

Williston Basin Petroleum Conference

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Director

North Dakota Pipeline Authority

May 12, 2021



Natural Gas Update



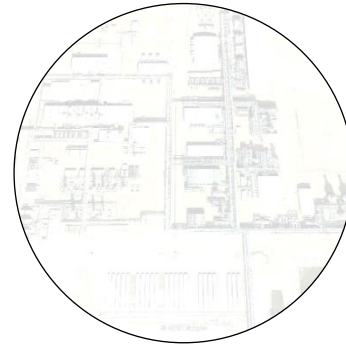
Production

- Technology
- Markets



Gathering

- Capacity
- Connections



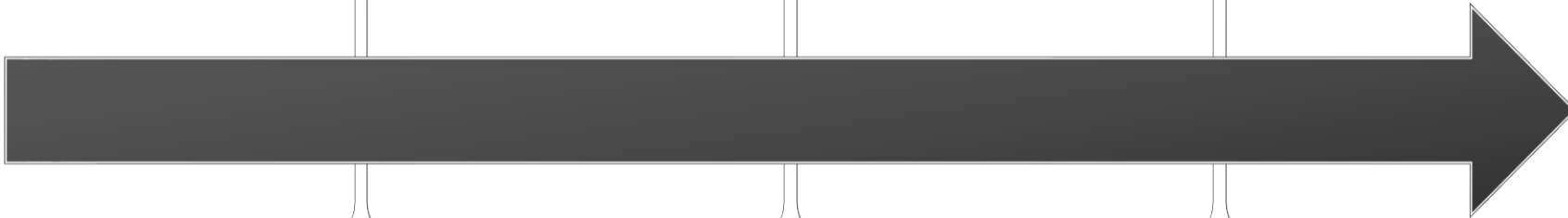
Processing

- Capacity
- Location

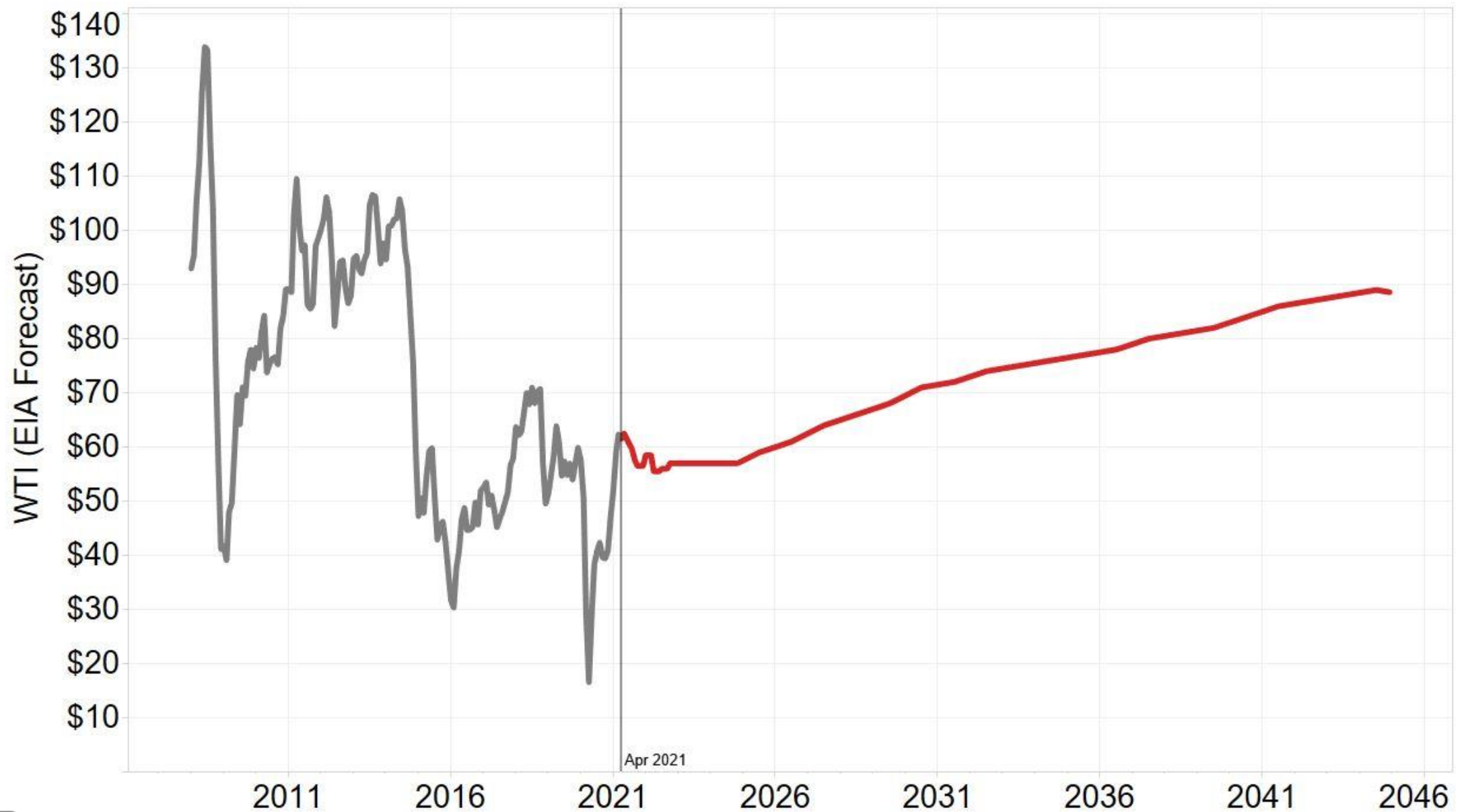


Transmission

- Dry Gas
- Natural Gas Liquids

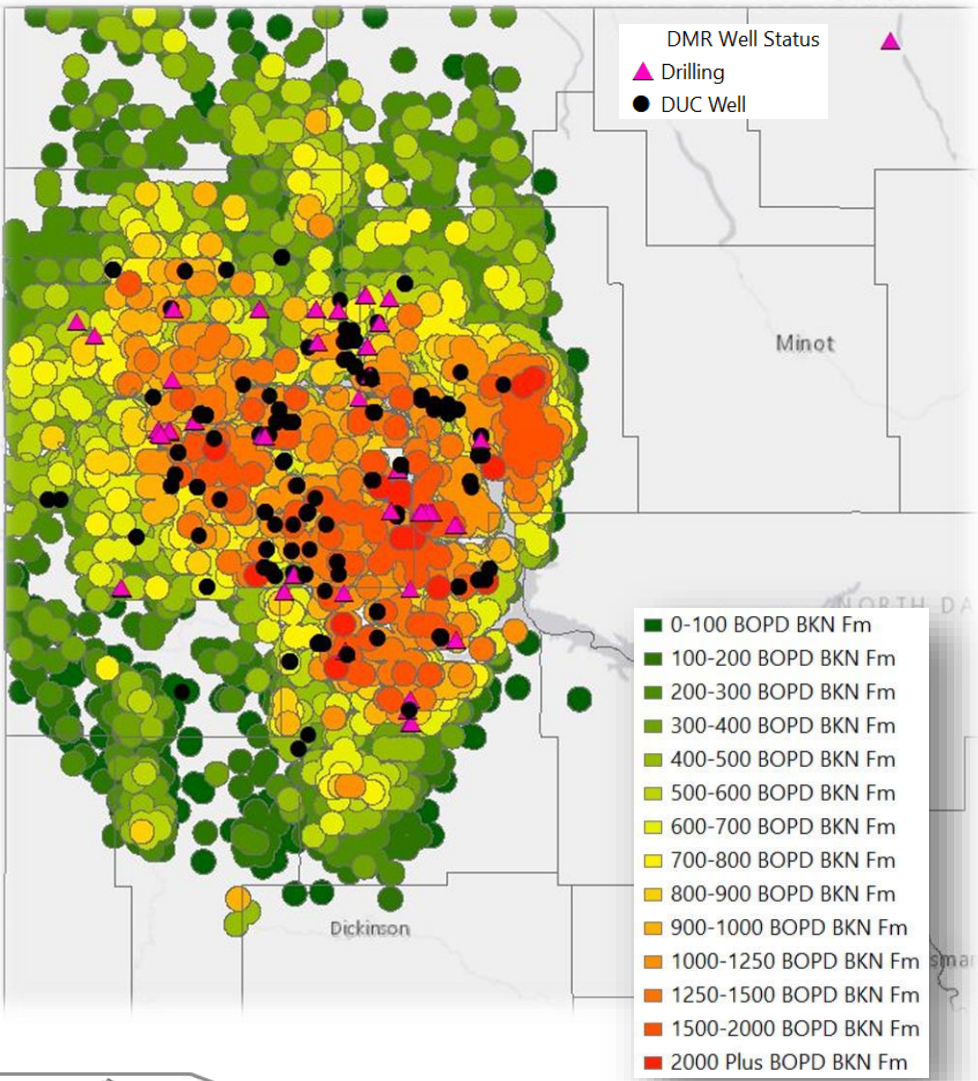


EIA Oil Price Outlook

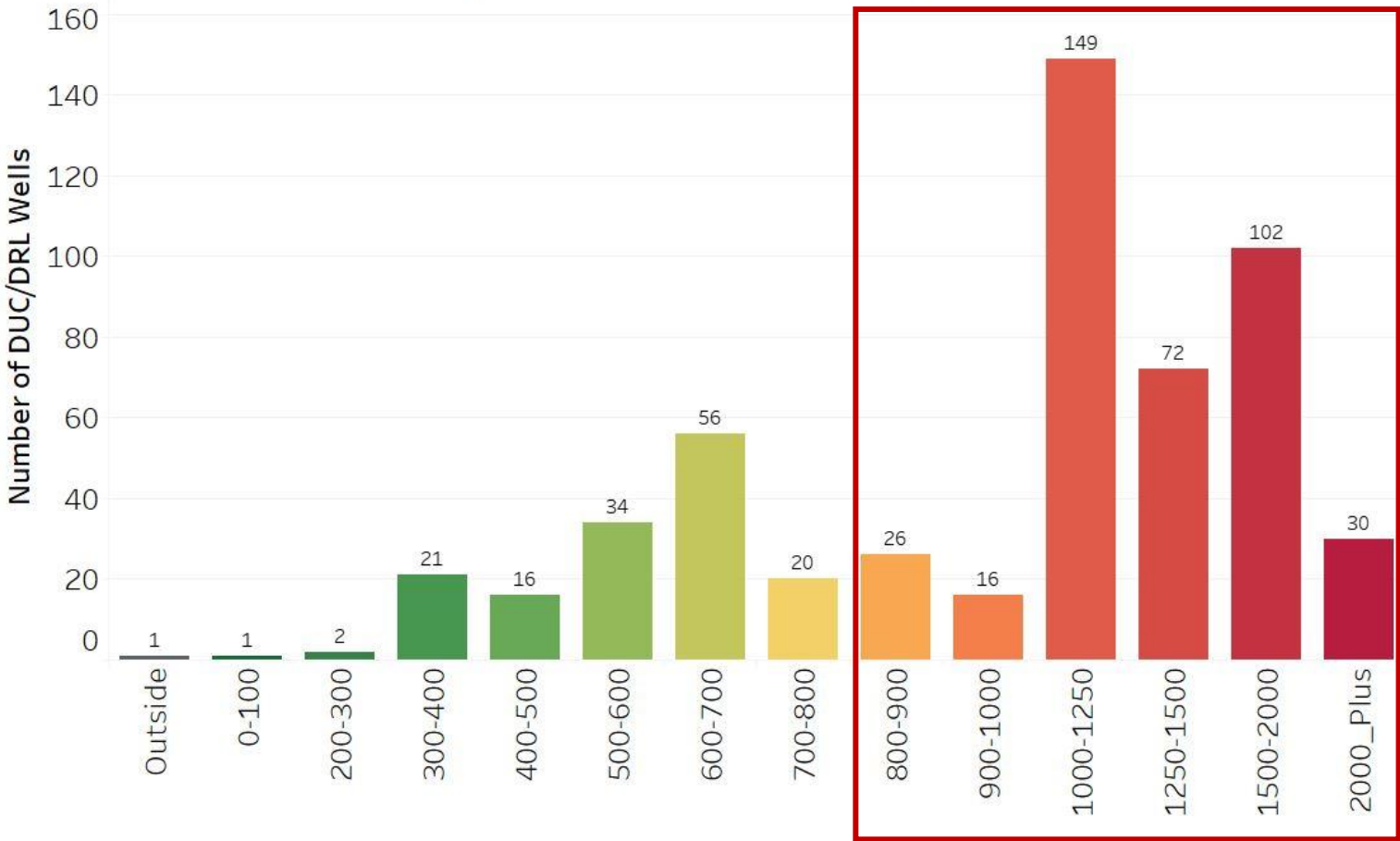


North Dakota Wells Waiting on Completion – April 2021

Bakken Formation



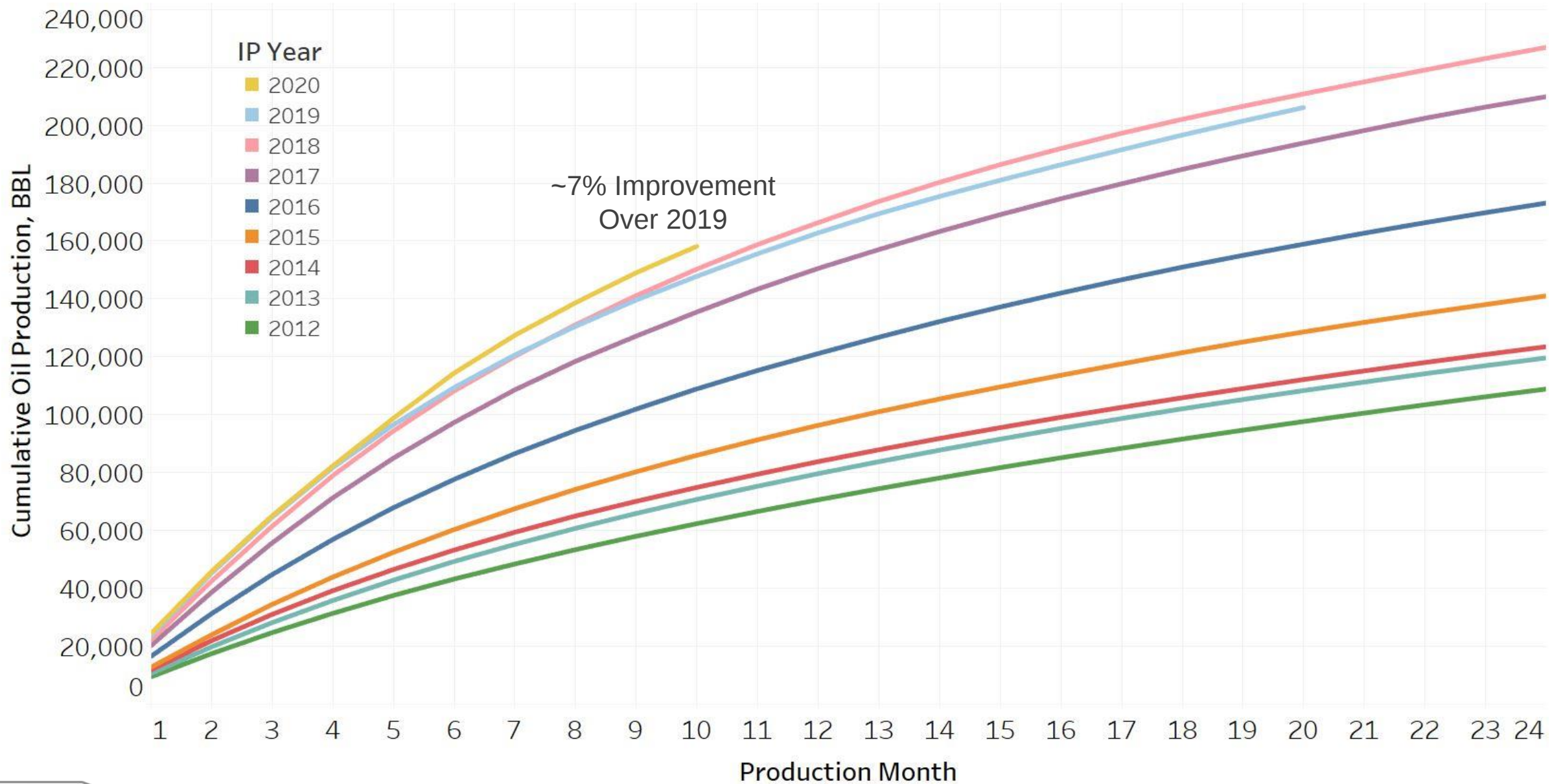
Bakken Geographic Production Zone (First Month BOPD)



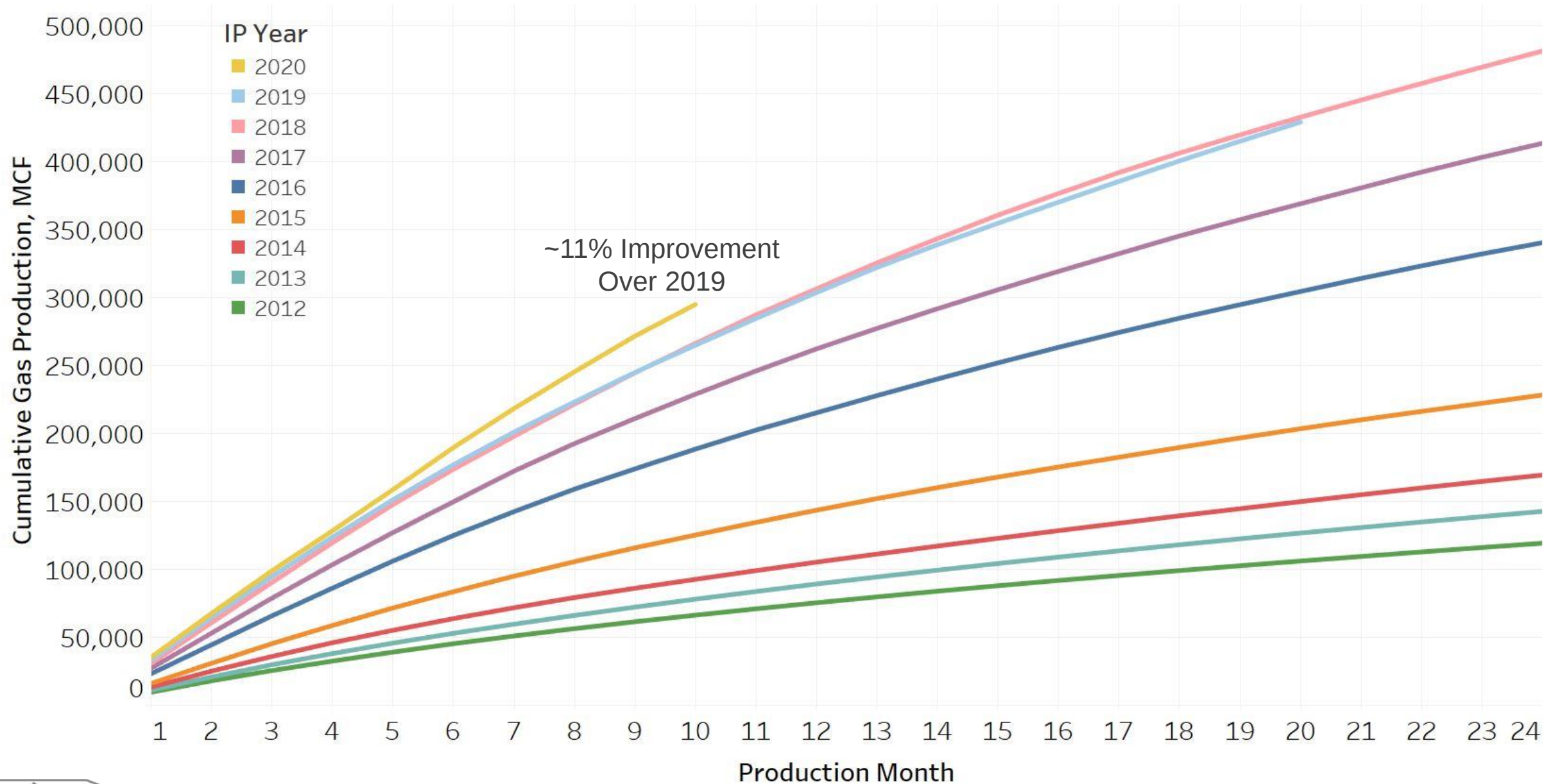
Most Attractive Acreage
in \$50+ WTI Environment



