

# North Dakota Petroleum Council Annual Meeting

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*Director*

*North Dakota Pipeline Authority*



**September 22, 2022**

# A Complete Gas Capture Solution



## Production

- Technology
- Markets
- Forecasting



## Gathering

- Capacity
- Connections
- Compression



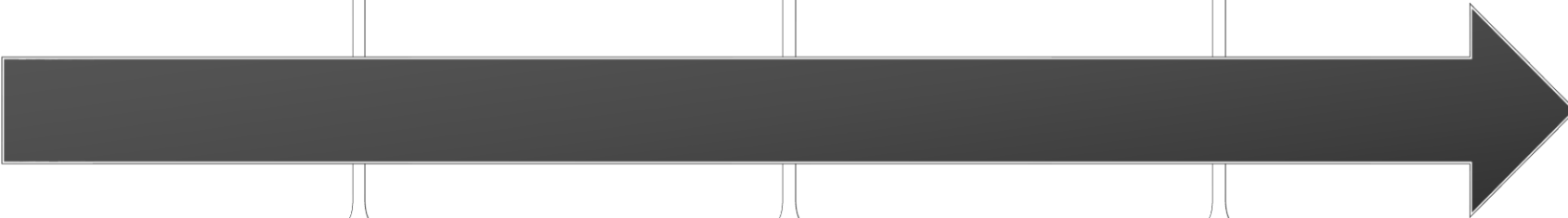
## Processing

- Capacity
- Location
- Configuration



## Transmission

- Dry Gas
- Natural Gas Liquids



# Natural Gas Update



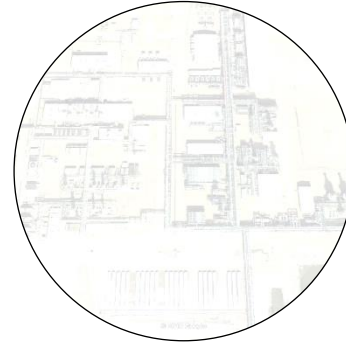
## Production

- Technology
- Markets



## Gathering

- Capacity
- Connections



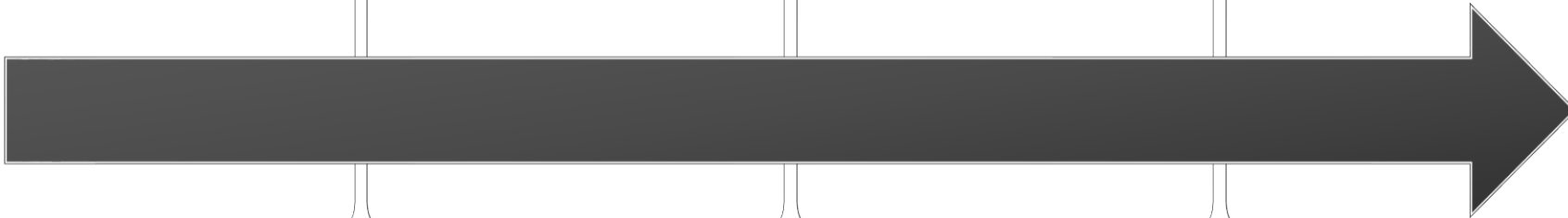
## Processing

- Capacity
- Location

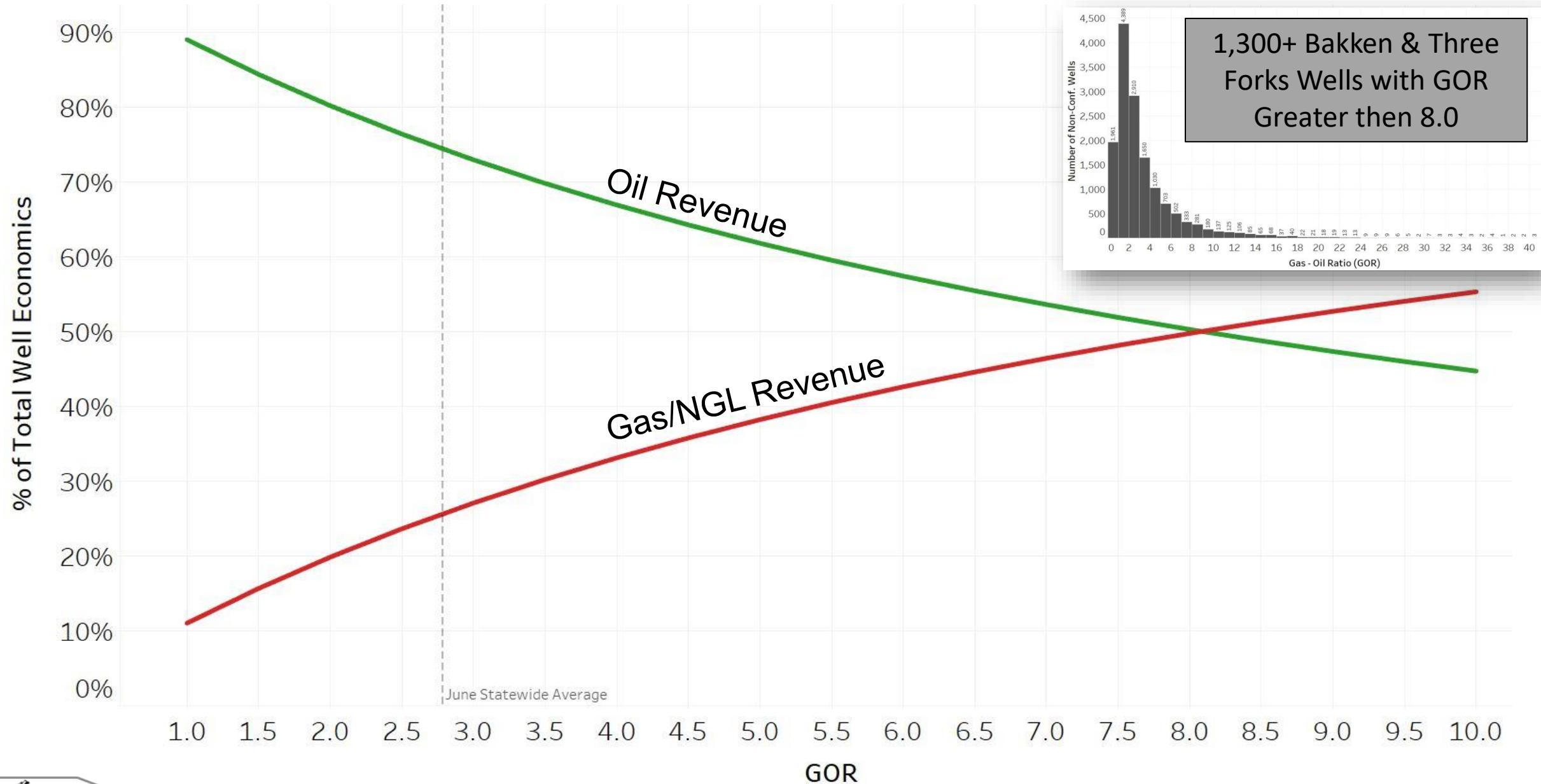


## Transmission

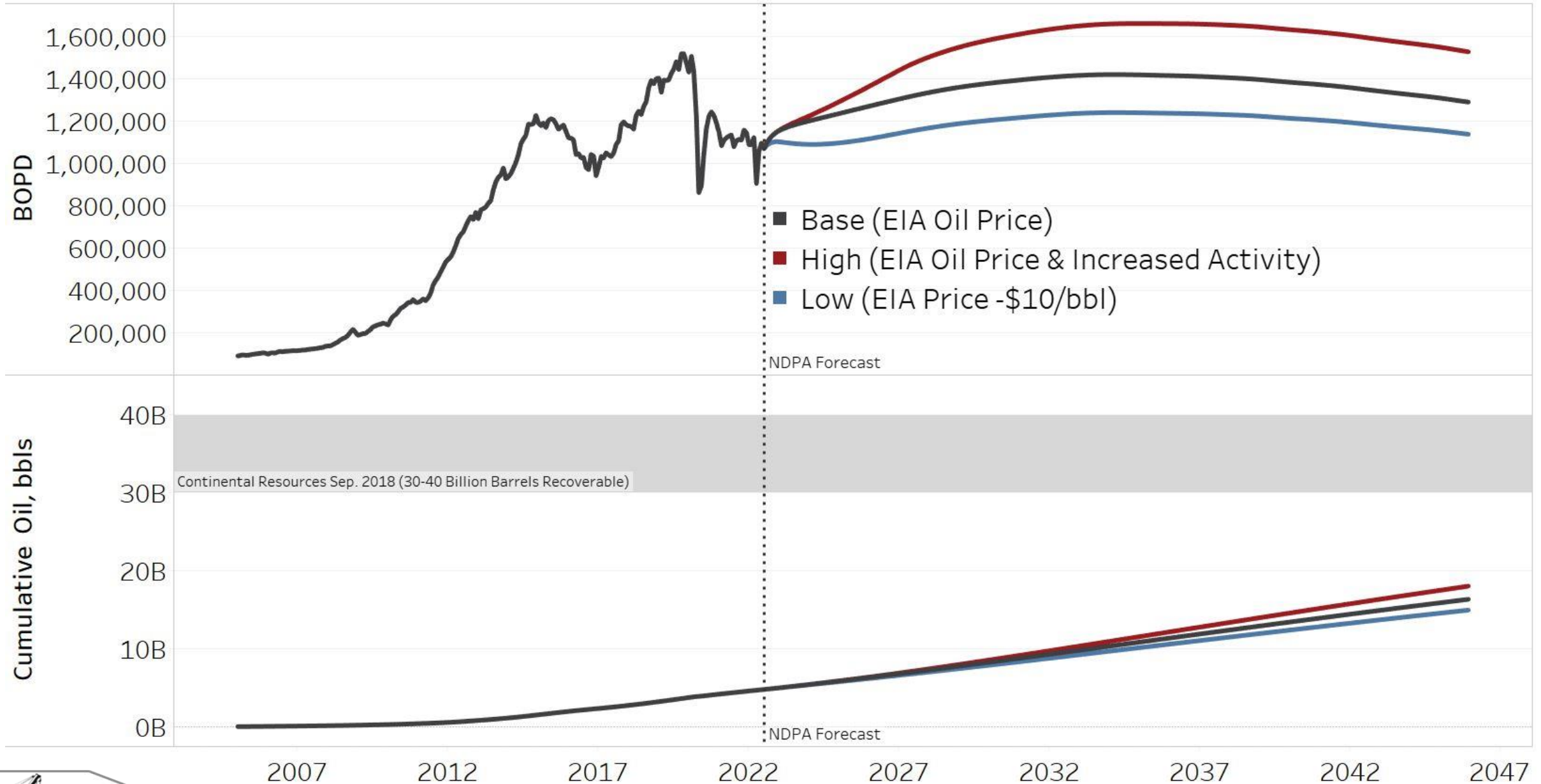
- Dry Gas
- Natural Gas Liquids



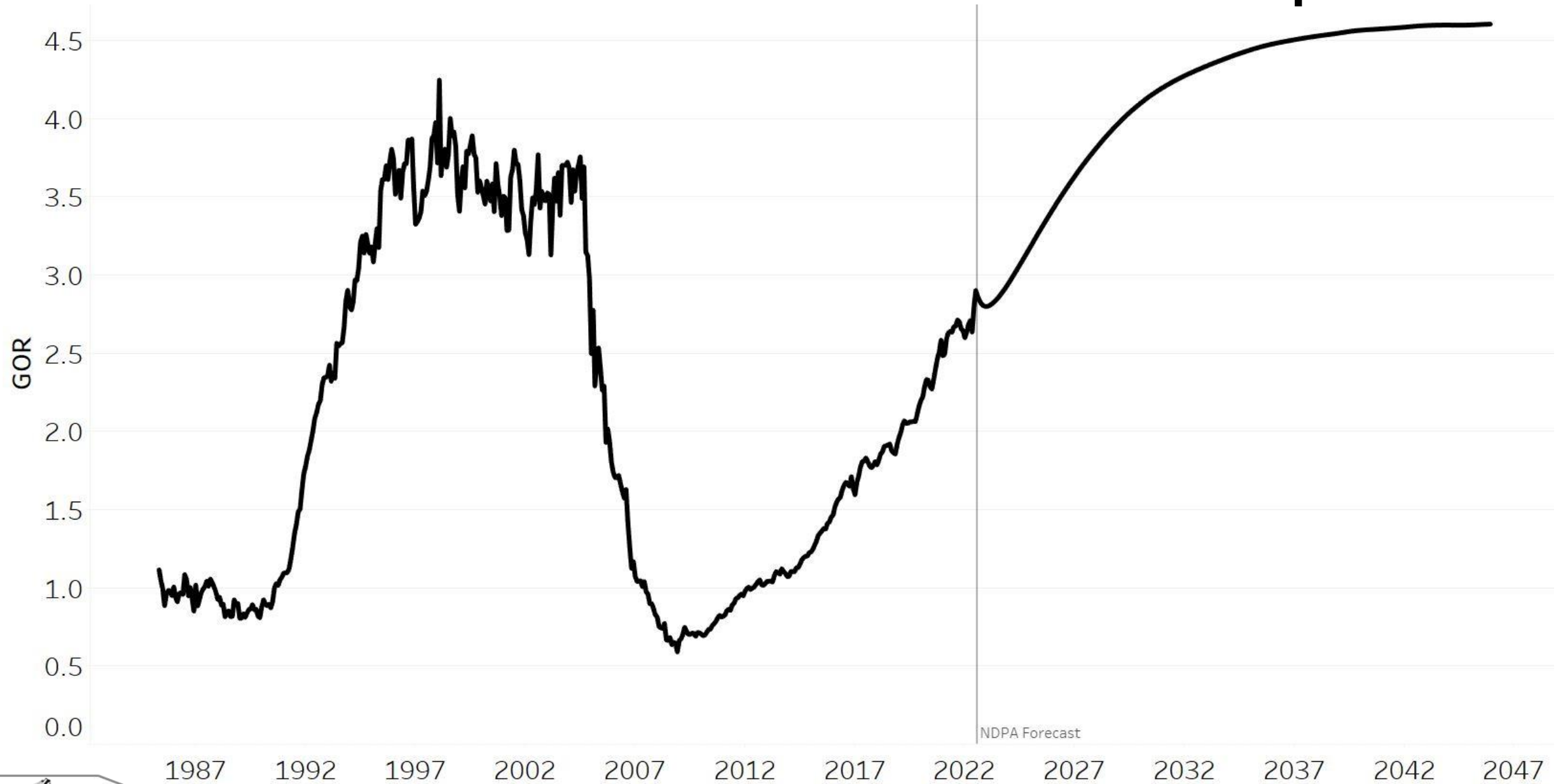
# Current Bakken Wellhead Economics



# ND Oil Production: EIA Price Deck



# ND Gas Production: GOR Assumption



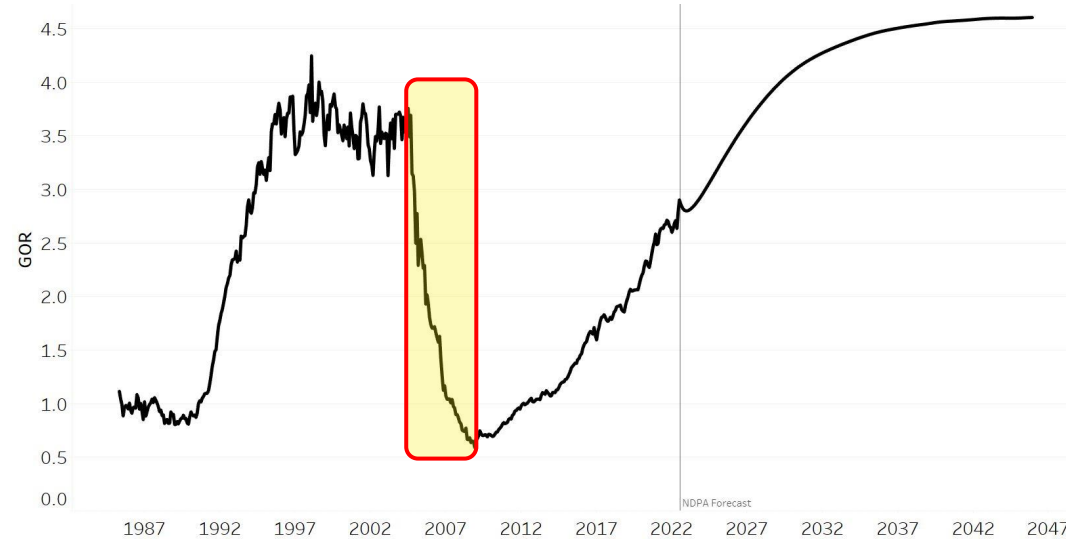
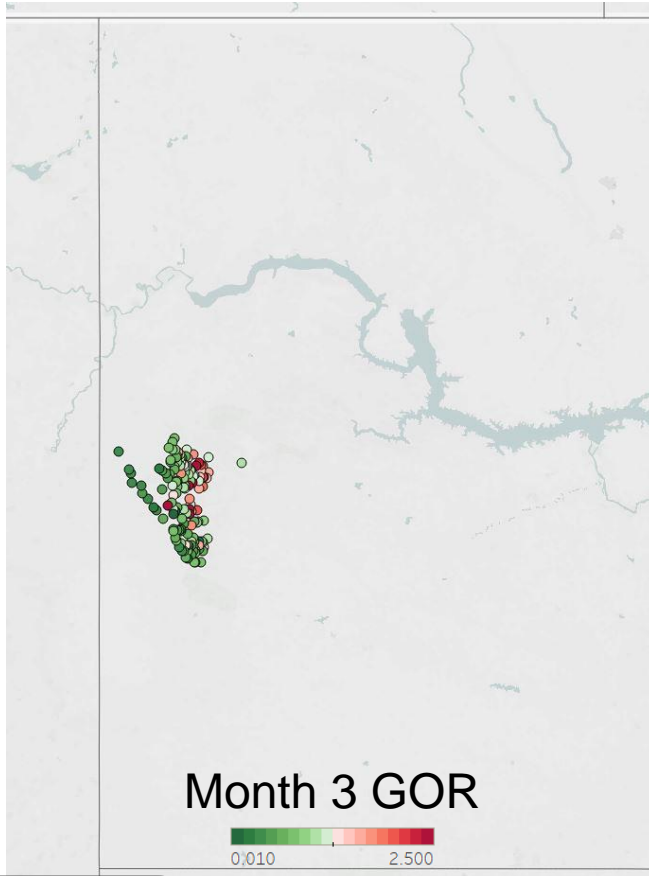
NDPA Forecast





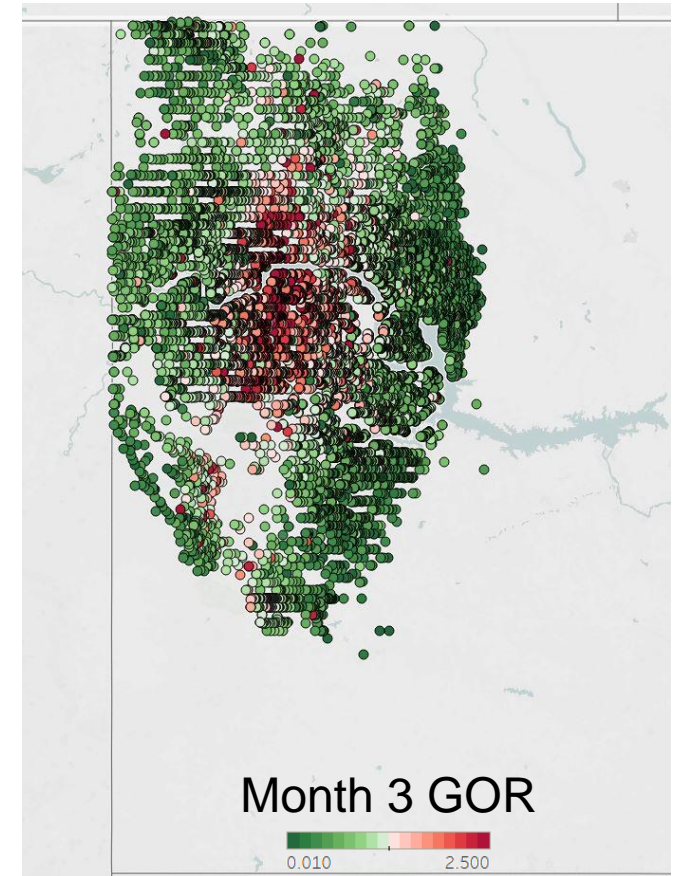
# The GOR “Reset” and Forward Expectations

Bakken GOR settles around ~3.6 from 1990's Bakken development in what is now considered “fringe” acreage



