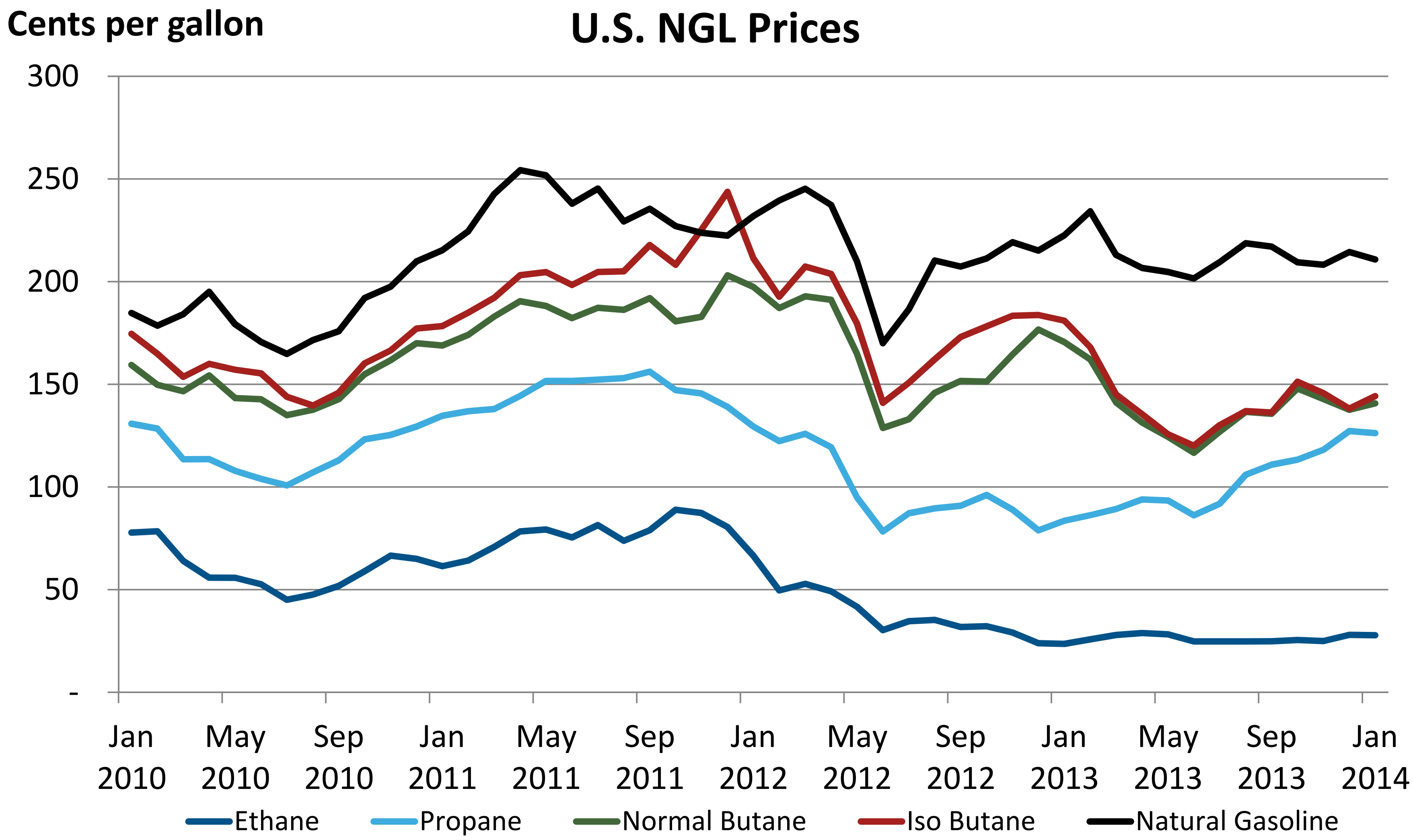
Platts Petrochemical Breakfast Session

London Oil Forum, February 17, 2014

North American NGL Prices to Date



Source: Bentek, ICE
Prices through January 16, 2014

U.S. dry gas production continues to reach record highs

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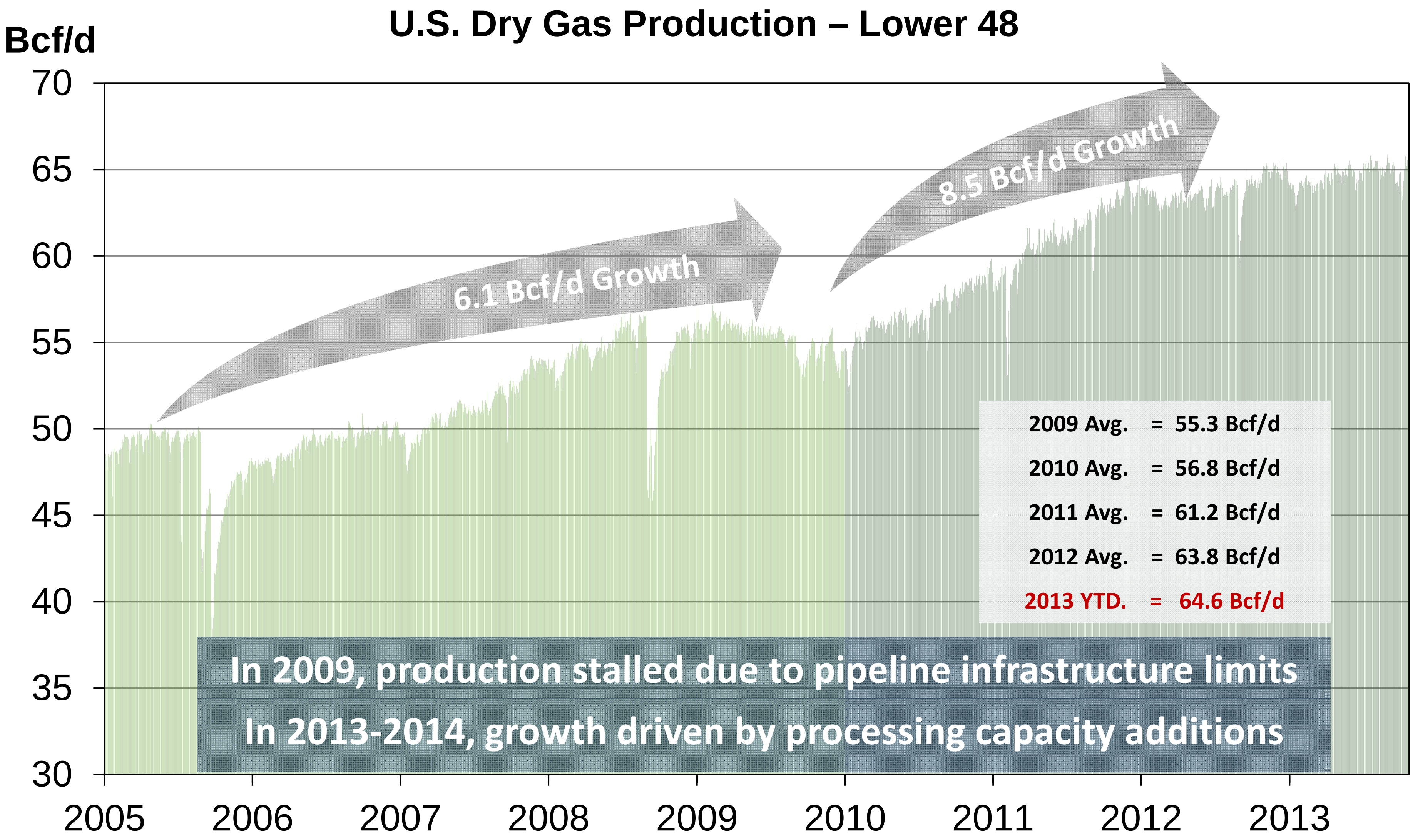
BENTEK Energy a unit of PLATTS



