

Gulf Coast Energy Outlook

*Gregory B. Upton Jr., Ph.D.
Louisiana State University
Center for Energy Studies*

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Introduction

Consensus Price Outlook

Up-Stream Oil and Gas

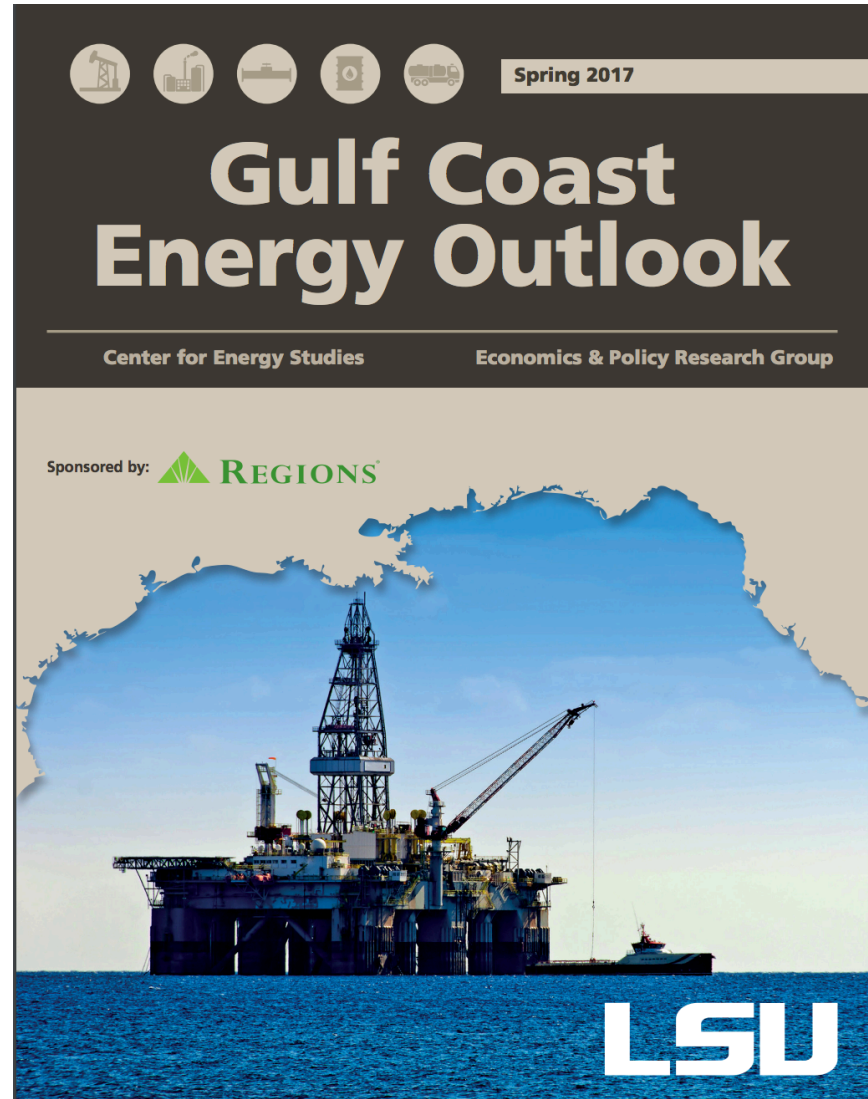
Industrial Outlook

Conclusions

Introduction

Gulf Coast Energy Outlook

- The inaugural **Gulf Coast Energy Outlook** seeks to provide a broad overview of the current status of trends guiding energy markets with an emphasis on the Gulf Coast Region.
- The research initiative is a collaborative effort of Louisiana State University's **Center for Energy Studies** and **E.J. Ourso College of Business** and focuses on the energy sector of the Gulf Coast Region's economy.



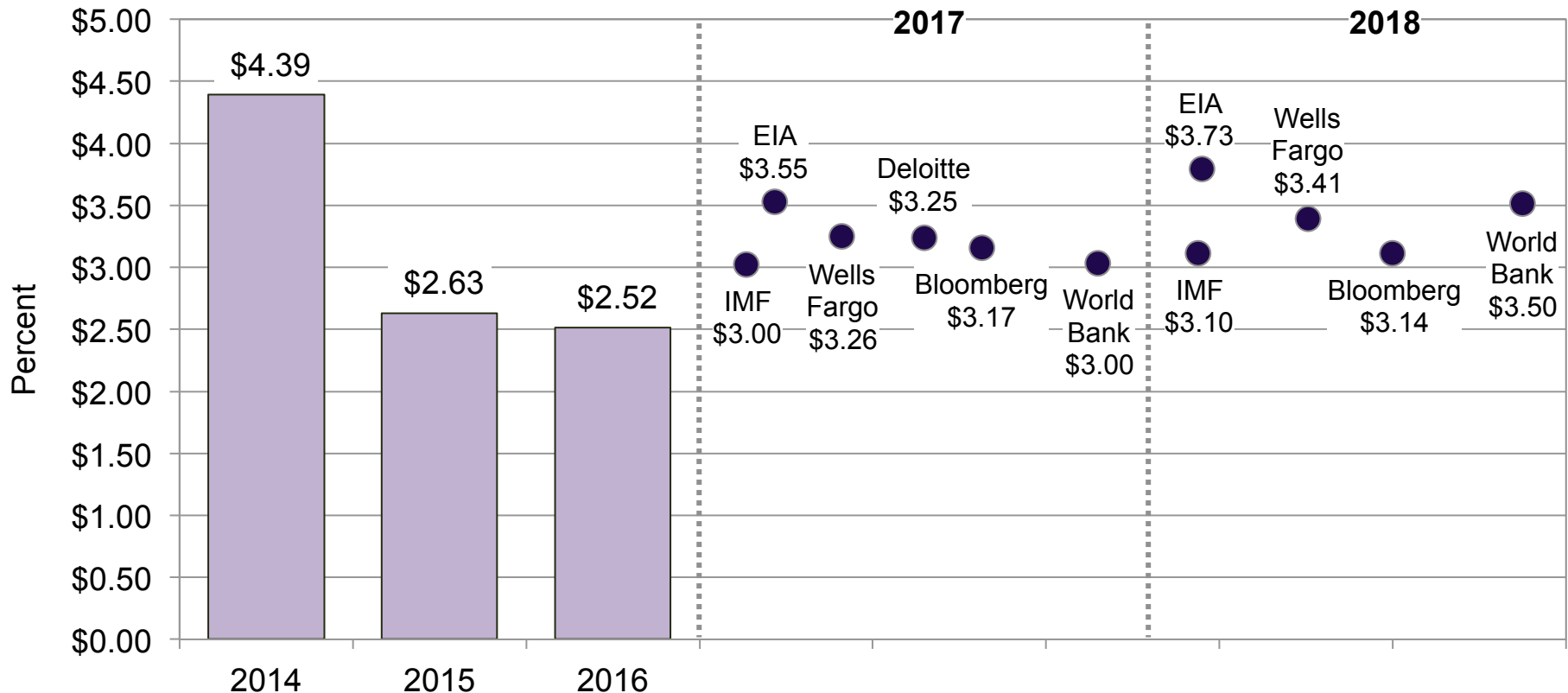
Introduction

- The advent of shale oil and gas has fundamentally shifted the energy outlook not only here in on the U.S. Gulf Coast, but also globally.
- U.S. shale production has led to significant decreases in global prices, and all eyes are on the resilience of U.S. producers in determining long term price forecasts.
- While Gulf Coast production has increased significantly with shale, the composition of this production has changed significantly, creating potential winners and losers.
- Significant opportunities for industrial expansion have been created, and historic investments in mid-stream and down-stream sectors are on the horizon.
- The advent of shale has also fundamentally changed electricity markets, shifting towards lower emissions natural gas and creating opportunities for significant growth in renewables.

Consensus Price Forecast

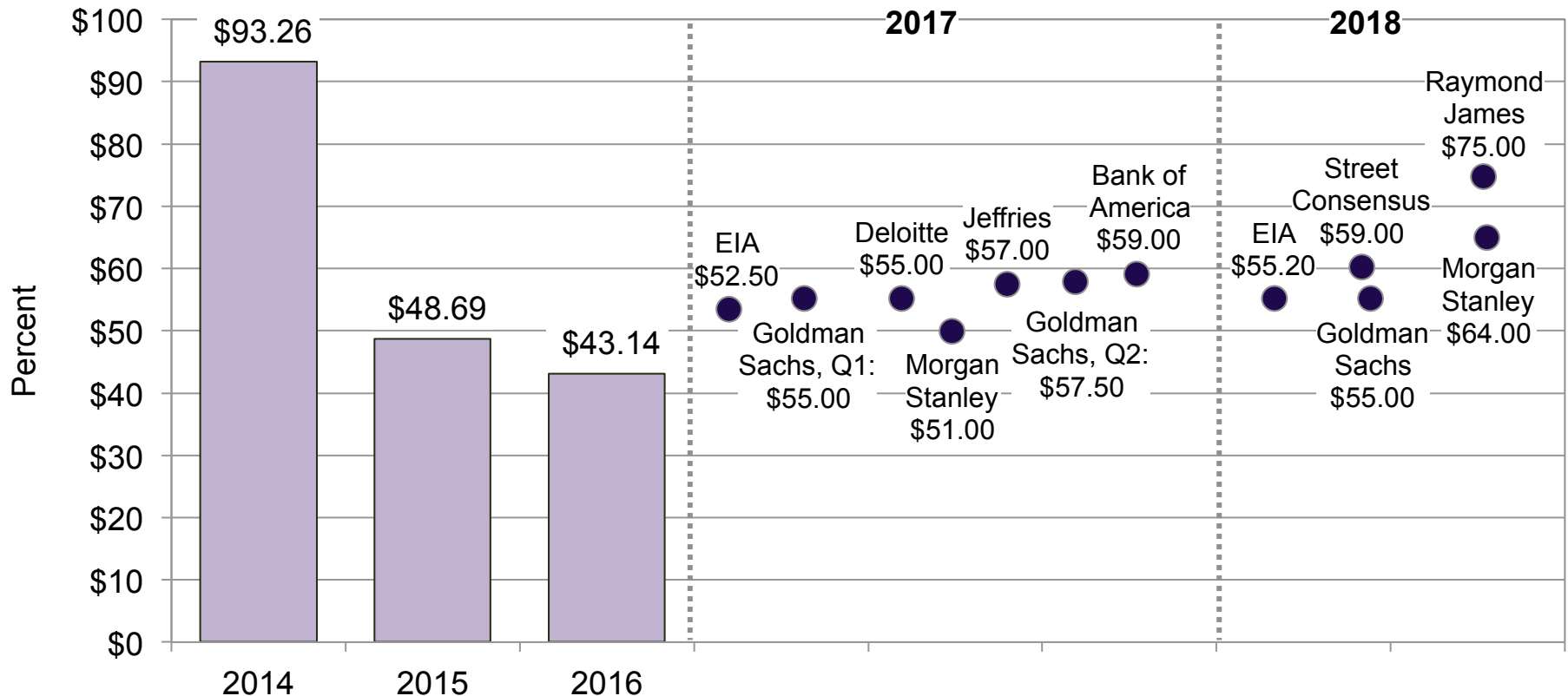
Current Natural Gas Prices and Near-Term Outlook

Natural gas prices are expected to stay below \$3.55 per MMBtu in 2017 and under \$3.75 in 2018.



Current Crude Oil Prices and Near-Term Outlook

Most crude oil price projections for 2017 are around \$55 per barrel. Prices are expected to increase in 2018, but remain below \$75 per barrel.