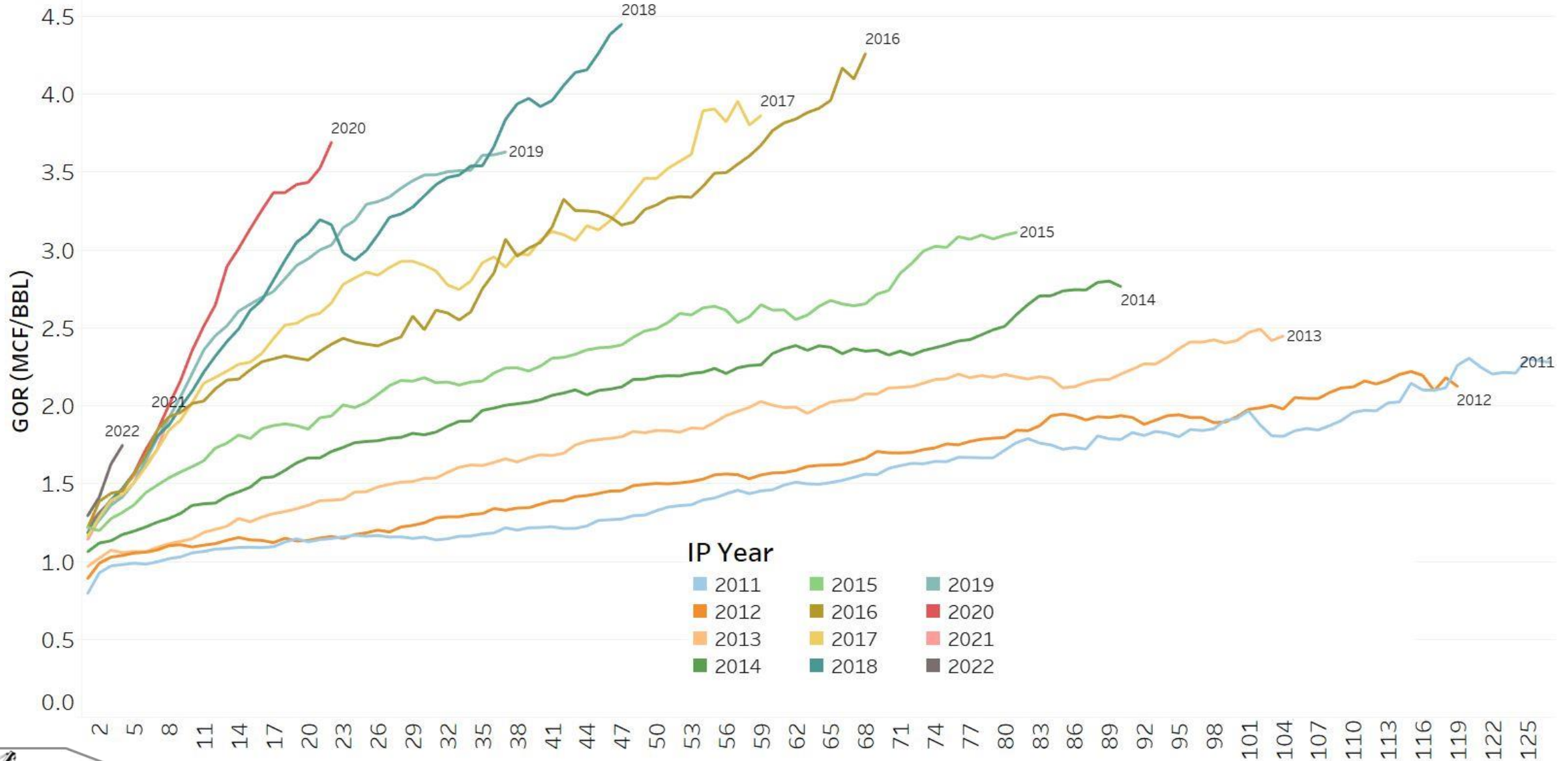
Mid-2000's: Modern Bakken development begins and statewide average GOR is “reset” with large volumes of new gas production

Future GOR will be driven by widespread development including deeper/hotter acreage with higher initial and sustained reservoir GOR



