

# NGL Update

**PREVIEW** | FundamentalEdge Report | November 2018

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FundamentalEdge  
by drillinginfo

# Key Takeaways

- *NGL production has hit a record high eight months in a row. Y-grade pipelines, railcars, and fractionators are all next to full. Oversupply and constraints have yielded lower prices, and lower netbacks. There is also increased volatility, which will likely remain at least over the next two to three years as incremental projects are completed and more constraints potentially unfold.*
- *NGL production keeps growing despite constraints across all other commodities and basins: the Permian has crude and processing issues, the DJ is dealing with line pressures, the Bakken has had a rough maintenance season, and the Mid-Continent battles spacing and productivity. That being said, if all of these issues did not exist, the NGL world would have bigger problems than it does now because of the bottlenecks further down the chain.*
- *The US NGL market is battling several infrastructure constraints as well, and getting the molecules to Mont Belvieu is one of them. After pipelines are filled, everyone turns to transport by rail. The Permian and Bakken battle their own logistical issues because of the volume of railcars in and out, while also limiting transportation from regions like Appalachia at the same time.*
- *The Cushing-Mont Belvieu spread continues to be wide because there is simply not enough pipeline space to get to the Gulf Coast. But if it were there, would it have anywhere to go? Fractionation space is the next bottleneck and continues to be tight.*
- *Many greenfield projects have been announced to increase frac space and take advantage of some of the wide frac margins and optimization opportunities. Some midstream providers have been creative, recommissioning frac space through maintenance, building small pipelines to increase flow optionality, or optimizing volumes on their systems and through storage to create more space.*
- *There is more frac capacity commissioning in early 2019, but the extra space won't hold for long. DUCs have been rising steadily, and a ramp in associated production could turn online when crude capacity opens up in the Permian. With more supply could come more bottlenecks, increased Y-grade in storage, and more petchem facilities looking for more feedstock.*
- *Recently, NGL prices have fallen with crude and the increasing domestic and global supply. Producer and marketer netbacks are also down, which is a result of the constraints, as they pay more for spot frac capacity, storage, and transportation to move their barrels. Midstream also suffers lower margins, but still reaps the benefits of the constraints through high utilization of assets, optimization opportunities, and absorbing those premiums from their customers.*

