

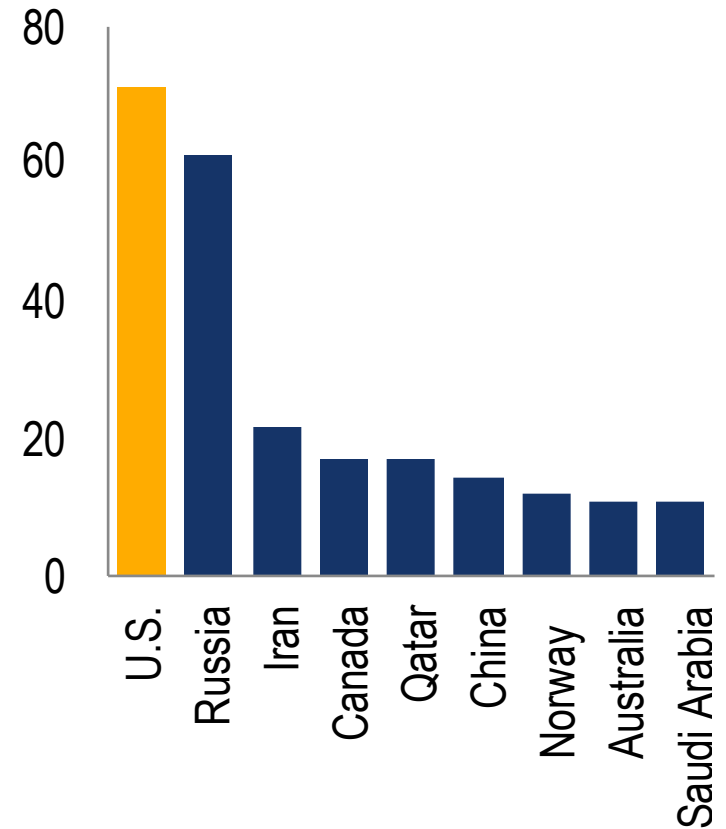
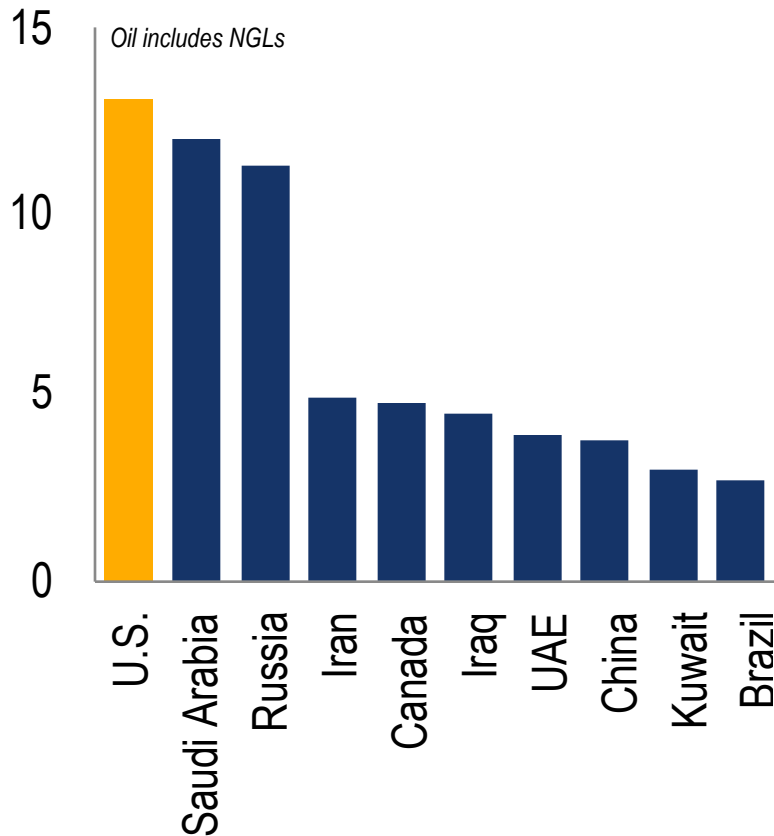
# 9th IEA-IEF-OPEC Symposium on Energy Outlooks The View from the US



*Jason Bordoff*  
February 27, 2019

# The US Is Now the World's Largest Oil and Gas Producer

Top 10 Oil Producing Countries in 2017 (mn b/d)    Top 10 Gas Producing Countries in 2017 (Bcf/d)



