



Regulatory Considerations and Policy Recommendations

NARUC-WIEB Carbon Capture,
Utilization, and Storage Workshop


FRIDAY, OCT. 16, 2020 | 1 – 2 PM ET

SPEAKERS

- **Kara Fornstrom**, Chairman, Wyoming Public Service Commission
- **Doug Scott**, Vice President, Electricity and Efficiency, Great Plains Institute



Western Interstate
Energy Board



Regulatory Considerations & Policy Recommendations

NARUC-WIEB CCUS Webinar Series

Kara B. Fornstrom, Chairman
Wyoming Public Service Commission
October 16, 2020



Today's Presentation

- CCUS Leadership – Wyoming Examples
- What's Impeding Utilities from Pursuing CCUS Technology?
- Is Regulatory Innovation the Missing Piece?
- Great Plains Institute CCUS Efforts
- Carbon Capture Ready– Policies/Incentives
- Regulatory Innovation – Wyoming HB200
- Conclusion/Questions



CCUS Leadership – Wyoming Examples

- Legal Framework
 - State and Federal
- Technology and Research: UW SER & ITC
 - UWyo School of Energy Resources
 - Integrated Test Center
- CO2 Pipeline Corridors
 - Streamline Permitting



Legal Framework: Wyoming Statutes

- Specifies who owns the pore space (Wyo. Stat. § 34-1-152 (2017))
- Establishes permitting procedures and requirements for CCS sites, including permits for time-limited research (Wyo. Stat. § 35-11-313 (2017))
- Provides a mechanism for post-closure MRV via a trust fund approach (Wyo. Stat. § 35-11-318 (2017))
- Provides a mechanism for utilization of storage interests (Wyo. Stat. § 35-11-315 (2017))
- Specifies that the injector, not the owner of pore space, is generally liable (Wyo. Stat. § 34-1-513 (2017))
- Clarifies that vis-à-vis storage rights, production rights are dominant but cannot interfere with storage (Wyo. State. § 30-5-501 (2017))
- Provides a certification procedure for CO2 incidentally stored during EOR (Wyo. Stat. § 30-5-202 (2017))



Legal Framework: Federal

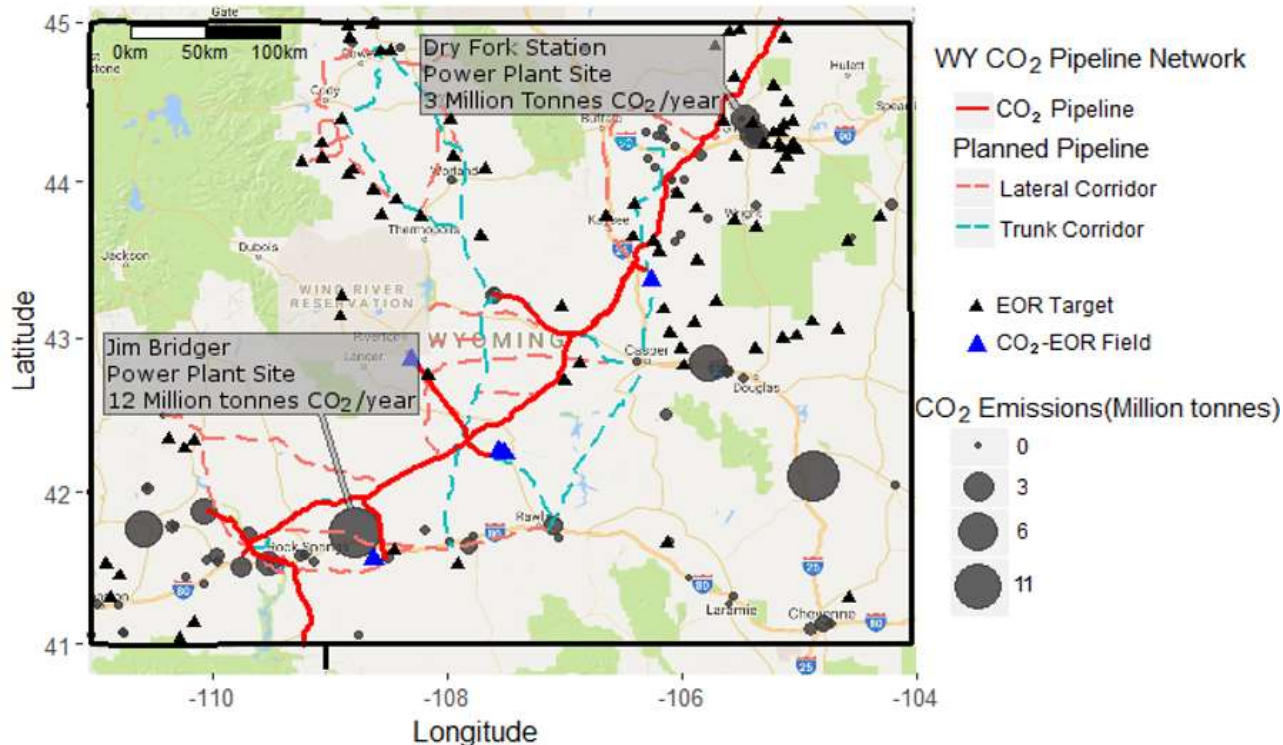
- FUTURE Act and 45Q Tax Credit
 - Introduced in July, 2017; signed by President Trump in February, 2018
 - Major components
 - Increased amount of tax credit
 - Extend timeframe, no volumetric limit
 - Made tax credit assignable
- Use it Act
 - Sponsored by U.S. Sen. John Barasso (R-WY)
 - Introduced in March 2018
 - Furthers the FUTURE Act by supporting carbon utilization and direct air capture research
 - Support federal, state, and non-governmental collaboration in the construction and development of CCUS facilities and CO2 pipelines



Technology: CCS and CCUS

- Wyoming Projects
 - UW School of Energy Resources
 - Carbon SAFE Phase II
 - Rare Earth Elements Research
 - Beneficiation
 - Enhanced Oil Recovery Institute
 - Integrated Test Center