Source: BENTEK Supply Demand Report and Market Call

U.S. NGL production continues to reach record highs

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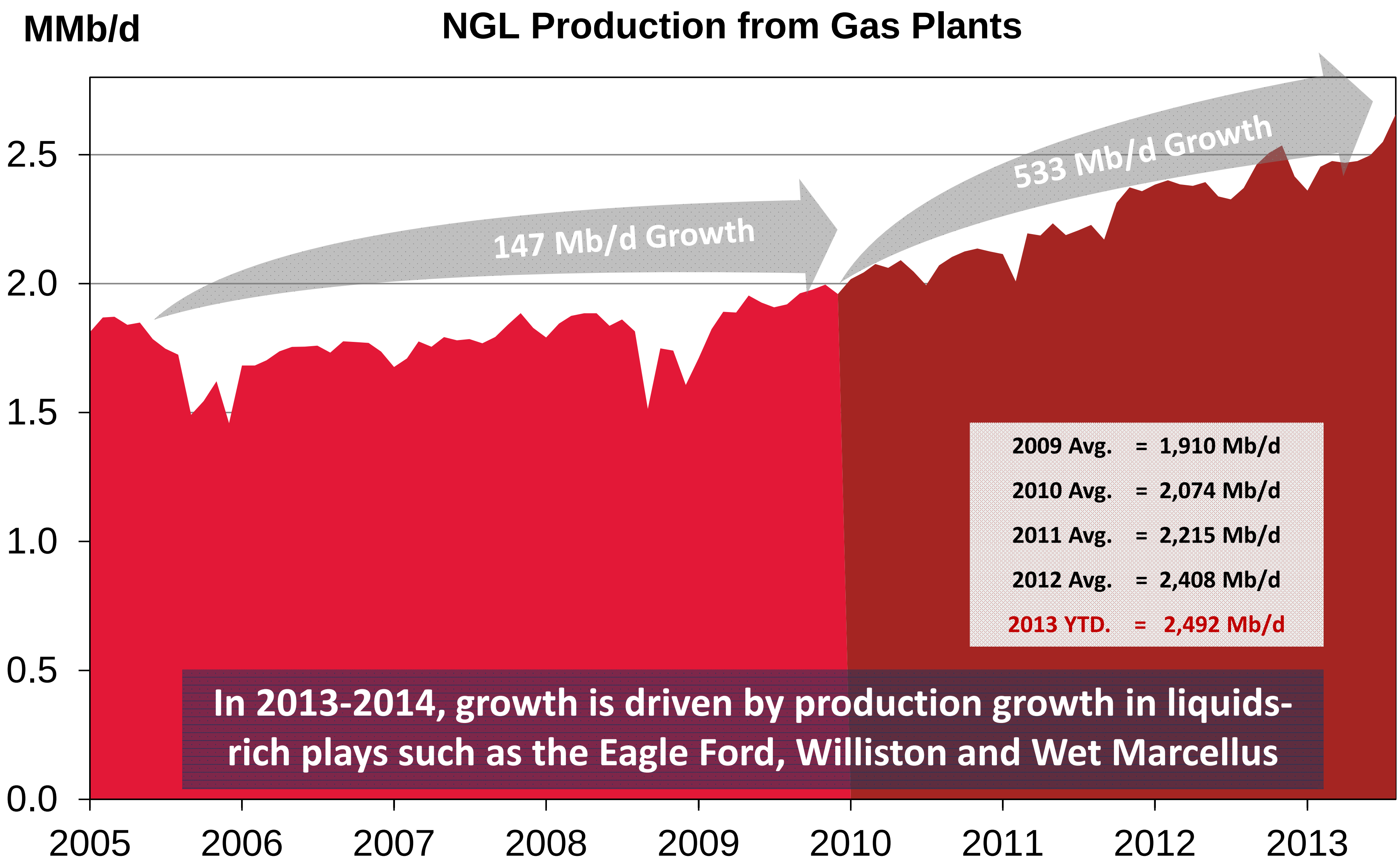
BENTEK Energy a unit of PLATTS



