

# North American Supply to Upset Global Markets?

**Mark Chung, Senior Manager, Energy Analysis**

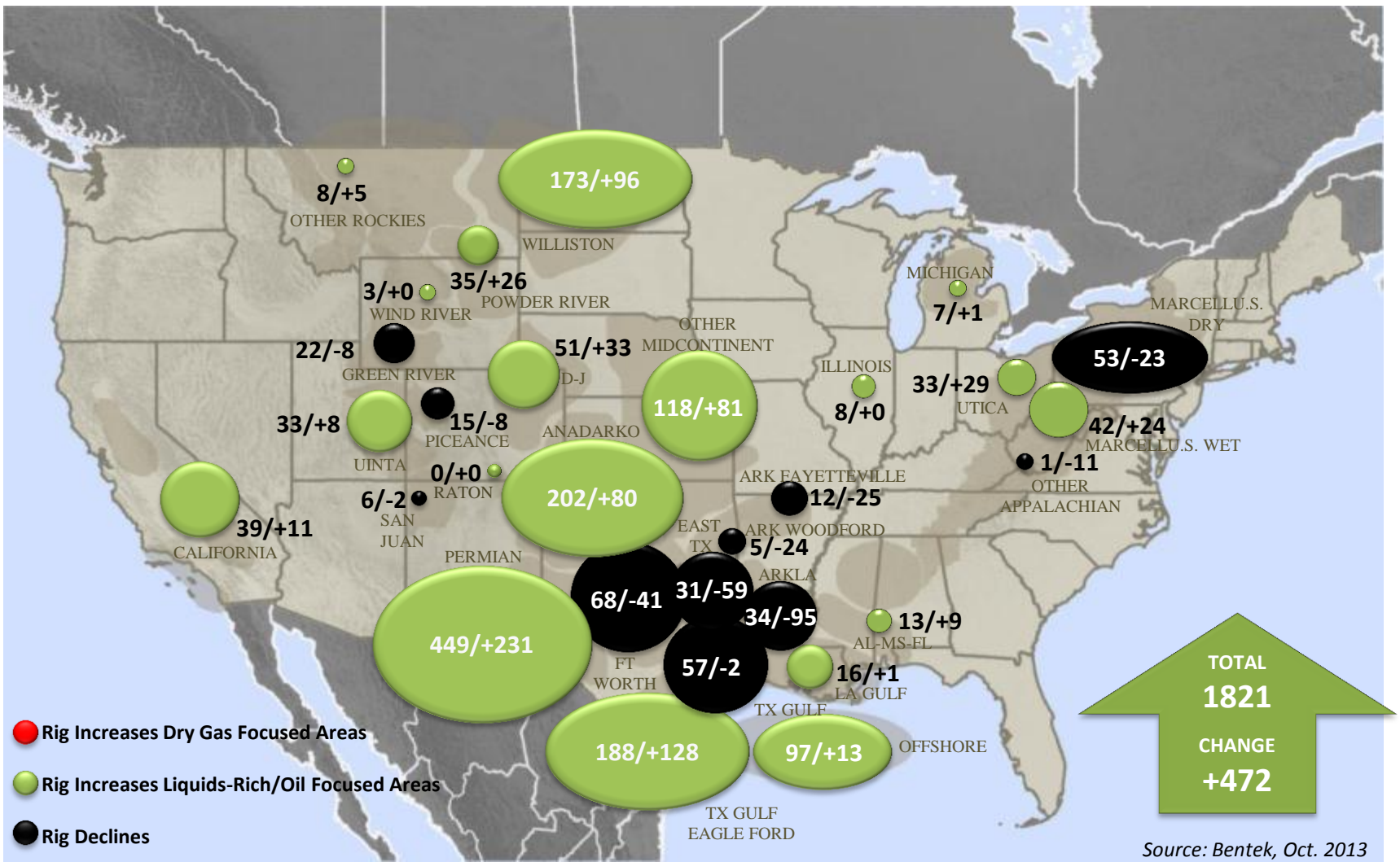
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London Oil Forum, February 17, 2014

<u>Topic</u>	<u>Time</u>
North American Crude Impacts	20 min
North American NGL Impacts	20 min
North American LNG Impacts	15 min
Conclusions & Questions	5 min

# North American Oil

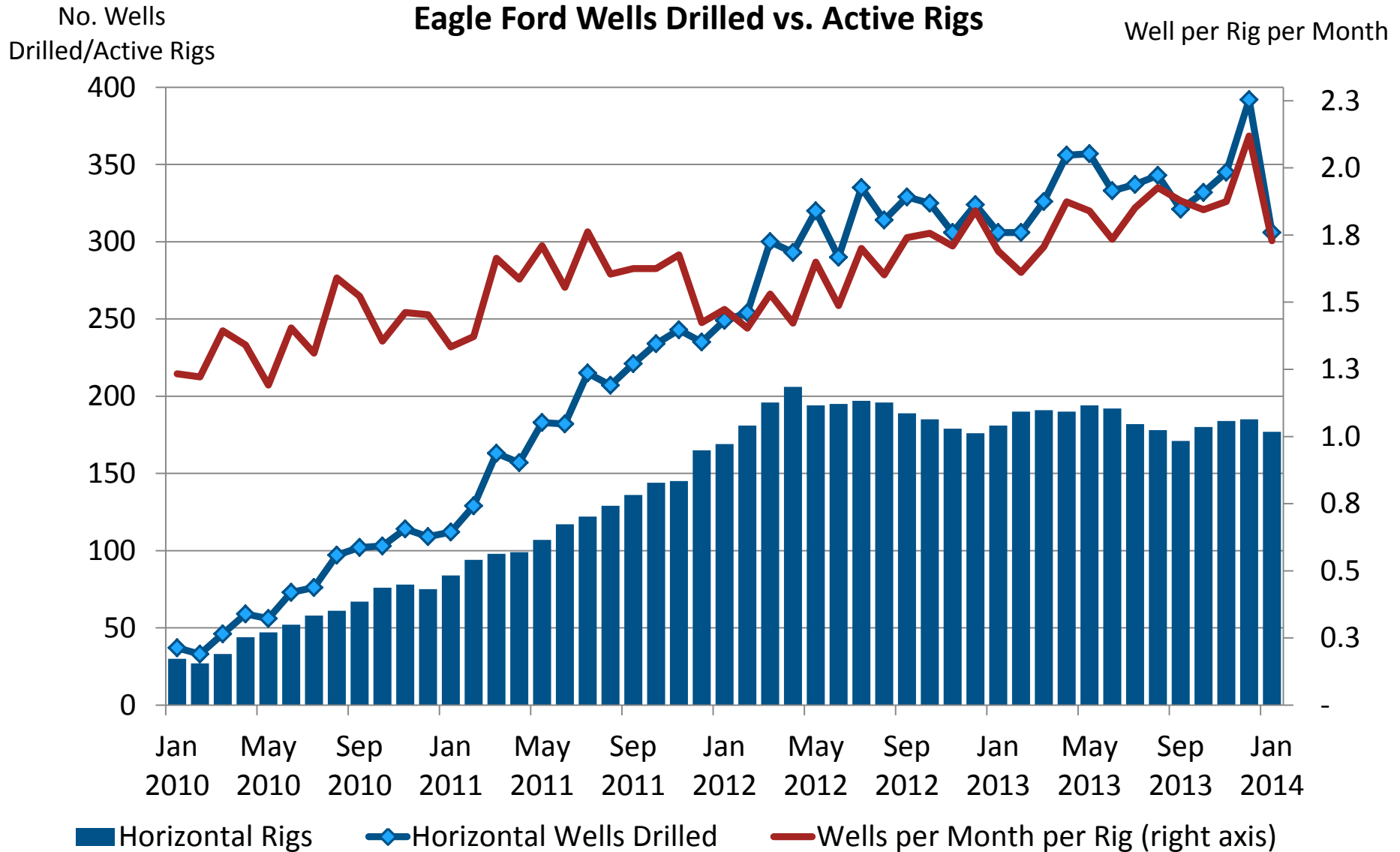
# U.S. Drilling Activity Focused on Liquids Plays



Source: Bentek, Oct. 2013

Active rig count: Oct. 4, 2013 / Change in rig count from Jan. 1, 2010

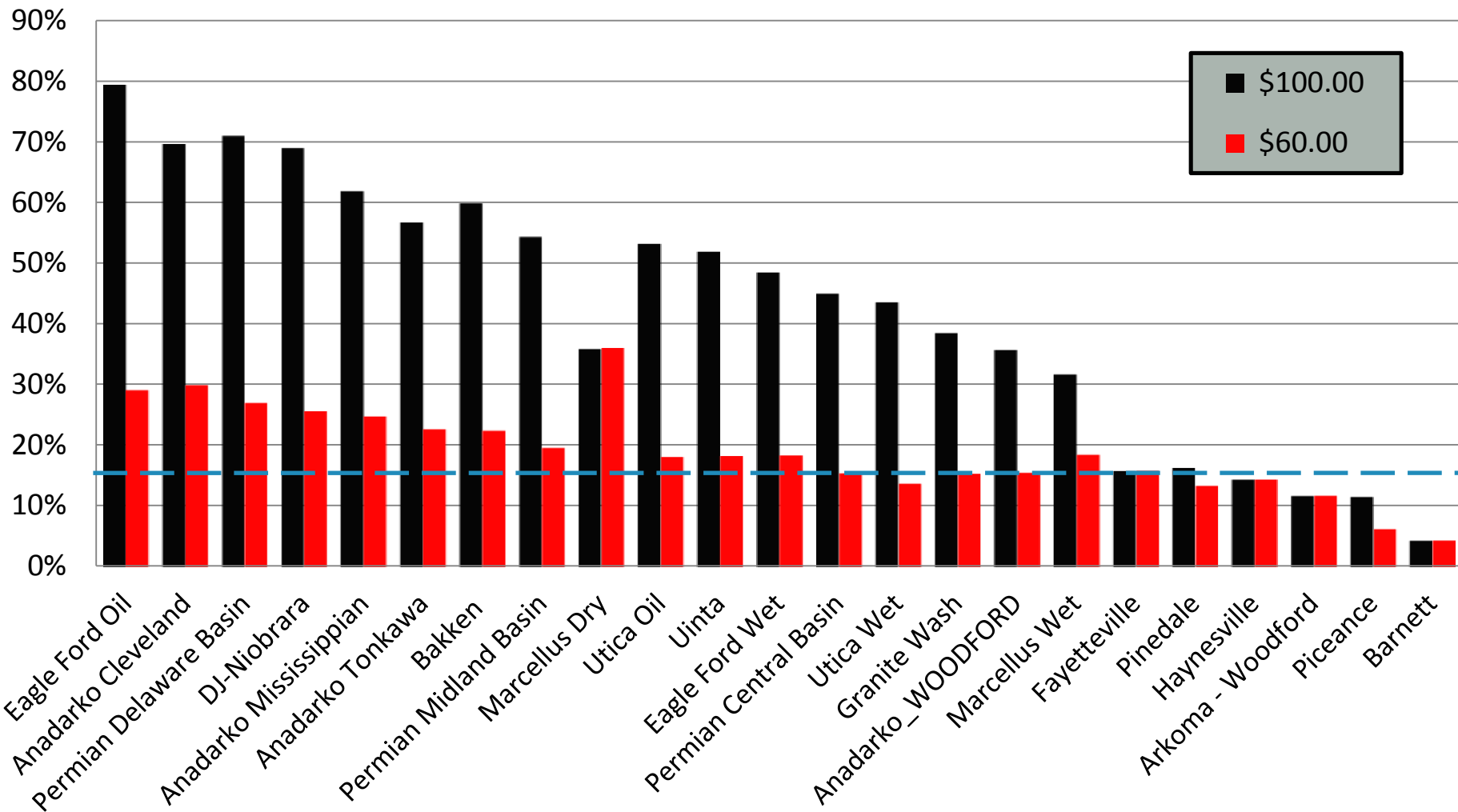
# Rig Count Does Not Reflect Improving Drilling Efficiencies



Source: Bentek and RIGDATA

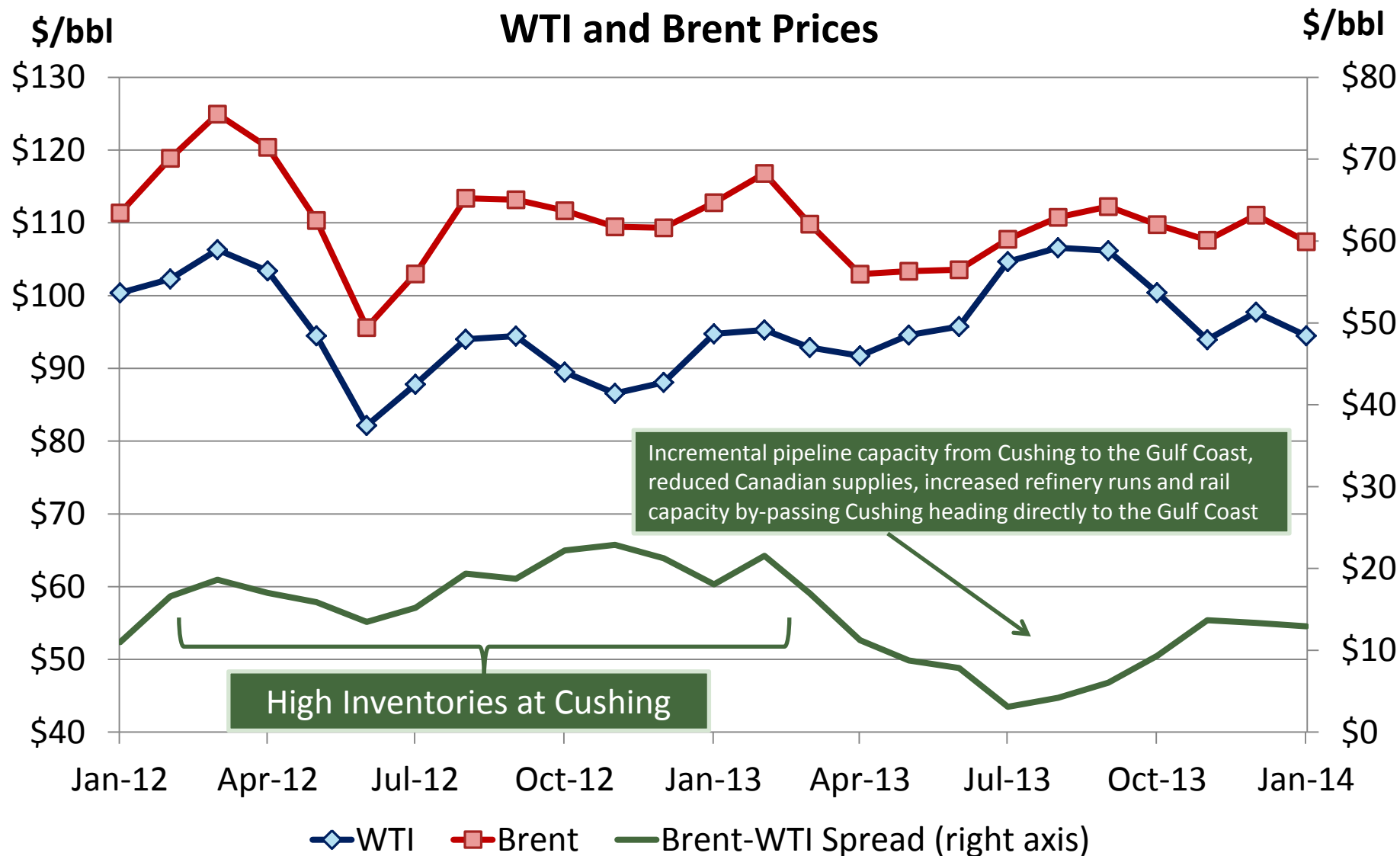
# IRR vary by Basin with Price of Oil

## Internal Rate of Return (IRR)

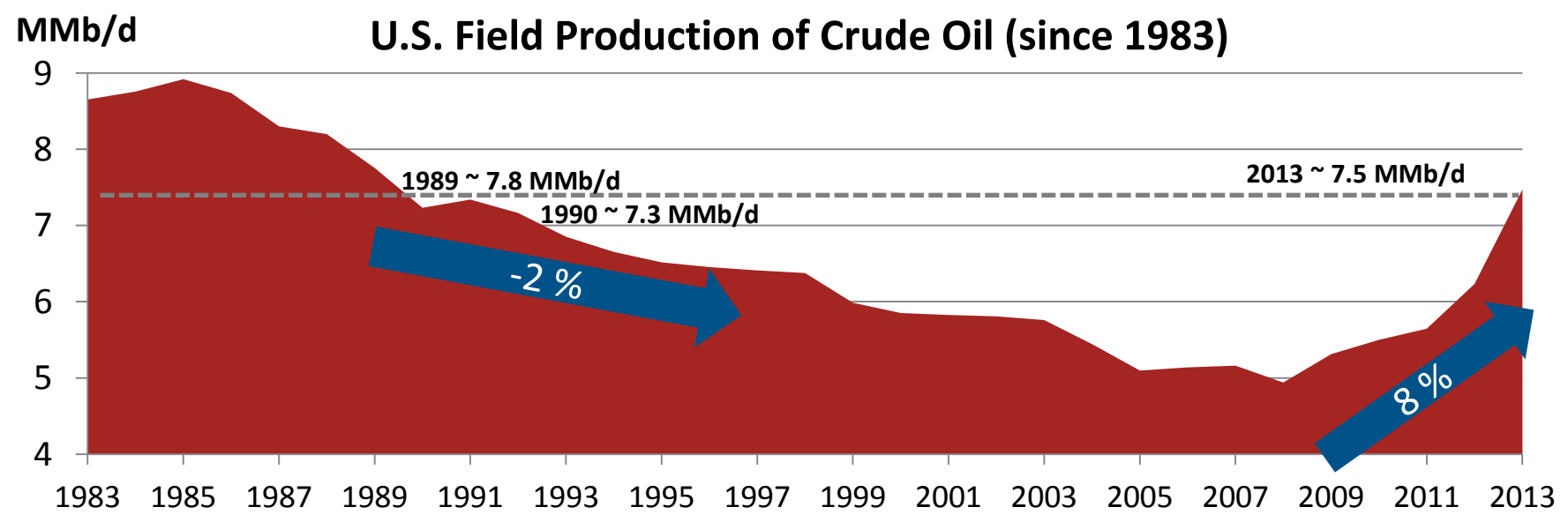
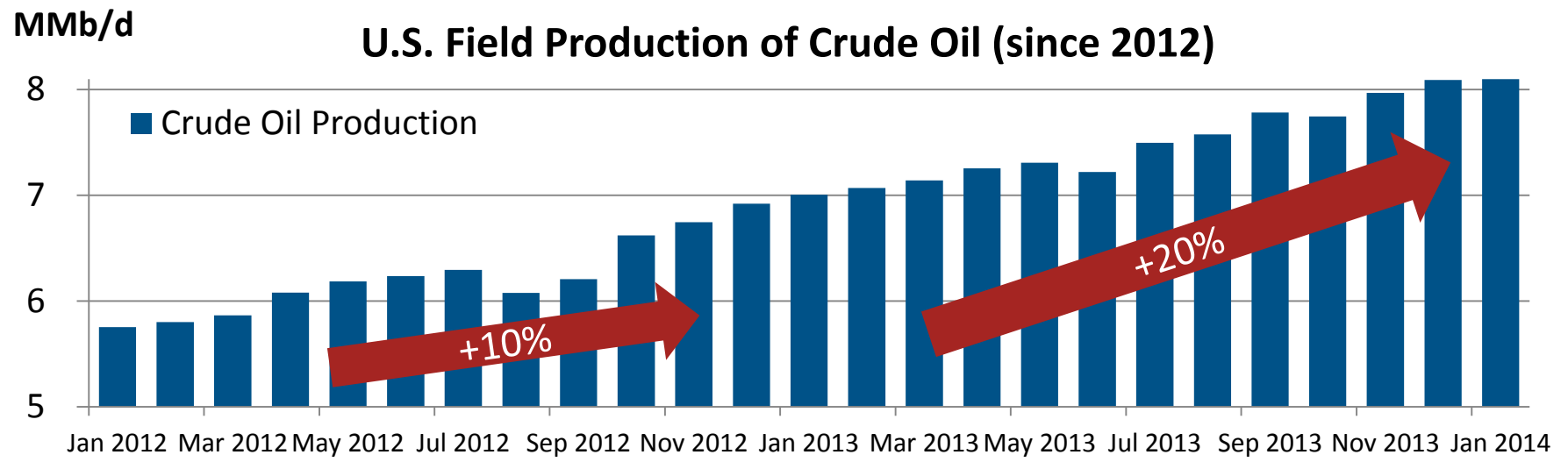