# Statewide Bakken Gas/Oil Ratios

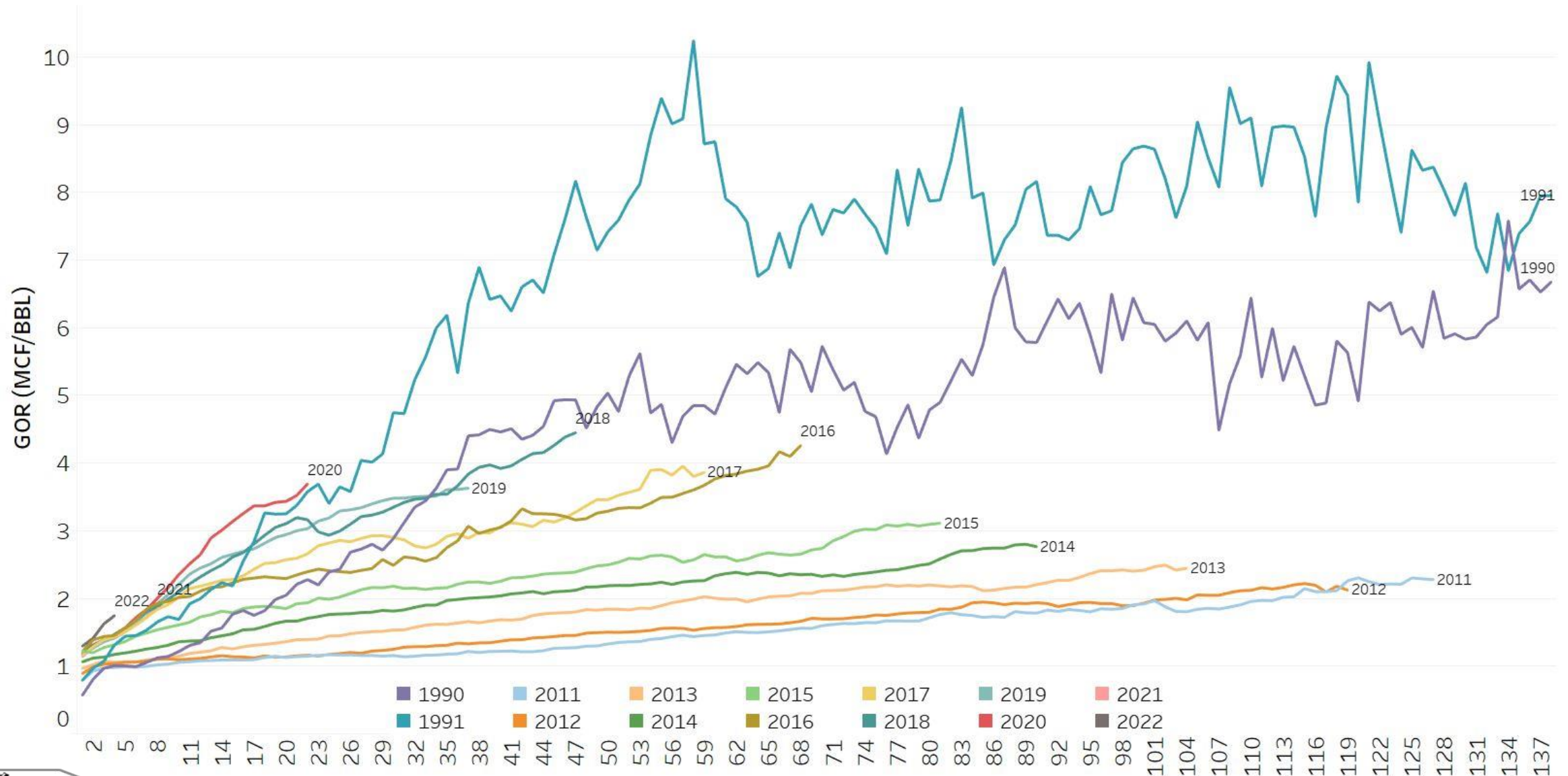
Production Month



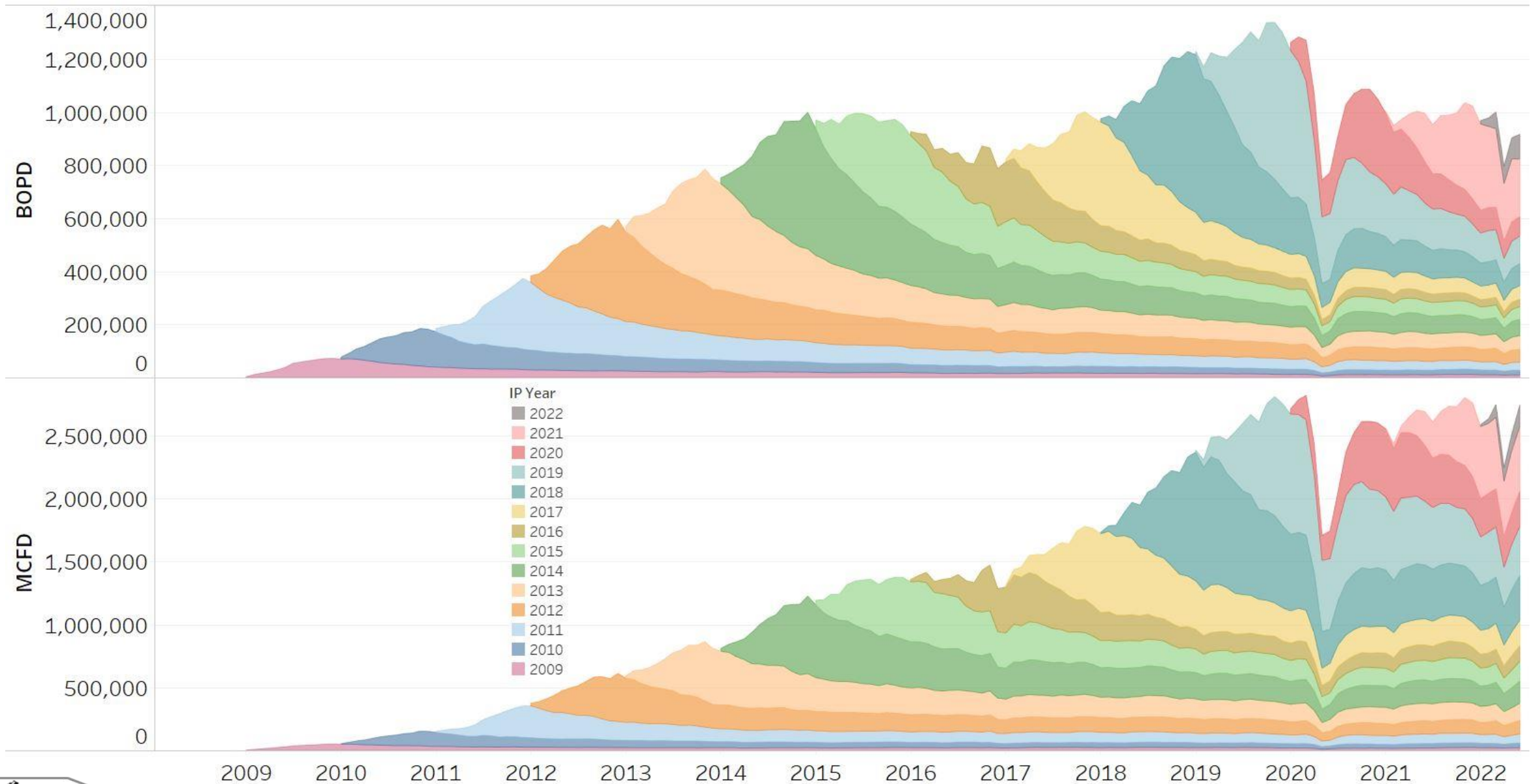


# Statewide Bakken Gas/Oil Ratios

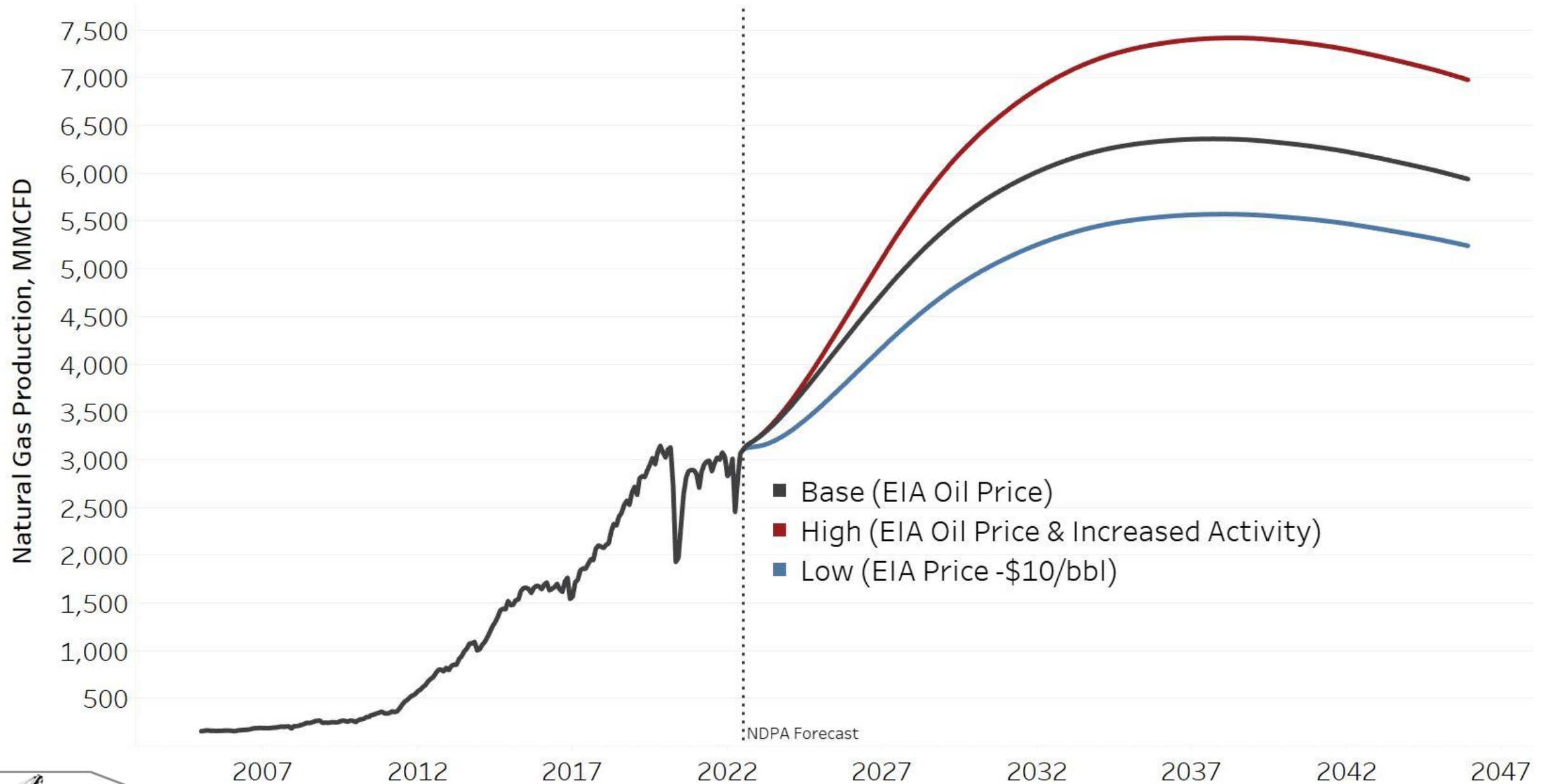
Production Month



# Terminal Gas Decline(?)



# ND Gas Production: EIA Price Deck





# Yearly Production Change, %

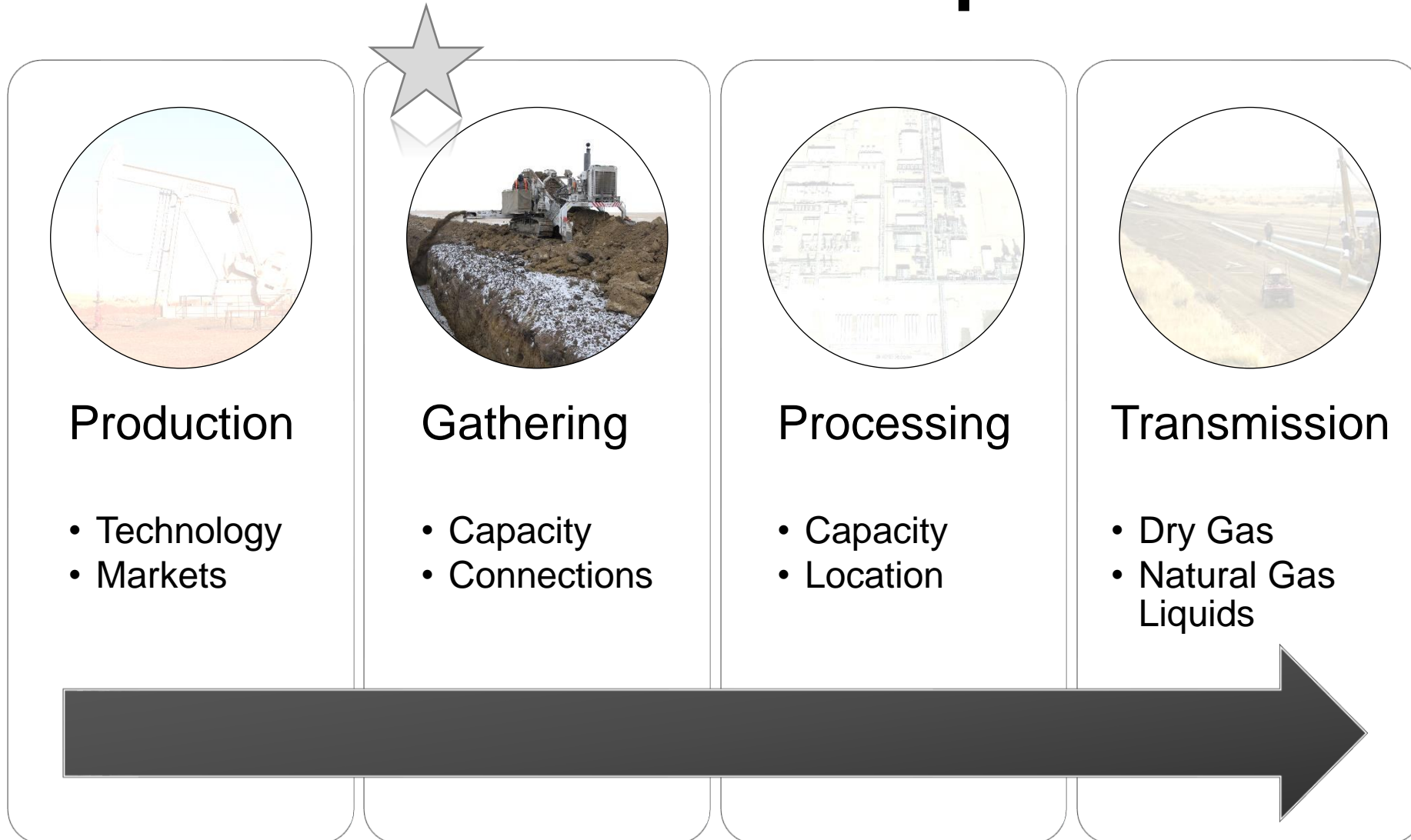


# What if Oil Production Growth is Flat?



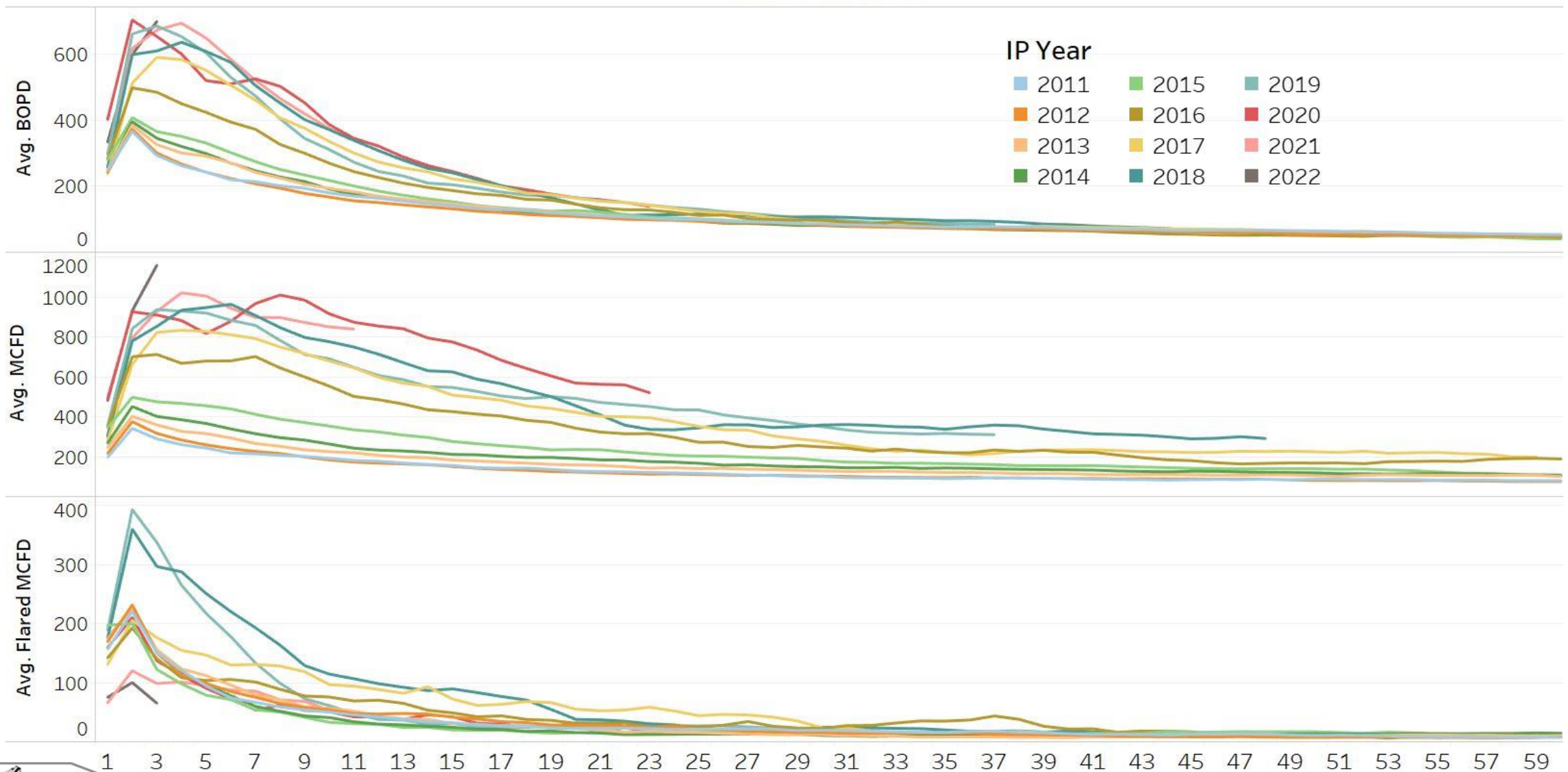


# Natural Gas Update

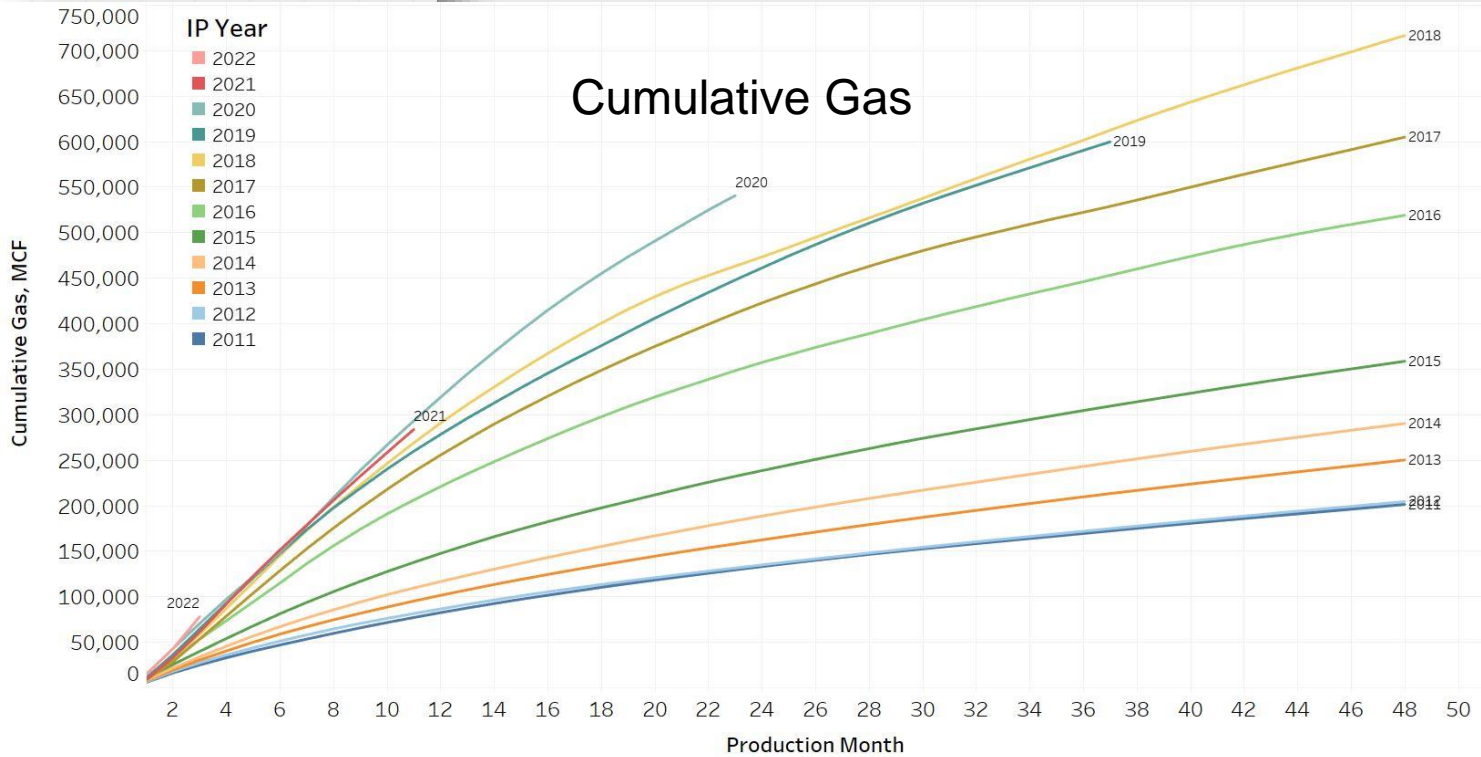
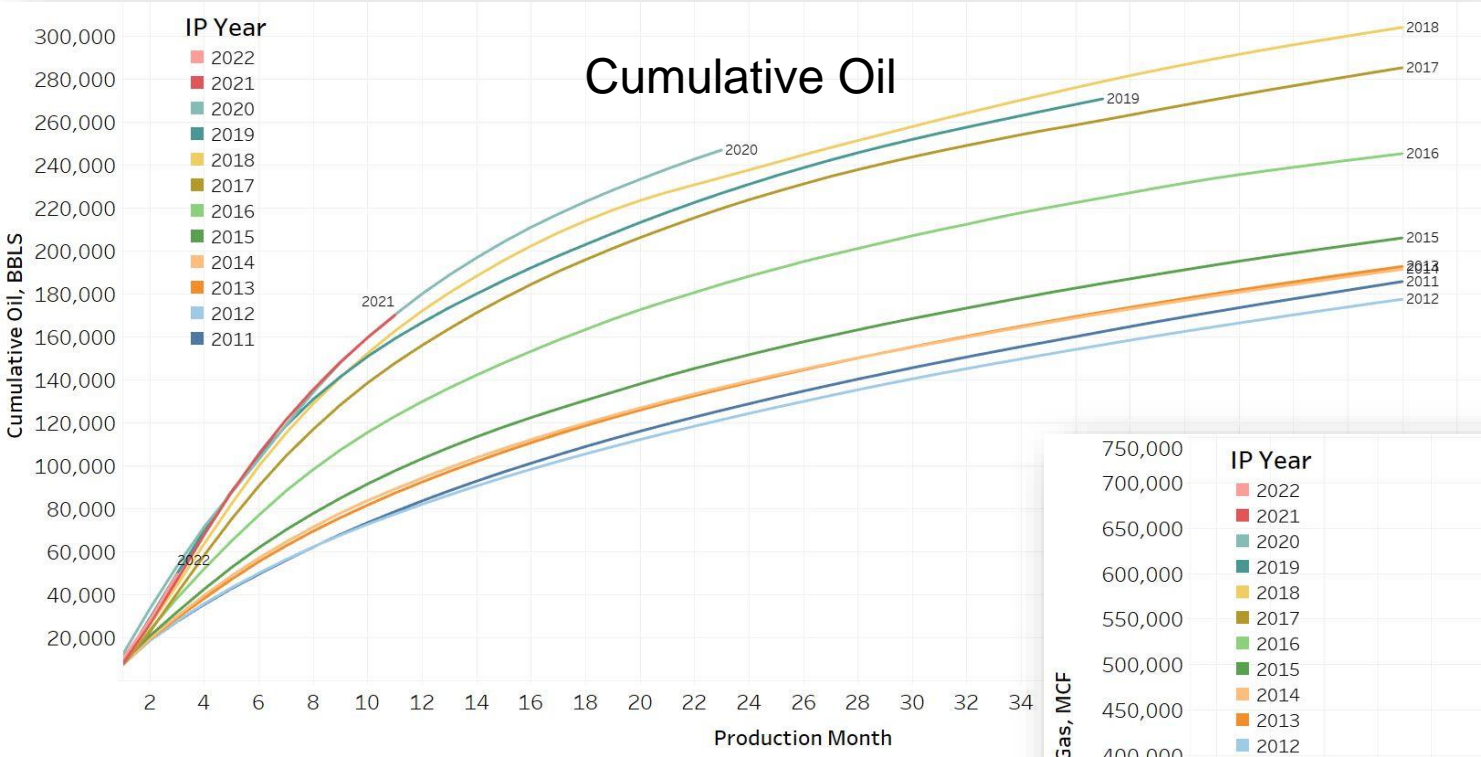


