

US EXPORTS

PREVIEW | FundamentalEdge | May 2018

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FundamentalEdge
by drillinginfo

*This is a **PREVIEW** of a 20+ Page Report*

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Introduction and Key Takeaways

- Growth in US oil and gas supply persists on the back of continued improvement in production economics by E&P companies. This growth is outpacing domestic demand and therefore forcing market players to find new homes for their commodities outside the US.
- The goal of this month's update to the *FundamentalEdge* report series is to understand the role of US Exports for crude oil, natural gas and NGLs and how infrastructure additions are being developed to allow the supply surplus to find a market overseas.
- **Crude oil** exports have grown since lifting the export ban in Dec 2015. Going forward most incremental growth in oil production is expected to be exported. Lighter quality crude produced in US shale basins is better suited for refinery fleets in Asia and Europe. As such, continued US supply growth is likely to be exported rather than displacing currently imported volumes.
- The US became a net exporter of **natural gas** in early 2017. On an annual basis, pipeline flows to Mexico and LNG exports now surpass total volumes imported from Canada. Further LNG liquefaction capacity additions will be the largest contributor to US exports in the near term.
- For **NGLs**, strong production growth coupled with high prices in destination markets has prompted significant export development projects for Ethane, LPGs and Pentanes plus. This will entice more NGLs to find a market outside of the US.

Crude Oil Production Growth and Exports Implications

According to the EIA's Weekly Petroleum Status Report, exports have been steadily increasing since early 2017.

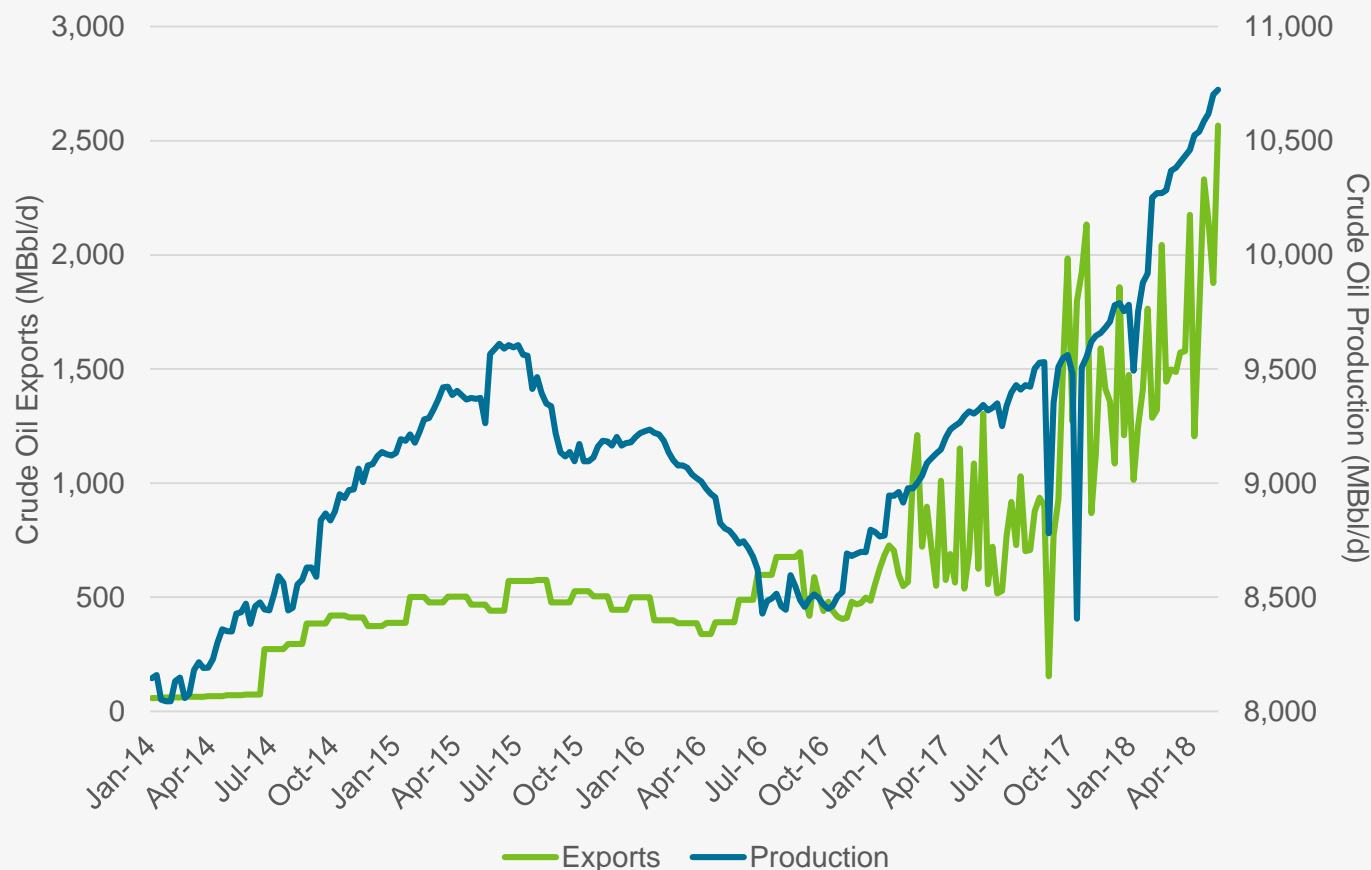
The chart shows the crude oil production in blue corresponding to the right axis increasing since late 2016 and corresponding almost one to one with exported crude oil volumes.

