

Williston Basin Petroleum Conference

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North Dakota Pipeline Authority



May 22, 2018

Natural Gas Capture



Production

- Technology
- Markets



Gathering

- Capacity
- Connections



Processing

- Capacity
- Location



Transmission

- Dry Gas
- Natural Gas Liquids



Natural Gas Capture



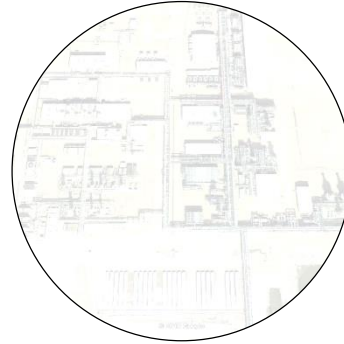
Production

- Technology
- Markets



Gathering

- Capacity
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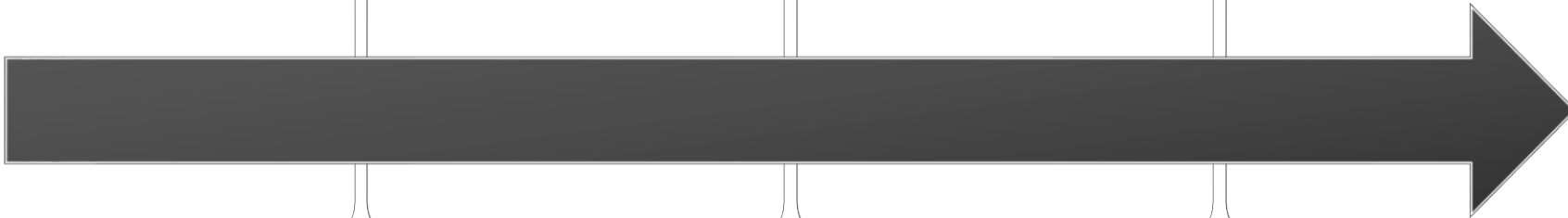
Processing

- Capacity
- Location

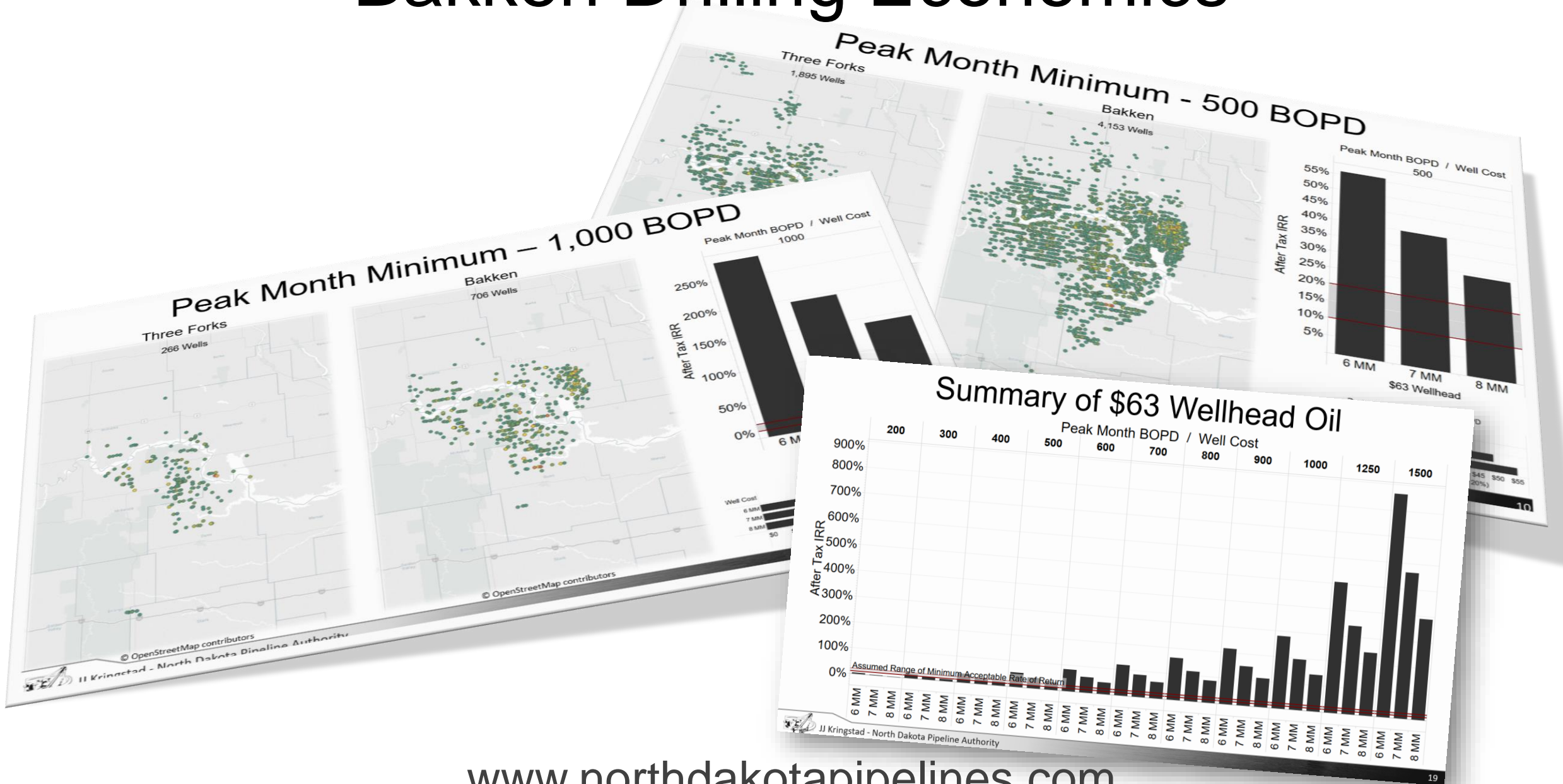


Transmission

- Dry Gas
- Natural Gas Liquids



Bakken Drilling Economics

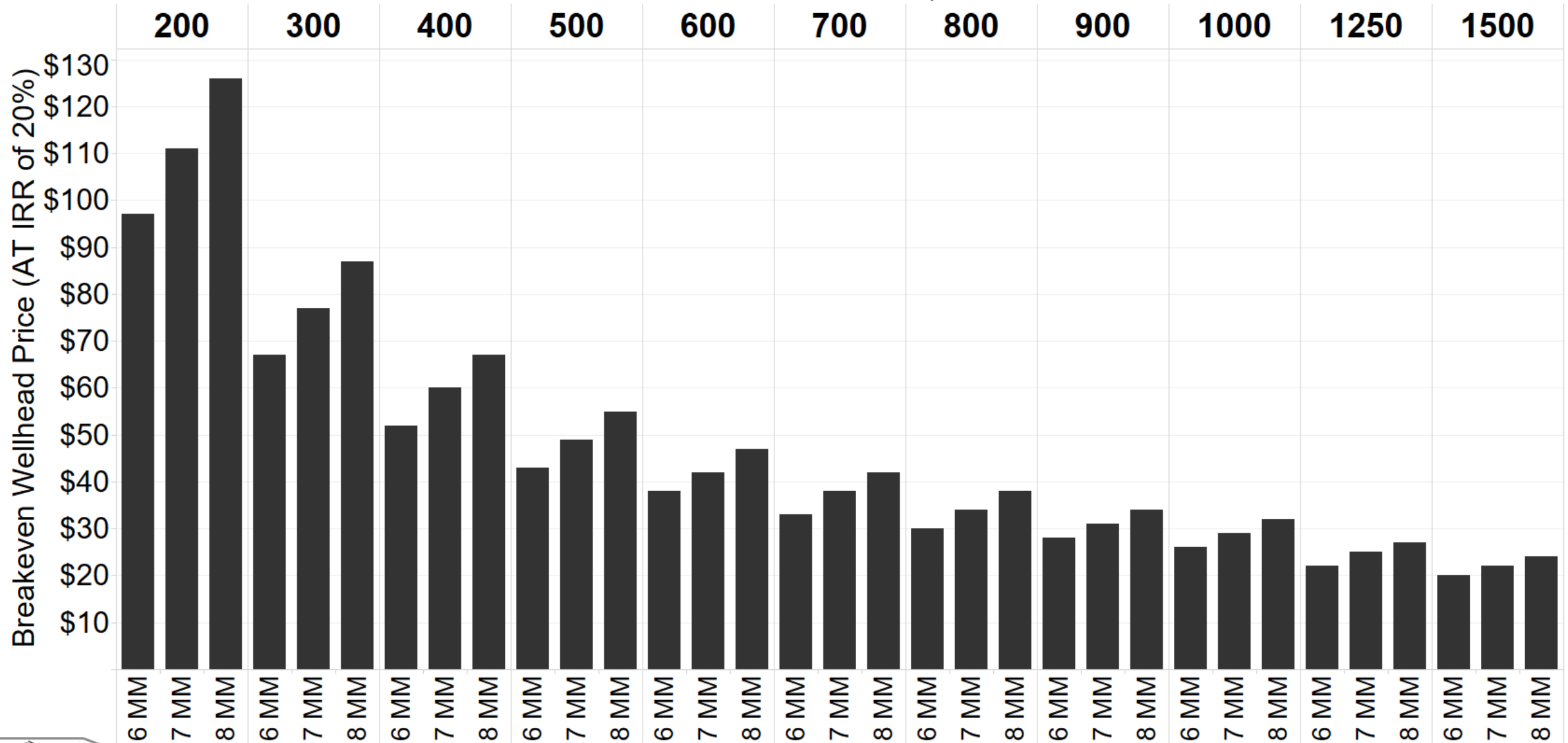


www.northdakotapipelines.com

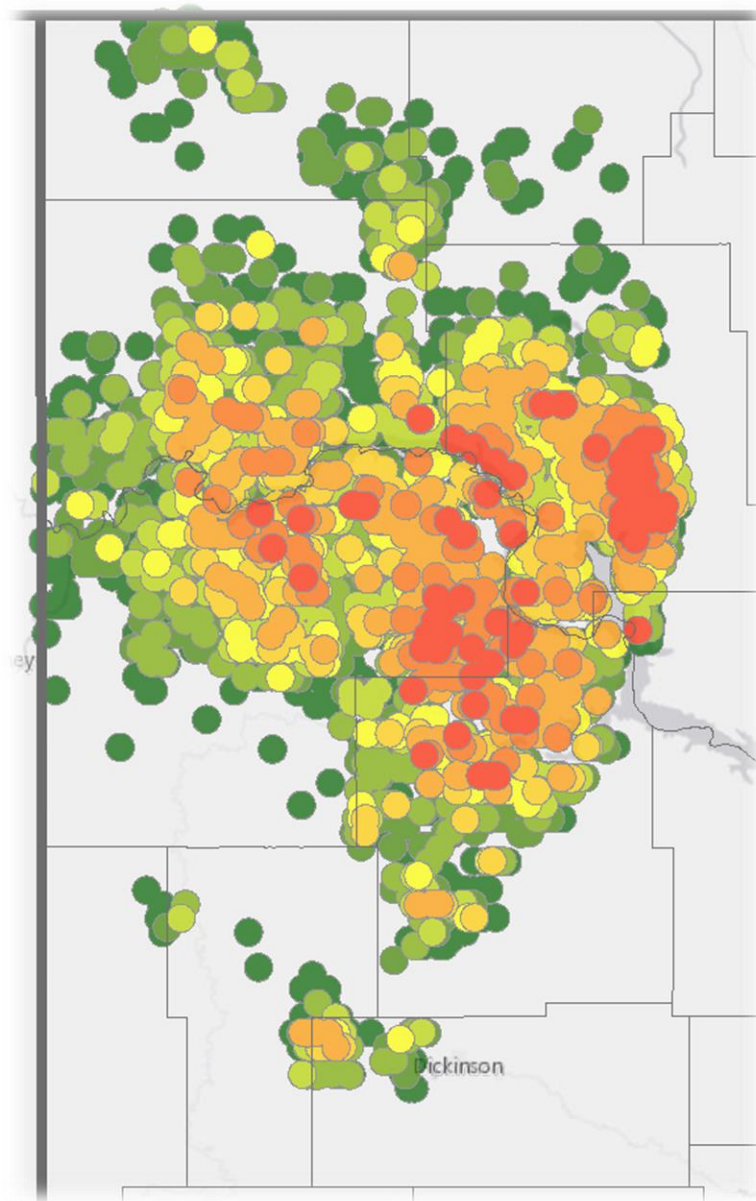


Breakeven Summary

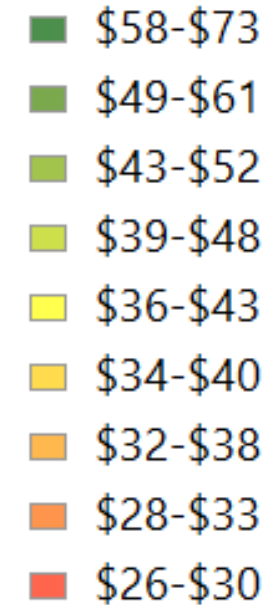
Peak Month Well Production, BOPD / Well Cost



Bakken Breakeven Price Range (20% IRR)



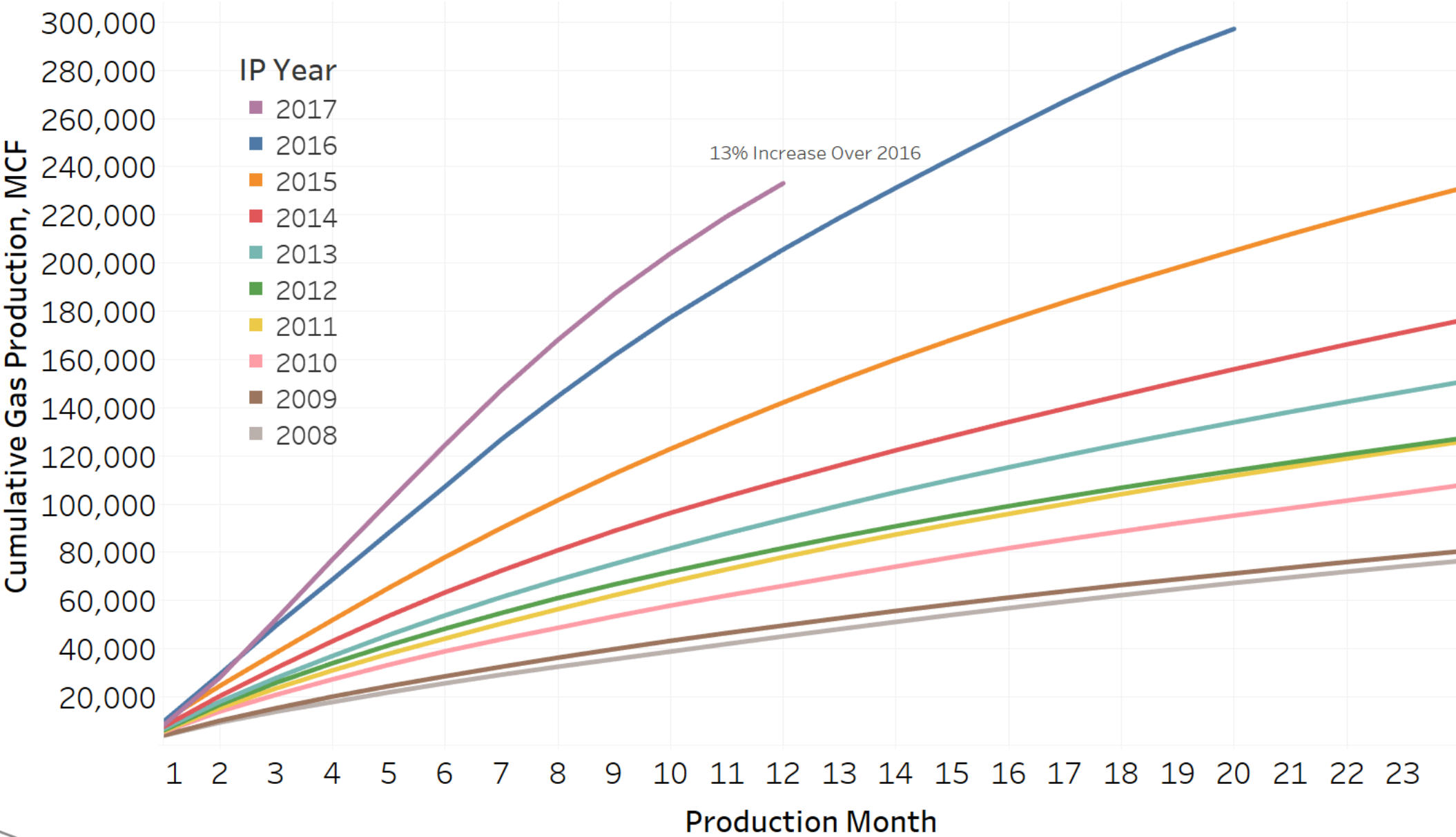
Bakken Breakeven Prices
\$6 - \$8 Million
Completed Wells Cost