Statewide Bakken Oil Performance

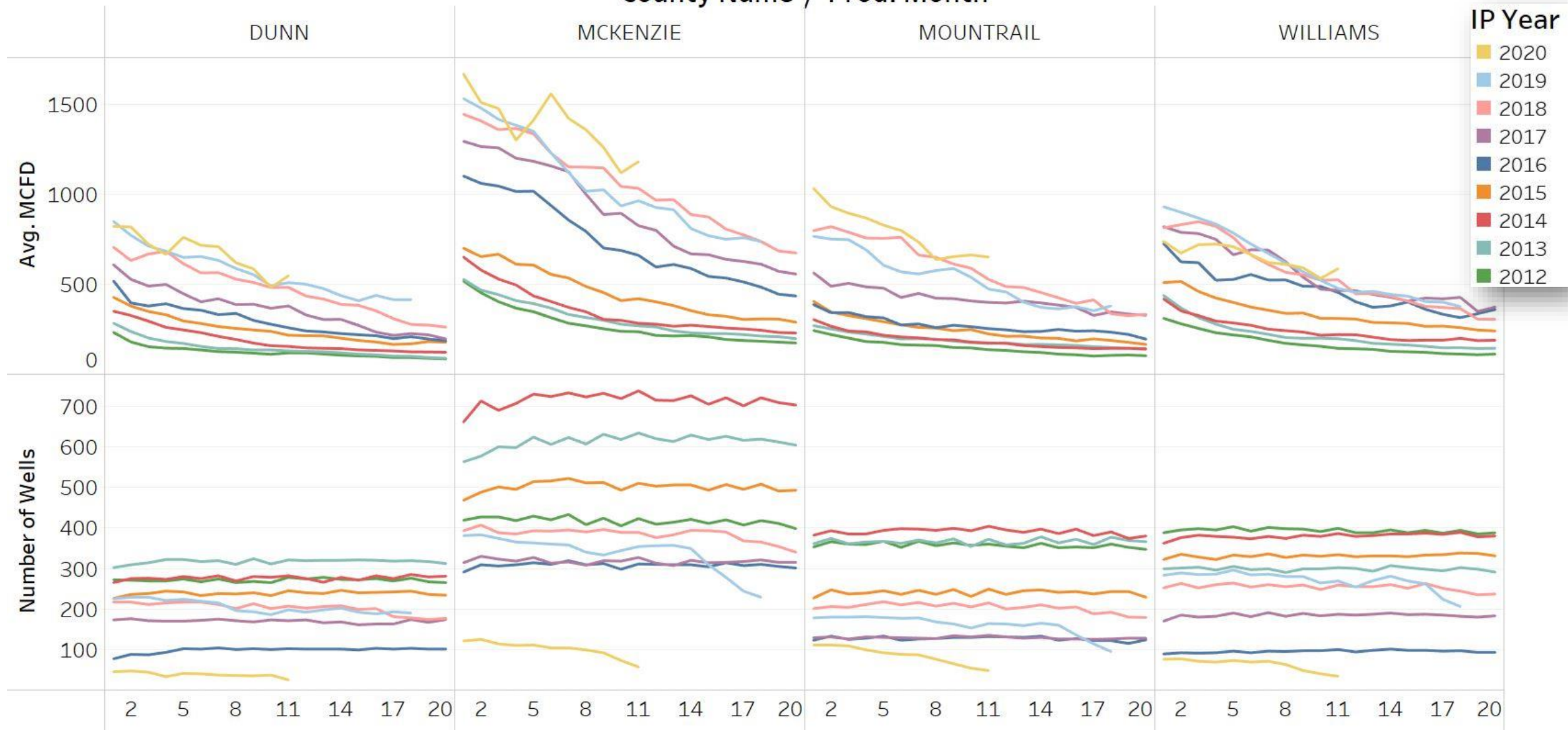


Statewide Bakken Gas Performance

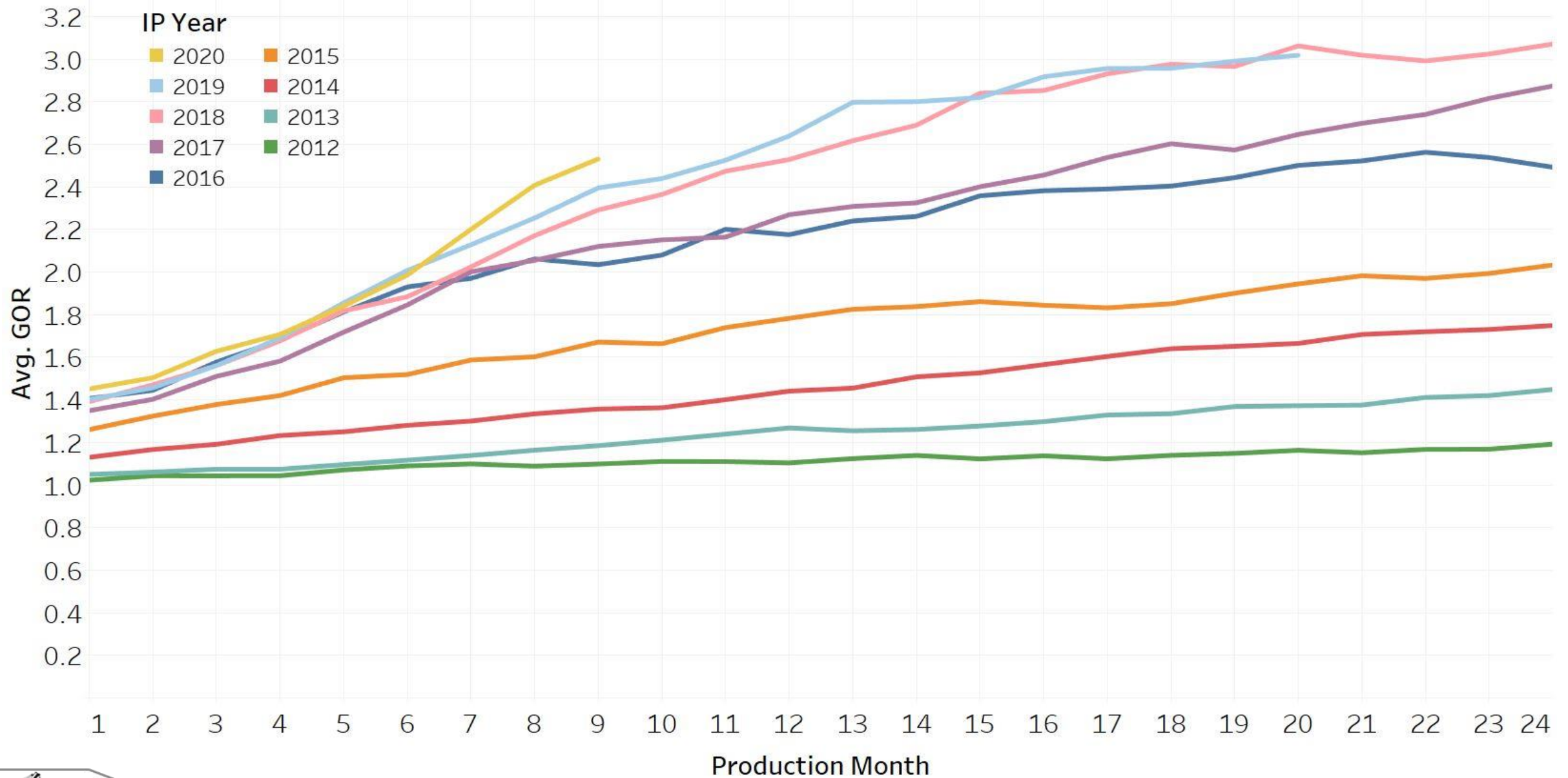


Core County Bakken Gas Performance

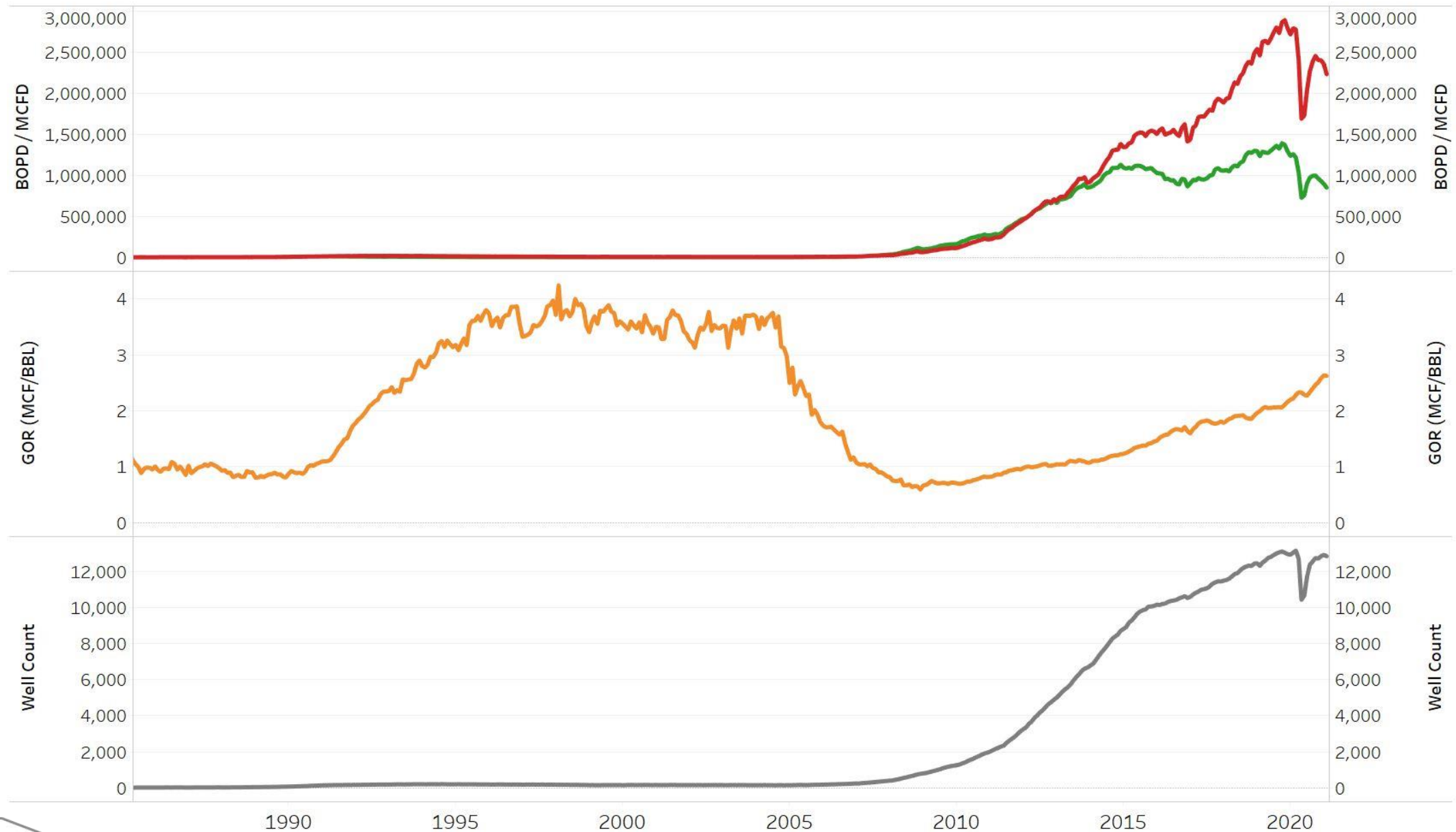
County Name / Prod. Month



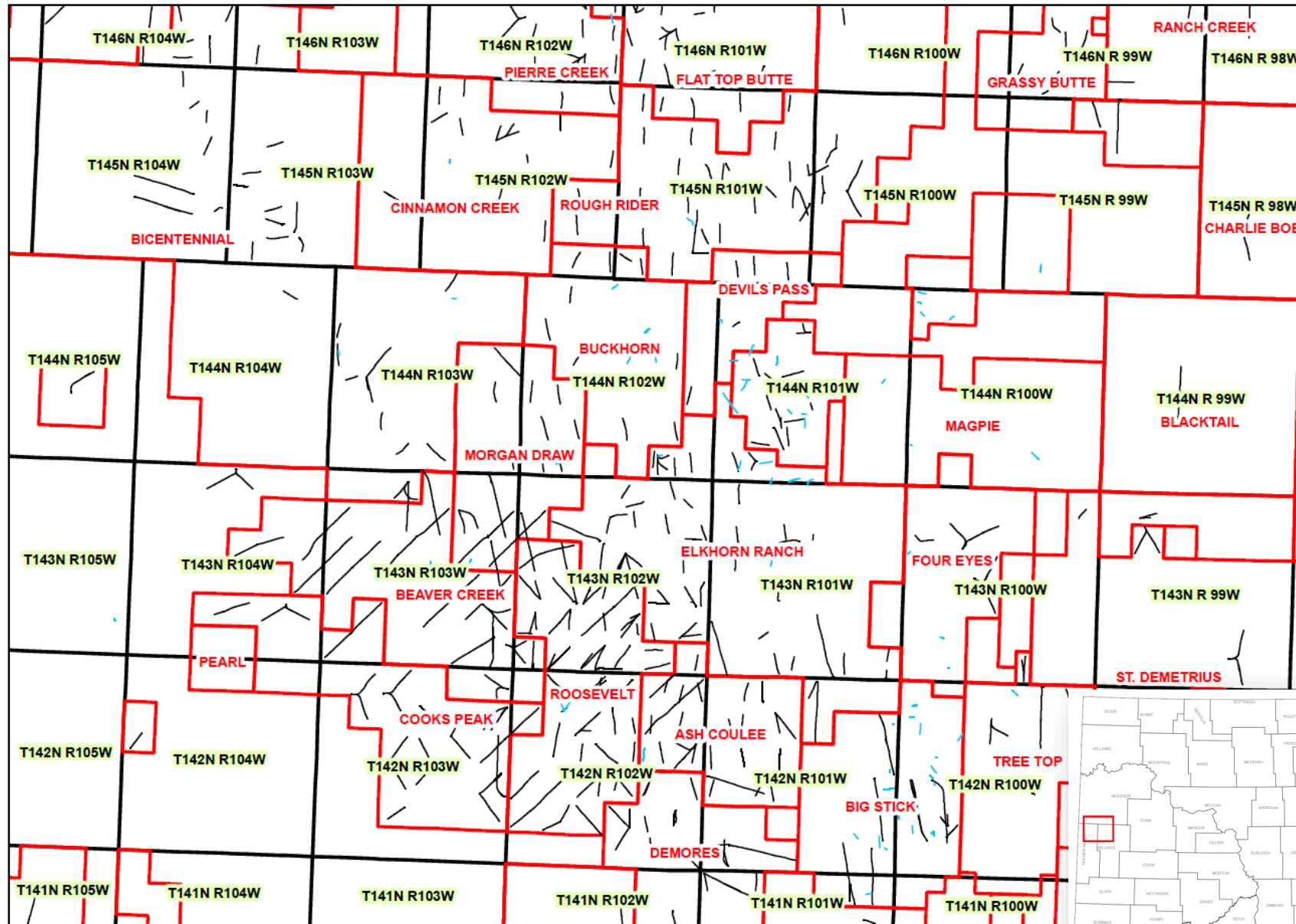
