

Summer 2023 Customer Presentation

Berkshire Hathaway Energy



BHE Pipeline Group



Customer Commitment

Vision Statement

 To be the preferred provider of natural gas transportation and storage services based on our integrity, operational excellence, financial strength and environmental responsibility

Mission Statement

• We are in business to serve our customers. Fairly. Efficiently. Reliably.

These statements mean that

- You will get what we promise on time
- We will share the purpose behind our actions
- We will commit to making it easy to do business with us
- We will negotiate and perform in good faith
- We will continue to invest in the pipeline in order to provide you highly reliable service and to meet your future growth needs

-Permanent Partners-

- Mutually beneficial relationships based on our core principles, not quarter over quarter profits
- Perform necessary due diligence, but maintain an attitude of partnership
- No surprises either way
- Frank, candid discussions
- Seek balanced outcomes

Why Six Core Principles and the focus on Permanent Partnerships? SUSTAINABILITY





Industry Leading Customer Service

- Northern ranked third behind sister companies Kern River Gas Transmission and Carolina Gas out of 38 interstate pipelines in the 2022 Mastio & Co. survey, resulting in a sweep of the top three spots for the second year in a row
- Northern ranked first in the "Mega" and "Major" pipeline categories for the 15th consecutive year
- The BHE Pipeline Group has finished first in the organization category for each of the last 18 years
- Northern scored highest in the following areas
 - 1. Accurate operational information availability
 - 2. Scheduled gas volumes are accurate
 - 3. Accuracy of invoices
 - 4. Firm gas transportation is highly reliable
 - 5. Representatives who listen well
- What must we do now to earn a "10" later this year?
 - "10" = 1st place
 - "9" = 5th place
 - "8" = Bottom 20%
 - "7" = Last





Rate Case Wrap Up

- After working with customers, FERC Trial Staff and other interested parties, Northern filed an unopposed settlement agreement with the FERC on June 23, 2023, effectively concluding Northern's section 4 general rate case proceeding that began in July 2022
- This settlement is the culmination of efforts by all the parties to reach a balanced outcome that allows Northern to recover the costs associated with \$1.6 billion in investment in the reliability and modernization of its systems since its last rate case, provides certainty for all parties, including a moratorium through June 2024, concludes an expensive and time intensive process and hastens the implementation of final rates and refunds
- This settlement supports Northern's capability to continue investing in the modernization of its pipeline system, ensuring that customers continue to receive the industry leading reliability that they have grown to expect from Northern
- Northern anticipates final approval from the FERC some time late this year, at which time, refunds will be issued and prospective tariff changes will be implemented
 - These prospective changes include:
 - The ability for customers to choose an average annual rate in order to flatten monthly charges
 - An increase in the frequency of refunding penalties back to customer from once to twice per year, ensuring cash is returned to customers in a more timely manner
 - A posting mechanism indicating when operational sales are being made
- How did the process work and how would you like us to engage the next time?
 - Tracker?
 - Get to the answer?

Recently Completed Market Area Expansions

- West Leg 2022
- Incremental capacity of 10,065 Dth/day
 - Nine customers
- Project scope
 - 1.7 miles of new 16-inch-diameter mainline loop near the existing Welcome, Minnesota, interconnect
- Project Cost: \$5.9 million
- In service: November 1, 2022



Current Market Area Expansions

- Northern Lights 2023
 - 50,889 Dth/day (Peak Winter MDQ)
 - In service: 2024
 - Capital: \$54.6m
 - Filed with FERC as a section 7c on March 28, 2022
 - Awaiting FERC authorization
- West Leg 2023 Expansion
 - 18,250 Dth/day (Peak Winter MDQ)
 - In service: November 1, 2023
 - Capital: \$20.9m
 - Prior Notice filed with FERC December 22, 2022
 - Approved March 1, 2023
- Hazel Branch Line 2023 Expansion
 - 2,000 Dth/day (Peak Winter MDQ)
 - In service: November 1, 2023
 - Capital: \$11.3m
 - Completing under Northern's blanket authority