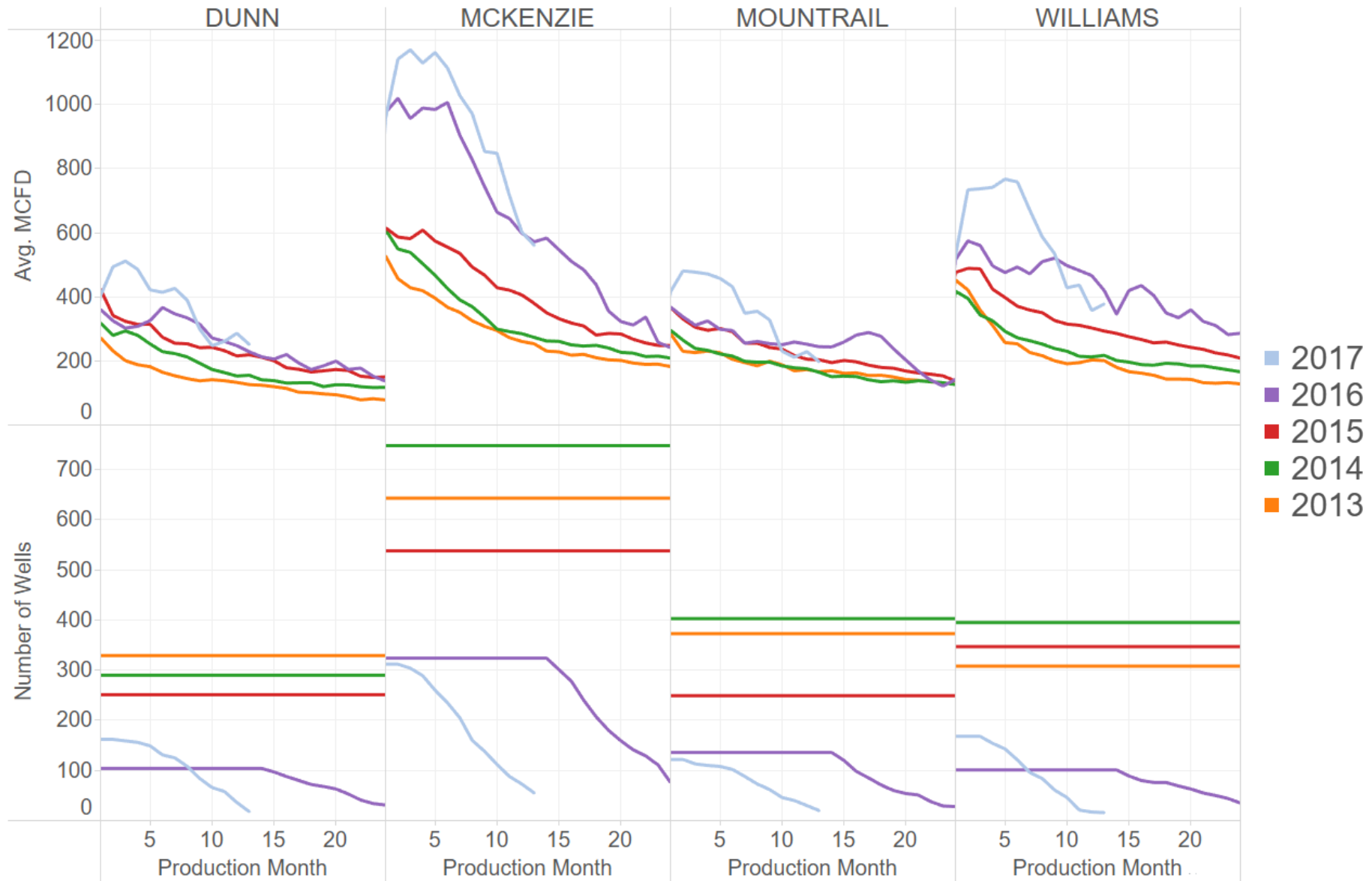
Background Map: Esri, HERE, DeLorme, MapmyIndia, ©
OpenStreetMap contributors, and the GIS user community



