

# Recent trends in the North American NGL Market

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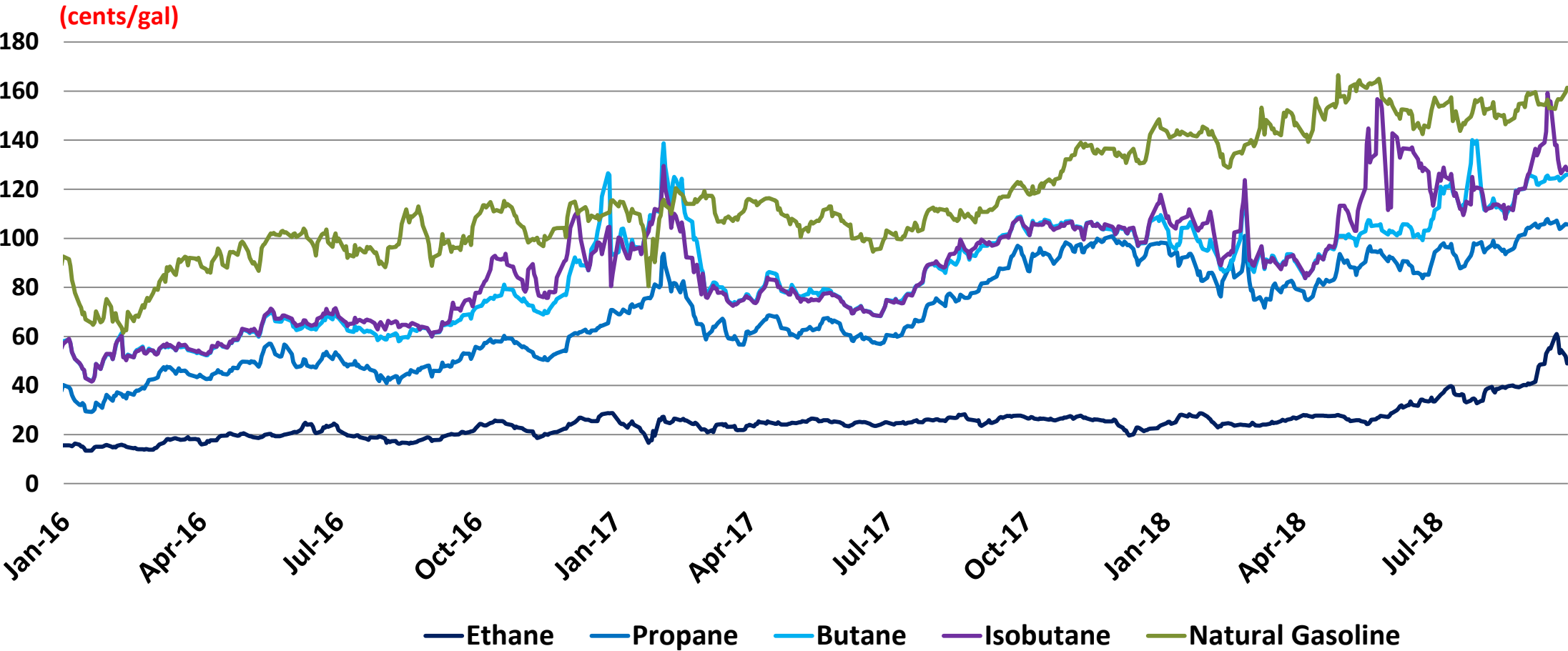


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**S&P Global**  
Platts

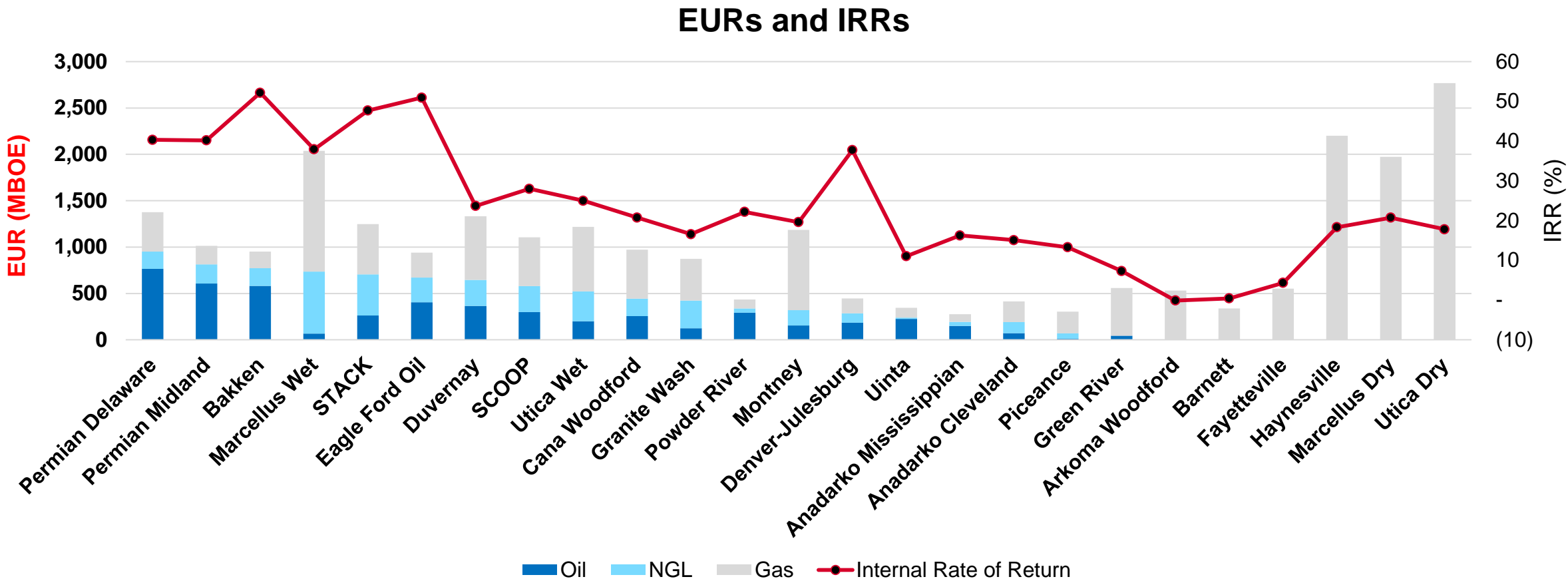
# Petchem demand driving global LPG demand and price strength; infrastructure constraints squeeze prices higher, especially ethane.

NGL PURITY PRODUCT PRICES AT MONT BELVIEU



Source: Platts Analytics

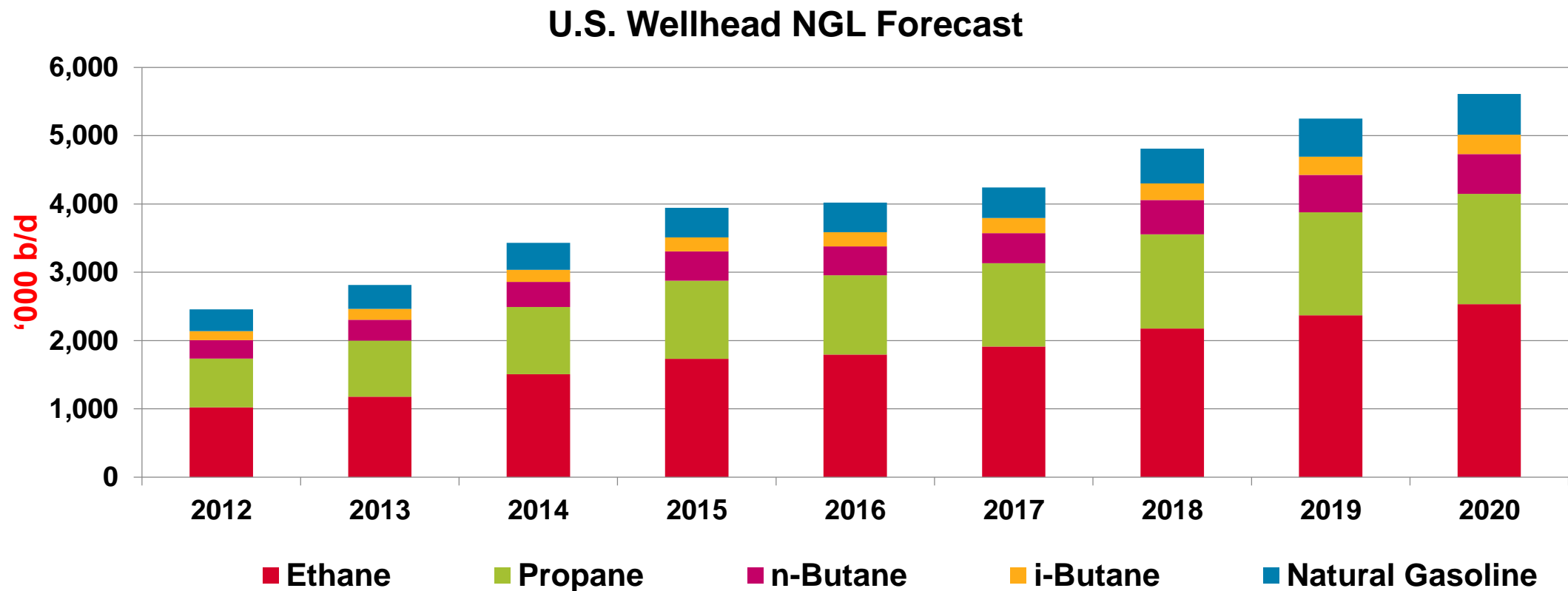
# North American drilling activity driven by liquids value



Source: S&P Global Platts Analytics

\*sorted by sum of oil and NGL EURs.

