

Gulf Coast Energy Outlook 2019

A large offshore oil rig is silhouetted against a bright sunset over the ocean. The sun is a large, glowing yellow circle on the left side of the frame. The rig's complex structure of pipes, cranes, and platforms is visible against the orange and red sky. The water in the foreground is dark and reflects the light from the sun.

David E. Dismukes, Ph.D. • Gregory B. Upton, Jr., Ph.D.
Dek Terrell, Ph.D.

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Introduction

Up-Stream Price and Production Outlook

Industrial Outlook and Export Economy

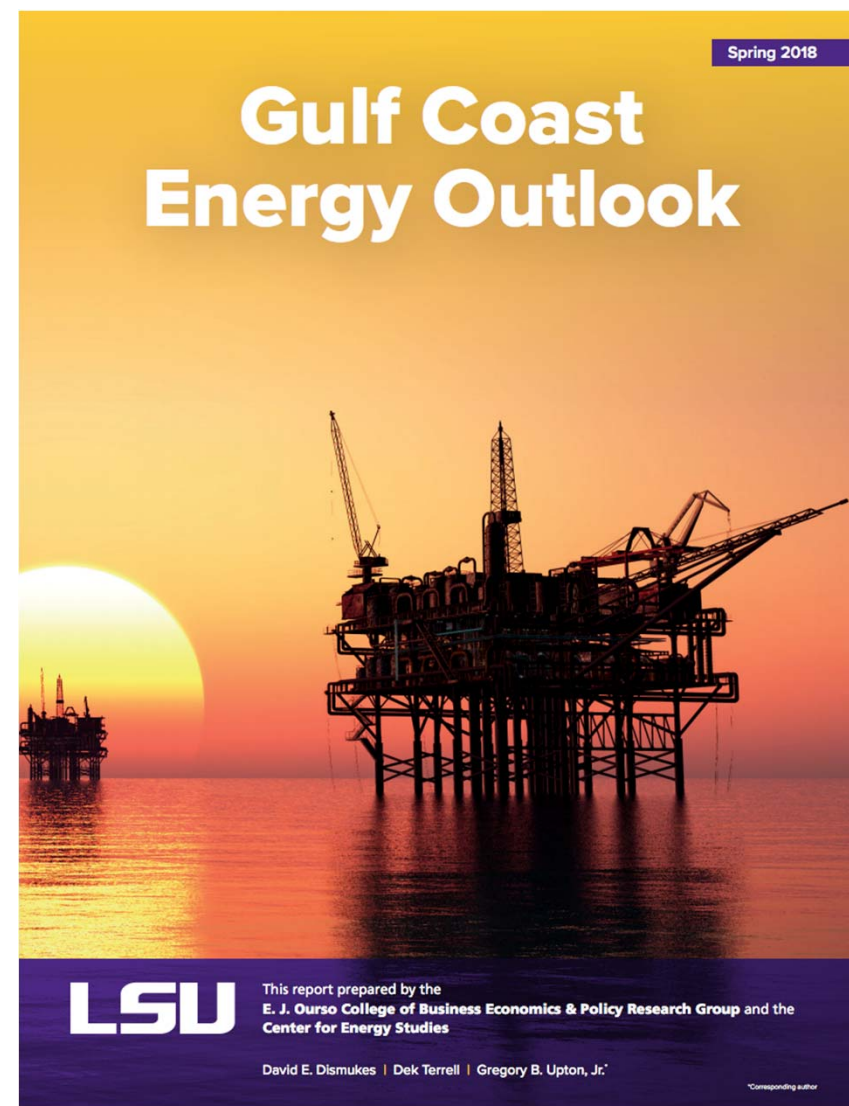
Employment Outlook

Conclusions

Introduction

Gulf Coast Energy Outlook

- The **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.



Gulf Coast Energy Outlook

- This outlook would not be possible without **feedback** from hundreds of stakeholders from across the energy industry.
- While “crunching the numbers” is a critical part of any synopsis report such as this one, equally as important is **input from stakeholders** who have an “on-the-ground” view of what is occurring in real time.

Thank you!

Gold



Silver



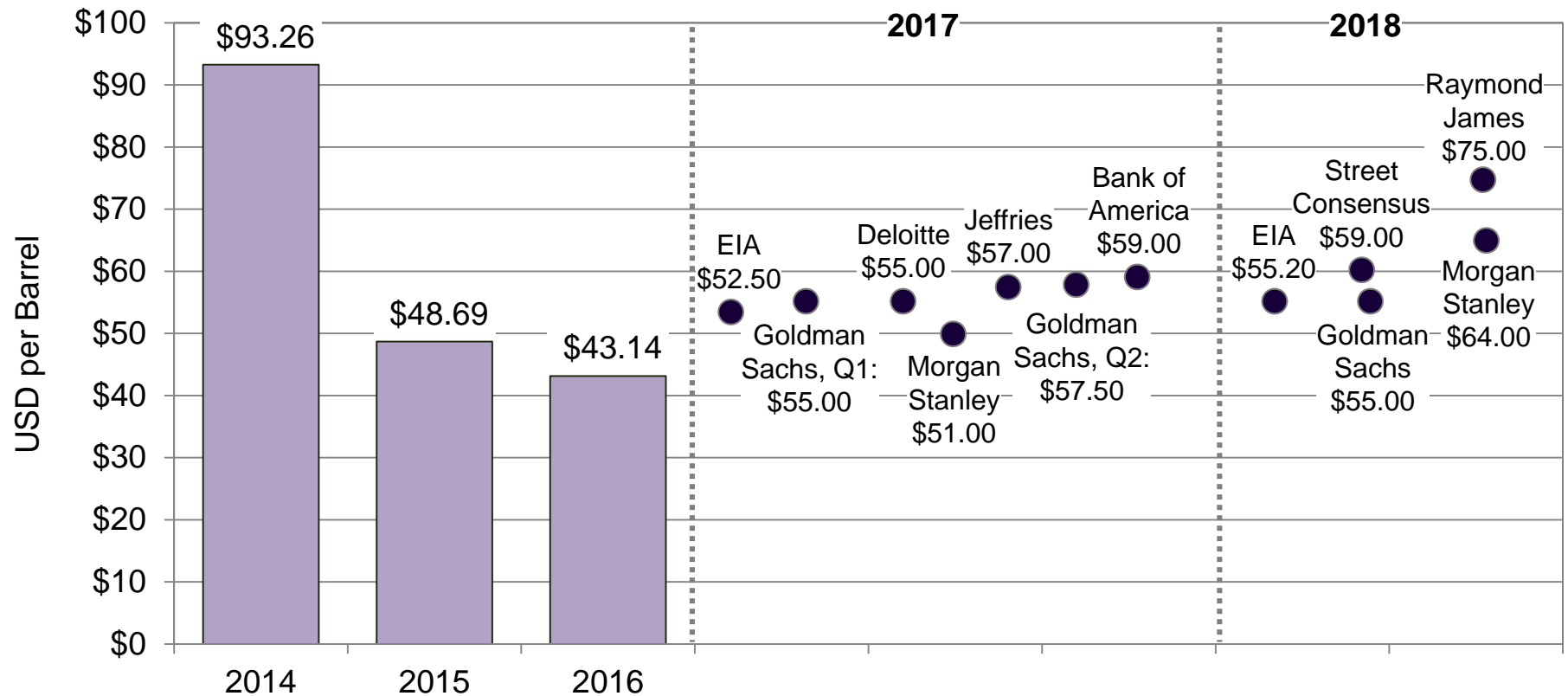
Bronze



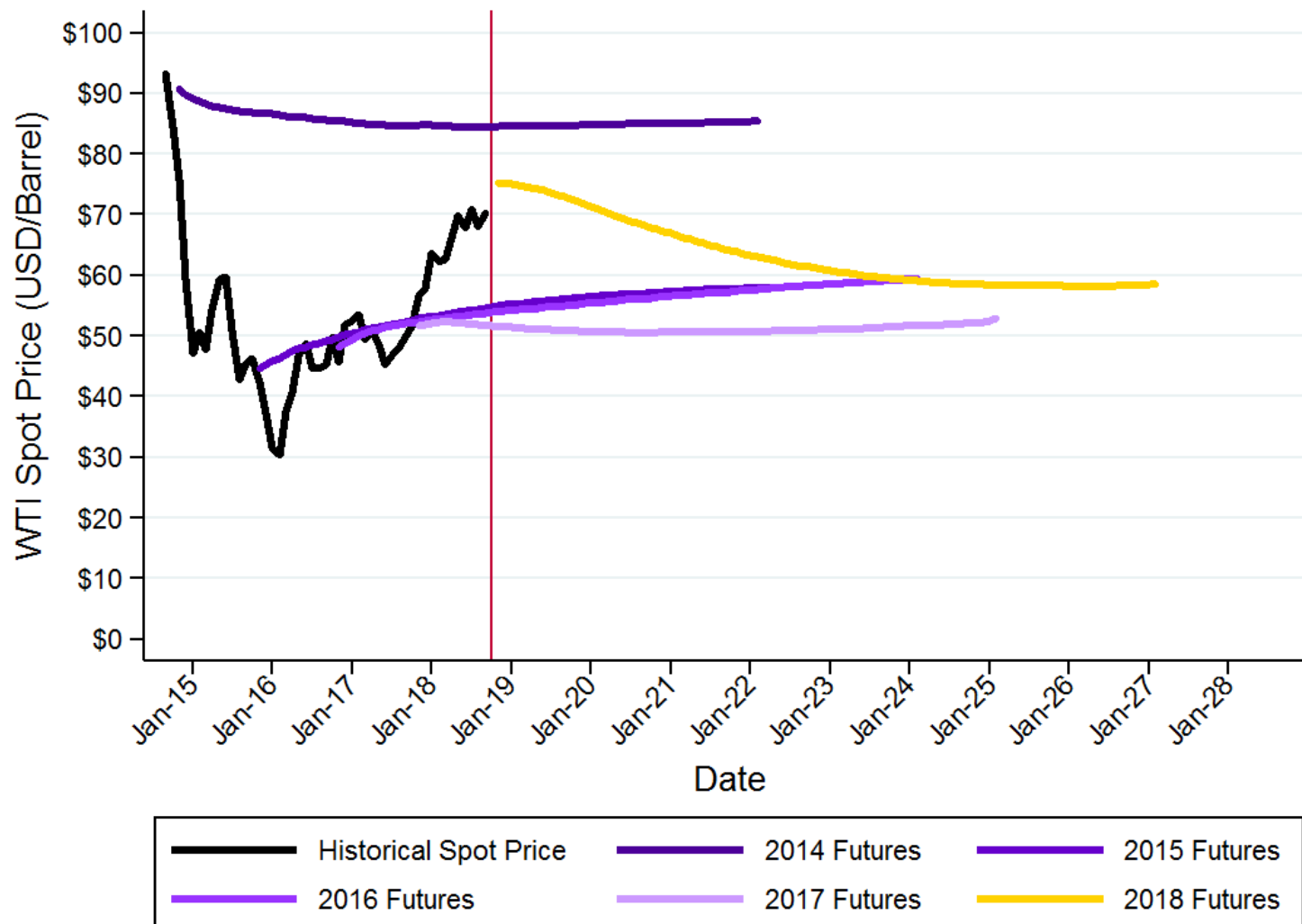
Up-Stream Oil and Gas Outlook

Current Crude Oil Prices and Near-Term Outlook

Most crude oil price projections for 2017 were around \$55 per barrel. Prices are expected to increase in 2018, but remain below \$75 per barrel. Actual 2017 prices ranged from \$45 to \$58 per barrel. Actual 2018 prices have ranged from \$62 to \$71 per barrel.

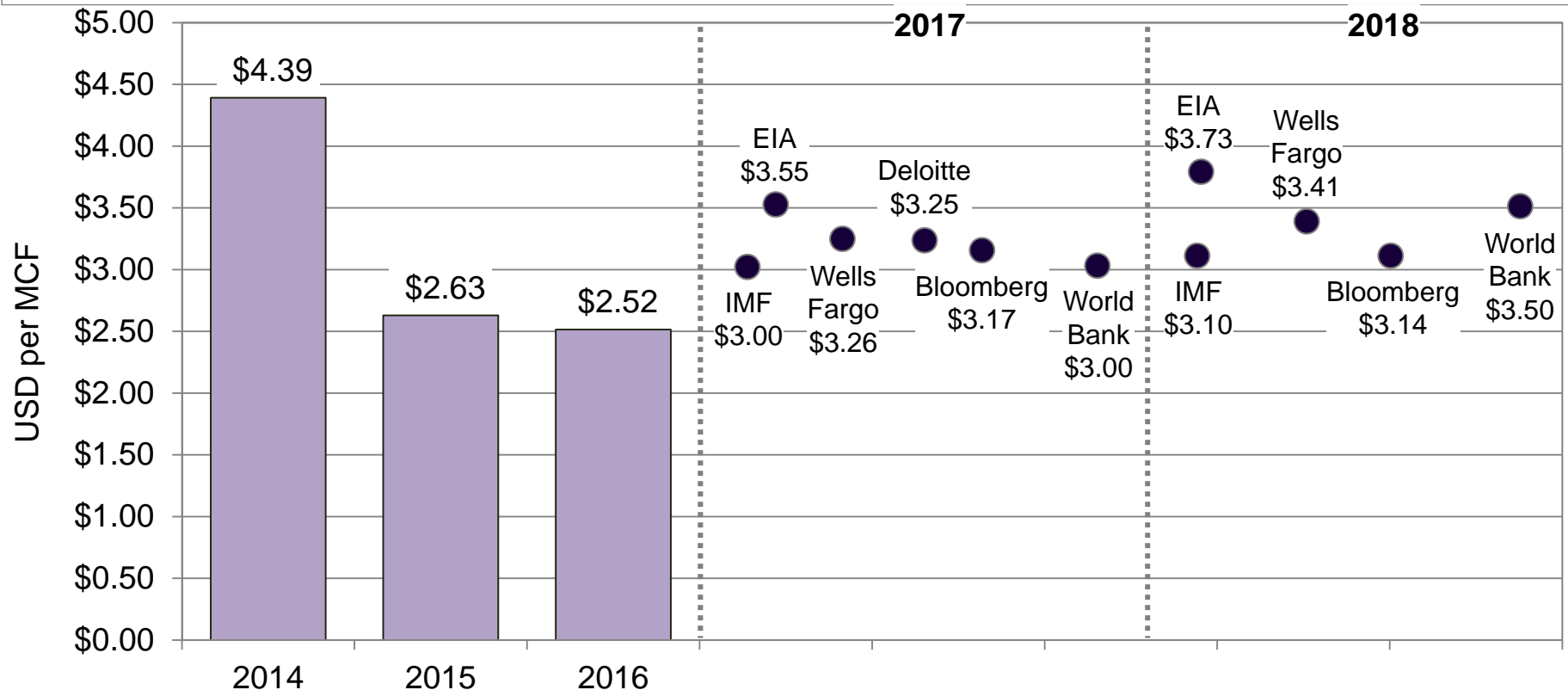


Crude Oil Futures Prices

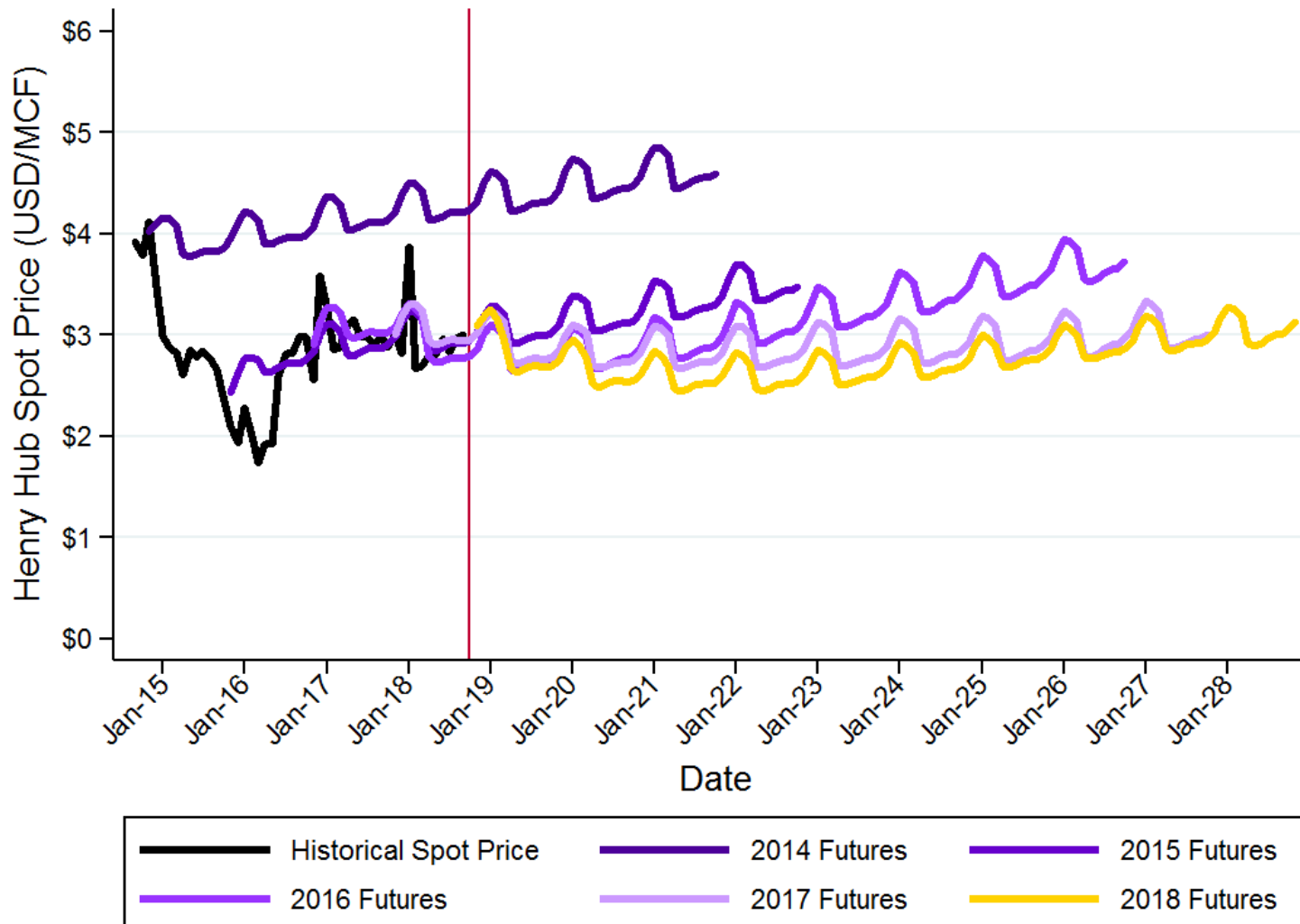


Current Natural Gas Prices and Near-Term Outlook

Natural gas prices were forecasted to stay below \$3.55 per MMBtu in 2017 and are projected to stay under \$3.75 in 2018.
Actual 2017 prices ranged from \$2.82 to \$3.30
Actual 2018 prices have ranged from \$2.67 to 3.87