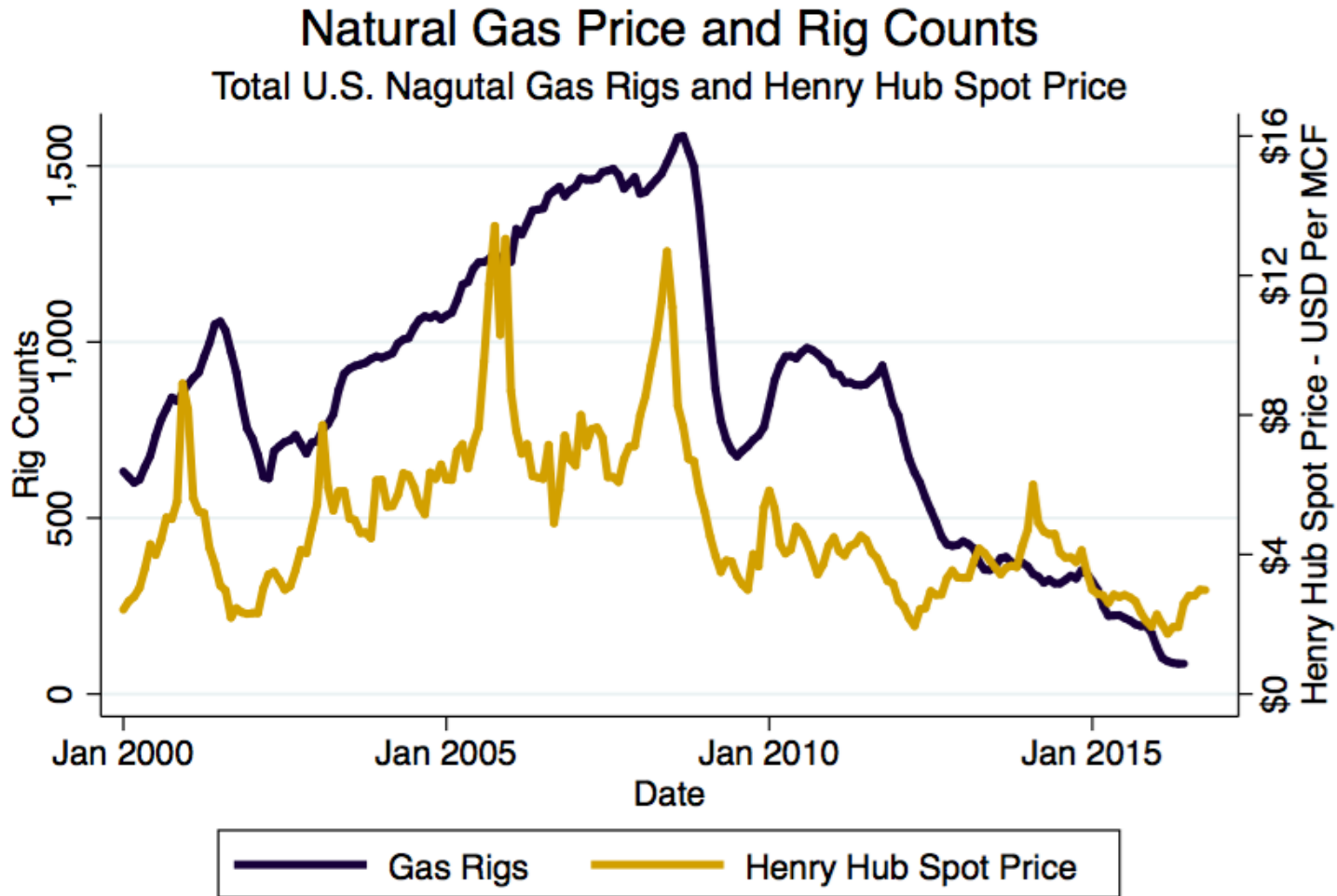


Up-Stream Oil and Gas

Up-Stream Oil and Gas

- From 1980 until the early 2000s, both Texas and Louisiana experienced significant decreases in crude production—both in absolute terms as well as a share of total US production. This was offset, though, by the relative increased share of Federal Offshore production.
- Due to the advent of shale oil production, Texas has seen a resurgence in crude production and now accounts for almost 60% of Gulf Coast Production.
- While Federal Offshore production has remained relatively flat, its relative share had declined significantly. The future of investment in offshore production is uncertain.
- Louisiana (state production) now accounts for less than three percent of our region's production.
- Gulf Coast relative share of U.S. production is now a larger share than at any point in the past four decades.

Natural Gas Prices and Rig Counts

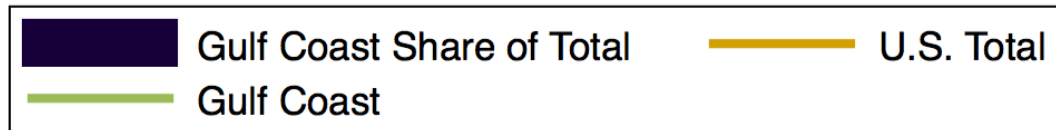
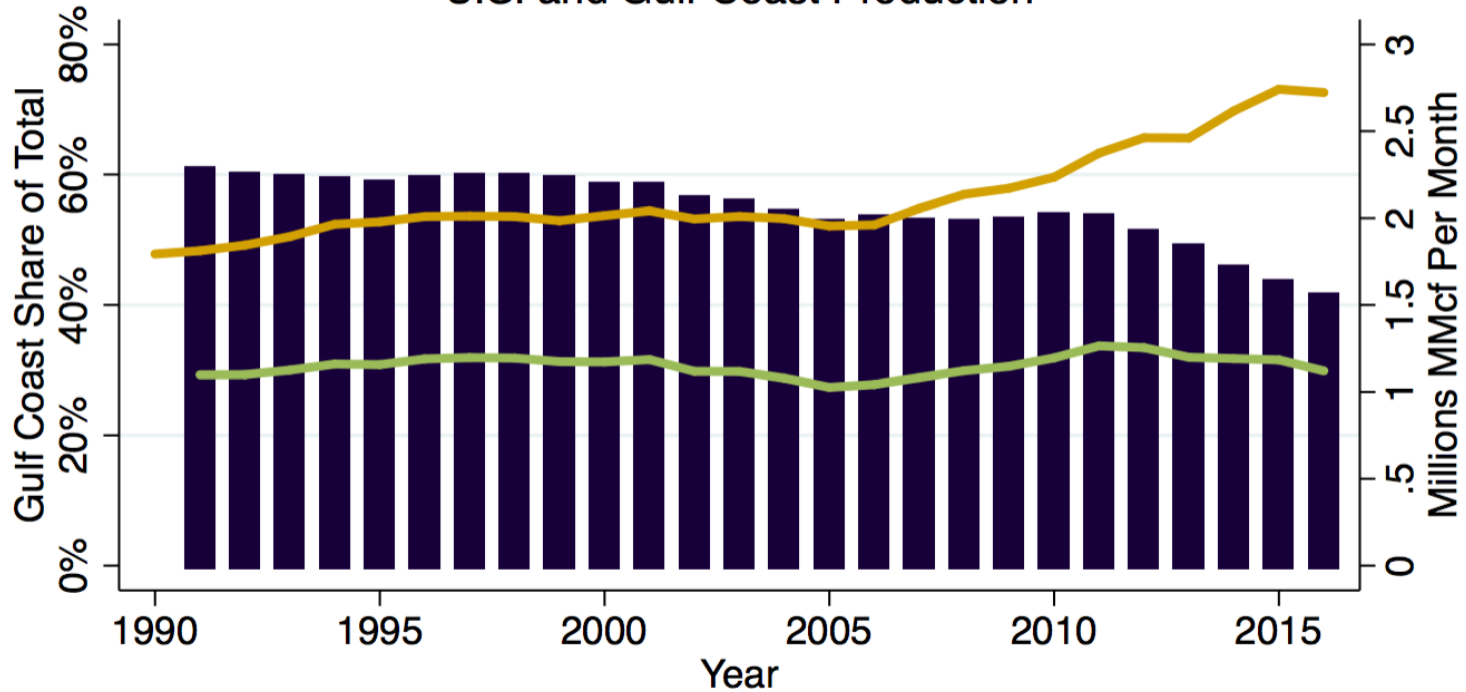


Source: EIA - Crude Oil and Natural Gas Drilling Activity. Rotary Rigs in Operation by Site.

Gulf Coast Natural Gas Production

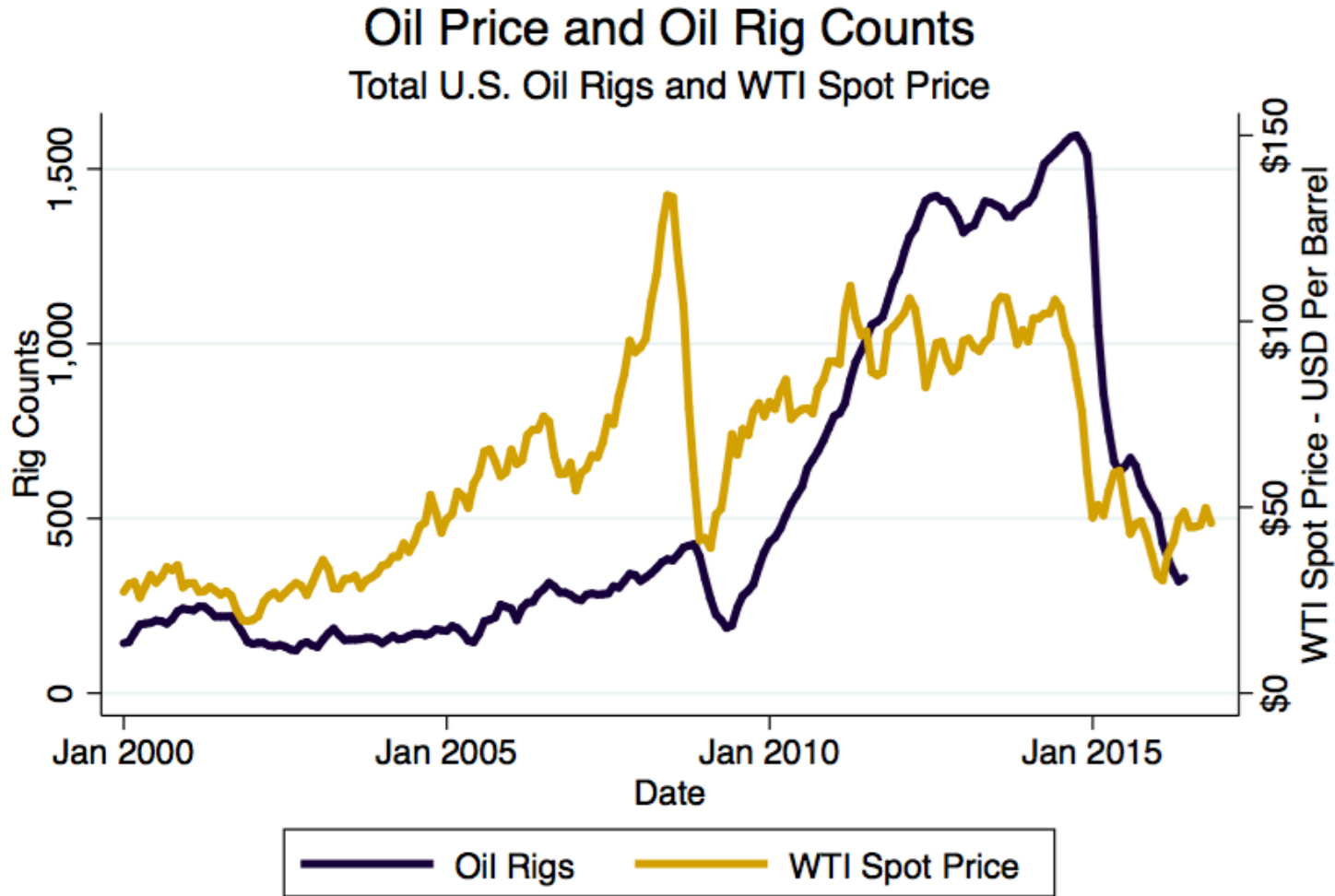
Natural Gas Production (MMcf)

