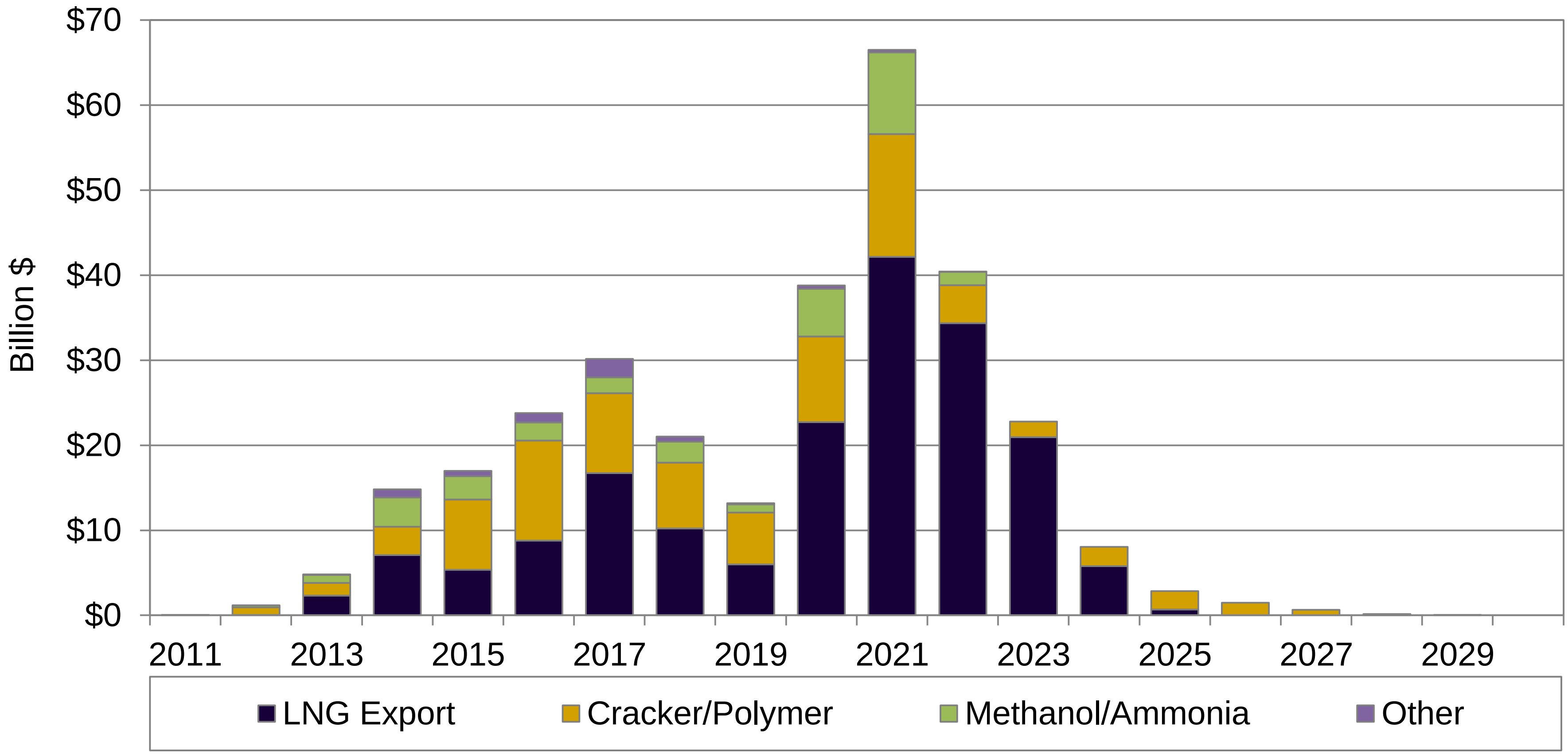
The continued low natural gas price outlook has facilitated considerable development of almost $308 billion: **$113 billion already completed (through 2018) and $195 billion remaining**, but heavily concentrated in LNG export facilities.




Source: David E. Dismukes (2013). *Unconventional Resources and Louisiana's Manufacturing Development Renaissance*. Baton Rouge, LA: Louisiana State University, Center for Energy Studies and author's updates.