CO2 Pipeline Corridors: Wyoming's Infrastructure



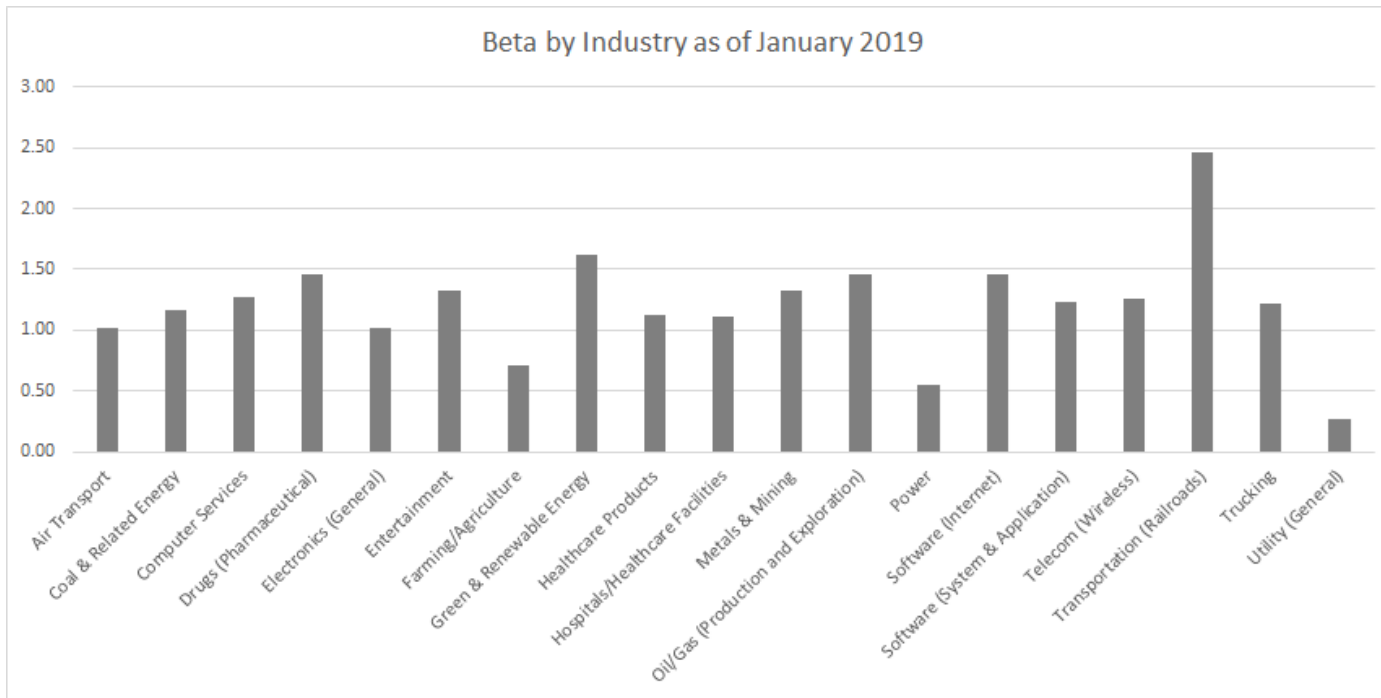


What's Impeding Utilities From Pursuing CCUS Technology?

- Utility Risk Profile
 - Different Business Models
- Financial Incentives
 - Traditional Rate Making Model



Utility Risk Profile: Risk Profile By Industry



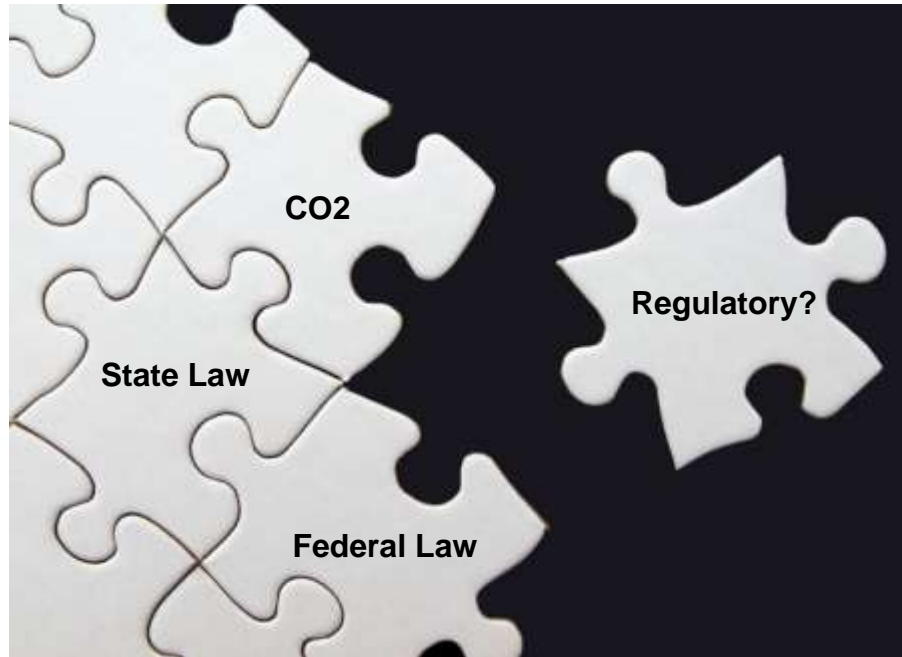


Traditional Rate Making Model

- The Regulatory Compact
 - Provides utilities the opportunity to recover expenses and earn a reasonable return on investments with the goal of ensuring safe, adequate, reliable service at reasonable rates, while protecting customers from monopoly abuses.
- Overriding Principles
 - Protect Public Interest
 - Used and Useful
 - Safe and Reliable
- Why isn't CCUS typically included in rate base?
 - Lack, to date, of commercial success
 - Is CCUS *necessary* in ensuring the goals set forth in the regulatory compact?



Is Regulatory Innovation the Missing Piece?



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Carbon Capture, Utilization & Storage Workshop Webinar Series Part 6

Western Interstate Energy Board &
NARUC Subcommittee on Clean Coal and Carbon Management