This confirms that all incremental barrels that are being produced are being exported instead of pushing out more imported barrels.

This is a further indication that the lighter crude oils that the US is producing is not as good a fit in the domestic refining slate as it is in the rest of the world's refining slate.

CHART 1

Historical crude oil exports and production



Source: EIA

US Production and Exports Outlook

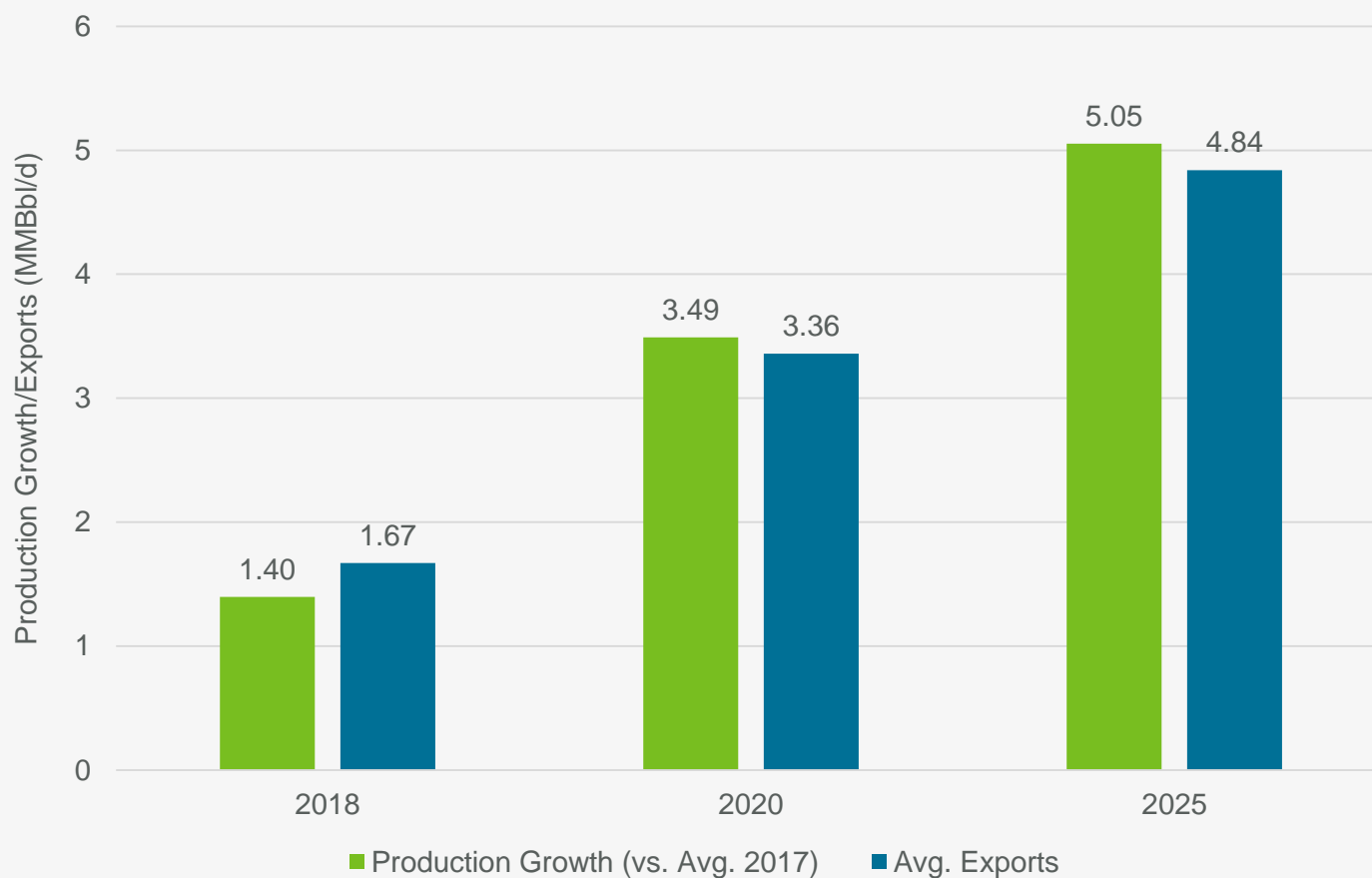
As US crude oil production grows, all incremental barrels are (and will continue to be) exported. The US production growth is largely in lighter crude oils, which will be the ones exported as it is a better fit in non-US refining fleets (see next slide).