Price Assumptions: Gas - \$4.00 /MMBtu; NGLs - 30% of WTI

# WTI-Brent Spread Widens on Supply Increases and Seasonal Lull on Refinery Runs

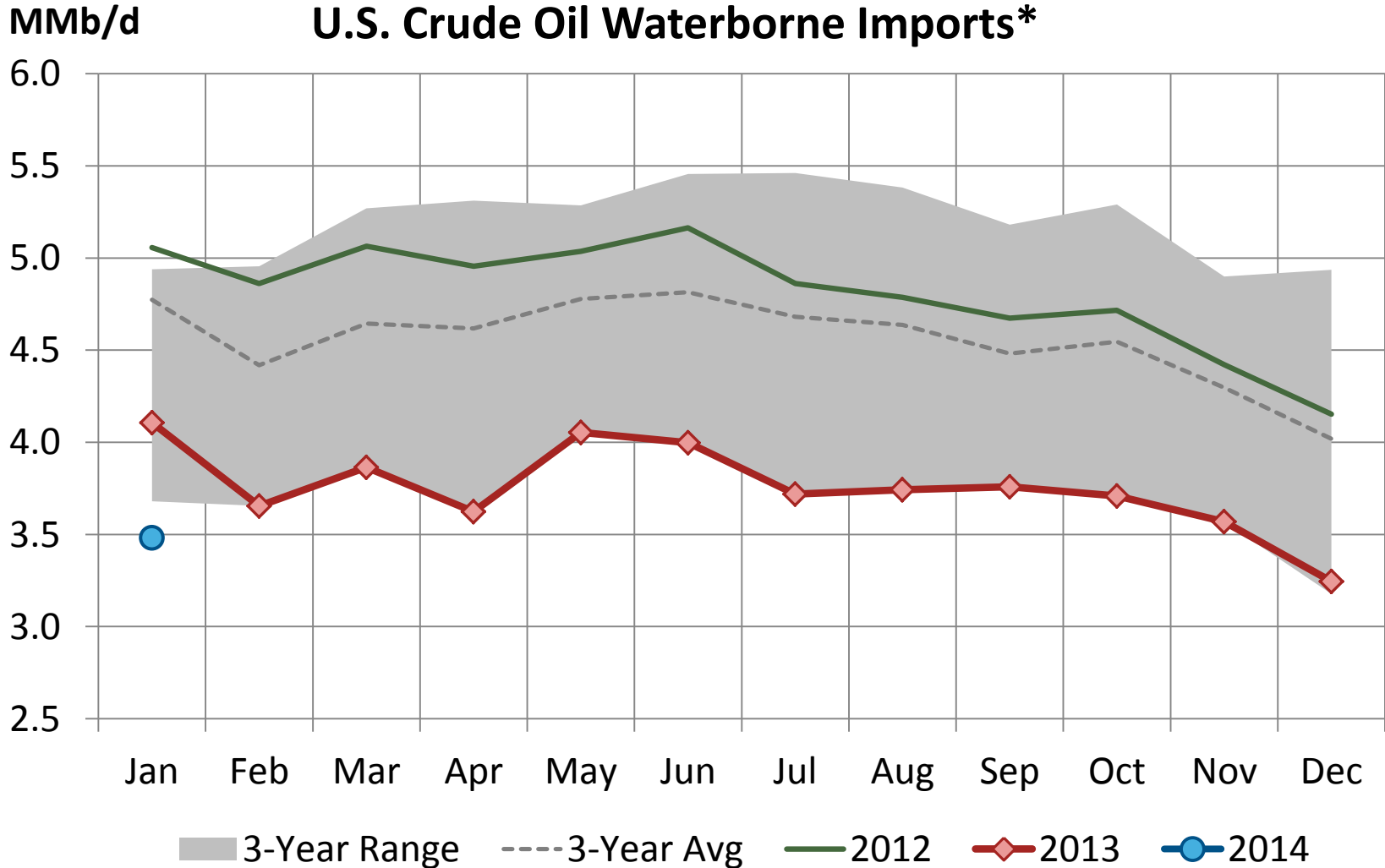


# U.S. Production Surged Continues to Surge at Unprecedented Rates

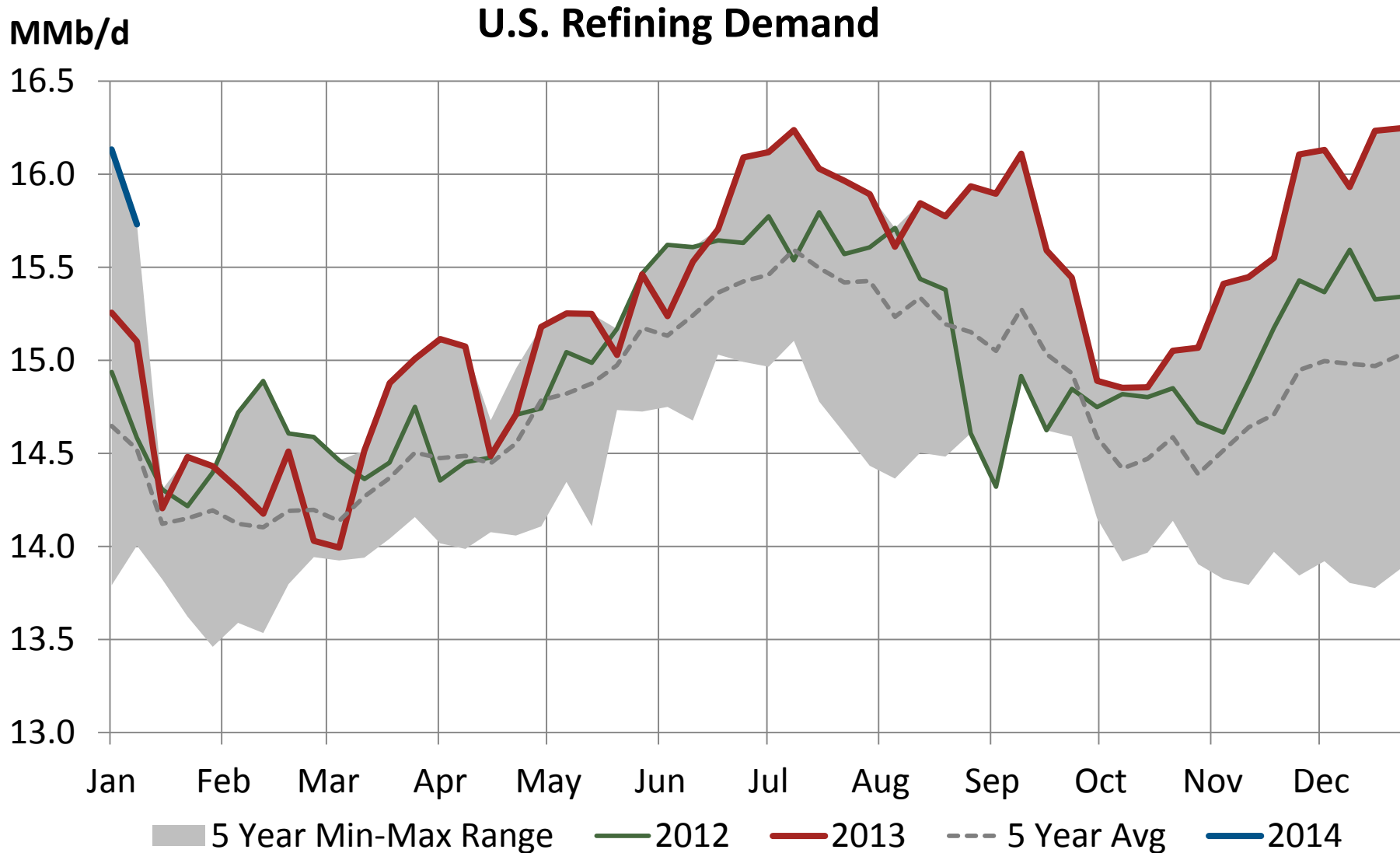




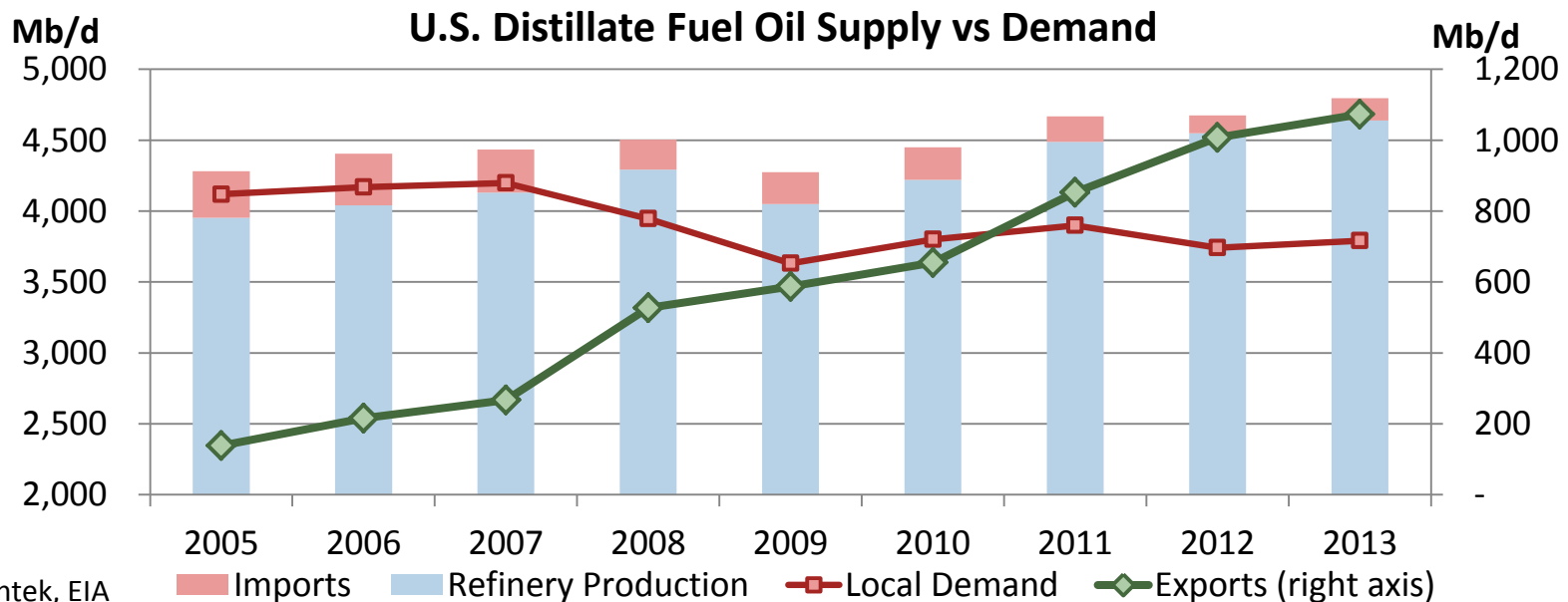
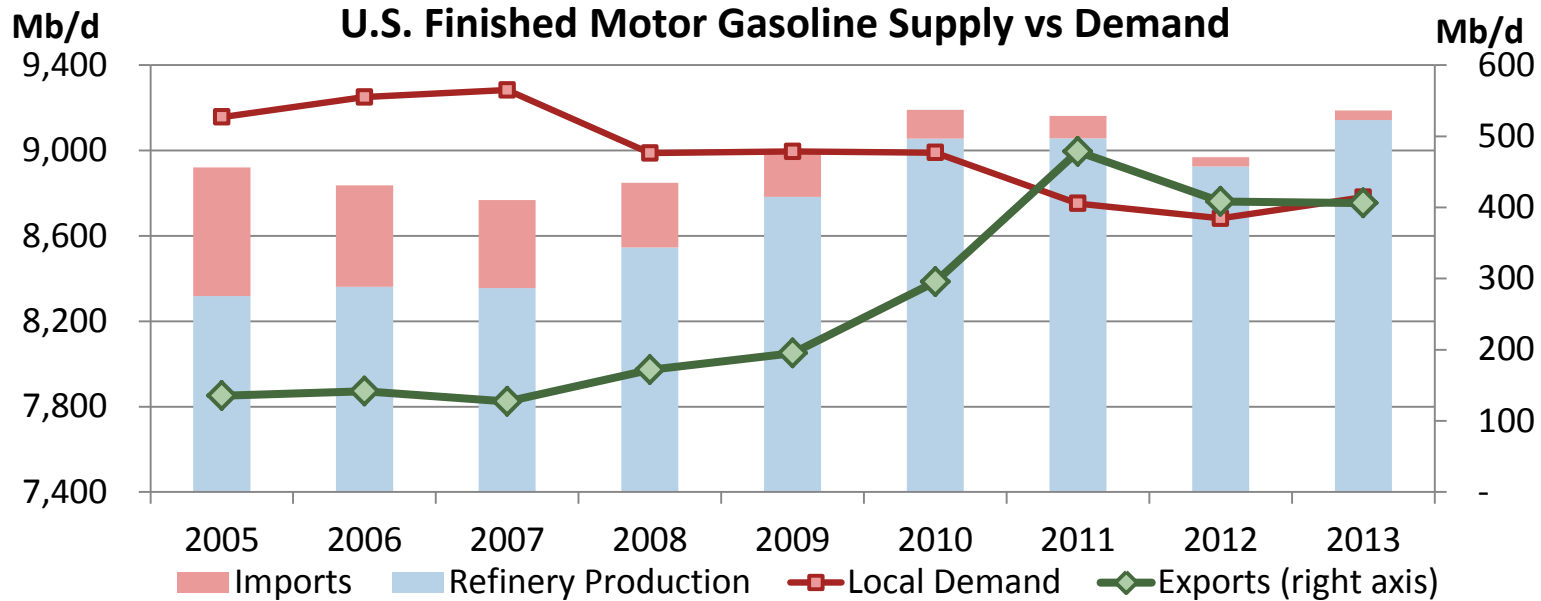
# U.S. Waterborne Imports Setting New Lows