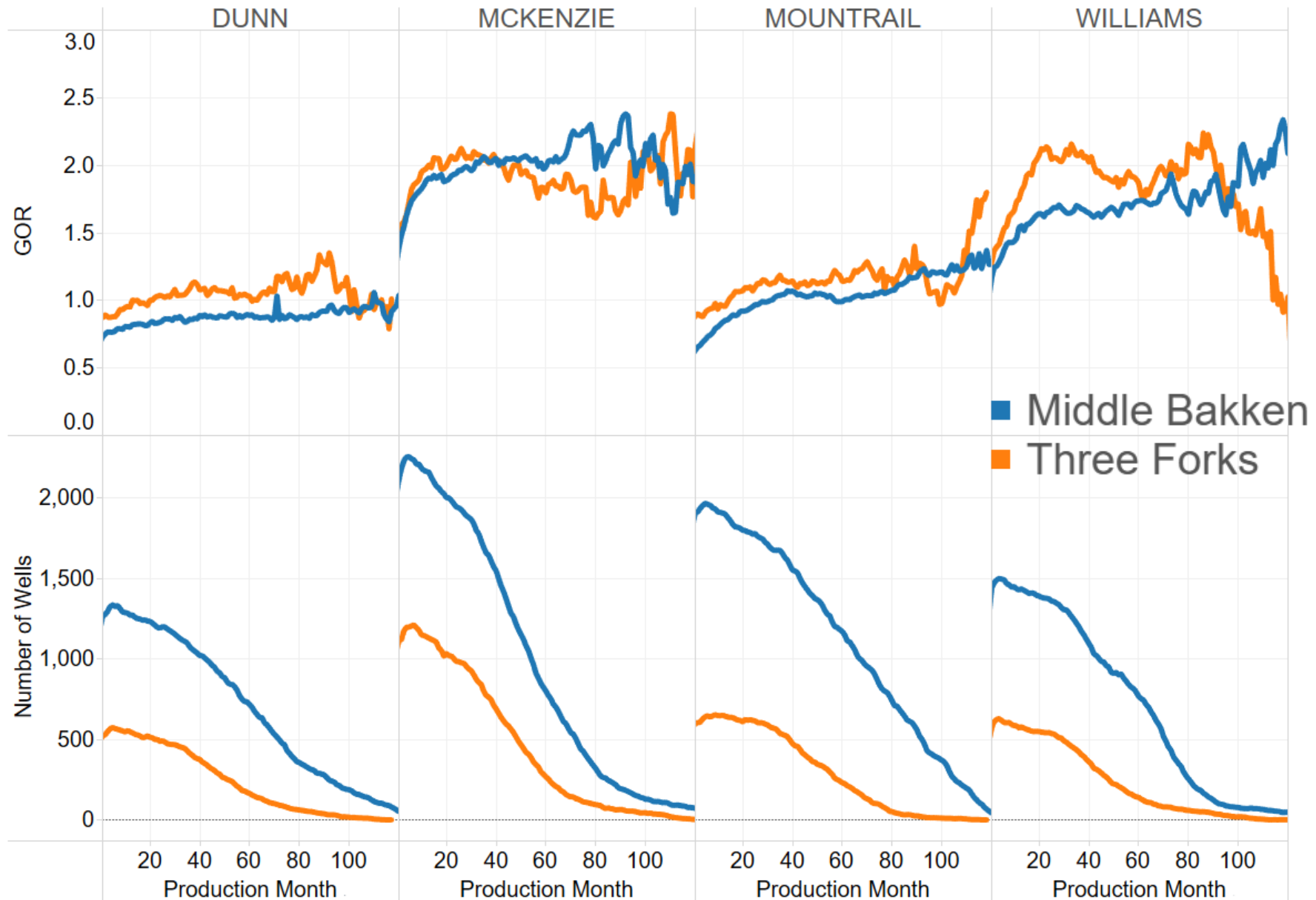
Statewide Gas Performance



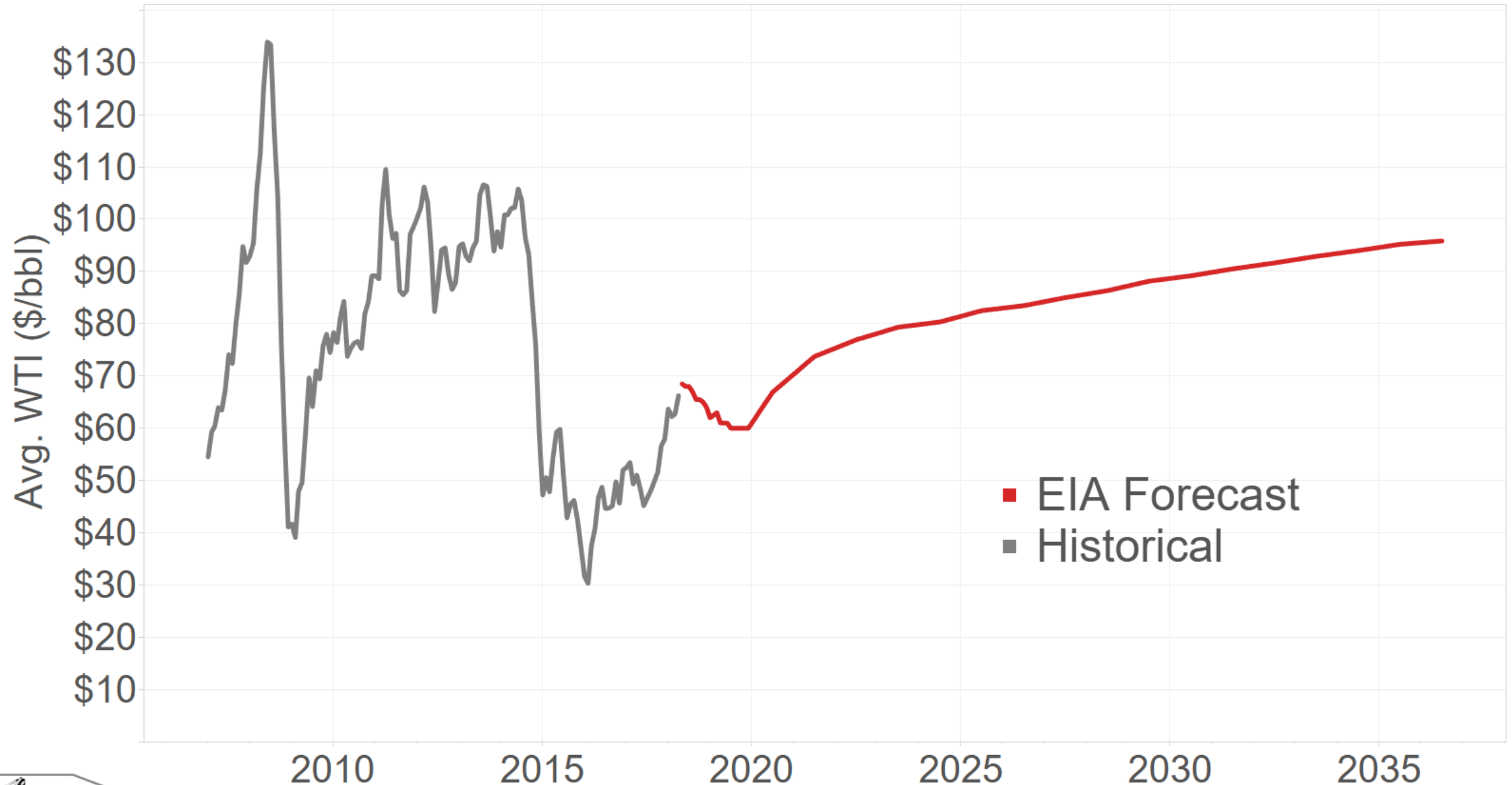
Bakken and Three Forks Well Performance



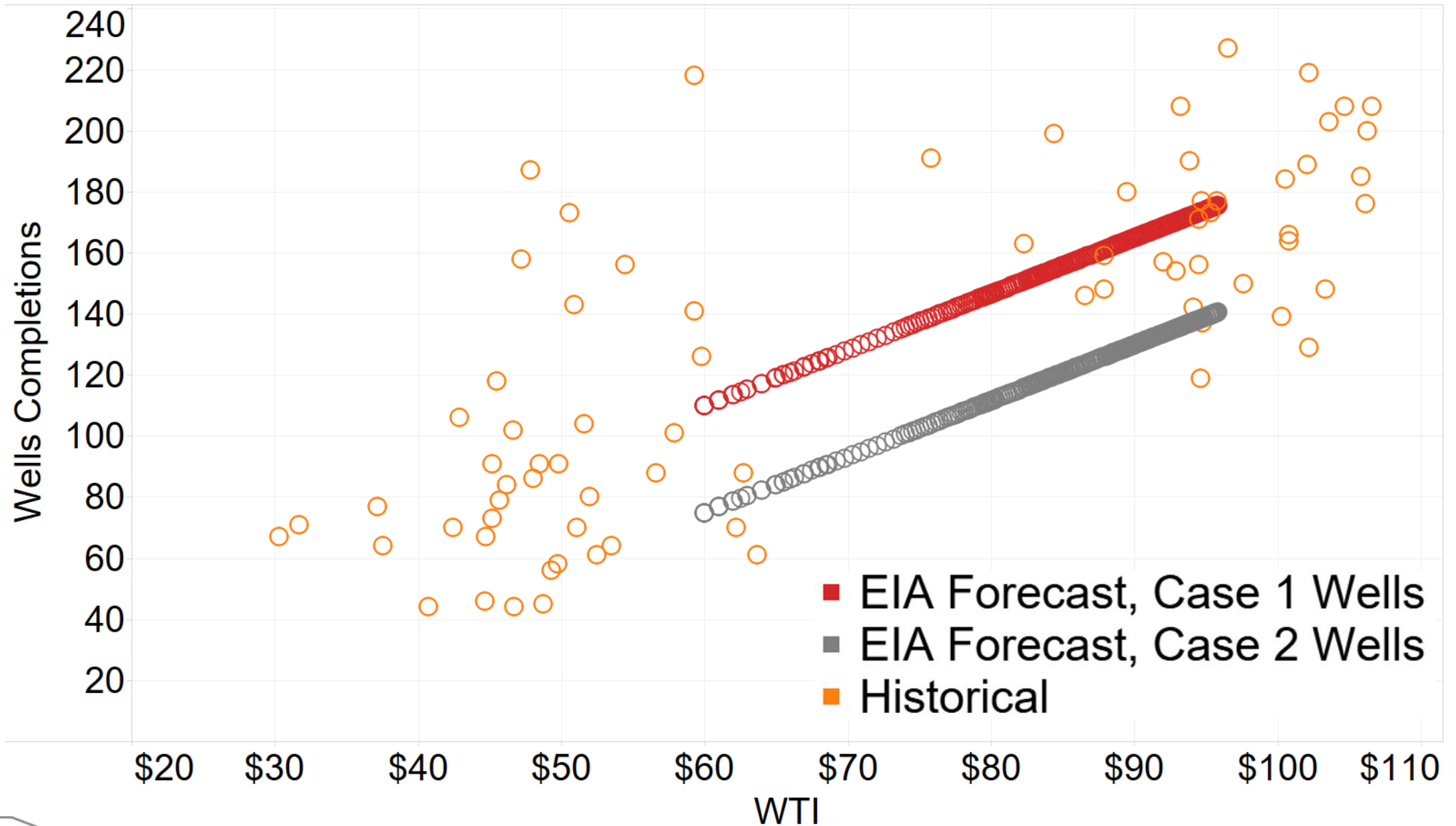
Bakken and Three Forks Gas Oil Ratio



DOE-EIA Forecasted Oil Price



Forecasting Activity vs. Price



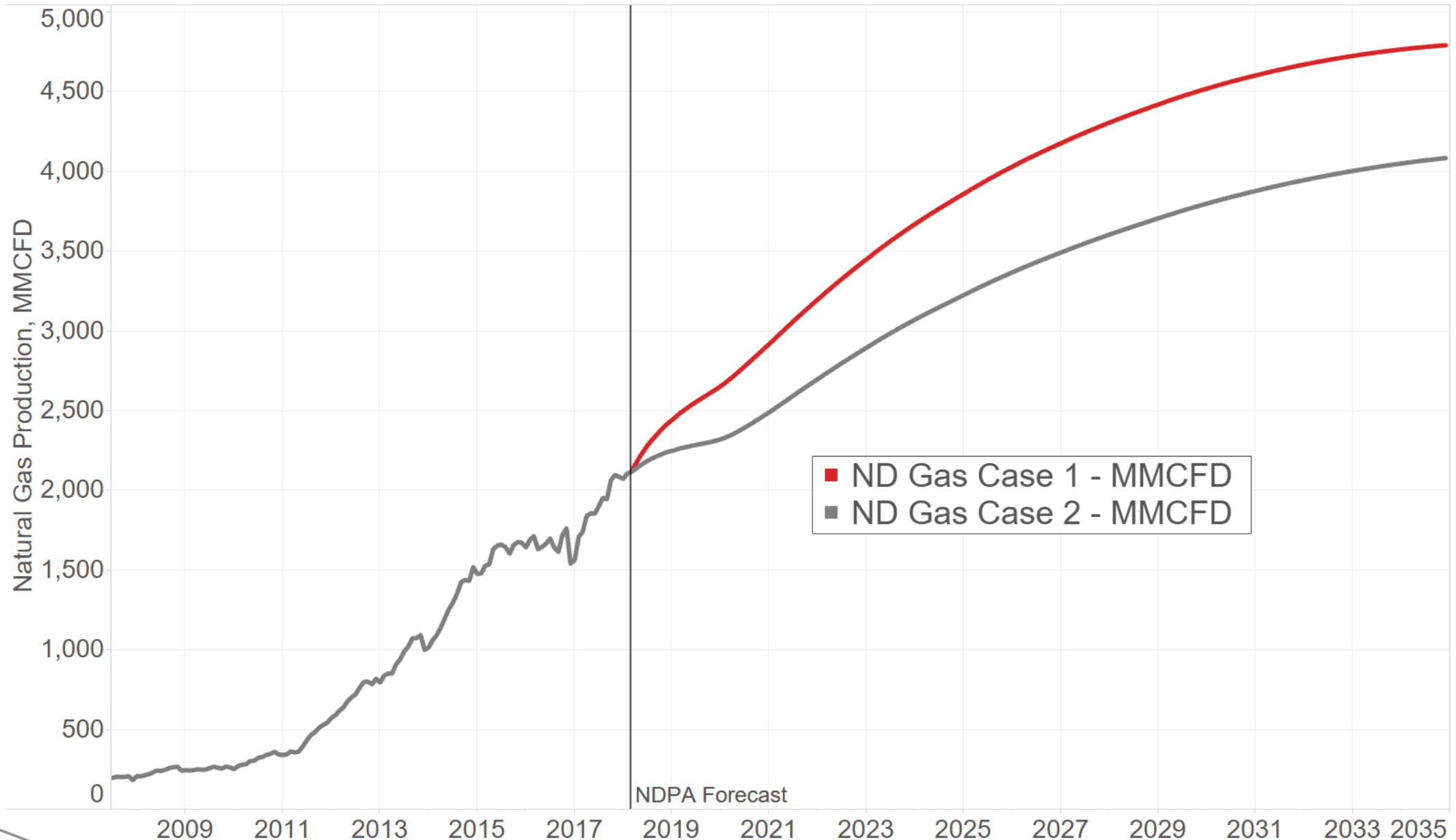
North Dakota Forecast Activity Assumptions



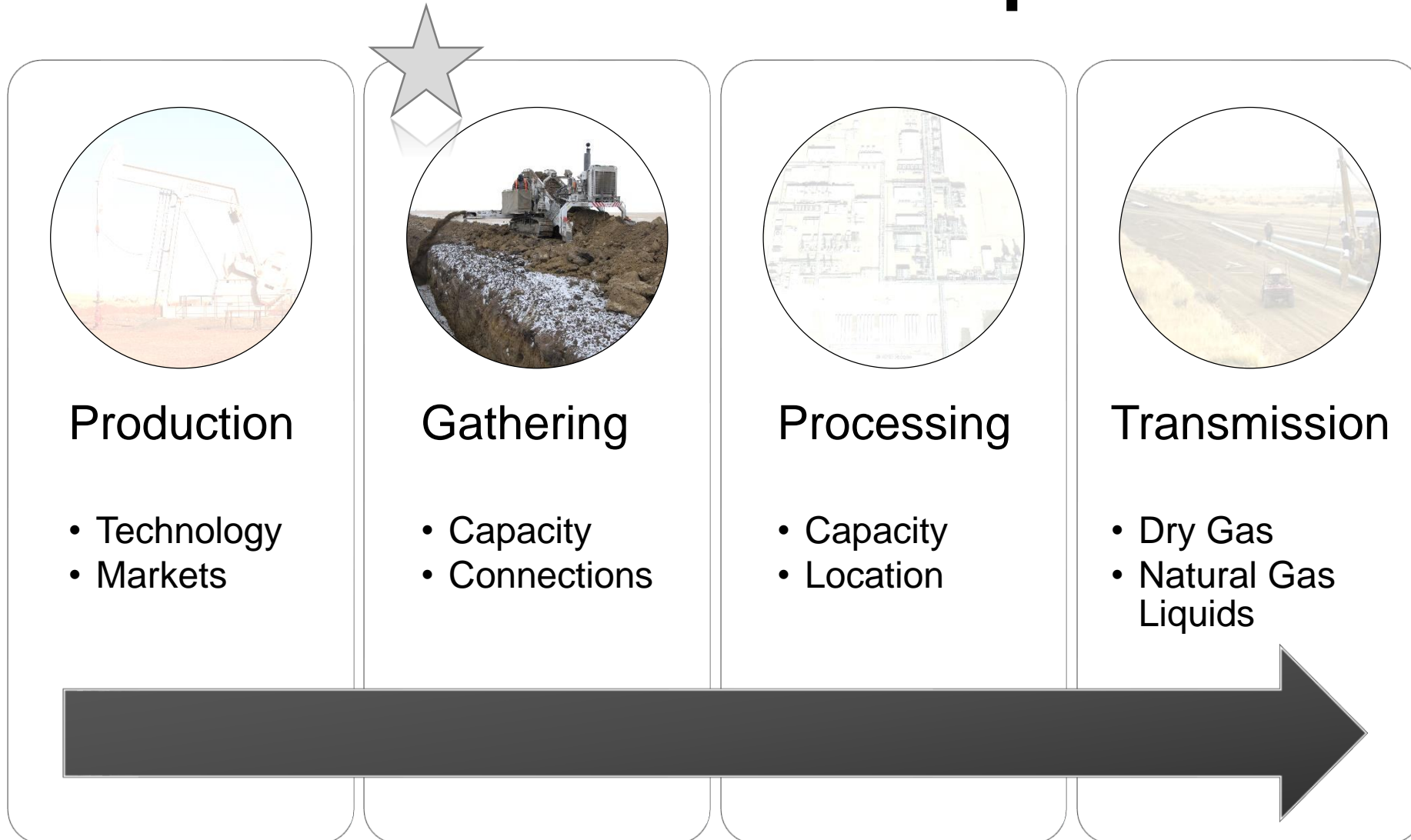
12



NDPA North Dakota Gas Production Forecast

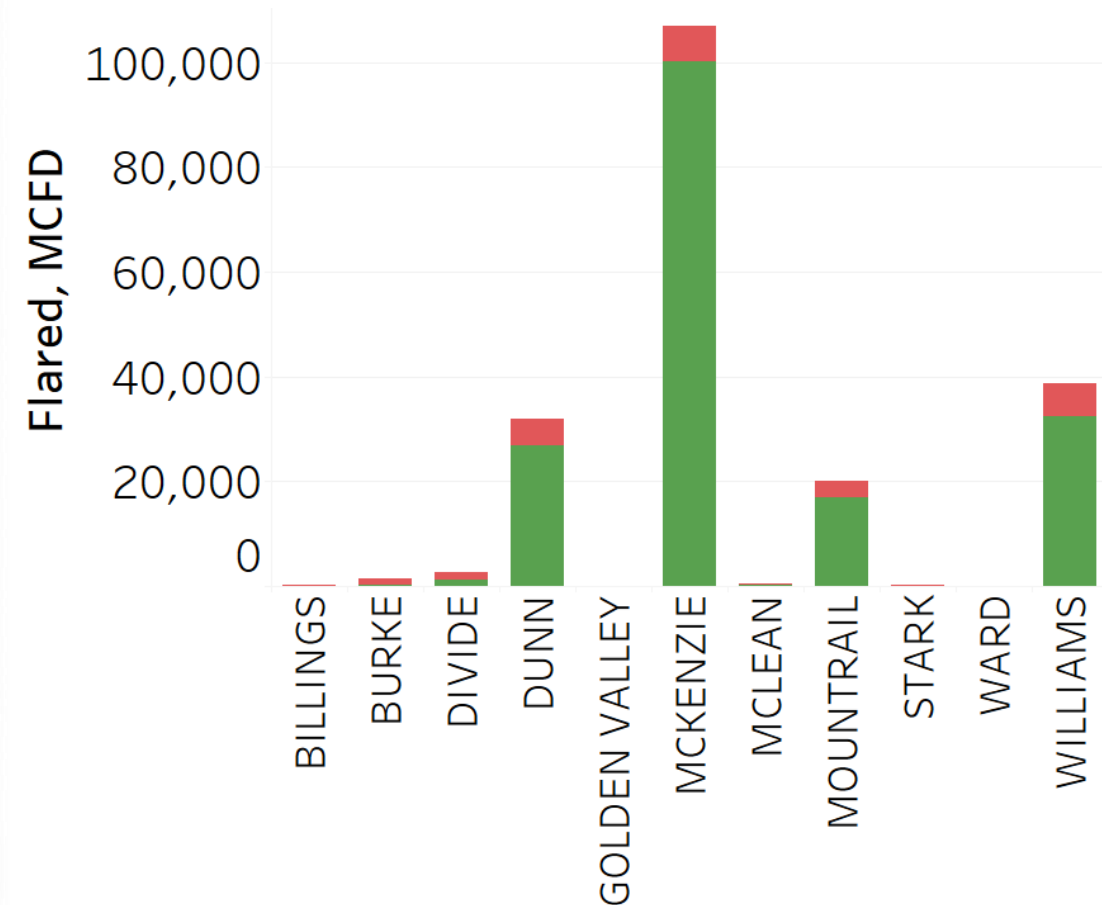
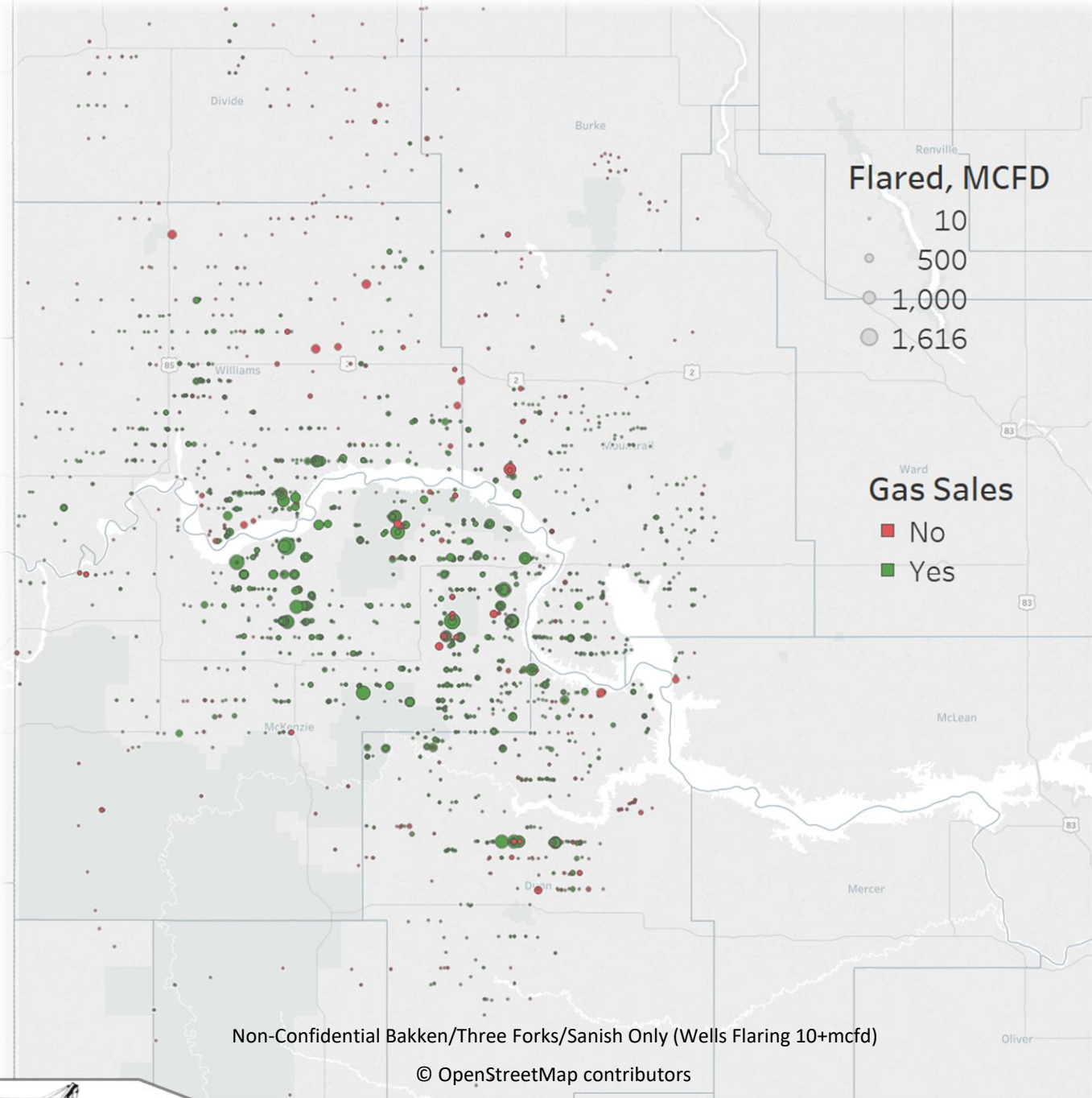


