The Future of the U.S. NGL Markets

Challenges for the Midstream Equal Opportunities for the Downstream

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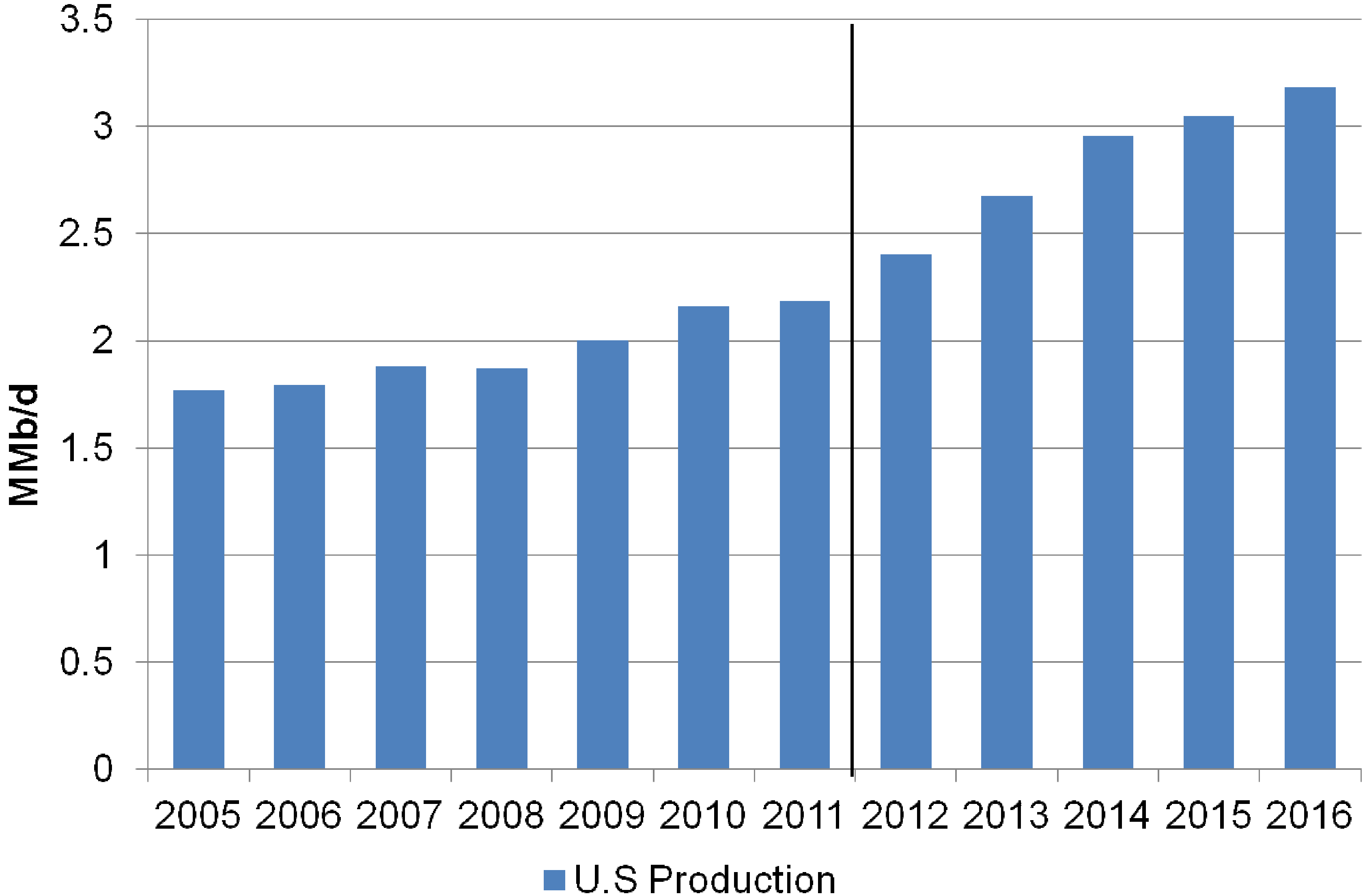
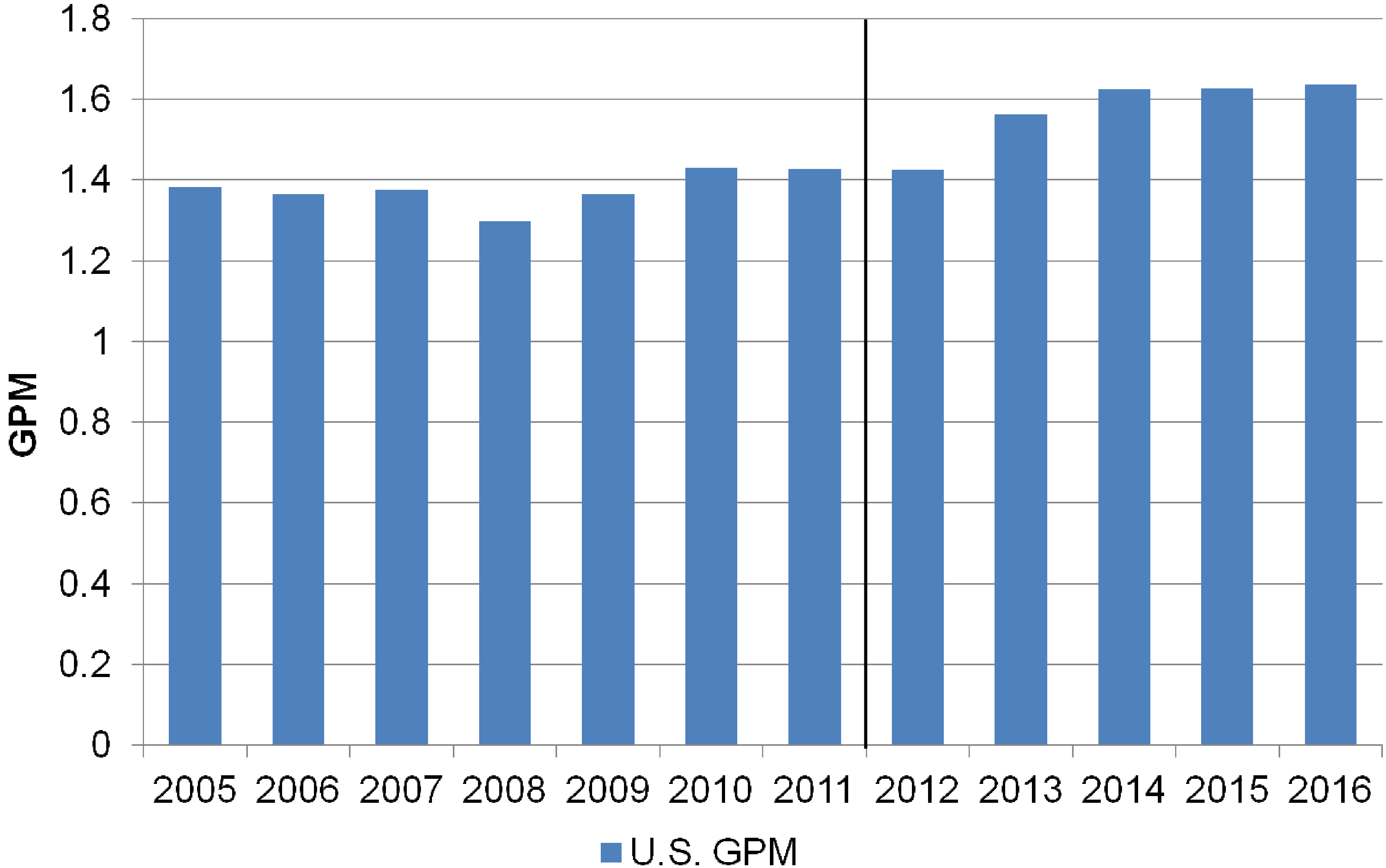
Challenges and Opportunities

