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# API Industry Outlook Third Quarter 2018



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# Key Points

## U.S. natural gas and oil set records for production & exports, but challenges escalated

- **Remarkable progress** in production so far in 2018, but **headwinds** with lower consensus growth expectations, rising price inflation, interest rates, **trade barriers & disputes**, and financial market uncertainties – and a flight to safety in the U.S. dollar that could **trigger** global credit downgrades
- Global oil markets appeared at a slight deficit in Q3 2018, without further OPEC actions. With Asia Pacific accounting for the largest growth in U.S. petroleum exports this year, the recent 1.3 million barrel per day decrease in U.S. petroleum exports **warrants monitoring**
- U.S. natural gas quietly achieved **12% annual growth** in Q3, but appears **demand-limited** by potential coal & nuclear power subsidies, global LNG market conditions, escalating trade disputes, and improved competitiveness by renewables
- Q3 2018 ethylene prices and margins **slid** to their lowest levels since 2010 as ethane prices rose and China imposed tariffs on U.S. exports



# Global Economy and Oil Markets

# Global economic and financial headlines - a roller coaster

- Bloomberg consensus expectations suggest solid but slower economic growth as uncertainties rise

## ➔ Global economic outlook is darkening: Kemp

Reuters

## ➔ China's economy cools further as investment growth hits a record low

## ➔ 'What happens in Turkey won't stay in Turkey': Why this debt crisis could be different

CNBC

## ➔ You Could Take a Roller-Coaster. Or Just Be Holding Italian Debt

Bloomberg

## ➔ Trade war won't hurt sovereign ratings, but dollar might: Fitch

Business Recorder

## ➔ Core inflation reading jumps the most since 2008

CNBC • 4 days ago

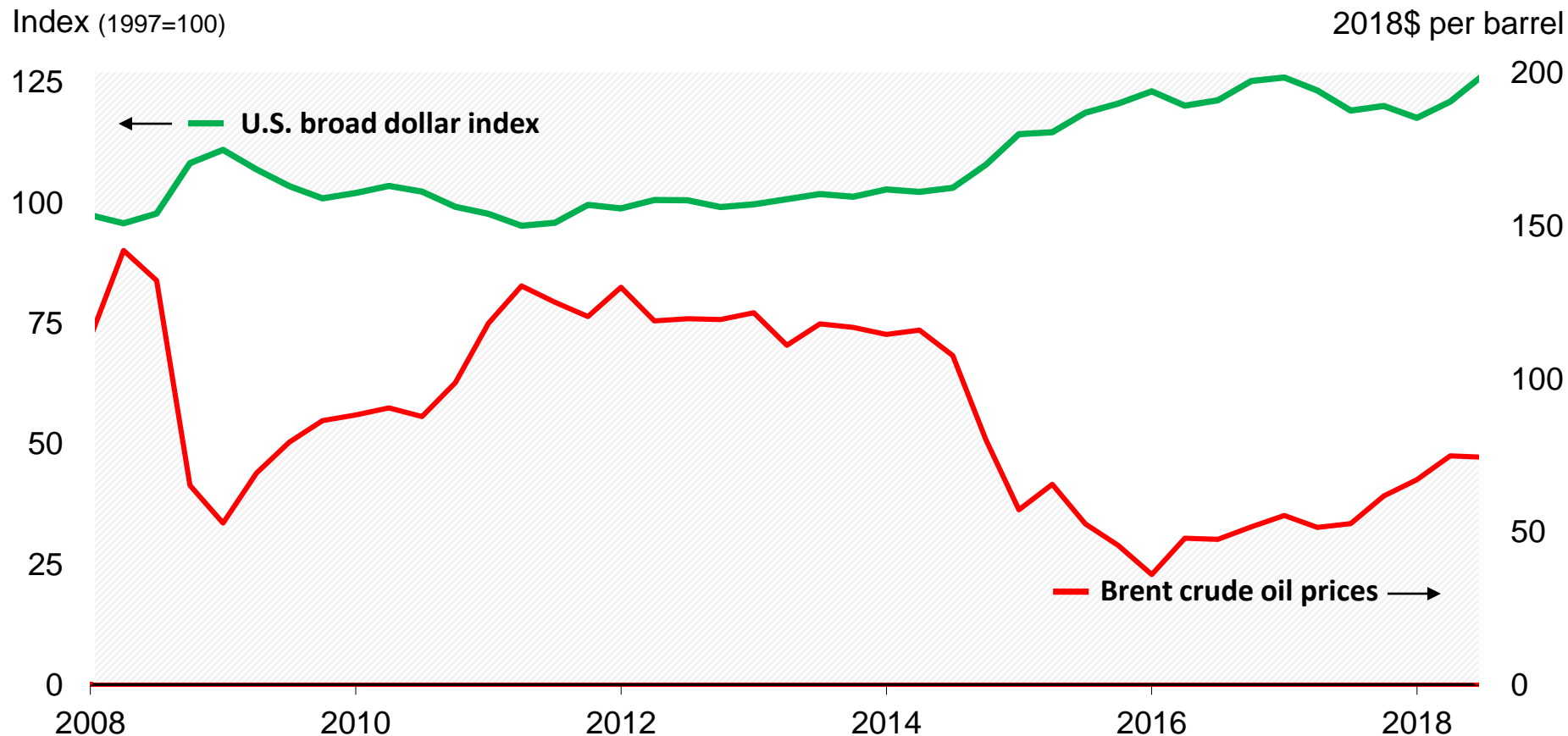
## ➔ Fed Holds Interest Rates Steady but, Defying Trump, Signals Increases to Come

The New York Times

# U.S. dollar appreciation toward a decade high represents a potential catalyst with oil and financial market implications

- Although many factors contribute to oil prices, a strong U.S. dollar has tended to correlate with low oil prices over the last decade