Northern Lights 2023 Expansion

- Incremental capacity of 50,889 Dth/day
 - Peak winter MDQ
- Project scope:
 - Mainline:
 - 2.79 miles of 36-inch near Lake Mills, MN
 - Branch Line:
 - 2.01 miles of 4-inch near Paynesville, MN
 - 1.14 miles of 24-inch near Wilmar, MN
 - 1.03 miles of 30-inch near Elk River, MN
 - 0.34 miles of 8-inch near Tomah, WI
 - 2.47 miles of 8-inch near Princeton, MN
 - TBS Modifications
 - Six in Minnesota, and 1 in Wisconsin
- Project Cost: \$54.6 million
- Awaiting FERC authorization; final completion in 2024



Developing Market Area Expansions

- Northern Lights 2025
 - Open season closed on May 22, 2023
 - Currently working with customers to determine final participants, total MDQ and facility requirements
 - Project will likely require a section 7c approval from the FERC
- West Leg 2024 Expansion
 - Open season ended April 21, 2023
 - Currently working with customers to determine final participants, total MDQ and facility requirements
 - Project will likely require a prior notice filing

Field Area Expansions

- Permian Highway Pipeline, Waha Interconnect
 - 100,000 Dth/day, delivery to Permian Highway
 - In service: November 2020
 - Approximately \$1.7m
- Gulf Coast Express Pipeline, Waha Interconnect
 - 100,000 Dth/day
 - In service: September 2021
 - Approximately \$1.3m
- Gulf Coast Express Pipeline, Spraberry Interconnect bi-directional updates at the interconnect
 - Adds bi-directional service for deliveries to Gulf Coast Express
 - 100,000 Dth/day interconnect delivery capacity
 - In service: September 2021
 - Approximately \$1.1m
- Whistler Pipeline, Spraberry Interconnect
 - 100,000 Dth/day, delivery to Whistler Pipeline
 - In service: November 2021
 - Approximately \$5.5m
- Spraberry Compression Project
 - Adds compression and pipeline headers and lateral
 - Increases Spraberry high pressure delivery capacity by 67,000 Dth/day each phase
 - In service: June 2022
 - Approximately \$19.2m

Demarc to Ventura Expansion

- Expansions on Northern have often occurred at the Ventura, Iowa interconnect with Northern Border pipeline; however, design capacity on Northern Border is 2.24 Bcf/day, which is does not match the 2.78 Bcf/day of take-away capacity contracted on Northern at Ventura
 - Customers are aware of this mismatch and utilize storage receipts on high flow days, mitigating the impact of this situation
 - Customers have elected expansion capacity receipts at Northern Border due to lower capital project costs
 - FERC policy provides the shipper is responsible for arranging upstream capacity; risk of non-performance by Northern Border is on the shipper
- Project Concept
 - Investment of \$75 million; annual cost of service of \$12 million; capital recovery rate of \$0.31/Dth/day
 - Incremental capacity of 100,000 Dth/day receipt point realignment from Ventura to Demarc
 - In service date of November 1, 2026, assuming timely agreement and regulatory approvals
- Current forward spreads indicate the cost of gas at Demarc is approximately \$0.20/Dth/day less than at Ventura, which is significant, but does not cover the cost of the buildout
- Northern is soliciting interest from customers on the project and, if interested, on the mechanism to finance the project and ensure Northern's cost recovery

Demarc to Ventura Expansion Proposed Facilities

- Additional compressor unit at Guthrie Center, Iowa
- New greenfield compressor station near Clarion, Iowa
- 4 miles of 6-inch pipeline loop on Denison, lowa branch line