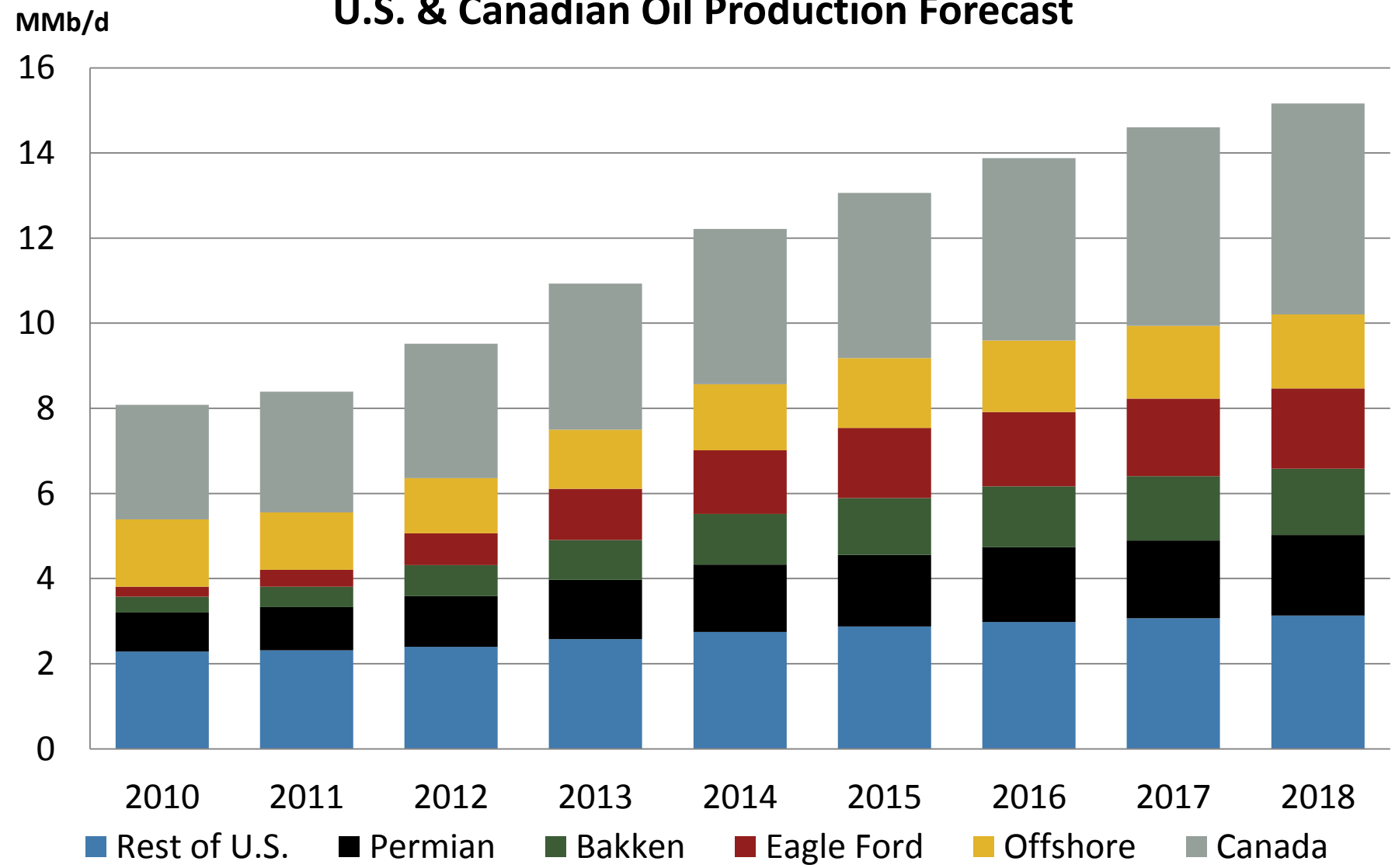
Source: Bentek, EIA \*Excluding Mexico



# The U.S. Has Become a Major Exporter of Gasoline and Distillates

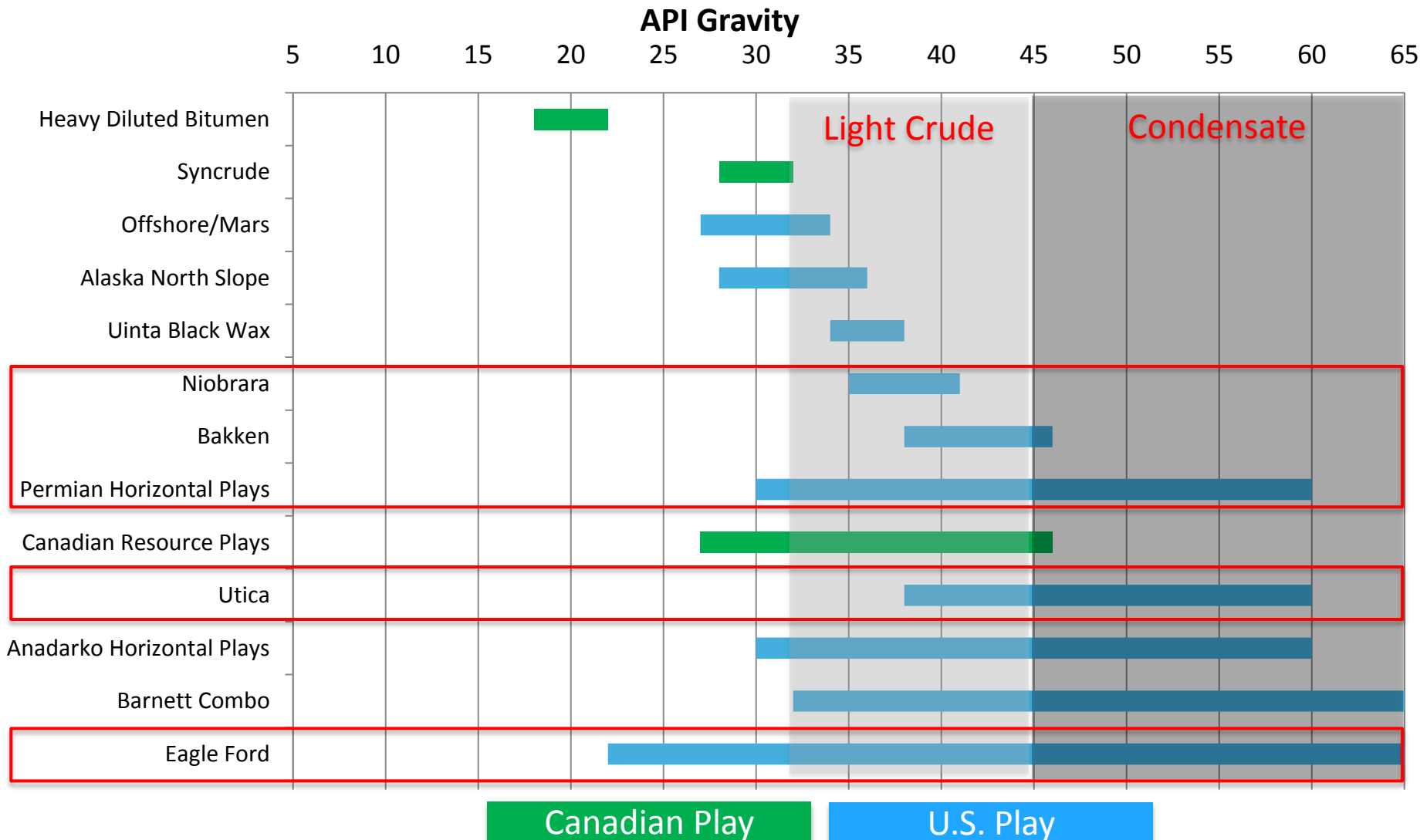


## U.S. & Canadian Oil Production Forecast



Source: HPDI & January 2014 Bentek Crude Oil PADD Balances

# U.S. Onshore Plays Predominantly Light Sweet Crude & Condensate, While Canadian Crudes Heavy



Note: Canadian Unconventional Plays Include Viking, Cardium, Duvernay, Alberta Bakken, Shaunavon

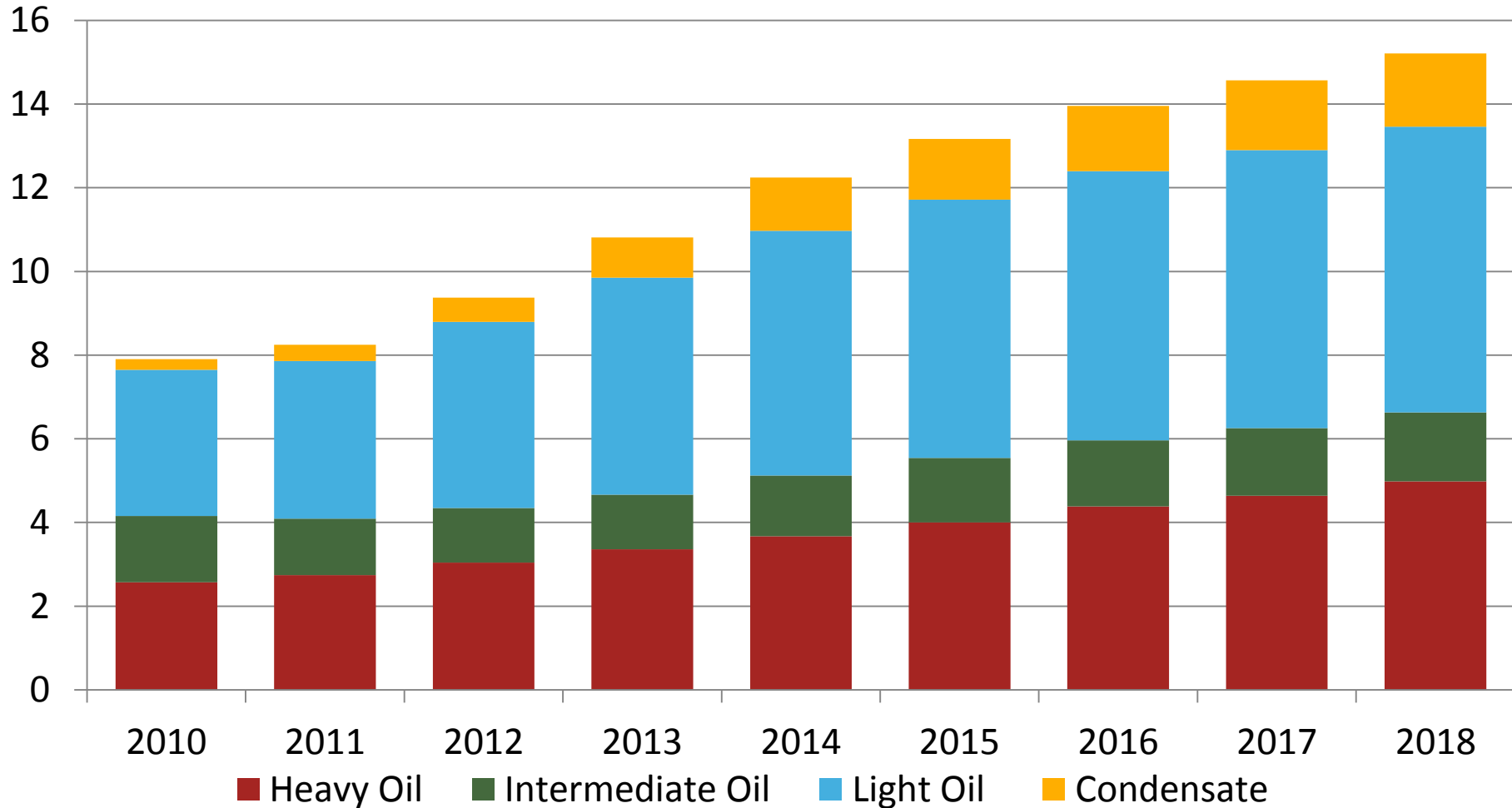
Note: Permian Horizontal Plays Includes: Cline, Avalon, Bone Spring, Wolfcamp

Note: Anadarko Horizontal Plays Includes: Mississippi Lime, Marmaton, Hogshooter, Granite Wash, Cana Woodford, SCOOP

# Light/Condensate Continues to Lead Growth, but Heavy Growth is Also Notable

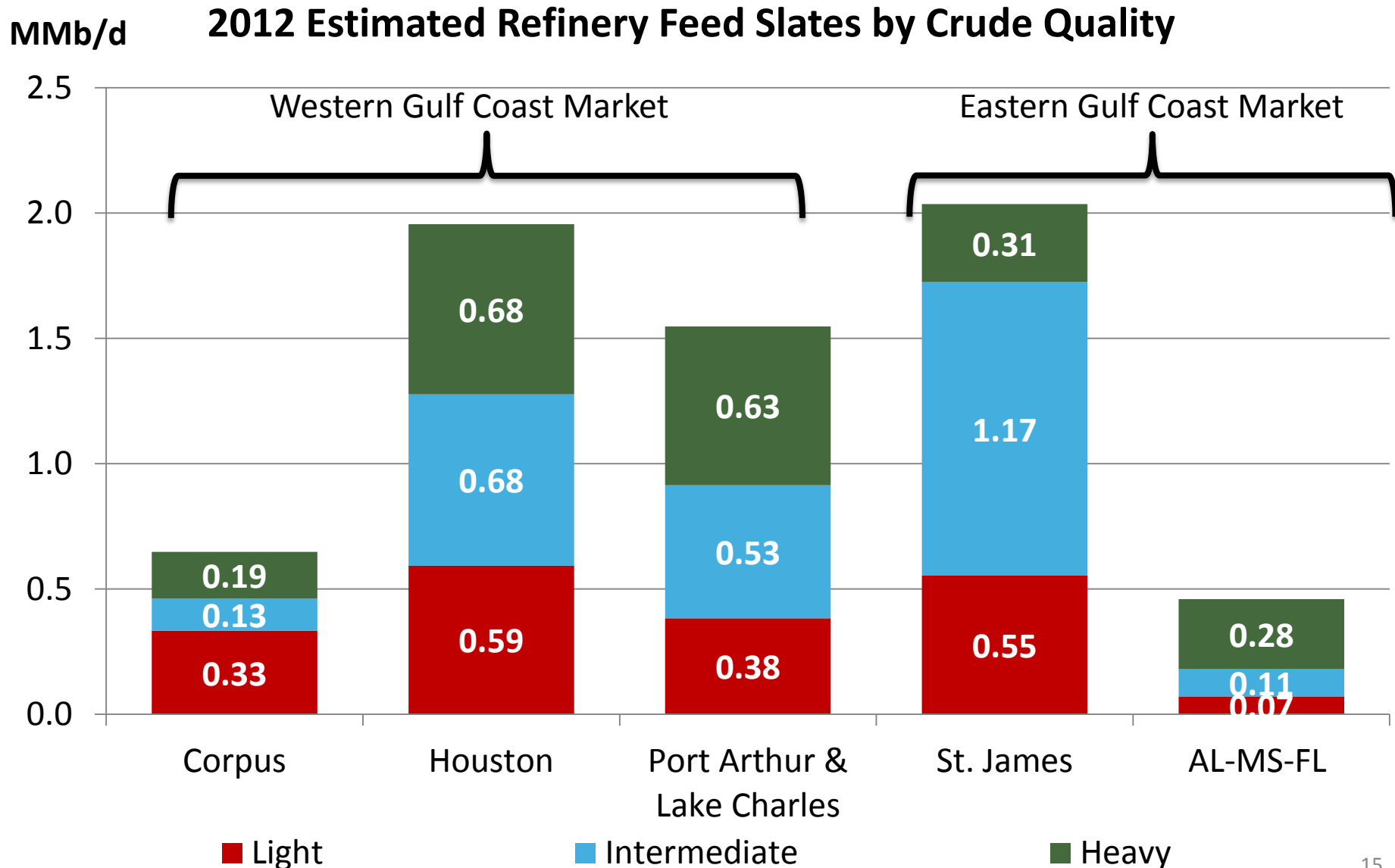
MMb/d

## North American Crude Production by Quality

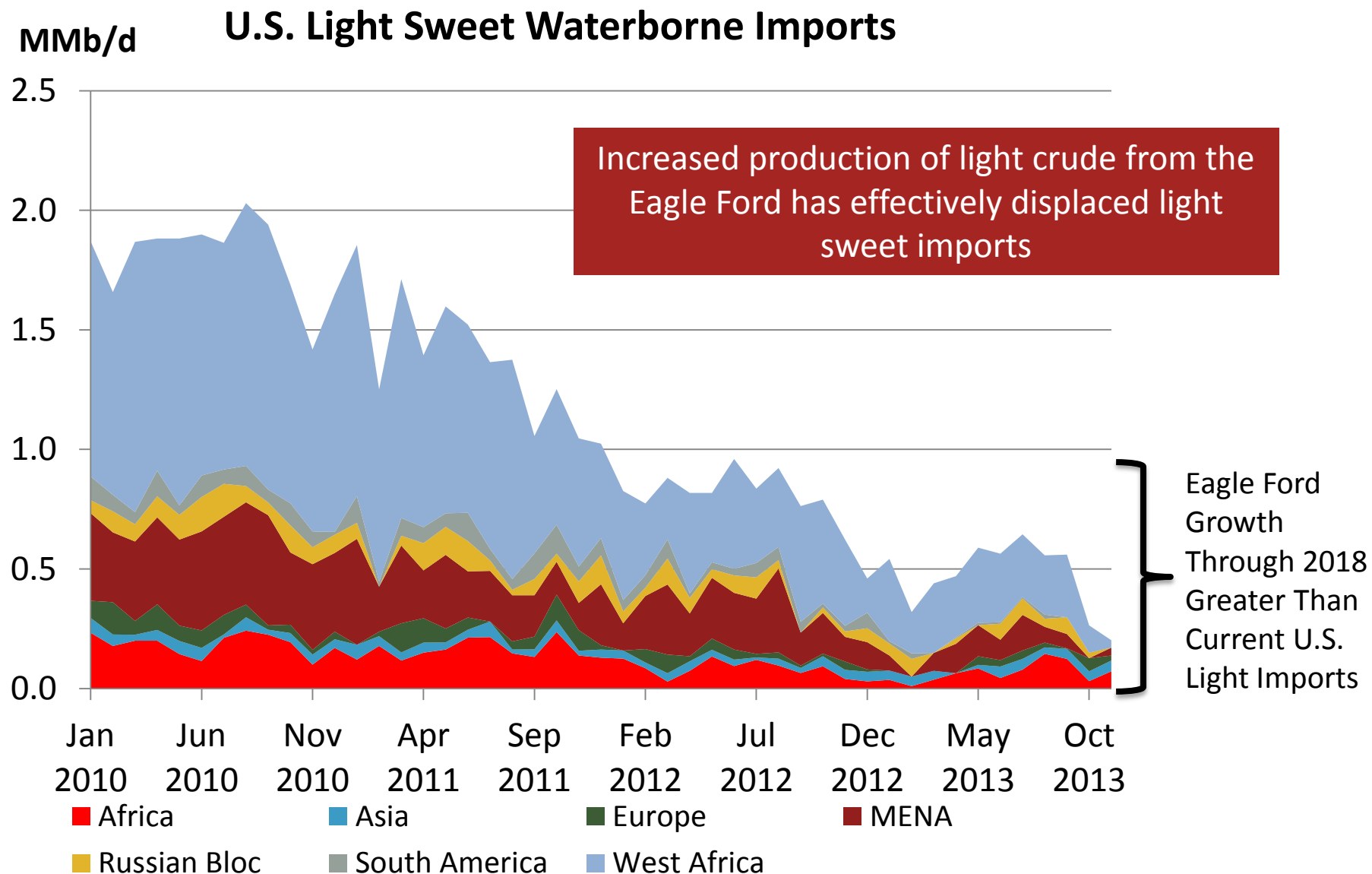


Heavy Oil: < 28° API; Intermediate Oil: 28° to 32°; Light Oil: 32° to 45°; Condensate: 45° to 65°

# Gulf Coast Refining Centers Consumed 6.3 MMb/d of Crude in 2012



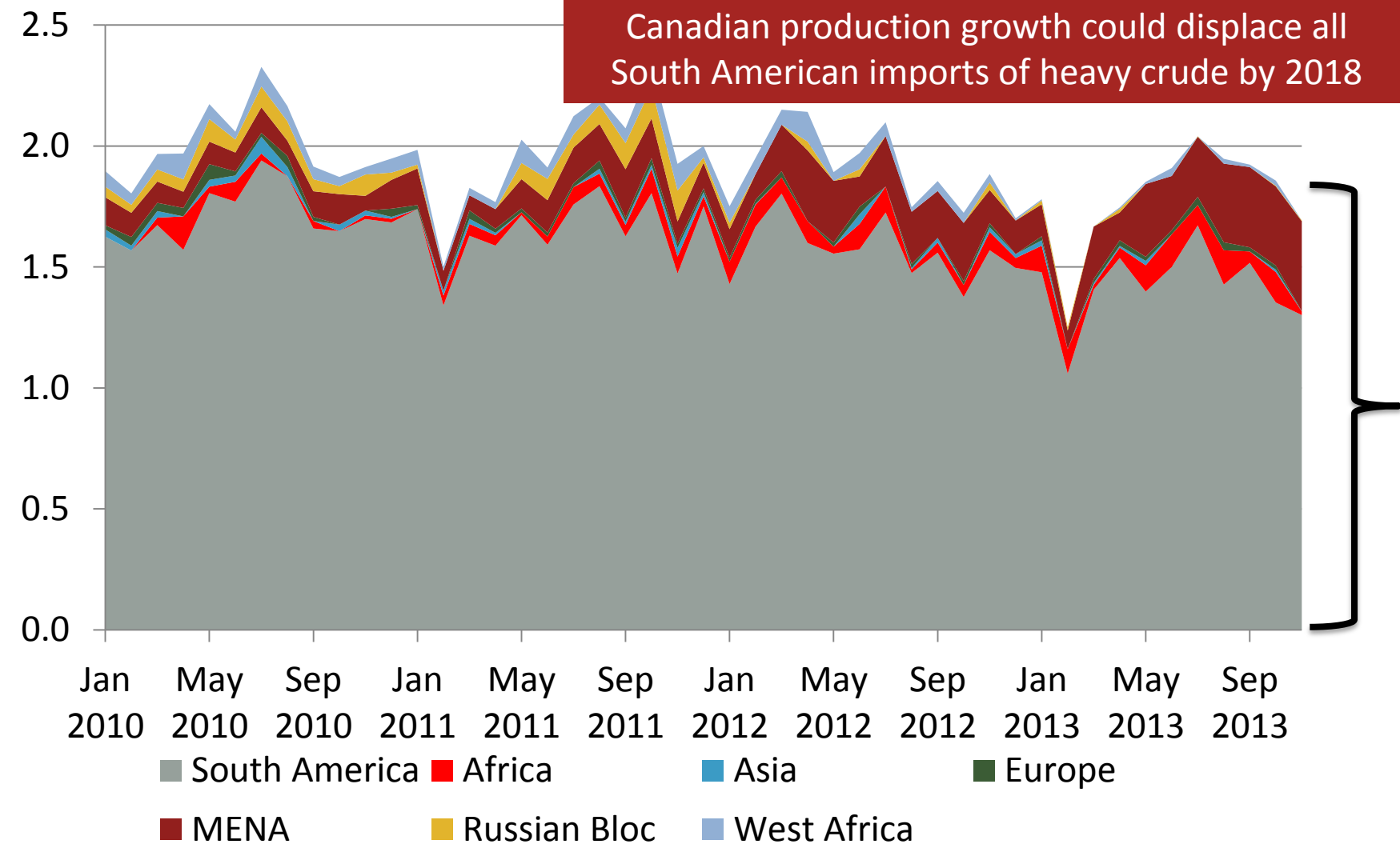
# N.A. Light Growth Has Already Pushed Out West African Light in U.S.G.C