# Shifting Early Production Strategies

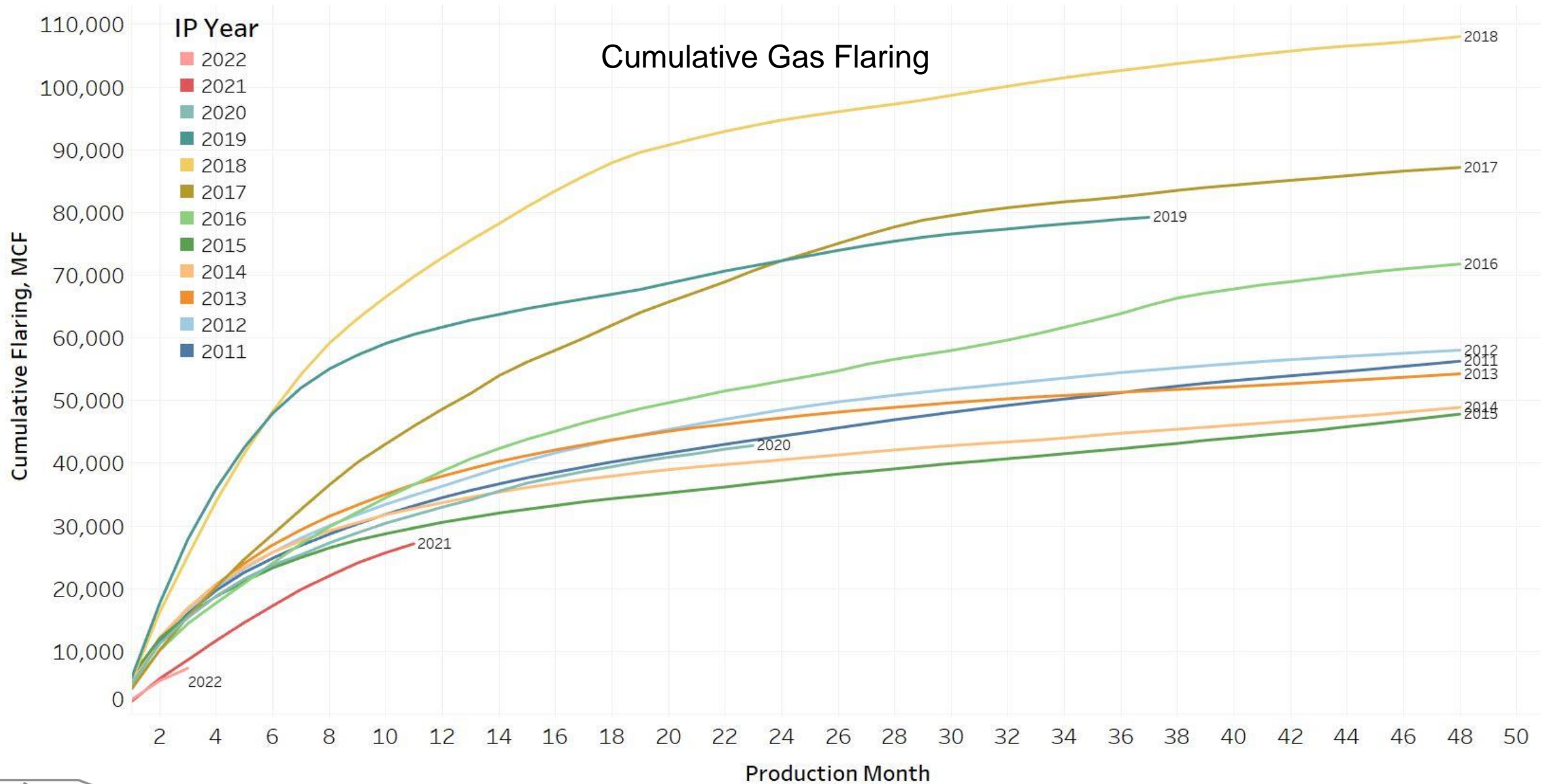
Production Month



# Shifting Early Production Strategies

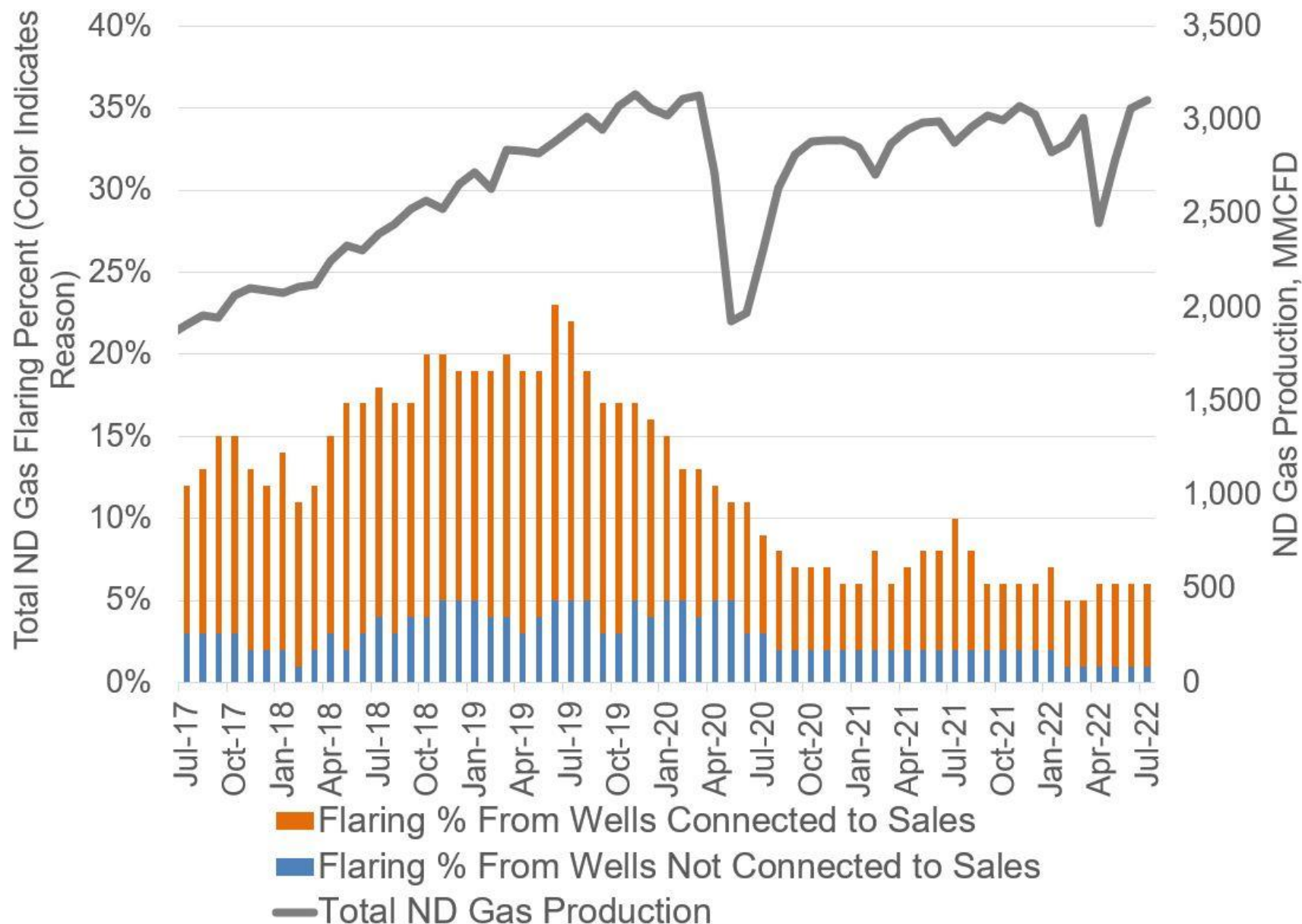


# Shifting Early Production Strategies



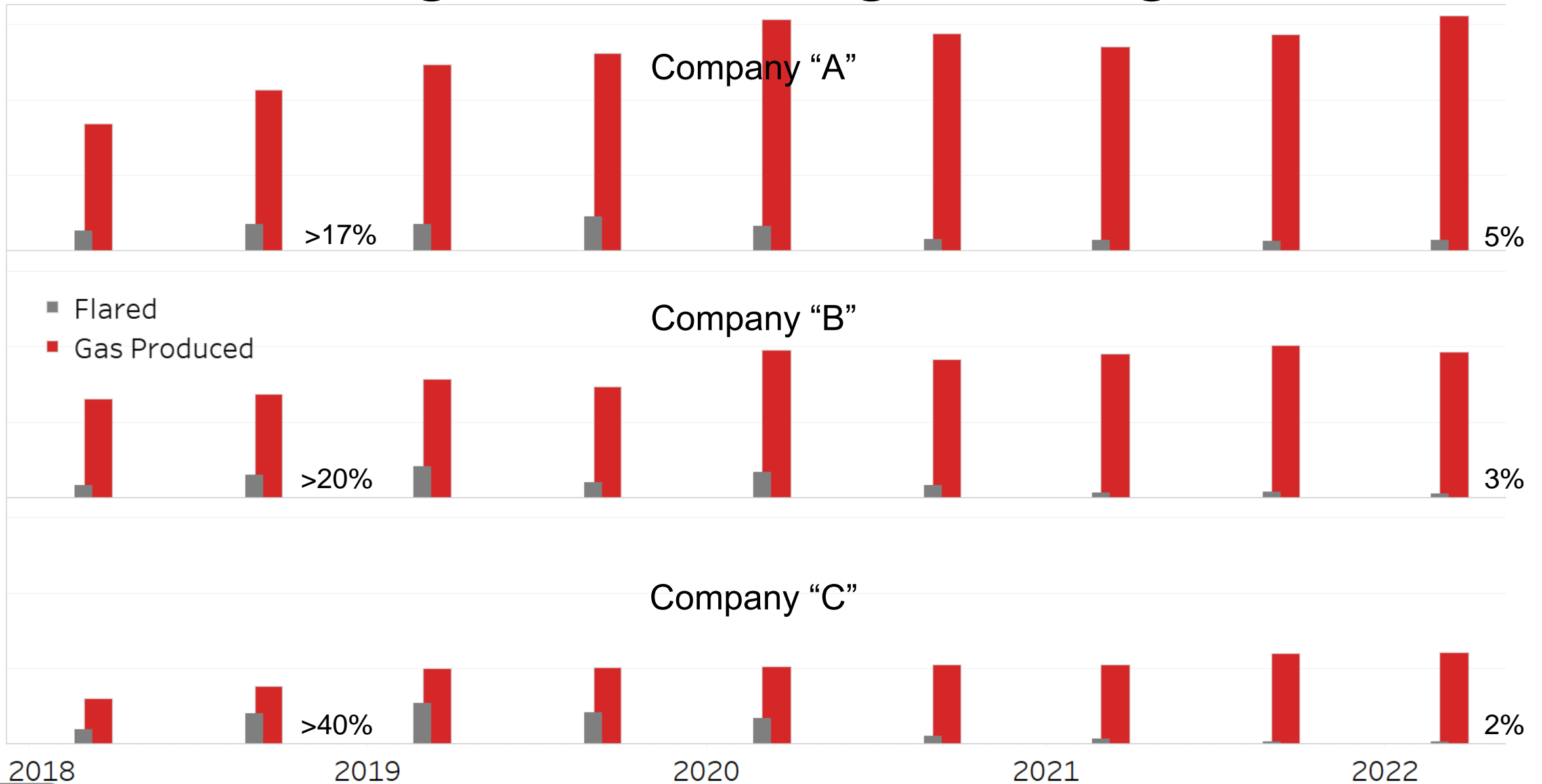


# Solving the Flaring Challenge

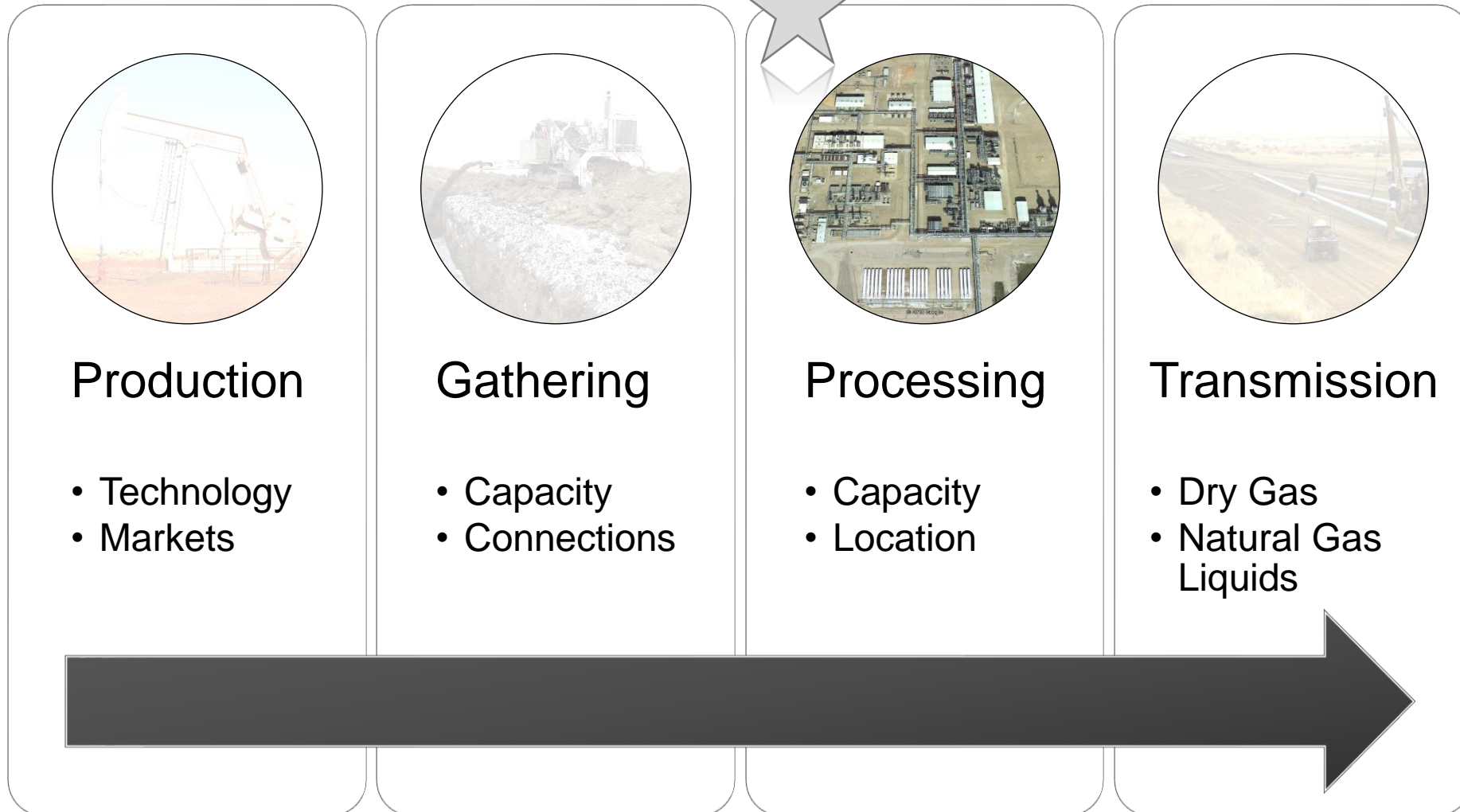




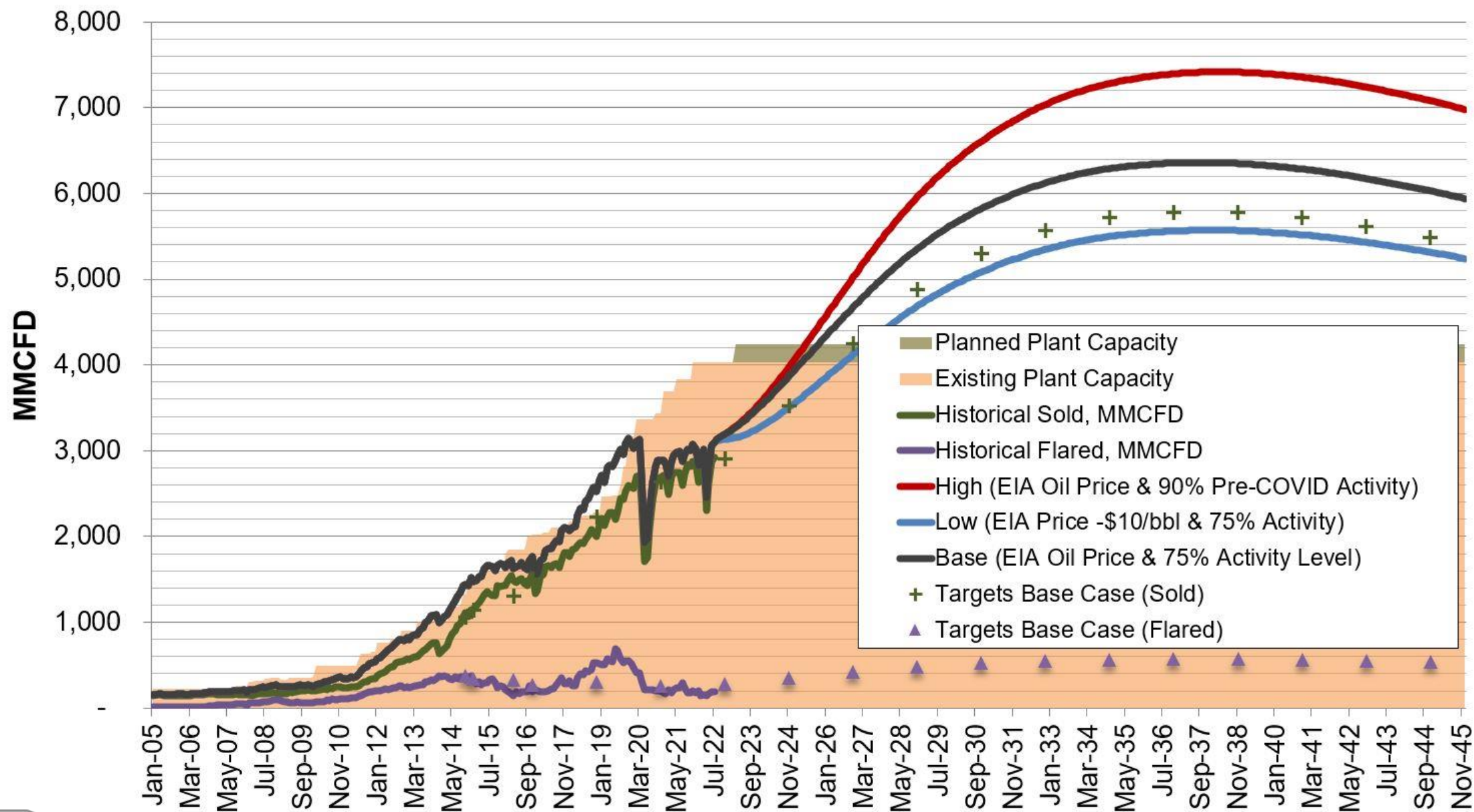
# ESG Targets Pushing Flaring Down



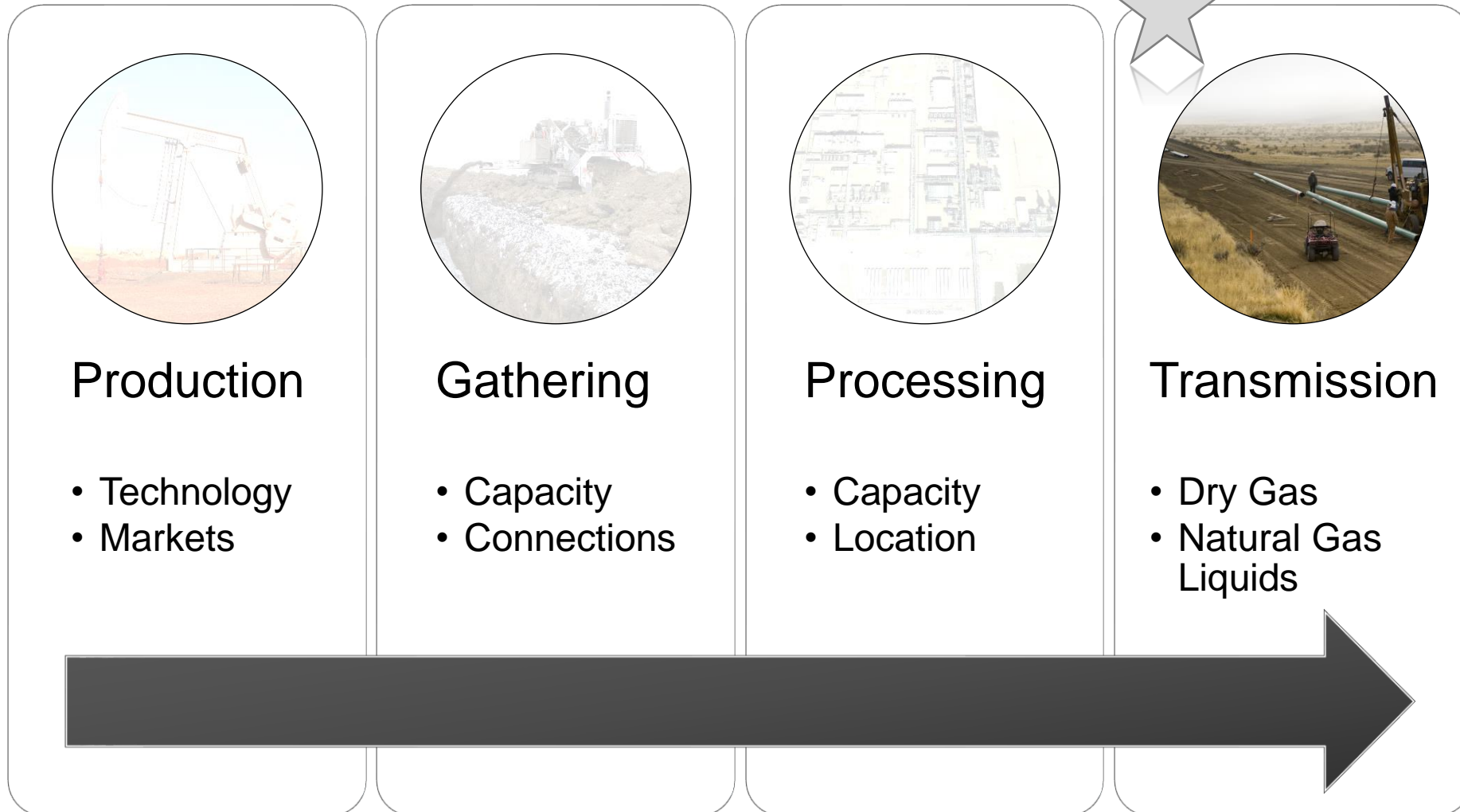
# Natural Gas Update



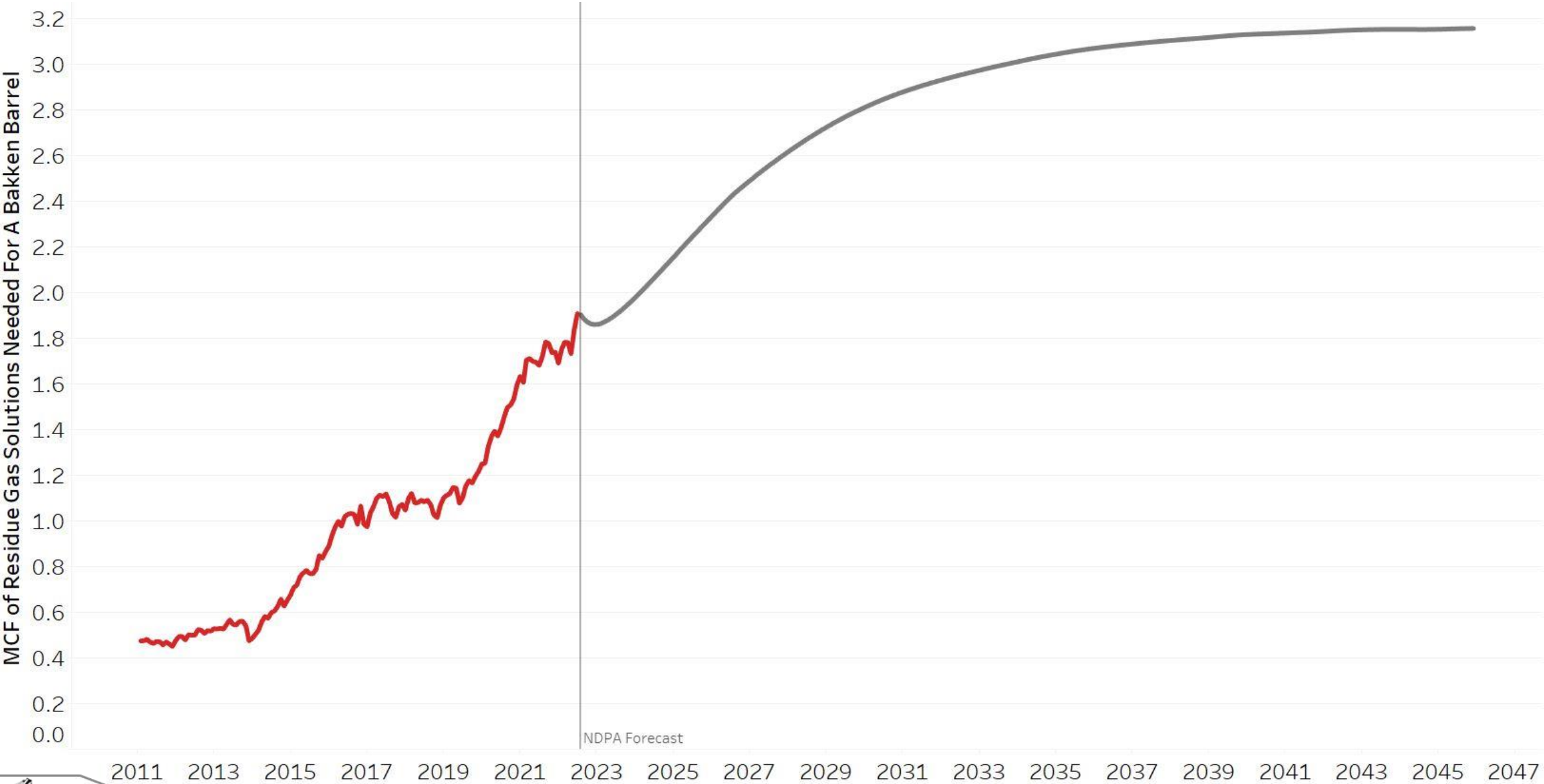
# Solving the Flaring Challenge



# Natural Gas Update

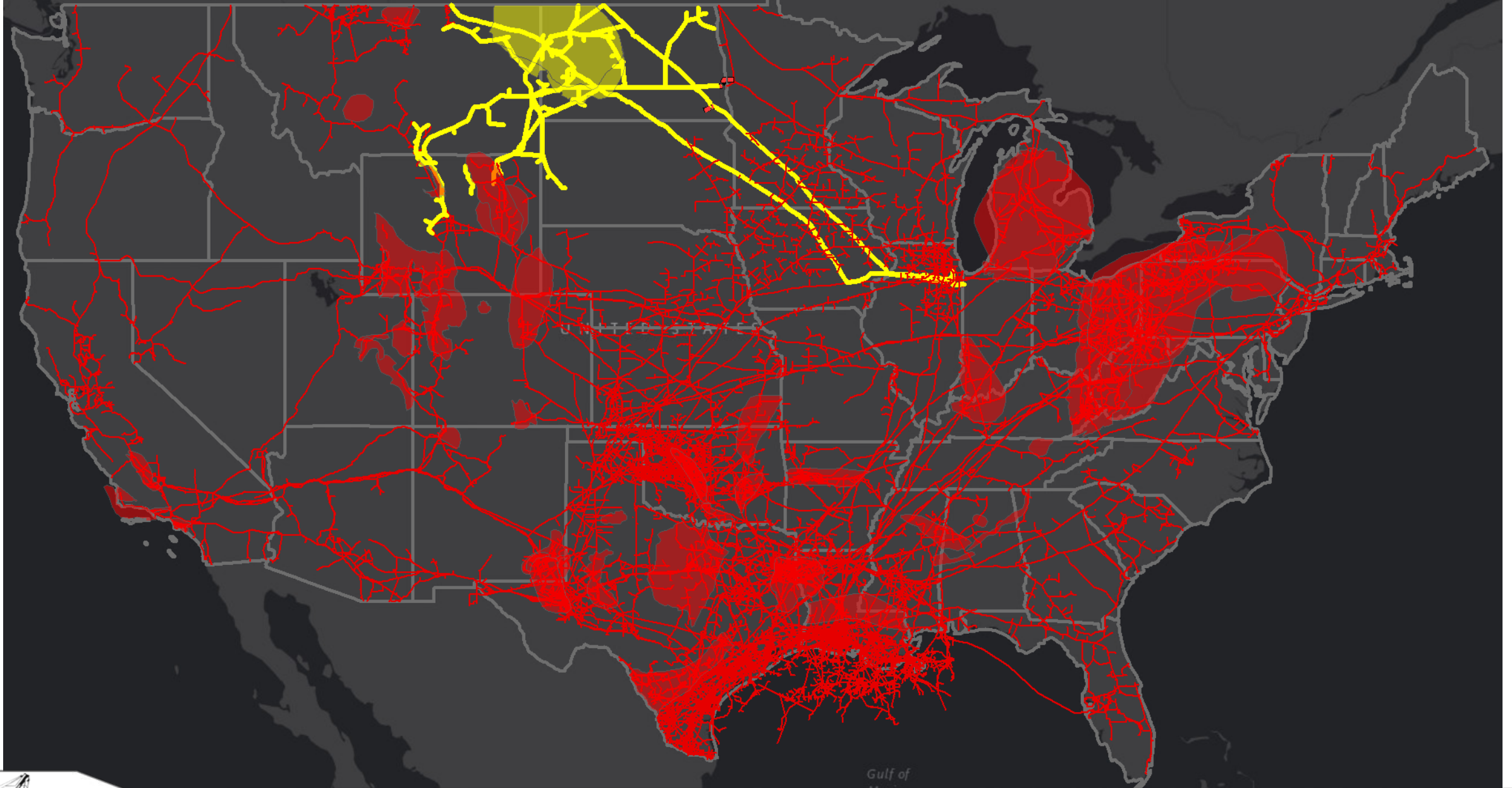