Winter 2022-2023 Review

- Colder than normal throughout most of the heating season
 - Winter Storm Elliott brought significantly colder than normal temperatures throughout Northern's operational area from December 17, 2022, through December 26, 2022
- Market Area deliveries on December 23, 2022, were 5.33 Bcf, the ninth highest delivery day alltime
- Four consecutive days with 5.0 Bcf/day or more of deliveries to the market from December 20th through December 23rd
 - Storage assets delivered 420 MMcf from LNG and 4.2 Bcf from underground storage during this period
- Market Area deliveries for the 2022-2023 heating season averaged 3.631 Bcf/day, third most alltime
 - Daily average Market Area delivery records in December and March

	System Weighted Temp vs Normal				
	18-19	19-20	20-21	21-22	22-23
November	31%	20%	9%	1%	11%
December	8%	5%	8%	7%	13%
January	8%	6%	13%	14%	7%
February	25%	4%	27%	21%	2%
March	22%	7%	15%	14%	23%
Heating Season	13%	0%	3%	8%	7%

Winter Storm Elliott Performance & Lessons Learned

- Compression was able to meet all customer demand, however, intermittent compressor outages occurred and accumulated 123 total hours of unavailability
 - Evaluated the need to improve building, lube oil system and outdoor valve heating
 - Reviewed wiring installation protocol during automation upgrades
- Measurement systems
 - Completed global review of solar power supply systems
- Fleet horsepower utilization was 63% on December 21, 2022, compared to 57% on the all-time peak day of January 6, 2022



Source: NOAA and the National Weather Service

Field team travel exceeded 194,000 miles throughout the 11-state footprint with zero OSHA recordable injuries and no preventable vehicle accidents

Advanced Technical Training

- The Owatonna Technical Training Center (OTTC) is Northern's advanced training center located in Owatonna, MN
- The facility opened in 2021 with the goal of providing high quality advanced training to our pipeline personnel in a safe, controlled environment
- Training is currently provided in four core areas
 - Gas Measurement
 - Corrosion
 - Mechanical Maintenance
 - Controls
- The facility has become a host site for safety and environmental training events throughout the company



Measurement Lab

Technicians are trained on flow meter, relief valve and control valve maintenance.



Measurement Lab

Owatonna Technical Training Center



Mechanical Lab

Training is provided on routine compressor maintenance tasks as well as overhauls and advanced troubleshooting.



Driving Simulator

A high-fidelity simulator is utilized to improve driving skills and manage extreme driving hazards in a safe environment.



Controls Lab

Technicians are trained on fire and gas systems, emergency shutdown controls and serial communications.



Corrosion training includes pipeline inspections, regulatory requirements and corrosion mitigation techniques.

Methane Emissions Reduction Initiative

- BHE Pipeline Group focuses on continuous methane emissions reductions
 - 2022 combined intensity rate was 90% lower than the natural gas transmission and storage segment emissions rate of 0.25%
- BHE Pipeline Group forecasts emissions 12 months forward and makes prioritized decisions to help control emissions to stay within goal

Year	BHEPG Methane Intensity
2022	0.028%
2021	0.049%
2020	0.041%
2019	0.040%
2018	0.050%
2017	0.046%

- Northern publicly posts an annual greenhouse gas report
 - Actual greenhouse gas emissions data
 - Description of GHG emission reduction strategies
 - Detail projects implemented to mitigate methane emissions
 - Annual reporting in accordance with ONE Future Protocol
 - Description of Northern's publicly disclosed efforts and requests submitted for interconnects with renewable natural gas, hydrogen, certified natural gas, or other low-carbon gas production facilities

Methane Emissions Reduction Initiative

Northern Methane Reduction Goals

- Reducing fugitive methane emissions by
 - Routing gas to a compressor
 - Routing gas to a flare
 - Routing gas to a low-pressure system by taking advantage of existing piping connections between highand low-pressure systems, temporarily resetting or bypassing pressure regulators to reduce system pressure prior to maintenance, or installing temporary connections between high- and low-pressure systems
 - Utilizing hot tapping, a procedure that makes a new pipeline connection while the pipeline remains inservice, flowing natural gas under pressure, to avoid the need to blow down gas
- Reducing methane emissions from non-emergency blow downs by at least 50% from total potential emissions
- Year-over-year reduction of the methane emissions rate (emissions/throughput)