## U.S. broad dollar index and Brent crude oil prices

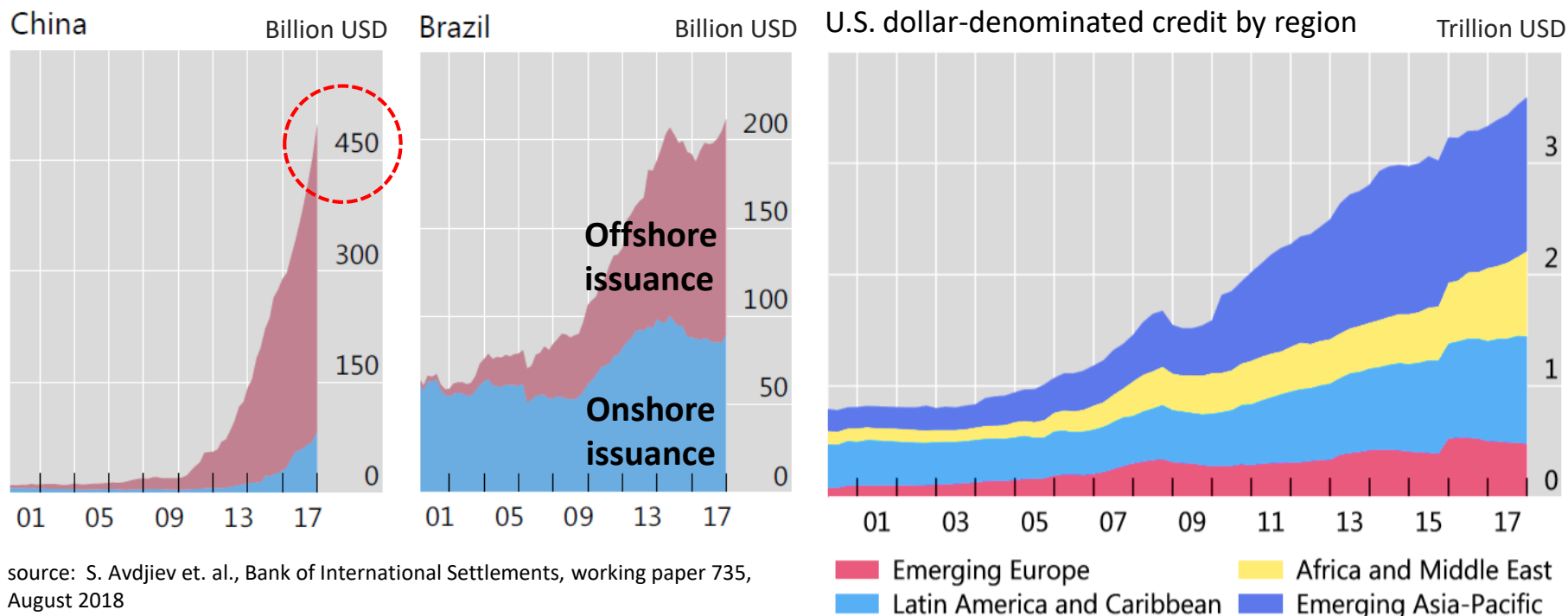


sources: Federal Reserve Board (August 2018), Bloomberg, U.S. BLS

# U.S. dollar appreciation threatens downgrades of global debt with broad economic and energy market implications

- U.S. dollar-denominated debt securities issued by non-bank entities in emerging markets **+17% y/y** since late 2017
- Debt not due immediately, but much of the capital has been squandered
- High offshore proportions could speak to the potential for global contagion

## U.S. dollar-denominated debt issued by non-bank entities in emerging markets



# Oil prices relate to many uncertain factors

## CURRENT FACTORS

## FUTURE EXPECTATIONS

Supply / Demand →

Seasonality →

Inventories →

Capacity utilization →

Value after refining →

Current market level  
and recent direction →



← Geopolitics

← Demand growth

← Supply growth

← Capacity growth

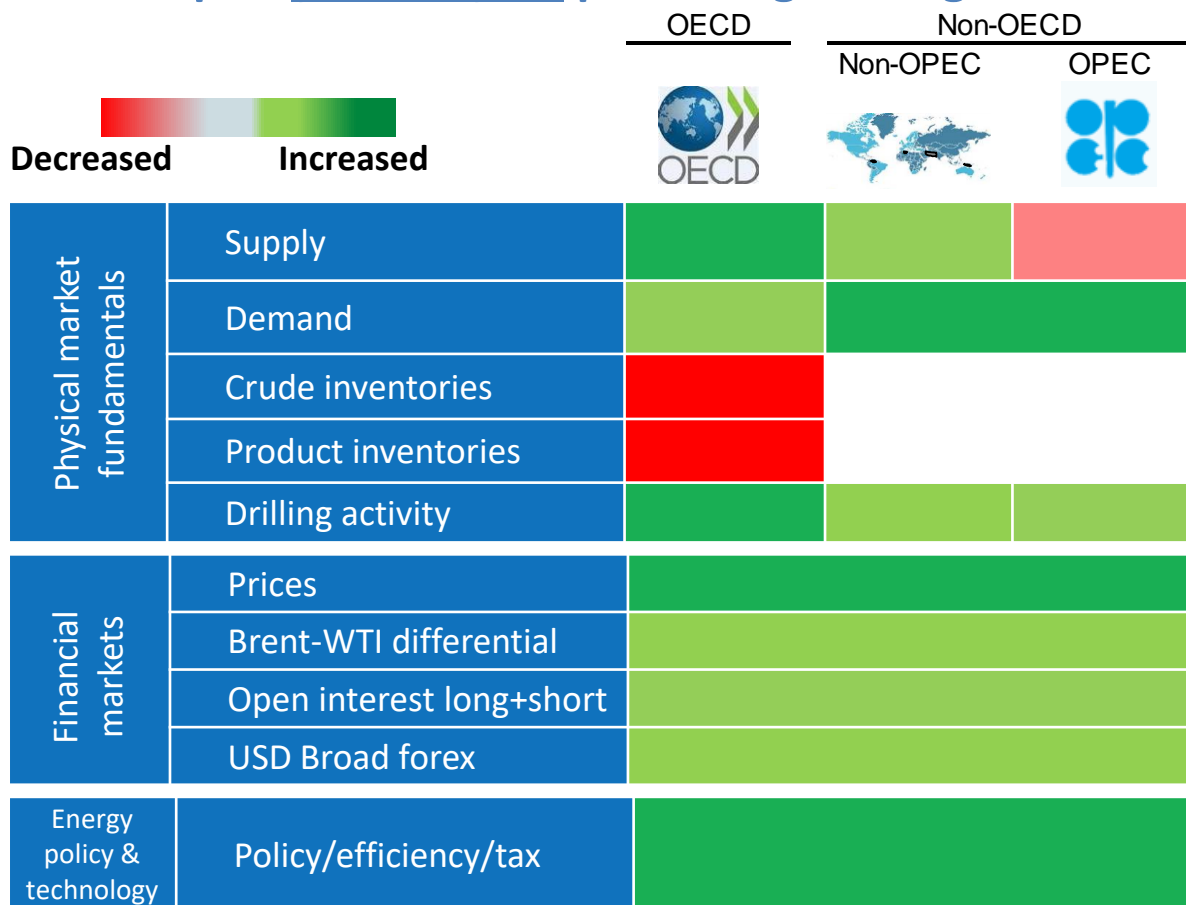
← Logistics availability  
marine, pipelines

## FINANCIAL MARKETS

interest rates, foreign exchange rates, equity markets

# Fundamentals sustained higher oil prices in Q3 2018

## Heat map of year-to-year percentage changes



### Q3 highlights

- U.S. supplies met virtually all global demand growth
- Inventories fell
- Drilling up worldwide
- Prices diverged
- Geopolitical risk premium
- Stimulative

