

CCUS

**Presented by: Jesse Arenivas, President
Kinder Morgan CO₂ Company**

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Outline

- Overview of Kinder Morgan
- CO₂ Source and Transportation
- Planning, Specifications, Compliance
- KM Outlook and Support for CCUS

Kinder Morgan: Leader in North American Energy Infrastructure

Unparalleled and irreplaceable asset footprint built over decades

Largest natural gas transmission network

- ~70,000 miles of natural gas pipelines
- 657 Bcfd of working storage capacity
- 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

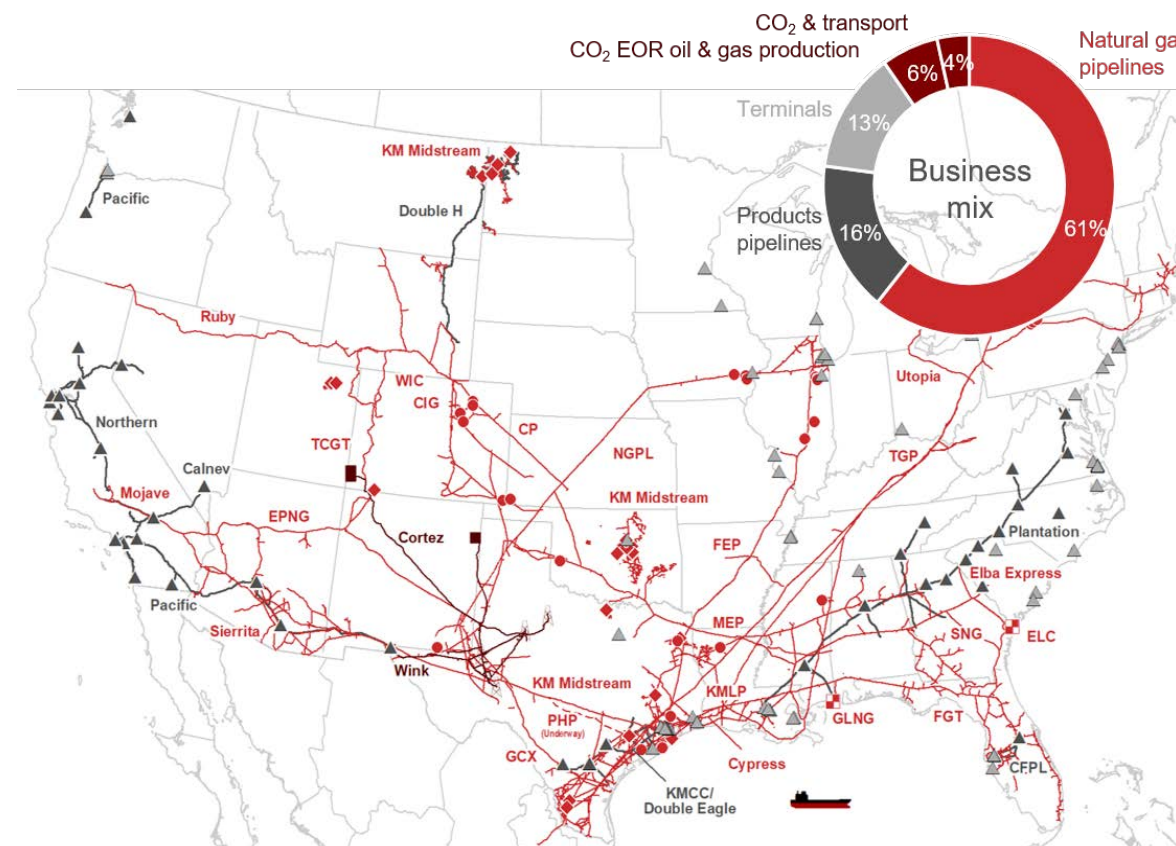
- Transport ~1.7 mmbbl/d of refined products
- ~6,900 miles of refined products pipelines
- ~5,800 miles of other liquids pipelines (crude and natural gas liquids)

Largest independent terminal operator

- 147 terminals
- 16 Jones Act vessels

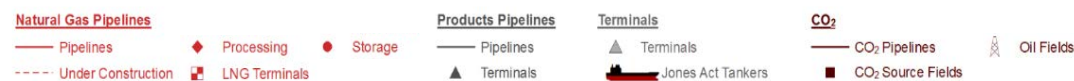
Largest transporter of CO₂

- Transport ~1.2 Bcfd of CO₂



Leading infrastructure provider across multiple critical energy products

Note: Mileage and volumes are company-wide per 2019 budget. Business mix based on 2019 budgeted Adjusted Segment EBDA plus JV DD&A.