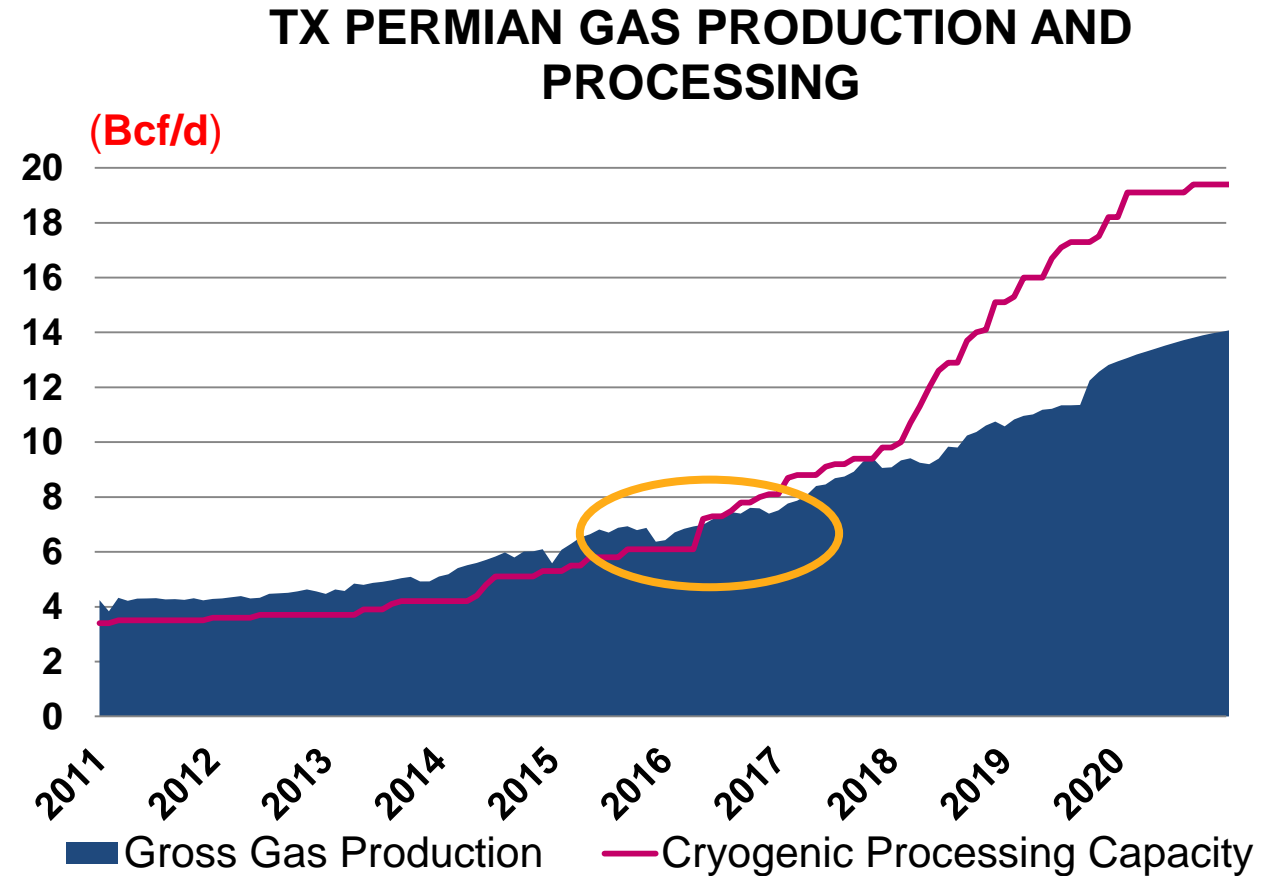
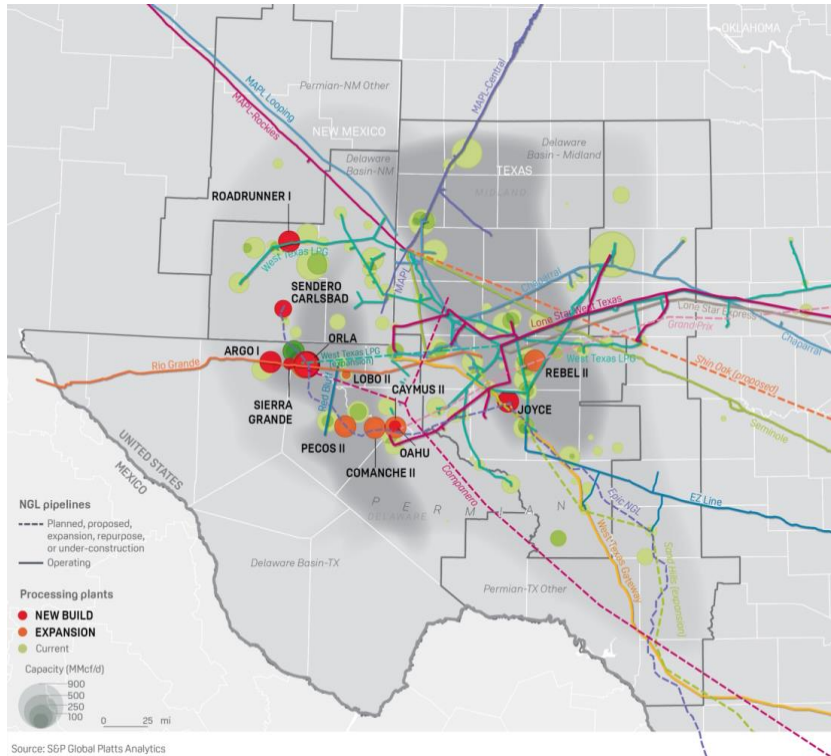
# US NGL supply grew five percent in 2017, with production forecast to grow by 12% in 2018.



Source: Platts Analytics

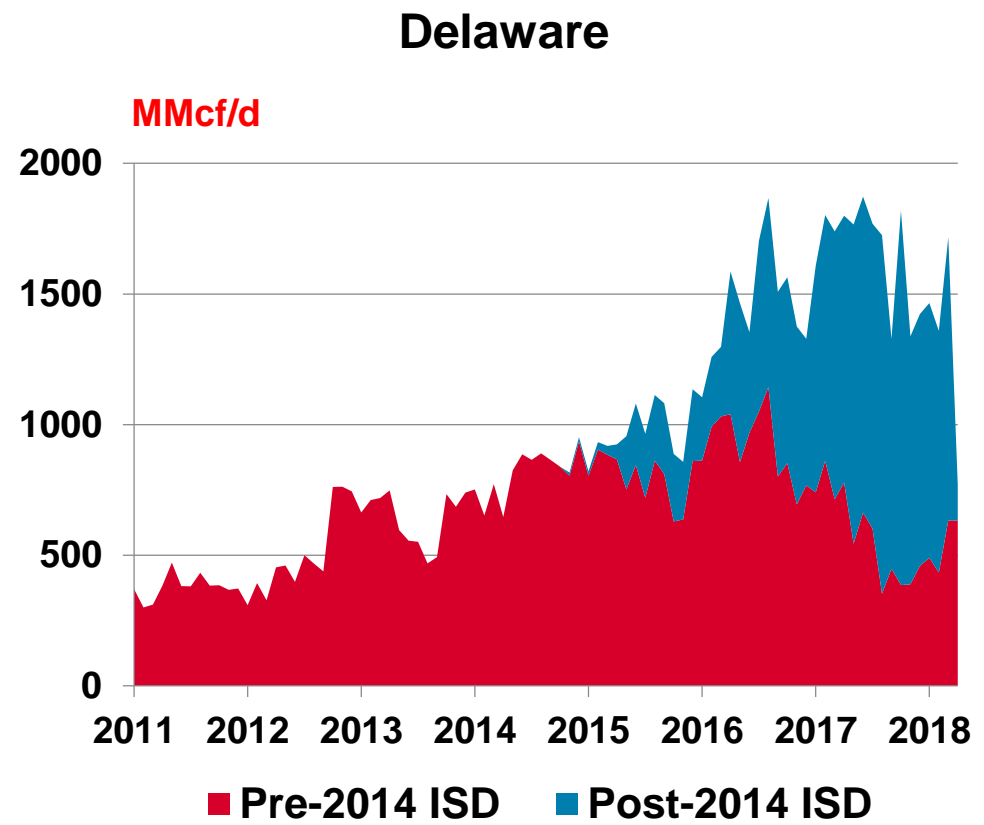
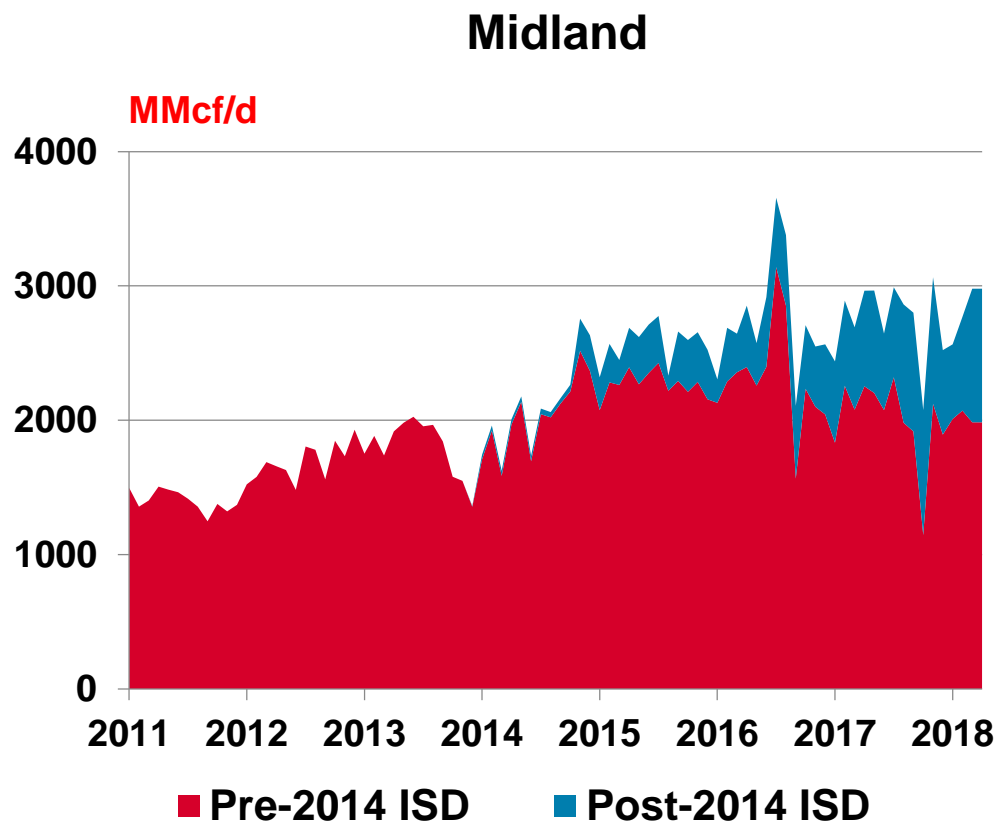
# Infrastructure and its impact on ethane prices