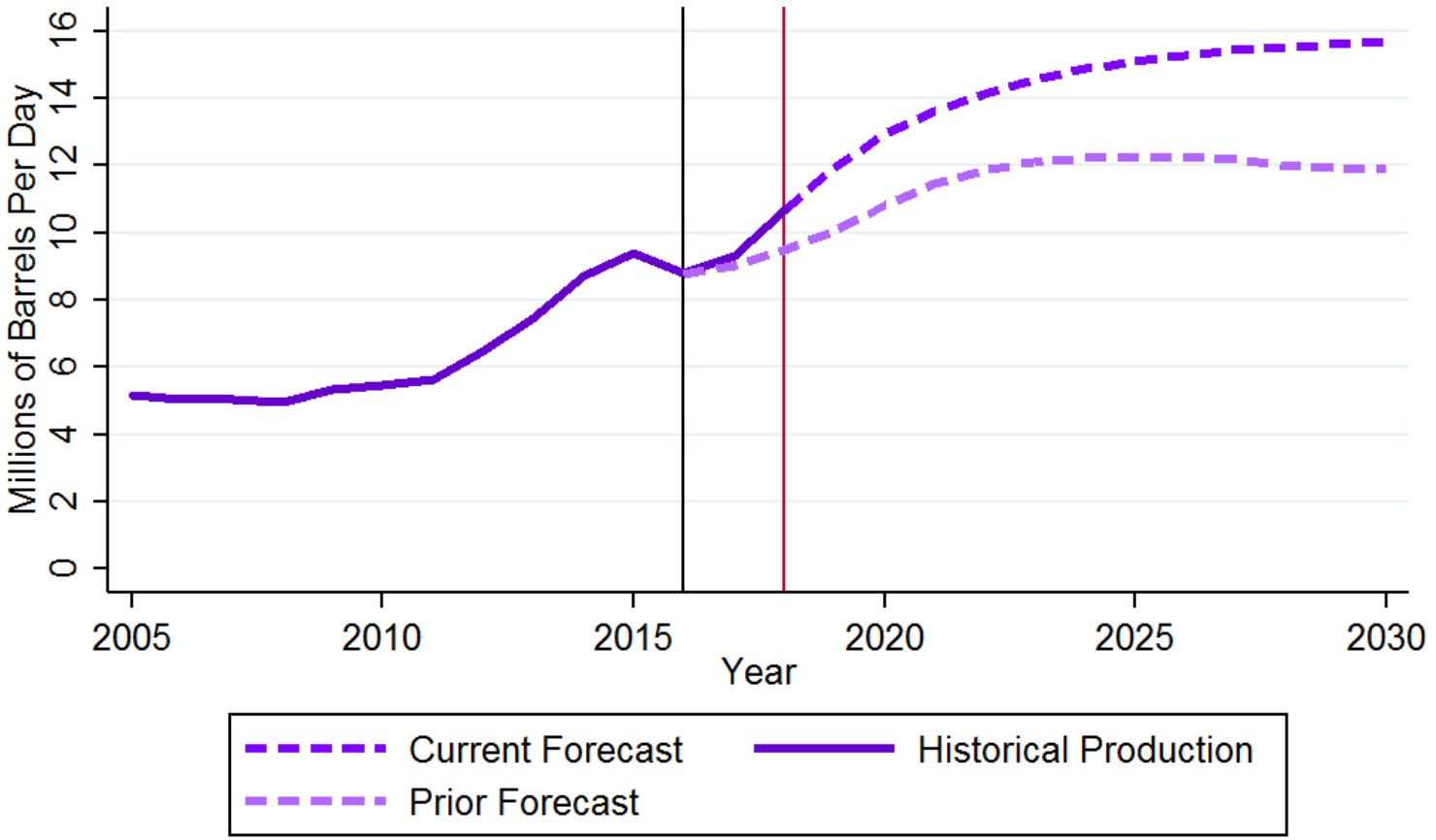


Natural Gas Futures Prices



Forecast Performance

Crude Oil Production Forecast
Total United States



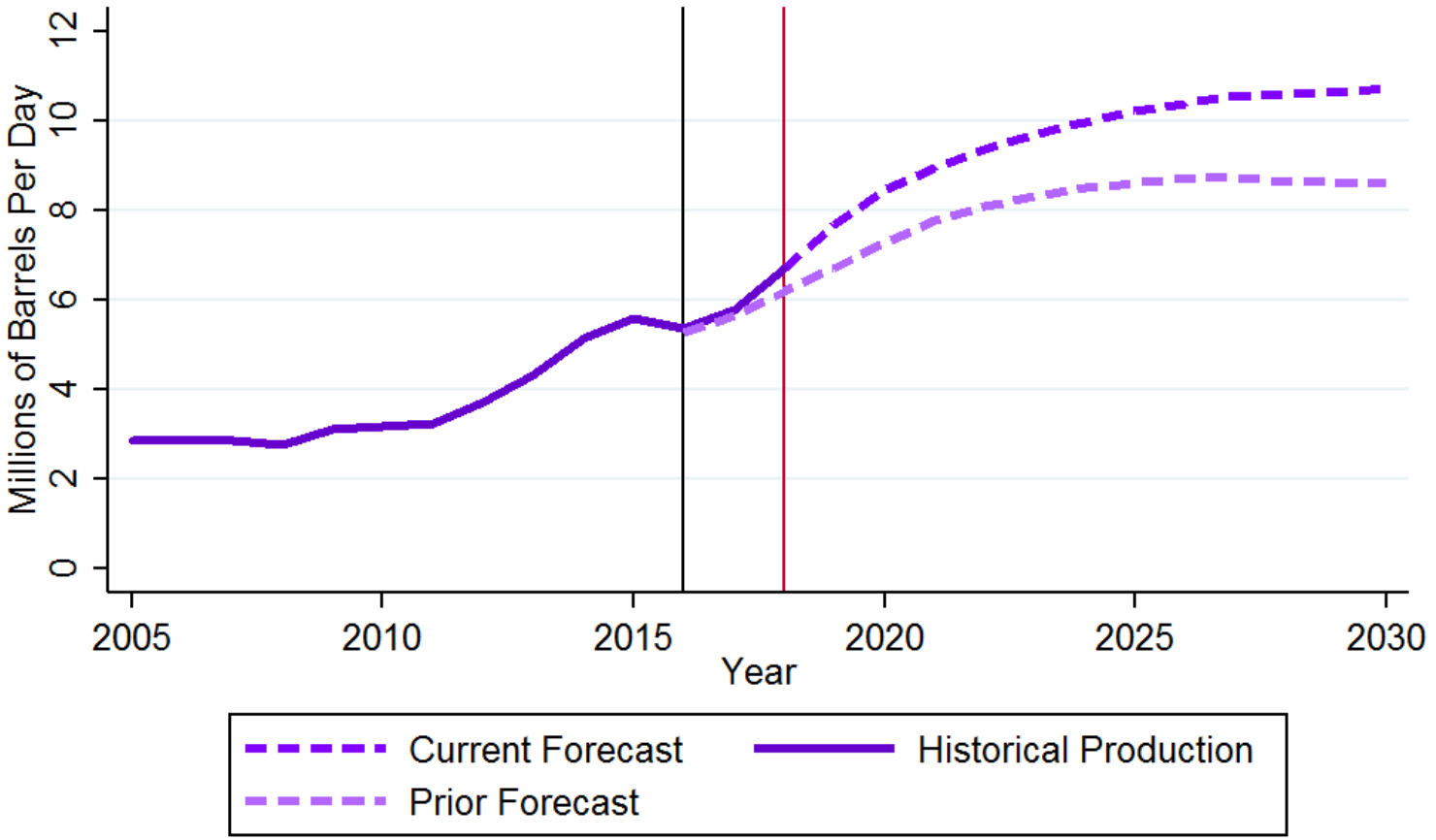
Forecasts based on DrillingInfo Prodcast.



Forecast Performance

Crude Oil Production Forecast

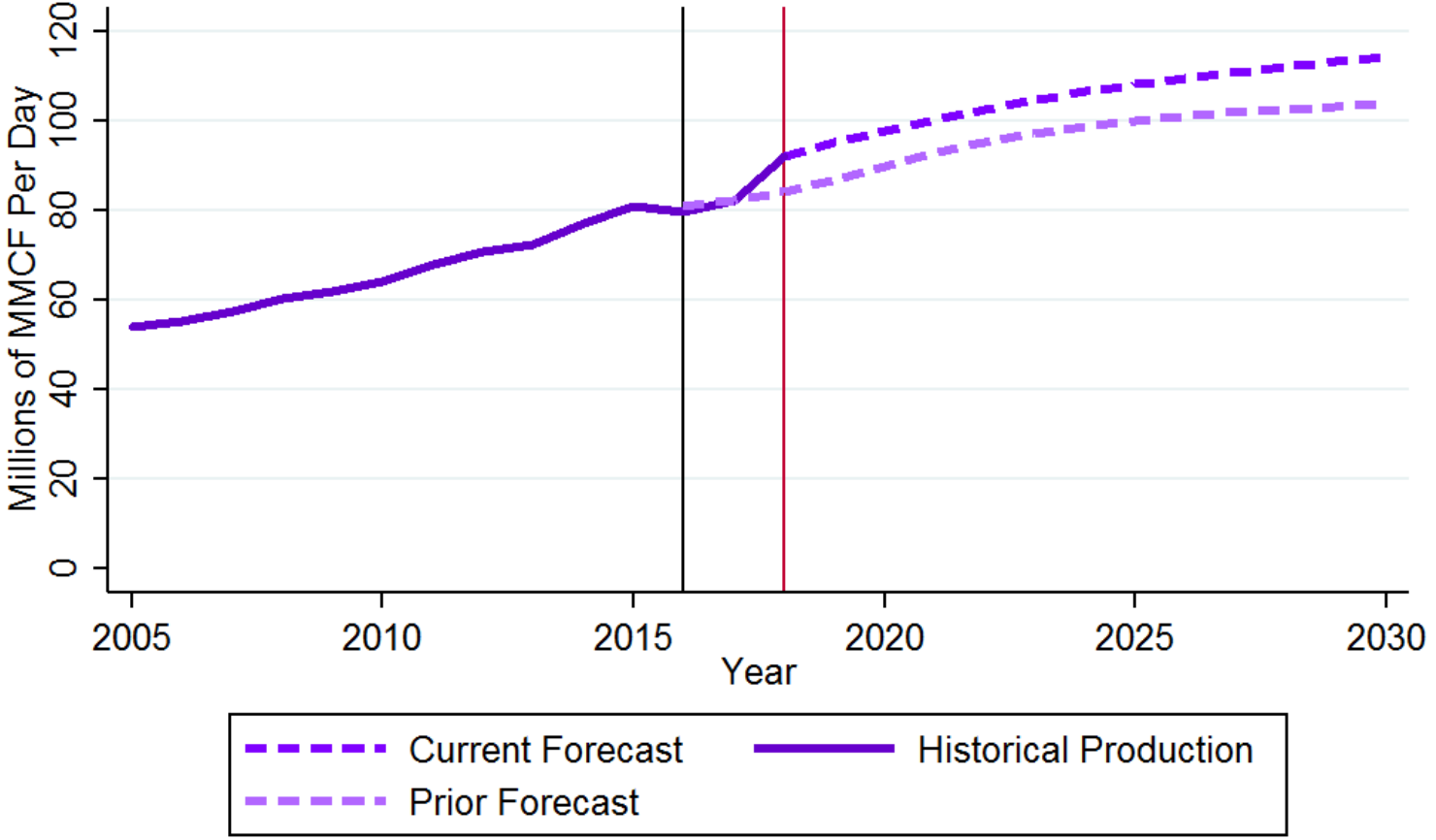
Gulf Coast



Forecasts based on DrillingInfo Prodcast.

Forecast Performance

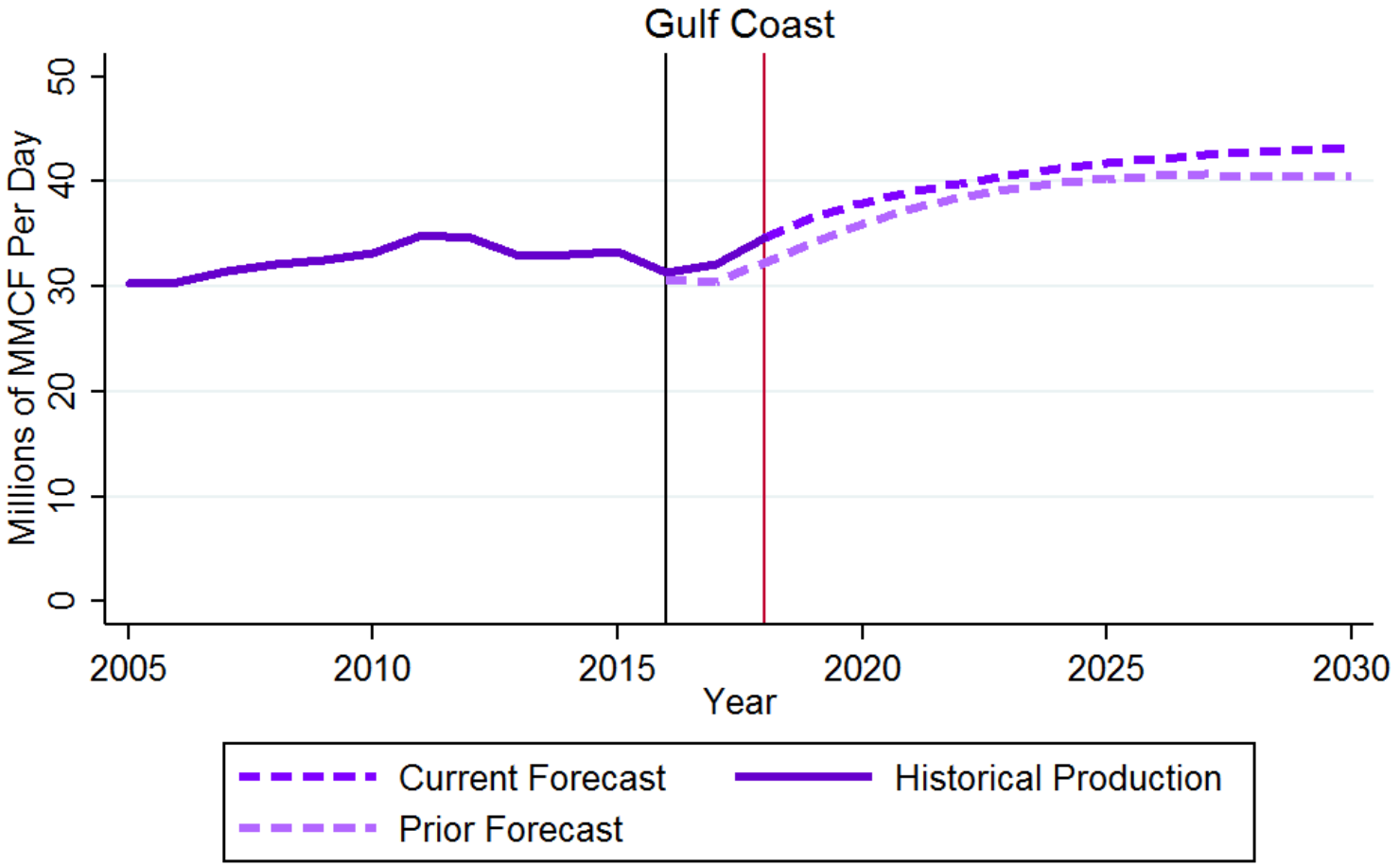
Natural Gas Production Forecast
Total United States



Forecasts based on DrillingInfo Prodcast.

Forecast Performance

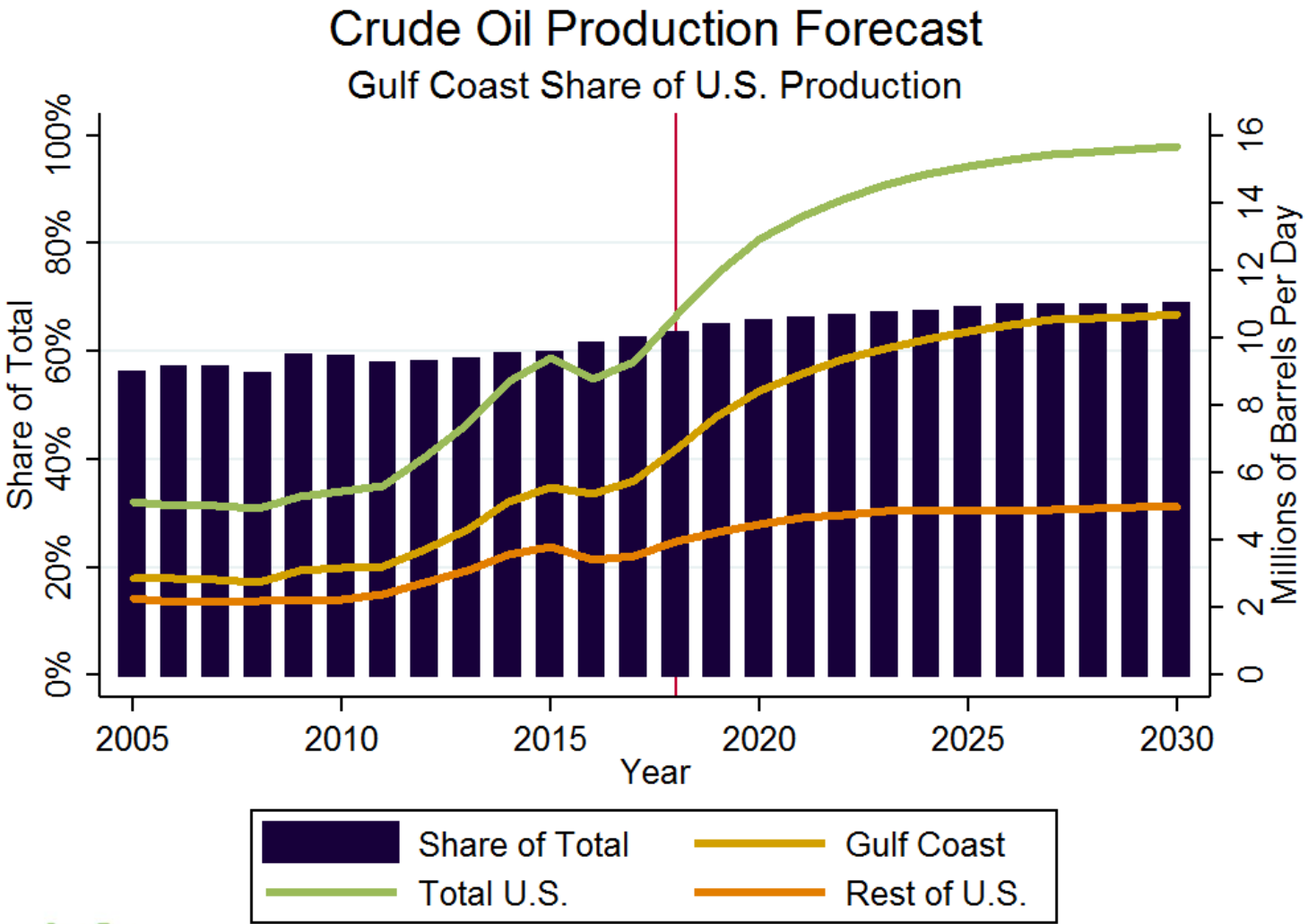
Natural Gas Production Forecast



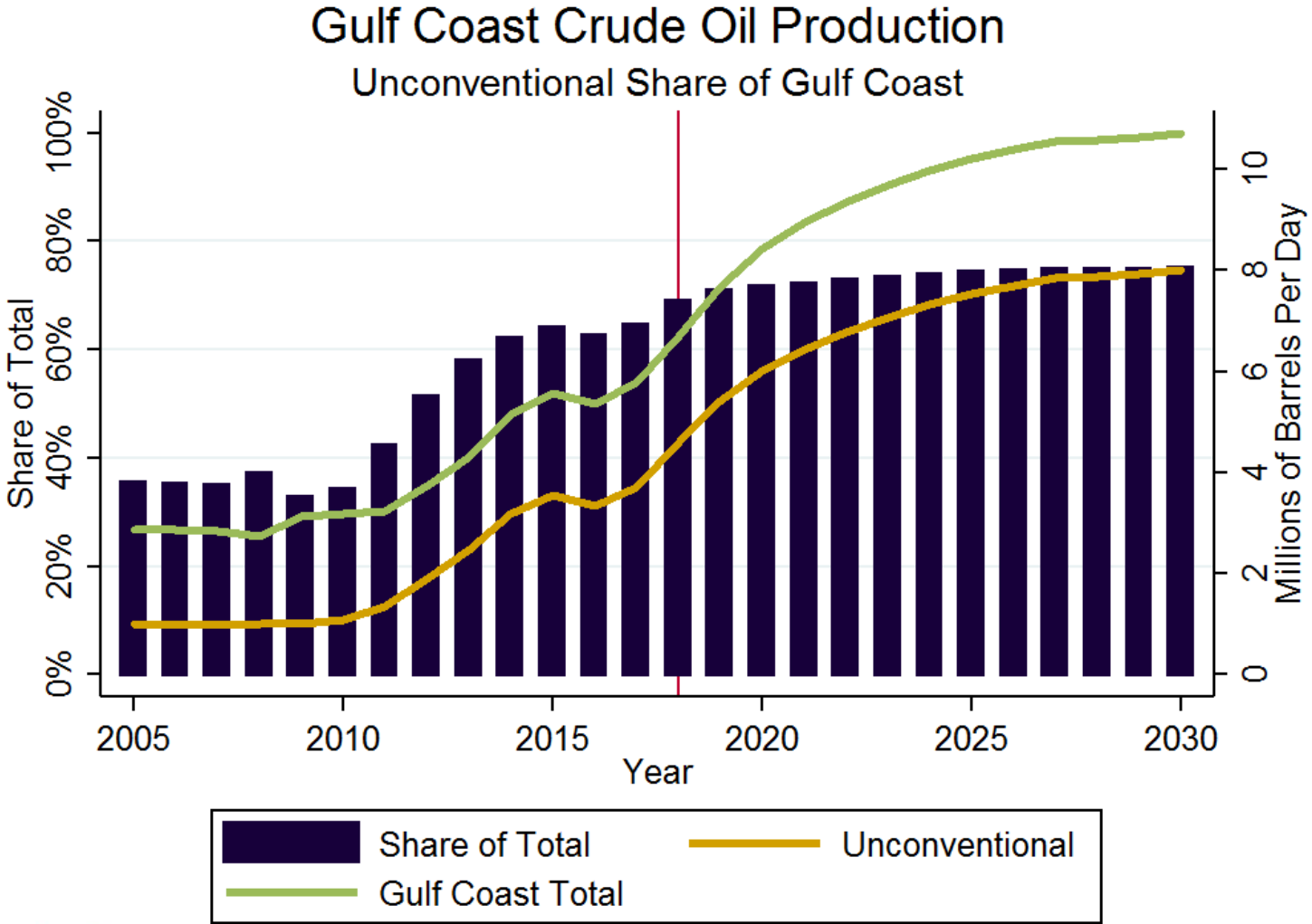
Forecasts based on DrillingInfo Prodcast.



