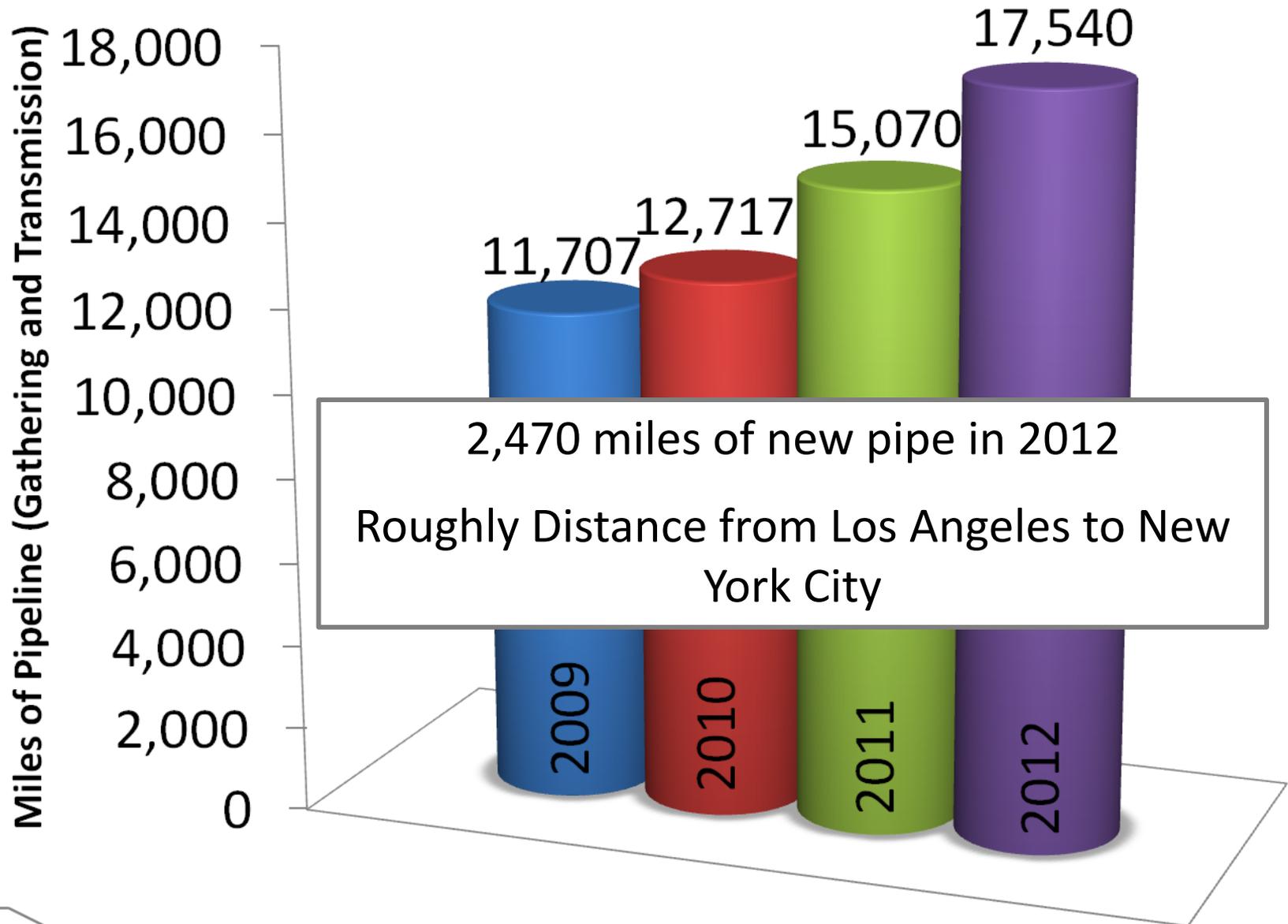




Energy Development and Transmission Committee
North Dakota Pipeline Authority
Justin J. Kringstad
October 14, 2013 - Bismarck, ND

North Dakota Pipeline Miles



Crude Oil

Understanding production potential

Understanding current transportation dynamics and potential transportation constraints

Understanding current and future market conditions



Crude Oil

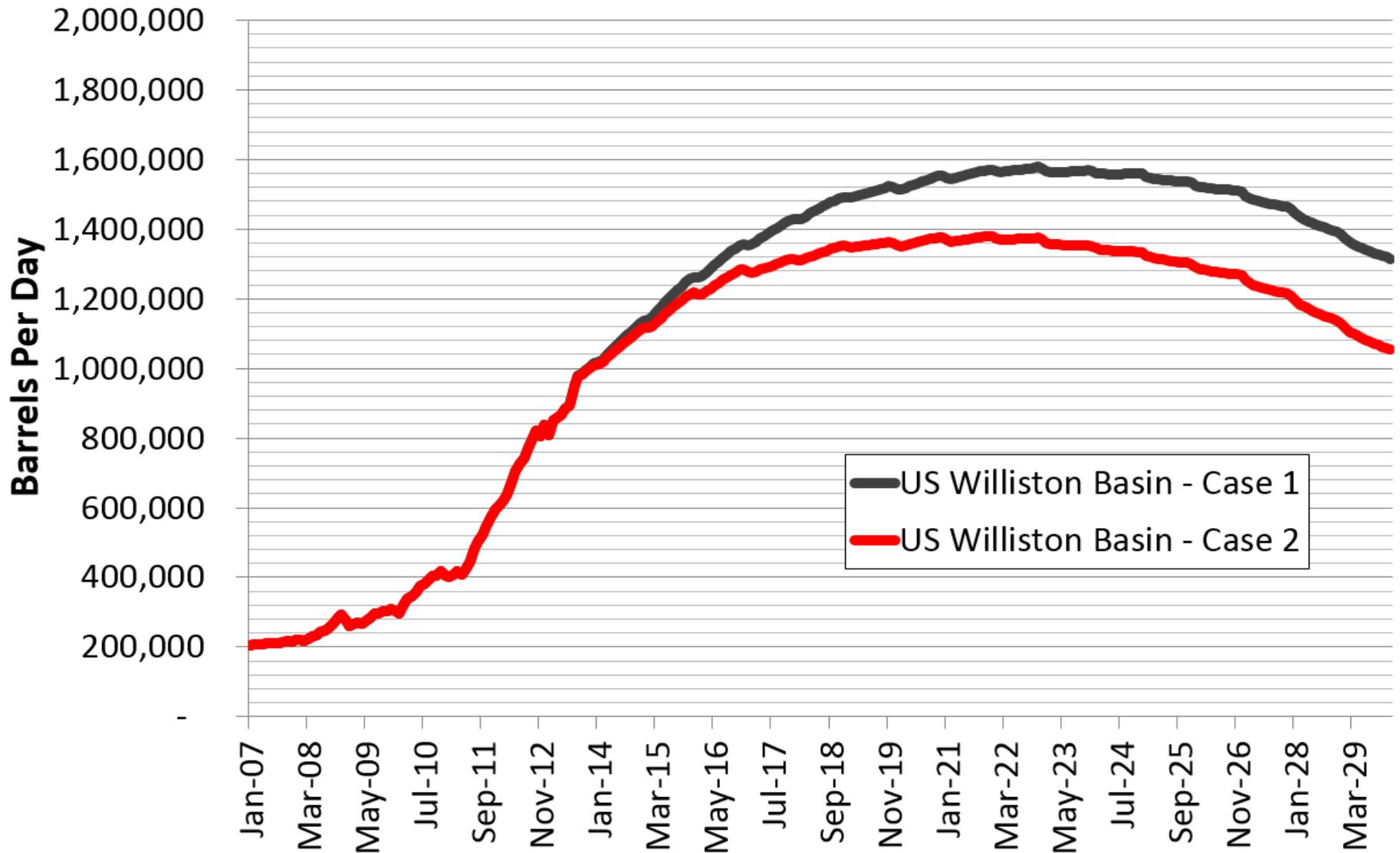
Understanding production potential

Understanding current transportation dynamics and potential transportation constraints

Understanding current and future market conditions



Forecasting Williston Basin Oil Production, BOPD



Production forecast is for visual demonstration purposes only and should not be considered accurate for any near or long term planning.



Crude Oil

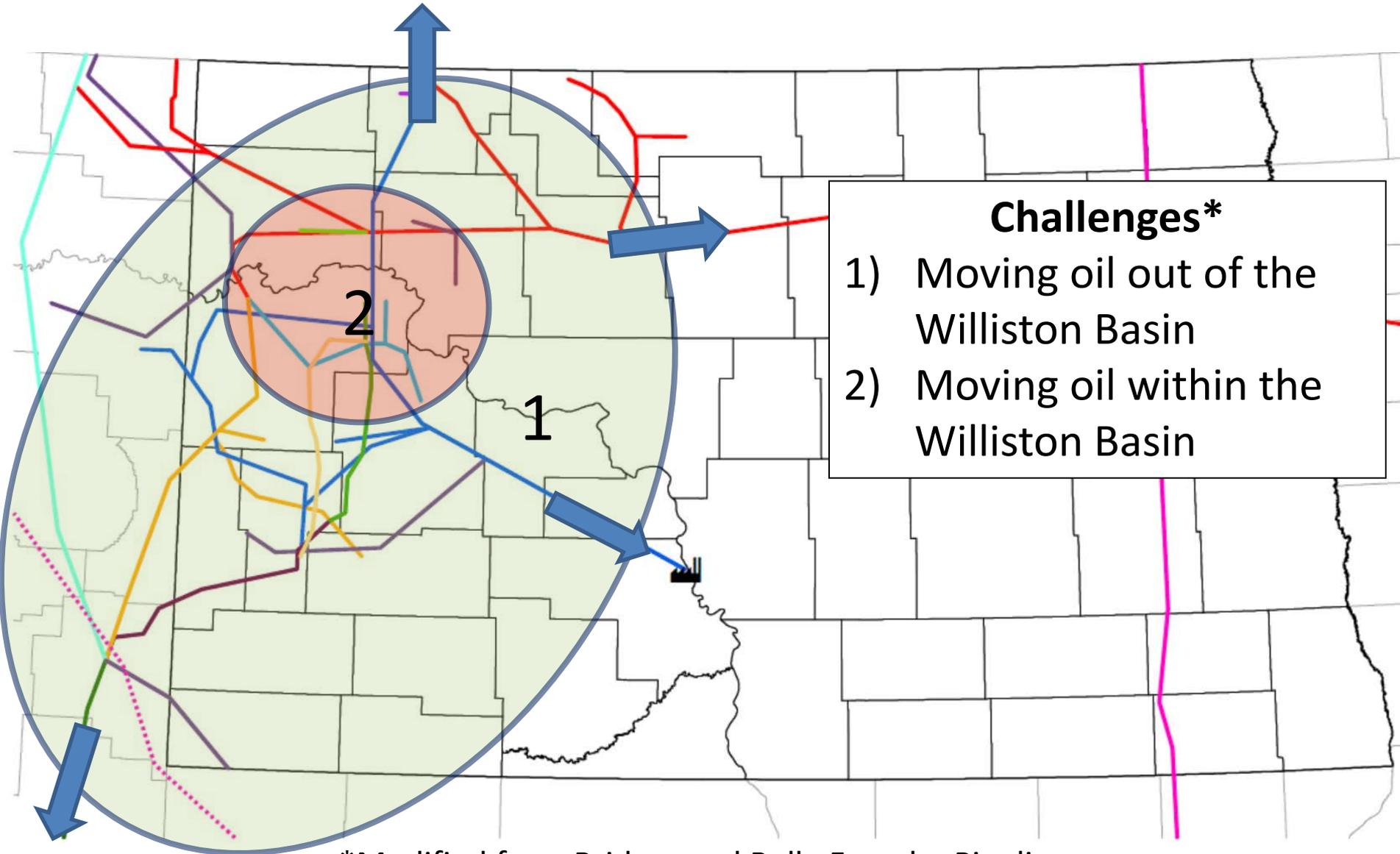
Understanding production potential

Understanding current transportation dynamics and potential transportation constraints