U.S. and Gulf Coast Production



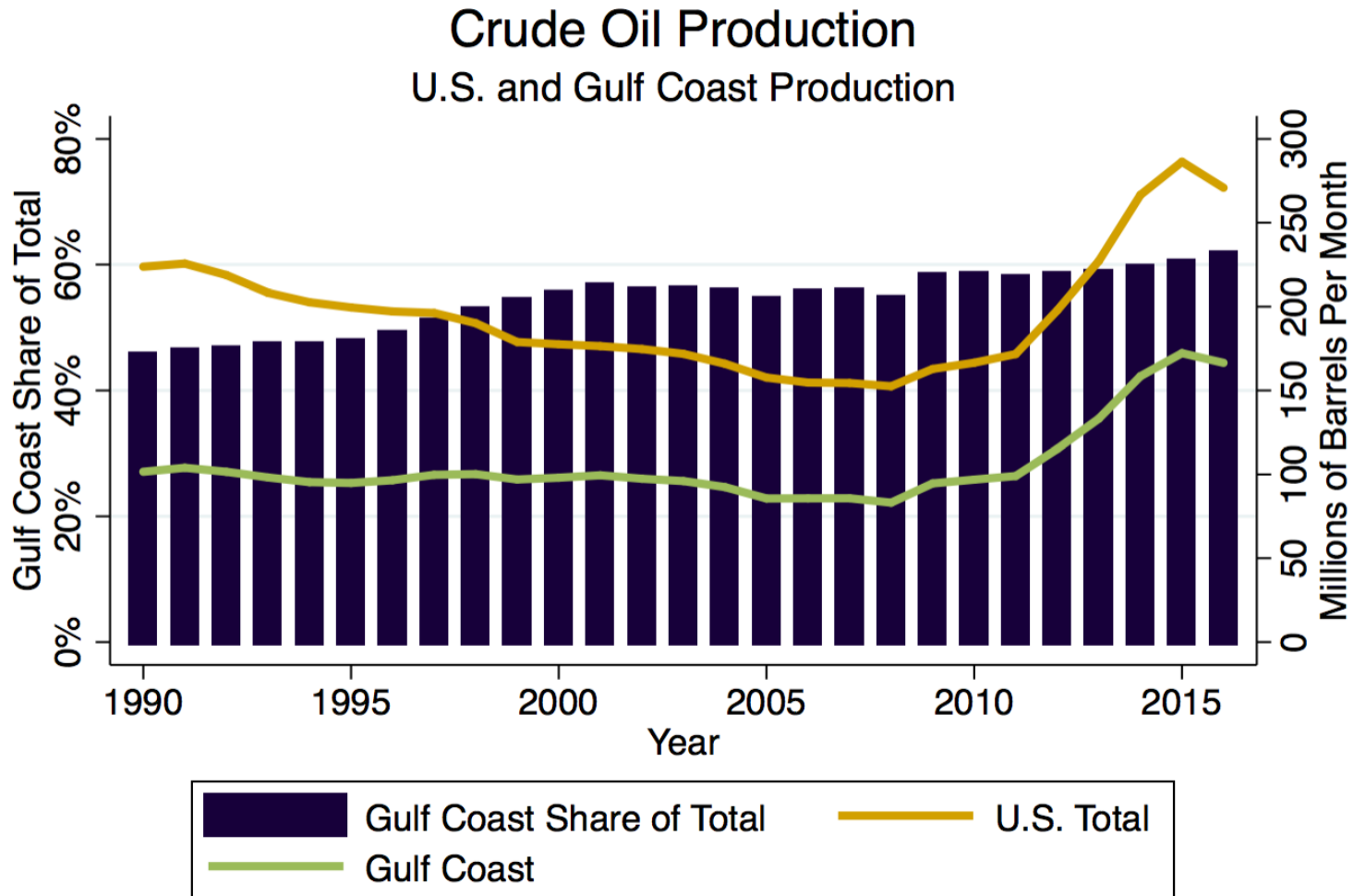
Source: EIA - Natural Gas Gross Withdrawals (Monthly). Gulf Coast defined as PADD 3. Data only available until September 2016, therefore average production in January-August shown for 2016. PADD 3 production data not available before 1991. Natural Gas production data not available for Alabama and Mississippi.

Oil Prices and Rig Counts



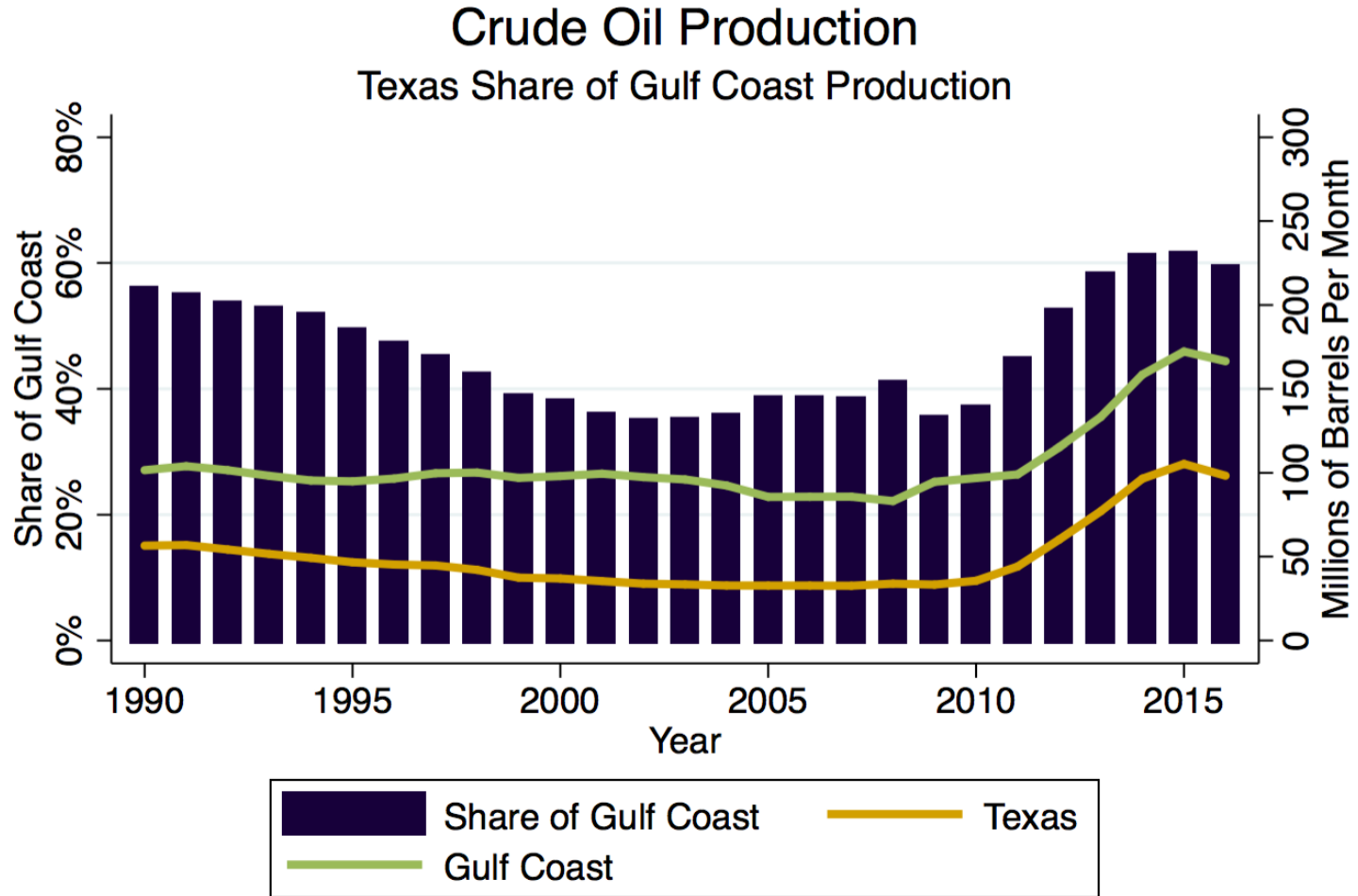
Source: EIA - Crude Oil and Natural Gas Drilling Activity. Rotary Rigs in Operation by Site.

Gulf Coast Crude Production



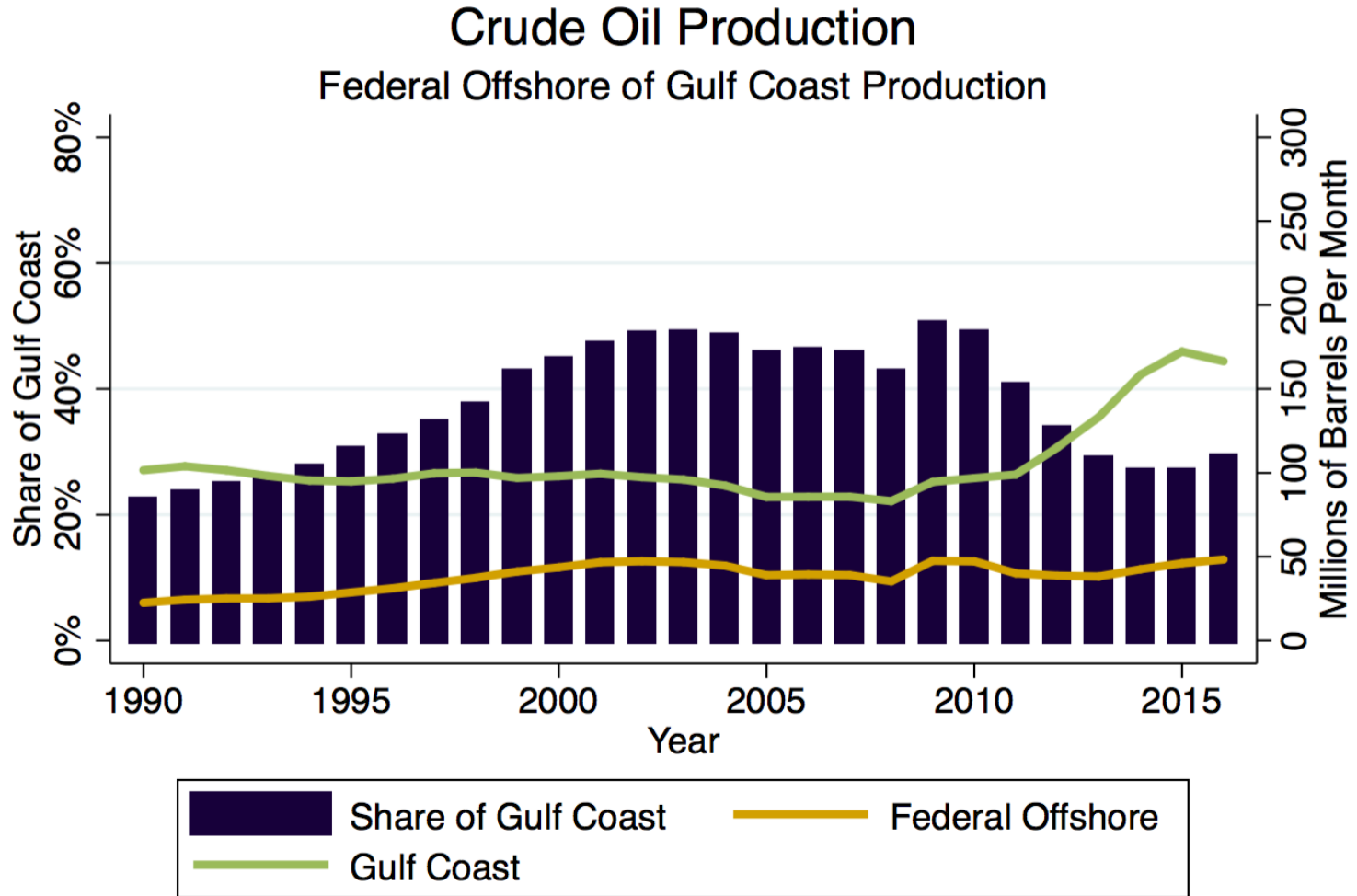
Source: EIA - Crude Oil Production (Monthly). Gulf Coast defined as PADD 3. Data only available until September 2016, therefore average production in January-August shown for 2016.