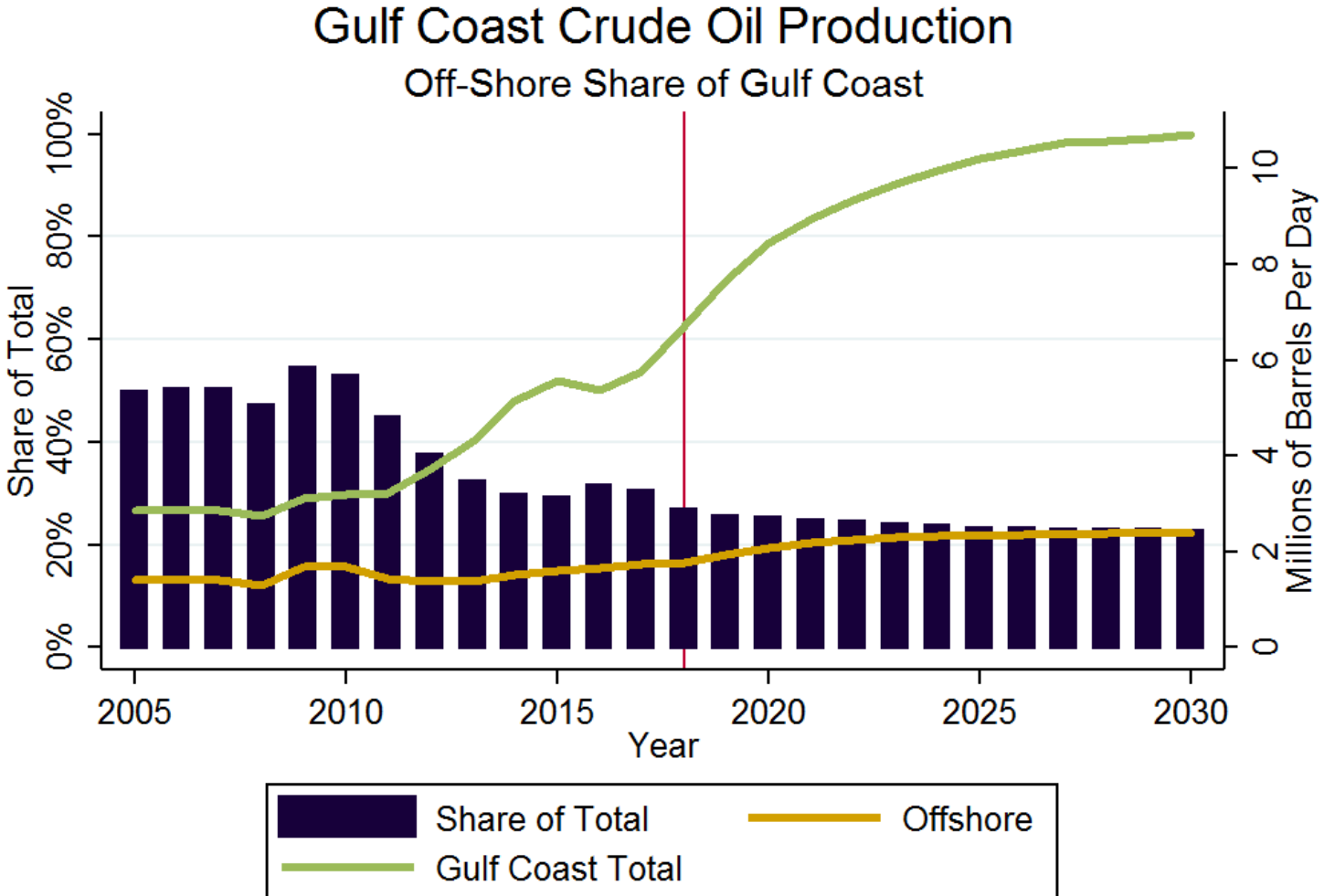
Gulf Coast Crude Oil Production Forecast



Unconventional On-Shore Crude Oil Forecast

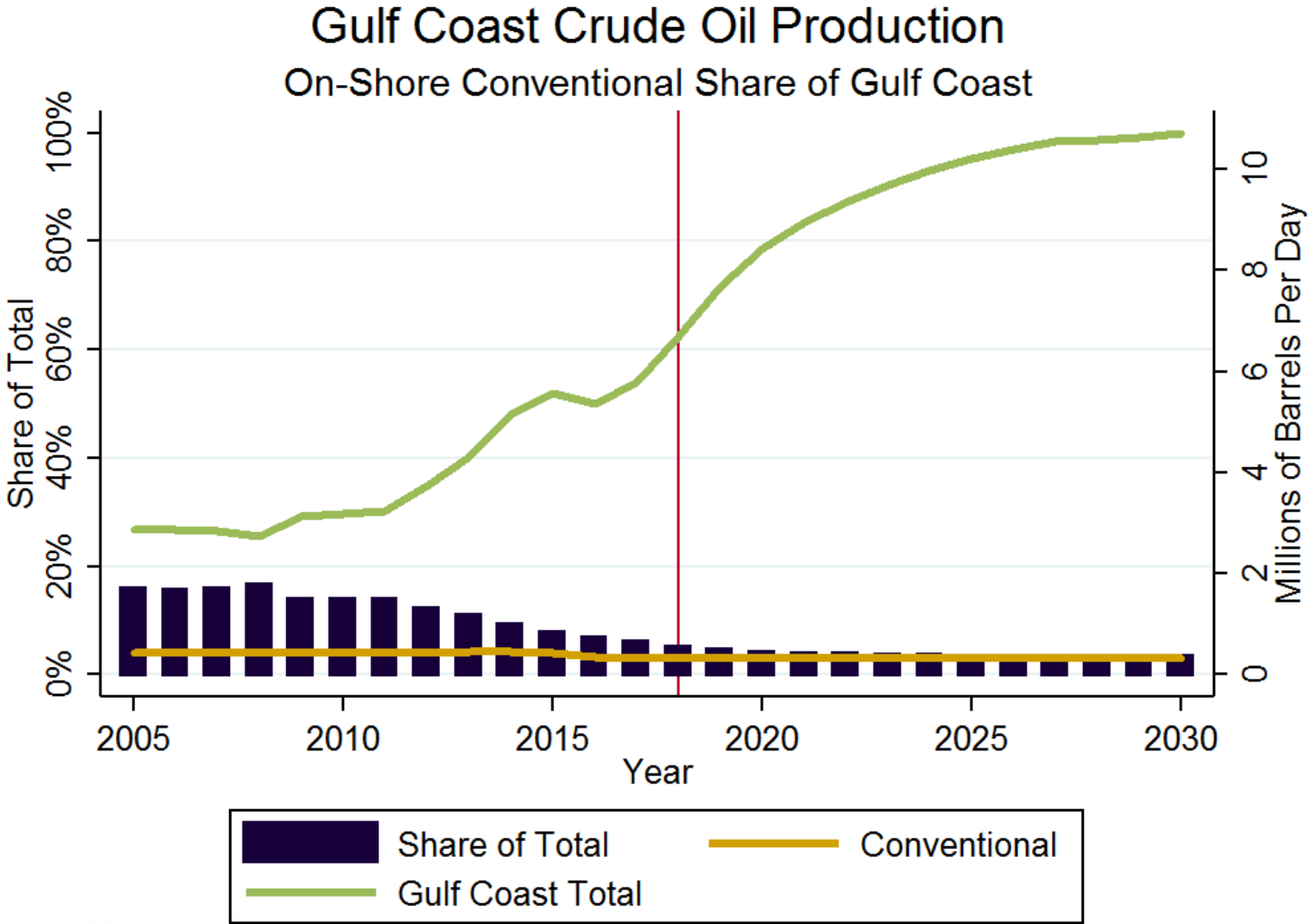


Off-Shore Crude Oil Forecast

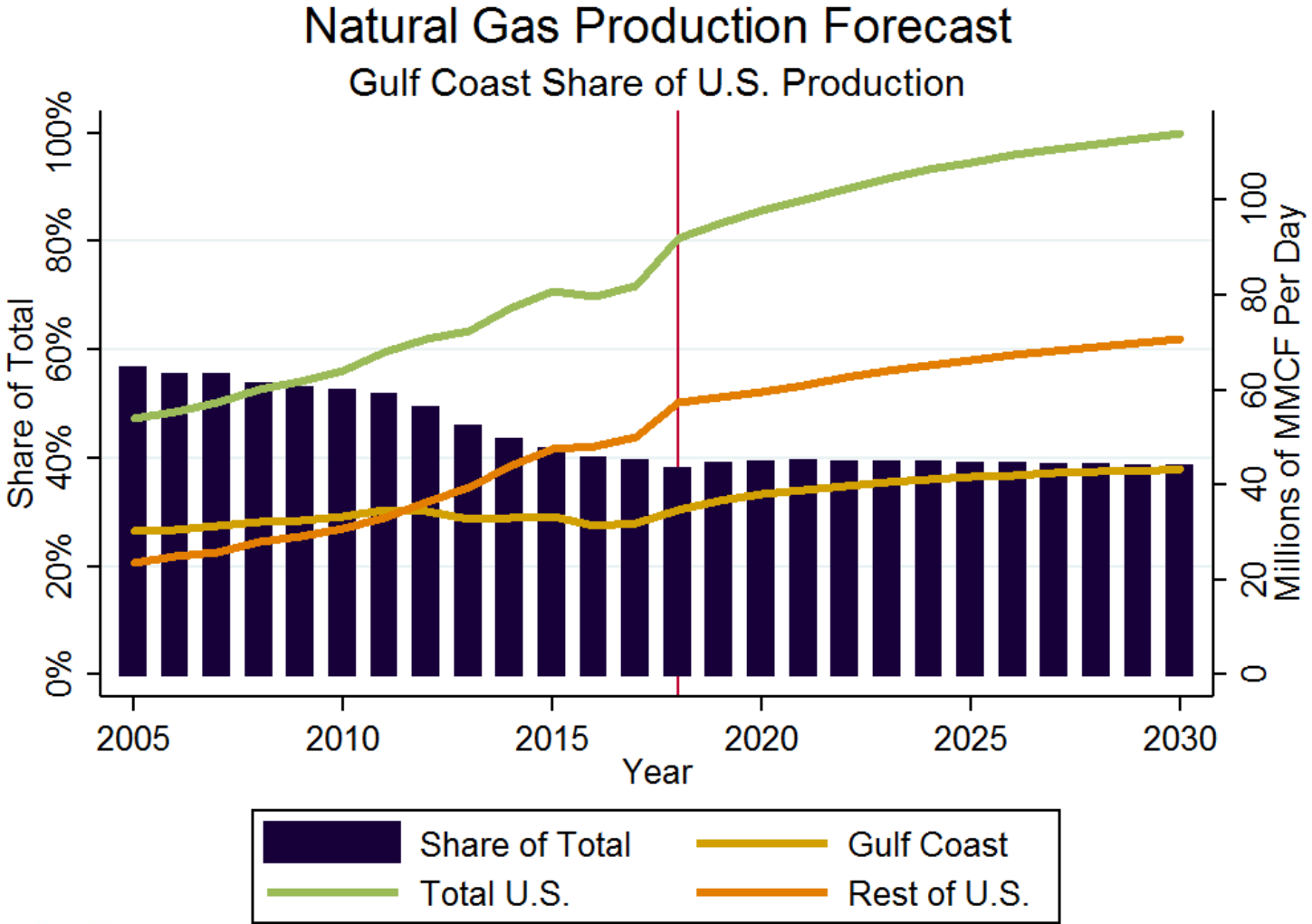


Note: Offshore includes both state and federal waters.

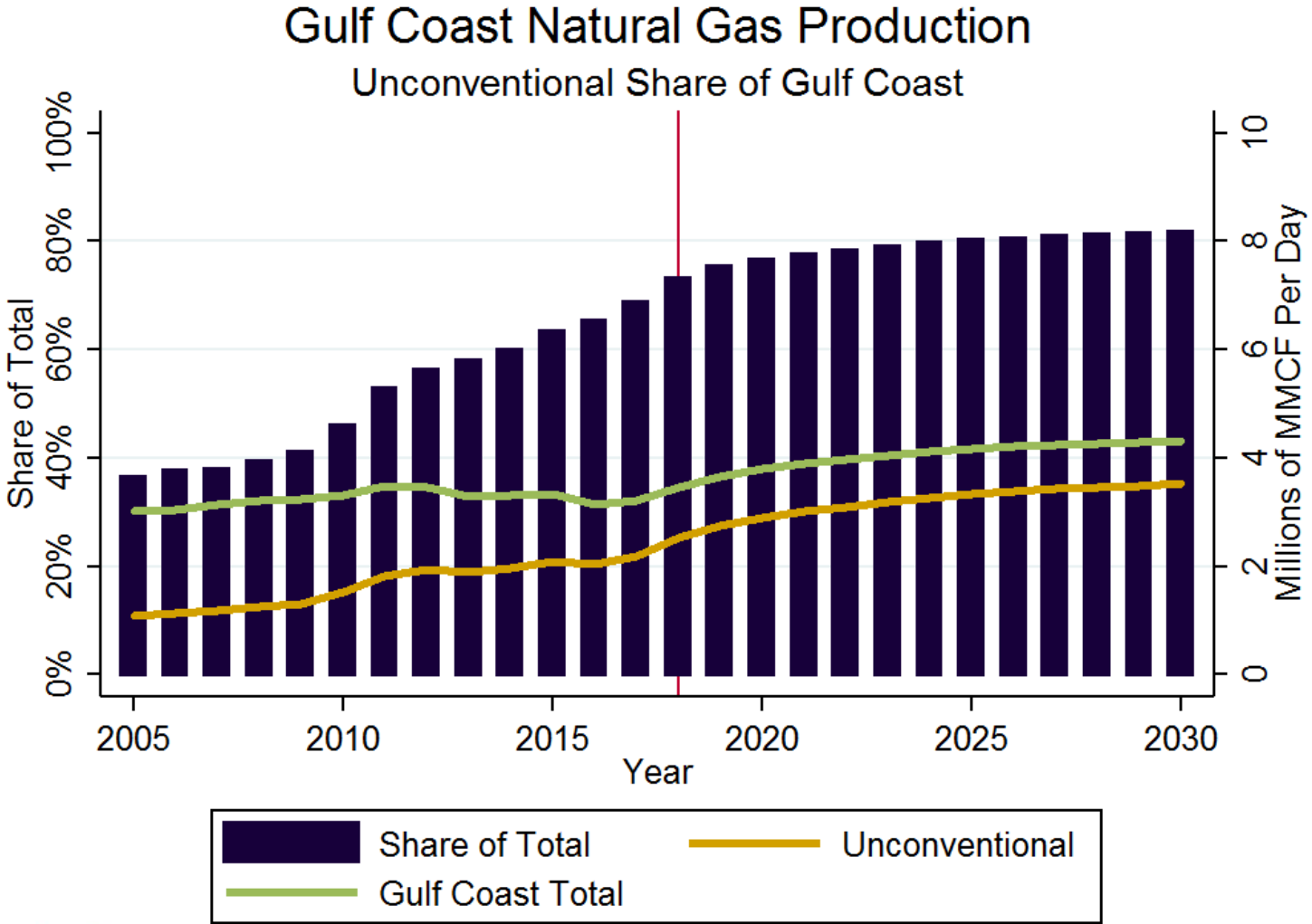
Conventional On-Shore Crude Oil Forecast



Gulf Coast Natural Gas Production Forecast

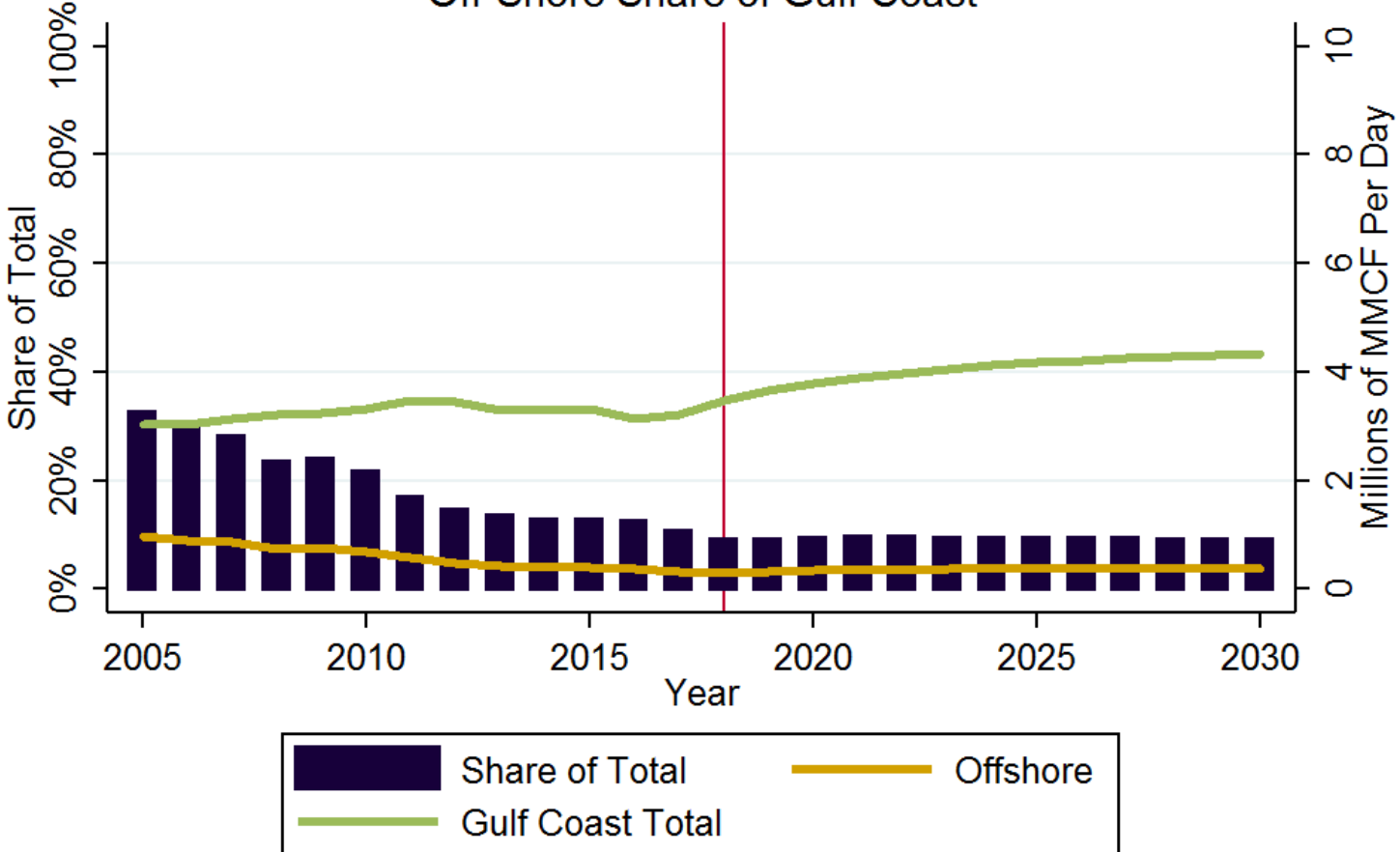


Unconventional On-Shore Natural Gas Oil Forecast



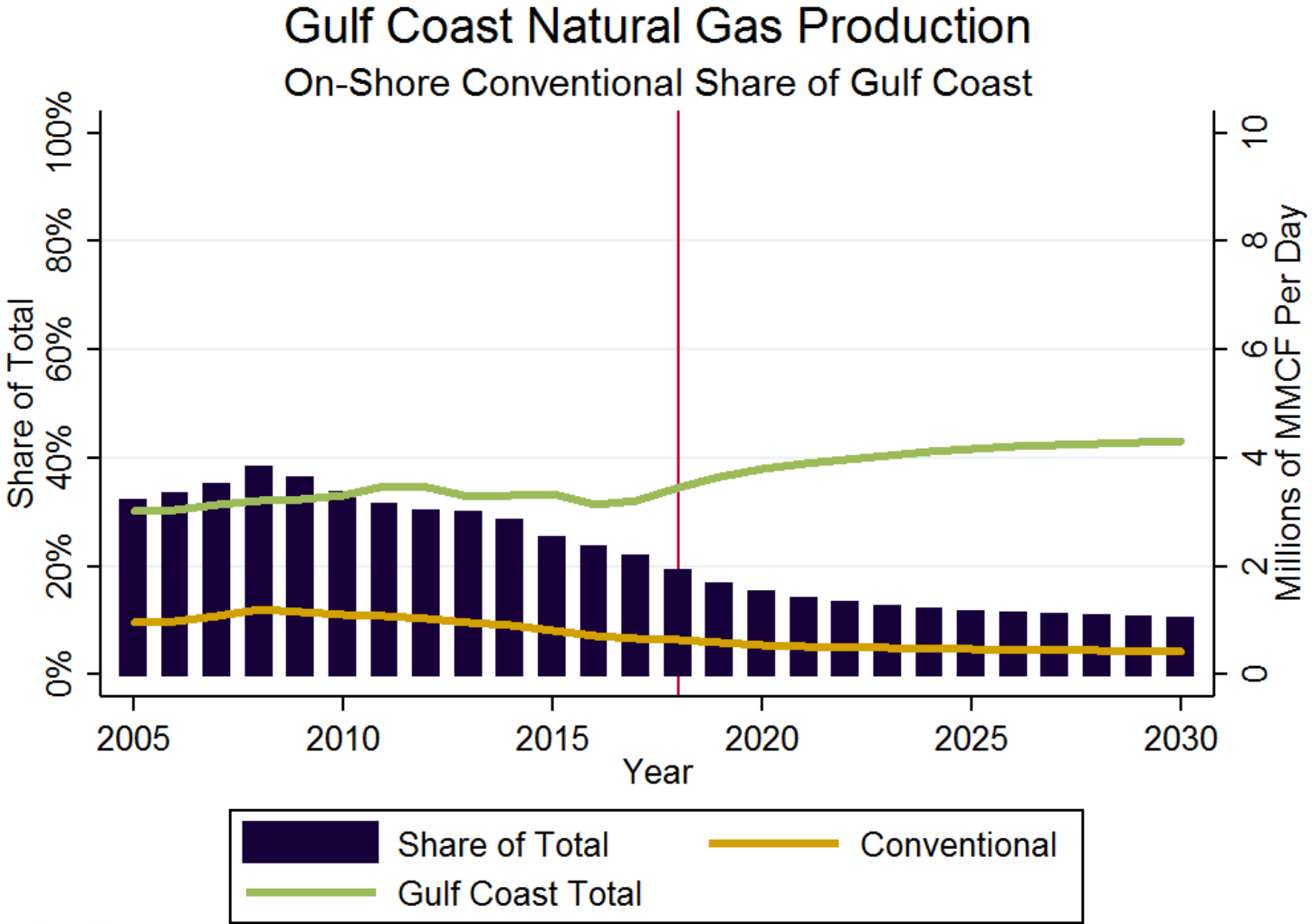
Off-Shore Natural Gas Forecast

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



Note: Offshore includes both state and federal waters.

