

## **Gulf Coast industrial development: overview of trends and issues.**

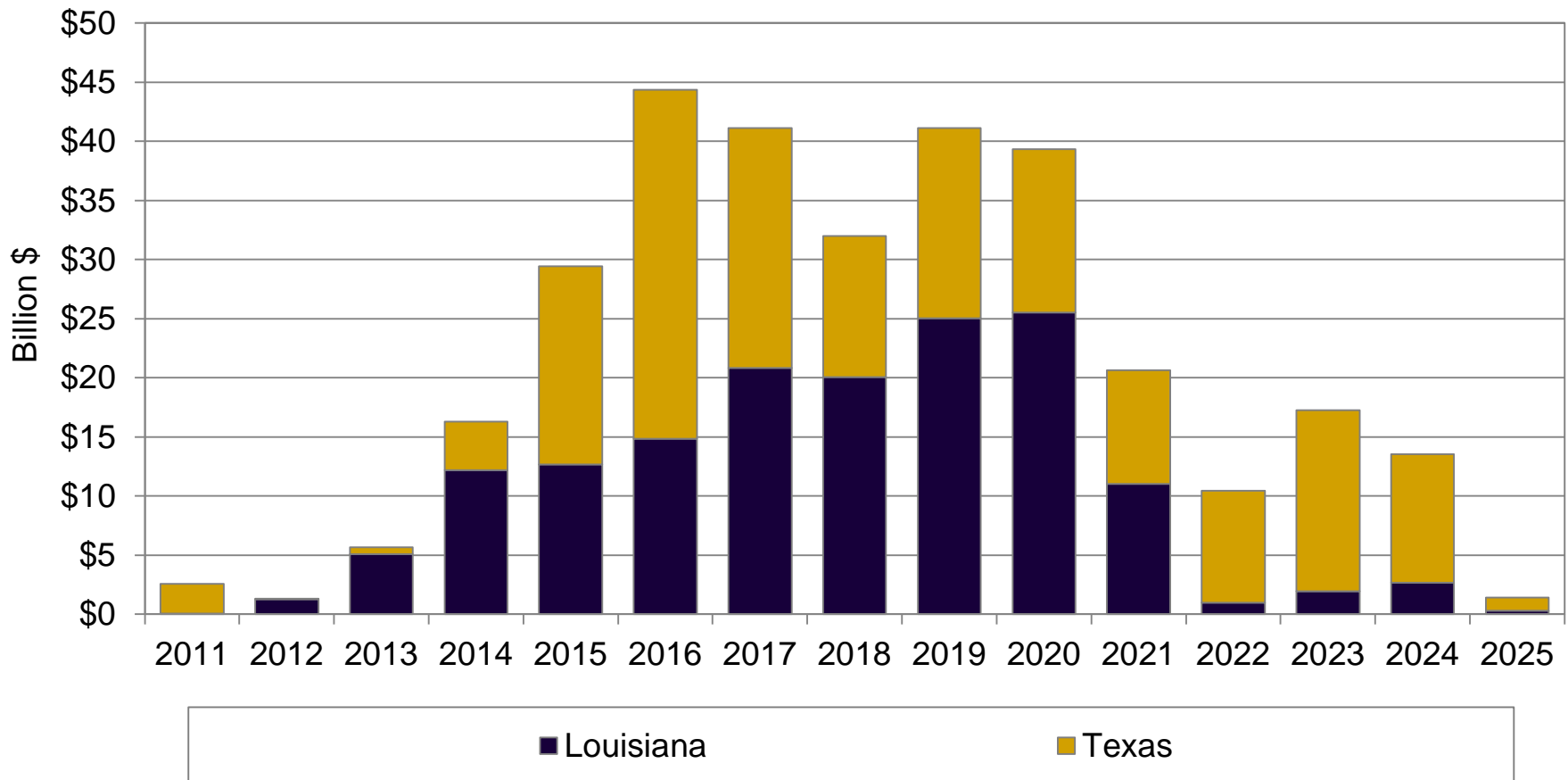
*Gulf Coast Power Association Meetings, New Orleans, Louisiana, February 8, 2018.*

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**Industrial Development**

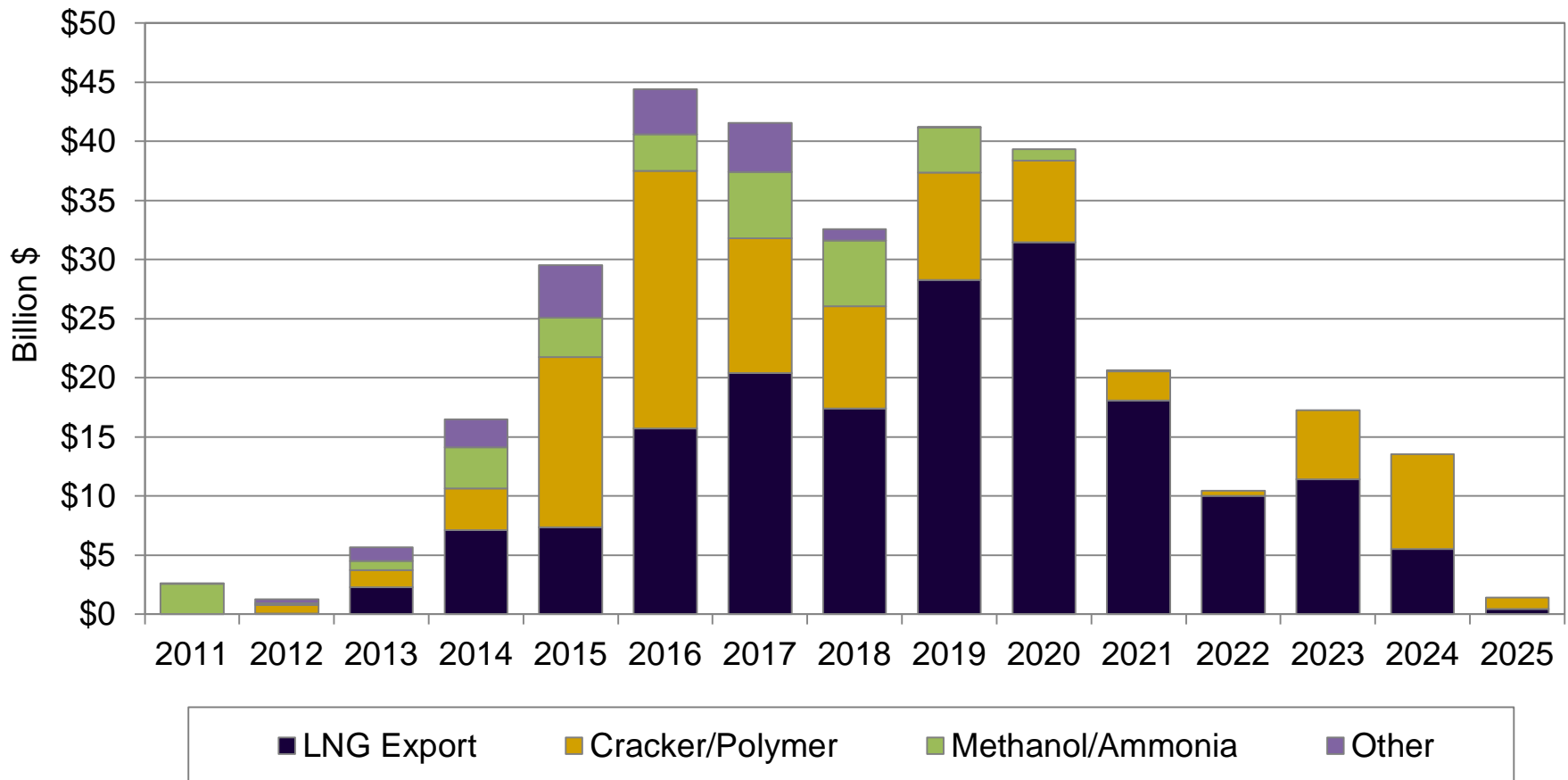
## Gulf of Mexico capital expenditures.