Understanding current and future market conditions



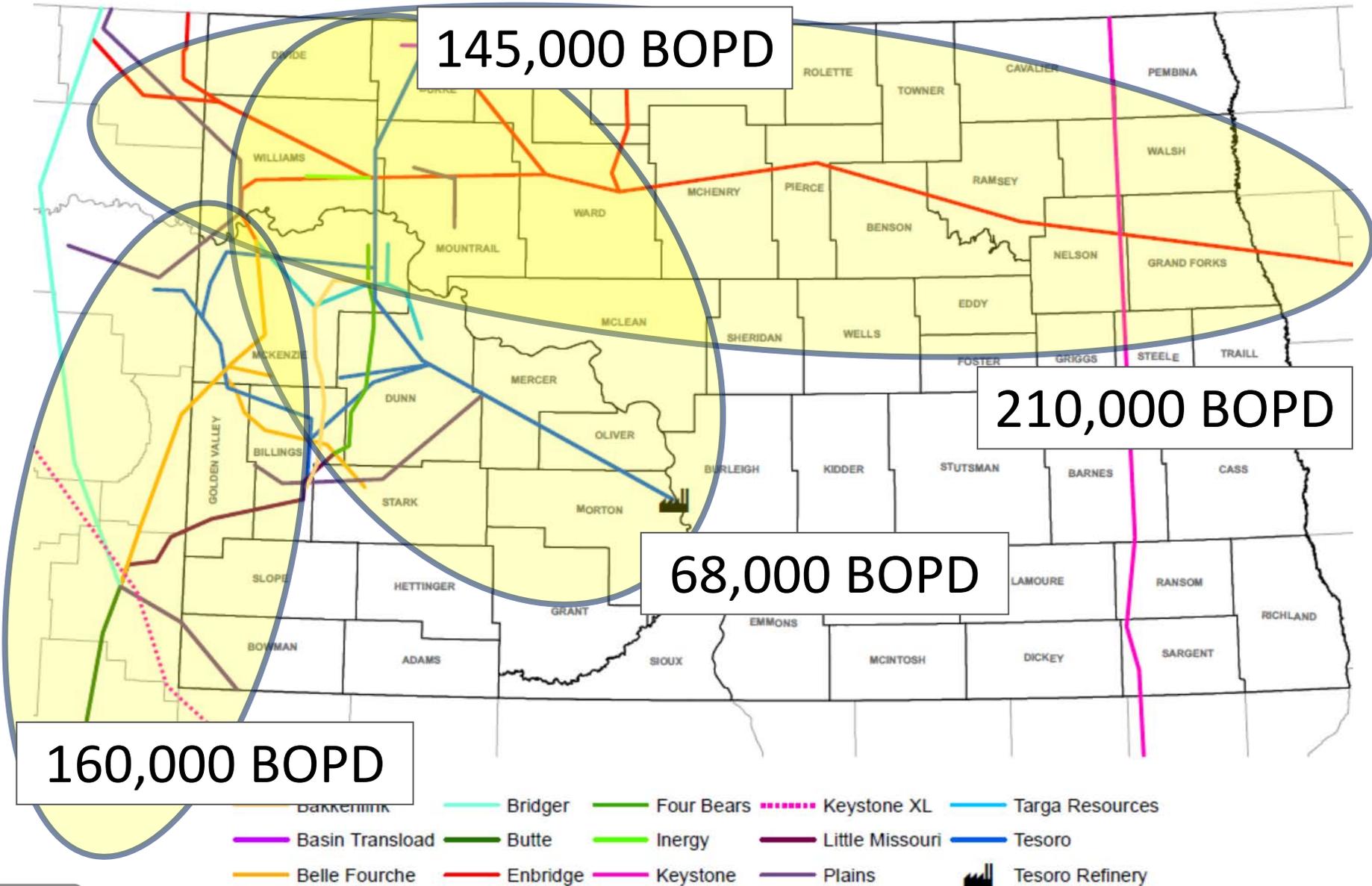
North Dakota Crude Oil Pipelines



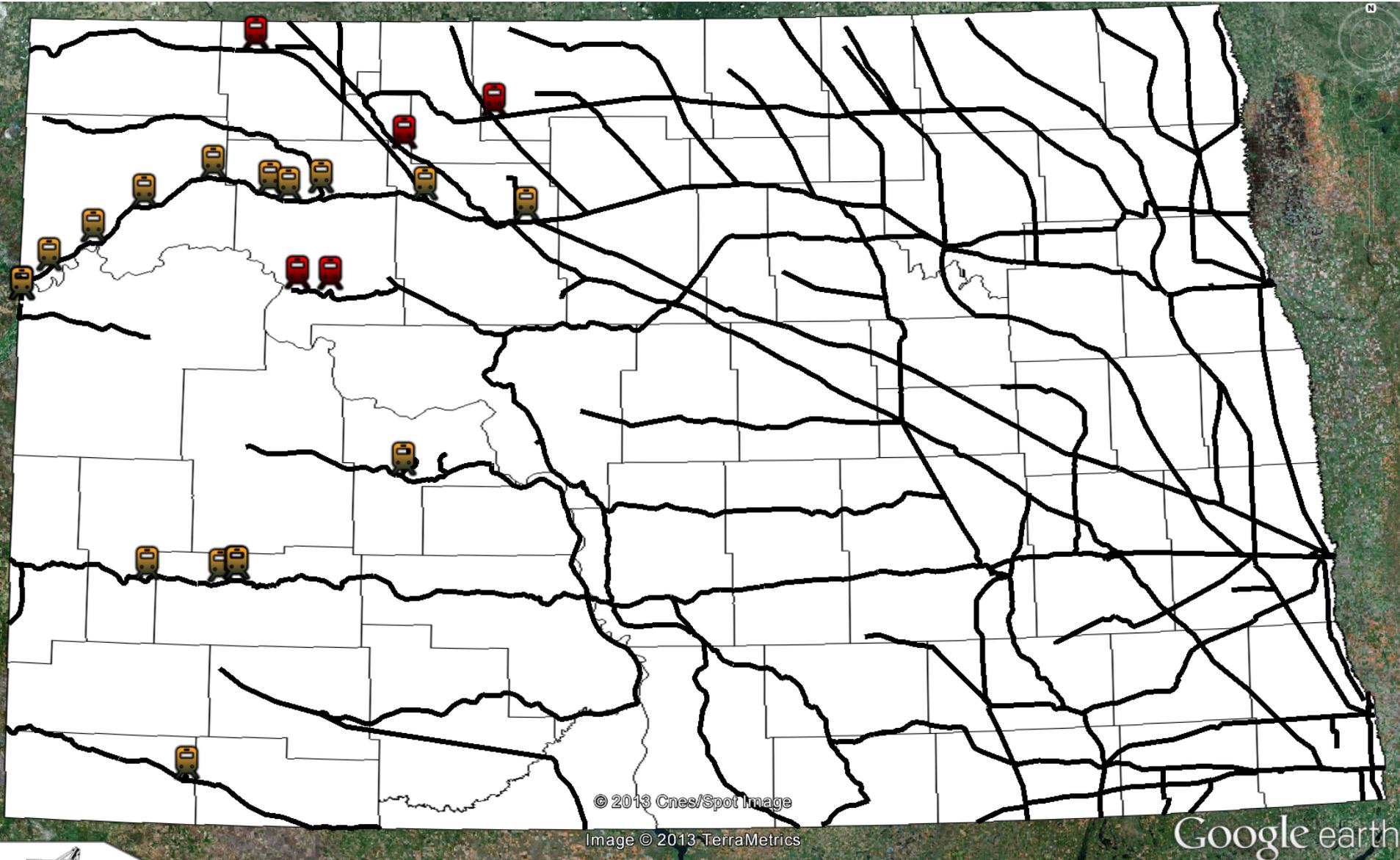
*Modified from Bridger and Belle Fourche Pipelines



North Dakota Crude Oil Pipelines



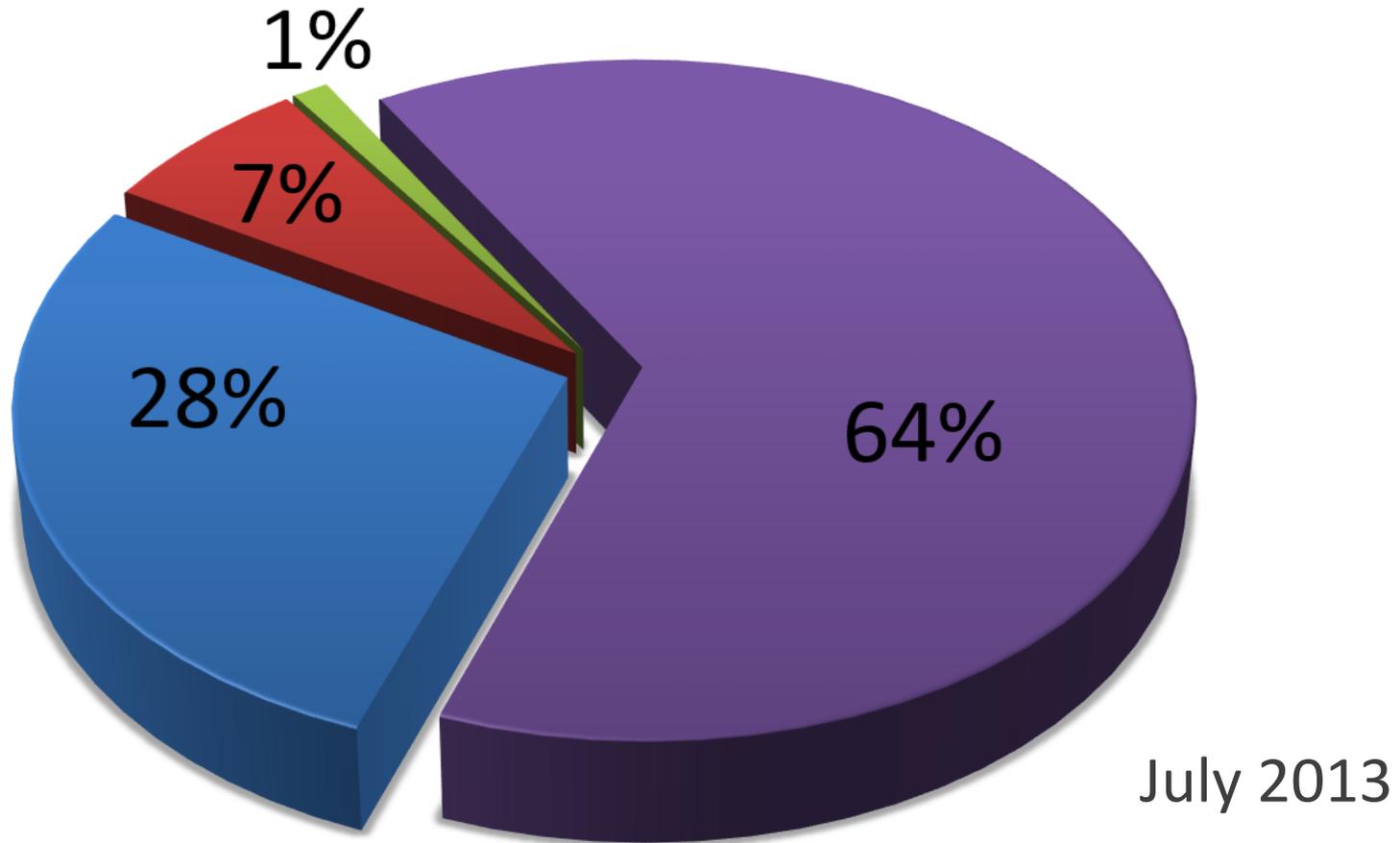
Oil Loading Rail Facilities



Estimated ND Rail Export Volumes



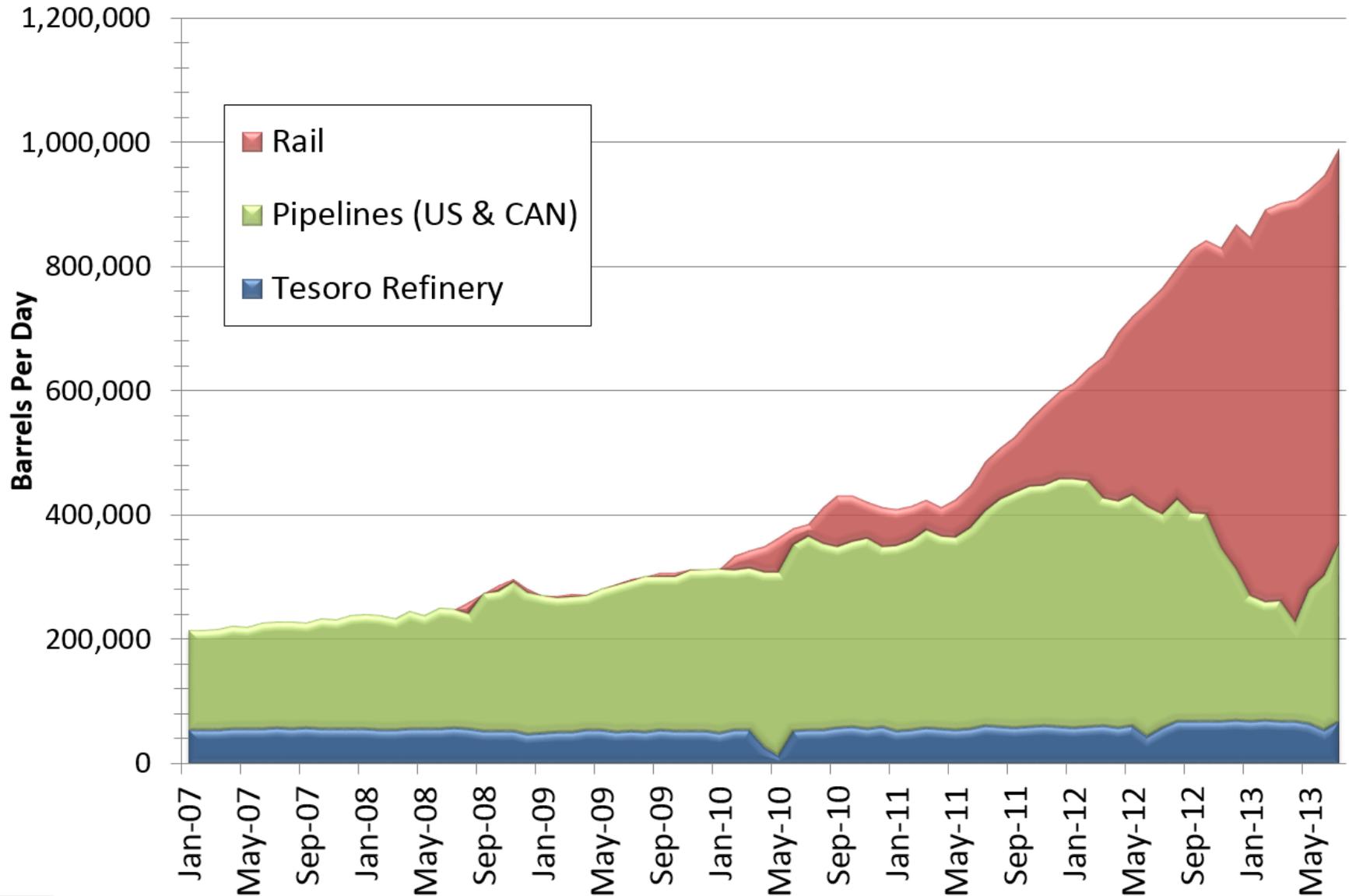
Estimated Williston Basin Oil Transportation



- Estimated Pipeline Export
- Tesoro Refinery
- Truck to Canadian Pipelines
- Estimated Rail