Source: BP Statistical Review 2018

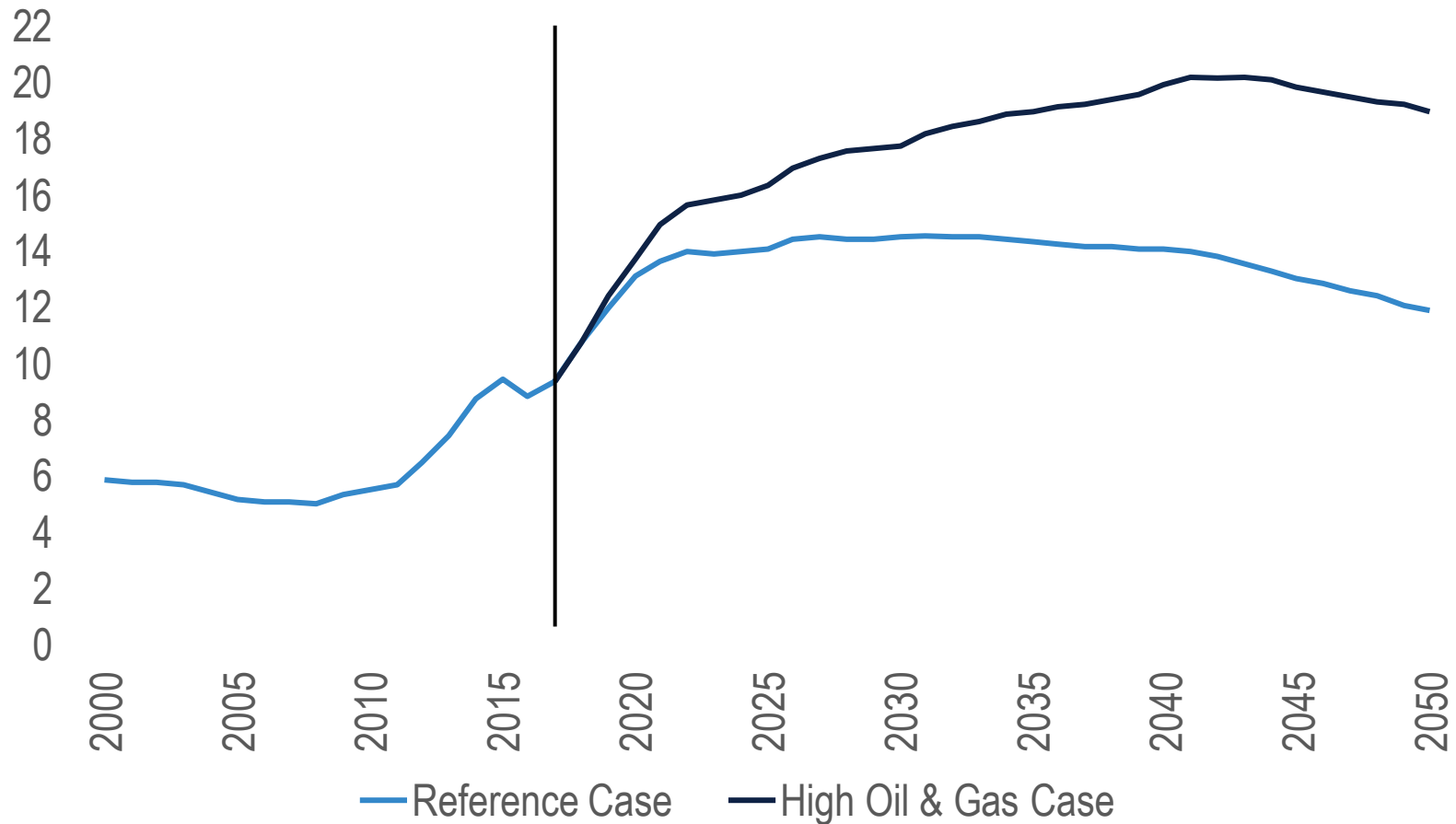


# Oil Outlook



# US Oil Production Growth Set to Continue for Some Time

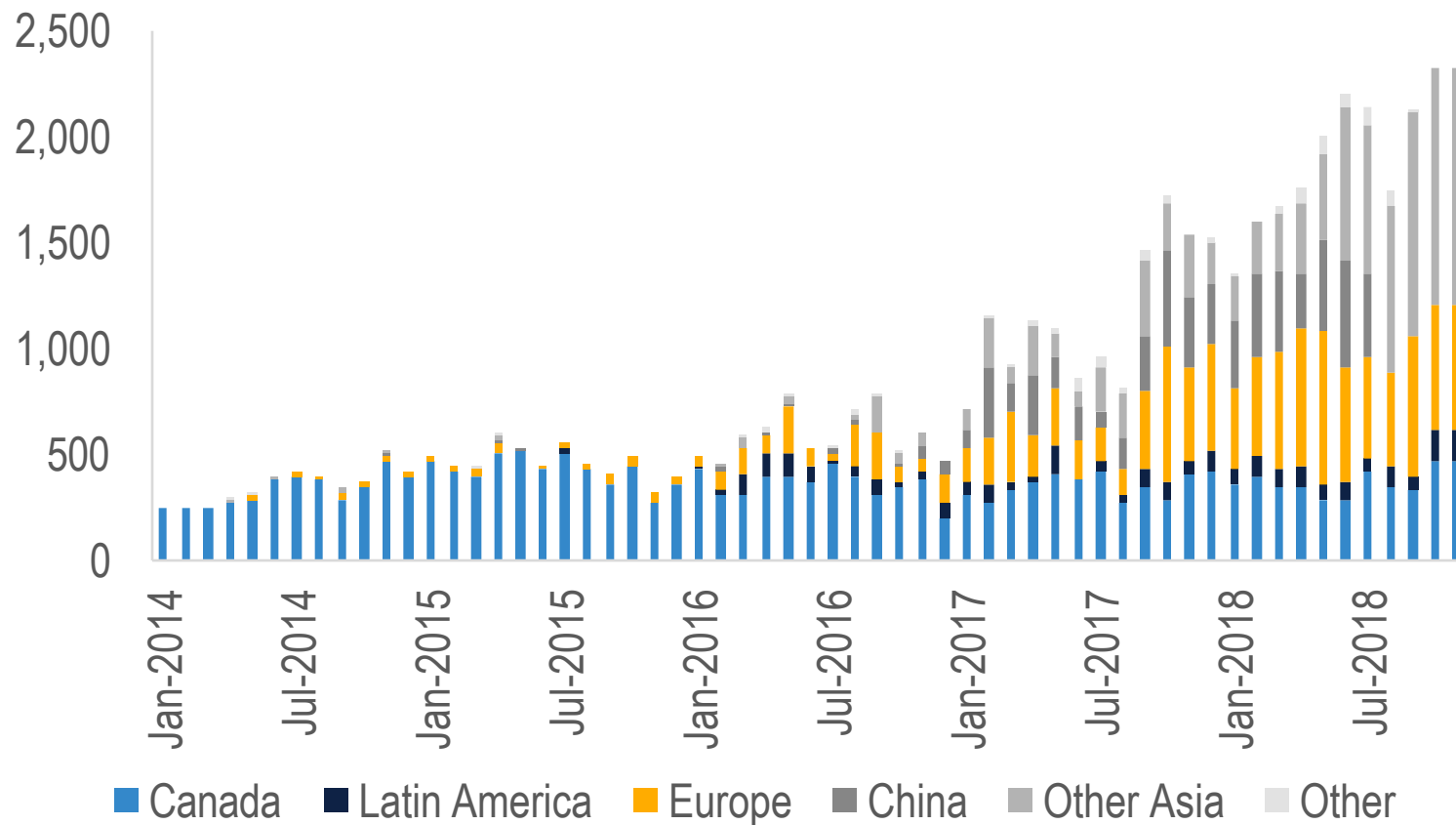
US Crude Oil Production (million b/d)



Source: EIA AEO 2019

# US Crude Exports Helped Meet the Energy Needs of More Than 50 Countries Since 2014

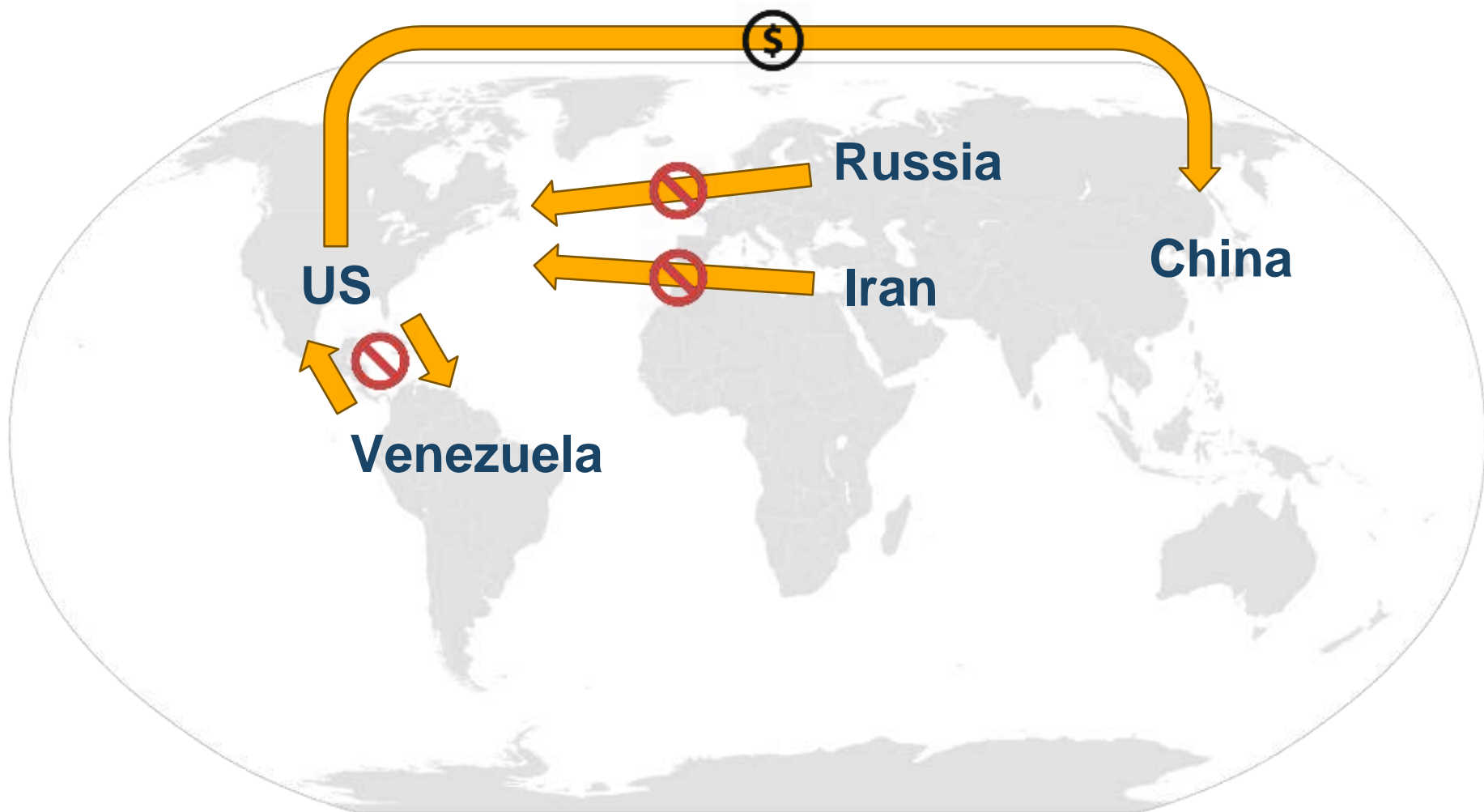
## US Crude Oil Exports by Destination (thousand b/d)