Source: EIA

NGL Supply from gas plants increased rapidly in 2013

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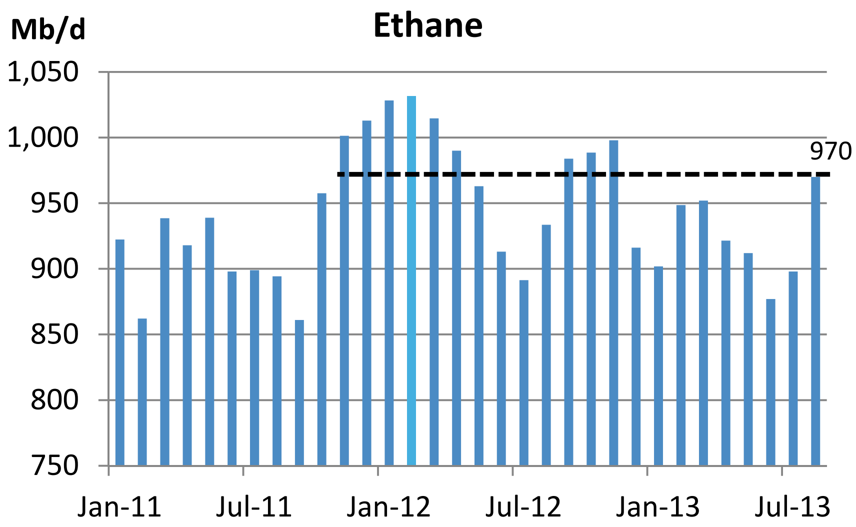
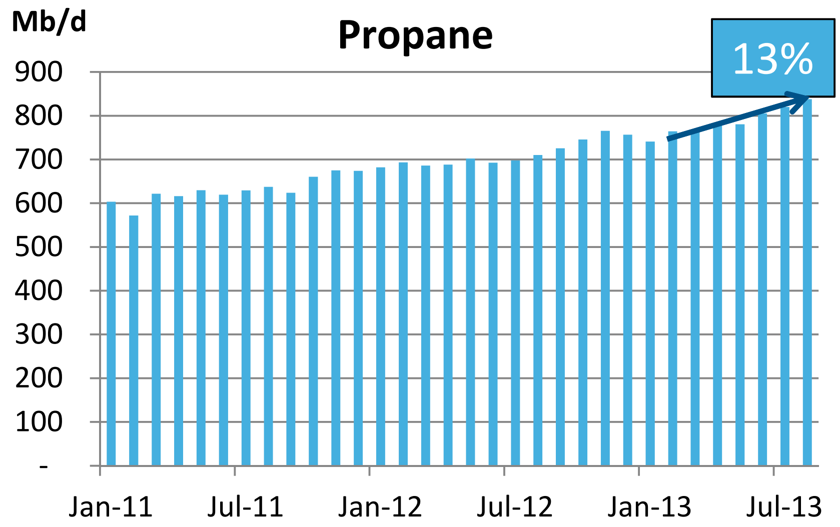
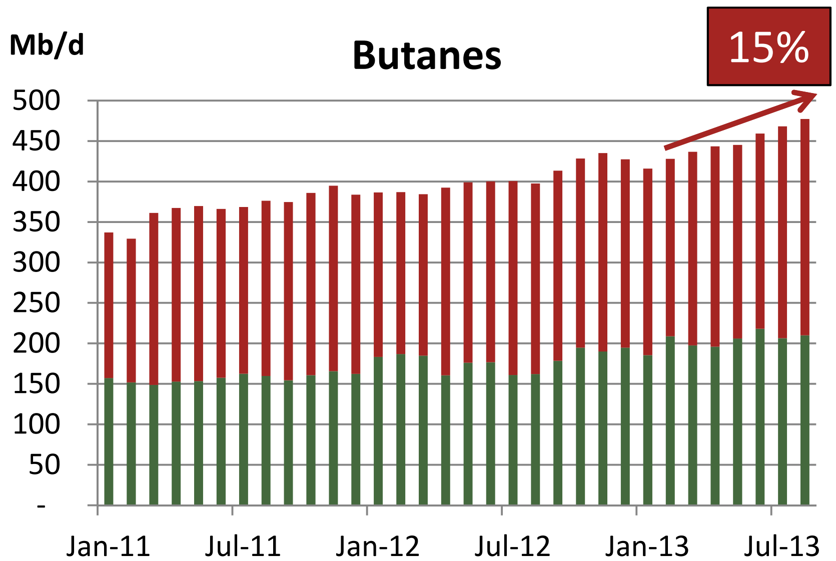
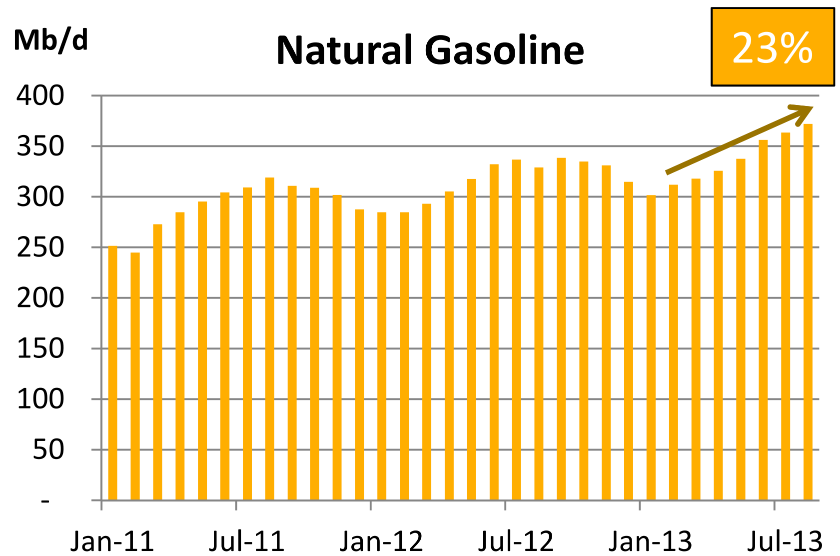
a unit of PLATTS