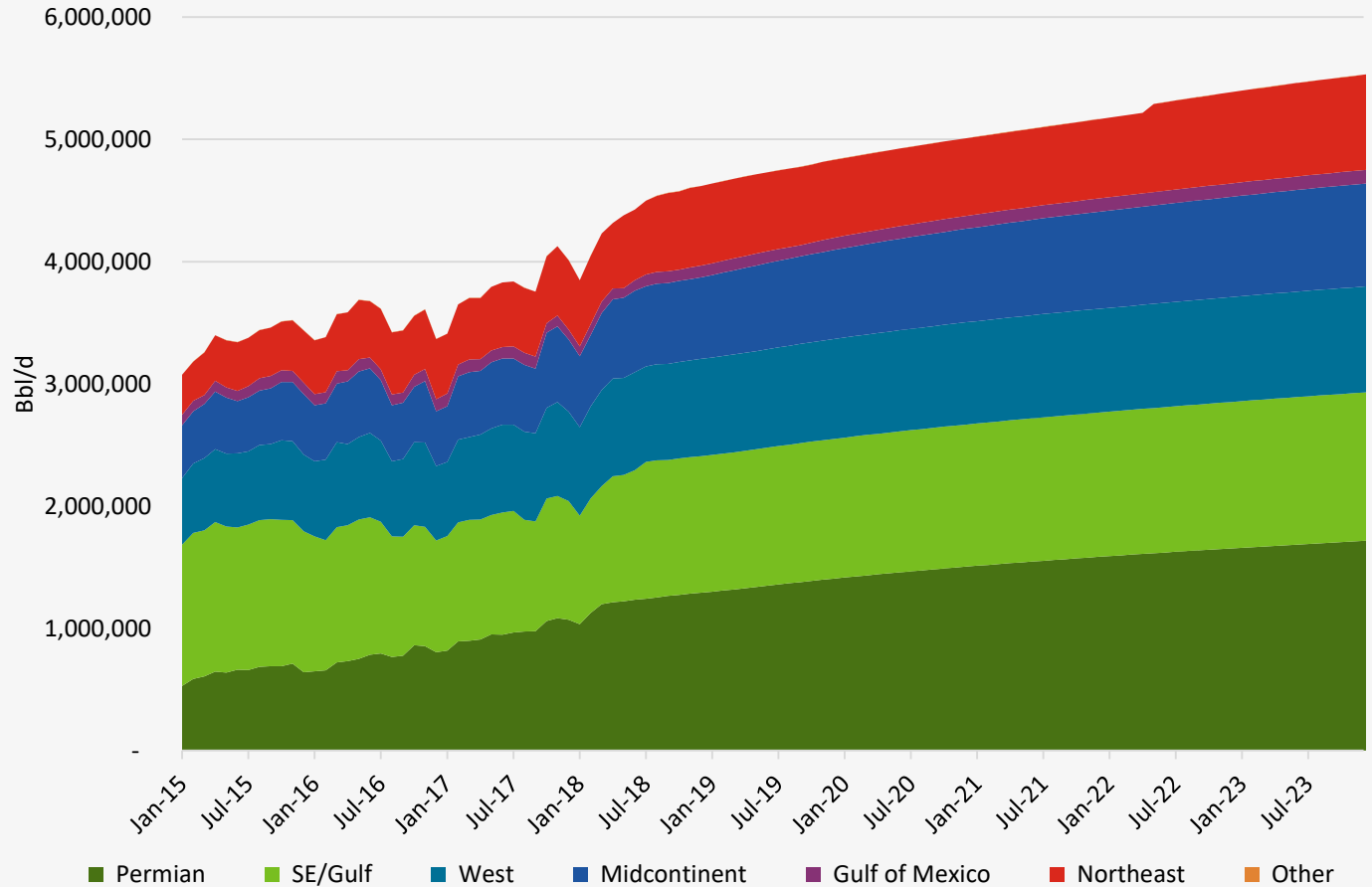
# Production

NGL production is hitting record highs despite fractionation and infrastructure constraints. August marked the eighth record in a row as production reached 4,570 MBbl/d.

Drillinginfo projects that NGL production will grow ~5% over the next year and ~21% over the next 5 years, with the highest growth out of the Permian (9% and 35% growth over one and five years, respectively).

Ethane rejection is likely maintained at high levels as midstream fractionates heavier barrels. This will encourage additional NGL pipeline capacity and additional fractionator capacity because supply is likely to grow.

CHART 1  
US NGL Production



Source: DI ProdCast, EIA

# Prices

With OPEC, Saudi Arabia, and Russia increasing crude production, global supply has brought down crude and heavier liquids prices. That, in turn, drives down normal butane. Normal butane is used as gasoline blending in the winter, so the discount from natural gasoline is normally the cost to blend.

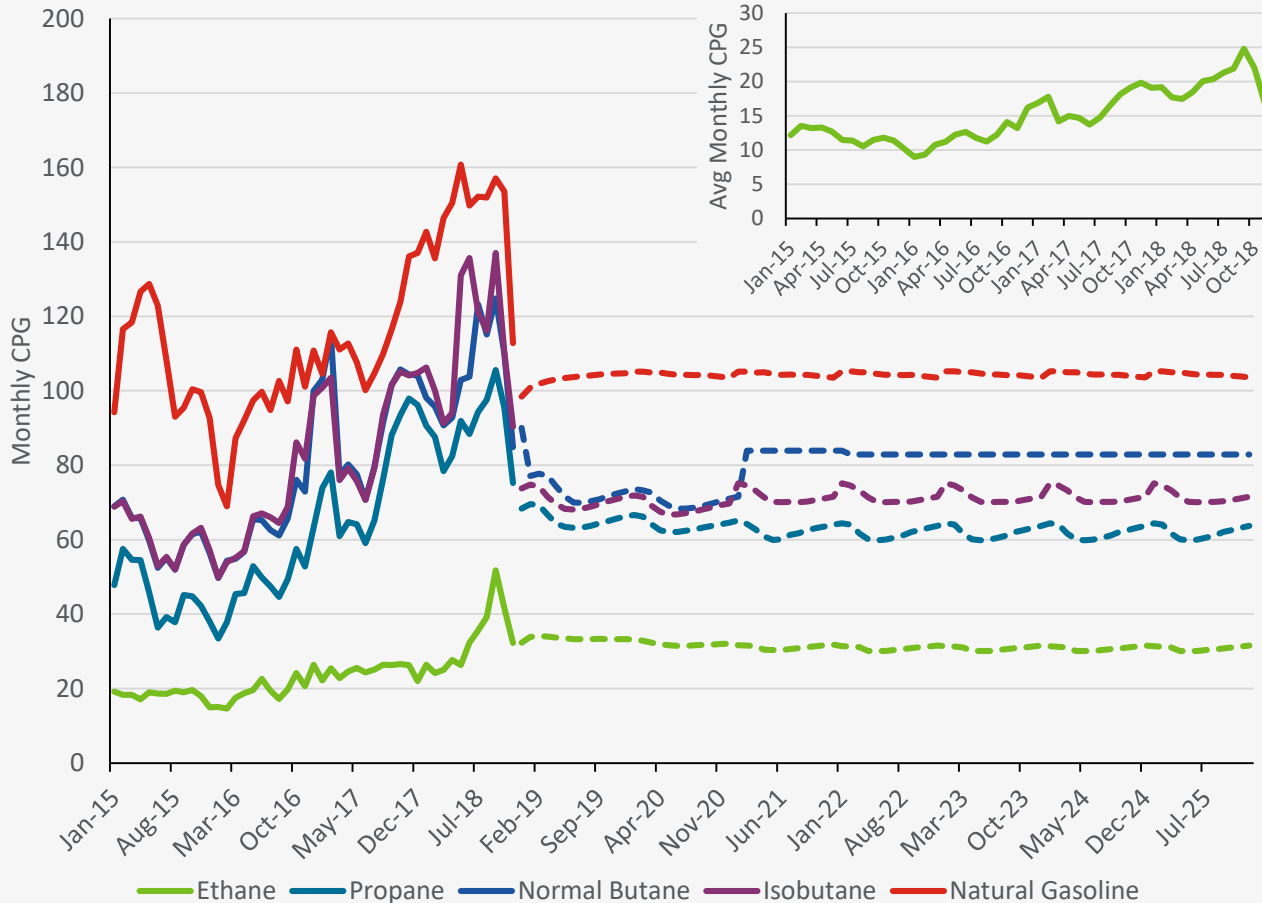
The increased associated global LPG production has supplied more Asian demand, in turn softened U.S. demand for LPG. LPG prices will likely increase slightly once Mariner East 2 is online, as that takes supply to export at Marcus Hook, and US buyers will be competing with international buyers to keep the products domestic.