Natural Gas Capture

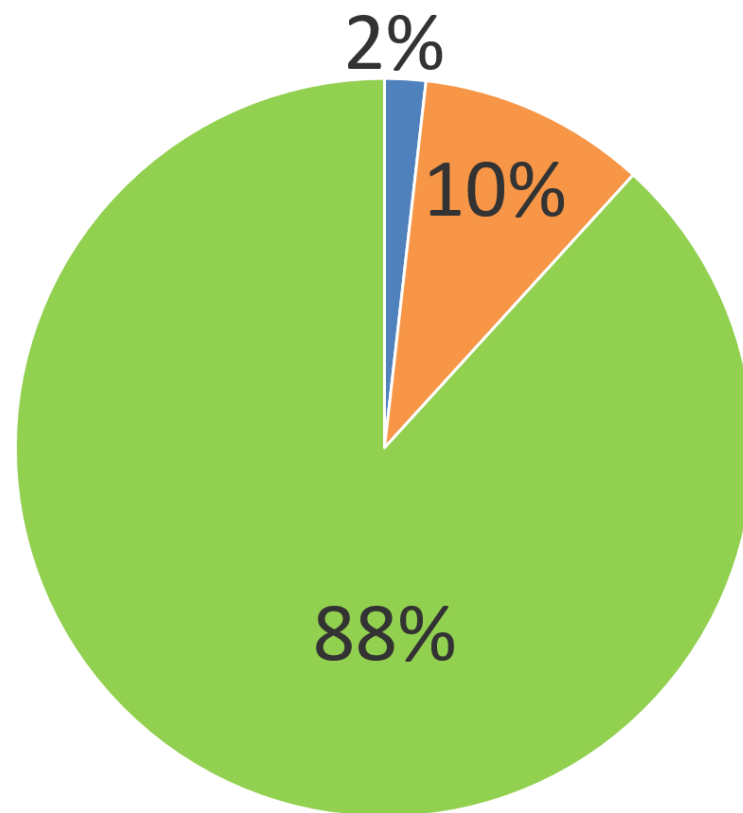


Solving the Flaring Challenge

February 2018



Solving the Flaring Challenge



Statewide

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

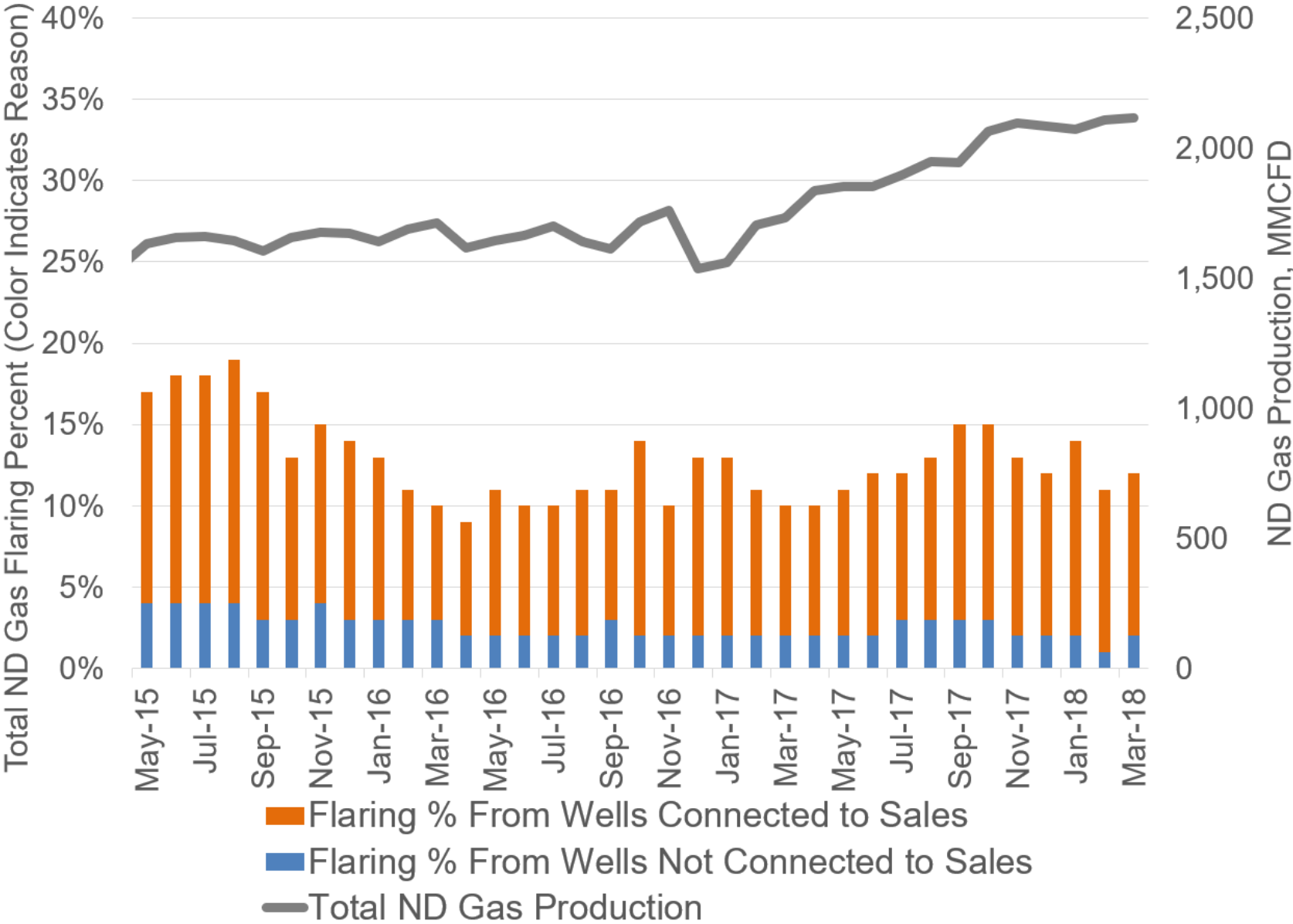
Simple Terms

Blue – Lack of pipelines
Orange – Challenges on existing infrastructure

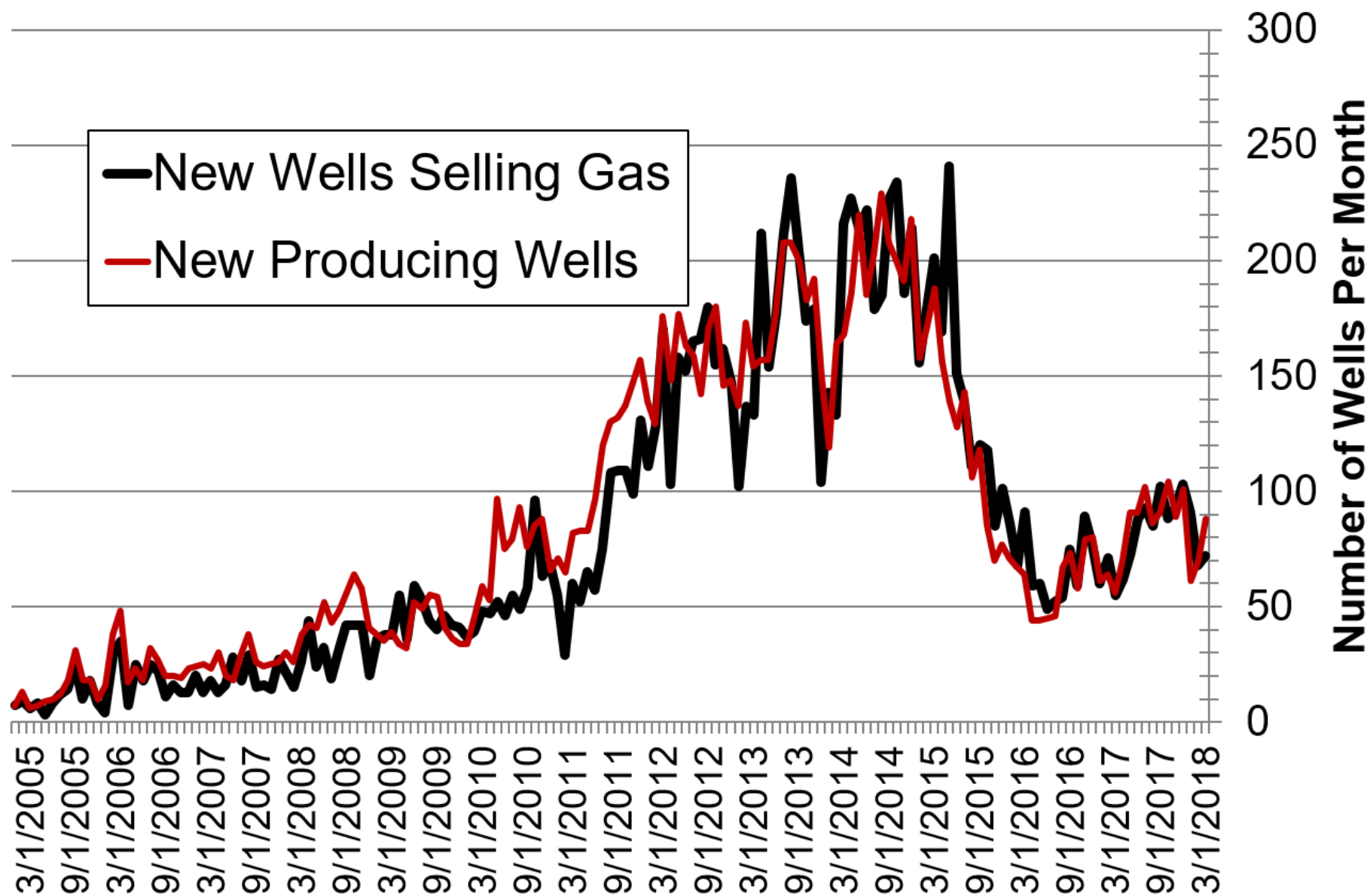
Mar 2018 Data – Non-Confidential Wells



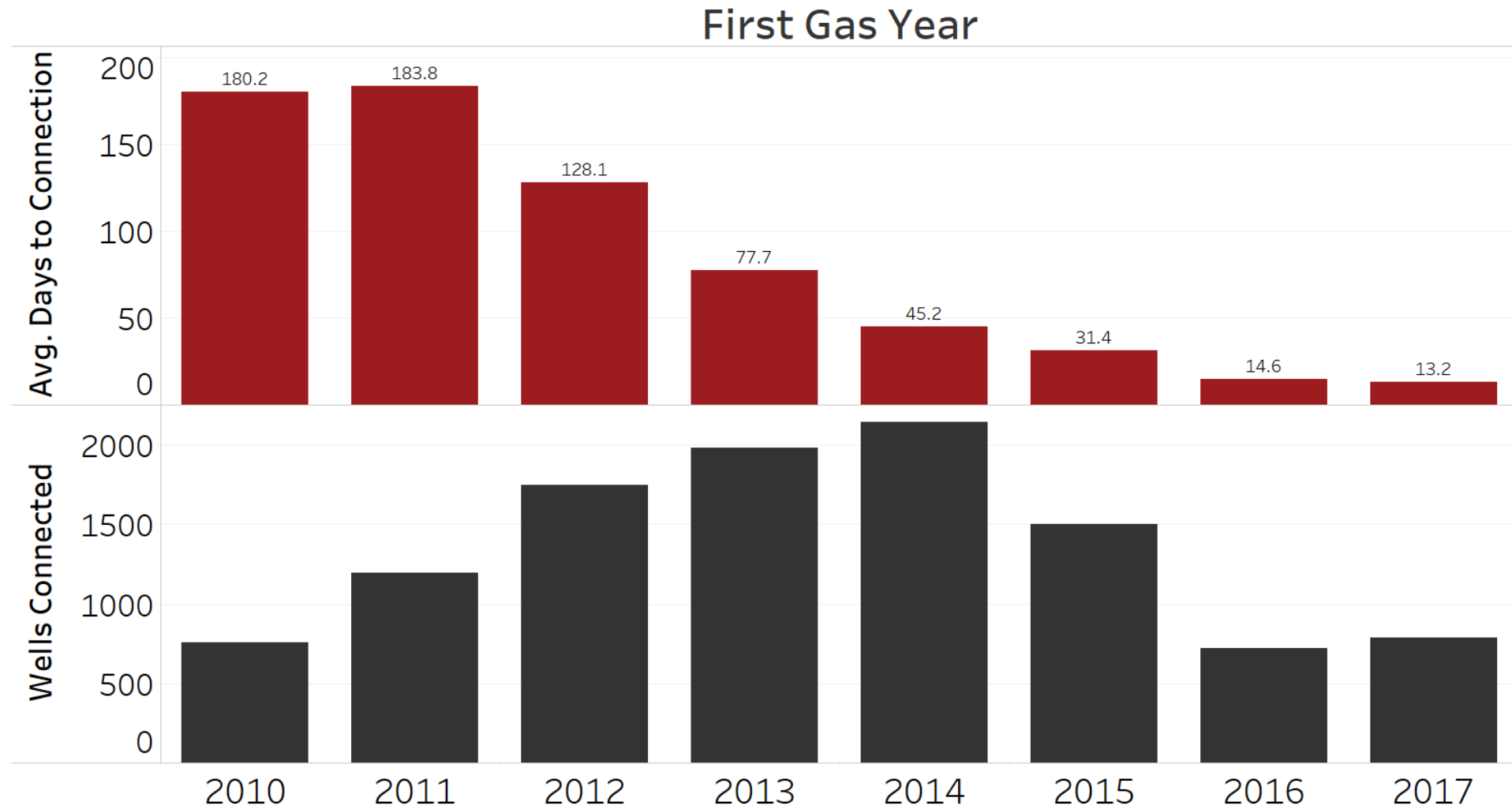
Solving the Flaring Challenge



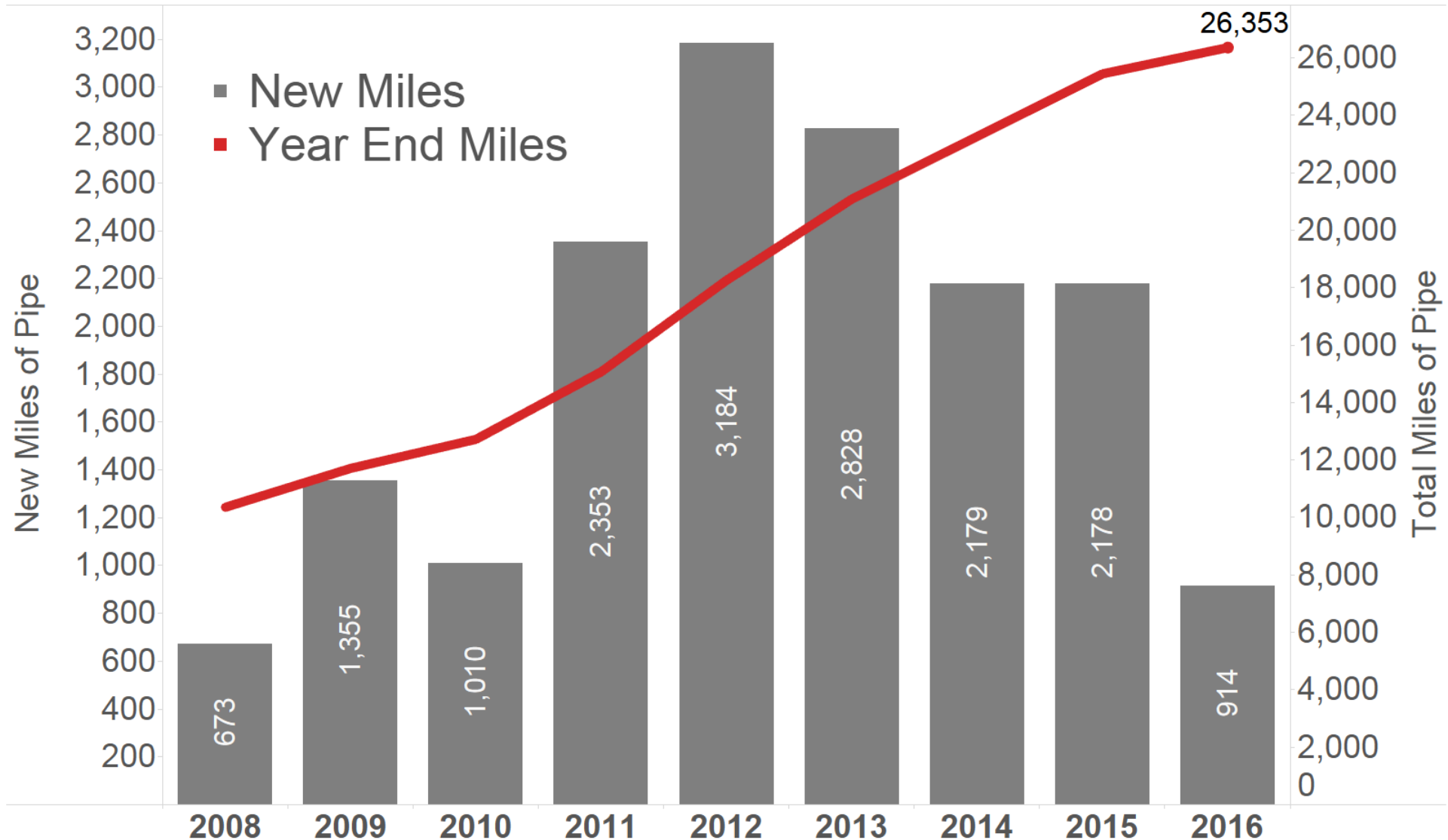
Solving the Flaring Challenge



Days to Connect to Gas Gathering



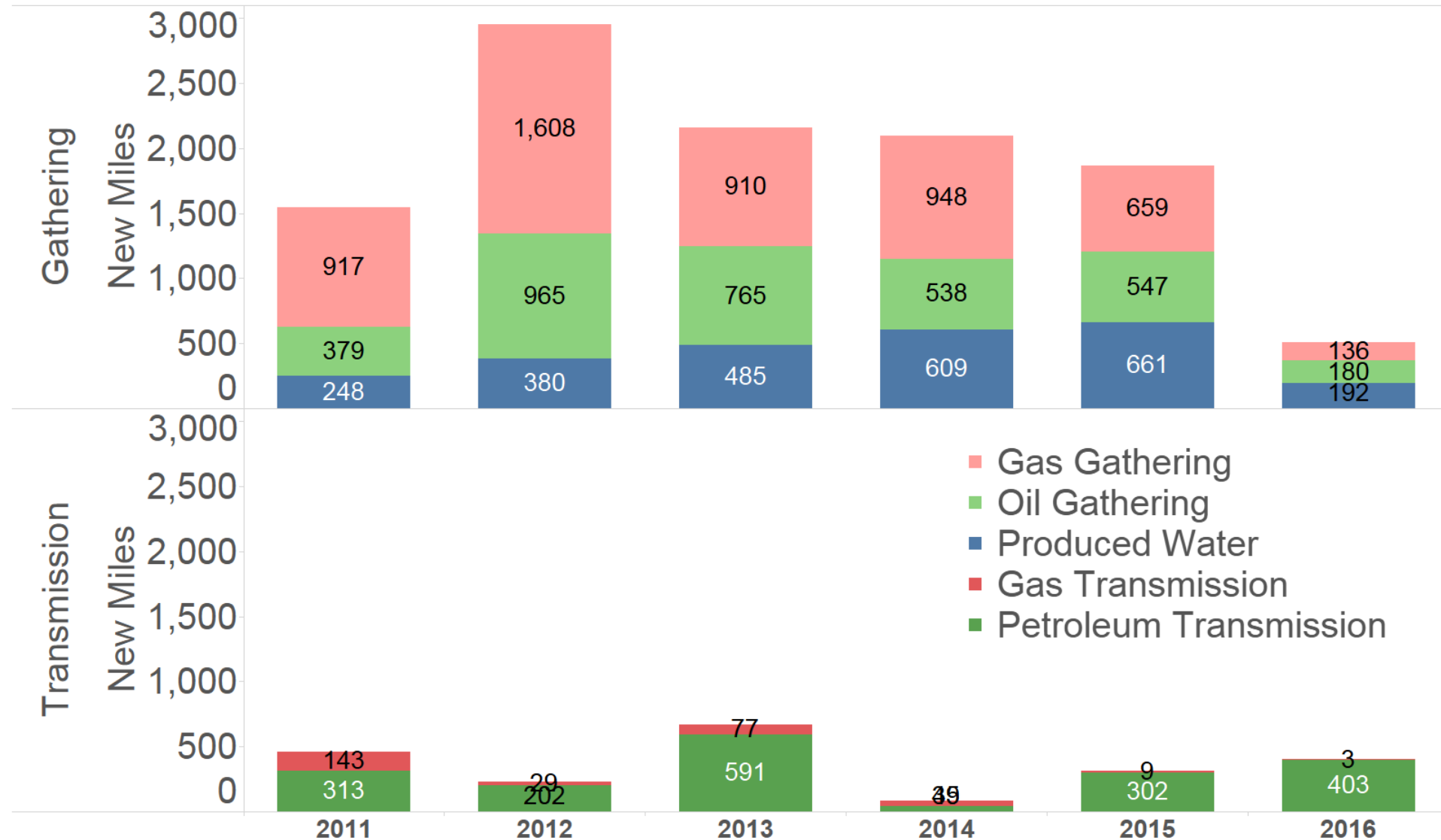
North Dakota Petroleum Pipeline Construction