Statewide Bakken Gas/Oil Ratios



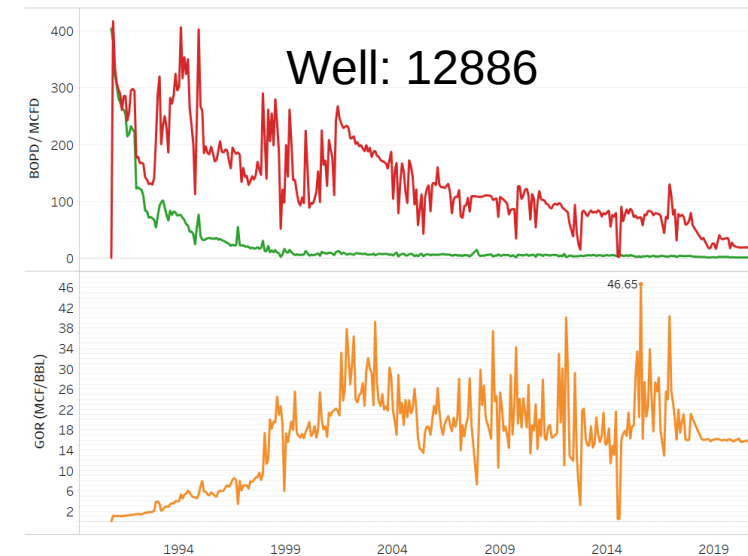
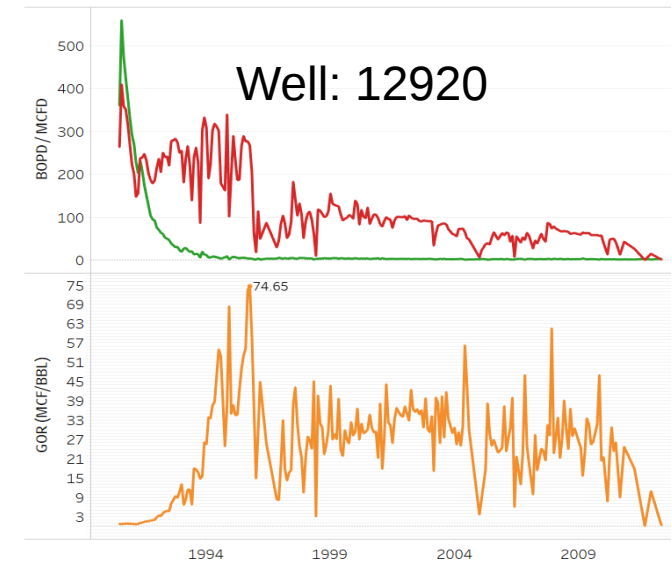
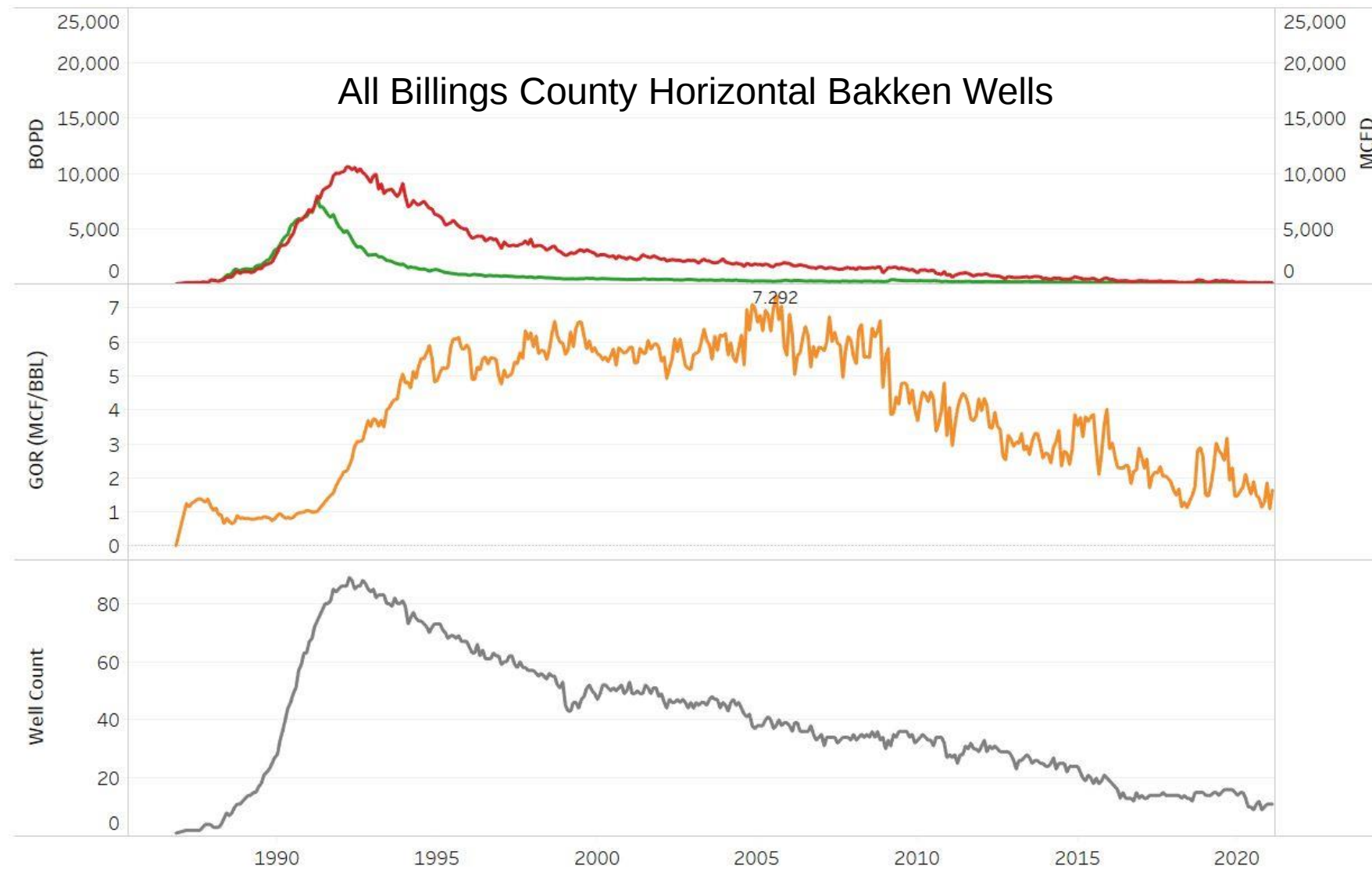
Statewide Bakken Production



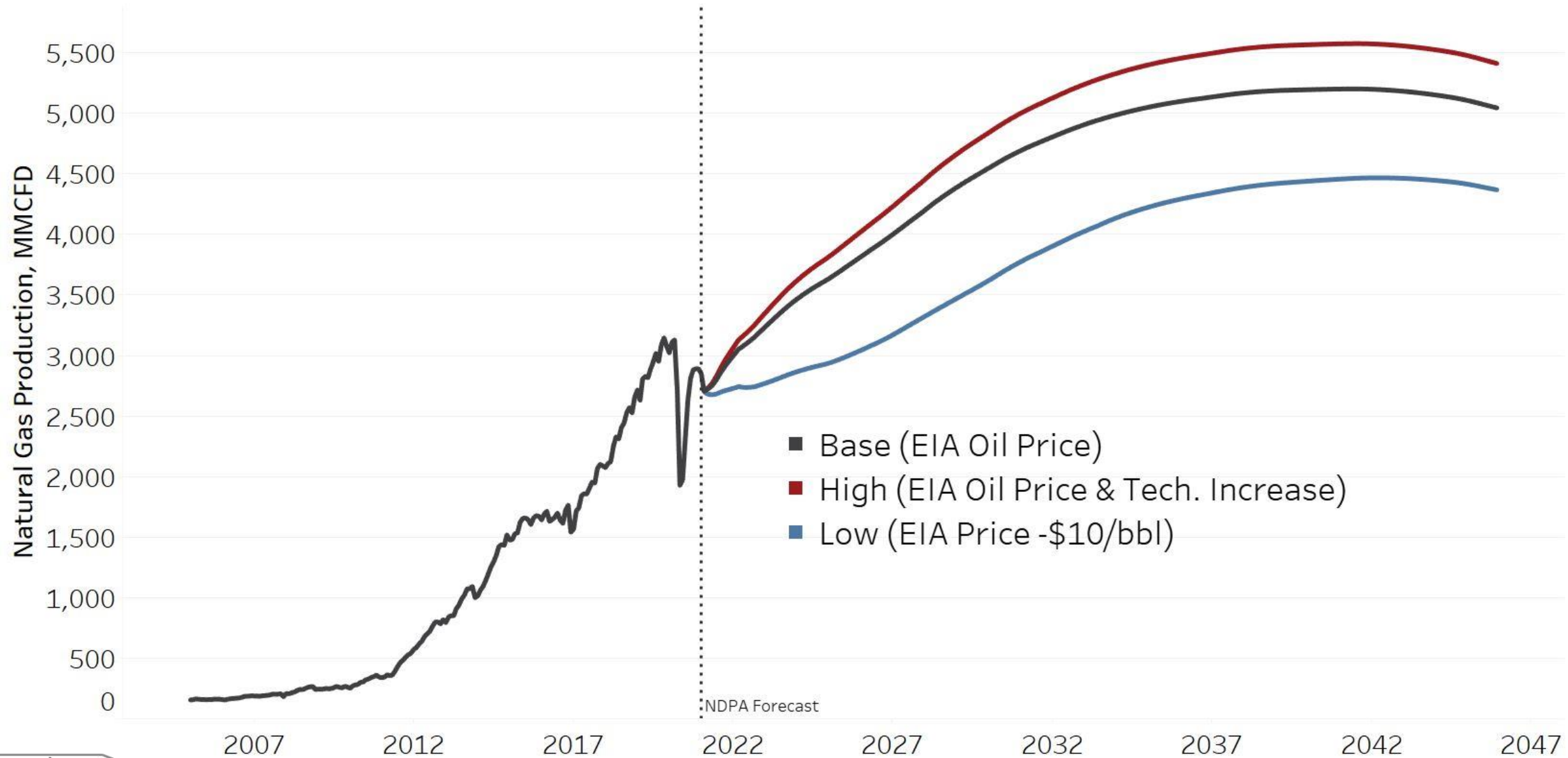
Back to the 90's...



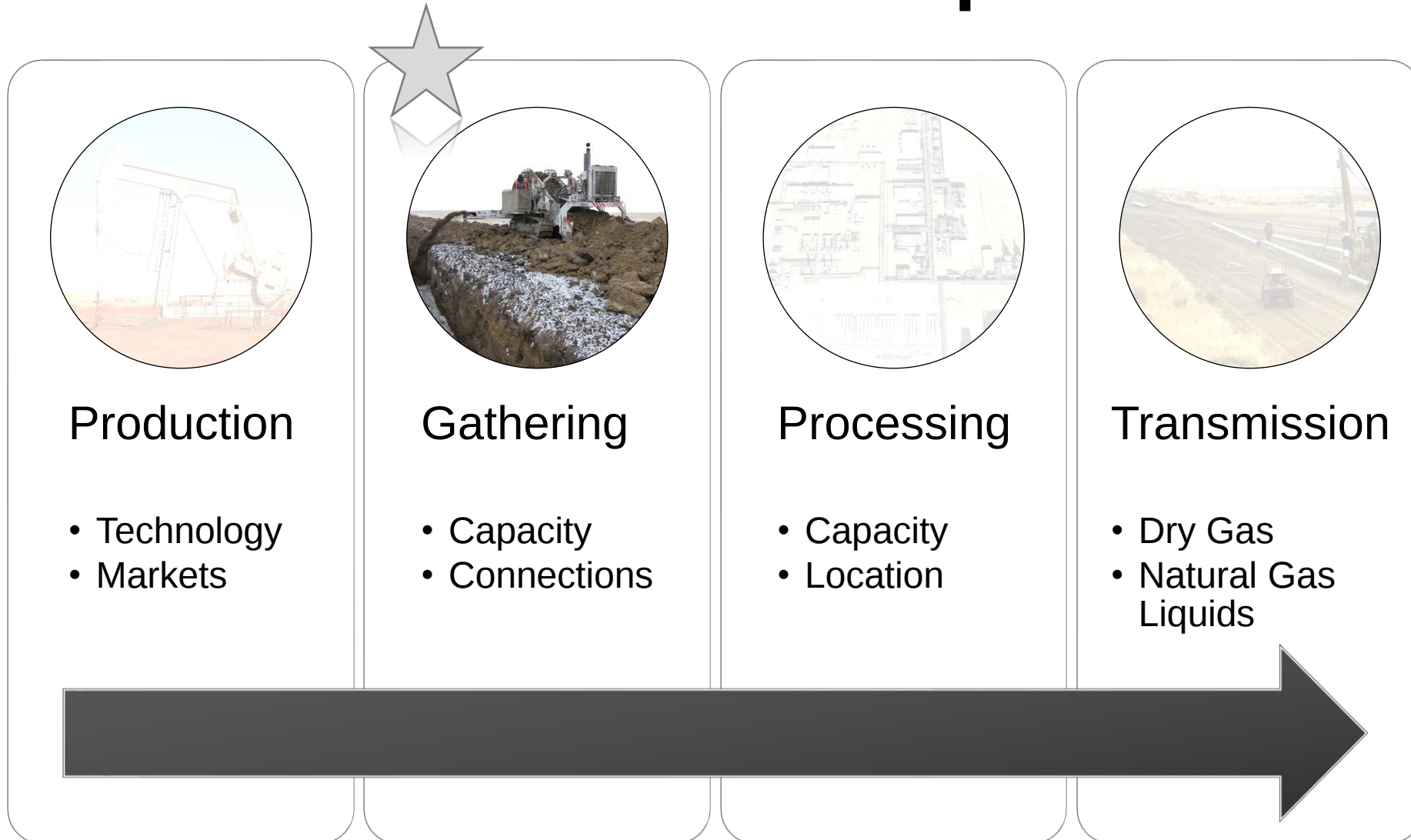
Back to the 90's...