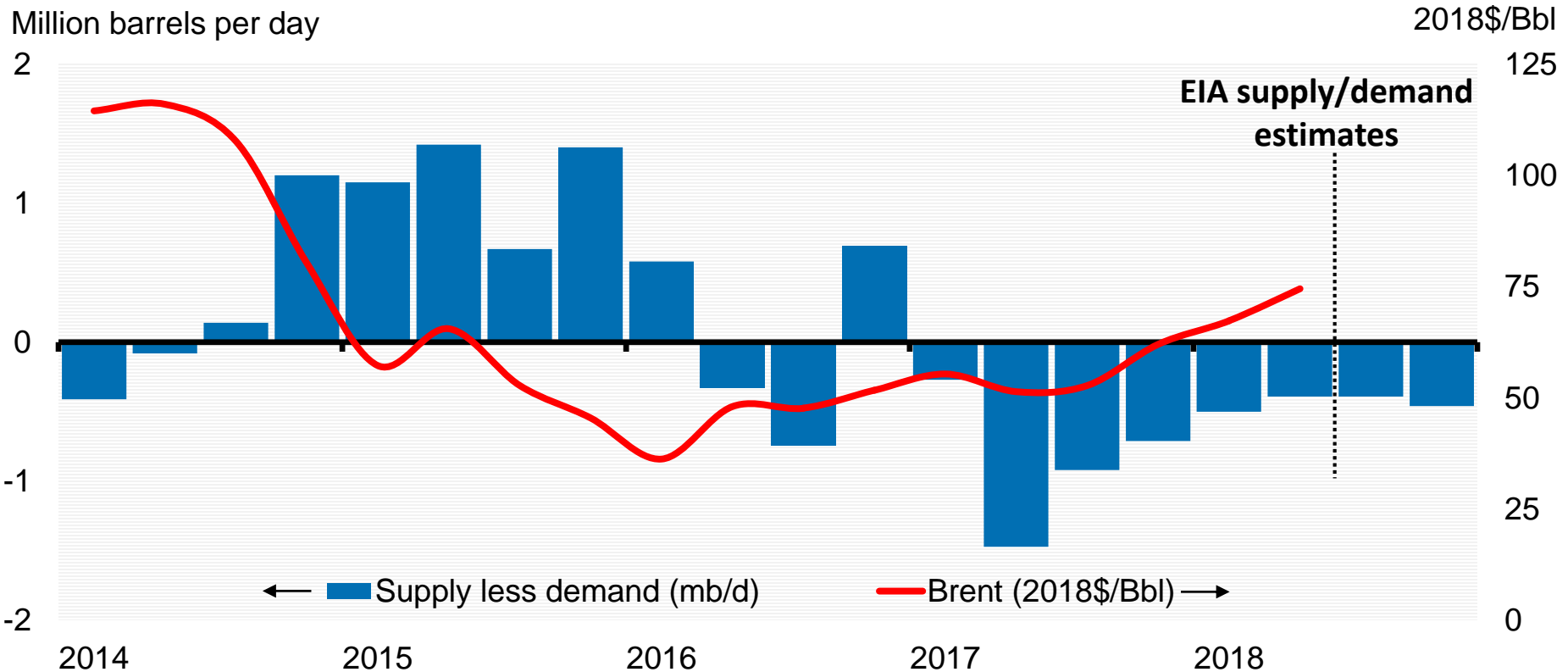
sources: API Monthly Statistical Report, IEA, EIA, Bloomberg, U.S. Federal Reserve, Baker Hughes, U.S. Commodity Futures Trading Commission



# EIA estimates suggest the global oil market has remained in a slight deficit

- ▶ The EIA has estimated that Non-OPEC countries, led by the U.S., will add 2.6 MBD of production by Q4 2018, compared with Q4 2017

## EIA global supply/demand estimates as of September 2018



sources: EIA STEO (September 2018), Bloomberg

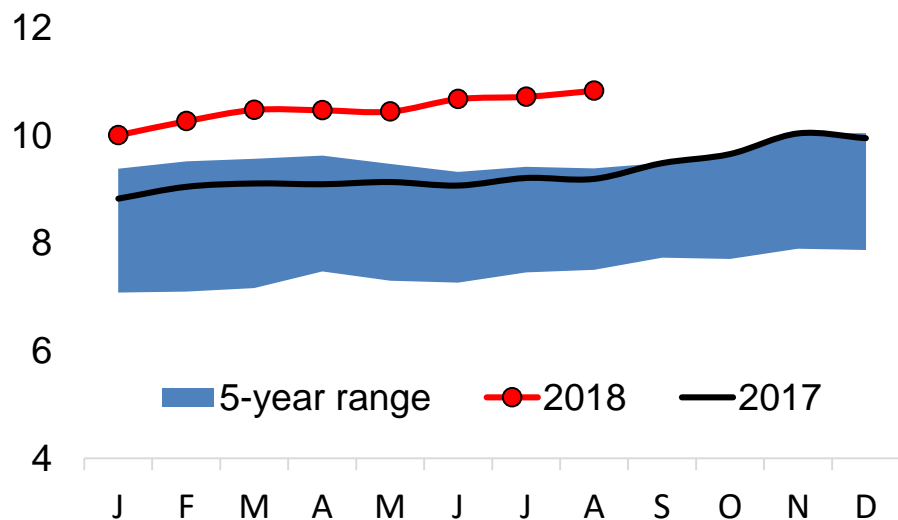
# Many new U.S. natural gas and oil industry records in 2018 ultimately hinge on global growth and trade relations

## The U.S. has supplied virtually all global oil demand growth so far in 2018

- Record crude oil (10.8 MBD)
- Highest Q3 demand (20.7 MBD) in 11 years and record refinery throughput (18 MBD)
- Highest petroleum exports on record so far this year, but a 1.3 MBD **setback** during Q3

### Crude oil production

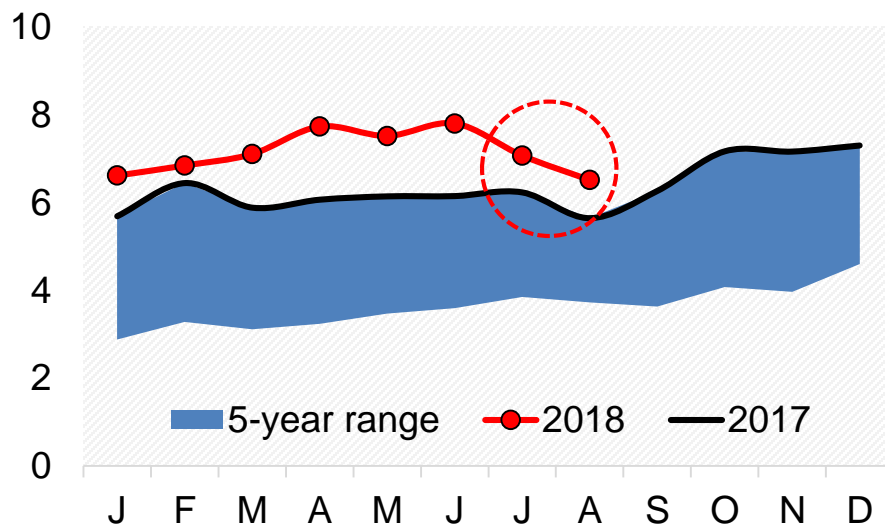
Million barrels per day



source: API Monthly Statistical Report (August 2018)

### Petroleum exports

Million barrels per day






# Natural Gas

# Record U.S. natural gas market growth has collided with challenges to LNG exports, gas into power, and trade issues

- Natural gas demand creation appears to be critical

## Heat map of year-to-year percentage changes

Decreased  Increased



Physical market fundamentals	Supply	Increased	Increased
	Demand	Increased	Increased
	Weather-related demand	Increased	Increased
	Exports	Increased	Decreased
	Inventories	Decreased	Decreased
	Drilling activity	Increased	Decreased
Financial markets	Prices	Decreased	Decreased
	NGL prices	Increased	Increased
	NYMEX-AECO differential	Increased	Increased
Policy & technology	U.S. coal & nuclear subsidies	Increased	Increased
	Trade dispute escalation	Increased	Increased