Sources: NDIC & PHMSA



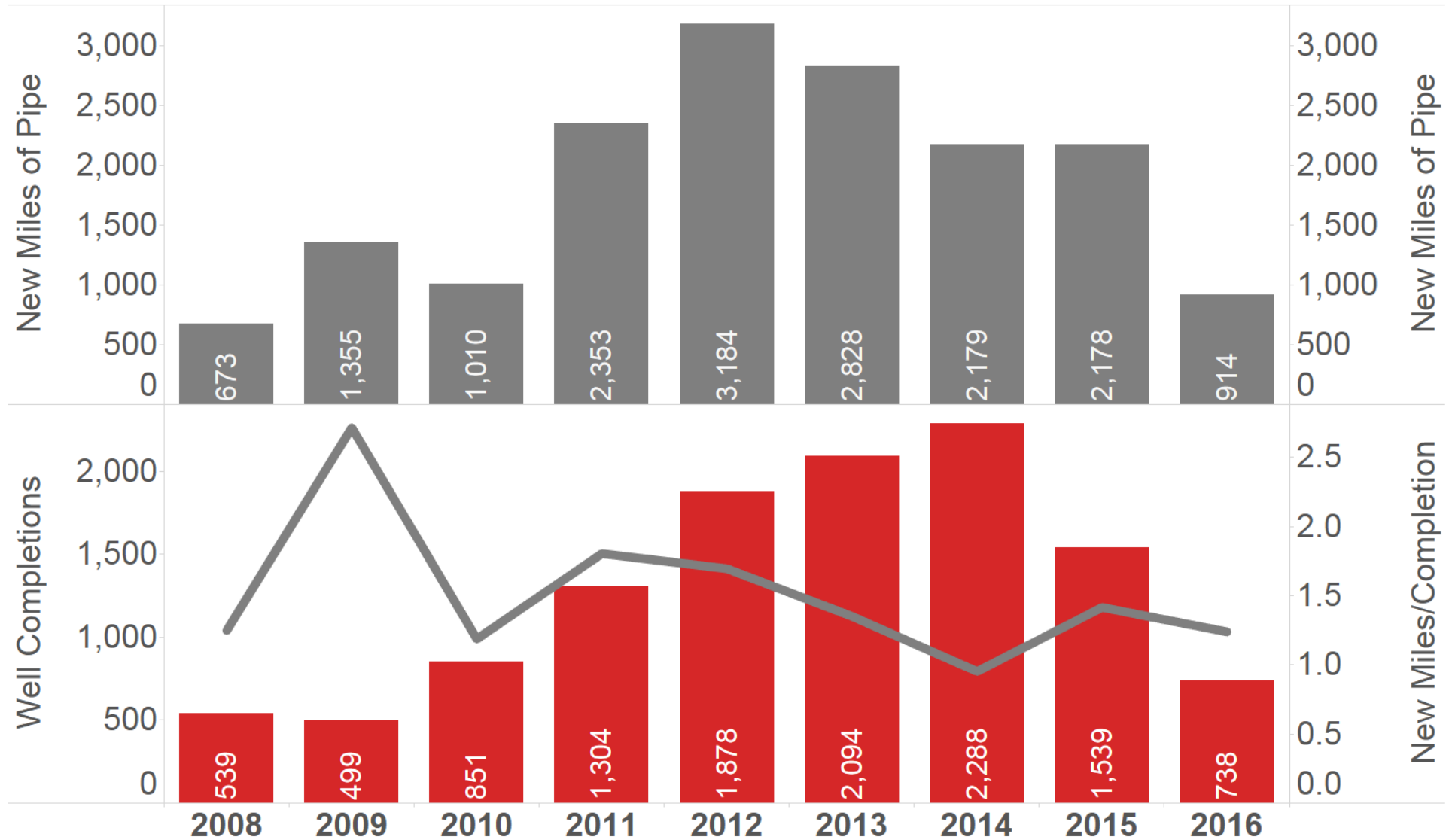
North Dakota Petroleum Pipeline Construction