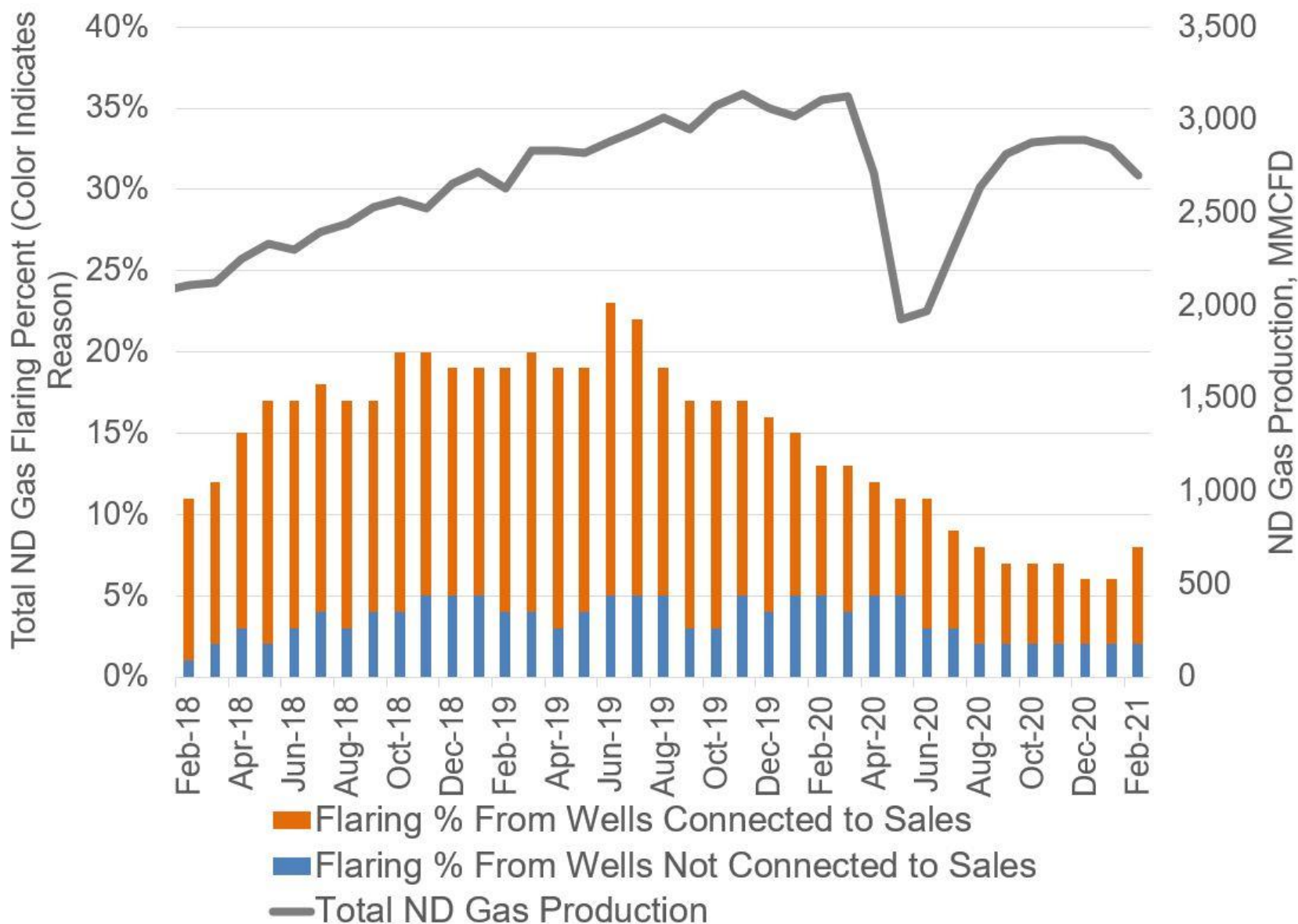
ND Gas Production: EIA Price Deck



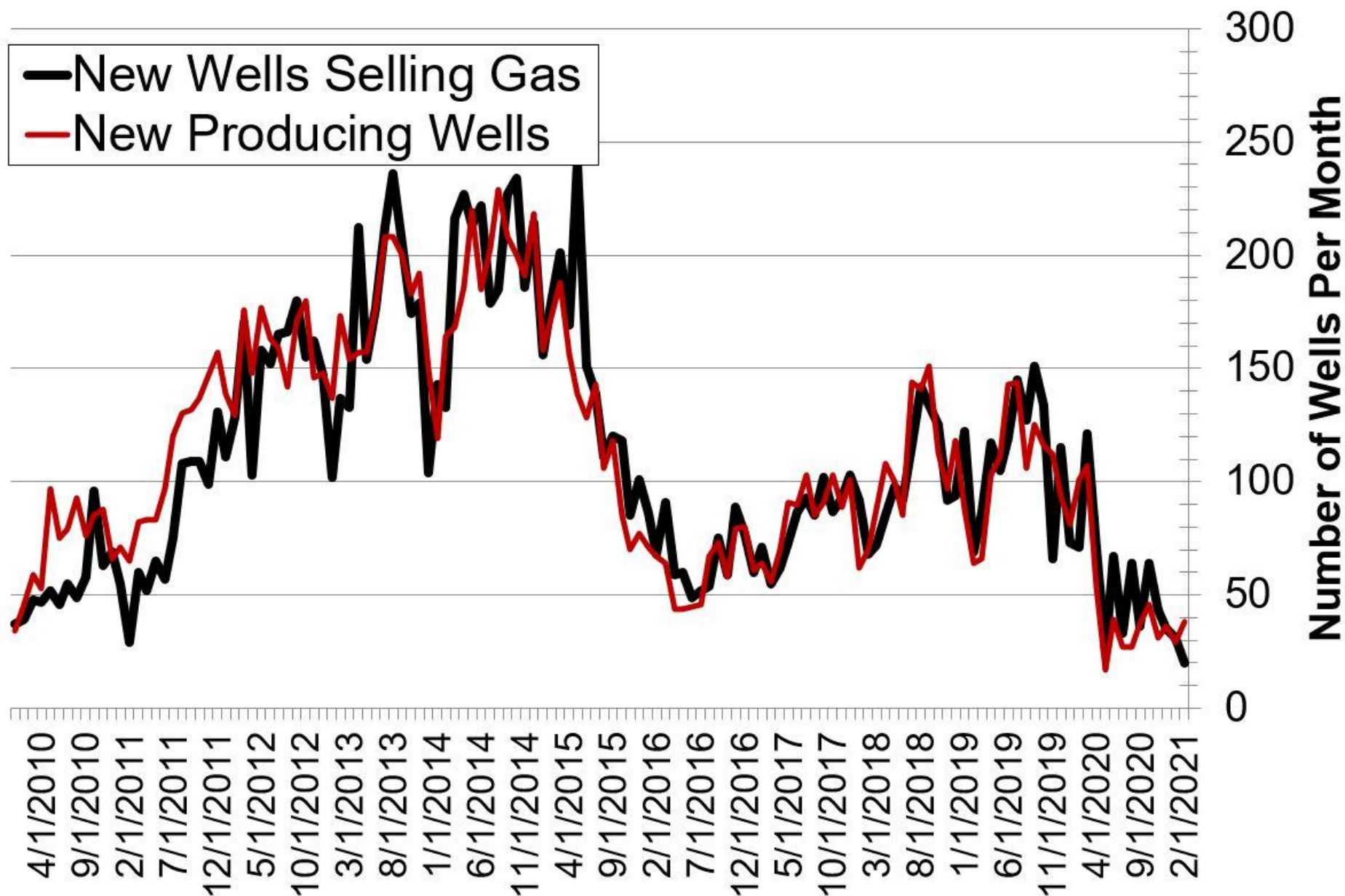
Natural Gas Update



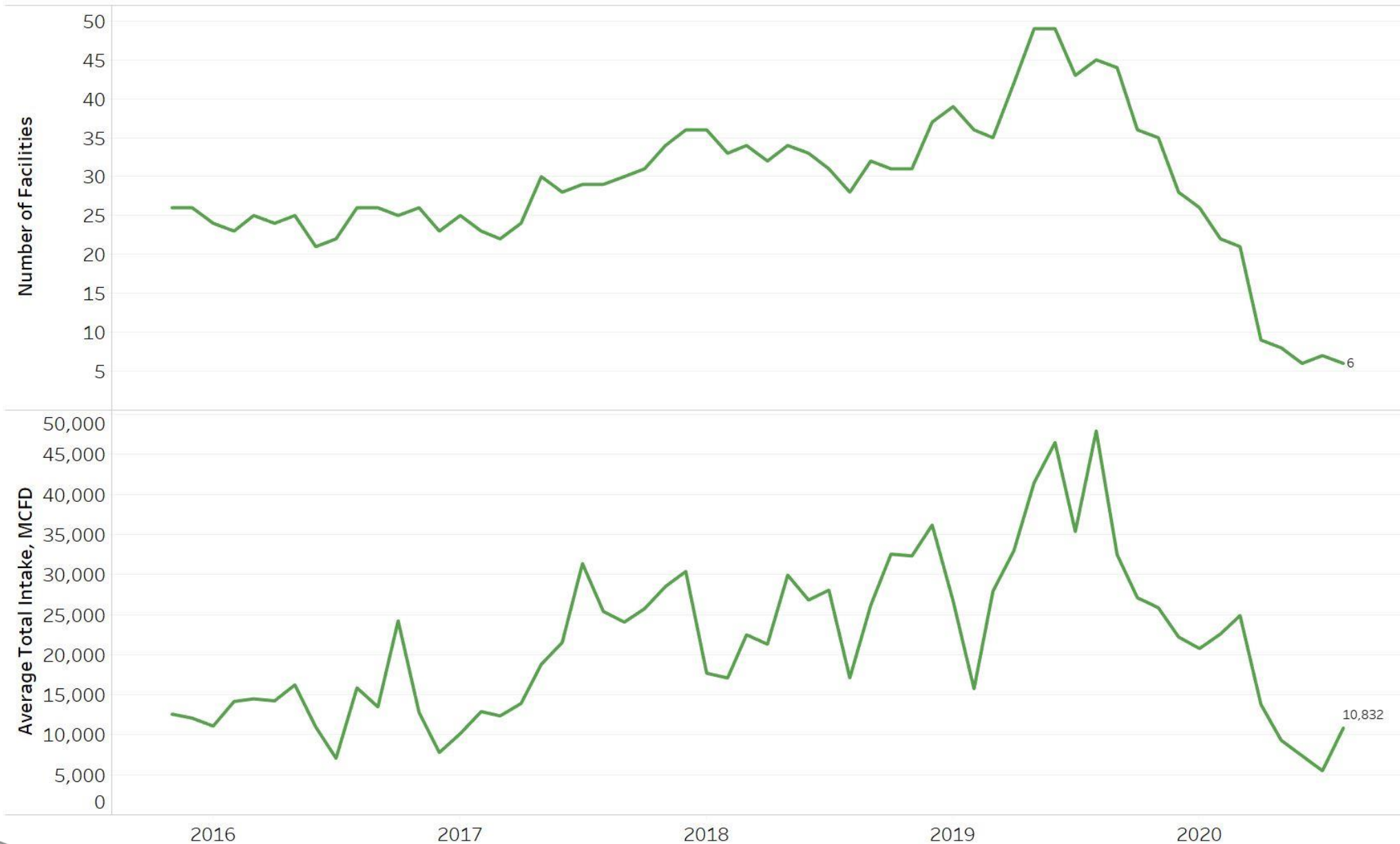
Solving the Flaring Challenge



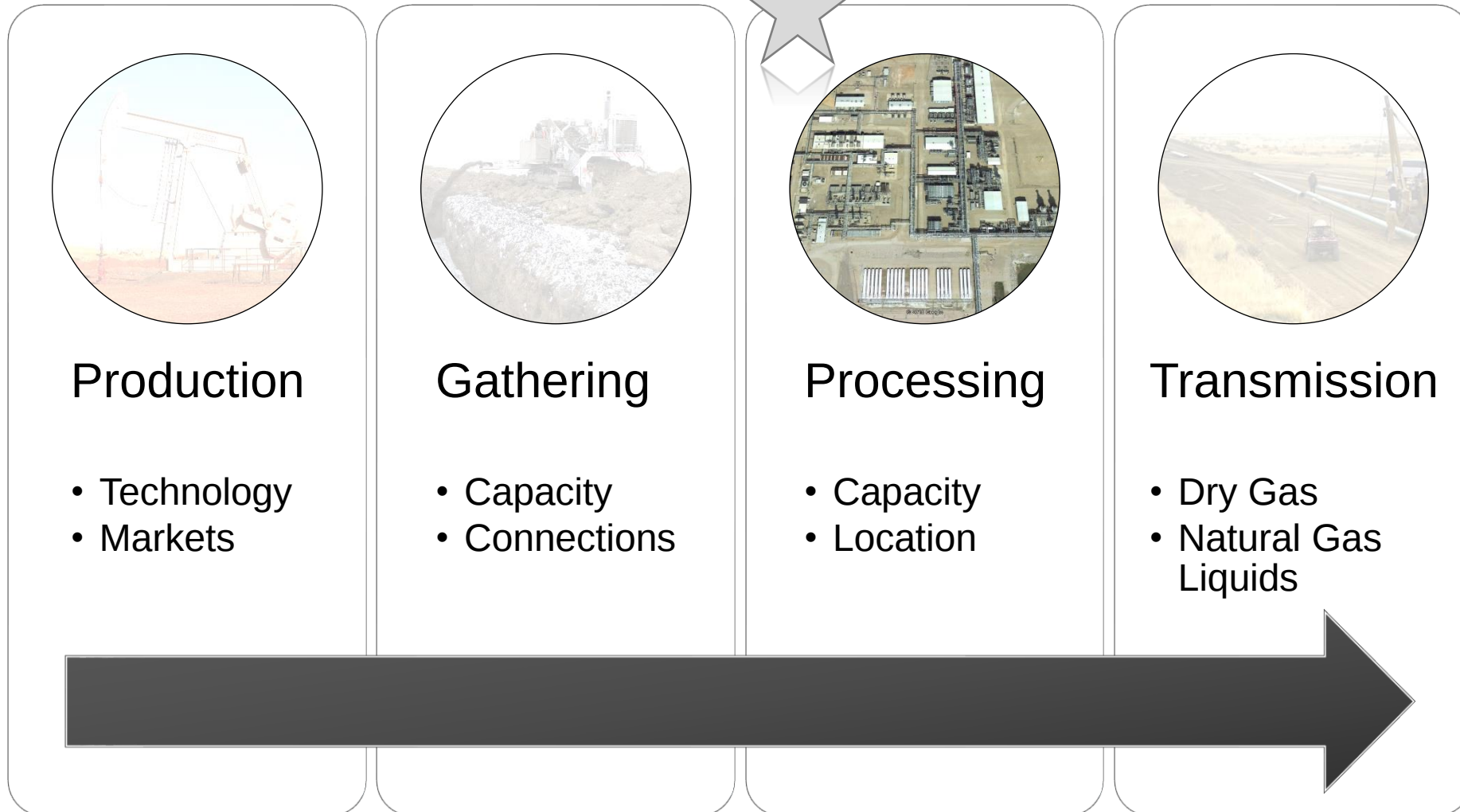
Solving the Flaring Challenge



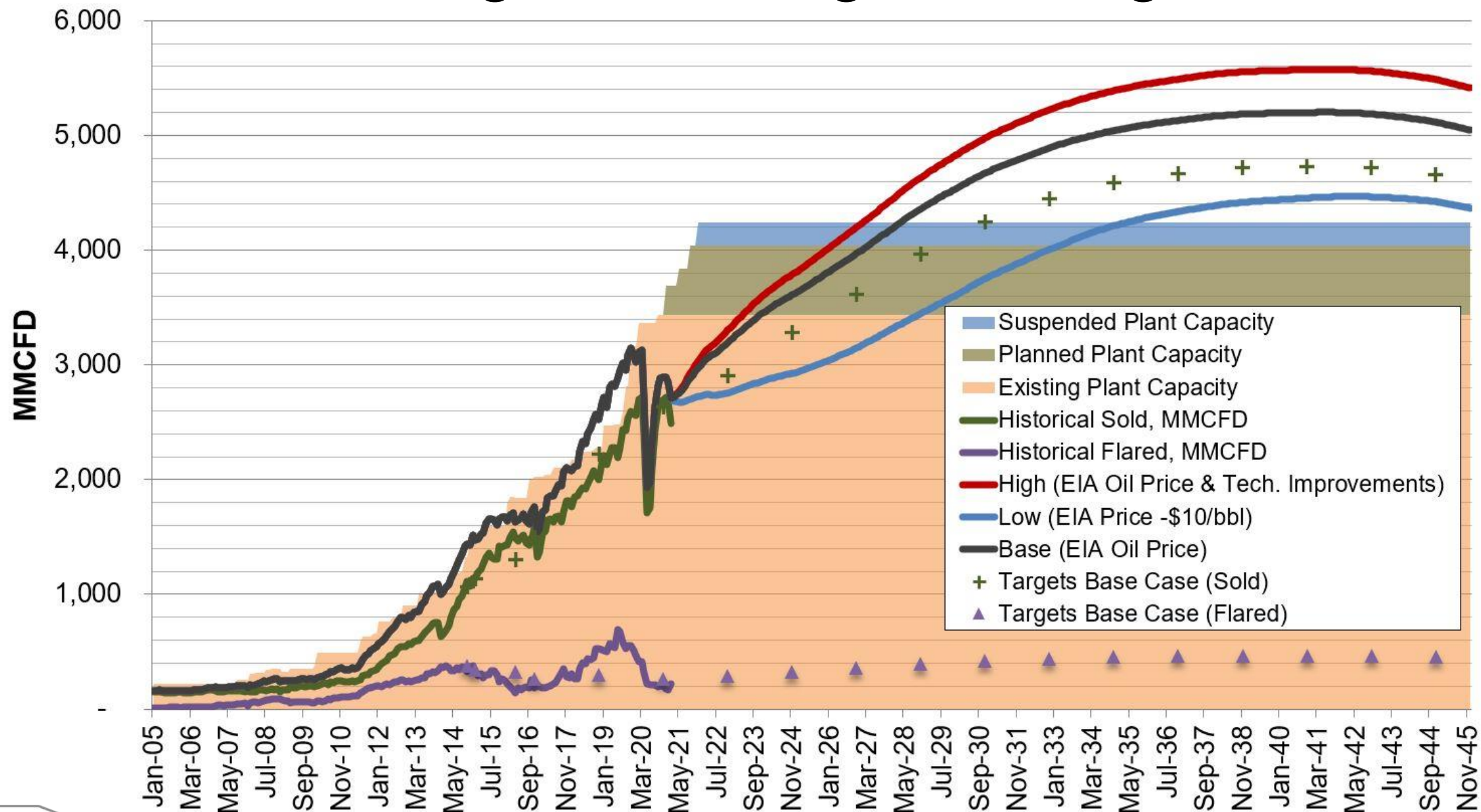
Wellhead Processing Units Reporting*



Natural Gas Update

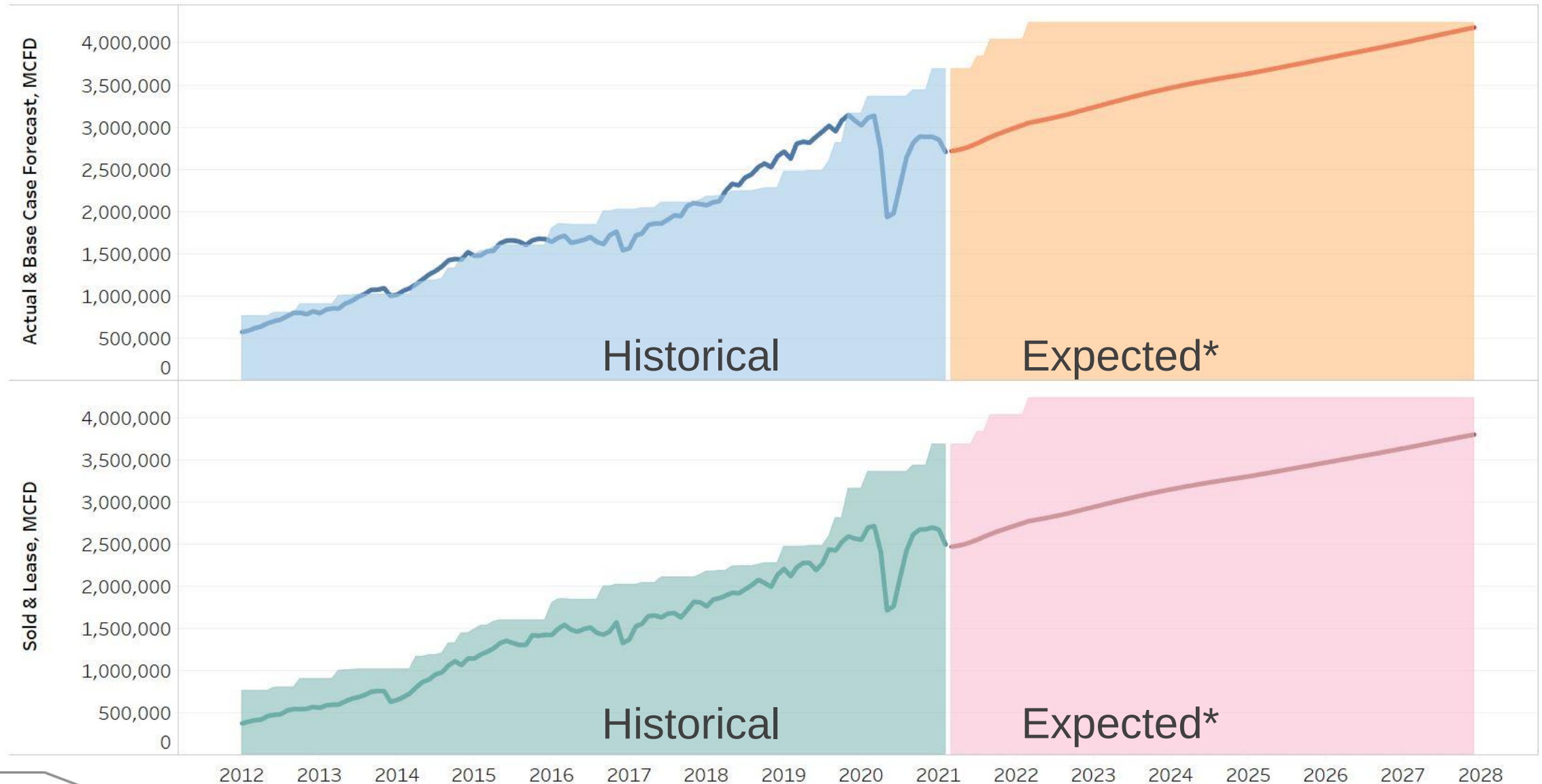


Solving the Flaring Challenge