sources: EIA, Bloomberg, Baker Hughes

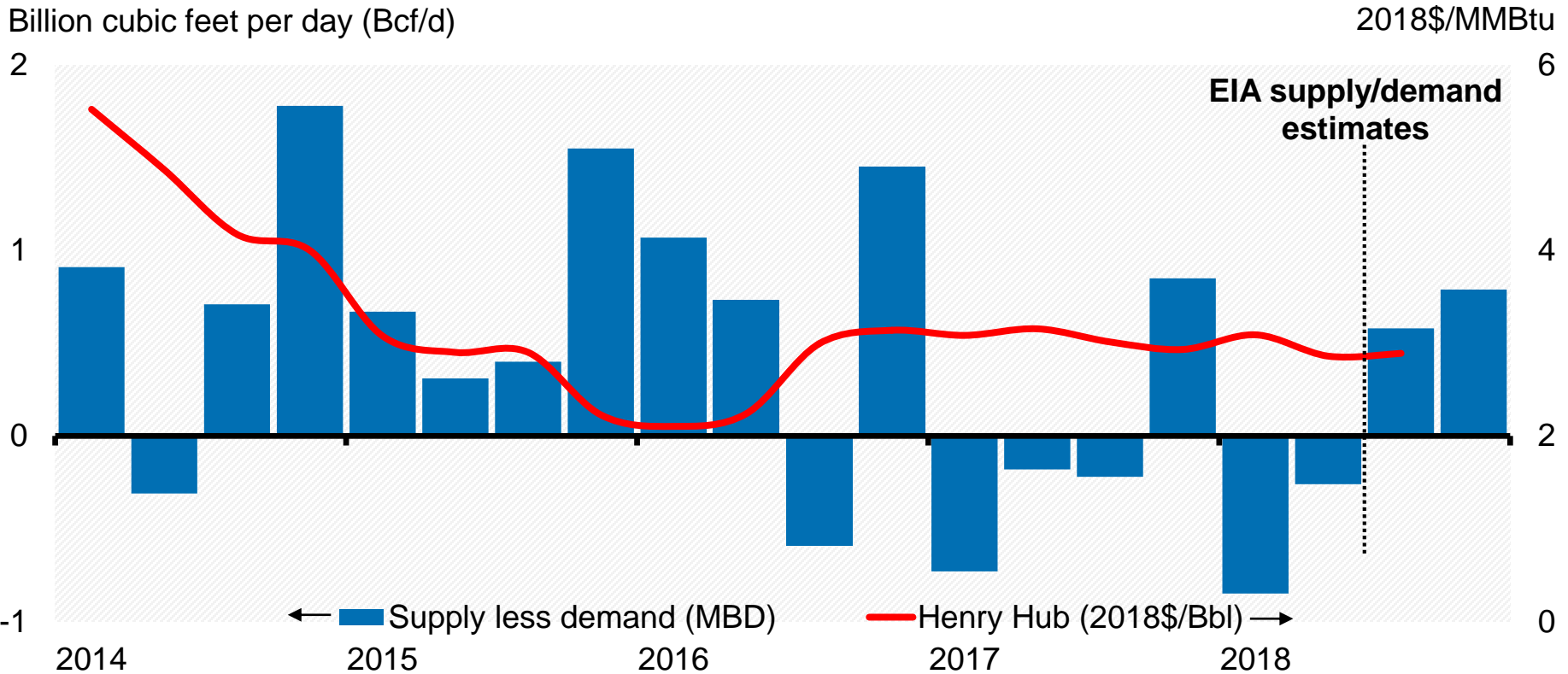
## Q3 highlights

- Q3 2018 market growth of nearly 12% y/y
- U.S. backed out Canadian imports
- U.S. LNG exports exceeded 3.0 bcf/d (vs. 1.7 bcf/d in Q3 2017)
- Policies promoted subsidies
- China threatened tariffs on U.S. LNG

# U.S. natural gas prices fell despite record market growth through Q3 2018 – EIA exposed a demand-limited market

- Notable increases in EIA quarterly estimates for oversupply second half of 2018

## EIA supply/demand estimates as of September 2018



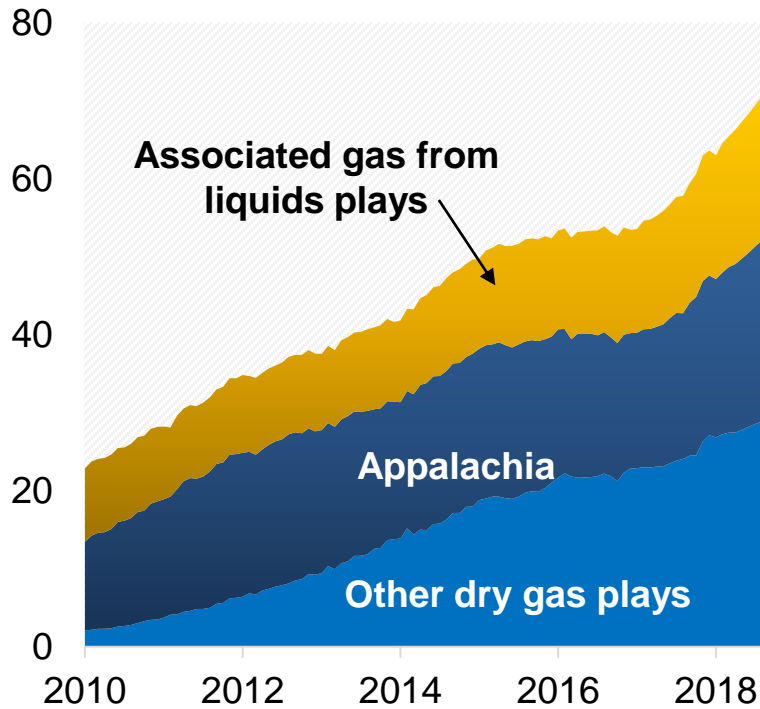
source: EIA STEO (September 2018)

# Drilling specifically for natural gas has become increasingly predominant and cost-effective in the U.S.

- With strong productivity gains, the burden to keep the energy renaissance going shifts to the market potential for natural gas demand

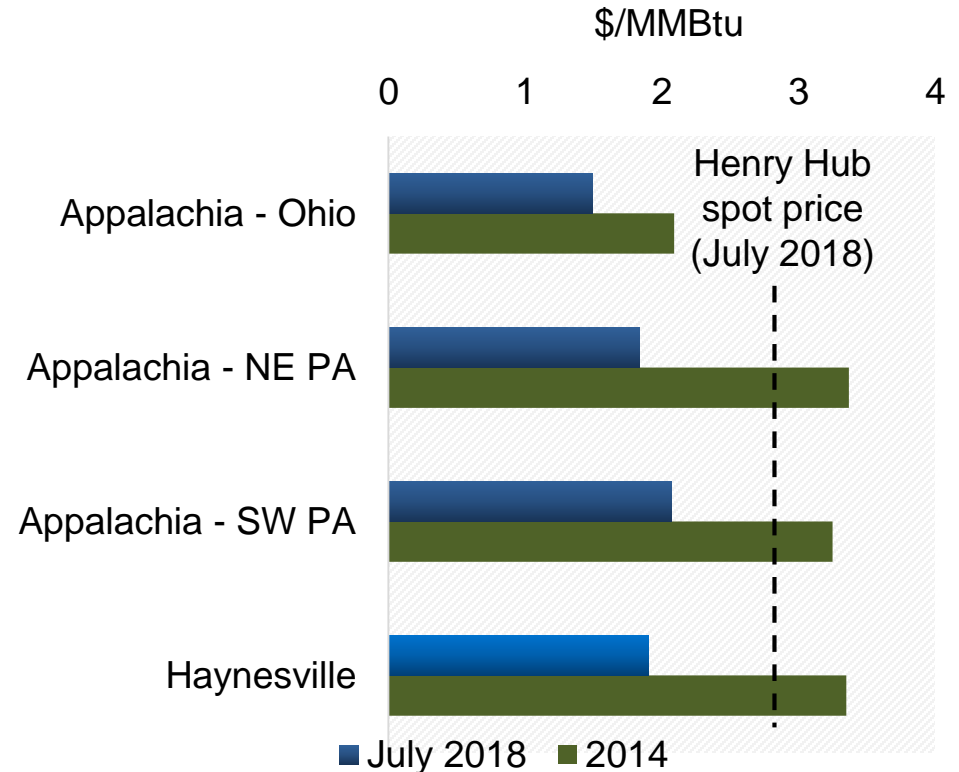
## U.S. gas production by play type

Billion cubic feet per day (Bcf/d)



