

# Growth in Appalachian hydrocarbon gas liquids production leads to downstream investment



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*For:*

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## EIA products help to shape the conversation

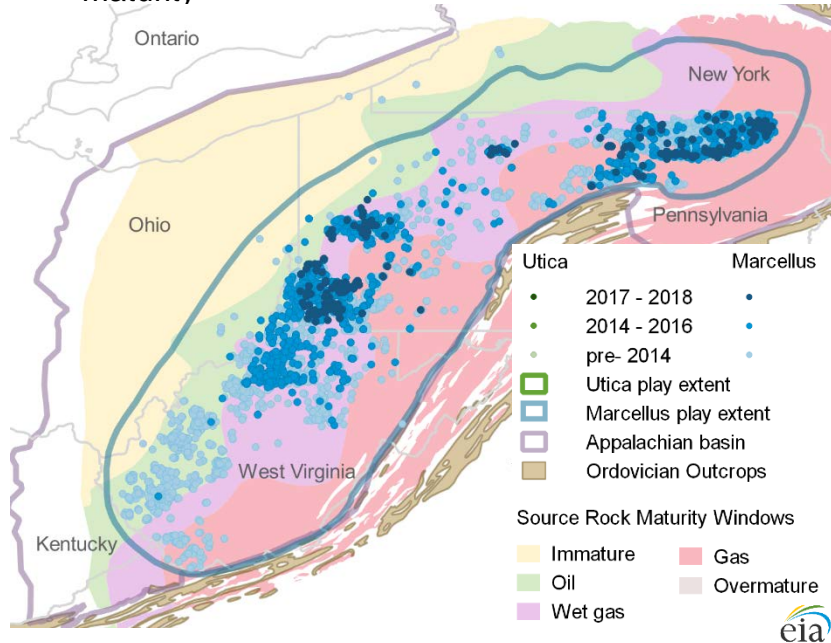
- EIA's Energy Mapping System provides data on U.S. energy infrastructure, including pipelines, terminals, refineries, gas plants, and petrochemical crackers
- EIA's tabulation of production data enables tracking of growth in natural gas and natural gas plant liquids (NGPL) production in the region and around the country
- Forecasting products, including the Short Term Energy Outlook (STEO) and the Annual Energy Outlook (AEO), provide insights into future trends and opportunities for consideration in long-term planning and investment
- EIA data tabulation of movements by pipelines, barges, and rail illustrate how the U.S. energy market balances production with demand
- Providing state-level supply and consumption data and estimates make more granular information available to consumers and local decision-makers
- Today In Energy articles educate and bring issues into focus, like our series on Appalachia natural gas developments

## Key takeaways

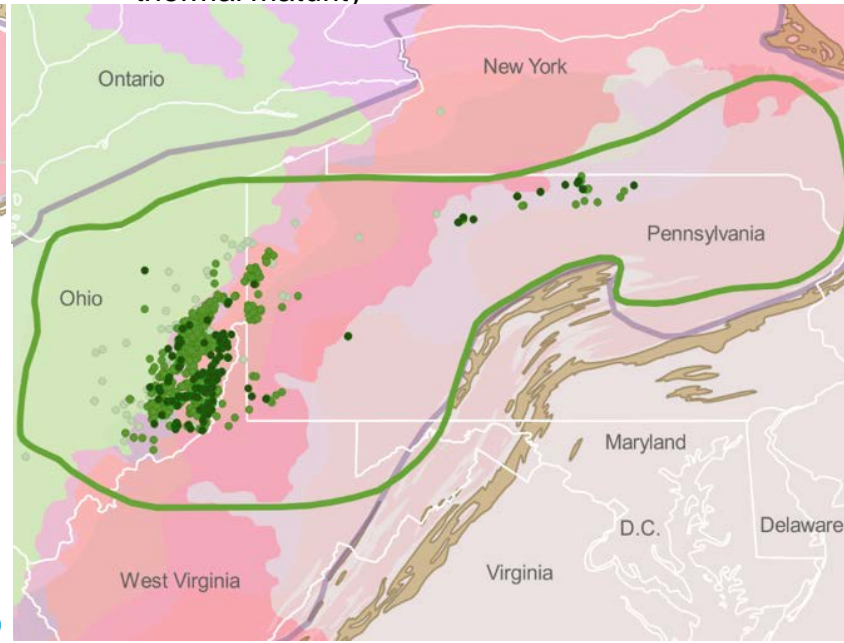
- EIA's coverage of Appalachian production growth is comprehensive
  - Current analytical and modeling work includes detailed well data
  - Monthly production statistics for natural gas and crude oil are collected and reported at the state level
  - Tables splitting out alkanes and olefins in hydrocarbon gas liquids (HGL) data provide clearer picture of the market
  - HGL-by-rail movements at the PADD level generate improved balances
- Improved forecasting tools round out the regional picture
  - AEO2018 features projections for region-level NGPL production
  - Drilling Productivity Report provides near-term outlook for drilling activity and production