**13 plants (2.4 Bcf/d) in TX Permian in 1H18, 17 plants + expansions (2.95 Bcf/d) by end 2018.**



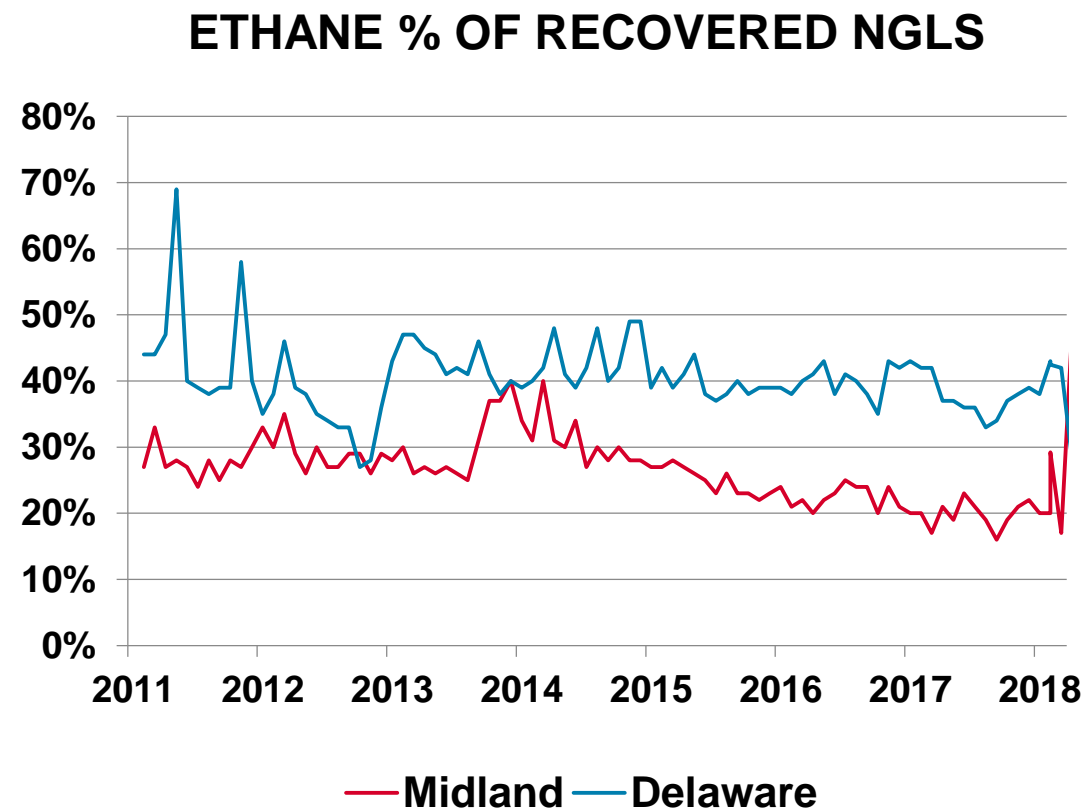
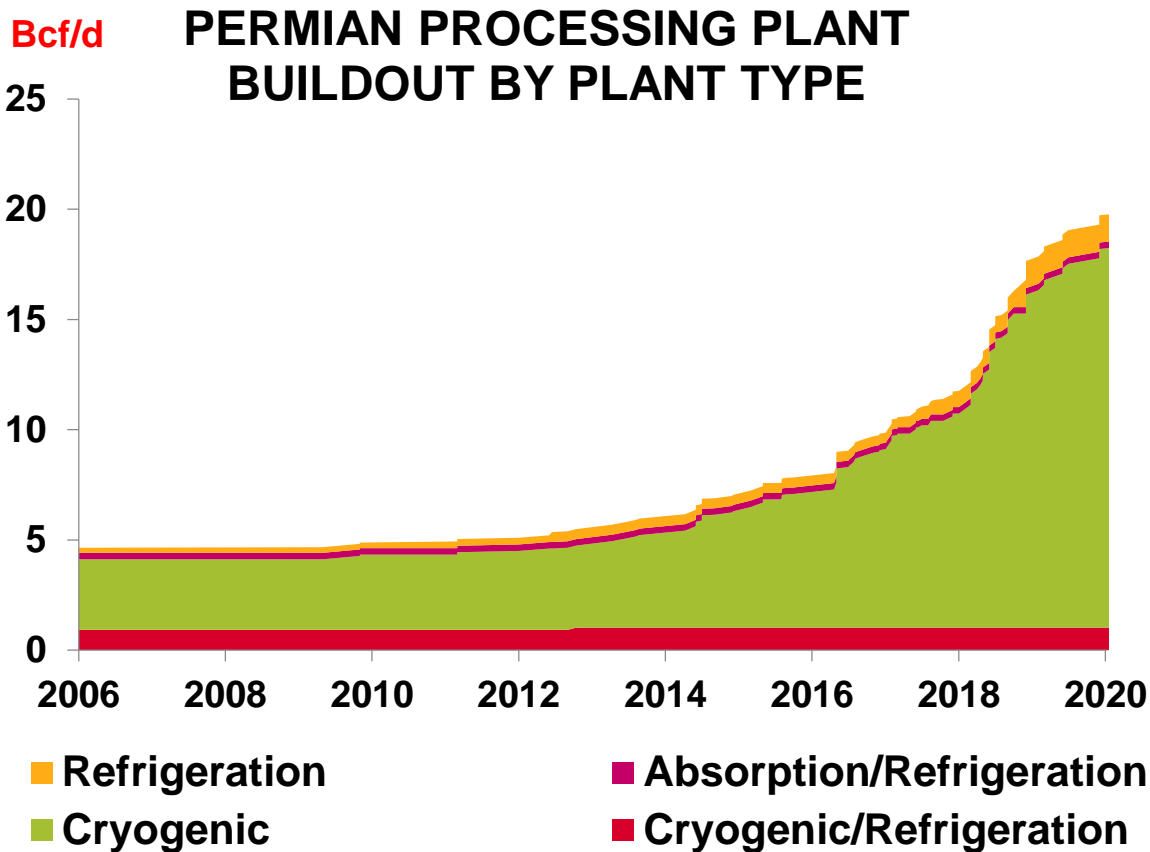
**Source: Platts Analytics**

# New plants taking a growing share of gas in Permian basin.



Source: Platts Analytics NGL Supply Databanks

# New cryo plant capacity in Permian offers processing upside, particularly for ethane.



Source: Platts Analytics NGL Supply Databanks



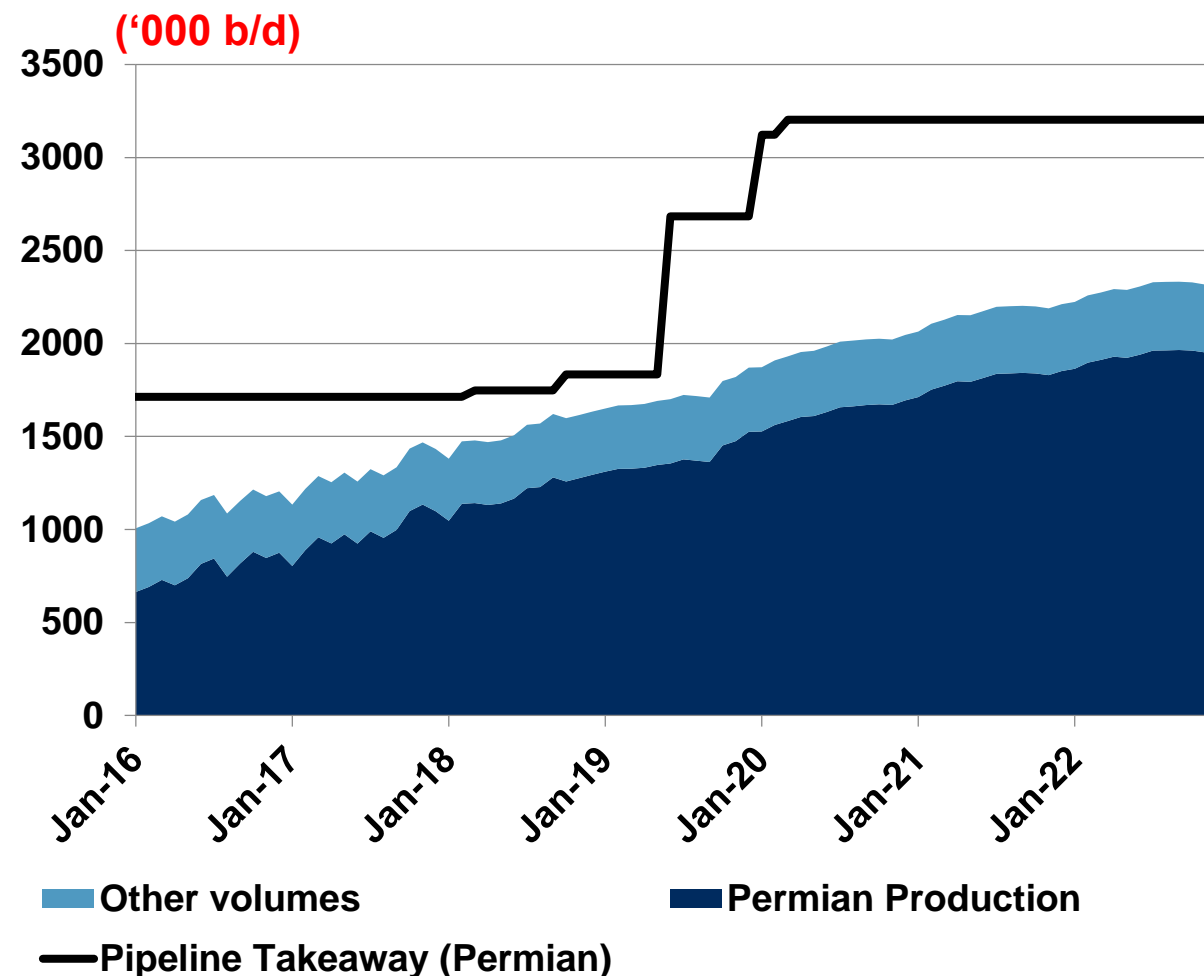
# Permian NGLs could crowd other volumes off pipelines until projects come online.