The continued low natural gas price outlook has facilitated considerable development of over \$318 billion: \$155 billion will be spent in Louisiana and \$162 billion in Texas.



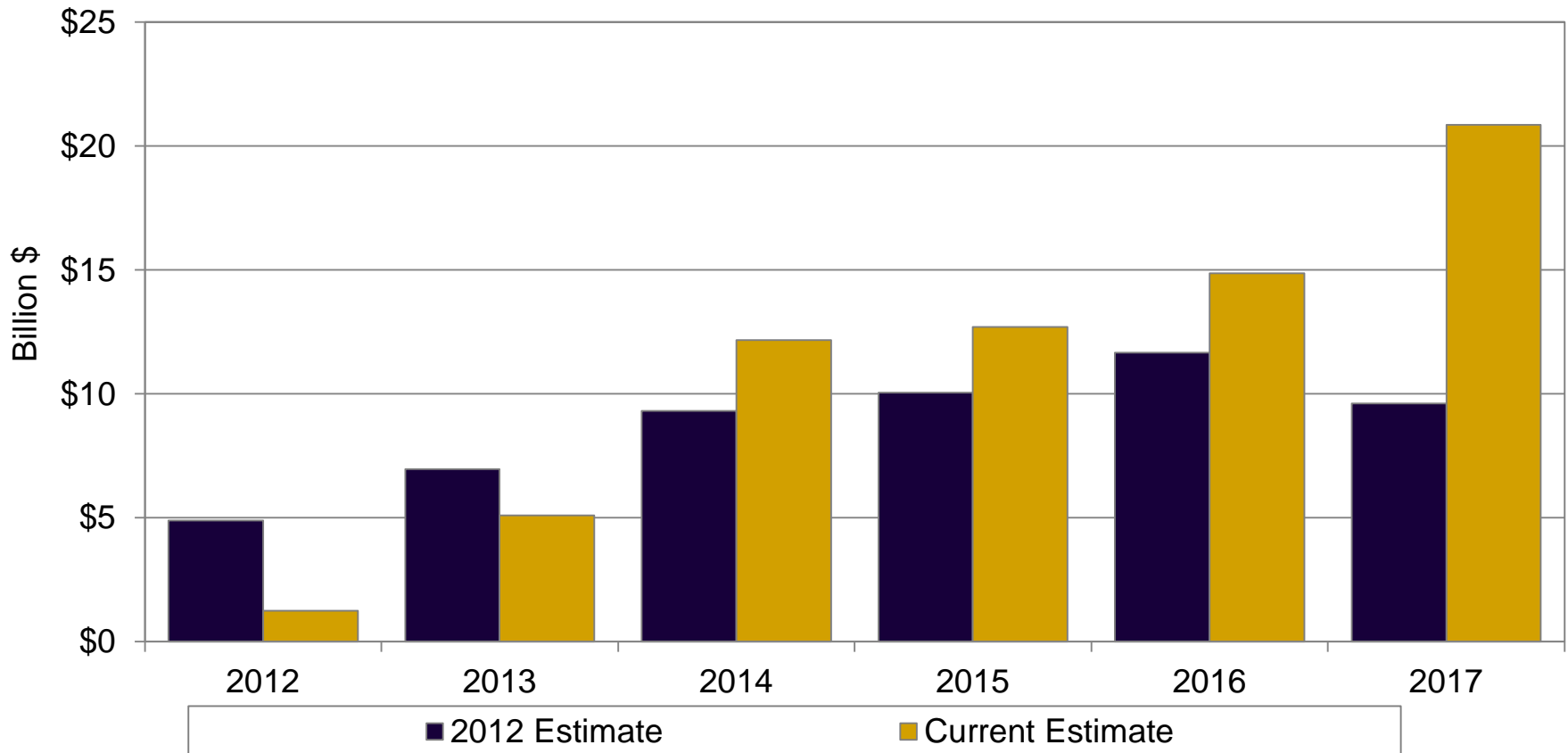
## Gulf of Mexico total capital expenditures by sector.

**The continued low natural gas price outlook has facilitated considerable development of over \$318 billion: \$100 billion already completed, \$218 billion remaining, but heavily concentrated in LNG export facilities.**



**Louisiana projected capital expenditures, then and now**

**Capital expenditures to date have exceeded early estimates. Projected expenditures for Louisiana 2012 were estimated to be \$53 billion (through 2017); however actual expenditures are closer to \$67 billion, a difference of almost 30 percent.**



**Industrial investment dynamics**

All of the industrial development to date has arisen in order to (1) serve global, not North American, markets and (2) leverage affordably-priced unconventional natural gas supplies.

Methanol  
Olefins  
Ammonia



US GOM industry competes with other places in the world that rely more heavily on crude oil-based feedstocks

LNG Exports  
GTL Exports

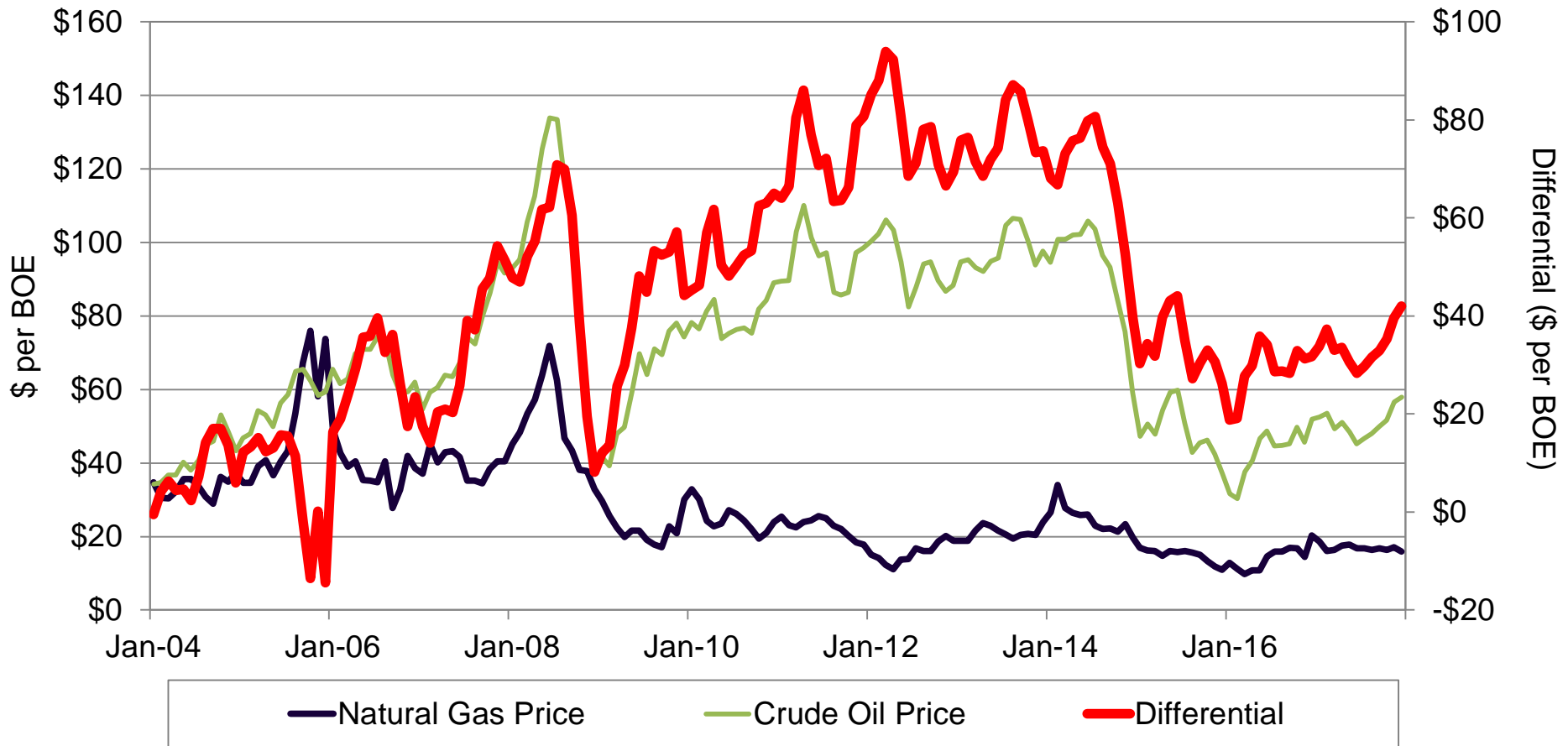


Provide a substitute fuel source (natural gas) to crude oil – trades at a value pegged to crude oil prices.