# The Appalachian basin has favorable geological characteristics to remain a producing region for the long haul

Marcellus wells through February 2018 and thermal maturity



Utica-Point Pleasant wells through February 2018 and thermal maturity



WV drilling data through Dec. 2016 only; annual data released 7 months after year-end.

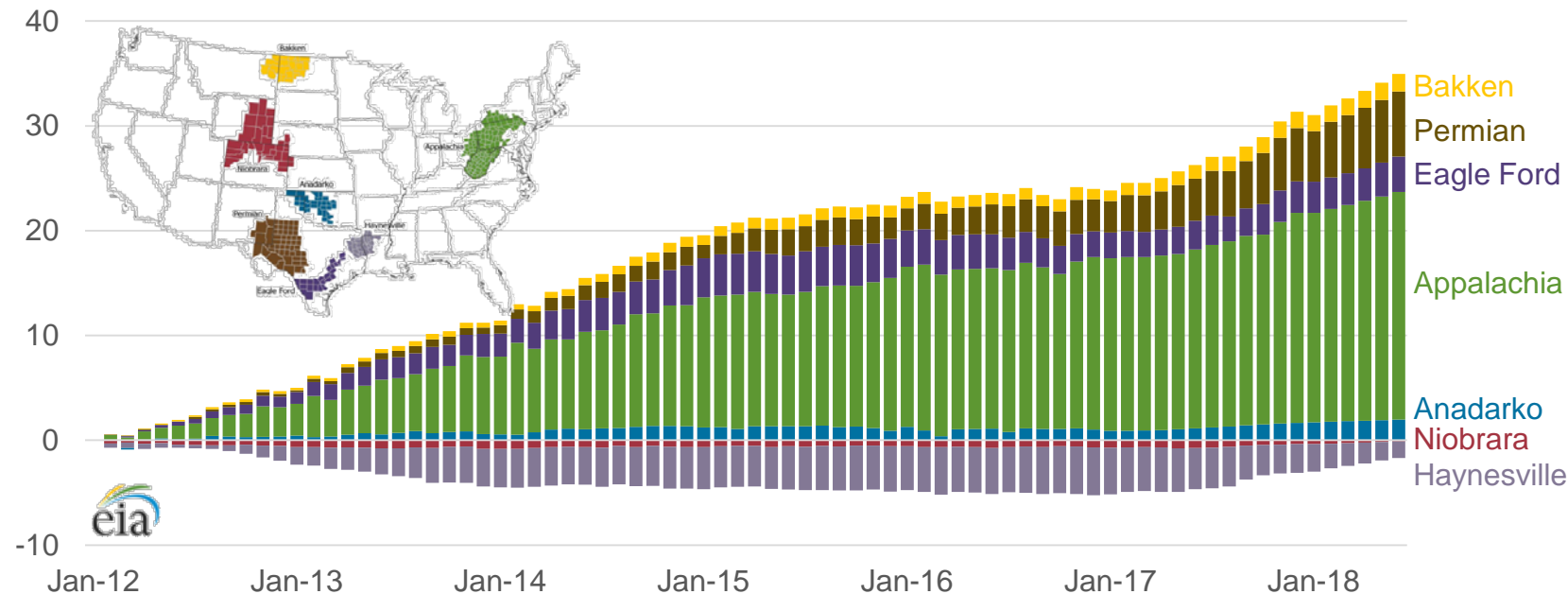
OH drilling data through Dec. 2017; quarterly data released 3 months after quarter end.