## PROPOSED PERMIAN NGL PIPELINES

Pipeline	Destination	Capacity	ISD
Sand Hills exp.	Mt. Belvieu	85	3Q18
Shin Oak	Mt. Belvieu	250 550	2Q19
Grand Prix	Mt. Belvieu	300 (550)	2Q19
EPIC Y-grade*	Corpus Christi	220 350 440 (600)	2H19
West Texas LPG exp.	Mt. Belvieu	80	1Q20
Companero	Corpus Christi	300	2020

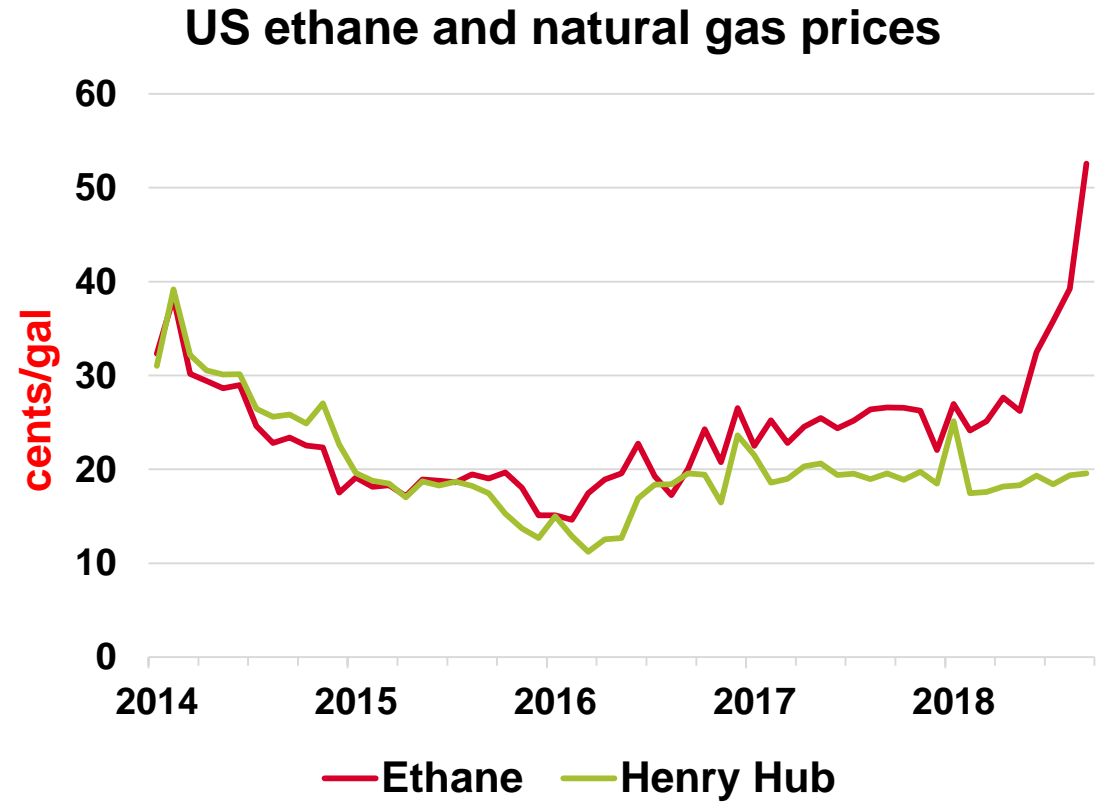
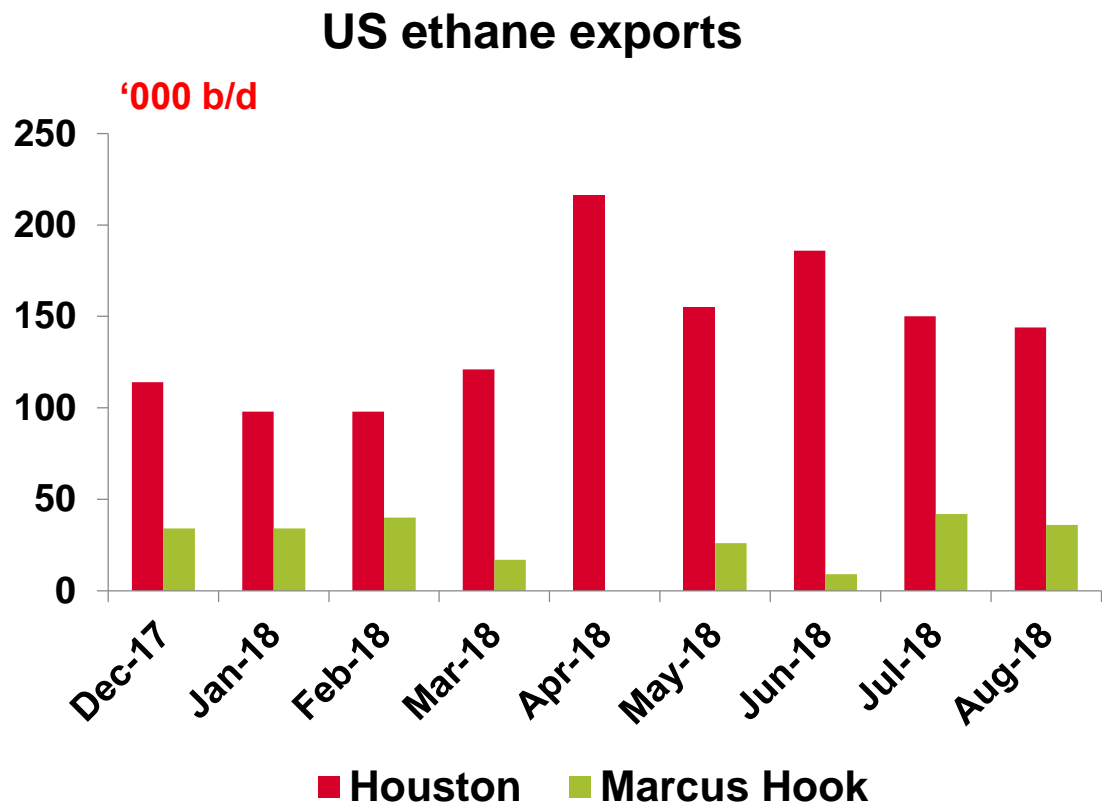
\* Will start in crude service; switch to y-grade by late 2019/early 2020

## PERMIAN NGL PRODUCTION AND TAKEAWAY



Source: Platts Analytics

# Mariner East 1 outage caused increased demand for ethane exports in the USGC.



Source: cFlow, S&P Global Platts, Platts Analytics

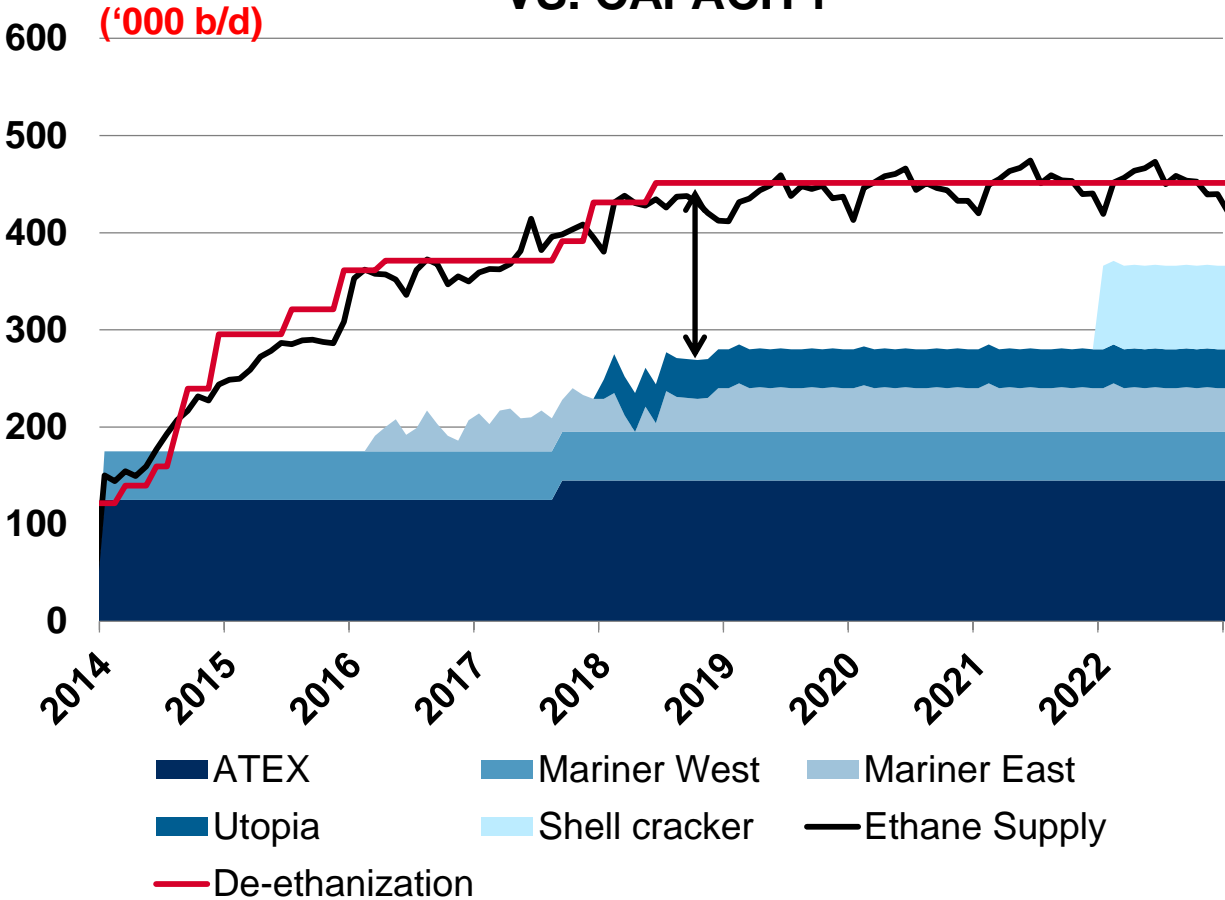
# Northeast ethane recovery steps up with Utopia startup, ATEX expansion, ME2.