*The economics of both sets of infrastructure are very dependent upon the differentials between crude oil and natural gas prices – not their absolute level, but their differential.*

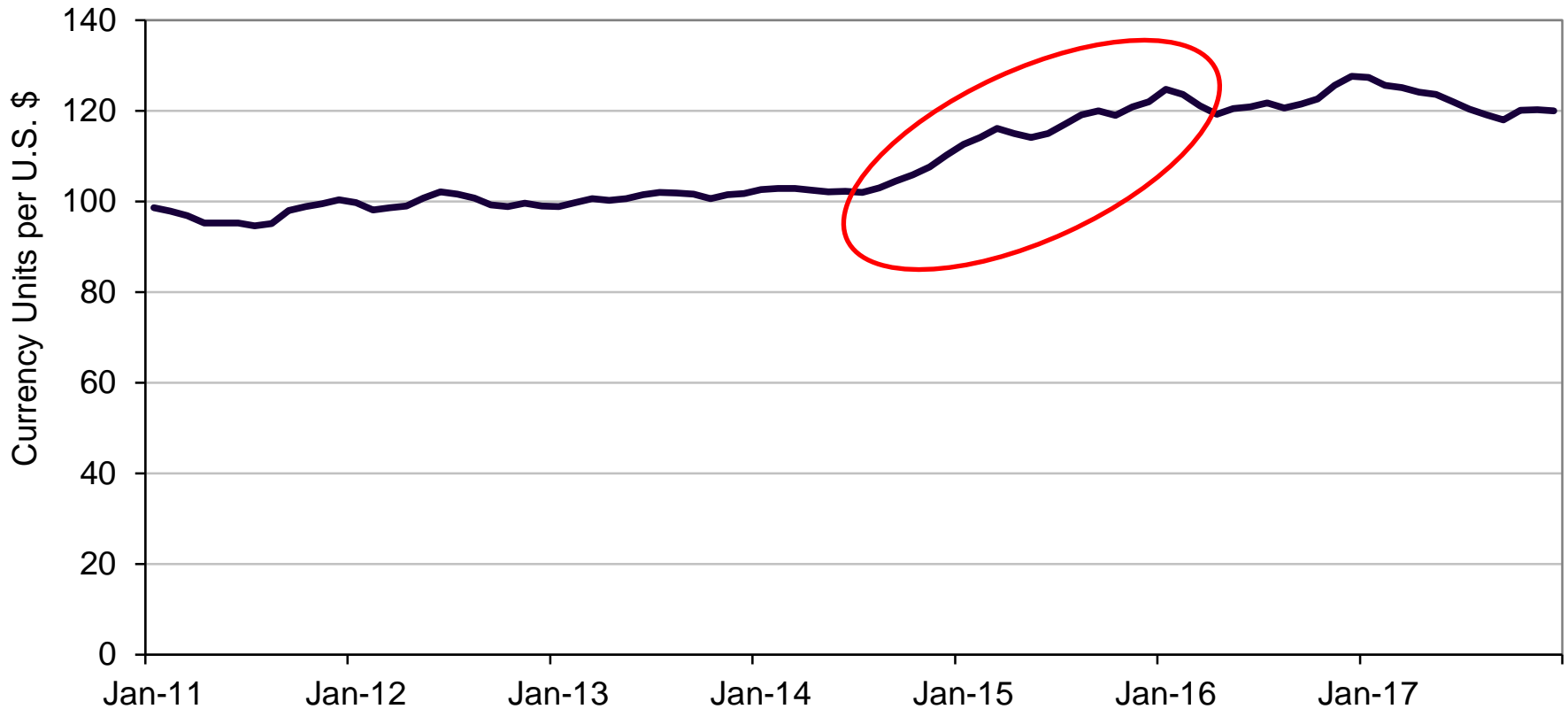
**Natural gas and crude oil prices**

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



Dollar valuations (Federal Reserve Broad Index)

**The dollar is up relative to the currencies: 20 percent appreciation over last six years, most of which was between 2014 and 2016.**



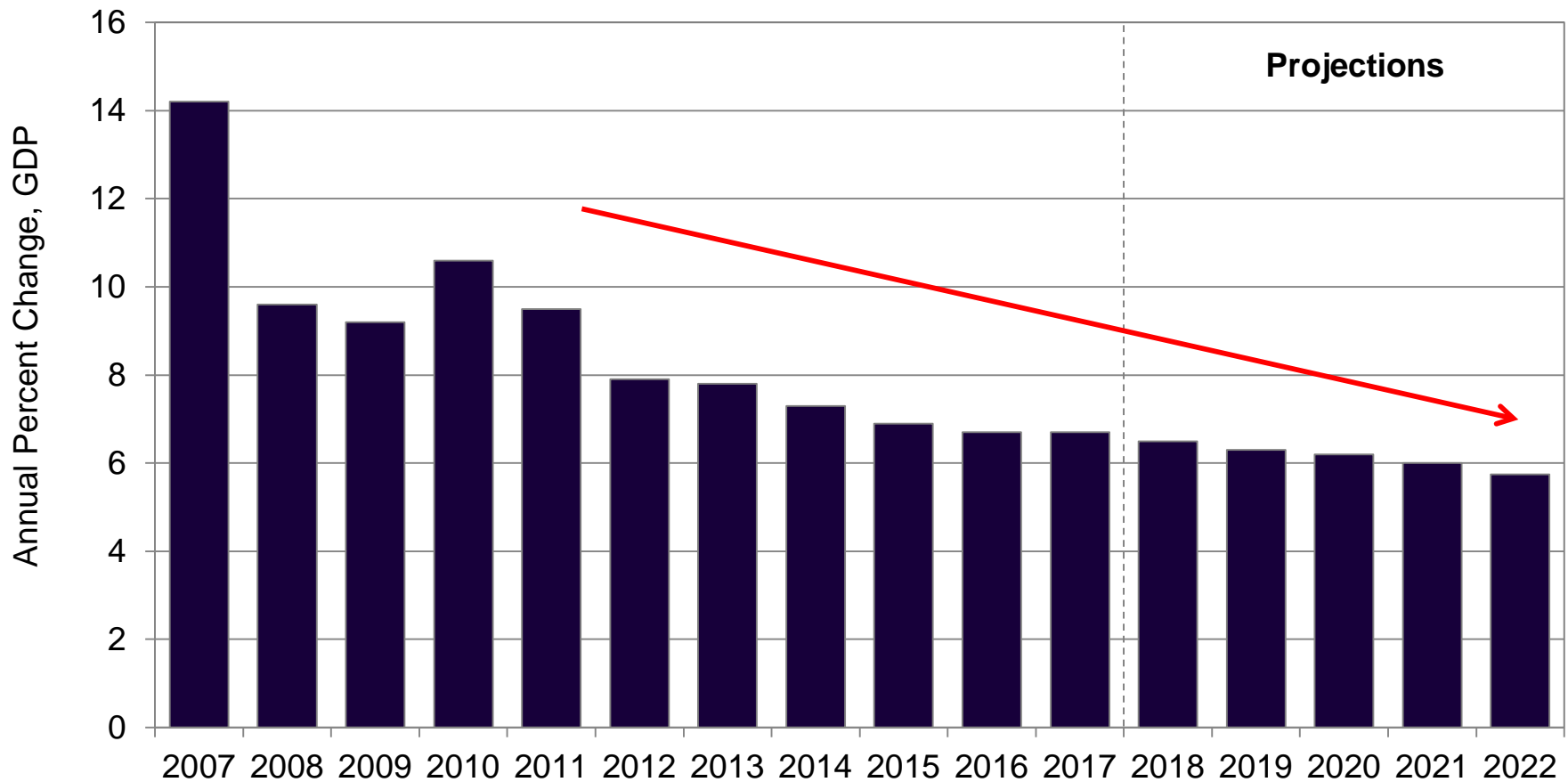
Note: The Broad Index is a weighted average of the foreign exchange values of the U.S. dollar against the currencies of a large group of major U.S. trading partners. Base year is 2002.