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- ❖ Natural Gas Transmission
- ❖ Products Pipelines
- ❖ Terminals
- ❖ CO₂

OUR VISION

Delivering Energy to
Improve Lives and
Create a Better
World

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CO₂ Segment Overview

World class, fully-integrated assets | CO₂ source to crude oil production and takeaway in the Permian Basin

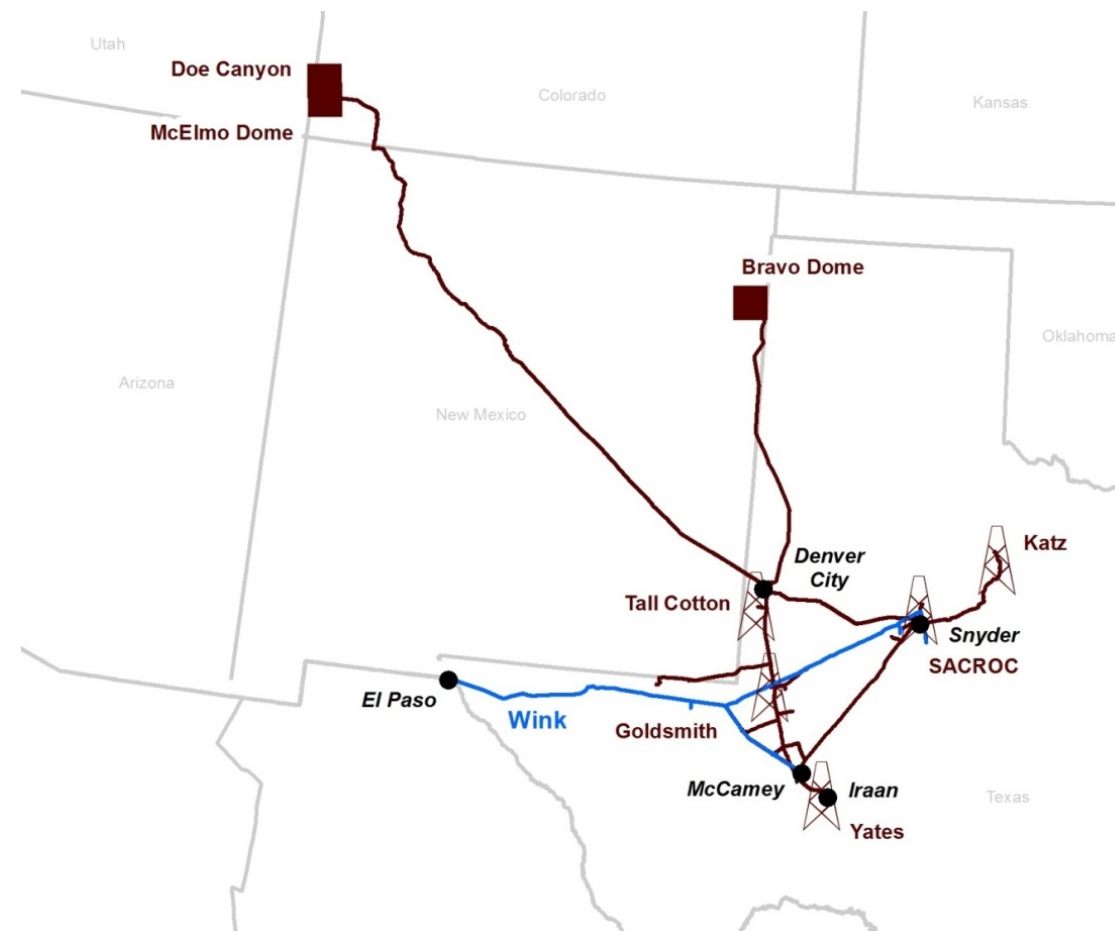
CO₂ & TRANSPORT

CO ₂ Reserves	KMI Interest		Location	Remaining Deliverability	OGIP (tcf)
McElmo Dome	45%	37%	SW Colorado	20+ years	22.0
Doe Canyon	87%	68%	SW Colorado	10+ years	3.0
Bravo Dome^(a)	11%	8%	NE New Mexico	10+ years	12.0