Source: EIA

NGL Supply Forecast from gas plants before ethane rejection

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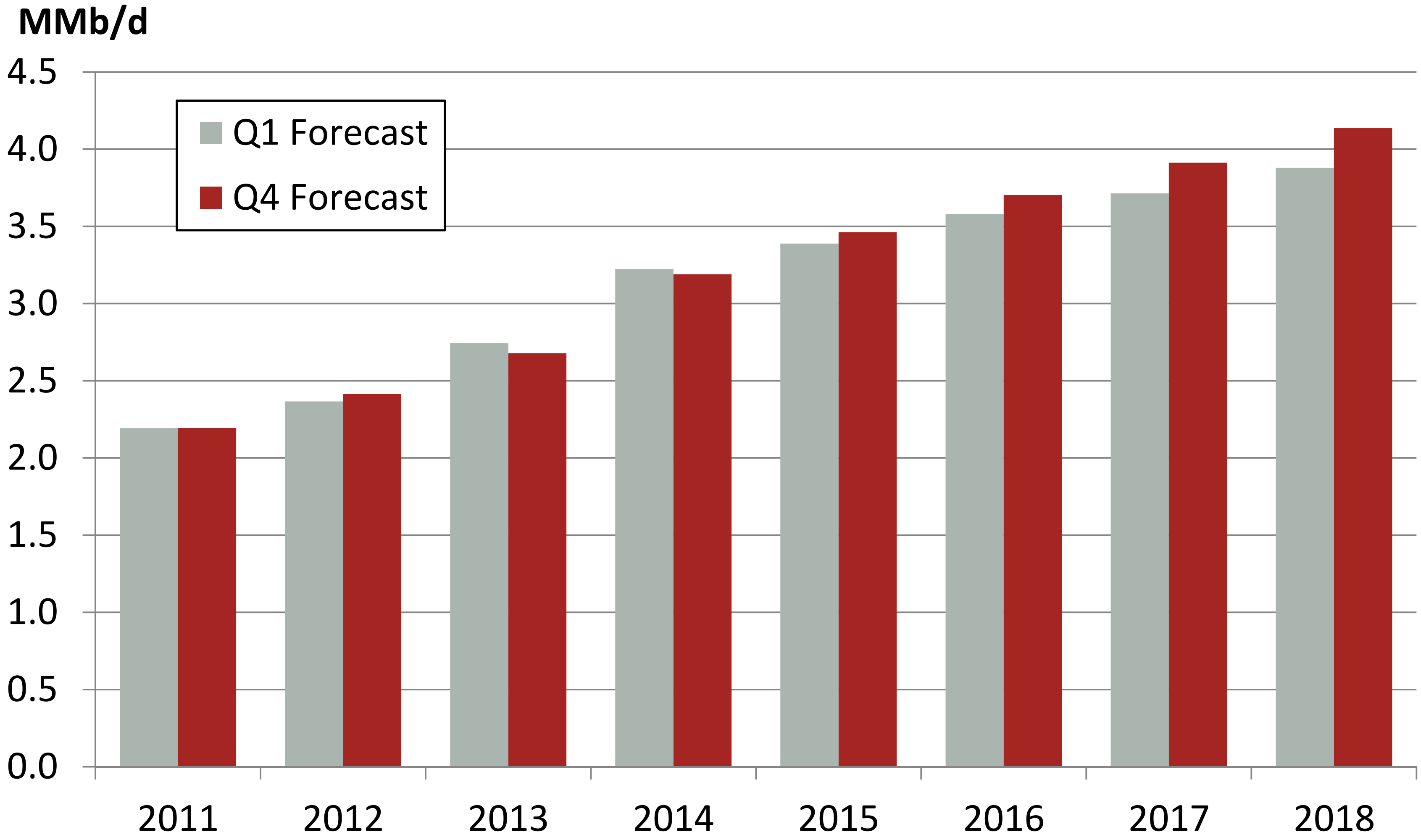
U.S. supply growth from gas plants expected to surpass 4 MMb/d by 2018



Source: Bentek *Market Call: North American NGLs*

Processing Plant Capacity additions sufficient to support NGL growth

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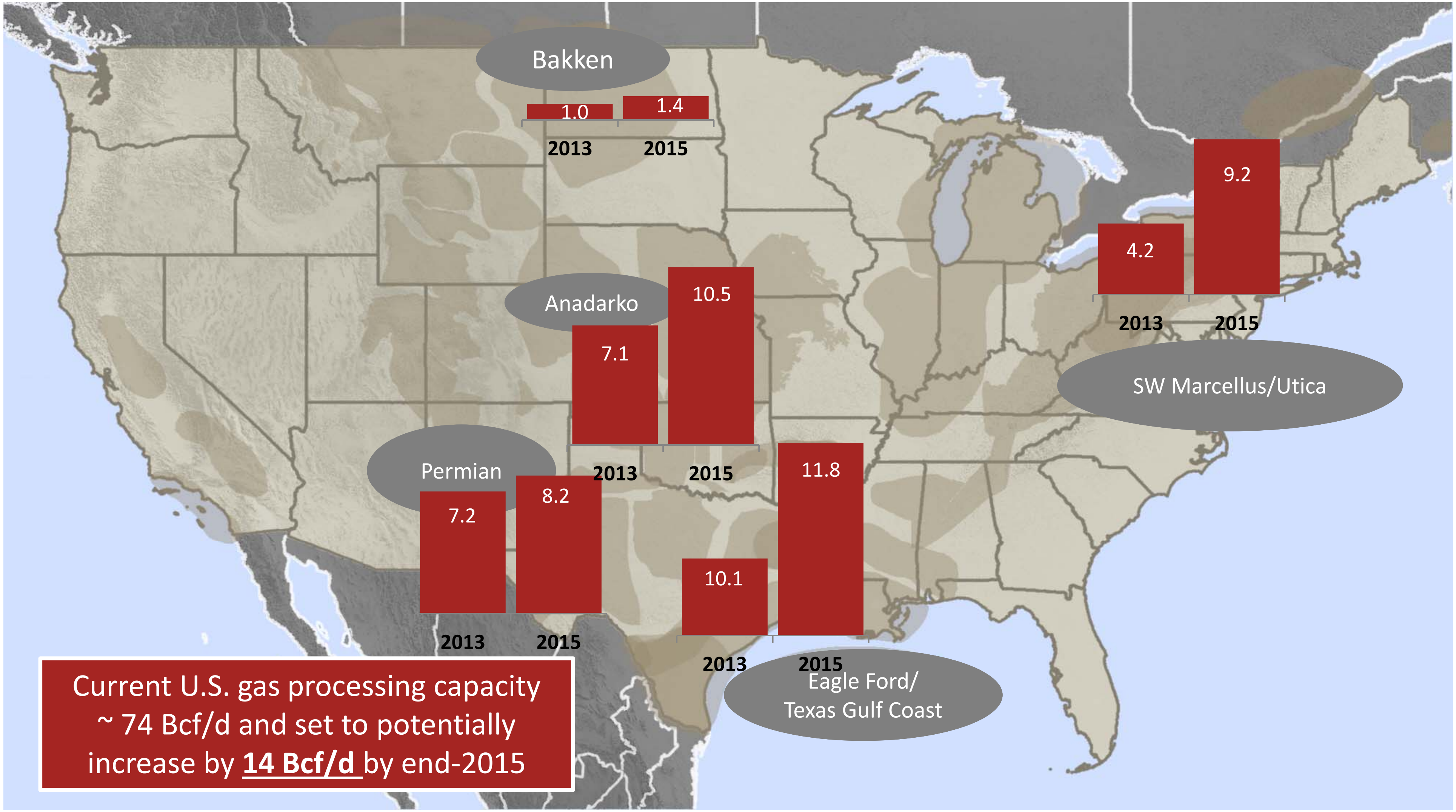

Current U.S. gas processing capacity ~ 74 Bcf/d and set to potentially increase by **14 Bcf/d** by end-2015