Texas' Share of Gulf Coast Crude Production



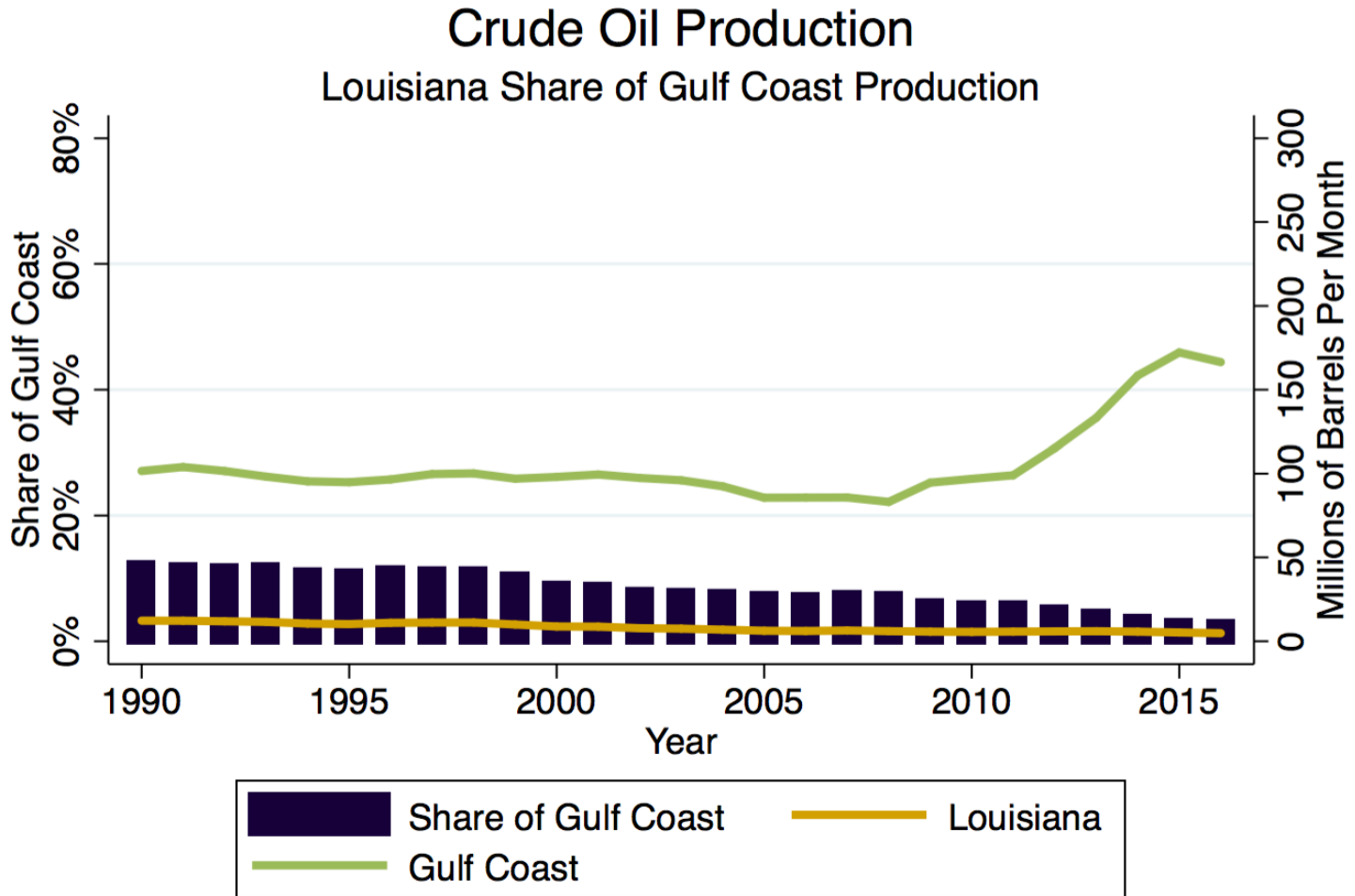
Source: EIA - Crude Oil Production (Monthly). Gulf Coast defined as PADD 3. Data only available until September 2016, therefore average production in January-August shown for 2016.

OCS's Share of Gulf Coast Crude Production



Source: EIA - Crude Oil Production (Monthly). Gulf Coast defined as PADD 3. Data only available until September 2016, therefore average production in January-August shown for 2016.

Louisiana's Share of Gulf Coast Crude Production

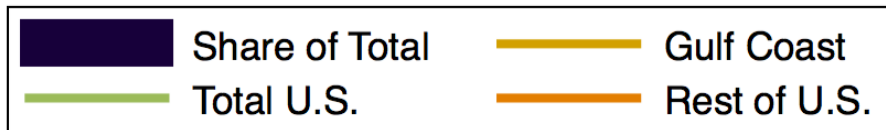
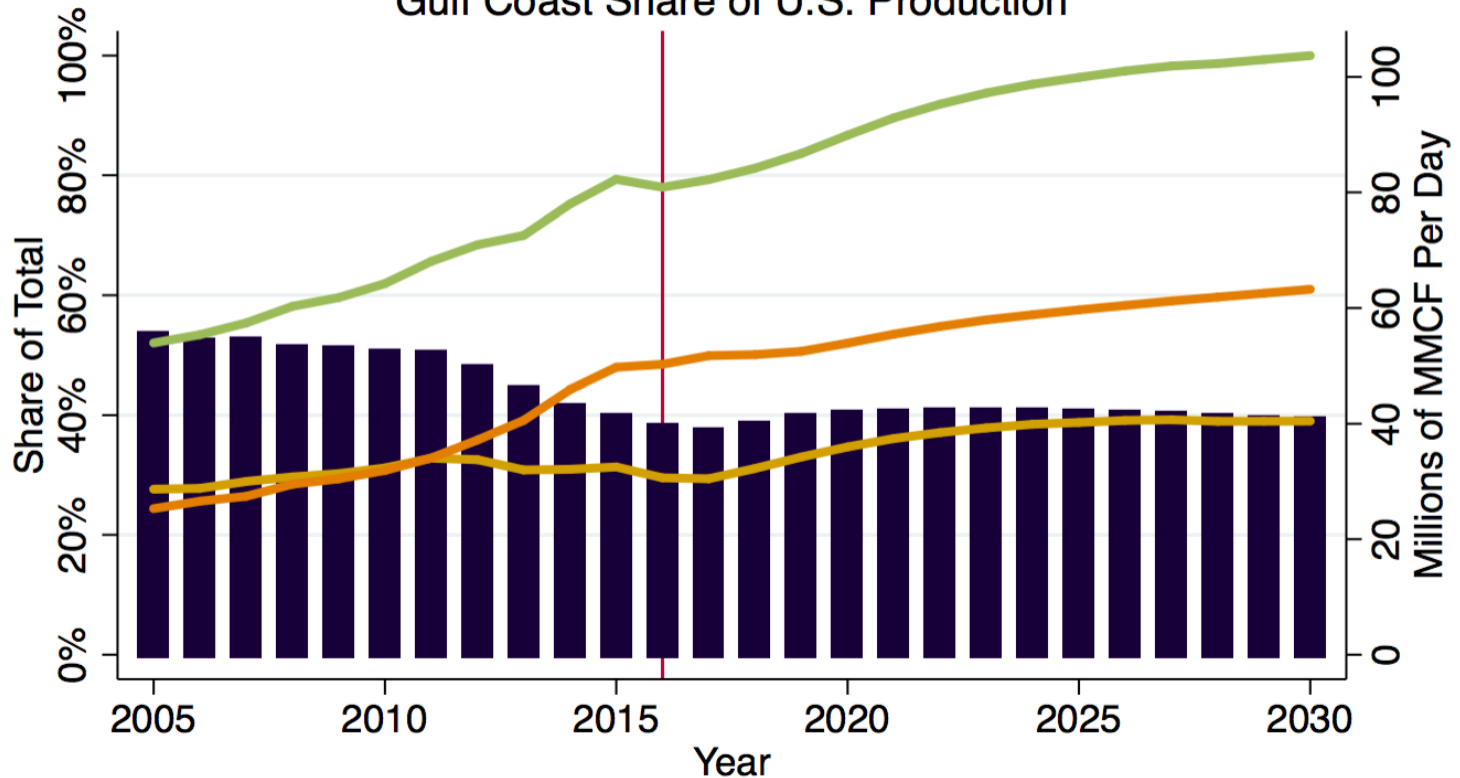


Source: EIA - Crude Oil Production (Monthly). Gulf Coast defined as PADD 3. Data only available until September 2016, therefore average production in January-August shown for 2016.

Up-Stream Oil and Gas Outlook

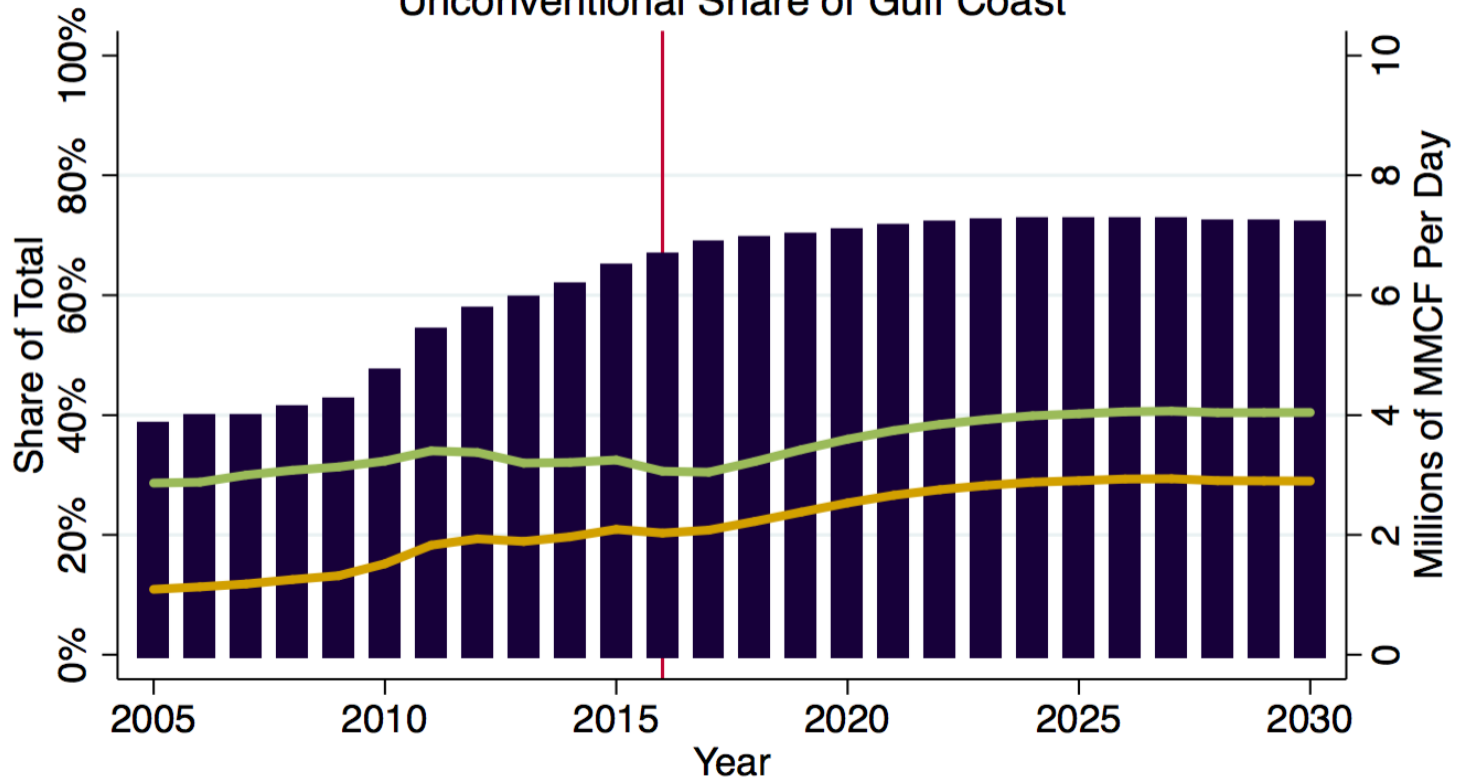
Gulf Coast Natural Gas Production Forecast