## GOM energy manufacturing investments by sector.

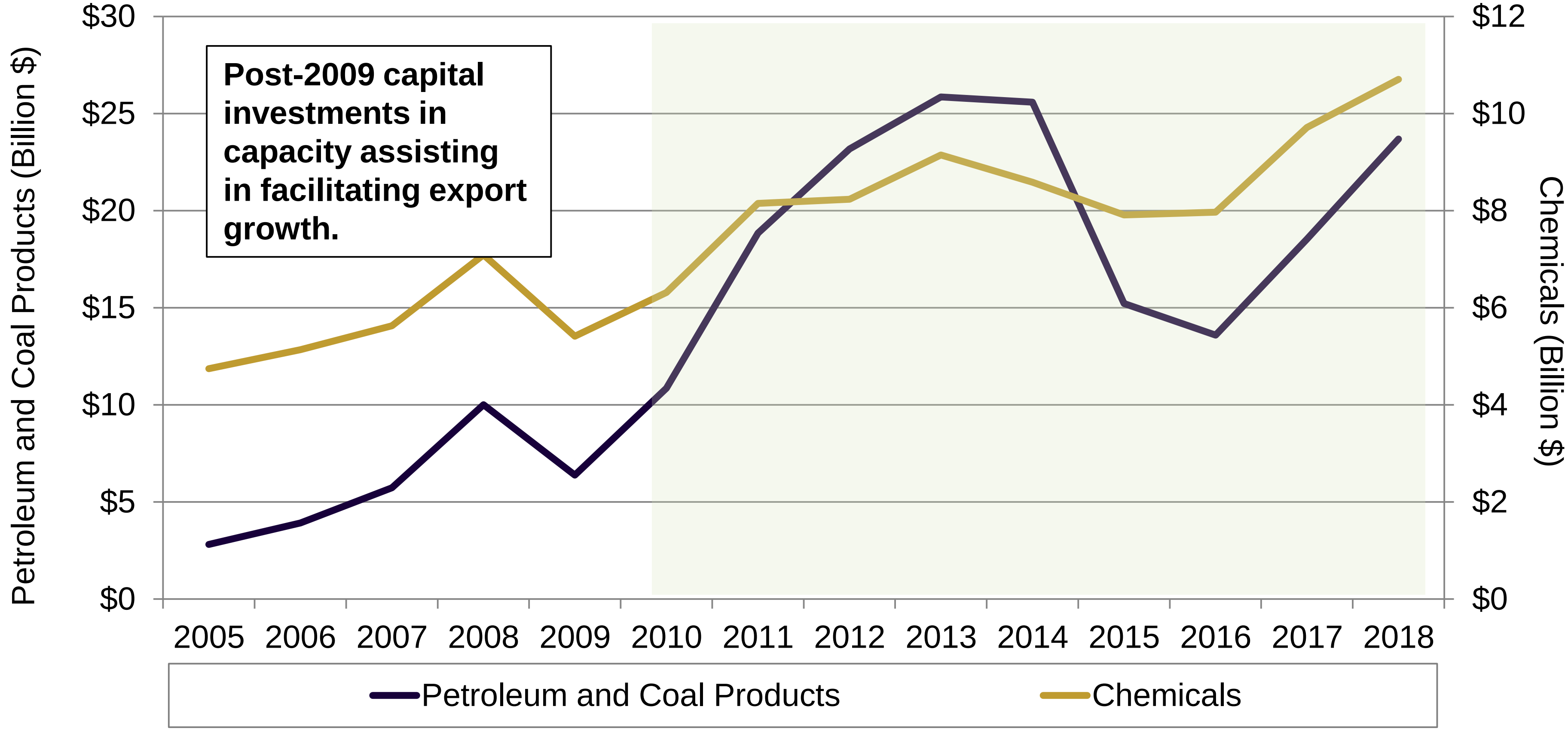
Prior to 2019, **LNG investments accounted for $55 billion (45 percent)** of all capital investments along the Gulf Coast. Olefins (cracker) and other petrochemical-based investments accounted for $43 billion (38 percent).




Source: David E. Dismukes (2013). *Unconventional Resources and Louisiana's Manufacturing Development Renaissance*. Baton Rouge, LA: Louisiana State University, Center for Energy Studies and author's updates.

## Louisiana exports (chemicals and refined product).

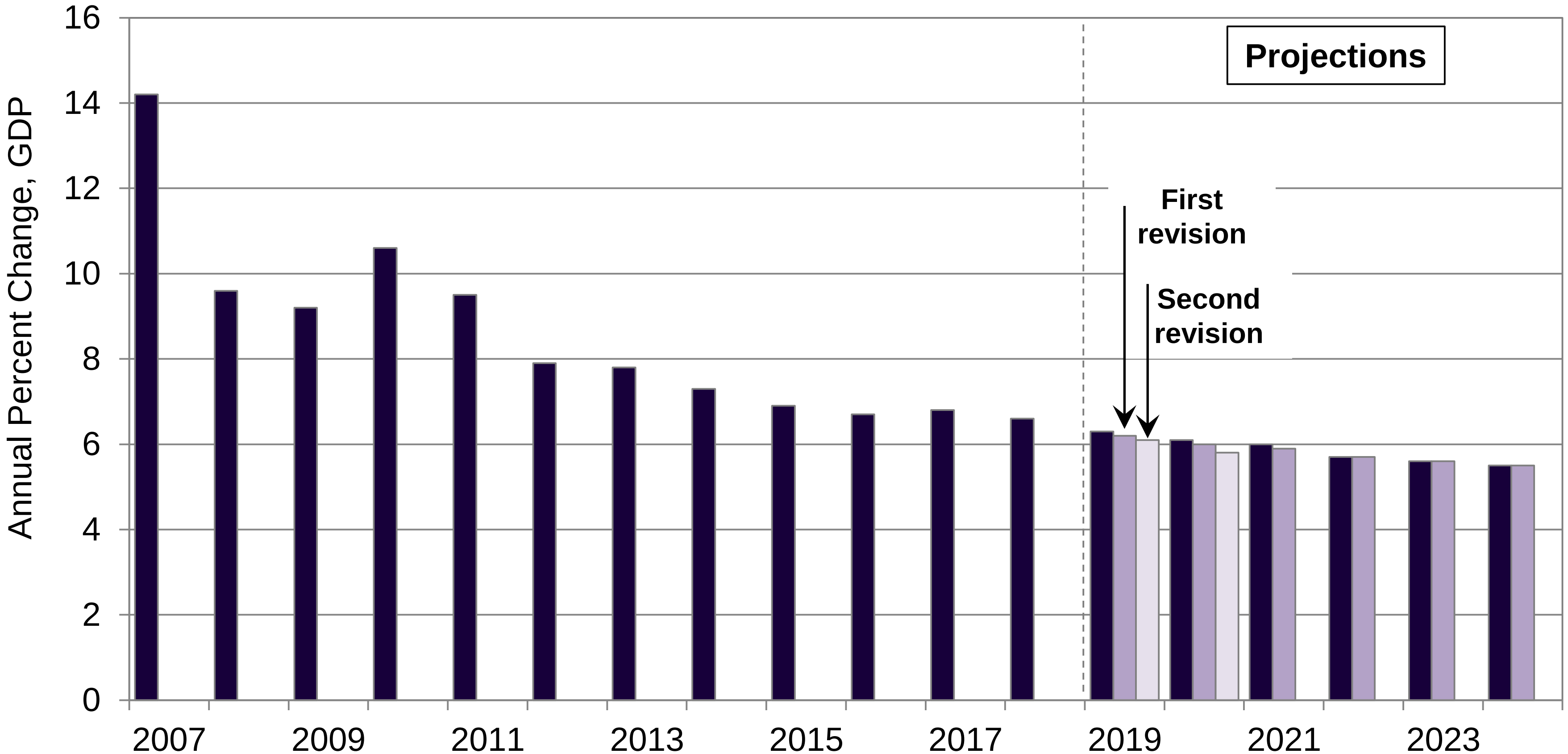
Louisiana exports of petroleum and coal products **increased 374 percent** between 2009 and 2014, fell in 2015-2016, but have since rebounded. **Chemical exports have increased 270 percent since 2009.** All facilitated by new capacity investments.