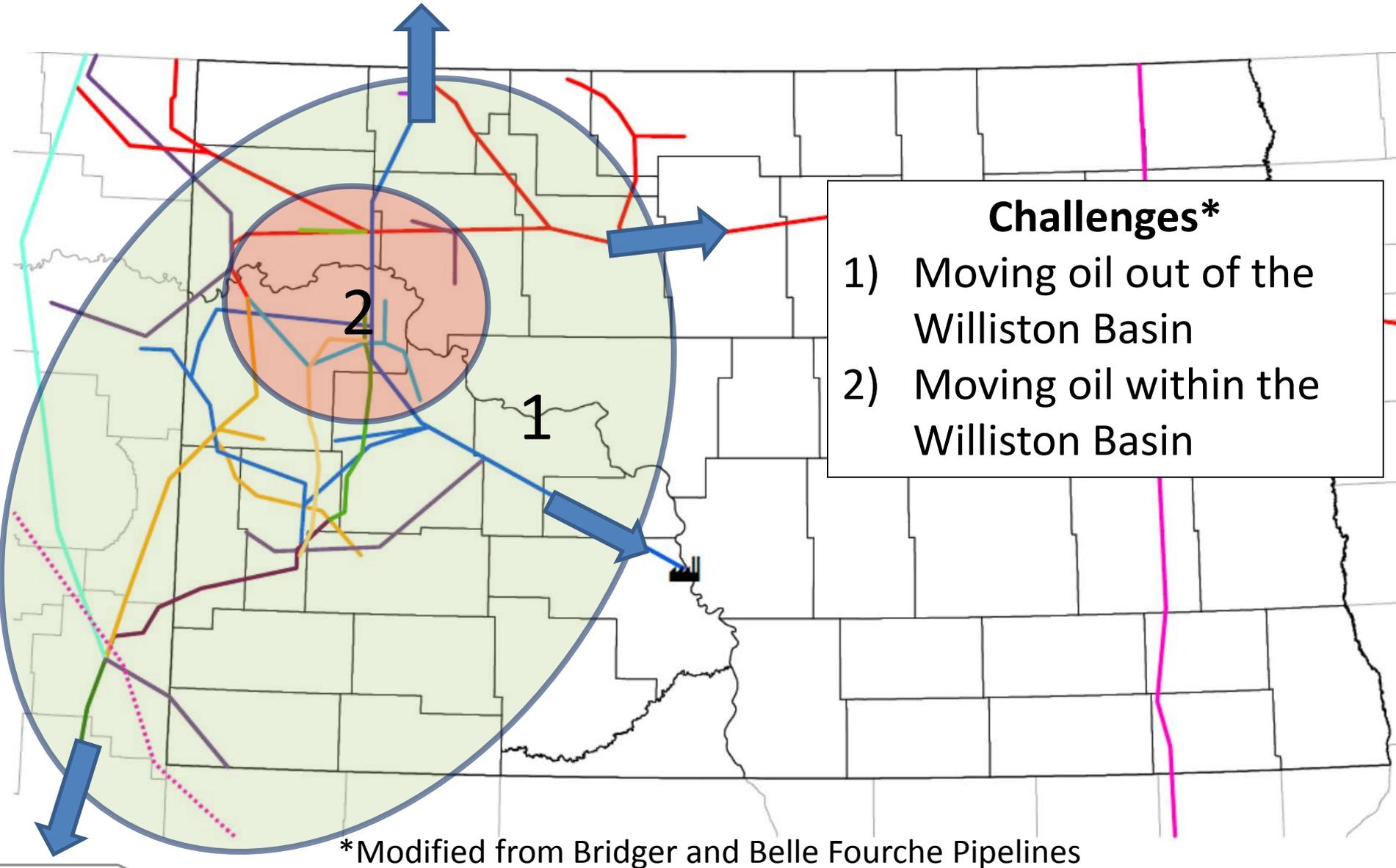
Estimated Williston Basin Oil Transportation



Crude Oil Gathering

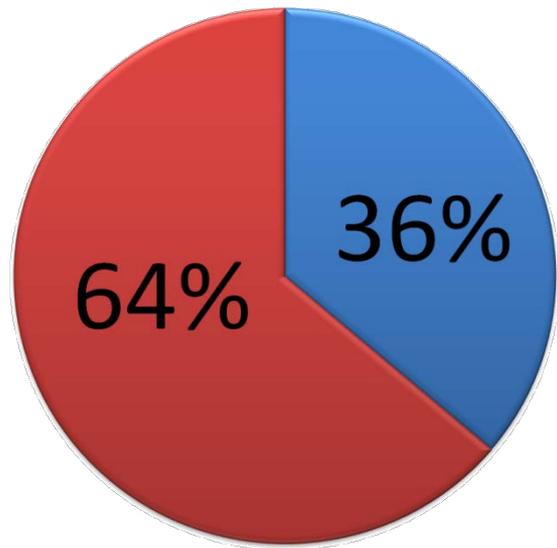


North Dakota Crude Oil Pipelines



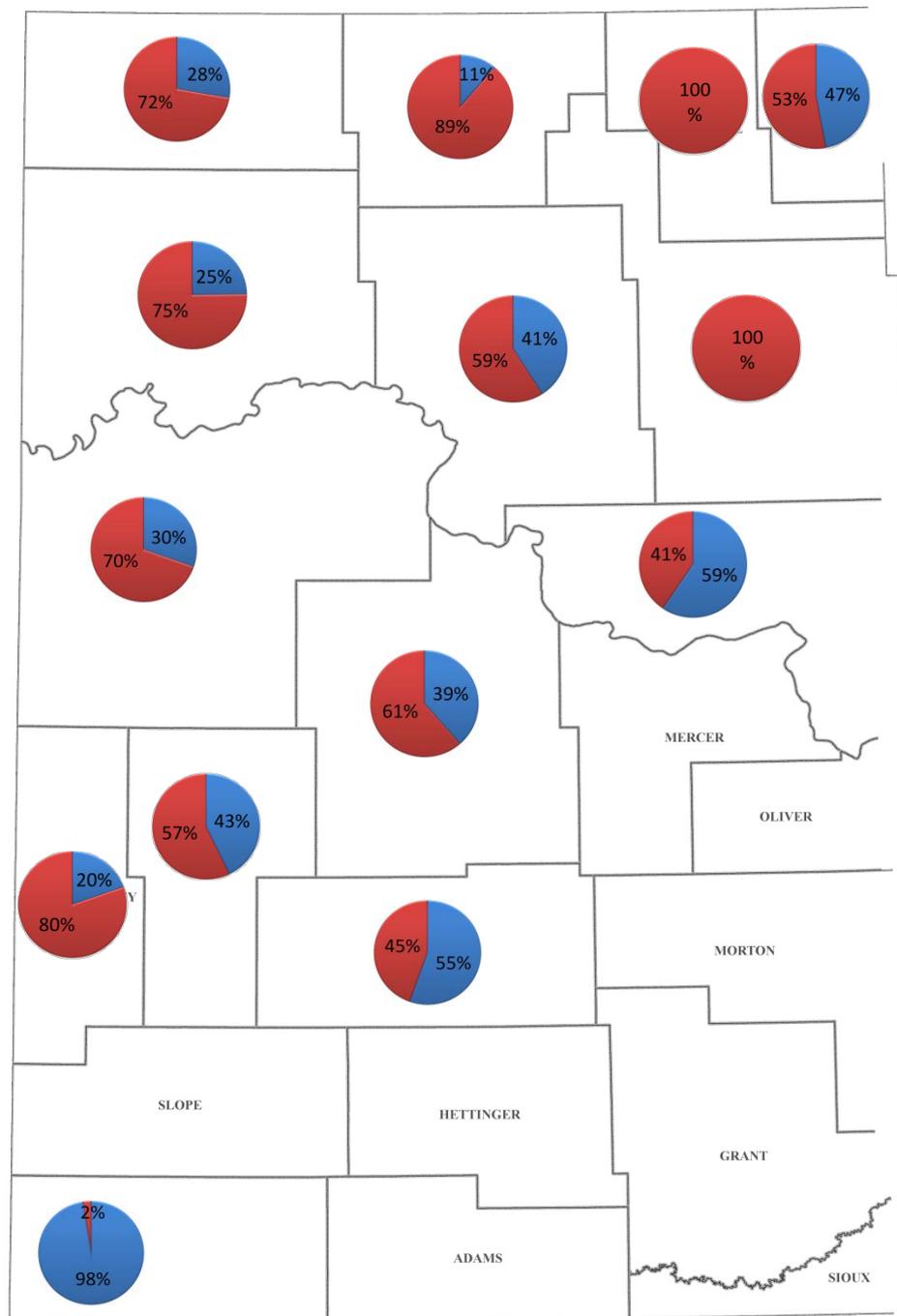
ND Crude Oil Gathering

Red – Trucked
Blue – Pipeline



All ND Production

Sep 2012 Estimates – Some data incomplete or unavailable



Crude Oil

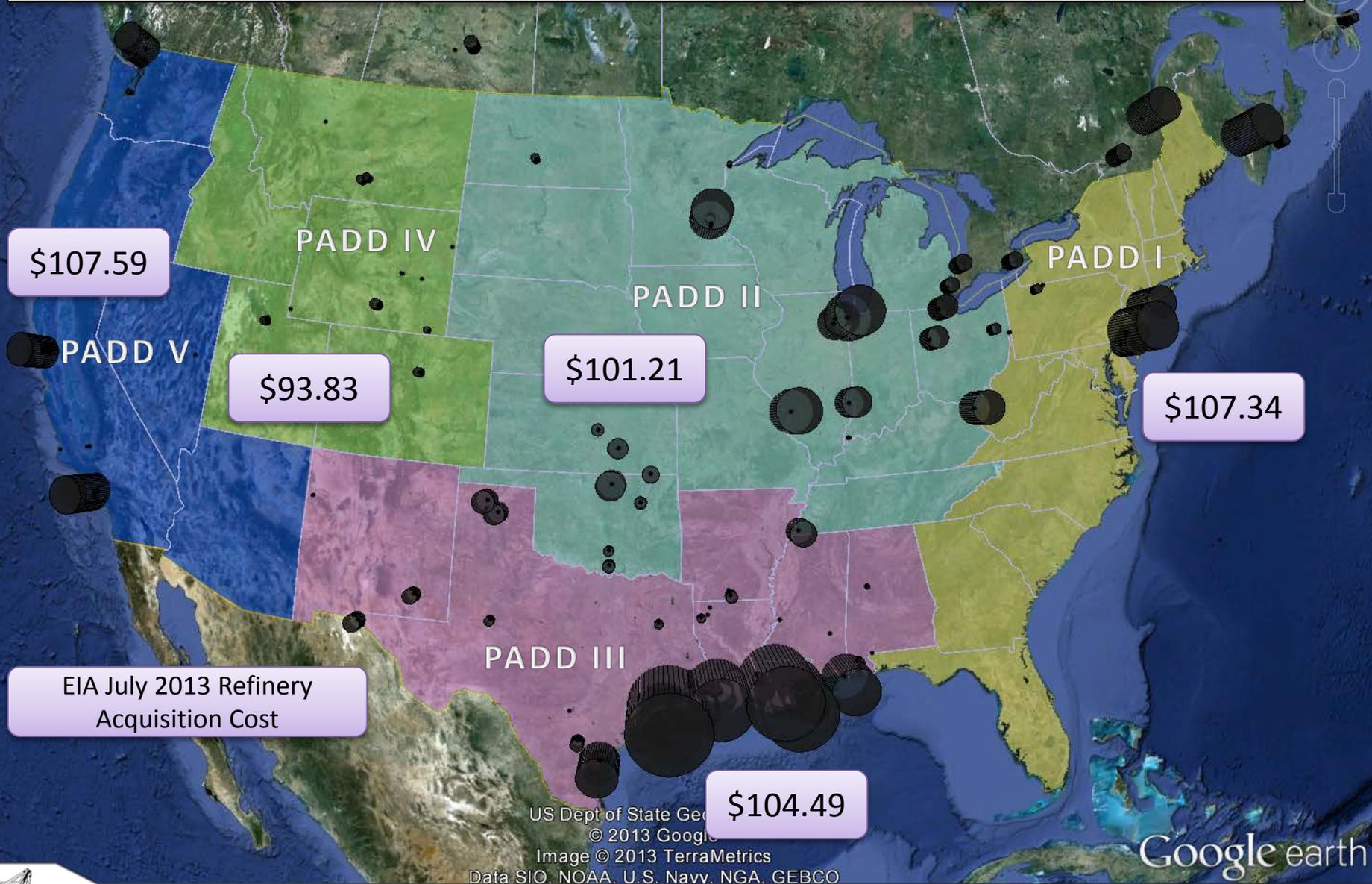
Understanding production potential

Understanding current transportation dynamics and potential transportation constraints

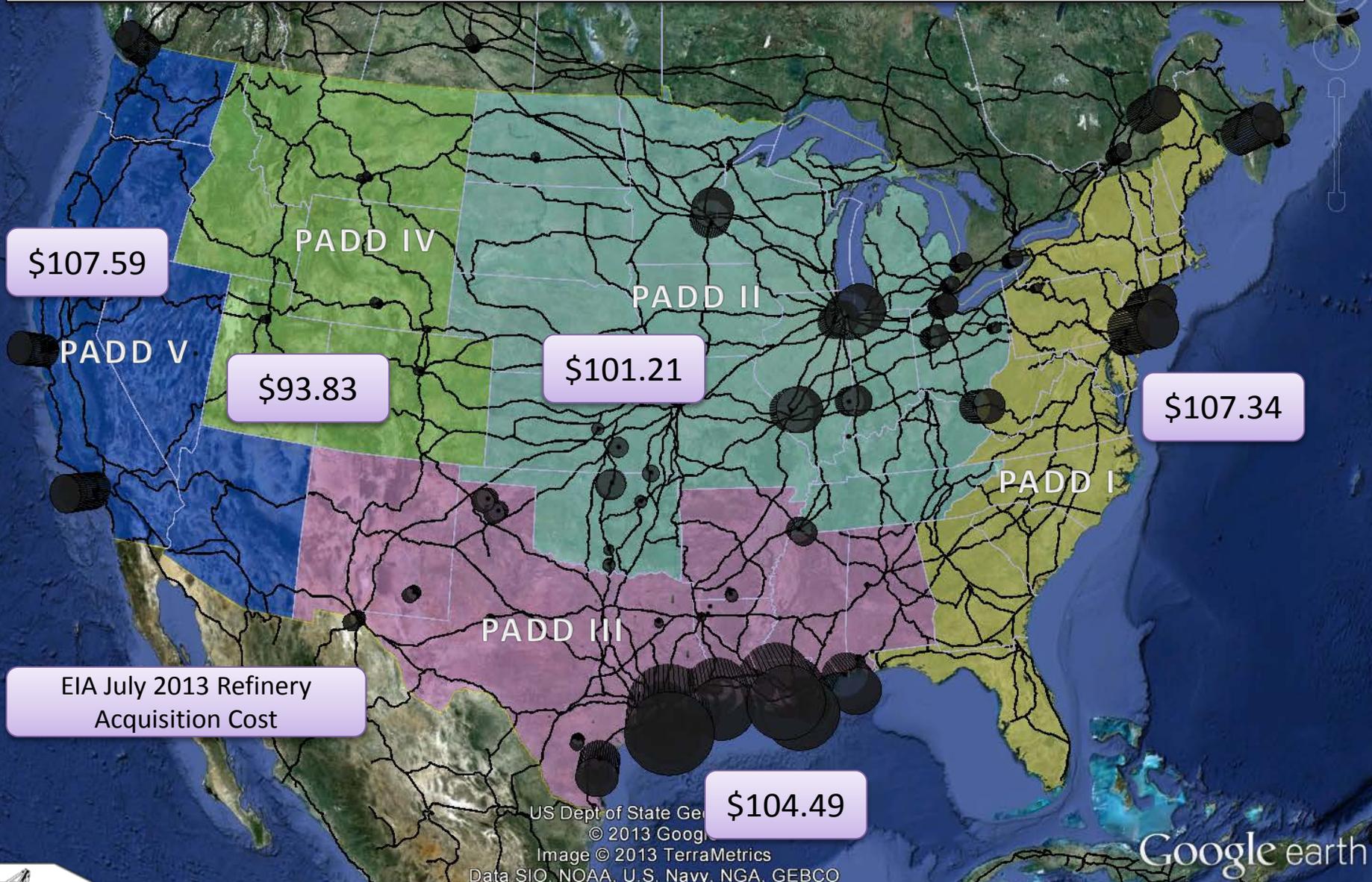
Understanding current and future market conditions