Source: EIA

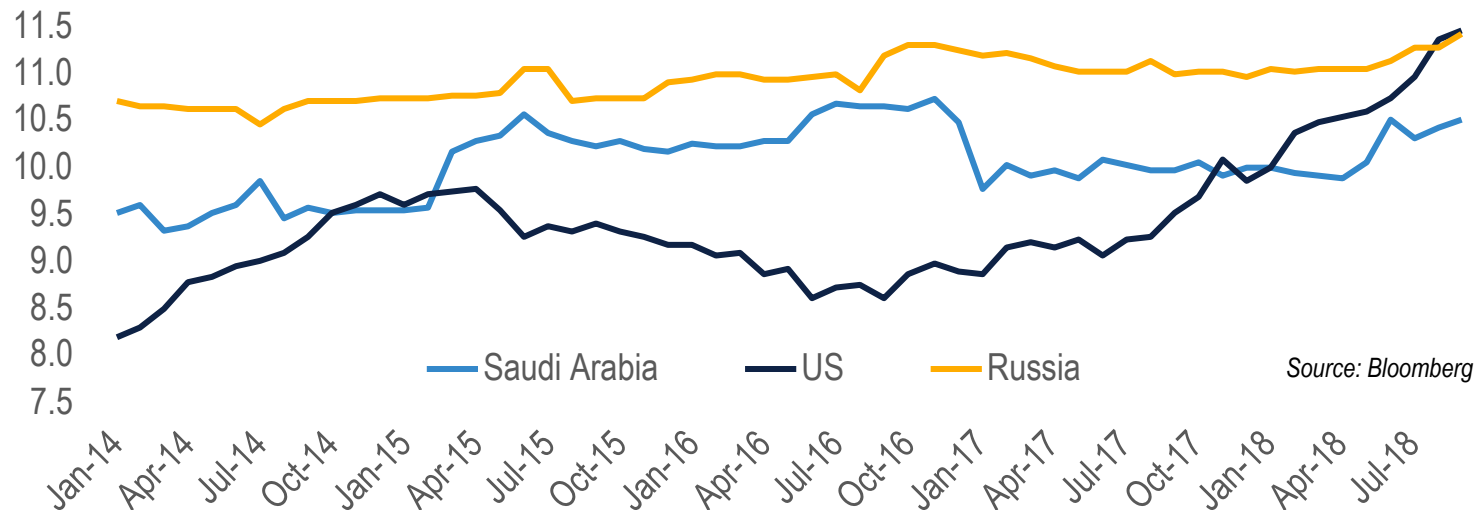


# US Trade and Sanctions Policy Have Implications for Global Oil Flows and Prices

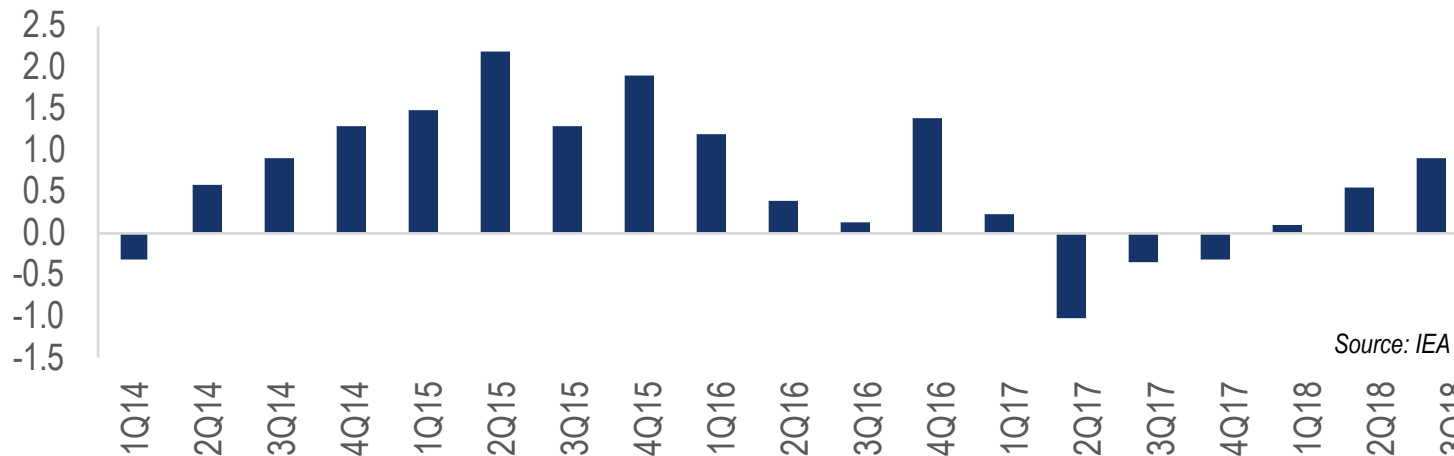


# US Shale Is an Imperfect Market Balancer

## Crude Oil Production in the US, Russia, and Saudi Arabia (mbpd)

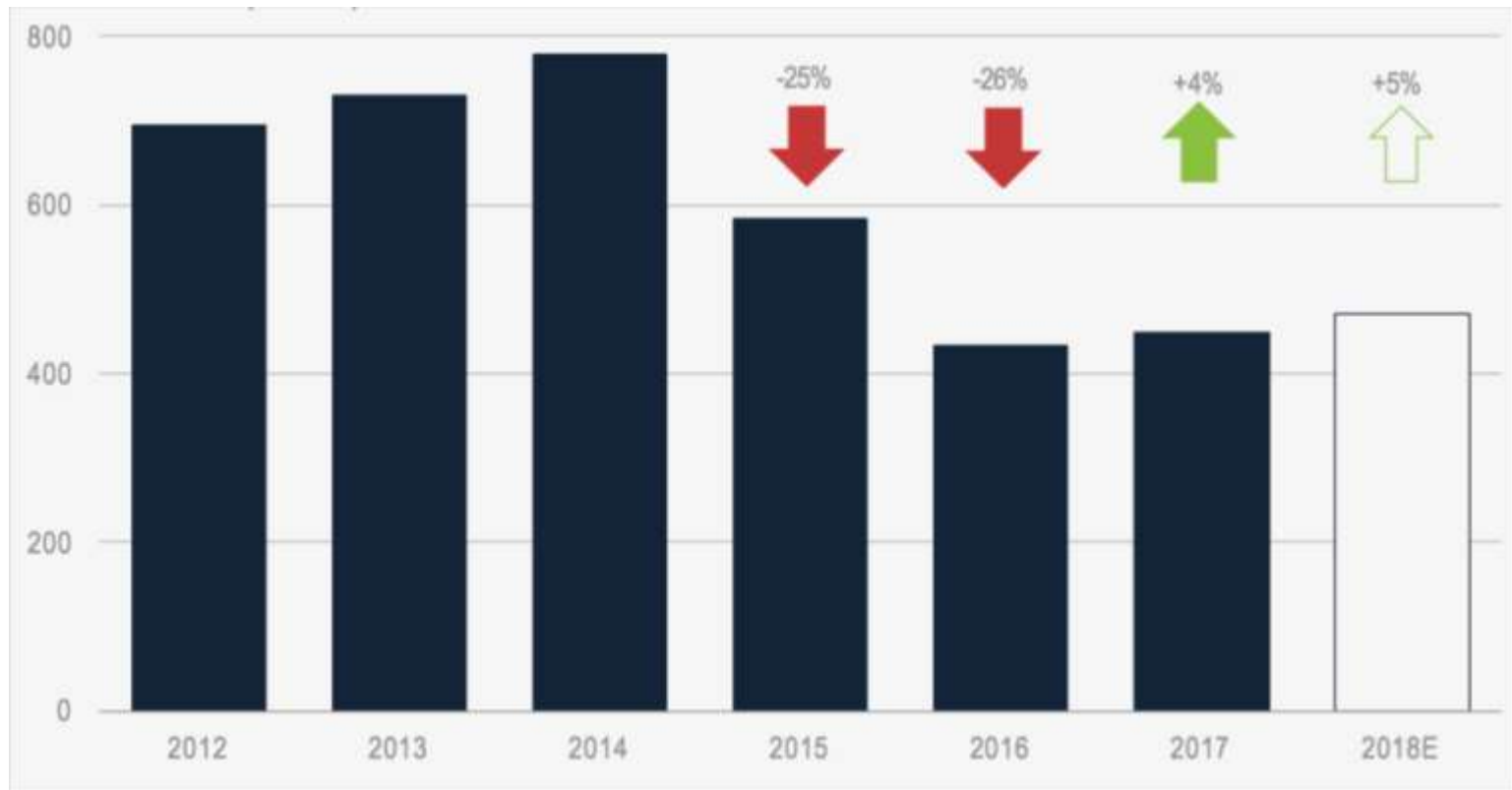


## Global Oil Supply / Demand Balance (mbpd)



# Short-Cycle Shale Raises