source: EIA Drilling Productivity Report

## Breakeven prices for selected gas plays\*

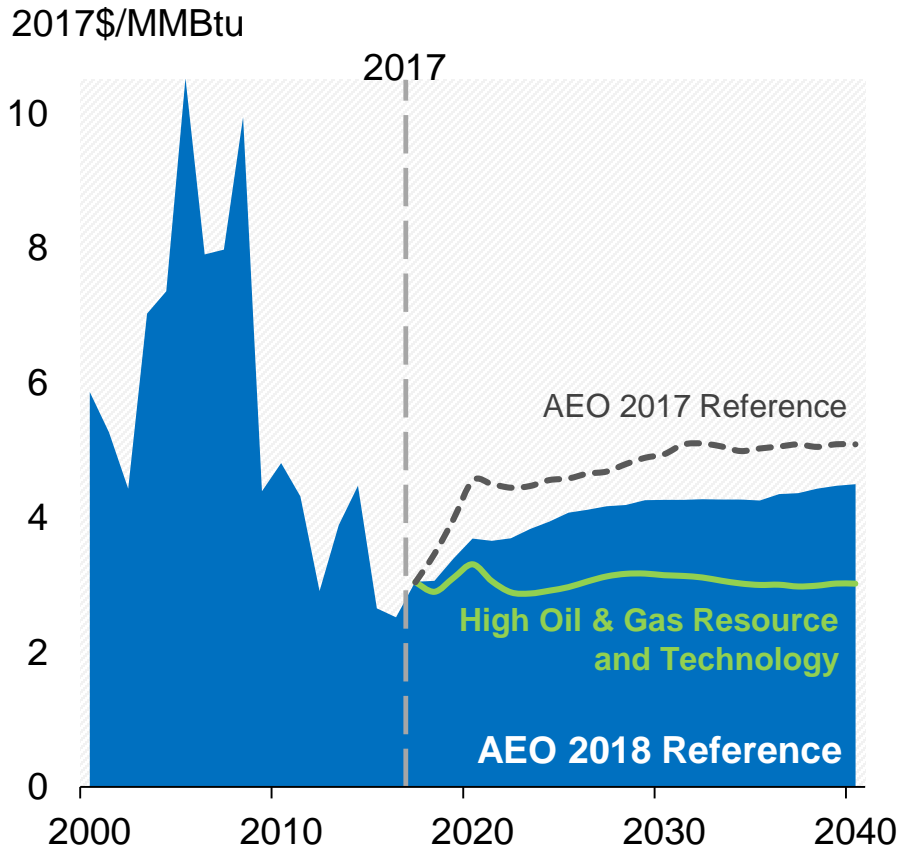


\*Half cycle breakevens assuming 10% discount factor and play-specific costs source: BTU Analytics (July 2018)

# EIA's 2018 AEO moved toward the high oil & gas resource and technology case

- Between 2018 and 2040, EIA's high oil & gas resource and technology case suggests a 70% production increase with steady prices at \$3.00/MMBtu

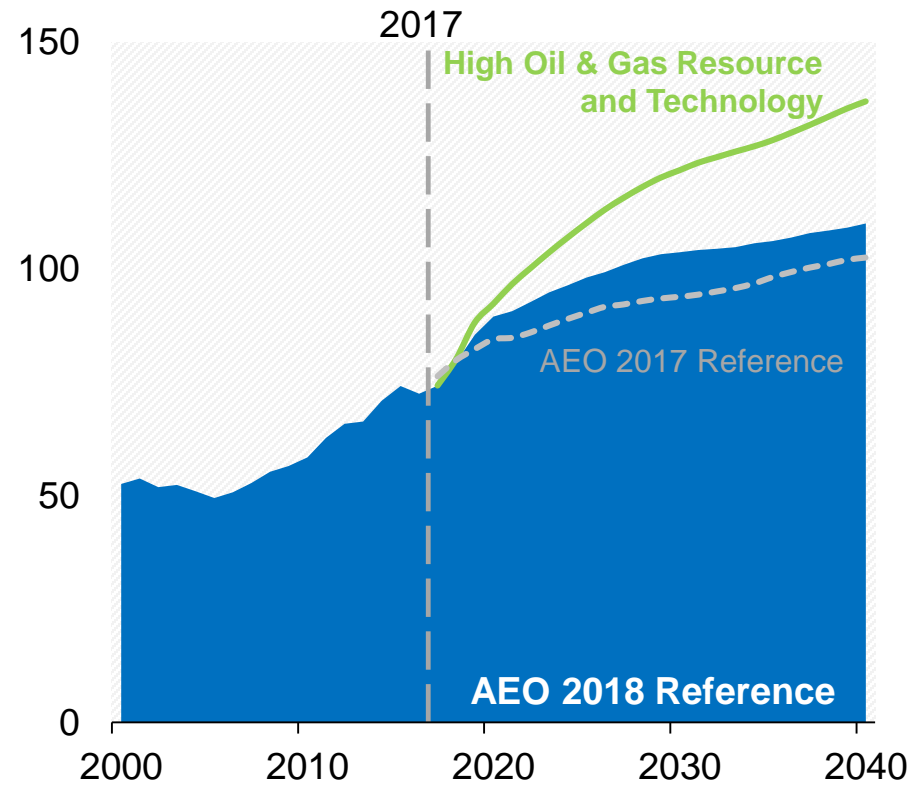
## Natural gas spot prices at Henry Hub



source: EIA AEO(2017, 2018)

## Dry natural gas production

Billion cubic feet per day (Bcf/d)



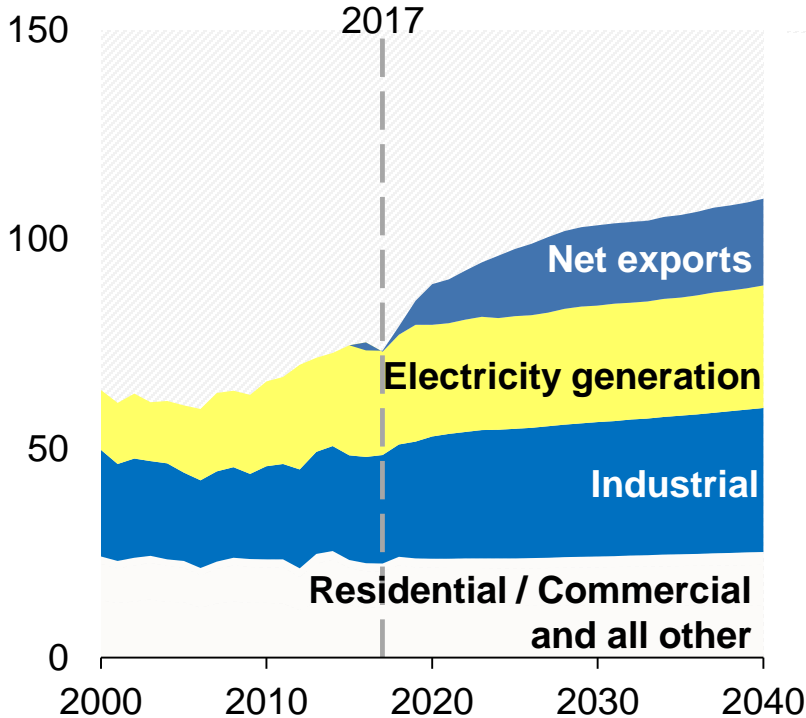
# EIA's estimation of U.S. natural gas markets hinges on LNG exports and to a lesser extent industrial and power growth