Source: International Trade Administration

## Changes in Chinese GDP forecasts.

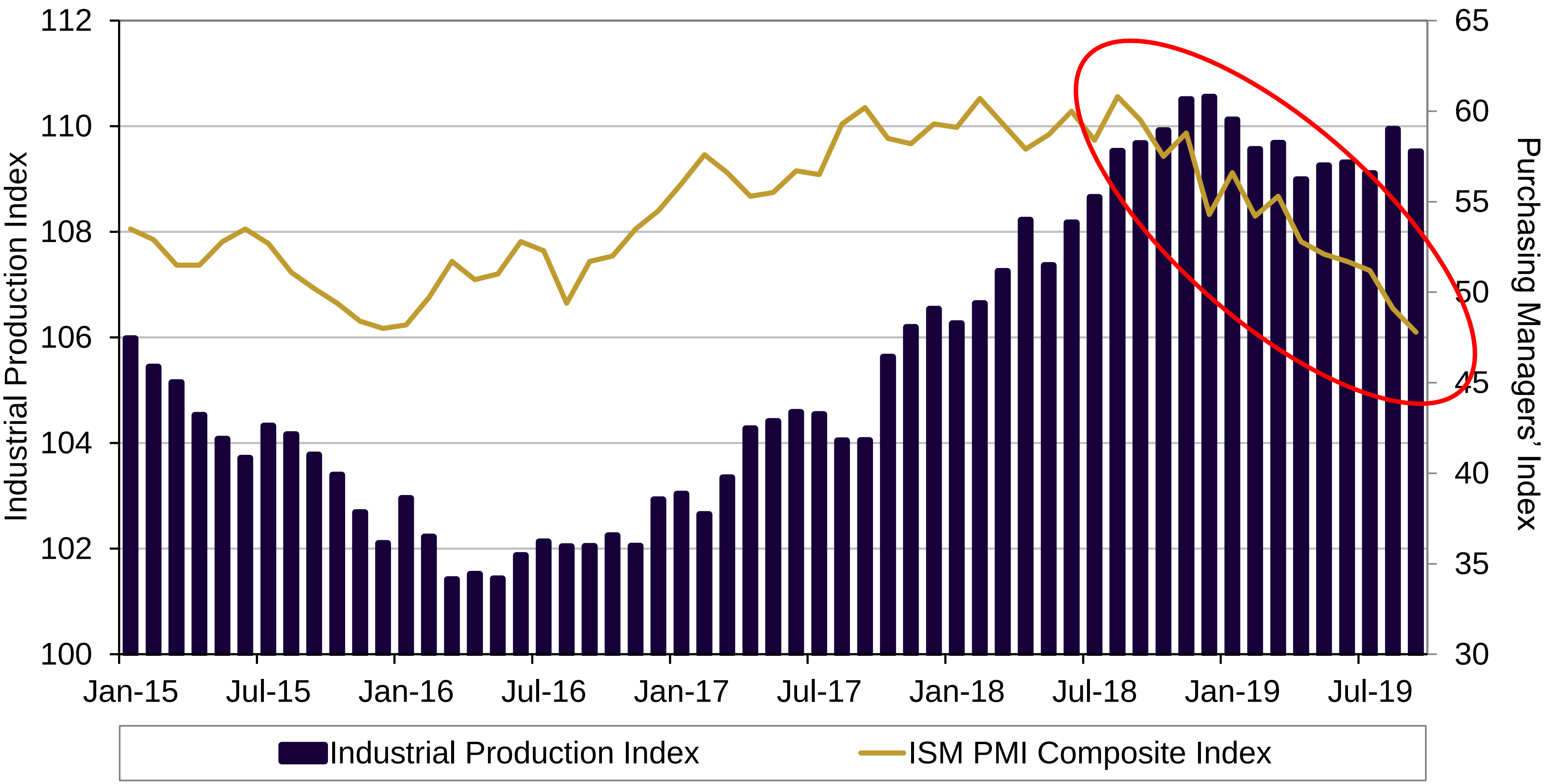
Chinese economic growth officially reported at 6.6 percent, reflects expectations of expansionary policy mix and a goal of doubling real GDP between 2010 and 2020. **Recent forecasts, however, have been revised downward more than once.**




Source: International Monetary Fund.