## U.S. Heavy Waterborne Imports

MMb/d



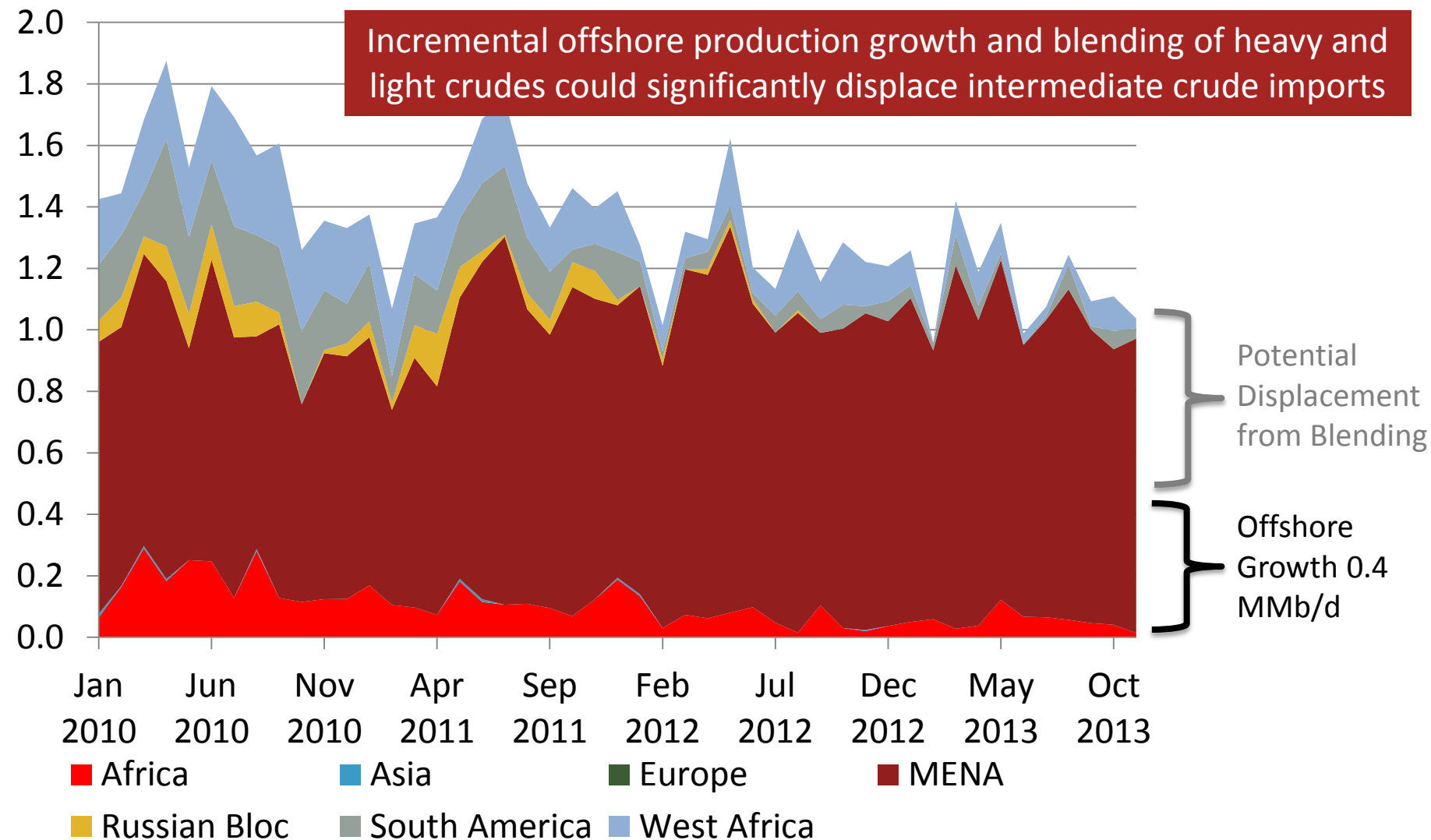
Source: Bentek through 11/2013, EIA

Note: Does not include volumes imported from Mexico

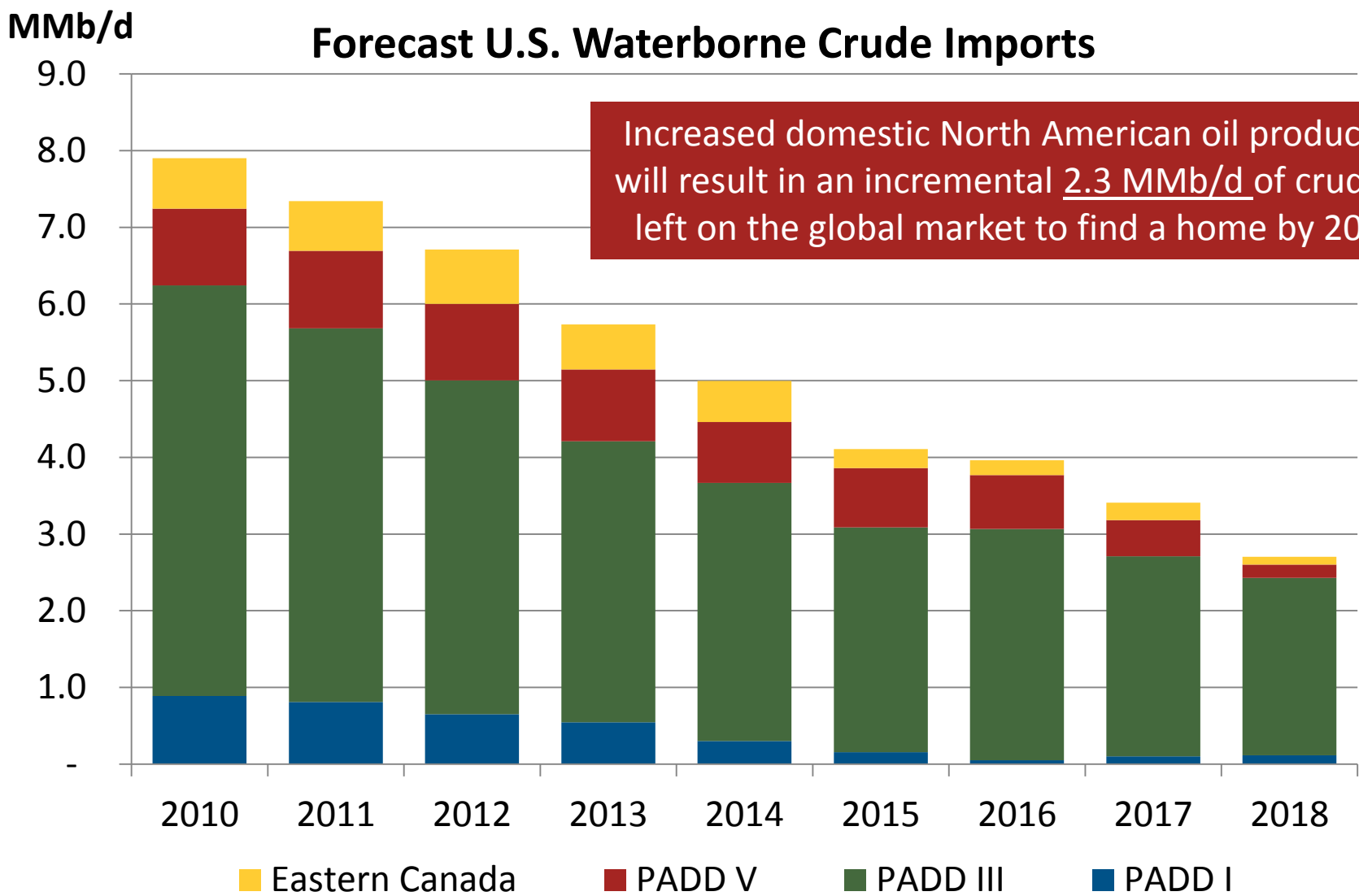
# Intermediate Imports Facing Pressure from Offshore & Blending of Light & Heavy

## MMb/d U.S. Intermediate Waterborne Imports

Incremental offshore production growth and blending of heavy and light crudes could significantly displace intermediate crude imports



# Most Imports to be Displaced by 2018 Due to Increased Access to North American Crude



Source: January 2014 BENITEK Crude Oil PADD Balances

## Supply Sources

### Lease Condensate

(Mixture of light liquids collected at the well head of gas wells and not transported in gas stream)

### Condensate/Ultra-Light Oil

(Mixture of liquids from an oil well with an API of 45°. Illegal to export under current U.S. law)

### Natural Gasoline

(A Natural Gas Liquid composed of mostly pentanes (C5) and small amounts of C6+ with an API of 80°. Obtained as a purity product from a fractionator)

**Barrel of  
Condensate**  
( $> 45^\circ$  API)

## Demand Sources

### Refineries for production of gasoline

(limited demand due to lack of increased refinery capacity to handle light crude)

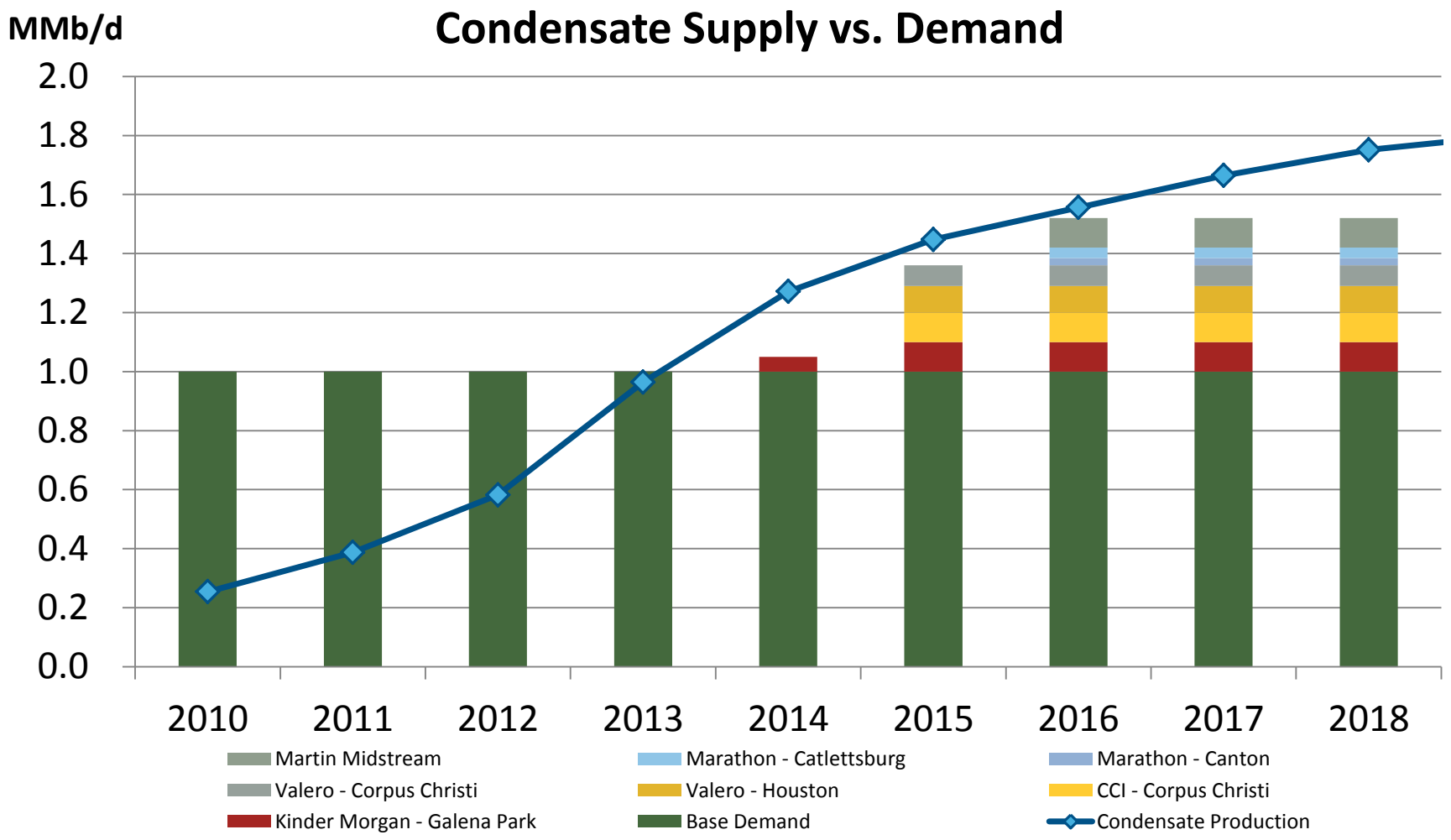
### Condensate Splitters

(Simple refineries that produce naphtha and light distillates from condensate)

### Diluent for Oil Sands Production

(limited demand due to competition from natural gasoline)

Incremental Splitter Capacity will likely be needed to accommodate supply growth

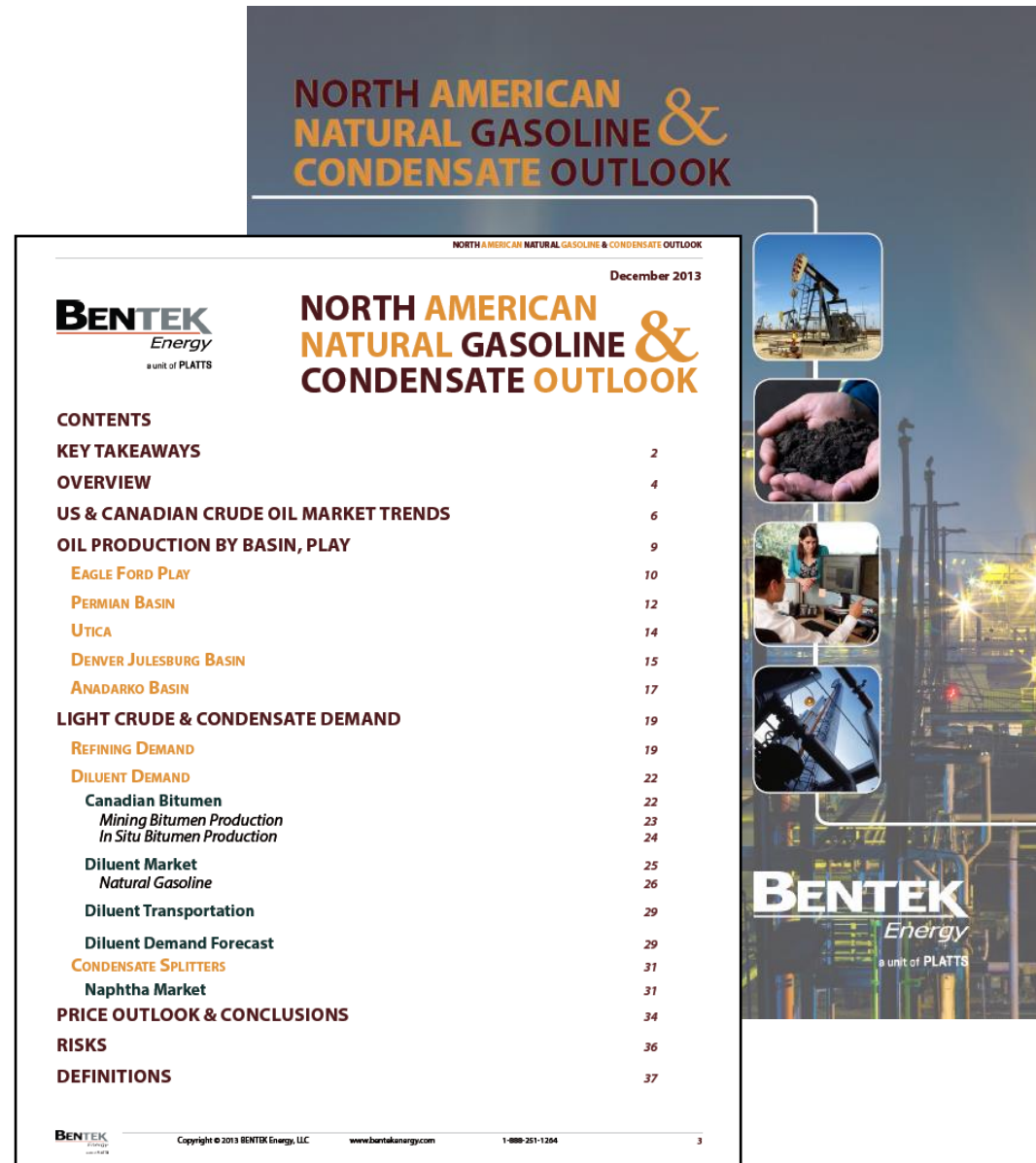


Source: Bentek's North American Natural Gasoline and Condensate Outlook

# N.A. Natural Gasoline and Condensate Outlook

Bentek's latest Market Alert looks at North American natural gasoline and condensate production growth and its effect on North American and Global Markets.

Contact Katie Lowe at [catherine.lowe@platts.com](mailto:catherine.lowe@platts.com) or call (720) 264-6600 for more information.



**NORTH AMERICAN NATURAL GASOLINE & CONDENSATE OUTLOOK**

December 2013

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**NORTH AMERICAN NATURAL GASOLINE & CONDENSATE OUTLOOK**

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- North American crude oil production is expected to grow rapidly over the coming years, growing by 3.0 MMb/d to 15 MMb/d by 2018.
- Majority of incremental oil production to be light (> 32° API) oil and/or condensate (> 45 ° API) in addition to heavy crude (~ 17° to 22° API) from Canada.
- North America will become less dependent on light and heavy imports and potentially displace intermediate imports in the medium to long-run.
- Condensate production will grow by 800 Mb/d. Likely to see even more announced splitter projects and incremental exports of naphtha.