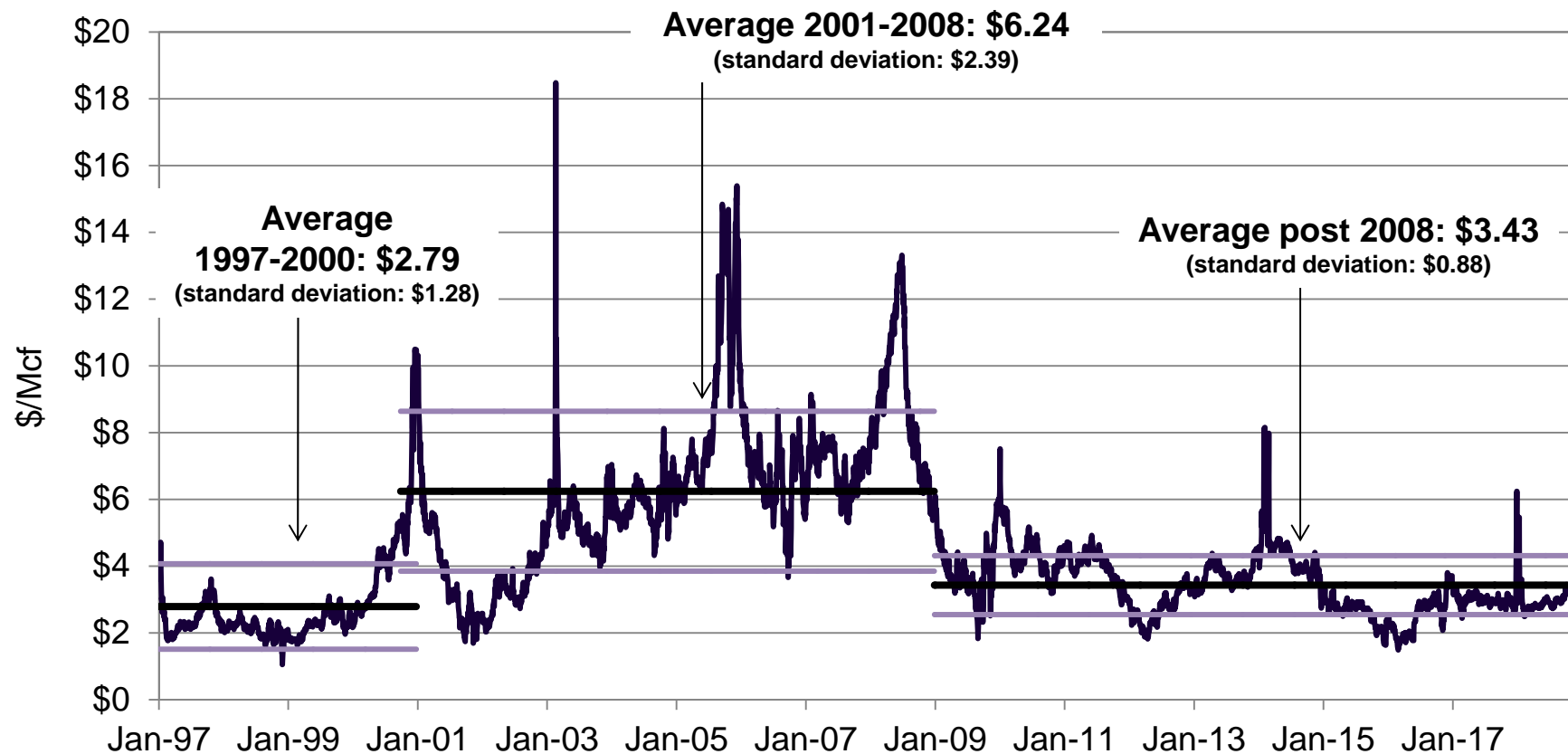
Conventional On-Shore Natural Gas Forecast



Industrial Outlook and Export Economy

Natural gas price trends

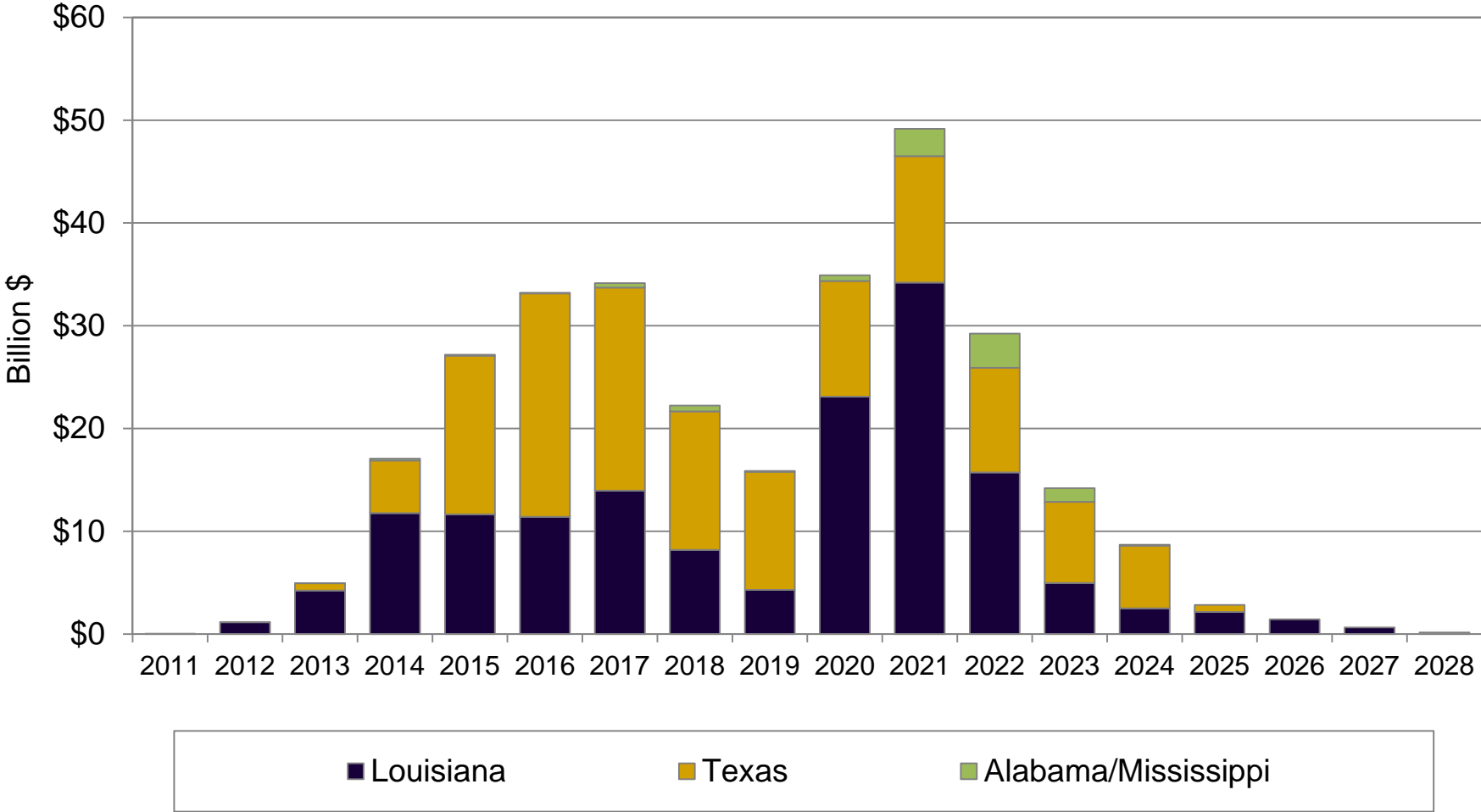
Natural gas price reductions (and reductions in volatility) are the direct result of unconventional oil and gas development.



Industrial/Export Outlook

Gulf of Mexico Region – Energy Manufacturing Capital Expenditures (by State)

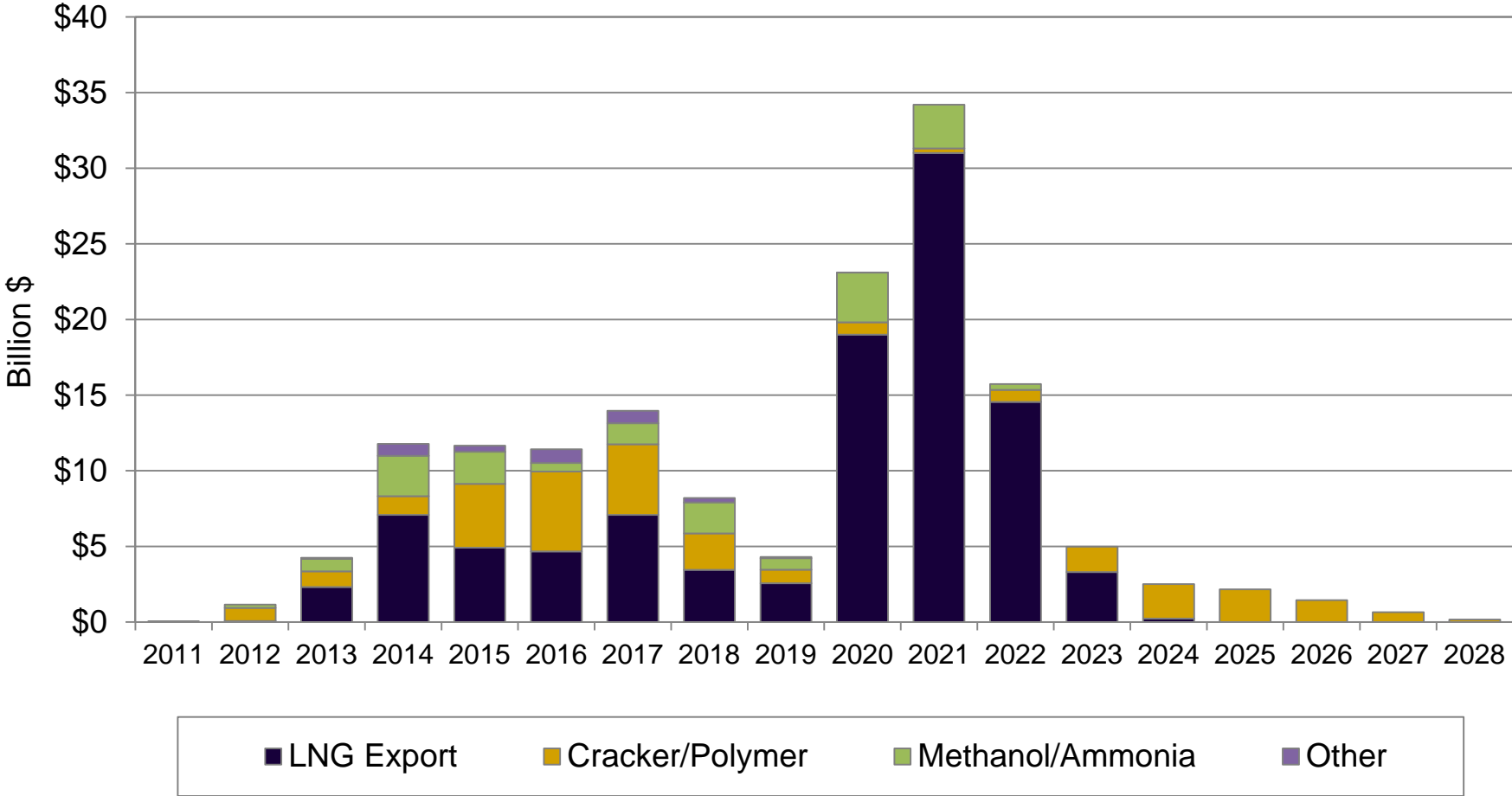
Capital expenditures have been relatively balanced across the two states.



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 total capital expenditures by sector

The Louisiana capital expenditures are more heavily weighted to LNG export facilities than in Texas.

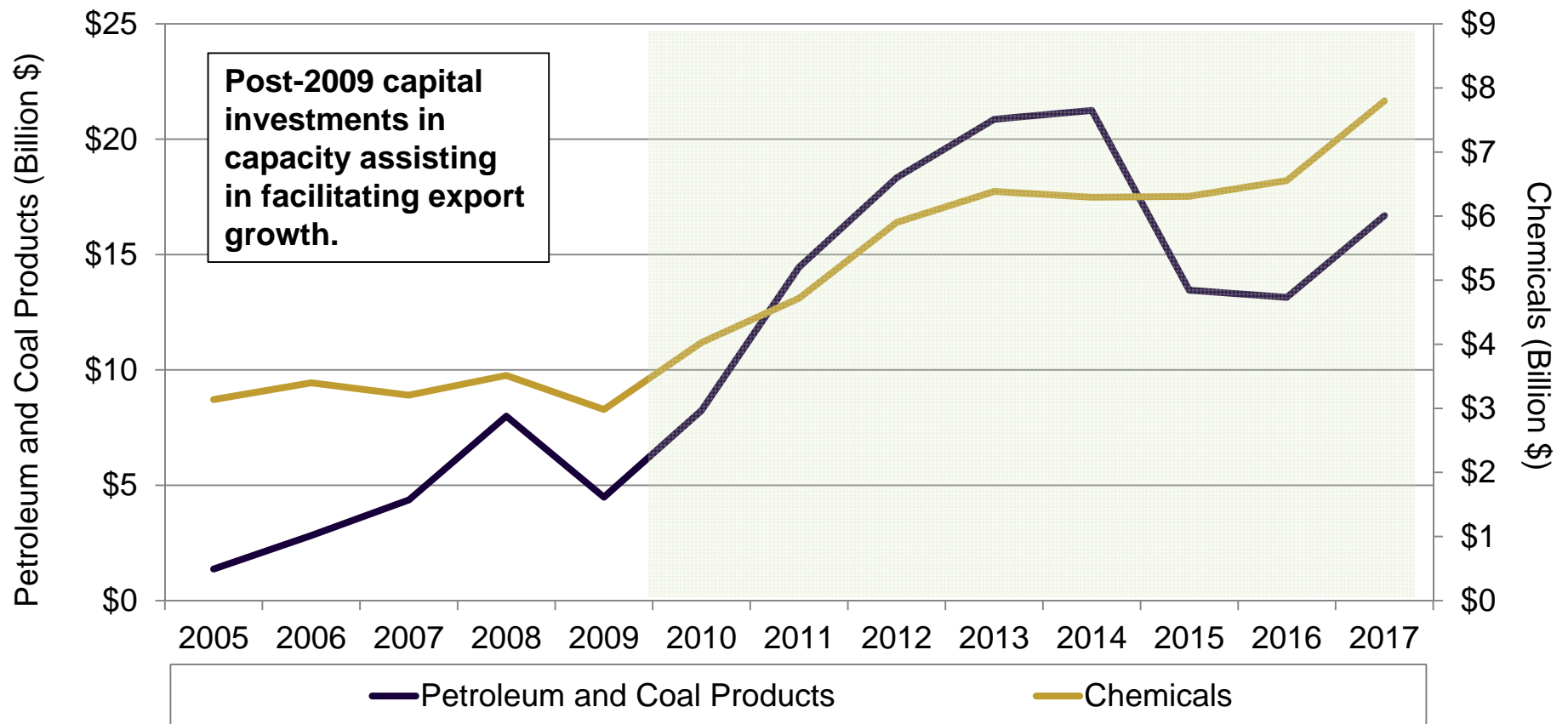


Source: David E. Dismukes (2013). *Unconventional Resources and Louisiana's Manufacturing Development Renaissance*. Baton Rouge, LA: Louisiana State University, Center for Energy Studies and author's updates.

Industrial/Export Outlook

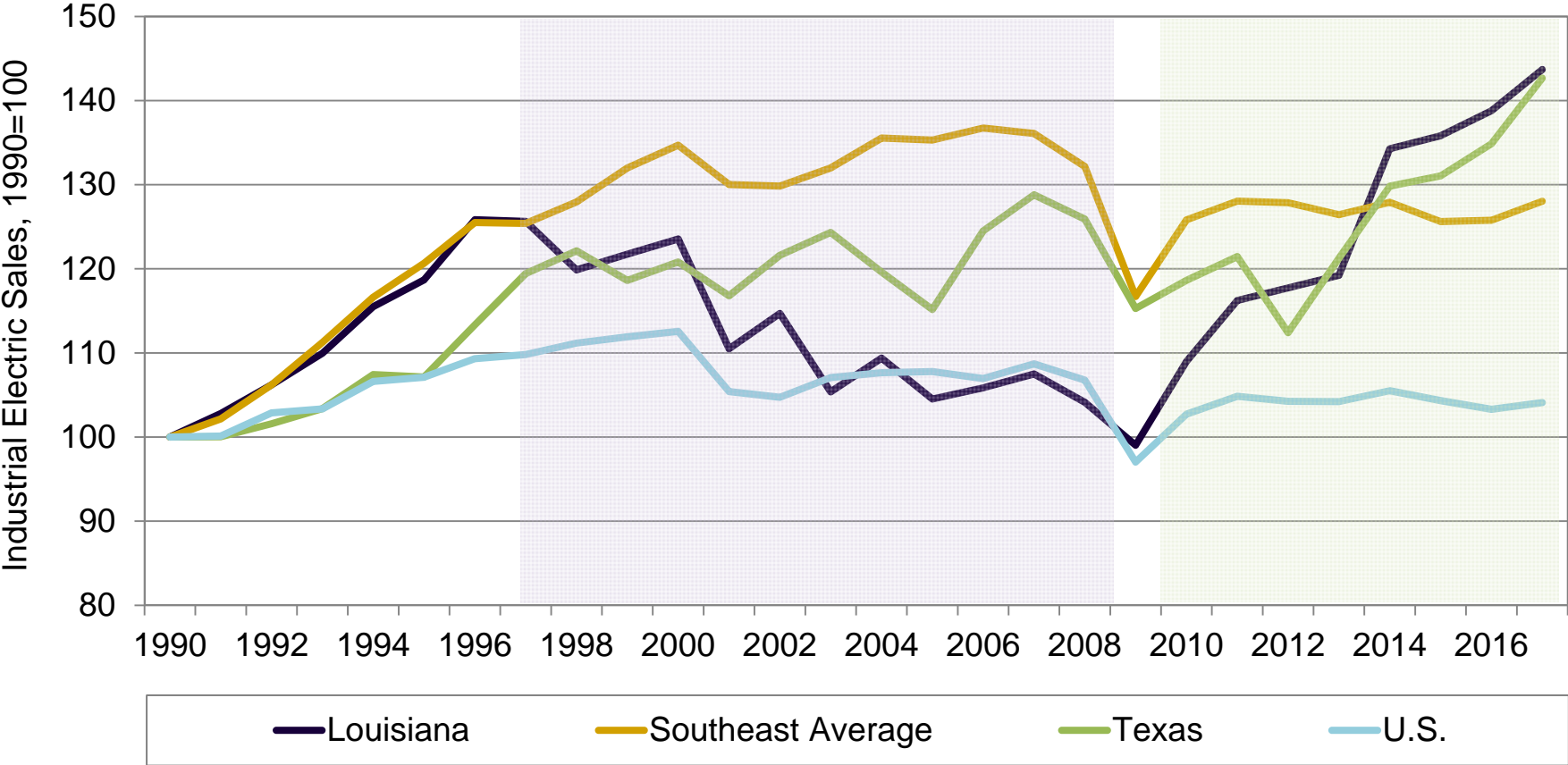
Louisiana exports (chemicals and refined product)

Louisiana exports of petroleum and coal products increased 374 percent between 2009 and 2014 but have fallen in recent years. Chemical exports have increased 161 percent since 2009. All facilitated by new capacity investments.



Industrial electric sales comparisons

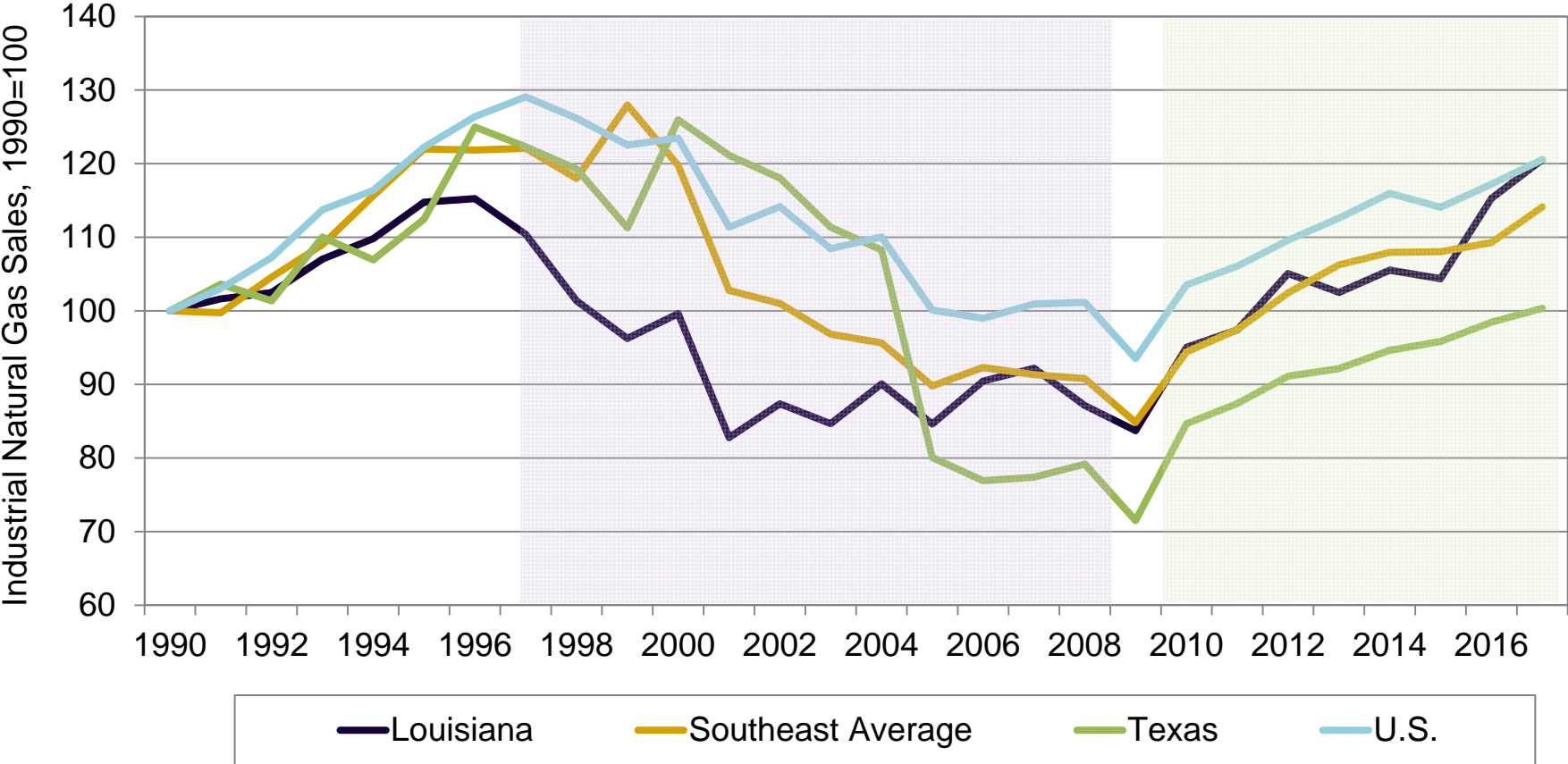
Louisiana’s industrial electric sales (proxy for onsite production activity) fell 21 percent between 1996 and 2009. Since then, they have jumped 45 percent.