Sources: EIA; DrillingInfo, Inc.; Appalachian Oil & Natural Gas Research Consortium; U.S. Geological Survey

# Since January 2012, the Appalachia region has accounted for 65% of increases in natural gas production from major shale regions

cumulative change in natural gas production since January 2012

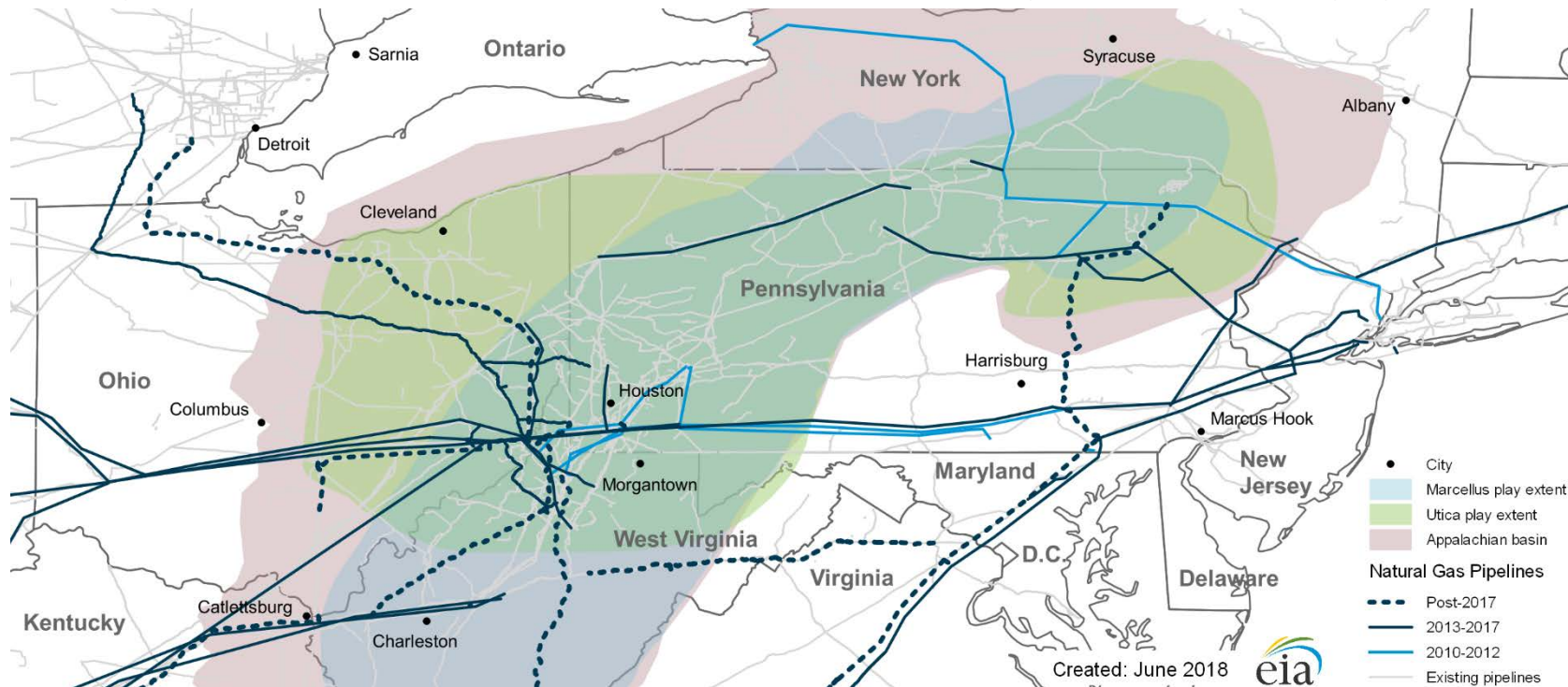
billion cubic feet per day



Source: U.S. Energy Information Administration, [Drilling Productivity Report](#), May 14, 2018

# Moving dry gas out of the Appalachian region is becoming easier, with outbound pipeline capacity rising four-fold since 2010