Source: Bentek ***NGL Facilities Databank***

NGL Pipelines on the Horizon

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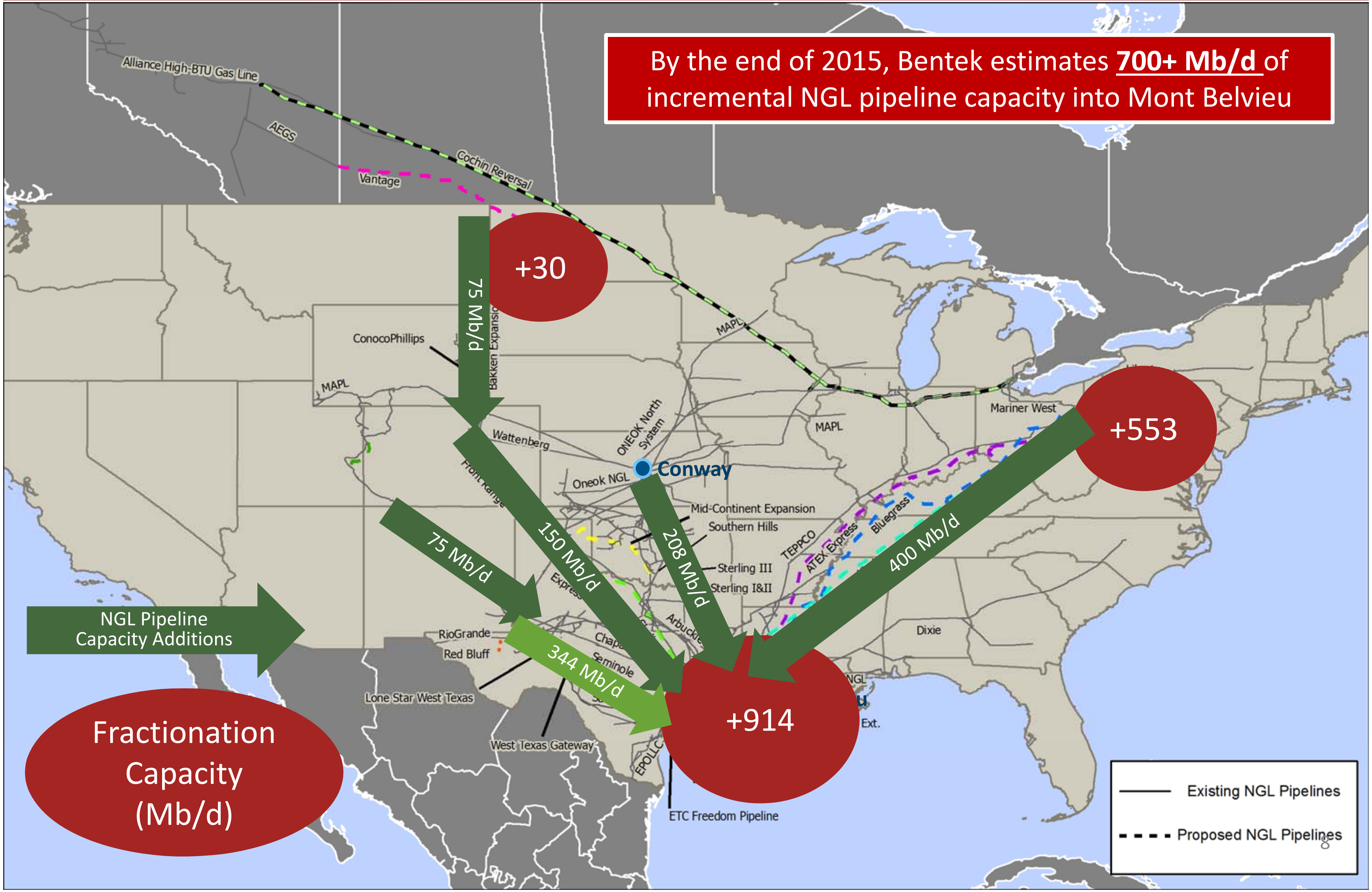

Ethane Rejection

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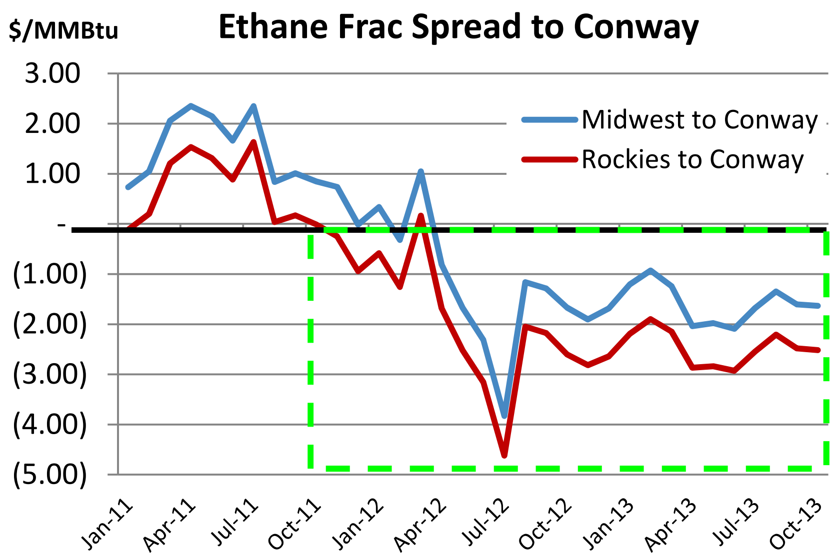