## U.S. industrial production index.

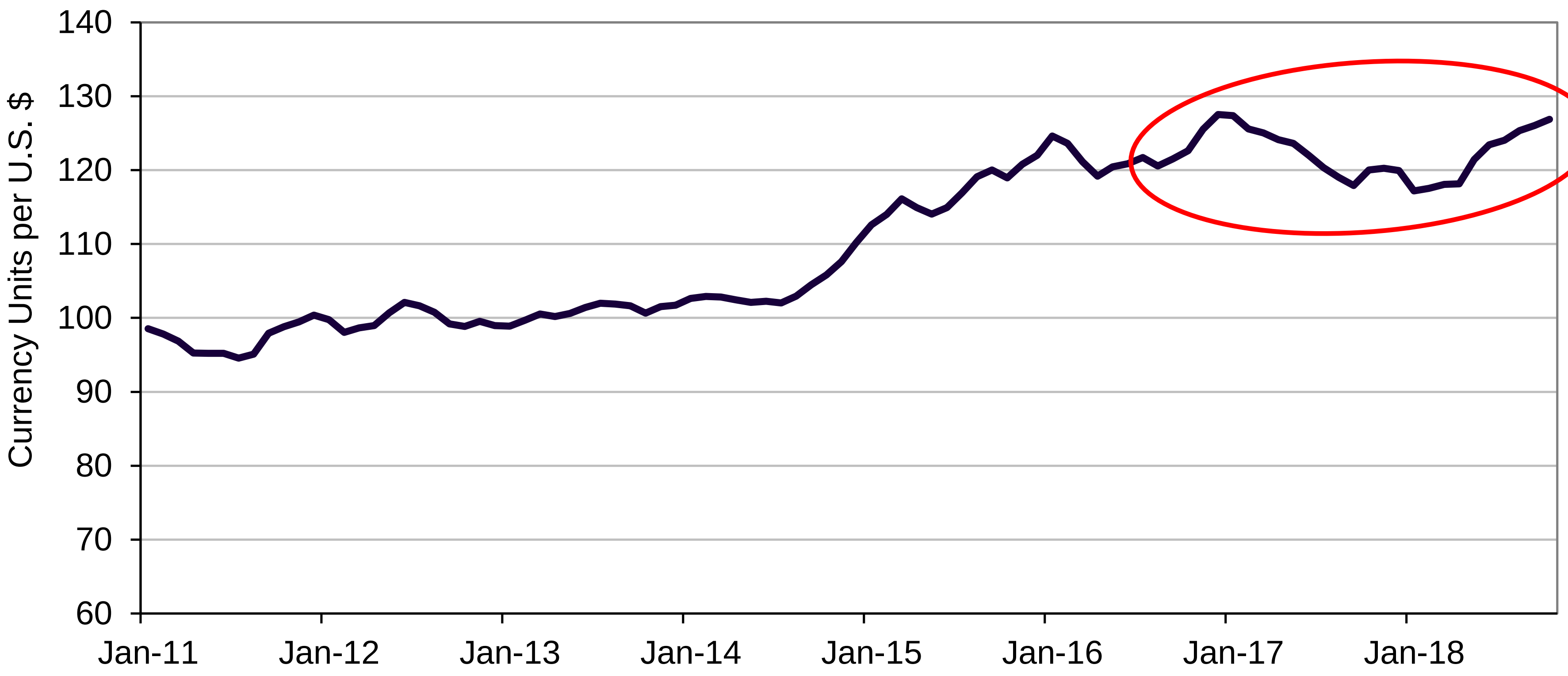
**Industrial production and purchasing indices** have been consistently increasing since the lows of 2016; **but have been falling since December 2018**.




Source: Federal Reserve Bank of St. Louis.

## U.S. dollar valuation, Federal Reserve Broad Index.

**The dollar is up relative to major trading partner currencies**: 23 percent appreciation over last five years, but just three percent in the last 12 months.




Note: The Broad Index is a weighted average of the foreign exchange values of the U.S. dollar against the currencies of a large group of major U.S. trading partners. Base year is 2002.
Source: Federal Reserve Bank of St. Louis.

## Total GOM investment, all project announcements.

Texas total investment = \$70.6 billion; **Louisiana total investment = \$116.3 billion**; Total GOM investment = \$194.9 billion – **assuming all projects are developed at anticipated cost and at anticipated schedule**.

| Year | Texas LNG | Texas Non-LNG | Louisiana LNG | Louisiana Non-LNG | Other GOM LNG | Other GOM Non-LNG | Total GOM LNG | Total GOM Non-LNG | Total |
|---|---|---|---|---|---|---|---|---|---|
| | (million \$) | | | | | | | | |
| 2019 | 3,503 | 5,126 | 2,466 | 2,075 | - | - | 5,969 | 7,201 | 13,170 |
| 2020 | 5,374 | 10,387 | 17,337 | 5,688 | 11 | - | 22,723 | 16,075 | 38,798 |
| 2021 | 9,817 | 15,352 | 31,773 | 9,001 | 561 | - | 42,150 | 24,352 | 66,503 |
| 2022 | 10,419 | 3,502 | 21,291 | 2,560 | 2,665 | - | 34,375 | 6,062 | 40,437 |
| 2023 | 5,448 | 151 | 12,167 | 1,699 | 3,327 | - | 20,941 | 1,850 | 22,792 |
| 2024 | 1,421 | - | 3,033 | 2,279 | 1,332 | - | 5,786 | 2,279 | 8,065 |
| 2025 | 99 | - | 476 | 2,159 | 104 | - | 679 | 2,159 | 2,838 |
| 2026 | - | - | 29 | 1,442 | - | - | 29 | 1,442 | 1,471 |
| 2027 | - | - | - | 648 | - | - | - | 648 | 648 |
| 2028 | - | - | - | 162 | - | - | - | 162 | 162 |
| 2029 | \$ - | \$ - | \$ - | \$ 11 | \$ - | \$ - | \$ - | \$ 11 | 11 |
| **Total** | **\$ 36,082** | **\$ 34,518** | **\$ 88,571** | **\$ 27,724** | **\$ 8,000** | **\$ -** | **\$ 132,653** | **\$ 62,241** | **194,895** |

