

Path to Reduction – Kinder Morgan Case Study (Transmission & Storage)

2nd Annual ONE Future Methane Strategies Event

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Kinder Morgan: Leader in Energy Infrastructure



Experienced operator with unparalleled footprint built over decades

Note: Mileage and volumes are company-wide per 2019 budget.

Largest natural gas transmission network

- ~70,000 miles of natural gas pipelines
- Connected to every important U.S. natural gas resource play and key demand centers
- Move ~40% of natural gas consumed in the U.S.

Largest independent transporter of refined products

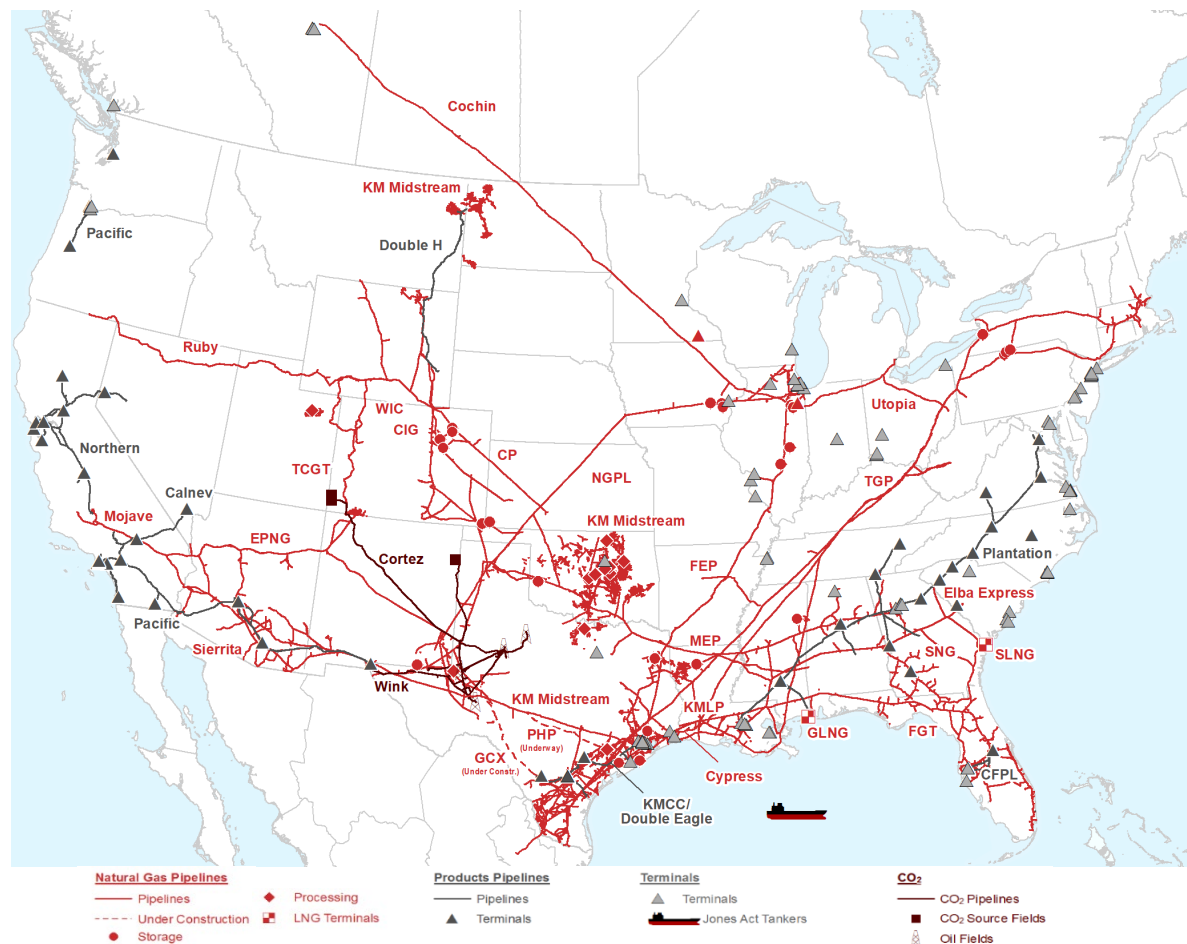
- Transport ~1.7 mmbbld of refined products
- ~6,900 miles of refined products pipelines
- ~5,800 miles of other liquids pipelines (crude and natural gas liquids)