Ethane hit a peak in late summer because of increased cracker demand and not enough supply. Despite some small fractionation projects turning online to relieve that demand, ethane continues to be volatile because of tight fractionation and pipeline space.

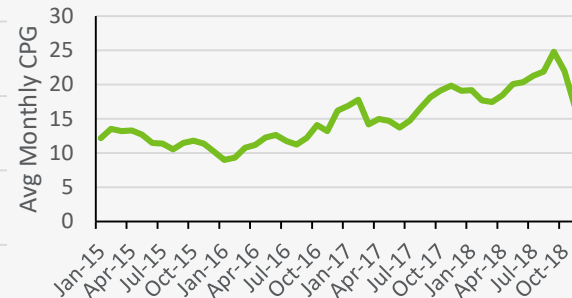
Prices will likely stay volatile as infrastructure, fractionation, and cracker projects come to fruition.

CHART 2

## NGL Price Trends and Forwards\*



## Frac Spread per Gallon



Source: EIA, Bloomberg  
\*Iso Butane Forwards from CME, extended flat starting 2023

# Recent NGL Announcements

*With record-high supply, fractionation margins, and constrained volumes surrounding the NGL market, several midstream companies have posted significant project announcements to take advantage of the market fundamentals.*

## **Enterprise Products**

- Several projects starting Q3'19 to provide 55 MBbl/d of frac capacity through the recommissioning of the company's Tebone frac, construction of 21 miles of new pipeline, and the conversion of 65 miles of a gas pipeline to NGLs in their South Texas pipeline system
- 150 MBbl/d incremental fractionation project to be completed in Q2'20, on top of a 150 MBbl/d frac to be completed in Q1'20

## **Targa**

- Shifted timing of Frac Train 5 and Gulf Coast Express to Q2'19 and Q4'19, respectively
- Constructing 2 new fractionation trains, Train 7 and 8, to add an incremental 220,000 in Q1'20 and Q2'20
- Efforts to expand LPG export capabilities at Galena Park by 50%, which is currently capable of exporting 7 MMBbl/month
- Ordering long-lead-time equipment for the expansion of Grand Prix

## **Energy Transfer**

- Lone Star Frac VI expected earlier in Q1'19 with 150 MBbl/d of fractionation capacity in Mont Belvieu
- Lone Star Frac VII expected in Q1'20 with 150 MBbl/d of fractionation capacity in Mont Belvieu
- 352-mile extension of Lone Star Express Pipeline from Wink, TX, to Fort Worth, TX

## **Enlink**

- Unlocking 30-35 MBbl/d of fractionation capacity in the Gulf Coast through increasing pipeline capacity, expected Q2'19

## **EPIC**

- Acquiring the Robstown NGL fractionation facility near Corpus Christi from Southcross Holdings. The deal includes immediate fractionation capacity of 64 MBbl/d for EPIC NGL customers through the Sand Hills pipeline
- Constructing Permian crude pipeline and fractionator (100 MBbl/d in Corpus Christi), and in the interim, company is converting NGL pipeline to crude pipeline; expected ship ~400 MBbl/d of crude from Q3'19 until January 2020

## **Phillips 66**

- Expanding Sweeny Hub to include add 300 MBbl/d of fractionation, associated pipeline infrastructure, and 6 MMBbl of storage
- DCP further expanding Sand Hills Pipeline, expected to reach 485 MBbl/d by end of 2018

## **Marathon**

- Fractionated volumes up 24% year-over-year primarily due to Hopedale Complex in the Northeast
- Expects to add 100 MBbl/d of fractionation capacity in the Northeast in Q4'18

Source: Company Filings

# Gulf Coast Storage

One of the key factors of NGL pricing is storage, and relative to the past 5 years, inventories have been lower in 2018 and have supported pricing.