***Good news/bad news: Louisiana announced investment is larger than Texas – but -- Louisiana announcements are heavily weighted towards LNG.***

## Total GOM investment, new baseline outlook.

Revised outlook sees **31 percent reduction in total Texas investment, 29 percent reduction in Louisiana** – 33 percent reduction across GOM – **all of these are far better than common energy infrastructure cancellation rates that have been as high as 50 percent**.

| Year | Texas | | Louisiana | | Other GOM | | Total GOM | | |
|---|---|---|---|---|---|---|---|---|---|
| | LNG | Non-LNG | LNG | Non-LNG | LNG | Non-LNG | LNG | Non-LNG | Total |
| | (million $) | | | | | | | | |
| 2019 | $ 3,417 | $ 4,975 | $ 2,205 | $ 1,991 | $ - | $ - | $ 5,622 | $ 6,966 | 12,588 |
| 2020 | 3,660 | 7,207 | 8,686 | 5,683 | - | - | 12,346 | 12,891 | 25,237 |
| 2021 | 4,667 | 9,655 | 11,830 | 9,001 | - | - | 16,497 | 18,655 | 35,152 |
| 2022 | 5,885 | 4,908 | 11,760 | 2,560 | - | - | 17,644 | 7,468 | 25,113 |
| 2023 | 3,037 | 491 | 11,642 | 1,699 | - | - | 14,679 | 2,191 | 16,870 |
| 2024 | 578 | - | 6,925 | 2,279 | - | - | 7,503 | 2,279 | 9,782 |
| 2025 | 34 | - | 1,891 | 2,159 | - | - | 1,924 | 2,159 | 4,084 |
| 2026 | - | - | 132 | 1,442 | - | - | 132 | 1,442 | 1,574 |
| 2027 | - | - | - | 648 | - | - | - | 648 | 648 |
| 2028 | - | - | - | 162 | - | - | - | 162 | 162 |
| 2029 | $ - | $ - | $ - | $ 11 | $ - | $ - | $ - | $ 11 | 11 |
| **Total** | **$ 21,277** | **$ 27,237** | **$ 55,071** | **$ 27,635** | **$ -** | **$ -** | **$ 76,348** | **$ 54,872** | **131,220** |

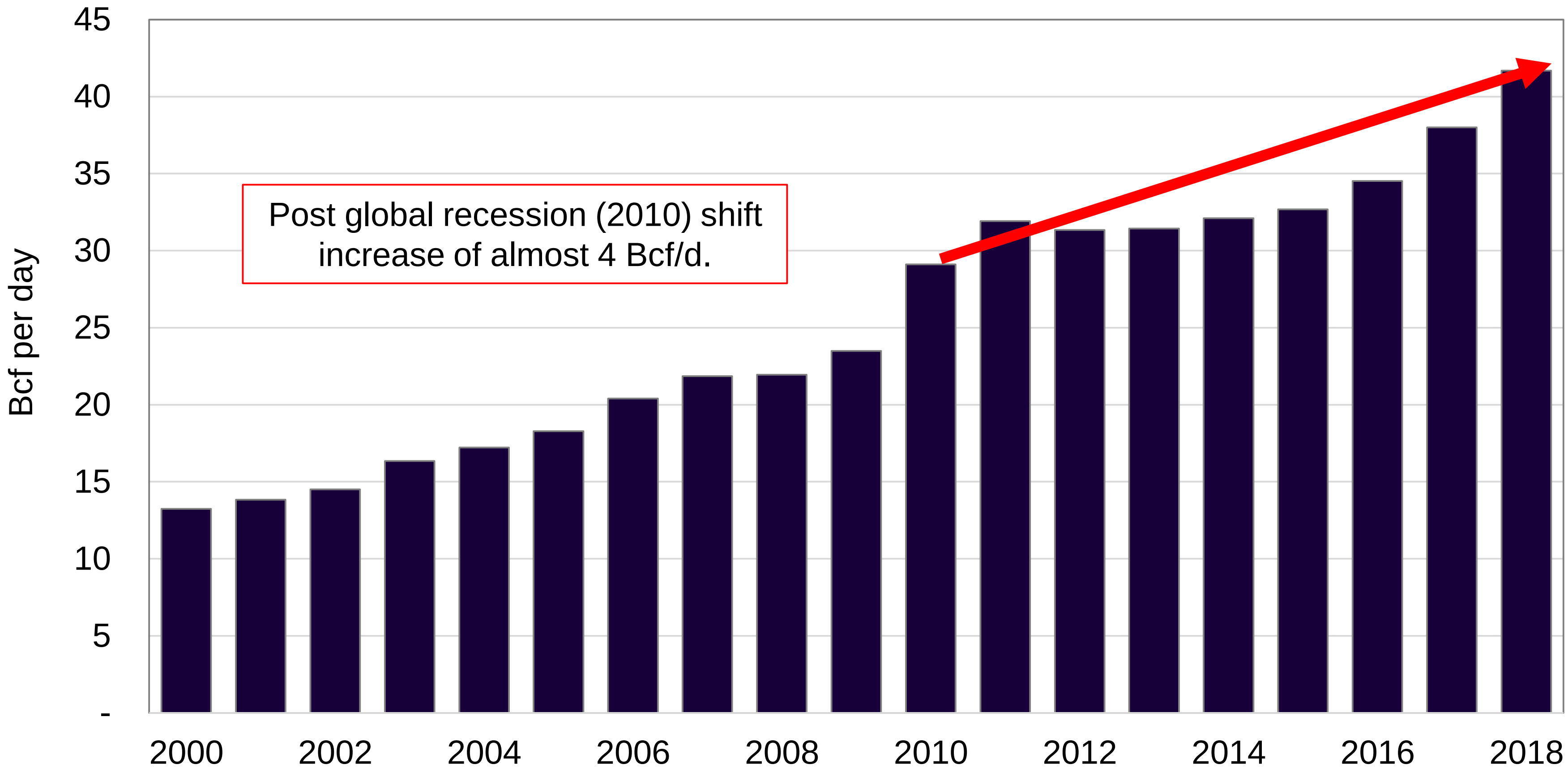
# Total GOM investment, new baseline outlook by investment type/year.