Note: Southeast states include Alabama, Arkansas, Florida, Mississippi and Georgia.
Source: U.S. Energy Information Administration.

Industrial natural gas sales comparisons

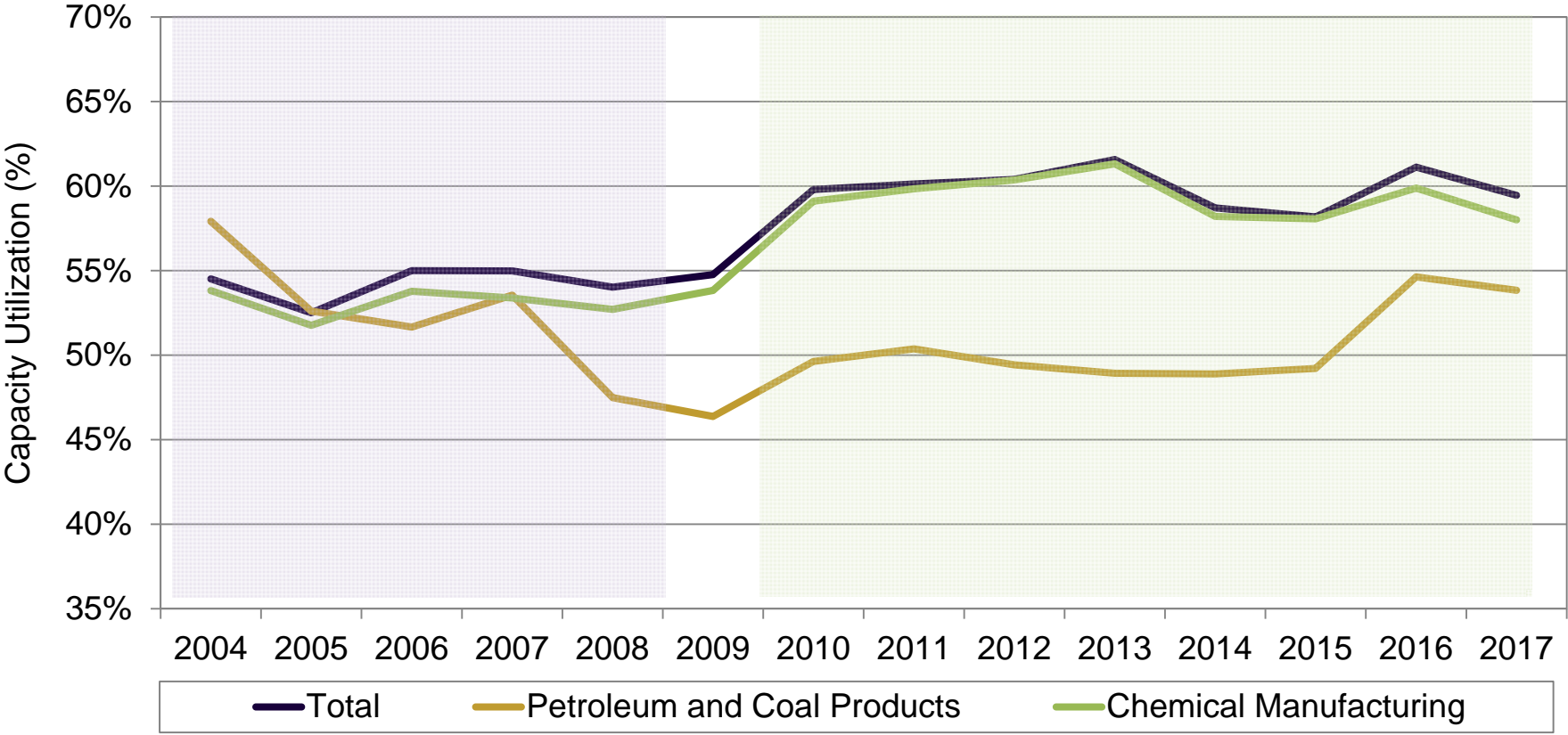
Louisiana's industrial natural gas sales (proxy for onsite production activity) fell 27 percent between 1996 and 2009. Since then, they have increased 44 percent.



Note: Southeast states include Alabama, Arkansas, Florida, Mississippi and Georgia.
Source: U.S. Energy Information Administration.

Estimated Louisiana CHP utilization

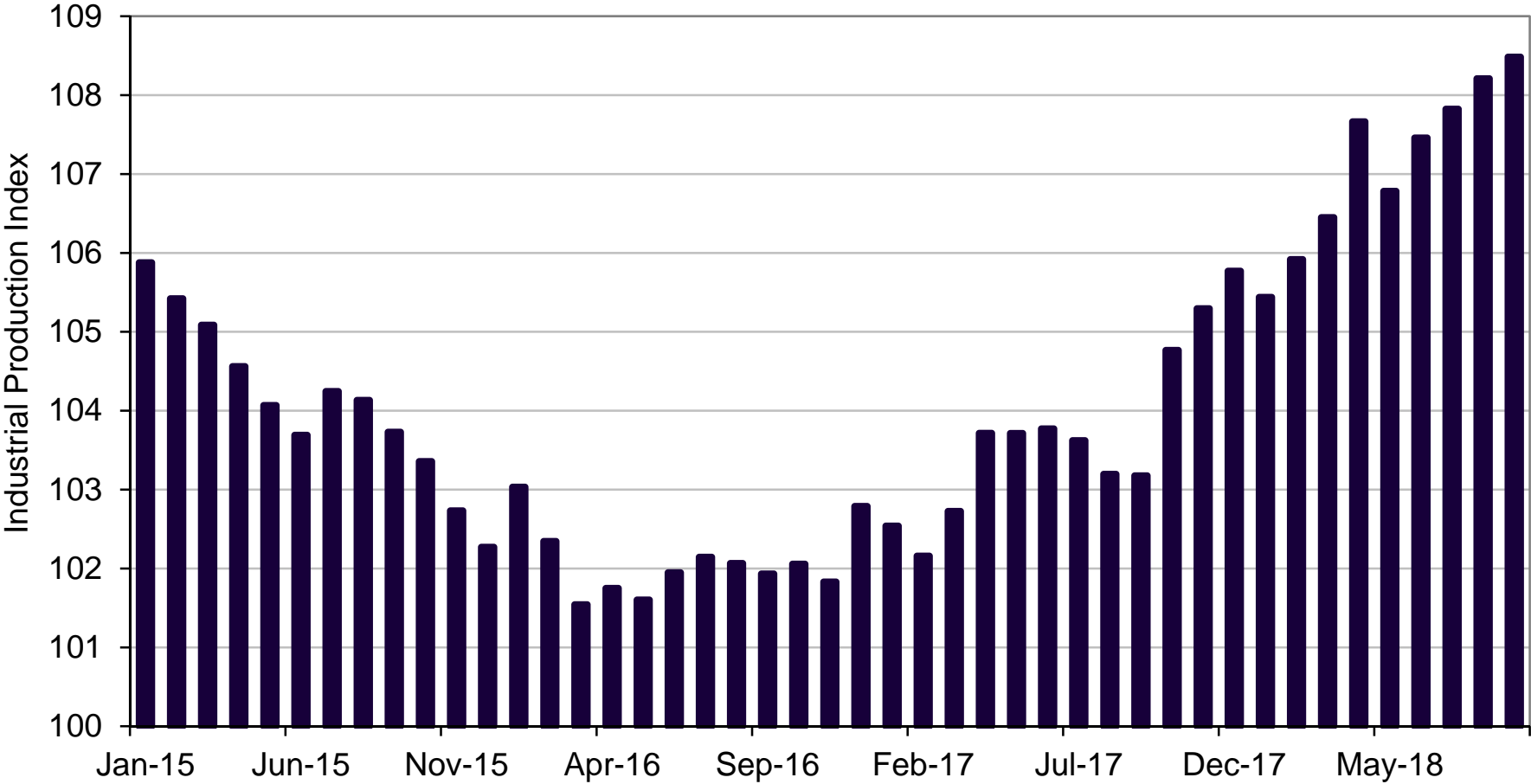
Cogeneration utilization (proxy for onsite production activity) at existing facilities has been stable, increasing slightly in 2015 and 2016.



Source: U.S. Energy Information Administration.

U.S. Industrial Production Index

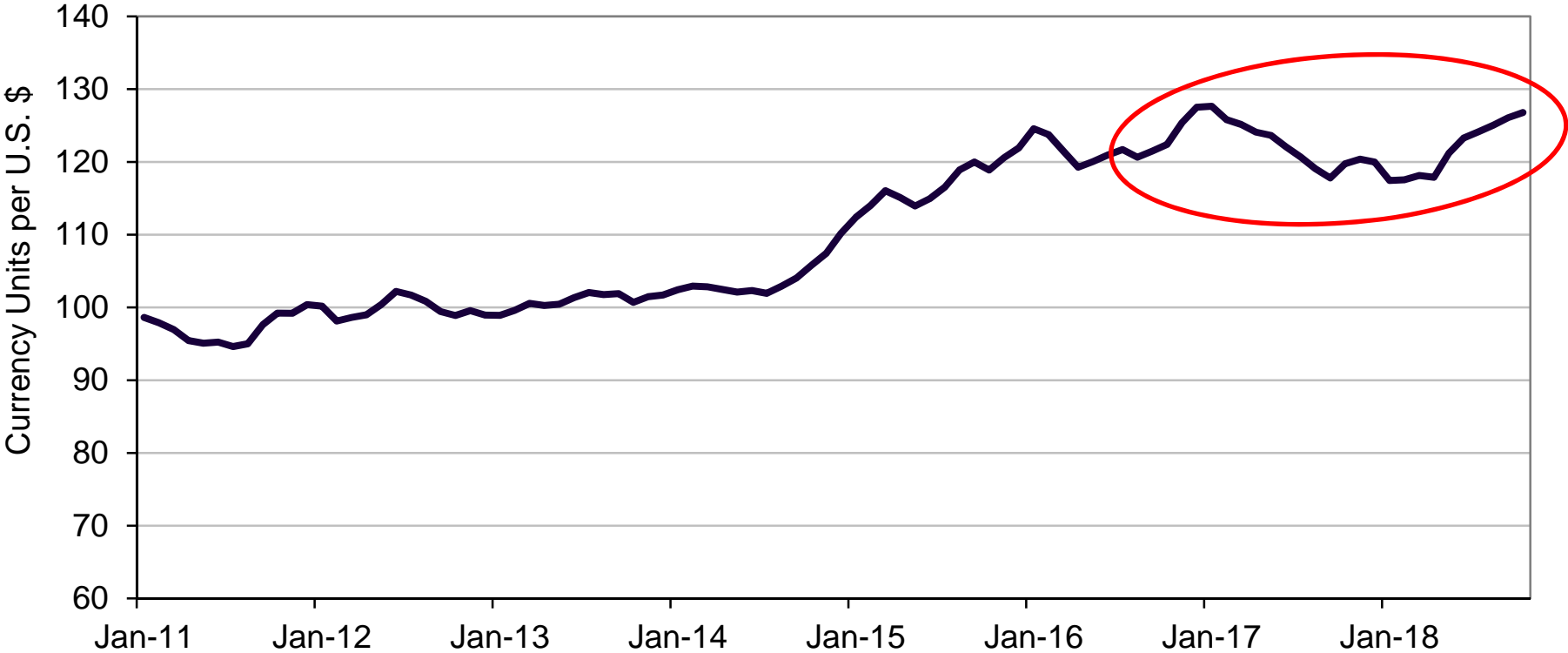
Industrial production consistently increasing since the lows of 2016.



Source: Federal Reserve Bank of St. Louis.

Dollar Valuations (Federal Reserve Broad Index)

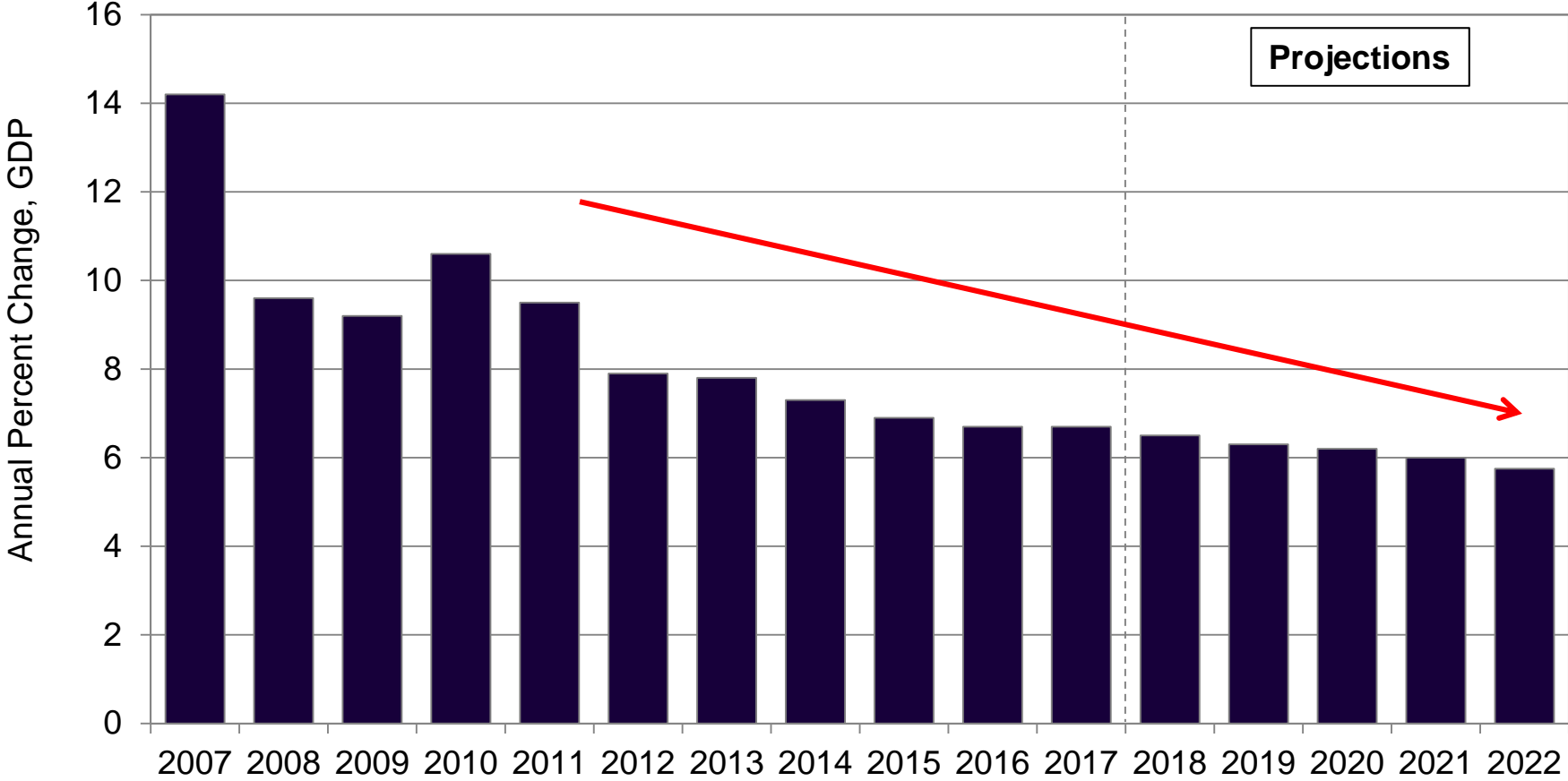
The dollar is up relative to the currencies: 25 percent appreciation over last five years, and six percent in the last 12 months.



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.

Changes in Chinese GDP

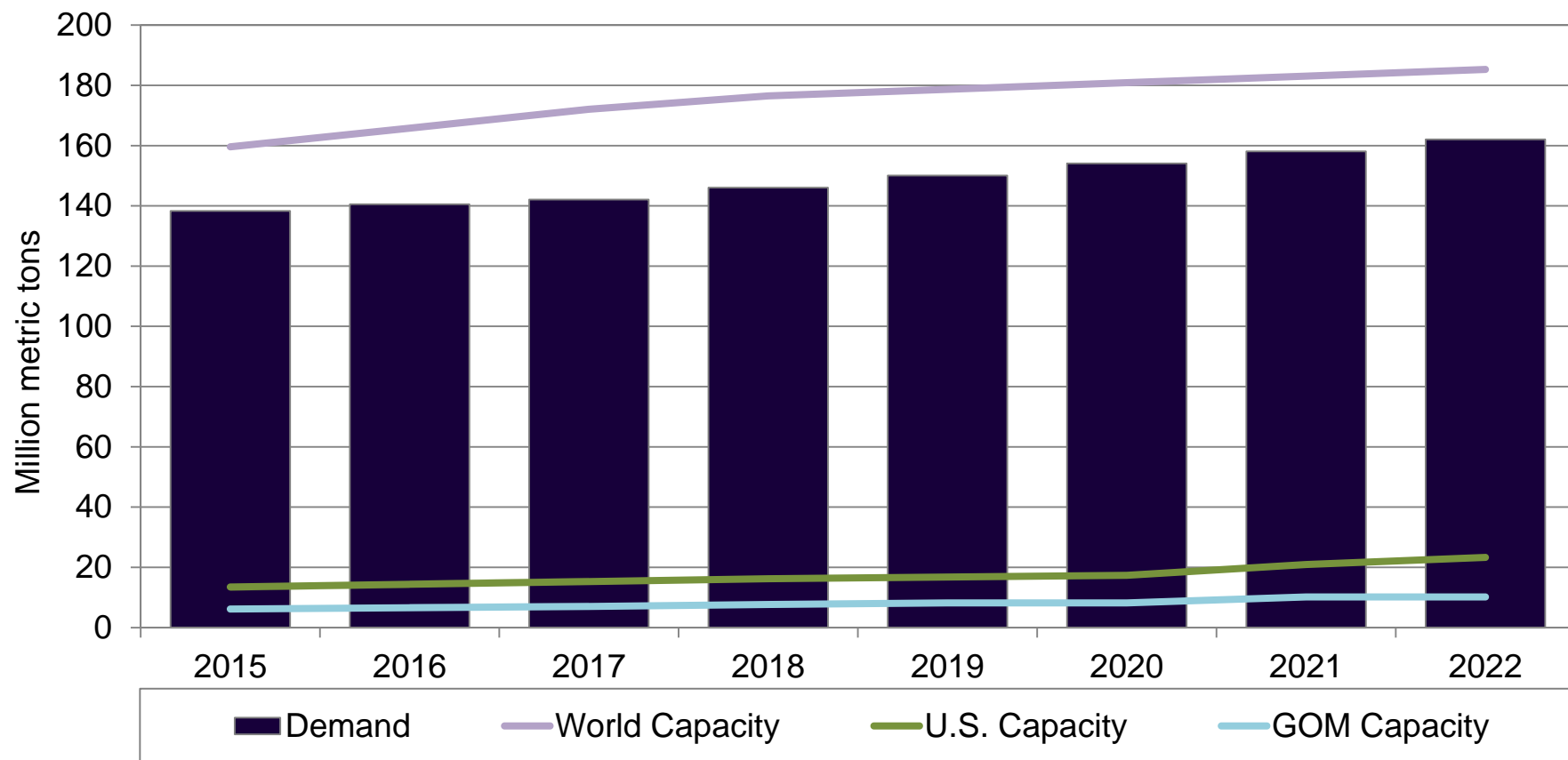
Chinese economic growth officially reported at 6.8 percent, reflecting expectations of expansionary policy mix and a goal of doubling real GDP between 2010 and 2020



Source: International Monetary Fund.

