



# WE'VE GOT THIS!

2019 GPA MIDSTREAM CONVENTION

APRIL 14-17, 2019 • SAN ANTONIO, TX

Technical

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## NGL Bbl Trending Lighter in Shale Age

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NGL production  
doubled since 2010

- 2,100 Mb/d in 2010
- 4,300 Mb/d in 2018
- Composition of NGL changing over time



5,000

U.S. NGL Production at Gas Plants (Mb/d)

4,500

4,000

3,500

3,000

2,500

2,000

2010

2011

2012

2013

2014

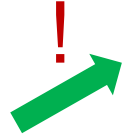
2015

2016

2017

2018

2019

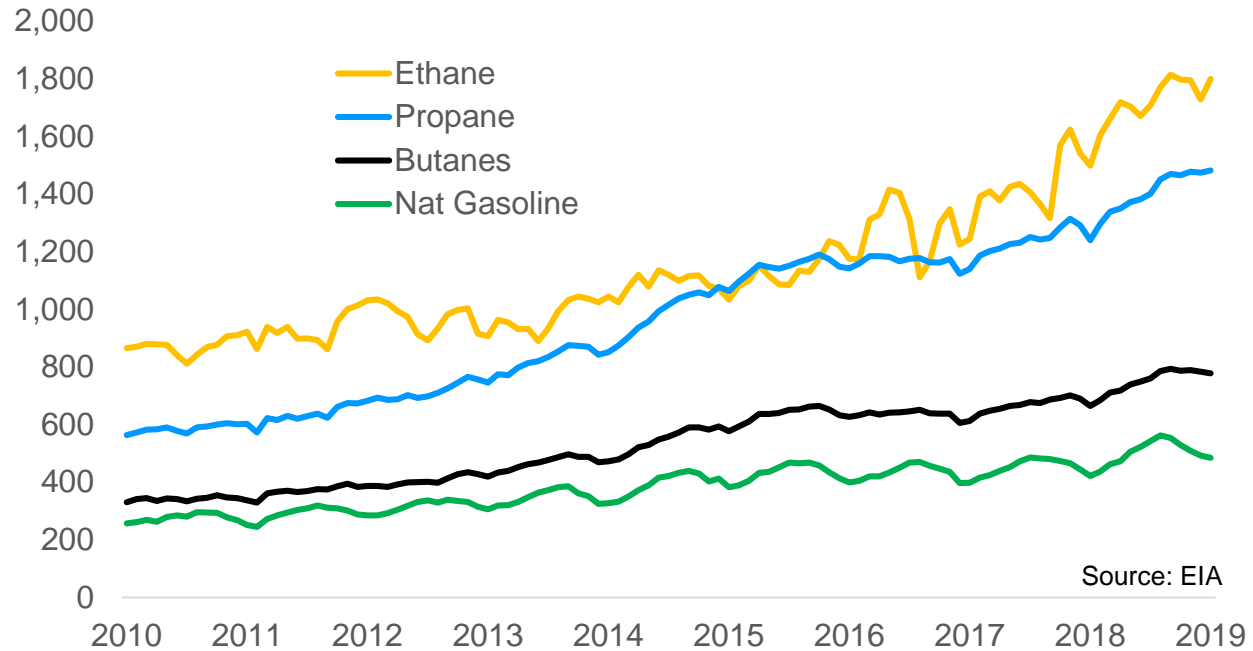


Source: EIA

- Do lighter hydrocarbons flow through rock better than heavier hydrocarbons?
- How much extractable ethane is available?
- What's in your forecast?