To facilitate this rapid increase in exports, additional infrastructure will be necessary.

Most of this infrastructure will be built in Houston and Corpus Christi. Corpus Christi is expected to be the leading point of export moving forward, thanks to its proximity to the Permian & Eagle Ford basins and less congested port.

CHART 3

Crude oil production growth and exports forecast



Source: DI ProdCast and Analysis

US Natural Gas Exports

In February 2017, the U.S. became a net exporter of natural gas, per EIA.

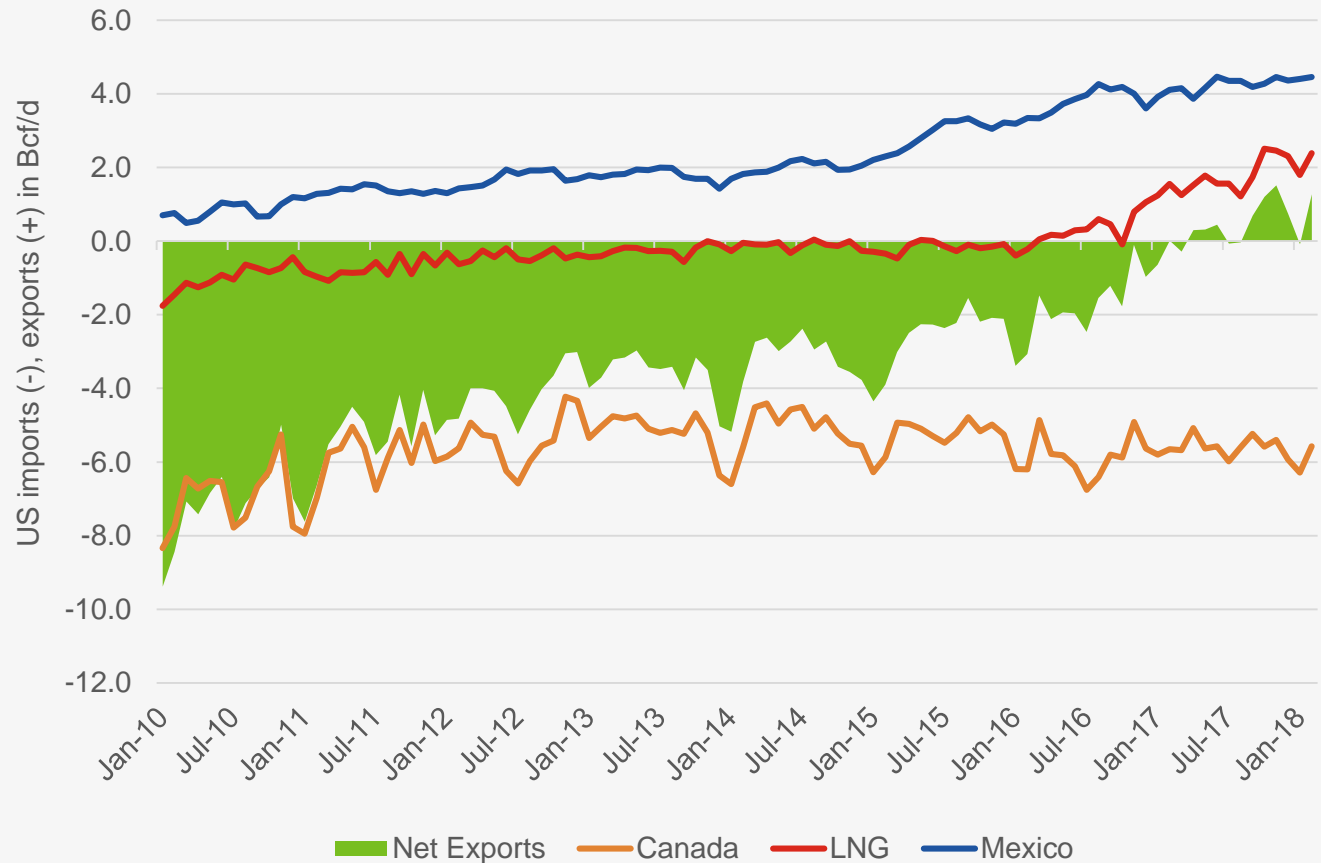
Historically, the U.S. has been a net importer of natural gas (mainly from Canada) with import volumes reaching over 8 Bcf/d.