Source: Federal Reserve Bank of St. Louis; and U.S. Energy Information Administration.



**Changes in Chinese GDP**

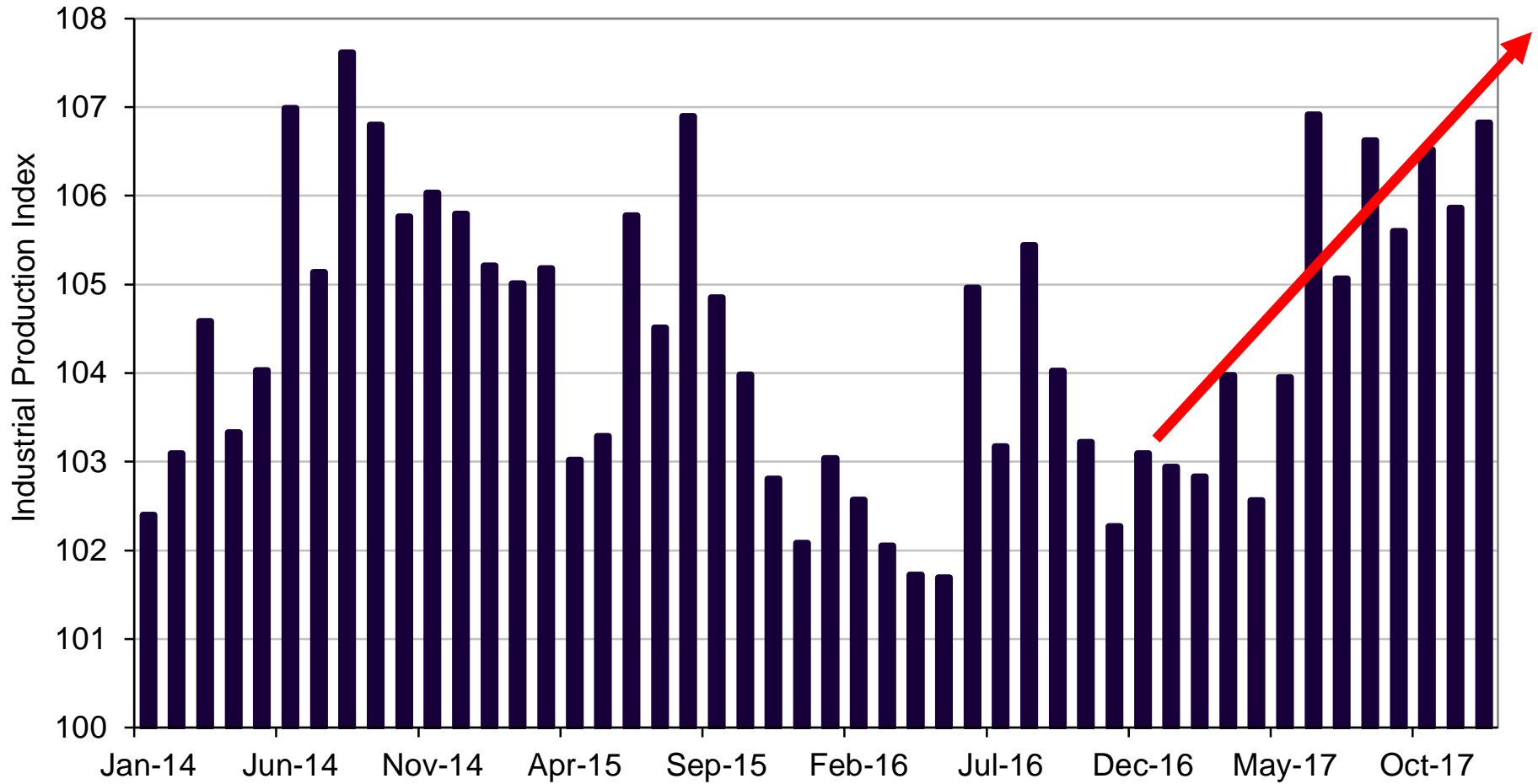
**Chinese economic growth officially reported at 6.8 percent, reflecting expectations of expansionary policy mix and a goal of doubling real GDP between 2010 and 2020**



**Development v. Output**

**U.S. Industrial Production Index**

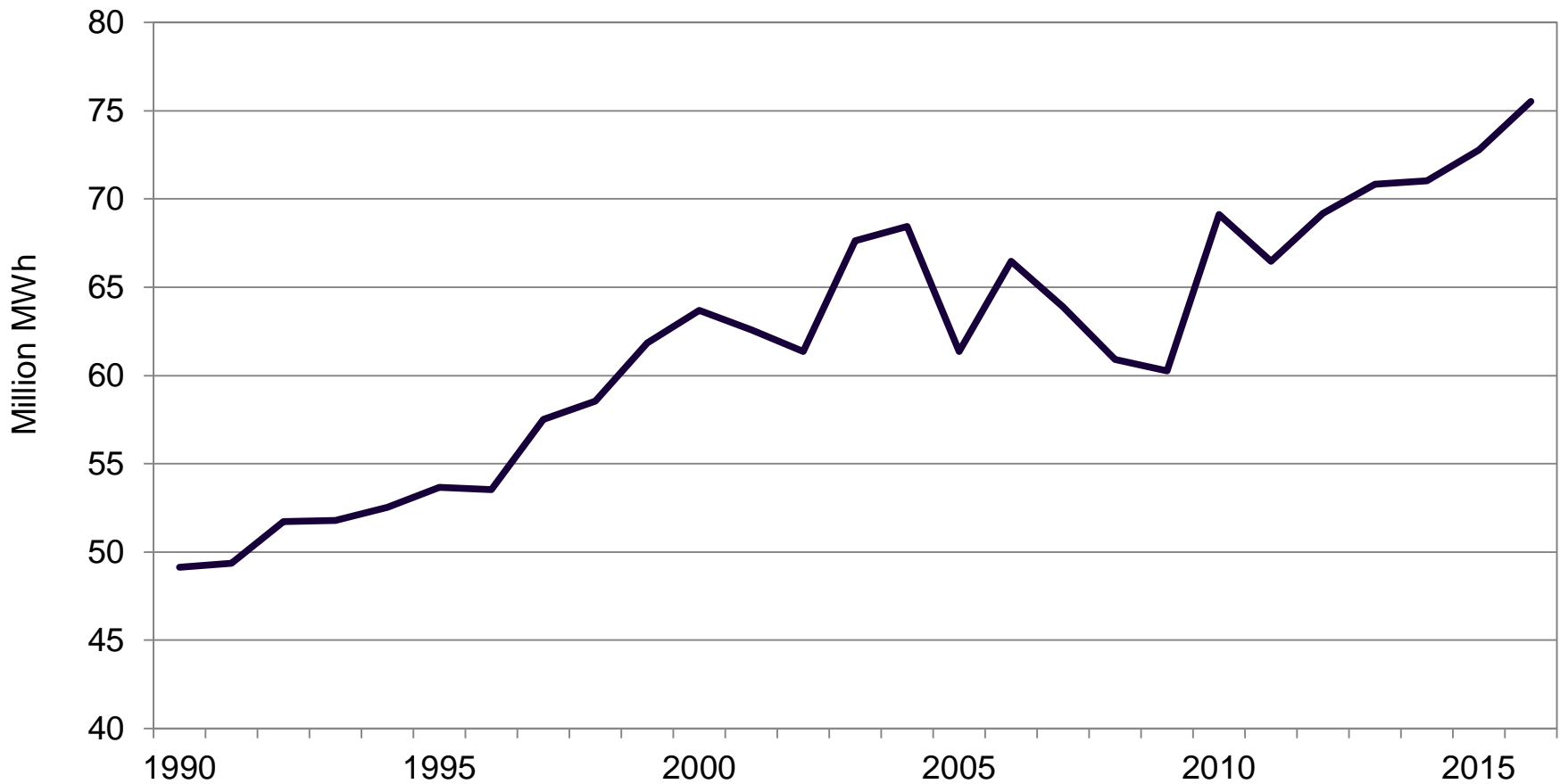
**National industrial production is on the rise since the 2016 slump.**