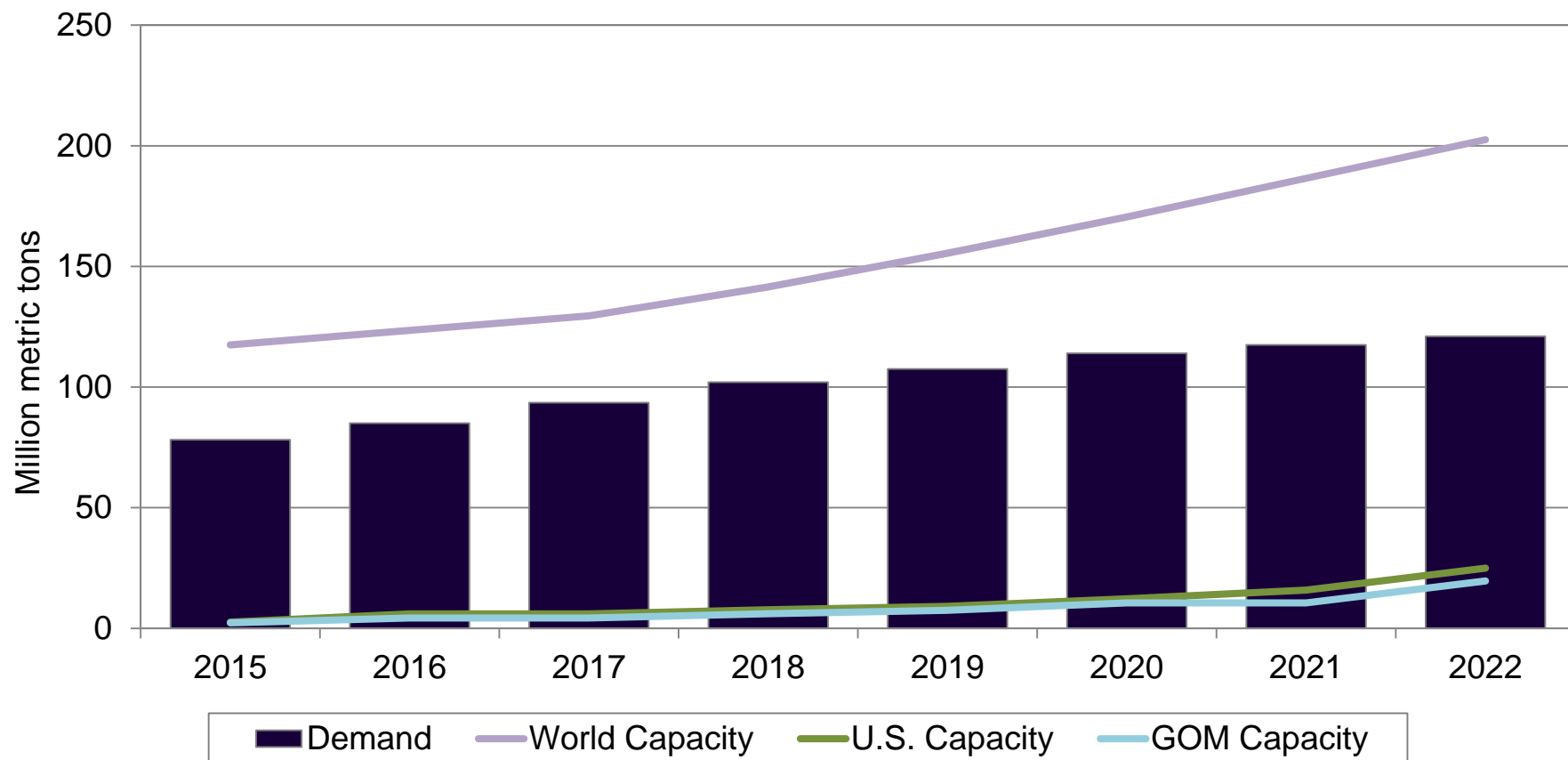
Ammonia demand and capacity outlook

Excess global ammonia supply continues to 2022. This excess is comparable to last year's GCEO forecast. Likely one of the reasons for a slow down in new project announcements.



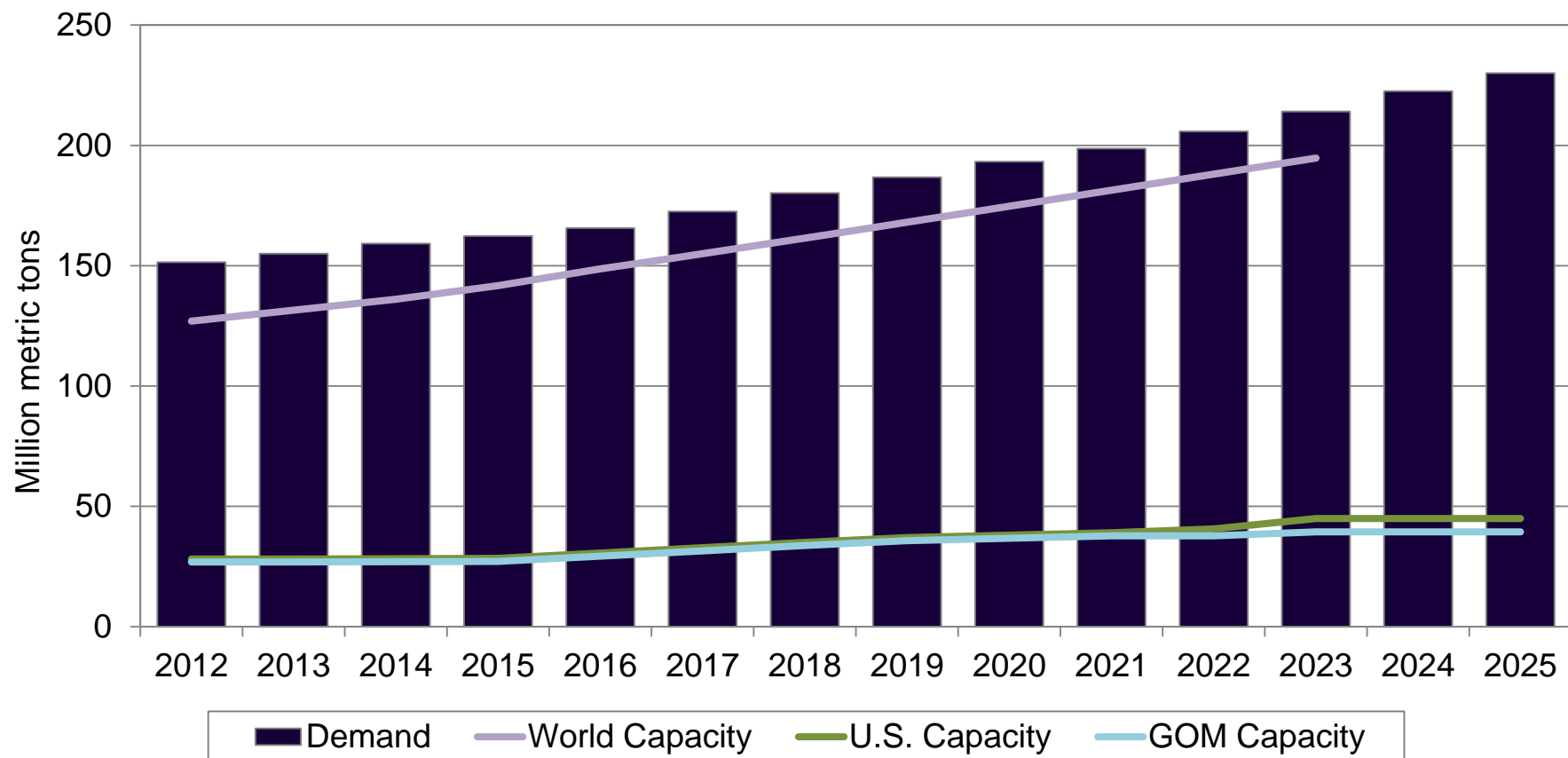
Methanol demand and capacity outlook

Methanol market is way over supplied – this is important change from last year’s GCEO.

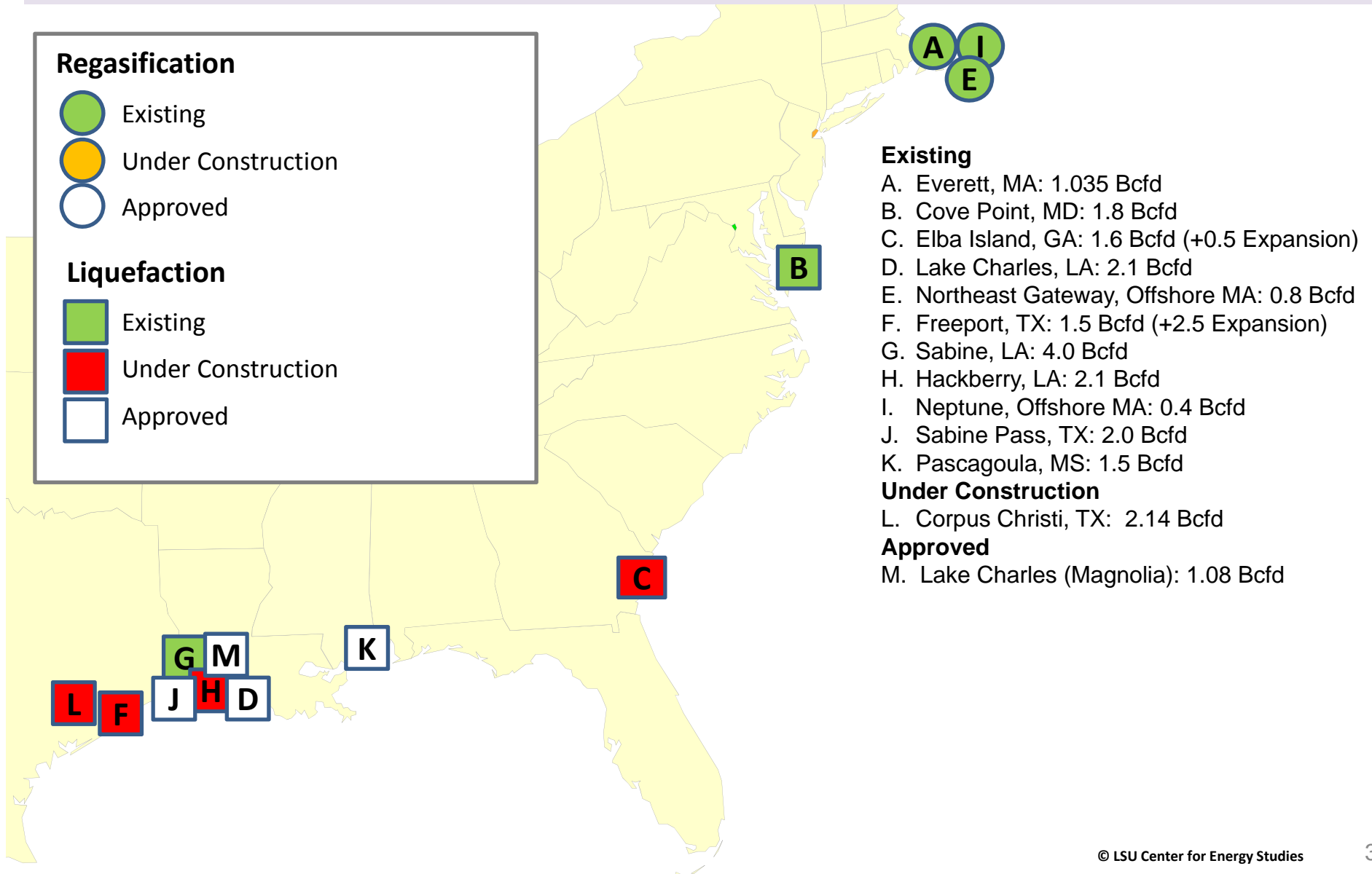


Ethylene demand and capacity outlook

Ethylene moves to becoming tighter than other chemical commodity markets and represents a big and important shift from last year's GCEO.

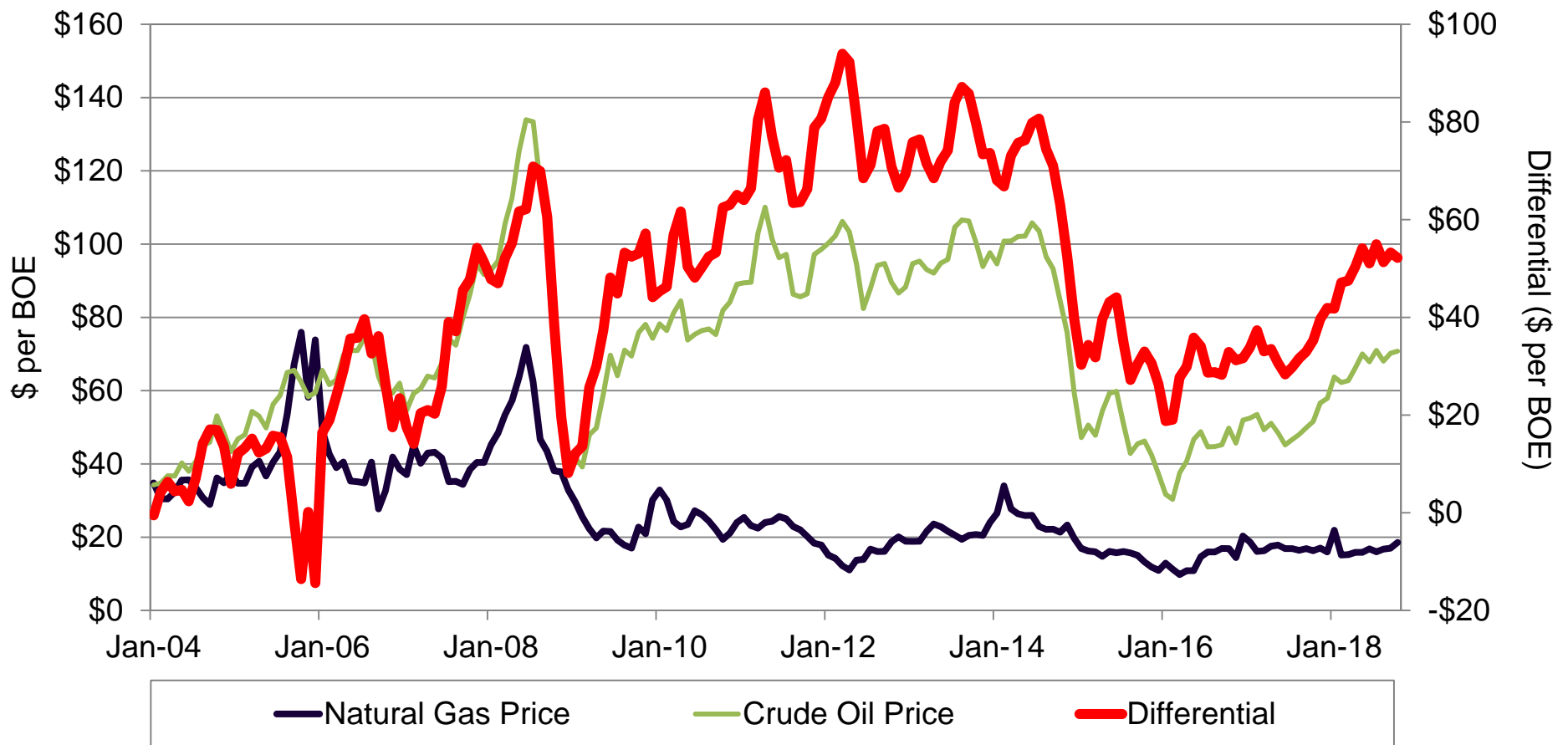


GOM LNG capacity.



Natural gas and crude oil prices

Natural gas/crude oil price spreads well in excess of \$60 per Bbl and as high as \$90 per Bbl. These differentials have collapsed by about half.



Industrial/Export Outlook

Example: Changes in competitiveness of US-sourced LNG

Economics of LNG development are important, but there are additional factors that can influence development such as geopolitical and supply stability concerns that could sustain continued projects.



Feedgas
40-60%
(\$/MMBtu)



Liquefaction
12%-20%
(\$/MMBtu)



Shipping & Fuel
20%-40%
(\$/MMBtu)



Regas
5%-8%
(\$/MMBtu)

Delivered Cost
(\$/MMBtu)

Equivalent Oil Price*
(\$/BOE)

Europe:

Low	\$3.00	\$1.25	\$1.40	\$0.50	\$6.15	\$35.65
High	\$5.00	\$1.25	\$1.65	\$0.50	\$8.40	\$48.72

Asia:

Low	\$3.00	\$1.25	\$2.50	\$0.50	\$7.25	\$42.05
High	\$5.00	\$1.25	\$3.00	\$0.50	\$9.75	\$56.55

Caribbean:

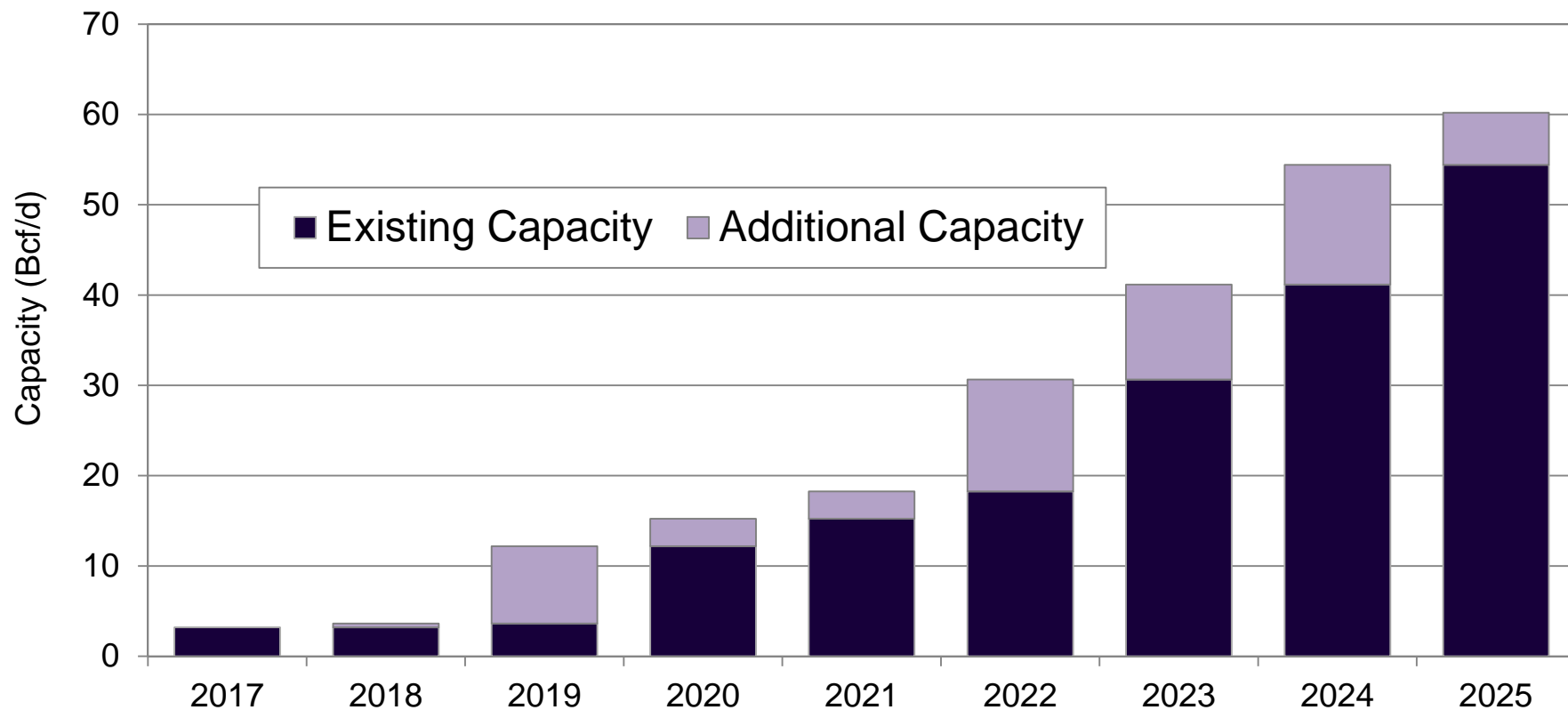
Low	\$3.00	\$1.25	\$0.75	\$0.50	\$5.50	\$31.90
High	\$5.00	\$1.25	\$1.00	\$0.50	\$7.75	\$44.95

Henry Hub	WTI	Brent
(11-15-2108):	(011-15-2108):	(11-15-2108):
\$3.91	\$56.59	\$66.70

Note: *uses a BOE conversion of 5.8 Mcf/BOE.
Source: Various sources

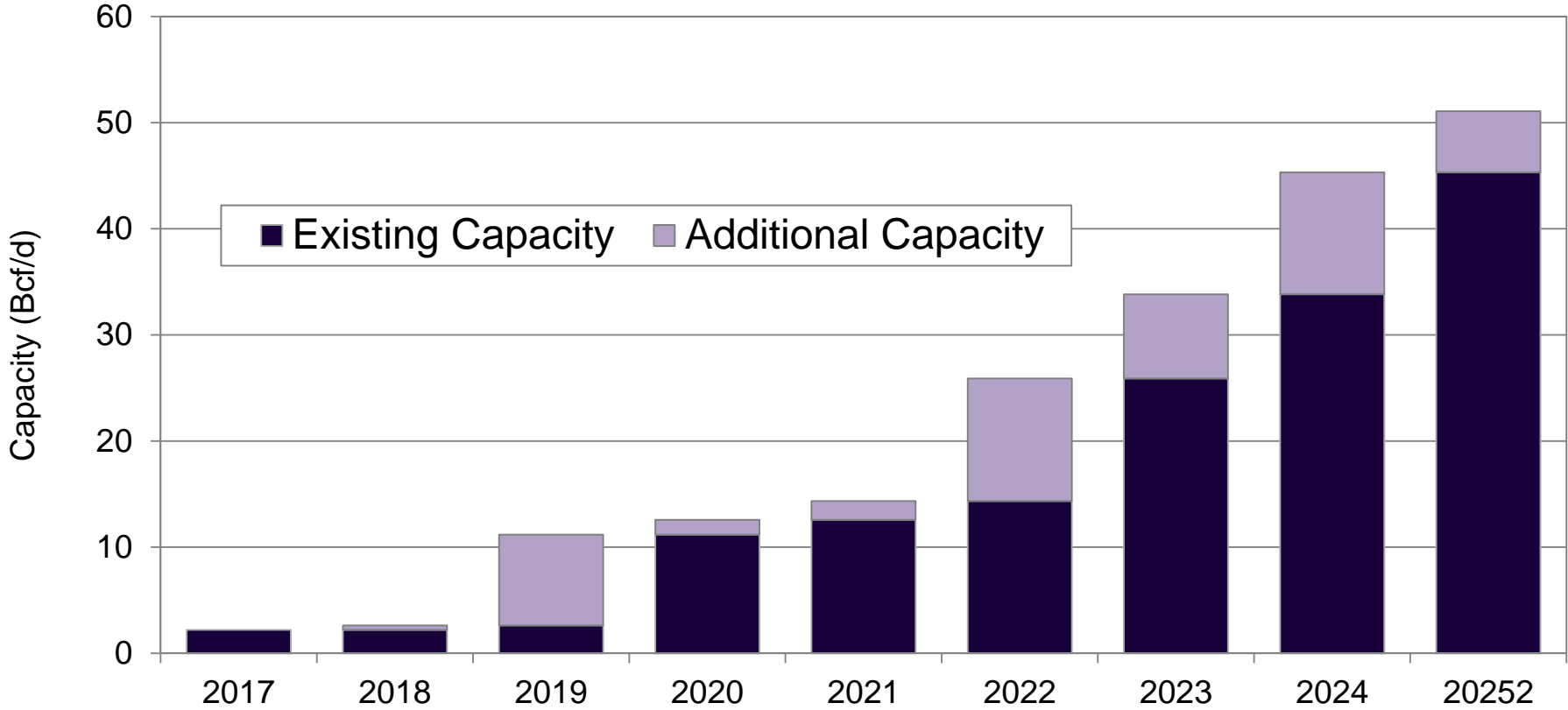
U.S. LNG capacity development outlook.