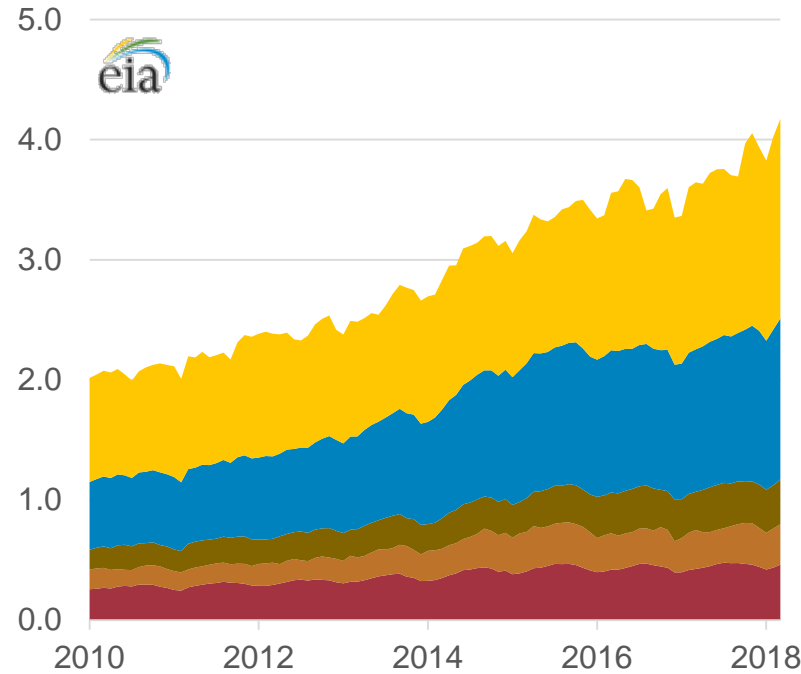
Natural gas pipelines in the northeastern United States built to move natural gas out of the producing region



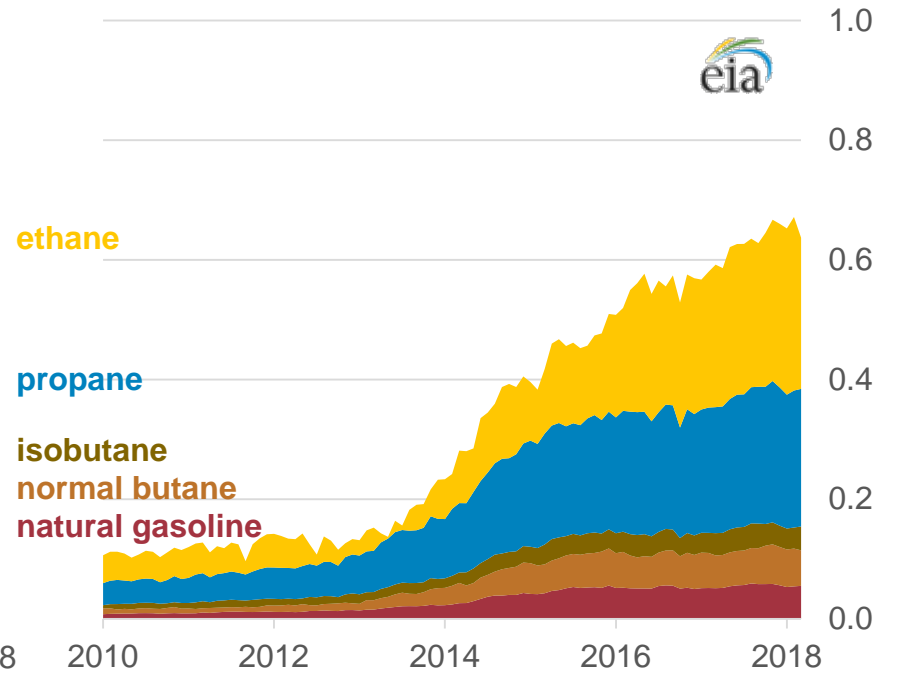
Source: EIA Natural Gas Dry Production; [Northeast region slated for record natural gas pipeline capacity buildout in 2018](#)