Concern About Long-Cycle Investment

Global Investment in Upstream Oil and Gas (nominal \$ billion)



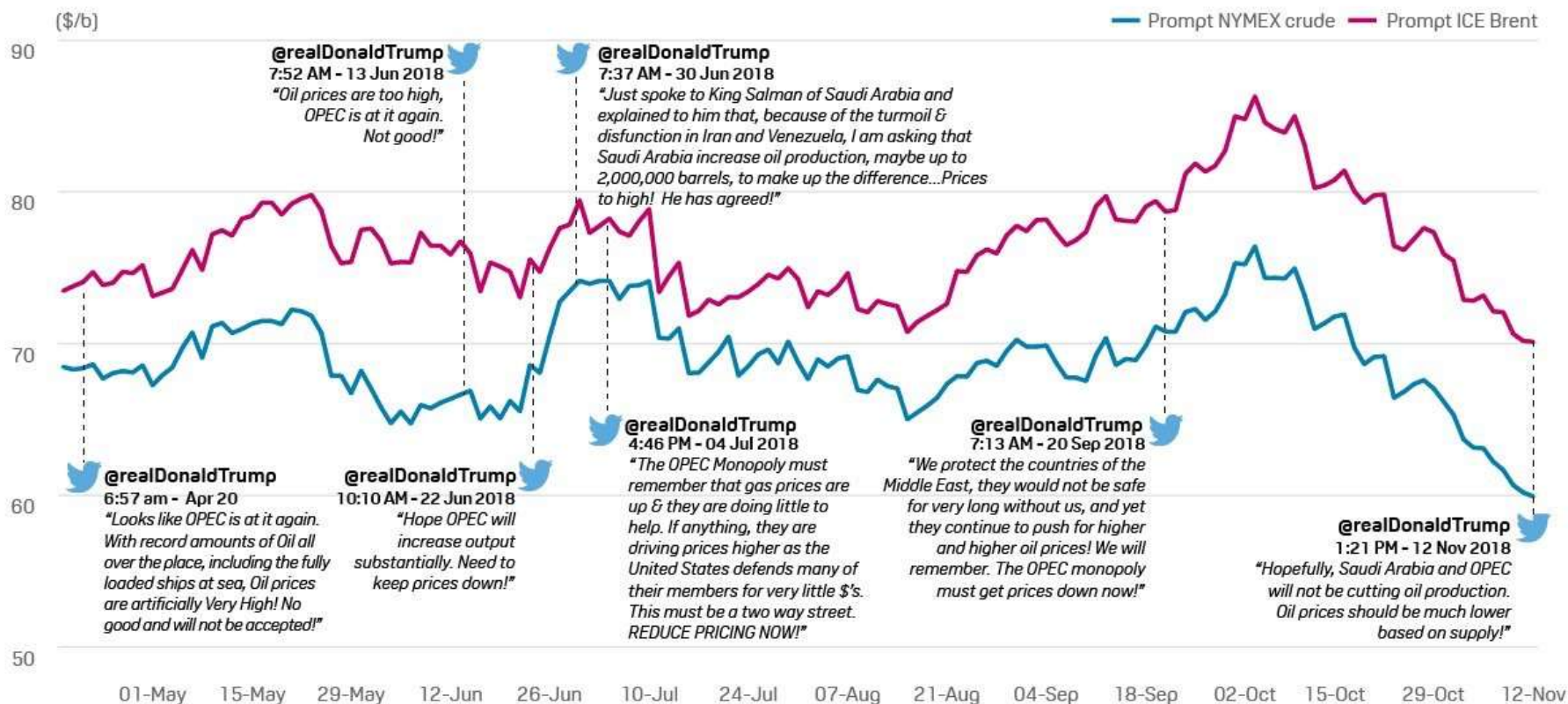
Source: IEA World Energy Investment 2018



# OPEC Is Under Fire From the White House

## US OIL DIPLOMACY BY TWEET

US President Donald Trump's latest tweet aimed at OPEC comes after a sharp drop in oil prices have spurred the producers group to consider output cuts.

