

CCUS Task Force

Key Issues to Consider

May 21, 2023

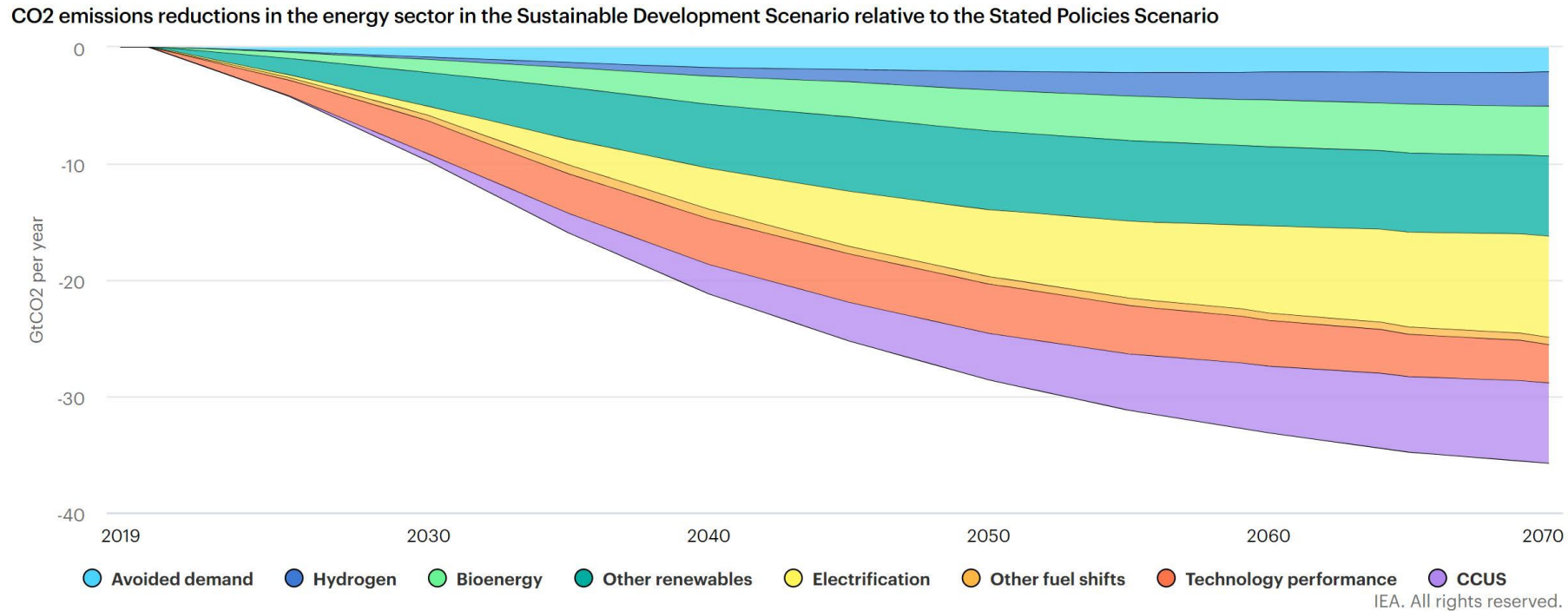


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CARBON MANAGEMENT'S ROLE IN ADDRESSING CLIMATE CHANGE

The IEA estimates that the global carbon management industry will need to scale up to well over 2,000 facilities, capturing 2.8 gigatons of CO₂ per year to limit warming to 2°C



The IPCC estimates that attempting to reach net-zero without carbon capture will increase costs by nearly 140% - unnecessarily burdening residential and business customers.

IEA (2020), CCUS in Clean Energy Transitions, IEA, Paris
<https://www.iea.org/reports/ccus-in-clean-energy-transitions>