# Since January 2010, NGPL production doubled in the U.S. and grew six-fold in Appalachia

U.S. NGPL production  
million b/d



Appalachia (KY, OH, PA, WV) NGPL production  
million b/d



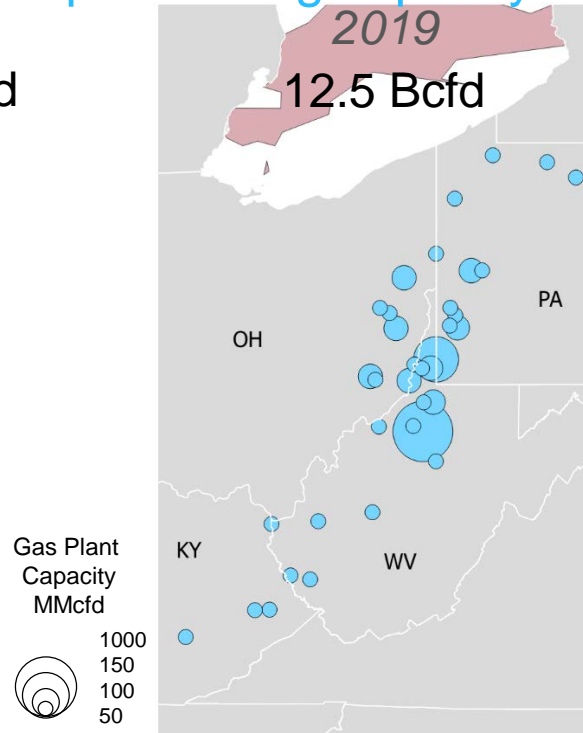
Source: [U.S. Natural Gas Plant Field Production](#); [Appalachian No. 1 NGP Field Production](#) + [IN,IL,KY NGP Field Production](#), data to Mar. 2018