Friday, October 16, 2020

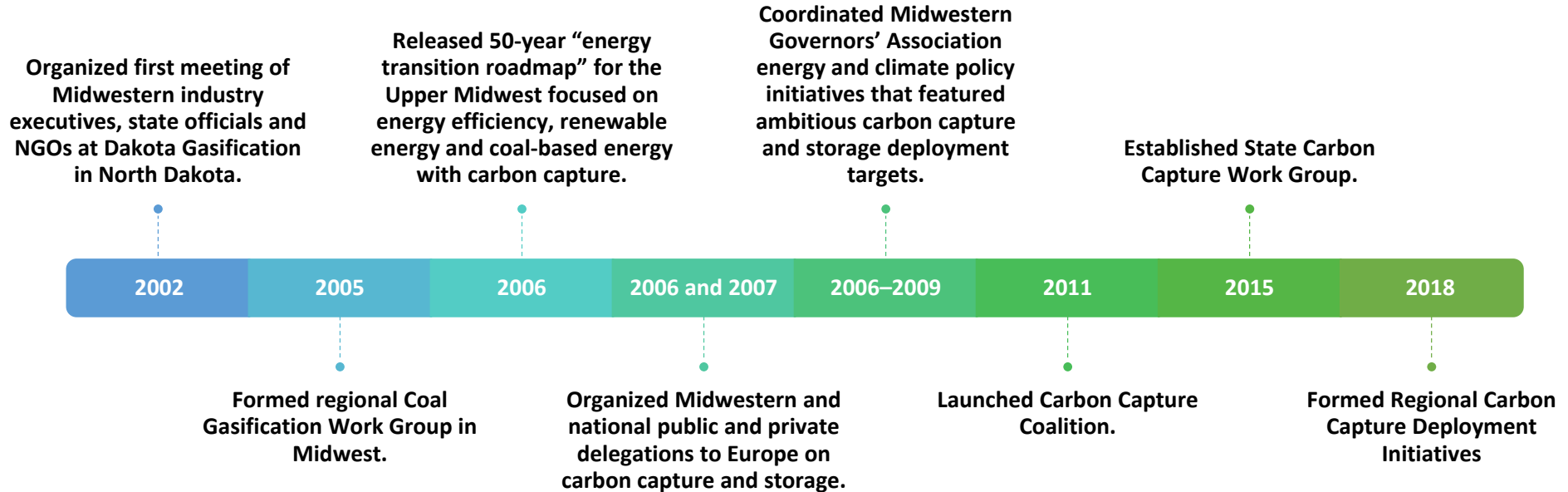
Doug Scott
Vice President, Electricity and Efficiency
Great Plains Institute



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Great Plains Institute: Nearly Two Decades Working to Advance Carbon Capture





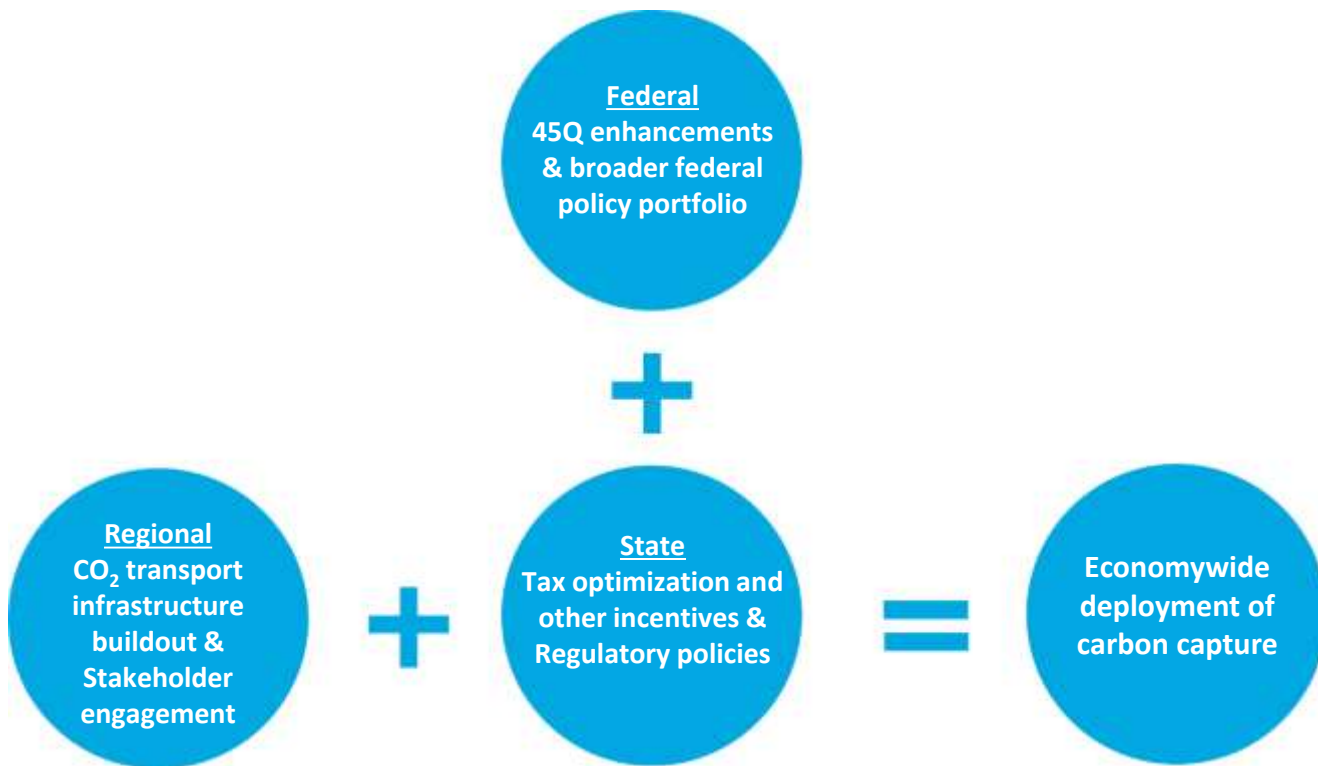
CARBON CAPTURE
COALITION

STATE
CARBON
CAPTURE
WORK
GROUP

REGIONAL
CARBON
CAPTURE
DEPLOYMENT
INITIATIVE

“All hands on deck” to achieve economywide deployment of carbon capture, transport, use, removal and geologic storage in the U.S.

Integrated Federal-State Policy Implementation: Key to Economywide Deployment that Achieves the Full Emissions Reduction, Economic & Jobs Potential of Carbon Capture



