



SCHOOL OF ENERGY RESOURCES

“Update on Wyoming’s New CCUS Policies”

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UNIVERSITY
OF WYOMING

Disclaimer

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Presentation Overview

- ✓ **Wyoming CCUS Overview**
- ✓ **What's New in CCUS in Wyoming**
- ✓ **Q&A**



Wyoming CCUS Overview



Wyoming Produces Prodigious Amounts of Fossil Fuels

Coal

- ✓ Wyoming has been the top coal-producing state since 1986
- ✓ Wyoming accounted for ~40% of coal mined in U.S. in 2018
- ✓ Wyoming holds more than one-third of U.S. coal reserves at producing mines



Natural Gas

- ✓ Wyoming in top 10 states for largest NG reserves
- ✓ Wyoming in top 10 states for highest NG production



Crude Oil

- ✓ Wyoming was the 8th largest crude-oil producing state in 2018, accounting for nearly 3% of U.S total crude oil output

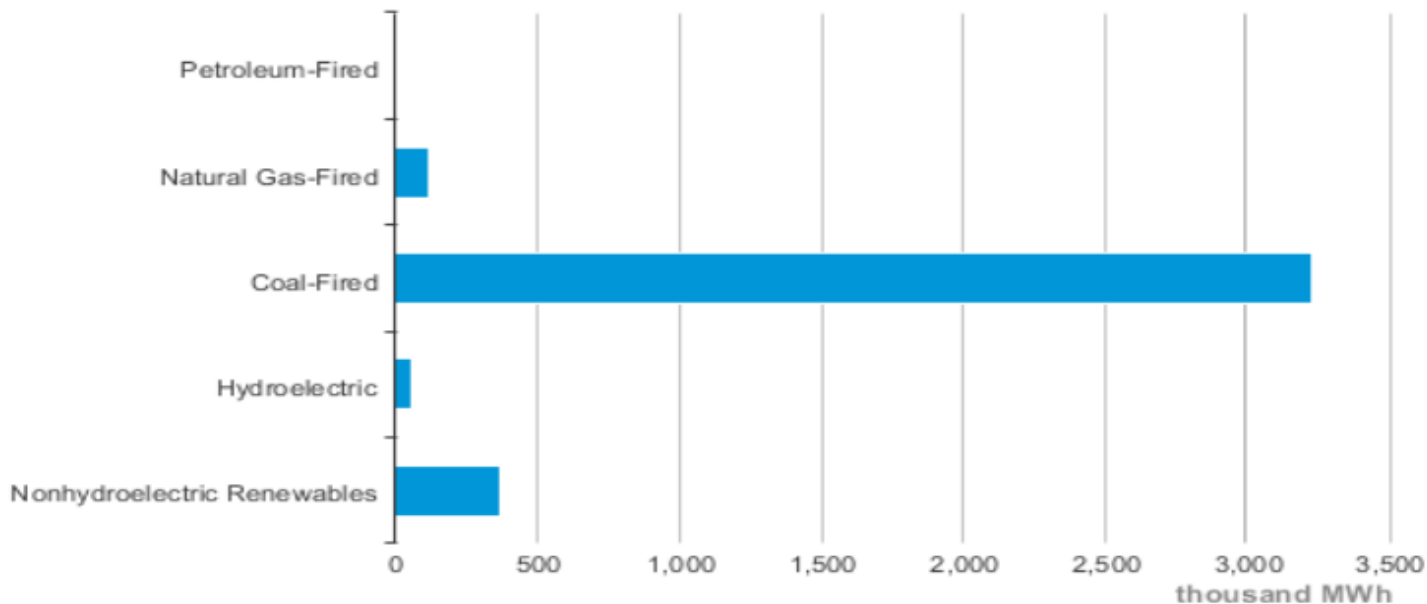


Source: EIA, State Energy Data System (Feb. 20, 2020) (available at <https://www.eia.gov/state/?sid=WY>)



Wyoming Also Produces Significant Amounts of Electricity from Coal

Wyoming Net Electricity Generation by Source, Dec. 2019



Source: Energy Information Administration, Electric Power Monthly

Source: EIA (available at <https://www.eia.gov/state/?sid=WY#tabs-4>)



... and Wyoming exports nearly all of that energy ...

“Wyoming produces 15 times more energy than it consumes, and it is the biggest net energy supplier among the states. Wyoming’s large energy producing sector and small population makes the state second in per capita energy consumption and also gives it the second most energy-intensive state economy, both after Louisiana.”