- The difference in lead time between drilling, processing, fractionation and NGL demand is and will continue to lead to periods of market length or tightness for ethane and propane.
  - Ethane is balanced to slightly long in U.S. Additional length will develop between 2014 and 2016 prior to the start up of new steam crackers
  - Propane is long in the U.S. Exports out of U.S. will solve the problem in the medium term. Longer term issues remain.
- Exports of butanes and natural gasoline are required to keep those markets balanced

NGL Production Increasing, Growth Expected to Continue



North American Natural Gas Production Getting Richer



Drilling to Demand – Time Lag, Volume Differences

Natural Gas Drilling

Time to Completion:
3 Months

Volume:
1,000 Mcf/d

Cost: $5.0 MM

Natural Gas Processing

Time to Completion:
18 Months

Volume:
200,000 Mcf/d
20 Mb/d

Cost: $110 MM

Natural Gas Liquids Fractionation

Time to Completion:
18 Months

Volume:
75 Mb/d NGLs
38 Mb/d Ethane

Cost: $260 MM

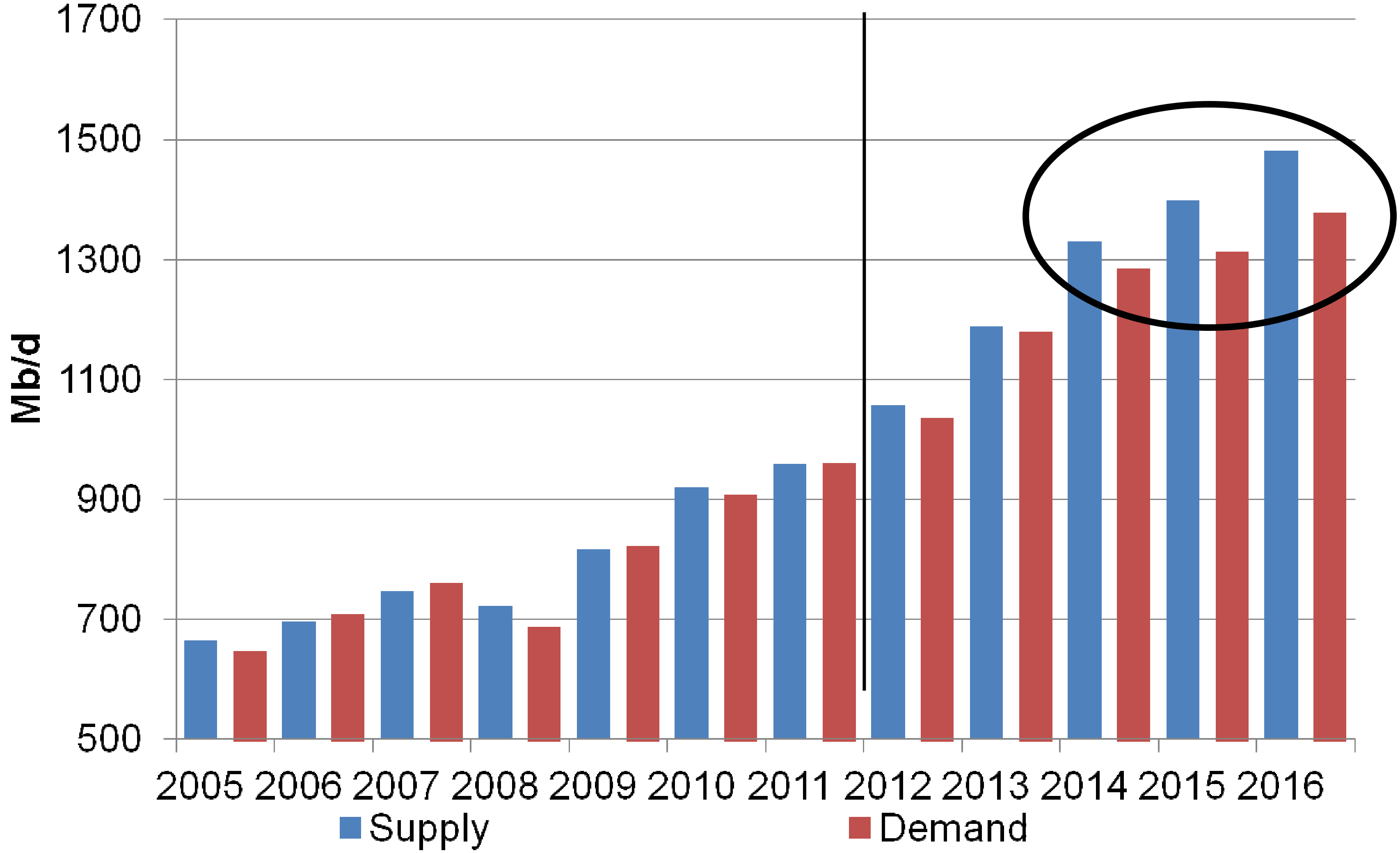
Ethylene Production

Time to Completion:
36 Months