STATE CARBON CAPTURE WORK GROUP

State Carbon Capture Work Group: Participating States

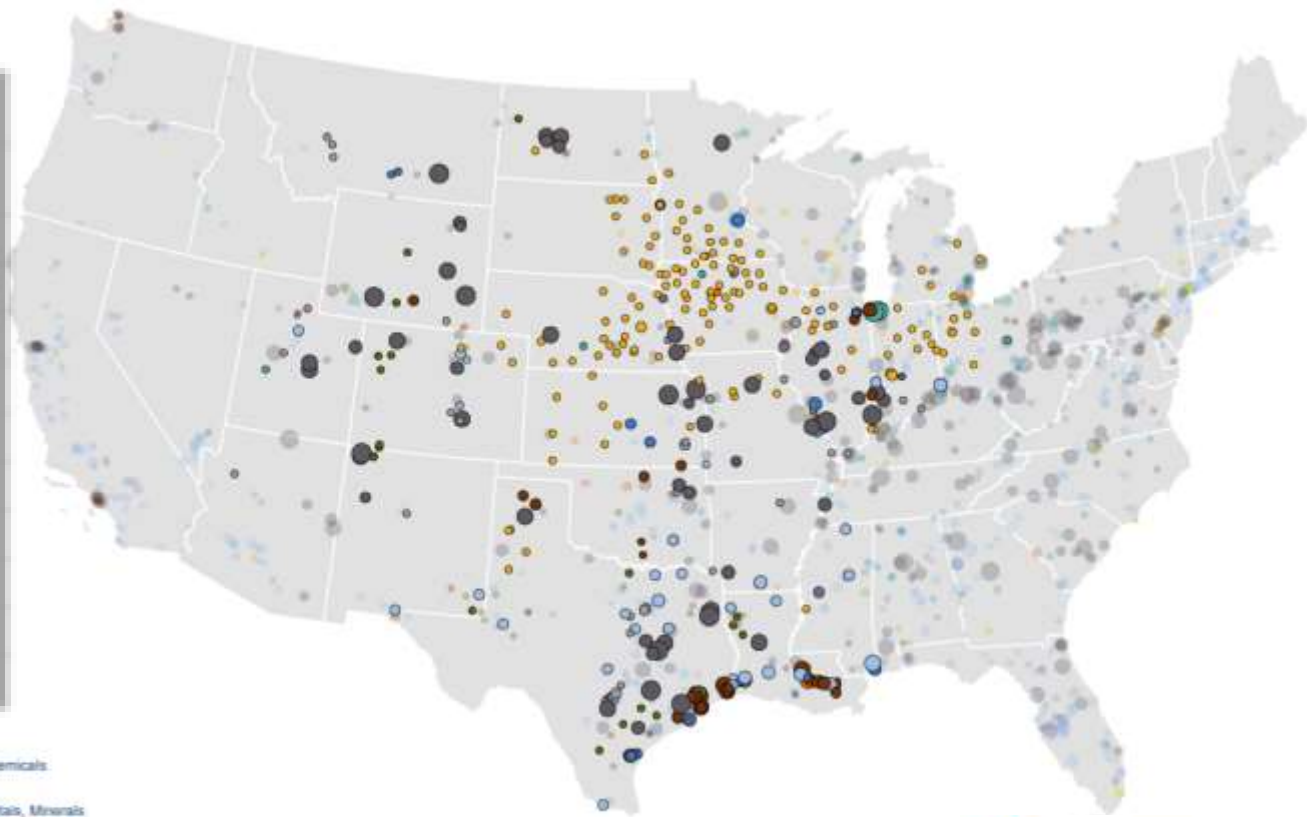


- Formed in 2015 by Governors Mead (R-WY) and Gov. Bullock (D-MT) and convenes 16 states.
- Made comprehensive state and federal policy recommendations from 2015-2018.
- Coordinates Midwestern and Western Regional Deployment Initiatives that bring together nearly 400 state officials & stakeholders from ~25 states.
- Modeled candidate capture and storage projects and CO₂ transport infrastructure (2-year+ effort).
- Forming state policy teams to develop policy recommendations to complement the 45Q tax credit and make states “carbon-capture ready.”

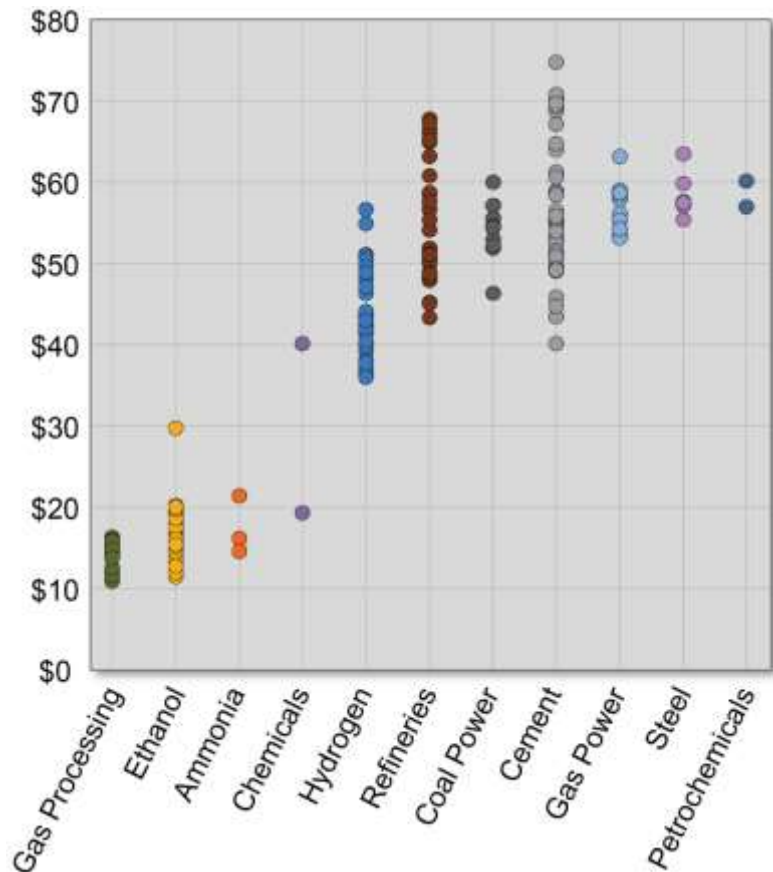
Economically Feasible Capture Retrofit with 45Q

Facilities identified by Regional Deployment screening

Industry	Capture Target (million MT/yr)
Steel (Blast Furnace)	12.5
Cement	29.5
NG Processing	4.5
Ethanol	36.2
Refineries (FCC)	25.4
Hydrogen	14.7
Lime	0.9
NG Power Plants	65.9
Ammonia	0.7
Coal Power Plants	132.6
Total	322.9



Estimated cost of capture per industry for near-term facilities in study area



Industry	Average Estimated Cost \$/ton	Range of Cost Estimates \$/ton
Gas Processing	\$14	\$11 - \$16
Ethanol	\$17	\$12 - \$30
Ammonia	\$17	\$15 - \$21
Chemicals	\$30	\$19 - \$40
Hydrogen	\$44	\$36 - \$57
Refineries	\$56	\$43 - \$68
Coal Power Plant	\$56	\$46 - \$60
Cement	\$56	\$40 - \$75
Gas Power Plant	\$57	\$53 - \$63
Steel	\$59	\$55 - \$64
Petrochemicals	\$59	\$57 - \$60

Base Scenario: Optimized near- to medium term transport network for CO₂ capture and storage under 45Q