**Most of the investment reduction is in the highly trade sensitive LNG sector**

| Year | Texas | | Louisiana | | Other GOM | | Total GOM | | |
|---|---|---|---|---|---|---|---|---|---|
| | LNG | Non-LNG | LNG | Non-LNG | LNG | Non-LNG | LNG | Non-LNG | Total |
| | (million $) | | | | | | | | |
| 2019 | -$ 86 | -$ 151 | -$ 261 | -$ 84 | $ - | $ - | -$ 347 | -$ 235 | - 582 |
| 2020 | - 1,715 | - 3,179 | - 8,651 | - 5 | - 11 | - | - 10,377 | - 3,184 | - 13,561 |
| 2021 | - 5,150 | - 5,697 | - 19,942 | - | - 561 | - | - 25,653 | - 5,697 | - 31,350 |
| 2022 | - 4,535 | 1,407 | - 9,531 | - | - 2,665 | - | - 16,731 | 1,407 | - 15,324 |
| 2023 | - 2,411 | 340 | - 525 | - | - 3,327 | - | - 6,262 | 340 | - 5,922 |
| 2024 | - 843 | - | 3,892 | - | - 1,332 | - | 1,717 | - | 1,717 |
| 2025 | - 66 | - | 1,415 | - | - 104 | - | 1,245 | - | 1,245 |
| 2026 | - | - | 104 | - | - | - | 104 | - | 104 |
| 2027 | - | - | - | - | - | - | - | - | - |
| 2028 | - | - | - | - | - | - | - | - | - |
| 2029 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | - |
| **Total** | **-$ 14,805** | **-$ 7,281** | **-$ 33,500** | **-$ 88** | **-$ 8,000** | **$ -** | **-$ 56,305** | **-$ 7,369** | **- 63,674** |

## World LNG trade volumes.

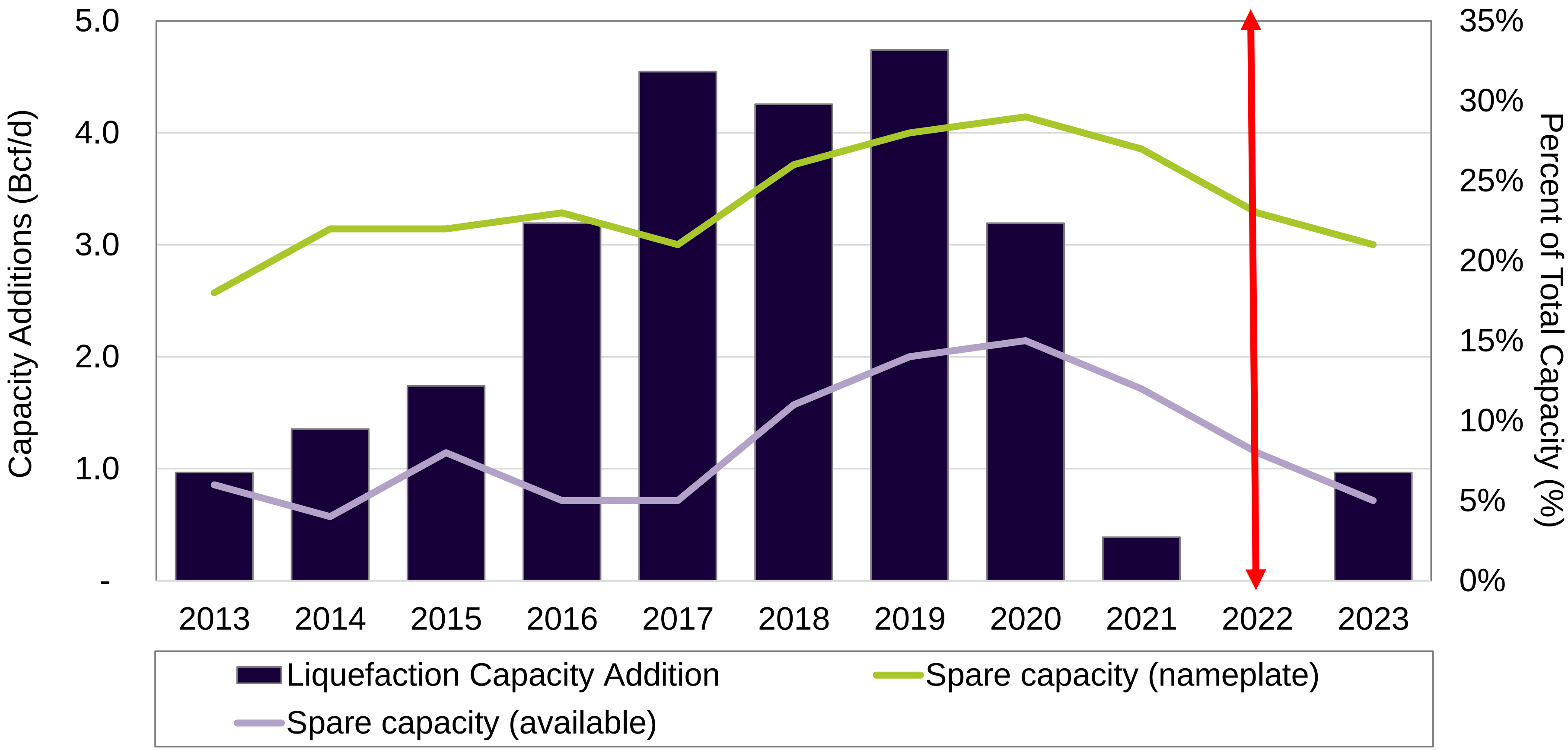
World LNG trade volumes have increased at an **average annual rate of seven percent over the last 18 years** and have increased **77 percent over the last 10 years.**