Natural Gas Production Forecast
 Gulf Coast Share of U.S. Production



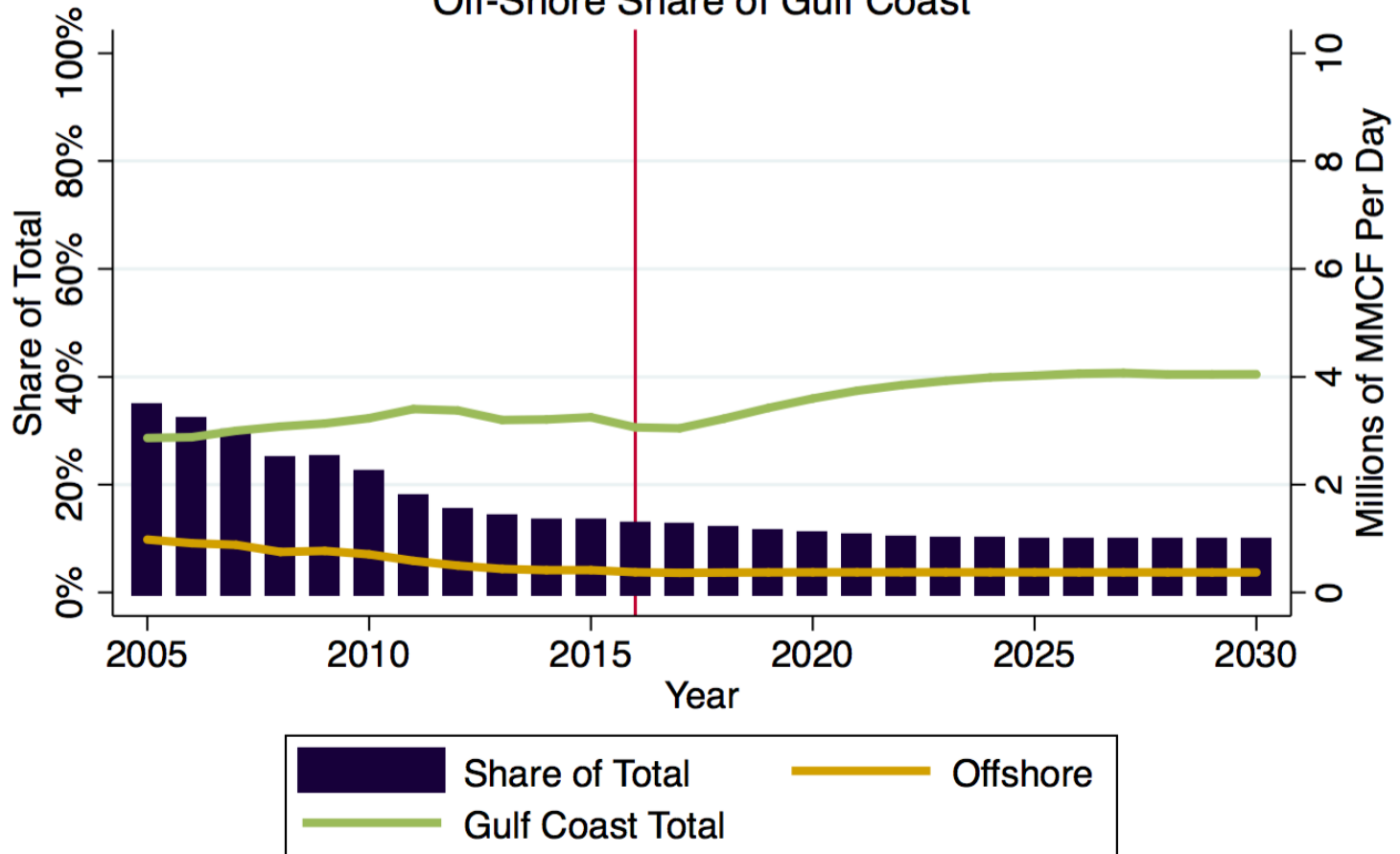
Unconventional On-Shore Natural Gas Oil Forecast

Gulf Coast Natural Gas Production
Unconventional Share of Gulf Coast



Off-Shore Natural Gas Forecast

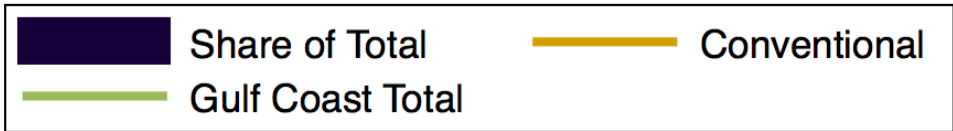
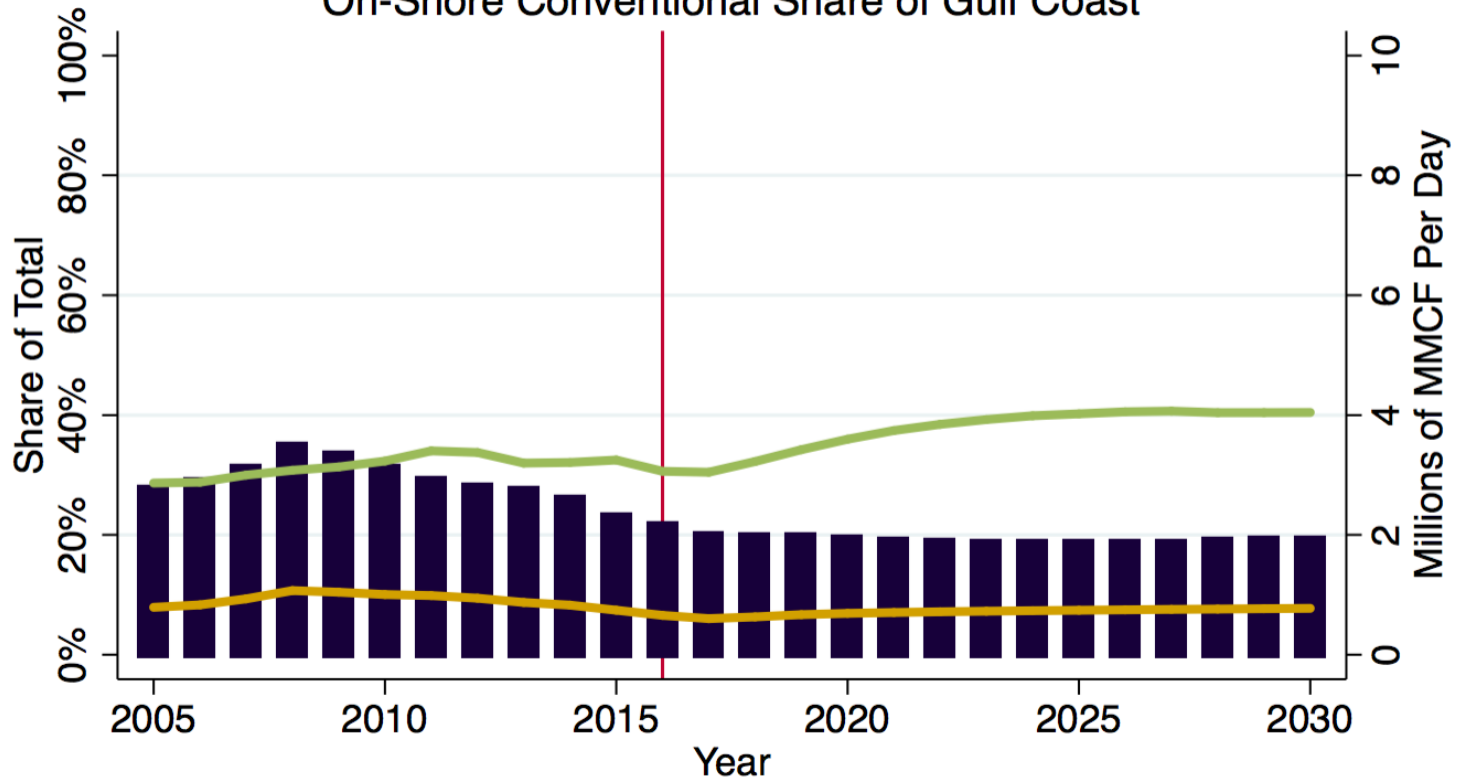
Gulf Coast Natural Gas Production
Off-Shore Share of Gulf Coast



Note: Offshore includes both state and federal waters.

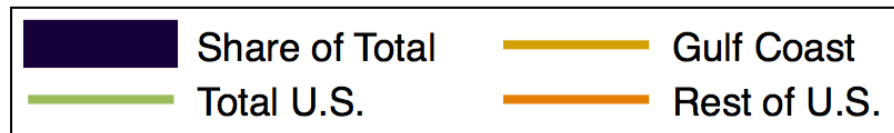
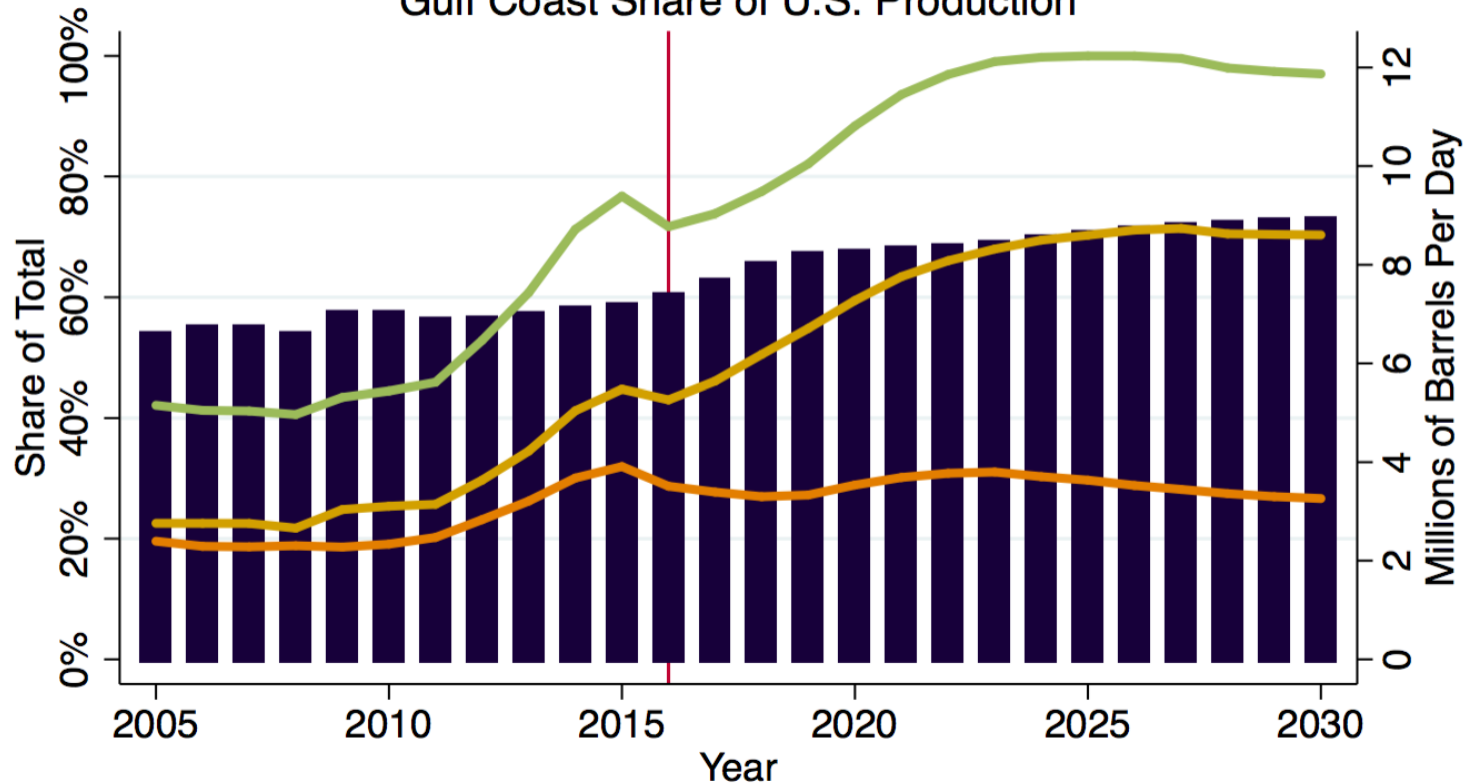
Conventional On-Shore Natural Gas Forecast