Source: Federal Reserve System.

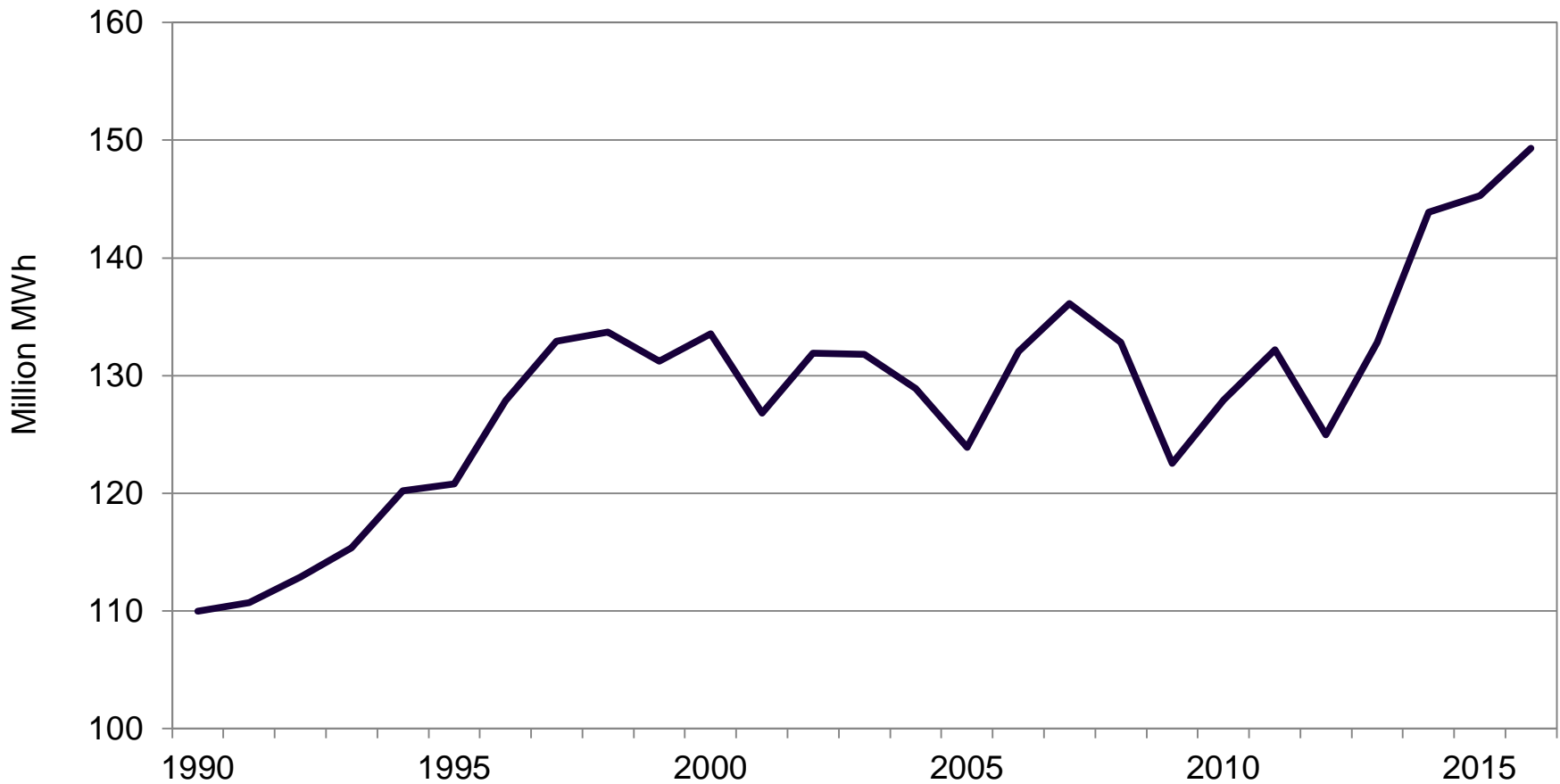
**Industrial electric generation, Louisiana and Texas**

**Industrial electric generation in Louisiana and Texas has increased by 14 percent, or two percent per year (on average) over the last five years.**



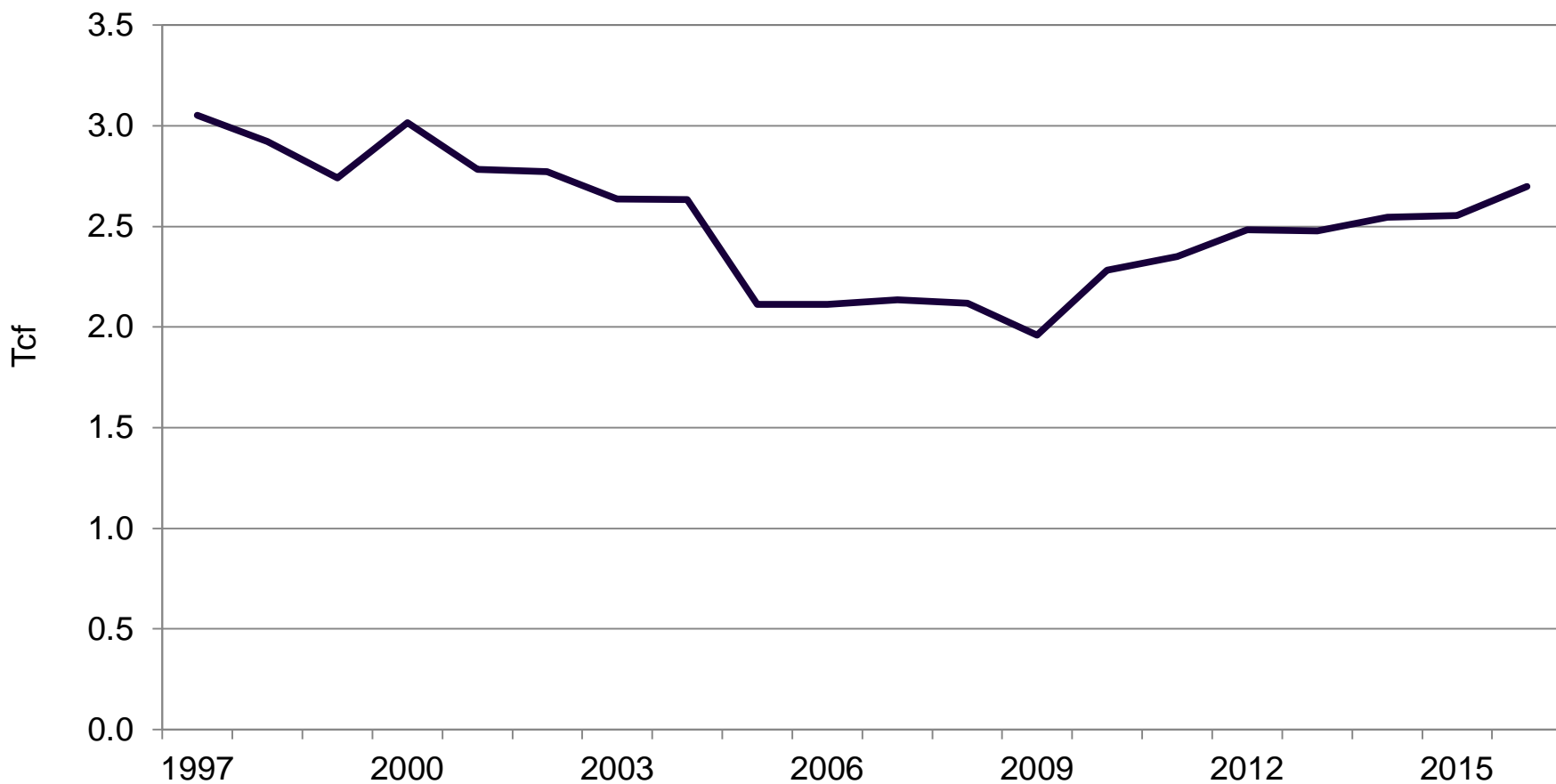
**Industrial electric retail sales, Louisiana and Texas**