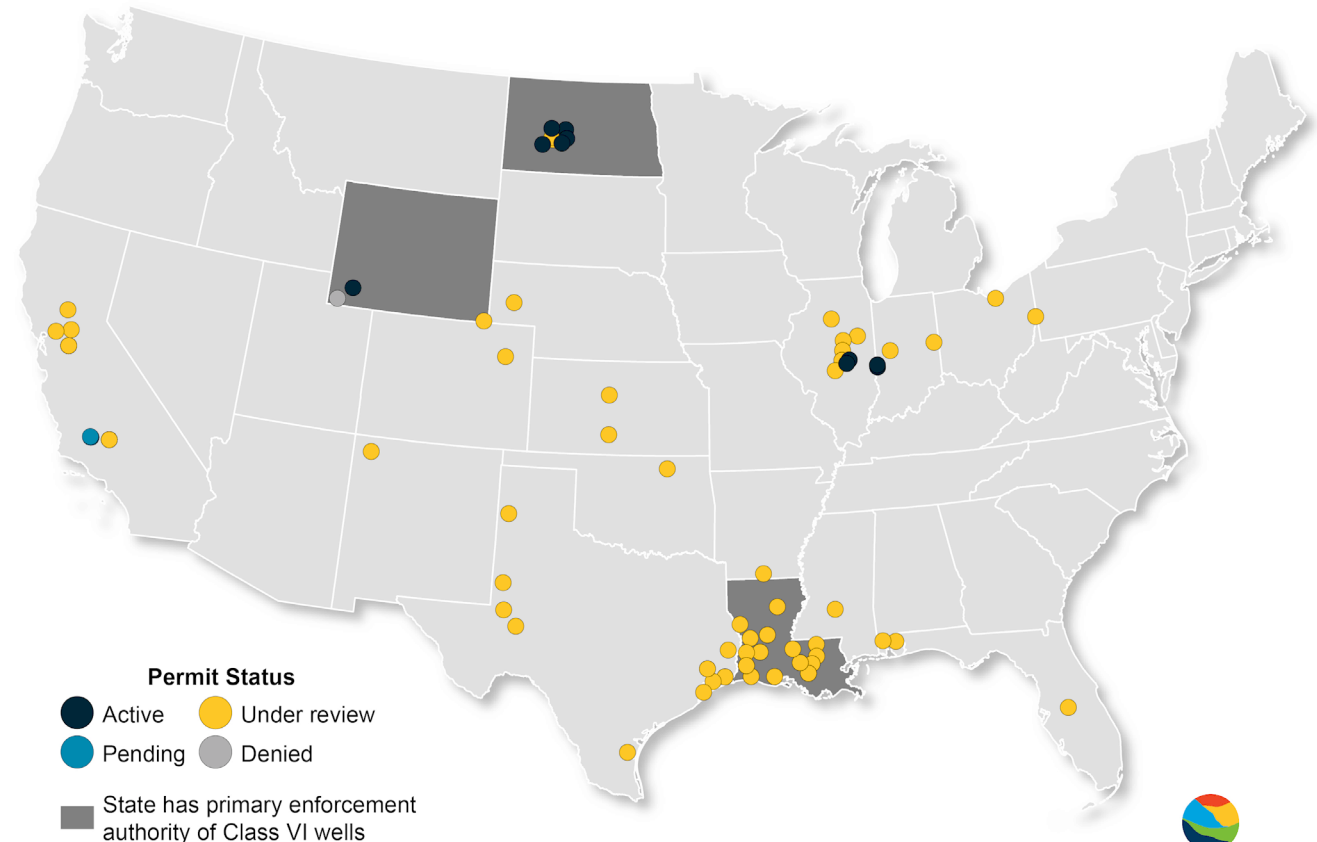
REGULATORY CHALLENGES

- Projects require many authorizing actions
- Some may be redundant
- There are opportunities to develop procedural efficiencies