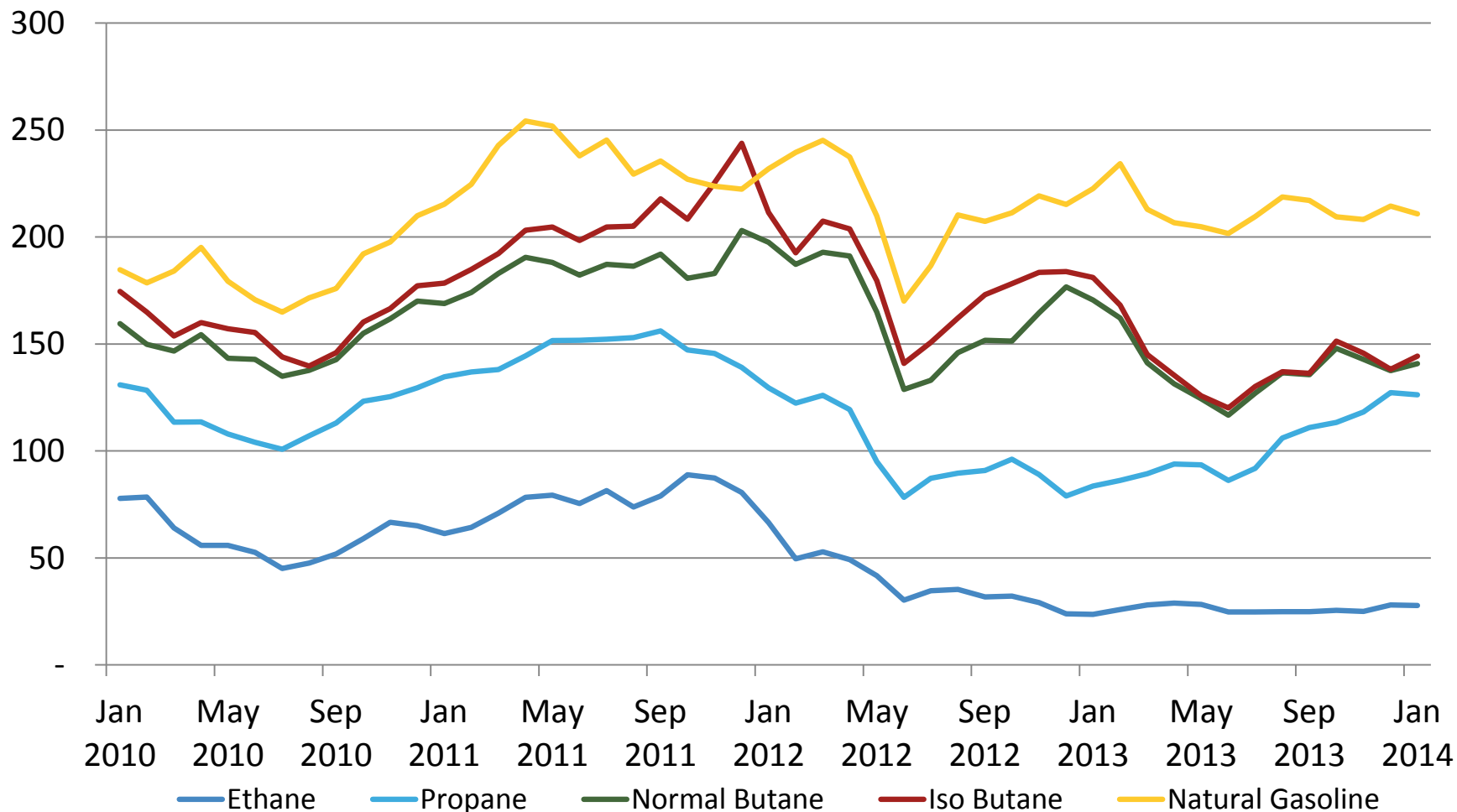
# North American NGLs



# North American NGL Prices to Date

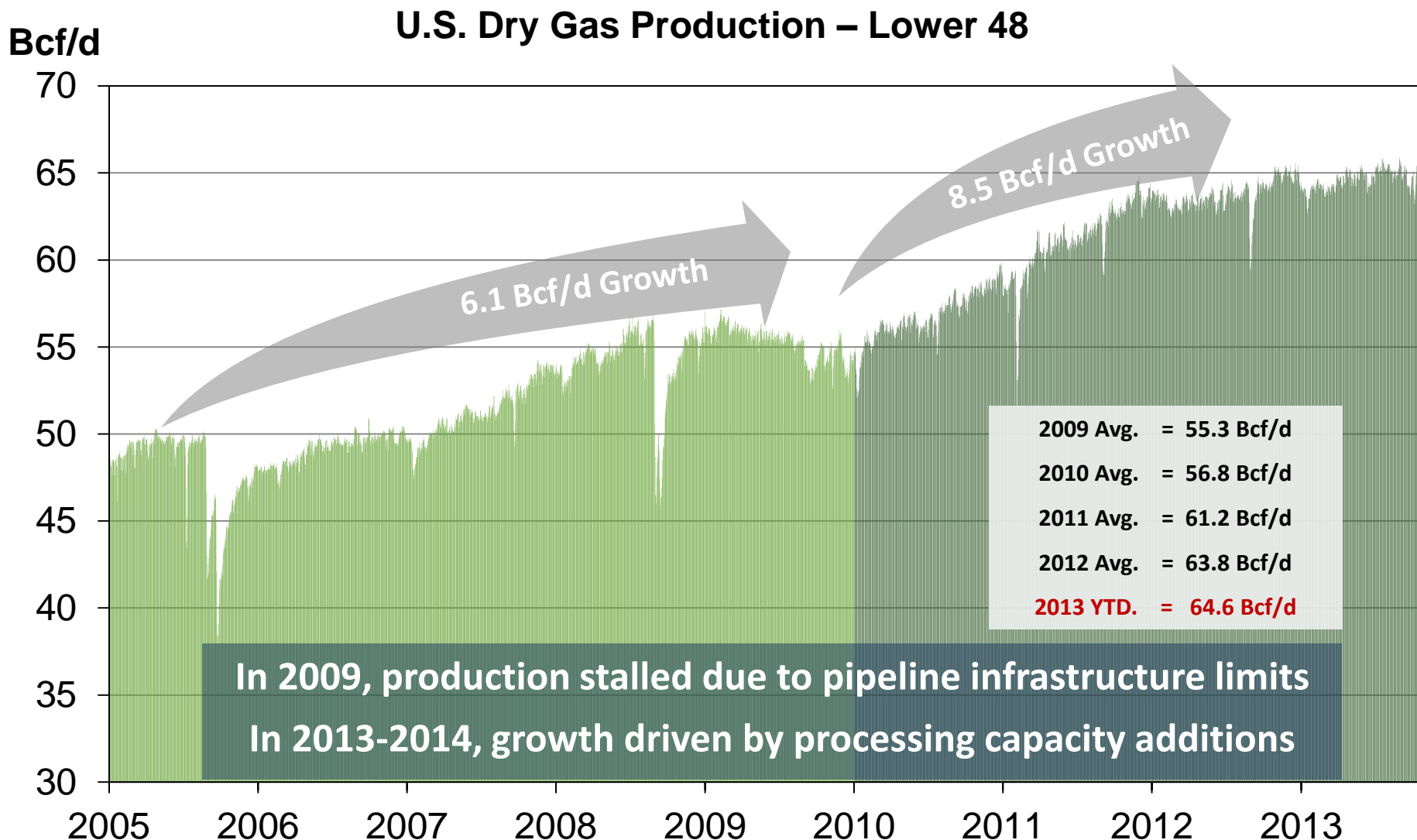
Cents per gallon

## U.S. NGL Prices



Source: Bentek, ICE  
Prices through January 16, 2014

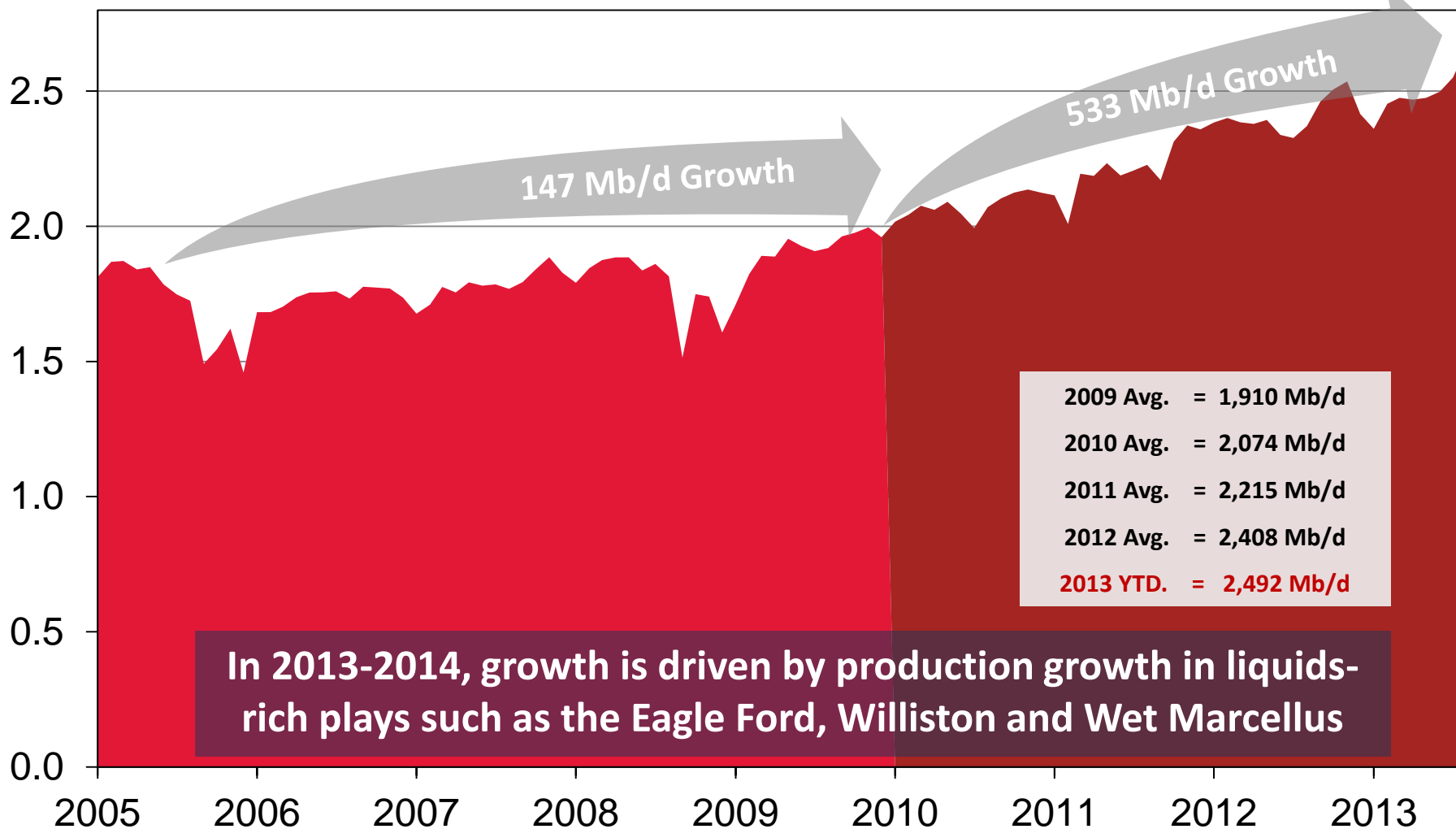
# U.S. Dry Gas Production Continues to Reach Record Highs



# U.S. NGL production continues to reach record highs

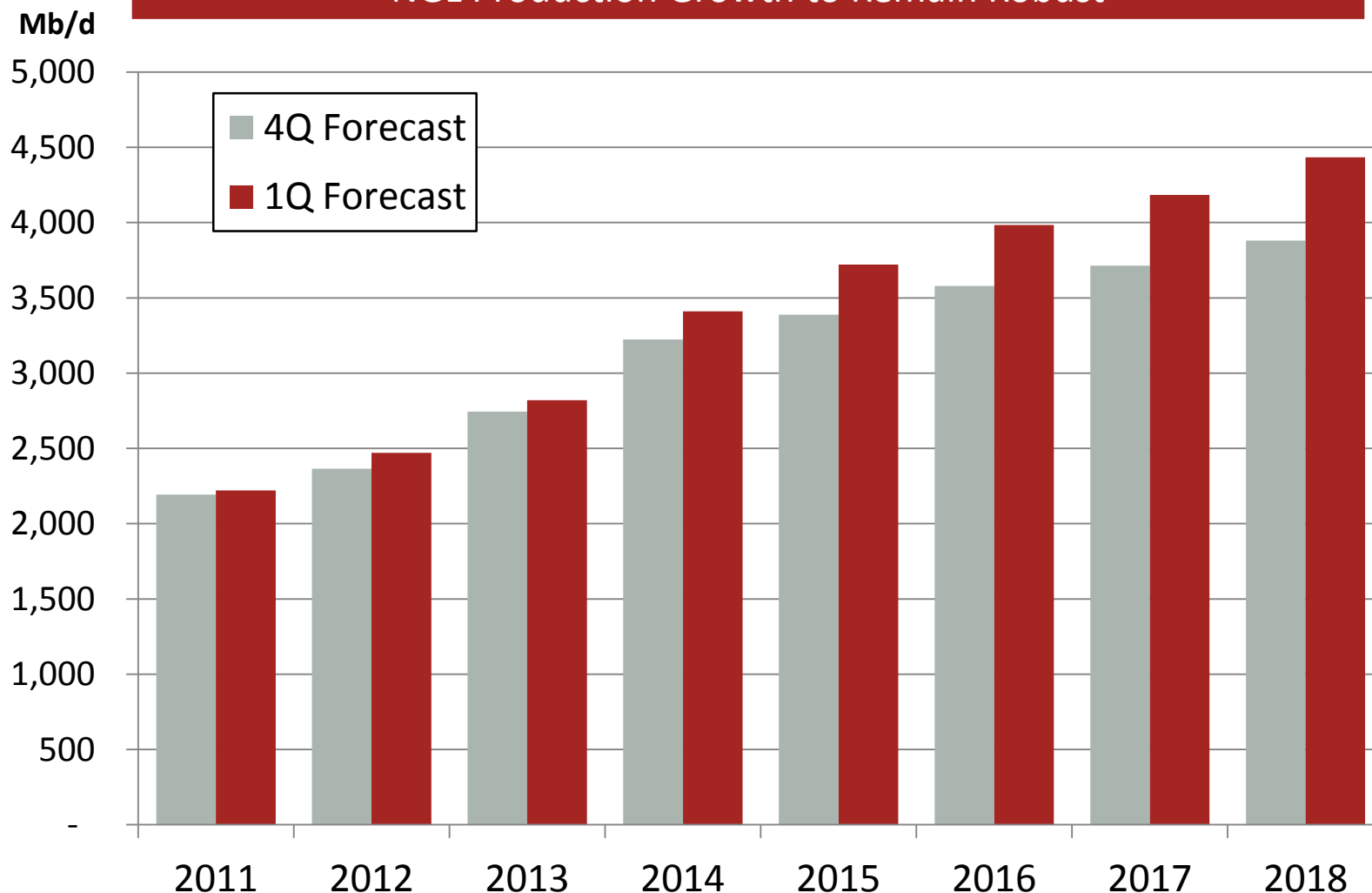
MMb/d

## NGL Production from Gas Plants



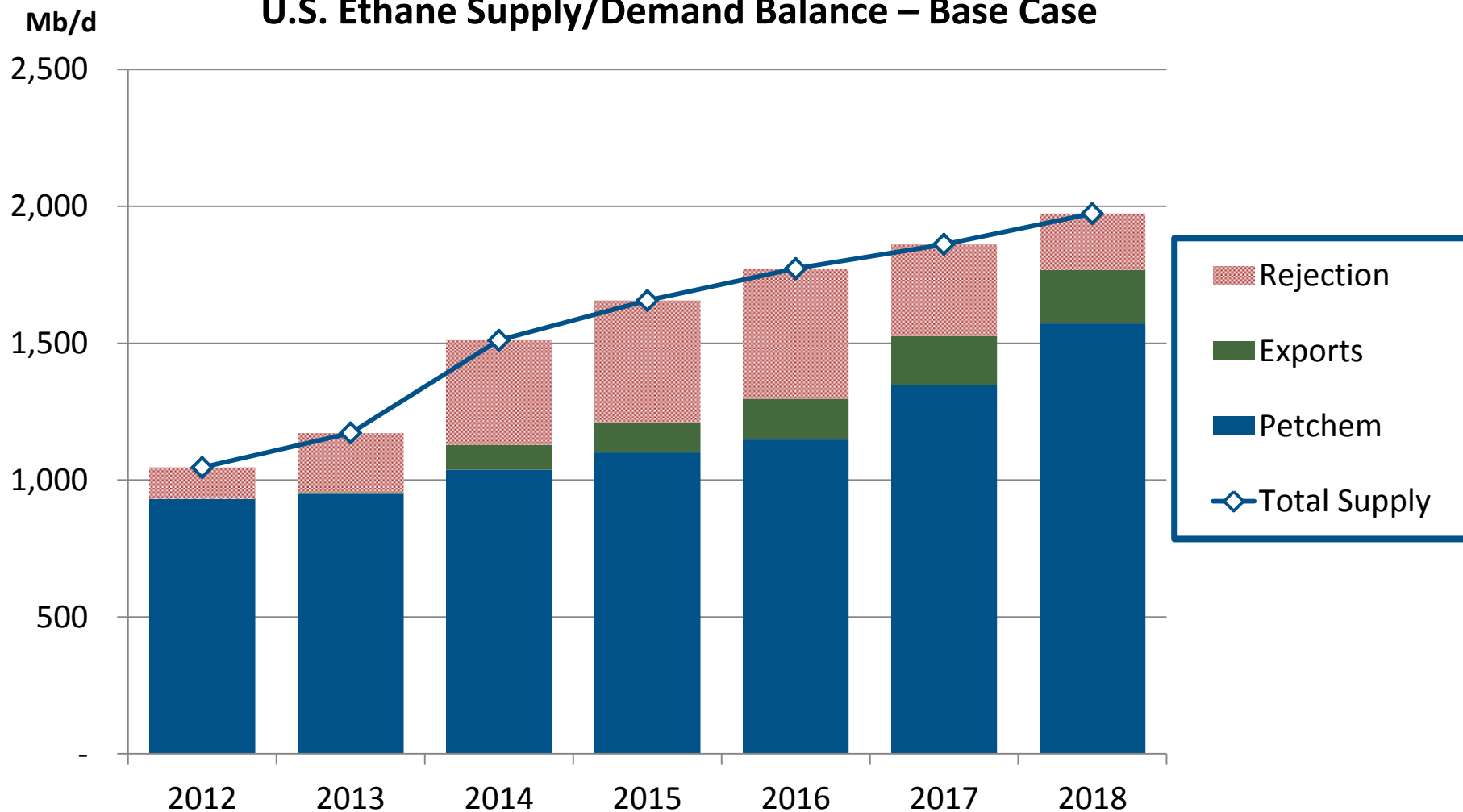
# Bentek revised upwards its NGL production forecast from gas plants