Four large cap midstream providers hold most of the Gulf Coast storage

Enterprise – ~130 MMBbl

Targa – ~70 MMBbl

Energy Transfer – ~53 MMBbl

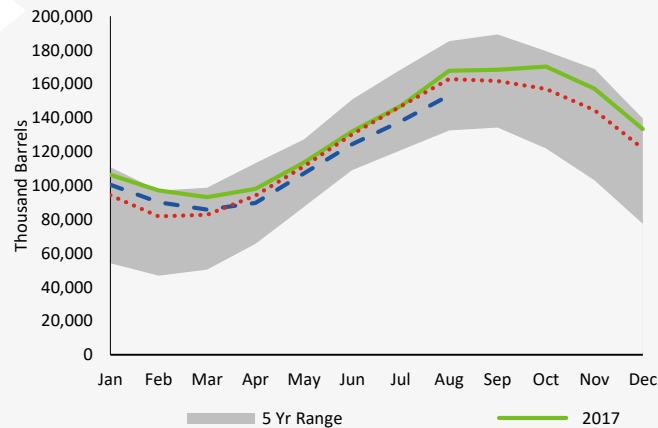
ONEOK – Est. <10 MMBbl but an expansion planned in 2020-21 (capacity undisclosed)

If these providers owned all the capacity at Mont Belvieu, that would imply an average utilization of less than 30% at bulk terminals in 2018. This is a substantially large buffer to accommodate NGLs in a circumstance in which frac capacity causes a flood of NGLs to storage.

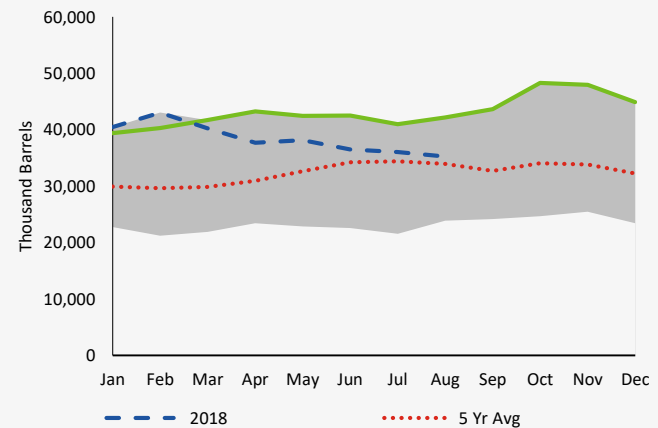
The tight frac capacity has forced some marketers to make the decision of whether to put NGLs in storage or pay a premium on fractionation. Though every contract is different, a backwardated curve causes most to favor the latter. Despite spot frac costs being higher than the cost to store, selling NGLs now versus next year could save a dime or more per gallon, not to mention the net present value of selling earlier, all of which often makes up the incremental cost to frac versus store.

Midstream companies are also incentivized to keep storage volumes low. For example, ONEOK wants to keep Y-grade storage low in order to book revenue earlier and limit their exposure to price swings.

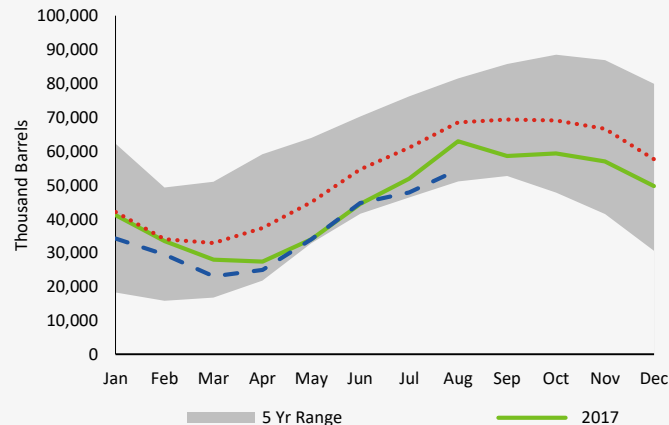
**CHART 3**  
Total NGL Bulk Terminal Stocks



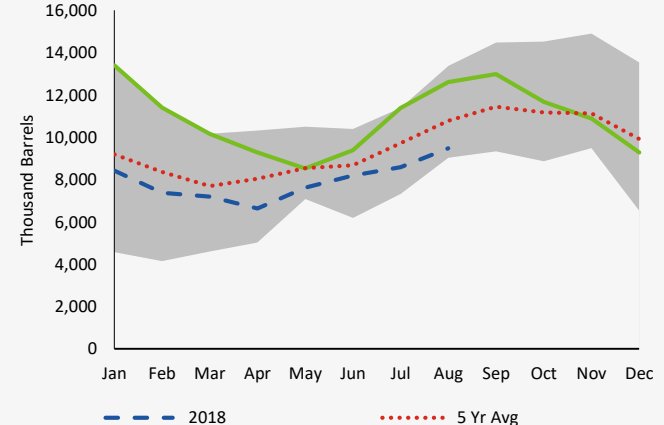
**CHART 4**  
Ethane Bulk Terminal Stocks



**CHART 5**  
LPG Bulk Terminal Stocks



**CHART 6**  
Pentanes+ Bulk Terminal Stocks



Source: Company Filings, EIA. Bulk Terminals defined as a facility used primarily for the storage and/or marketing of petroleum products which has a total bulk storage capacity of 50,000 barrels or more and/or receives petroleum products by tanker, barge, or pipeline.