# The Importance of Residue Gas Solutions Continues to Increase





# Bakken Natural Gas Infrastructure



# Driving Forces for New Gas Pipelines



Supply Push



Demand Pull



System Reliability



# Who Signs Up For Capacity?

Shippers



Producers



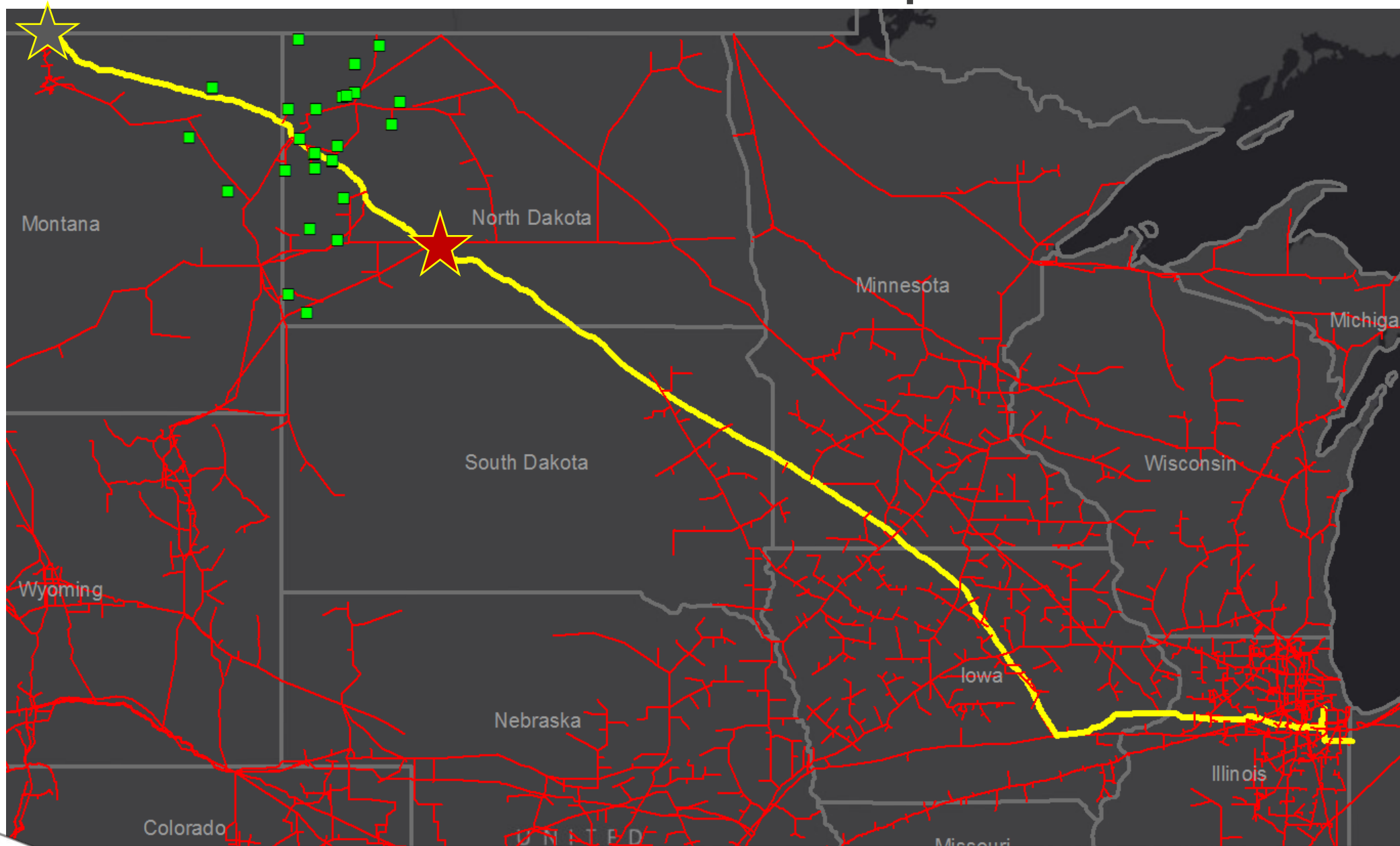
Marketing Firms



Consumers/LDC

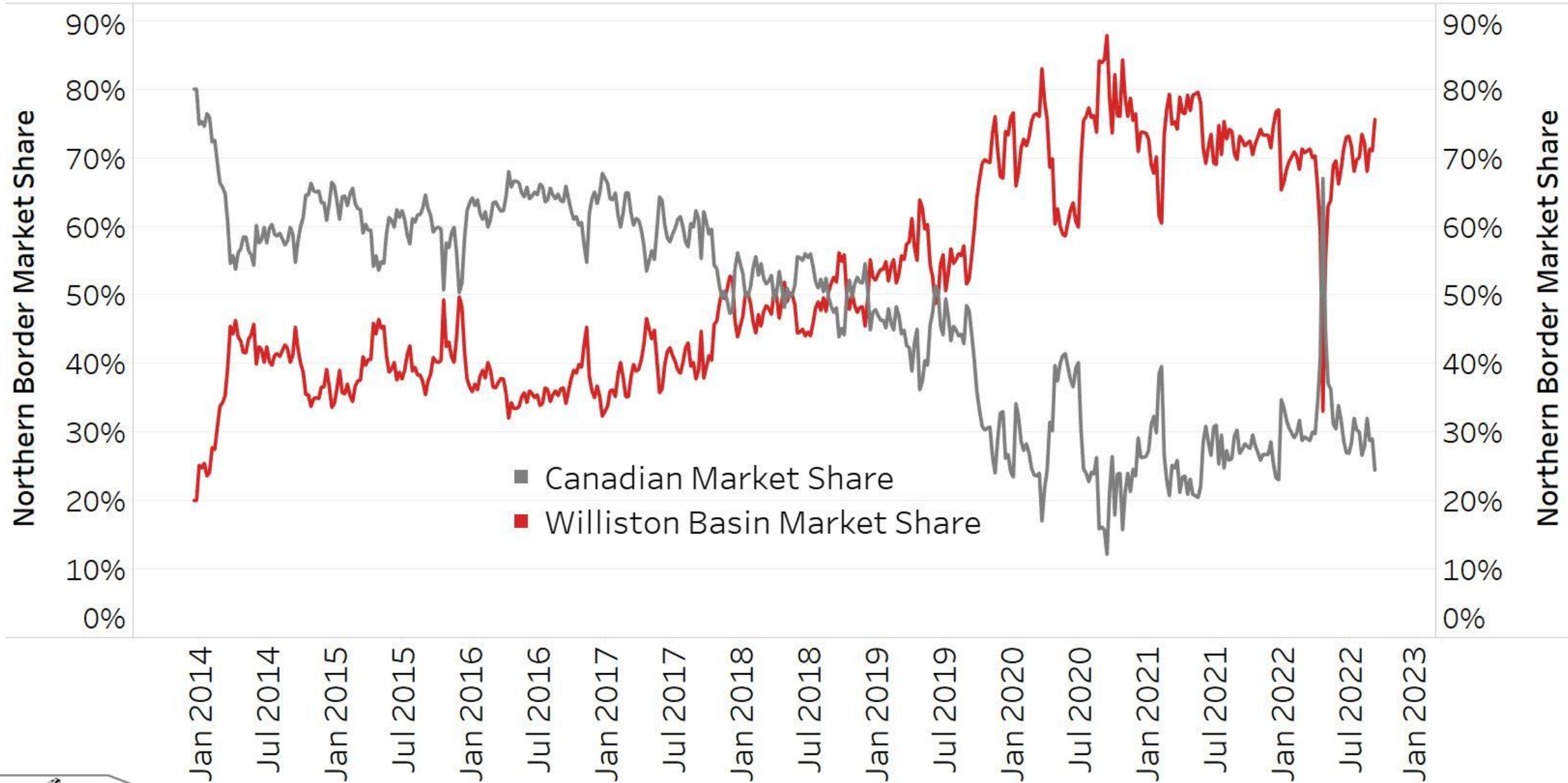


# Northern Border Pipeline



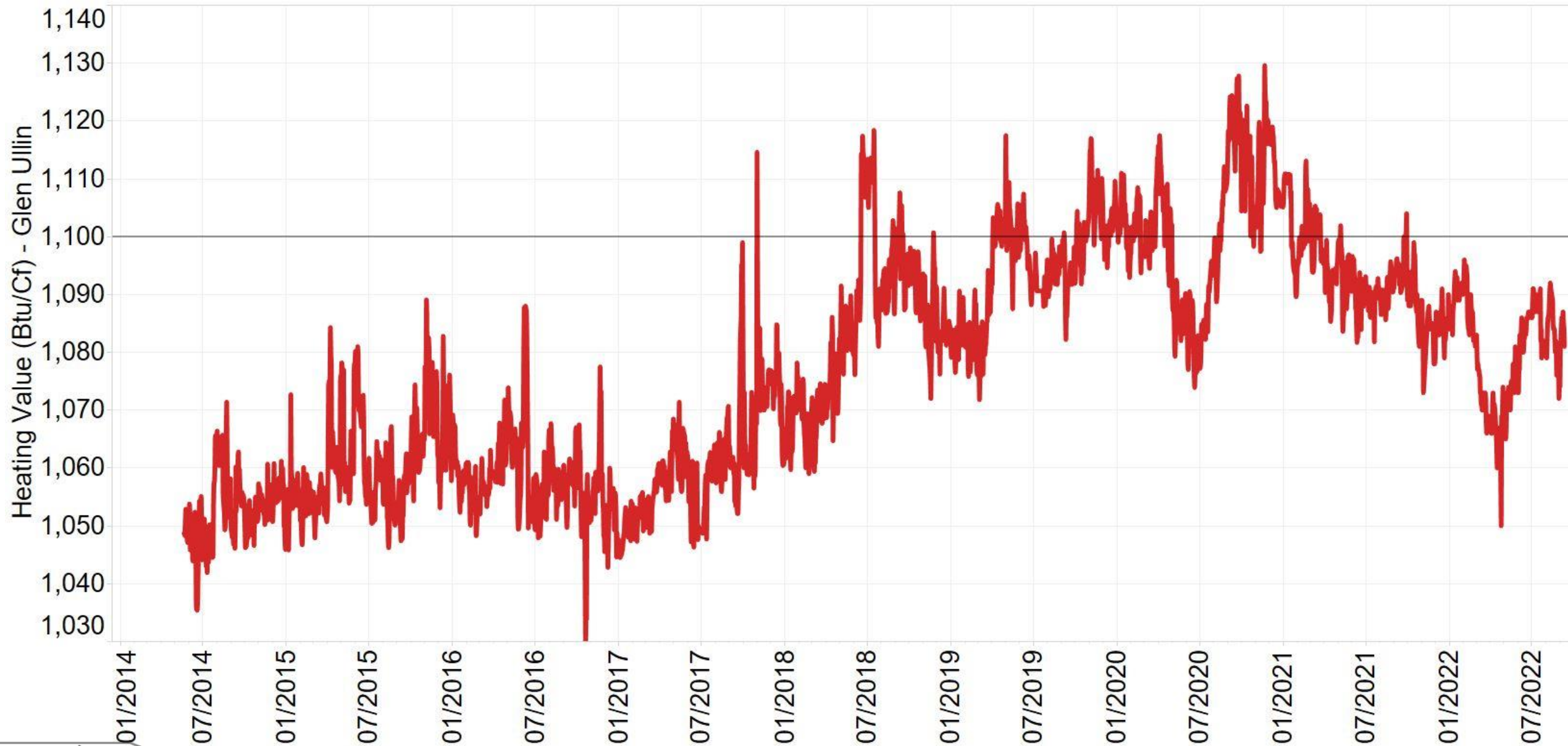


# Northern Border Pipeline Market Share

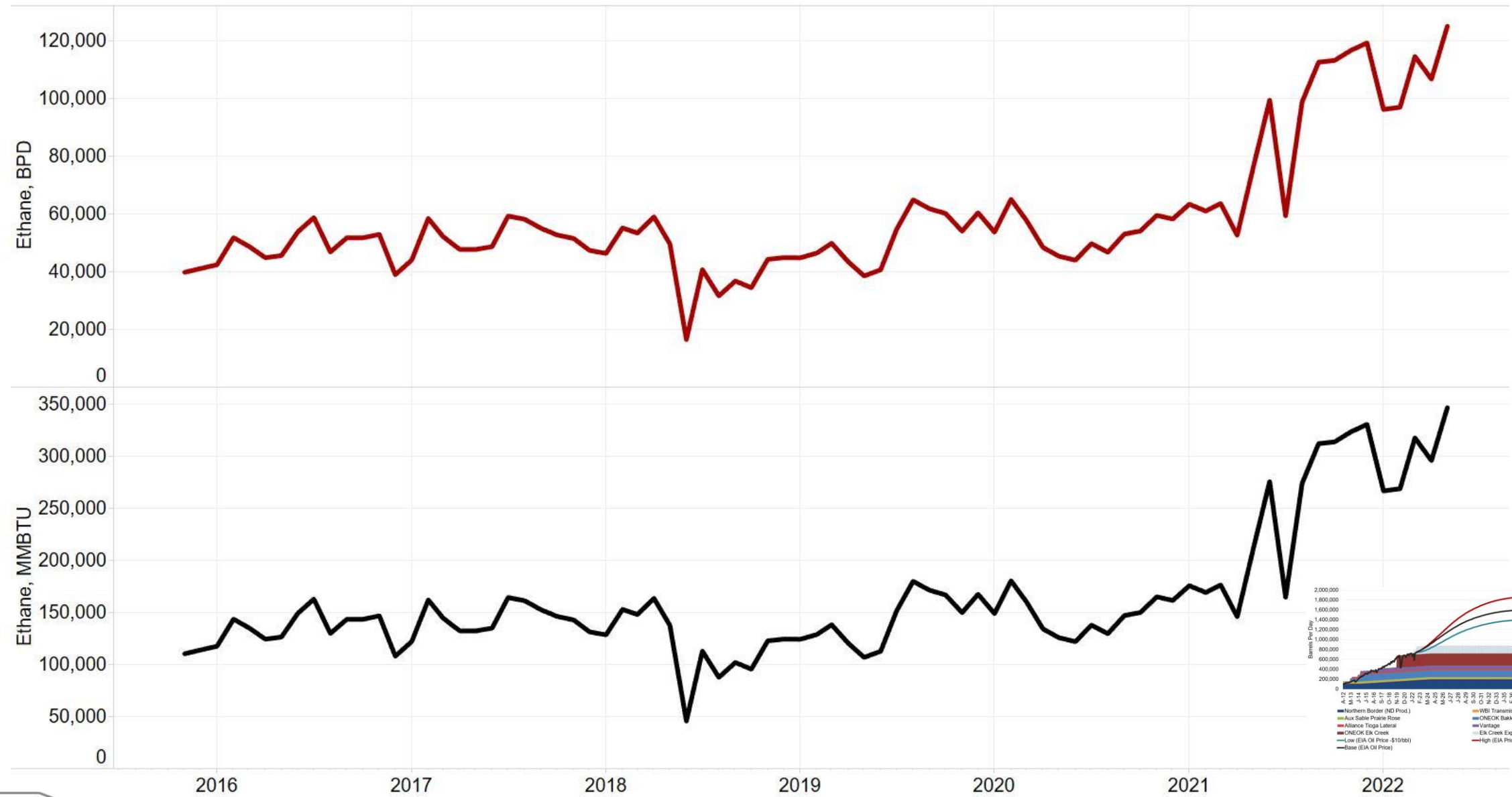




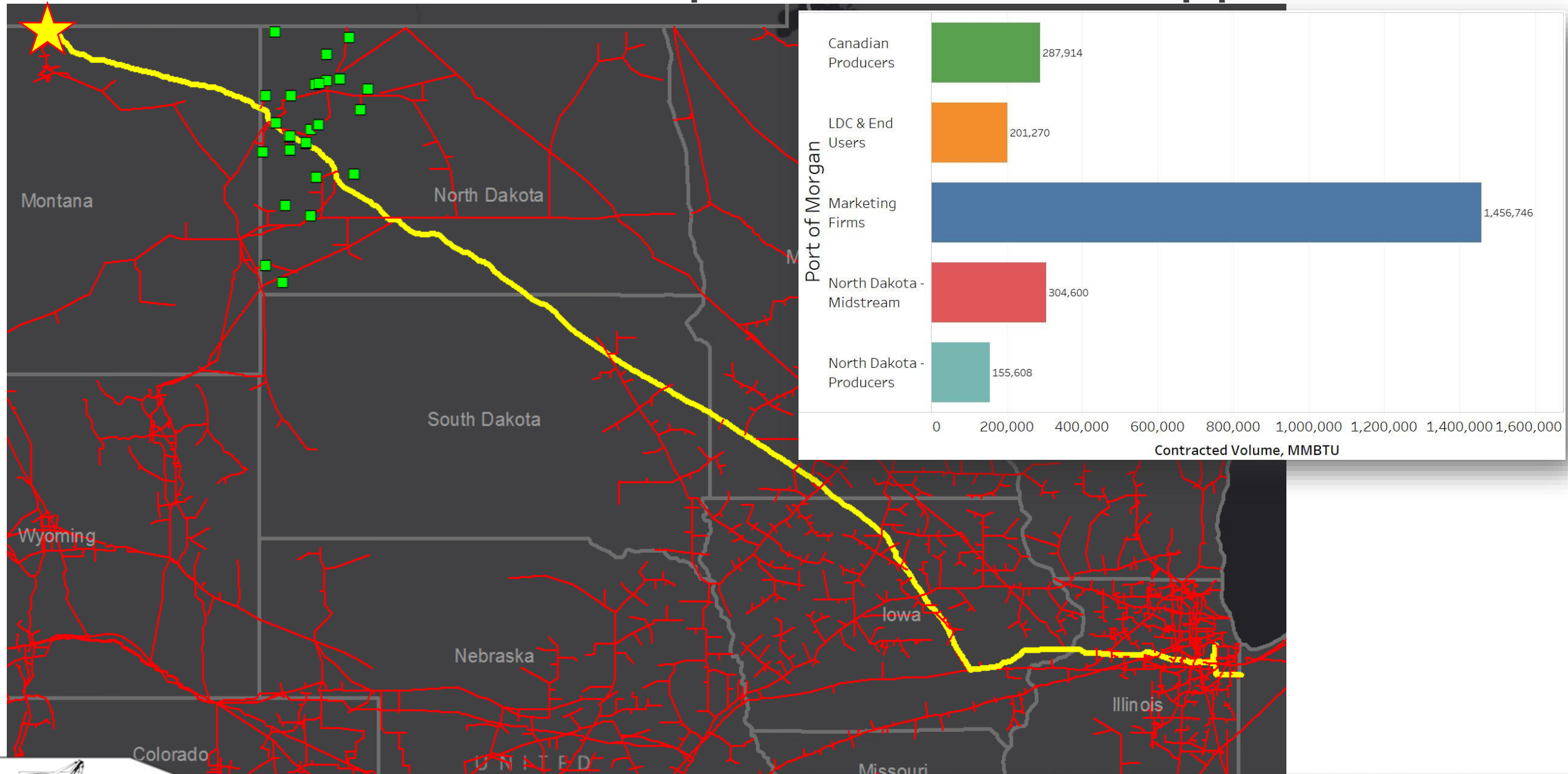
# Northern Border BTU at Glen Ullin, ND



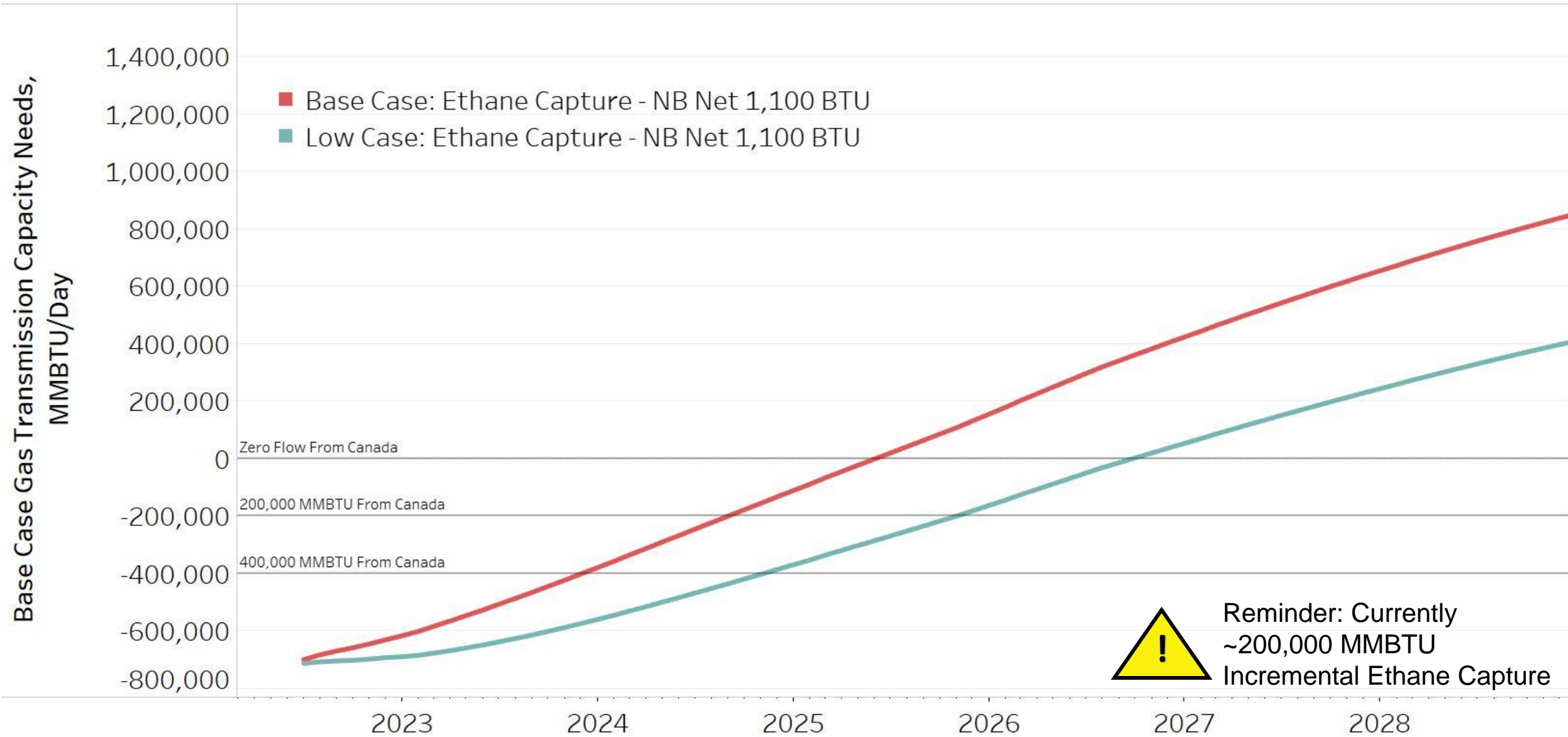
# ND Ethane Capture Driving Down NB BTU & Market Share