## NGL Production Growth to Remain Robust



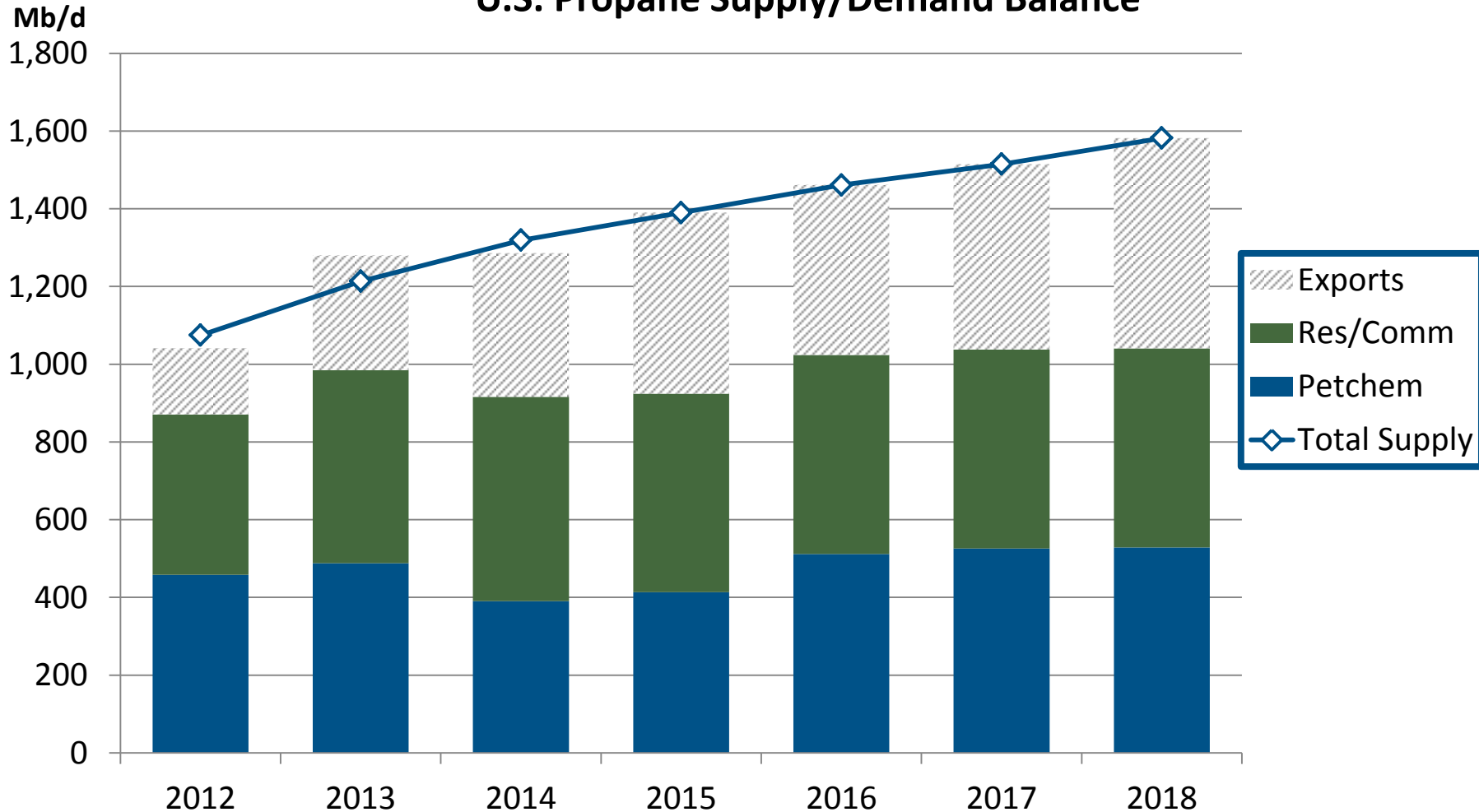
Ethane demand will struggle to keep pace with supply growth

## U.S. Ethane Supply/Demand Balance – Base Case

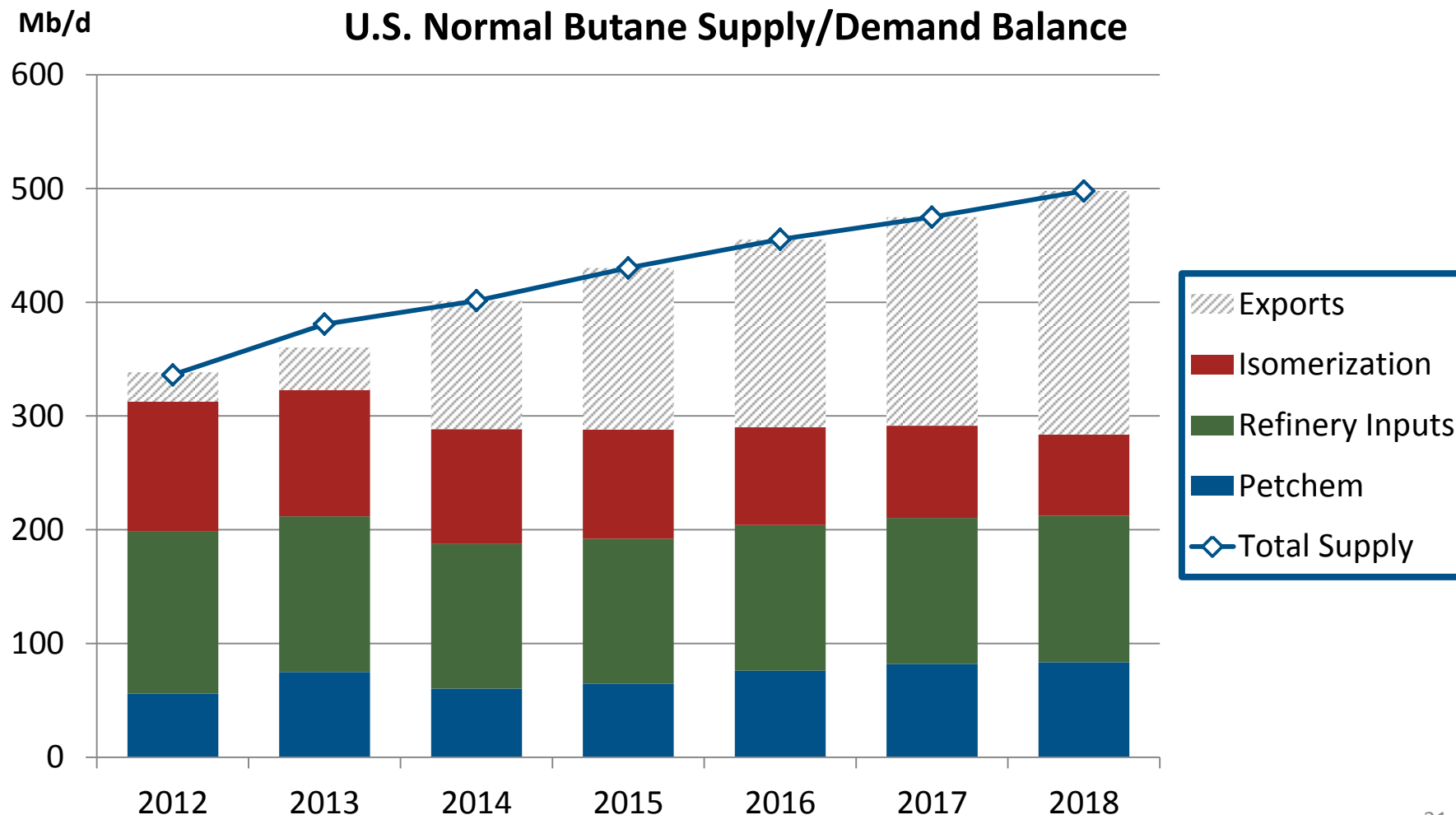


Assuming sufficient demand from global markets, propane exports will help rebalance the market.

## U.S. Propane Supply/Demand Balance

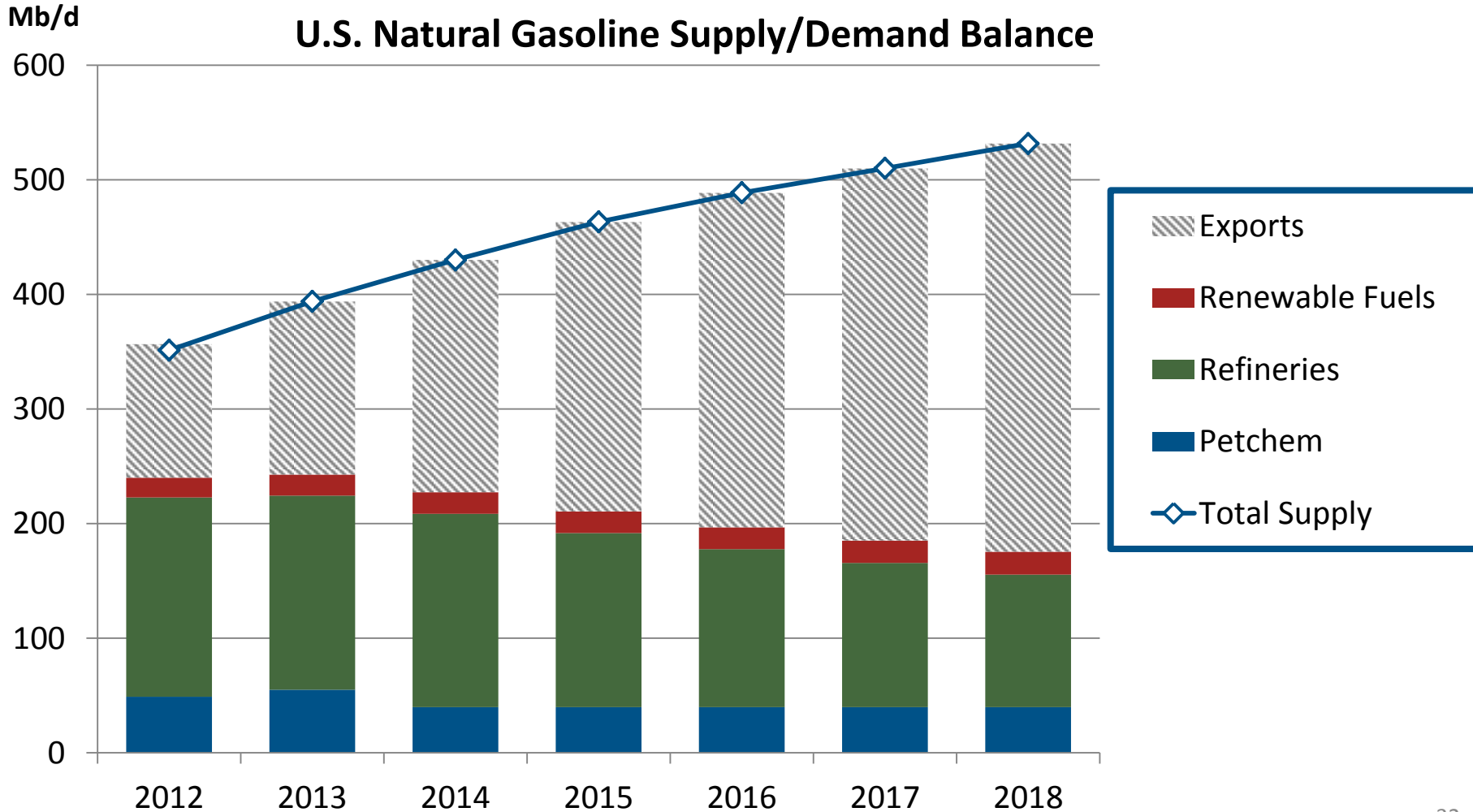


Assuming sufficient demand from global markets, normal butane exports will help rebalance the market.



Source: Bentek Market Call: North American NGLs

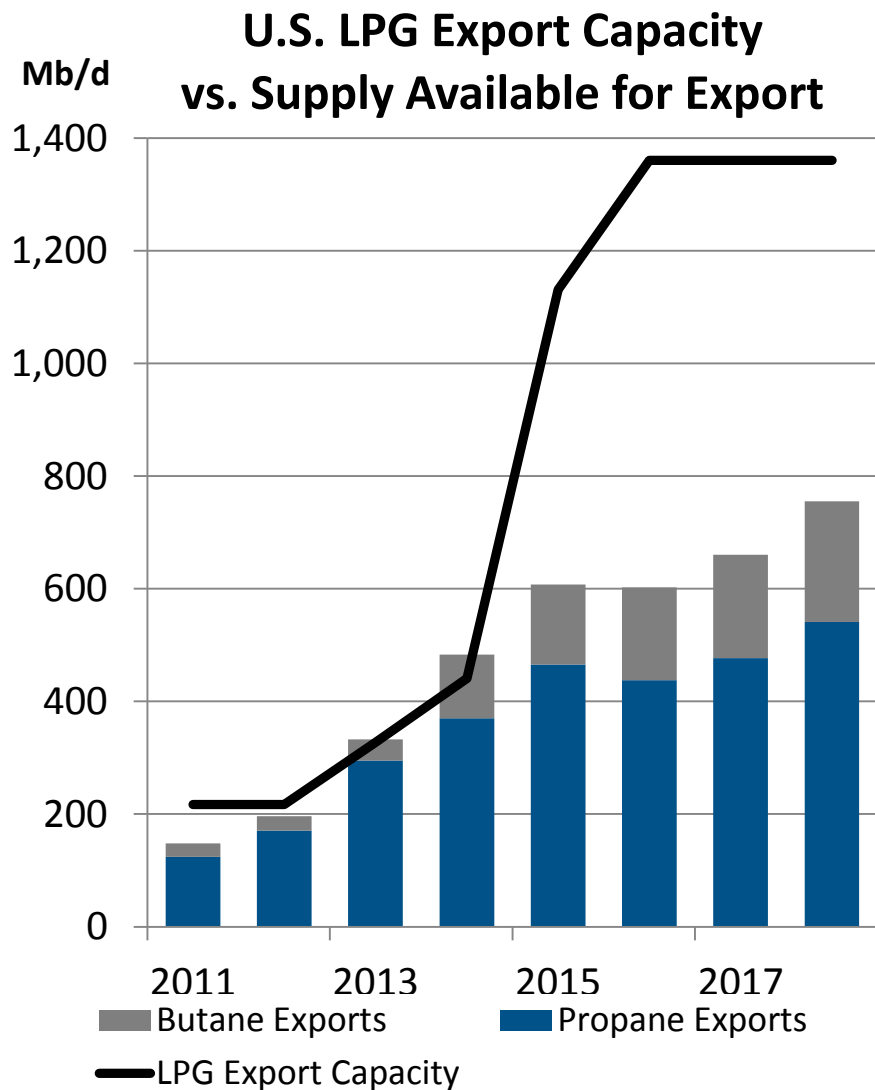
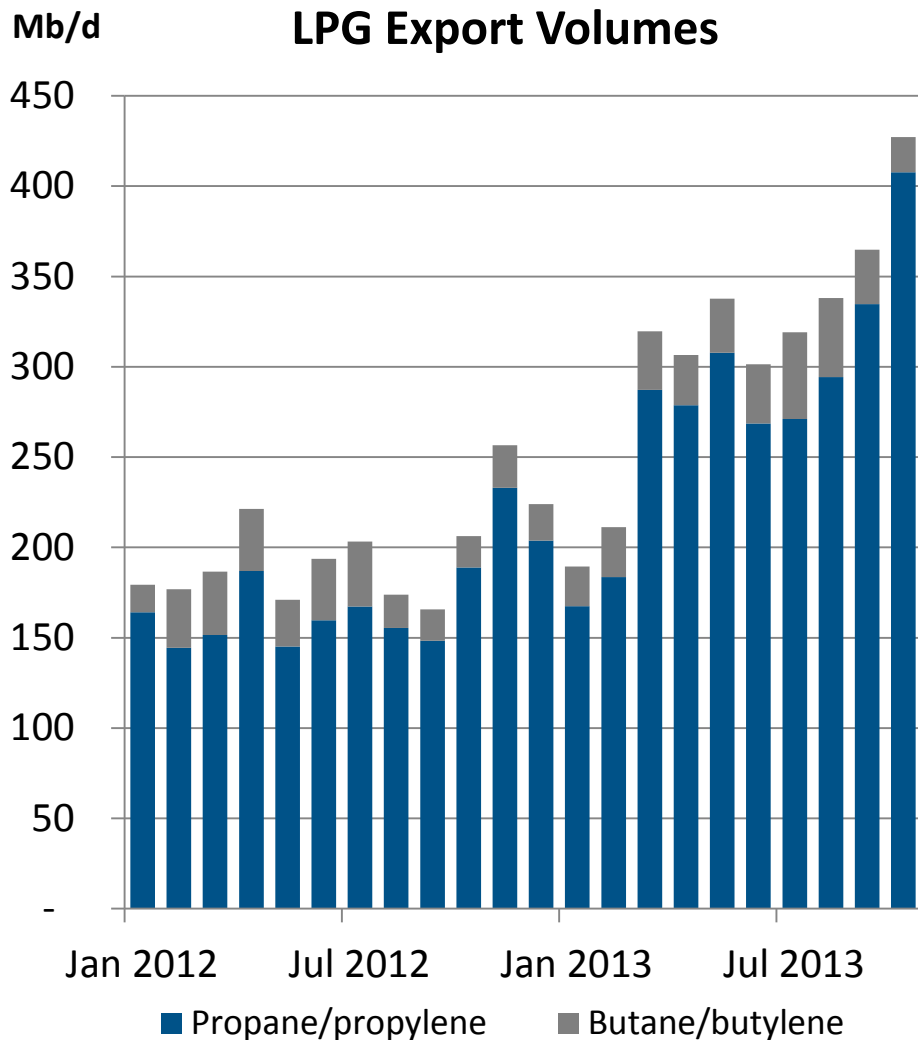
Natural gasoline prices should remain strong as long as diluent demand remains healthy



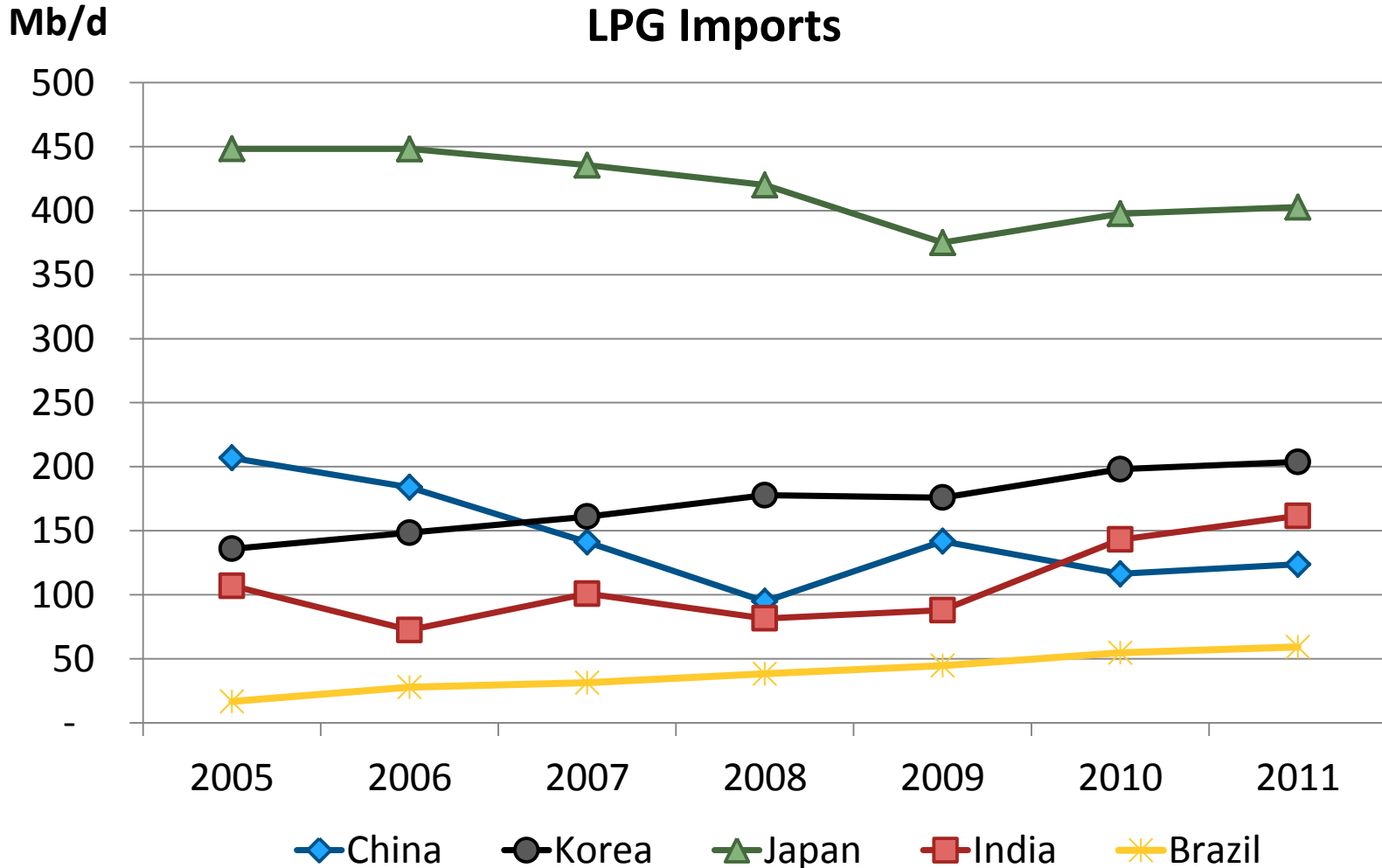
Source: Bentek Market Call: North American NGLs