-- EIA

Source: EIA (available at <https://www.eia.gov/state/?sid=WY>)



And Why Is That?

Nine (9) states have more cattle than people.

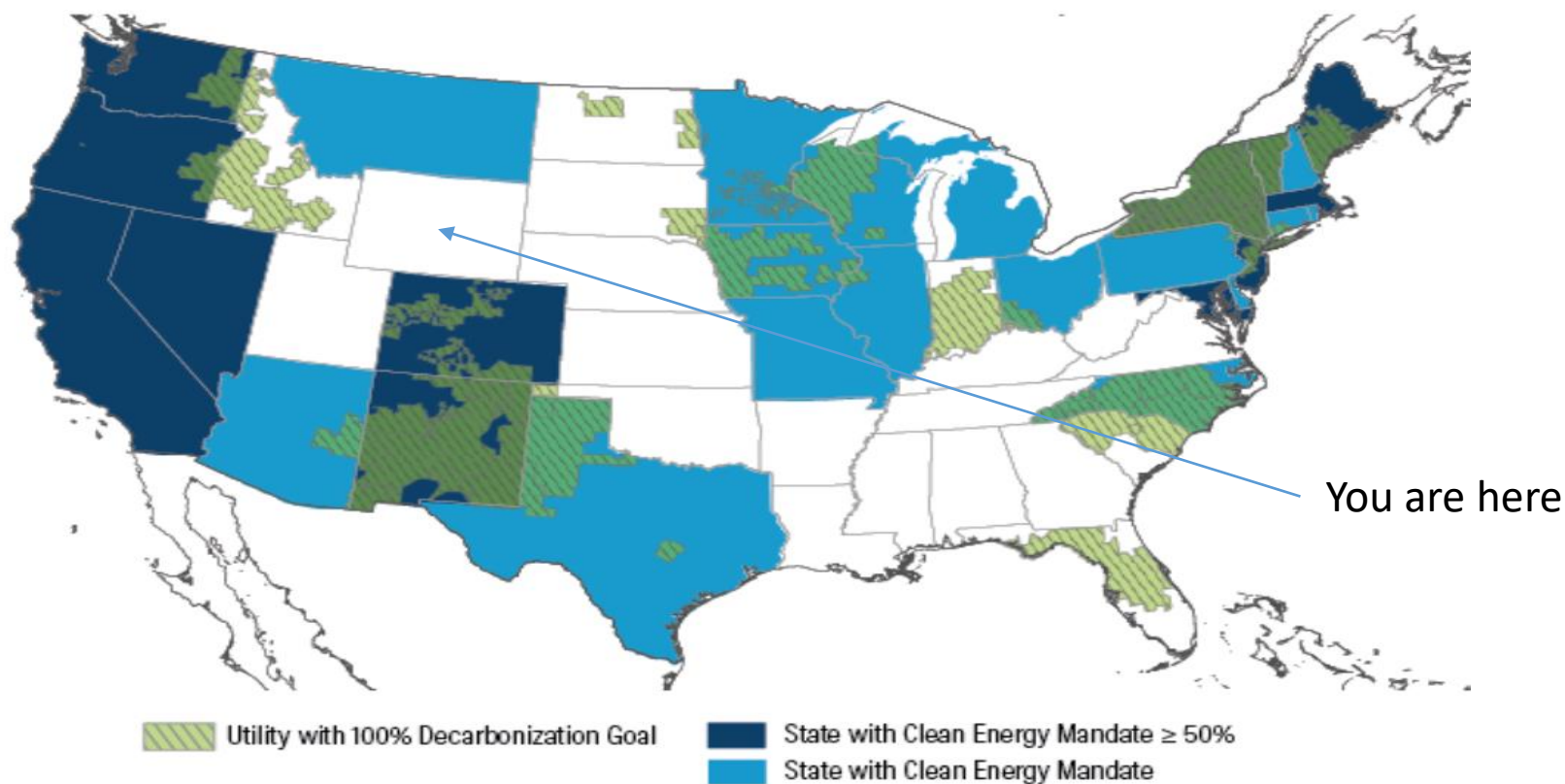
Rank	State	Human	Cattle	Ratio
1	South Dakota	844,877	3,650,000	4.32
2	Nebraska	1,868,516	6,150,000	3.29
3	Montana	1,015,165	2,550,000	2.51
4	North Dakota	723,393	1,770,000	2.45
5	Wyoming	582,658	1,270,000	2.18
6	Kansas	2,893,957	5,800,000	2.00
7	Idaho	1,612,136	2,190,000	1.36
8	Iowa	3,090,416	3,700,000	1.20
9	Oklahoma	3,850,568	4,300,000	1.12