# Significant midstream investment in the region allows production to grow

## Natural gas processing capacity

2010

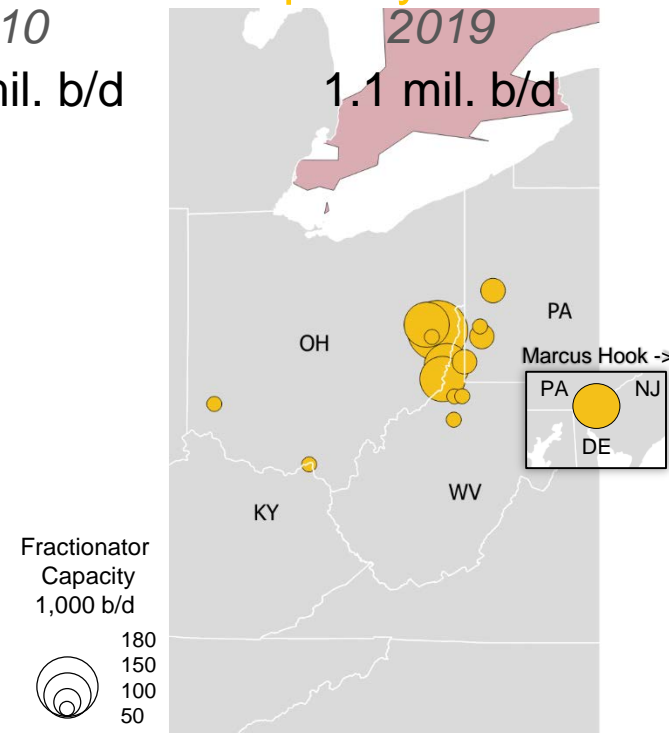
1.1 Bcfd



## Fractionation capacity

2010

0.04 mil. b/d



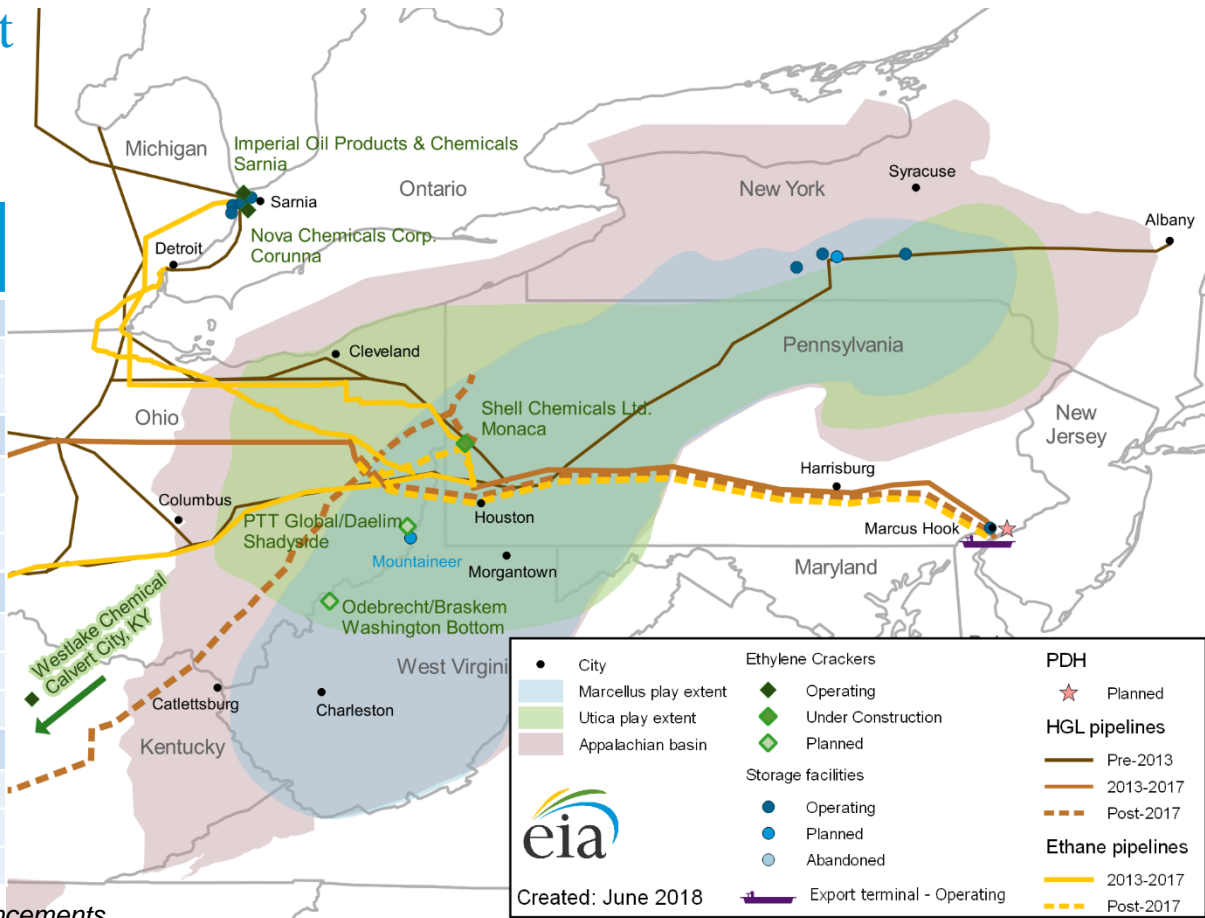
Source: U.S. Energy Information Administration [EIA-757 Data](#); Company public filings and press releases; [Appalachian natural gas processing capacity key to increasing natural gas, NGPL production](#)