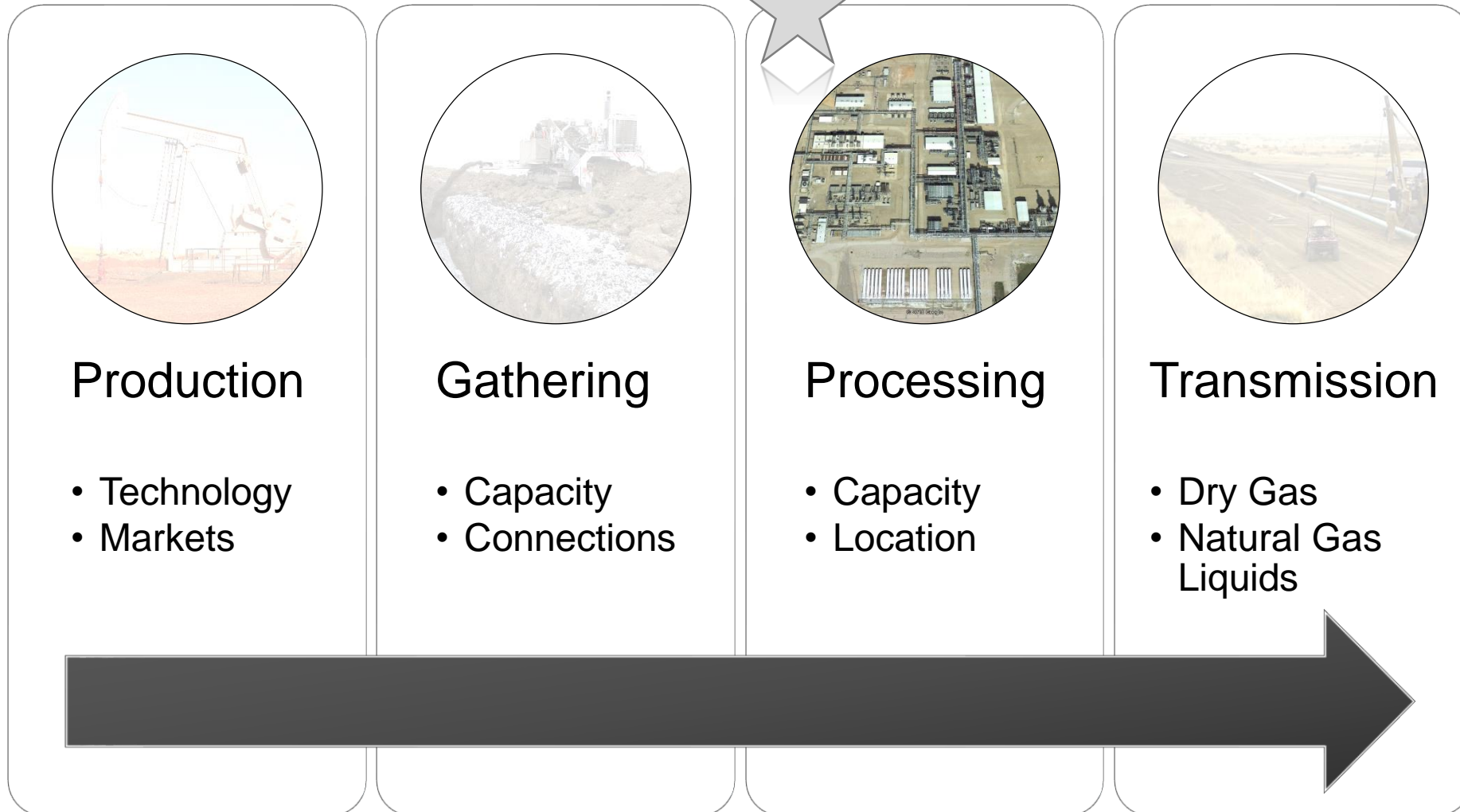
Sources: NDIC & PHMSA



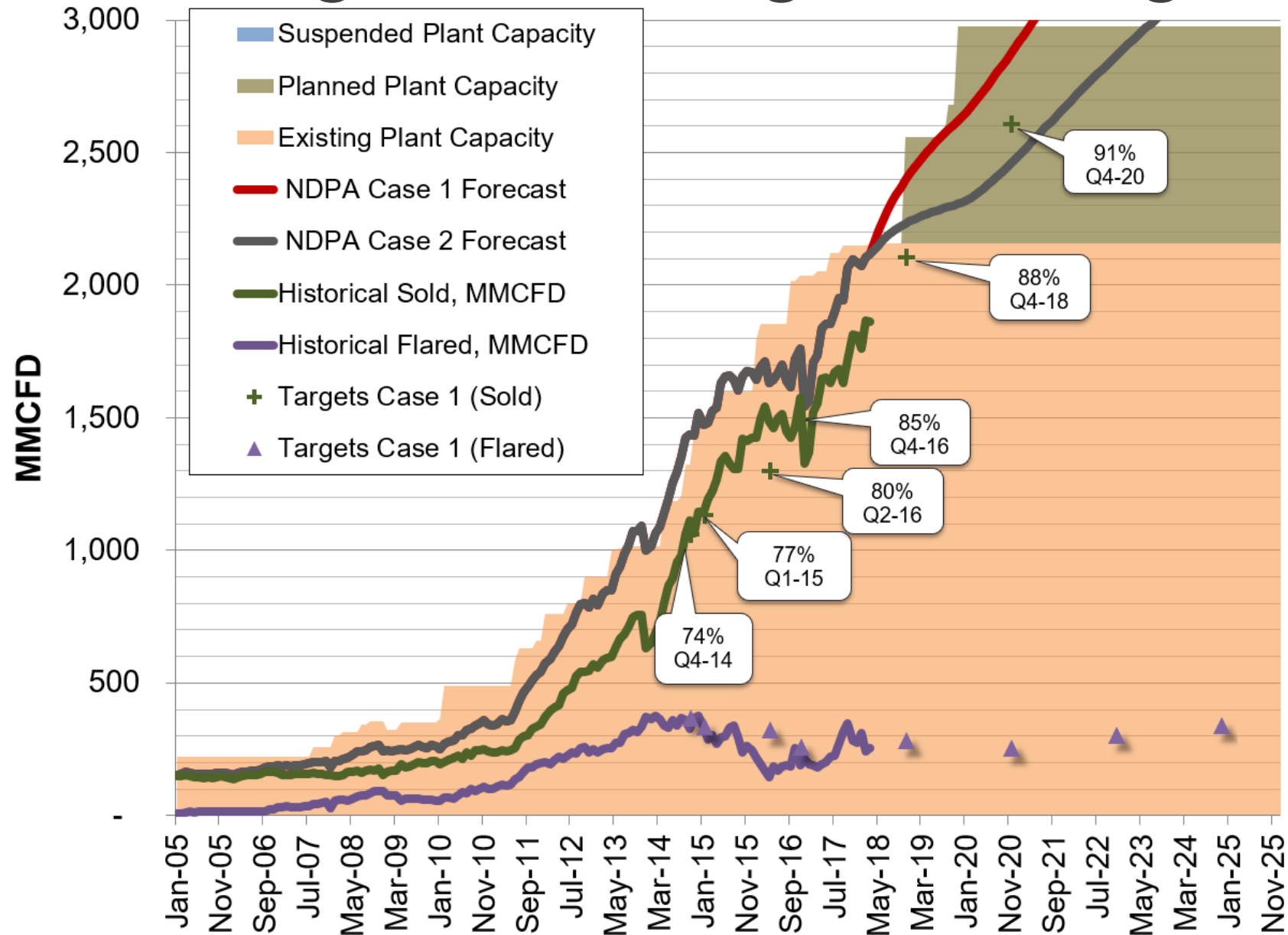
New Miles and Well Completions



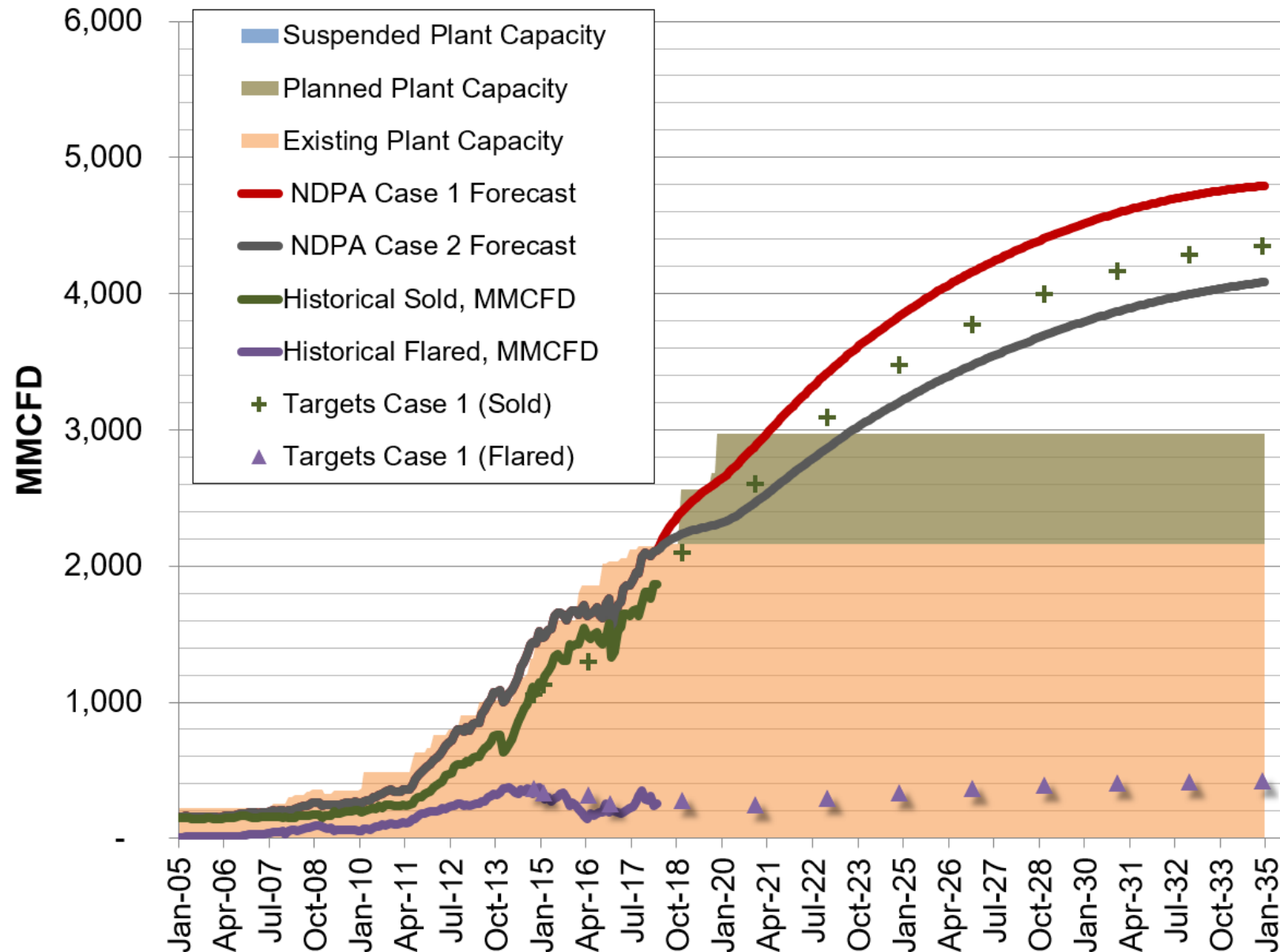
Natural Gas Capture



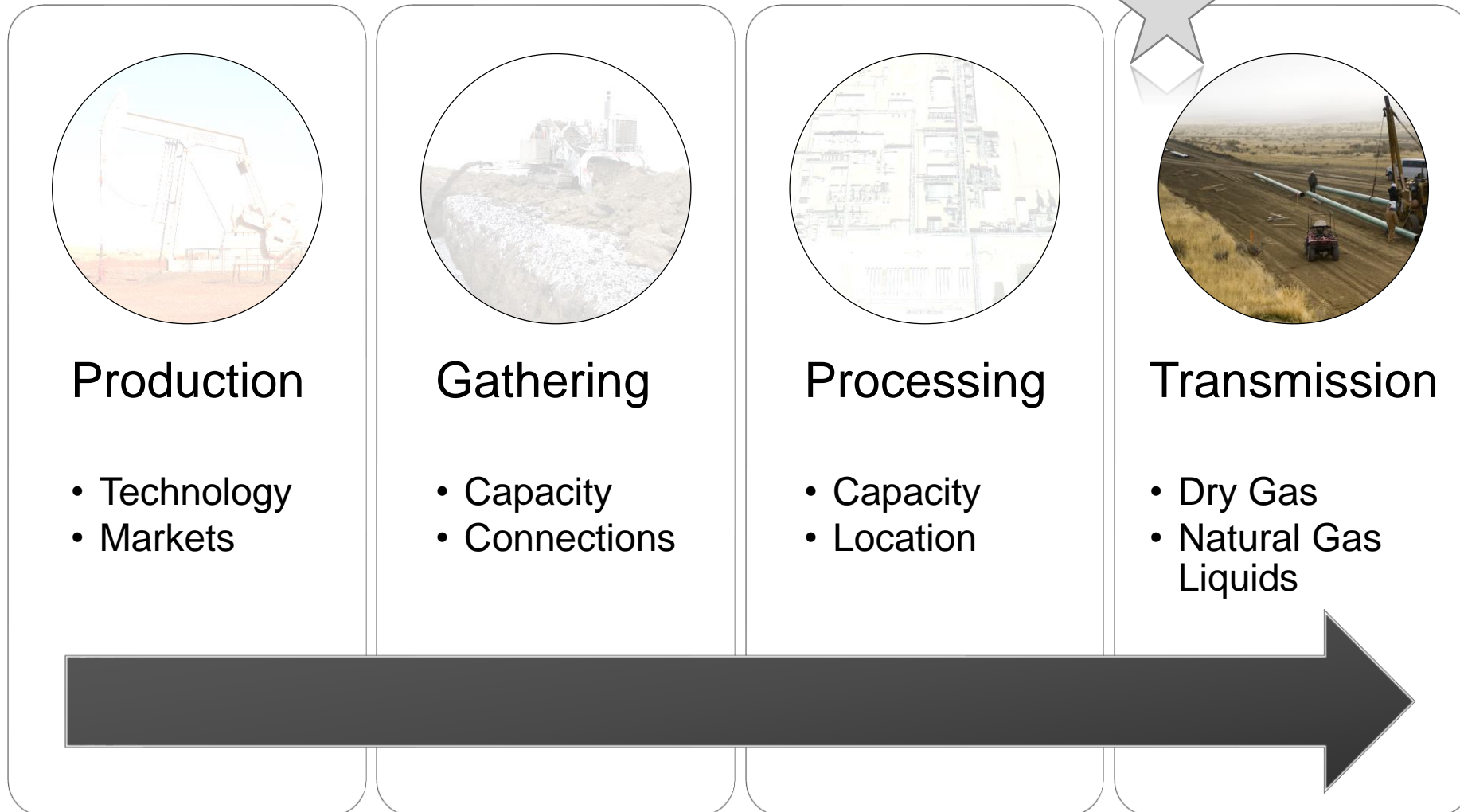
Solving the Flaring Challenge



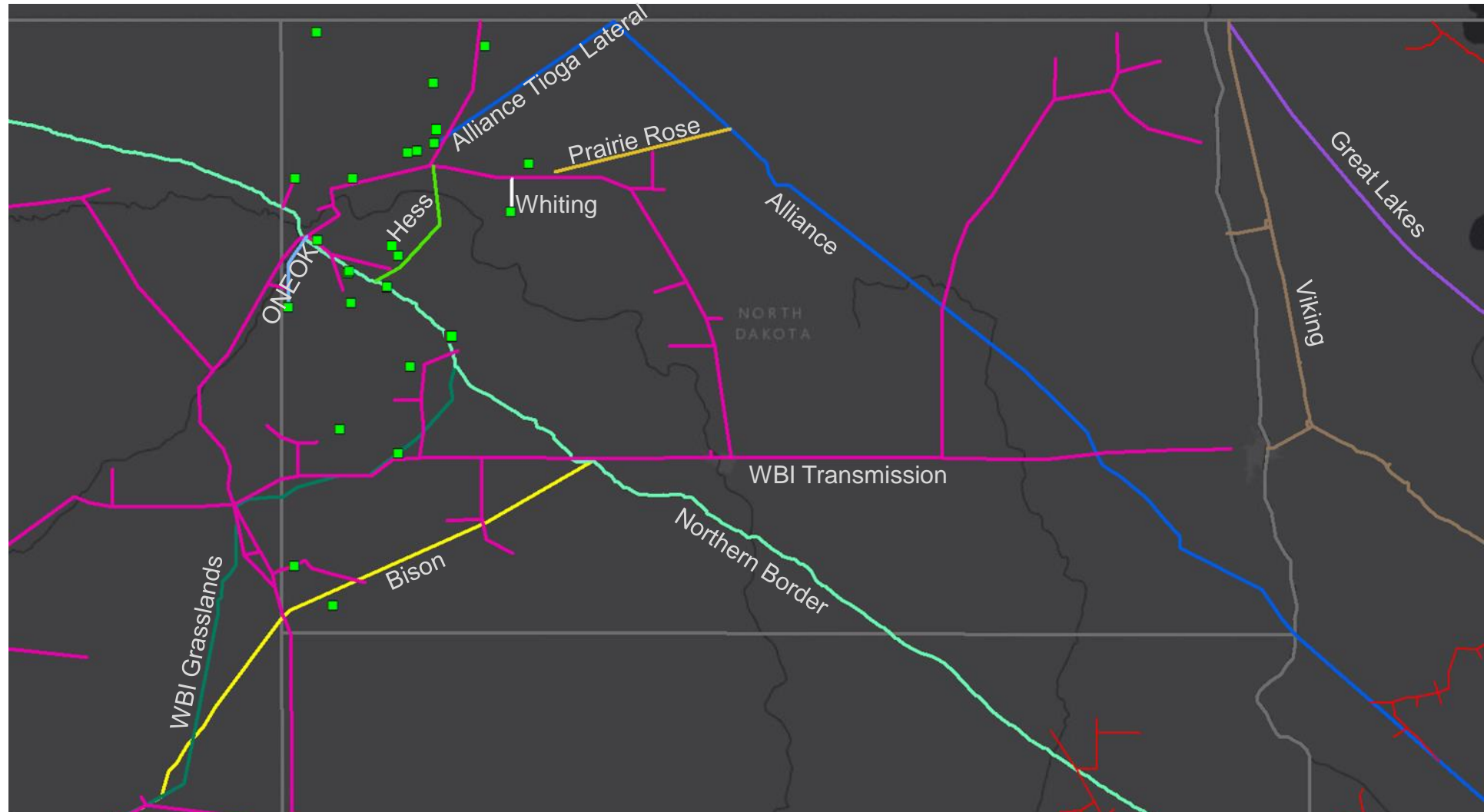
Solving the Flaring Challenge



Natural Gas Capture

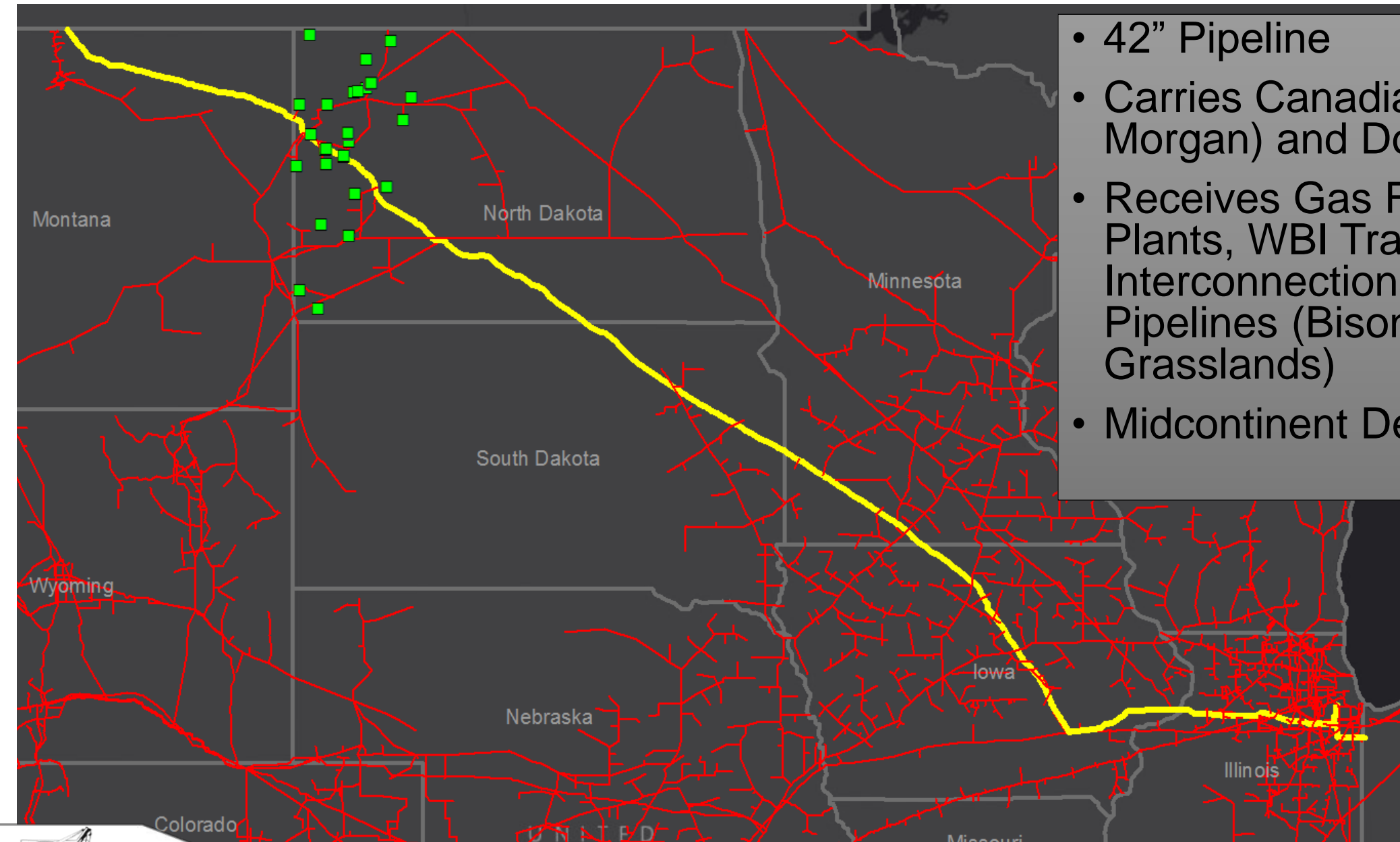


Major Gas Pipeline and Processing Infrastructure

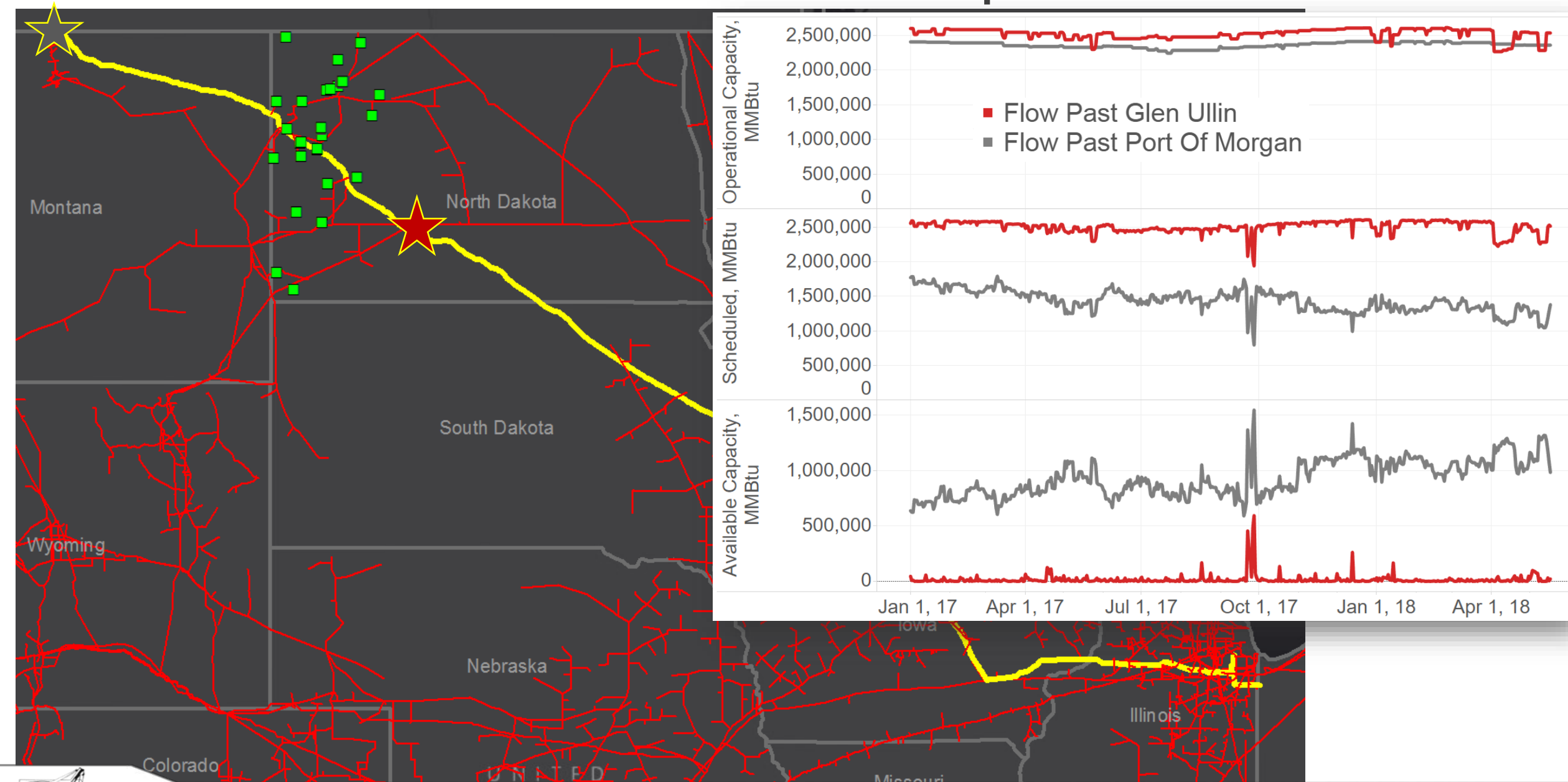


Northern Border Pipeline

- 42" Pipeline
- Carries Canadian (Port of Morgan) and Domestic Gas
- Receives Gas From ND Plants, WBI Transmission Interconnections, and WY Pipelines (Bison & Grasslands)
- Midcontinent Deliveries