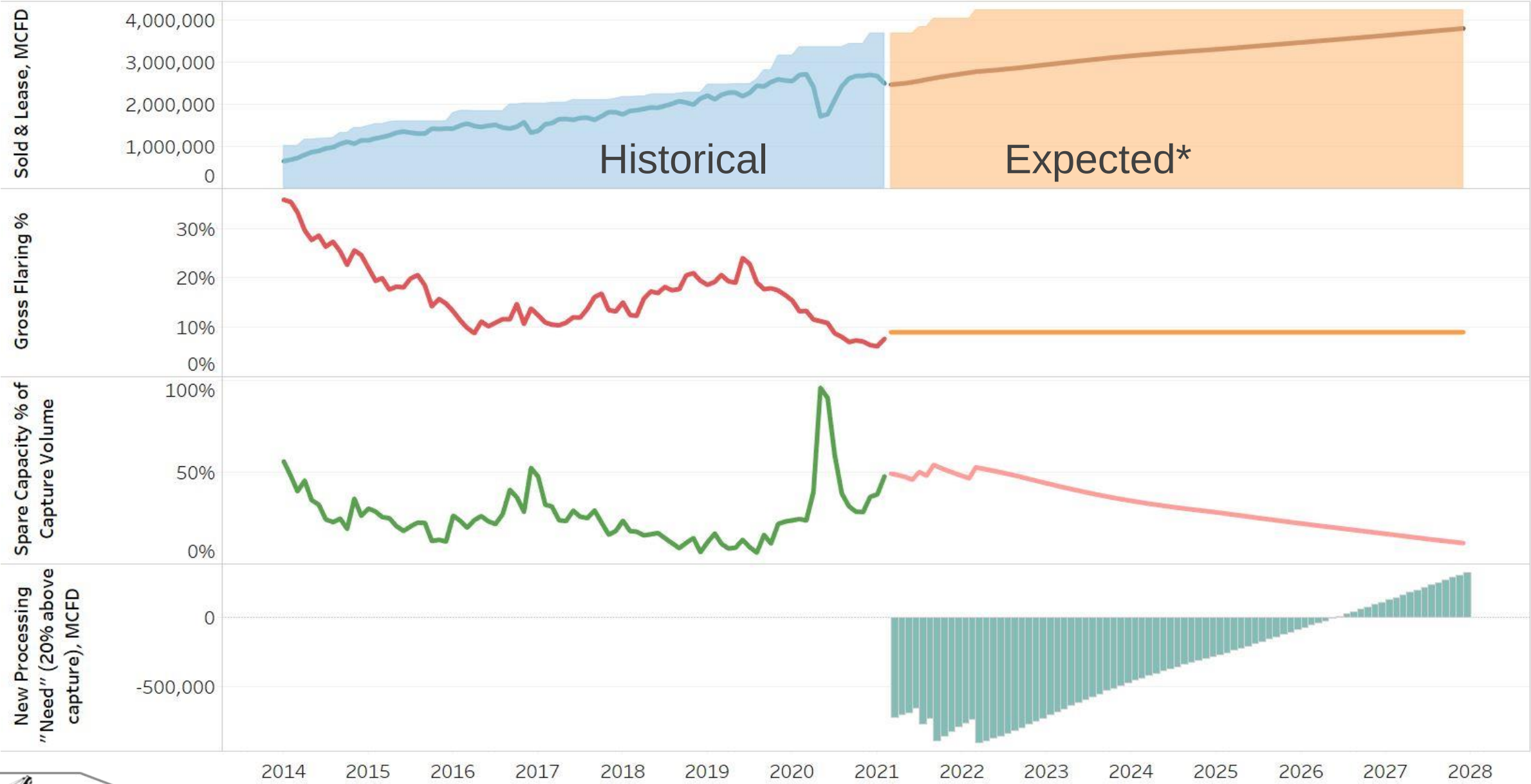


Gas Processing Capacity & Future Outlook

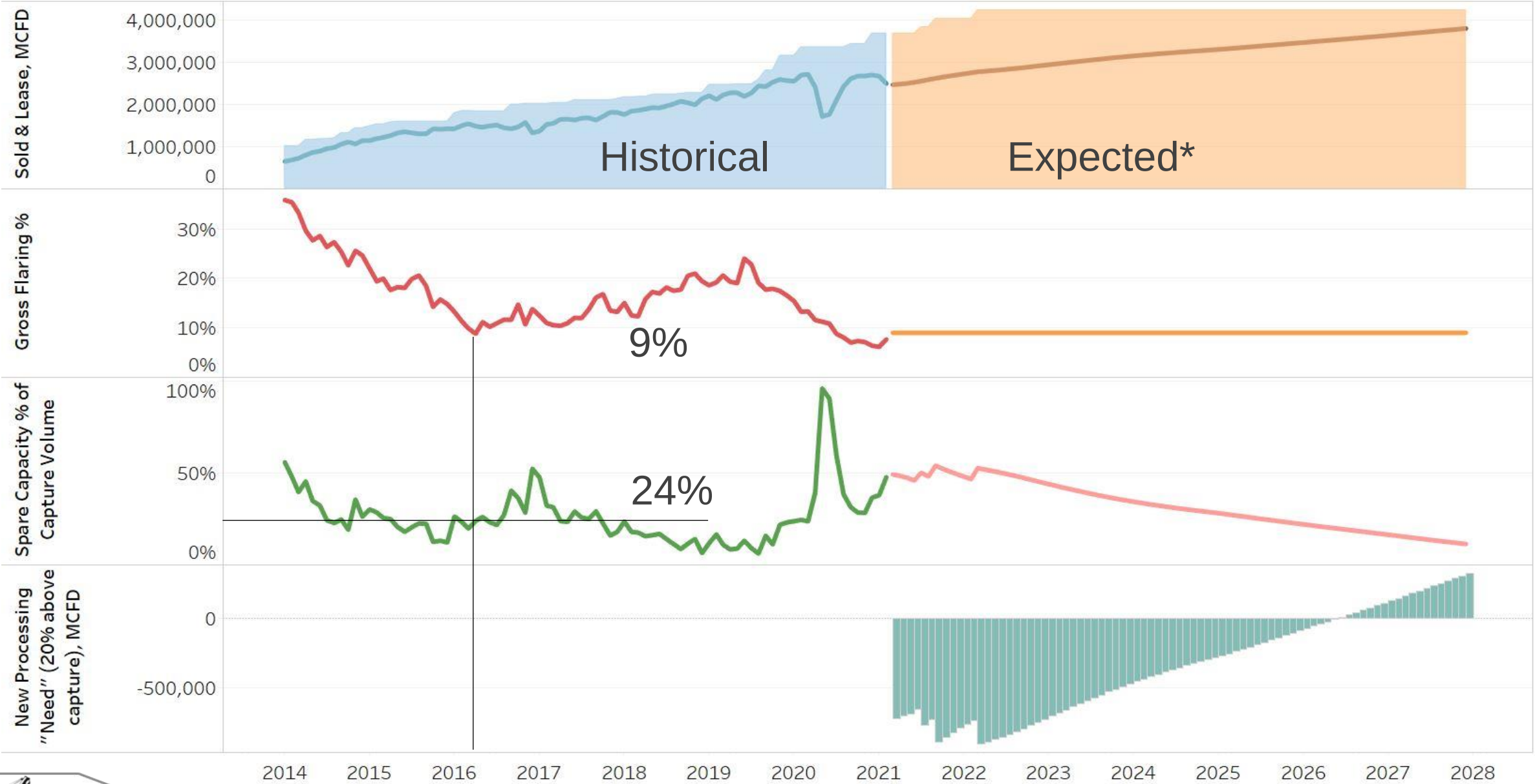
Assumes Current Technology – Enhanced Oil Recovery Not Included



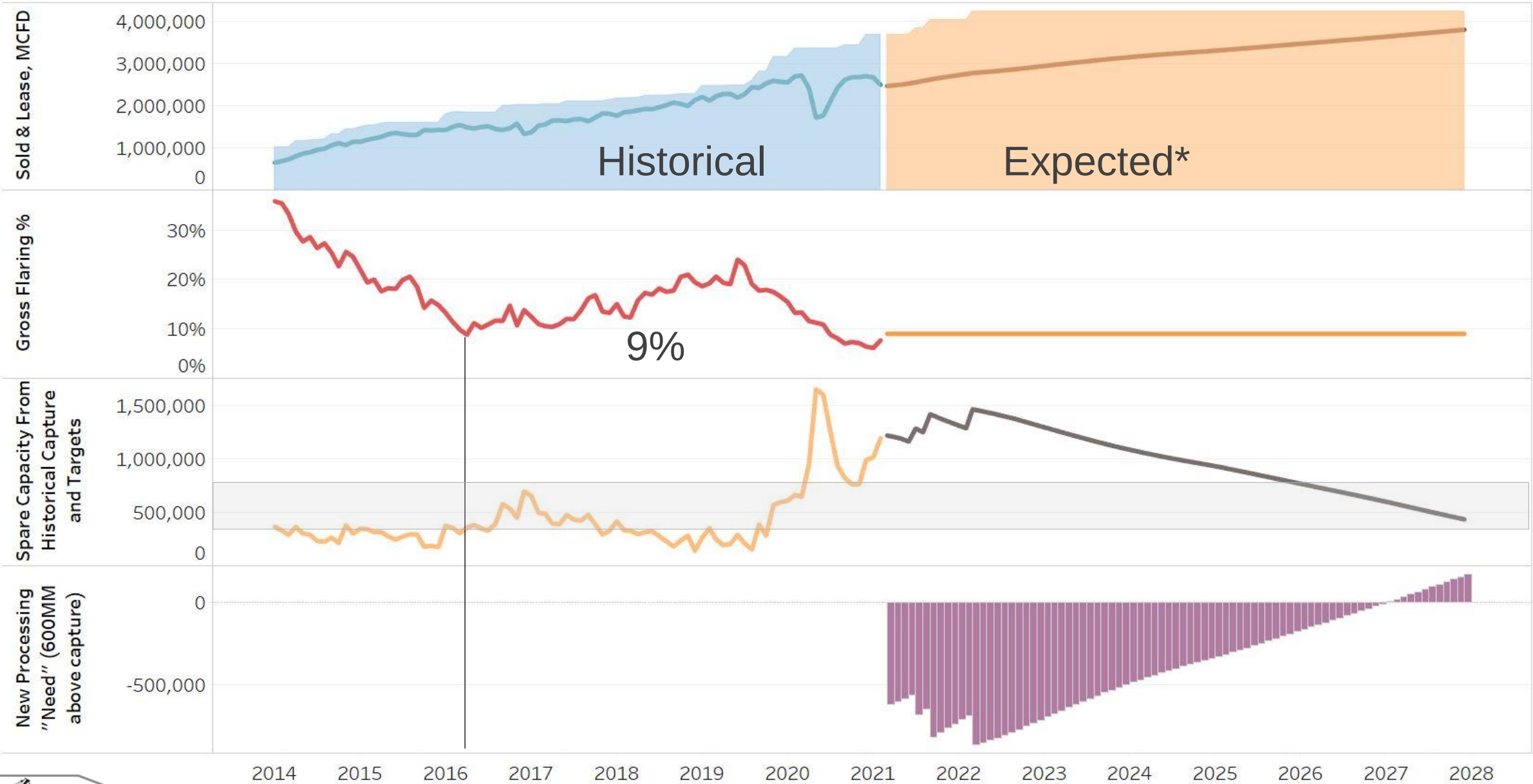
Gas Processing Capacity & Spare Capacity



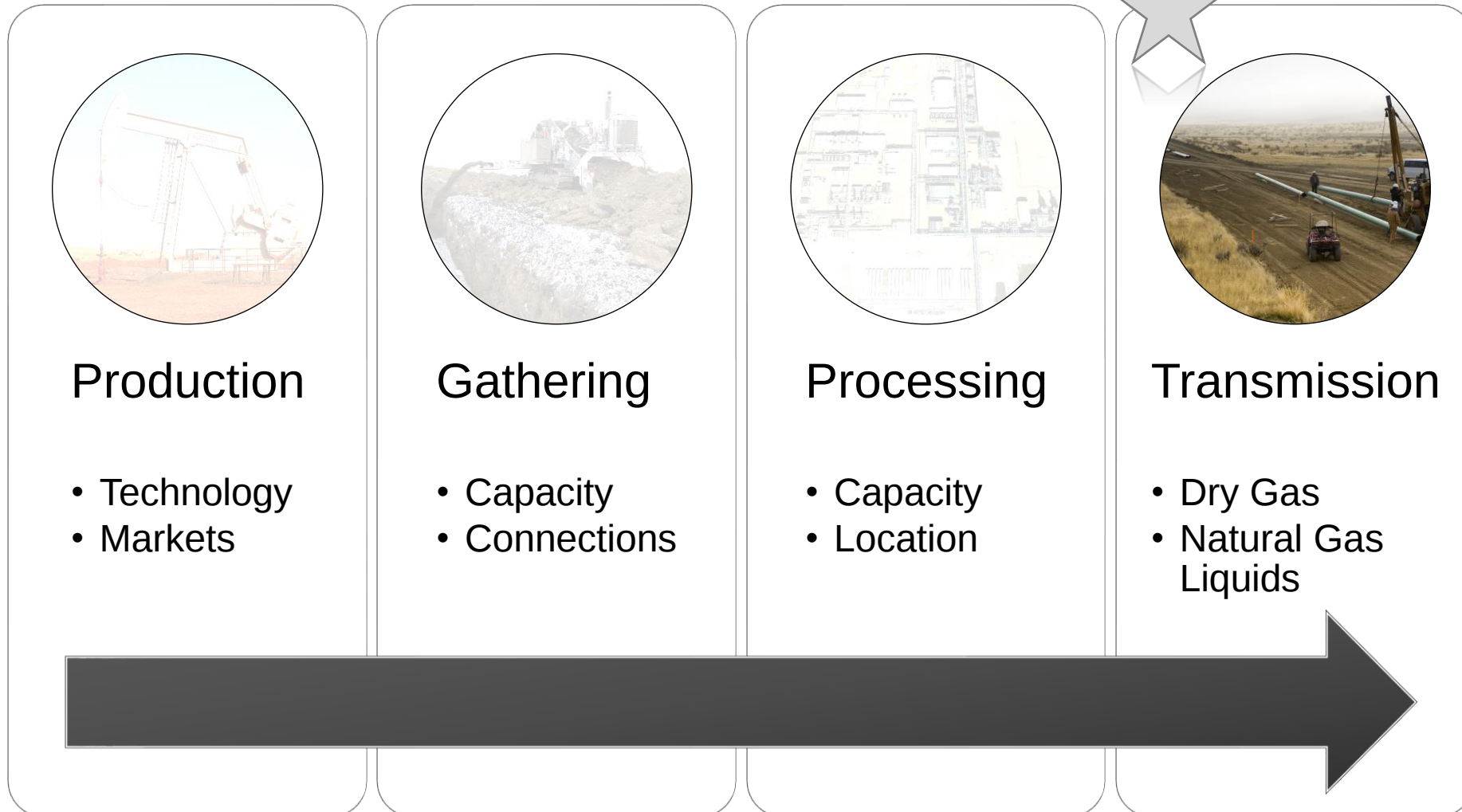
Gas Processing Capacity & Spare Capacity



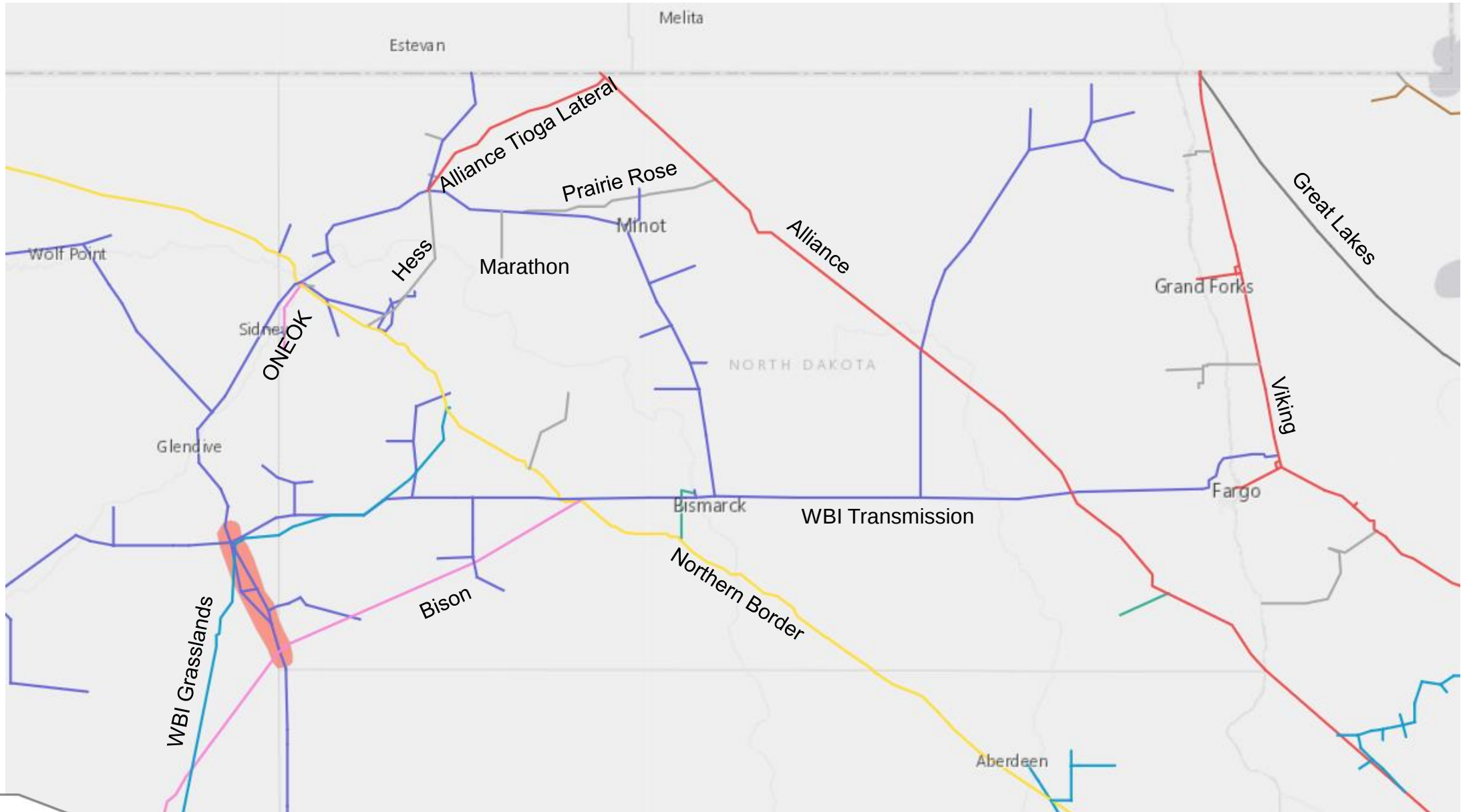
Gas Processing Capacity & Spare Capacity