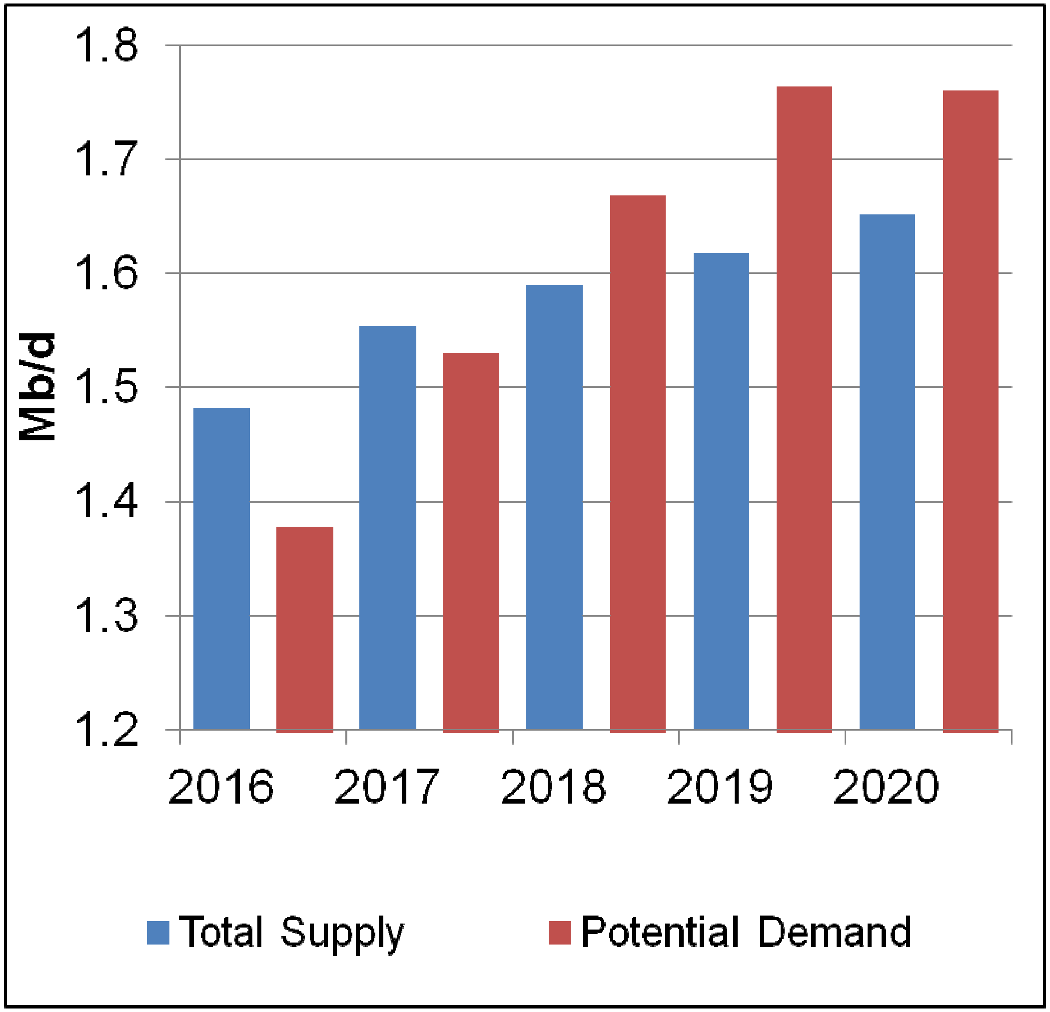
Feedstock Volume:
90 Mb/d Ethane

Cost - $2.0 Billion

U.S. Ethane – Petrochemicals Have Kept Up So Far

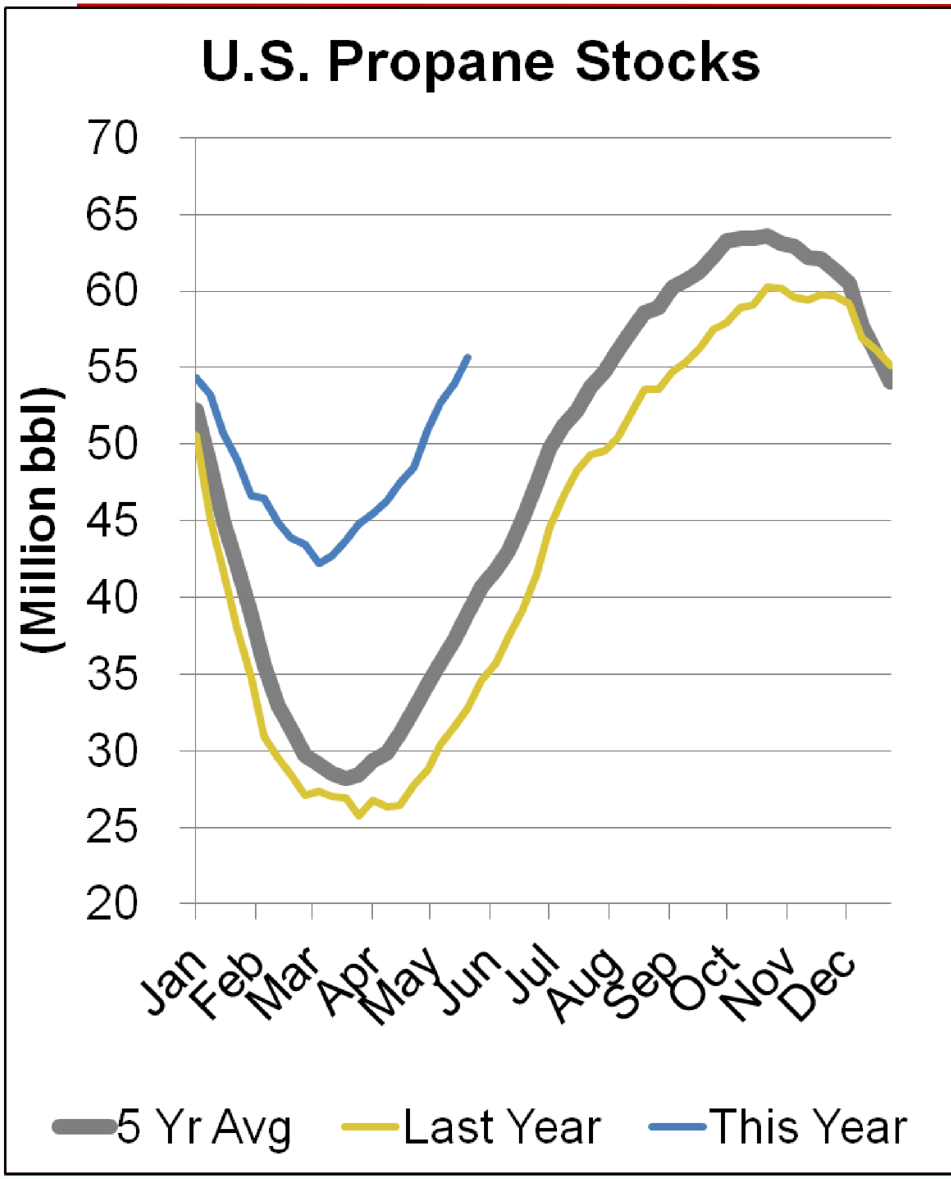


U.S. Cracker Start–Ups Rebalance and Even Tighten the Market



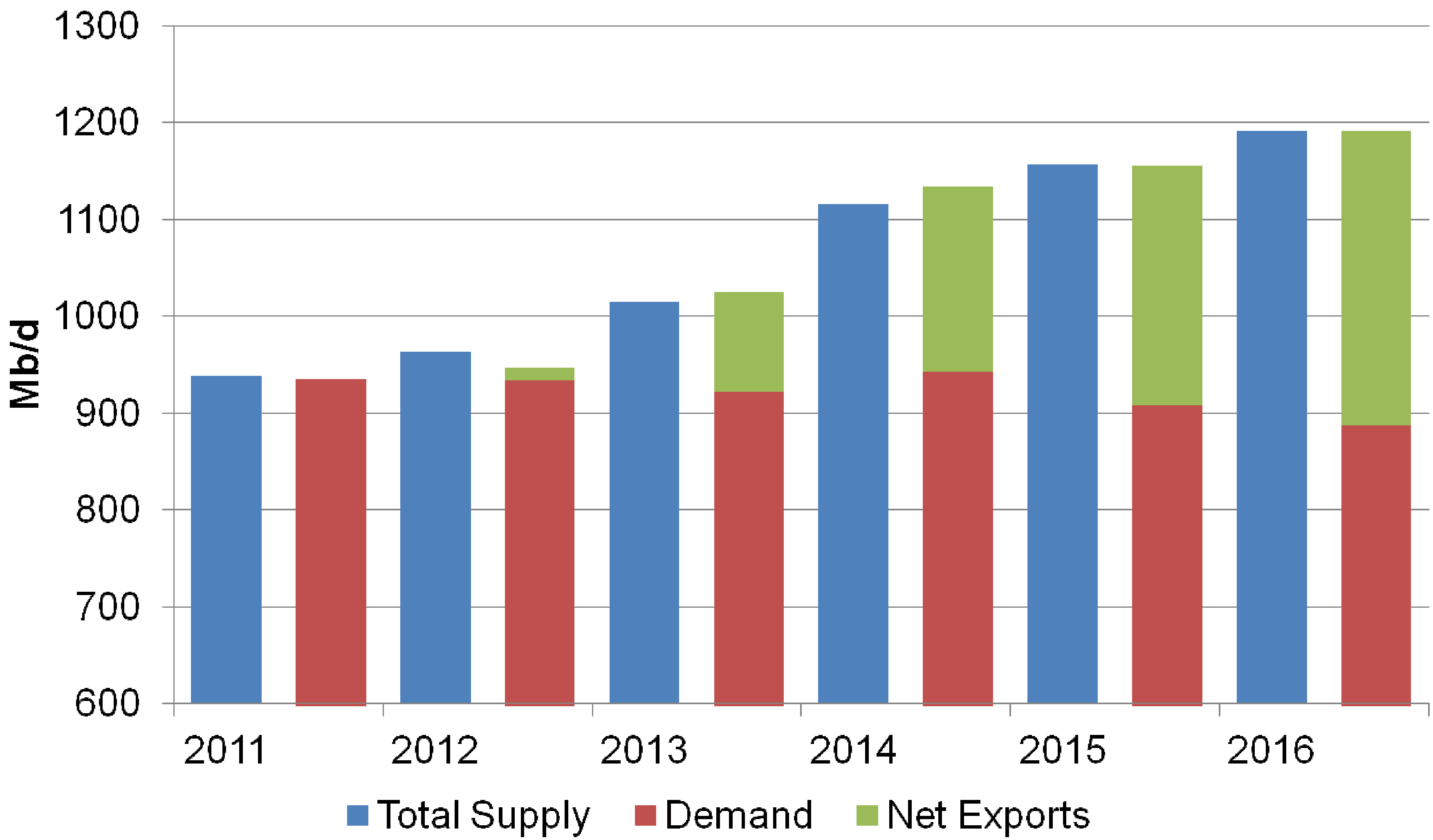
- Base Case includes 5 new steam crackers starting up between 2017 and 2021
- Start up of new units brings market back into balance in mid-2017
- With five units starting up, ethane market will be oversubscribed unless there is feedstock switching

