

Industrial Commission Midstream Update

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Geological Engineer

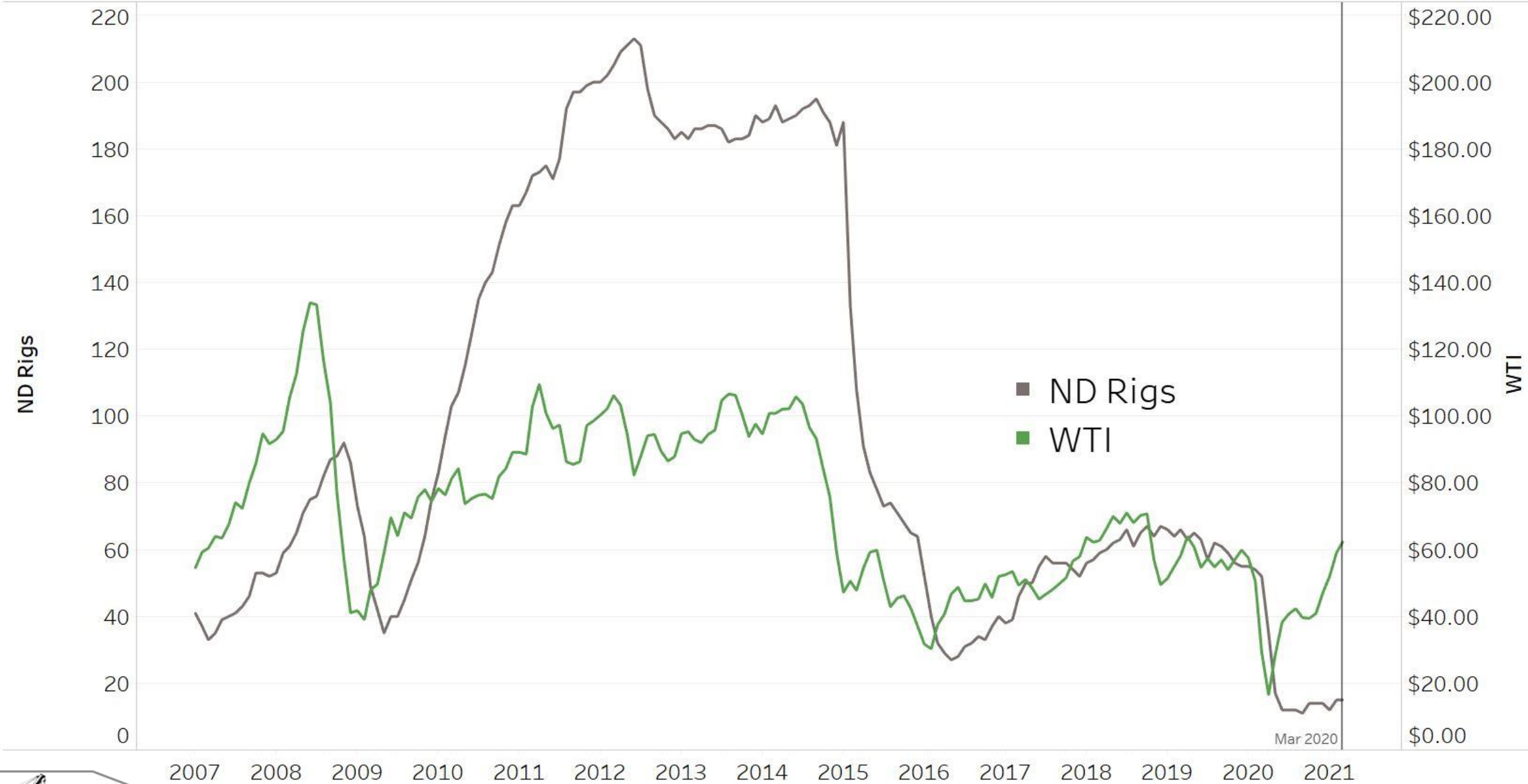
Director

North Dakota Pipeline Authority

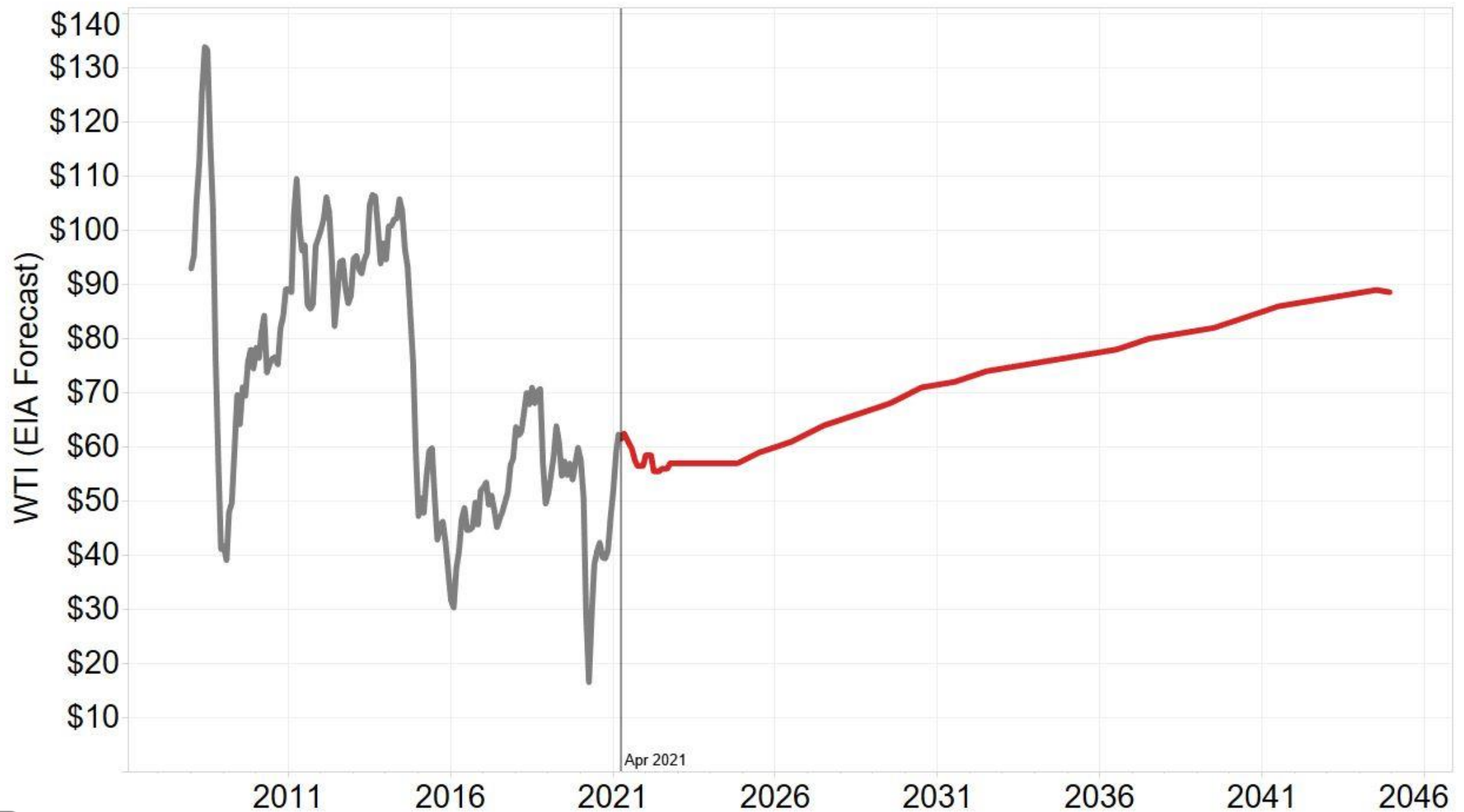
April 27, 2021



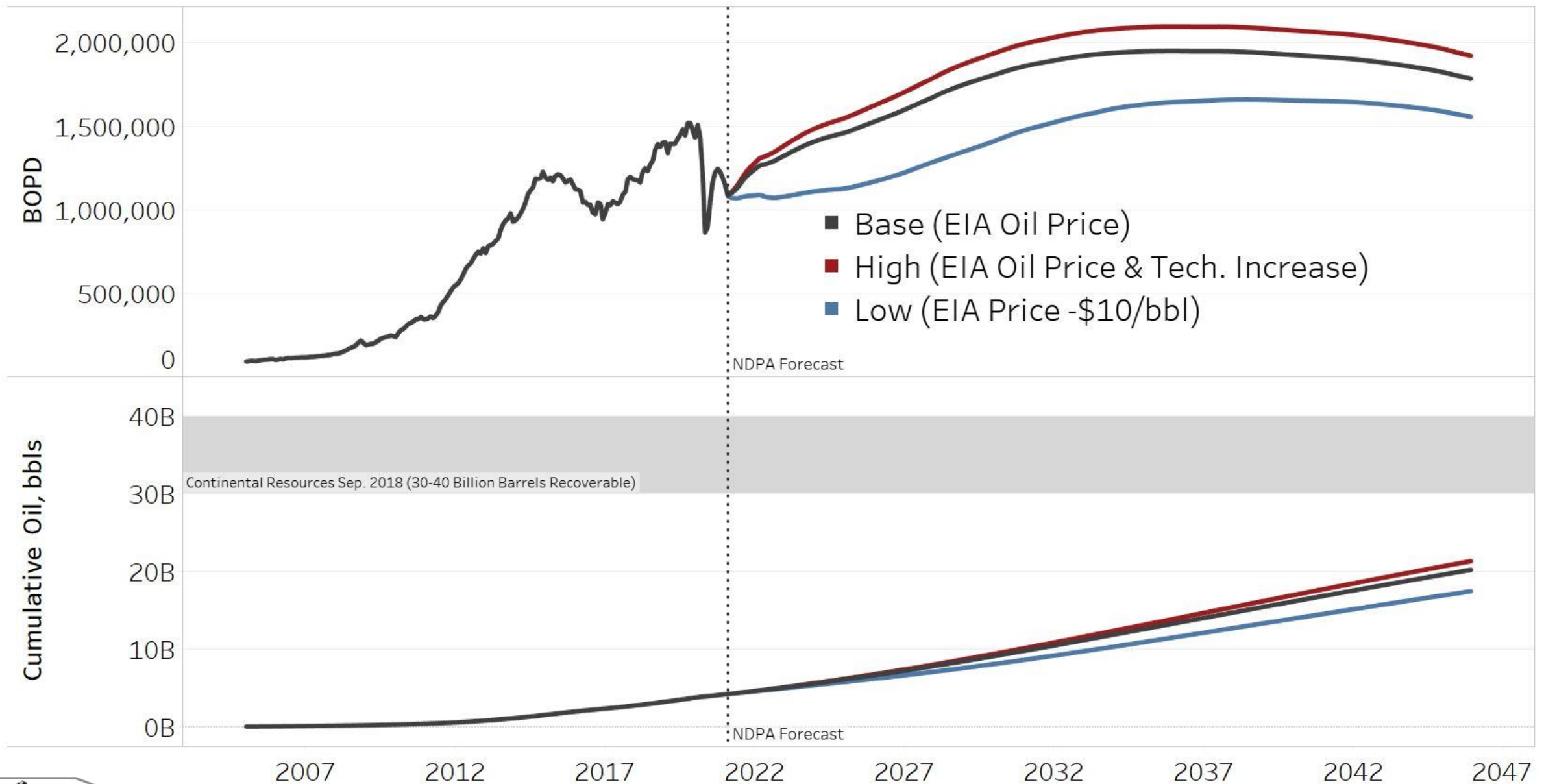
North Dakota Drilling Activity History



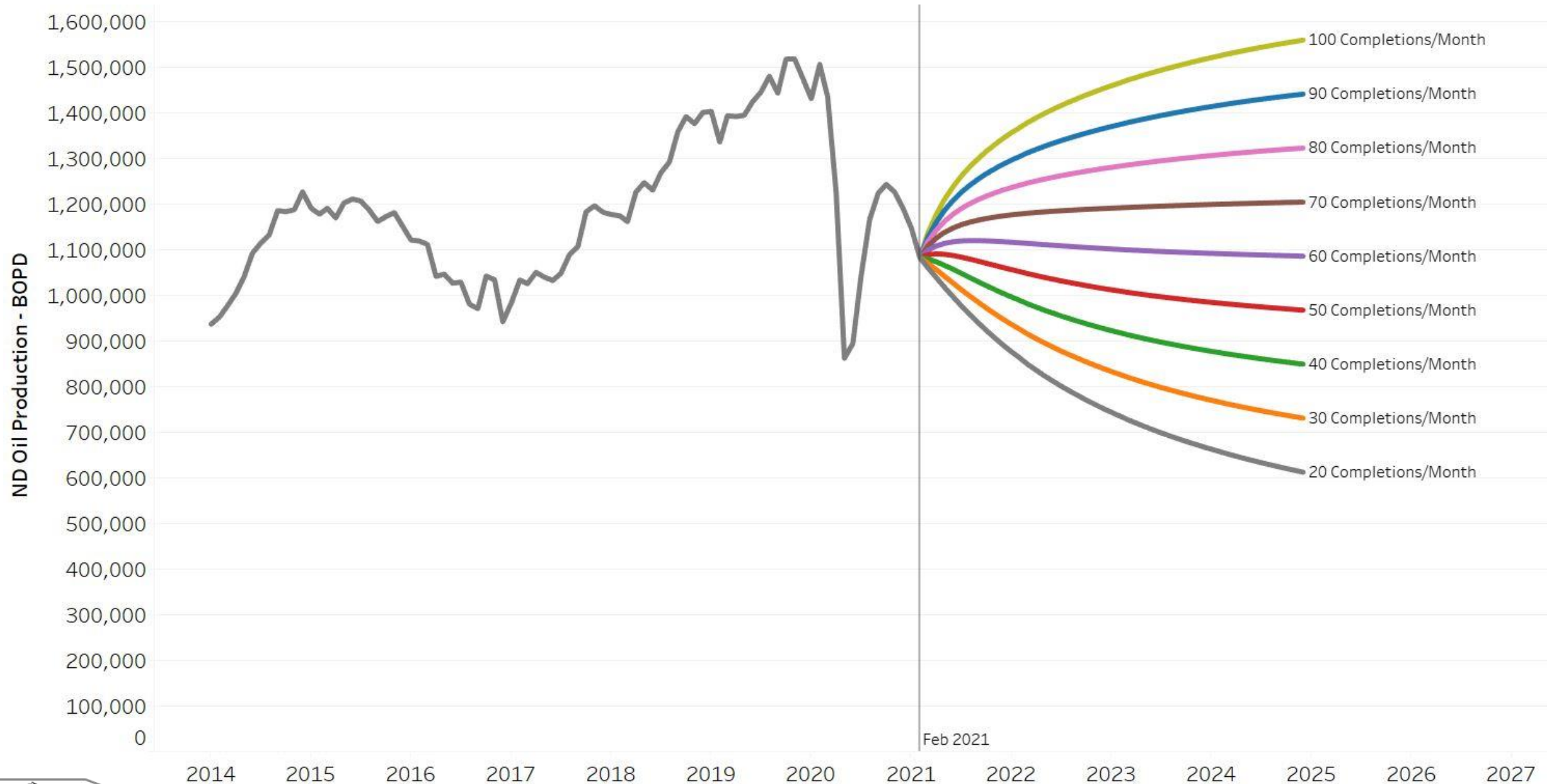
EIA Oil Price Outlook



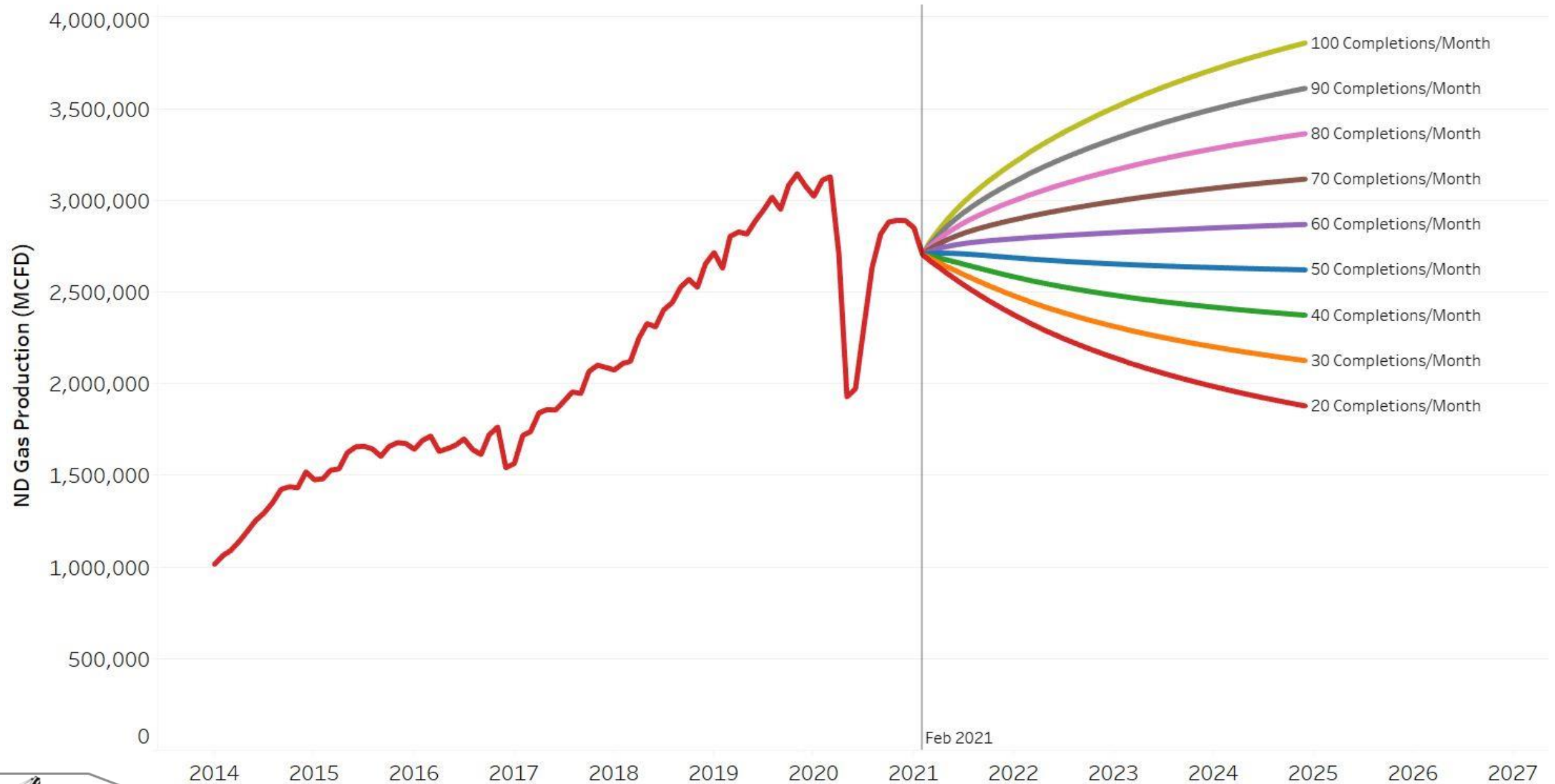
ND Oil Production: EIA Price Deck