# Northern Border Pipeline P.O.M. Shipper Mix



# Residue Gas Pipeline Capacity Needs





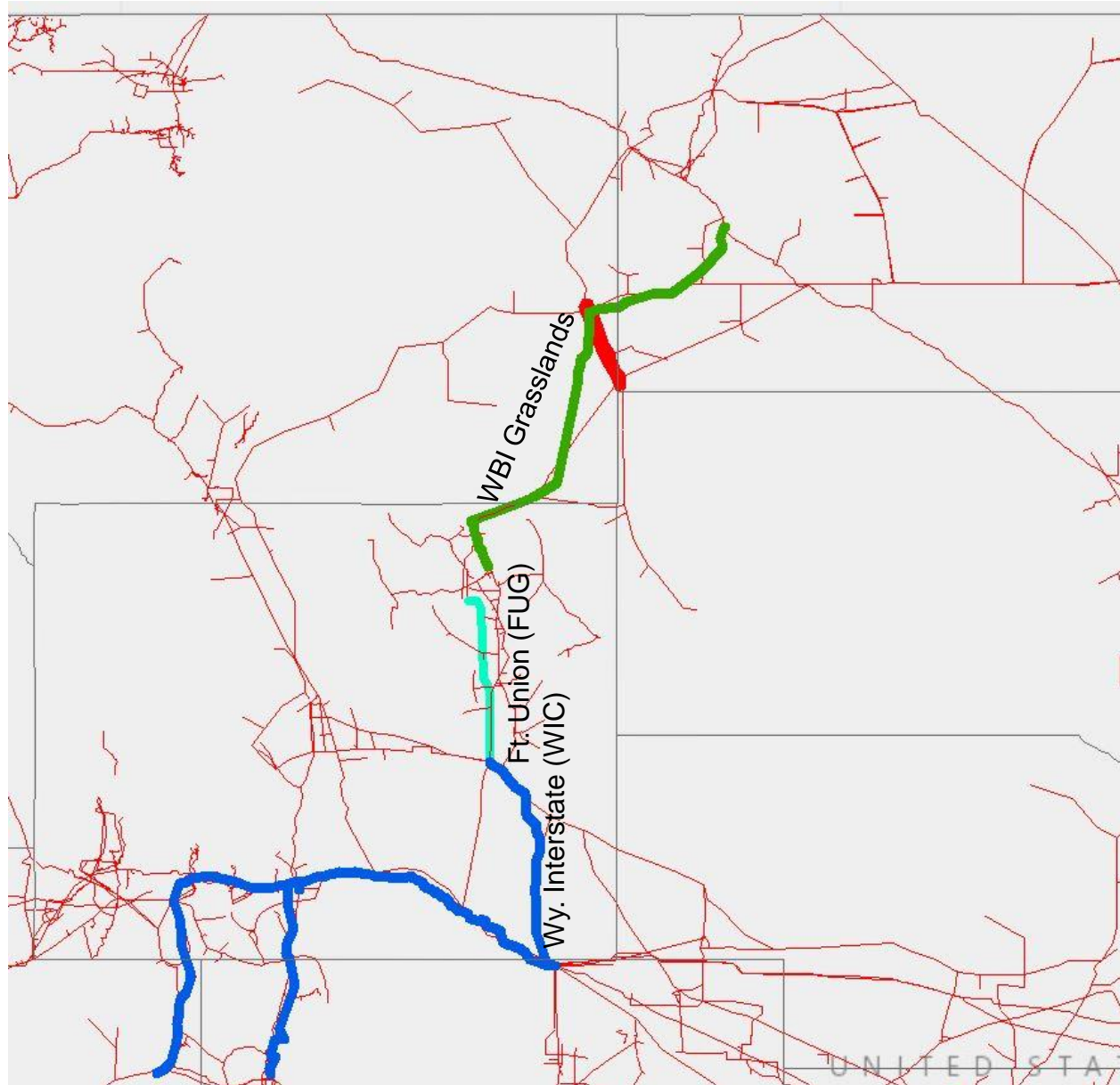
# WBI Energy – Grasslands South Project

## Project Highlights

- Binding open season Jan 10 – Feb 25, 2022
- Repurpose Grasslands Pipeline (16")
- Proposed Capacity 94,000 Dth/Day
- Access to Baker storage field
- Q3 2023 proposed completion
- Seeking commitments 10yrs or Longer
- Fort Union Gas Gathering and Wyoming Interstate Company provide further transport to Cheyenne hub.

## Proposed Tariff Rates

- WBI \$0.32356/Dth + Fuel/Elec to WIC/FUG Interconnect
- FUG/WIC to Cheyenne \$0.2899/Dth + Fuel/Elec



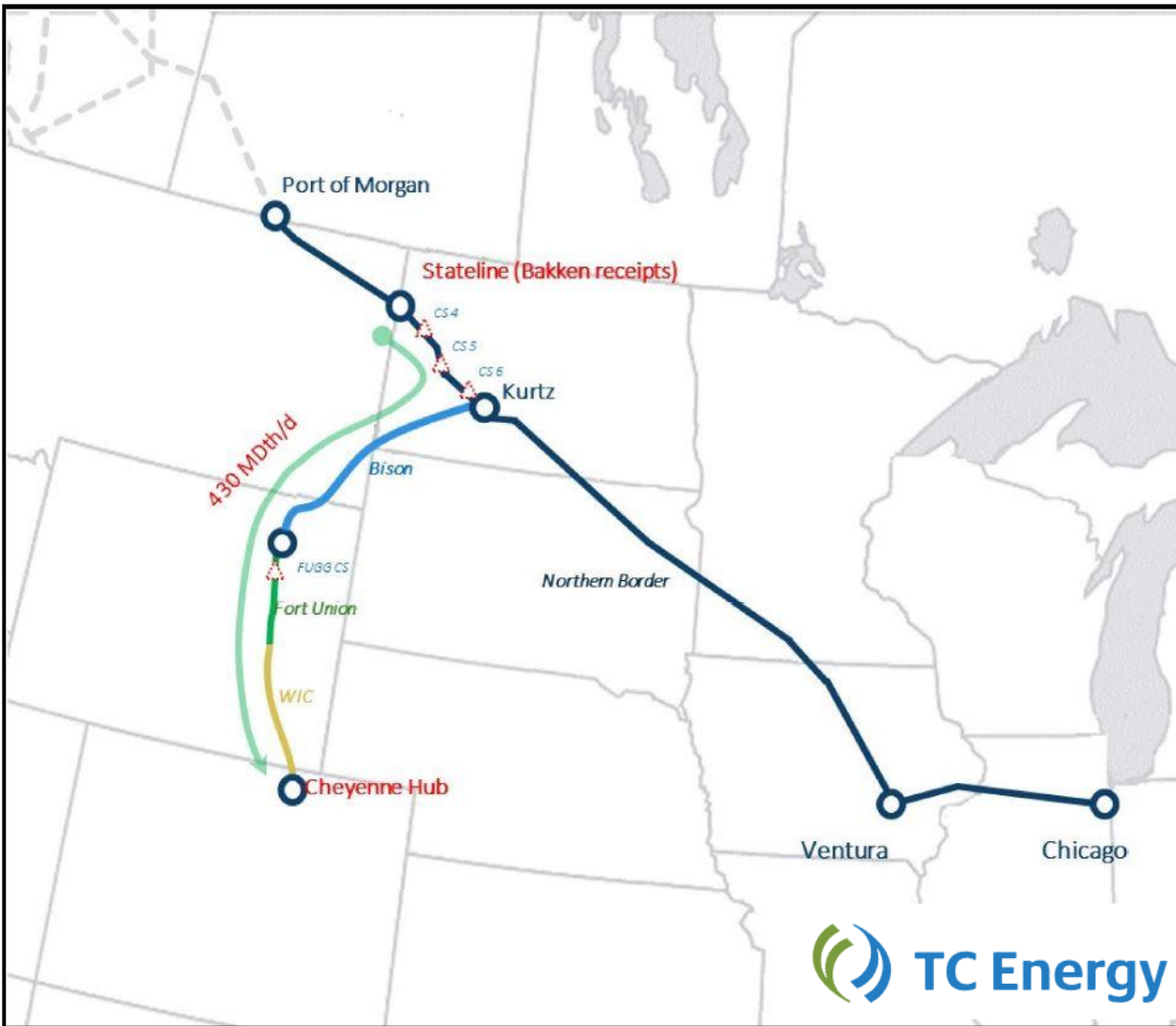
# TC Energy – Proposed Bison XPress Project

## Project Highlights

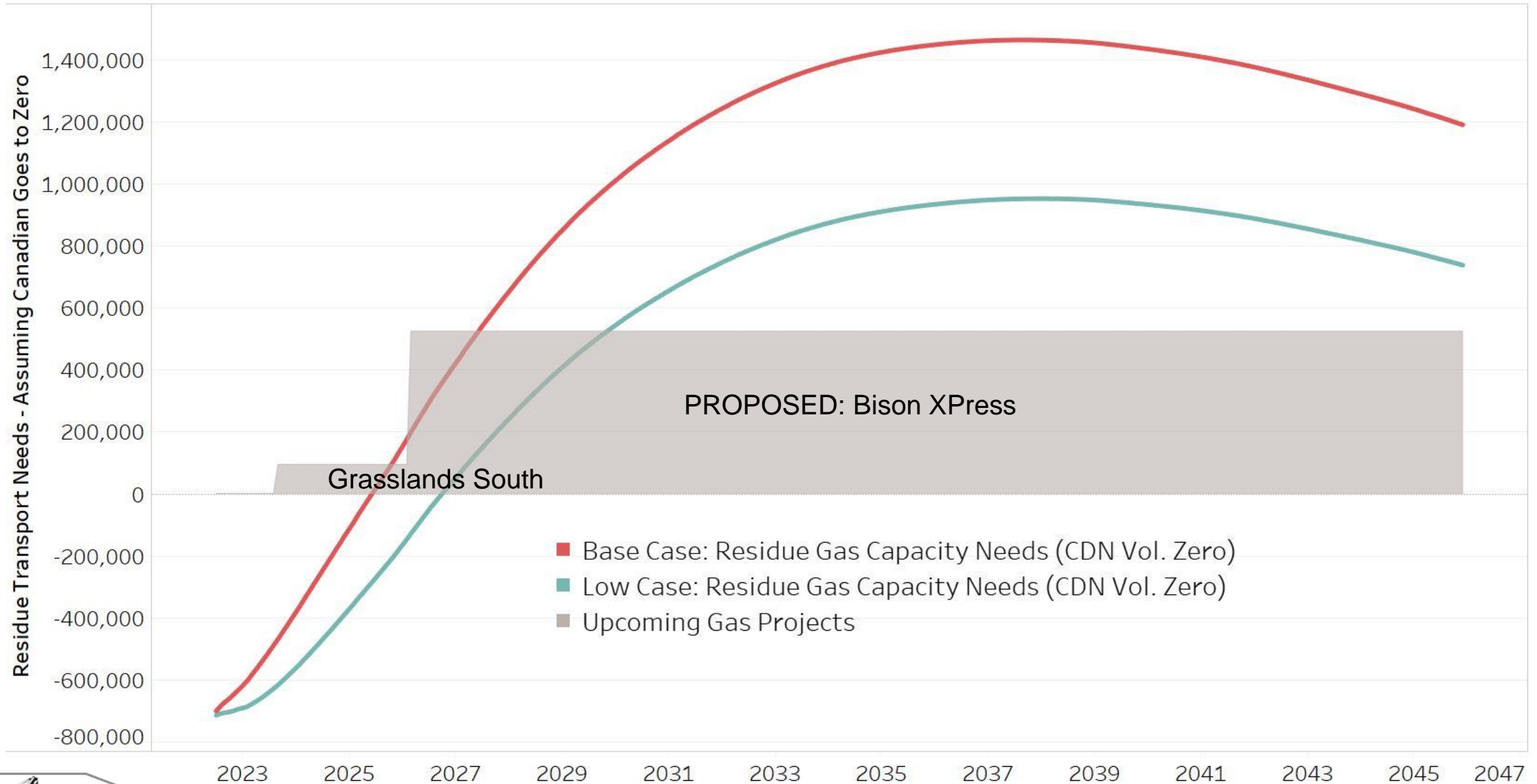
- Non-binding open season April 4 - May 6, 2022
- Three compressor upgrades in North Dakota
- Reverse the idle Bison Pipeline (30" – 302 Mile)
- Proposed capacity 430,000 Dth/Day
- Q1 2026 targeted in-service date
- Fort Union Gas Gathering and Wyoming Interstate Company provide further transport to Cheyenne hub.
- Seeking commitments 10yrs or Longer

## Proposed Tariff Rates

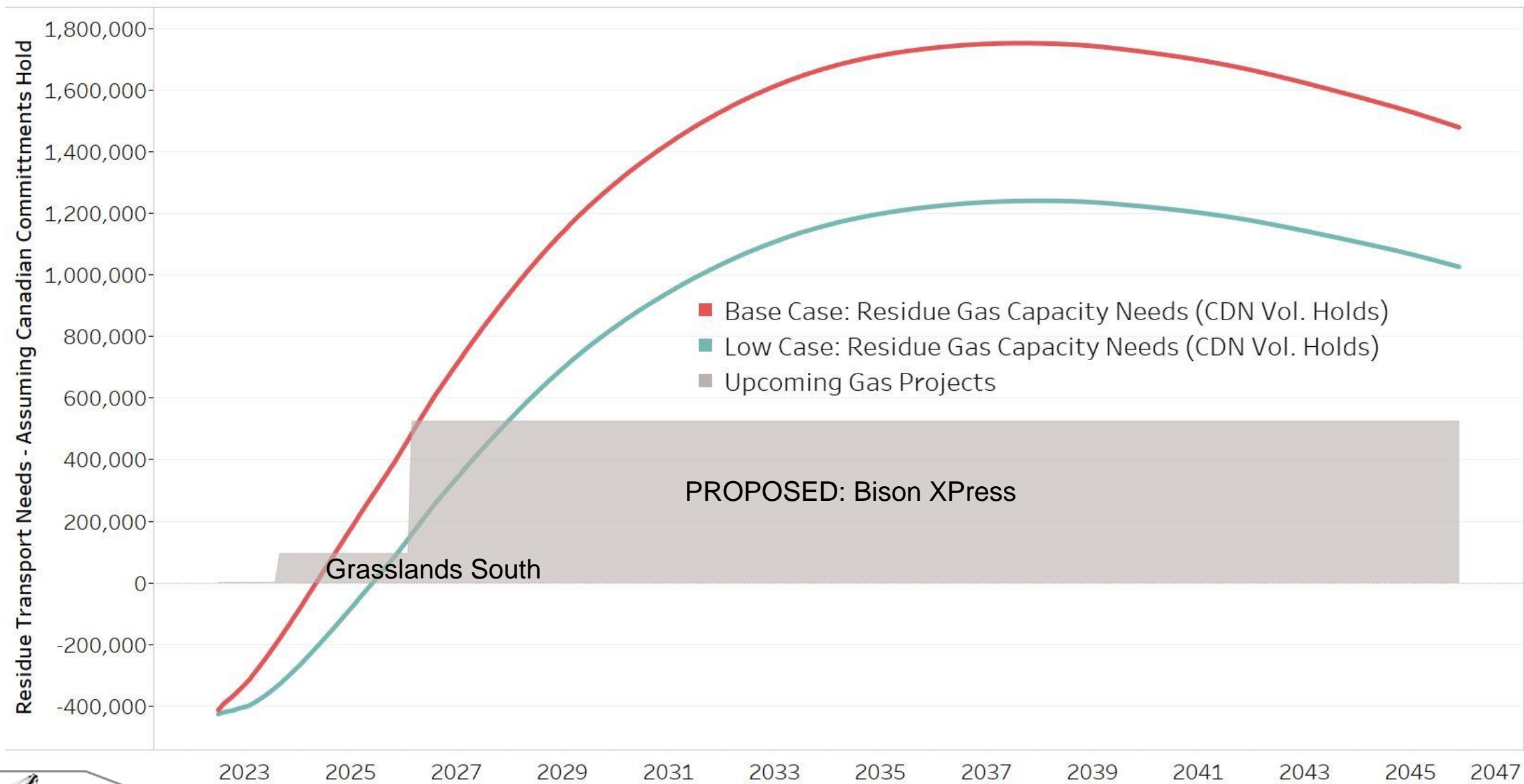
- NBPL/Bison \$0.45/Dth + Fuel/Elec to WIC/FUG Interconnect
- WIC/FUG to Cheyenne \$0.30/Dth + Fuel/Elec
- Anchor Shipper Minimum: 50,000 Dth/Day