Pipelines	KMI Interest	Location	Capacity (mmcfpd)
Cortez	53%	McElmo Dome to Denver City	1,500
Bravo^(a)	13%	Bravo Dome to Denver City	375
Central Basin (CB)	100%	Denver City to McCamey	700
Canyon Reef	97%	McCamey to Snyder	290
Centerline	100%	Denver City to Snyder	300
Pecos	95%	McCamey to Iraan	125
Eastern Shelf	100%	Snyder to Katz	110
Wink (crude)	100%	McCamey to Snyder to El Paso	145 mbbl/d

EOR OIL PROD

Crude Reserves ^(b)	KMI Interest	NRI	Location	OOIP (billion bbls)
SACROC	97%	83%	Permian Basin	2.8
Yates	50%	44%	Permian Basin	5.0
Katz	99%	83%	Permian Basin	0.2
Goldsmith	99%	87%	Permian Basin	0.5
Tall Cotton	100%	88%	Permian Basin	0.7



a) Not KM-operated.

b) In addition to KM's interests above, KM has a 22%, 51%, and 100% working interest in the Snyder gas plant, Diamond M gas plant and North Snyder gas plant, respectively.

c) 2019 budgeted Adjusted Segment EBDA plus JV DD&A. See Non-GAAP Financial Measures and Reconciliations.

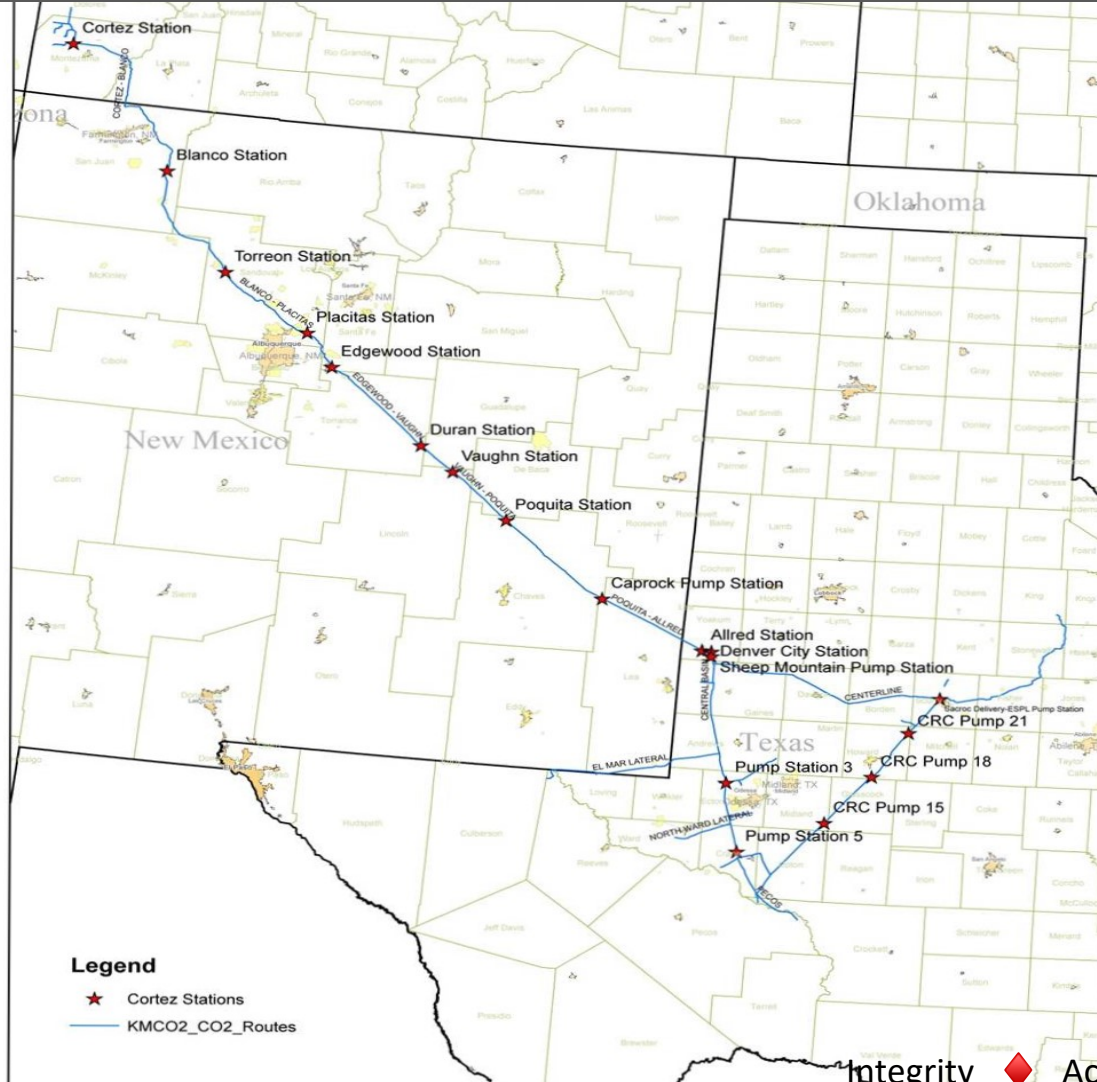
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Kinder Morgan CO₂ Pipeline Systems