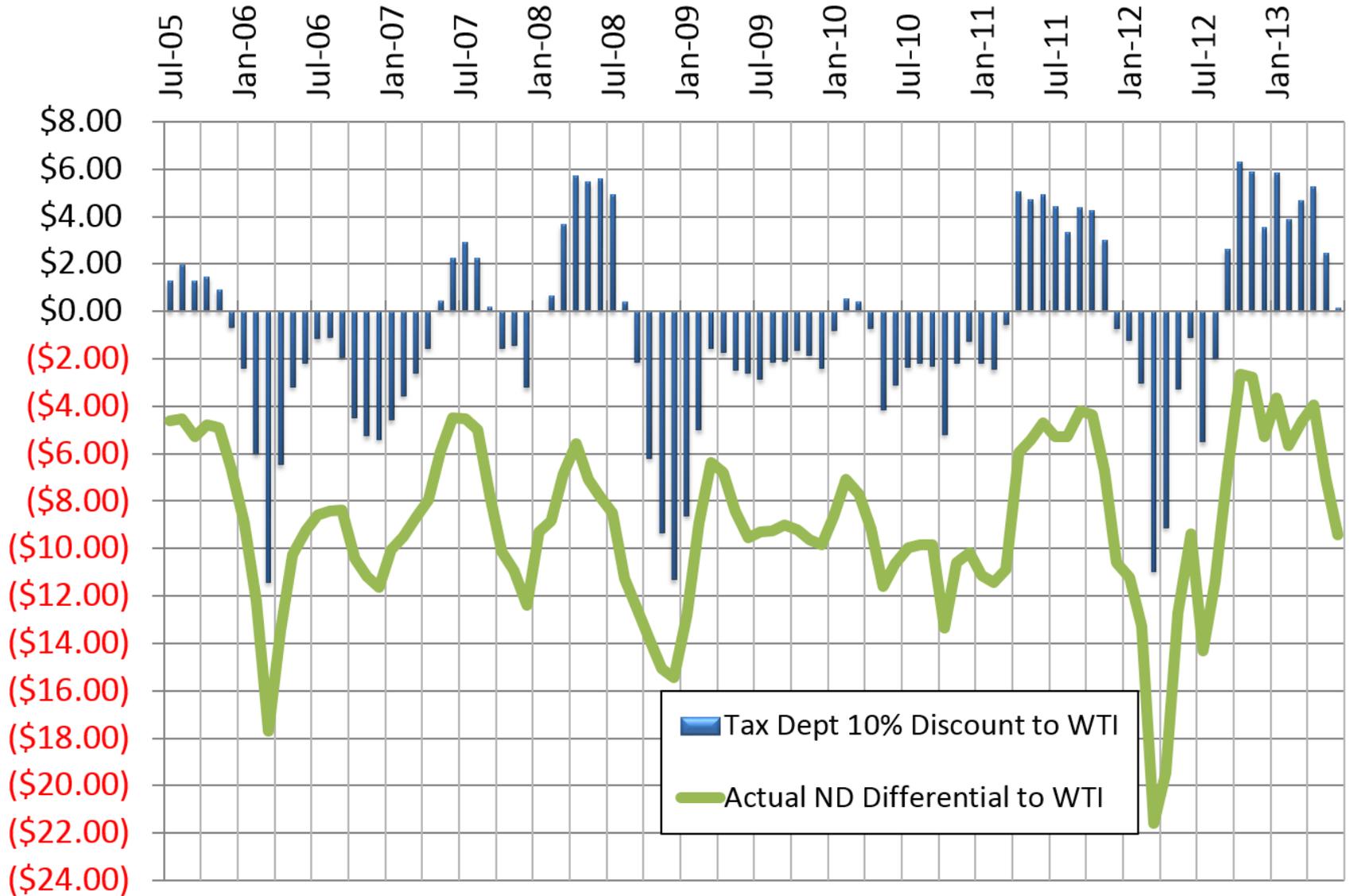
US Refining Infrastructure



Major Rail Lines and Refineries



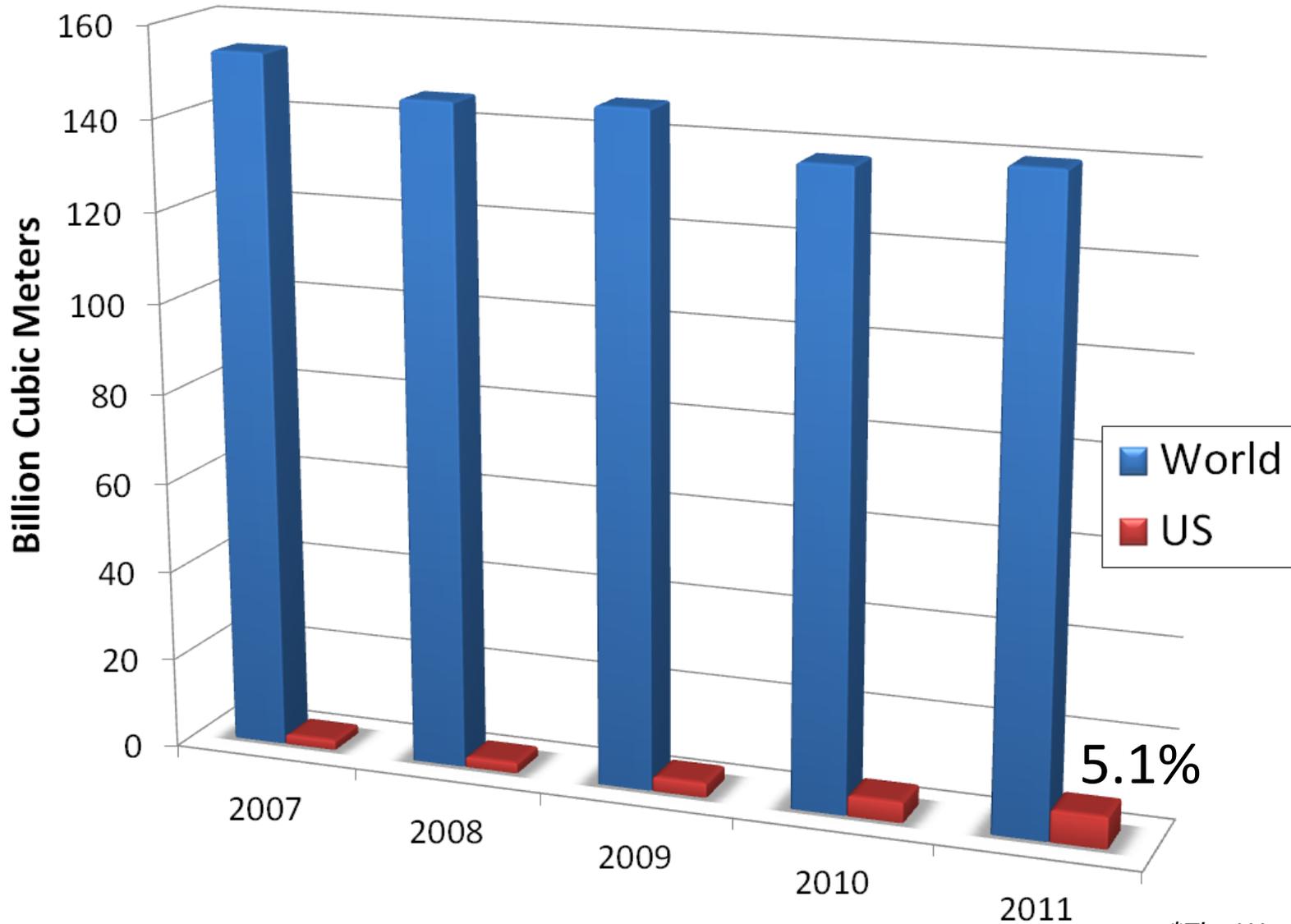
ND Wellhead Price Snapshot



Natural Gas



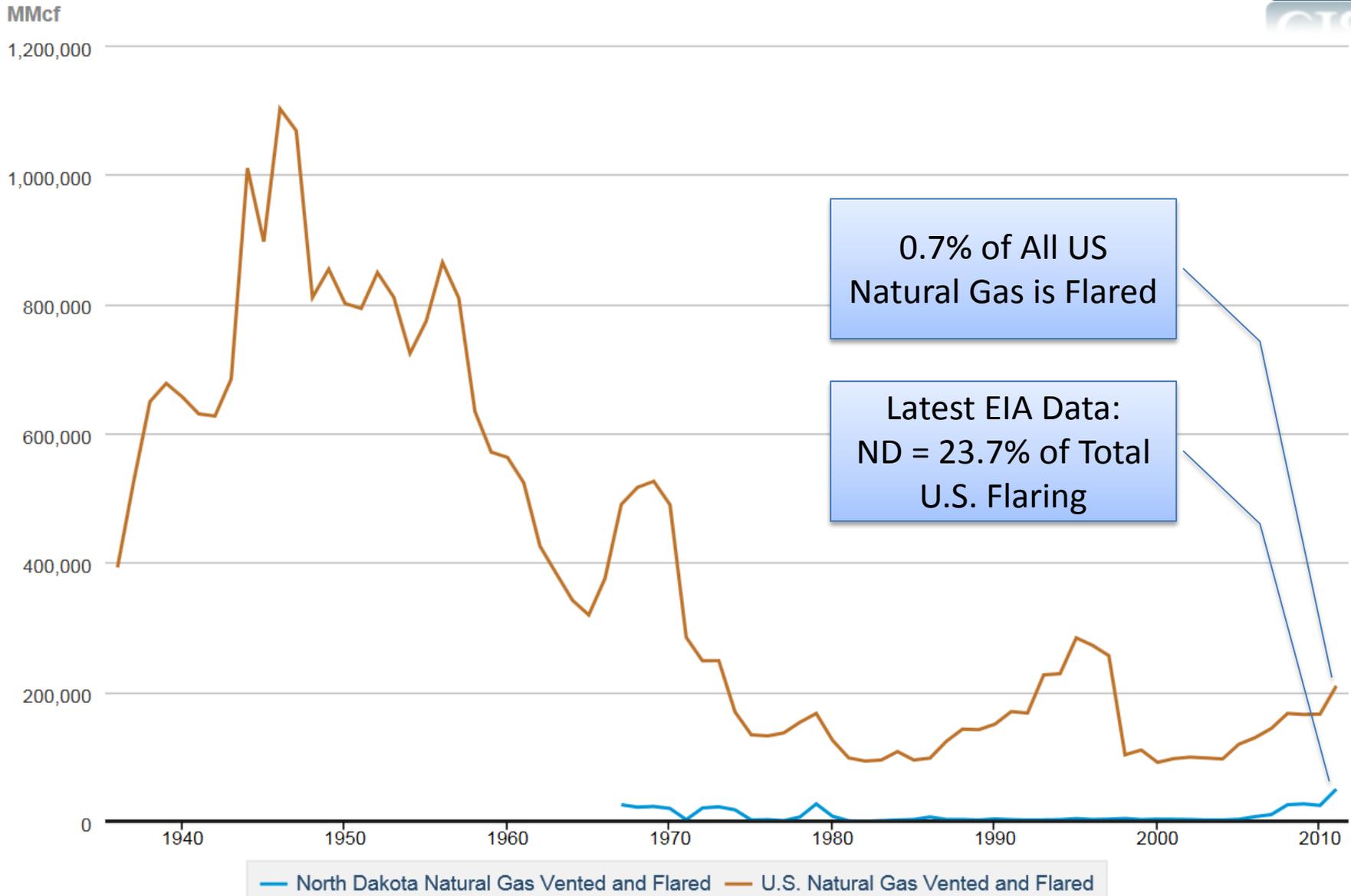
World Gas Flaring Estimates*



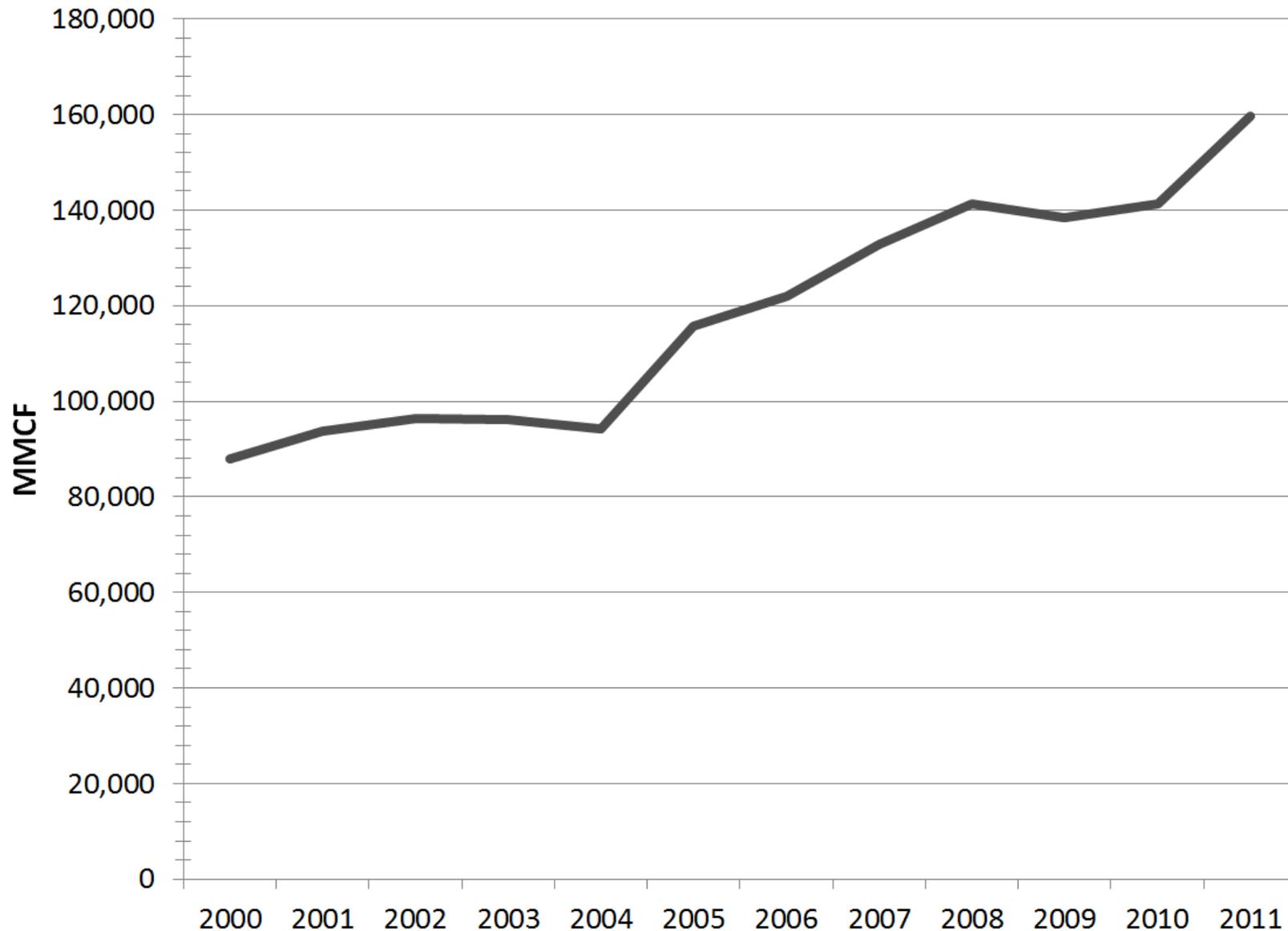
*The World Bank



U.S. Gas Flaring



U.S. Flaring Minus ND



Natural Gas Flaring Facts/Challenges



Primary Challenges

- *Size of resource*
- *Young age of development*
- *Harsh winter conditions*
- *Resource potential still being explored*

Regulations

- *Flaring regulated by the ND Industrial Commission/Oil & Gas Division with existing penalties and incentives in place to reduce flaring*



Challenges to Reducing North Dakota Flaring

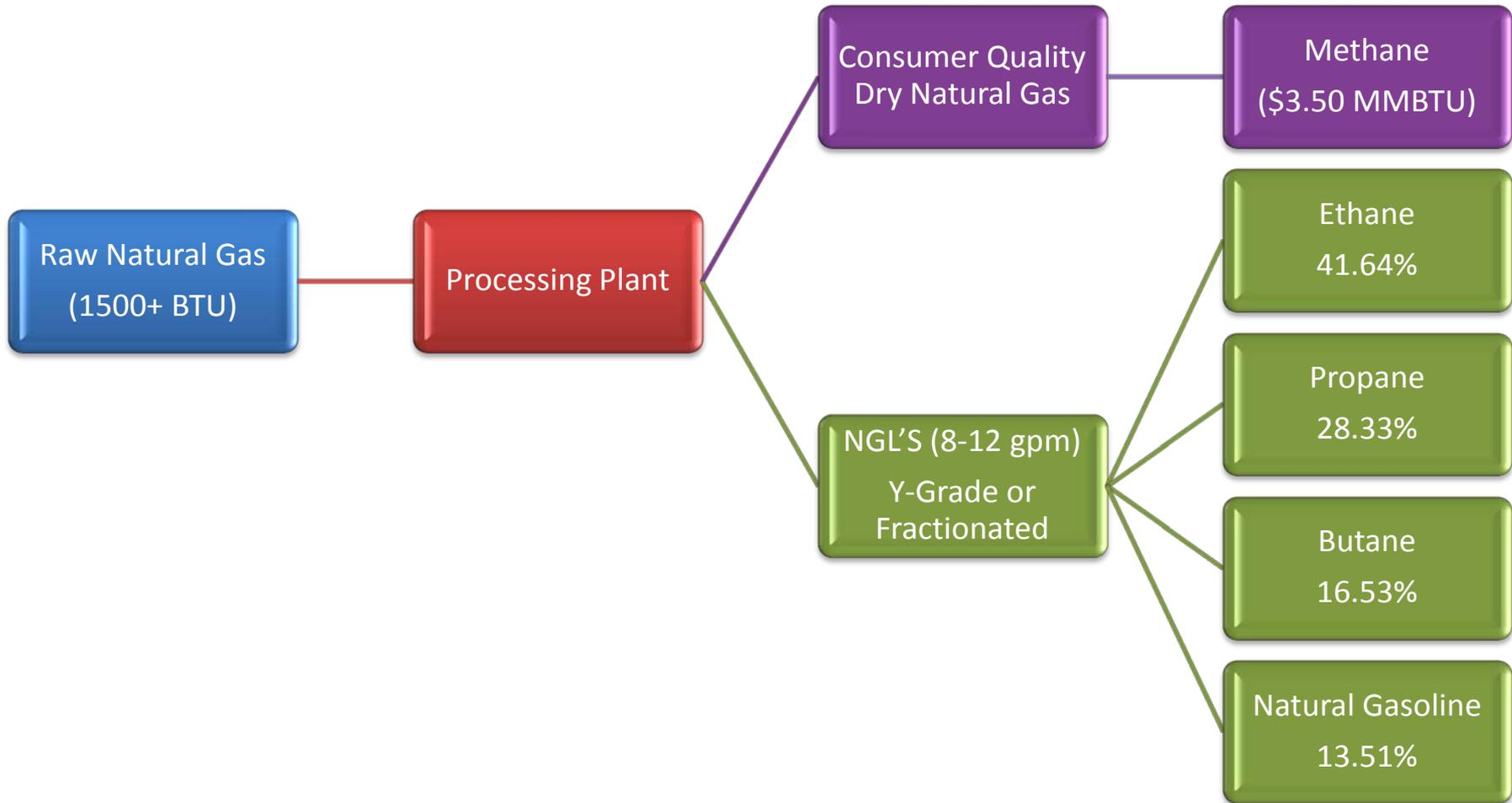
- *Upfront Planning/Coordination*
- *Obtaining Easements*
- *Understanding Bakken/Three Forks Gas Quality*
- *Understanding Production Potential*
- *Properly Sizing New Gas Gathering Pipelines*
- *Enhancing Existing Gathering Pipelines*
- *Sufficient Gas Processing Capacity (Timing and Location Critical)*
- *Adequate Interstate Pipeline Capacity*
- *Ramping Up Flaring Alternatives (Short & Long Term)*