Increasing domestic supply coming on the back of development of unconventional resources has transformed the US into a net exporter. Reduced imports from Canada, increased pipeline exports to Mexico and the construction of LNG liquefaction terminals enabled this transition.

By 2022, The U.S. is expected to net export ~8 Bcf/d of natural gas on an annual basis. This consists of 5 Bcf/d to Mexico via pipelines and 8 Bcf/d via LNG; offset by 5 Bcf/d of continued imports from Canada to meet seasonal demand in the Northeast and Midwest markets.

CHART 6

Natural Gas Net Exports



Source: EIA

All Proposed LNG Export Capacity

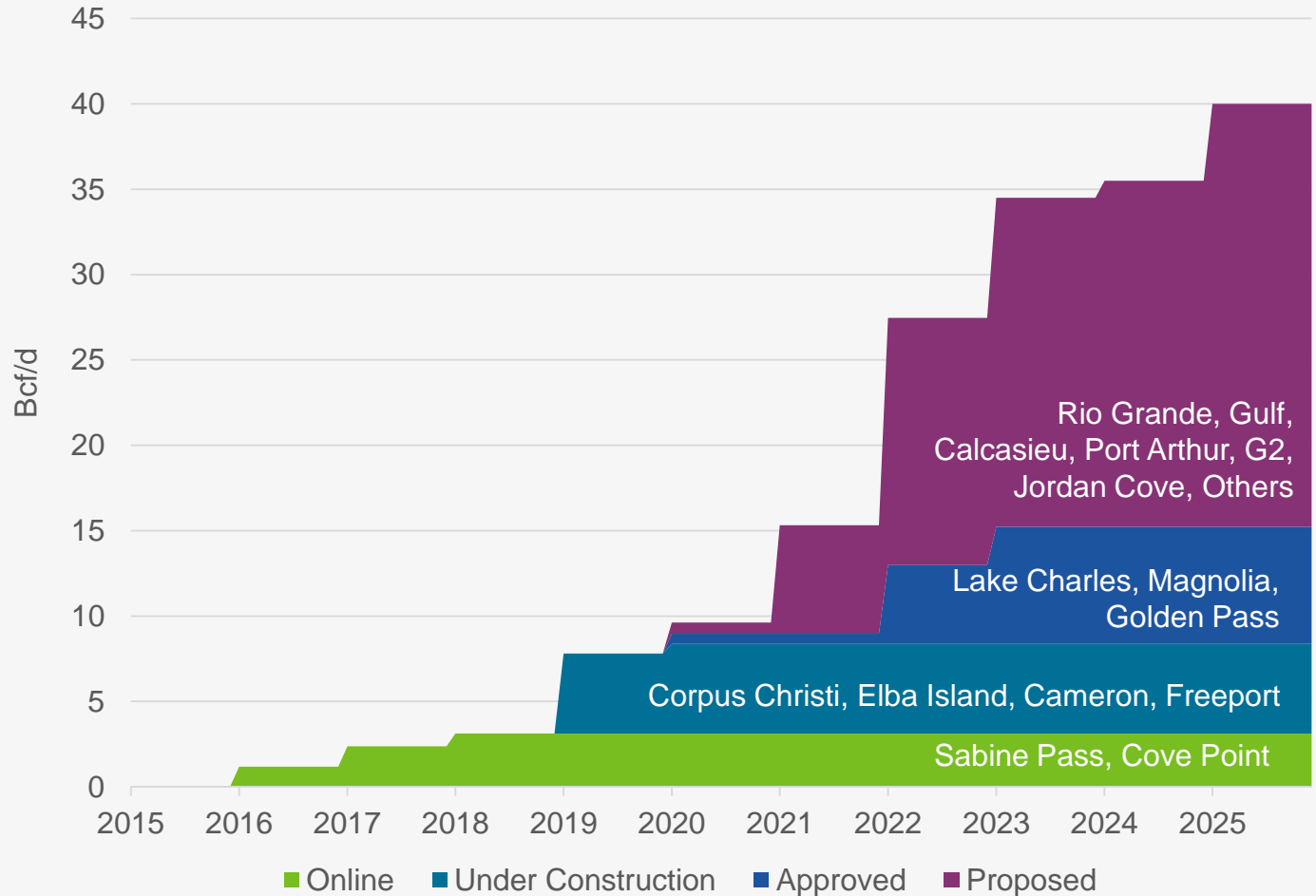
Drillinginfo's 5 year forecast for LNG exports only includes projects currently under construction.

Additionally, there are 4 projects already approved but not under construction and many others announced.

In total, there is currently about 40 Bcf/d of LNG liquefaction capacity that could be brought online over the next 10 years.

CHART 8

All Proposed LNG Export Capacity



Source: FERC, DI Analysis

Mexico Supply/Demand Overview

Natural gas is primarily used in Mexico to support power generation.