**Gulf coast industrial retail electricity sales have increased by as much as 20 percent over the last five years.**



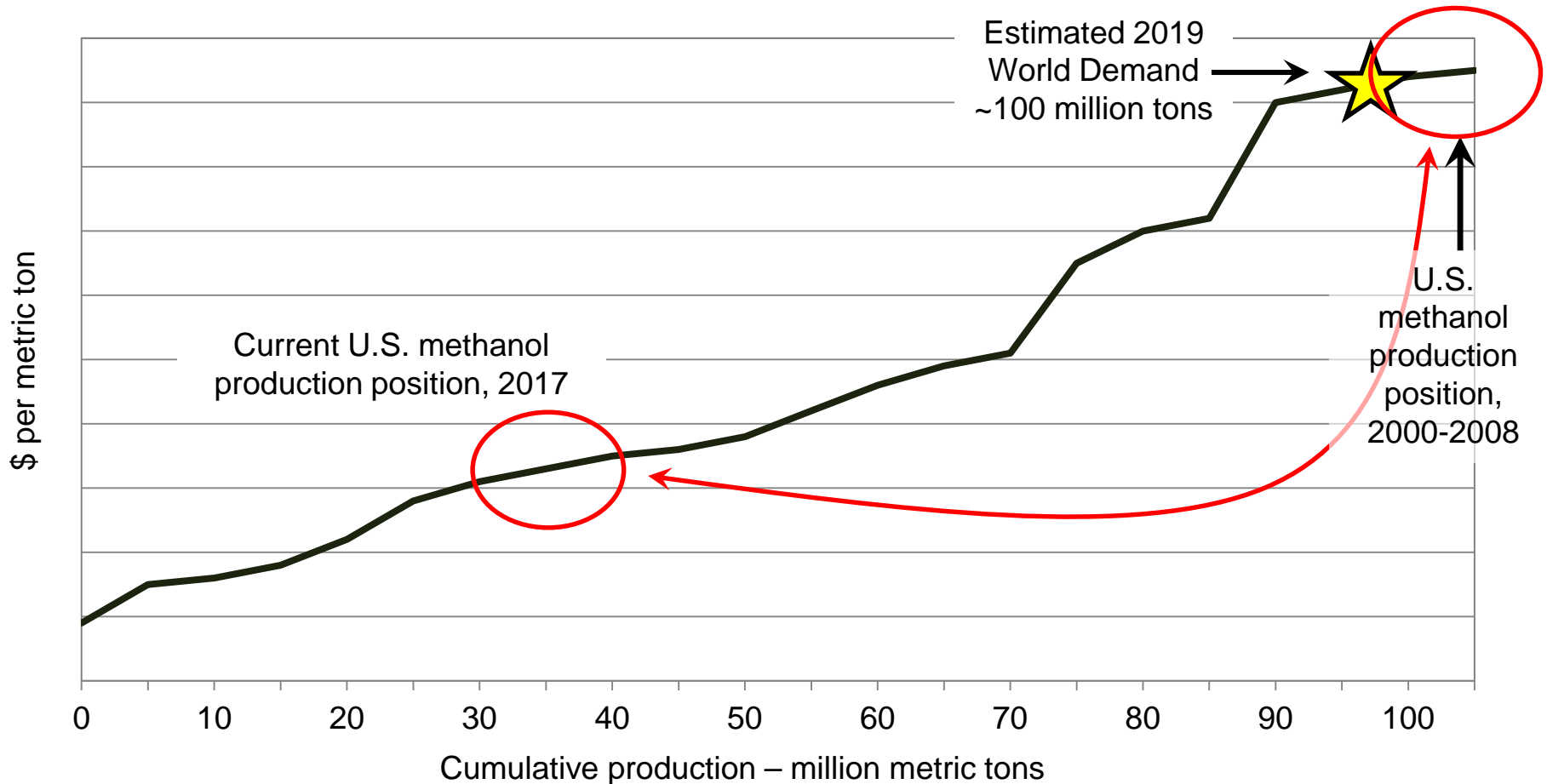
**Industrial natural gas sales, Louisiana and Texas**

**Industrial natural gas sales fell for over a decade, but turned around in 2009 and have been increasing at an average annual rate of five percent.**



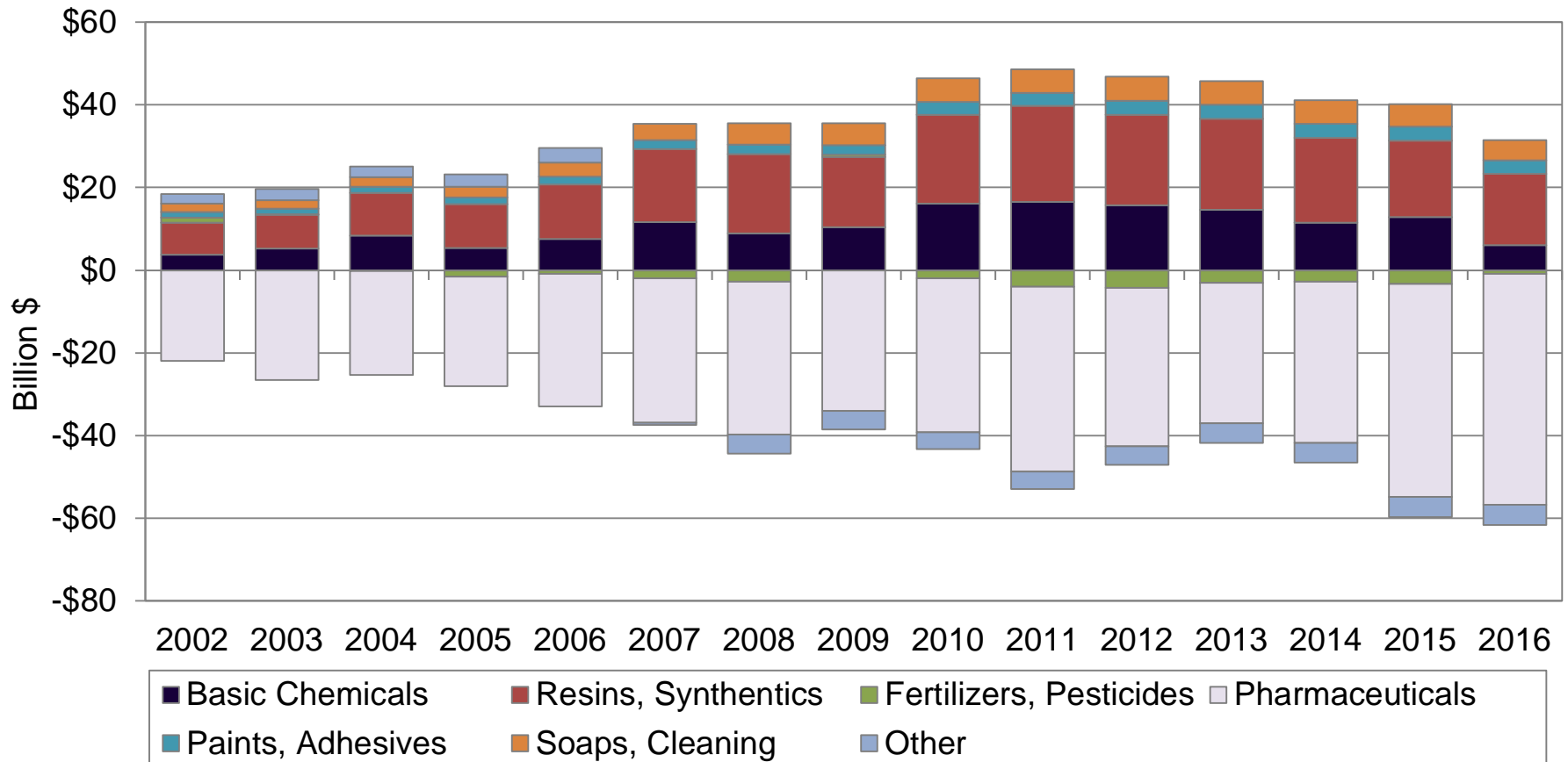
**Changing world petrochemical economics; methanol example.**