Appendix B Table 2 Authorizing Actions Which May be Necessary to Construct Pipelines in the WPCI Corridors		
Agency	Nature of Authorizing Action	Authority
Federal Permits, Approvals, and Reviews		
Bureau of Land Management	Amends Resource Management Plan	Federal Land Policy and Management Act of 1976
	Grant right-of-ways and issue temporary use permits	Section 28 of the Mineral Leasing Act of 1920
	Issue materials sales contracts	Materials Act of 1947, as amended; 30 U.S.C. 601, 602; 43
	Issue antiquities and cultural resource use permit to excavate or remove cultural resources on federal lands	Antiquities Act of 1906, 16 U.S.C. Section 431-433; Archaeological Resources Public Protection Act of 1979, 16 U.S.C. Section 470aa-
	Approve herbicide use on federal lands	BLM Manual 9011.1, Guidelines for Conducting Chemical Pest Control Program
U.S. Fish and Wildlife Service	Section 7 Consultation process for endangered or threatened	Endangered Species Act of 1973; 16 U.S.C. 1531 et seq.
Federal Highway Administration	Issue permits to cross federal-aid highways	23 U.S.C. Sections 116, 123, 23 CFR Part 645 Subpart B
U.S. Army Corps of Engineers	Issue Section 404 permit (nationwide) for placement of dredged or filled material in waters of the U.S.	Section 404 of the Clean Water Act of 1972 (40 CFR 122-123); 33 U.S.C. Section 1344; 33 CFR Parts 323, 325
Bureau of Alcohol, Tobacco and Firearms	Issue permits to purchase, store, and use explosives	Section 1102(a) of the Organized Crime Control Act of 1970, 18 U.S.C. Section 841-848; 27 CFR Part 181
Advisory Council on Historic Preservation	Review and compliance activities related to cultural resources	Section 106 National Historic Preservation Act (16 U.S.C. 470) (36 CFR Part 80)
State of Wyoming and Local		
Department of Environmental Quality – Water Quality Division	Issue National Pollution Discharge Elimination System (NPDES) Permit for discharges; approve Storm Water Pollution Prevention Plan	Wyoming Environmental Quality Act, W.S. 35-11-301
	401 Water Quality Certification	Section 401 of the Clean Water Act
Wyoming Highway Department	Issue permits for oversize and overweight loads	Chapters 17 and 20 of the Wyoming Highway Department Rules and Regulations
	Issue encroachment permits for state highways	Chapter 12 of the Wyoming Highway Department Rules and Regulations
State Land Board	Issue easements to cross state lands	W.S. 35-20 and 36-20
Wyoming State Engineer's Office	Grant permit to appropriate water for hydrostatic testing, dust control, and other uses	W.S.41-121 through 147
State Historic Preservation Office	Review compliance activities related to cultural resources	Section 106 National Historic Preservation Act (16 U.S.C. 470)
County Commissioners	Road crossing permits, land use permits, and licenses	County zoning regulations
County Health Departments	Temporary sanitation facilities	County sanitation regulations

CLASS VI WELLS

- There are currently ~200 class VI well applications submitted to EPA
- To date, EPA has authorized 4 Class VI wells
- LA, ND and WY have been granted primacy to administer Class VI programs.
- ND has authorized 4 and WY has authorized 3 Class VI wells.



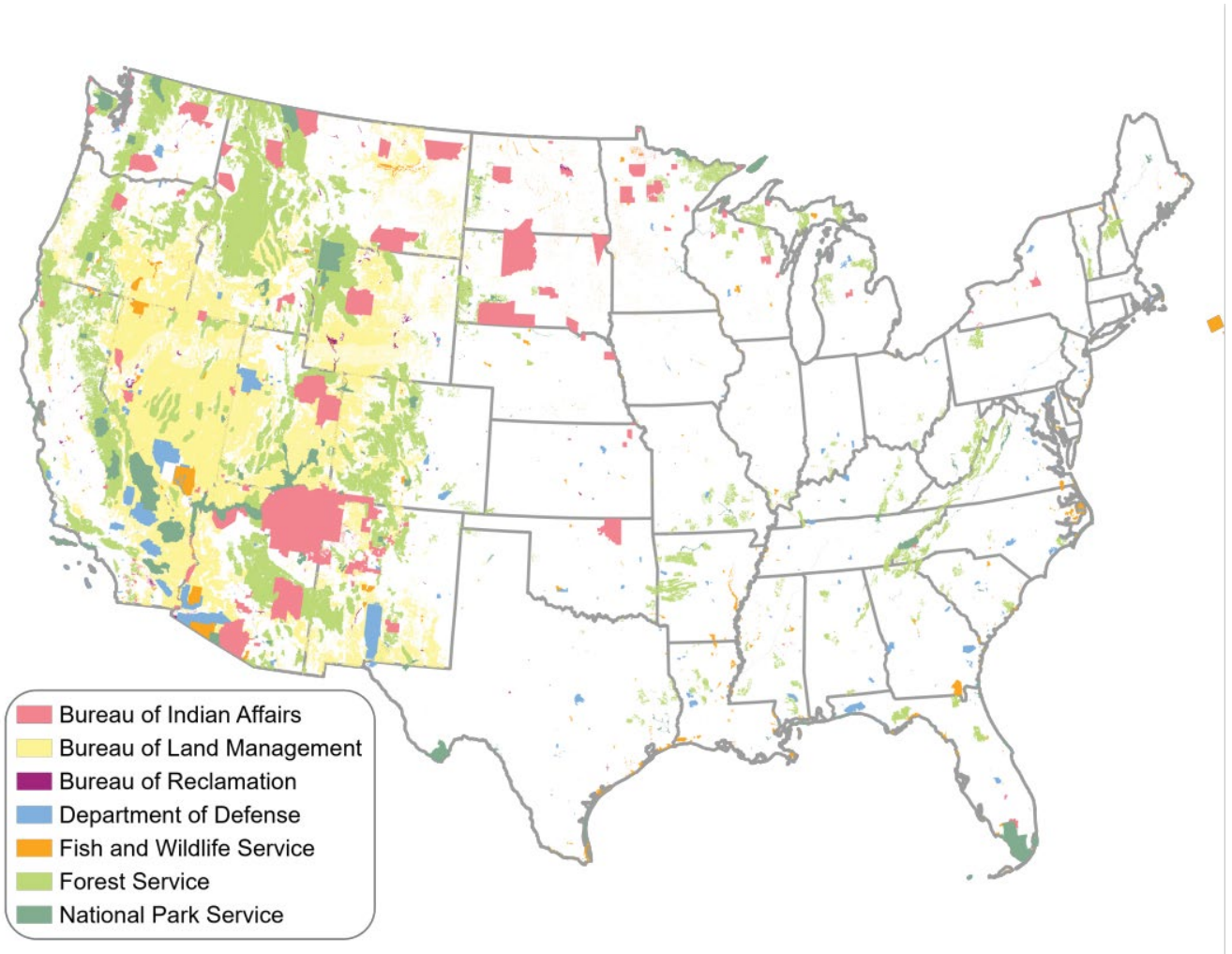
Sources: US EPA, Louisiana Department of Energy and Natural Resources, North Dakota Department of Mineral Resources, Wyoming Department of Environmental Quality