NORTHEAST ETHANE DEMAND + TAKEAWAY PROJECTS

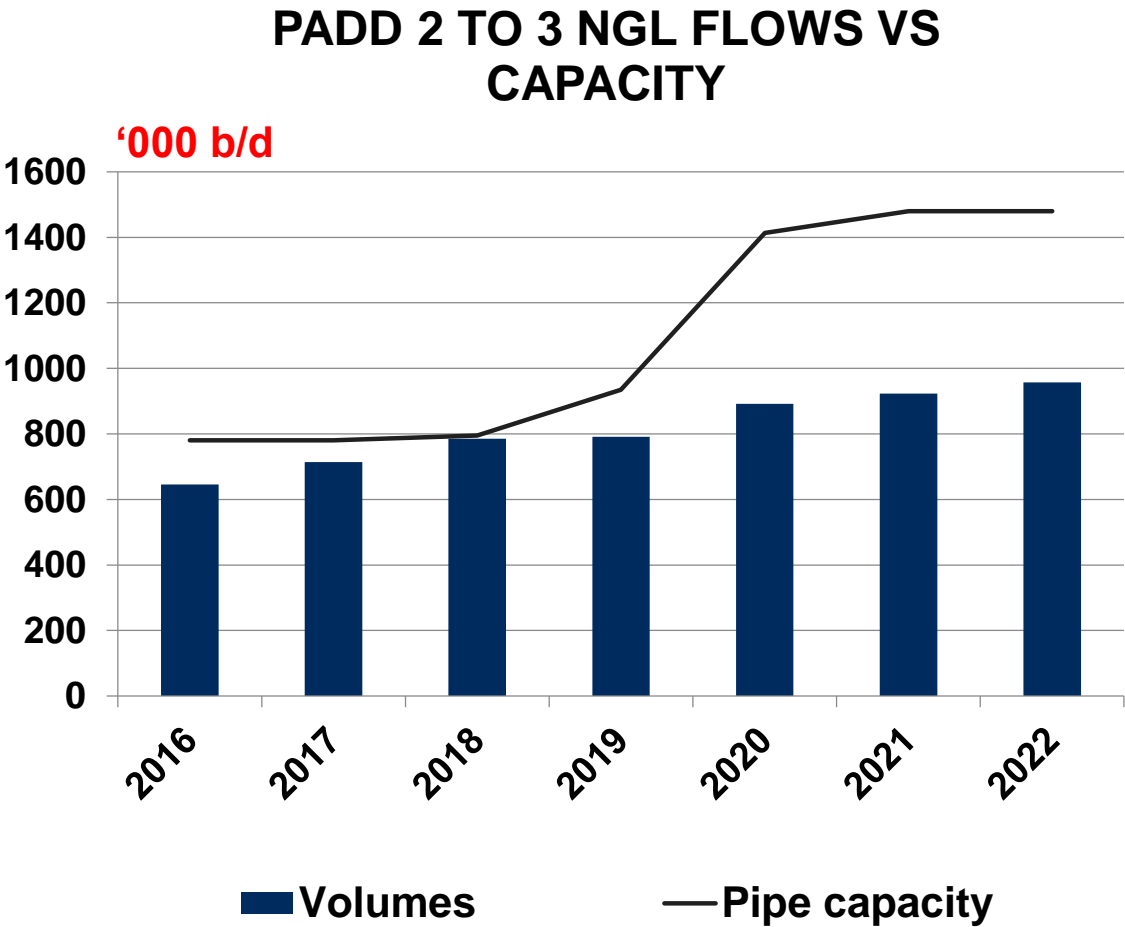
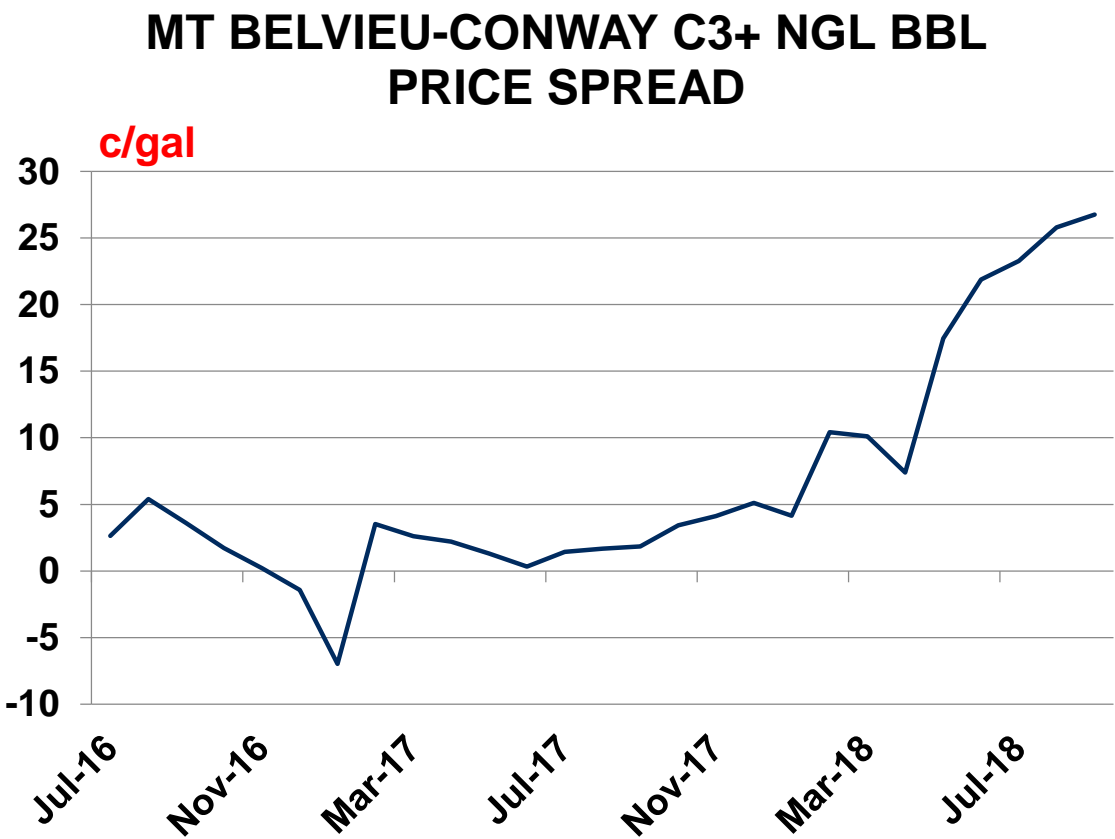
Facility/ Pipe	Destination	Volume	ISD
Utopia	Corunna, ON	40	1/2018
ATEX exp.	Mt. Belvieu, TX	25	1/2018
Mariner East	Marcus Hook, PA	30	2018
Shell cracker	Monaca, PA	86	2022