**Low cost U.S. natural gas production will continue to expand giving the U.S. and particularly the GOM region a significant cost advantage for petchem production.**



### U.S. chemicals net exports.

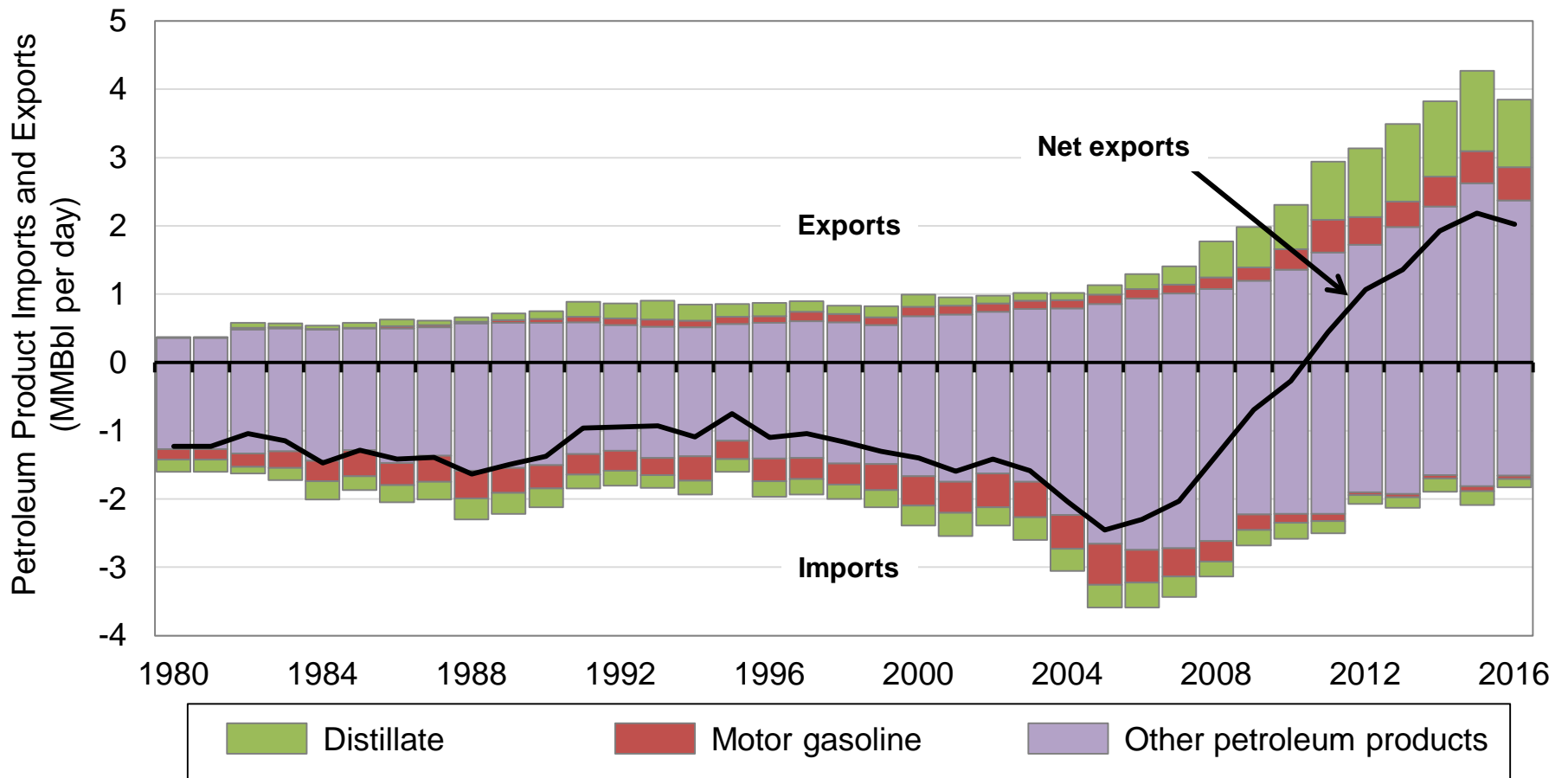
The majority of increasing chemical imports are pharmaceuticals. Basic chemicals, resins, paints and adhesives continue to be exported. Have reach a zero net imports/exports position with ag chemicals.