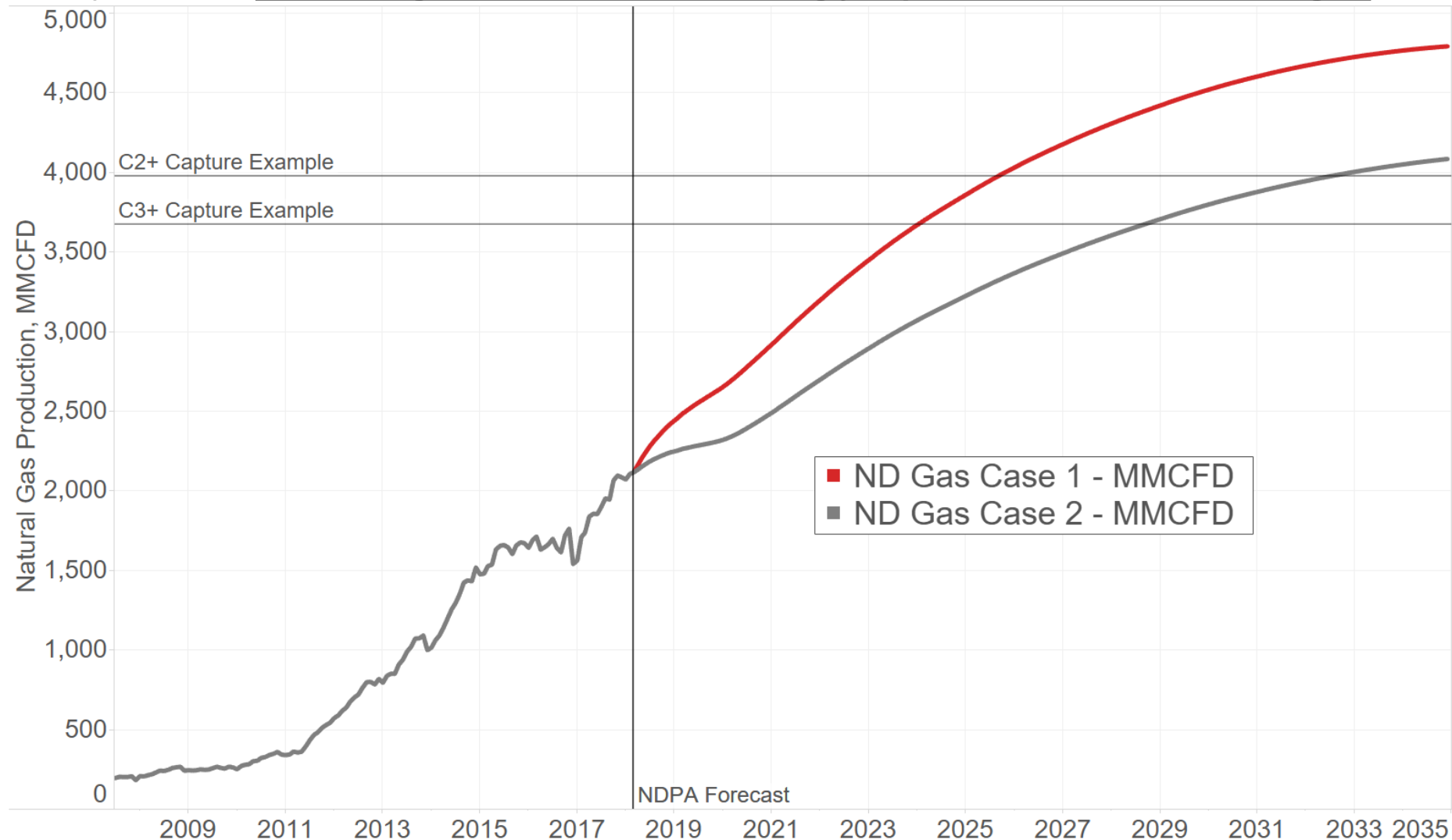


Northern Border Pipeline



Simplified Example NB Calculations

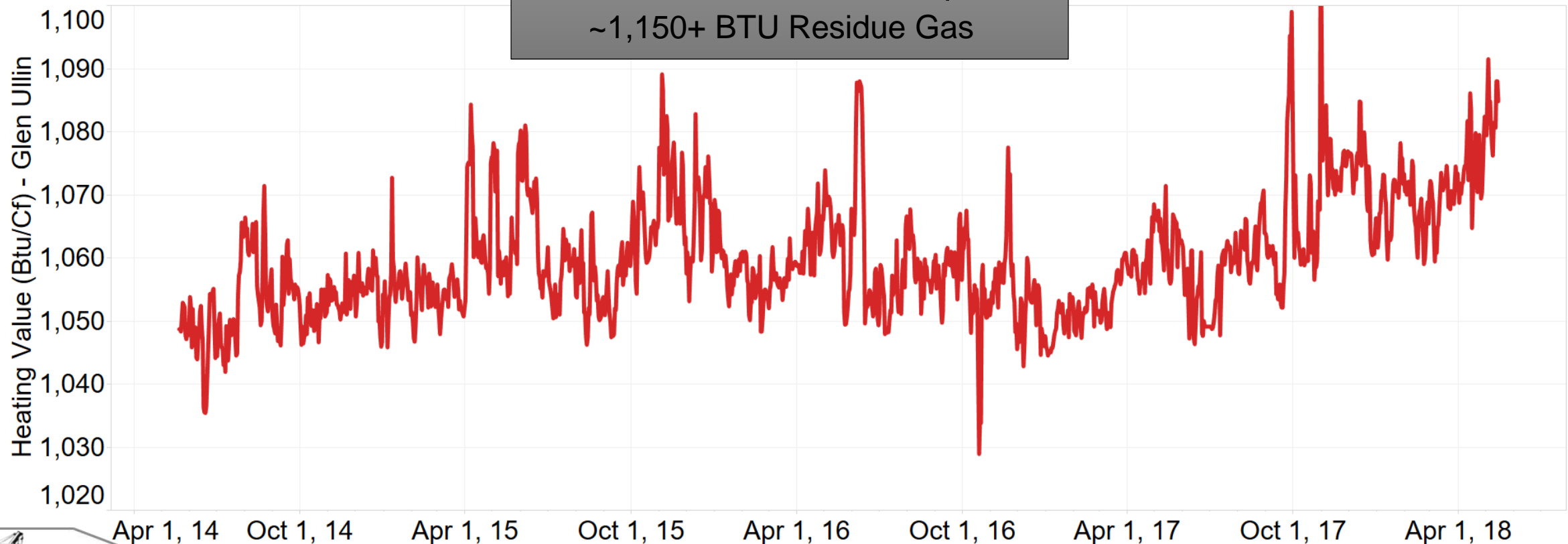
Conclusion: **IF** no other gas export options open and all other deliveries on other pipelines stay static, ND gas production could increase 1.56-1.86 BCFD (from Mar-18) before Northern Border is 100% Bakken production. **BTU management becomes increasingly important for Bakken residue gas.**



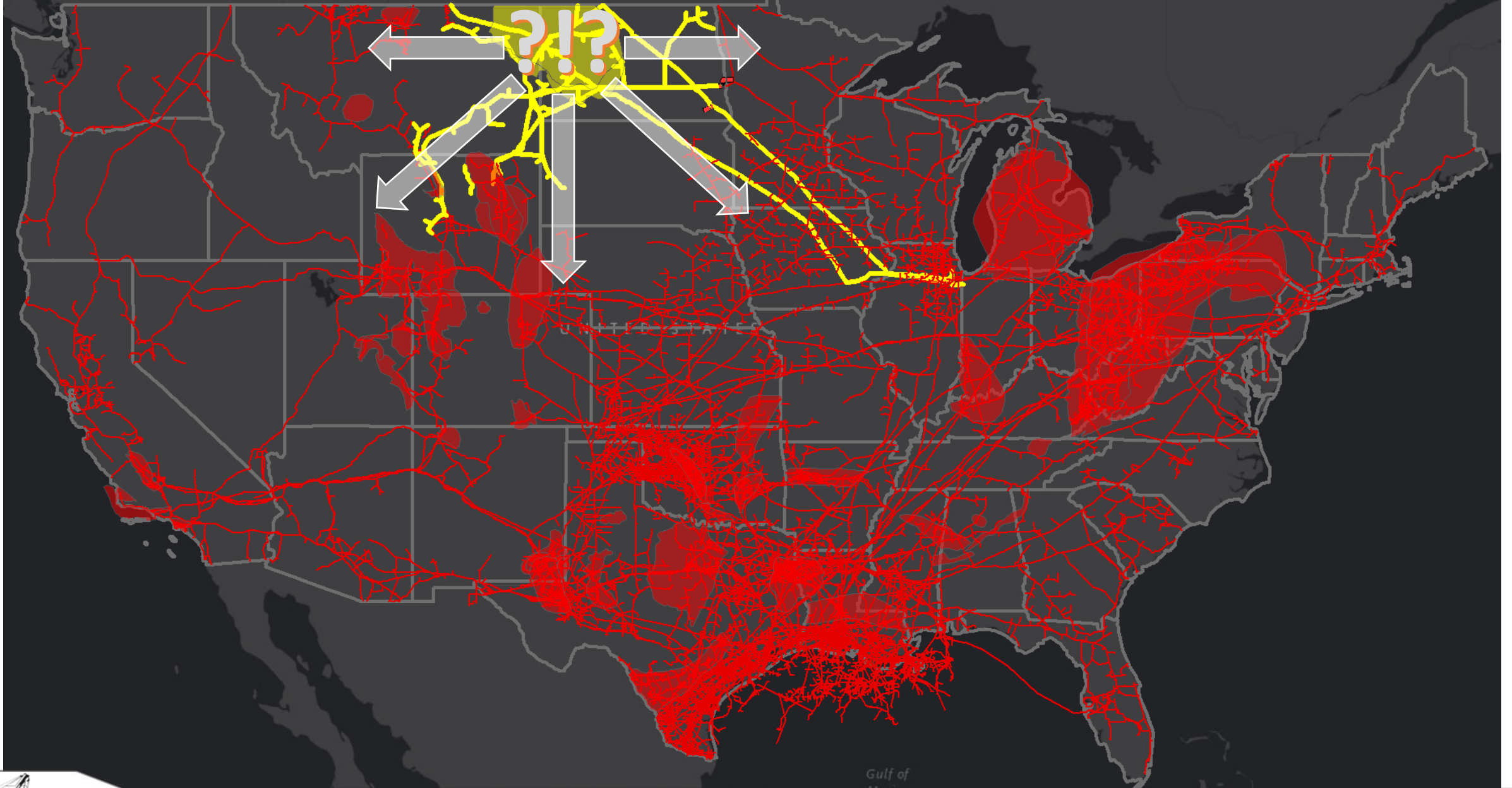
Simplified Example NB Calculations

Conclusion: **IF** no other gas export options open and all other deliveries on other pipelines stay static, ND gas production could increase 1.56-1.86 BCFD (from Mar-18) before Northern Border is 100% Bakken production. **BTU management becomes increasingly important for Bakken residue gas.**

- Gas Plants With C2+ Capture
~1,010+ BTU Residue Gas
- Gas Plants With C3+ Capture
~1,150+ BTU Residue Gas



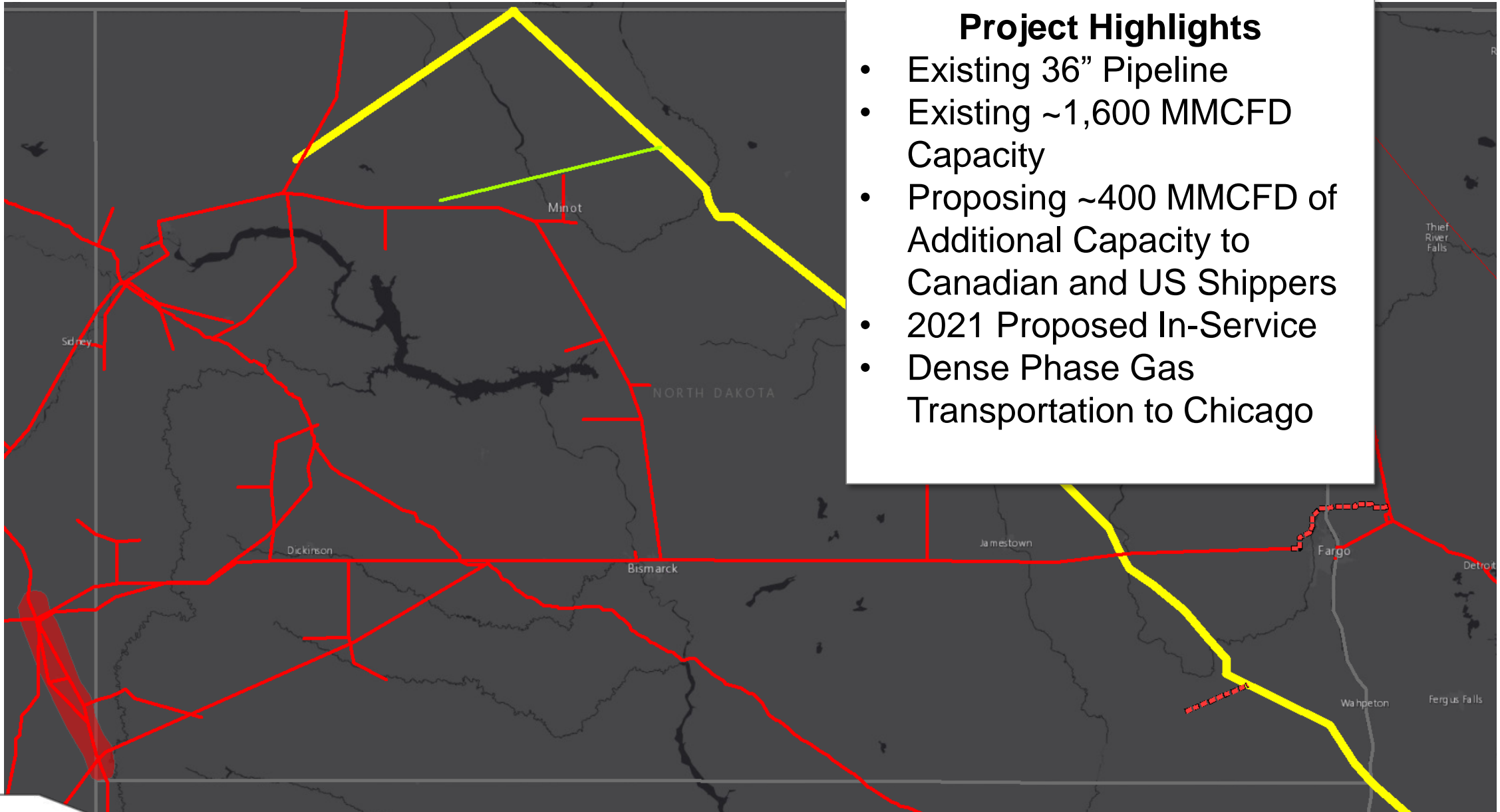
Now What?