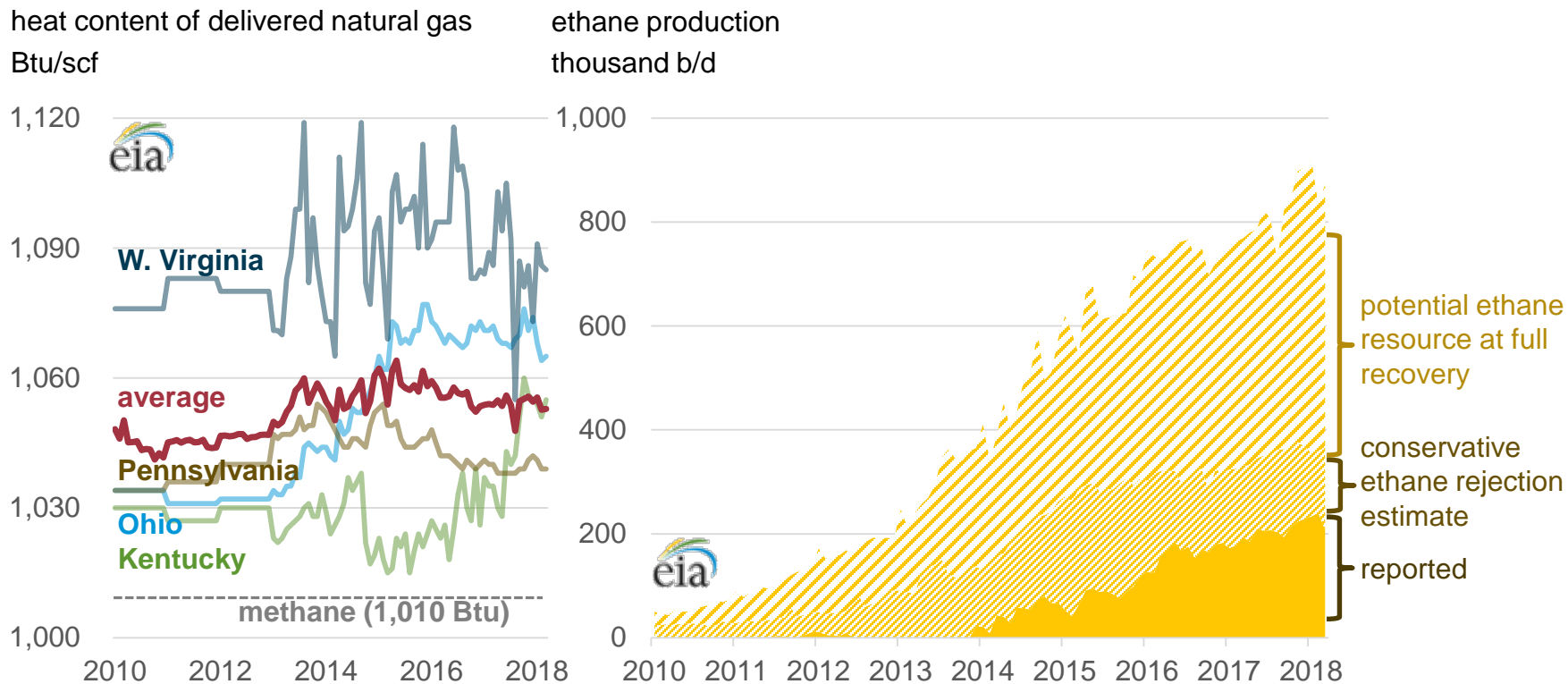
# Projects to ship HGL out precede development of in-region demand

HGL pipeline	Throughput (1,000 b/d)	Start
<b>To Canada</b>		
Mariner West	50	2013 Q4
Utopia East	50	2018 Q1
<b>To U.S. Gulf Coast</b>		
ATEX	125	2014 Q1
ATEX expansion	25	2017 Q4
UMTP	430	2019+
<b>To overseas export markets</b>		
Mariner East	70	2015 Q3
Mariner East II	275	2018 Q3
Mariner East IIx	250	2019 Q2
<b>To local market</b>		
Teppco	60	2014 Q1
Cornerstone	100	2016 Q4
Falcon (Shell)	107	±2020

Source: EIA, company filings and public announcements



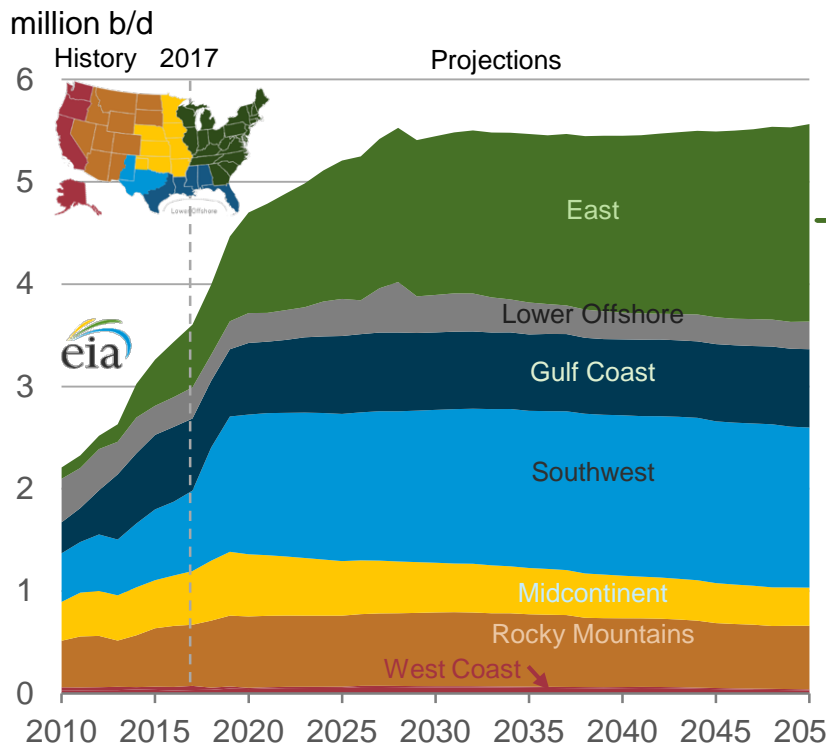
# Gas quality data suggests the resource potential, especially for ethane, is above rates of current Appalachian production