## U.S. NGL Production at Gas Plants (Mb/d)



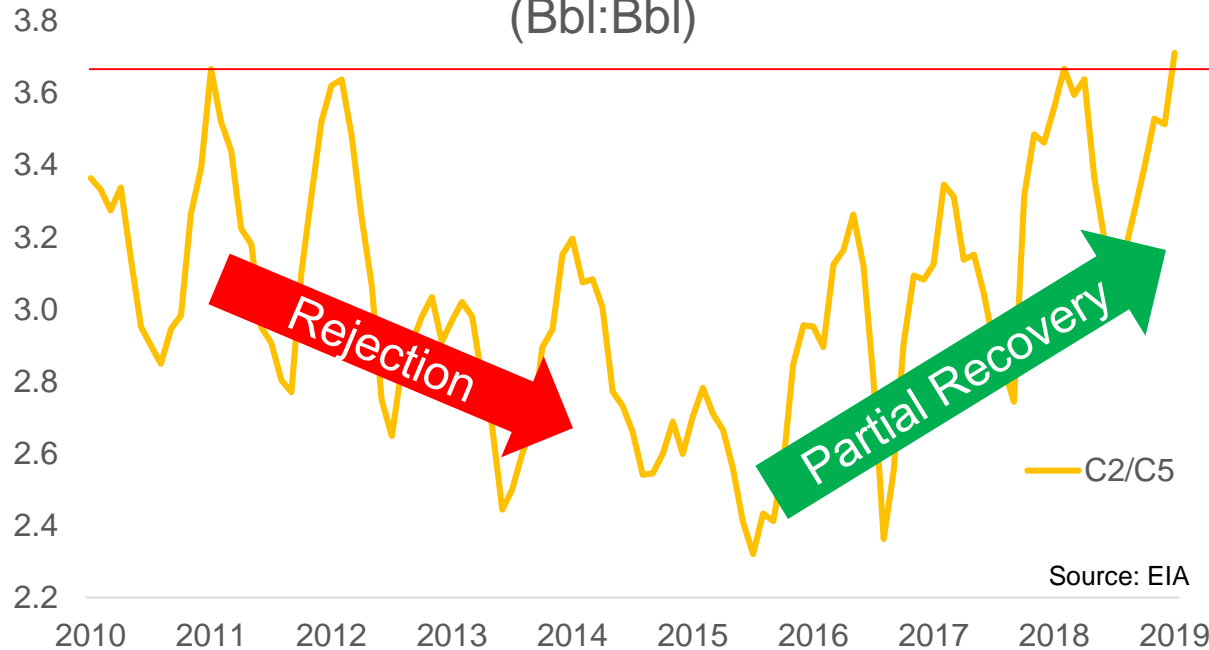
## Ratio trending higher

- Gas plant fleet is now more able to extract ethane - cryo
- Gas plant fleet in partial recovery mode
- Bakken and Marcellus now extracting ethane