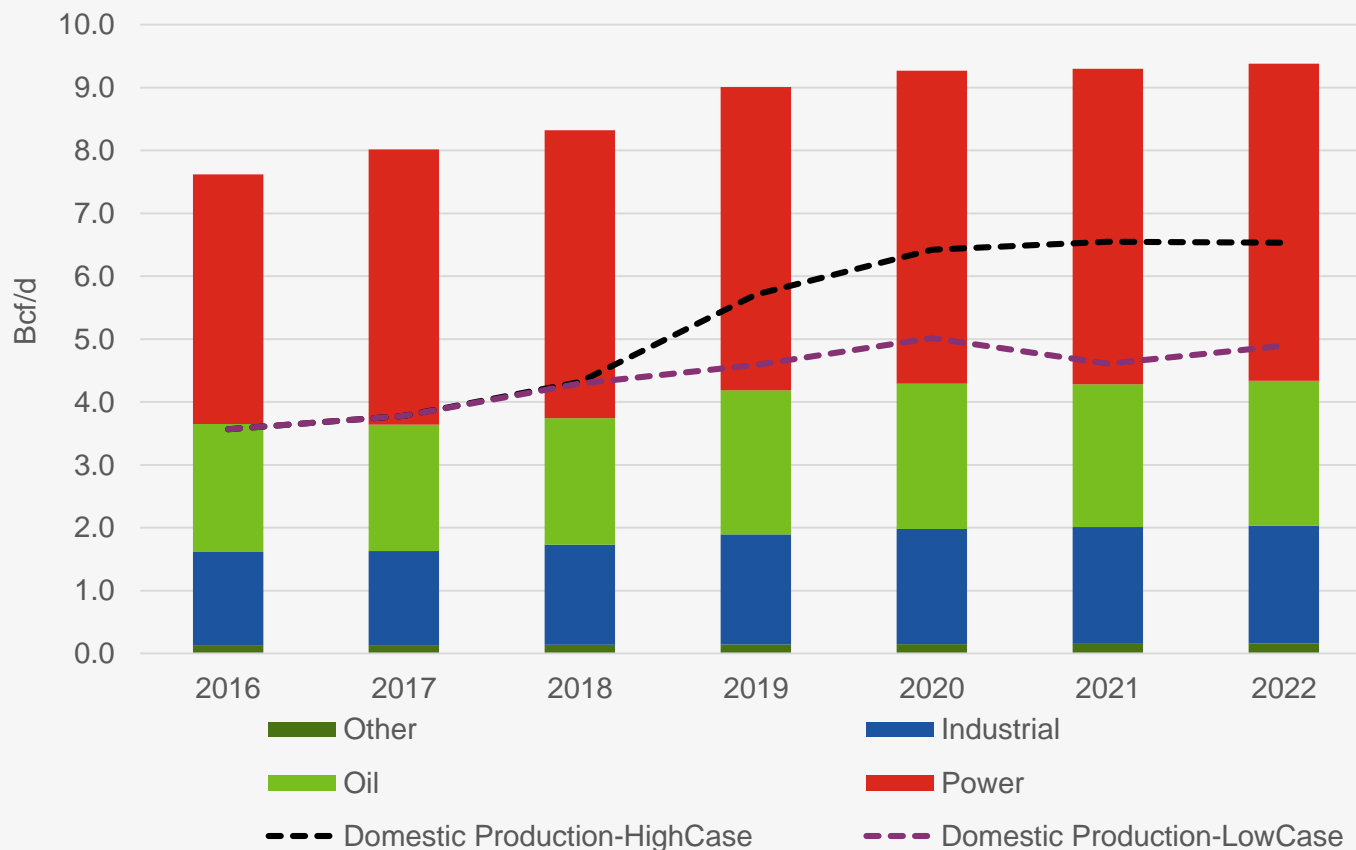
In 2017, power demand accounted for 55% of total natural gas demand. Following that, the crude oil sector (25%) and industrial demand (19%) make up the rest.

By 2022, total demand is expected to grow by 17% or 1.4 Bcf/d.

SENER (Secretaría de Energía) presents 2 scenarios for domestic production. A low case estimate based on 2P reserves (proved and probable) and a high case estimate using 3P reserves (proved, probable and possible). either scenario, demand growth outpaces supply.

Mexico imports gas via LNG and via pipeline from the US. There are 3 terminals (Costa Azul, Altamira and Manzanillo) currently importing < 1.0 bcf/d, mostly at Manzanillo. As pipelines become available, LNG imports should decline further. At least one of these facilities, Sempra's Energia Coast Azul is evaluating liquefaction capabilities to export from the site.

CHART 11
Mexico Supply and Demand



Source: SENER

Ethane Exports by Origin and Destination

Historically, pipeline to Canada was the only source for exporting ethane. Until 2016, the Williston and Utica accounted for all of the ethane exports, sending it North to Canada via the Mariner West and Vantage pipelines. It wasn't until 2016 when Marcus Hook and Morgan's Point went into service, adding waterborne export demand out of the Northeast and the Gulf Coast. Utopia East, in-service in January '18 allows 50 MBbl/d (expandable to 75 MBbl/d) from the Northeast to Canada.

Ethane demand is anticipated to outpace supply at current recovery rates. This has and will continue to incentivize more ethane recovery. With full ethane recovery, however, supply will outpace demand and more infrastructure will be needed to place the ethane. Global prices vs. local prices will drive whether this infrastructure will be new world scale crackers or export facilities.

The export facilities mentioned above allow for ethane to be sent waterborne from the US to mainly Europe and Asia. As Utopia and future projects come online, exports to North America, Europe, and Asia are expected to continue to grow.