- Without the healthy evolution of LNG markets and continued free trade, upstream U.S. natural gas development could be stymied

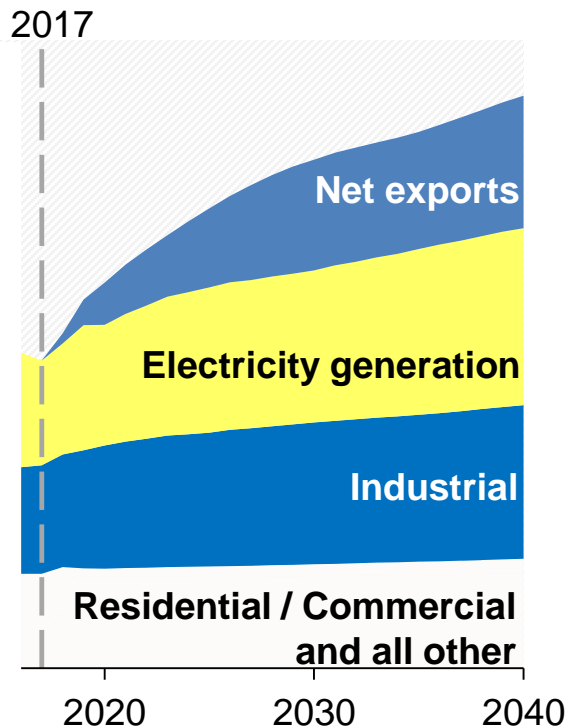
## U.S. domestic natural gas consumption plus exports

### Reference case

Billion cubic feet per day (Bcf/d)



### High Oil & Gas Resource and Technology



2018 to 2040 changes (Bcf/d)

	<u>Reference</u>	<u>High</u>
Net exports	18.8	29.2
Electricity generation	3.1	15.7
Industrial	7.5	9.8
Residential / Commercial and all other	0.1	0.6

source: EIA AEO (2018)

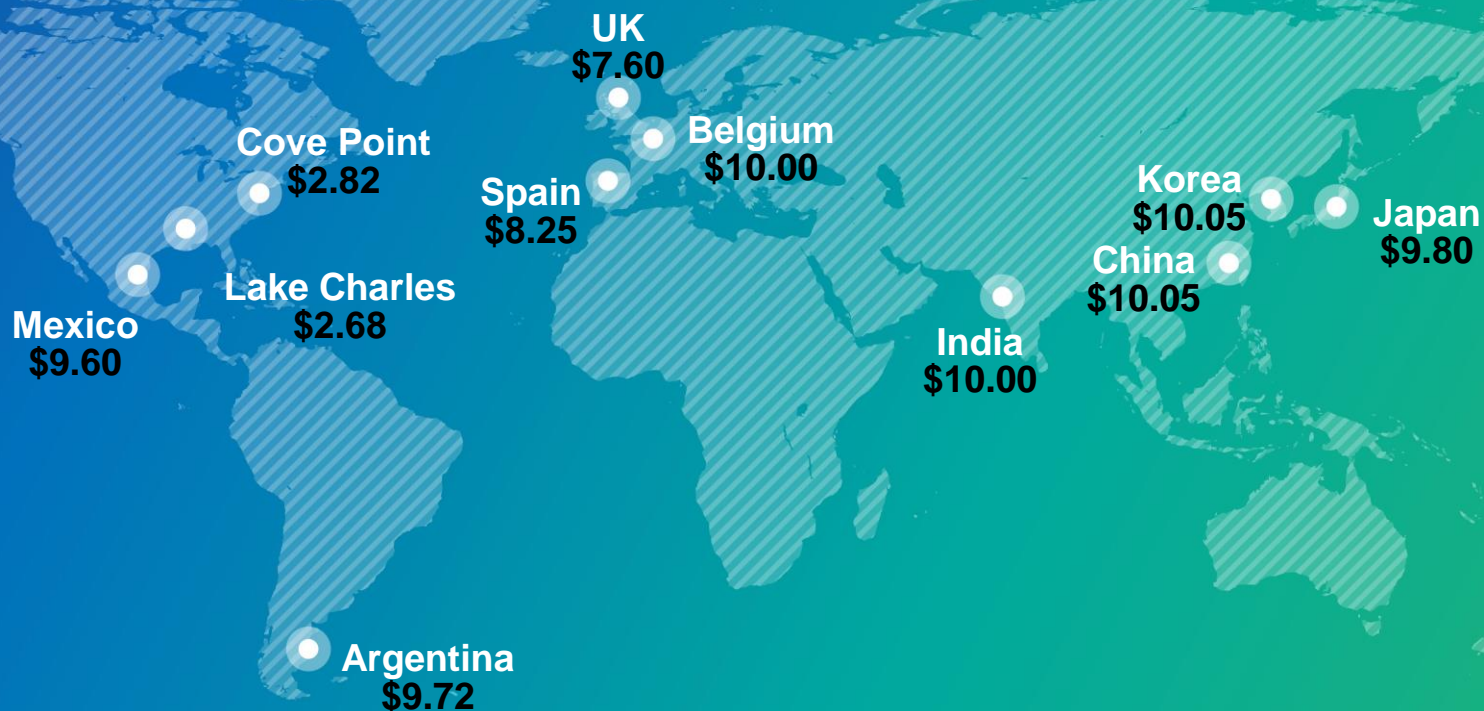


# Low U.S. natural gas prices motivate LNG production and exports

- U.S. natural gas prices have remained less than one-third of many international levels

## Global natural gas landed prices (\$/MMBtu) – August 2018

sources: U.S. [FERC](#) (September 2018), METI

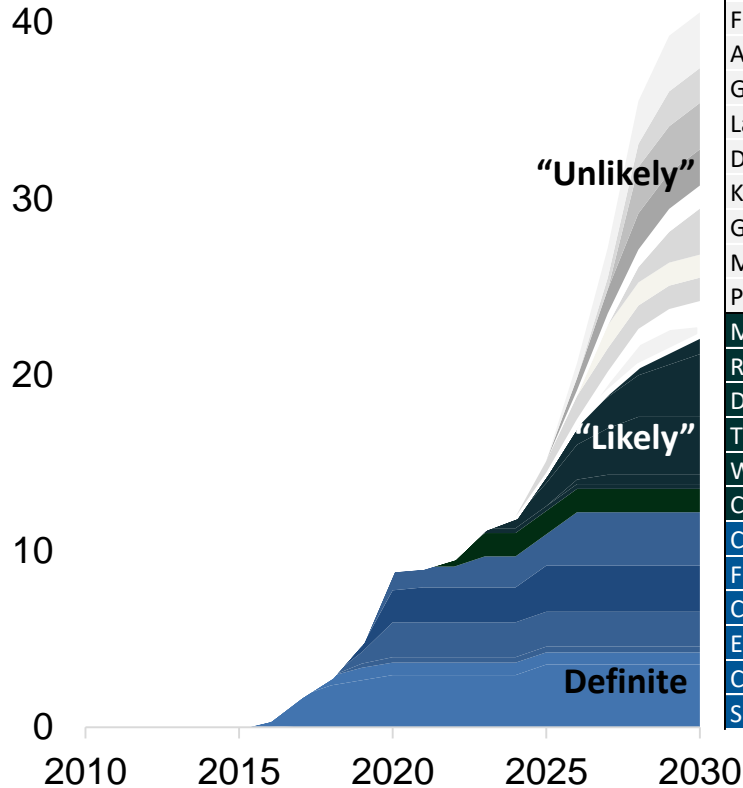


# U.S. natural gas market to Asia Pacific grew the most through approvals, buyer participation, and free trade

- ▶ Bloomberg anticipates about 20 Bcf/d of U.S. LNG export capacity by 2030 – a 7X increase from 2018