Setting new records while only in partial recovery mode

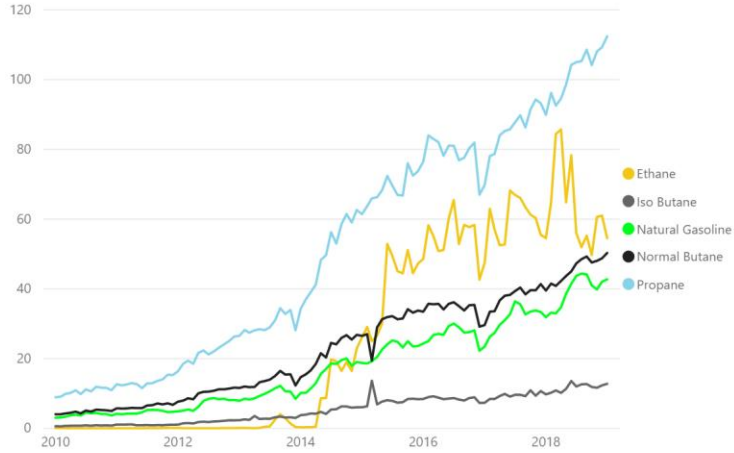


## Ethane vs Natural Gasoline Production (Bbl:Bbl)



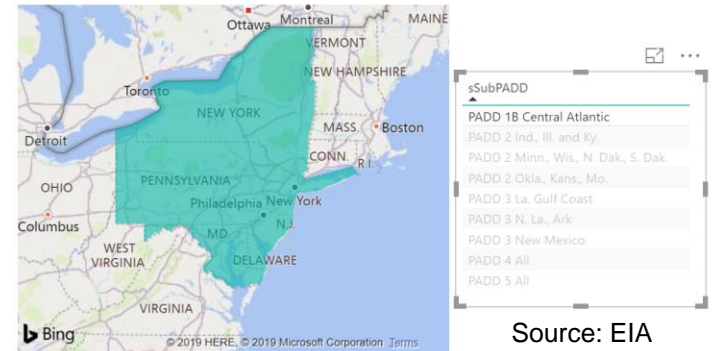
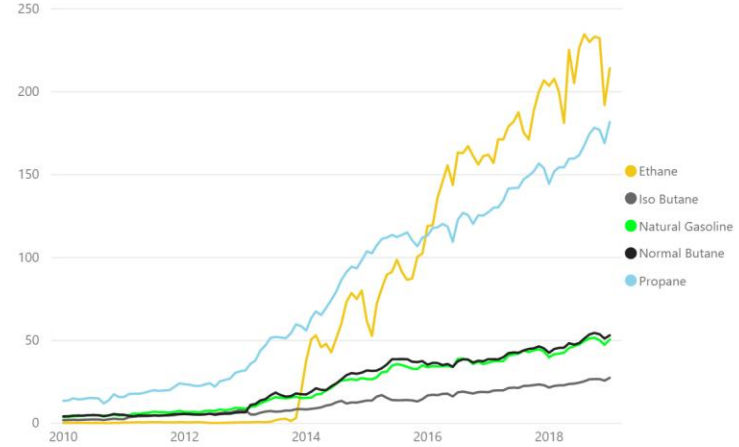
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U.S. Gas Plant NGL Production (Mb/d)

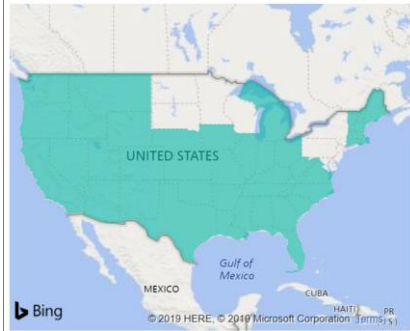


**Bakken and Marcellus certainly impacting the ratio as shown by yellow line increasing from near zero in 2014**

U.S. Gas Plant NGL Production (Mb/d)