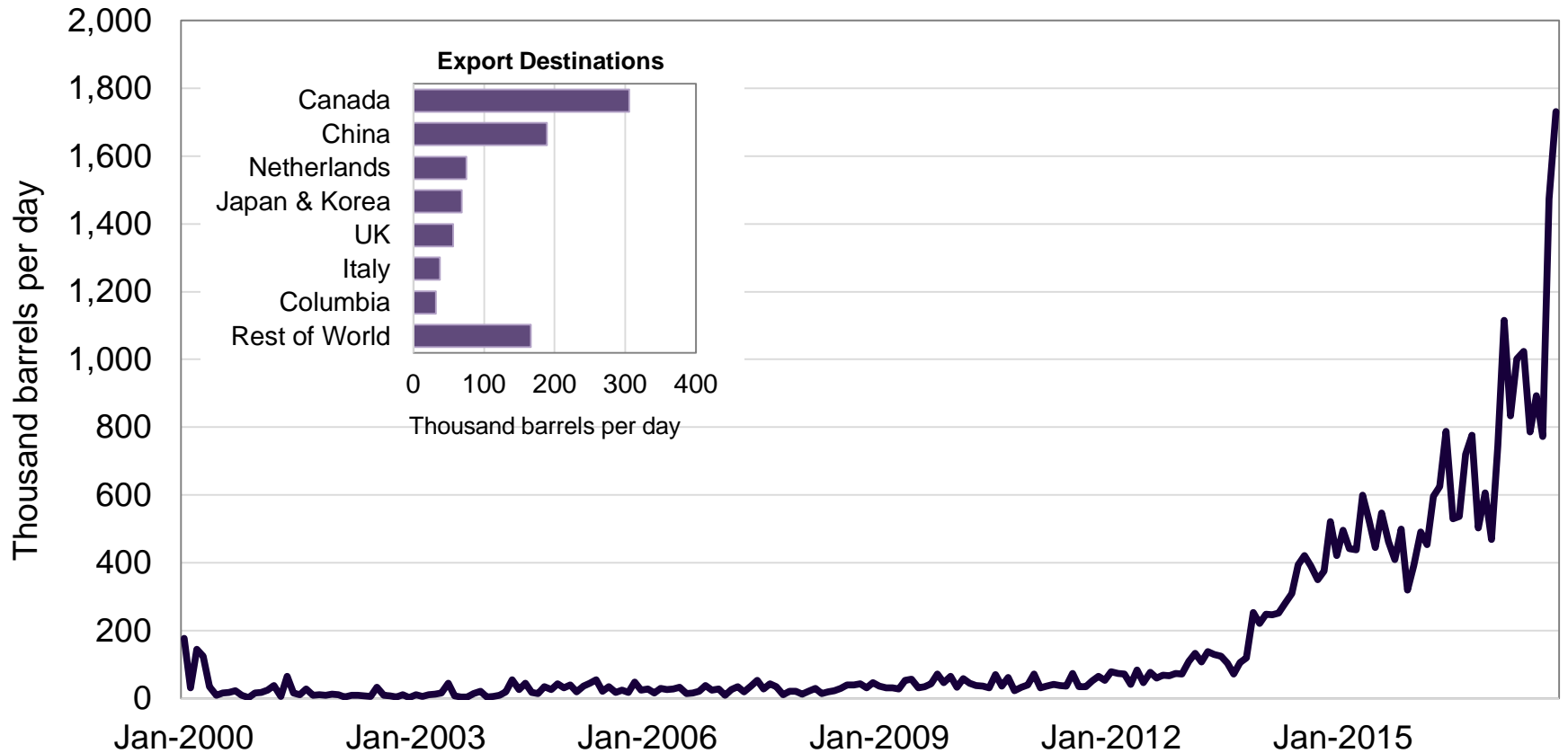
**U.S. petroleum product imports and exports.**

**In 2011, the U.S. became a net exporter of petroleum products. Net exports have increased 360 percent since then.**



U.S. crude oil exports.

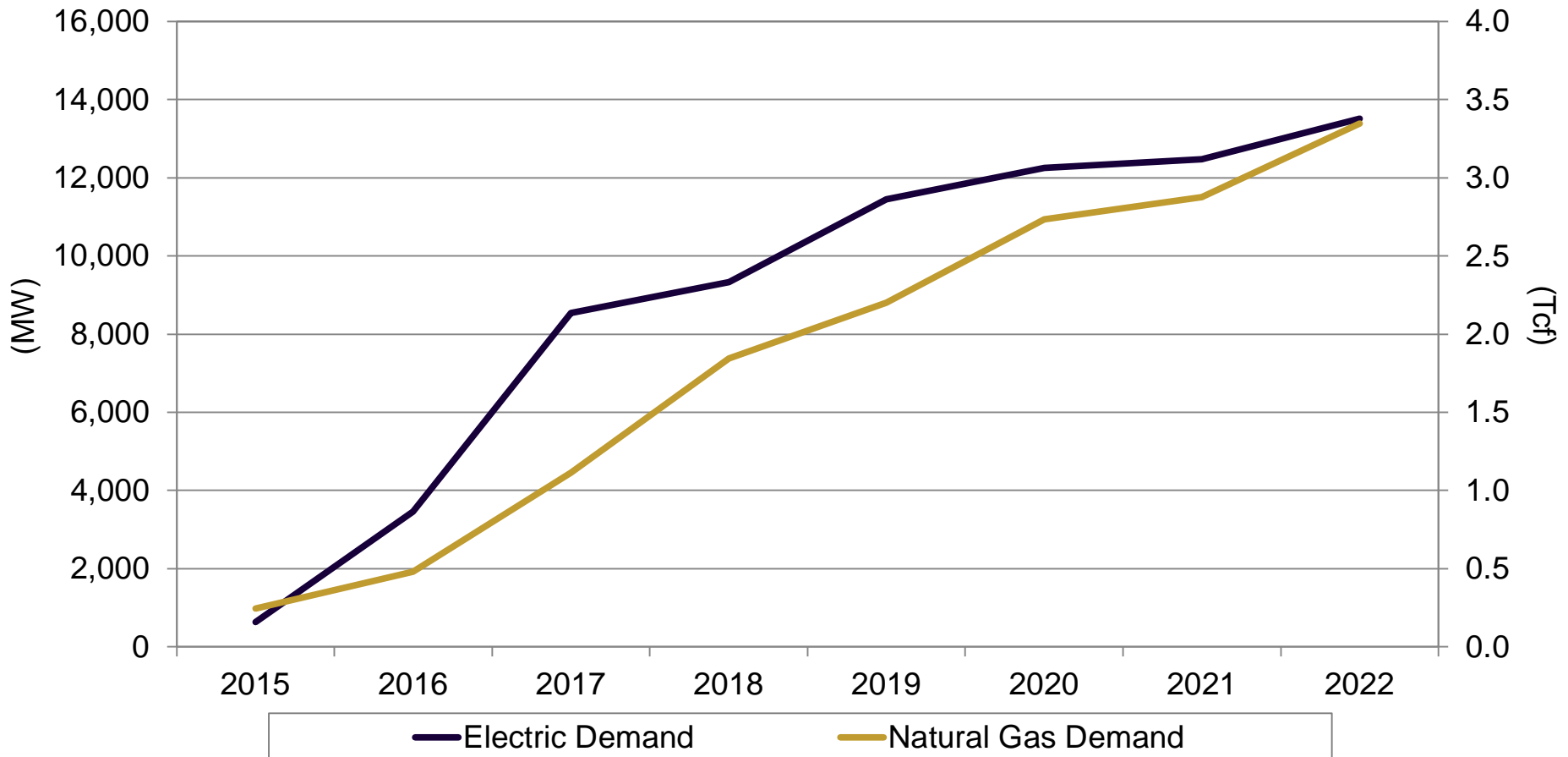
In December 2015, **restrictions on exporting U.S. produced crude oil were lifted**. In 2016, the **U.S. exported an average of 520,000 barrels per day** and **exceeded one million barrels per day in 2017**. Opportunities for the U.S. to participate further in global crude oil exports are considerable, and the Gulf Coast will be the beneficiaries of these opportunities.



## Conclusions

**Estimated electricity demand from new industrial projects, Louisiana and Texas**

**The cumulative electric load from new industrial projects could reach about 13,500 MW by 2022; and annual natural gas use could reach close to 3,500 Bcf.**



**Handicapping 2018-2019 industrial development.**

<b>Potential 2018-2019 Impacts on Gulf Coast Industrial Development</b>		
<b>Factor</b>	<b>Bullish</b>	<b>Bearish</b>
<b>Crude oil prices</b>	<b>Price build (over \$70/Bbl)</b> 30%	<b>Price maintenance (\$60/Bbl-\$65/Bbl)</b> 70%
US natural gas prices	Price build (over \$3.50/Mcf) 5%	Price maintenance (\$3.00-\$3.50/Mcf) 95%
<b>Global economic growth</b>	<b>Building strength</b> 75%	<b>Weakness</b> 25%
Global commodity prices	Price maintenance 60%	Strong build 40%
<b>Exchange rates</b>	<b>Dollar depreciation</b> 50%	<b>Dollar appreciation</b> 50%
Interest rates	Low longer term rates 10%	Building longer term rates 90%
<b>Federal energy/environmental regulations</b>	<b>Continued lightening</b> 90%	<b>Retrenchment</b> 10%
State policies (LA)	Removing uncertainty 10%	Increasing uncertainty 90%

Questions, Comments and Discussion.



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