Source: Platts Analytics

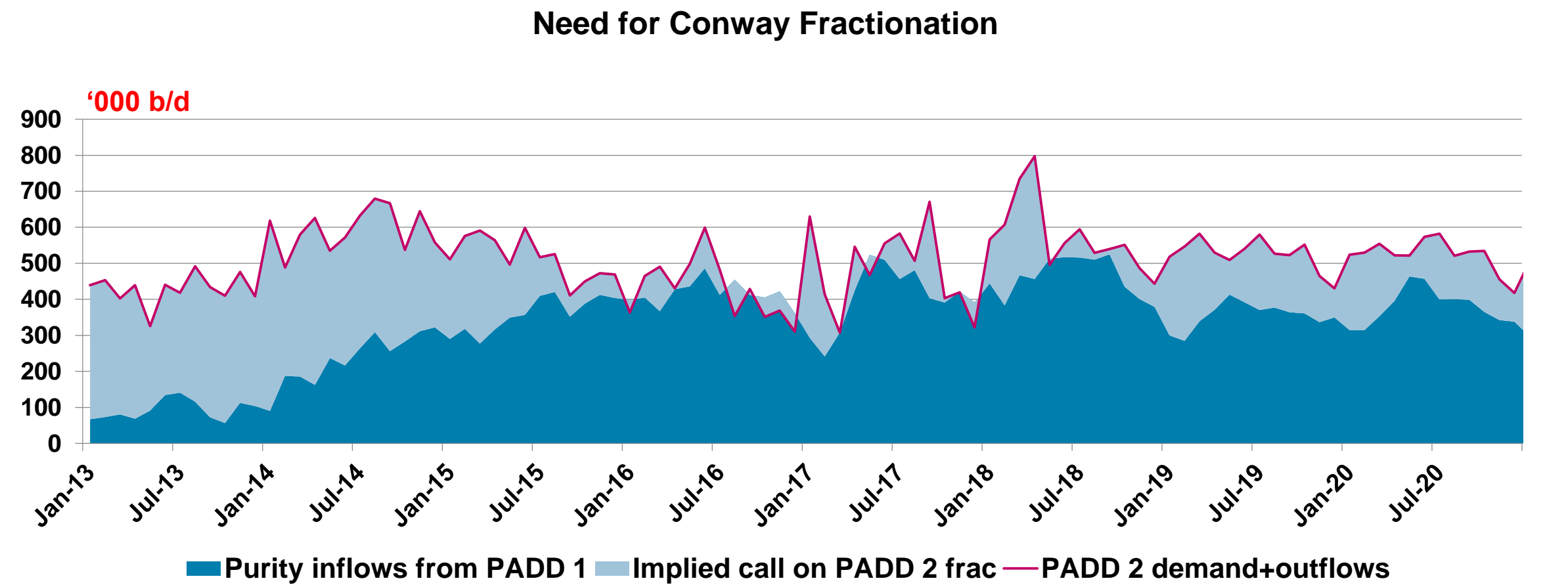
NORTHEAST WELLHEAD ETHANE VS. CAPACITY



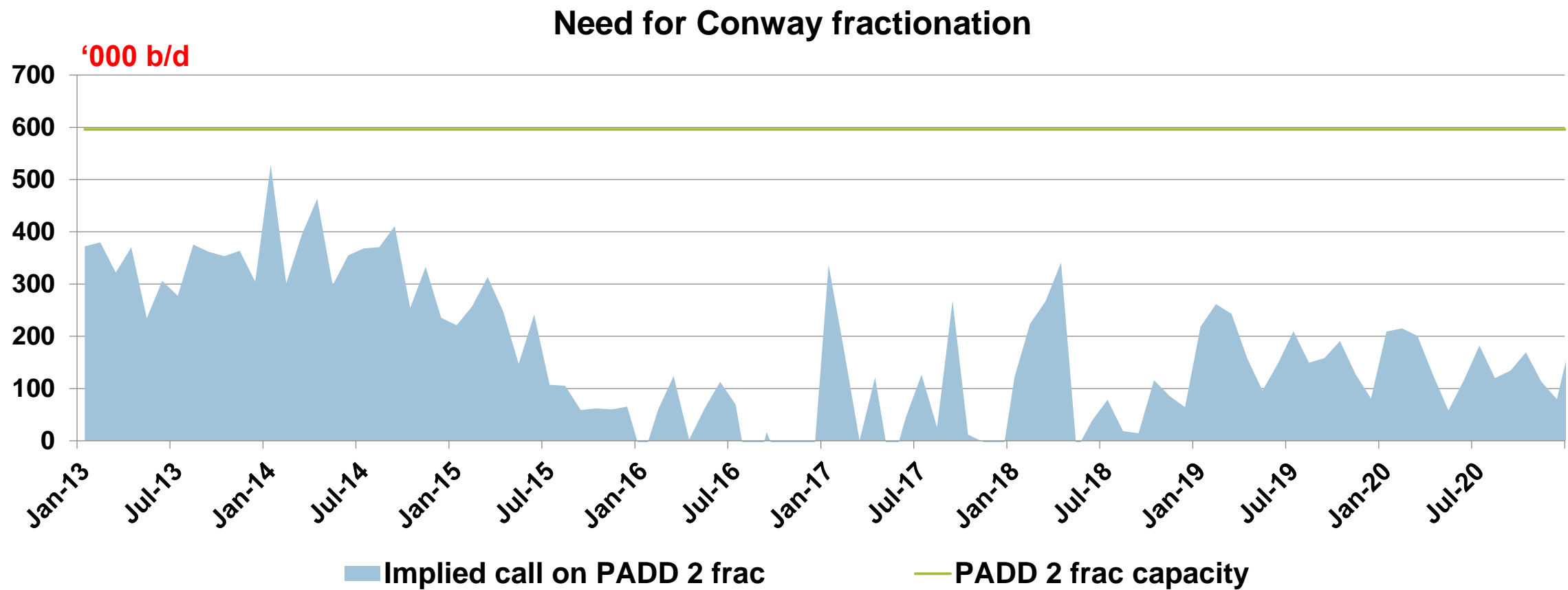
# Are pipelines full between Midcontinent and Mont Belvieu?



# Inflow of product to PADD 2 lowered demand for fractionation—more raw mix through to MB.



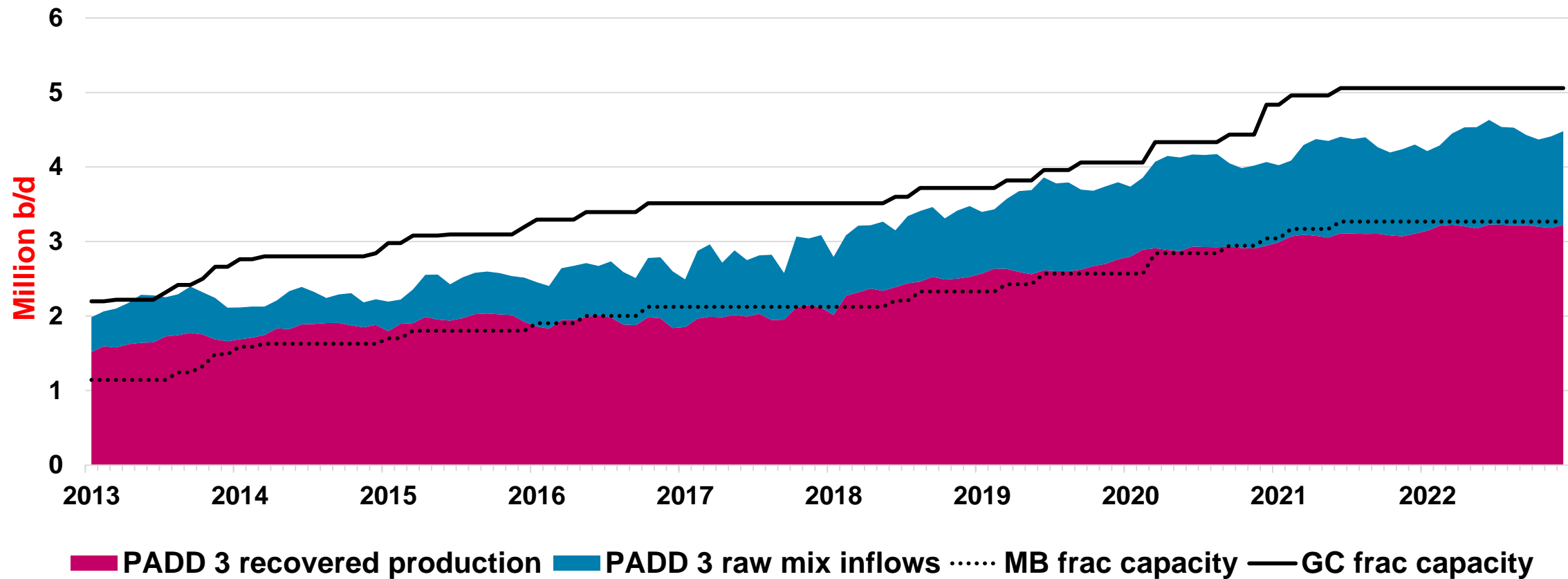
# Inflow of product to PADD 2 lowered demand for fractionation well below capacity.



Source: Platts Analytics

# Despite US supply growth, purity product markets to be squeezed by tight fractionation capacity.

Gulf Coast fractionator utilization

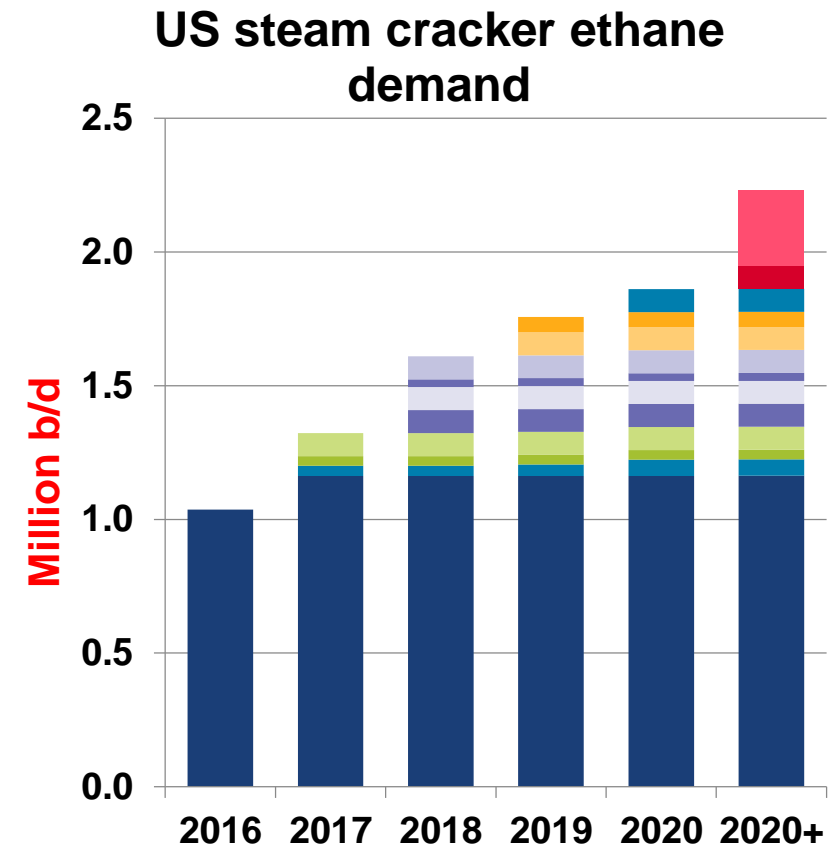
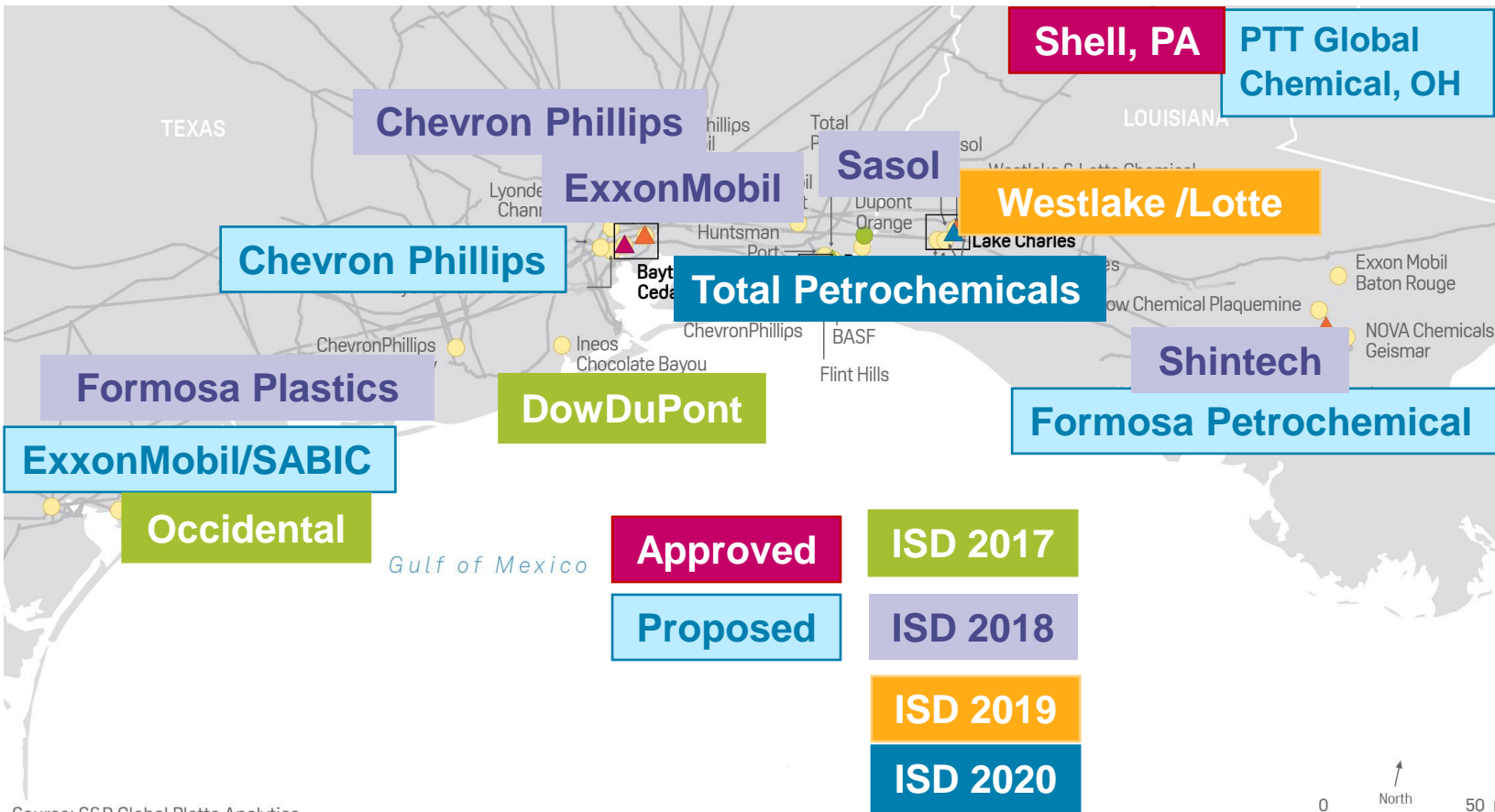