Gulf Coast Natural Gas Production
On-Shore Conventional Share of Gulf Coast



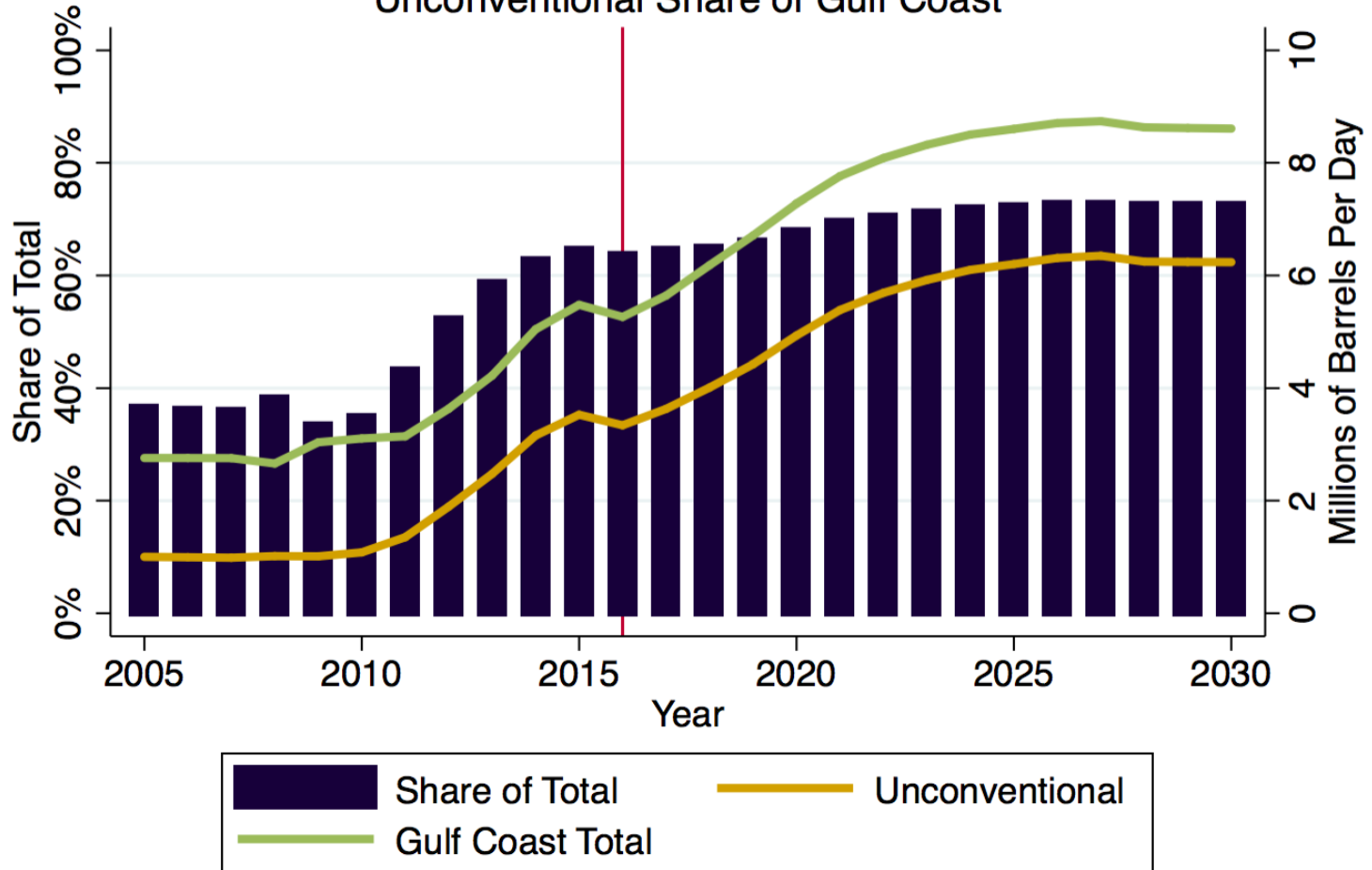
Gulf Coast Crude Oil Production Forecast

Crude Oil Production Forecast
Gulf Coast Share of U.S. Production



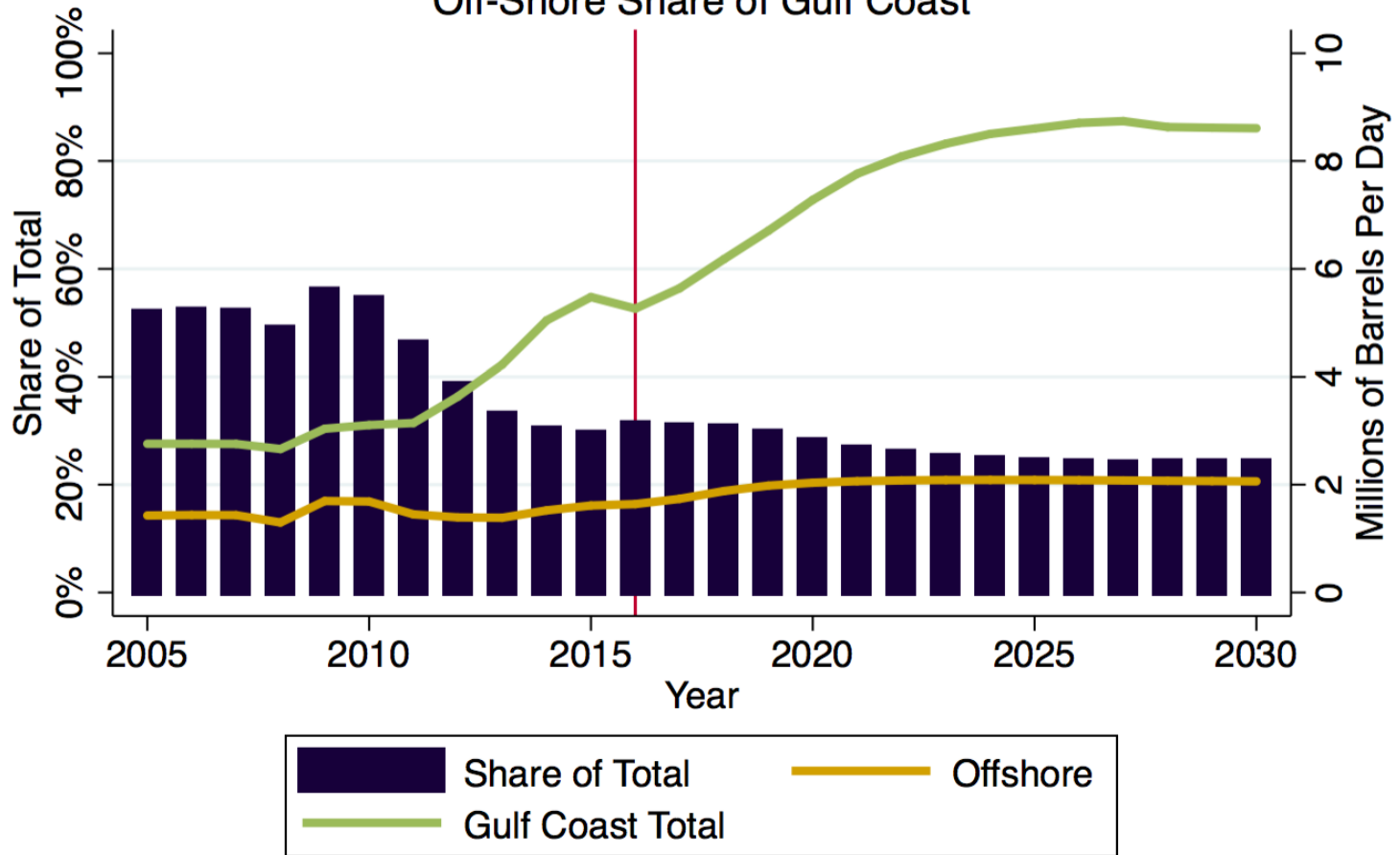
Unconventional On-Shore Crude Oil Forecast

Gulf Coast Crude Oil Production
Unconventional Share of Gulf Coast



Off-Shore Crude Oil Forecast

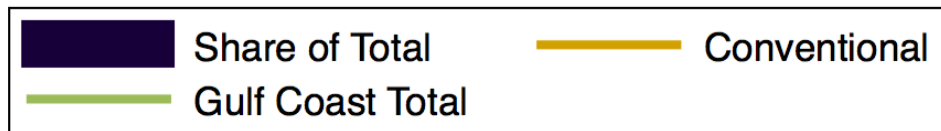
Gulf Coast Crude Oil Production
Off-Shore Share of Gulf Coast



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Conventional On-Shore Crude Oil Forecast