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FEDERAL LANDS

- The Federal Government owns and/or administers nearly 1/3 of the US surface estate.
- Class VI and IRS regulations require that CO₂ be permanently stored.
- Procedurally, it is unclear how to access federal pore space for a “permanent use”.



Storage Opportunities

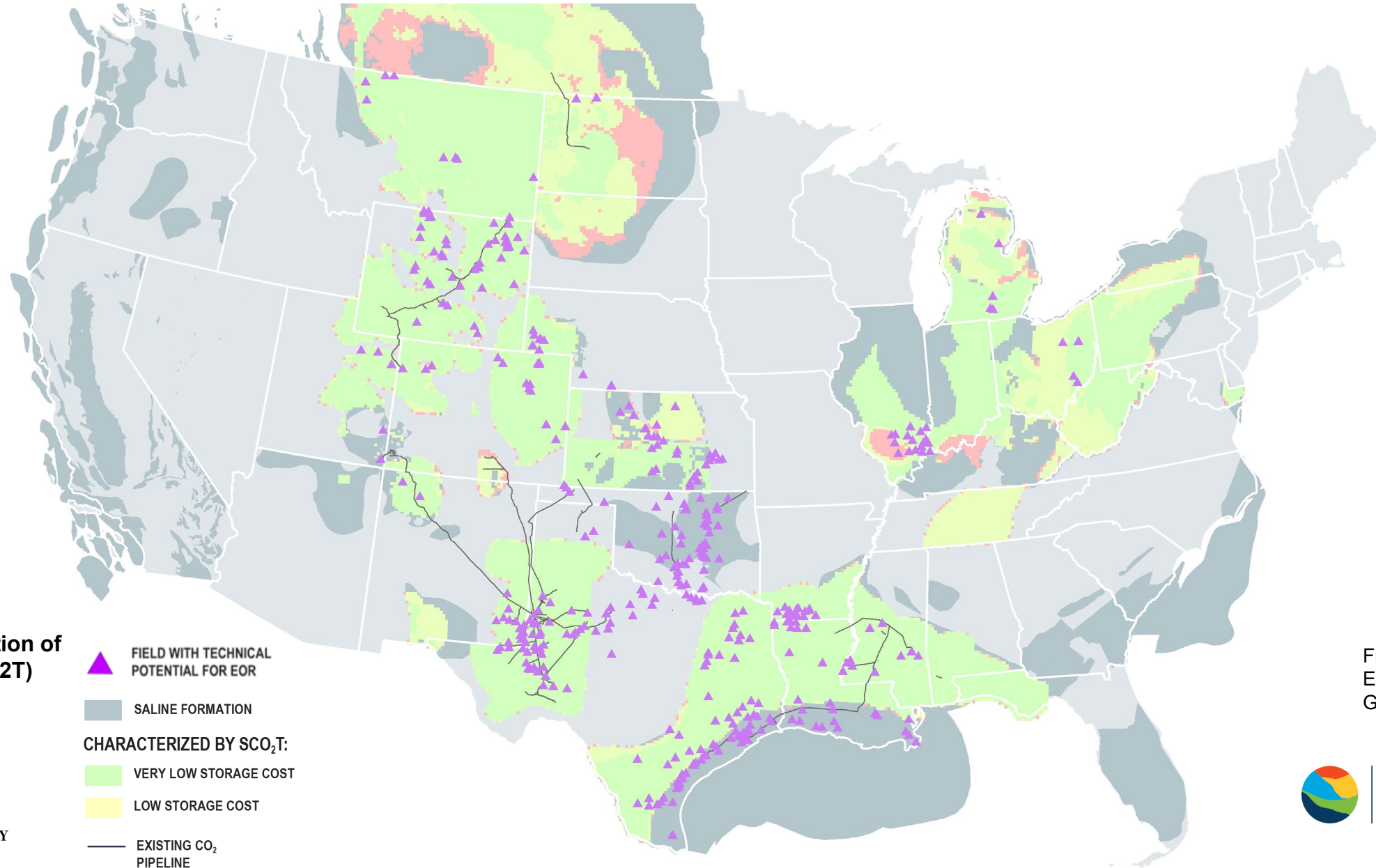


Figure authored by
Elizabeth Abramson,
GPI, March 2020



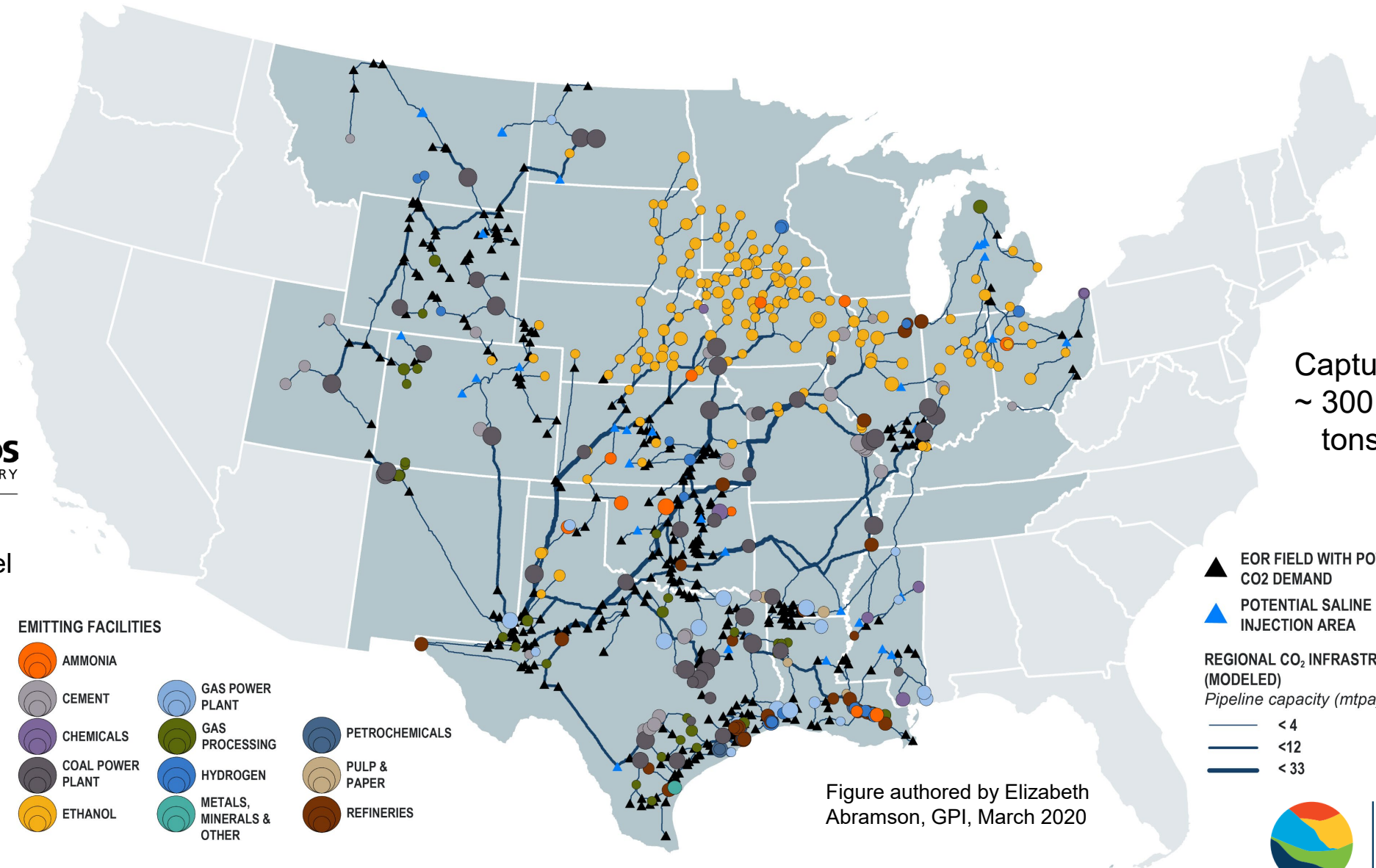
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Saline data via
The Sequestration of CO₂ Tool (SCO₂T)