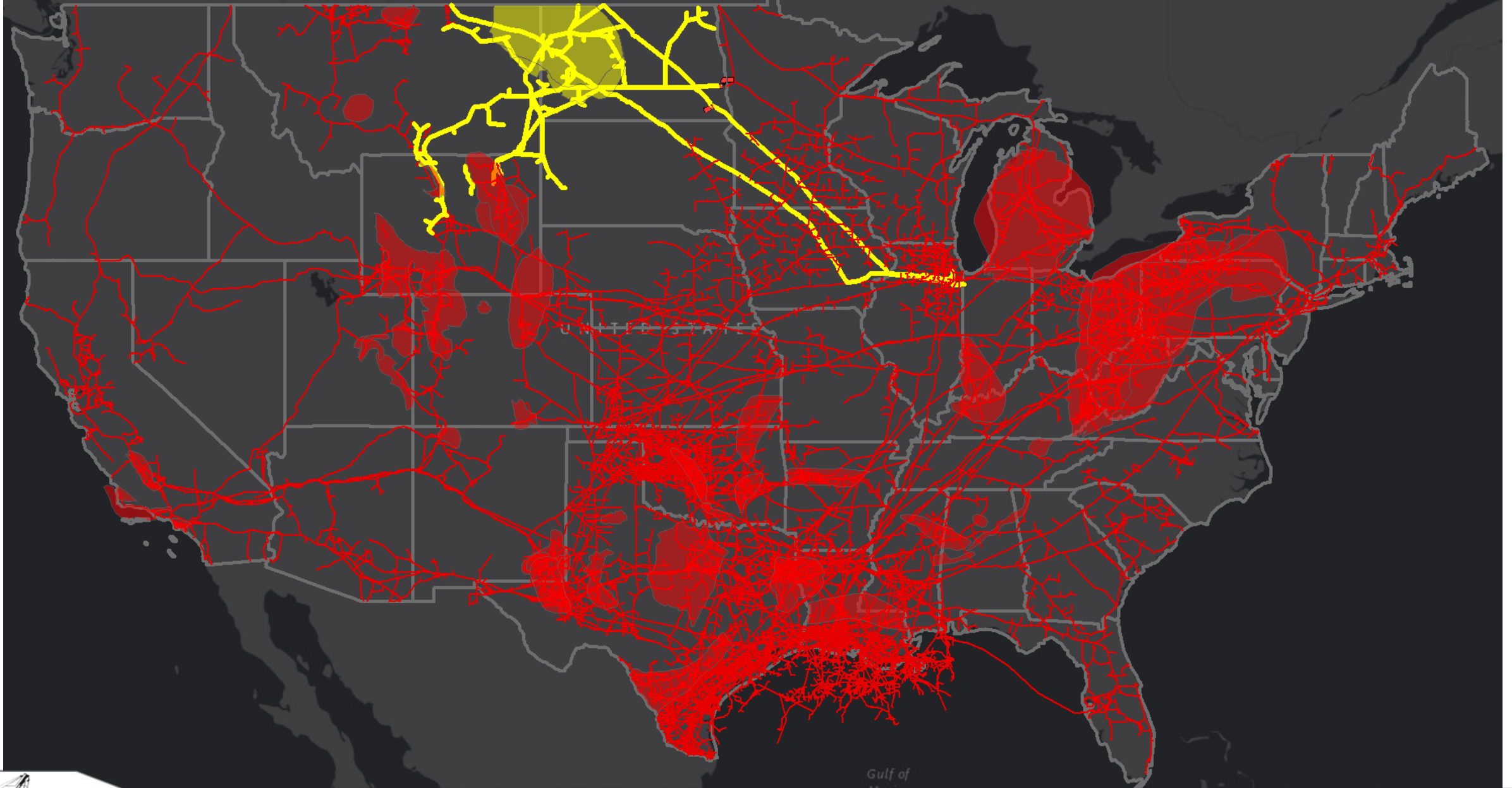
Natural Gas Update



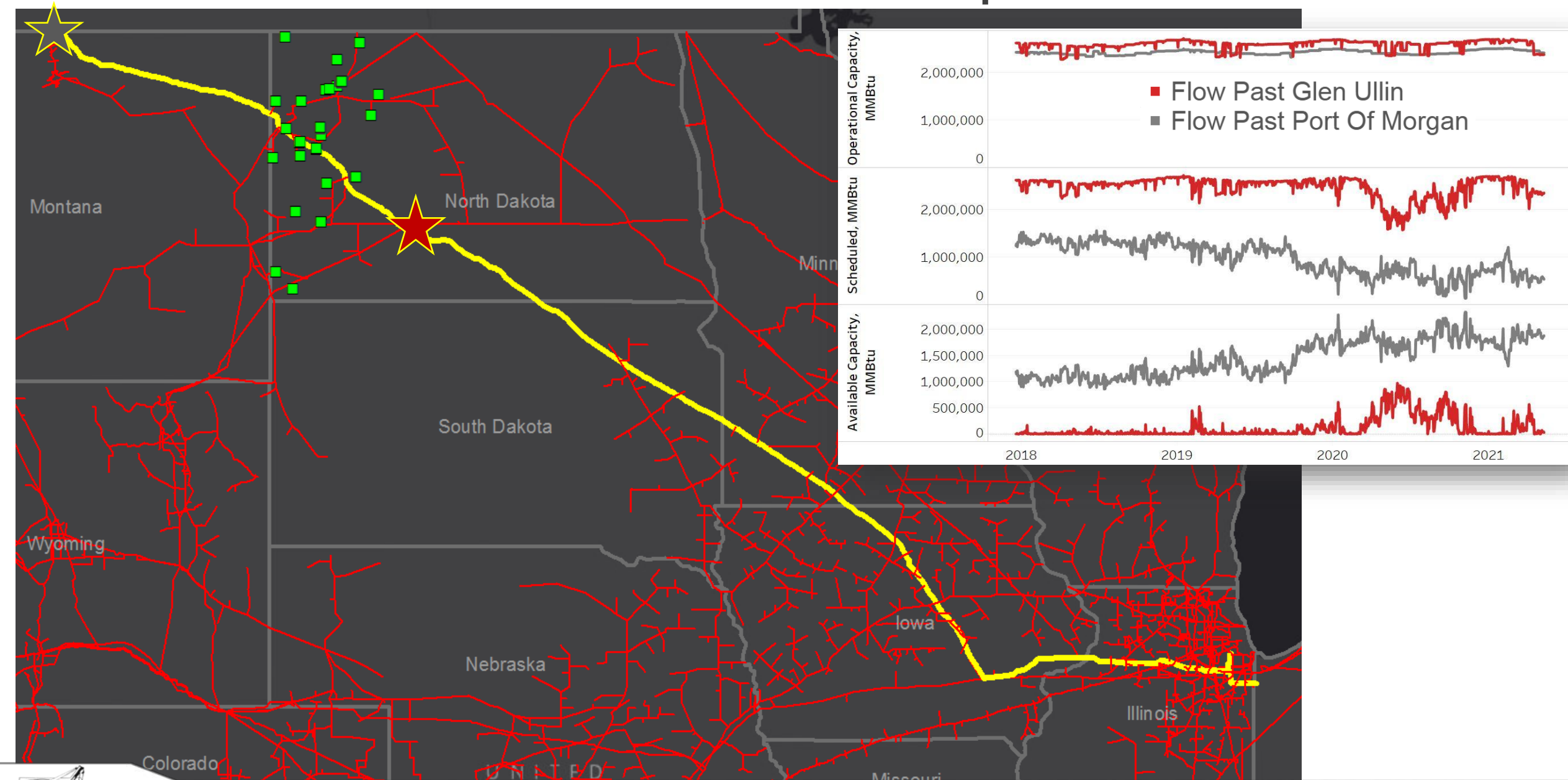
Major Gas Pipeline Infrastructure



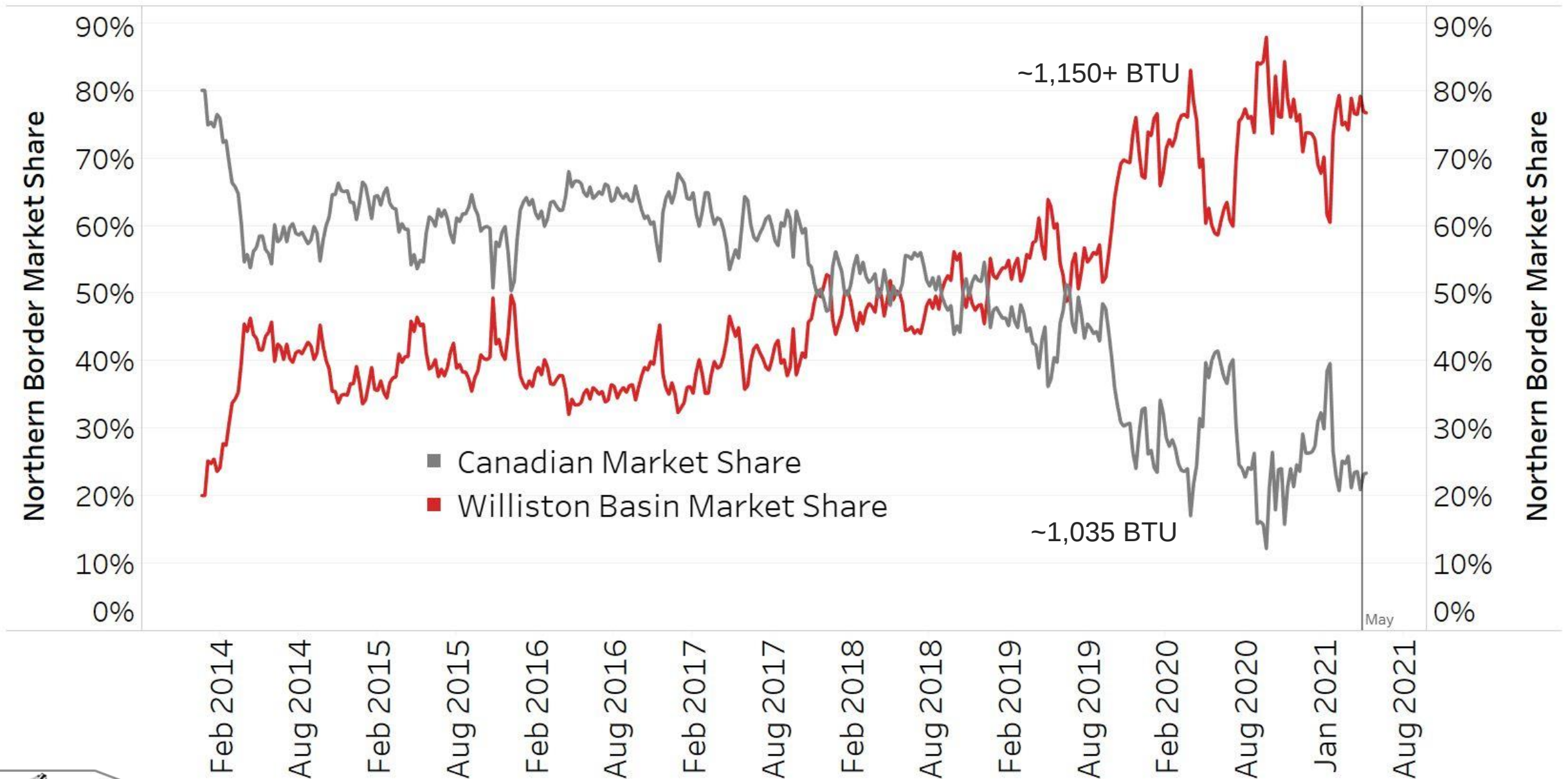
Bakken Natural Gas Infrastructure



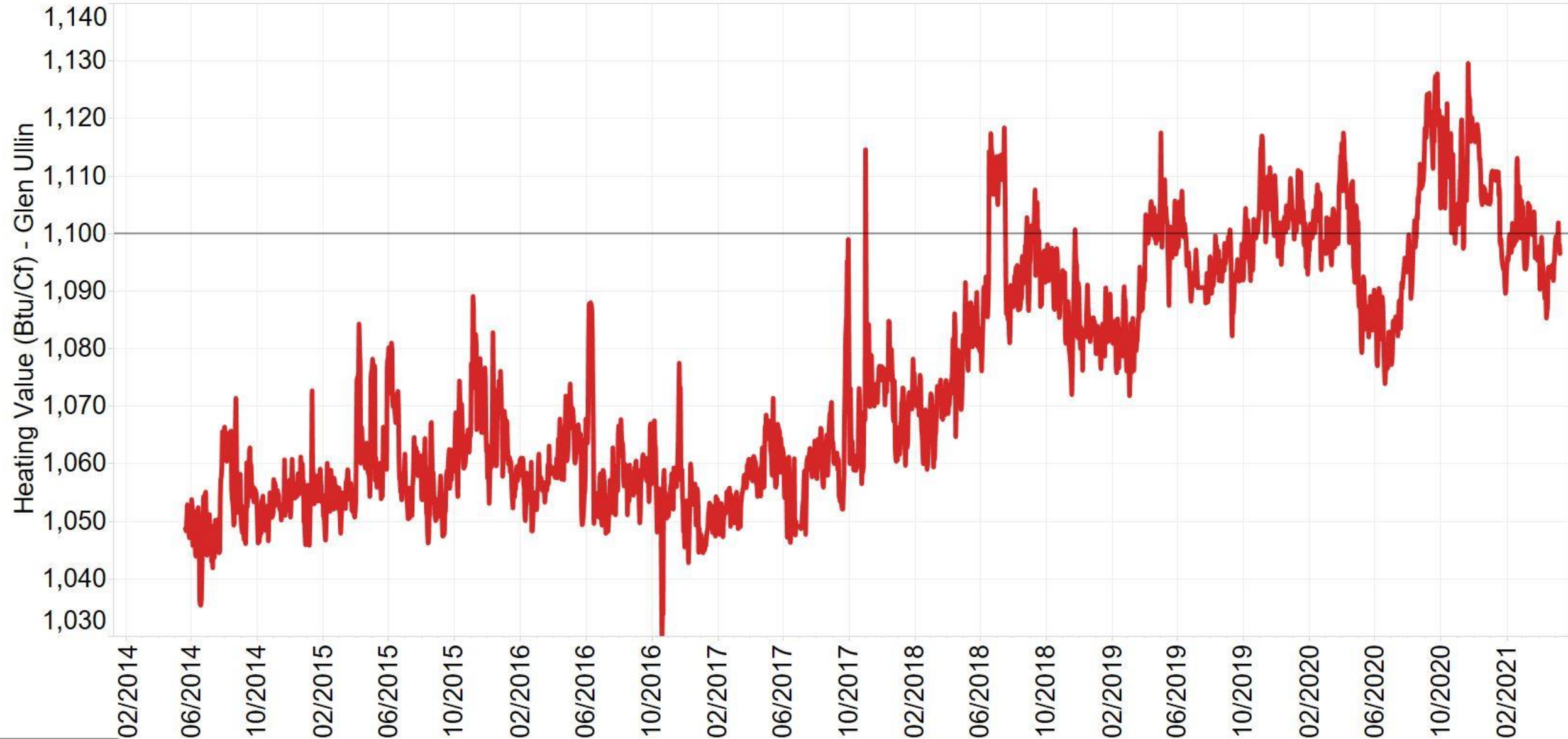
Northern Border Pipeline



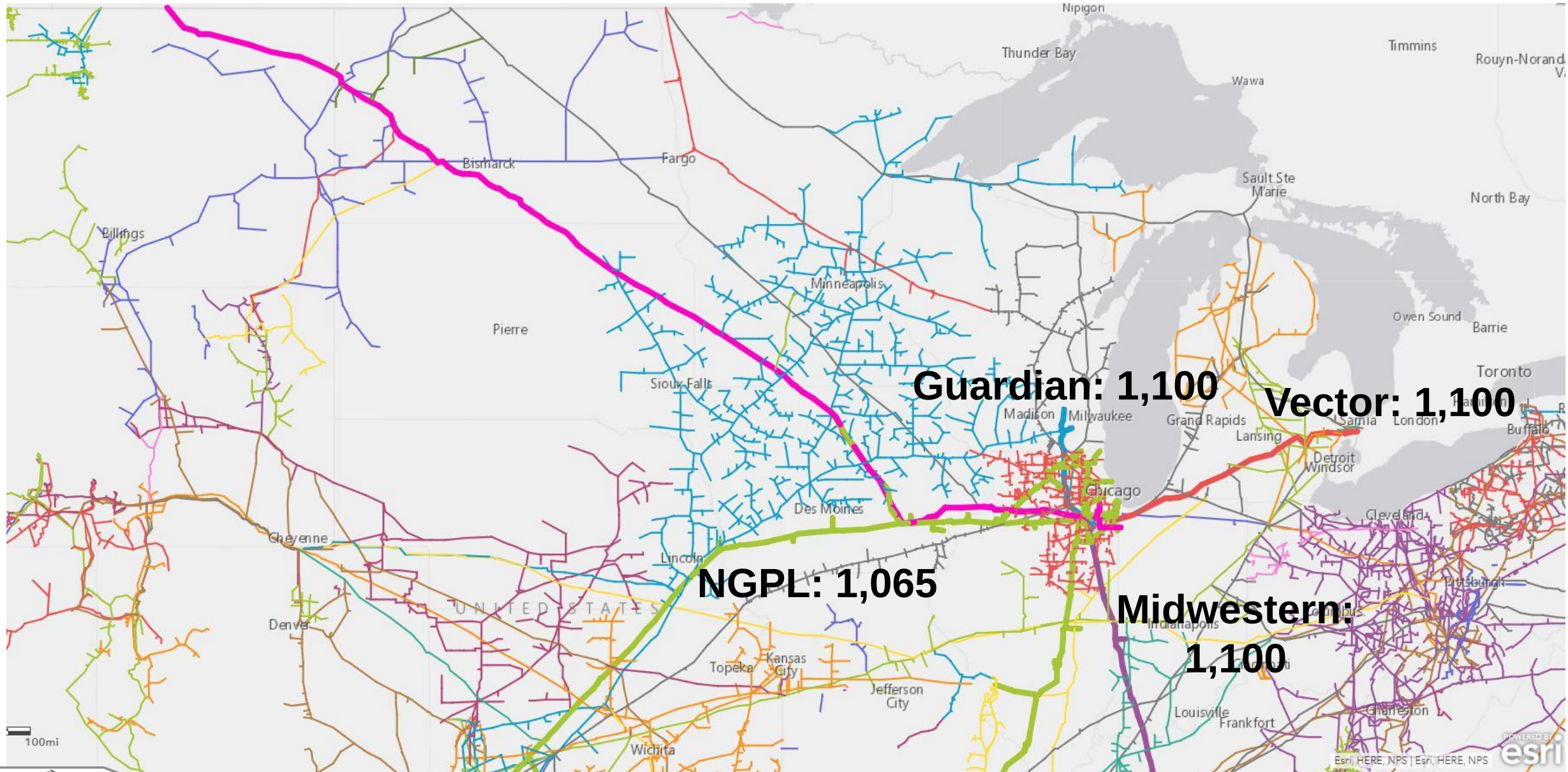
Northern Border Pipeline Market Share



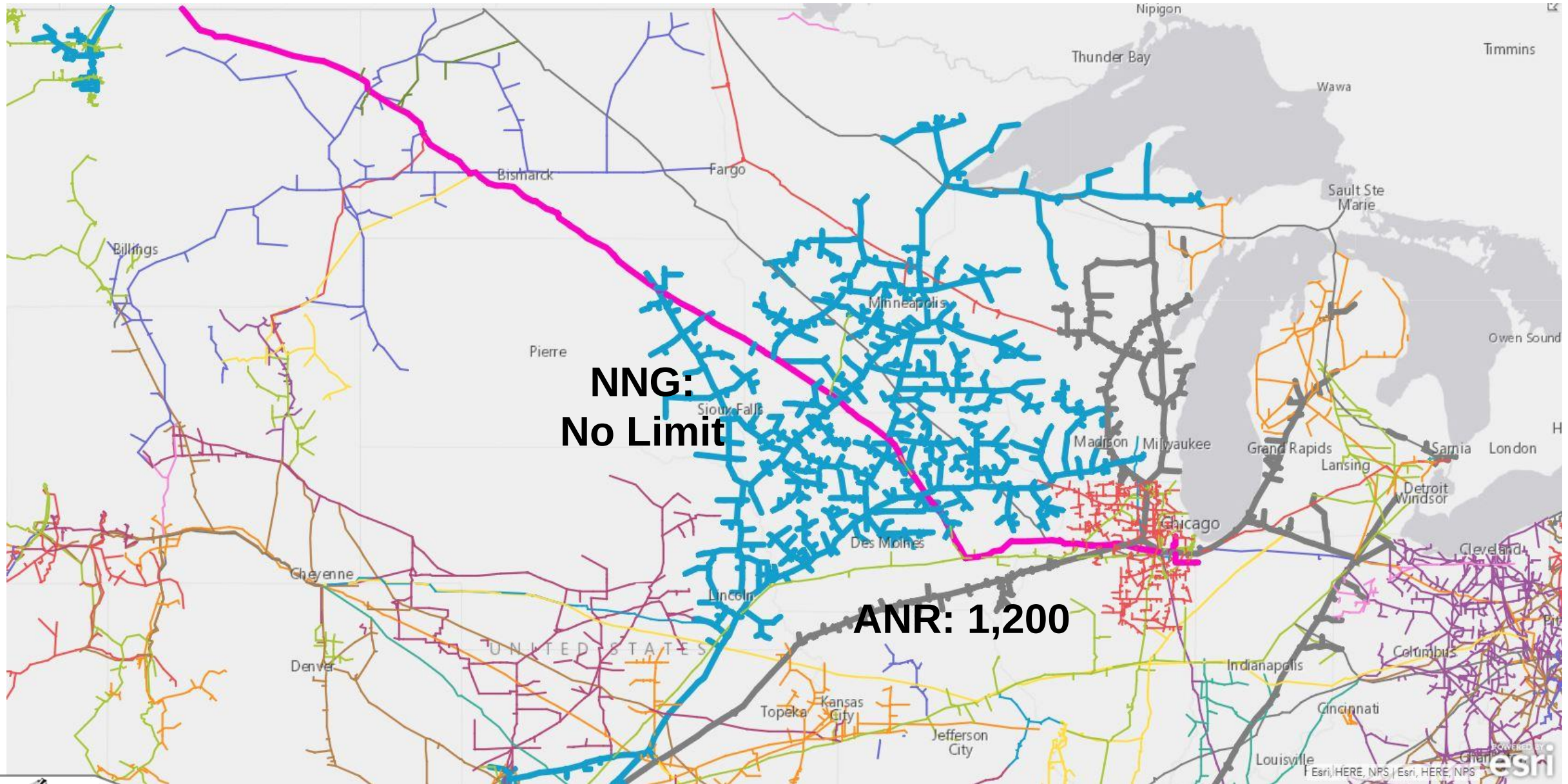
Northern Border BTU at Glen Ullin, ND



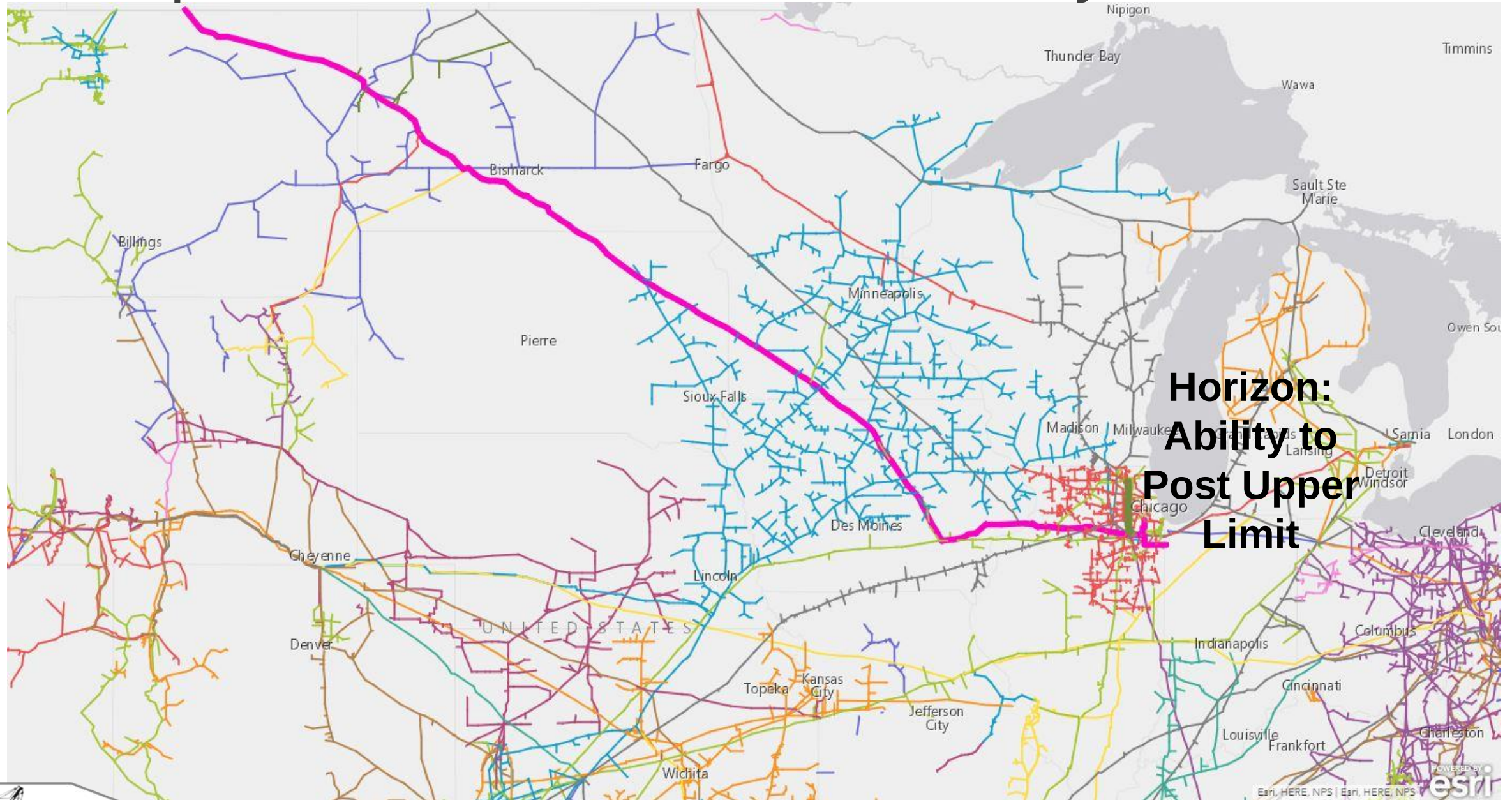
NB Pipeline Interconnects With Known BTU Limits



NB Pipeline Interconnects With BTU Limits $> 1,100$

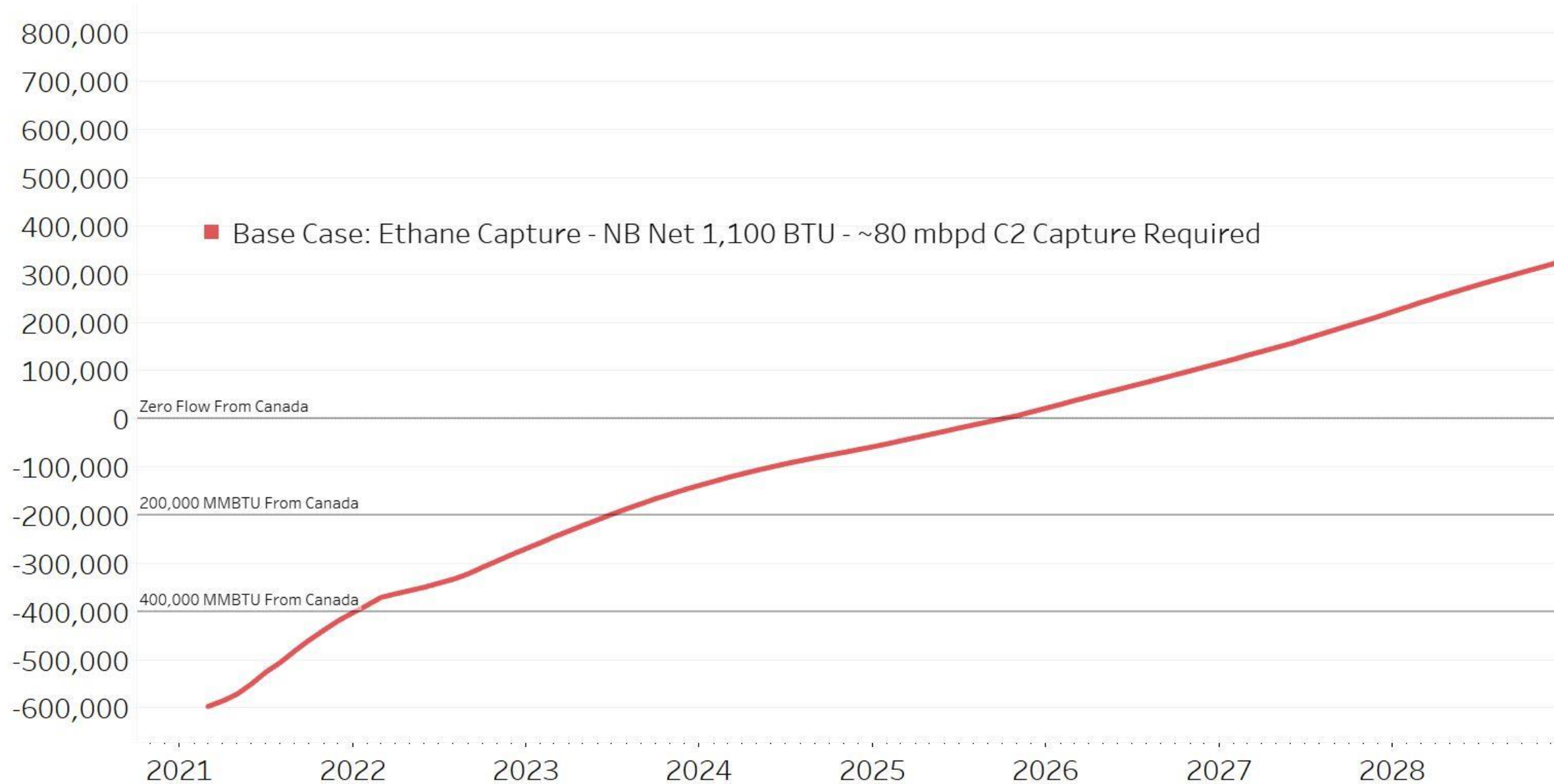


NB Pipeline Interconnects With Ability to Add Limits

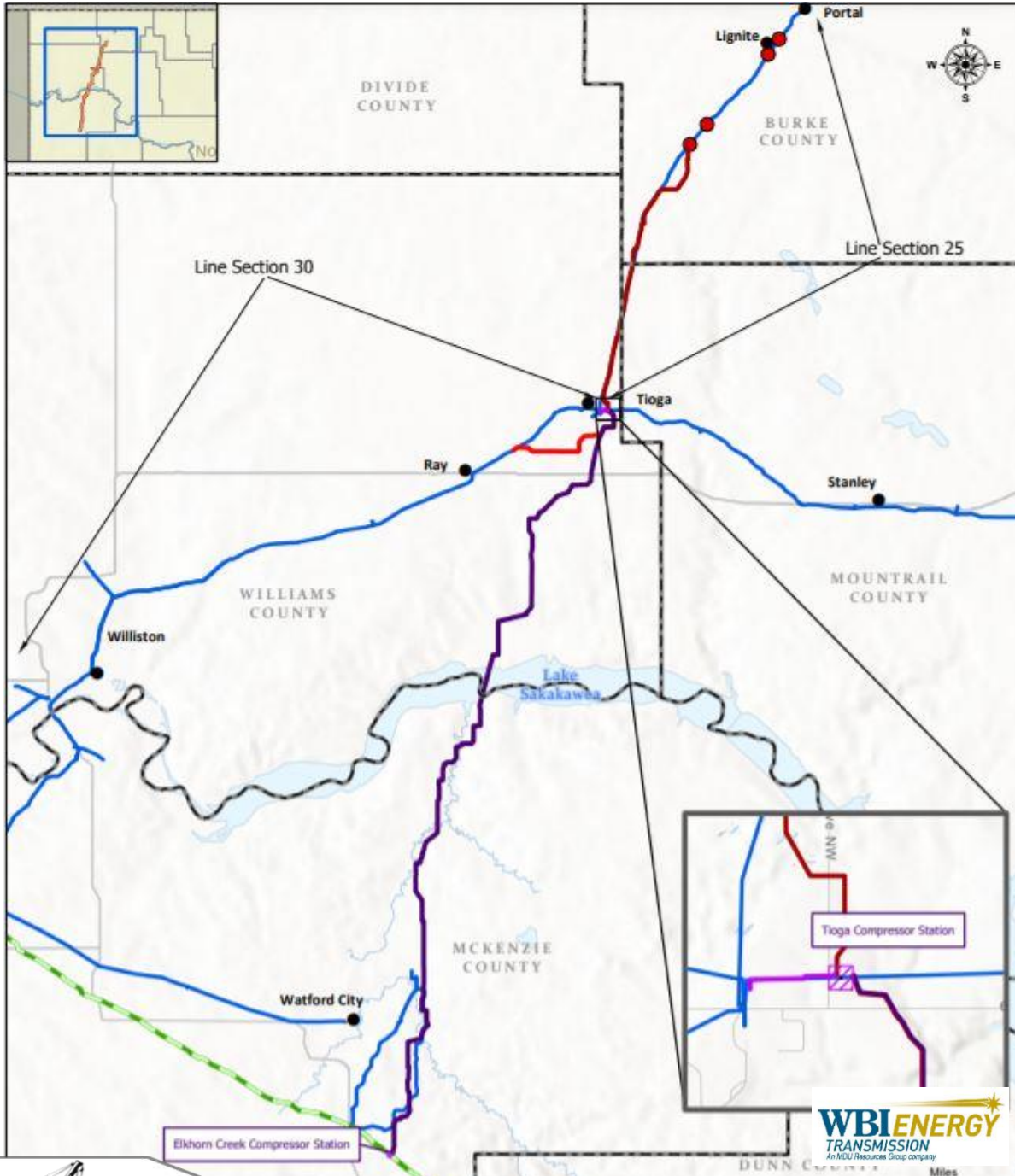


Northern Border – BTU Calculations*

Case 1 Gas Transmission Capacity Needs, MMBTU/Day



WBI Energy – North Bakken Expansion Project

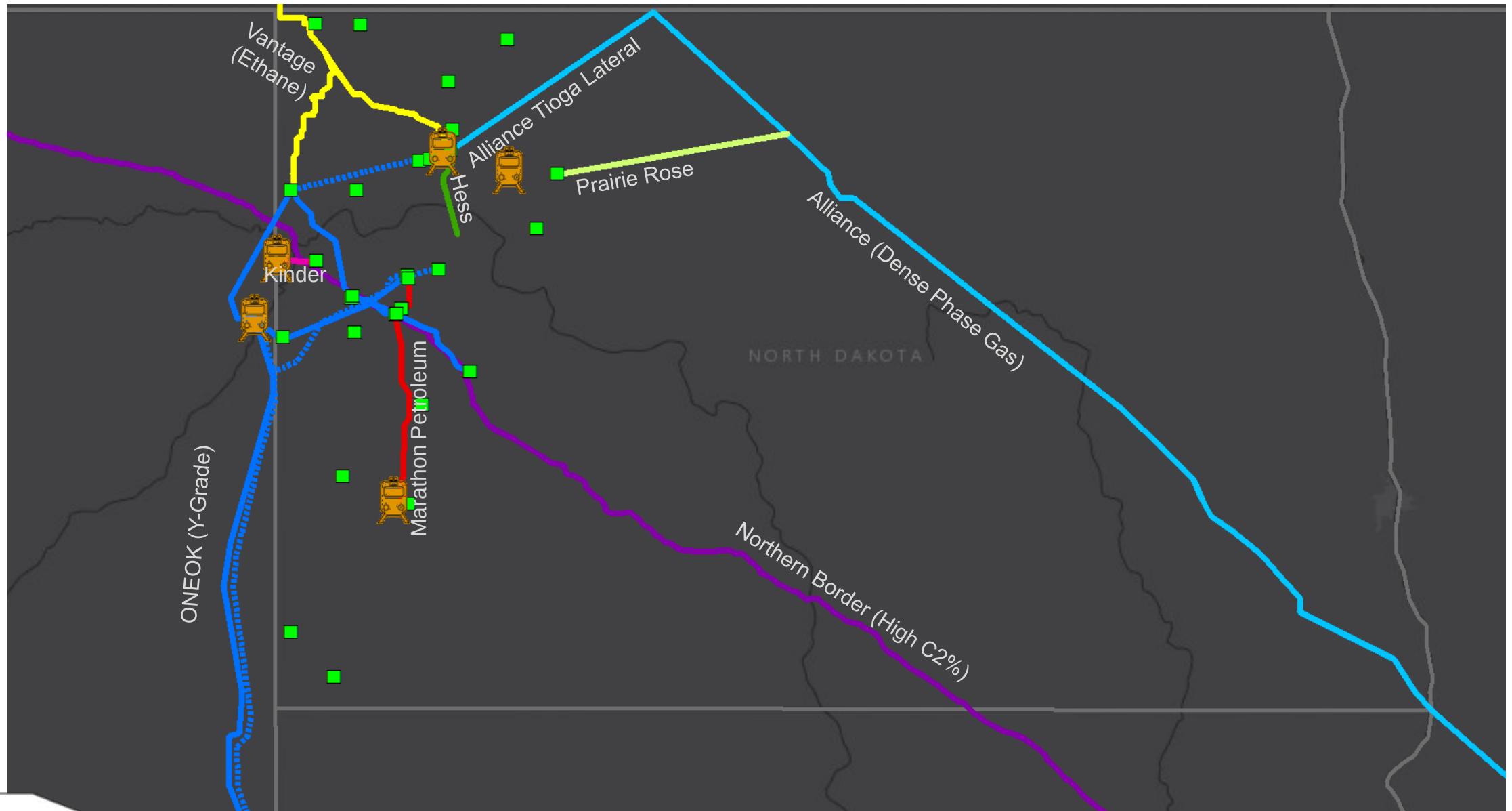