If all of 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.



GOM LNG capacity development outlook.

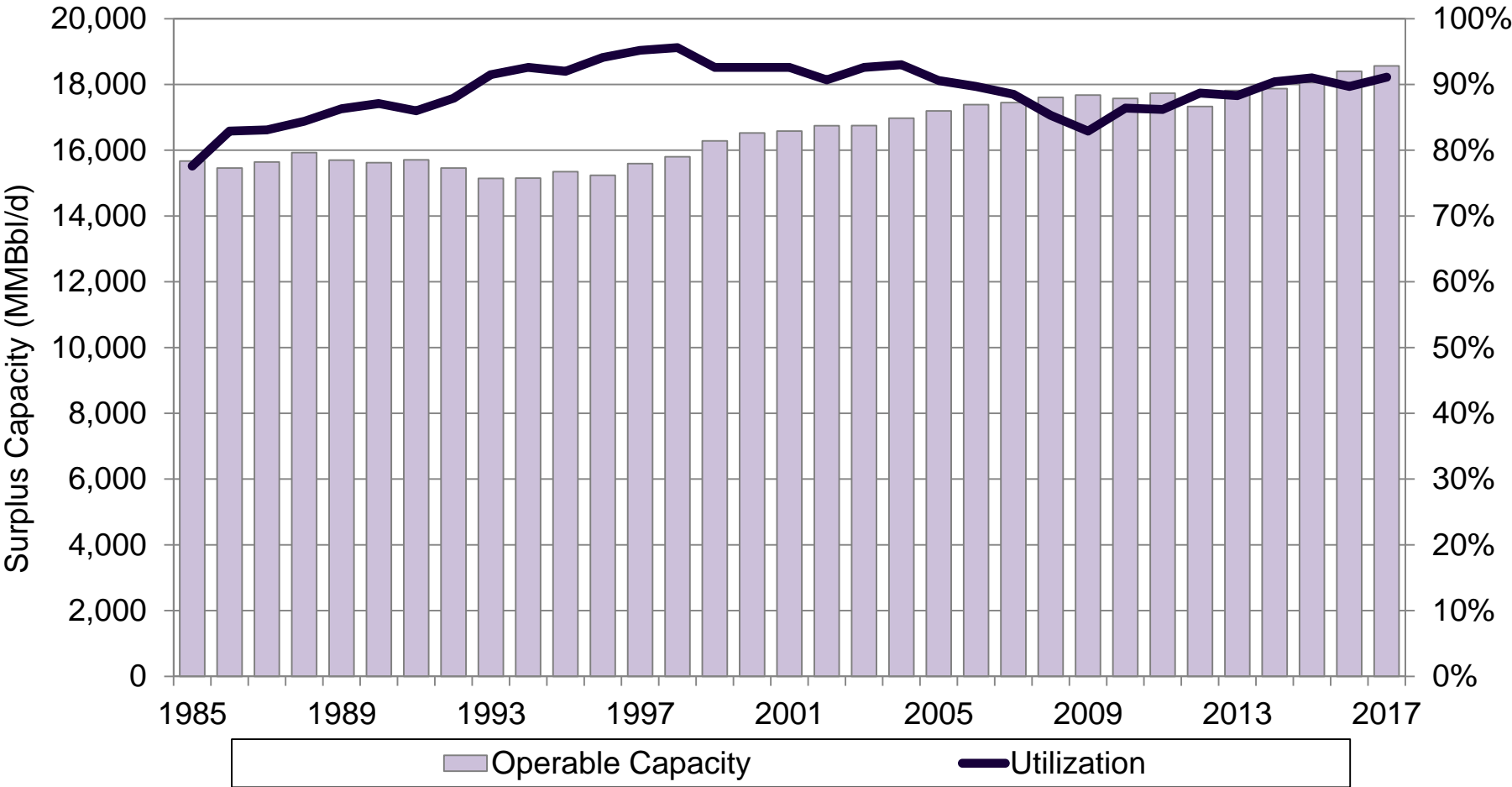
If all of the LNG applications currently filed with the Department of Energy were to come online, the GOM liquefaction capacity would exceed 50 Bcf per day by 2025.



Source: U.S. Department of Energy.

U.S. refining capacity and utilization.

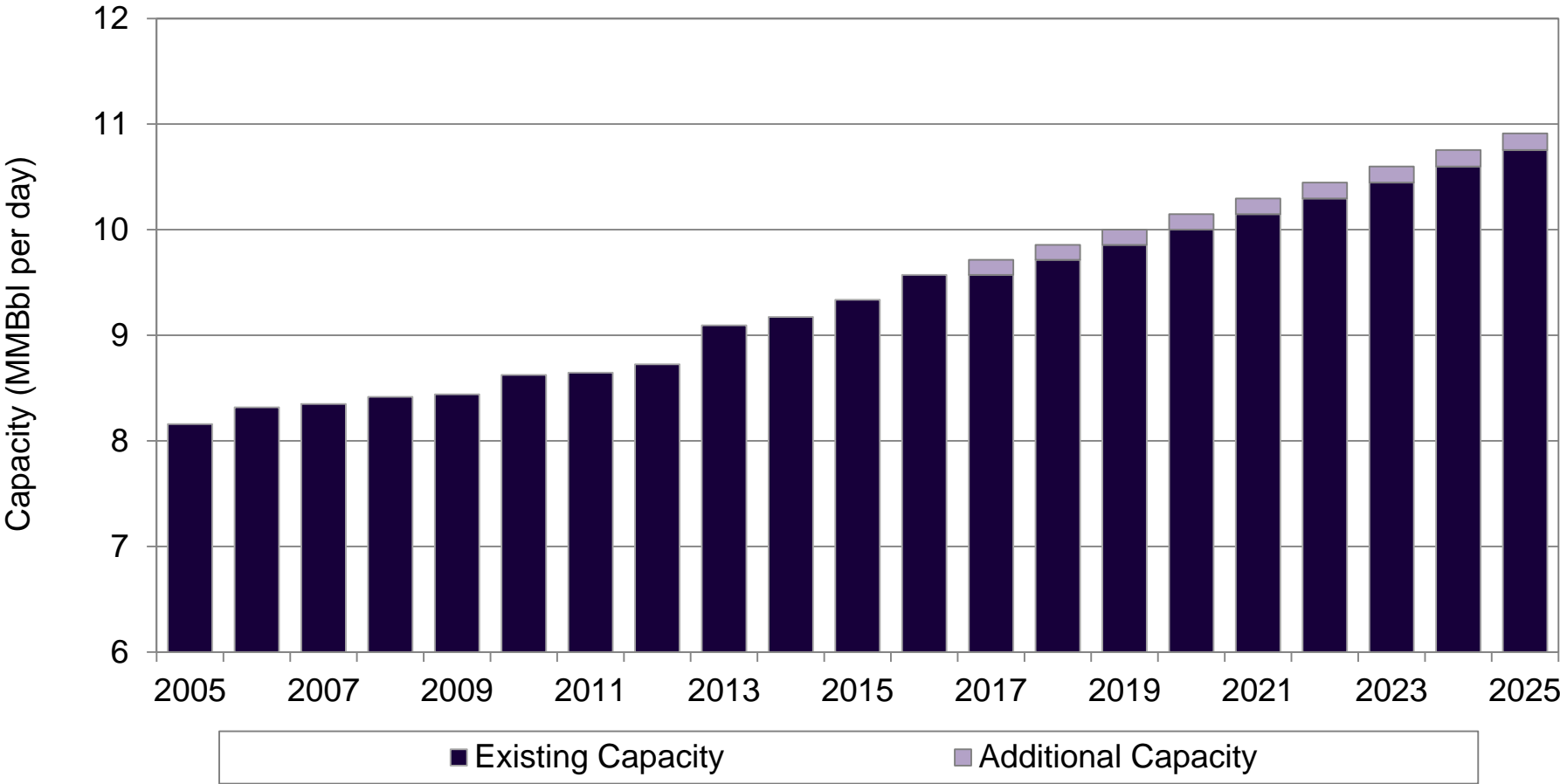
Operable capacity at U.S. refineries has increased over 20 percent since 1995 while utilization has remained stable at 90 percent.



Source: Energy Information Administration, U.S. Department of Energy.

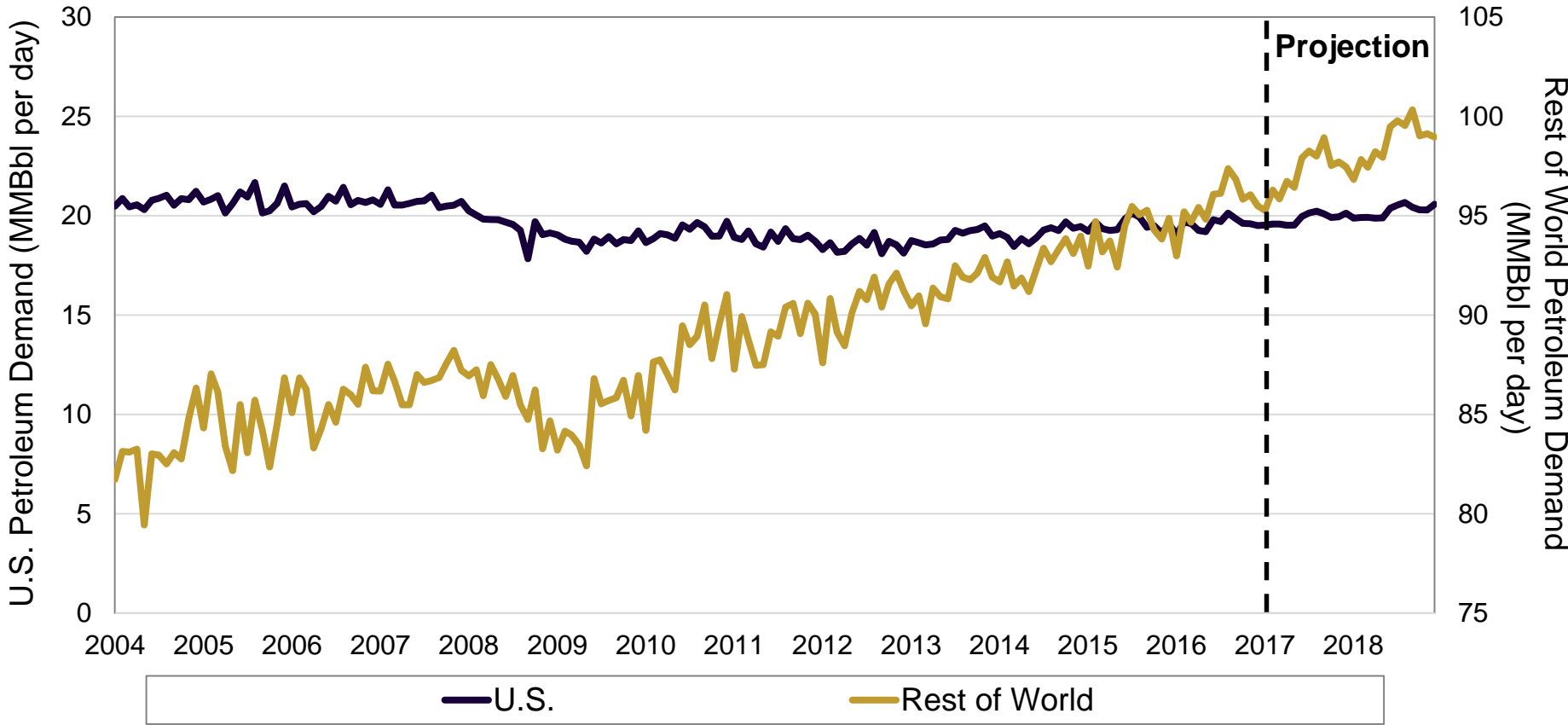
GOM refinery capacity outlook.

GOM refinery capacity has been increasing annually at an average rate of 1.5 percent per year.



Petroleum and liquid fuels demand.

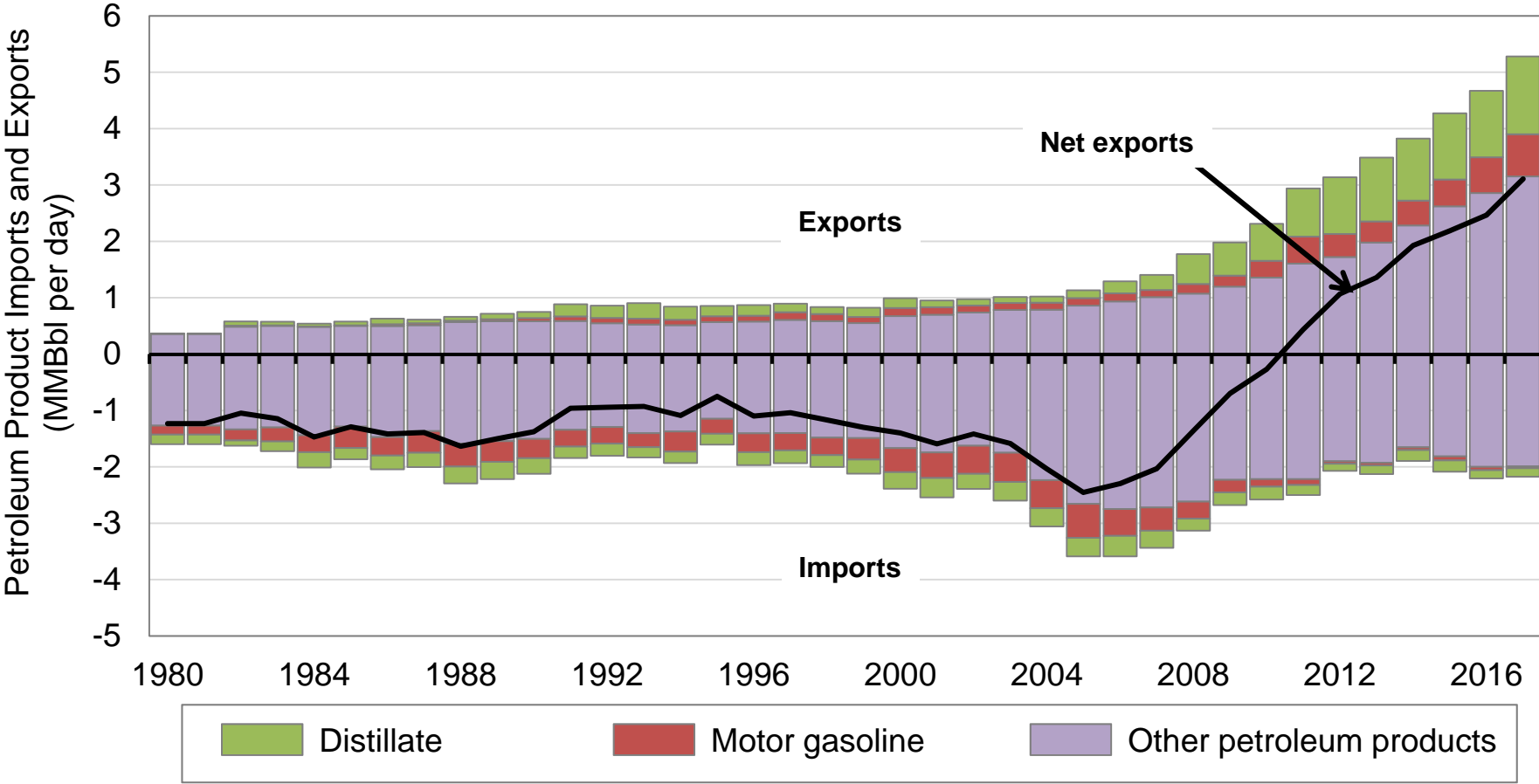
U.S. demand for liquid fuels has been relatively flat, while **demand in the rest of the world has been increasing** underscoring the opportunities for new Louisiana-based energy exports.



Source: U.S. Energy Information Administration.

U.S. petroleum product imports and exports.

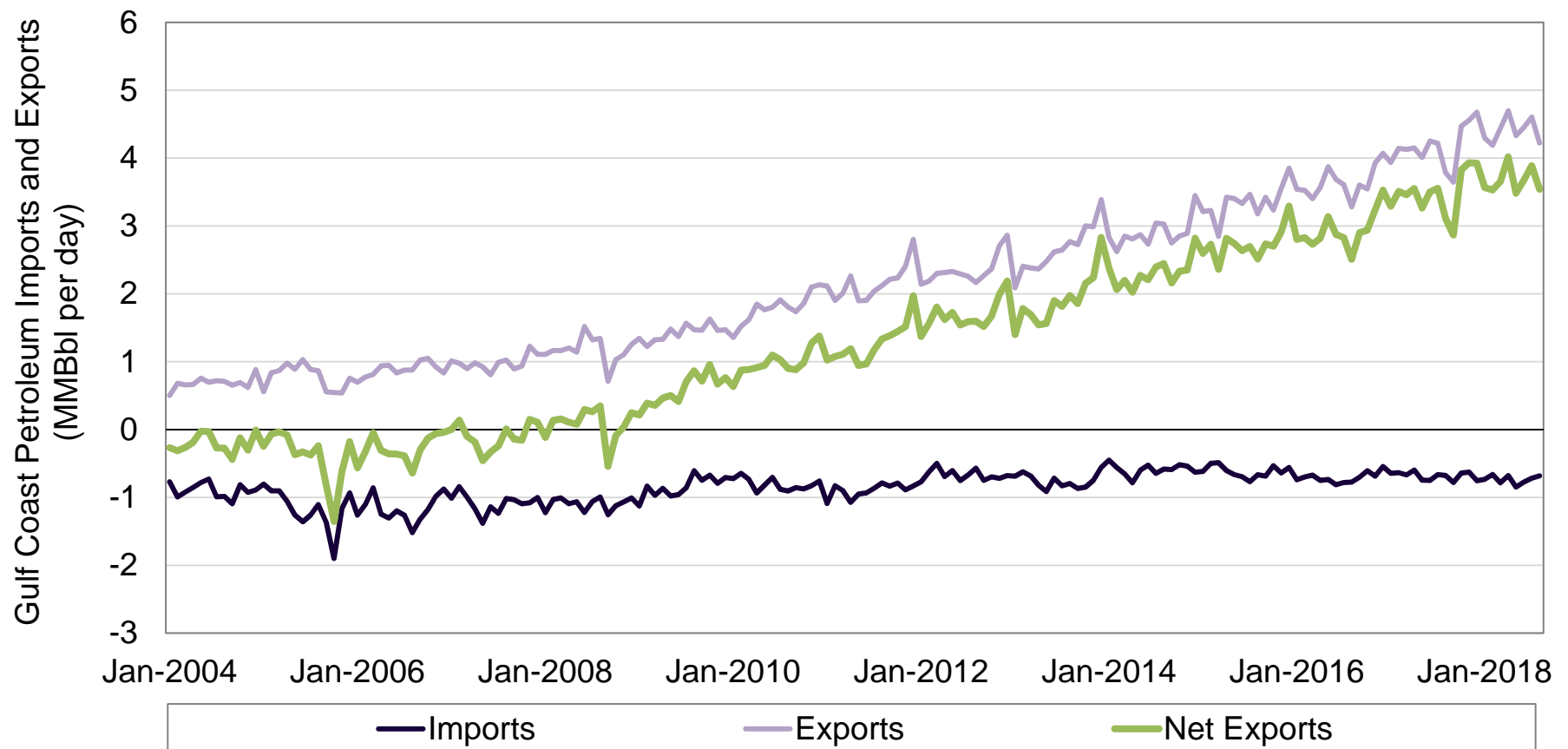
In 2011, the U.S. became a net exporter of petroleum products. Net exports have increased over 600 percent since then.



Source: U.S. Energy Information Administration.

Gulf Coast petroleum net exports.

The Gulf Coast region became a net exporter of petroleum products at the end of 2008. Since then net exports have increased at an average annual rate of 40 percent.



Employment Forecast

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

Employment Forecast

Relative energy sector sizes as measured by employment in 2017.

Region	Percent of Region Total Employment		Percent of Industry Employment in US	
	Oil and Gas	Refining and Chemical Manufacturing	Oil and Gas	Refining and Chemical Manufacturing
Alabama	0.1%	0.7%	0.3%	1.4%
Louisiana	1.7%	2.0%	7.2%	4.0%
Mississippi	0.3%	0.7%	0.7%	0.9%
Texas	1.7%	0.9%	47.6%	11.0%
Gulf Total	1.4%	0.9%	55.8%	17.3%
US Total	0.3%	0.6%	100.0%	100.0%

Source: U.S. Bureau of Labor Statistics, 2017 annual Quarterly Census of Employment and Wages data.