## North American LNG projects

Billion cubic feet per day (Bcf/d)



Plant name	BNEF likelihood	Final Investment Decision (FID) Status	2030 capacity (Bcf/d)
LNG Canada	Unlikely	Planning FID	3.2
Corpus Christi Train 4	Unlikely	Under regulatory review	3.0
Plaquemines	Unlikely	Planning FID	2.6
Freeport LNG Train 4	Unlikely	Under regulatory review	2.6
Alaska LNG	Unlikely	Planning FID	2.6
Golden Pass	Unlikely	Waiting to FID	2.1
Lake Charles	Unlikely	Waiting to FID	2.0
Delfin FLNG	Unlikely	Waiting to FID	1.3
Kitimat LNG	Unlikely	Waiting to FID	1.3
Goldboro LNG	Unlikely	Planning FID	1.3
Monkey Island (SCT&E)	Unlikely	Under regulatory review	1.3
Port Arthur LNG	Unlikely	Under regulatory review	0.7
Magnolia LNG	Likely	Waiting to FID	1.1
Rio Grande LNG	Likely	Planning FID	3.6
Driftwood	Likely	Planning FID	3.3
Texas LNG	Likely	Planning FID	0.5
Woodfibre LNG	Likely	FID taken	0.3
Calcasieu Pass	Highly Likely	Planning FID	1.3
Corpus Christi Tr. 1-3	In operation/definite	Under construction	3.0
Freeport LNG Tr. 1-3	In operation/definite	Under construction	2.6
Cameron LNG	In operation/definite	Under construction	2.0
Elba Island	In operation/definite	Under construction	0.3
Cove Point	In operation/definite	Operational	0.7
Sabine Pass	In operation/definite	Operational	3.6

source: Bloomberg New Energy Finance (August 2018)