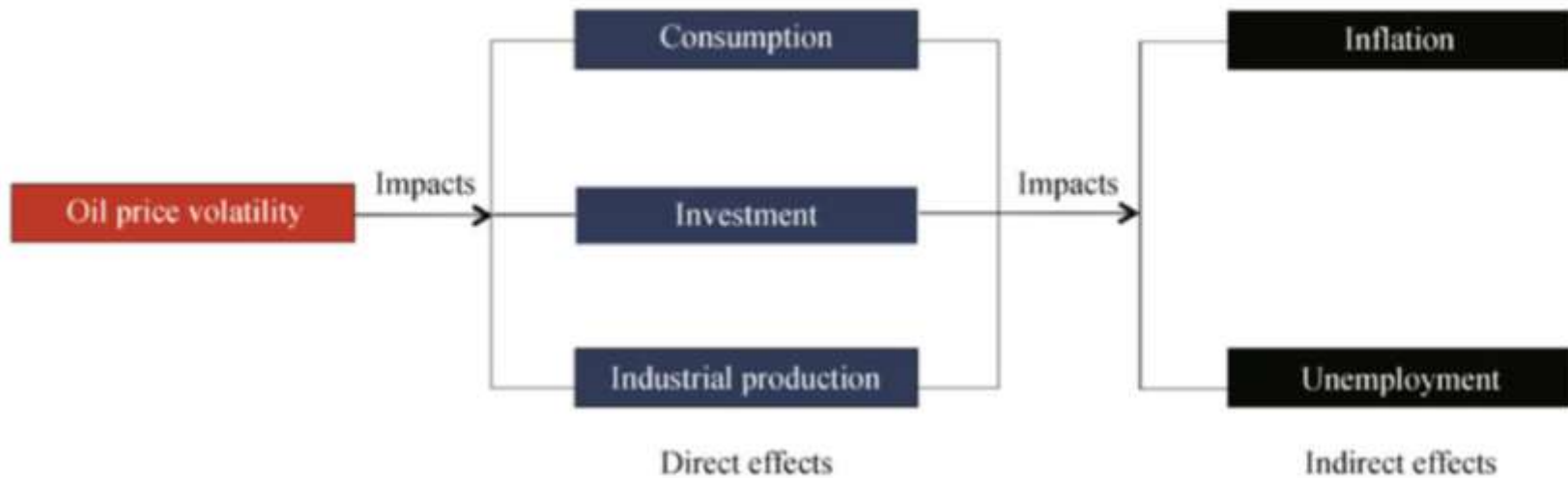


Source: S&P Global Platts



# Oil Price Volatility Is Harmful for the US Economy

## Direct and Indirect Impacts of Oil Price Volatility

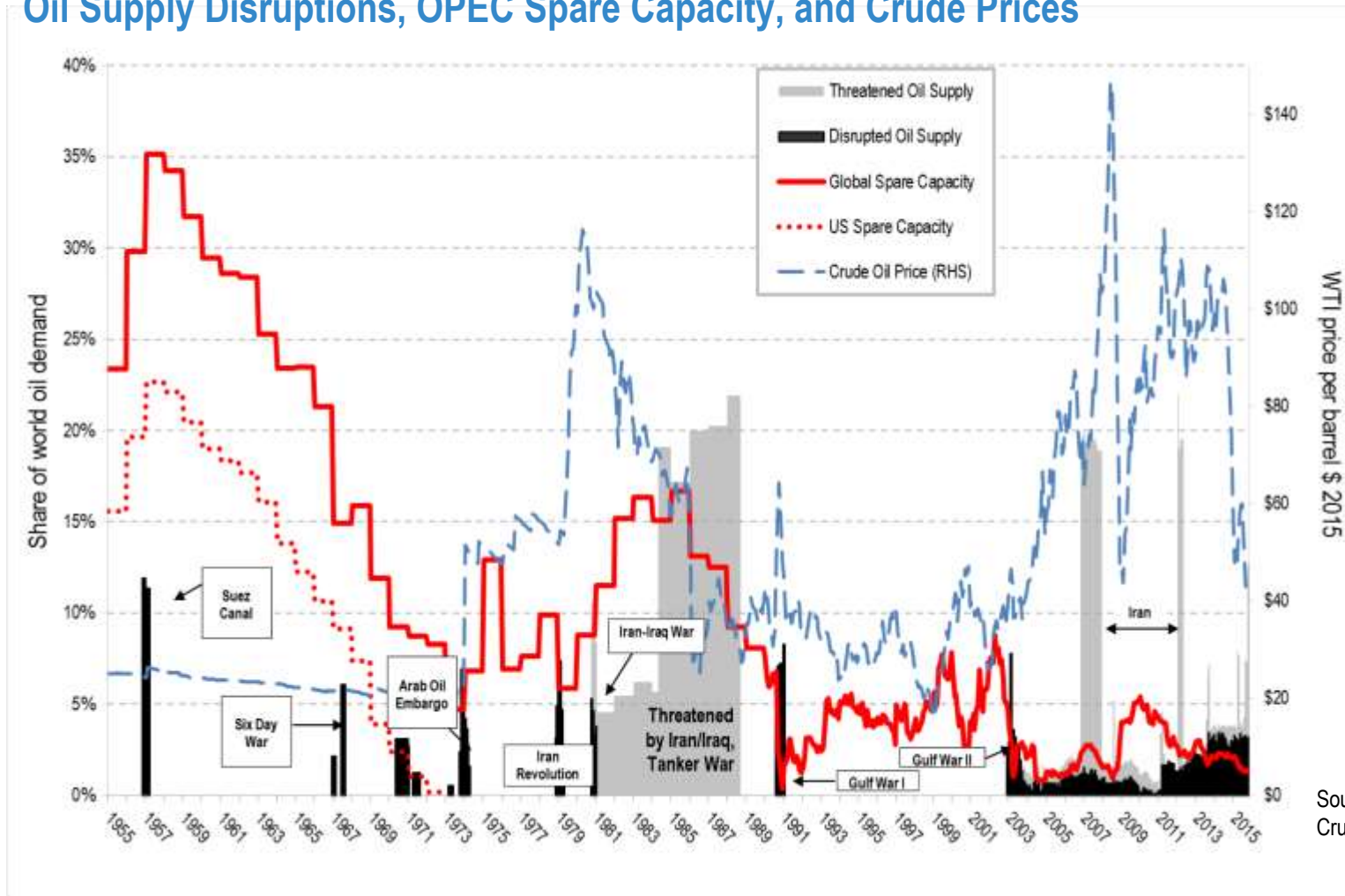


***“[Oil price] volatility has several damaging and destabilizing macroeconomic impacts that will present a fundamental barrier to future sustainable economic growth if left unchecked”***

Zoheir Ebrahim, Oliver Inderwildi, and David King, “Macroeconomic Impacts of Oil Price Volatility: Mitigation and Resilience,” *Frontiers in Energy*, vol. 8, issue 1 (2014)