Strengthening Landowner Relations



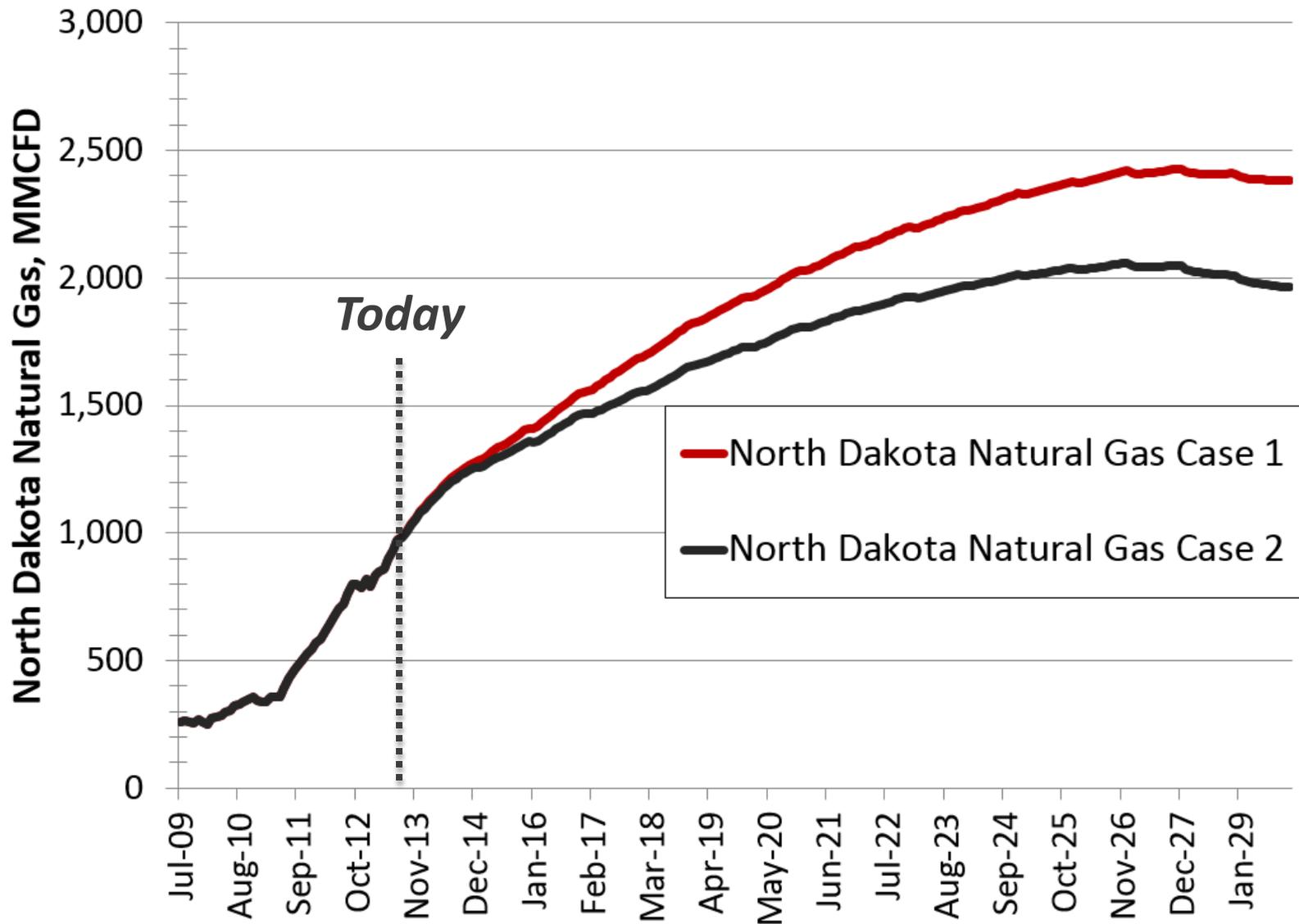
Rich Natural Gas



**Using NGL breakdown from the July 2012 BENTEK Natural Gas Study*



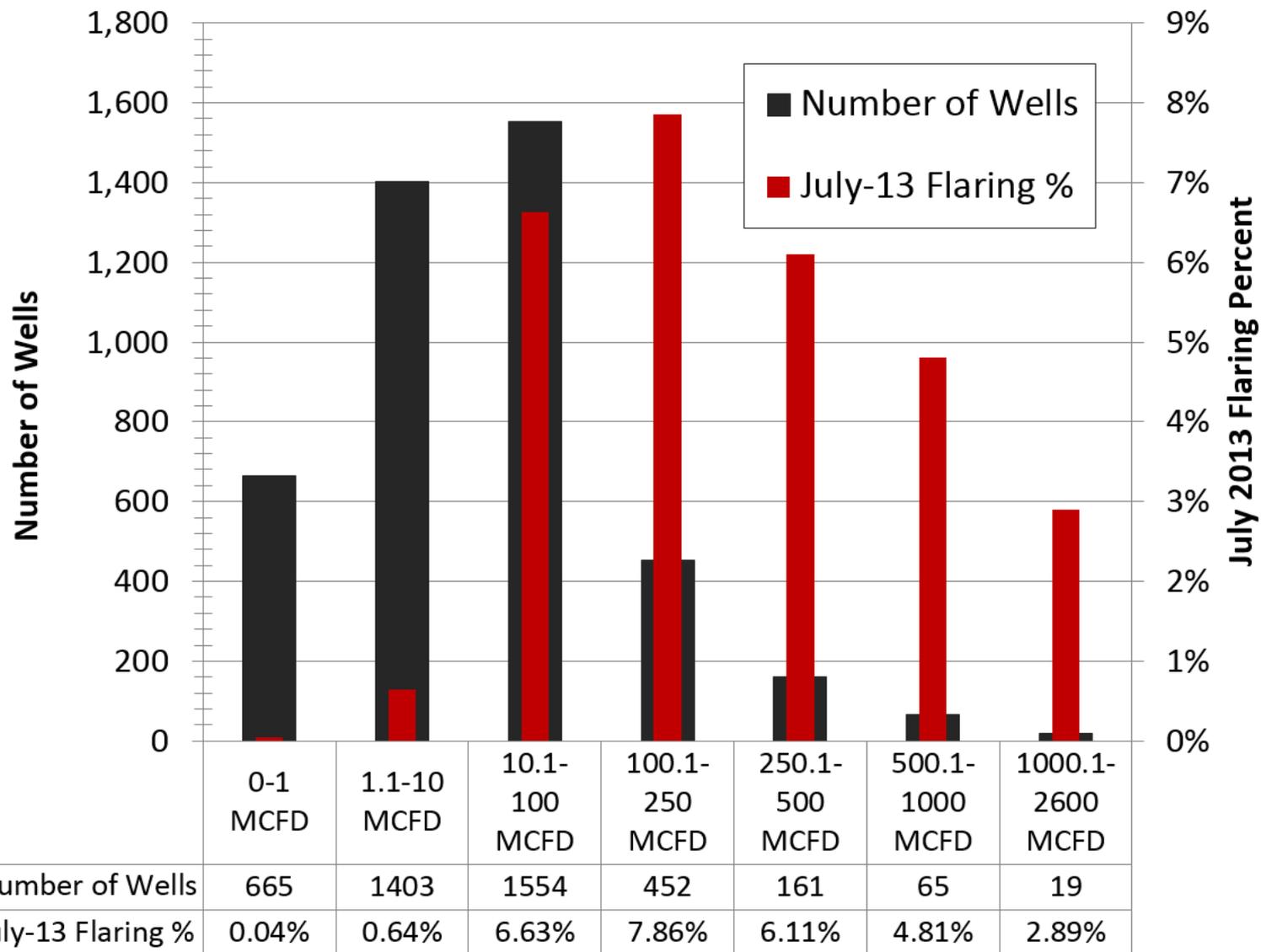
Forecasting North Dakota Gas Production



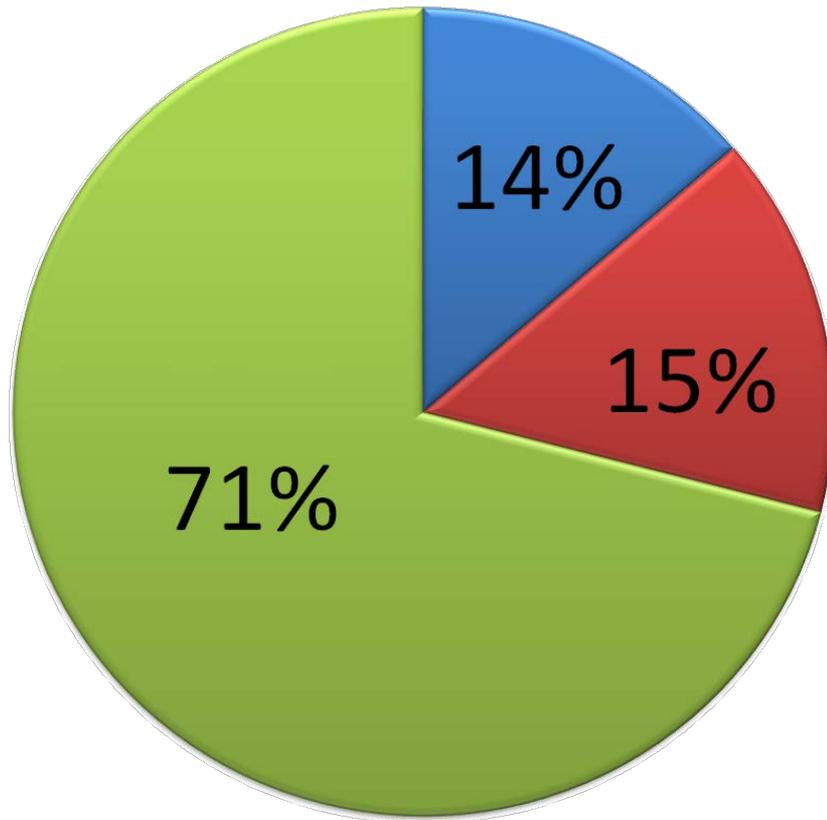
Production forecast is for visual demonstration purposes only and should not be considered accurate for any near or long term planning.



Understanding Which Wells Are Flaring



Solving the Flaring Challenge



Statewide

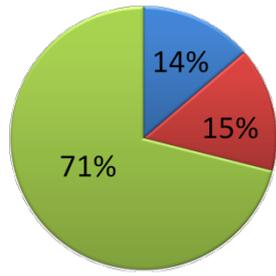
GREEN – % of gas captured and sold
Red – % flared from wells with at least one mcf sold.
Blue – % flared from zero sales wells

Simple Terms

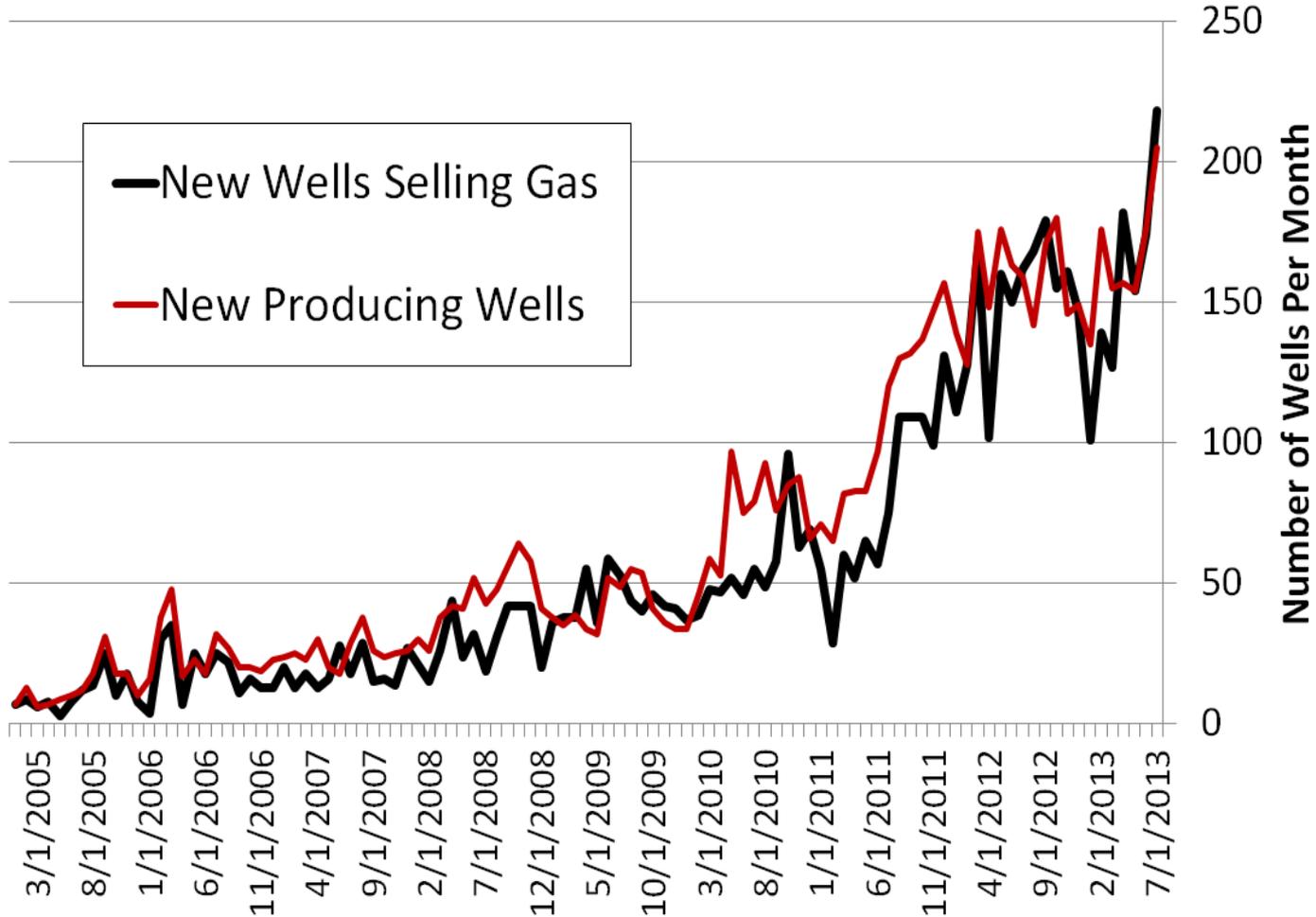
Red – Challenges on existing infrastructure
Blue – Lack of pipelines