# LPG Exports continue to reach new record highs



The balance of the global LPG market remains firmly in the hands of Asian and Emerging Economies

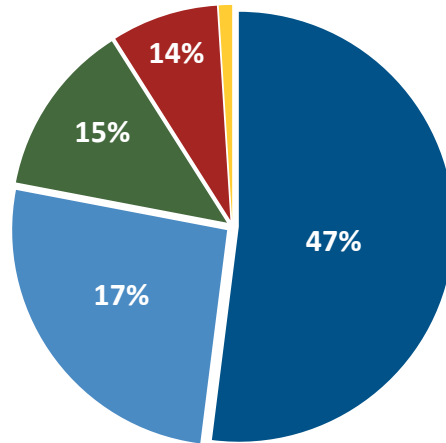


Source: Bentek, IEA, ANP

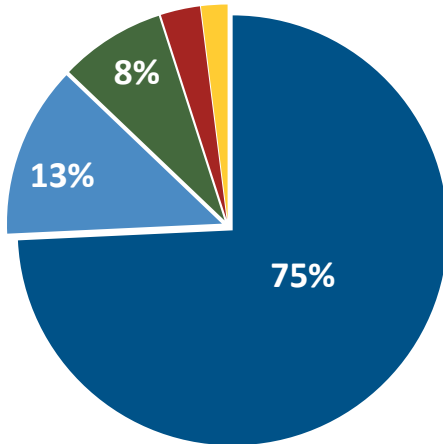
# Major Uses of LPG

- Residential/Commercial
- Petrochemical
- Industrial
- Auto
- Other

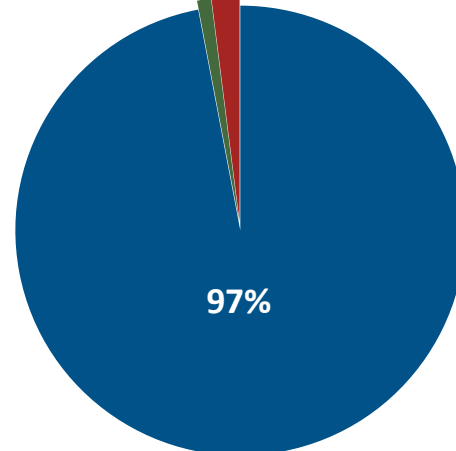
## Japan



## China



## India



## Future Demand Will Depend on:

- Continued global **economic growth** (and increases in living standards) in **emerging economies** such as China, India and Brazil.
- Investment in **infrastructure** such as roads and import/export facilities for **distribution** and **storage** to meet seasonal swings in demand.
- Competition with **traditional fuels** in the following sectors: Residential/commercial, automobiles, petrochemicals and power generation.

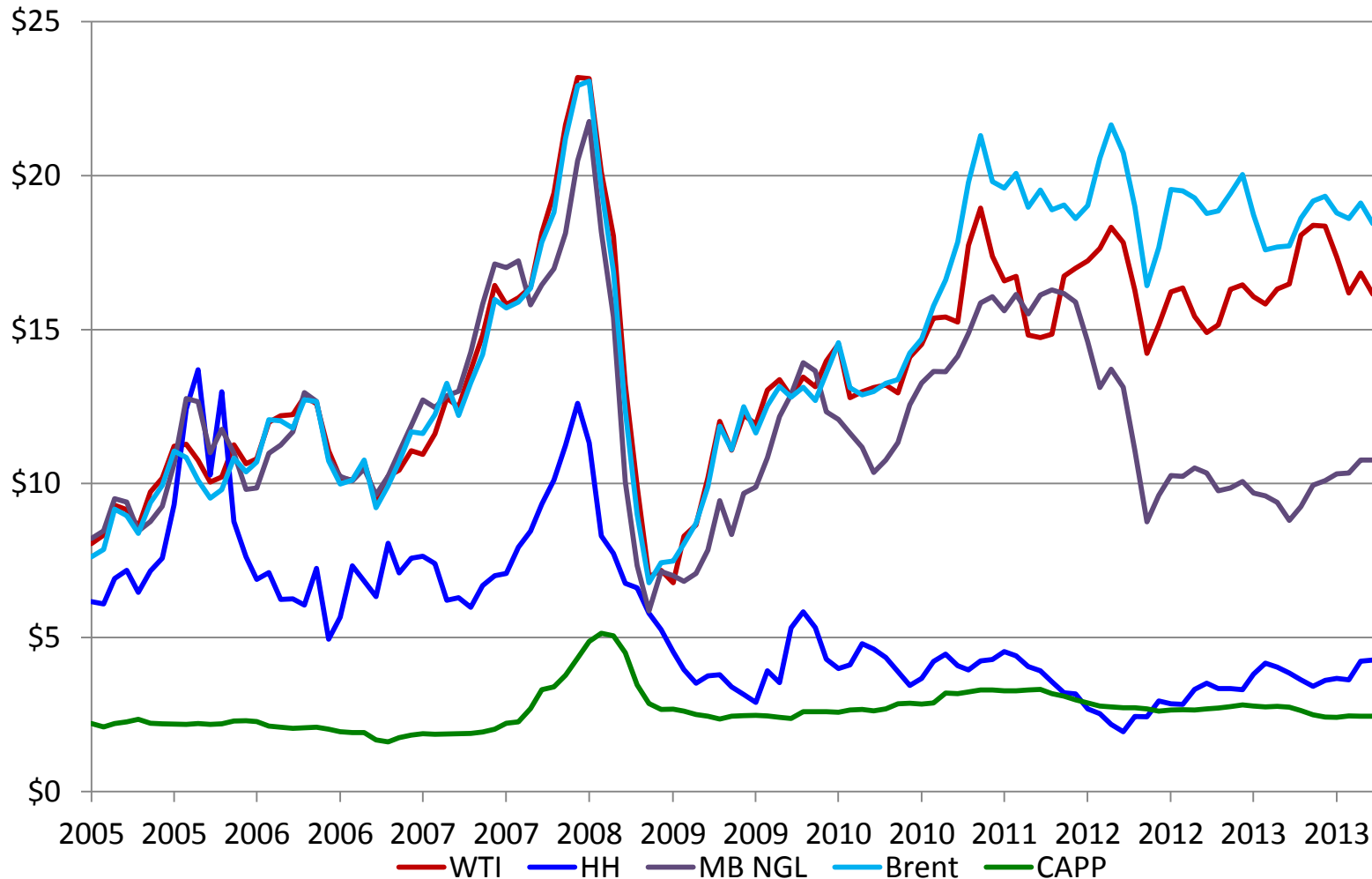
- U.S. NGL production is expected to outpace local demand for all products, making exports a critical demand component.
- Ethane is expected to be oversupplied through the foreseeable future and demand will hinge on incremental demand creation from petrochemical production.
- Propane and butane prices will depend on the global market's ability (Emerging market economic growth) to consume incremental exports from the U.S.
- Natural gasoline should remain well-balanced assuming Canadian oil sands production remains robust.