# OPEC Plays a Crucial Role in Mitigating Oil Price Volatility

## Oil Supply Disruptions, OPEC Spare Capacity, and Crude Prices



Source: Bob McNally, Crude Volatility

**“OPEC’s use of spare capacity has reduced price volatility, perhaps by as much as half”**

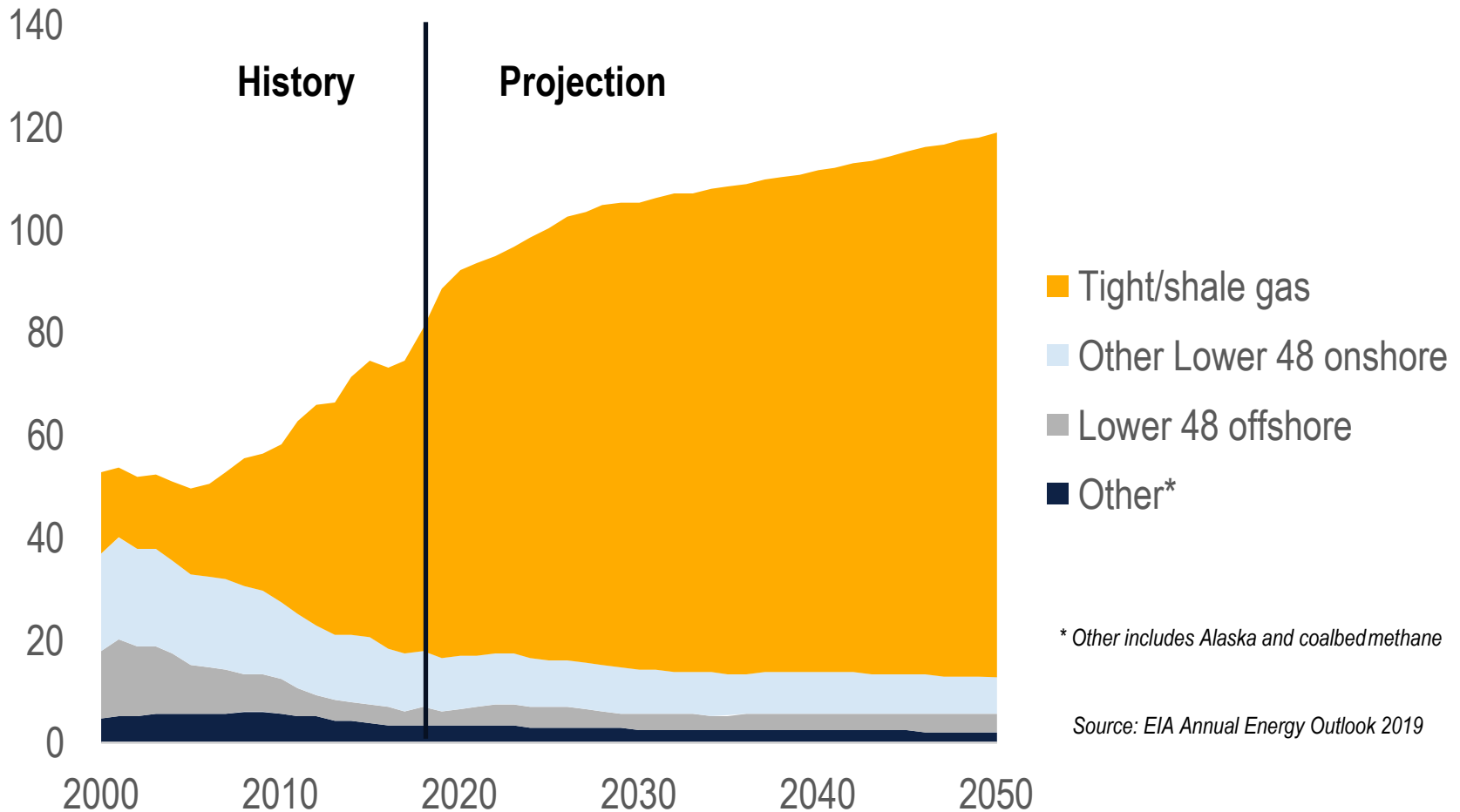
Axel Pierru et al., "OPEC's Impact on Oil Price Volatility: The Role of Spare Capacity." *Energy Journal*, Vol. 39, No. 2, March 2018.

# Natural Gas Outlook



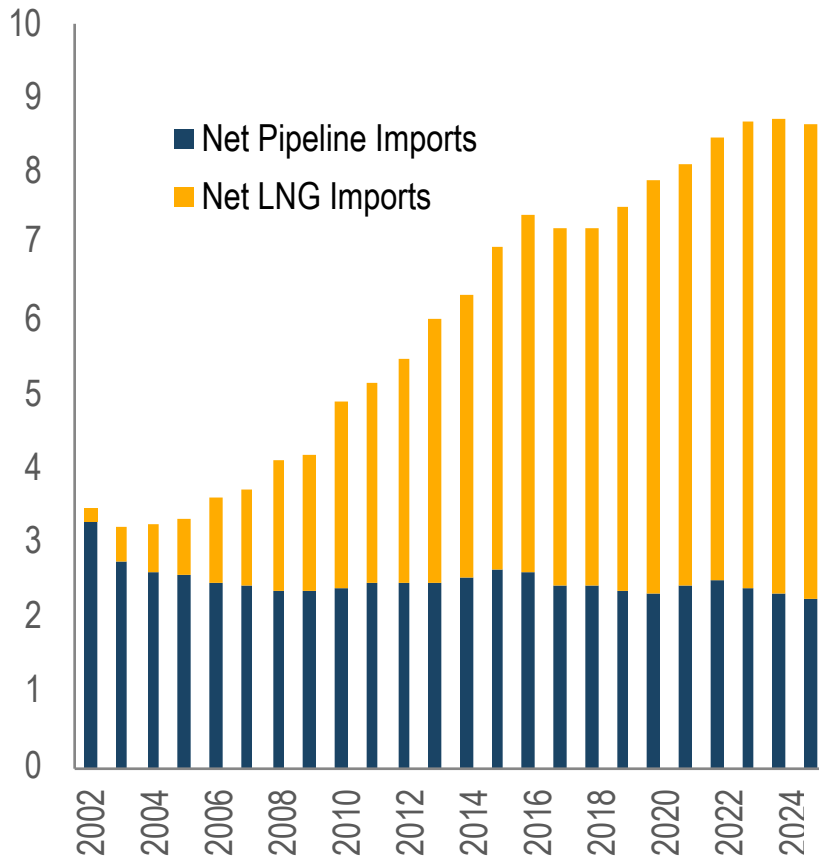
# The US Shale Gas Boom Shattered Notions of Scarcity...