Gulf Coast Crude Oil Production
On-Shore Conventional Share of Gulf Coast



Industrial Outlook

Industrial Outlook

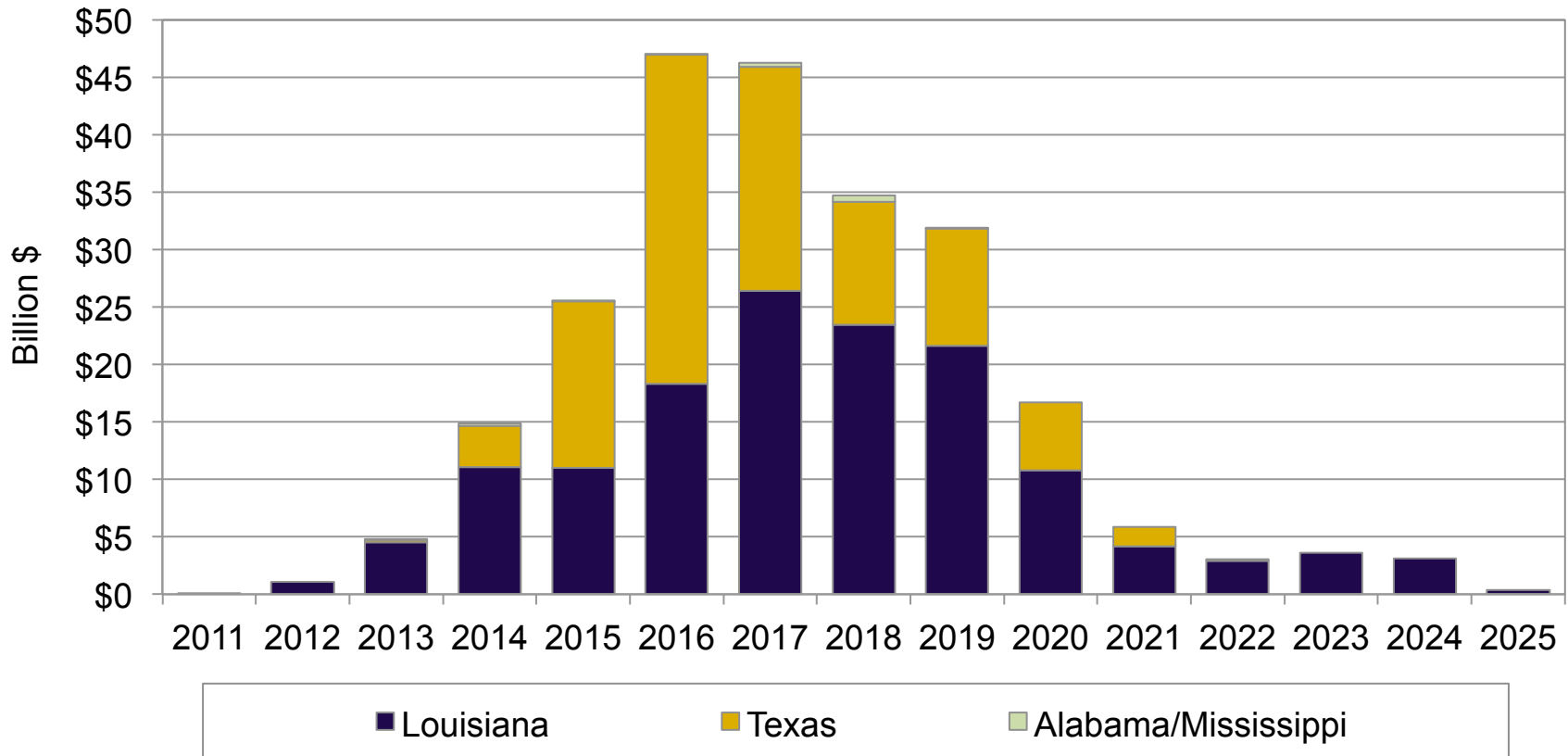
- There is a symbiotic relationship between natural gas prices and Louisiana's energy-intensive manufacturing base. Louisiana manufacturing relies heavily on natural gas for heat, steam, power generation and most importantly, feedstock purposes. Louisiana's chemical industry is particularly reliant upon natural gas and natural gas liquids since both are used to produce a wide range of goods.¹
- Abundant and inexpensive natural gas along side the U.S. increase in oil production has led to significant industrial investments.
- Significant investments in crude oil transport, including pipeline reversals, expansions, and additions, alongside the lifting of the crude oil export ban can create an environment that allows for the Gulf Coast to become the epicenter for hydrocarbon trading.²

1. 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.

2. Upton (2016). *Crude Oil Exports and the Louisiana Economy. A discussion of the U.S. policy of restricting crude oil exports and its implications for Louisiana*. Baton Rouge, LA: Louisiana State University, Center for Energy Studies.

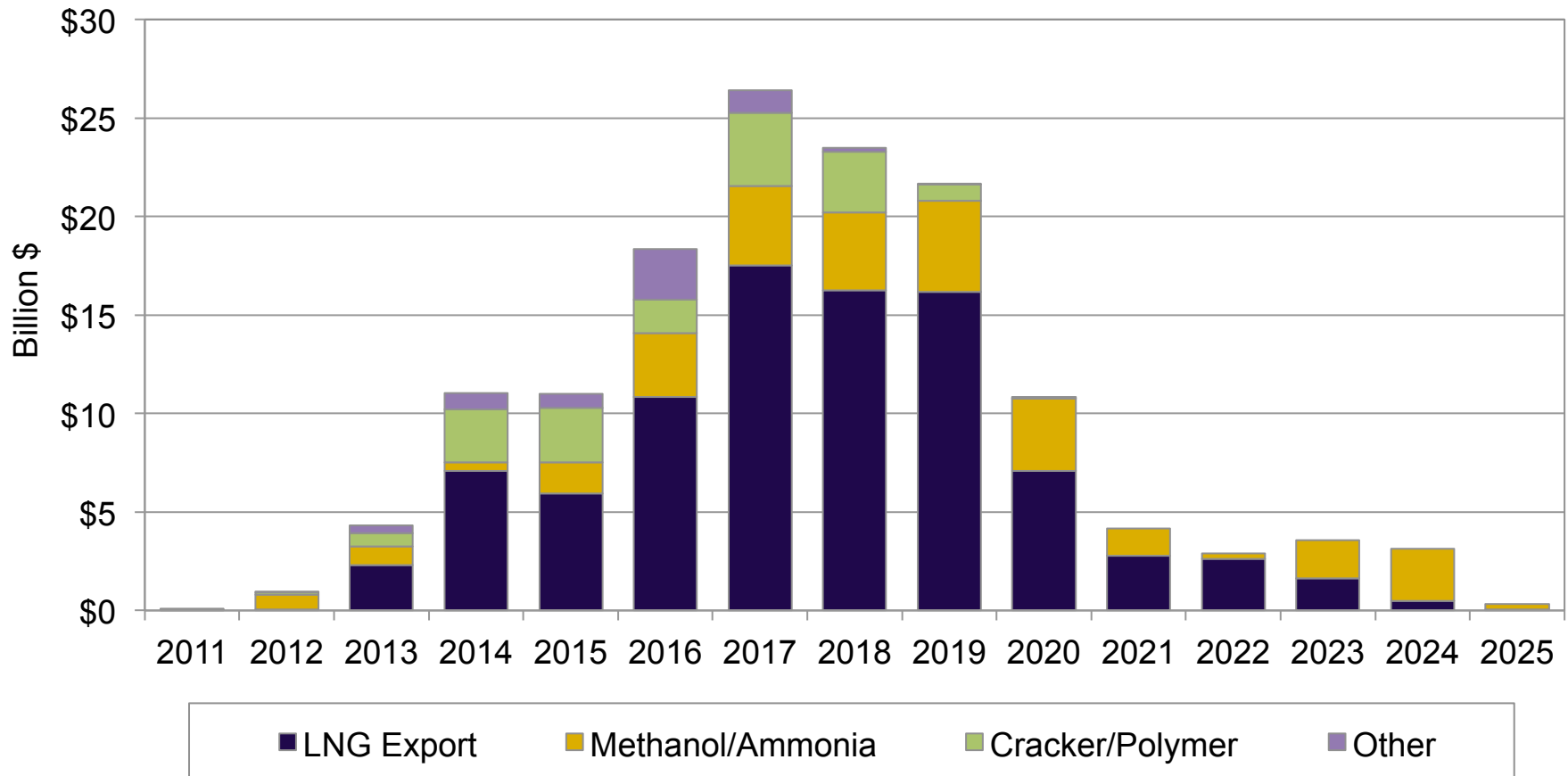
Gulf of Mexico region: energy manufacturing capital expenditures (by state).

An estimated \$240 billion in new energy-based manufacturing development is expected, most of which should occur between 2015 and 2019.



Louisiana energy manufacturing total capital expenditures by sector.

The continued low natural gas price outlook has facilitated considerable development of over \$142 billion: \$46 billion already completed, \$96 billion remaining, but heavily concentrated in LNG export facilities.