CO₂ Pipeline System



Main Pipeline Details

Name	Length (miles)	Diameter	Year Built
CRC PL	138	16"	1975
Cortez PL	502	30"	1984
Central Basin PL	143	26", 24", 20", & 16"	1985
Pecos PL	25	8"	1985
Centerline PL	112	16"	2002
Cogdell PL	4	10"	2003
Eastern Shelf PL	91	10"	2010
All In Total	1,298	4" to 30"	

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Proven CO₂ Infrastructure and Market

- Pipeline design and integrity programs critical to safe operations
- Operation and maintenance is somewhat unique
- Trained personnel
- Adherence to product specifications
- Reliable delivery and injection for commercial use
- CO₂ market and contracts to support take-away

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CO₂ Pipeline Specifications

Quality specifications for CO₂ pipelines.

- a) Product. Contain at least 95 mole percentage of CO₂.
- b) Water. Contain no free water, and not more than thirty (30) pounds of water per mmcf in the vapor phase.
- c) Hydrogen Sulfide. Contain no more than 20 ppm, by volume, of H₂S.
- d) Total Sulfur. Contain no more than 35 ppm, by weight,
- e) Temperature. Shall not exceed 120°F.
- f) Nitrogen. Contain no more than 4 mole percent.
- g) Hydrocarbons. Contain no more than 5% mole percent and Dew point no more than -20°F.
- h) Oxygen. Contain no more than 10 ppm, by weight, of oxygen.
- i) Other. Contain no liquid glycol or no more than 0.3 gallons of glycol per MMcf.

Why are these specifications important?

- a) Product. Maintain dense phase and EOR needs
- b) Water. Free water causes corrosion and damages pump seals.
- c) Hydrogen Sulfide. Dangerous to health and safety of the public. Special requirements if > 99 ppm in Texas.
- d) Total Sulfur. Foul odor in product and causes injection problems
- e) Temperature. Protect pipeline external coating
- f) Nitrogen. Maintain dense phase of product.
- g) Hydrocarbons. Maintain dense phase of product.
- h) Oxygen. Catalyst for other internal corrosion components. H₂S and O₂ form elemental sulfur in EOR piping
- i) Other. Glycol damages pump seals.

Note – see Kinder Morgan CO₂ pipeline specification sheet for full list

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CO₂ Pipelines and Natural Gas Pipelines

- CO₂ Pipelines have same metallurgy as Natural Gas Pipelines
- CO₂ Pipelines have higher operating pressures
 - Gas – 600 to 1200 psig
 - CO₂ – 2000 to 3000 psig
- CO₂ - PHMSA regulated under CFR Part 195, “Transportation of Hazardous Liquids by Pipeline”
- Natural Gas – PHMSA regulated under CFR Part 192, “Transportation of Natural and Other Gas by Pipeline”
- Pipeline Safety Management System – API RP 1173

CO₂ Infrastructure Planning

- **State and Local agencies may have additional regulations**
- **Regulations are specific, prescriptive and auditable**
- **Regulatory and permitting processes requires significant planning time**
 - 2-4 year permitting process
 - Local, state, federal agencies
 - Coordinated efforts for proper alignment
 - Time and preparation needed for agency and public meetings
 - Requirements vary by impact area

Planning and Economics

- **Kinder Morgan brings capital discipline**
 - Defined benefit
 - Experience invaluable for execution and de-risking for success
 - Investments supported by long term contracts
 - If marketing CO₂, important to have reliable deliveries and good relations with customers

- **Partner to support incentives like 45Q**
 - Opposition to new pipeline infrastructure is a potential barrier to CCUS