Monthly Completion Scenarios - Oil

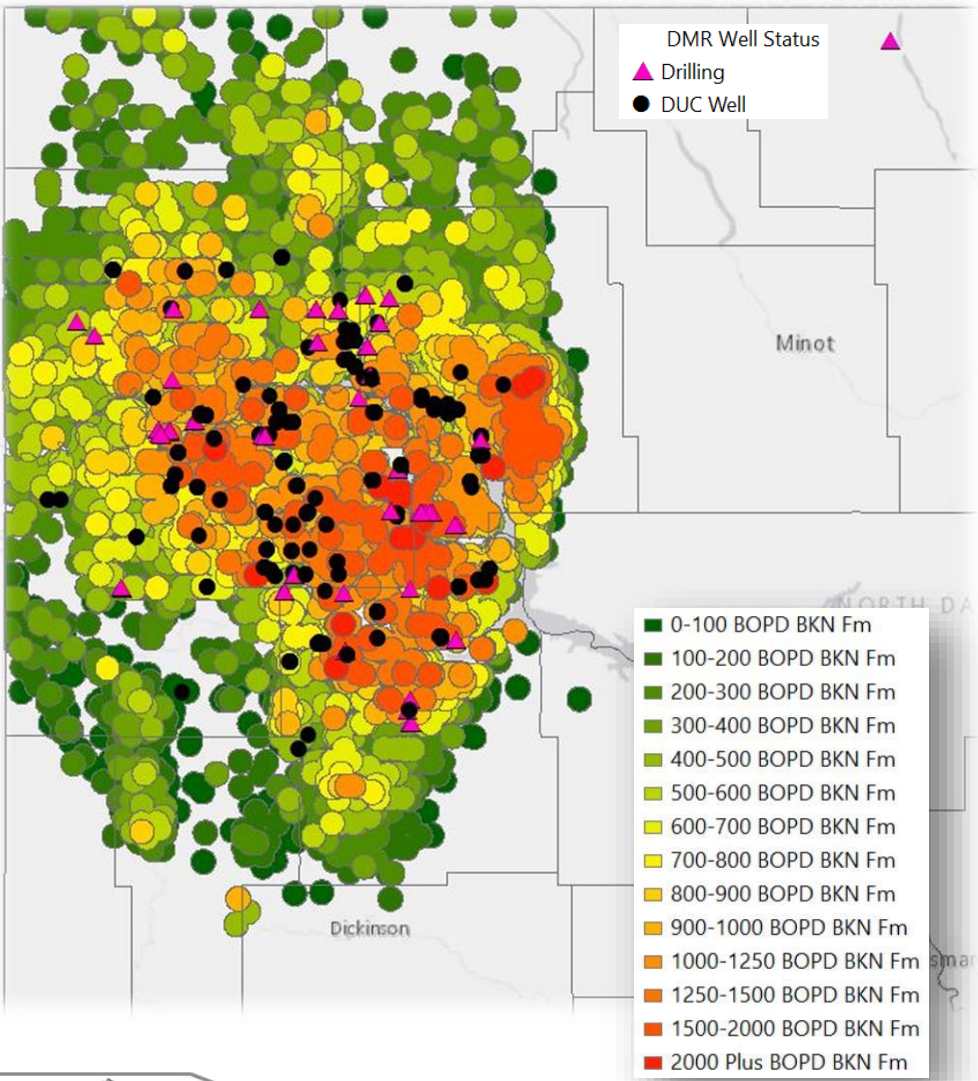


Monthly Completion Scenarios - Gas

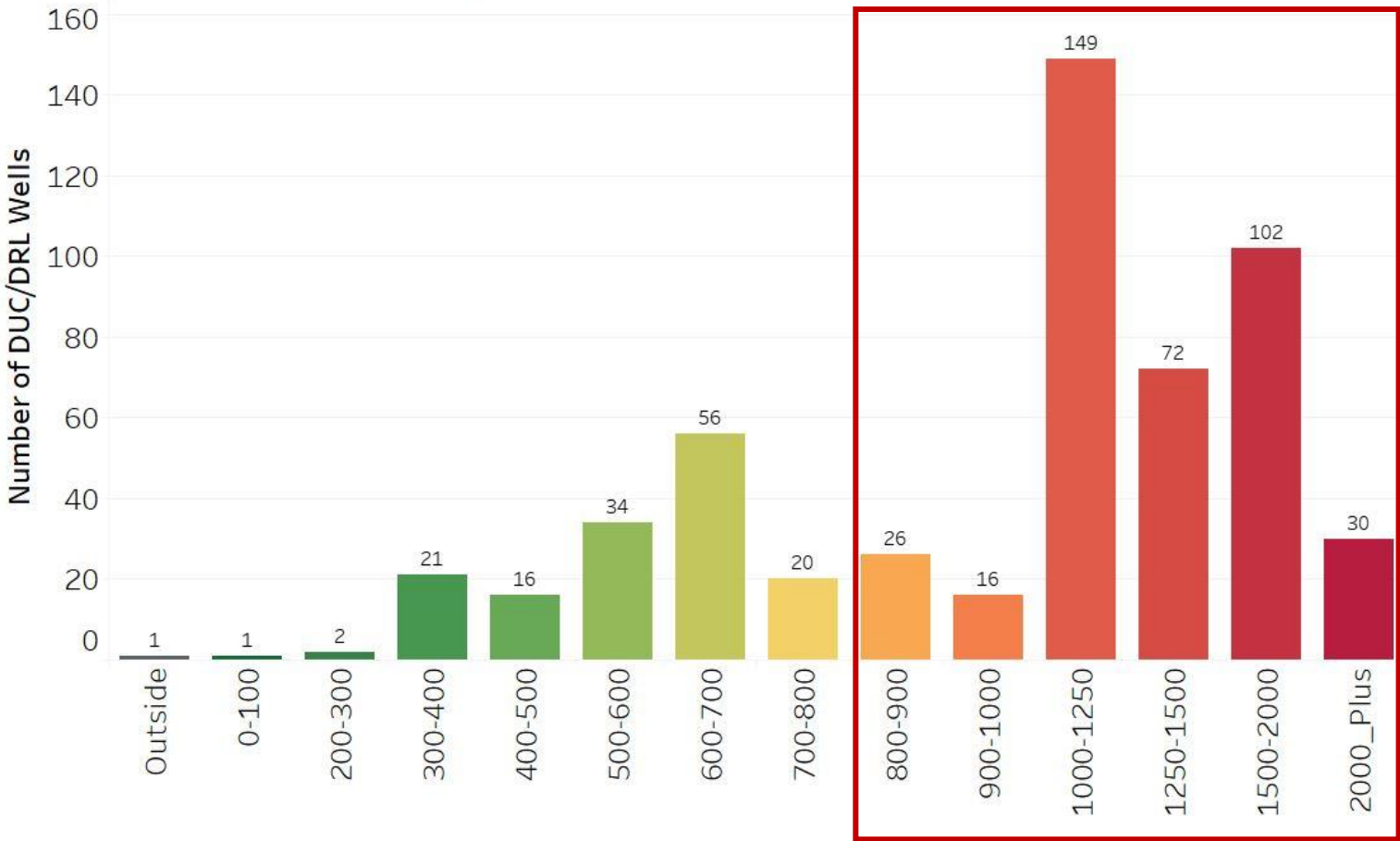


North Dakota Wells Waiting on Completion – April 2021

Bakken Formation



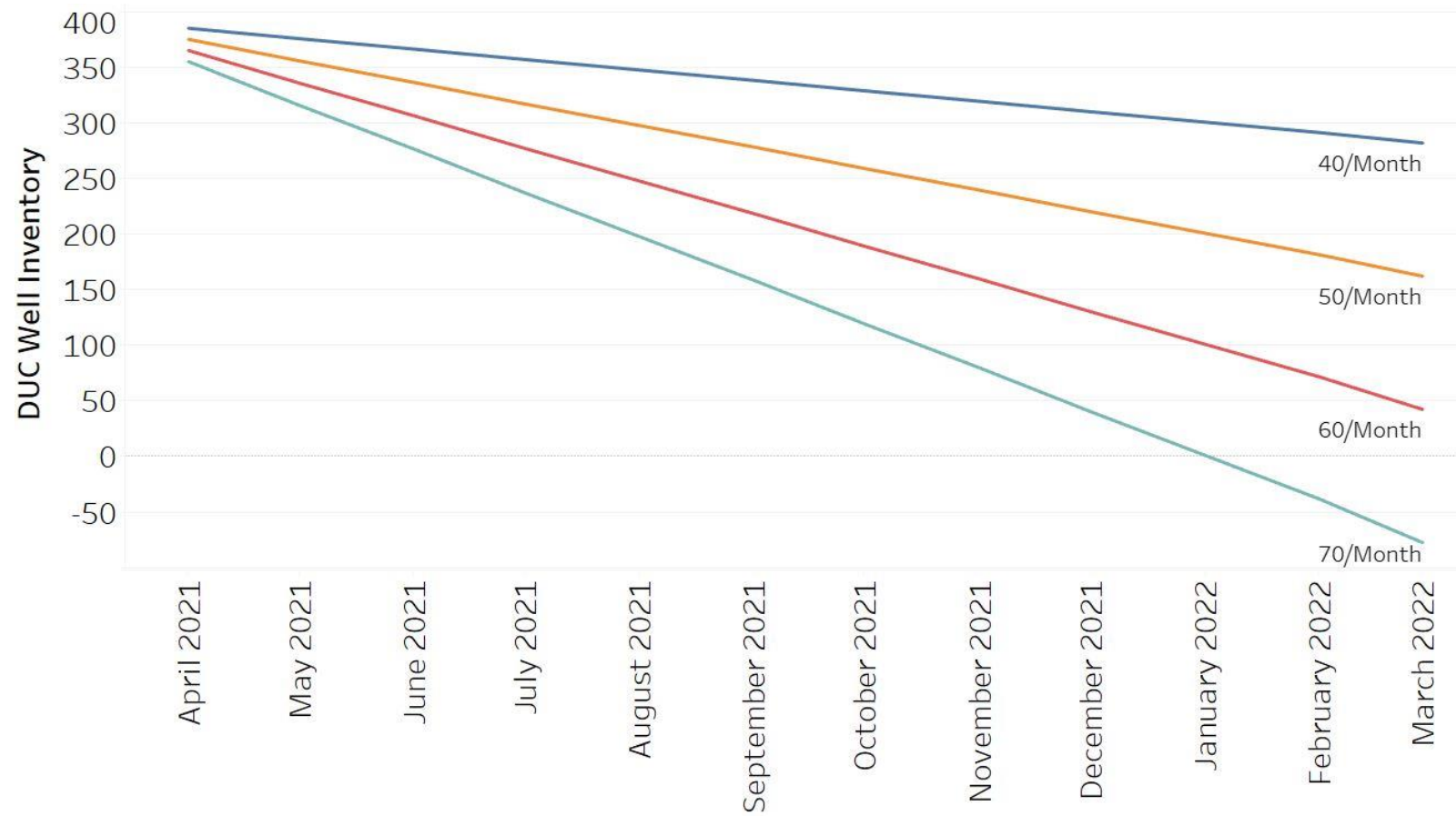
Bakken Geographic Production Zone (First Month BOPD)



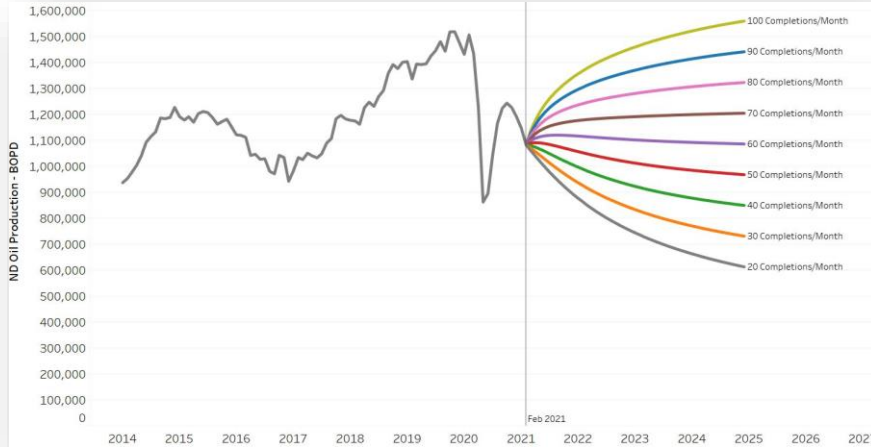
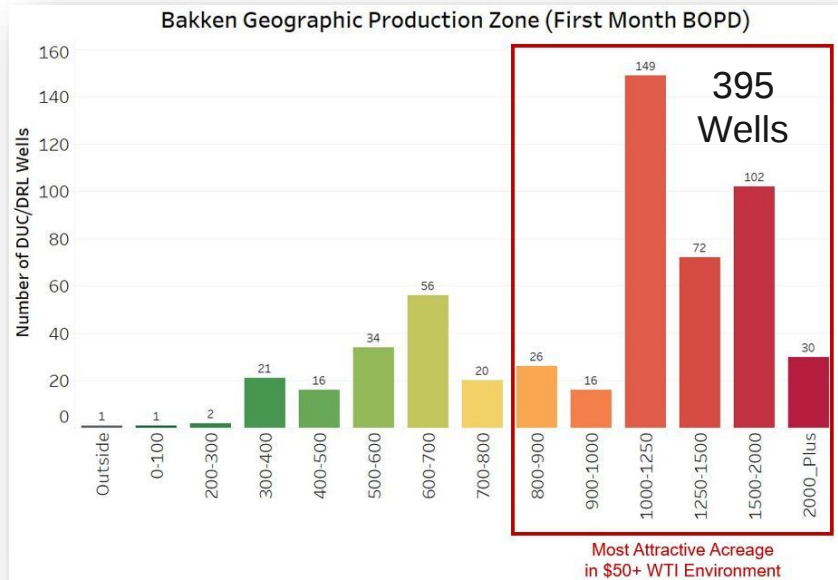
Most Attractive Acreage
in \$50+ WTI Environment