Employment Forecast

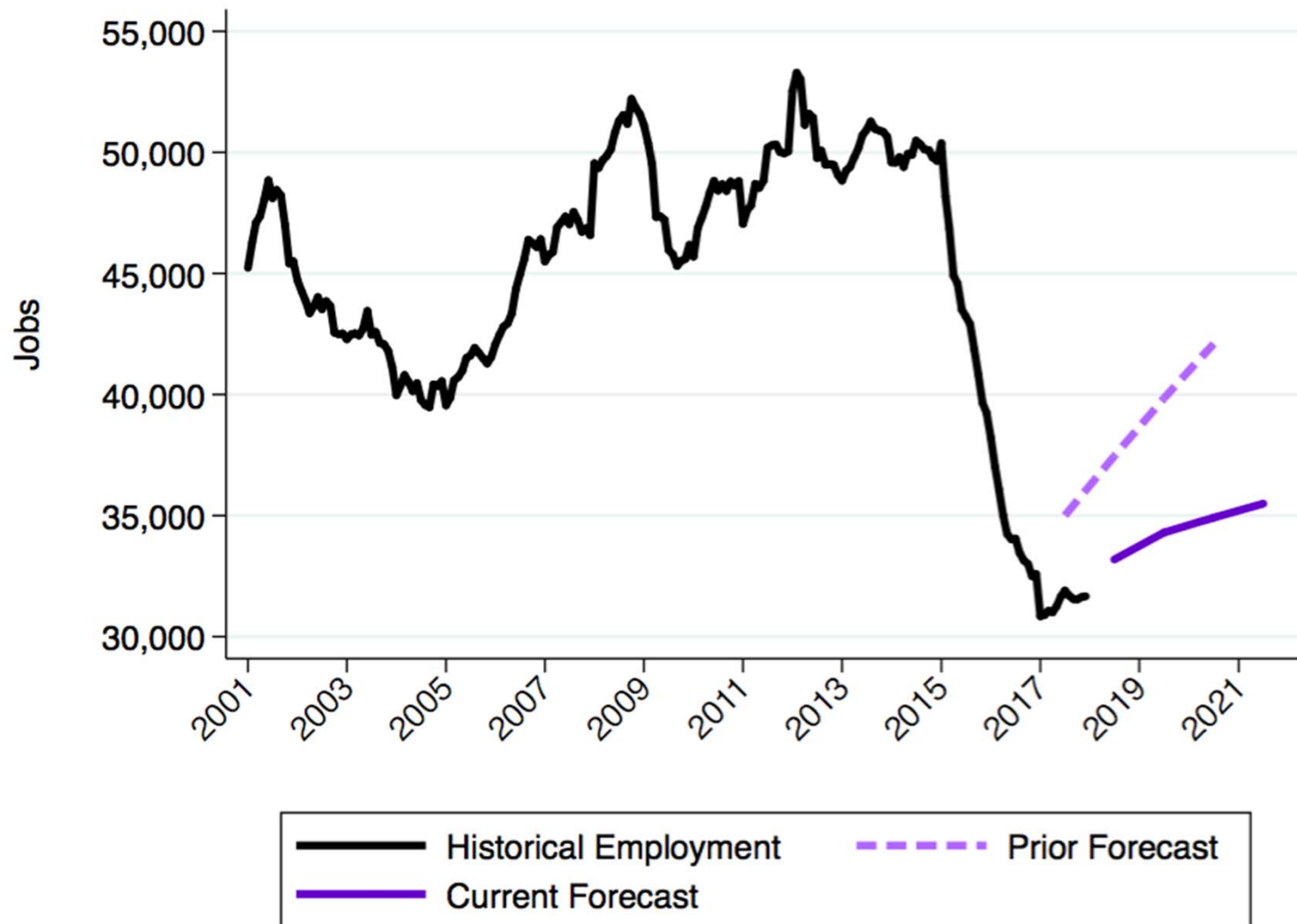
Relative energy sector sizes as measured by GDP in 2016.

Region	Percent of Region GDP		Percent of Industry GDP in US	
	Oil and Gas	Refining and Chemical Manufacturing	Oil and Gas	Refining and Chemical Manufacturing
Alabama	0.2%	2.8%	0.2%	1.1%
Louisiana	3.7%	14.3%	4.4%	6.6%
Mississippi	0.5%	3.4%	0.3%	0.7%
Texas	6.8%	5.7%	54.5%	17.6%
Gulf Total	5.5%	6.2%	59.4%	26.1%
US Total	1.1%	2.8%	100.0%	100.0%

Source: U.S. Bureau of Economic Analysis.

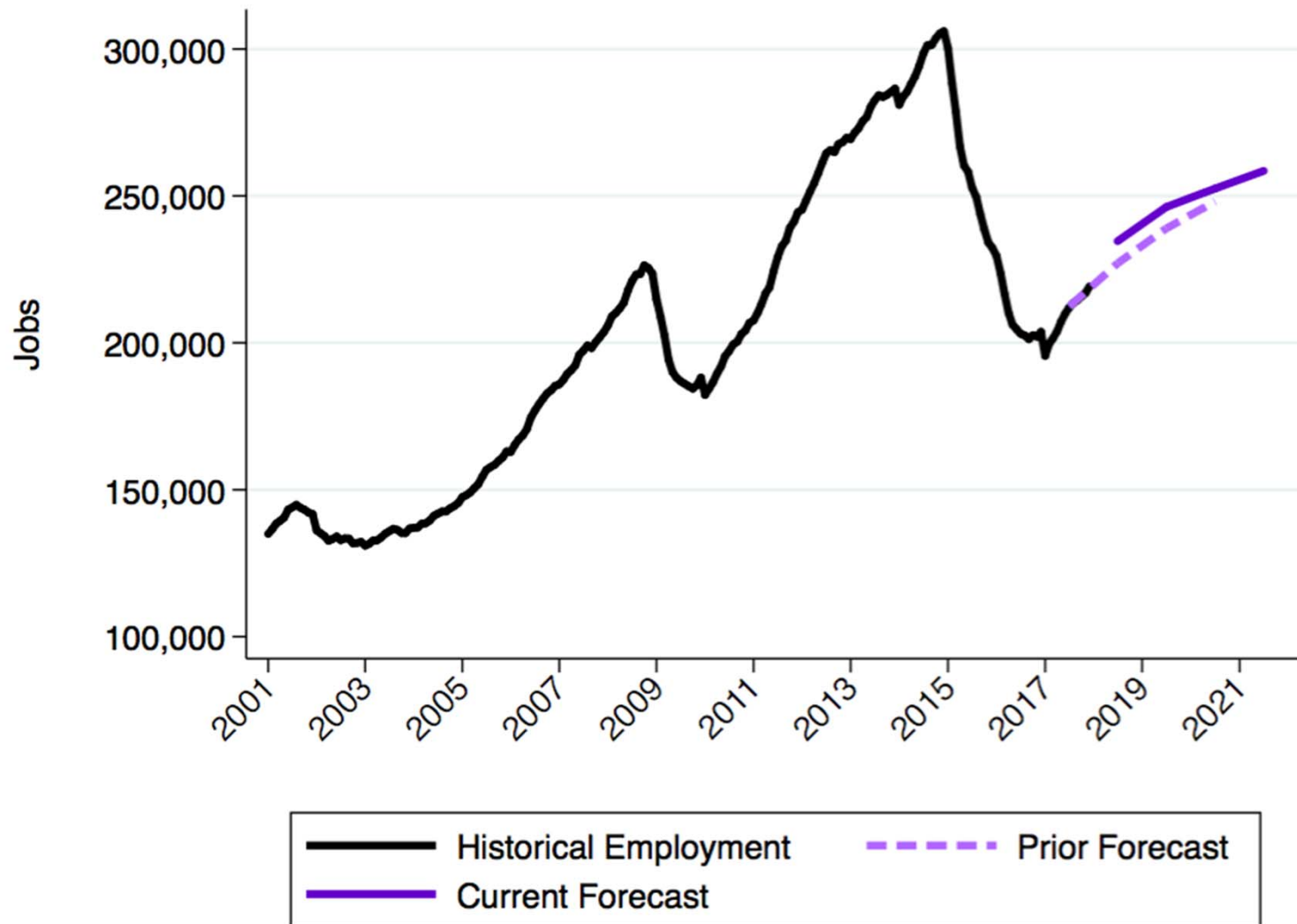
Employment Forecast

Louisiana Upstream



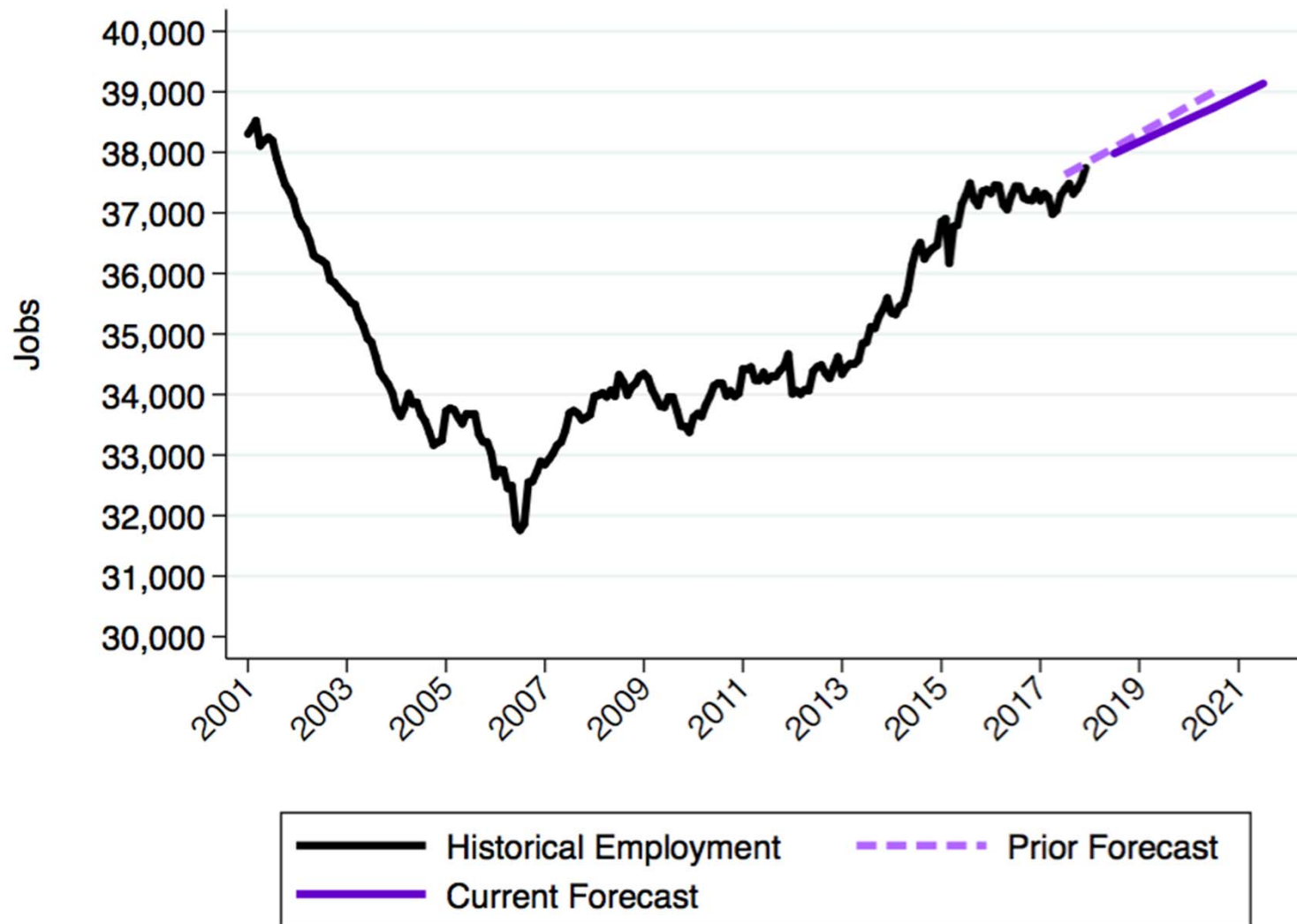
Employment Forecast

Texas Upstream



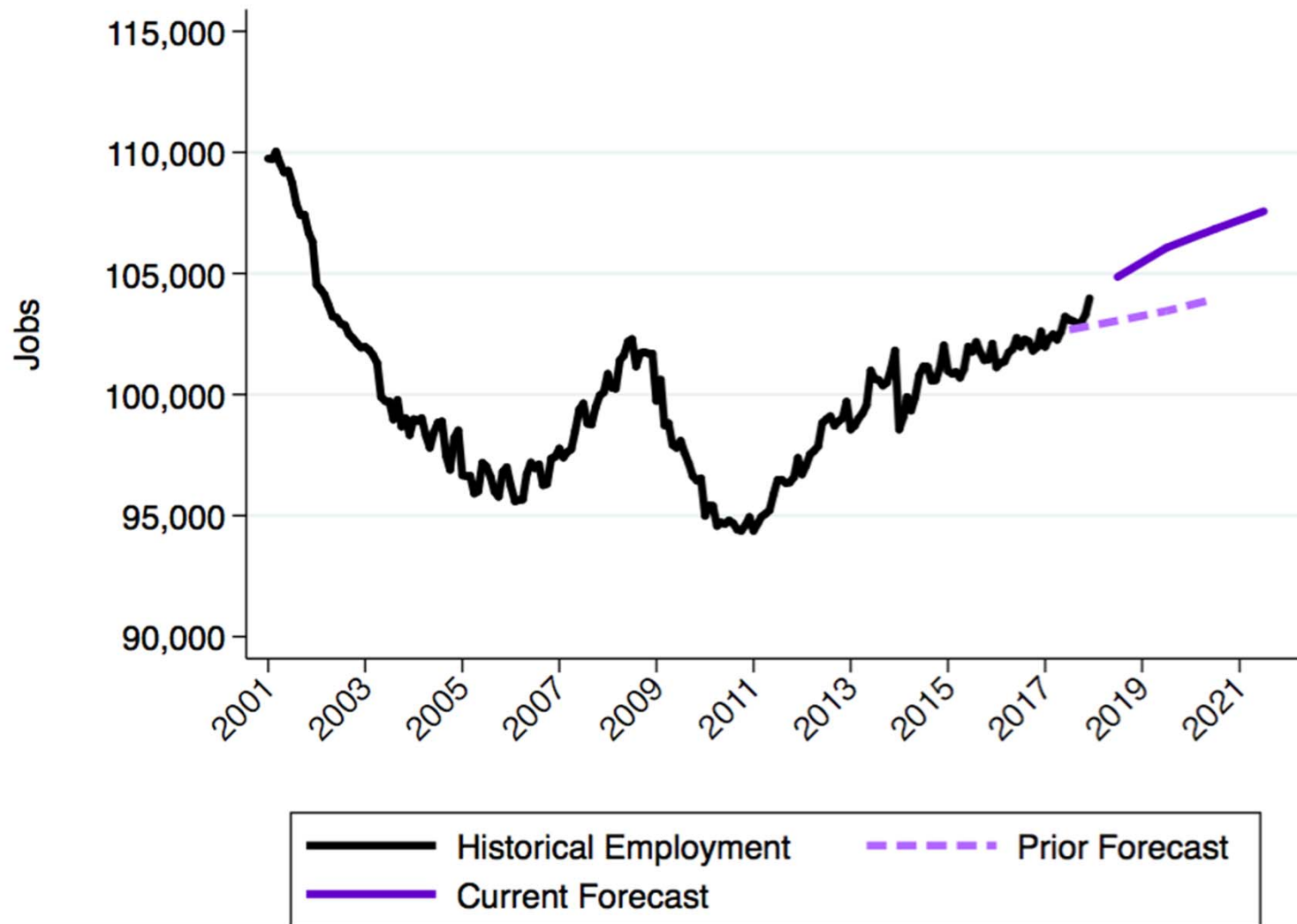
Employment Forecast

Louisiana Refining and Chemicals



Employment Forecast

Texas Refining and Chemicals



Conclusions

Conclusions

- U.S. and Gulf Coast domestic **crude oil and natural gas** production should **continue to be strong**.
 - The nation and region will build upon existing productivity gains.
 - **Drilling activity** may start to geographically **diversify**, but not enough to knock the Permian basin off its perch as being the premier U.S. unconventional basin.
 - The overall “**cool-down**” in **crude oil demand** should allow infrastructure development to catch up with production requirements.
 - “**Quality over quantity**” mentality by larger companies. Drilling responsiveness has changed in the last recovery period, being more tepid given investor expectations about balance sheet improvement versus drilling (capital budgets are flat).
- The **price outlook** (crude oil, natural gas) is a little **more complicated** than last year.
 - Last year’s issue was the **resilience of shale production to the price drop**.
 - 2017 saw crude prices rise (natural gas flat). Market has now shifted to **correction mode** (crude oil) given changing expectations.
 - **Crude prices will stay relatively low** (recent oil/gas price decoupling was short lived).
 - Next year, the issue will be **economic growth** and the corresponding issues of Fed tightening, exchange rates, inflation, and fiscal stimulus.

Conclusions

- The 2019 GCEO **petrochemical industry outlook is flat.**
 - The **capacity utilization outlook for existing and recent investments will likely not increase in any measurable fashion** given a number of global headwinds that include: (a) a slow-down in Asian demand; (b) increased dollar valuations; and (c) continued trade policy uncertainties.
 - The GCEO does not anticipate any chemical industry or LNG project cancellations, but it is not implausible to see that many **currently-announced projects move out** their anticipated project commercial **operation dates** in order to account for the current global market and geo-political uncertainties.
- The 2019 GCEO sees a **continued positive, yet limited growth outlook for U.S. refining.** Refineries will benefit from continued growth of U.S. crude oil supplies and the geographic diversity of those supplies. The sector will also benefit from **continued pipeline infrastructure** moving into and within the region. Product demand growth and storage will be the top issues to watch.

Conclusions

- Thus, on an overall basis, the GCEO anticipates, on average, that the region will **build upon its economic gains of the last year**, although those gains will likely be **slower due to concerns about economic growth** and several geopolitical tensions that create uncertainties that are not conducive for capital formation and growth in this industry.
- The region will continue to become a **more integrated part of the overall world energy market** and will likely place itself in a favorable position for future growth once some of these uncertainties start to evaporate.
- The GCEO sees **regional employment continuing to grow** over the next year in both the upstream and downstream sectors for both Louisiana and Texas.
 - Louisiana **upstream growth has been tempered** considerably from last year's projections.
 - For Louisiana, there is more **employment in refining and chemicals** than upstream and we anticipate this to continue but on slower basis.
 - In contrast, **Texas still employs approximately two workers in the upstream sector for every downstream employee** whereas in Louisiana this is more like a one-to-one relationship.

Thank You!!

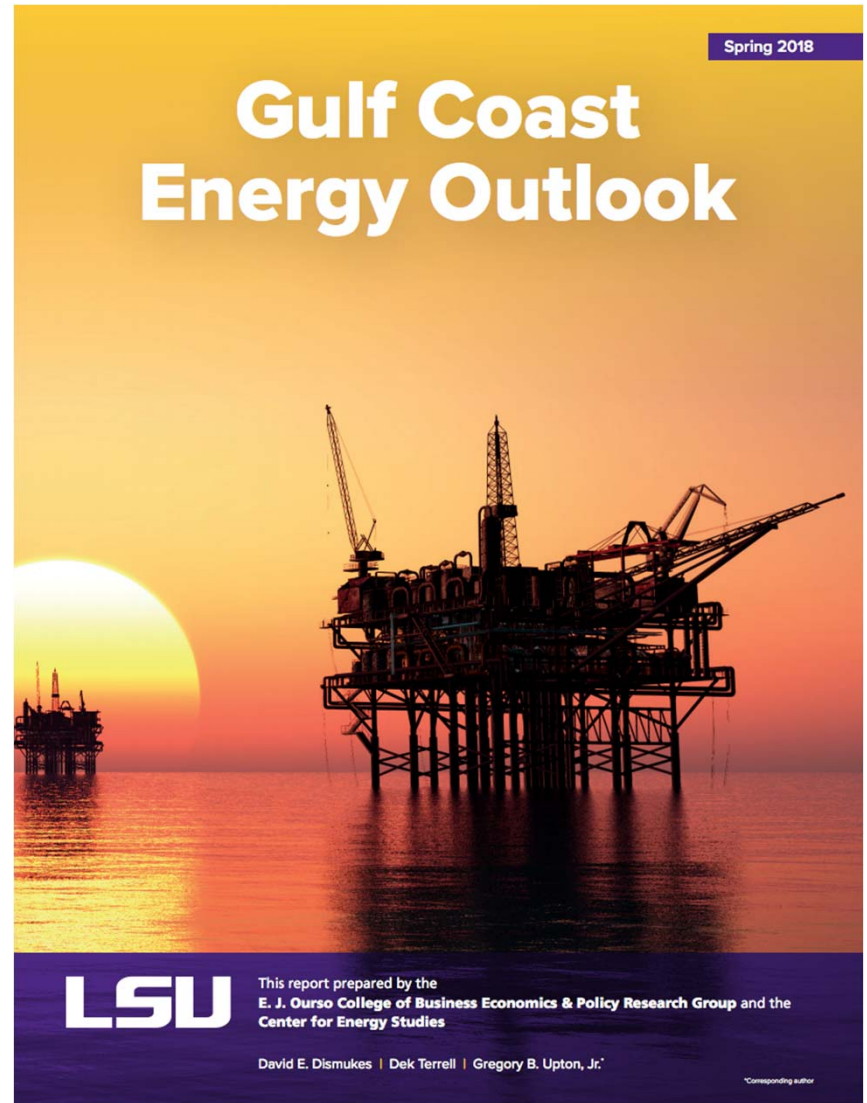
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Silver



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