Largest independent terminal operator

- 157 terminals

Largest transporter of CO₂

- Transport ~1.2 Bcfd of CO₂



Kinder Morgan – Decades of Commitment to Methane Reductions

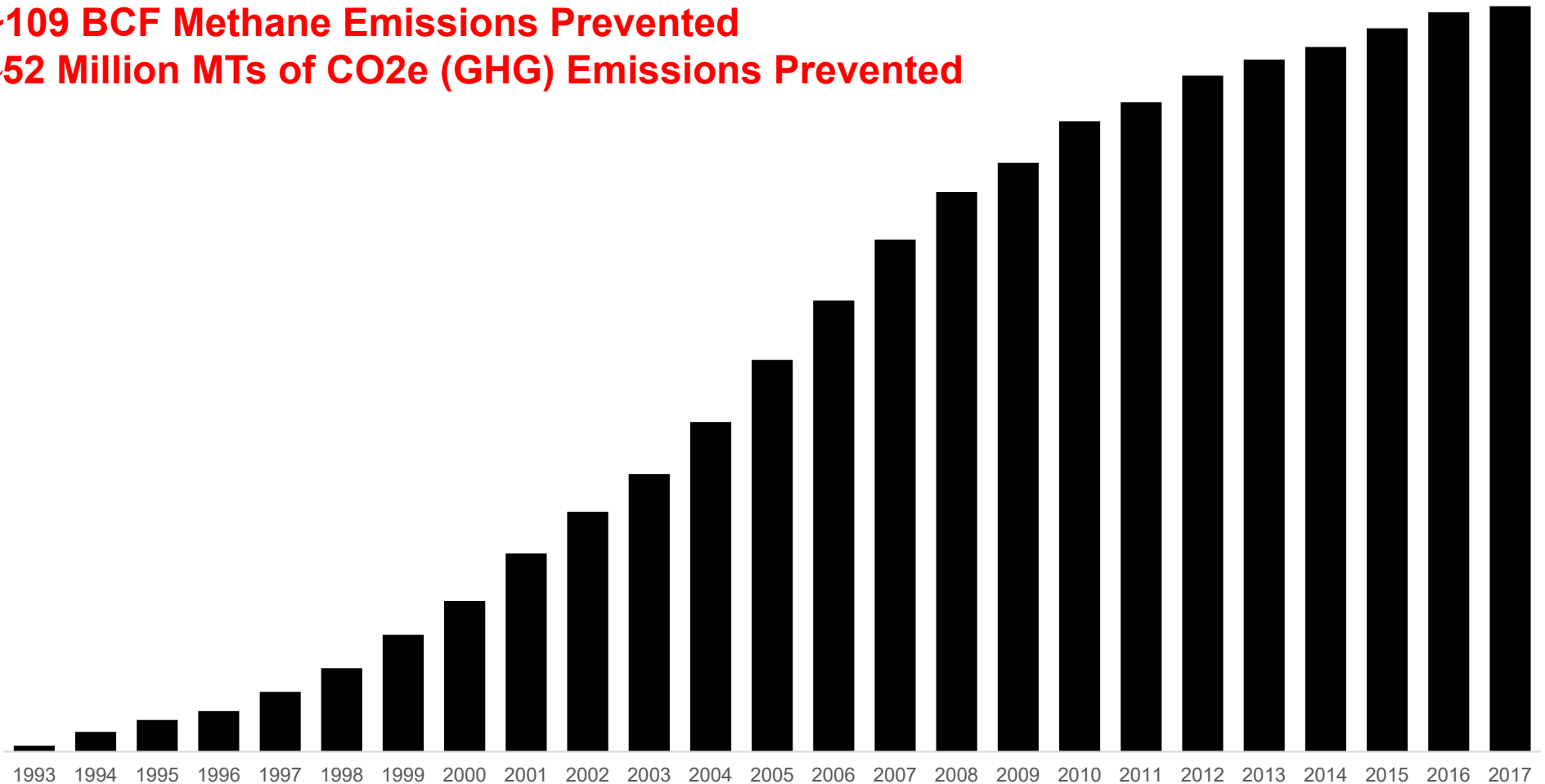
- Charter Partner of EPA's Natural Gas STAR Program: 1993 to present (see next slide)
 - Many innovative technologies and practices resulted from the program
- A Founding Member of the ONE Future Coalition in 2014
- A Charter Partner of EPA's Natural Gas STAR Methane Challenge Program – ONE Future Option in 2016
 - KM committed to a methane emission intensity target of 0.31% across our transmission and storage operations by 2025.
 - **First reporting year of 2017, KM achieved a methane emission intensity of 0.04%**
 - Additional years of methane emission reductions and methane emission intensities needs to be collected to better understand the trends and targets.
 - Continuous Improvement: ONE Future's methane management approach aligns with Kinder Morgan's Operations Management Systems (OMS) philosophy.