Completion Scenarios & DUC Inventory*

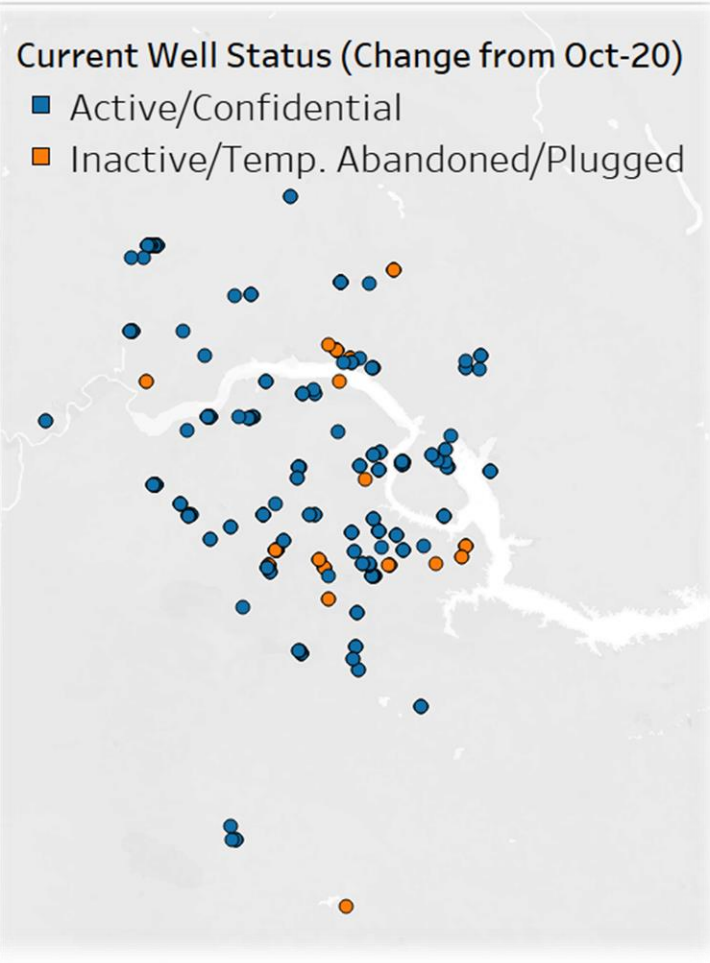


*Assumes 17 Rigs @ 1.8 New Wells Per Month



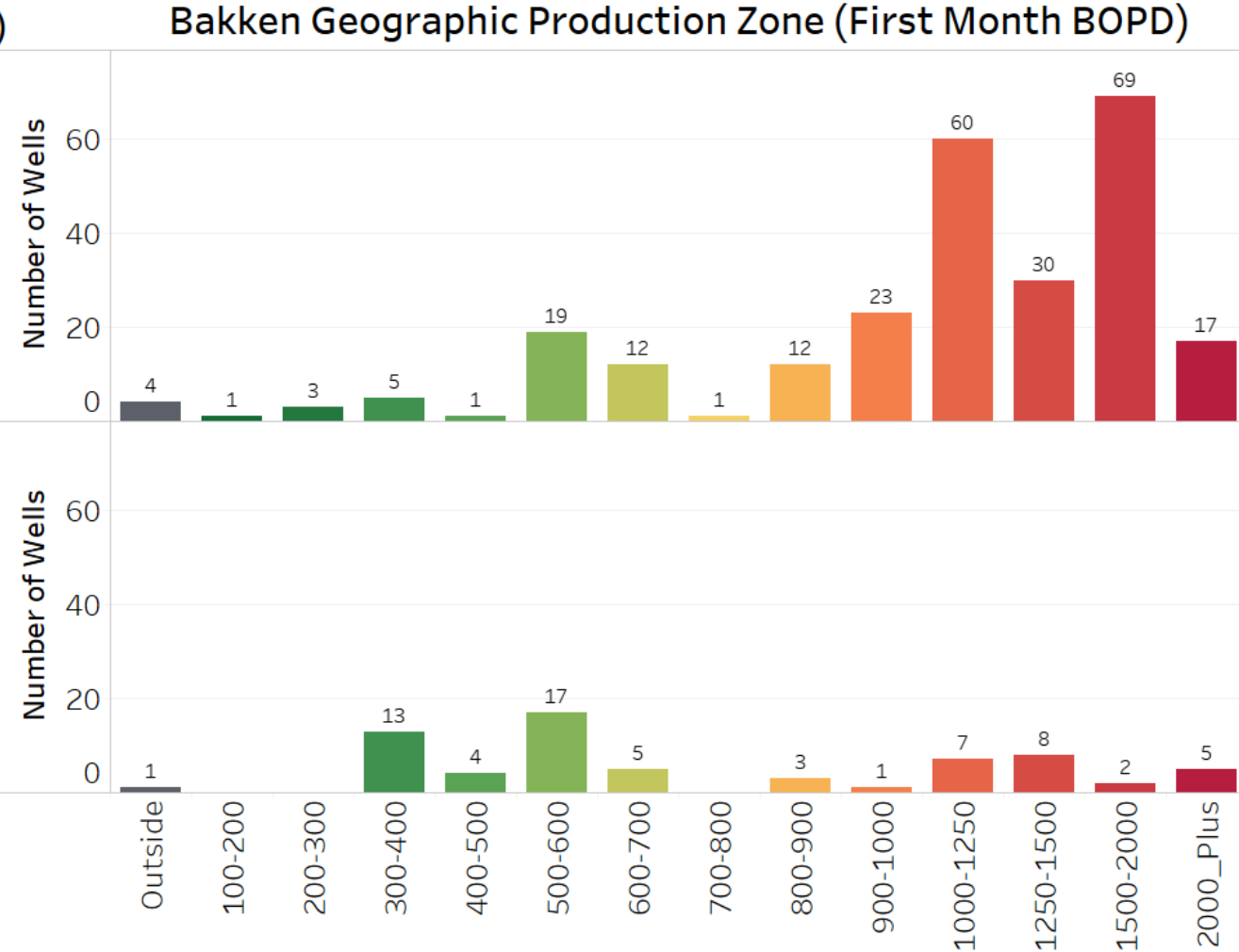
Where are they now?

(October 2020 to April 2021 Status Change)

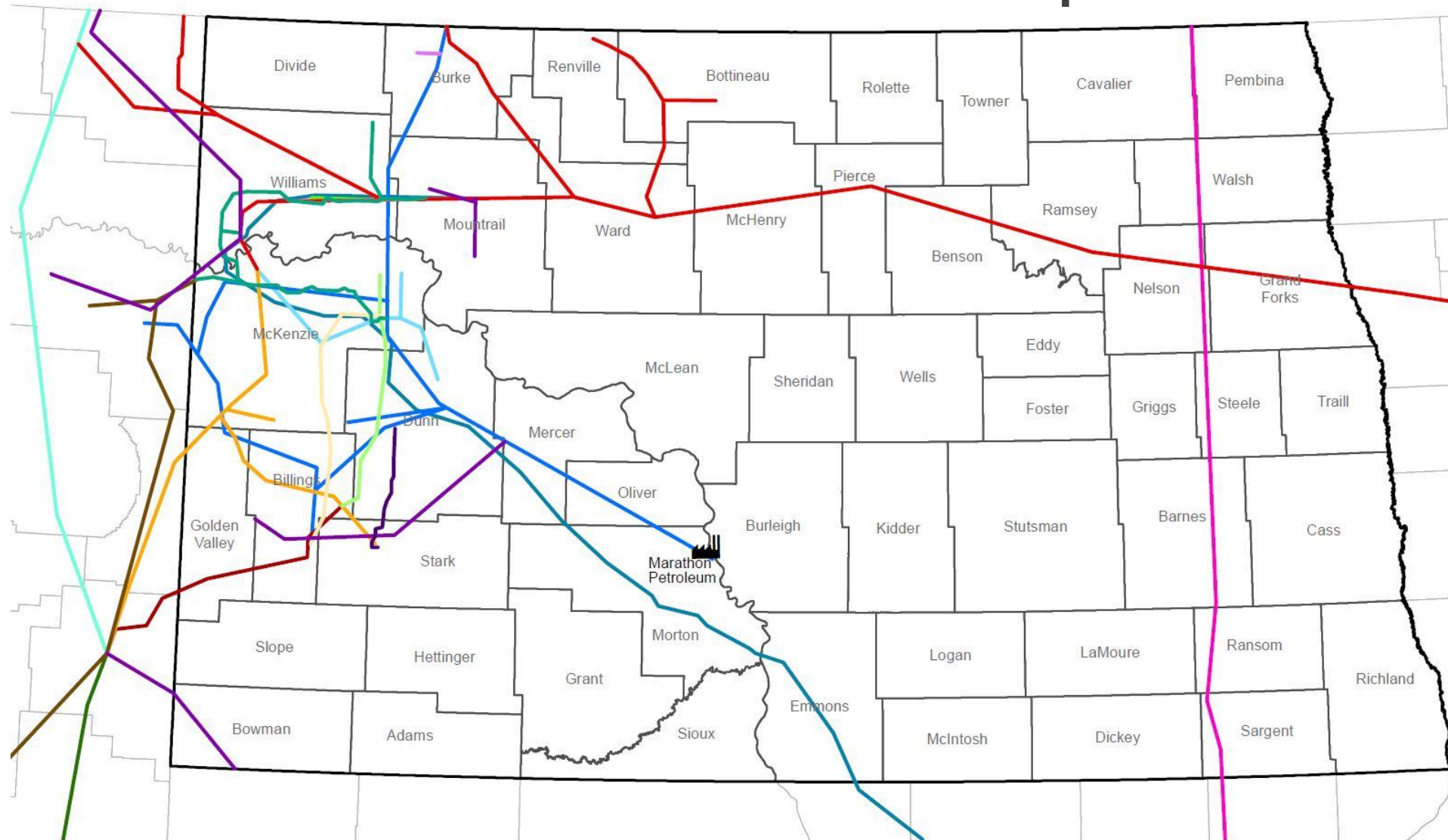


Well Status (Apr 2021)

Active/Confidential



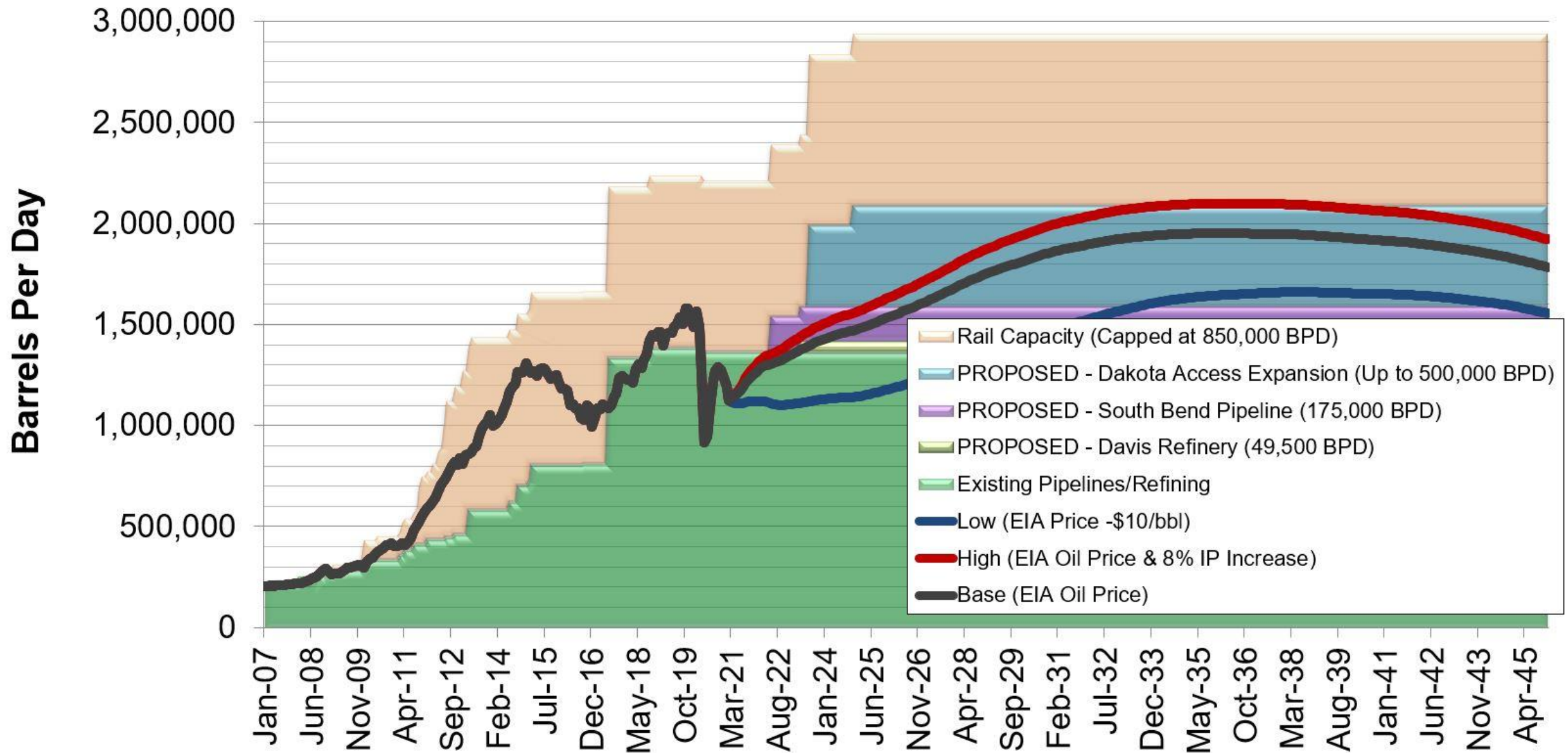
North Dakota Oil Transmission Pipelines



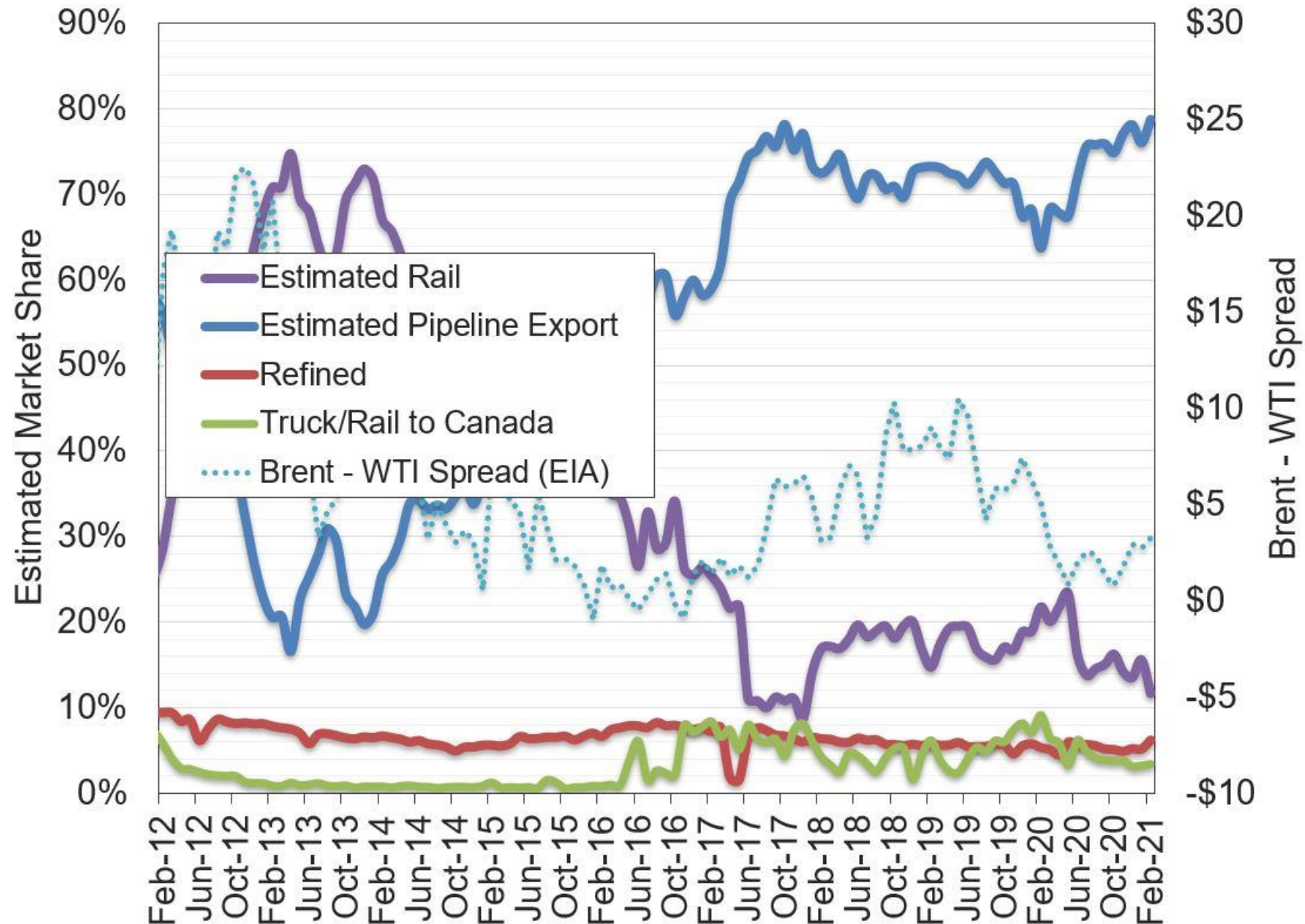
- | | | | | | |
|--------------------|-----------------|---------------|------------|-------------------|----------|
| Refinery | Basin Transload | Butte | Double H | Hiland | Bridger |
| Bakken Oil Express | Belle Fourche | Crestwood | Enbridge | Keystone Pipeline | Targa |
| BakkenLink | Bridger | Dakota Access | Four Bears | Little Missouri | Marathon |



Williston Basin Oil Production & Export Capacity, BOPD



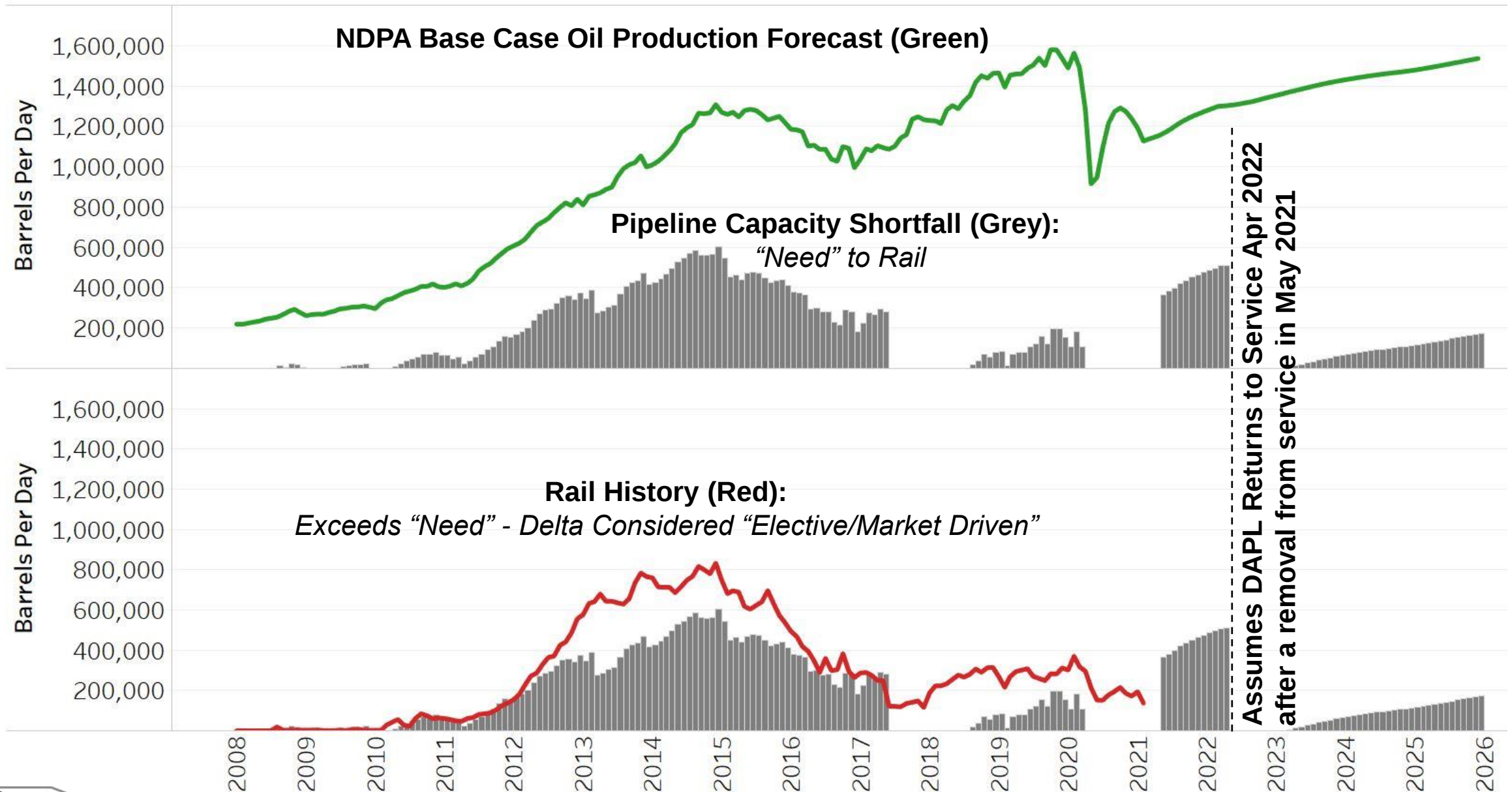
Estimated Williston Basin Oil Transportation