Portable Compression



Hot Tap and Bypass





- Through summer 2023, Northern is operating 114 compression units greater than 40 years old (62.0% of total units), with 70 units exceeding 60 years old (38.0% of total units)
- As assets approach or exceed the original intended service life, risks must be strategically and diligently managed to ensure equipment safety and reliability





- Without asset modernization, Northern will be operating 107 units over 75 years old (58.2% of total units), 59 units over 90 years old (32.1% of total units), and five units over 100 years old by 2050
- With strategic investments in compression replacement on an annual basis, the risks inherent to operating units past the end of their service life are manageable
- Asset modernization is critical to customer reliability expectations

Vintage Pipeline Abandonment Projects





- Replace vintage pipeline installed with antiquated construction techniques
- Complete replacement of largediameter (>12") vintage mainlines within the next 6 years
 - Since 2019 583 miles of largediameter 1930s vintage A-line was abandoned
 - 2023-2029 329 miles of additional large-diameter vintage pipeline abandonment is planned
- Continue to address small-diameter vintage pipeline segments

Vintage Pipeline Abandonment Projects



- In 2022, completed \$143m in projects
 - Installed 82 miles of pipeline
 - Abandoned 79 miles of pipeline
- In 2023, \$79m in projects planned
 - Installing 10.5 miles of pipeline
 - Abandoning 115 miles of pipeline







Large-Diameter In-Line Inspection Modifications





- In-line inspection (ILI) is used to assess the integrity of pipelines
 - Pipeline modifications are needed to enable inspection tool launching, receiving and passage
- Current ILI modifications focus on largediameter (≥16") pipelines
 - 45% of Northern's 14,300-mile system is 16-inch-diameter or larger
- Large-diameter pipeline modifications
 - By 2023, 71% of Northern's largediameter pipeline will be in-line inspectable
 - By 2029, 95% of Northern's largediameter pipeline will be in-line inspectable

Large-Diameter In-Line Inspection Modifications



- In 2022, completed \$64m in projects
 - 342 miles of pipeline was made in-line inspection capable
- In 2023, \$63m in projects planned
 - 191 miles of pipeline will become in-line inspection capable













Consequence Segments



- 2002 Pipeline Safety Improvement Act
 - Result of El Paso pipeline rupture near Carlsbad, New Mexico in 2000
- 2019 Pipeline Safety Improvement Act
 - Result of explosions in Merrimack Valley, Massachusetts in 2018
 - Over 3 times the scope of the 2002 Act



MAOP Reconfirmation



603 miles of HCA, MCA, and Class 3 locations



- 93 miles MAOP reconfirmation is required
 - Grandfathered pipeline segments that will no longer be able to operate at high pressure without action
- 510 miles MAOP reconfirmation is not necessary, but traceable, verifiable, and complete (TVC) records validation is required

- Roughly 200 MAOP reconfirmation projects are needed
 - First 50% of mileage required by 2028
 - Remaining 50% by 2035

Ozone Transport Rule



- 2023 Ozone Transport Rule
 - 18 compressor units are impacted in two states (Texas and Oklahoma)
 - Units are required to achieve enhanced emissions performance by 2026

Engine Type and Fuel	Published NOx Emissions Limit (grams per horsepower per hour)		
Natural Gas Fired Four Stroke Lean Burn	1.5 g/hp-hr		
Natural Gas Fired Two Stroke Lean Burn	3.0 g/hp-hr		

- Compliance accomplished through unit retrofits or replacement
 - Upgrades are not technologically viable on some vintage units
 - Some units are nearing end of life and require replacement versus emission modifications at a high cost, \$3m to \$5m
 - Current strategy is a blend of unit upgrades and replacements at a total cost of \$120m