# Gulf Coast Fractionation Tightness

It is no secret that fractionation space is tight, and has been since early this year. Assuming tightness likely peaked toward late summer this year, the chart to the right compares incremental supply to added frac capacity from that point on.

Our incremental supply forecast includes current production in PADD 2 and Mid-Con, as well as potential additional supply from new build pipelines out of the Permian and Mid-Con, with incremental supply from other basins areas assumed constant.

Incremental frac capacity includes all announcements out of Mont Belvieu, as well as two projects along the coast from EPIC and Phillips 66. The near term is still tight, but incremental short-term levers and expansions of existing footprints have allowed for some slight slack in the bottlenecks.

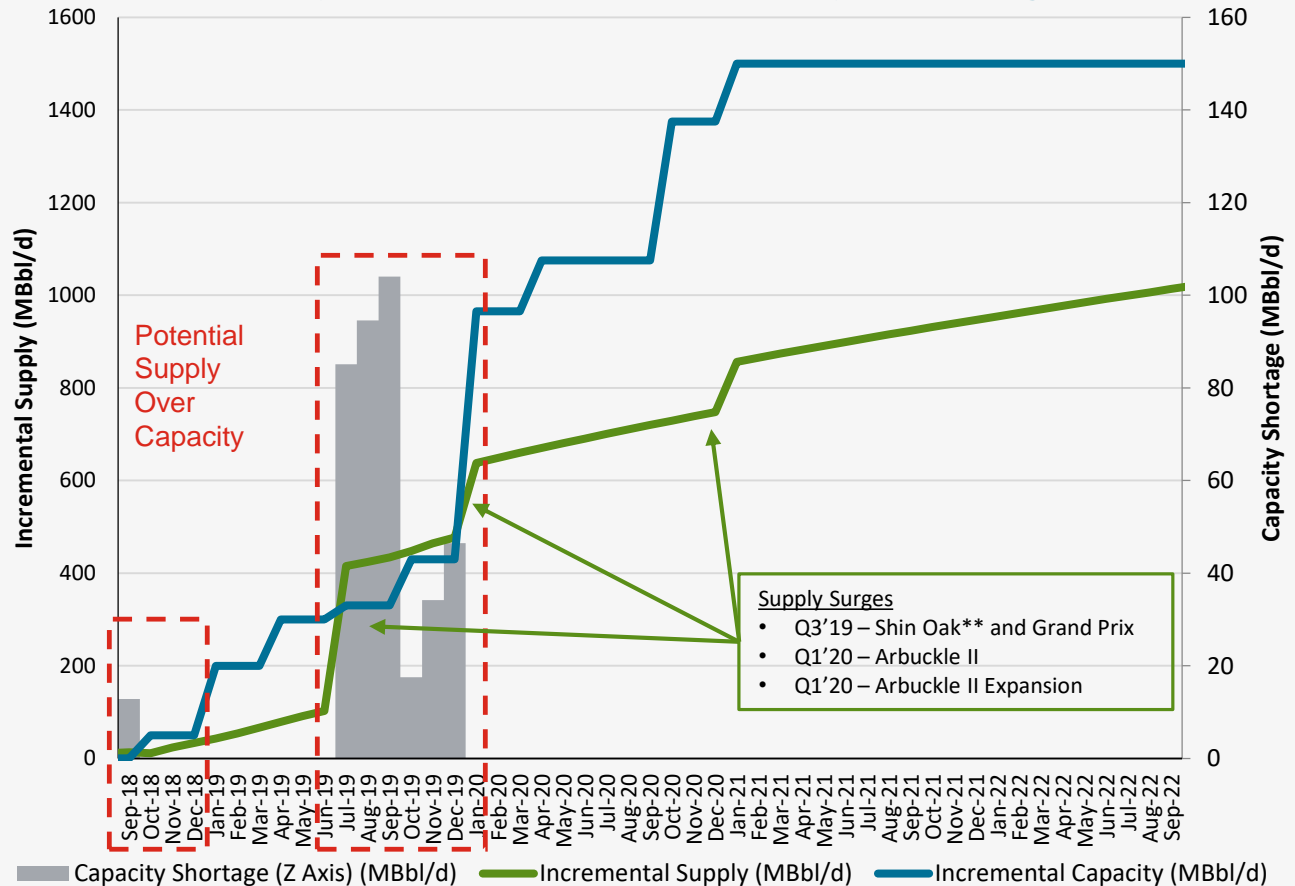
Assuming the 250 MBbl/d of additional frac capacity opens for business in January 2019, utilization will likely have breathing room until mid-2019 after Shin Oak and Grand Prix turn online. Additional crude capacity, processing expansions, and associated NGL production will likely result in a relatively high usage of these projects.