Propane Market Length a Major Factor in Price Changes

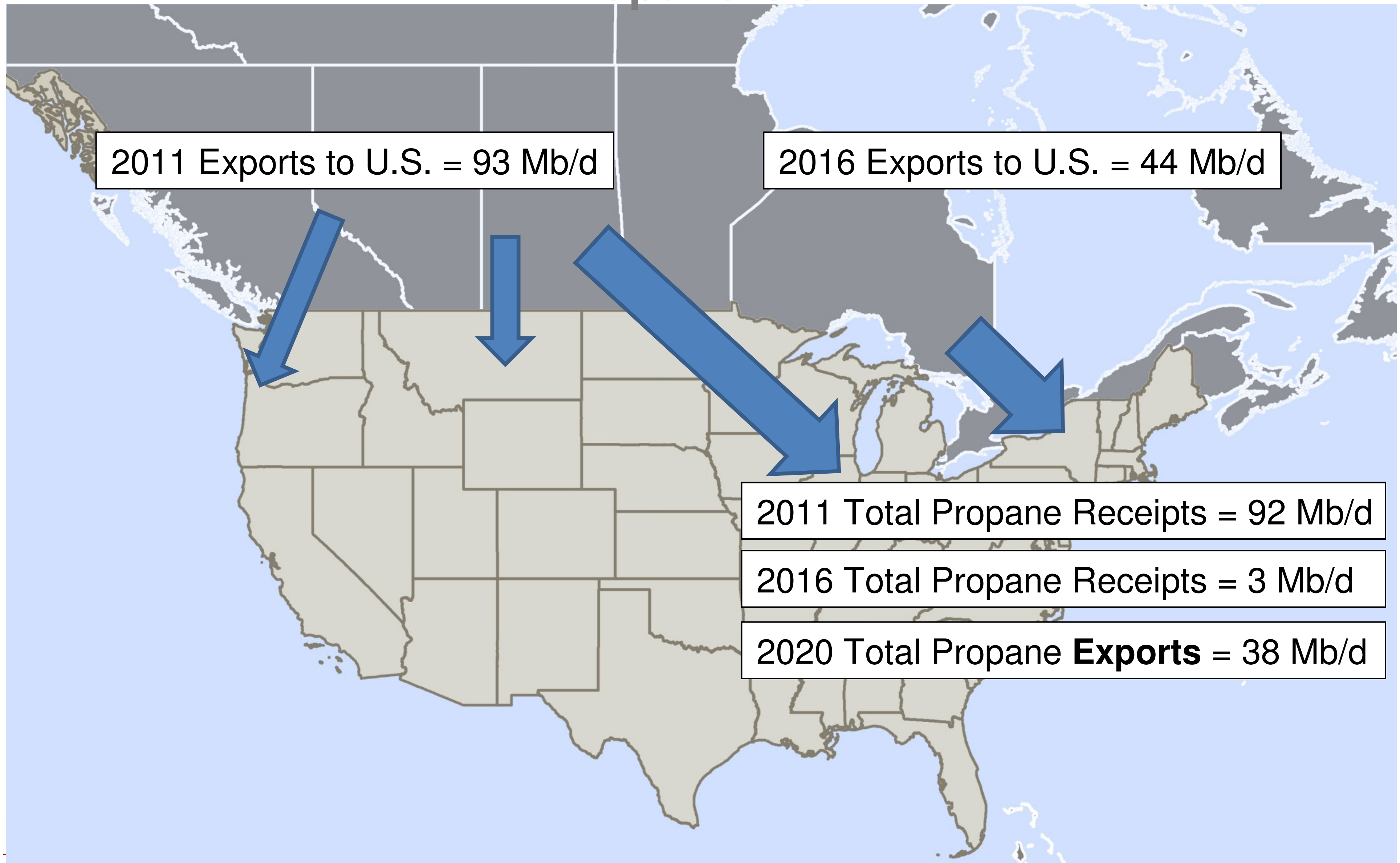


- The 2011/2012 winter had 20% fewer cooling degrees day than the five year average
- Current propane stocks are 45% higher than average (16.7 MMbbl)
- Propane Storage in PADD II is 50% higher than average
- Propane Storage in PADD III is 45% higher than average