## US Dry Gas Production Under the EIA's Reference Case Scenario (Bcf/day)

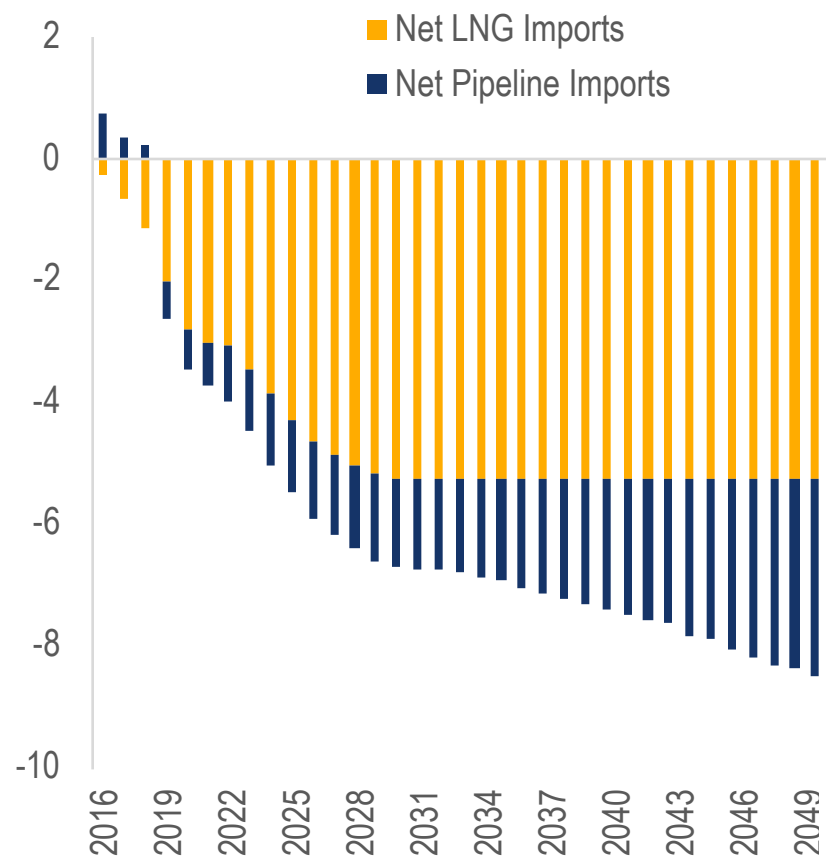


# ...And Completely Turned the US Natural Gas Outlook Around

**AEO 2005 US Net Natural Gas Imports (Tcf)**



**AEO 2018 US Net Natural Gas Imports (Tcf)**



Source: EIA Annual Energy Outlook 2005 and 2019



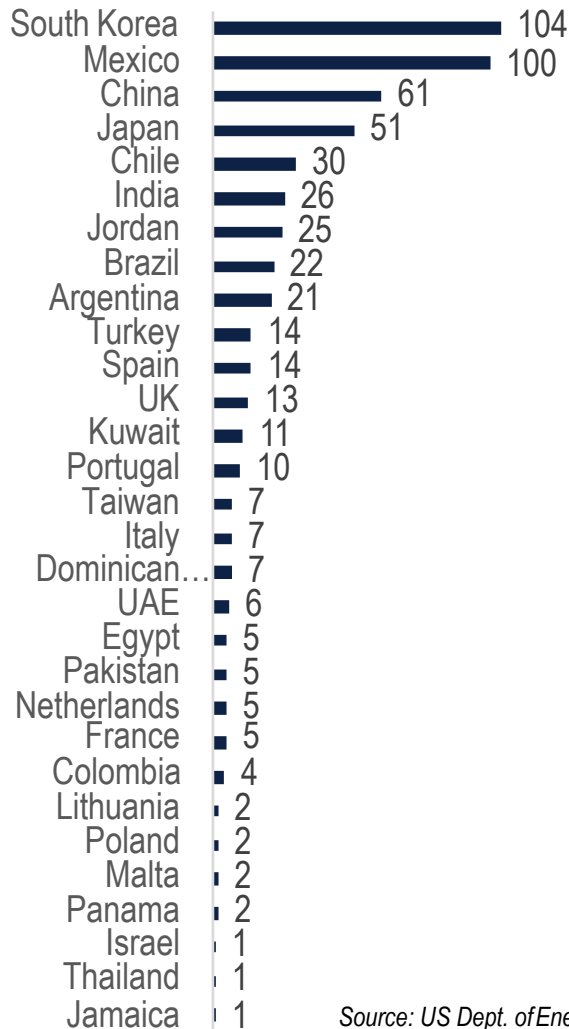
# US LNG Exports Are Impacting Russian Gas Policy in Europe

- US LNG flexibility undermines the market power of established exporters
- US LNG can empower importers and create a buyers' market for LNG
- US LNG can help create a more efficient gas markets based on gas-on-gas competition
- US LNG can export low US prices to the rest of the world and mitigate high prices elsewhere
- US LNG can improve European energy security, foster gas market integration and increase the negotiating leverage of European allies against Gazprom



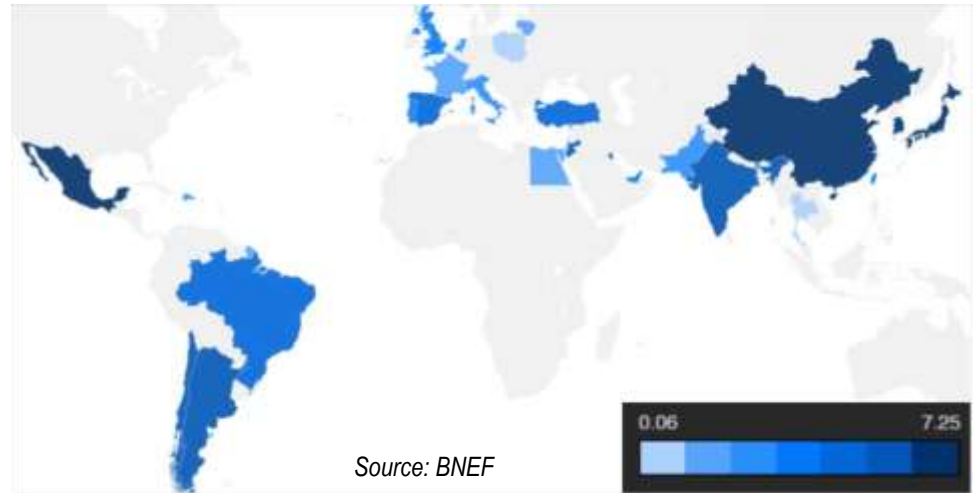
# Flexible US LNG Is Finding Markets Around the World