Projects like Arbuckle II (400 MBbl/d) will transport more Y-grade to the coast but would be somewhat offset by Sterling III converting from shipping 190 MBbl/d of Y-grade to purity products instead. This will potentially alleviate the spread between Conway and Belvieu – which will remain wide until Q1'20 when Arbuckle II and ONOEK's 4<sup>th</sup> fractionator are placed into service.

2020 will be the year of relief, as each of the four large cap midstream companies turn on 535 MBbl/d of frac capacity in Q1 alone.

CHART 7

## Incremental Supply vs. Gulf Coast Frac Capacity Since August\*



Source: Company Filings, DI Procast

\* Includes Mont Belvieu Expansions as well as EPIC's 100 MBbl/d frac and PSX's 300 MBbl/d Sweeny Frac.

\*\* Supply from Shin Oak negated due to EPD and EPIC converting NGL lines to crude. EPIC's reversion date not included.

# Mont Belvieu Fractionation Tightness

Mont Belvieu is home to a large portion of US fractionation facilities. Chart 8 portrays current capacity of Mont Belvieu plus future expansions at the NGL hub and others along the Gulf Coast.

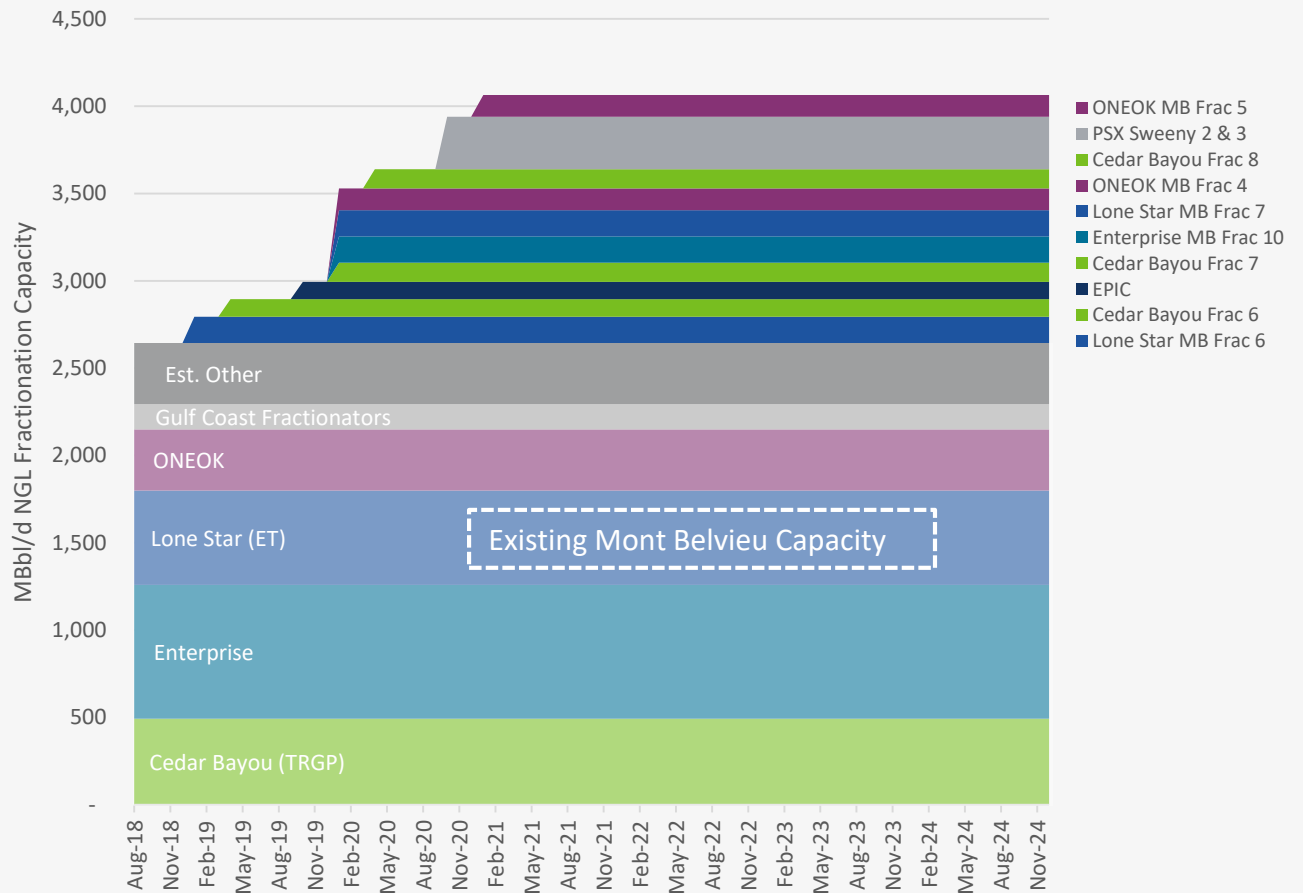
Recently, several midstream providers have pulled some strings to quickly add small amounts of capacity through maintenance, pipelines, and recommissioning old facilities.