# Residue Capacity Needs : **ZERO CANADIAN**

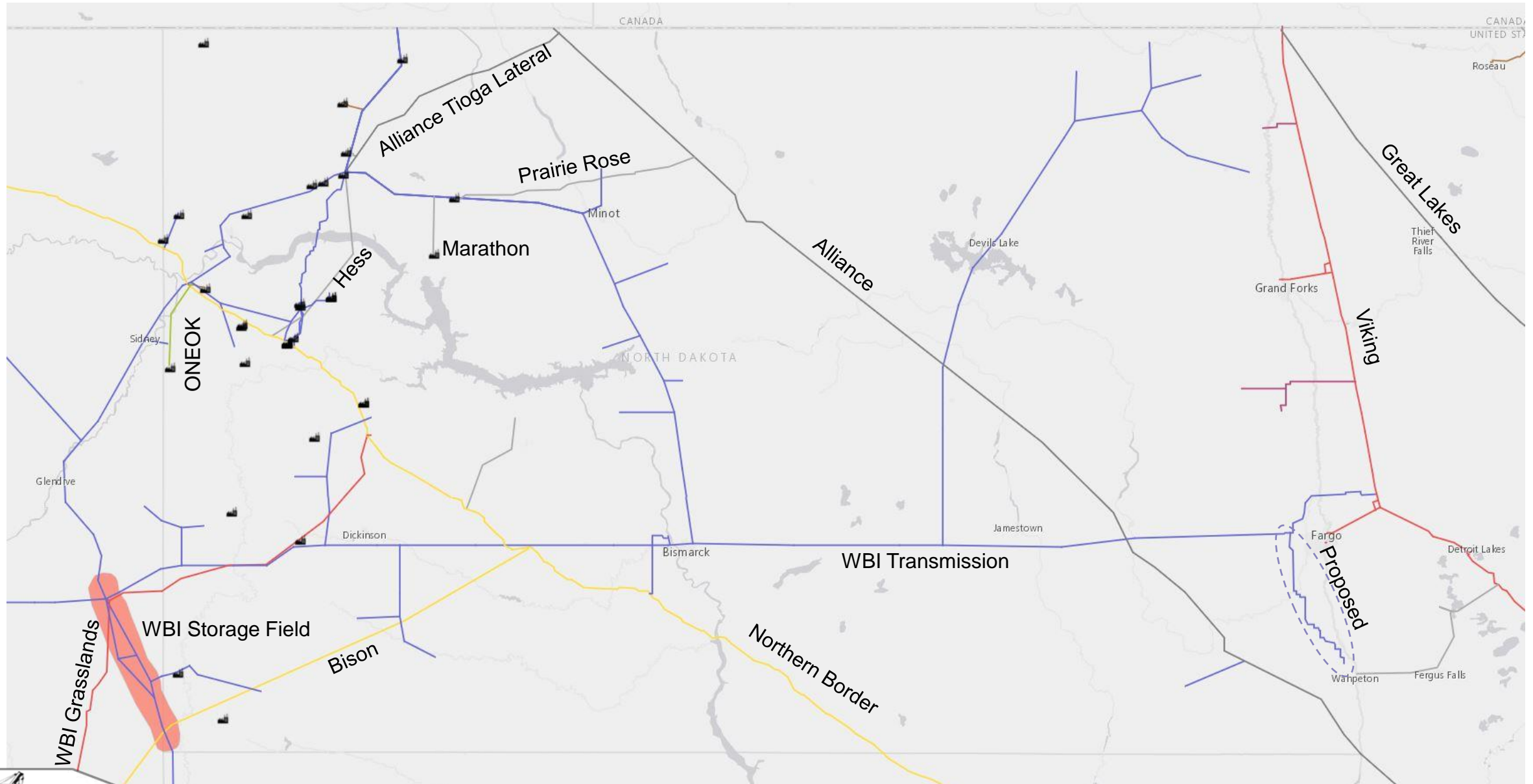


# Residue Capacity Needs: ~288,000 MMBTU CDN

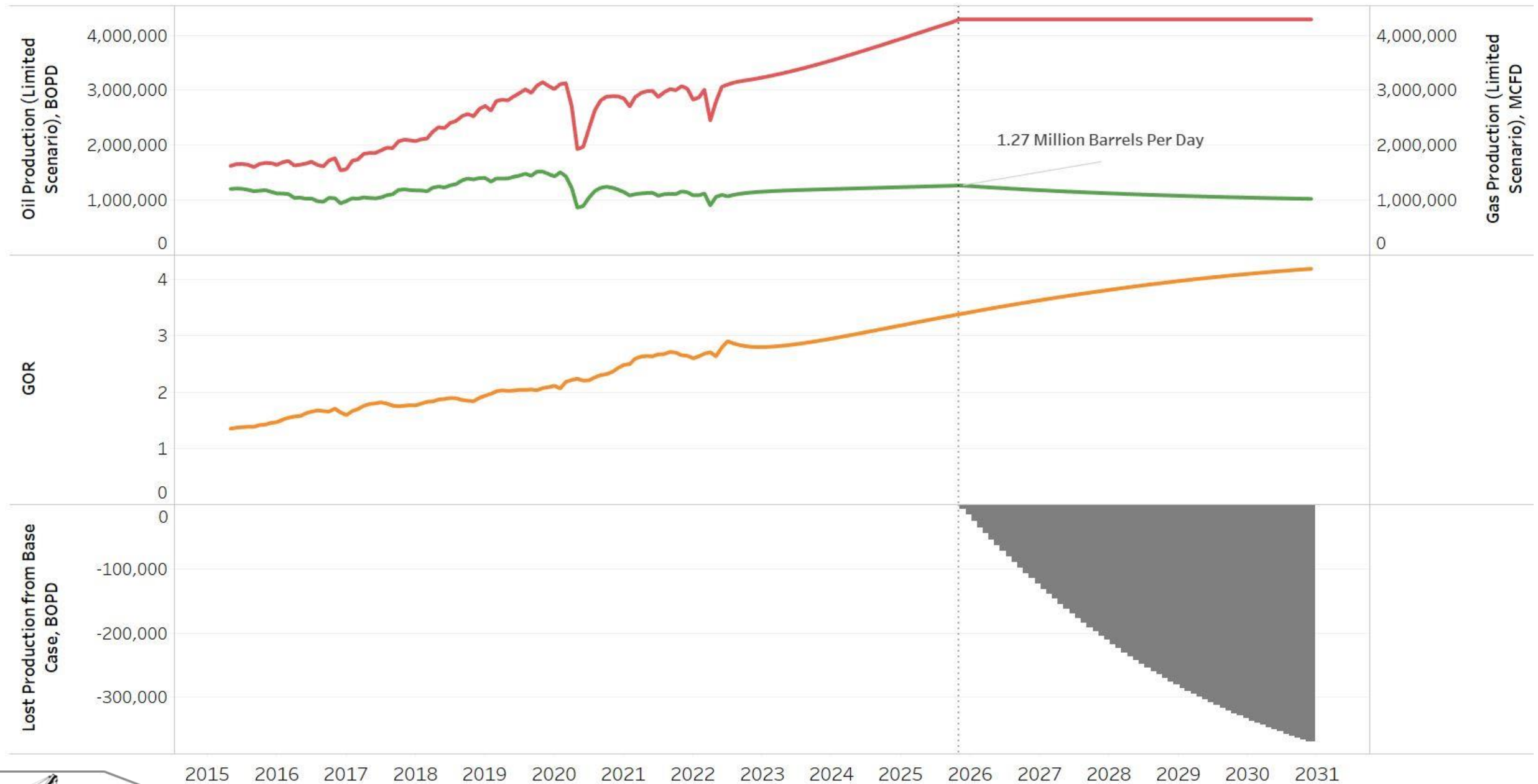




# Major Residue Gas Pipeline Infrastructure



# Gas Limitations Would Force Oil Production Down As GOR Rises



# Value of a Dekatherm (MMBTU)

## Key Assumptions

- Current North Dakota GOR = 2.79
- Gas Plant Shrink = 30% (NGL removal)
- Residue Gas BTU ~ 1,140
- Flaring ~6%
- ND Tax Rate 9.5% (without price trigger)
- ND Wellhead Oil Price \$80

## Resulting Oil and Natural Gas Tax Value

- 1 MCF plant tailgate = 1.14 Dekatherms
- 1 MCF plant tailgate = 1.43 MCF plant inlet
- 1 MCF plant tailgate = 0.54 Barrels in the field (assuming flaring rate of 6%)
- 0.54 Barrels = \$4.14 in state oil tax revenue
- 1 MCF plant tailgate = 1.14 Dekatherms = \$4.14 + ~\$0.13 in natural gas tax revenue
- 1 Dekatherm = \$3.63 in oil tax revenue + ~\$0.11 in natural gas tax revenue
- **1 Dekatherm = \$3.74 in combined oil and natural gas taxes to the State of North Dakota**



# Pipeline Authority Tools

## **54-17.7-04. Powers.**

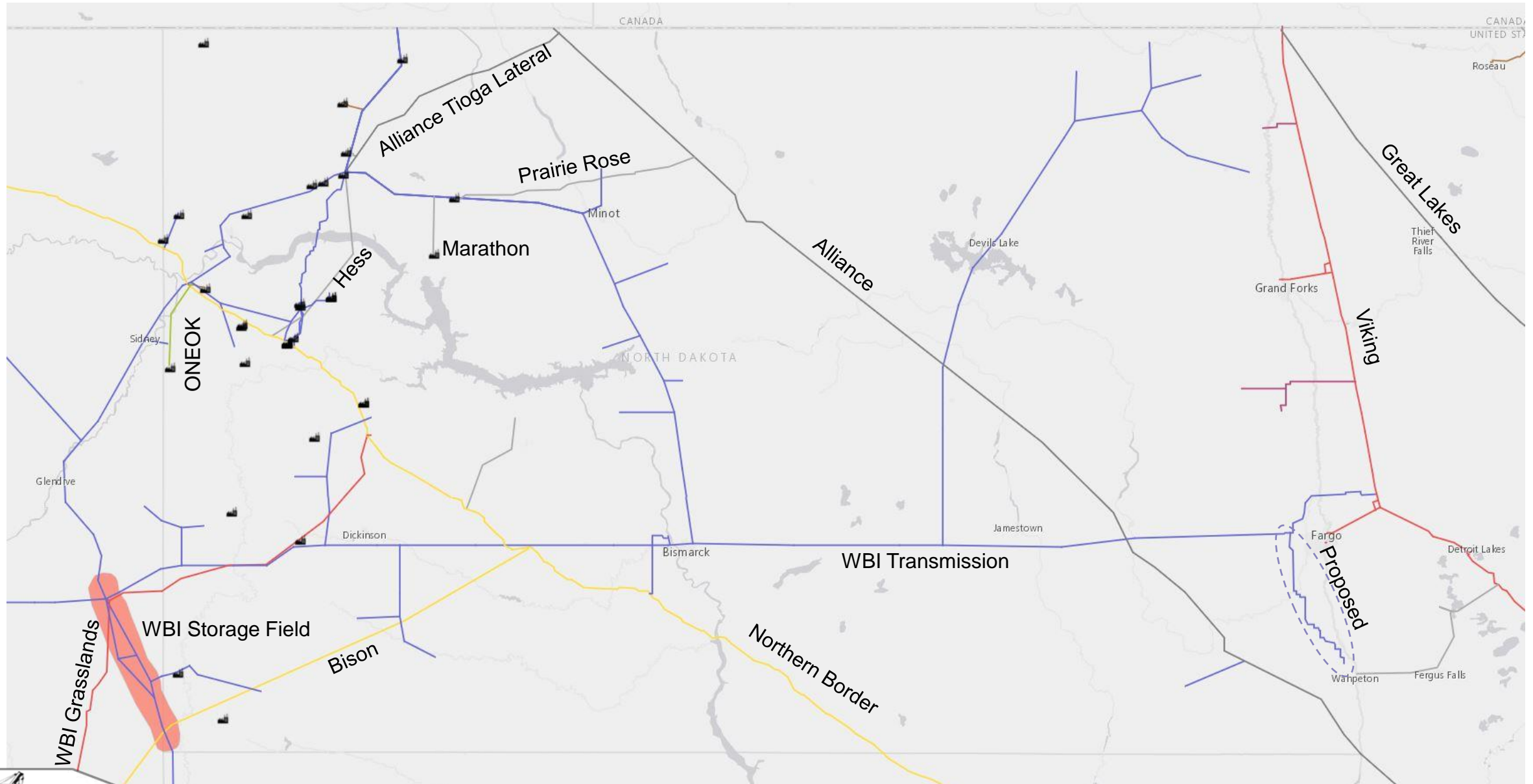
The authority has all powers necessary to carry out the purposes of this chapter, including the power to:

1. Make grants or loans and to provide other forms of financial assistance as necessary or appropriate for the purposes of this chapter.
2. Make and execute contracts and all other instruments necessary or convenient for the performance of the authority's powers and functions.
3. Acquire, purchase, hold, use, lease, license, sell, transfer, and dispose of an undivided or other interest in or the right to capacity in any pipeline system or systems, including interconnection of pipeline systems, within or without the state of North Dakota in order to facilitate the production, transportation, distribution, or delivery of energy-related commodities produced in North Dakota as a purchaser of last resort. The obligation of the state may not exceed ten percent of the pipeline authority's acquisition or purchase of a right to capacity in any pipeline system or systems, or interconnection of pipeline systems, and the state's obligation is limited to the funding available from the oil and gas research fund.
4. Borrow money and issue evidences of indebtedness as provided in this chapter.

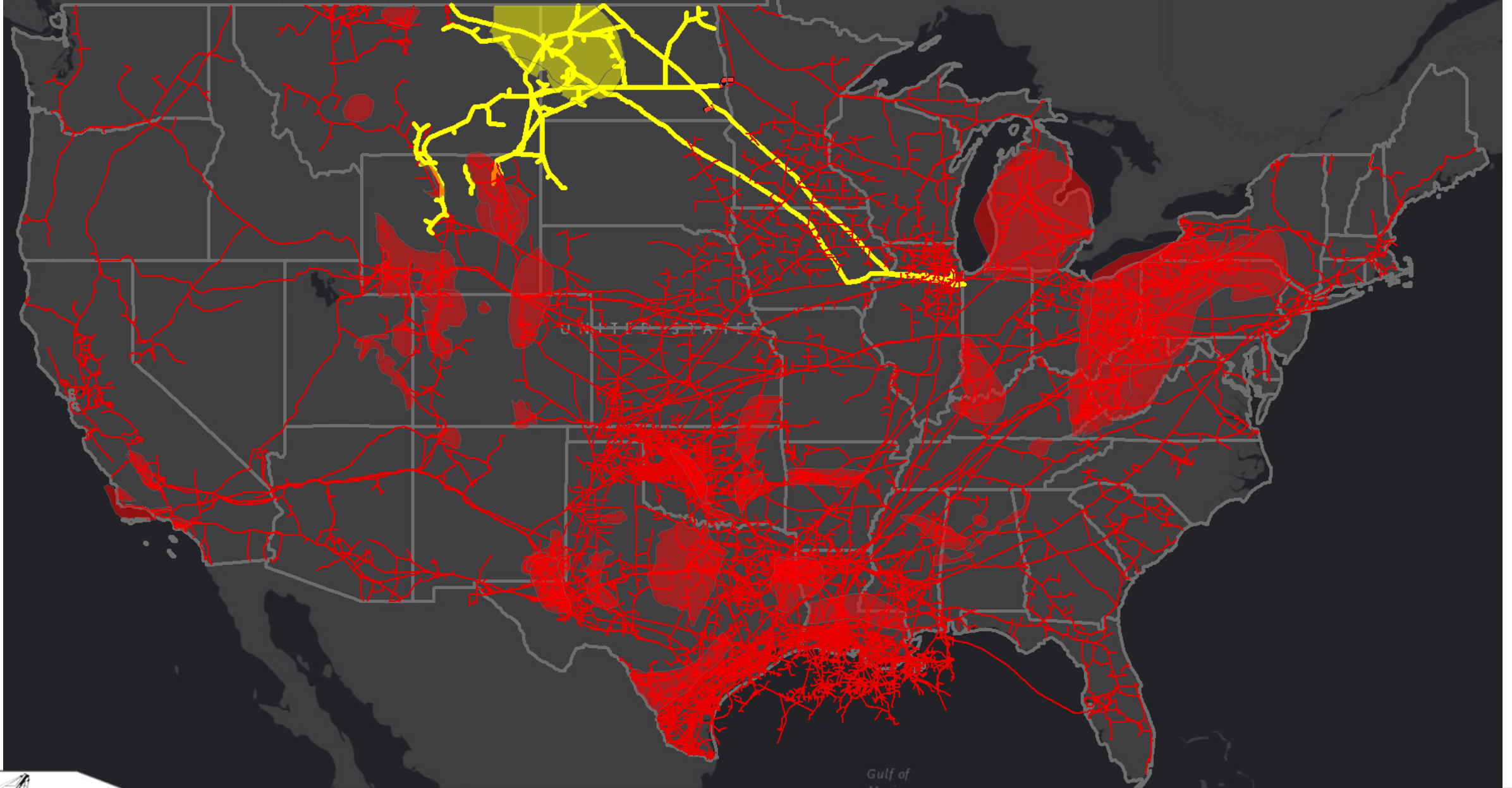




# Natural Gas Pipeline Grant Program

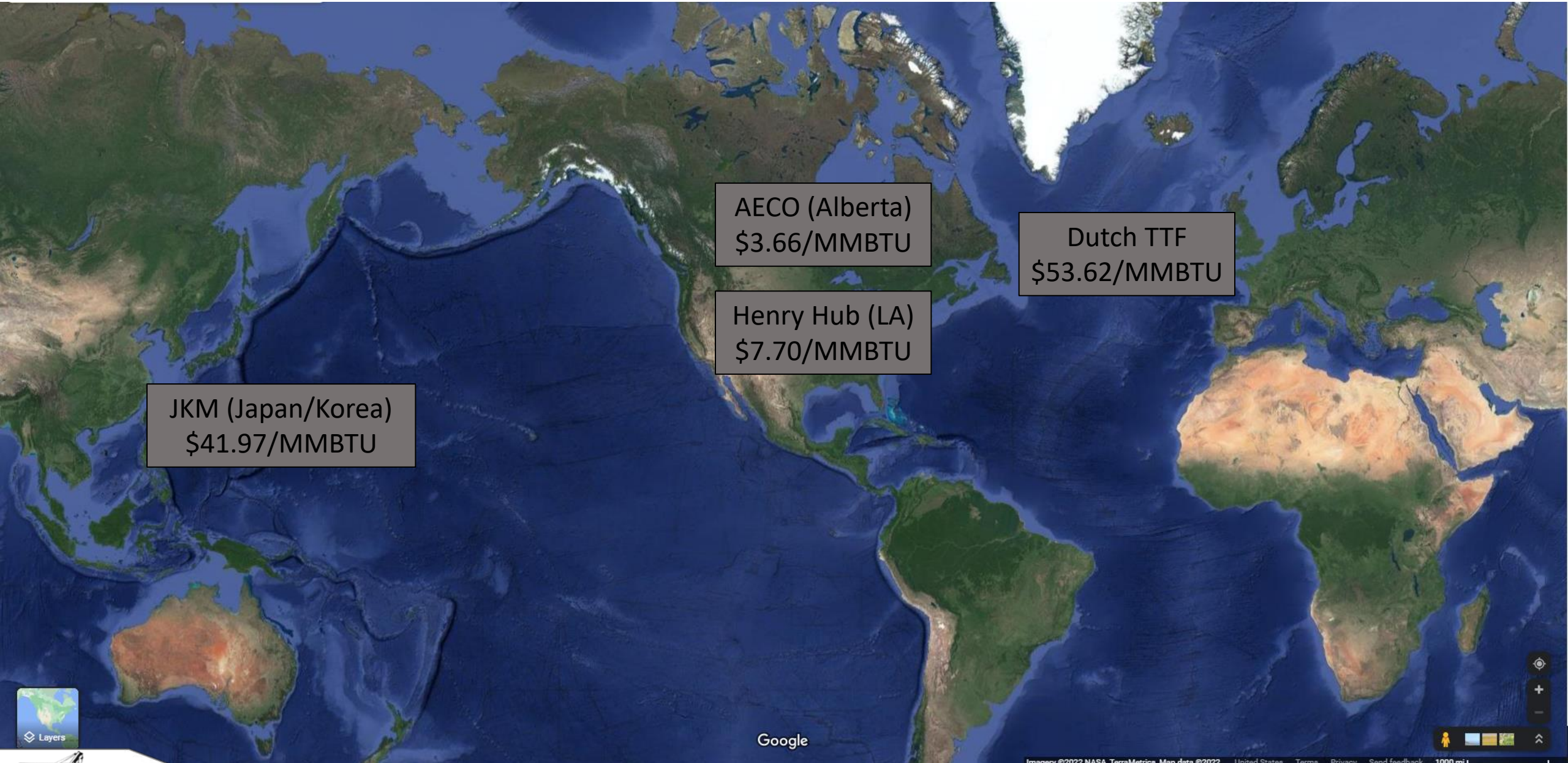


# Bakken Natural Gas Infrastructure





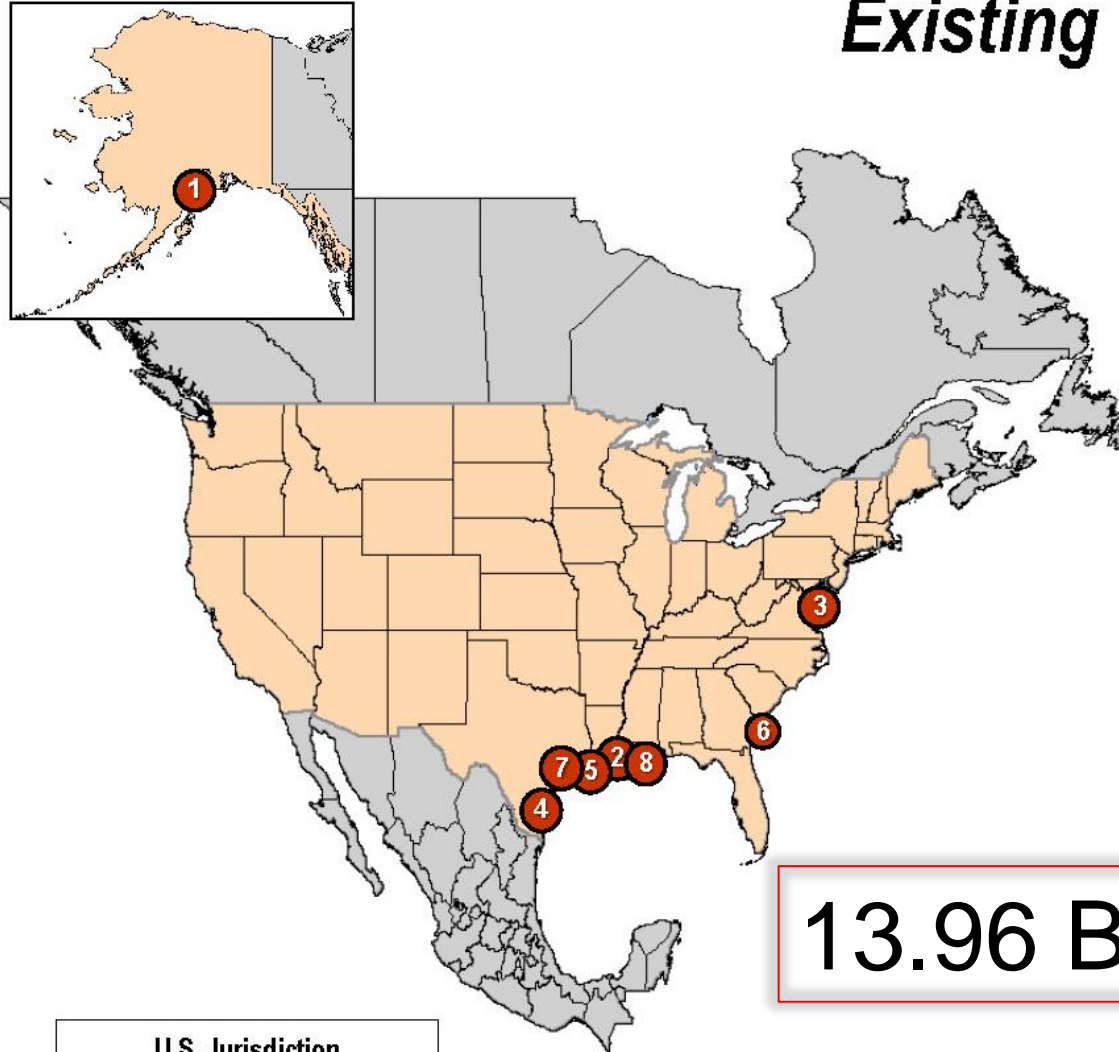
# Global Natural Gas Prices





# North American LNG Export Terminals

## Existing



### Export Terminals

#### UNITED STATES

1. Kenai, AK: 0.20 Bcfd (Trans-Foreland)
2. Sabine, LA: 4.55 Bcfd (Cheniere/Sabine Pass LNG – Trains 1-6)
3. Cove Point, MD: 0.82 Bcfd (Dominion–Cove Point LNG)
4. Corpus Christi, TX: 2.40 Bcfd (Cheniere – Corpus Christi LNG Trains 1-3)
5. Hackberry, LA: 2.15 Bcfd (Semptra–Cameron LNG, Trains 1-3)
6. Elba Island, GA: 0.35 Bcd (Southern LNG Company Units 1-10)
7. Freeport, TX: 2.38 Bcfd (Freeport LNG Dev/Freeport LNG Expansion/FLNG Liquefaction Trains 1-3)
8. Cameron Parish, LA: 1.11 Bcfd (Venture Global Calcasieu Pass Units 1-6)