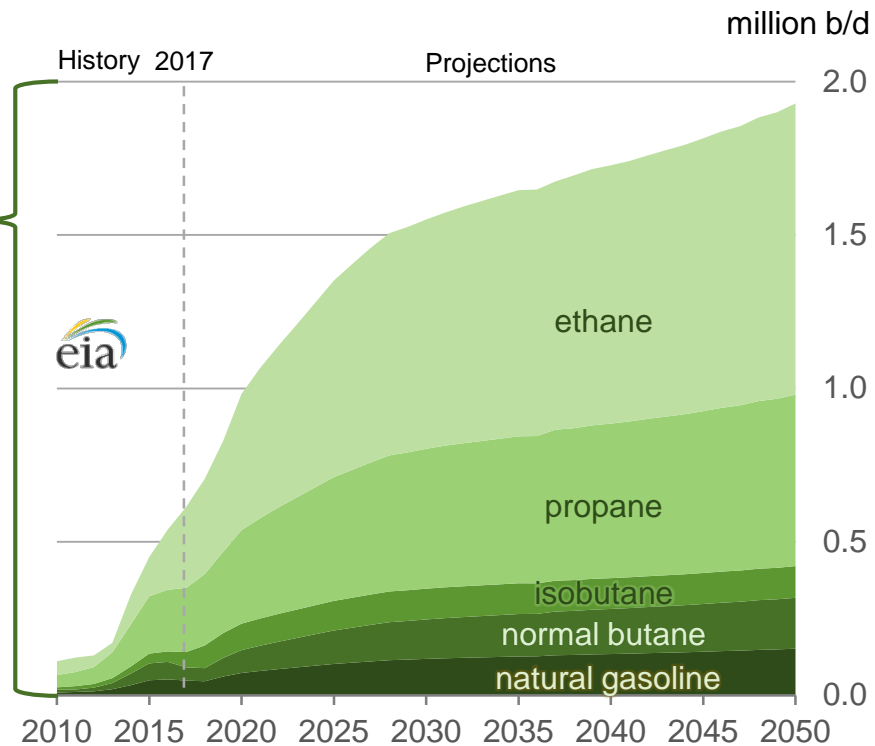
Source: EIA [Heat Content of Natural Gas Consumed](#); [Natural Gas Gross Withdrawals and Production](#); [Natural Gas Plant Field Production](#)

# EIA's AEO projects the East region to produce 35% of total U.S. NGPL production, with ethane accounting for half of that production

U.S. annual NGPL production by region



East Region annual NGPL production by product



Source: EIA AEO; [Natural gas plant liquids production reaches new annual record in 2017, with projected continued growth](#)

## For further reading...

### Today in Energy

[https://www.eia.gov/todayinenergy/index.php?tg=HGL%20\(hydrocarbon%20gas%20liquid\)](https://www.eia.gov/todayinenergy/index.php?tg=HGL%20(hydrocarbon%20gas%20liquid))

### Energy by rail data

[https://www.eia.gov/dnav/pet/pet\\_move\\_railNA\\_a\\_EPLLPA\\_RAIL\\_mbbbl\\_m.htm](https://www.eia.gov/dnav/pet/pet_move_railNA_a_EPLLPA_RAIL_mbbbl_m.htm)

### *Short-Term Energy Outlook (STEO)*

<https://www.eia.gov/outlooks/steo/>

### Energy Explained: *Hydrocarbon Gas Liquids*

[http://www.eia.gov/energyexplained/index.cfm?page=hgls\\_home](http://www.eia.gov/energyexplained/index.cfm?page=hgls_home)

### State Energy Data Portal

<https://www.eia.gov/state/>

### *Drilling Productivity Report*

<http://www.eia.gov/petroleum/drilling/>

### EIA Annual Conference

<https://www.eia.gov/conference/2018/>