INDIANA UNIVERSITY

Near- and Medium-Term Scenario: Optimized transport network for CO₂ capture and storage under 45Q



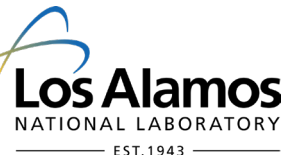
Capture and storage:
~ 300 million metric
tons per year

- ▲ EOR FIELD WITH POTENTIAL CO₂ DEMAND
- ▲ POTENTIAL SALINE INJECTION AREA

REGIONAL CO₂ INFRASTRUCTURE (MODELED)

Pipeline capacity (mtpa)

- < 4
- < 12
- < 33



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

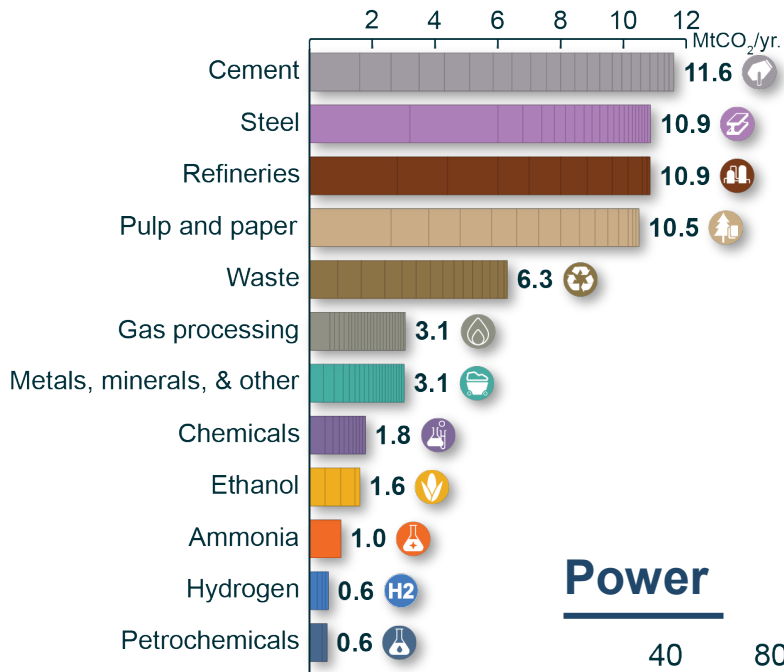
Figure authored by Elizabeth
Abramson, GPI, March 2020