Source: <https://beef2live.com/story-cattle-inventory-vs-human-population-state-0-114255>



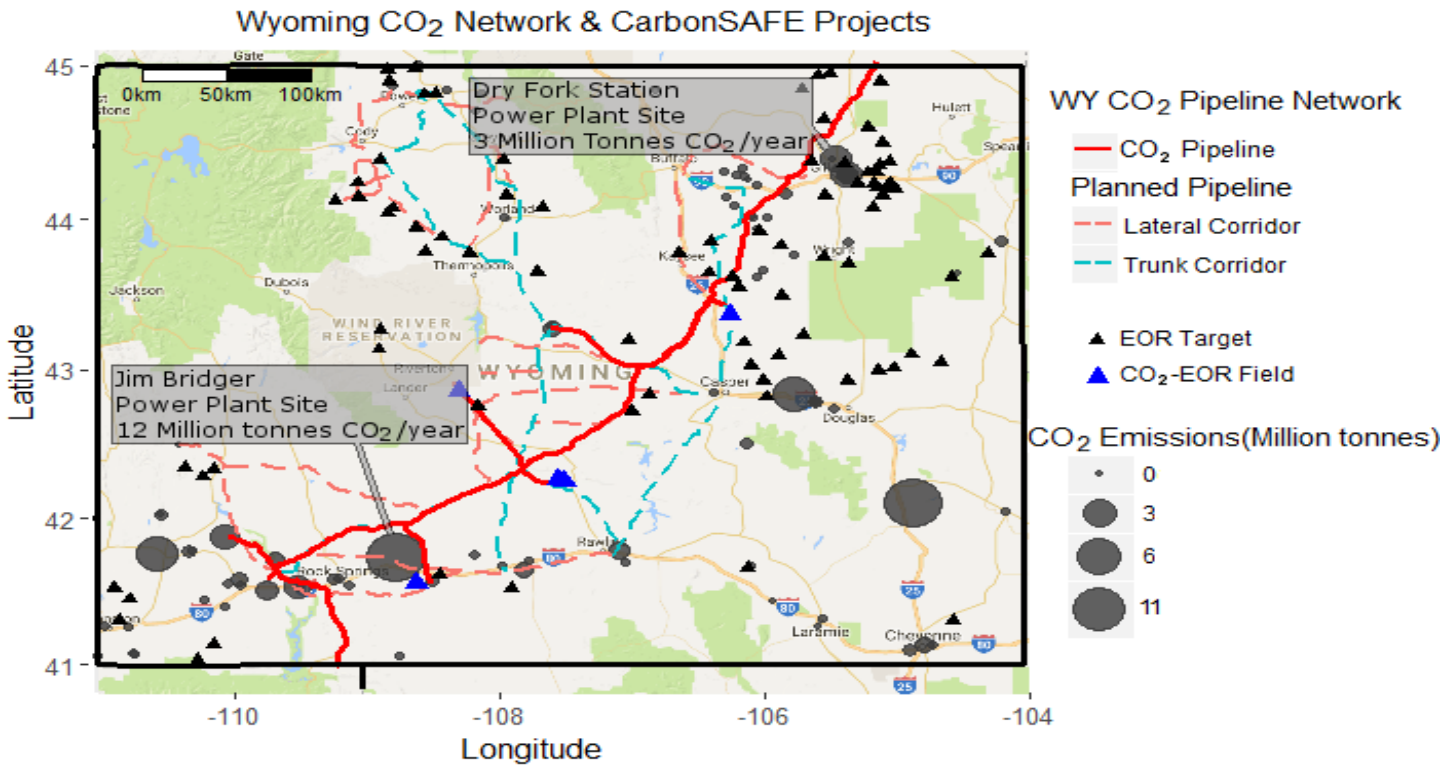
... and more and more of those customer States have decarbonization policies in place ...



Sources: Smart Electric Power Alliance; World Resources Institutes (available at <https://twitter.com/WRIEnergy/status/1212811068457848834/photo/1>)



Wyoming is Home to CCUS Geologic Attributes, Infrastructure & Projects



... plus the Wyoming Integrated Test Center, Wyoming CarbonSAFE, XOM Shute Creek & more ...