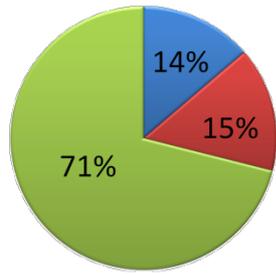
July 2013 Data – Non-Confidential Wells



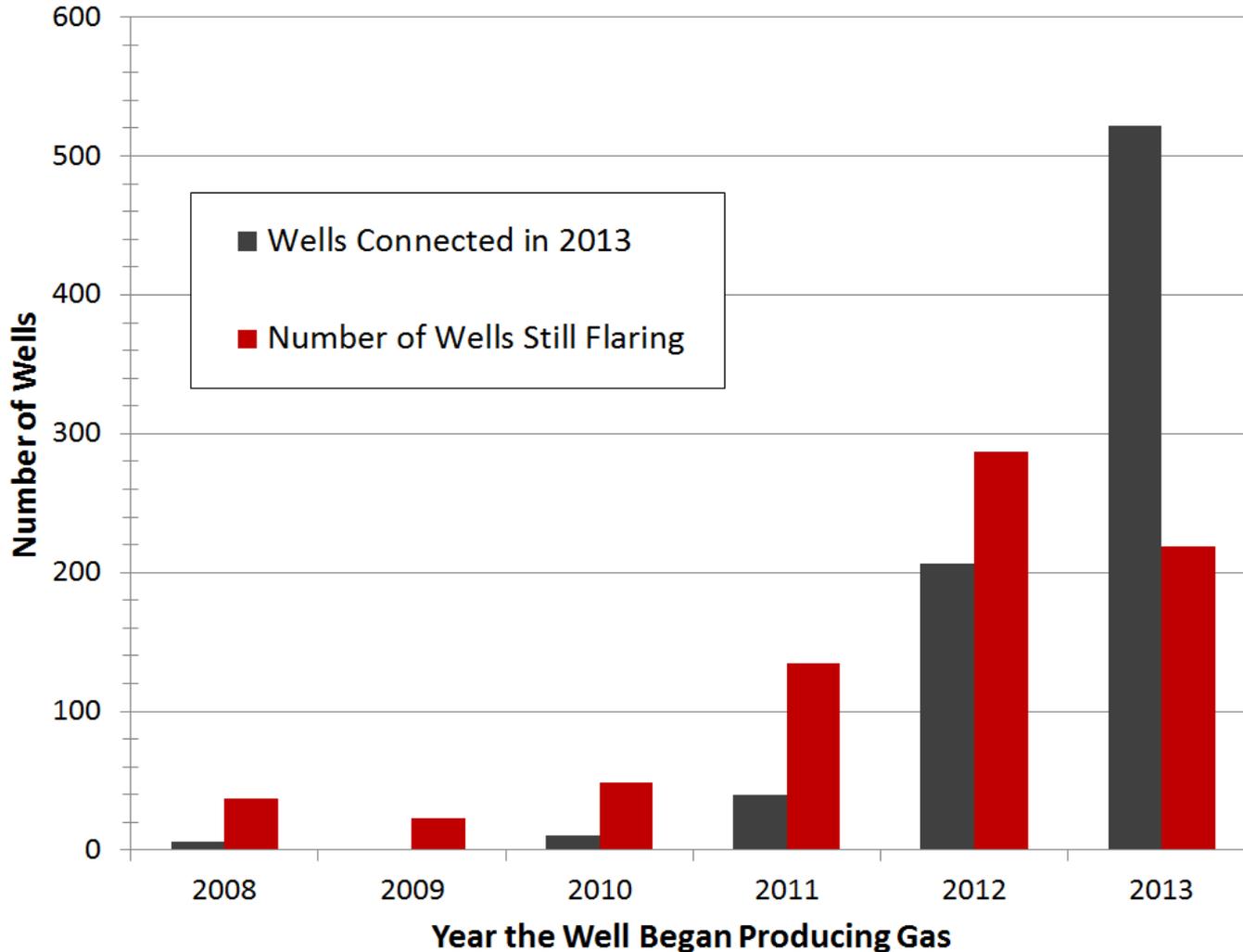


Capturing the 14% Faster Well Connections

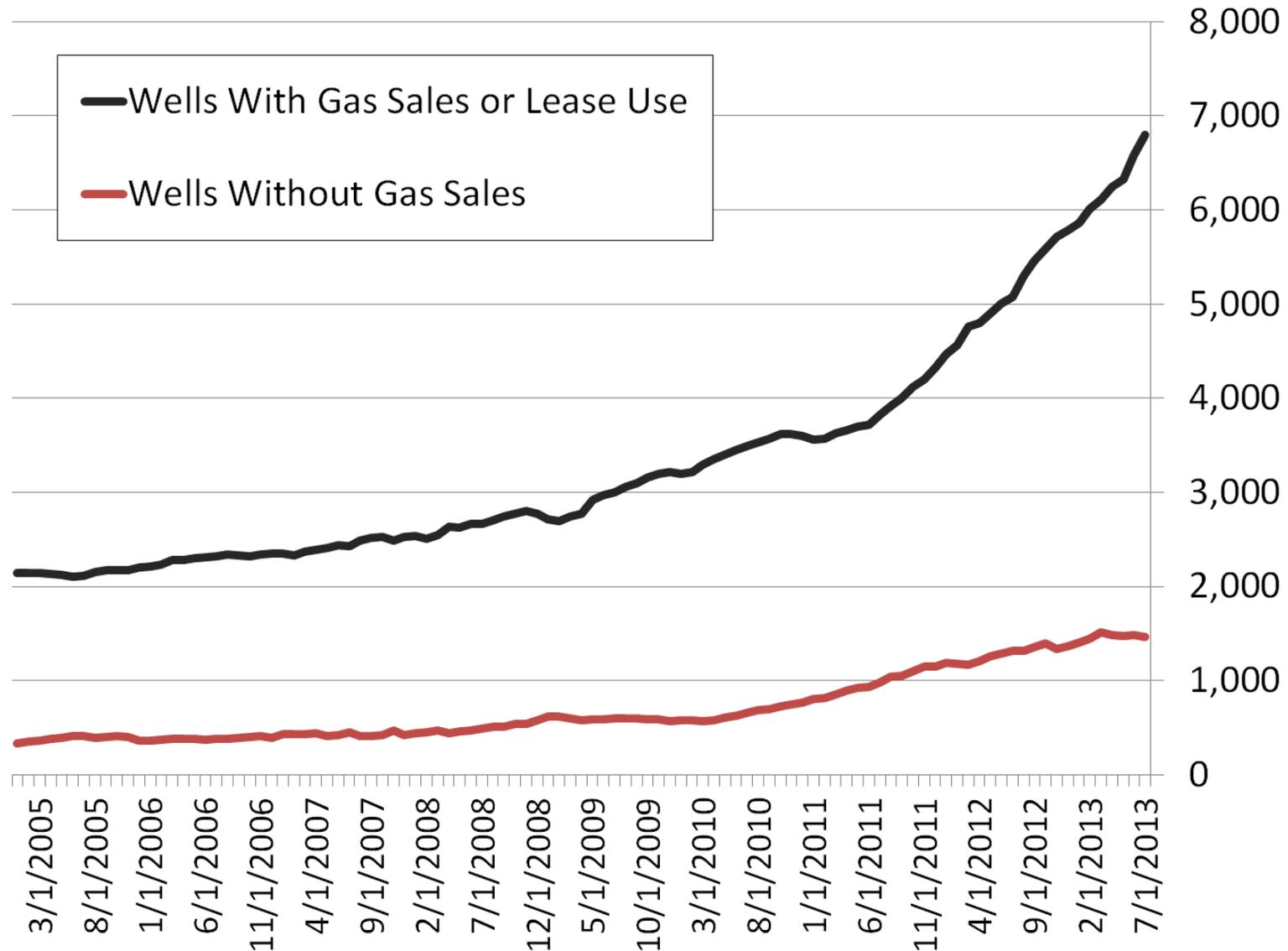


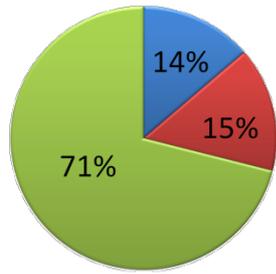


Capturing the 14% Catching Early Production

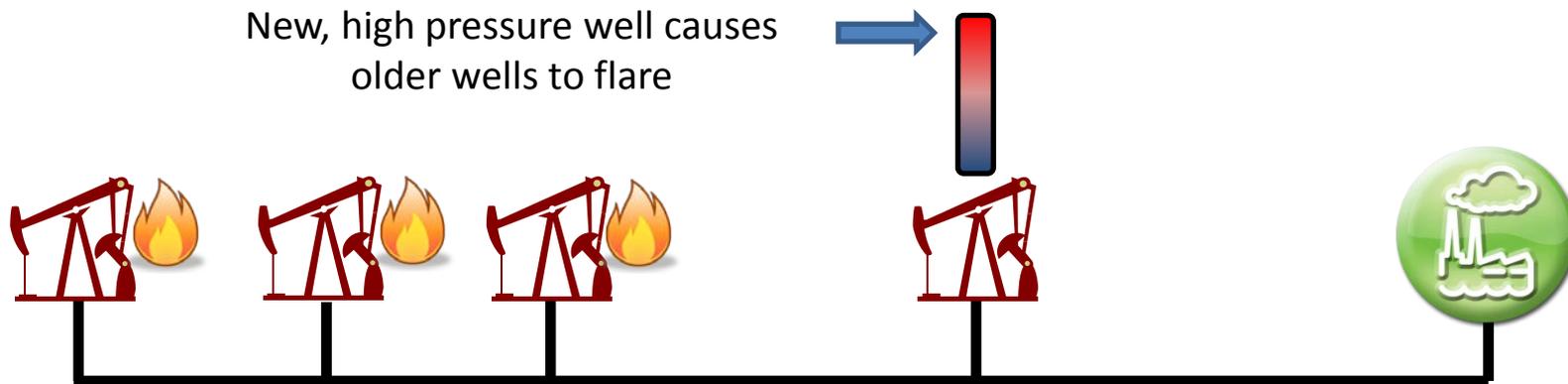
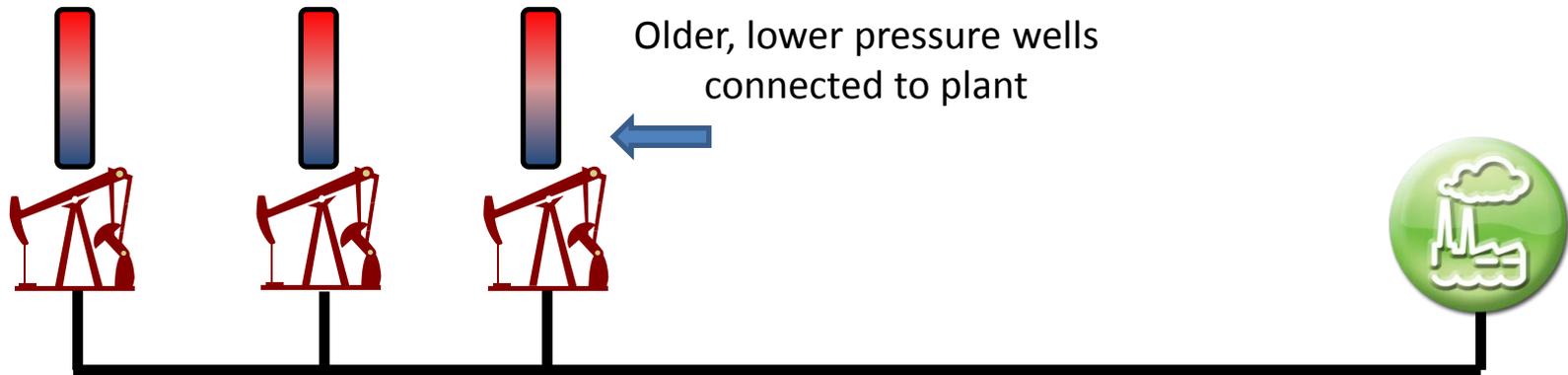