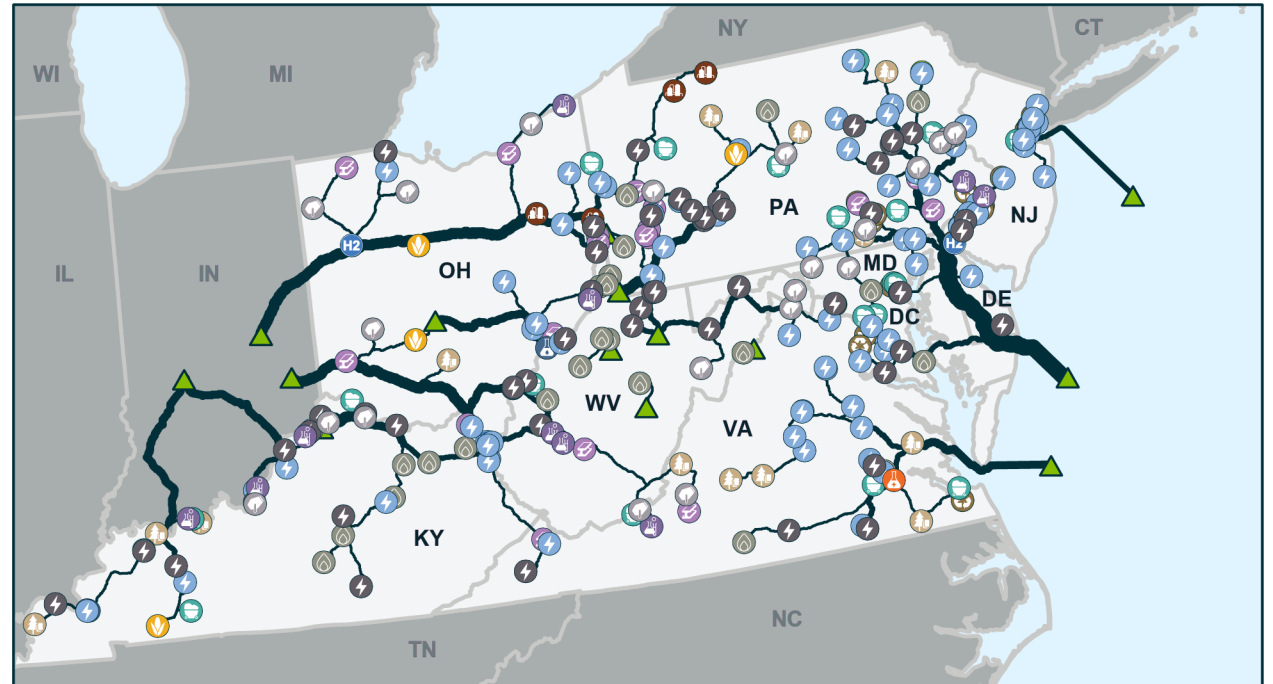
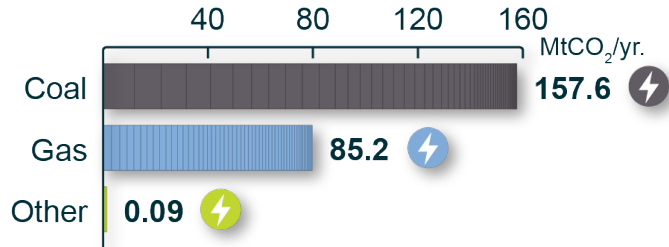
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Midcentury scenario results