Estimated ND Rail Export Volumes



Rail Transport Outlook if DAPL is Shutdown



Natural Gas Update



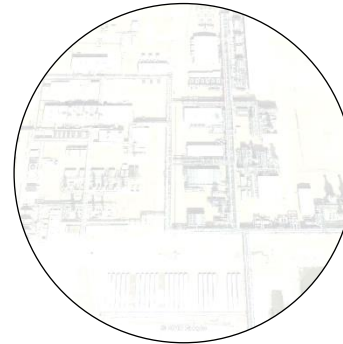
Production

- Technology
- Markets



Gathering

- Capacity
- Connections



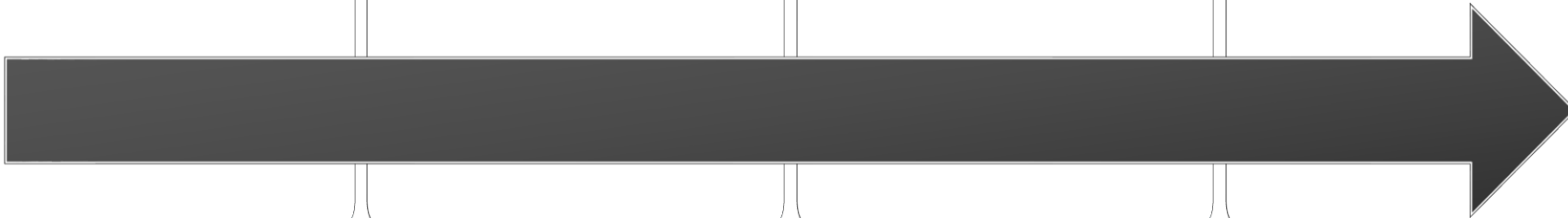
Processing

- Capacity
- Location

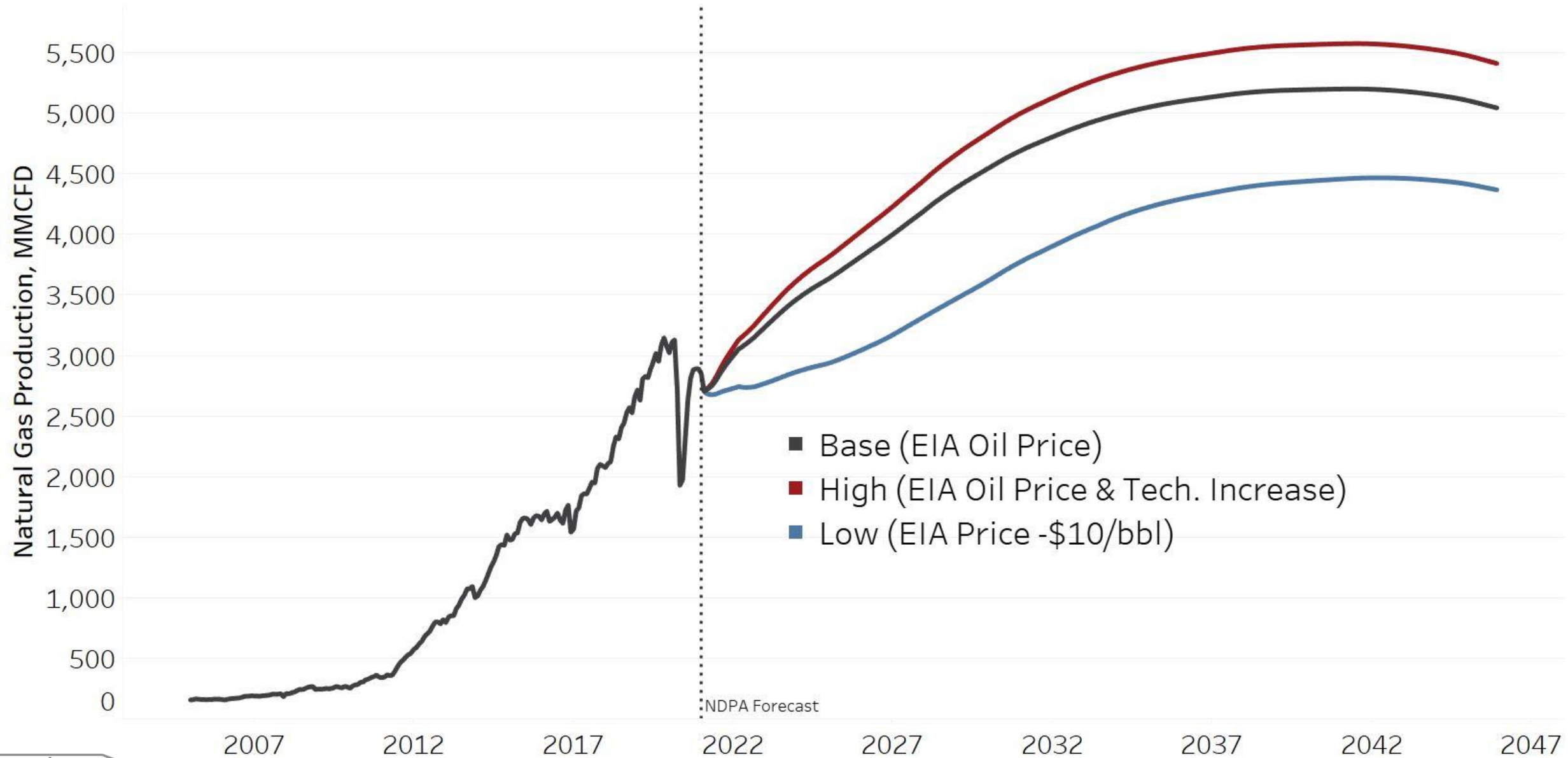


Transmission

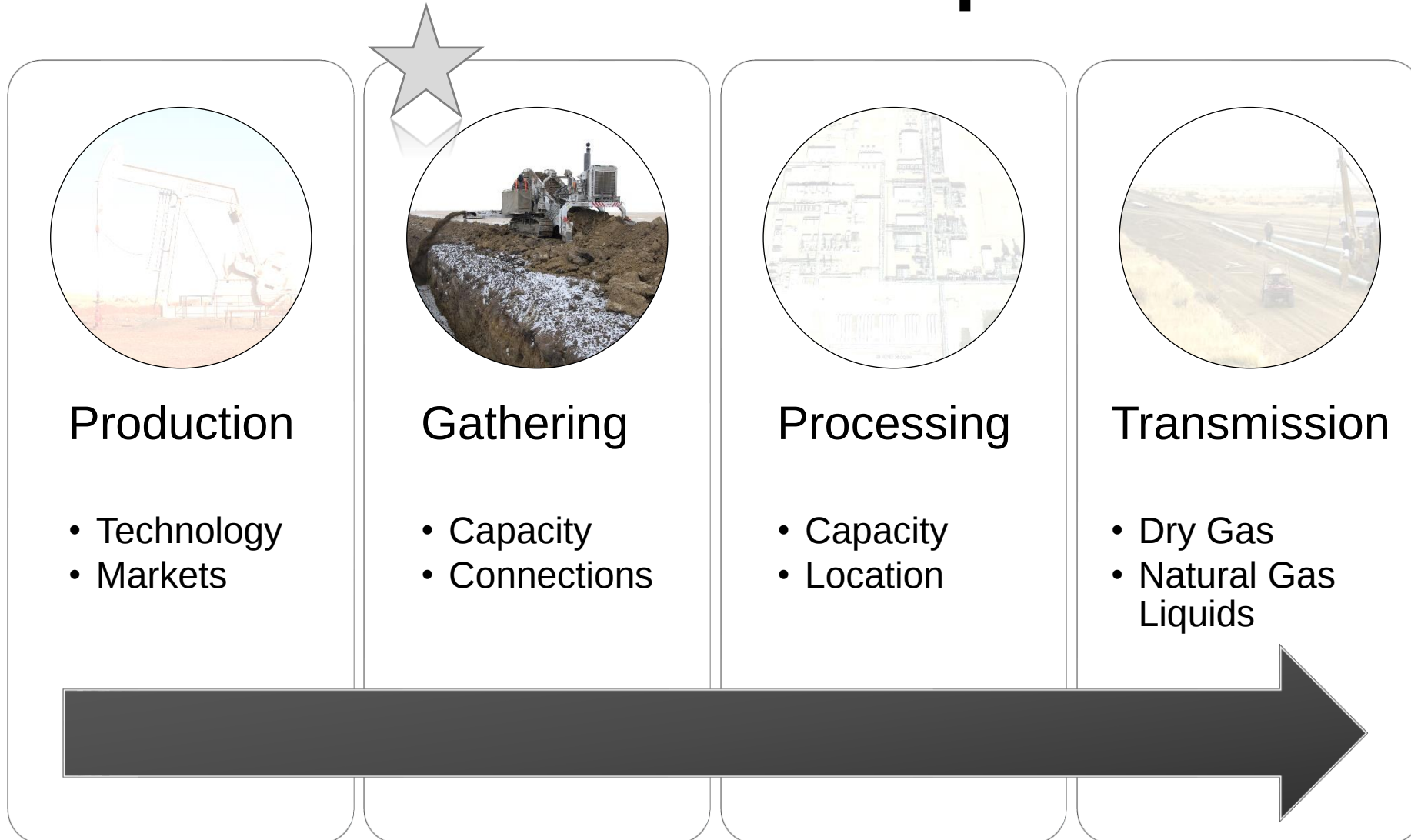
- Dry Gas
- Natural Gas Liquids



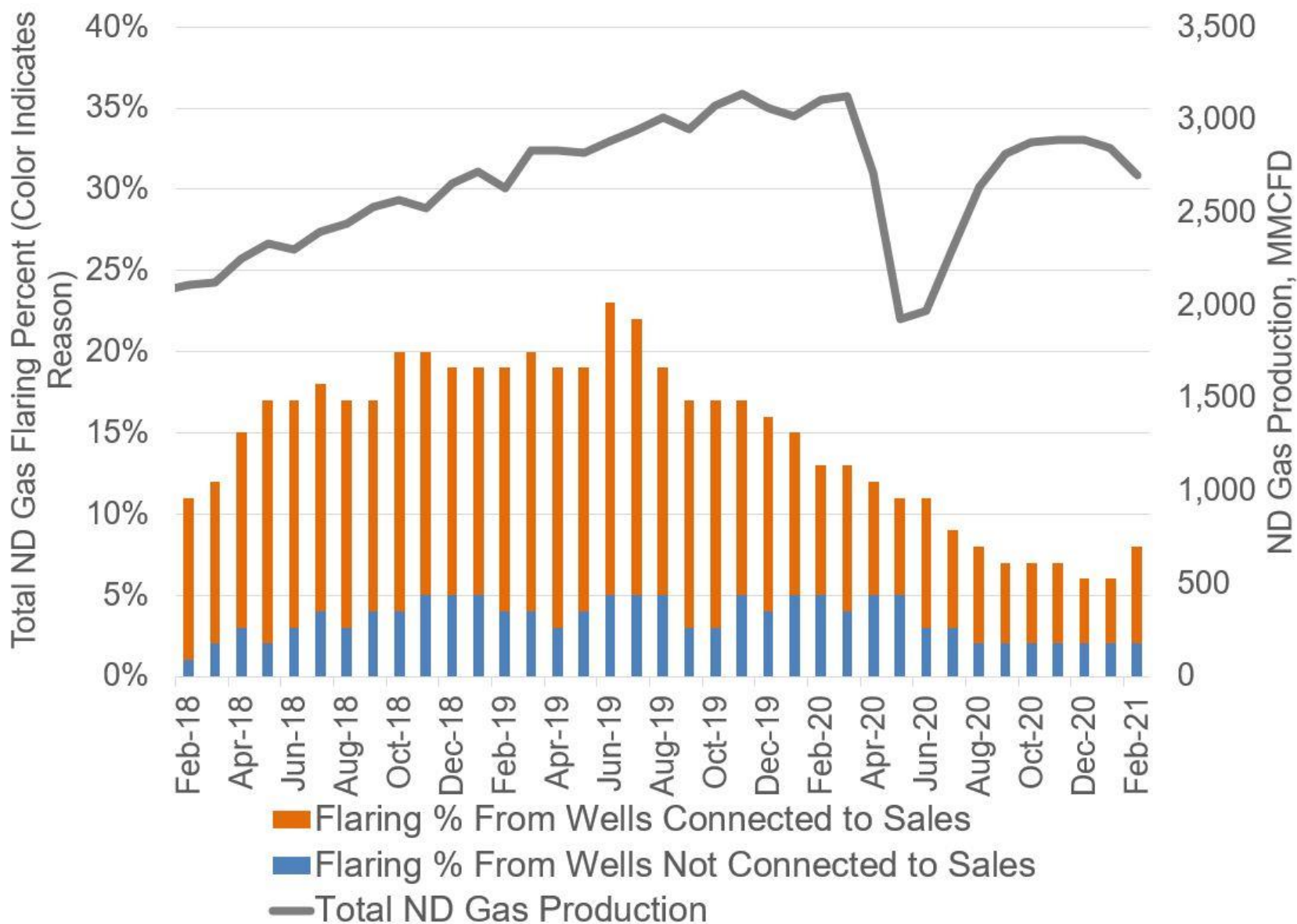
ND Gas Production: EIA Price Deck



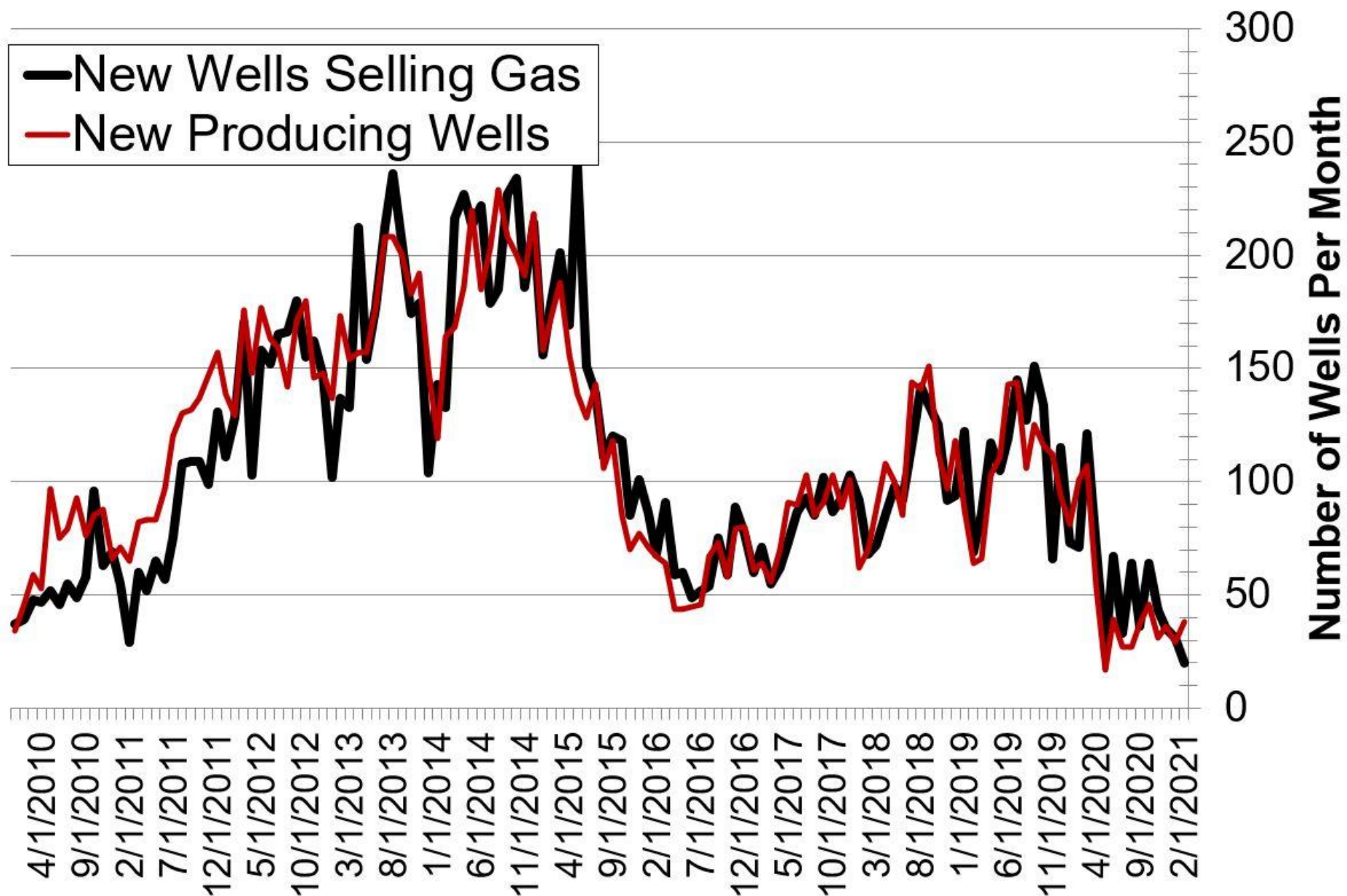
Natural Gas Update



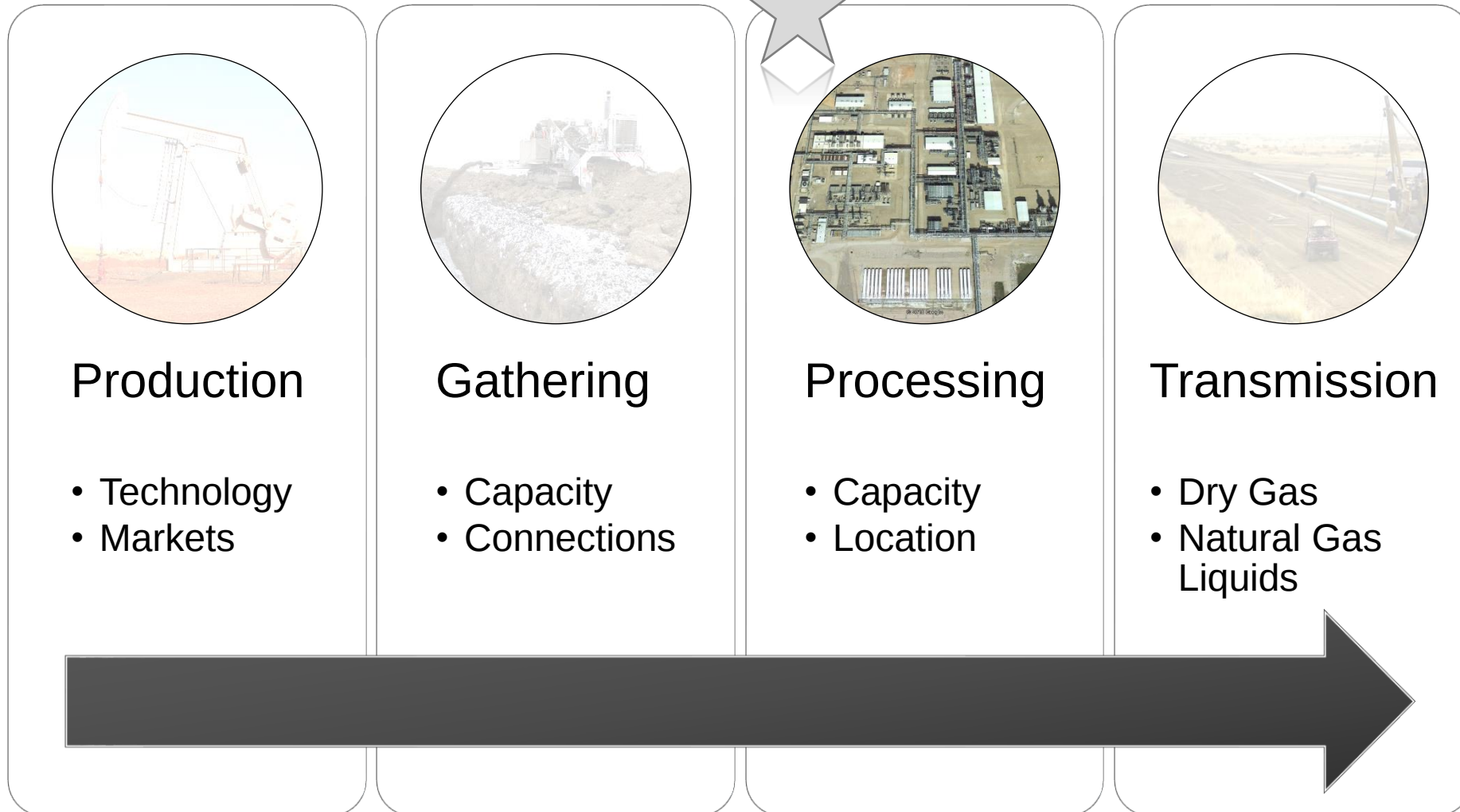