## US LNG Exports by Destination (cargoes)

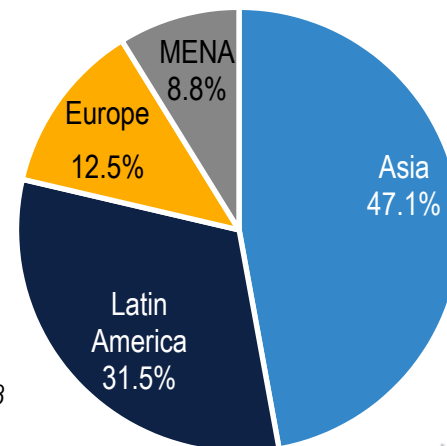


Source: US Dept. of Energy

## US LNG Export Volume by Country (mtpa)



## US LNG Export Volume by Region



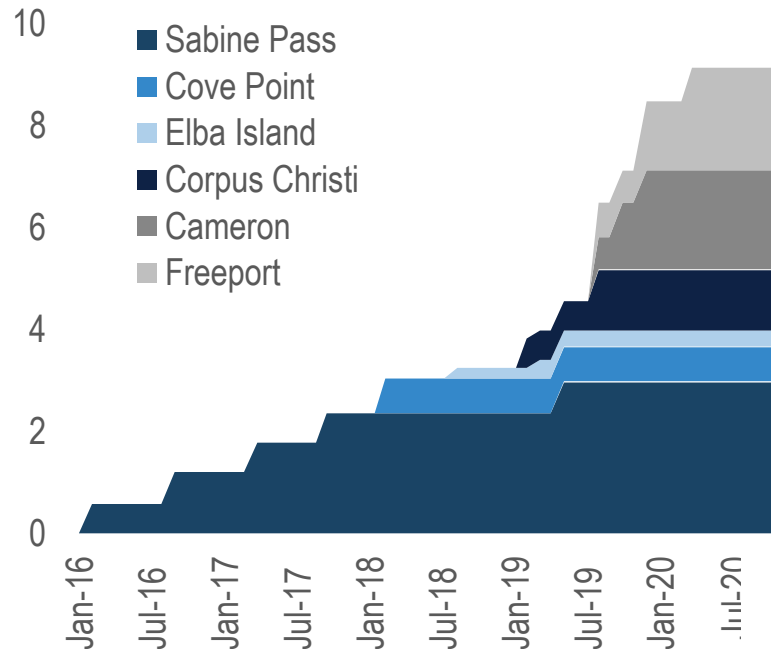
Source: US Dept. of Energy

Note: all data from Feb 2016 to Nov 2018



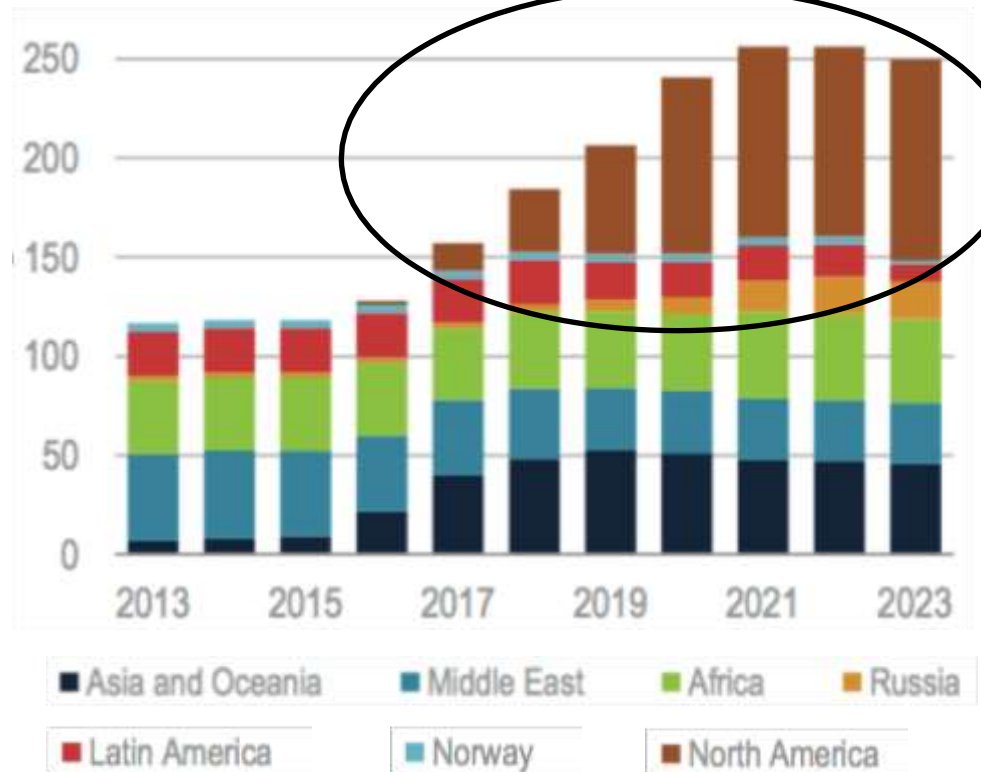
# US LNG Export Capacity Is Ramping Up, Nearly Doubling Flexible LNG Volumes Worldwide

## US LNG Export Capacity Under Construction or in Operation (Bcf/d)



Source: CGEP based on company disclosures

## LNG Export Contract Volumes With Flexible Destination (bcm)



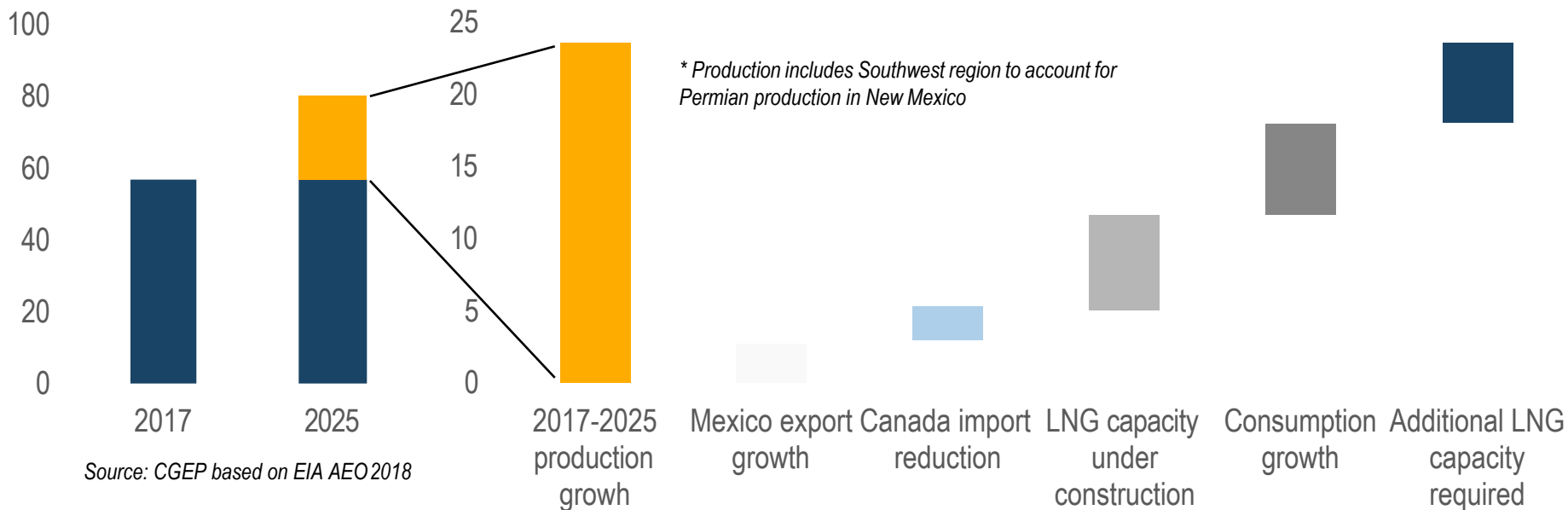
Source: IEA Global Gas Security Review 2018



# Permian Associated Gas Needs an Outlet Point

US Gas Production East of the Rockies\* (Bcf/d)

Sources of Demand for US Gas Production East of the Rockies\* (Bcf/d)



- Further LNG capacity will likely be needed to accommodate booming shale production East of the Rockies (Marcellus/Utica dry gas + Permian associated production)
- Infrastructure bottlenecks present downside risk to oil production
- Associated gas boom could lead to gas priced below Henry Hub flowing into global market

# Implications of US Energy Revolution--Summary

- **Oil Markets**

- Supply surge pressured prices, challenging producer economies
- Short-cycle dynamic challenging OPEC ability to manage markets
- Shift in dialogue from consumer-producer to producer-producer
- More freedom to use sanctions as a weapon, including export embargo
- New vulnerabilities, e.g., in trade war with china
- Changed US perception, e.g., SPR sell-off
- Reduced macroeconomic vulnerability to price shocks
- BUT... US is still NOT ENERGY INDEPENDENT!

- **Natural Gas Markets**

- Facilitate transition to more flexible, integrated, competitive, liquid gas market
- E.g., Russia. US LNG has helped:
  - Reduce Russian revenue
  - Undermine oil-linked pricing model
  - Forced contract renegotiations
  - Accelerated domestic gas market liberalization and LNG development

# Thank You

For more information contact

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(212) 851-0193**