## Excluding Bakken and Marcellus

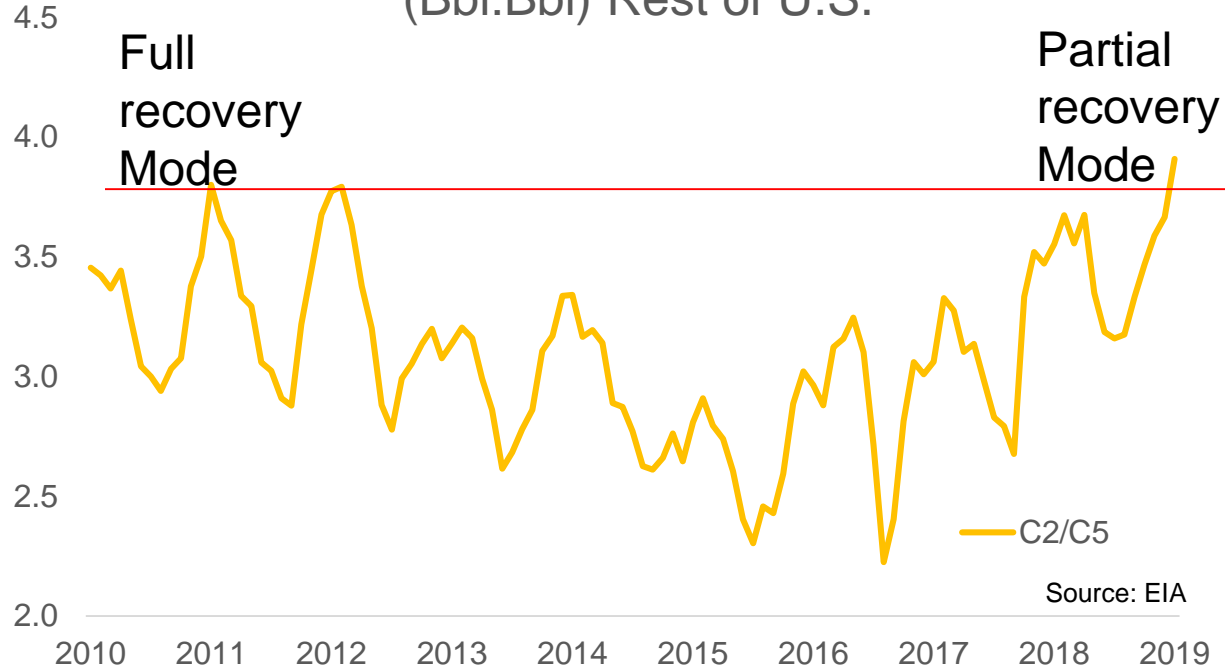


- Why rest of U.S. setting new records while only in partial recovery mode?
- How much ethane could the improved gas plant fleet recover if it tried?

**Probably more ethane available than we think!**



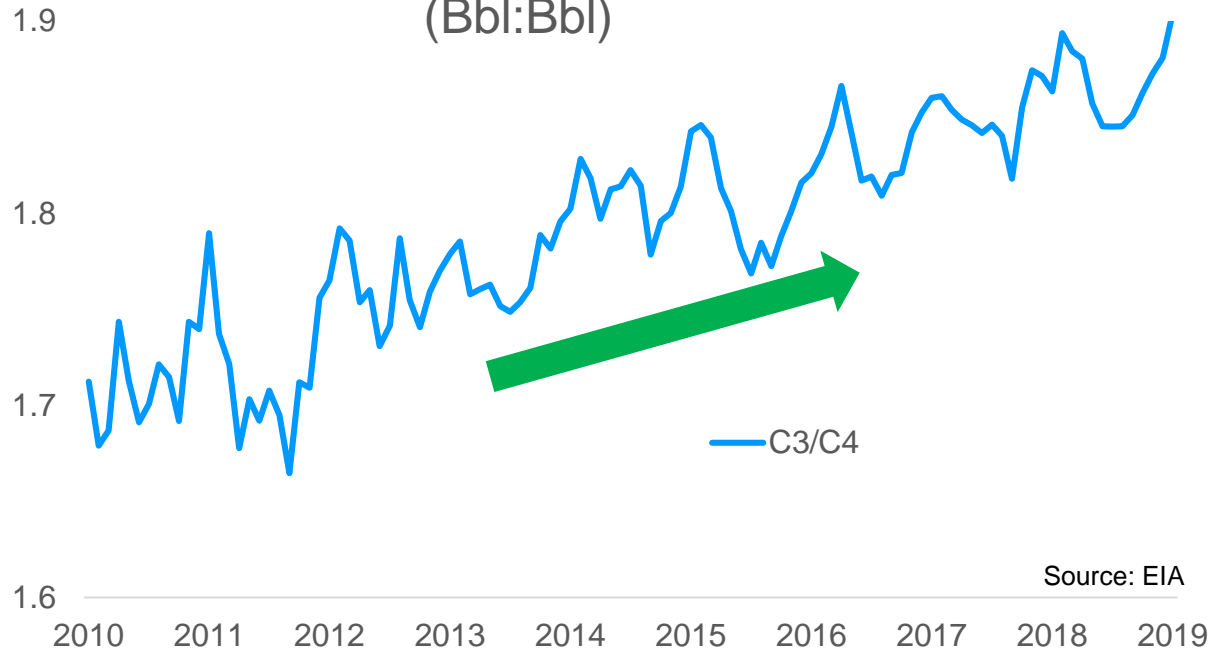
## Ethane vs Natural Gasoline Production (Bbl:Bbl) Rest of U.S.



