The Ins and Outs of NGLs

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What Are NGLs?

- Natural Gas Liquids or NGLs are paraffinic hydrocarbons produced as a by-product of natural gas and oil production.

- Ethane (Plastics)
- Propane (Heating)
- Normal Butane (Gasoline Blending)
- Isobutane (Gasoline Blending)
- Pentanes (Gasoline Blending)

How Are NGLs Produced?

- Oil
- Wet Natural Gas
- Gas Processing
- Raw Mix NGLs
- Refinery
- Exports
- Purity Products
- Heating
- Petrochemicals
- Fractionation
Petrochemicals Are Components Of Many Common Consumer Goods

Ethylene or ethylene by-products are major components of these products.
U.S. Olefins Are Resurgent As U.S. Ethane Falls Relative To Alternatives

Ethane Prices versus the Alternatives’ Prices

- U.S. Ethane
- Mid East Ethane
- NW Europe Naptha
- Oil Derived Naptha
- Japan Naptha
- U.S. Natural Gasoline

Source: Ponderosa Advisors/Platts
Drilling Today is Focused on Oil Rich Shale Plays

Permian
442 Rigs (22%)

Eagle Ford
249 Rigs (13%)

Anadarko
230 Rigs (12%)

Williston (Bakken)
198 Rigs (10%)

Marcellus/Utica
132 Rigs (7%)
Dry Gas Declines Are Offset By Associated Gas Production

Dry Gas Definition: Production Areas With GPM<1.15

Source: Ponderosa Advisors, HPDI, FERC
When Comparing the Value of the Markets; Natural Gas Liquids Are Still Small

2012 Average

$38 Billion
Natural Gas Liquids
Production Volume = 2.4 MMb/d

$223 Billion
Crude Oil
Production Volume = 6.5 MMb/d

$75 Billion
Natural Gas
Production Volume = 12.2 MM BOE/d

Source: EIA, OPIS
NGL Production Will Continue to Increase with Higher Crude and Gas Production

NGL Production Forecast

NGL Production, MMb/d

- U.S. NGL Production
Conclusions

• NGLs are a by-product of both crude oil and natural gas production
• The market for NGLs is small compared to the oil and gas market, but it has huge implications for the competitiveness of U.S. manufacturing
• NGL production is expected to grow by more than 60% between 2013 and 2020 driven by crude oil production increases
• The major risk factor to this outlook is a slow down in the development of U.S. crude and natural gas production.