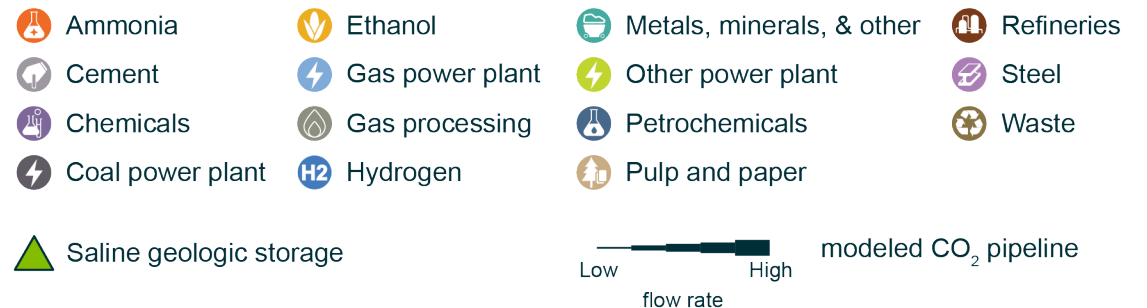
Industry



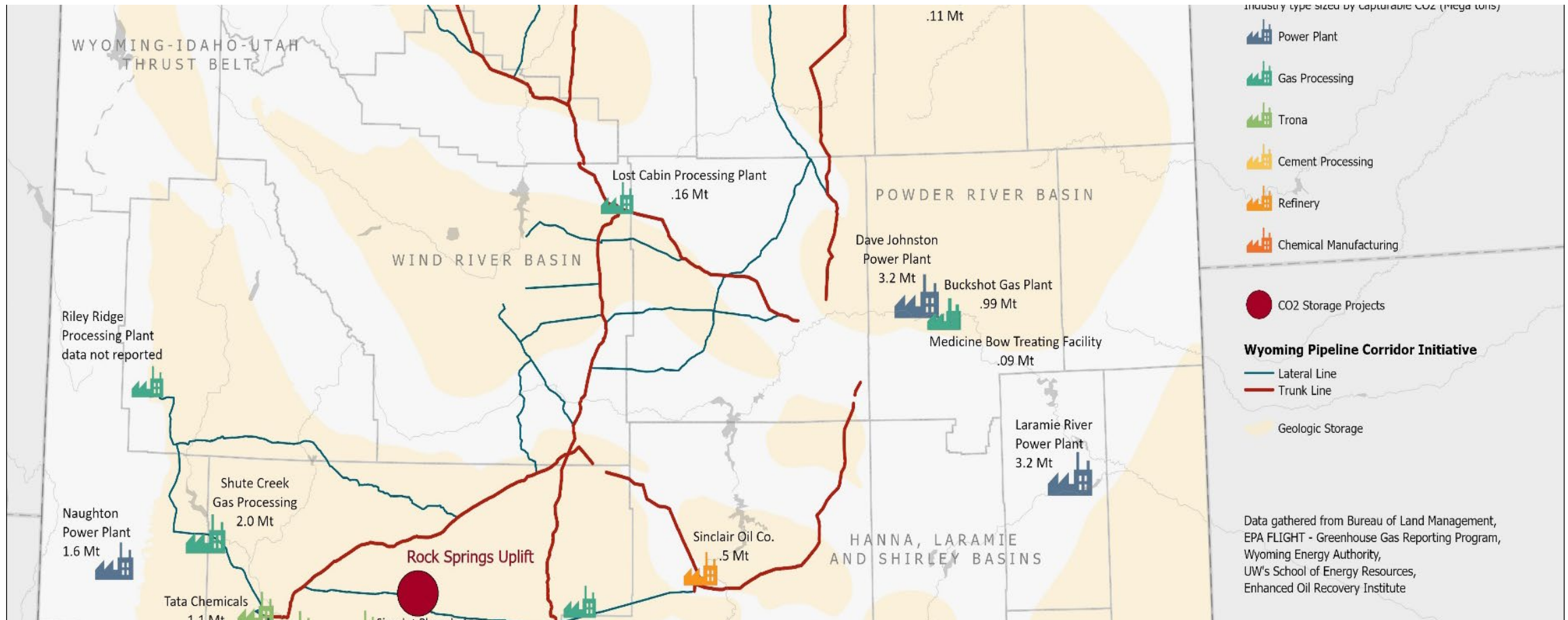
Power



Based on results of *SimCCS*[®] and data from EPA GHGRP, 2021; NATCARB 2015; CARBON SOLUTIONS *SCO₂TP*[®] 2022.



State Led Initiatives with Federal Support



PUBLIC PERCEPTION

The screenshot shows a web browser window displaying a news article from 'THE ADVOCATE'. The article title is 'Lake Maurepas carbon capture project faces backlash over test wells: 'Give us a break''. The author is listed as 'BY LARA NICHOLSON | Staff writer' and the date is 'Dec 21, 2022'. The article features a large image of an industrial site with drilling equipment. A PDF icon is visible on the right side of the article, with a 'Download PDF (Free)' button and an 'Open' button. The browser's address bar shows the URL: 'https://www.theadvocate.com/baton_rouge/news/environment/lake-maurepas-carbon-capture-projec...'. The Windows taskbar at the bottom shows the date as 9/19/2023 and the temperature as 62°F.

The screenshot shows a web browser window displaying a news article from 'Nebraska Examiner'. The article title is 'South Dakota regulators deny permit for Navigator CO2 carbon pipeline'. The author is 'BY JOSHUA HAIAR' and the date is 'SEPTEMBER 6, 2023 2:00 PM'. The article features a large image of three people sitting at a table in a meeting room, with the South Dakota state seal visible in the background. The browser's address bar shows the URL: 'https://nebraskaeaminer.com/2023/09/06/south-dakota-regulators-deny-permit-for-navigator-co2-c...'. The Windows taskbar at the bottom shows the date as 9/19/2023 and the temperature as 62°F.

The screenshot shows a web browser window displaying a news article from 'Colorado Sun'. The article title is 'Colorado wants to create carbon-capture hubs across the state. But locals aren't sold.'. The article is categorized under 'ENVIRONMENT'. The author is 'Michael Booth' and the date is '4:29 AM MDT on Sep 17, 2023'. The article features a banner for 'Special Olympics Colorado HALL of FAME' presented by 'PAVILIONS' on 'October 11, 2023'. The article text states: 'State officials are all in on making Pueblo, Yuma and other areas into carbon-capture hubs, for jobs and revenue. But neighbors of the smokestacks don't want more carbon under their ground.' The browser's address bar shows the URL: 'https://coloradosun.com/2023/09/17/colorado-carbon-capture-future/'. The Windows taskbar at the bottom shows the date as 9/19/2023 and the temperature as 64°F.

Thank You

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