Project Highlights

- ~60 Miles - 24" Pipeline
- ~30 Miles - 12" Pipeline
- \$260+ Million
- Preliminary Capacity 250,000 MCFD
- Expandable to 375,000+ MCFD
- Q4 2021 Proposed Completion
- Residue Gas Service From North of Lake Sakakawea to Northern Border Pipeline in McKenzie County



Regional NGL Infrastructure



NGL Chemistry Study - 2020



ASSESSMENT OF BAKKEN PETROLEUM SYSTEM PRODUCED GAS COMPOSITIONS

Final Report

(Project Period: October 15, 2019 – June 19, 2020)

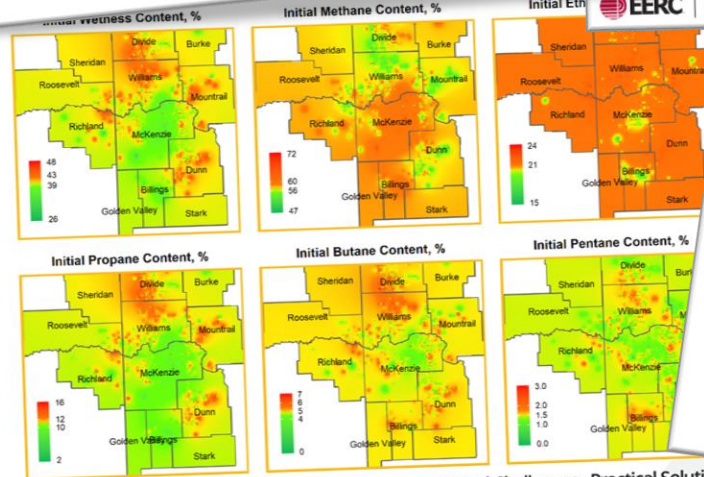
Prepared for:

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Bismarck, ND 58505-0840

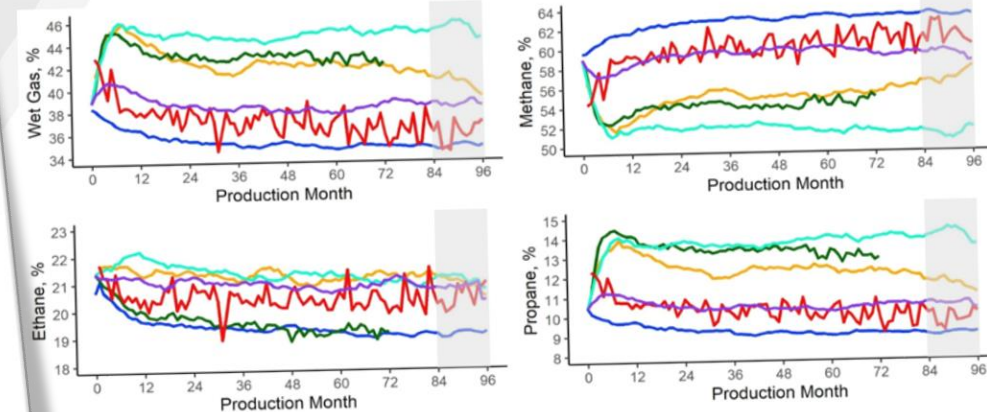
Spatial Patterns

- ❖ The highest methane concentrations occur in the core Bakken area, and the lowest levels occur in northern Williams and southern Divide counties.
- ❖ There is considerably less variation in ethane content across the BPS than with other NGLs.