Source: Platts Analytics

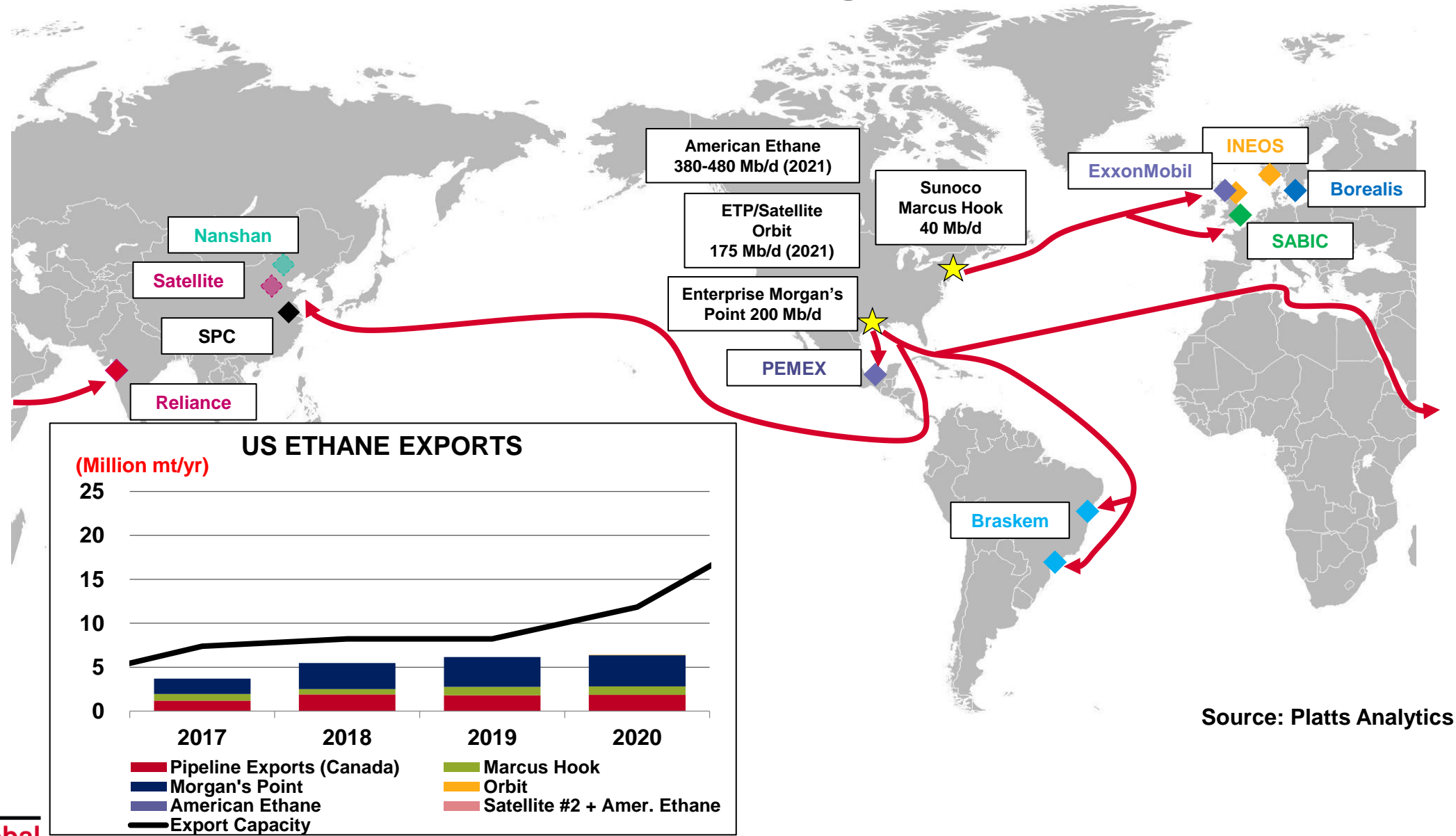
# NGL Demand



# US steam cracker buildout can more than double ethane demand between 2016 and early 2020s.

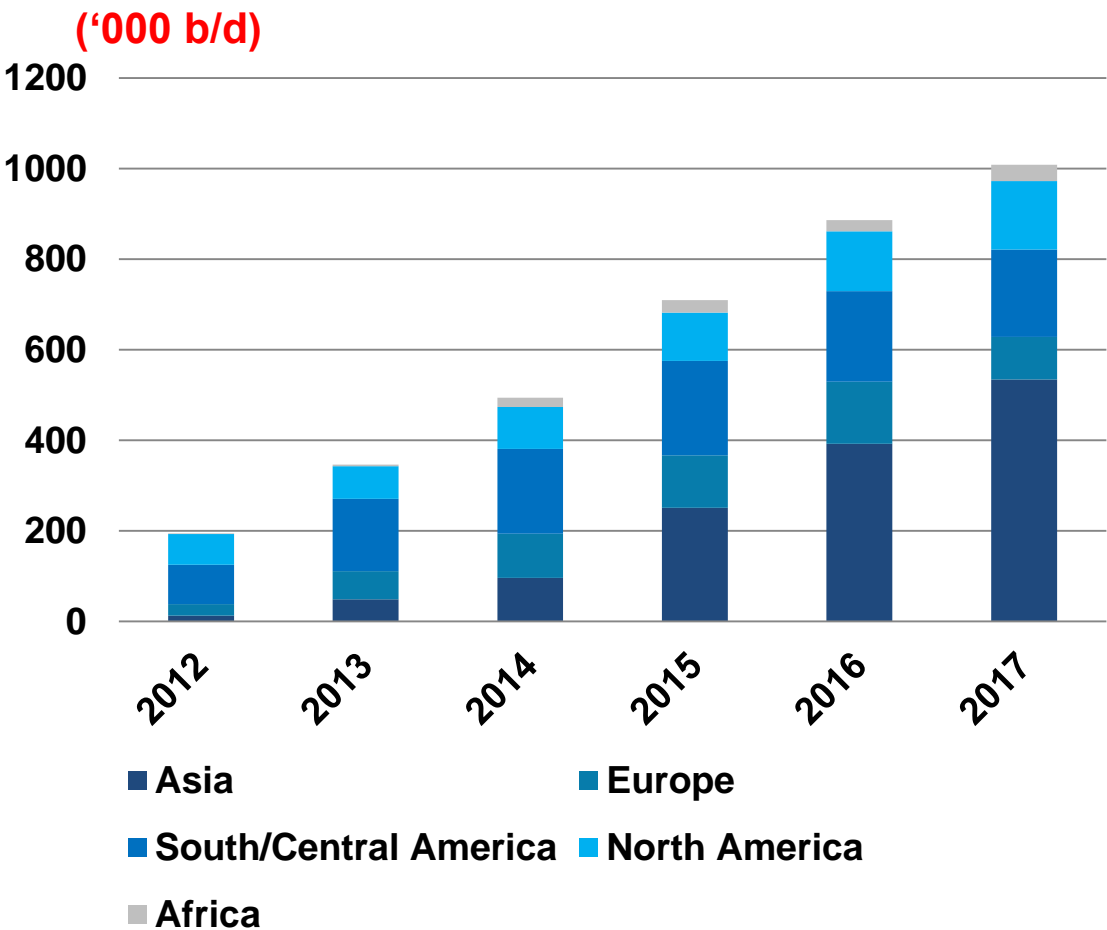


# Surplus US ethane continues to have global appeal.

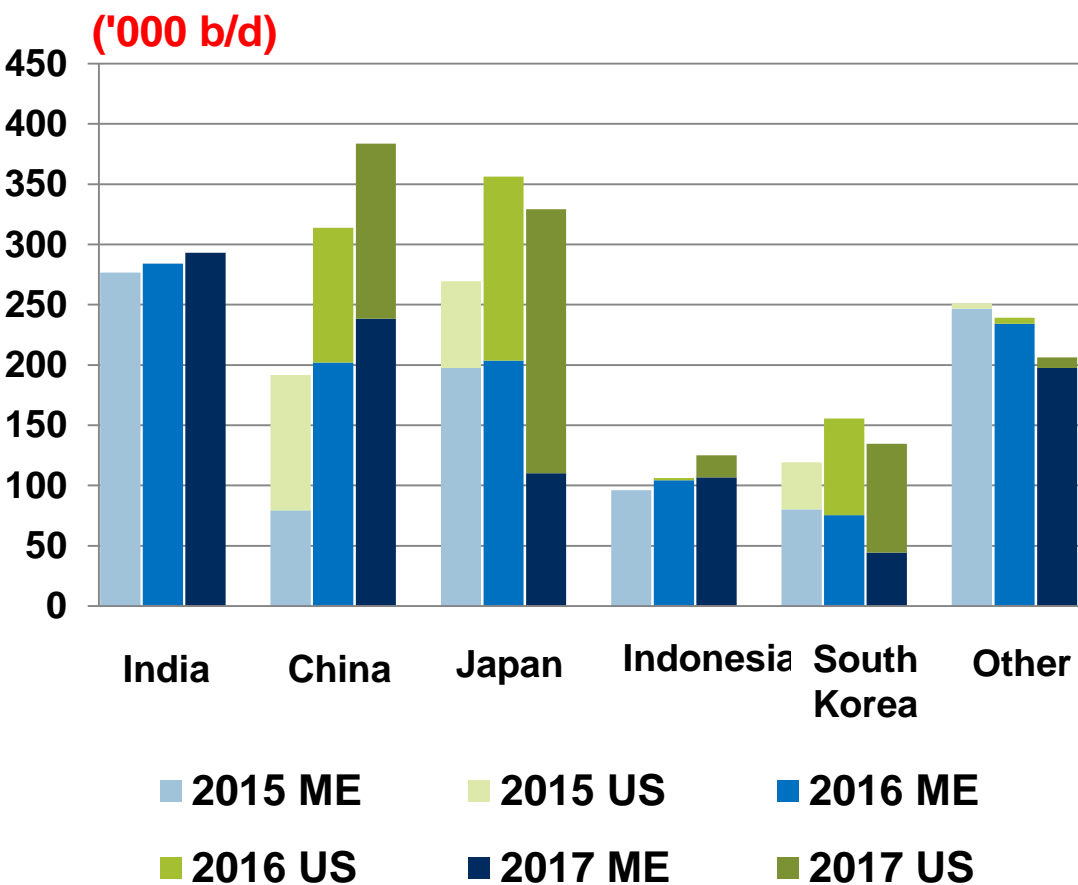


# US LPG exports increasingly bound to (NE) Asia

US LPG exports by destination

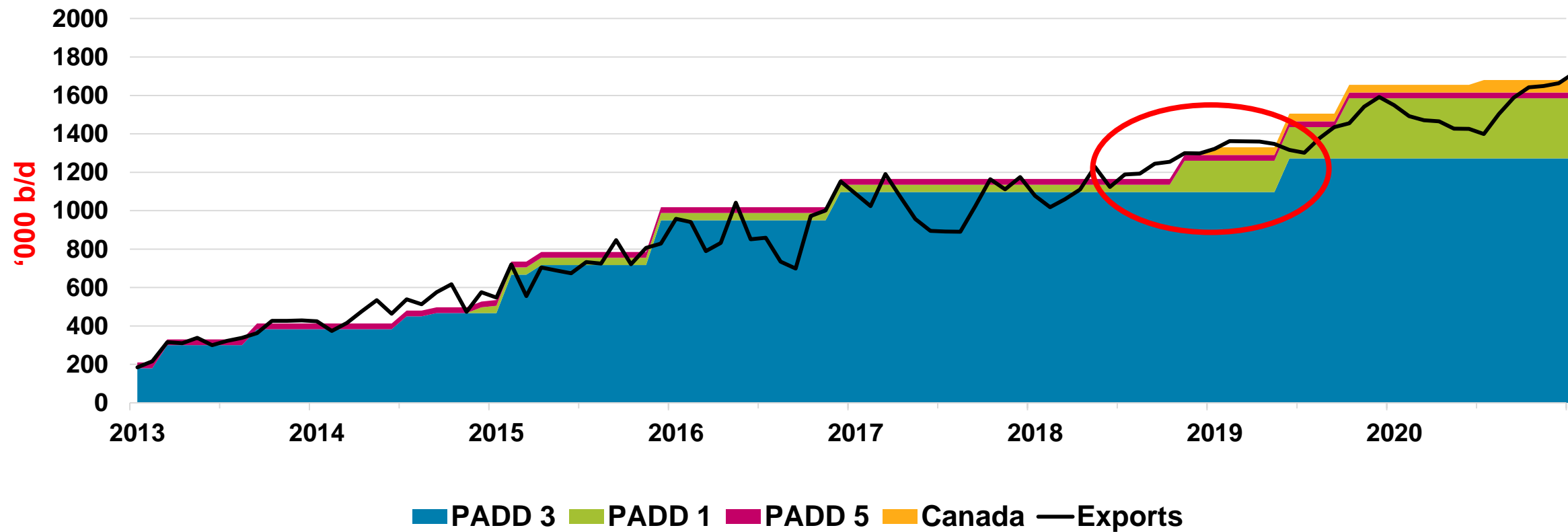


Asian LPG imports by destination



# Lack of LPG terminal expansions in North America could lead to price dislocations.

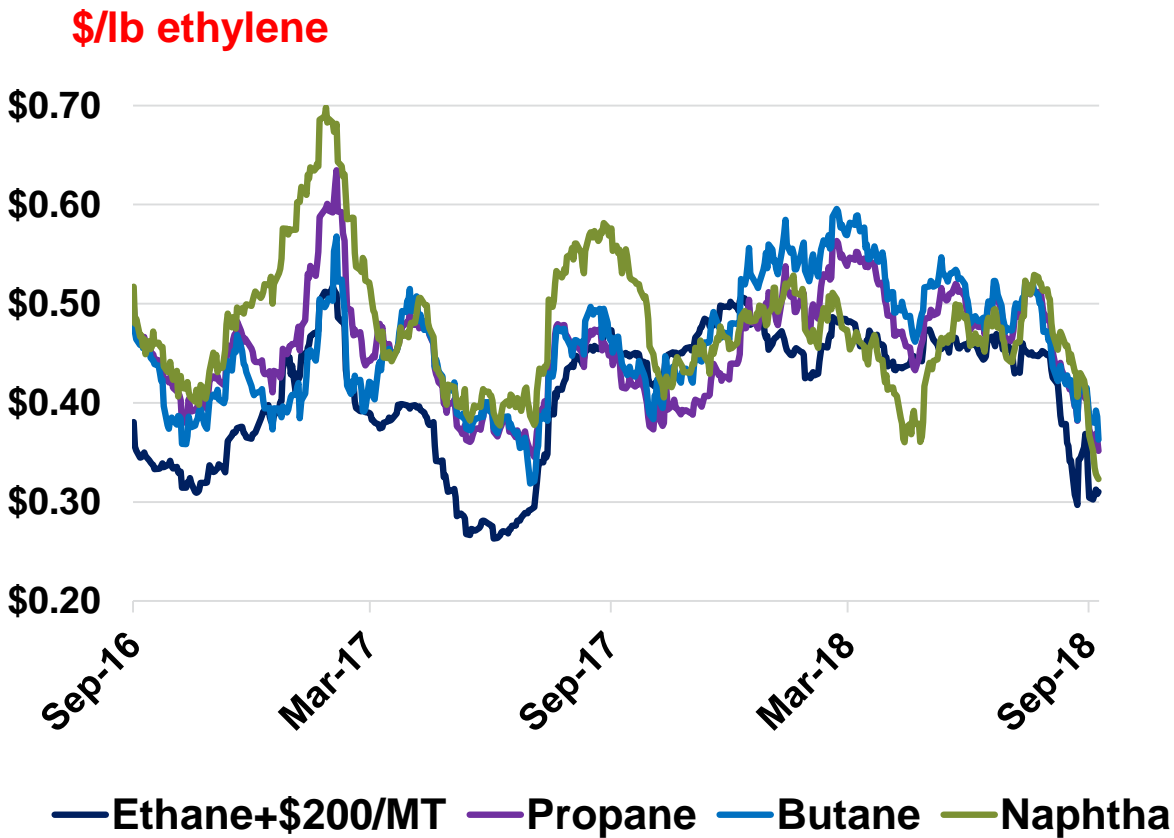
North American LPG exports and capacity



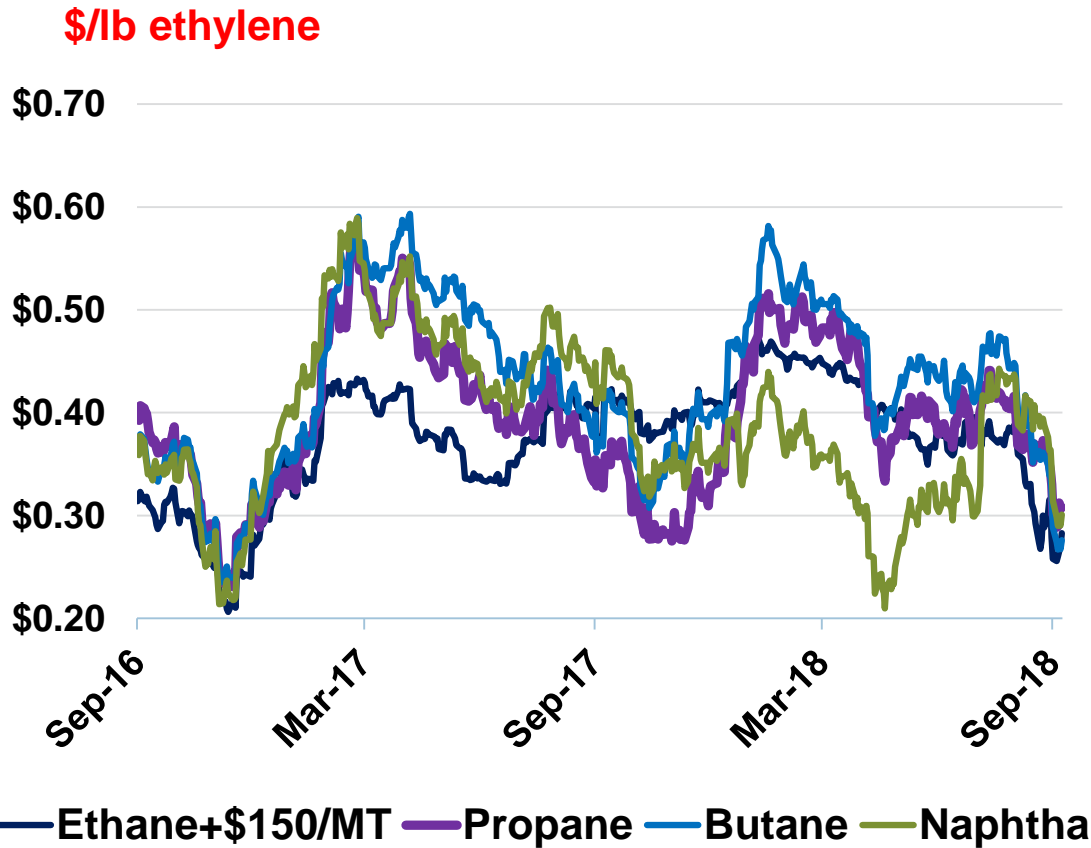
Source: Platts Analytics

# LPG continues to price into cracker feed slate amid global length, high naphtha prices

## NORTHEAST ASIA CRACKER MARGINS



## NORTHWEST EUROPE/ARA CRACKER MARGINS



# Conclusions

- Insufficient infrastructure and growing supply were key contributors price movements in 2017 and 2018
  - Permian processing and takeaway
  - Midcontinent takeaway
  - Mont Belvieu fractionation capacity
- Look for 2019 to be another year full of infrastructure challenges
  - New ethylene plants and ethane export terminals will help support ethane prices
  - Growing LPG supplies could overwhelm export terminals and pressure Mont Belvieu prices relative to other regions

# Thank you



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NGLs

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