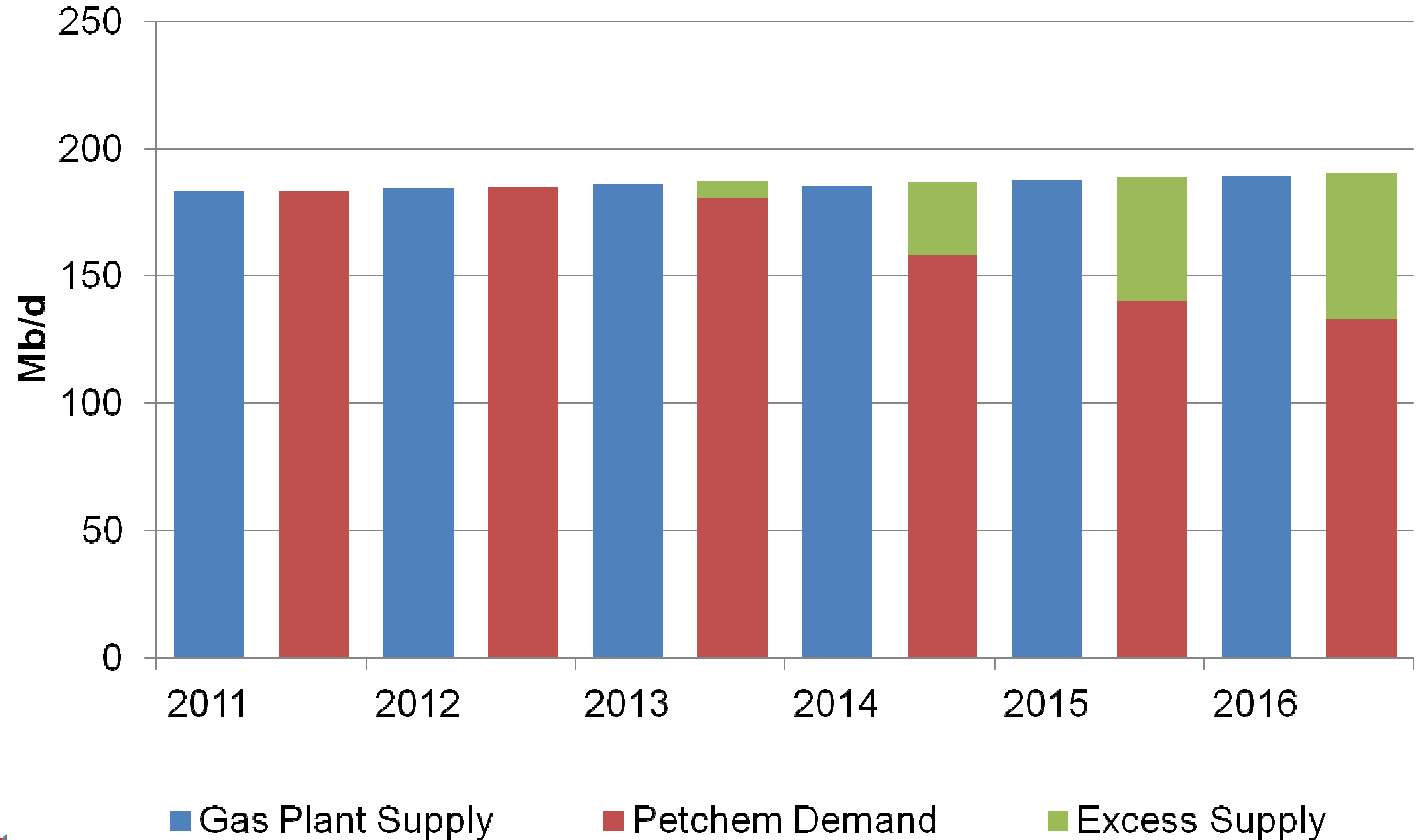
Rebalancing the U.S. Propane Market



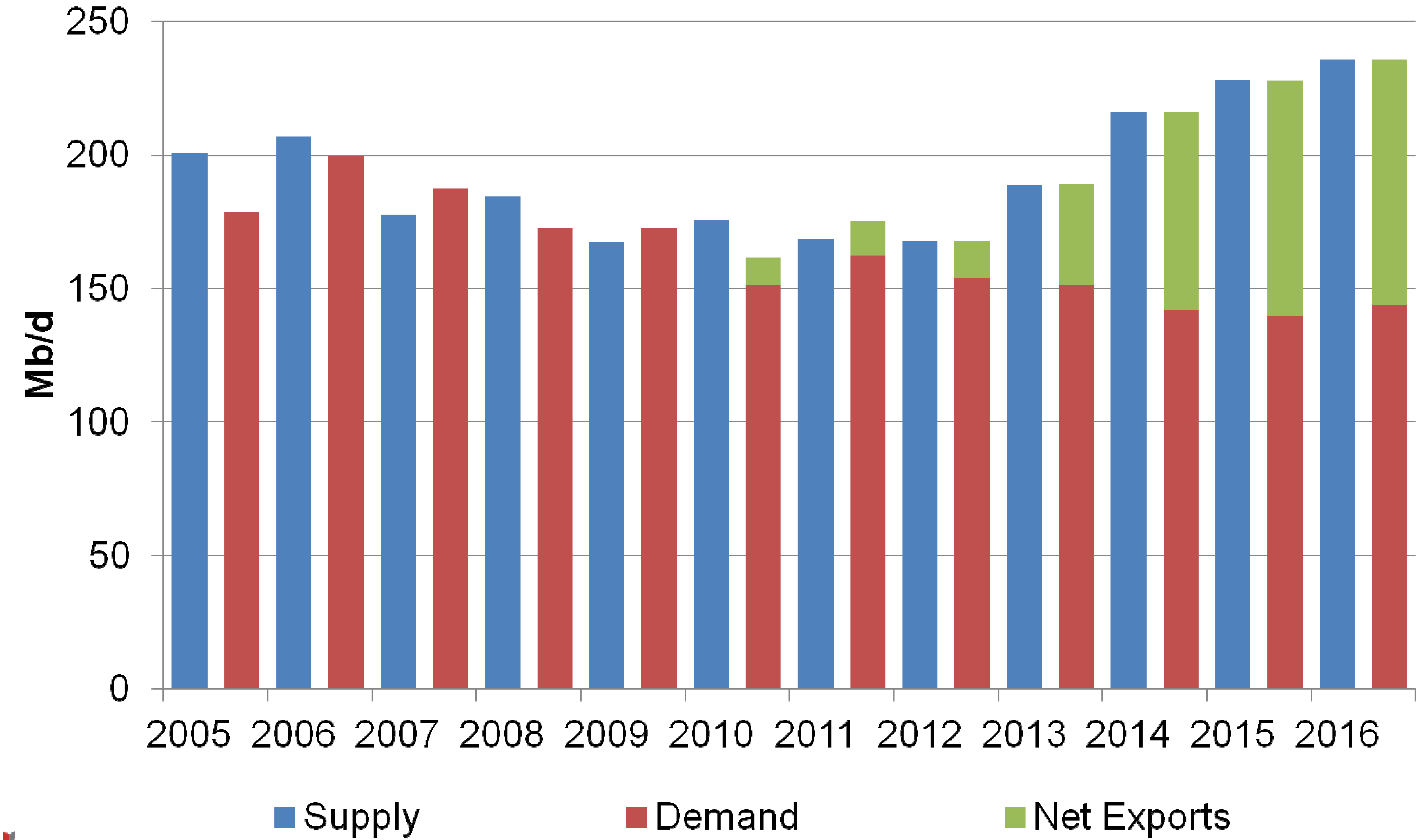
Challenges in the Medium to Long Term – Where Will The Propane Go?