- Why propane production growing faster than butanes production?
- New cryo plants slipping less propane in rejection mode
  - But, Midstream industry has always been careful to maximize propane recoveries at gas plants
  - Even straight refrigeration plants can easily recover most propane



## Propane vs Butanes Production (Bbl:Bbl)



What ratio does your NGL forecast have for 2030?

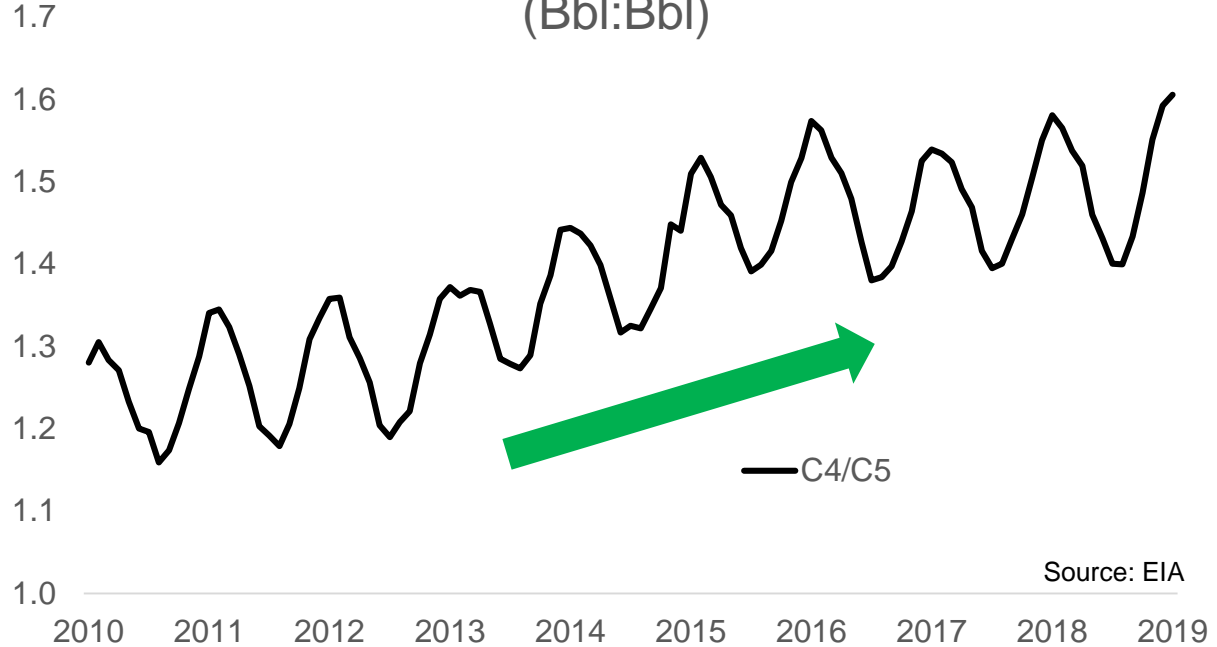


- Why would C4 be up compared to C5?
- Stabilized overhead causing? – no
  - Small % of plant inlet
  - Producers are capturing more condensate at wellhead which should make butanes ratio decrease not increase