CHART 13
Ethane Exports by US Region

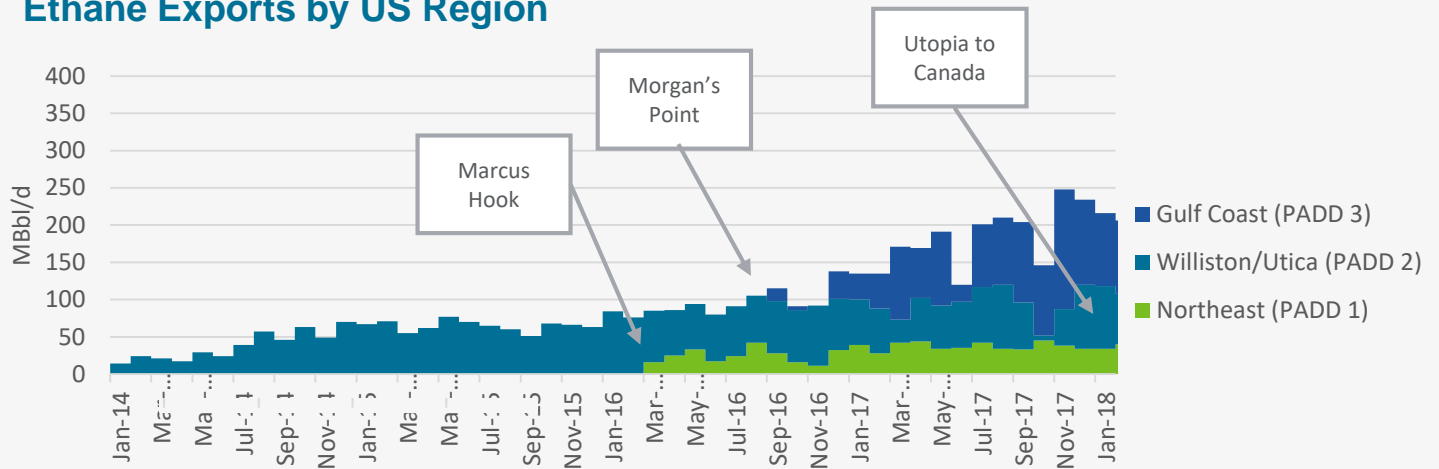


CHART 14
Ethane Supply vs. Demand

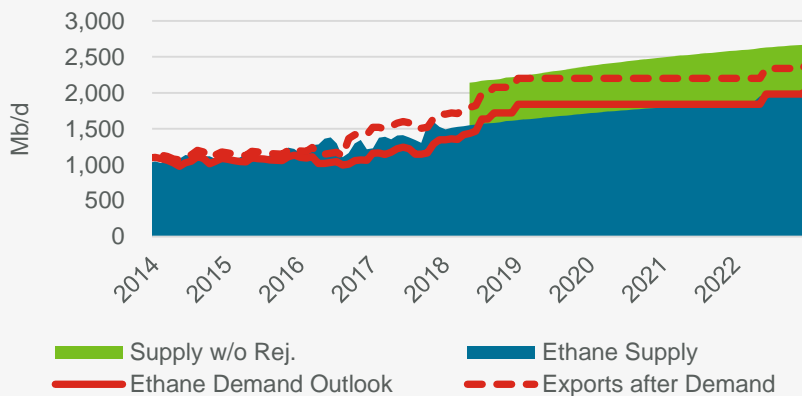
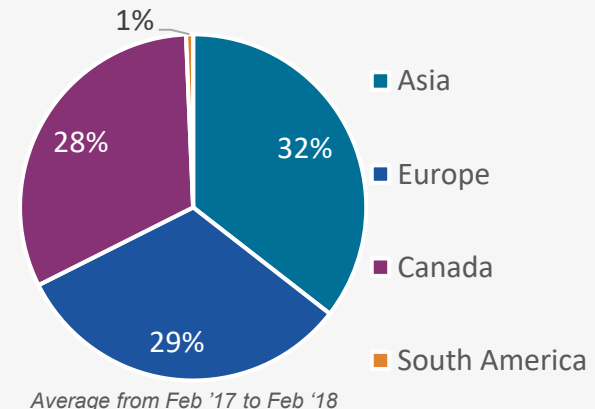


CHART 15
Ethane Exports by Destination



Sources: DI Prodcast, EIA, Hodson

Contact

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