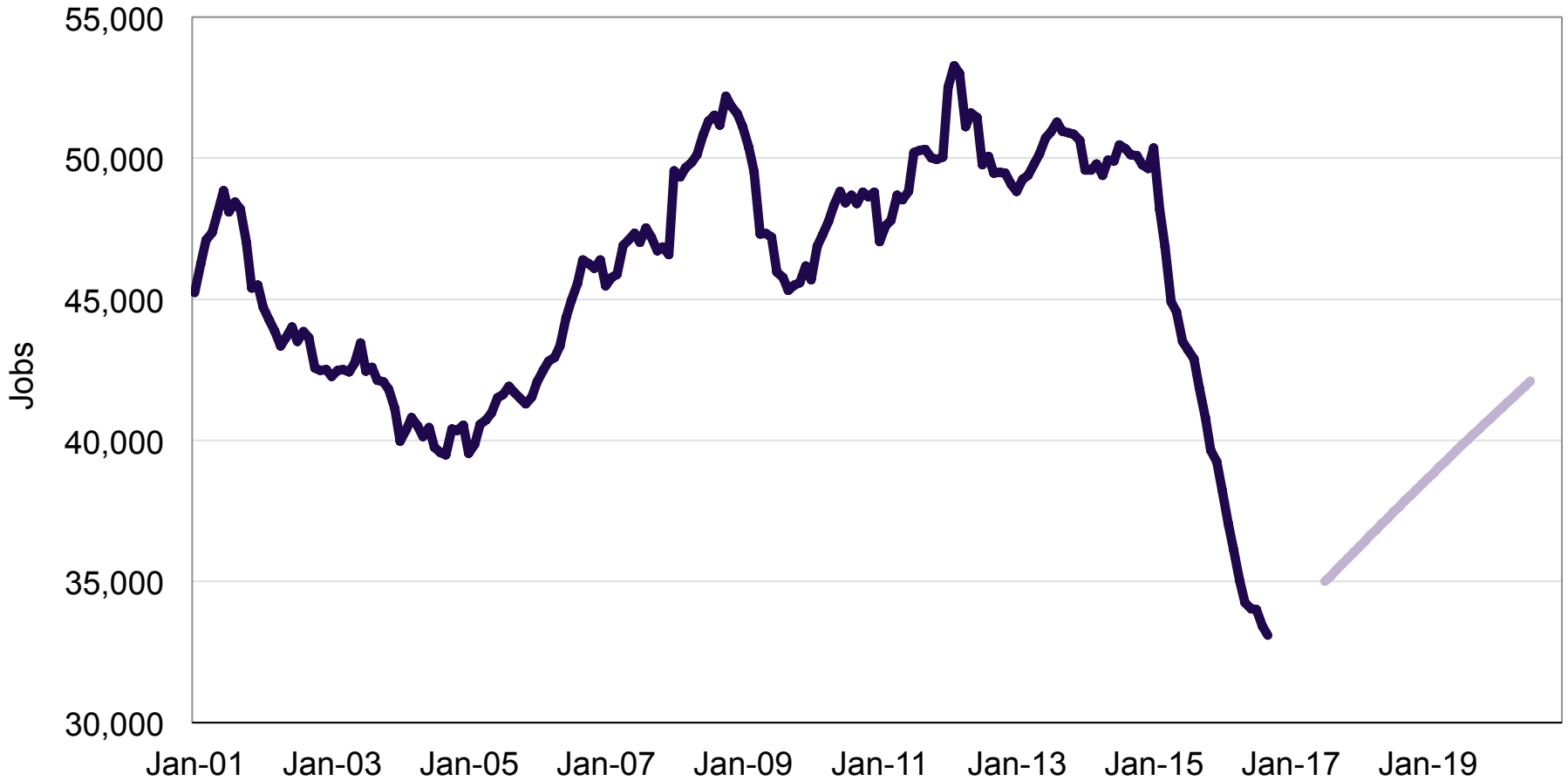
Workforce

Key Industries

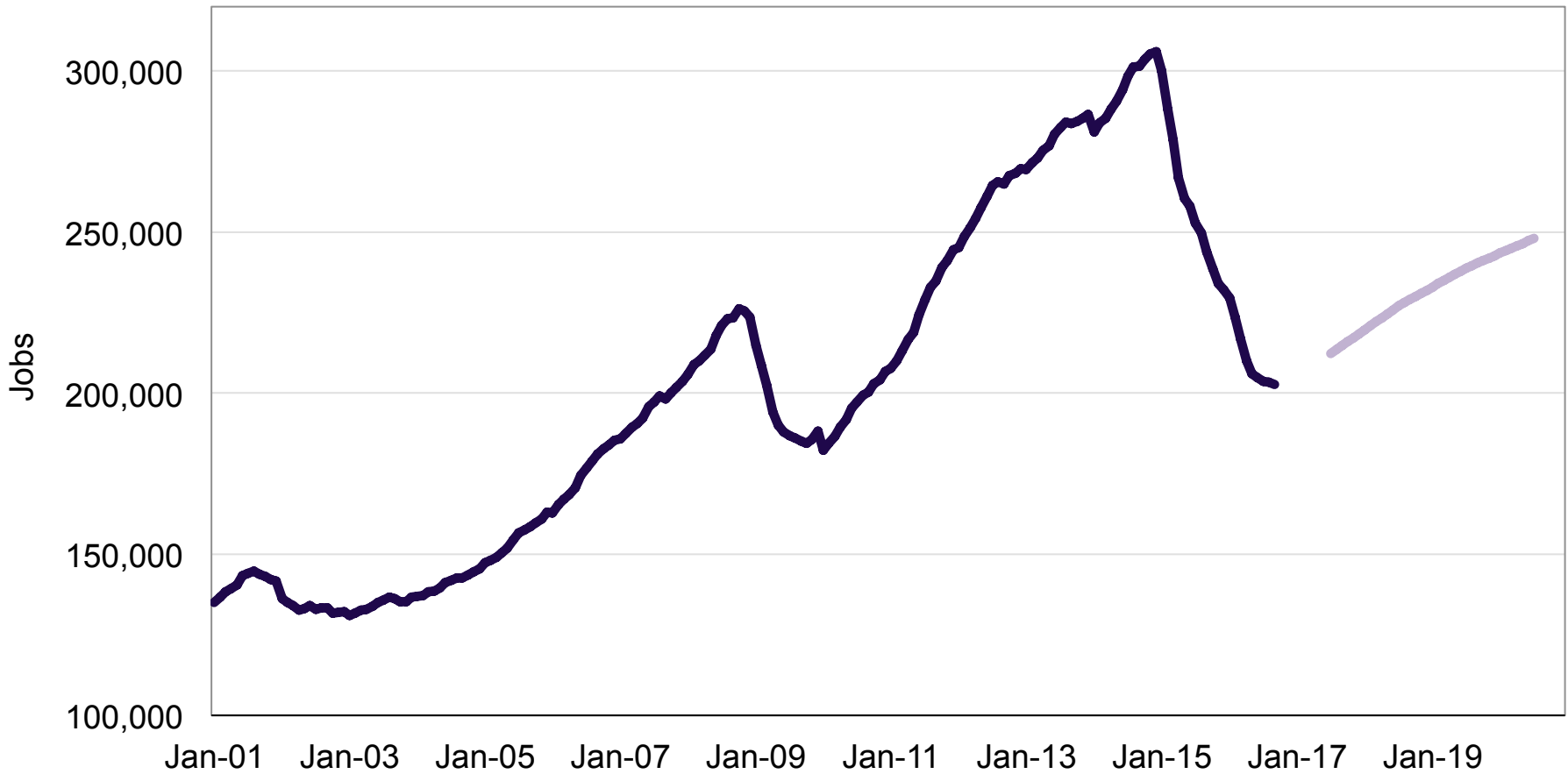
- Oil and Gas
 - NAICS 211: Oil and Gas Extraction
 - NAICS 213: Support Activities for Mining

- Refinery and Chemical Manufacturing
 - NAICS 324: Petroleum and Coal Products Manufacturing (refineries)
 - NAICS 325: Chemical Manufacturing

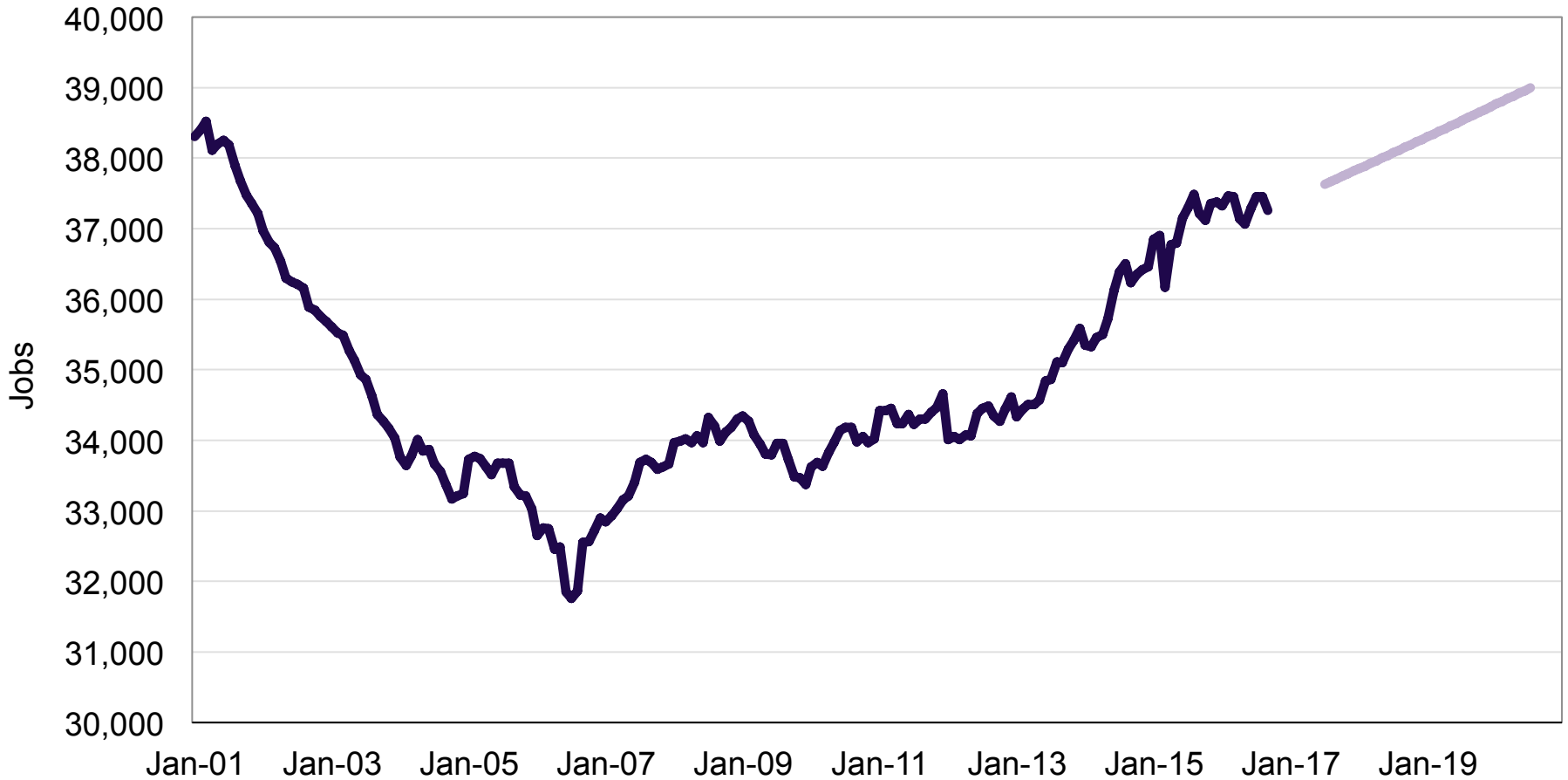
Louisiana oil and gas employment forecast



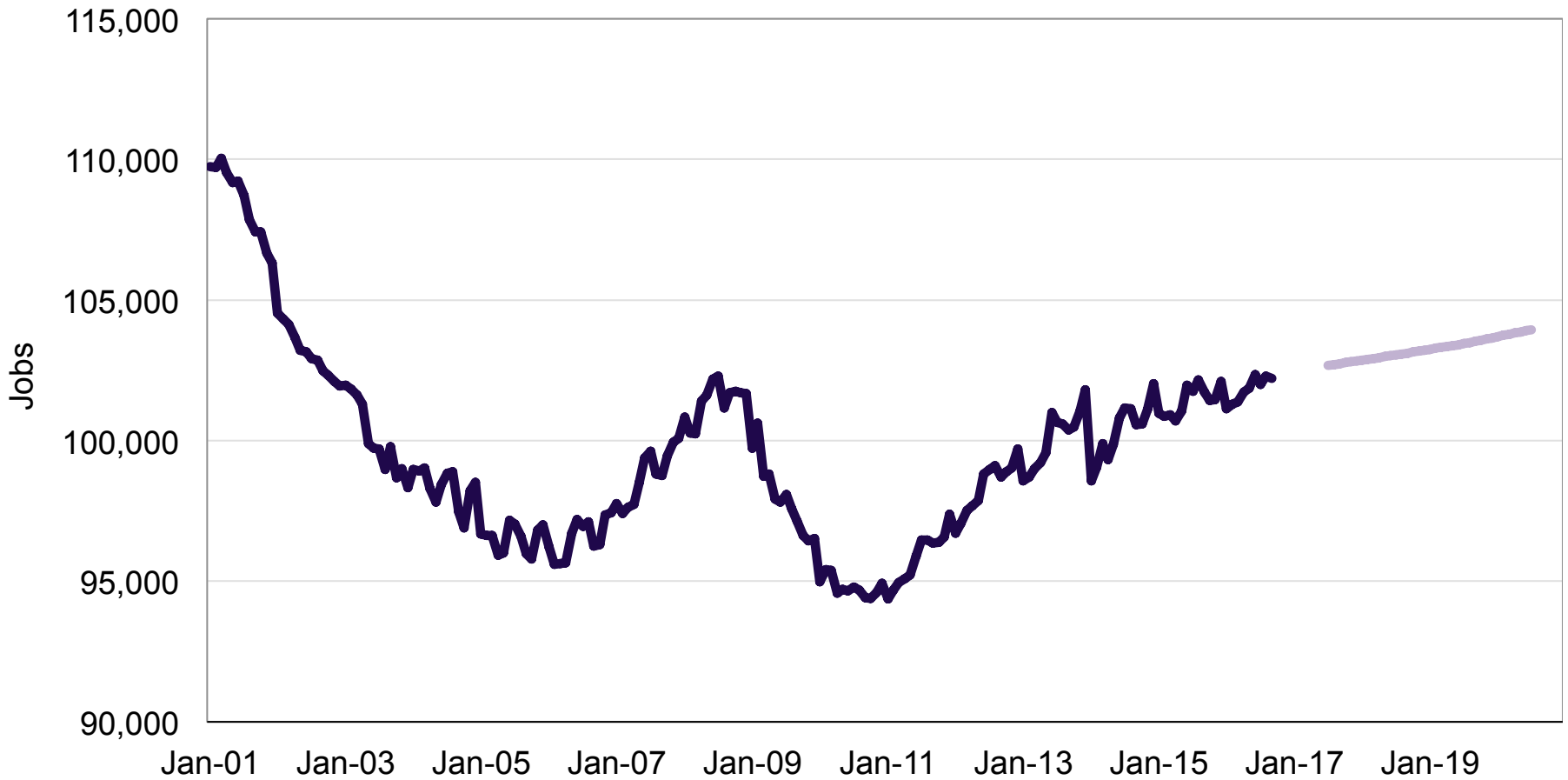
Texas oil and gas employment forecast



Louisiana refinery and chemical sector employment forecast



Texas refinery and chemical sector employment forecast



Conclusions

Conclusions

- Over the past decade, worldwide energy markets have been fundamentally changed due to the advent of U.S. shale oil and gas development.
- These changes have not only impacted *where* hydrocarbons are produced, but has also created significant change to the transportation, processing, and final use.
- The gulf coast has seen large increases in oil and gas production, with these increases mainly concentrated in Texas. Louisiana and Federal Offshore production have decreased in their relative importance.
- Significant investments in the refining, petrochemicals, and transport of hydrocarbons have been made, and will continue to be made over the next decade. The Gulf Coast is well positioned, and could potentially become the world-cited crude benchmark.