**No sufficient explanation available!**



## Butanes vs Natural Gasoline Production (Bbl:Bbl)

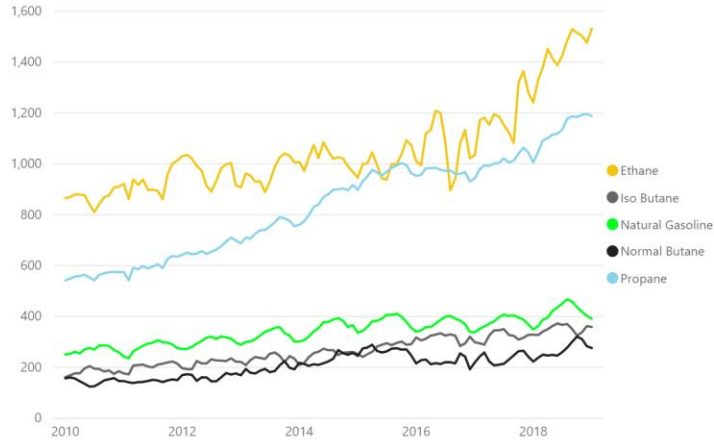


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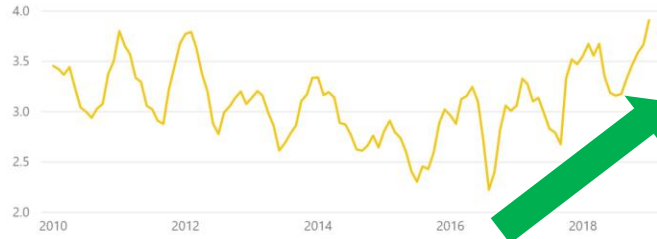
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U.S. Gas Plant NGL Production (Mb/d)



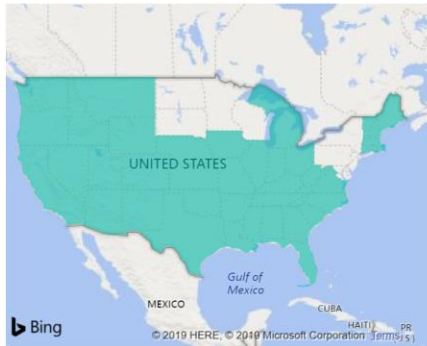
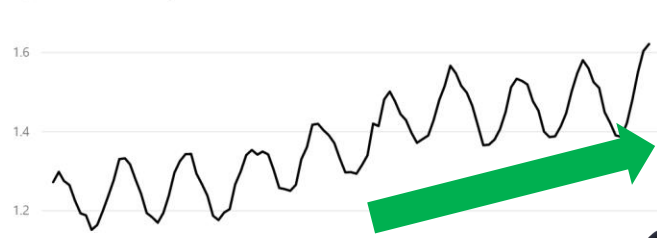
C2/C5 Production Ratio by Date



C3/C4 Production Ratio by Date



C4/C5 Production Ratio by Date



**Lighter/Heavier  
NGL ratios all  
trending higher  
in this new shale  
age – what's in  
your forecast?**

## Implications

- NGL Bbl trending lighter in shale age
- U.S. Petchem demand for ethane has lagged so far, will it ever catch up?
- When U.S. processing fleet goes into full recovery mode, production will surprise to the upside at over 50% of NGL Bbl



46%

## Ethane % of NGL Bbl

44%

42%

40%

38%

36%

34%

32%

30%

2010 2011 2012 2013 2014 2015 2016 2017 2018 2019

Source: EIA



Do industry forecasts have NGL ratios continuing to trend higher?

Could the trend accelerate?

Additional focus and well data needed!

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# Blackbird BI, LLC

- Cloud BI service and custom solutions company adding value to supply/demand/import/export/ pricing/other data
- Self-serve data model to rapidly cruise through data and build your own insights fast (*see demo video online*)
- Managed and administered by professional with vast experience in Oil & Gas operations and economics enabling rich out-of-the-box Power BI dashboards
- Provides key insights on Oil & Gas data to assist your company's decision making process
- Data platform framework in Cloud
  - Data cleaning and standardization speeds EIA data integration
  - Easy to integrate with most datasets like Well data
- Capable to select and implement right solution and technology stack in the areas of Oil & Gas data analytics