Solving the Flaring Challenge



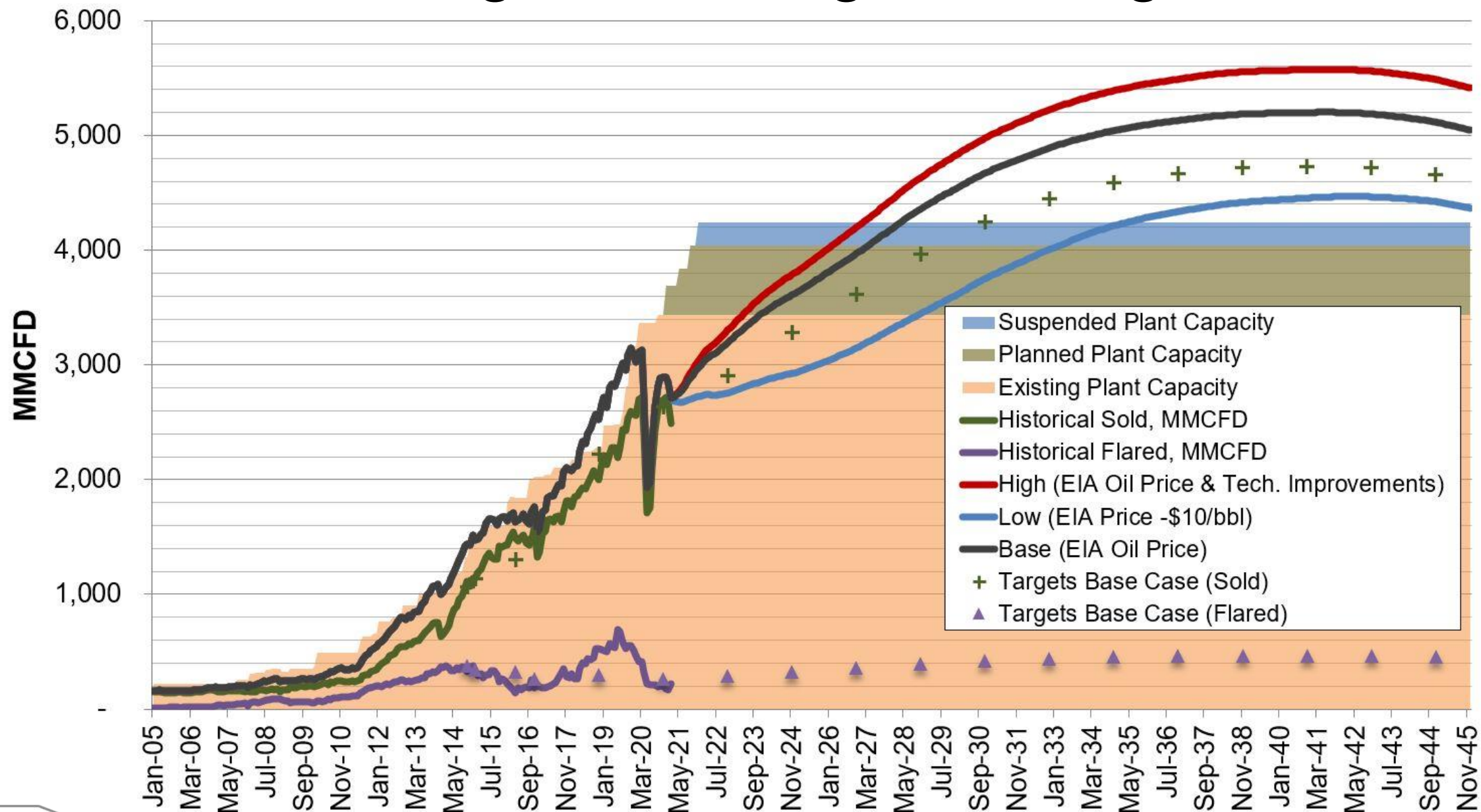
Solving the Flaring Challenge



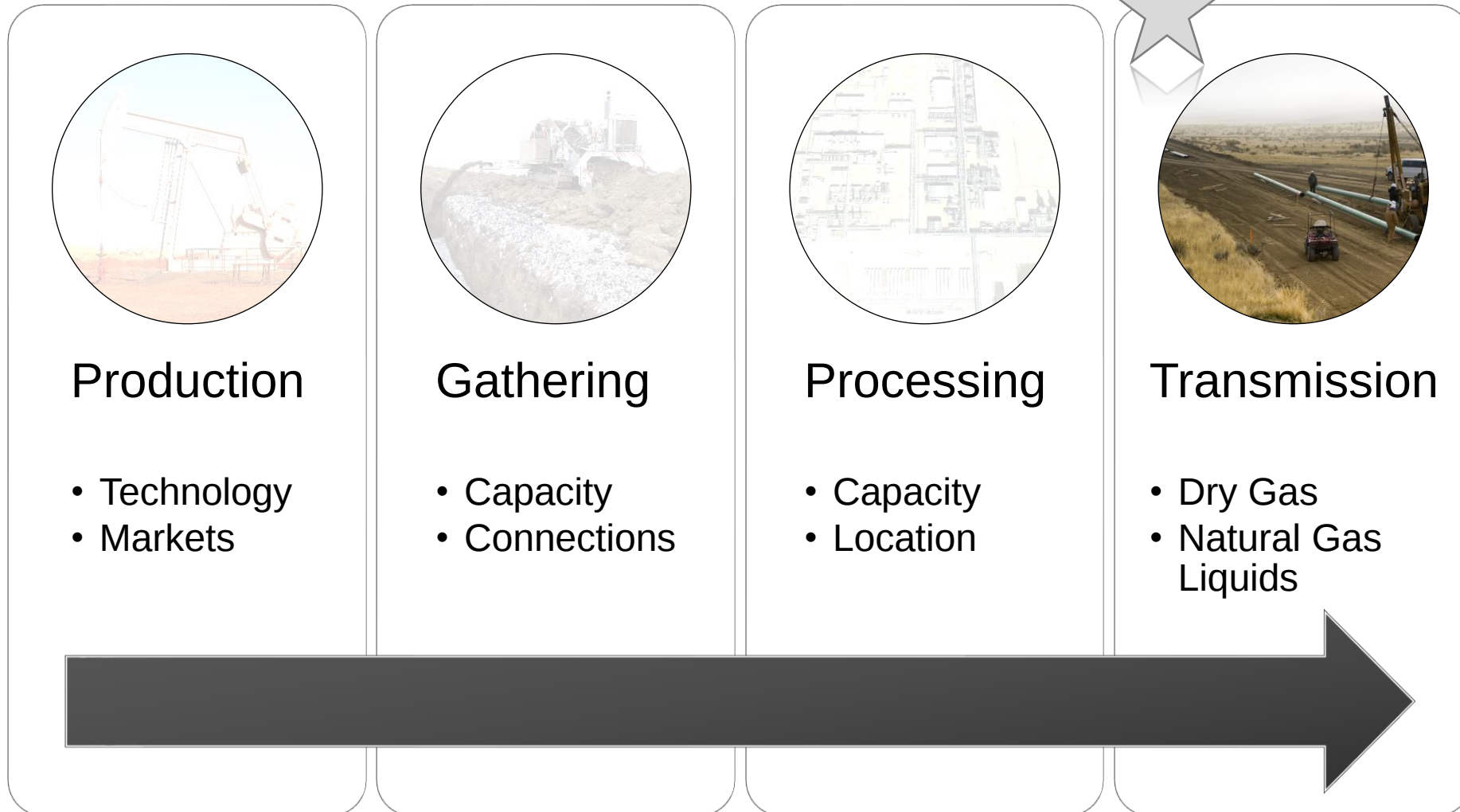
Natural Gas Update



Solving the Flaring Challenge



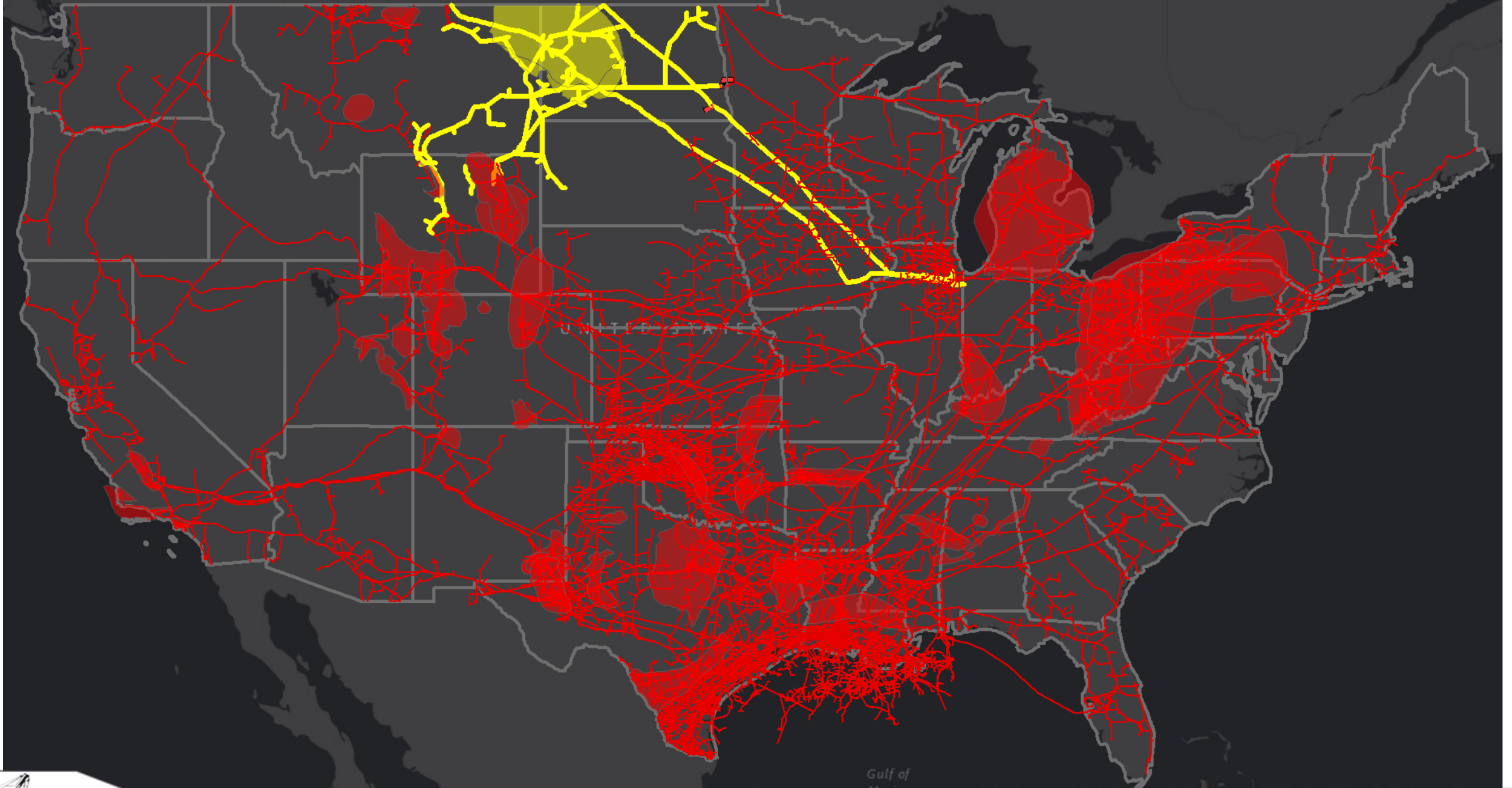
Natural Gas Update



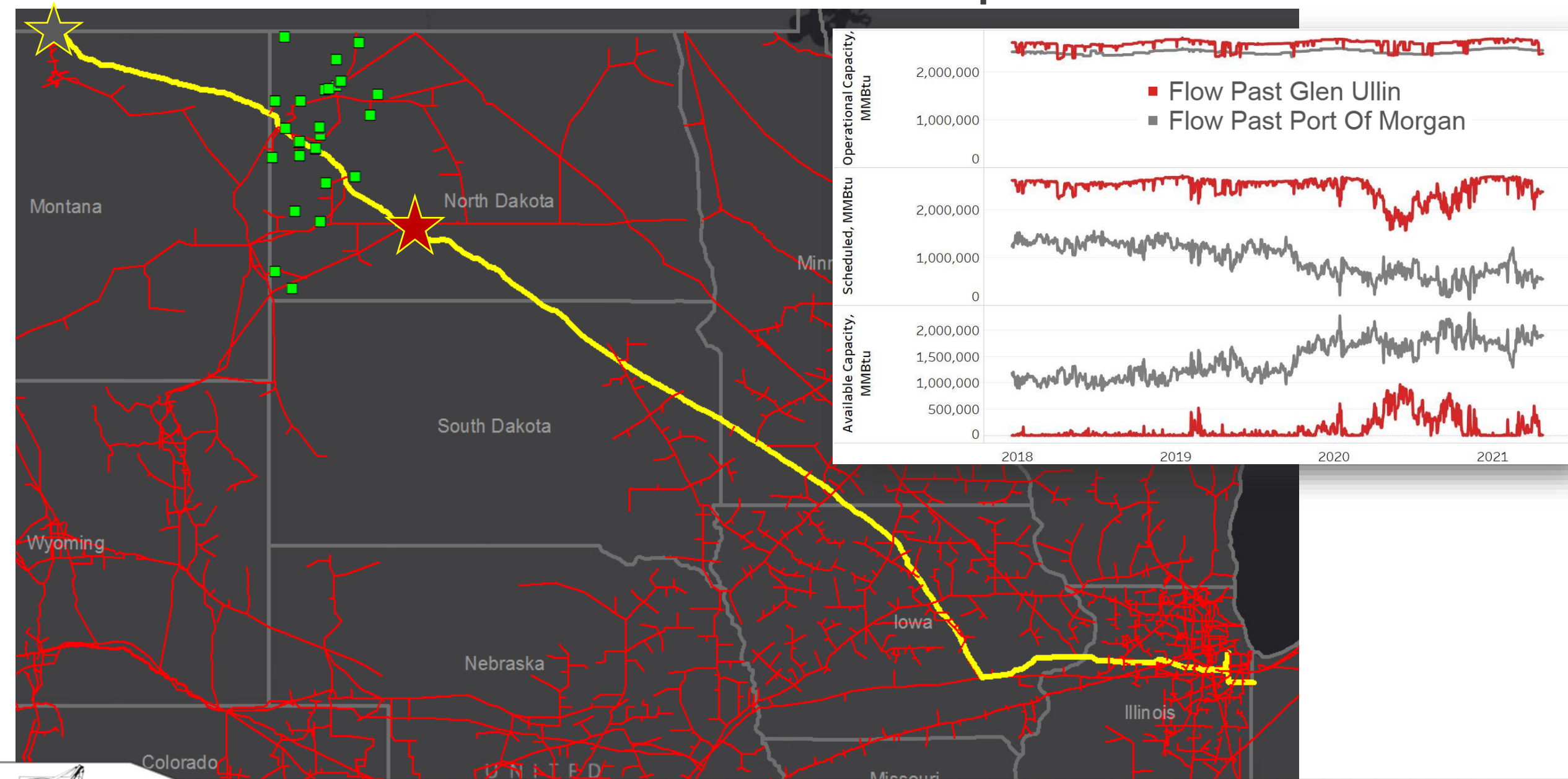
Major Gas Pipeline Infrastructure



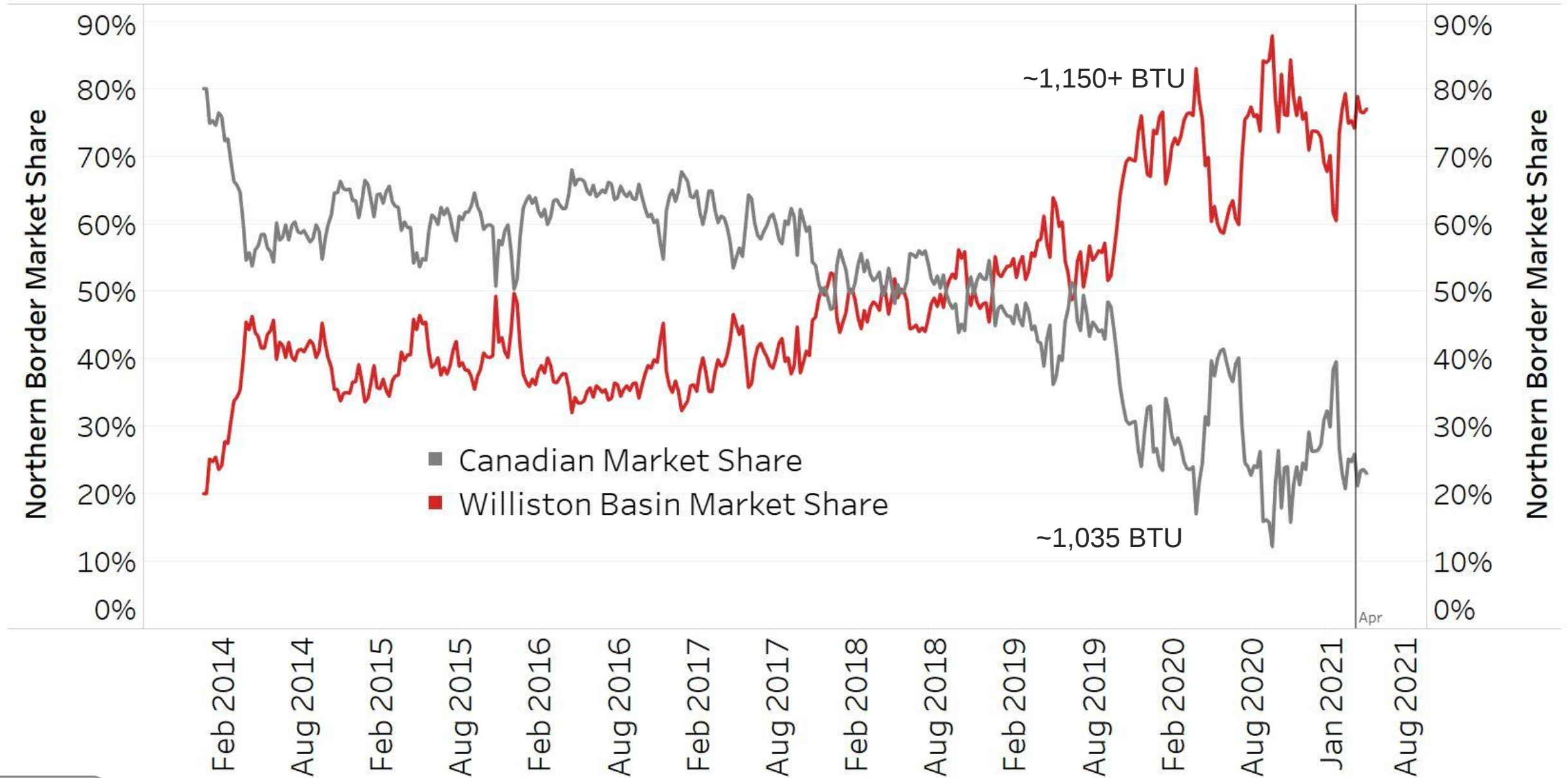
Bakken Natural Gas Infrastructure



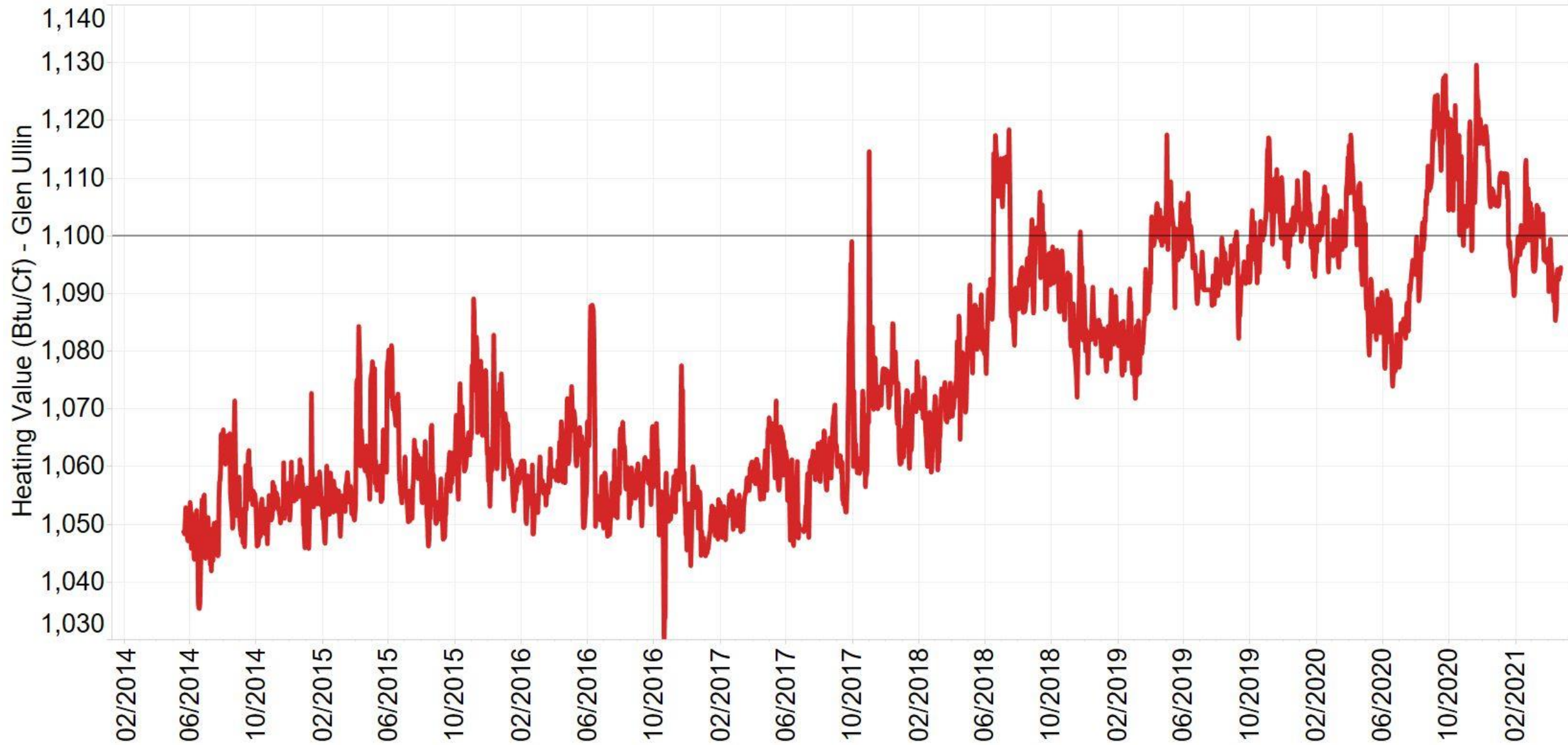
Northern Border Pipeline



Northern Border Pipeline Market Share

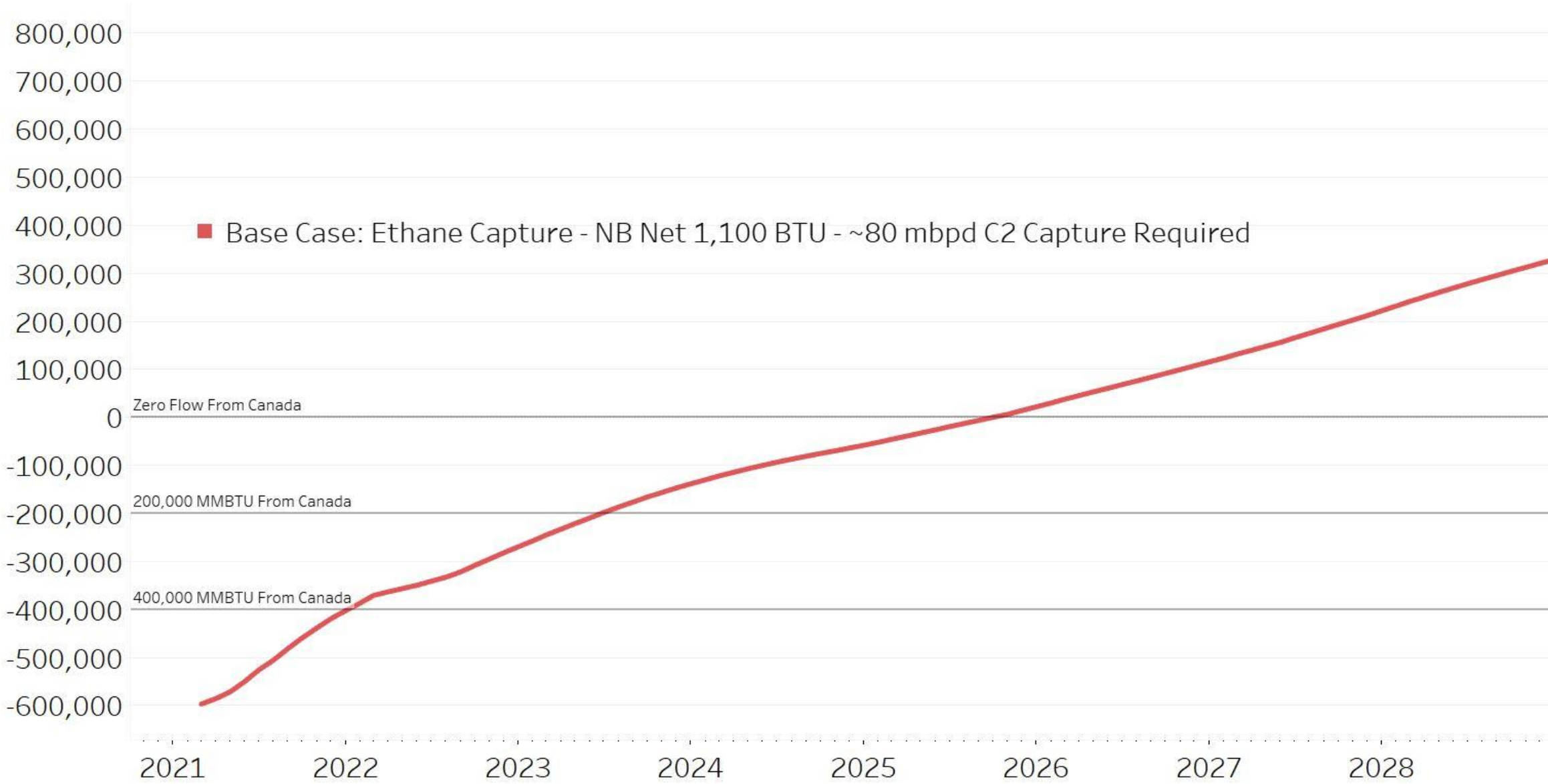