Capture and storage:
~ 300 million metric tons per year



SimCCS CO₂ transport model

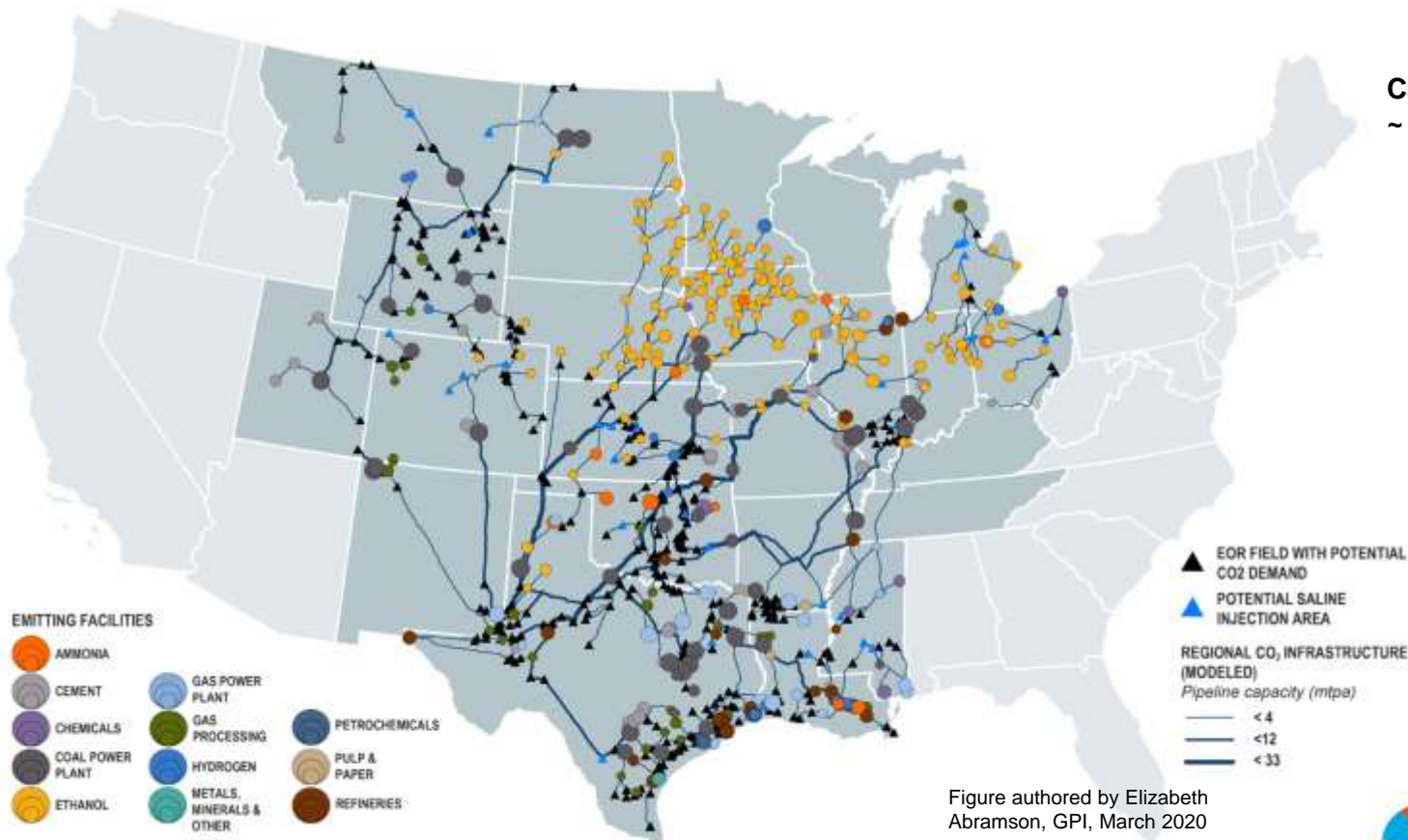


Figure authored by Elizabeth Abramson, GPI, March 2020

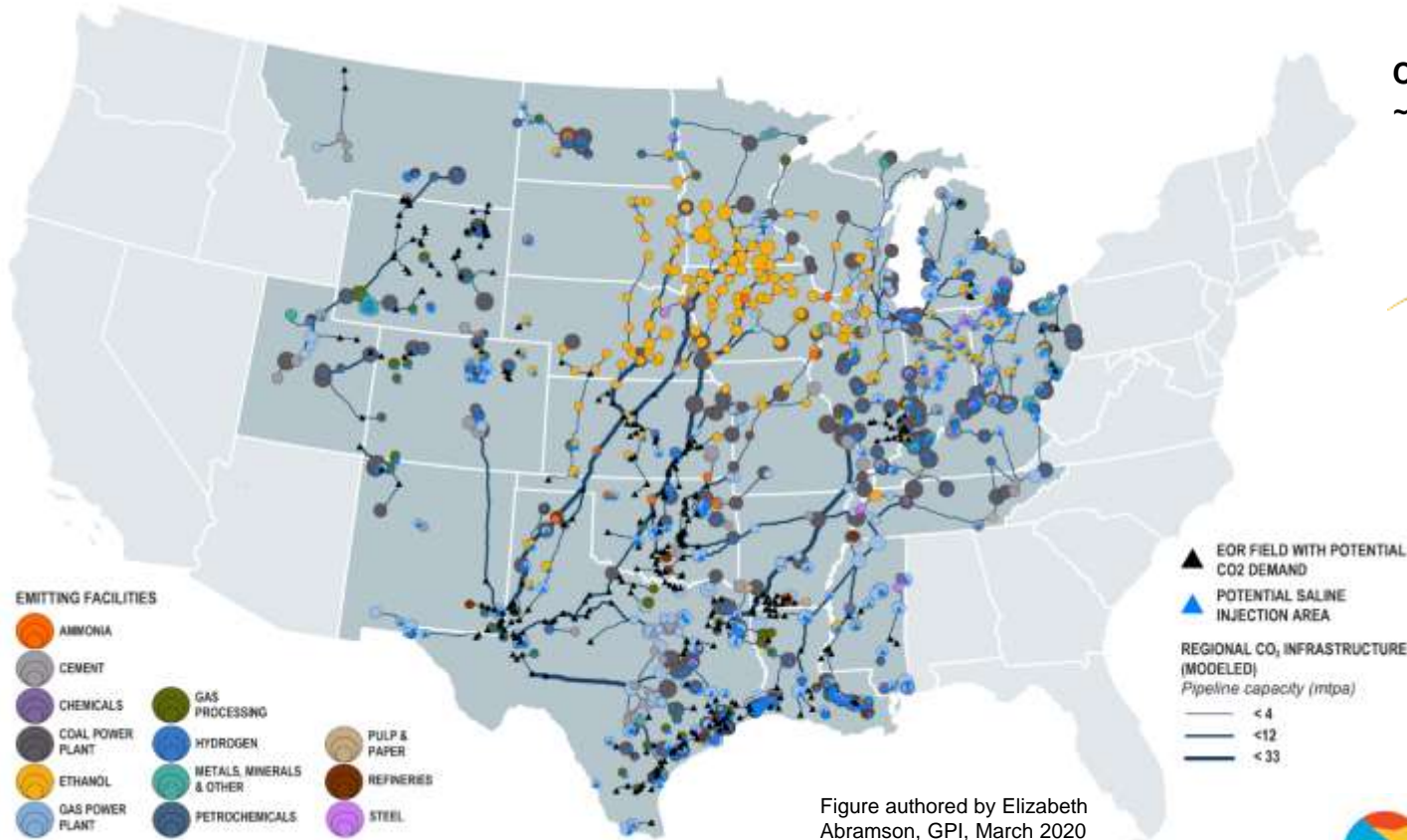


Long-term economy-wide deployment: Expanded storage in deep saline formations and petroleum basins

Capture and storage:
~ 670 million metric
tons per year



SimCCS CO₂
transport model



EMITTING FACILITIES

- AMMONIA
- CEMENT
- CHEMICALS
- COAL POWER PLANT
- ETHANOL
- GAS POWER PLANT
- GAS PROCESSING
- HYDROGEN
- METALS, MINERALS & OTHER
- PETROCHEMICALS
- PULP & PAPER
- REFINERIES
- STEEL

▲ EOR FIELD WITH POTENTIAL CO₂ DEMAND

▲ POTENTIAL SALINE INJECTION AREA

REGIONAL CO₂ INFRASTRUCTURE (MODELED)

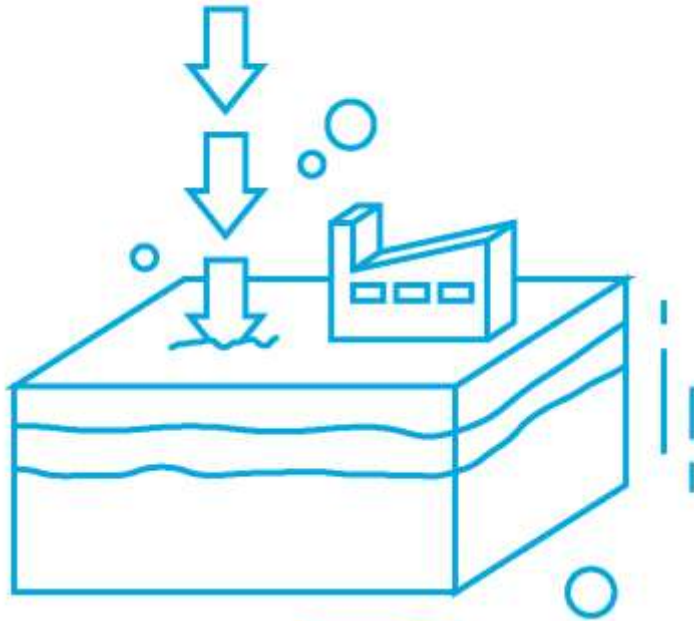
Pipeline capacity (mtpa)

- < 4
- < 12
- < 33

Figure authored by Elizabeth
Abramson, GPI, March 2020



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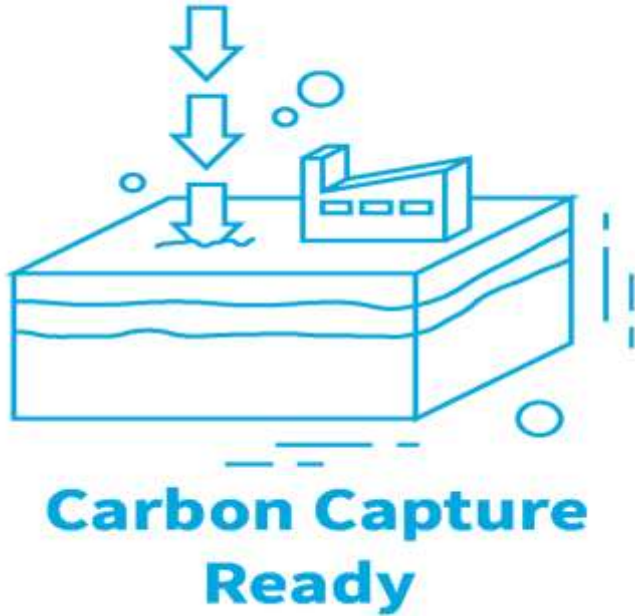
**Carbon Capture
Ready**