# Through Q3 2018, the U.S. became a large net exporter of natural gas for the first time

## U.S. natural gas trade

January through June 2018

**U.S. gross exports: 9.3 Bcf/d**

**U.S. gross imports: 8.4 Bcf/d**

**U.S. net exports: 0.9 Bcf/d**

September 2018 – EIA estimate

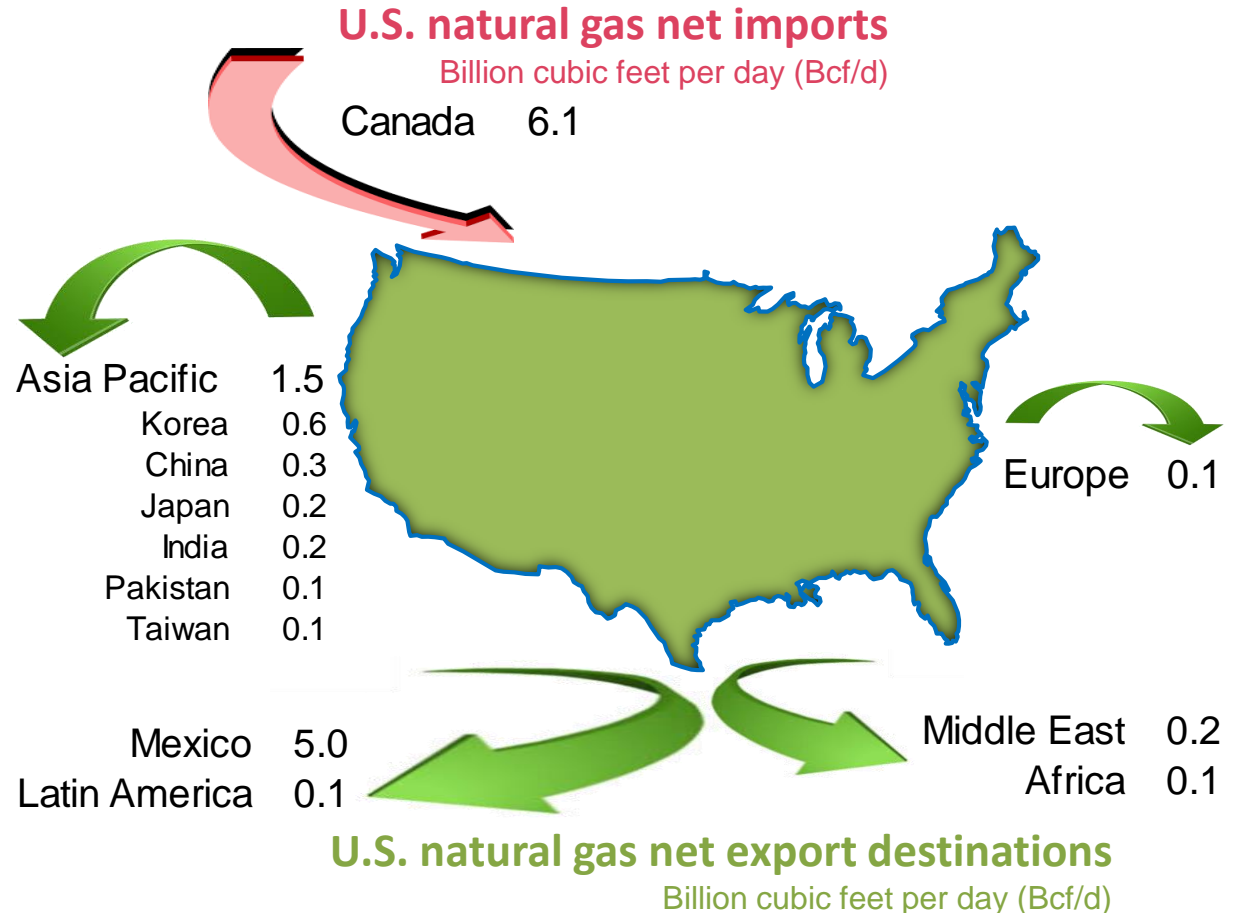
**U.S. gross exports: 10.1 Bcf/d**

**U.S. gross imports: 7.3 Bcf/d**

**U.S. net exports: 2.8 Bcf/d**

\* source: EIA, data year-to-date through June 2018

## U.S. natural gas net trade positions by destination (January to June 2018)





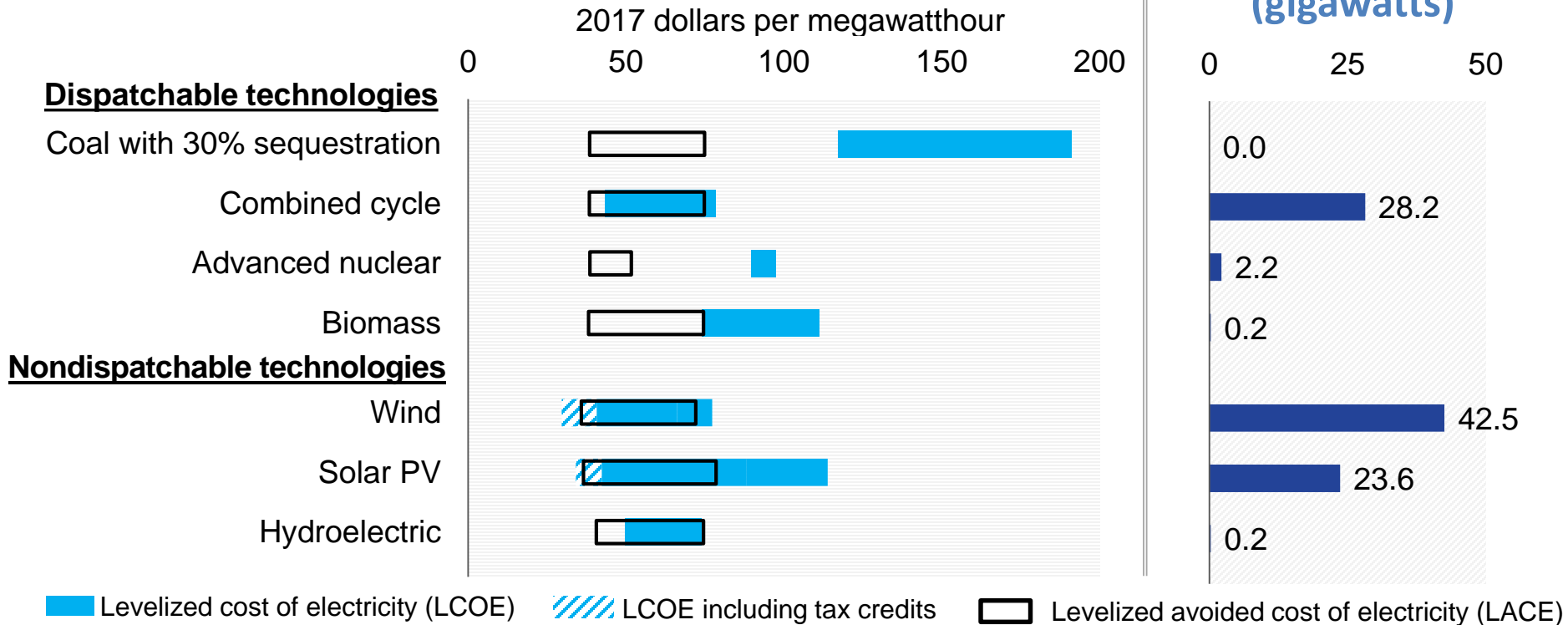
A nighttime cityscape with a colorful bar (red, green, orange, cyan, purple) across the top. The main image shows a large industrial facility, likely a refinery, with a bridge in the foreground and a body of water reflecting the lights.

# Leveraging the U.S. Energy Renaissance

# EIA's representative cost comparisons suggest wind and solar photovoltaic are competitive with gas combined cycle

- With renewables' capacity additions estimated twice those of natural gas, the sustainability of subsidies becomes a question

## Levelized cost projections by technology, 2022



source: EIA AEO (2018)

# EIA's projected mix of electricity generation technologies varies widely across cases

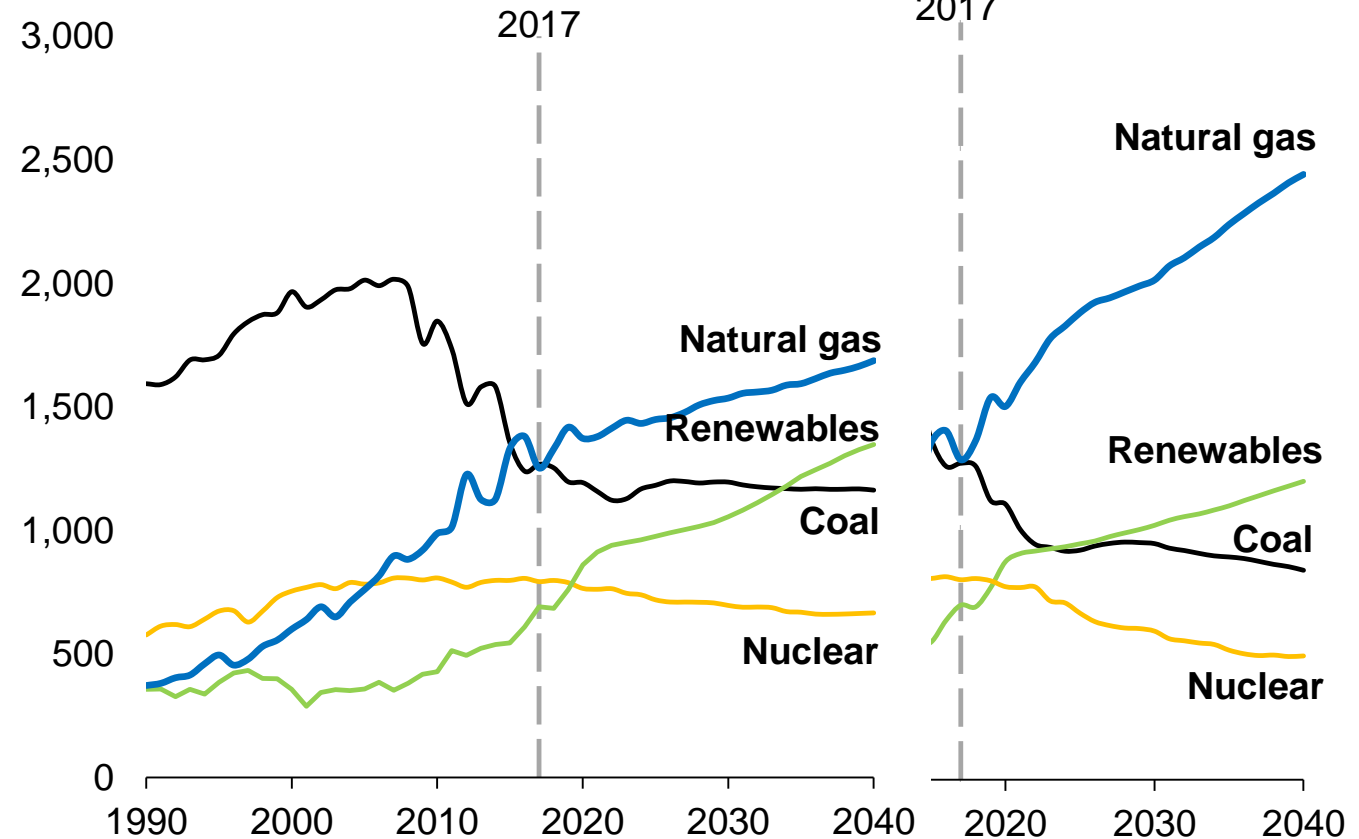
## Selected factors that affect generation investments

- Relative costs
- Utilization rate and load shape
- Existing resource mix
- Regional value of capacity

## Electricity generation from selected fuels

### Reference case

Billion kilowatthours



source: EIA AEO (2018)

# Q3 2018 U.S. ethylene margins were the lowest since 2010, and ethane feedstock costs rose in the quarter

- ▶ The U.S. energy renaissance depends on healthy petrochemical markets, which at low margins have a heightened sensitivity to ethane feedstock costs and trade issues

## U.S. ethylene prices, margins and ethane feedstock costs through August 2018