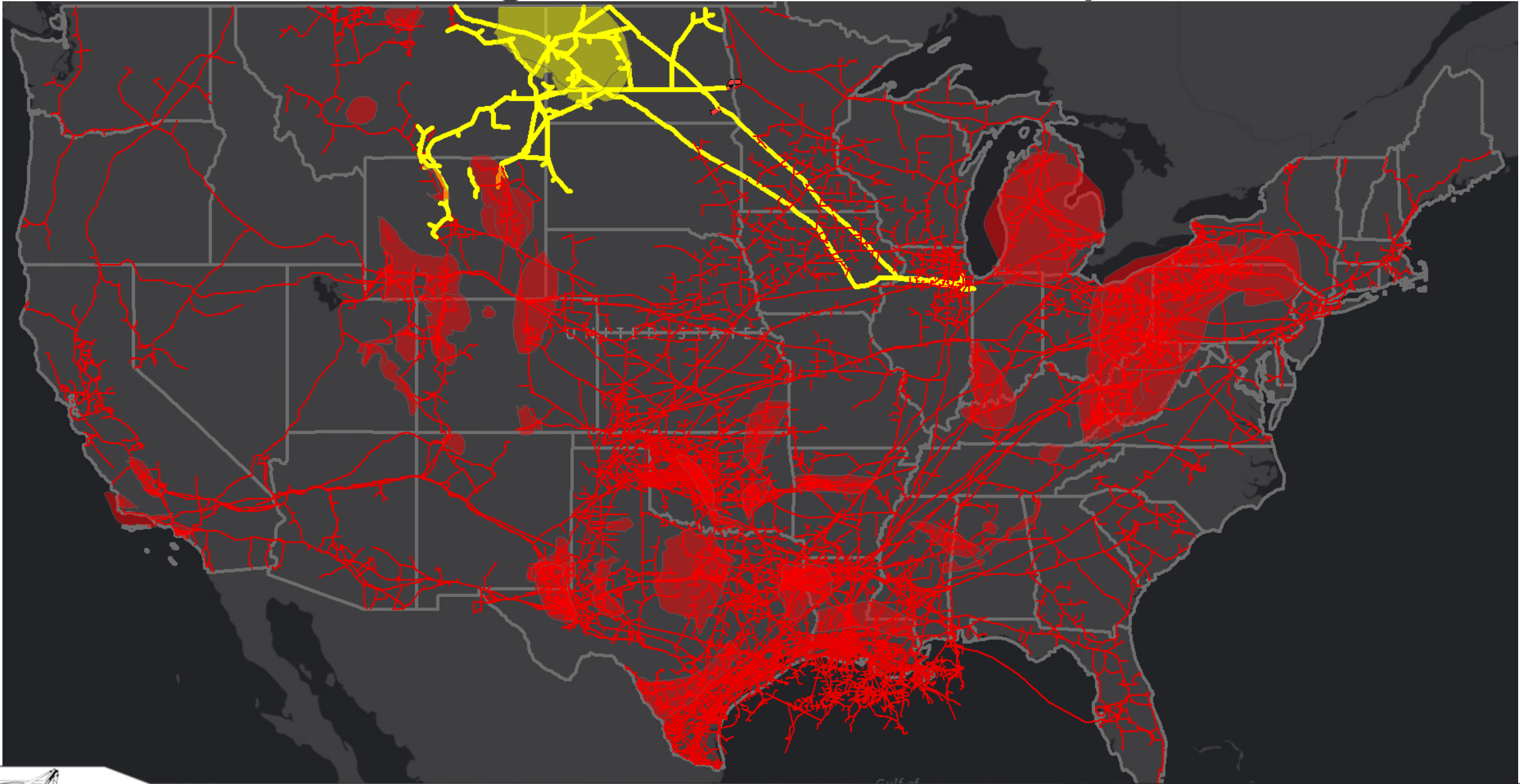
Alliance Pipeline Open Season

Project Highlights

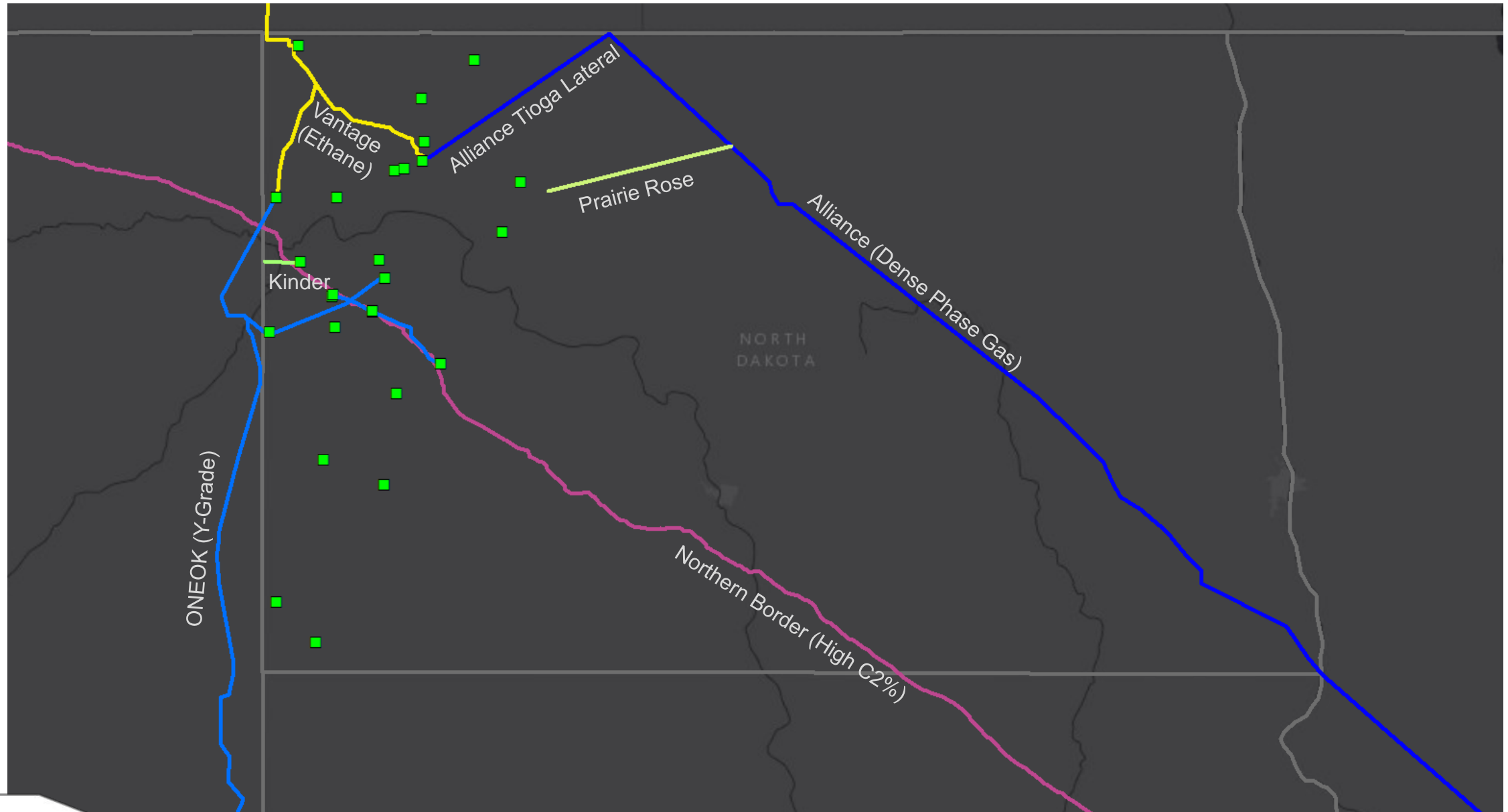
- Existing 36" Pipeline
- Existing ~1,600 MMCFD Capacity
- Proposing ~400 MMCFD of Additional Capacity to Canadian and US Shippers
- 2021 Proposed In-Service
- Dense Phase Gas Transportation to Chicago



Increasing Midwest Gas Competition

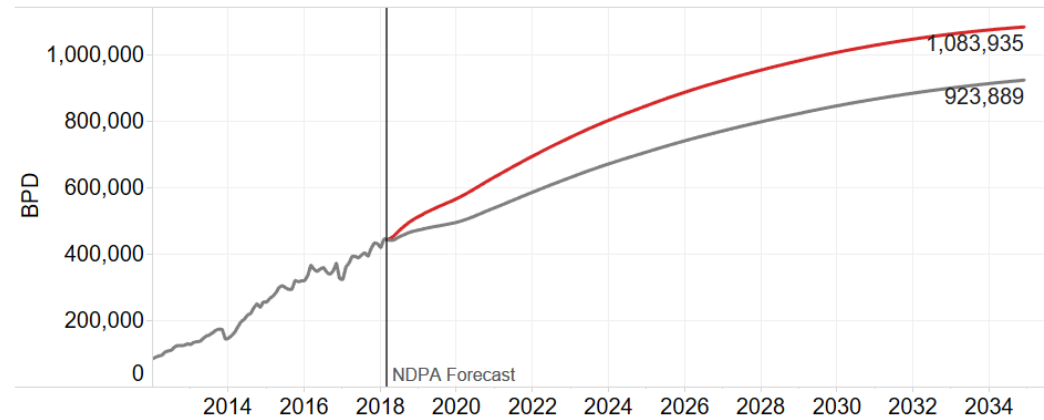


Regional NGL Infrastructure

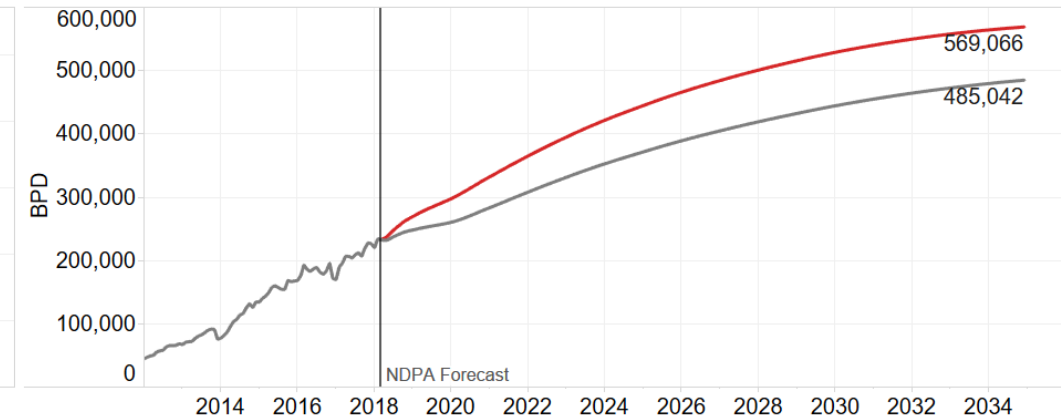


North Dakota Captured* NGL's

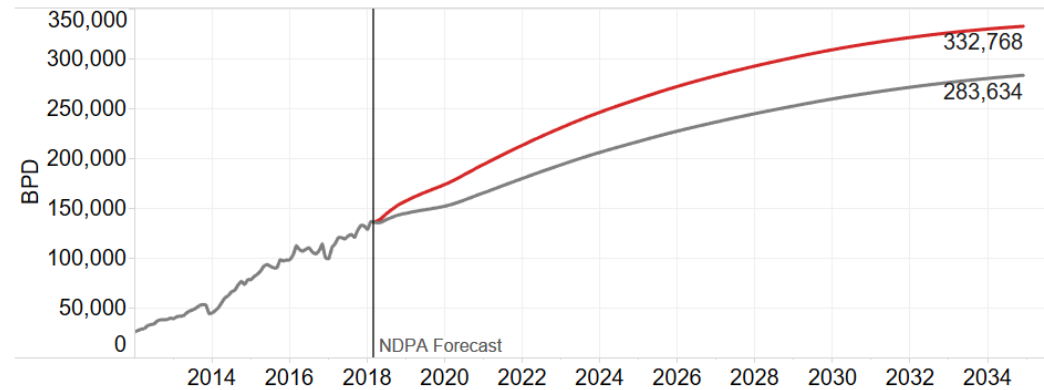
All Natural Gas Liquids



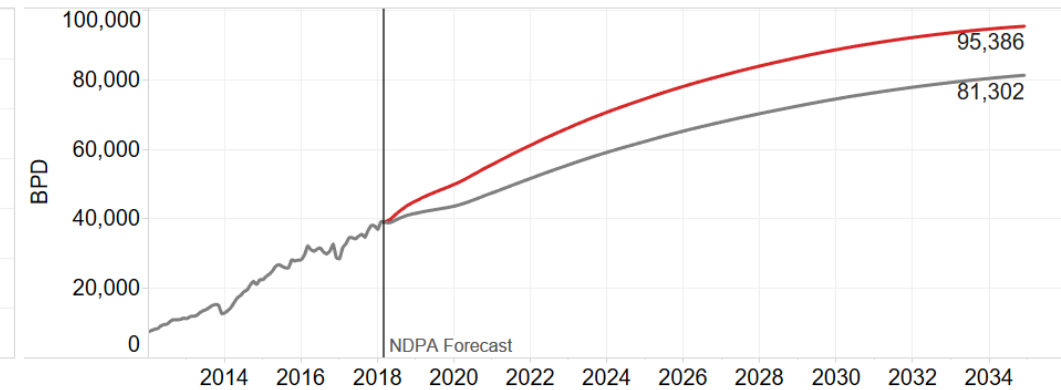
Ethane



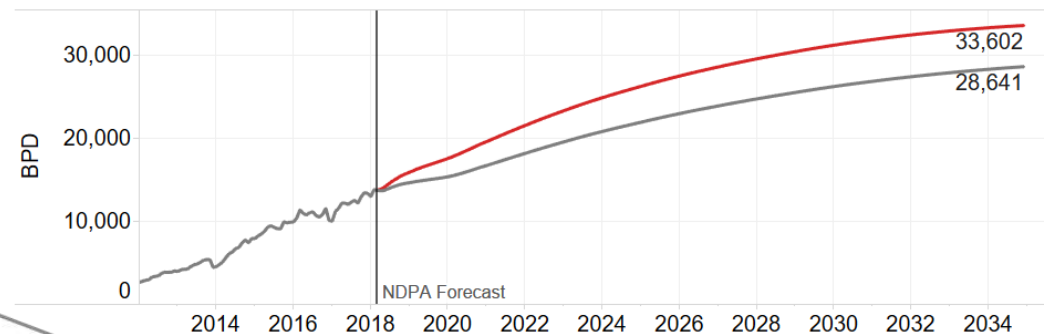
Propane



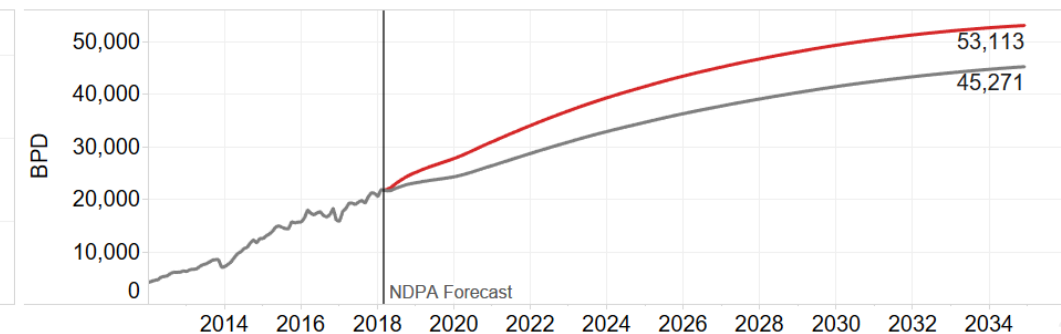
Butane



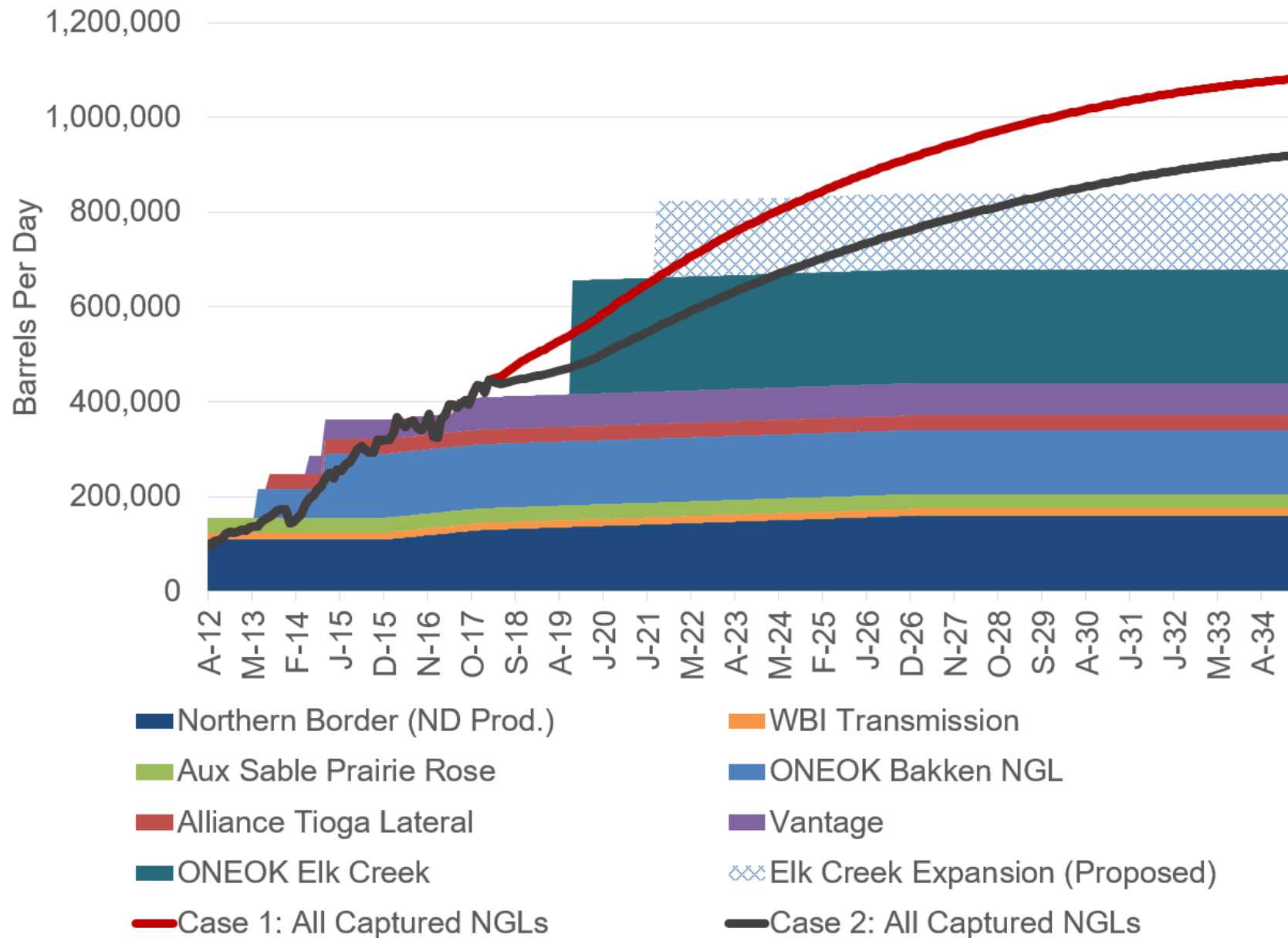
Isobutane



Natural Gasoline



NGL Pipeline Takeaway Options



Contact Information

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