Kinder Morgan – Methane Reductions since 1993 EPA’s Natural Gas STAR program



SUCCESSFUL METHANE EMISSIONS REDUCTIONS (Bcf cumulative)^(a)

~109 BCF Methane Emissions Prevented
~52 Million MTs of CO₂e (GHG) Emissions Prevented



Source: EPA Inventory of U.S. Greenhouse Gas Emissions & Sinks: 1990-2017 (published 04/11/2019). Emissions reductions statistics refer to changes through 2017, the latest available.

a) Kinder Morgan's EPA Natural Gas STAR Summary Report (September 2018)

Kinder Morgan – Methane Reduction Programs Timeline (2015 to present)



- 2015: As part of ONE Future, began collaborating with USEPA on their Methane Challenge program to include a ONE Future option
- 2016: USEPA finalized the Methane Challenge-ONE Future option in August
- January 1, 2017: Official start date of Kinder Morgan's commitments under Methane Challenge
- 2017: Rollout of Methane Challenge tools and tracking systems to be used by stakeholders within Kinder Morgan: leak survey and repair spreadsheets, leak tracking database, gas loss minimization form
- 2017: Updating emission reporting tools for tracking and reporting methane reductions
- 2018: Finalize and rollout internal policy and procedure implementing program
- 2018 to present: Continue collaboration with EPA and Other Agencies

- Kinder Morgan Transmission and Storage (T&S) Assets
 - 21 Transmission Pipeline Entities
 - ~ 70,000 miles of pipeline
 - > 300 transmission compressor stations
 - 22 underground storage facilities

- ONE Future-Methane Challenge Commitments include:
 - Leak detection & repair at T&S stations (Phase-In 2017 to 2021)
 - Reduction of Transmission Pipeline Blowdown volumes
 - Pipeline pump downs and compression sleeves
 - Other technologies & work practices on case-by-case basis

- Year 1: 2017 Methane Reductions (volume)*
 - Vol. Leak Detection & Repair = 176,511 thousand cubic feet (MCF)
 - Reduction of Transmission Pipeline BDs = 3,115,817 MCF

- Year 1: 2017 Methane Reductions (mass)*
 - Vol. Leak Detection & Repair = **3,389 MT CH₄ (84,725 MT CO₂e)**
 - Reduction of Trans. Pipeline BDs = **59,823 MT CH₄ (1,495,592 MT CO₂e)**

*Includes the annual methane reductions associated with Kinder Morgan's Methane Challenge commitments in 2017. Does not include the additional EPA Natural Gas STAR recurring reductions reported to EPA separately for 2017.

Kinder Morgan – Critical Elements for Successful Implementation

- Communication , Communication, Communication (3Cs) to all affected internal customers, getting input as the program is being developed and rolled out
 - Sharepoint sites for data collection and wide access to internal stakeholders
 - Methane Leak Database for tracking leaks found and repairs made
 - Methane Leak Dashboard for all internal customers to access
- Data, Data, Data (3Ds): heavy reliance on data collected and reported
- Tools available to the front-line stakeholders (i.e., Operations and Technicians).
 - User-friendly spreadsheets and databases accessible across the assets
 - When possible, make use of systems already in place that are familiar with stakeholders
- Company-wide internal procedures that outlines the program, responsible parties, methodology, clear and specific guidance and training requirements.
- Proper training and guidance to our internal customers is critical
- Third year of program: program continues to evolve and other reduction opportunities
- Continuous Improvement: always seek opportunities to make improvements

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