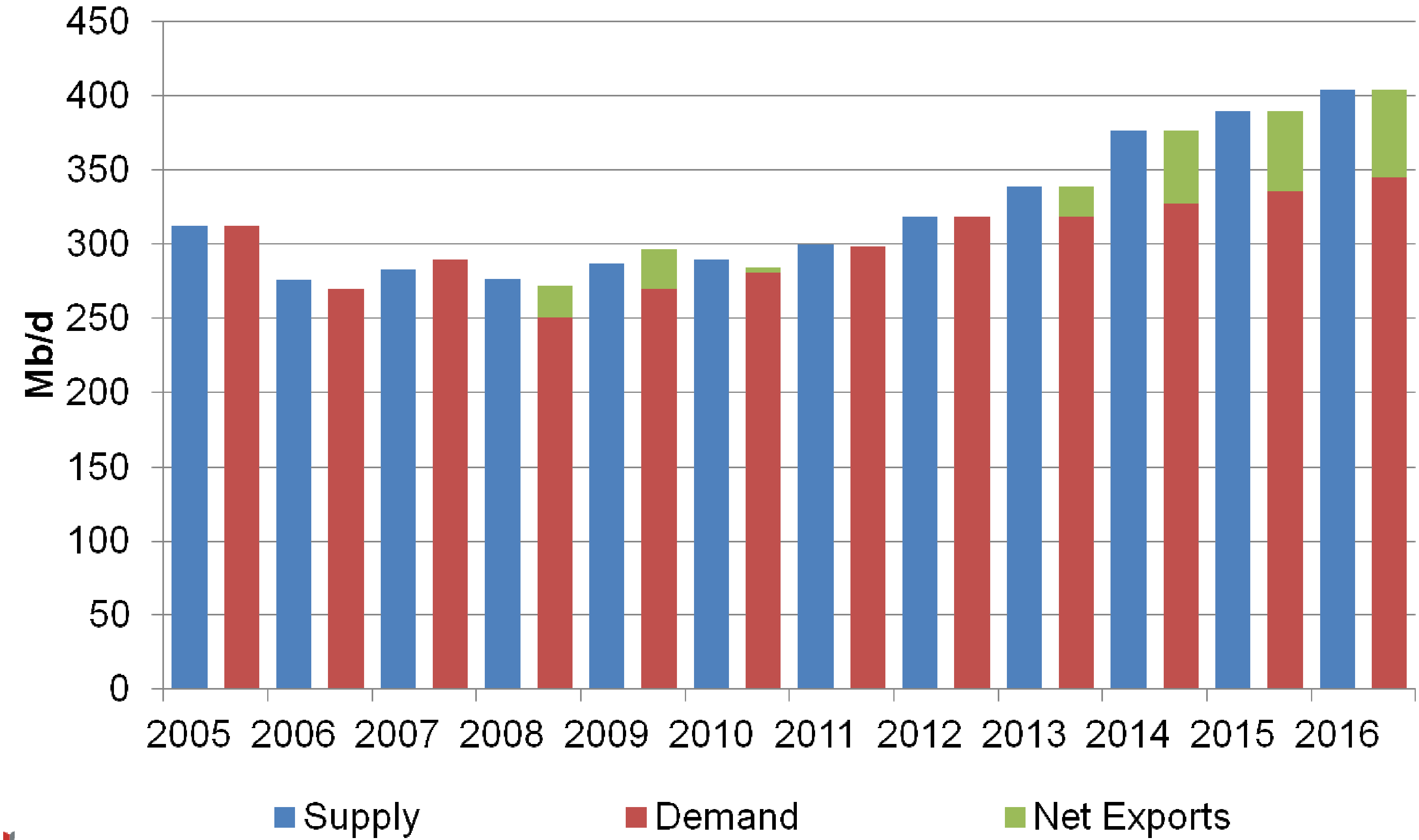
Canadian Propane – Other Demand Required



Butane Markets – Exports Also Required to Keep Market Balanced



Natural Gasoline Markets – Exports Also Required



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