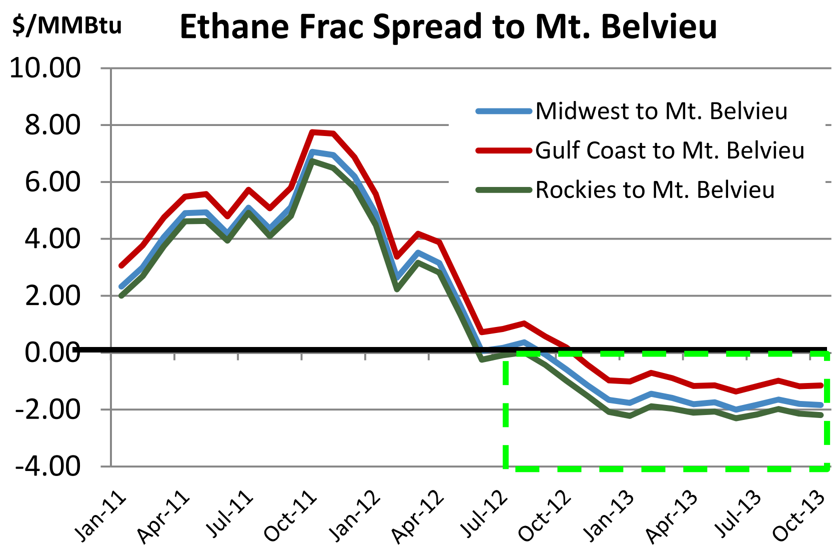

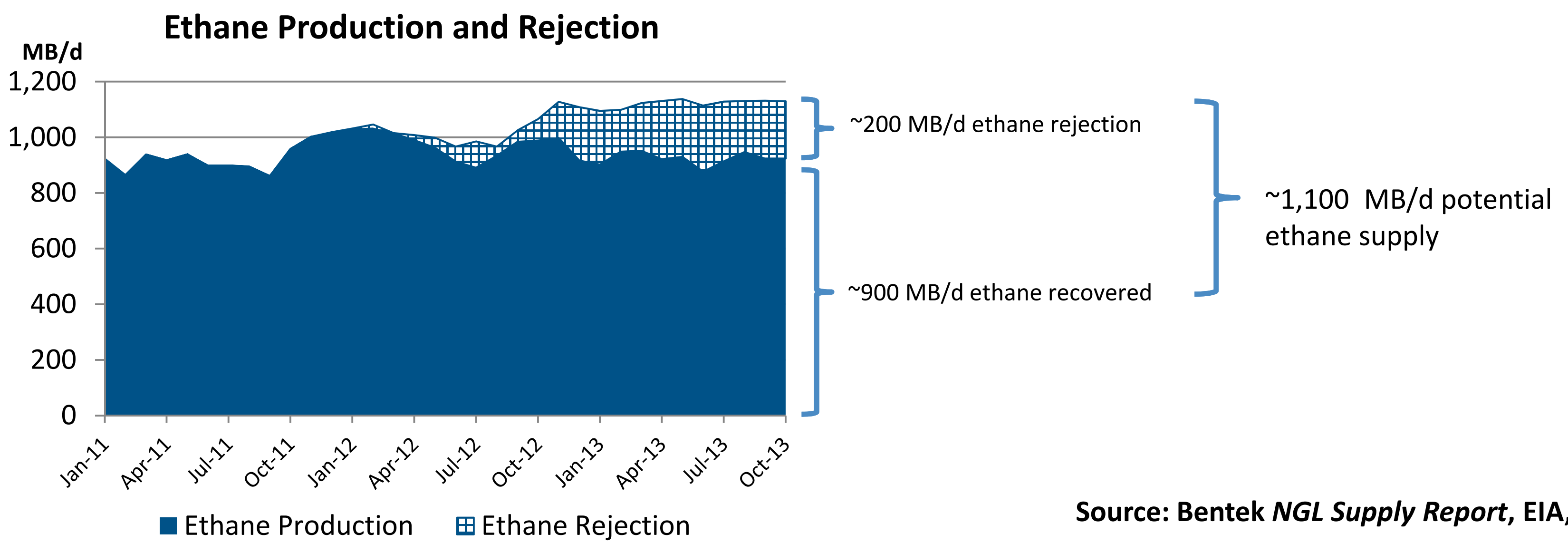

Source: Bentek *NGL Supply Report*, EIA, ICE

Steam Cracker Operations in the U.S. increasing Ethane demand

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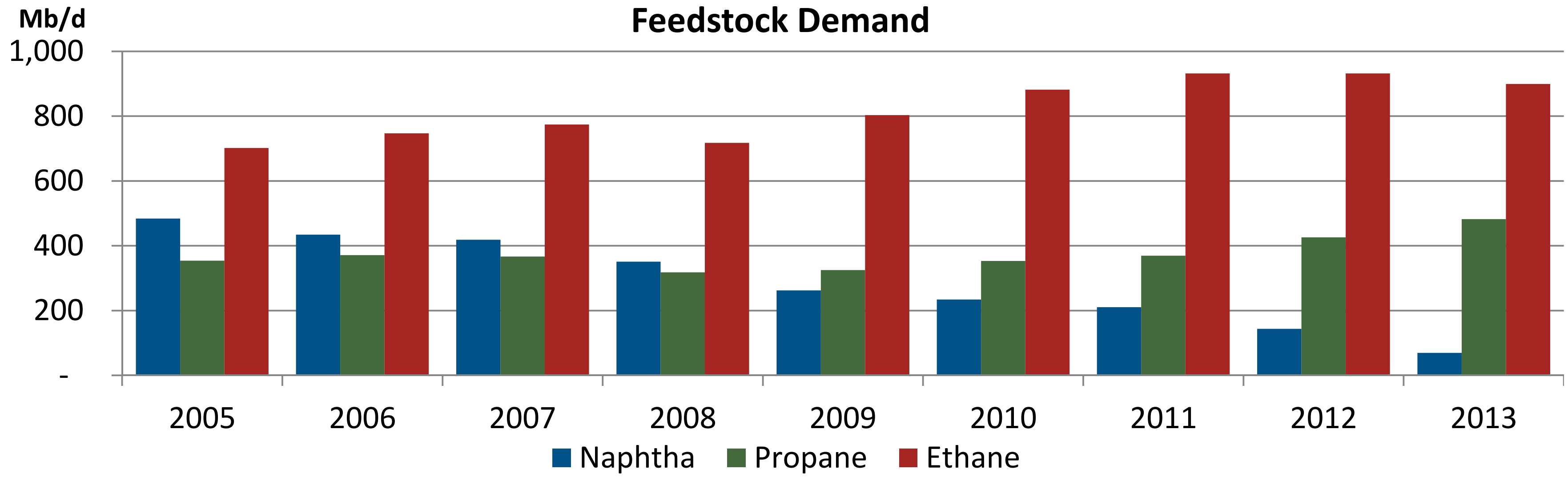