- **Helium recovery, where viable, helps economics**

CO₂ Infrastructure

- **Existing CO₂ Pipeline Systems are a natural fit for CCUS**
 - Safe method for transportation and distribution
 - CO₂ transportation and marketing fundamentals are well established
 - Pipelines excel at moving large volumes of fluids
 - Network can expand in capacity and location

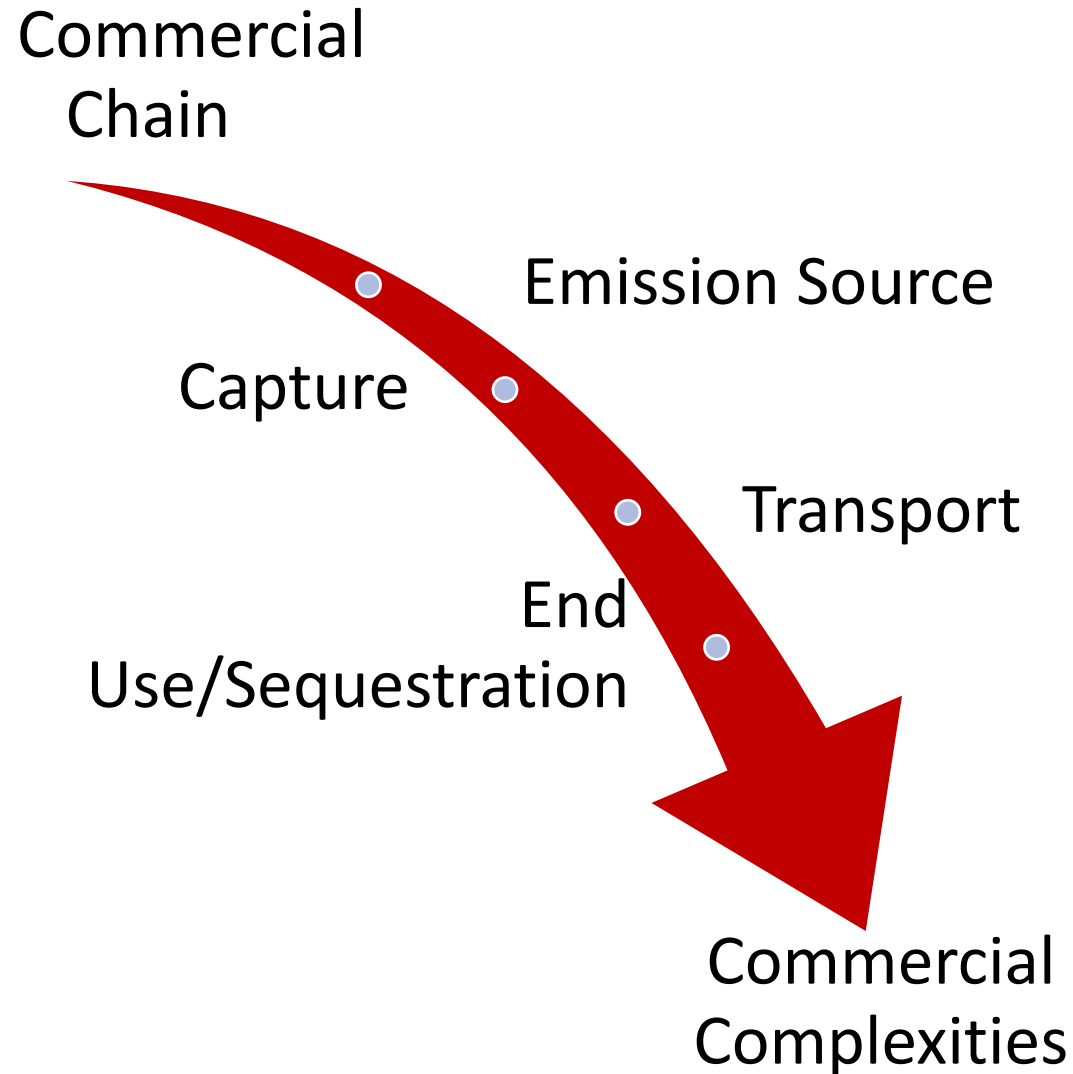
- **Kinder Morgan has extensive experience and expertise in EOR and CO₂ system design, implementation and operation and is ready to help grow CCUS infrastructure**

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Commercial Complexities



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Thank You!



Jesse Arenivas
President
Kinder Morgan CO₂ Company L.P.

Jesse_Arenivas@kindermorgan.com
Houston, Texas
713-369-9105

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