# North American Gas

# Gas, Oil and NGL Price Comparison

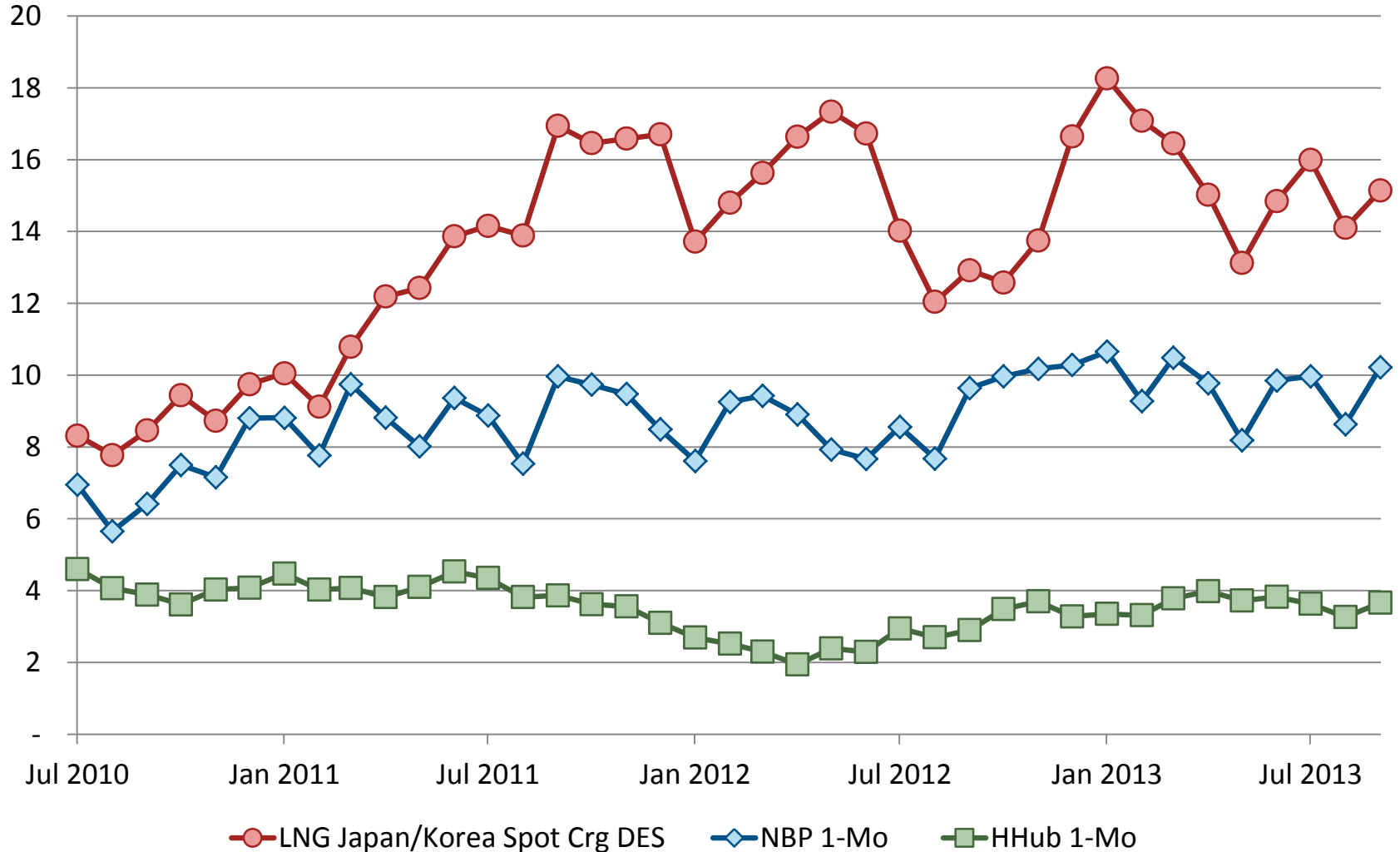
\$/MMBtu

## \$/MMBtu Equivalency Chart

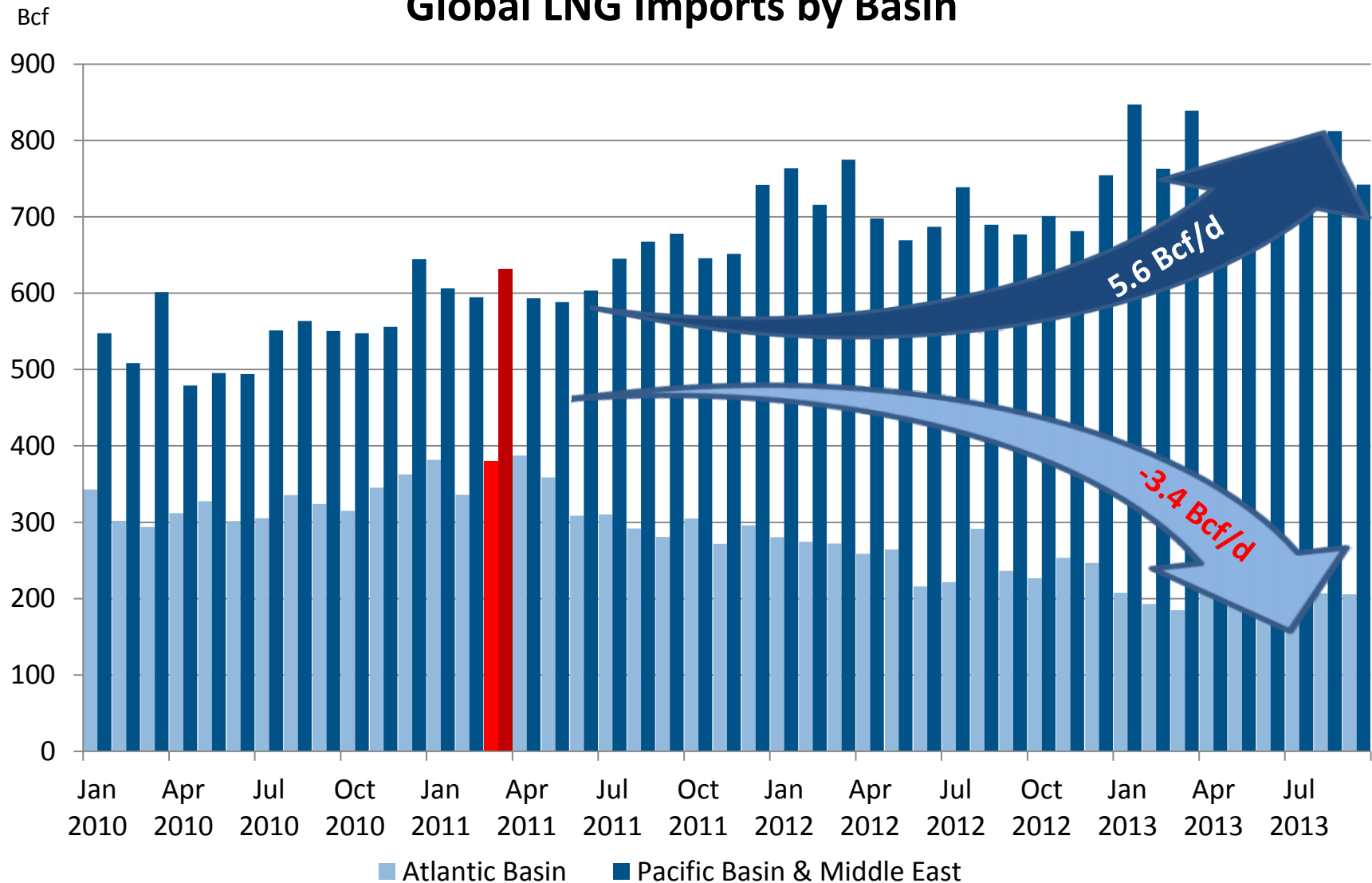


\$/MMBtu

## Global LNG Prices



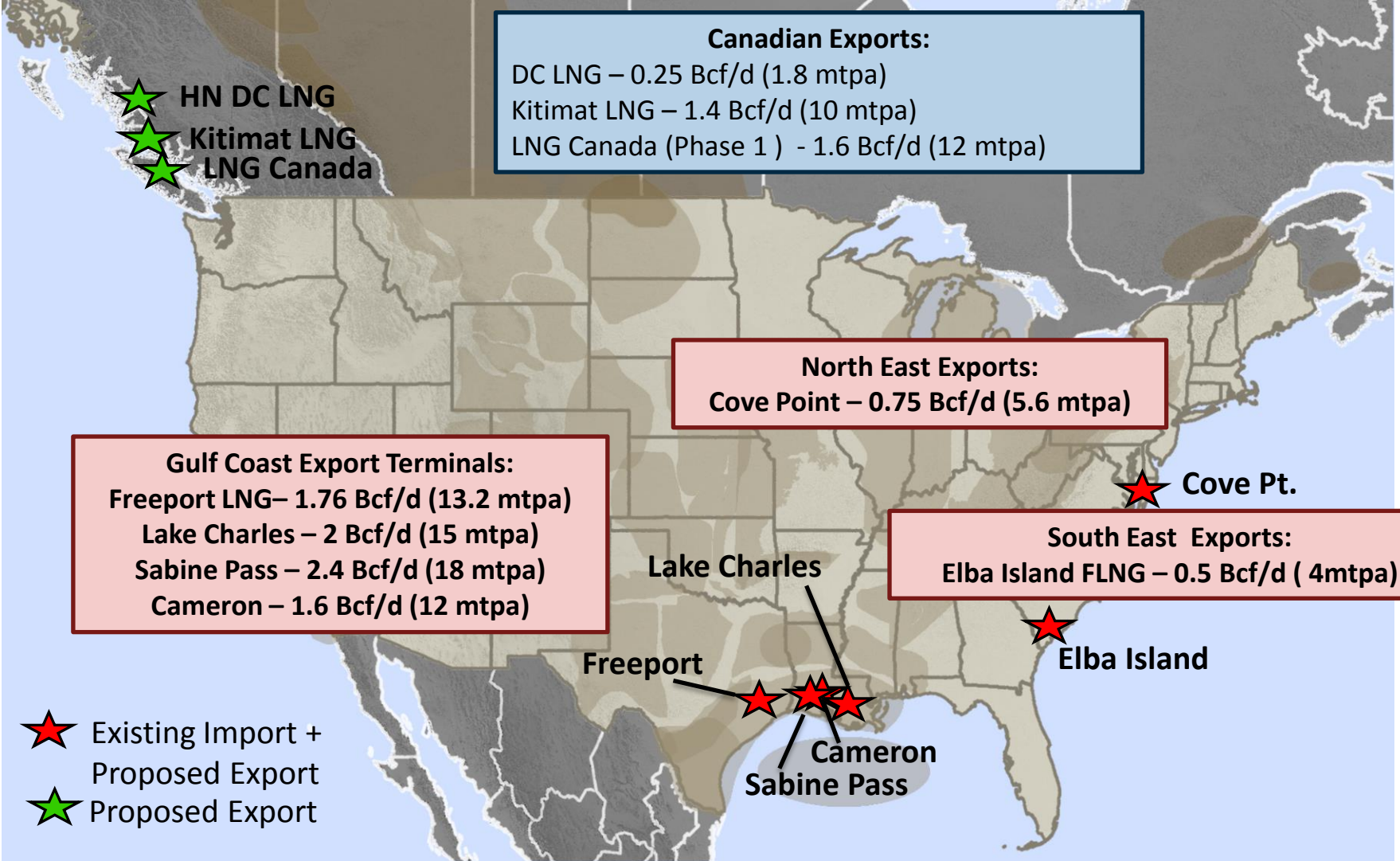
## Global LNG Imports by Basin



Source: Bentek

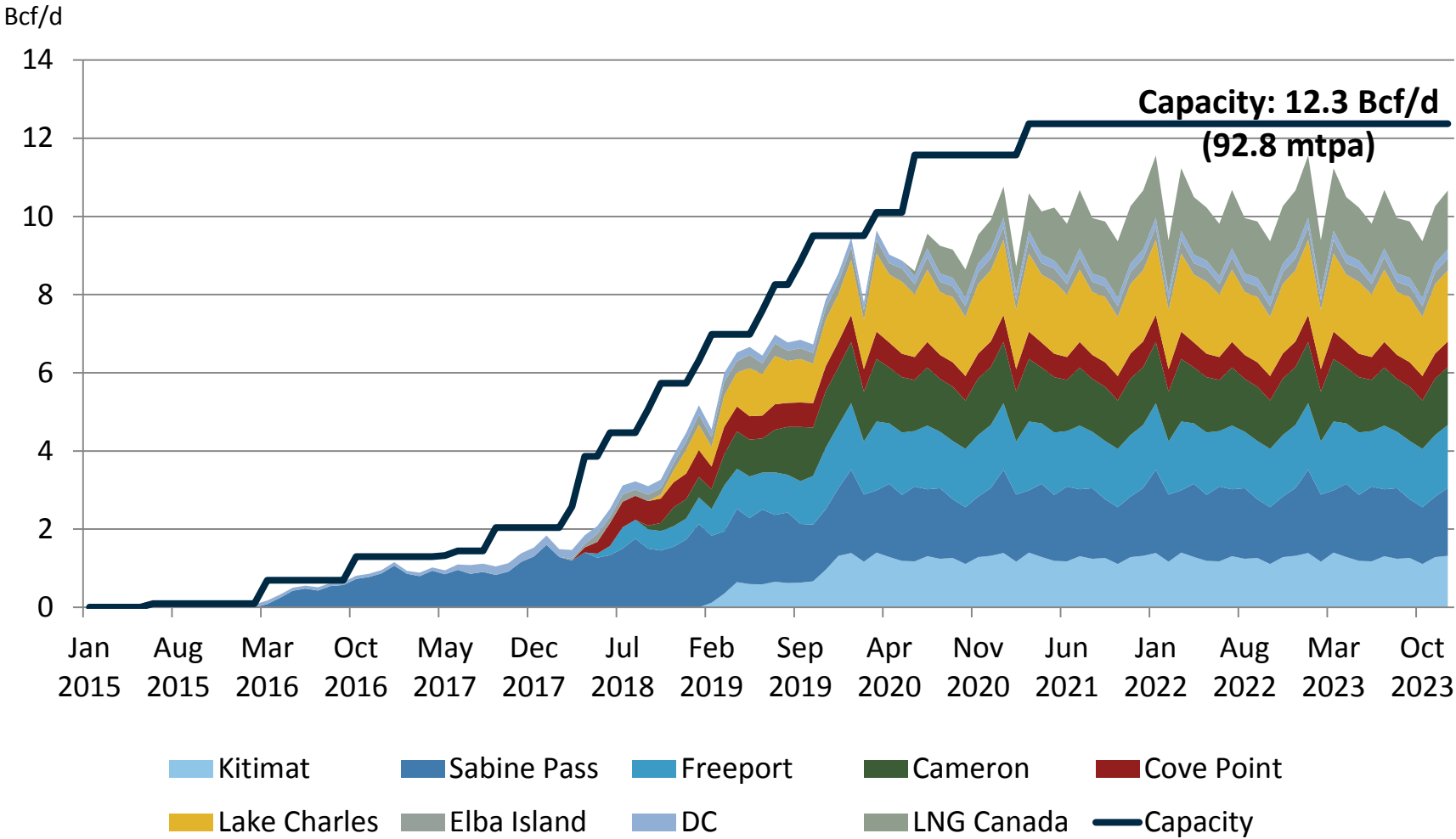


# North American Exports: Base Case Forecast



Source: Bentek

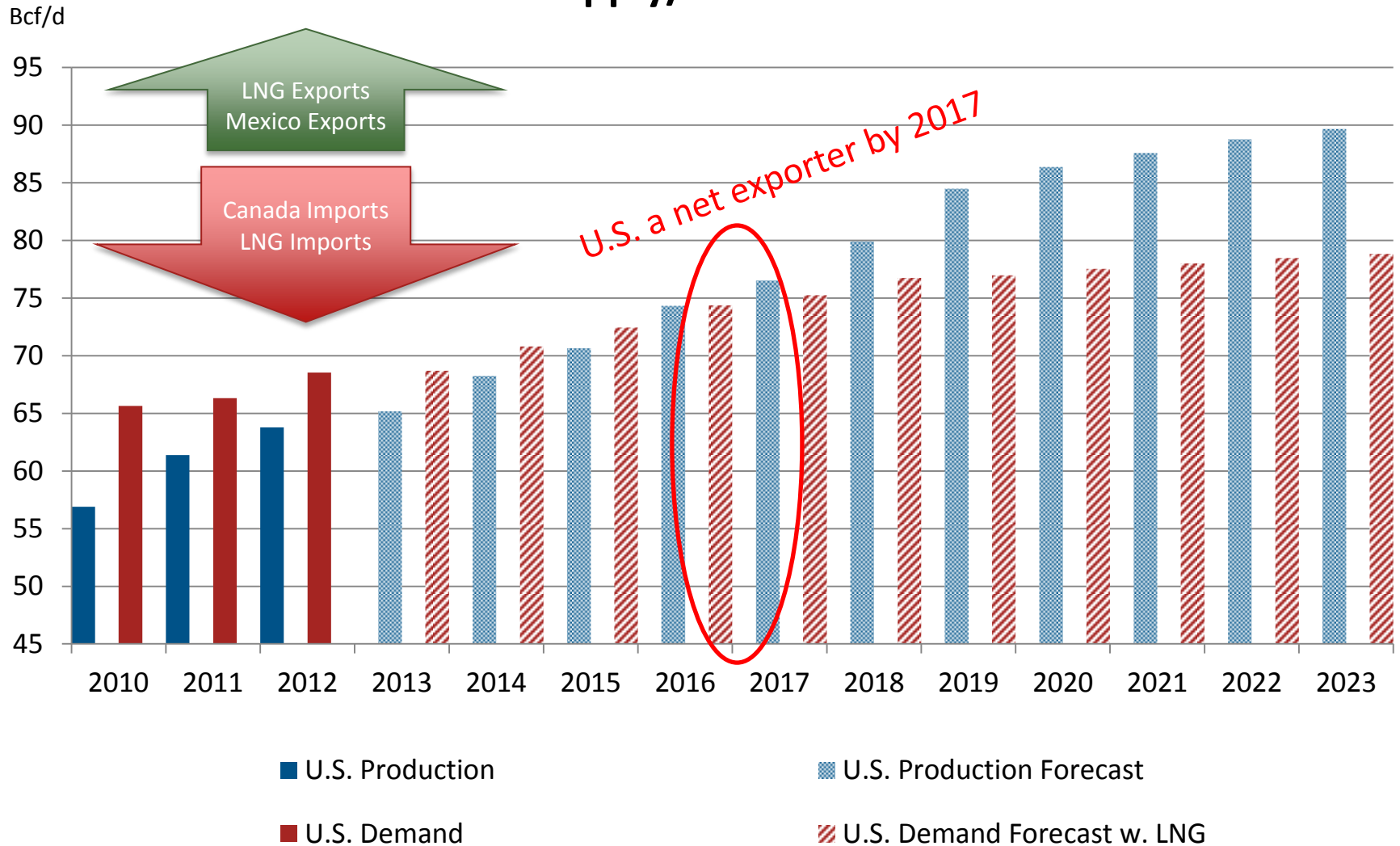
North American LNG exports will average 10.32 Bcf/d (77 mtpa) in 2023



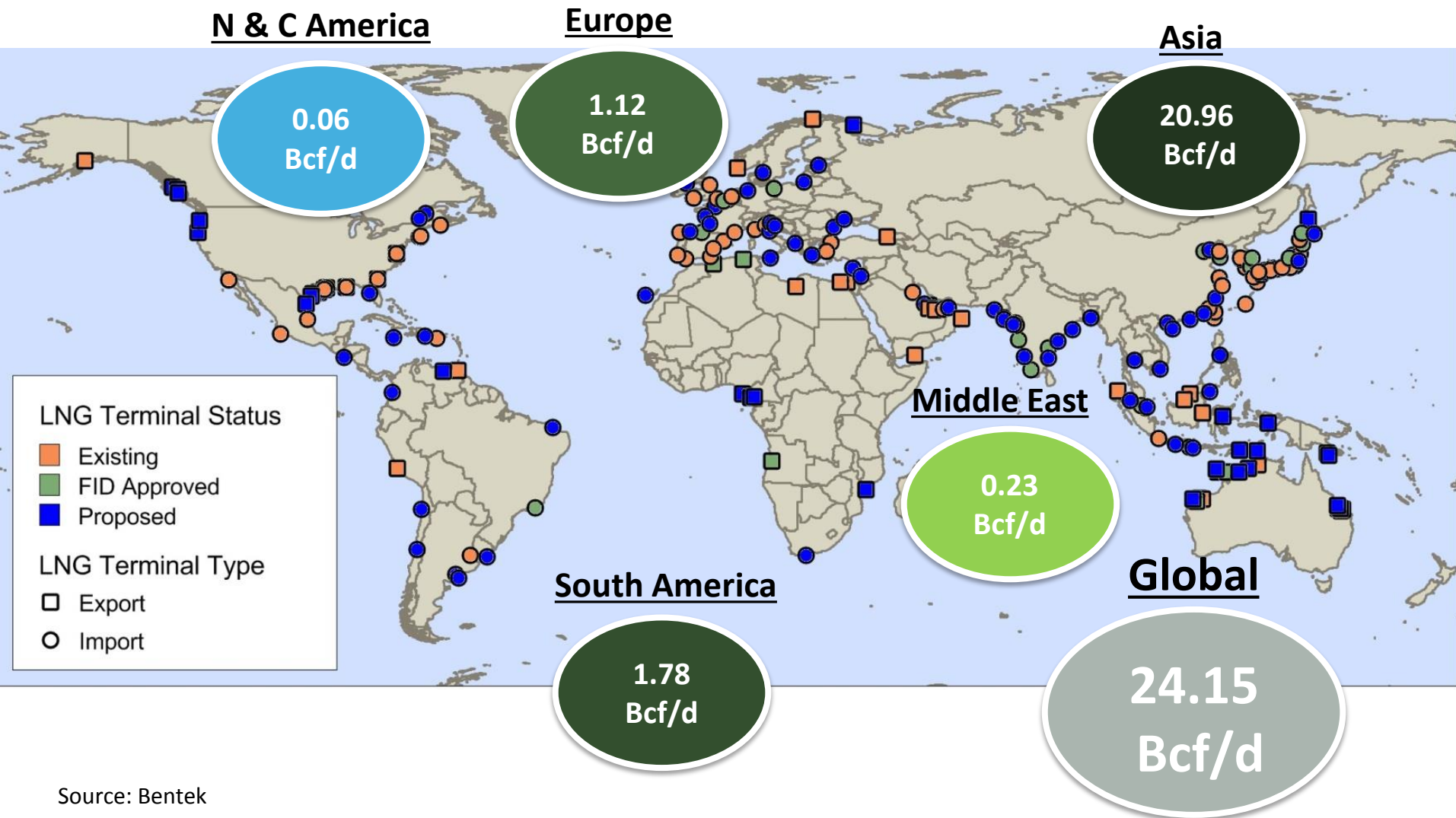
Source: Bentek

# U.S Market Continues to Lengthen U.S. Net Exporter by 2017

## U.S. Supply/Demand Balance



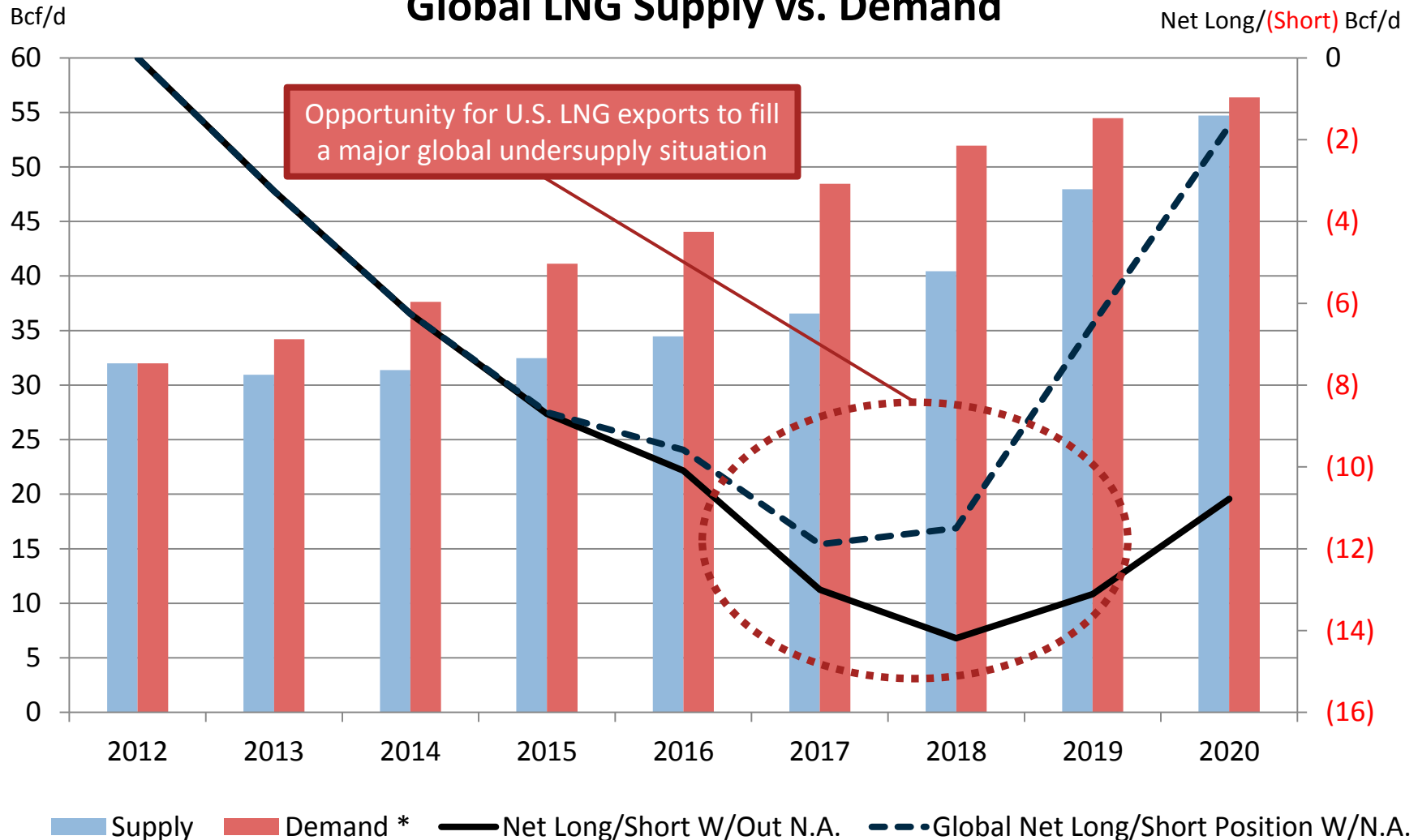
# Global LNG Demand Growth: 2012-2020



Source: Bentek

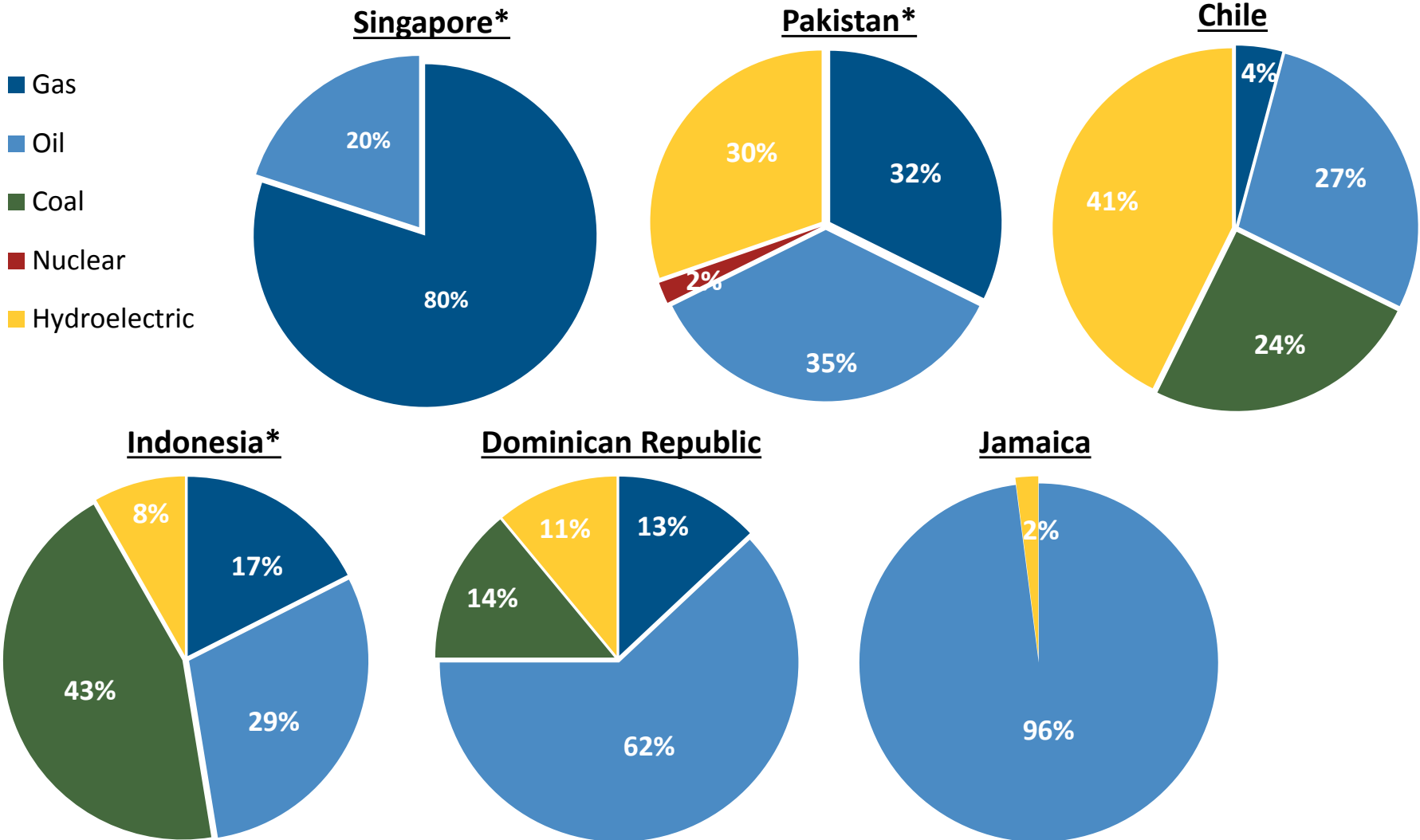
# N.A. LNG Exports Help Balance LNG Market By 2020

## Global LNG Supply vs. Demand



\*Demand theoretical (i.e. without supply constraints)

# LNG Imports to Take Larger Share of Power Generation Mix



Source: Bentek

\*Note: Countries new to importing LNG

- U.S. gas production growth based on shale gas development has outpaced demand growth and caused a decline in prices, generating opportunities for North American Exports
- Base Case BENTEK NA Exports Forecast: 6 U.S. Projects, 3 Canadian Projects, total NA exports will average 77 mtpa (10.32 Bcf/d) in 2023; 70.5 mtpa (9.4 Bcf/d) under contract
- U.S. to become net gas exporter by 2017 and help balance the global market, as demand growth continues upward driven by Asia.
- As a result of increased LNG exports, gas is expected to make up a larger share of the power generation mix at the expense of expensive and relatively “dirtier” fuels such as oil and coal.

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