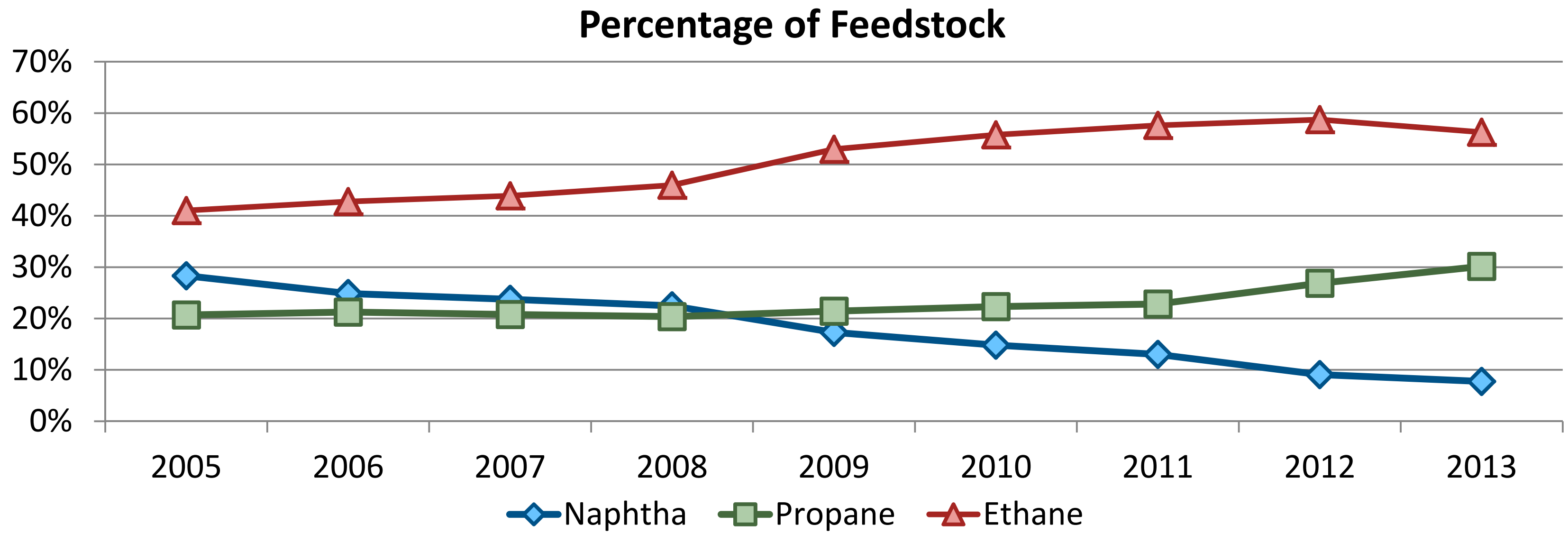

Source: Hodson Report

Ethane Supply/Demand

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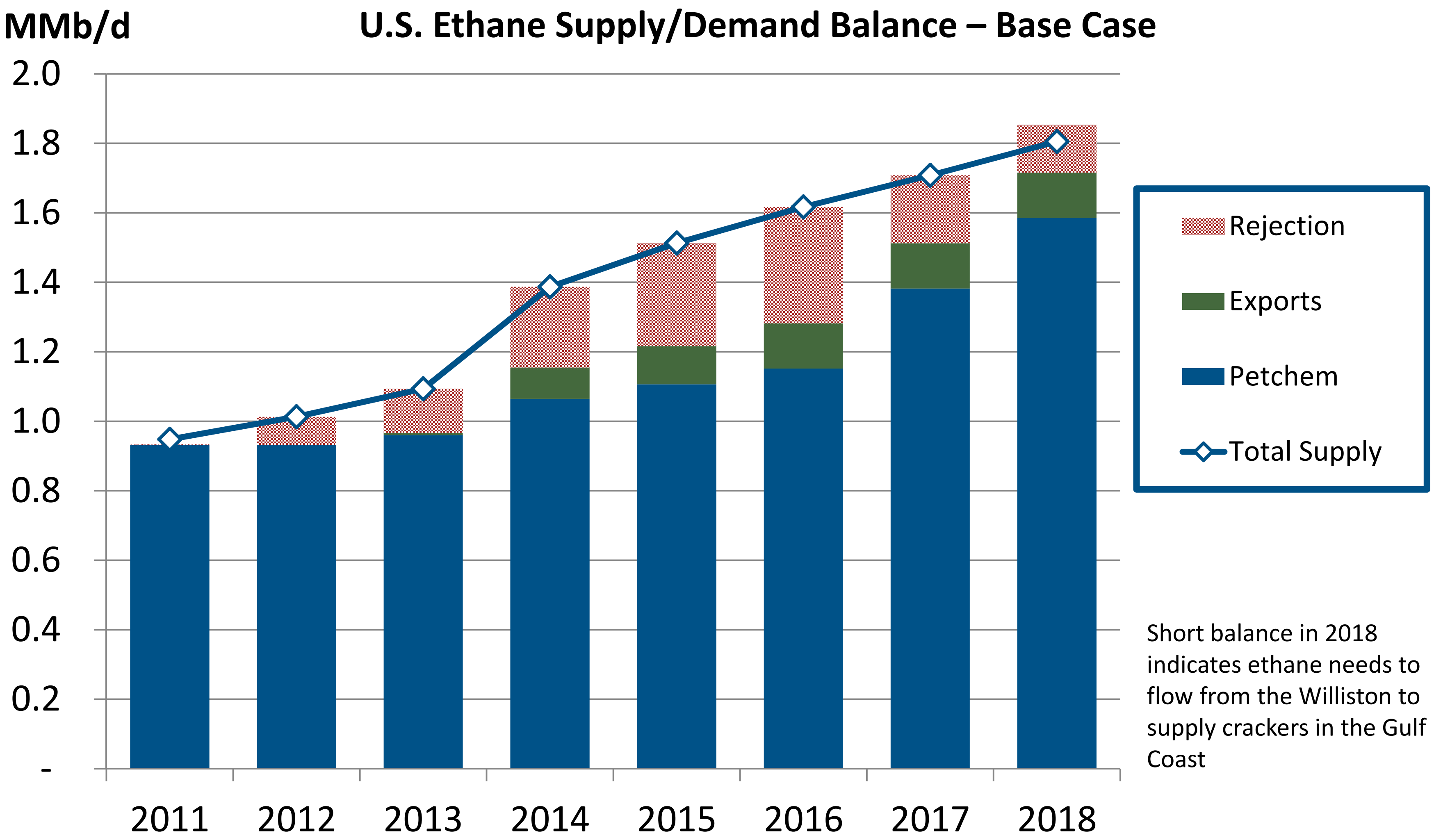
Ethane demand will struggle to keep pace with supply growth



Short balance in 2018 indicates ethane needs to flow from the Williston to supply crackers in the Gulf Coast

Source: Bentek *Market Call: North American NGLs*

Ethylene Facilities

Project Name/Location	Owner	Ethane Capacity (MB/d)	In-Service Date	Status	Region
Baytown, TX	ExxonMobil	89	2017	Planned	Gulf Coast
Baytown, TX	Chevron	89	2017	Planned	Gulf Coast
Ingleside, TX	OxyChem/Mexichem	36	2017	Planned	Gulf Coast
Westlake, LA	Sasol	89	2017	Planned	Gulf Coast
Freeport, TX	Dow Chemical	89	2017	Under Construction	Gulf Coast
Point Comfort, TX	Formosa	48	2018	Planned	Gulf Coast
Total Base Case		**440**			

Sabic, Braskem, Indorama, PTT Global, Bayer, Axiall, Hanwha Chemical, LydonellBasell	89 each	3,300 MMlb/year	Speculative	

Source: Bentek *NGL Facilities Databank,* company reports

Key Takeaways

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- U.S. NGL production is expected to ***grow dramatically*** over the next several years.
- Midstream infrastructure seems to be ***keeping pace***, bringing incremental supplies to market.
- Downstream infrastructure, however, especially on the ethane side will be ***hard-pressed*** to keep up with supply growth.
- Ethane is expected to be ***oversupplied*** through the foreseeable future and demand will hinge on incremental demand creation from petrochemical facilities.