Goal: Help States Become “Carbon Capture Ready” and Take Full Economic Advantage of 45Q Tax Credit Before the End of 2023

- Developing state policy frameworks to complement 45Q and other federal policies, including:
 - ✓ Delegation of EPA authority for permitting saline storage projects (federal UIC Class VI) to states;
 - ✓ Rules for long-term CO₂ storage;
 - ✓ Rules for CO₂ transport and storage space;
 - ✓ Financial incentives for carbon capture; and
 - ✓ Optimization of state taxes to incentivize capture, transport, use and storage
- Establishing state policy teams to develop legislative and other policies for their states, based on modeling and analysis.

Is Your State Carbon Capture Ready?

State-Level Carbon Capture Checklist



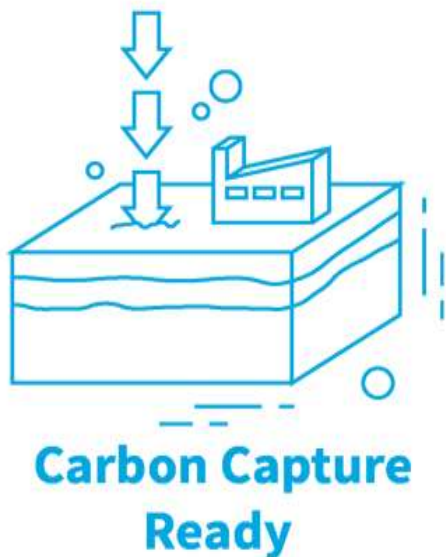
- **State Regulatory Policies**
- Establish Regulatory Regime
- Declare CO2 storage to be in the public interest
- Streamline siting processes to reduce delays in permitting
- Require regulated utilities to consider carbon capture technology in their integrated resource plans