#### U.S. Jurisdiction

● FERC

● MARAD / U.S. Coast Guard

**As of August 16, 2022**

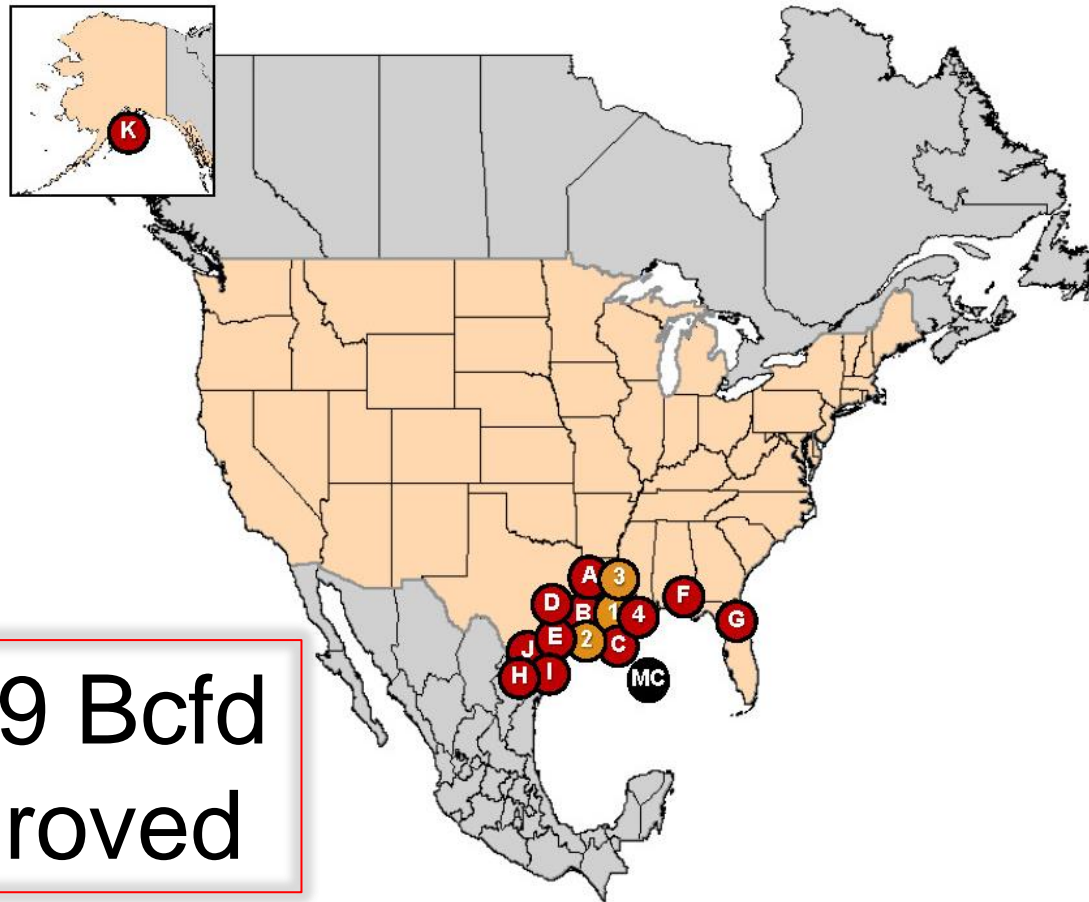
**No updates since previous issuance**





# North American LNG Export Terminals

## *Approved, Not Yet Built*



29.59 Bcfd  
Approved

### U.S. Jurisdiction & Status

- FERC - Approved, Under Construction
- FERC - Approved, Not Under Construction
- MARAD / U.S. Coast Guard

### Export Terminals

#### UNITED STATES

##### **FERC – APPROVED, UNDER CONSTRUCTION**

1. Cameron Parish, LA: 0.55 Bcfd (Venture Global Calcasieu Pass Units 7-9) (CP15-550)
2. Sabine Pass, TX: 2.57 Bcfd (ExxonMobil – Golden Pass) (CP14-517, CP20-459)
3. Plaquemines Parish, LA: 3.40 Bcfd (Venture Global Plaquemines) (CP17-66)
4. Calcasieu Parish, LA: 3.81 Bcfd (Driftwood LNG) (CP17-117)

##### **FERC – APPROVED, NOT UNDER CONSTRUCTION**

- A. Lake Charles, LA: 2.27 Bcfd (Lake Charles LNG) (CP14-120)
- B. Lake Charles, LA: 1.19 Bcfd (Magnolia LNG) (CP14-347)
- C. Hackberry, LA: 1.41 Bcfd (Semptra - Cameron LNG Trains 4 & 5) (CP15-560)
- D. Port Arthur, TX: 1.86 Bcfd (Semptra - Port Arthur LNG Trains 1 & 2) (CP17-20)
- E. Freeport, TX: 0.74 Bcfd (Freeport LNG Dev Train 4) (CP17-470)
- F. Pascagoula, MS: 1.50 Bcfd (Gulf LNG Liquefaction) (CP15-521)
- G. Jacksonville, FL: 0.13 Bcfd (Eagle LNG Partners) (CP17-41)
- H. Brownsville, TX: 0.55 Bcfd (Texas LNG Brownsville) (CP16-116)
- I. Brownsville, TX: 3.6 Bcfd (Rio Grande LNG – NextDecade) (CP16-454)
- J. Corpus Christi, TX: 1.58 Bcfd (Cheniere Corpus Christi Stage III) (CP18-512)
- K. Nikiski, AK: 2.63 Bcfd (Alaska Gasline) (CP17-178)

##### **MARAD/USCG – APPROVED, NOT UNDER CONSTRUCTION**

- MC. Gulf of Mexico: 1.8 Bcfd (Delfin LNG)

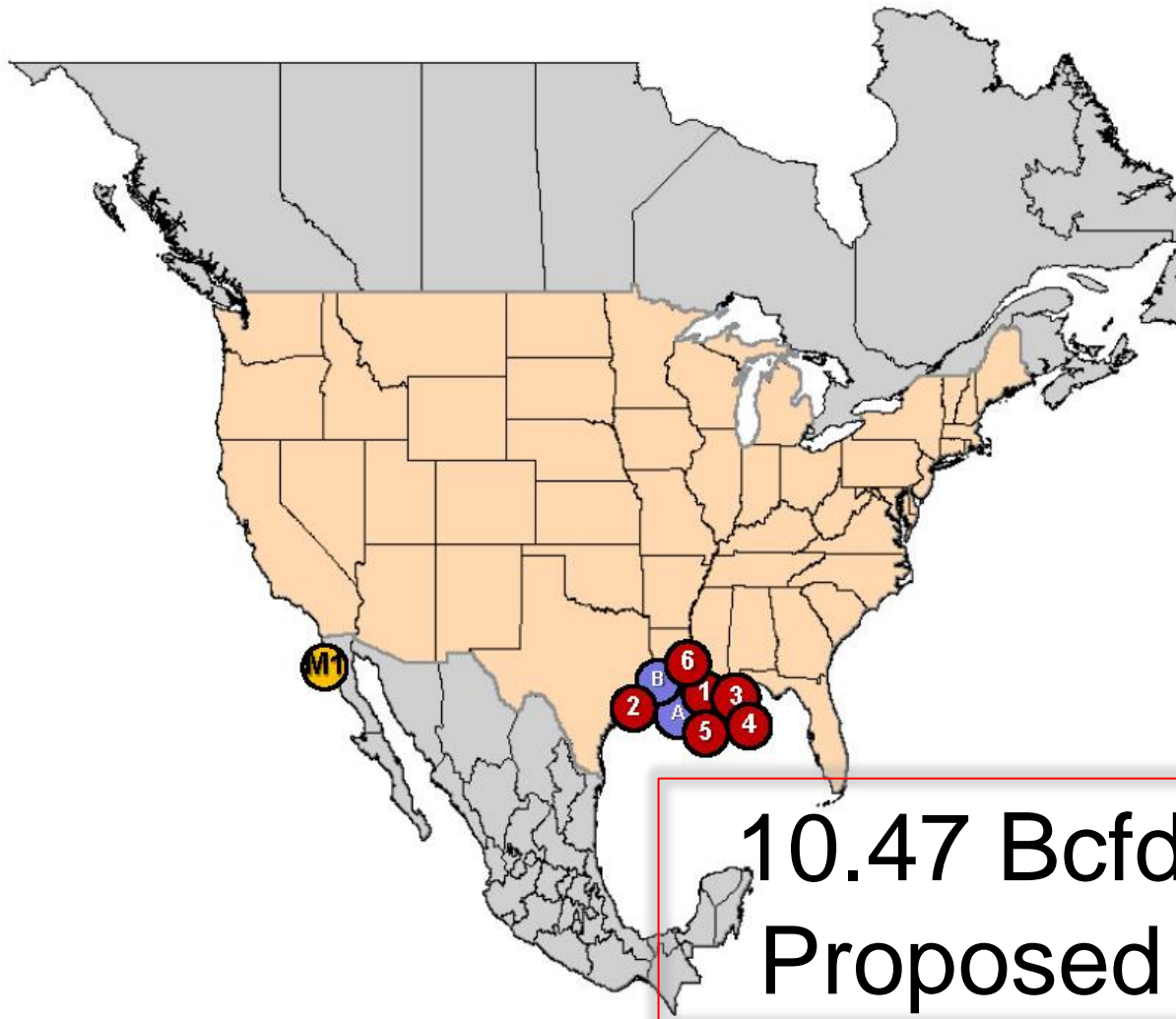
#### CANADA - LNG IMPORT AND PROPOSED EXPORT FACILITIES

<https://www.nrcan.gc.ca/energy/natural-gas/5683>

**As of August 16, 2022**  
**No updates since previous issuance**



# North American LNG Export Terminals Proposed



## UNITED STATES

### PROPOSED TO FERC

#### Pending Applications:

1. Cameron Parish, LA: 1.18 Bcfd (Commonwealth, LNG) (CP19-502)
2. Port Arthur, TX: 1.86 Bcfd (Sempra - Port Arthur LNG Trains 3 & 4) (CP20-55)
3. Cameron Parish, LA: 3.96 Bcfd (Venture Global CP2 Blocks 1-18) (CP22-21)
4. Cameron Parish, LA: .06 Bcfd (Venture Global Calcasieu Pass) (CP22-25)
5. Hackberry, LA: -0.45 Bcfd (Sempra - Cameron LNG Vacate T5 & modify T4) (CP22-41)
6. Plaquemines Parish, LA: 0.45 Bcfd (Venture Global Plaquemines) (CP22-92)

#### Projects in Pre-filing:

- A. LaFourche Parish, LA: 0.65 Bcfd (Port Fourchon LNG) (PF17-9)
- B. Plaquemines Parish, LA: 2.76 Bcfd (Delta LNG - Venture Global) (PF19-4)

## CANADA

### For Canadian LNG Import and Proposed Export Facilities:

<https://www.nrcan.gc.ca/energy/natural-gas/5683>

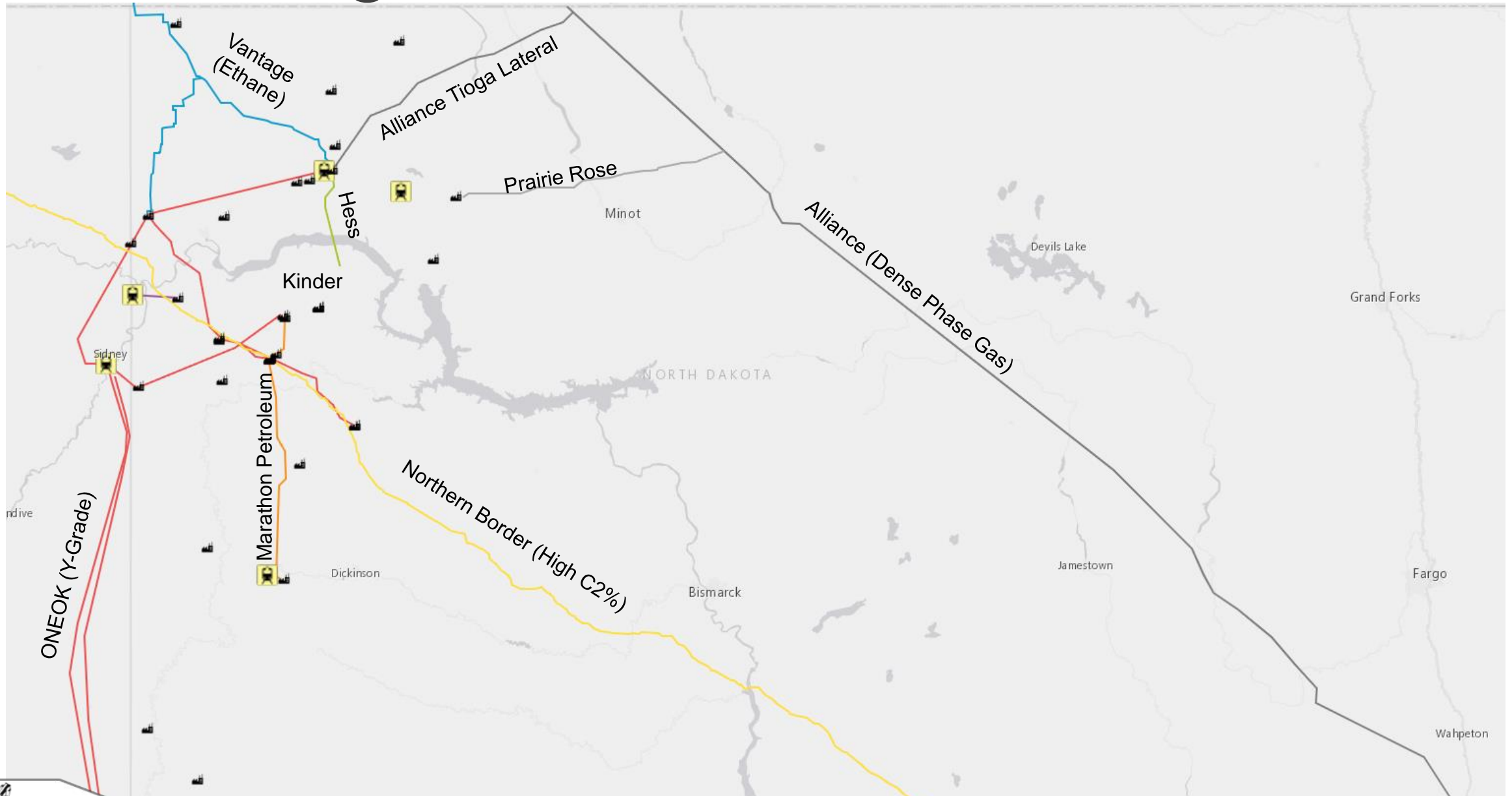
### MEXICO (Projects in advanced planning/development stages)

- M1. Baja California, MX: 0.4 Bcfd (Sempra – Energia Costa Azul Phase 1)

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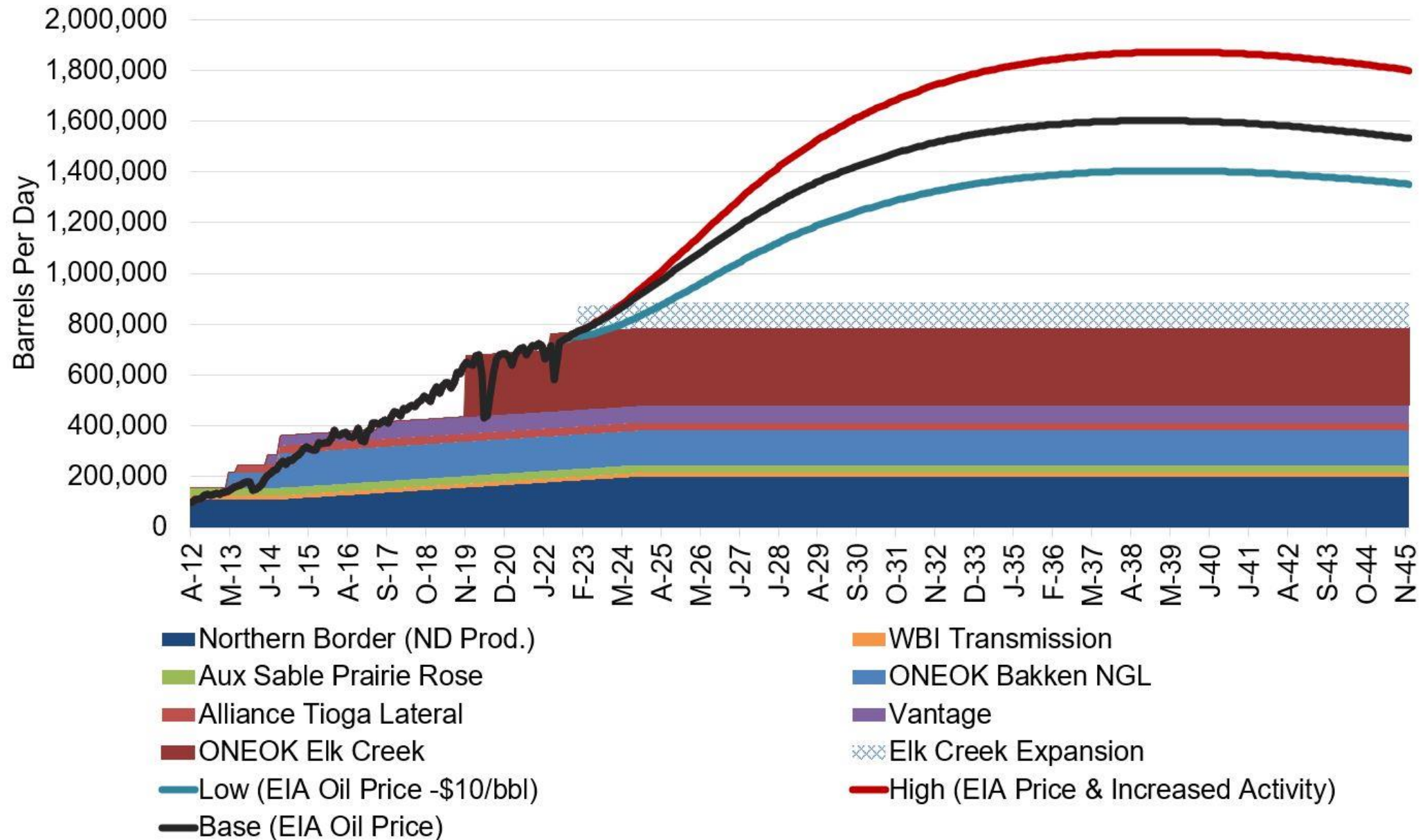


# Regional NGL Infrastructure





# NGL Pipeline Takeaway Options





# Contact Information

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North Dakota Pipeline Authority

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Websites:

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[www.northdakotapipelines.com](http://www.northdakotapipelines.com)