Actual capacity can also vary depending on the weather. In the winter, ONEOK mentioned their ability to frac beyond the maximum stated capacity because of the colder temperatures.

Phillips 66 is also expanding its Sweeny frac not too far from Mont Belvieu, adding two 150 MBbl/d fractionators in late 2020. And EPIC is adding 100 MBbl/d of space in Corpus Christi in Q3'19.

CHART 8

## Major Mont Belvieu Fractionation Facilities and Gulf Coast Expansions



Source: Company Filings



# NGL Pipeline Projects

Y-grade pipelines are largely full. Many projects and expansions have been announced to increase the liquidity of the flows throughout the US. Almost all basins await at least one project to assist in the bottlenecks.

TABLE 1  
NGL Pipeline Projects

	Pipeline	Operator	Capacity (MBbl/d)	Completion Date
Permian	Sand Hills Expansion	DCP Midstream	45	End of 2018
	Grand Prix	Targa	300	Q2'19
	EPIC	EPIC Pipeline	350	2H'19
	Shin Oak	Enterprise	550	Q2'19
	West TX LPG Expansion	ONEOK	80	Q1'20
	Lone Star Express	Lone Star (Energy Transfer)	350	Q4'20
	Permian-Corpus Christi	Permico	300	Q4'20
	<b>TOTAL</b>		<b>1,975</b>	
Northeast	Pipeline	Operator	Capacity (MBbl/d)	Completion Date
	Mariner East 2	Energy Transfer	275	Q1'19
	Mariner East 2x	Energy Transfer	250	Q3'19
	<b>TOTAL</b>		<b>525</b>	
Mid-Con	Pipeline	Operator	Capacity (MBbl/d)	Completion Date
	Sterling III Expansion	ONEOK	60	Q4'18
	Arbuckle II and Exp.	ONEOK	400, 100	Q1'20/Q1'21
	<b>TOTAL</b>		<b>460, 560</b>	
Rockies	Pipeline	Operator	Capacity (MBbl/d)	Completion Date
	Elk Creek	ONEOK	240	Q3'19
	Front Range and Texas Exp.	DCP Midstream	100, 90	Q3'19
	DJ SoHi Ext. Via White Cliffs	DCP Midstream	90	Q4'19
	<b>TOTAL</b>		<b>520, 610</b>	

Source: Company Filings

# NGL Petrochemical Projects

With the ever-increasing production of NGLs in the US, many new builds or expansions of crackers and petrochemical facilities have been made to take advantage of the historically inexpensive feedstock.

Between Q2'18 and Q4'19 alone, there will be a total of 15,470 million pounds per year of ethylene capacity (441 MBbl/d ethane equivalent). That's about 45% of PADD 3's 2018 average daily production of ethane, and slightly over 25% of US daily ethane production.

DowDupont also is planning to expand their Freeport cracker that was recently commissioned in September 2017 from 3,300 to 1,100 MMlbs/yr. The project is currently planned for late 2019.

Projects like the Shell cracker in Monaca will greatly take a load off of ethane differentials in the Northeast. Shippers on the project will now be able to receive better in-basin pricing instead of having to pay 15-20 cents to ship it to the Gulf Coast. This also relieves pricing for other sellers who aren't on the project, as they won't be competing for tight space on railcars, or pipes like Mariner East or ATEX.

PTTGC America is attempting to build and jointly operate an ethane cracker in the Northeast as well. That awaits an investment agreement with Daelim, which is likely.

TABLE 2

## New and Expanded Steam Cracker Capacity

Year In Service	Company/Location	Ethylene (MMlbs/yr)	~Ethane Equivalent (MBbl/d)	FID
2018	ChevronPhillips/Cedar Bayou #2	3,300	94	Complete
2018	ExxonMobil/Baytown #3	3,300	94	Complete
2018	Indorama/Lake Charles, LA	970	28	Complete
2019	Shintech/Plaquemine, LA	1,100	31	Under Const.
2019	Westlake/Lotte /Lake Charles, LA	2,200	63	Under Const.
2019	Sasol/Lake Charles #2	3,300	95	Under Const.
2019	Formosa/Point Comfort #3	3,500	100	Under Const.
2019	DowDupont/Freeport LHC9 (expansion)	1,100	31	Under Const.
2020	TOTAL/Port Arthur, TX	2,200	63	Under Const.
2020	Ineos/Chocolate Bayou (expansion)	600	17	Pending
2021	Shell/Monaca, PA	3,530	101	Under Const.
2022+	PTT Global/Daelim/Belmont, OH	2,200	63	FID in 2019
2022+	Sabic/ExxonMobil/Corpus Christi, TX	4,000	114	FID
2022+	Formosa/St. James, LA	2,650	75	Pending
2022+	ChevronPhillips/US	3,300	94	FID in 2019
2022+	Aither Chemicals/NE US	600	17	Pending
2022+	Appalachian Resins/Monroe County, OH	500	14	Pending
2022+	Ascent (Braskem)/West Virginia	3,300	94	Pending
2022+	Badlands NGL/North Dakota	2,650	75	Pending
2022+	Badlands NGL	3,300	94	Pending
2022+	NOVA Chemicals (Williams)/Geismar #2	3,300	94	Pending
2022+	Motiva/US Gulf Coast	3,300	94	FID in 2019
	<b>Total</b>	<b>54,200</b>	<b>1,545</b>	