Northern Border BTU at Glen Ullin, ND

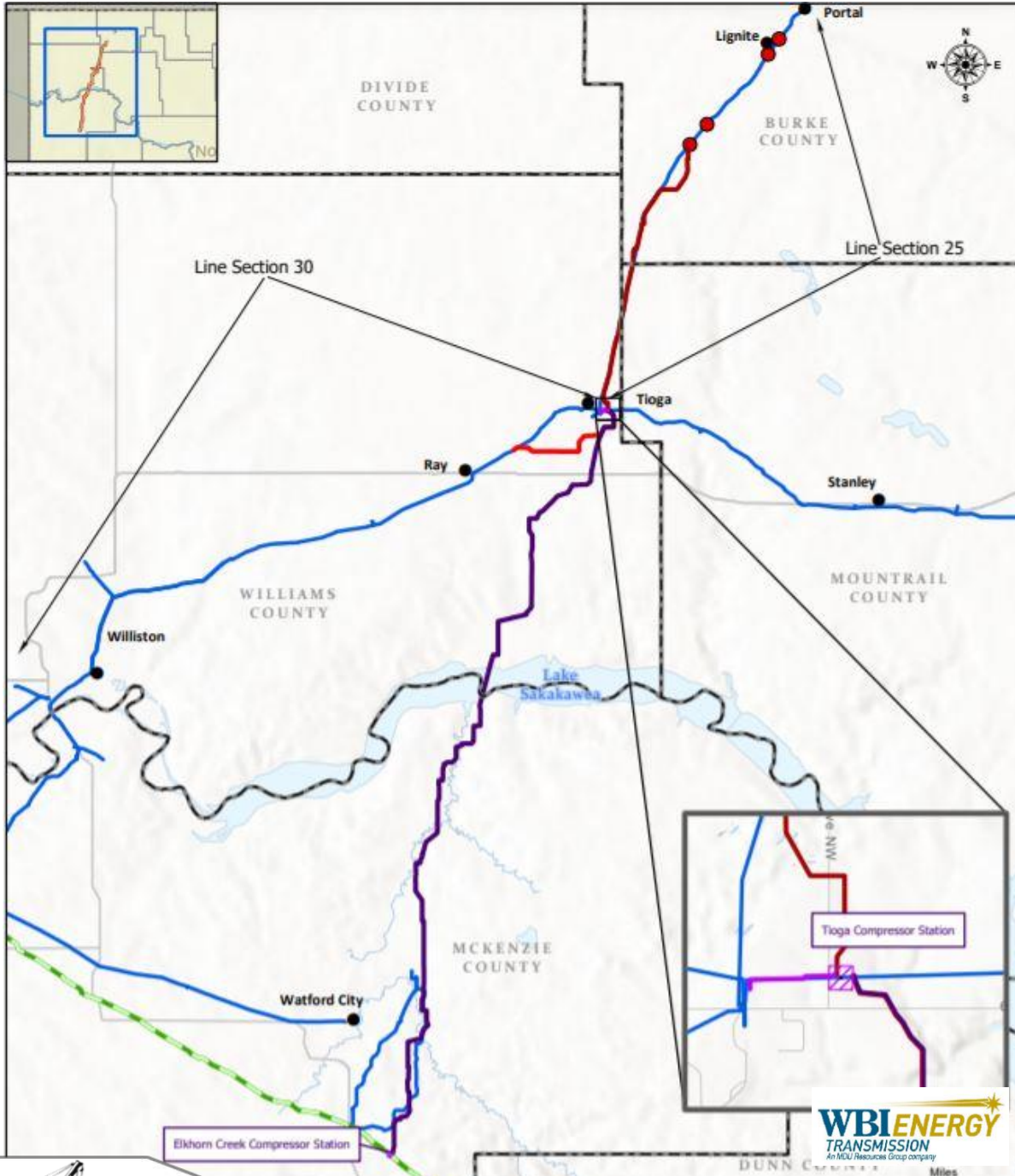


Northern Border – BTU Calculations*

Case 1 Gas Transmission Capacity Needs, MMBTU/Day



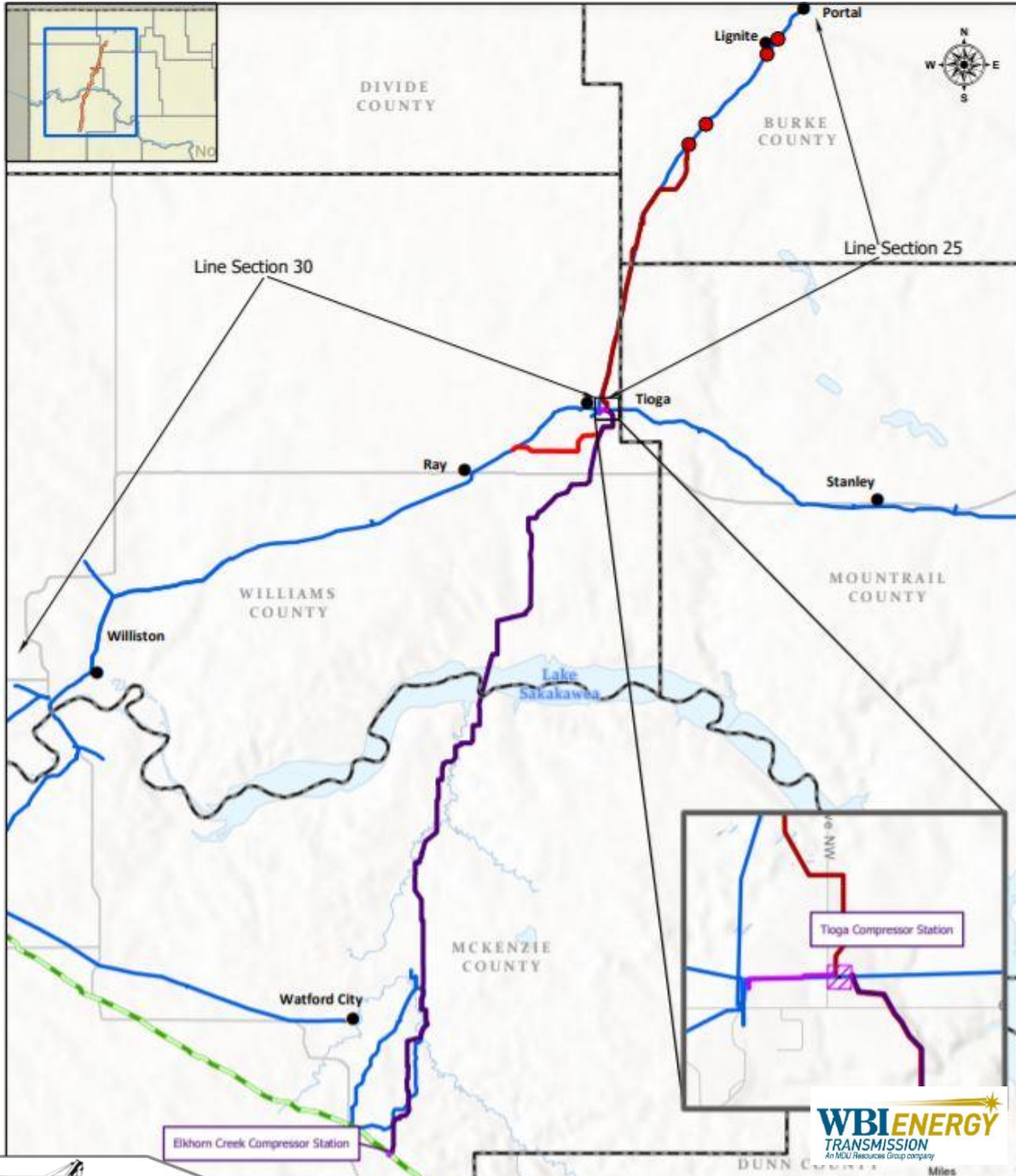
WBI Energy – North Bakken Expansion Project



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





Potential North Dakota Oil Tax Impact

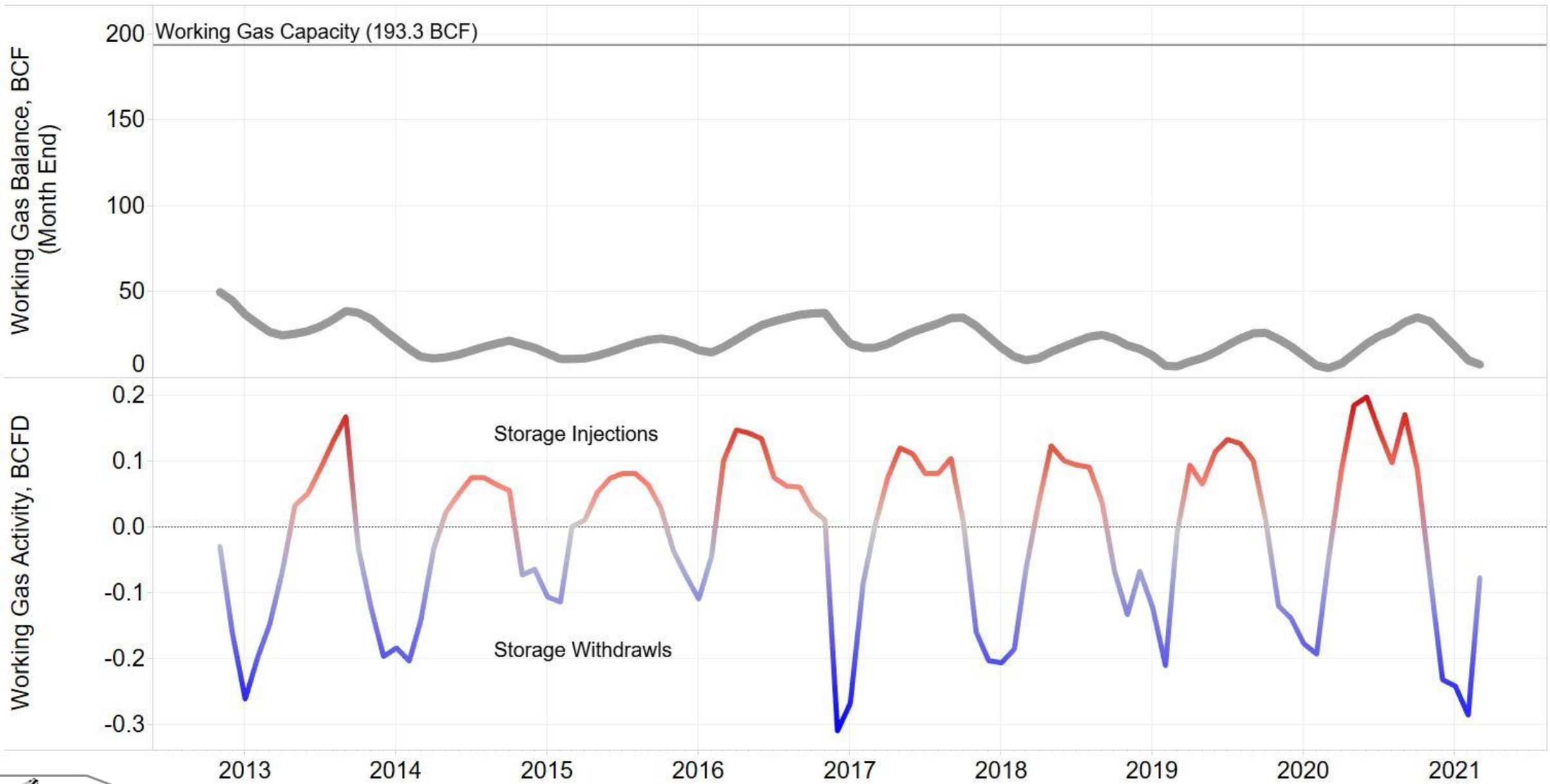
250,000 MCFD Calculation

- = 137,360 BOPD at 2 GOR, 0.7 tailgate/inlet factor, and meeting gas capture targets
- Assume \$54 wellhead oil price and 9.6% avg. tax rate
- = \$1,017,000+ per day