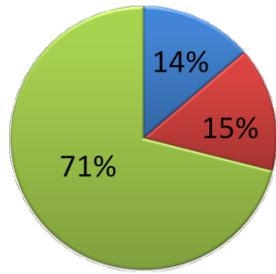
ND Gas Gathering Statistics



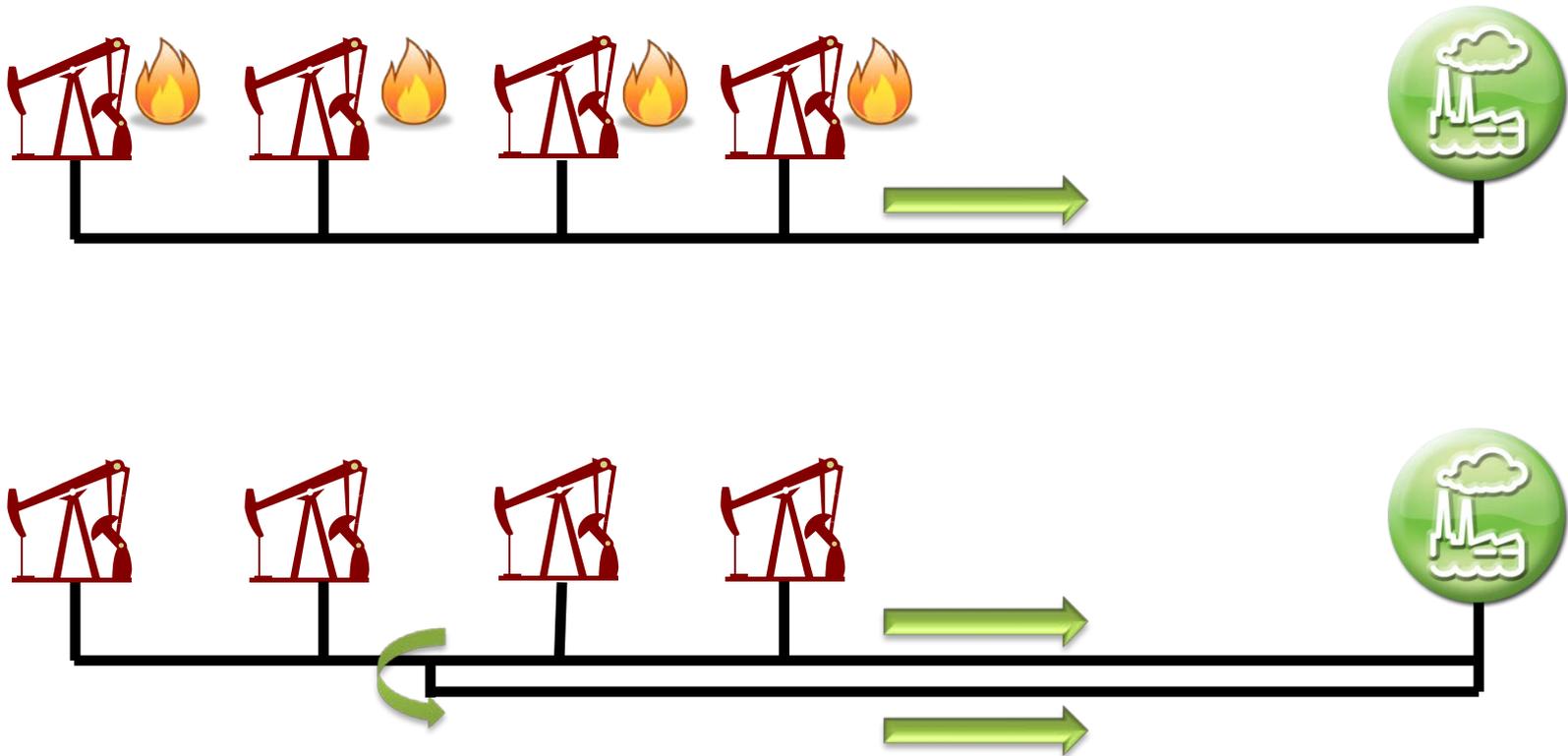


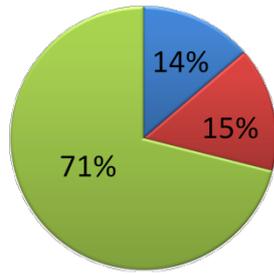
Capturing the 15% Additional Compression





Capturing the 15% Looping Existing Pipelines





Capturing the 15% Frequent Pigging

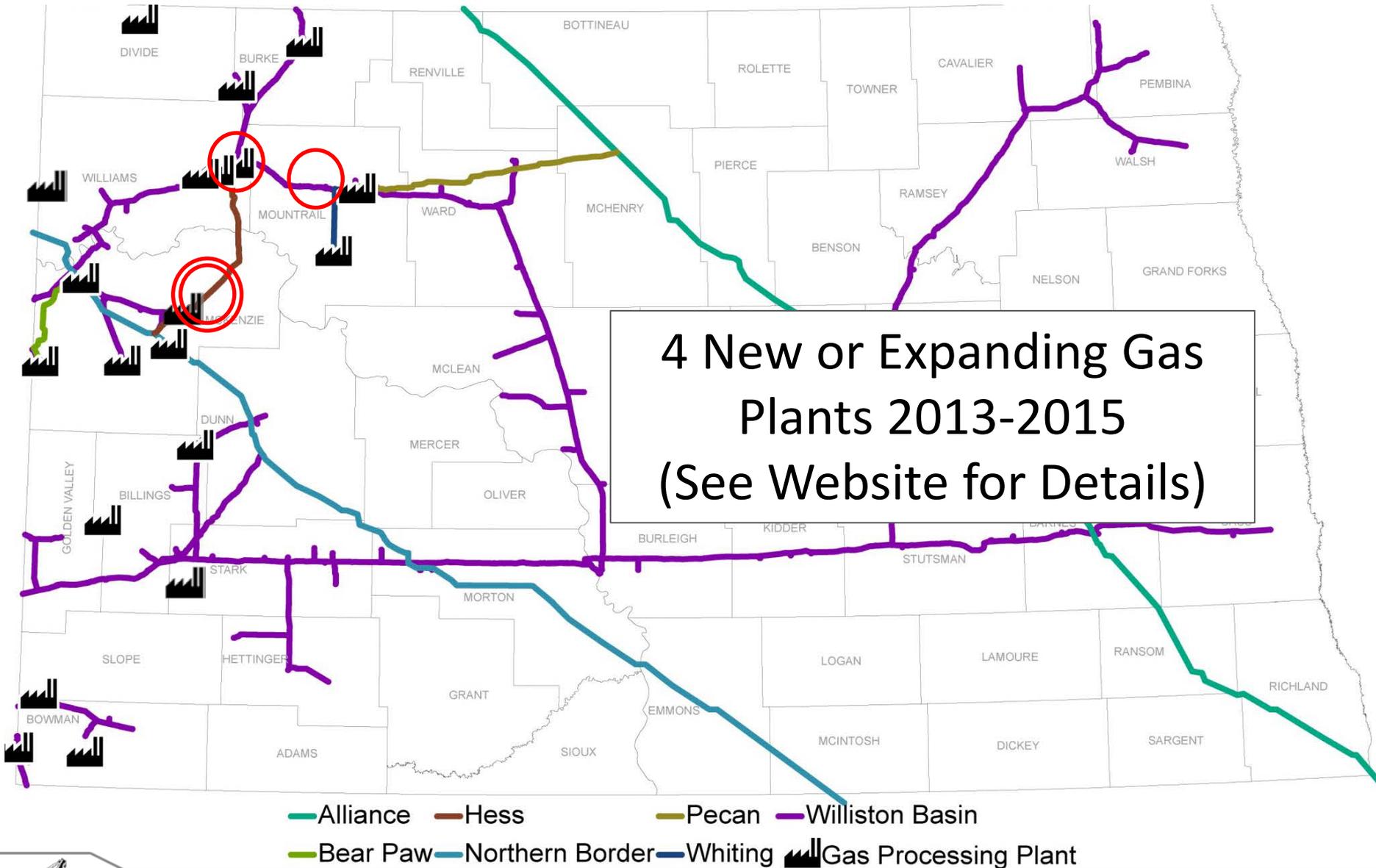
NGL buildup in gathering pipelines
reduces area for gas to flow