Making Your State Carbon Capture Ready



- **Financial Incentives for Carbon Capture**
- Offer financial assistance for carbon capture projects and CO2 pipelines
- Design off-take agreements to provide a guaranteed buyer
- Include carbon capture as an eligible technology for cost-recovery mechanisms
- Qualify carbon capture as eligible in electricity generation portfolio or clean energy standards or voluntary goals
- State assumption of long-term liability for stored CO2
- Advocate for federal authorization for and state use of private activity bonds for carbon capture
- Establish low-carbon credit programs
- Enact procurement programs that require the purchase of electricity, fuels or products produced through carbon capture

More Actions to Make Your State Carbon Capture Ready

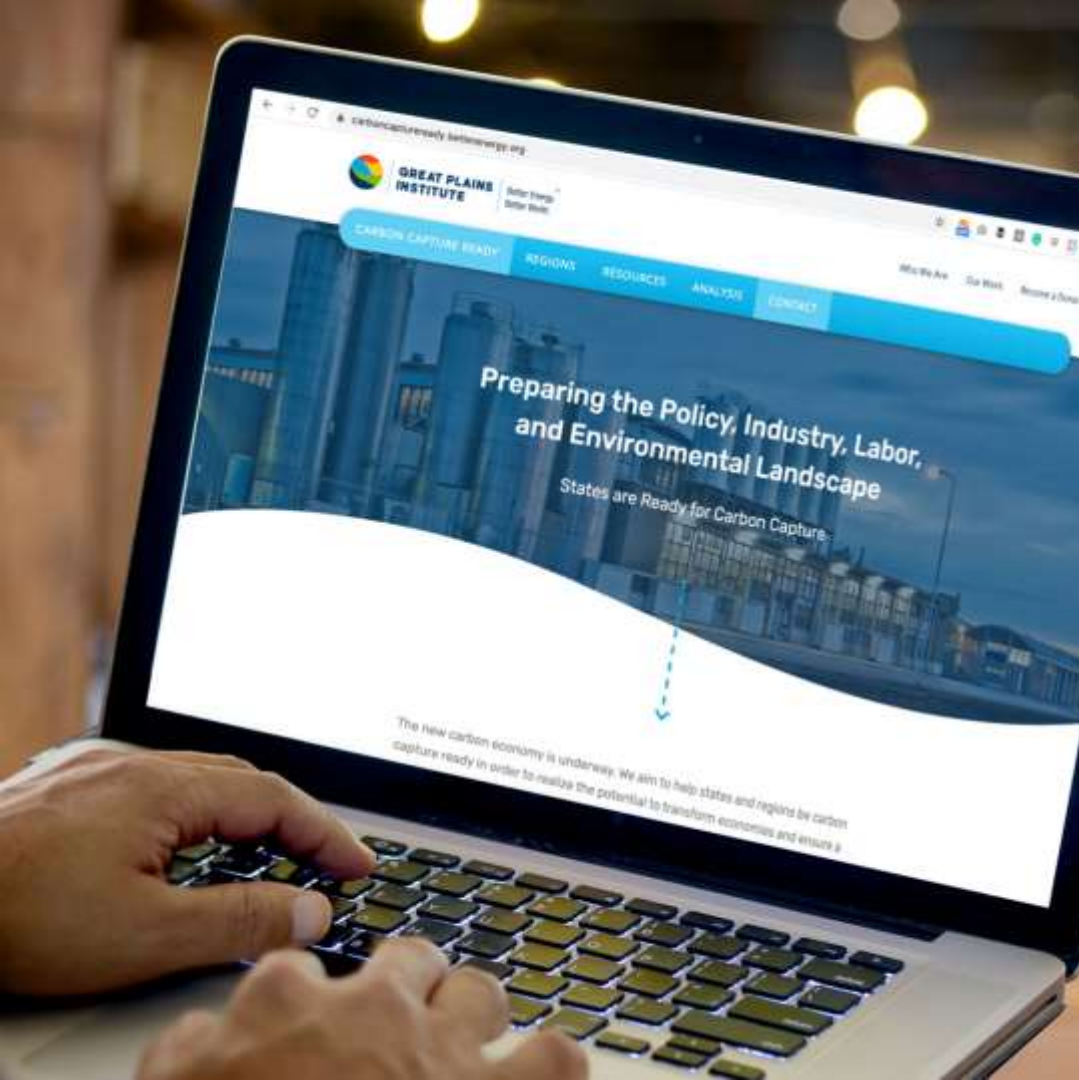


- **Tax Incentives/Optimization**
- Provide Incentives or optimize state tax codes through:
 - * Tax credits for CO₂-EOR storage and saline storage
 - * Corporate income tax reductions
 - * Exemptions from property and sales tax on CO₂-EOR and geologic storage machinery and equipment
 - * Severance tax reductions on oil produced through CO₂-EOR using anthropogenic CO₂
 - * Provide for ad valorem and property tax abatement for carbon capture and transport infrastructure

Building Out Web Tools for State Policymakers and Stakeholders

- Regional analysis & modeling.
- State-level factsheets detailing carbon capture opportunities.
- Best practices for states to become “carbon capture ready”.
- Detailed information on state policies already implemented.
- Additional resources, including one-page primers on carbon capture, 45Q and the federal policy landscape.

www.carboncaptureready.org



Development of Multistate CO₂ Transport Infrastructure MOU



- Organized through State Carbon Capture Work Group; October launch anticipated.
- KS, LA, MD, MT, OK, PA and WY have signed on, with several other states currently considering joining the MOU, which aims to:
 - Develop an initial CO₂ transport infrastructure action plan within one year;
 - Make state and regional policy recommendations related to CO₂ transport infrastructure deployment to implement that plan;
 - Engage stakeholders to solicit input on policy recommendations;
 - Support efforts in Congress to incorporate CO₂ transport infrastructure into federal infrastructure legislation, including measures for federal financing; and
 - Support CO₂ transport infrastructure buildout through strategies identified in the plan, including state incentives and investments, public-private partnerships, and other mechanisms as appropriate.

Thank You

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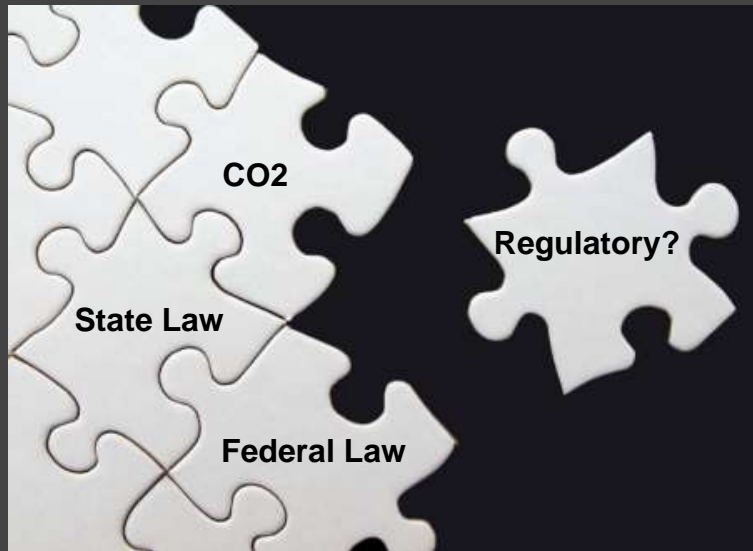
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Is Regulatory Innovation the Missing Piece?