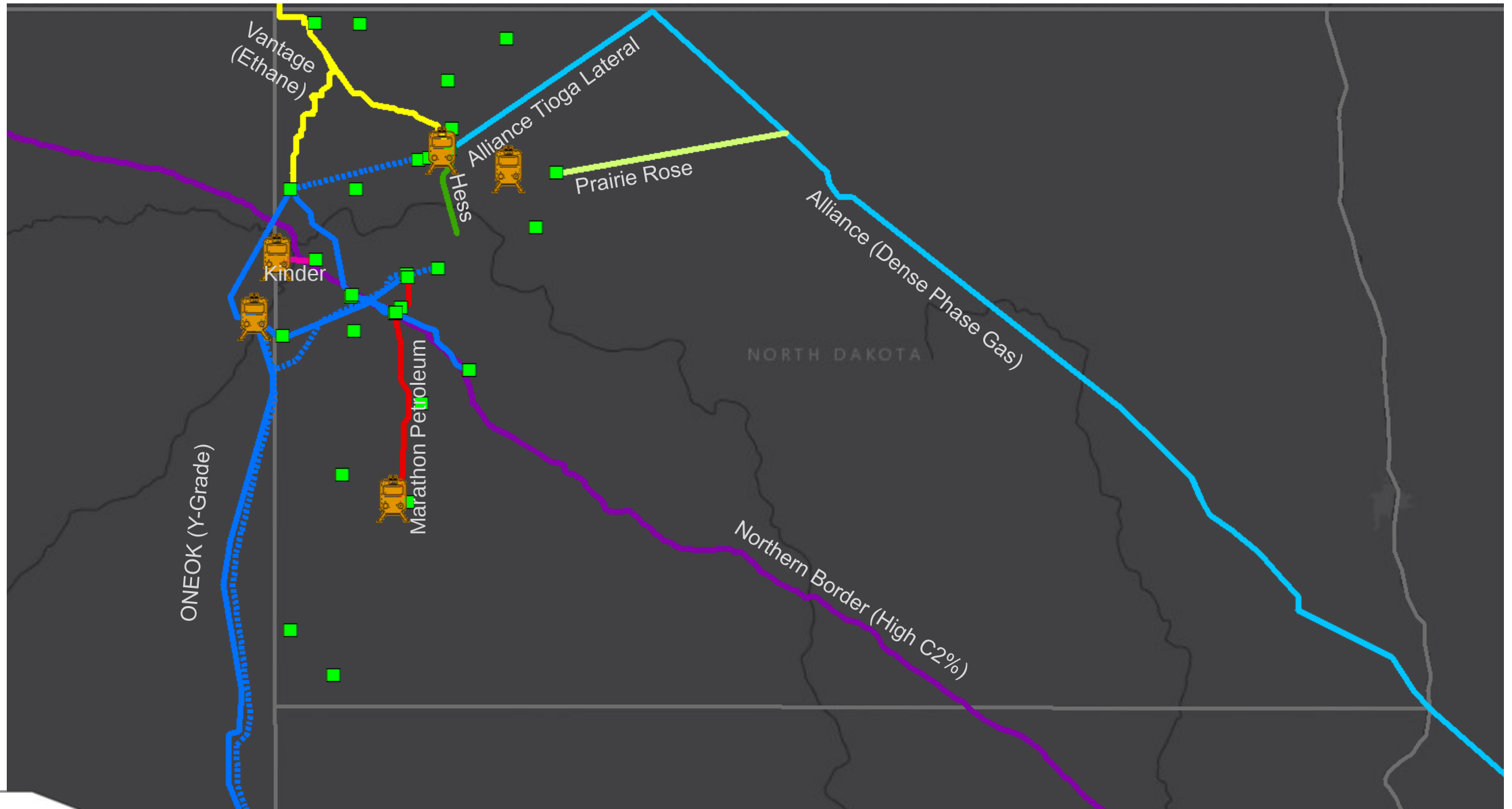
~\$30.9 million per month



Residue Gas Storage Update – WBI Energy

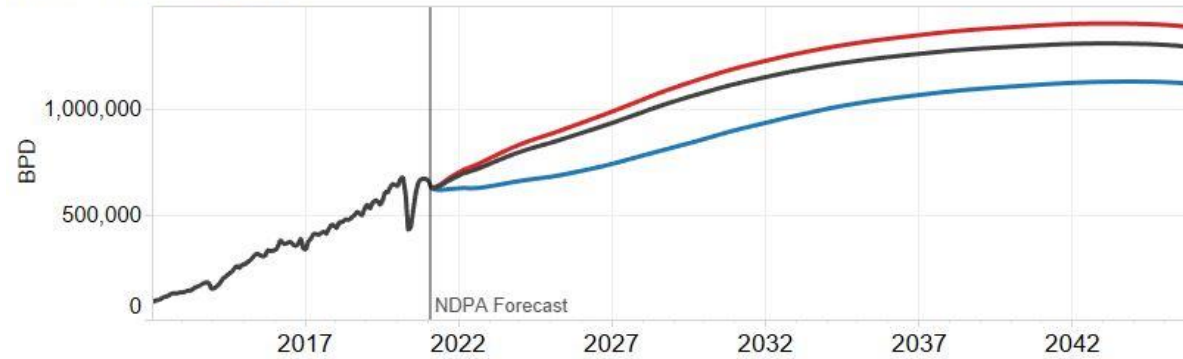


Regional NGL Infrastructure

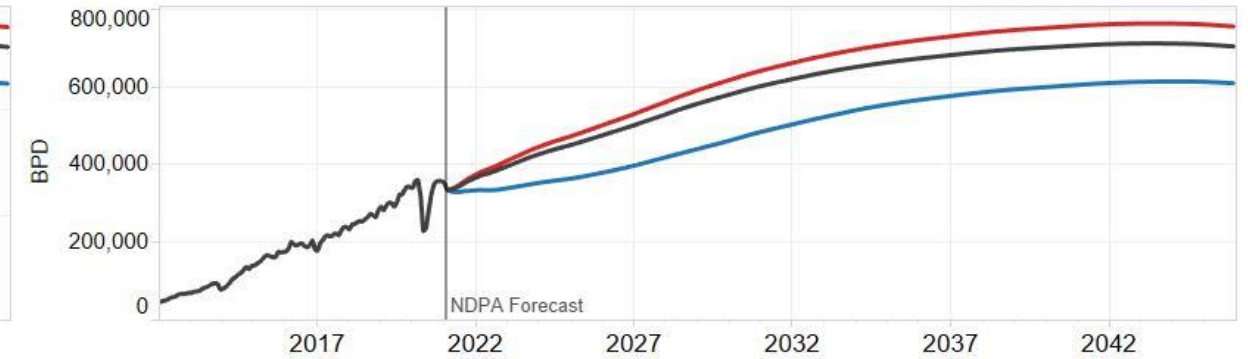


North Dakota Captured* NGL's

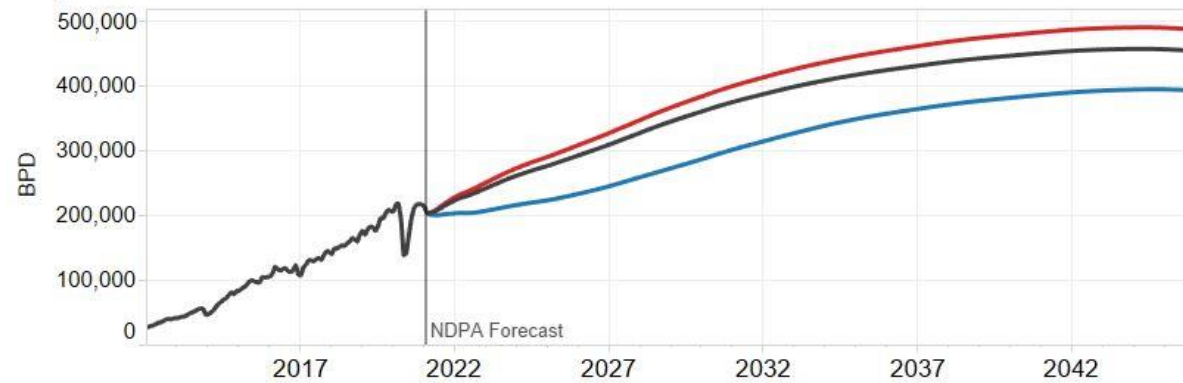
All Natural Gas Liquids



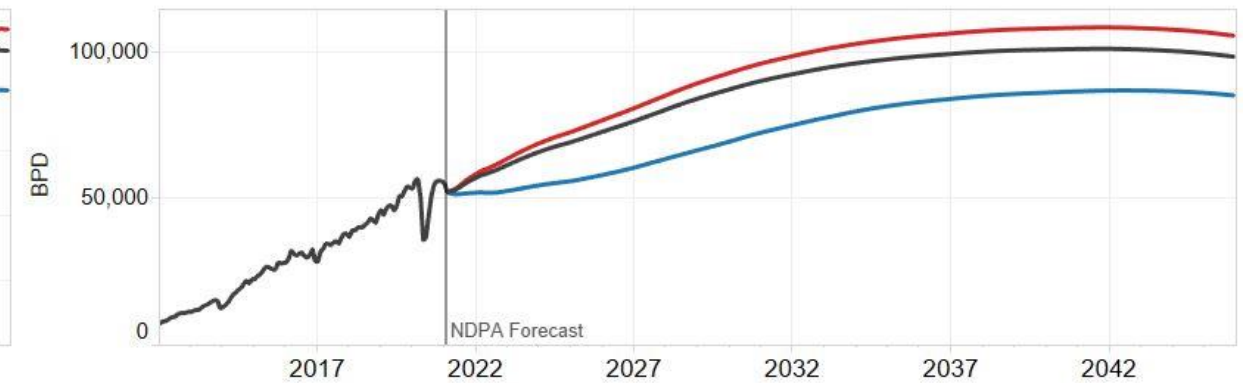
Ethane



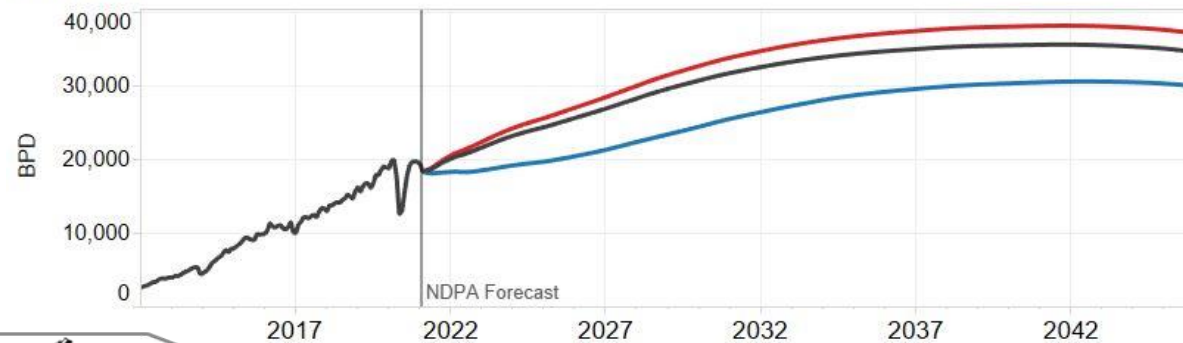
Propane



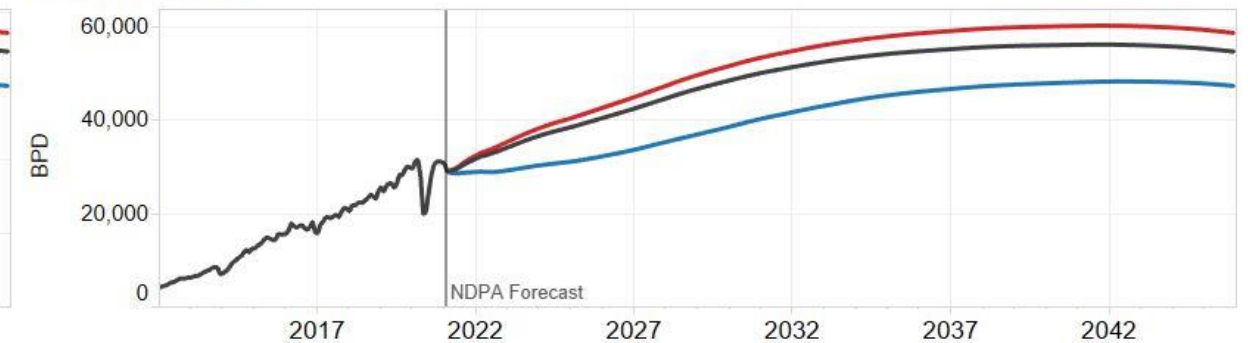
Butane



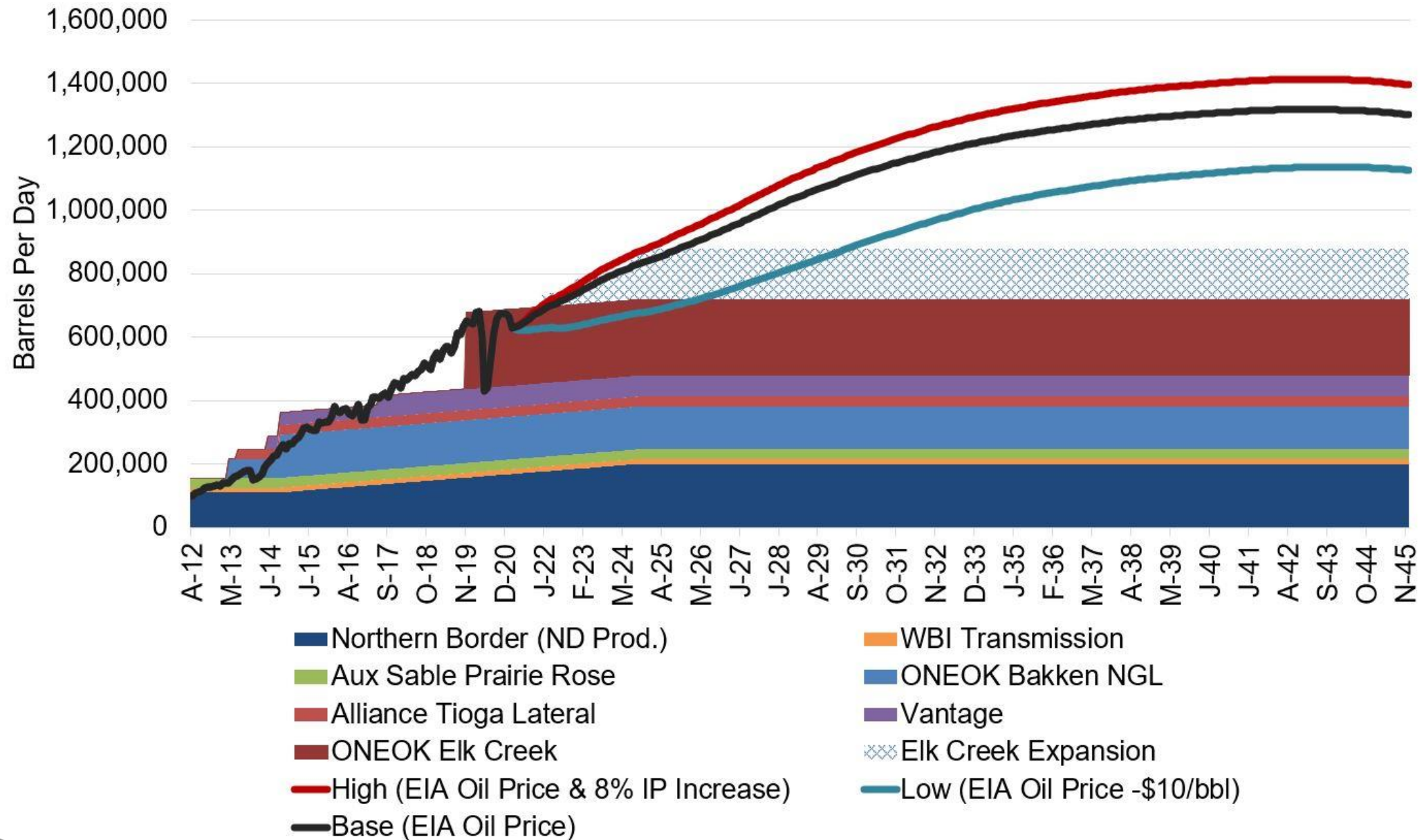