Wyoming Governmental Agencies Have Been Focused on CCUS for Many Years



Image credits: (Wyoming government agencies)



Wyoming's CCS/CCUS Legal Regime

Wyoming law --

- ✓ Specifies who owns the pore space (Wyo. Stat. § 34-1-152 (2019))
- ✓ Establishes permitting procedures and requirements for CCS sites, including permits for time-limited research (Wyo. Stat. § 35-11-313 (2019))
- ✓ Provides a mechanism for post-closure MRV via a trust fund approach (Wyo. Stat. § 35-11-318 (2019))
- ✓ Provides a mechanism for unitization of storage interests (Wyo. Stat. § 35-11-315 (2019))
- ✓ Specifies that the injector, not the owner of pore space, is generally liable (Wyo. Stat. § 34-1-513 (2019))
- ✓ Clarifies that vis-à-vis storage rights, production rights are dominant but cannot interfere with storage (Wyo. Stat. § 30-5-501 (2019))
- ✓ Provides a certification procedure for CO₂ incidentally stored during EOR (Wyo. Stat. § 30-5-502 (2019))

Source: Wyoming Statutes



What's New in CCUS in Wyoming



What's New: Laws

✓ Existing Coal-Fired Power Plants

- “Good faith effort” to sell before retiring (SF 159 (2019))
- **Reliable and dispatchable low-carbon energy standards (HB 0200 (2020))**

✓ Other

- Reclamation of surface coal mines – turbine blades (HB0142) (2020))
- Monthly payment of ad valorem tax on mineral production (HB0159) (2020))
- Oil & gas tax – new production (HB0243) (2020))
- Coal severance tax exemption – Canadian & Mexican ports (HB0231) (2020))
- Wyoming Coal Marketing Program (HB0004) (20200)



What's New: Executive Branch

- ✓ *Wyoming Integrated Test Center activities (WIA)*
- ✓ *UIC Class VI Primacy (DEQ)*
- ✓ *DOE CCUS Studies (UW, Office of the Governor, EORI, WIA, others)*
(<https://governor.wyo.gov/media/news-releases/2019-news-releases/governor-gordon-forges-partnership-to-study-wyomings-carbon-capture-potent>)
- ✓ *Examination of Announced Coal Plant Retirements (PSC)*
- ✓ *Formation of Wyoming Energy Authority (WEA) (HB003)*
- ✓ *Wyoming Pipeline Corridor Initiative (Office of the Governor)*
- ✓ *Power Wyoming Initiative (Office of the Governor)*
- ✓ *Western Coal Export Terminal(s)* (<https://www.reuters.com/article/us-usa-court-coal/coal-states-ask-supreme-court-to-overturn-washington-coal-terminal-ban-idUSKBN1ZK2PI>)



What's New: County Level

Campbell County Takes Another Step To Develop "Carbon Valley"

By CATHERINE WHEELER • JUL 18, 2019

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CREDIT CAMPBELL COUNTY

Campbell County Commissioners have approved an agreement with the city of Gillette that hopes to bring economic diversification to northeast Wyoming.

Source: <https://www.wyomingpublicmedia.org/post/campbell-county-takes-another-step-develop-carbon-valley#stream/0>



What's New: University of Wyoming

- ✓ *CCUS Leadership*
 - *Dr. Holly Krutka, New Executive Director, School of Energy Resources (SER)*
- ✓ *CCUS-Related Applied Research*
 - *Wyoming CarbonSAFE Phase 2 (<https://www.uwyo.edu/cegr/research-projects/project-carbonsafe-p1-dryfork.html>)*
 - *U.S.-China Clean Energy Research Center (<https://www.uwyo.edu/cegr/research-projects/project-uschina-clean-energy.html>)*
 - *SER RFP for design and construction of a pilot project using advanced coal-based generation technology that captures at least 75% of CO₂ emissions*
 - *Montana State University's WAFERx (https://waferx.montana.edu/the_project.html)*
 - *Carbon Engineering*
- ✓ *SER Center for Energy Regulation & Policy Analysis (<http://www.uwyo.edu/ser/research/centers-of-excellence/energy-regulation-policy/index.html>)*
- ✓ *Identification & Characterization of REE's in Western coals & coal byproducts*



Q&A



For More Information

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