Source: Jacobs Consultancy, Company Filings, DI Analytics

# Ethane and LPG Exports

Ethane export capacity is expected to plateau over the next three years, with some incremental exports after Mariner East 2 and 2x begin service. Energy Transfer and Satellite Petrochemical recently announced a joint venture, "Orbit Gulf Coast NGL Exports," for the construction of an ethane export terminal to deliver to a Satellite cracker in China.

LPG export capacity of the Northeast will increase parallel to the commissioning of Mariner East 2 and 2x, although the utilization of the pipeline is expected to gradually fill up over 2019. If international prices are better than domestic, the four-dock Marcus Hook export facility will be key to facilitating growth in Appalachia NGL production.

Enterprise announced the expansion of EHT by 175 MBbl/d. The company is confident that with over a million barrels a day of new fracs announced through 2020, there will be ample LPG on the coast that will have to clear.

Targa announced efforts to expand their LPG export capabilities at Galena Park to 10.5 MMBbl/month. The facility is currently capable of exporting 7 MMBbl/month.

CHART 9  
Ethane Exports and Future Capacity

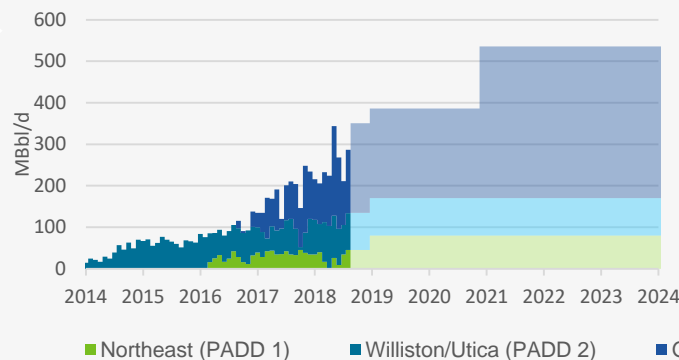


CHART 10  
LPG Exports and Future Capacity

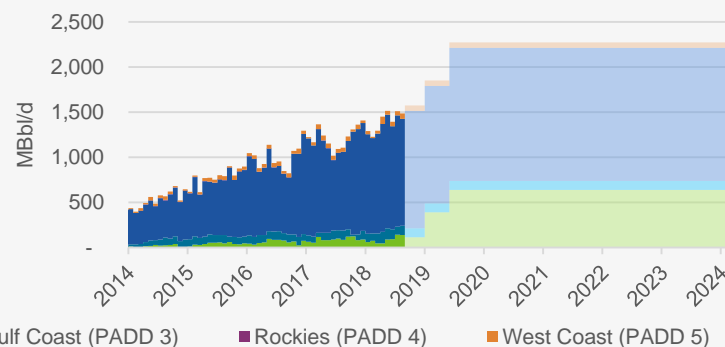


TABLE 3  
Key Export Pipelines or Facilities

Export Infrastructure	Operator/Owner	Location	Product	Status
Mariner West Pipeline	ET/Sunoco	Ohio to Canada	Ethane	In Service
Vantage Pipeline	Pembina Prairie Facilities	North Dakota to Canada	Ethane	In Service
Marcus Hook Terminal	ET/Sunoco	Philadelphia to Europe	Ethane + LPG	In Service
Morgan's Point Terminal	Enterprise	Texas to Europe, India, Brazil etc.	Ethane	In Service
UTOPIA Pipeline	Kinder Morgan	Ohio to Ontario, Canada	Ethane	In Service
Nederland Marine Terminal	Sunoco/Lonestar	Nederland, TX	LPG	In Service
Freeport Terminal	Phillips 66	Freeport, TX	LPG	In Service
Enterprise Hydrocarbons Terminal	Enterprise	Houston Ship Channel	Ethane + LPG	In Service and Expanding in 2H'19
Galena Park Terminal	Targa	Galena Park	LPG	In Service and Expanding in 2019
Orbit Gulf Coast Terminal	ET and Satellite Petrochemical	Gulf Coast to China	Ethane	Q4'20
Price Rupert Terminal	Pembina Pipeline Corporation	Prince Rupert, BC, Canada	LPG	Mid-2020

Source: EIA, Company Filings

# Contact

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