Isobutane



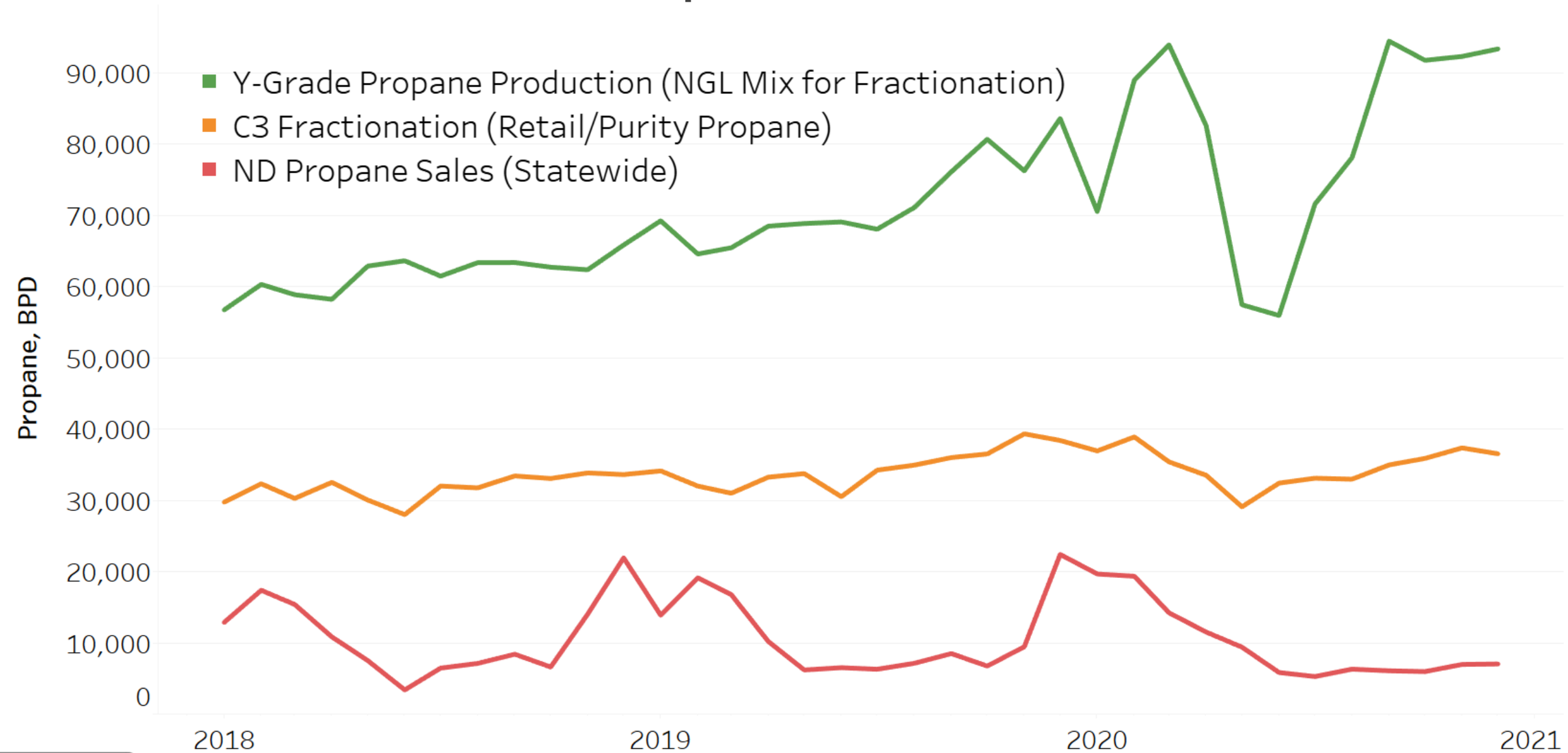
Natural Gasoline



NGL Pipeline Takeaway Options



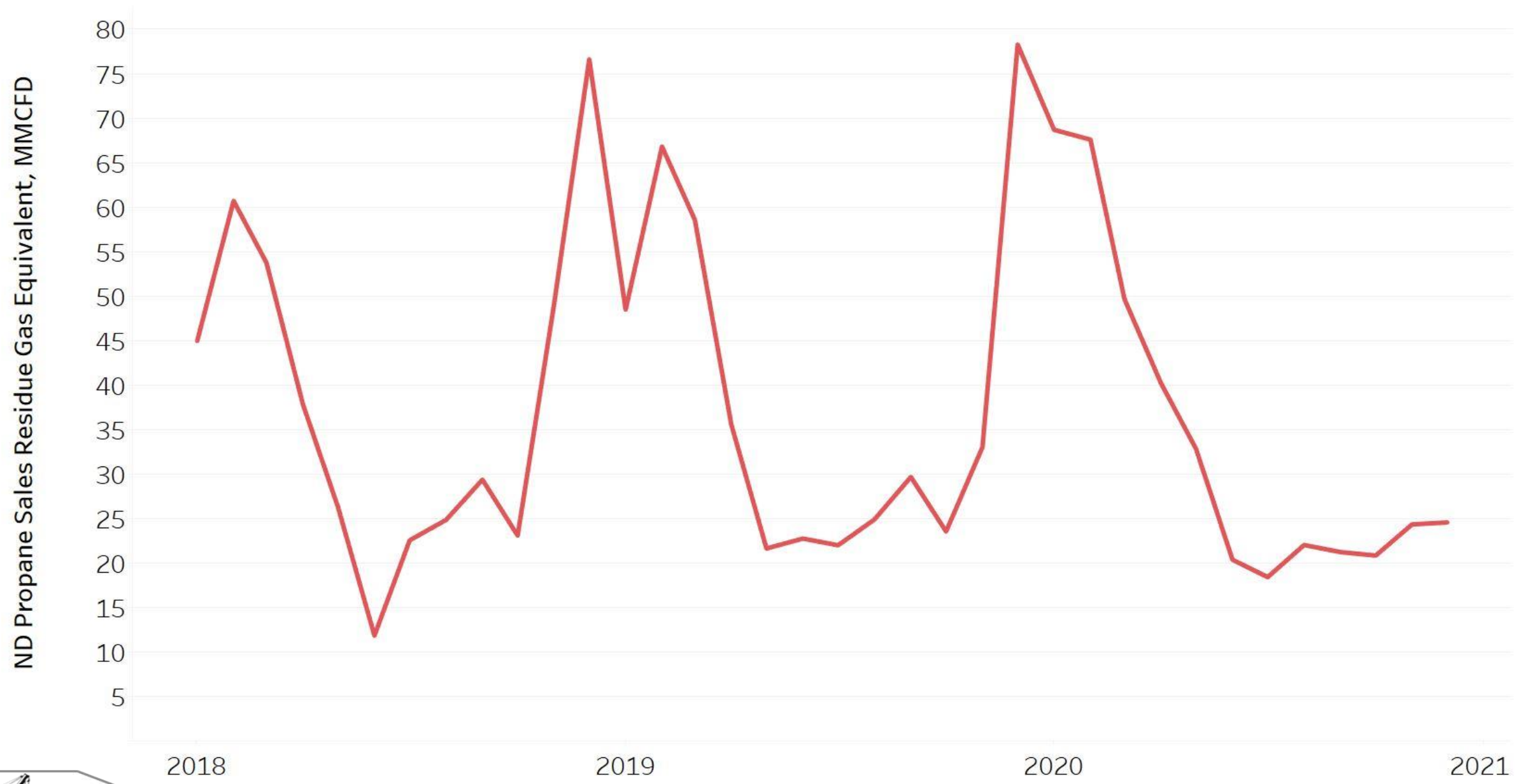
North Dakota Propane Production & Sales



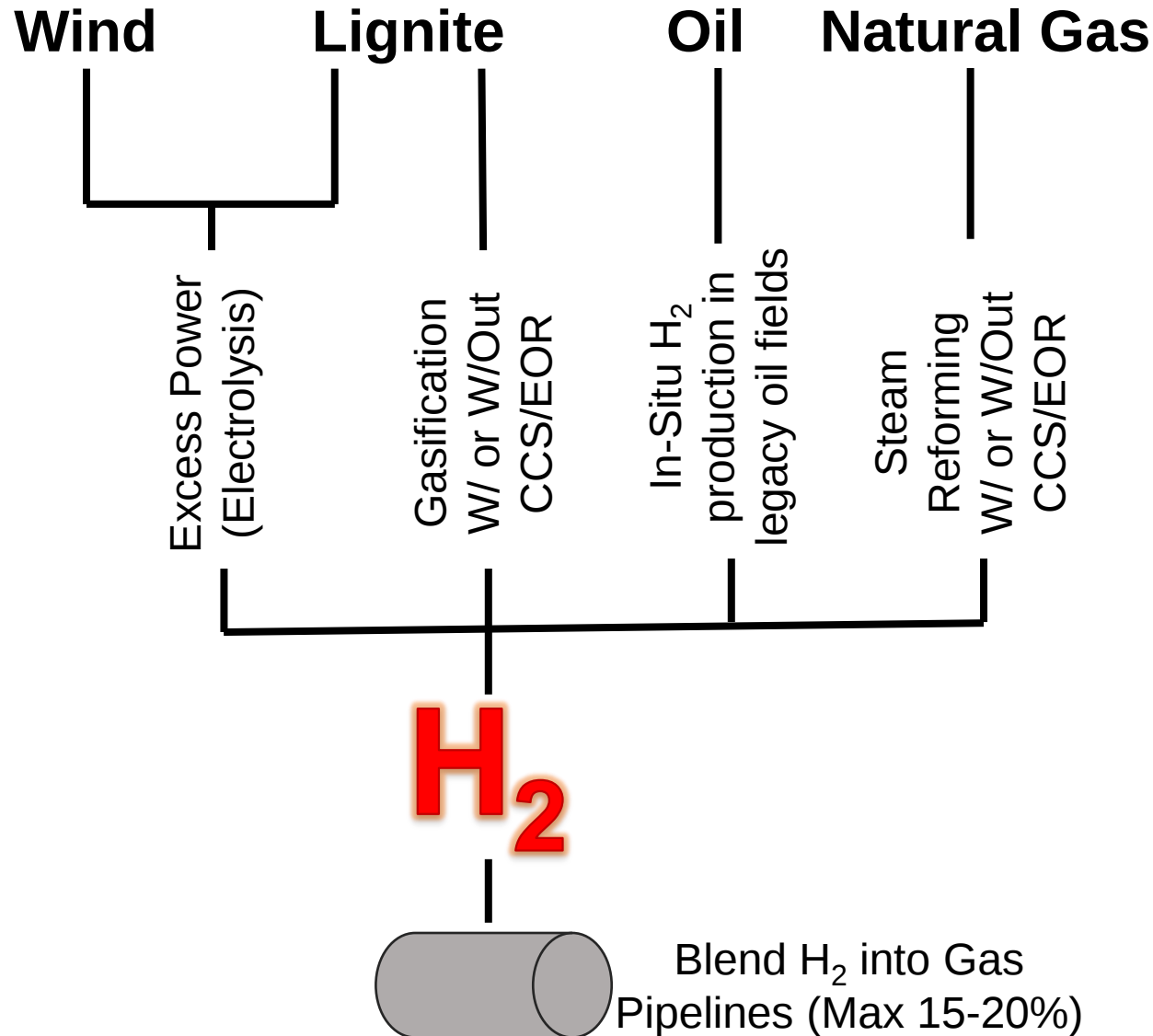
North Dakota Gas Plants Propane Output



North Dakota Propane Sales Residue Gas Equivalent*



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

- Lowers 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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