**HB200: Created W.S. 37-18-101
and 37-18-102**

**RELIABLE AND
DISPATCHABLE LOW-
CARBON ENERGY
STANDARDS**





Reliable and Dispatchable Low-Carbon Energy Standards

37-18-101: Definitions

37-18-102:

Energy Generation Portfolio Standards

Rate Recovery and Limitations

Reporting Requirements

Definitions

- In Statute:
 - Carbon Capture, Utilization and Storage Technology
 - Dispatchable
 - Low-Carbon
 - Reliable
- Others Needed in Rules?
 - Power Quality
 - Intermittent OR Intermittent Availability
 - Incremental Costs





Energy Generation Portfolio Standards

- Commission Shall Establish Energy Portfolio Standards that Maximize Use of Dispatchable and Reliable Low-Carbon Electricity
 - Require utility to generate specified percentage of electricity
 - Establish a Date to Achieve (no later than 7.1.2030)
 - Shall Establish Intermediate Standards
 - Require Demonstration in IRP
- Shall for **Each** Public Utility
 - Establish Baseline Standards for Reliability to Ensure Intermittent Generation does Not Unreasonably Diminish Power Quality
 - Require Utility to Monitor and Report Reliability and Power Quality Outcomes
 - Require Utility to take any Steps Commission deems Necessary to Maintain Reliability and Power Quality



Rate Recovery and Limitations

- Grants Explicit Authority to seek Rate Recovery
 - Higher ROE
 - Integral or Adjacent
- Sharing Band with Shareholders for CO2 Sales Revenue
- Rate Recovery Mechanism
 - Incremental Costs
 - 2% Surcharge: Establish and Collect Prior
 - Recovery of Prudently Incurred Incremental Costs

Penalty, Rulemaking and Reporting

- SF159 “Hammer”
 - Commission Shall Promulgate Rules
 - Satisfactorily Progressing to Standard
 - Achieving Reliability & Power Quality Outcomes
 - Commission Shall Report to the Legislature
 - Is Implementation Meeting Legislative Declaration
 - Should it Be Continued, Modified or Repealed
-

Next Steps

Inclusive Stakeholder Process

Rulemaking

RMP's 2021 IRP

A horizontal bar with a teal segment on the left and an orange segment on the right.

Conclusion/Questions?

Chairman Kara B. Fornstrom

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Email: kara.fornstrom@wyo.gov

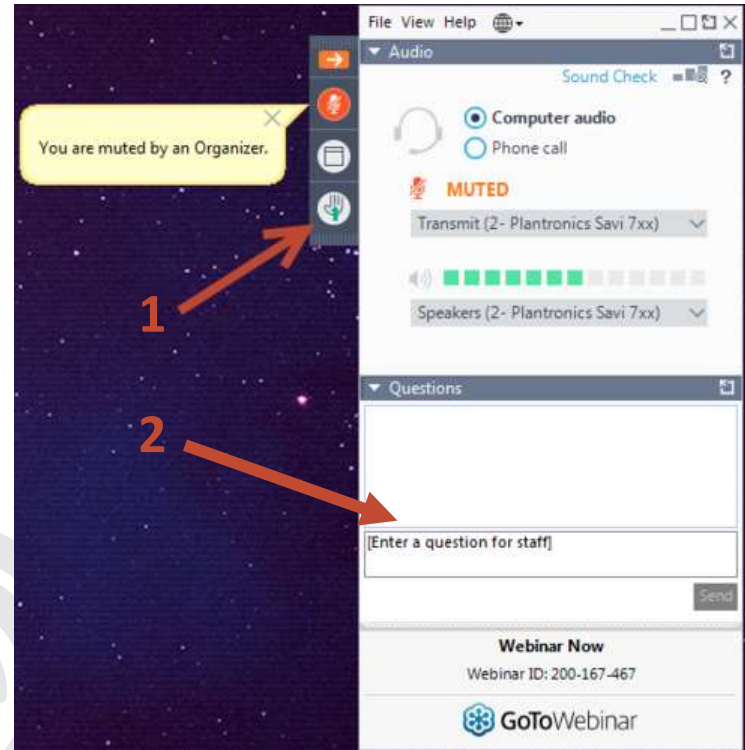
Follow me on Twitter [@k2bfornstrom](https://twitter.com/k2bfornstrom)



QUESTIONS

Submit questions two ways:

1. Raise your hand and the moderator will call on you to unmute your line
2. Type a question into the question box



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UPCOMING NARUC EVENTS

Innovation Webinars

- Oct 22, 3-4PM (ET): [Emerging Possibilities for Bulk Energy Storage](#)
- Nov 19, 3-4PM (ET): [Where the Wind Blows: Offshore Wind Outlook for State Regulators](#)

NARUC Annual Meeting – Nov 5-6 and 9-11

- Registration open
- <https://www.naruc.org/meetings-and-events/naruc-annual-meetings/2020-annual-meeting/>



UPCOMING WIEB EVENTS

Save-the-Dates

Fall 2020 JOINT CREPC-WIRAB MEETING Webinar Series

Fridays: October 23, October 30, November 6, and November 13, 2020

11:00 – 12:30 PM (MT) / 10:00 – 11:30 AM (PT)

You are invited to join us on Fridays this October and November for the Fall 2020 Joint CREPC-WIRAB Meeting Webinar Series, where western electric utility policymakers and regulators, industry experts, consumer advocates, and other stakeholders will explore and discuss current and emerging electricity trends, challenges, and opportunities for the Western Interconnection.

<https://westernenergyboard.org/>

Joint CREPC-WIRAB Meetings are conducted by the Committee on Regional Electric Power Cooperation (CREPC)—a joint committee of the Western Interstate Energy Board and the Western Conference of Public Service Commissioners—and the Western Interconnection Regional Advisory Body (WIRAB).



THANK YOU FOR JOINING THE WEBINAR SERIES

Presentation slides and recordings from the series will be available on the NARUC website:

<https://www.naruc.org/cpi-1/energy-infrastructure-modernization/carbon-capture-utilization-and-storage/>



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