Source: BP Statistical Review of World Energy.

## LNG liquefaction capacity additions.

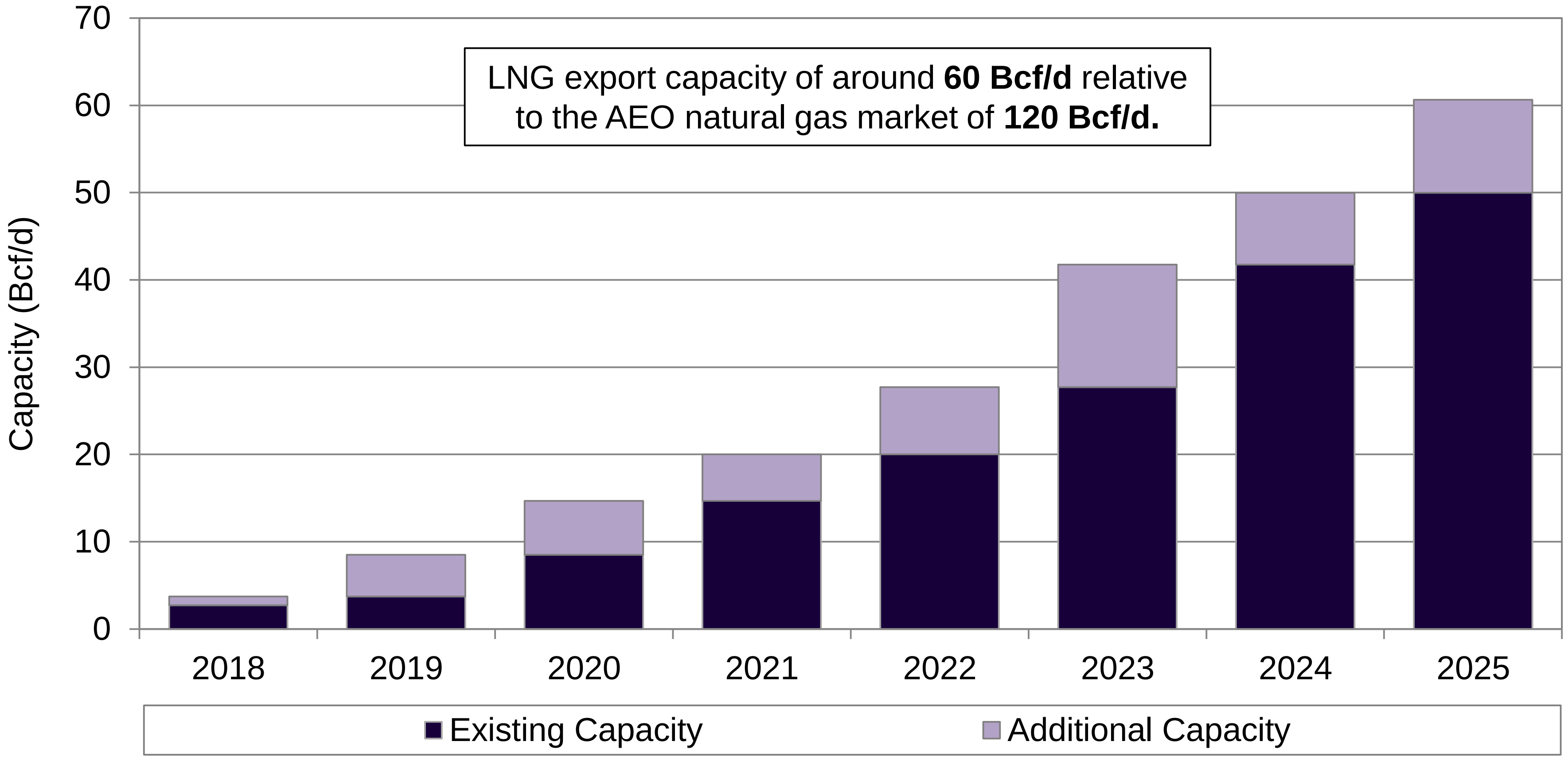
**Excess capacity** facilitating considerable competition – "nirvana" (for developers) is anticipated to arrive around **2021-2022** as capacity tightens and it becomes sellers' market.




Source: International Energy Agency, Gas 2018.

# U.S. LNG export capacity development: announced projects.

If all the LNG applications currently filed with the Department of Energy were to come online, U.S. liquefaction capacity **would exceed 60 Bcf per day by 2025**.