Ethylene Facilities

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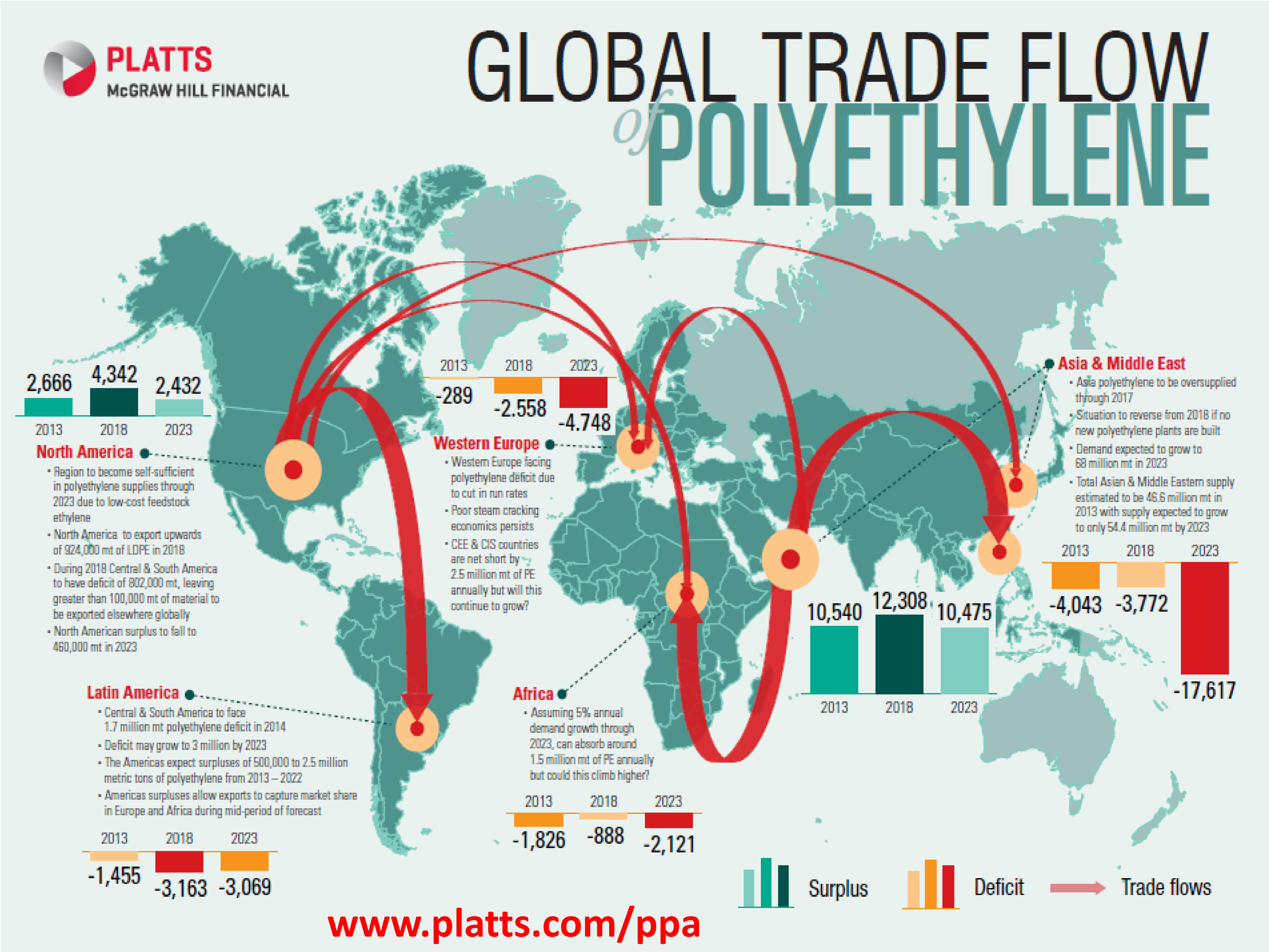
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GLOBAL TRADE FLOW of POLYETHYLENE
2,666
4,342
2,432
2013
2018
2023
North America
• Region to become self-sufficient in polyethylene supplies through 2023 due to low-cost feedstock ethylene
• North America to export upwards of 924,000 mt of LDPE in 2018
• During 2018 Central & South America to have deficit of 802,000 mt, leaving greater than 100,000 mt of material to be exported elsewhere globally
• North American surplus to fall to 460,000 mt in 2023
2013
2018
2023
-289
-2.558
-4.748
Western Europe
• Western Europe facing polyethylene deficit due to cut in run rates
• Poor steam cracking economics persists
• CEE & CIS countries are net short by 2.5 million mt of PE annually but will this continue to grow?
Asia & Middle East
• Asia polyethylene to be oversupplied through 2017
• Situation to reverse from 2018 if no new polyethylene plants are built
• Demand expected to grow to 68 million mt in 2023
• Total Asian & Middle Eastern supply estimated to be 46.6 million mt in 2013 with supply expected to grow to only 54.4 million mt by 2023
2013
2018
2023
-4,043
-3,772
-17,617
10,540
12,308
10,475
2013
2018
2023
Latin America
• Central & South America to face 1.7 million mt polyethylene deficit in 2014
• Deficit may grow to 3 million by 2023
• The Americas expect surpluses of 500,000 to 2.5 million metric tons of polyethylene from 2013 – 2022
• Americas surpluses allow exports to capture market share in Europe and Africa during mid-period of forecast
2013
2018
2023
-1,455
-3,163
-3,069
Africa
• Assuming 5% annual demand growth through 2023, can absorb around 1.5 million mt of PE annually but could this climb higher?
2013
2018
2023
-1,826
-888
-2,121
Surplus
Deficit
Trade flows
www.platts.com/ppa

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