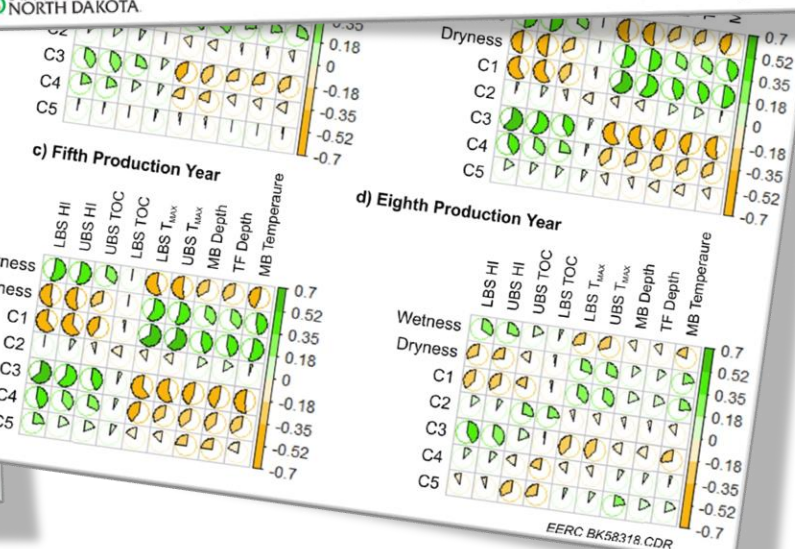
Critical Challenges. Practical Solutions.

Temporal Patterns in Measured Gas Composition



— Divide — Dunn-McKenzie — Mountrail
— Dunn — McKenzie — Williams

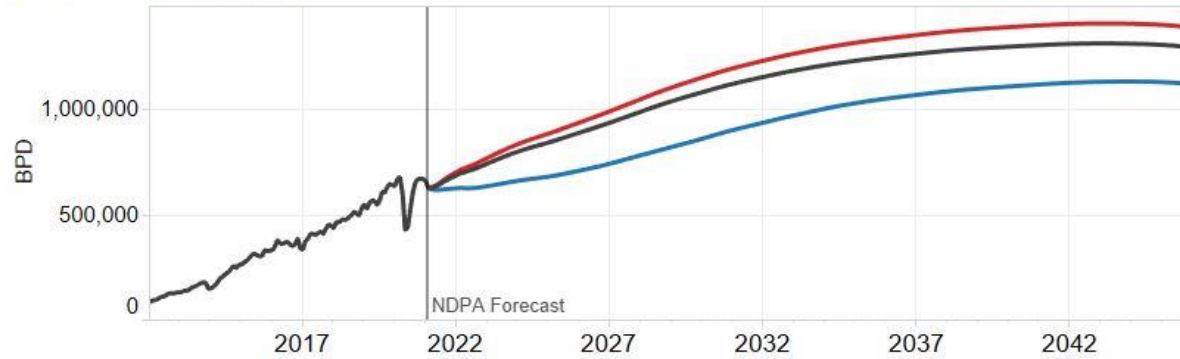
Critical Challenges. Practical Solutions.



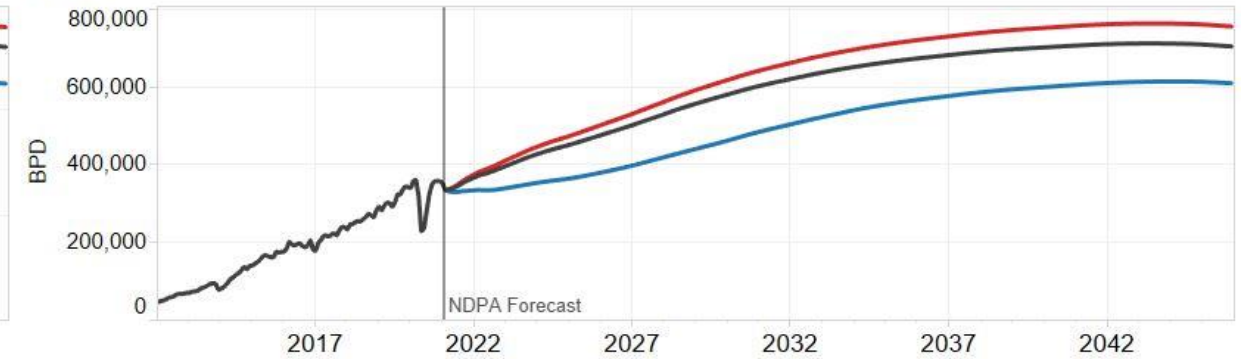
EERC BK58318.CDR

North Dakota Captured* NGL's

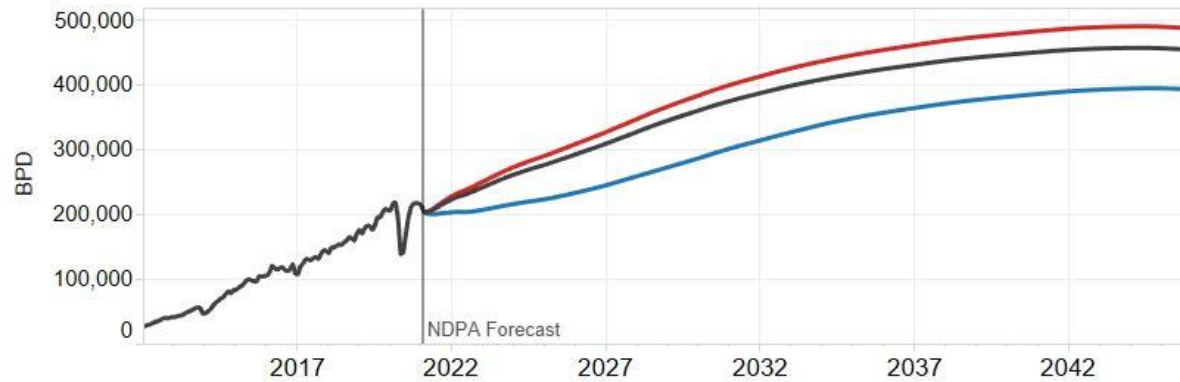
All Natural Gas Liquids



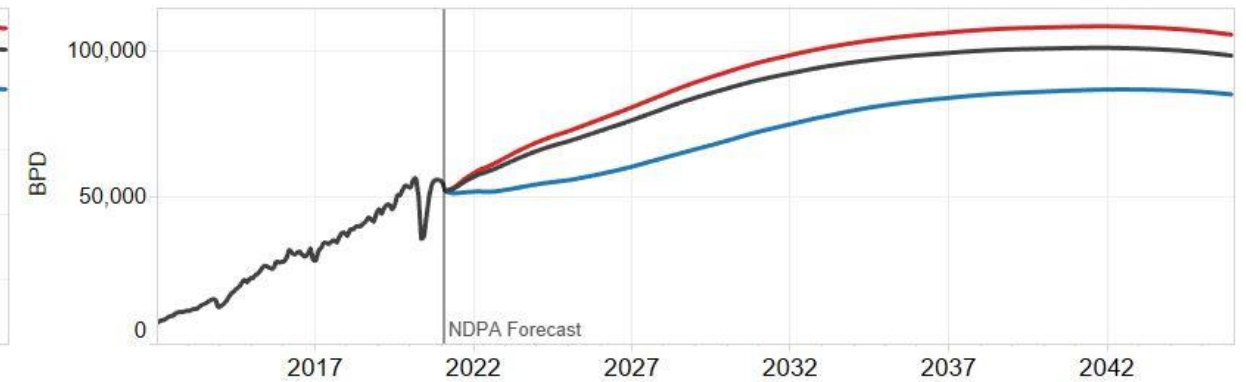
Ethane



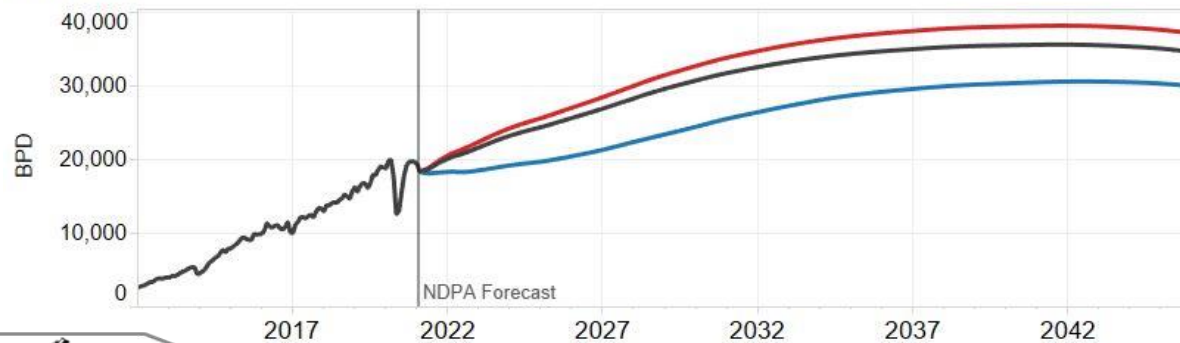
Propane



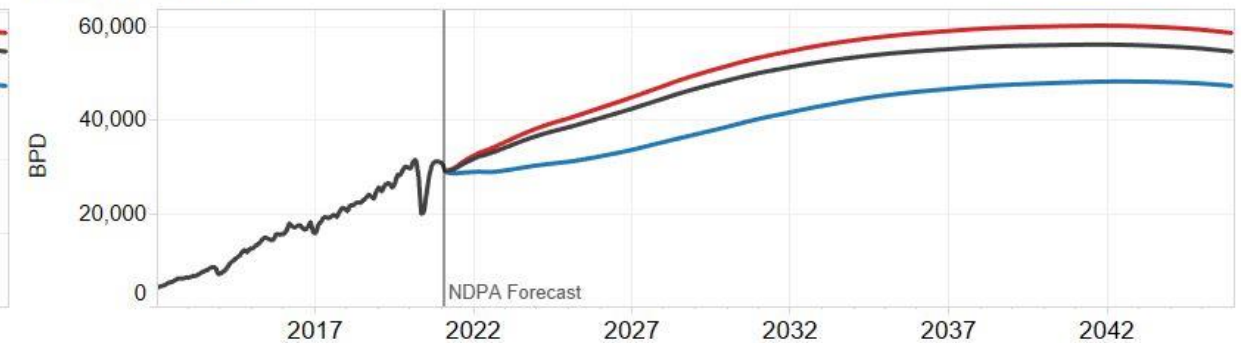
Butane



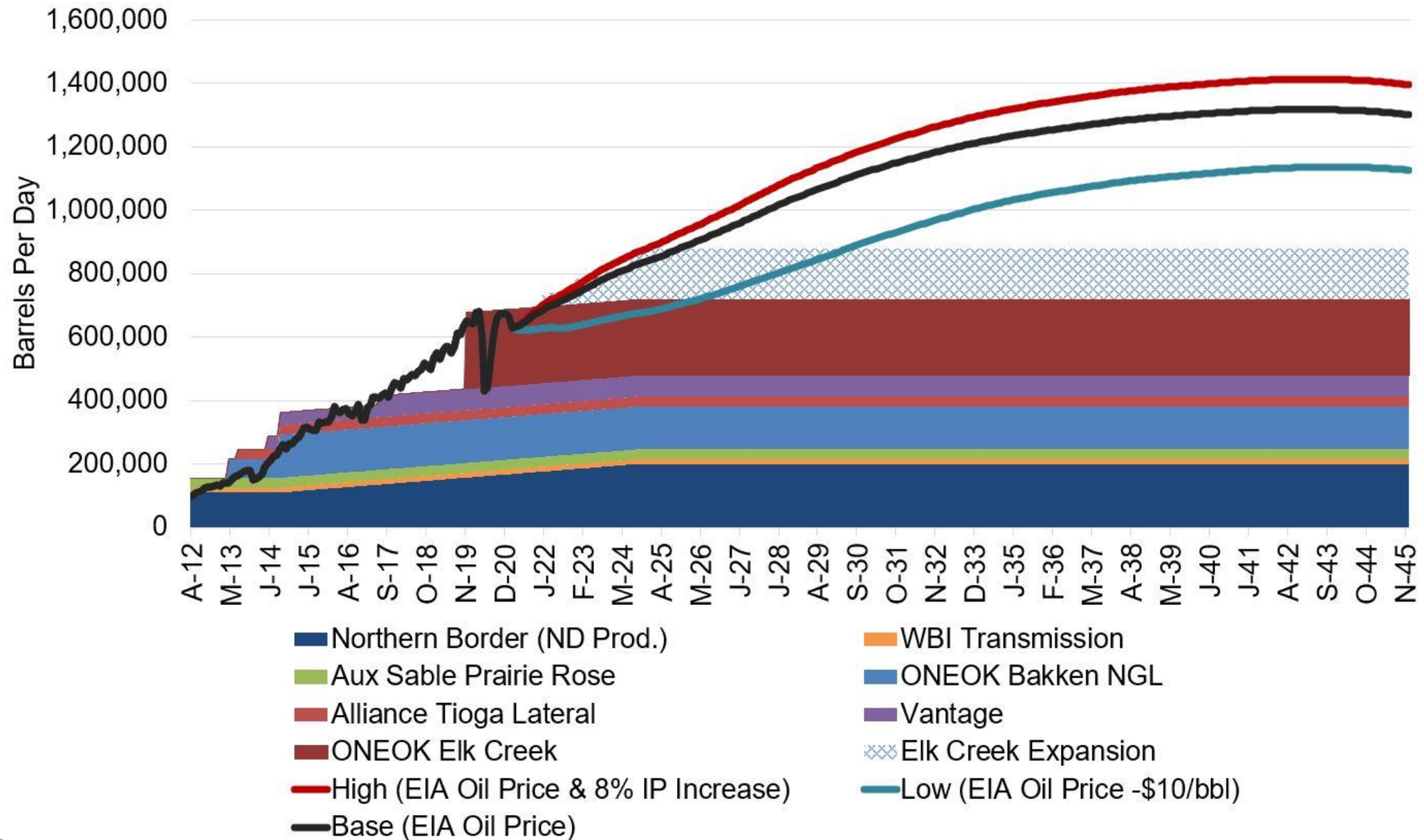
Isobutane



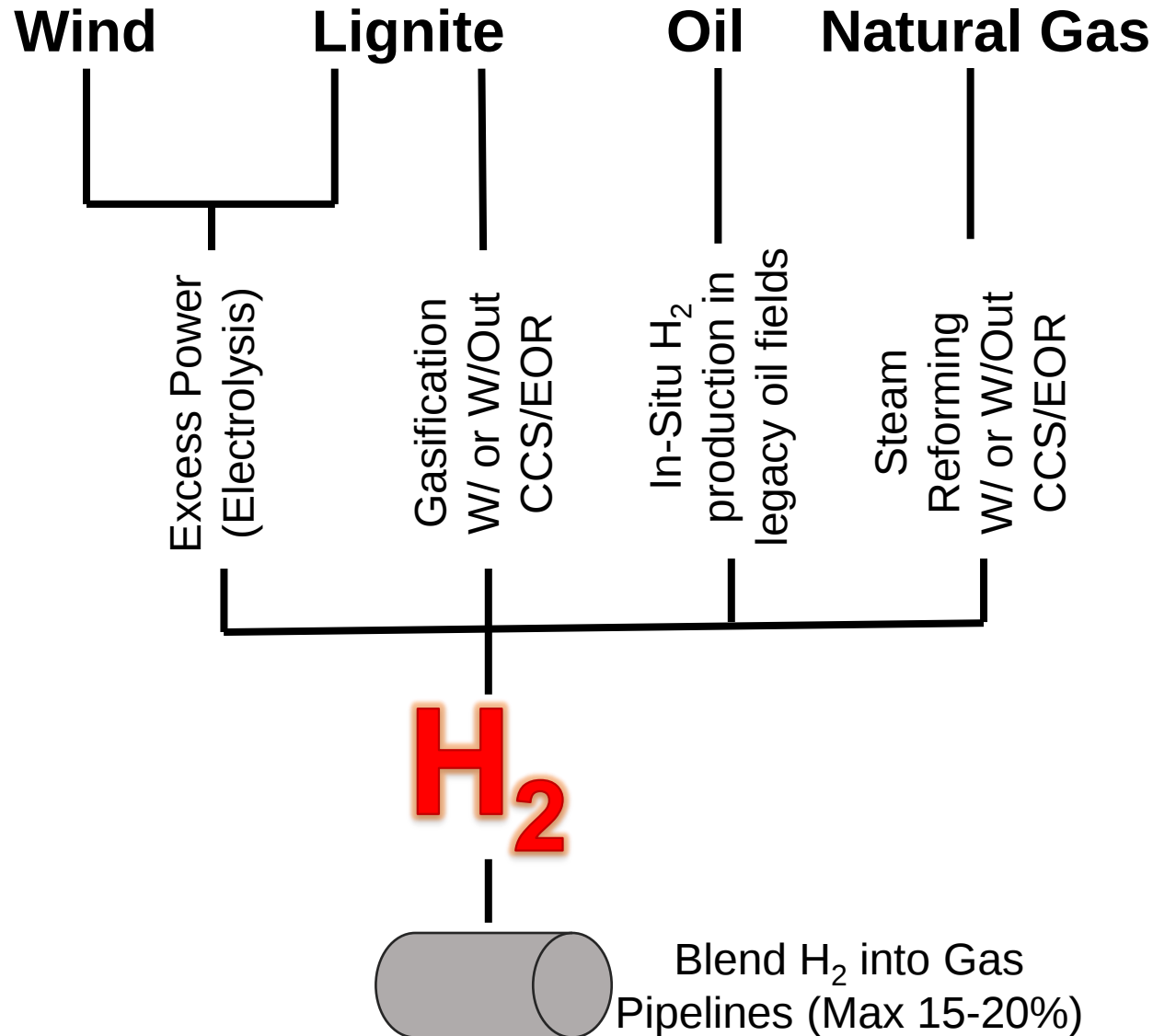
Natural Gasoline



NGL Pipeline Takeaway Options



Exploring Hydrogen Solutions



Electric Generation

- Large and Immediate Market for Excess Power in Regional Pipelines
- Excess Electrons Sold for H₂ BTU Value in Gas Markets
- Gas Pipelines Could Support Intermittent Deliveries
- Gasification Options for Lignite



Gas Pipelines & Petroleum

- Lowest Pipeline BTU
- Possible Support for Expansion Efforts
- Gas Marketing Advantages with Renewable or Carbon-Free Sources of H₂
- In-situ H₂ production in legacy fields
- Natural Gas Steam Reforming W/CCS or EOR Options



North Dakota

- Grows the "Energy Pie"
- Supports Current and Future Jobs
- First Step in Hydrogen Bridge for New Industries (Petchem, Fertilizer, Renewable Natural Gas, vehicles, etc.)
- ESG Benefits?



Contact Information

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**Know what's below.
Call before you dig.**

Websites:

www.pipeline.nd.gov
www.northdakotapipelines.com