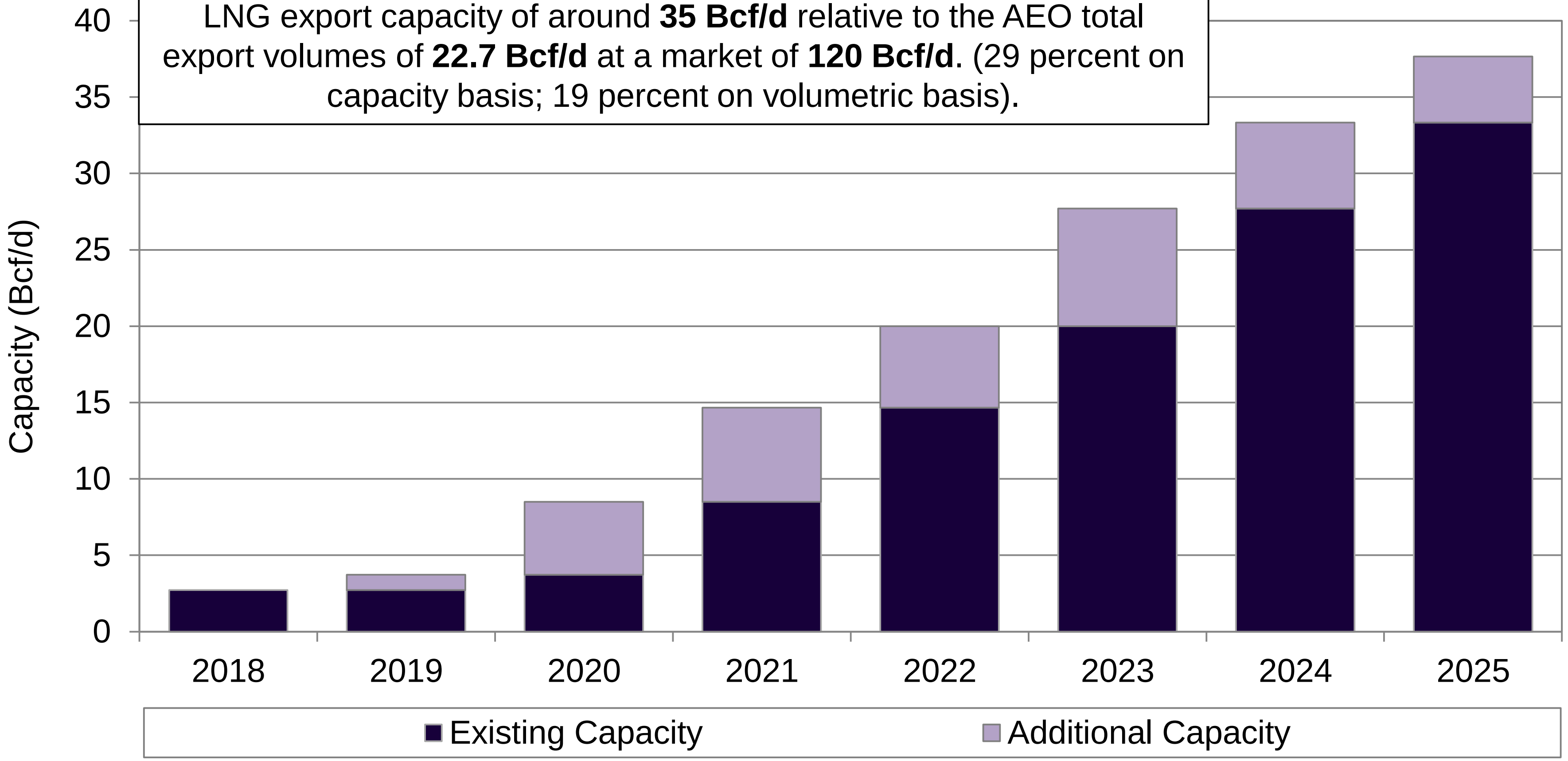



Source: U.S. Department of Energy.

## U.S. LNG export capacity development: new baseline forecast.

Using the GCEO baseline forecast for project development results in a lower estimate of **35 Bcf/d by 2025.**

LNG export capacity of around **35 Bcf/d** relative to the AEO total export volumes of **22.7 Bcf/d** at a market of **120 Bcf/d**. (29 percent on capacity basis; 19 percent on volumetric basis).




Source: U.S. Department of Energy.

# Conclusions

## Conclusions.

- **Uncertainties will likely lead to the market moving "sideways" through 2020**. Trade talks are early in the process. Trade is an important lynch-pin in energy price recovery since these tensions are repeatedly being pointed to as the underlying source of global economic weakness.
- **Worst-case scenario**. Phase 1 **trade negotiations fall apart** or result in an outcome **generally seen as weak** or non-consequential resulting in:
  - A continued **faltering in world economic activity** making the current supply-demand imbalance worse.
  - **OPEC/Saudi hesitation** in taking action to re-balance market.
  - **Prices fall** .... Considerably (like mid-$40s/Bbl for WTI).
  - Flight to quality, **U.S. dollar appreciation** making U.S. exports more expensive, drives down dollar denominated energy commodity prices.
  - **Dramatic slowing** in U.S. (and global) **processing and export investment** (particularly acute here along the Gulf Coast).
  - Considerable **ripple impact to the U.S. economy** and already cooling U.S. energy demand growth.

## Questions, comments and discussion.

**David E. Dismukes**
Professor and Executive Director
Center for Energy Studies
Email: dismukes@lsu.edu

Phone: 225-578-4343

URL: www.enrg.lsu.edu