*More of an issue in winter months due
to lower ground temperature causing
more liquids to drop out*



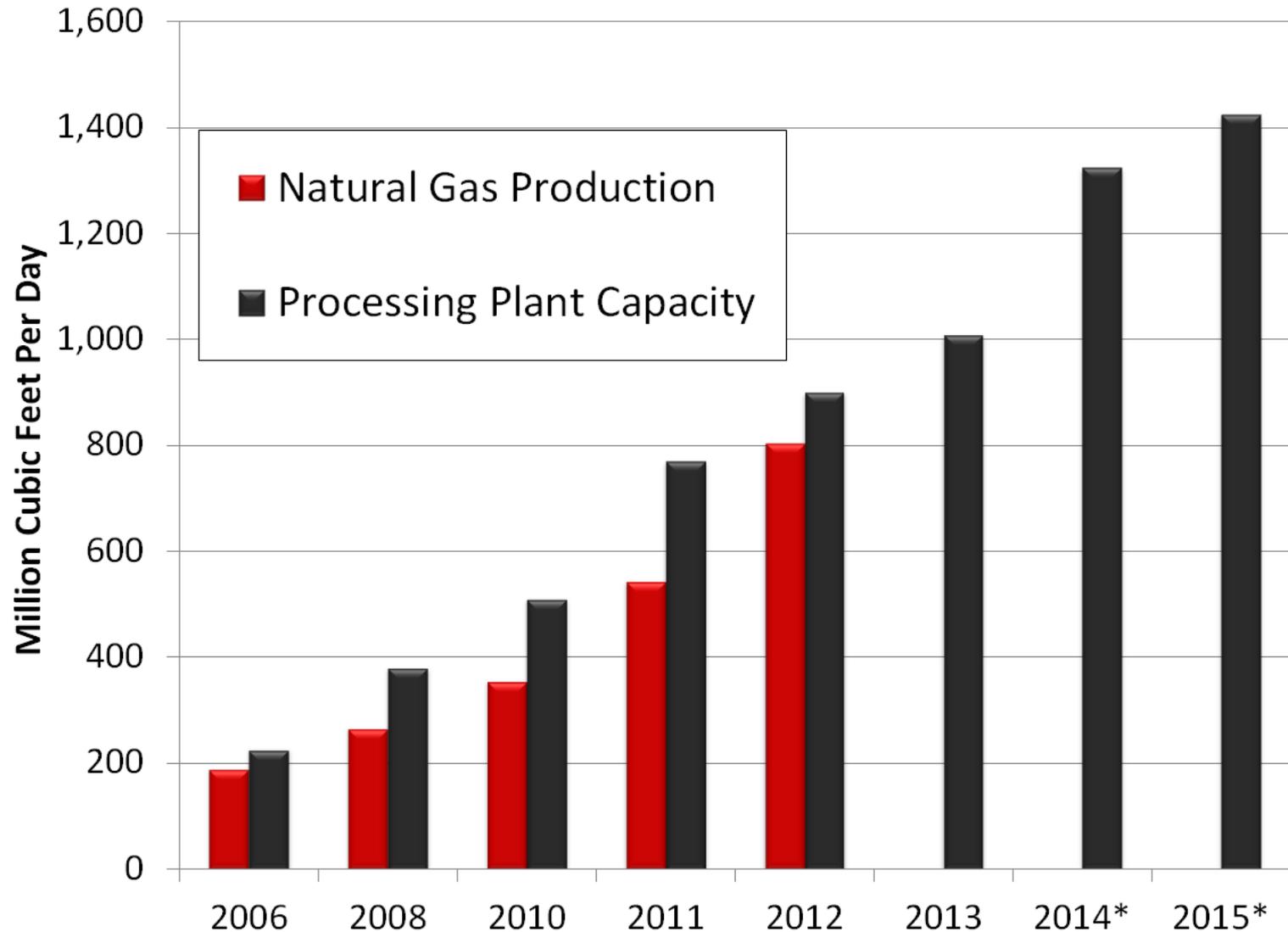
Natural Gas Processing & Transmission



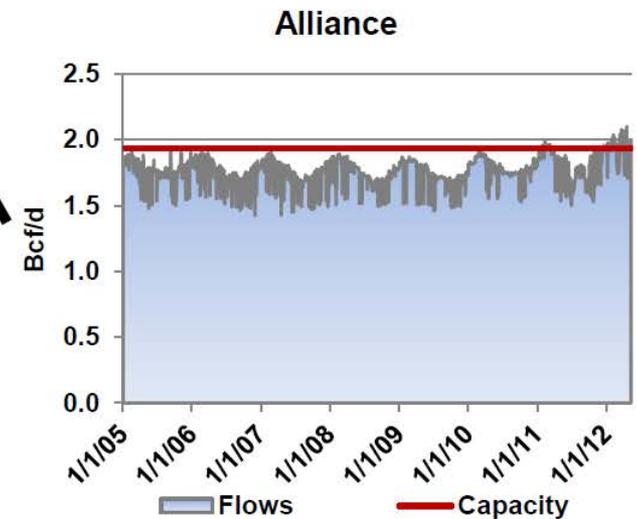
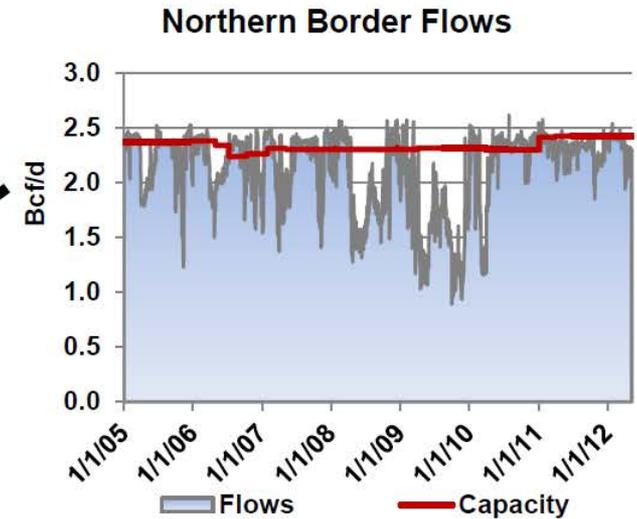
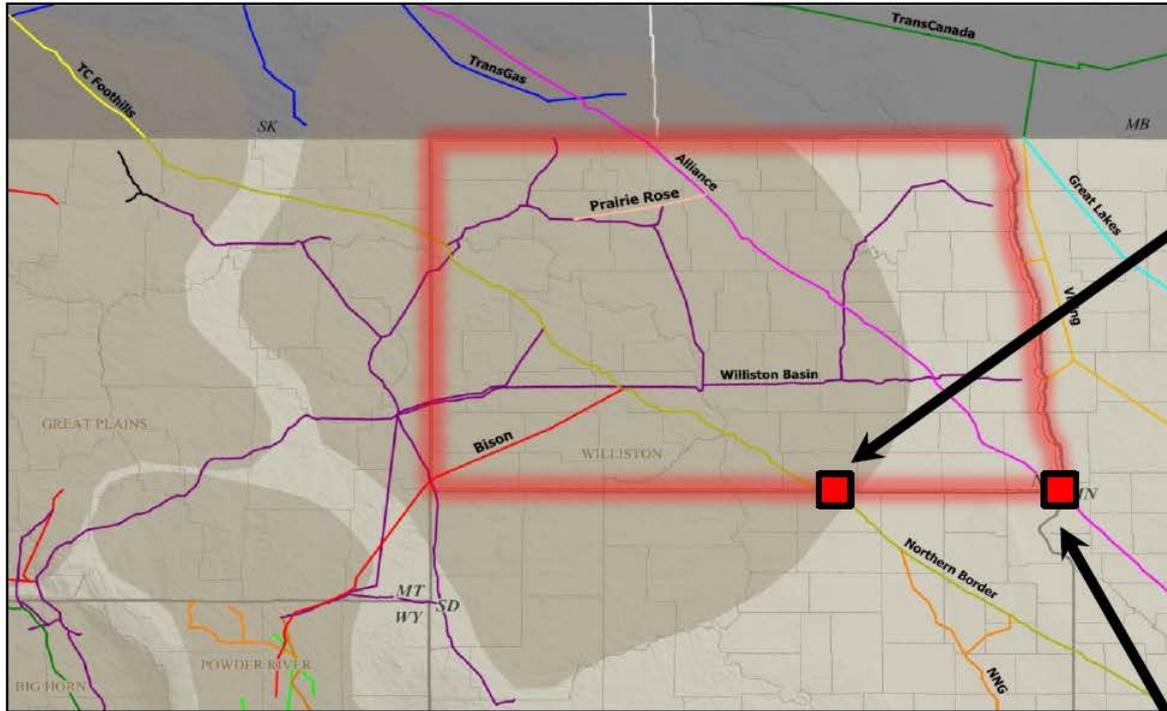
4 New or Expanding Gas Plants 2013-2015
(See Website for Details)



ND Gas Plant Capacity



Open Capacity Leaving N. Dakota Is Tight



- Northern Border and Alliance Serve As the Primary Routes to Transport Gas From the Region.
- Each Have Limited Open Mainline Capacity to Carry Additional Williston Supply.

Flaring Alternatives

**ND PIPELINE
AUTHORITY**

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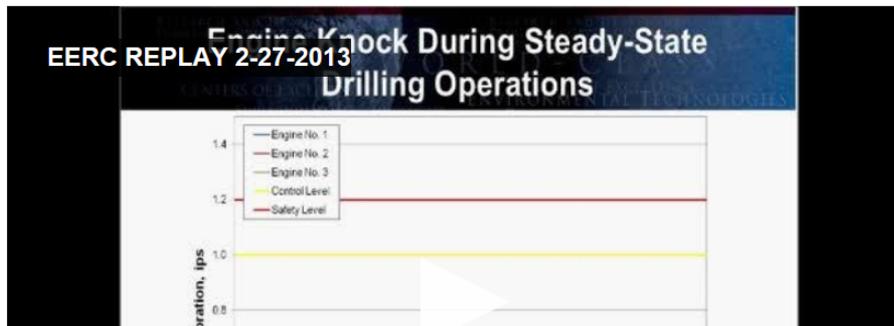
February 27, 2013 – Use of Associated Gas to Power Drilling Rigs

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- February 2013
- October 2012

META

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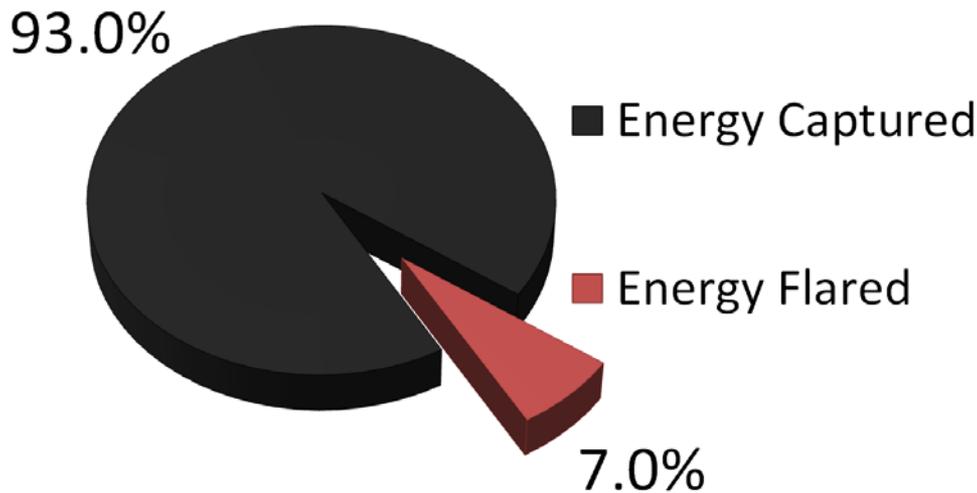
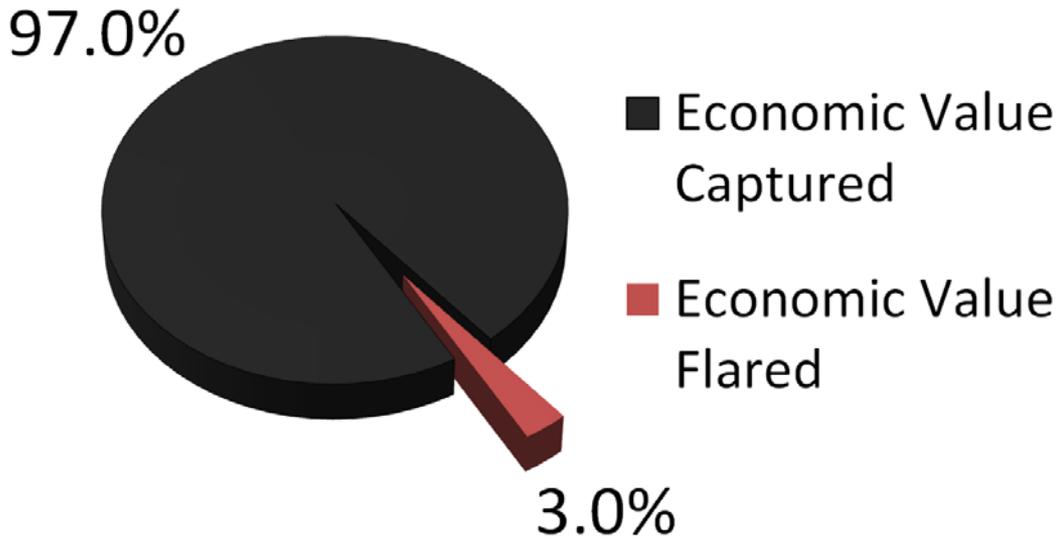
November 5, 2012 – EERC Associated Gas Use Study

December 18, 2012 – Natural Gas Flaring Alternatives (Company Presentations)

February 27, 2013 – EERC Use of Associated Gas to Power Drilling Rigs



ND Wellhead Recovery Estimates



*Estimate
Data/Assumptions:
June 2013
Production*

*Oil Price of \$86/bbl,
Natural Gas/NGL
Wellhead Price of
\$8.00/MCF*



Contact Information

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www.pipeline.nd.gov

www.northdakotapipelines.com



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