CCUS Issues that Challenge Progress - Legal Panel

Appalachian Hydrogen & Carbon Capture Conference
Southpointe, Pennsylvania
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CCUS Issues that Challenge Progress – Legal Panel

Moderator:

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Panelists:

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Carbon Capture & Sequestration: An Overview

Armando Benincasa
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CCUS Overview

- A carbon neutral future in a world still dependent upon fossil fuels for energy
- CCUS as an answer to bridging two worlds
- Challenges presented
- Movement to the future

A Carbon Neutral Future

- Fossil Fuels remain a vital source for energy production
  - As of 2021, according to the EIA, fossil fuels—petroleum, natural gas, and coal—accounted for about **79%** of total U.S. primary energy production
- State Government Trends
  - At least 21 individual states now have some version of 100% clean energy goals into the future
- Biden Administration Goals
  - 100% clean electrical grid by 2035
  - Net-zero carbon emissions by 2050

Council of Environmental Quality Report to Congress on Carbon Capture, Utilization, and Sequestration, June 30, 2021

"To avoid the worst impacts of climate change and reach President Biden's goal of net-zero emissions by 2050, we need to safely develop and deploy technologies that keep carbon pollution from entering the air and remove pollution from the air."

"The report we are releasing today outlines a framework for how the United States can accelerate carbon capture technologies and projects in a way that benefits all communities."

What is Carbon Capture and Sequestration?

- Carbon Capture and Sequestration, generally known as CCUS, is an anthropogenic carbon emission reducing technology that can help lower greenhouse gas emissions created when burning fossil fuels
- Generally, CCUS is a three-step process:
  1. Capture – carbon dioxide is separated from other gases at its emitting source, like coal and natural-gas-fired electric generation facilities
  2. Transport – the captured carbon dioxide is compressed and transported by pipelines, road, or ship to storage sites

  3a. Utilization – oil and gas production

  3b. Sequestration – the captured carbon dioxide is injected into underground geologic formations for permanent storage

Challenges for CCUS

- Cost
  - CCUS technology of the scale needed to capture and sequester large amounts of CO_2 has not been readily available
  - Cost associated with removing CO_2 and delivering and sequestering the gas has meant that most projects need significant public dollars
    - The Illinois Basin – Decatur Project, primarily funded through the Midwest Geological Sequestration Consortium through the DOE announced in May 2021 the successful capture and storage of one million metric tons of CO_2

Challenges for CCUS

- Environmental Concerns
  - Model regulations have been developed and regulatory programs exist for CO_2 capture and injection, but issues related to environmental safety persist and current regulatory programs lack specificity related to long-term liability for environmental risk
- Transportation
  - Pipeline capacity and development
- Property Rights and Operational Liabilities
  - Pore space, use of eminent domain, and long-term liability

Refining CCUS Technology is Necessary to Control Future Costs

- Federal Research and Development
  - The primary focus is on early-stage R&D to develop coupled simulation tools, characterization methods, and monitoring technologies. This focus is intended to improve storage efficiency, reduce overall cost and project risk, decrease subsurface uncertainties, and identify ways to ensure that operations are safe, economically viable, and environmentally benign.
  - The Energy Act of 2020 authorized an expanded scope for DOE carbon capture and carbon removal research programs
  - The President's FY2022 Budget also proposes expanding DOE's CCUS activities compared to previous years

Tax Credits to Encourage CCUS Project Development

- Tax Credits
  - Internal Revenue Code Section 45Q offers tax credits that vary between $12 to $50 per metric ton of carbon captured and sequestered depending on timing and type of project
  - Tax credits historically used to incentivize wind and solar projects are now being used to reduce the cost and risk to private capital when investing in carbon dioxide emissions capture and storage
  - American Jobs Act
    - In line with the SCALE Act and the House Select Committee on the Climate Crisis's recommendation, supports large-scale carbon sequestration efforts to capture CO_2 directly from emission sources and from ambient air
    - Reforms the 45Q tax credit to make it direct pay and easier to use for hard-to-decarbonize industrial applications, direct air capture, and power plant retrofits

Providing an Environment to Encourage CCUS - SCALE Act

- The Storing CO_2 and Lowering Emissions Act (SCALE Act)
  - Bipartisan legislation would enable CO_2 transport and storage infrastructure required to scale up carbon capture, removal, use, and storage across domestic industries
  - The SCALE Act focuses on three key areas:
    - A federal financing mechanism for CO_2 transport and storage infrastructure and leveraging economies of scale by reducing the overall costs associated with interconnected systems buildout
    - Supports development of saline geologic storage resources and implementation of the EPA permitting program on CO_2 injection for secure geologic storage
    - Grants for states and municipalities to acquire low- and zero-carbon products derived from CO_2 and carbon oxides

Inflation Reduction Act

- Major Changes to 45Q Tax Credit
  - Raises credit values to $85 and $180 for both point source and direct air capture
  - Provides a direct pay and transferability option for developers who claim the credit
  - Extends the commence construction window for projects to 2023
  - Broadens the definition of qualified facilities

Environmental Concerns/Liabilities

- Permitting/UIC authorization for Class VI injection wells under the SDWA
- Short and Long-term liability for storage issues

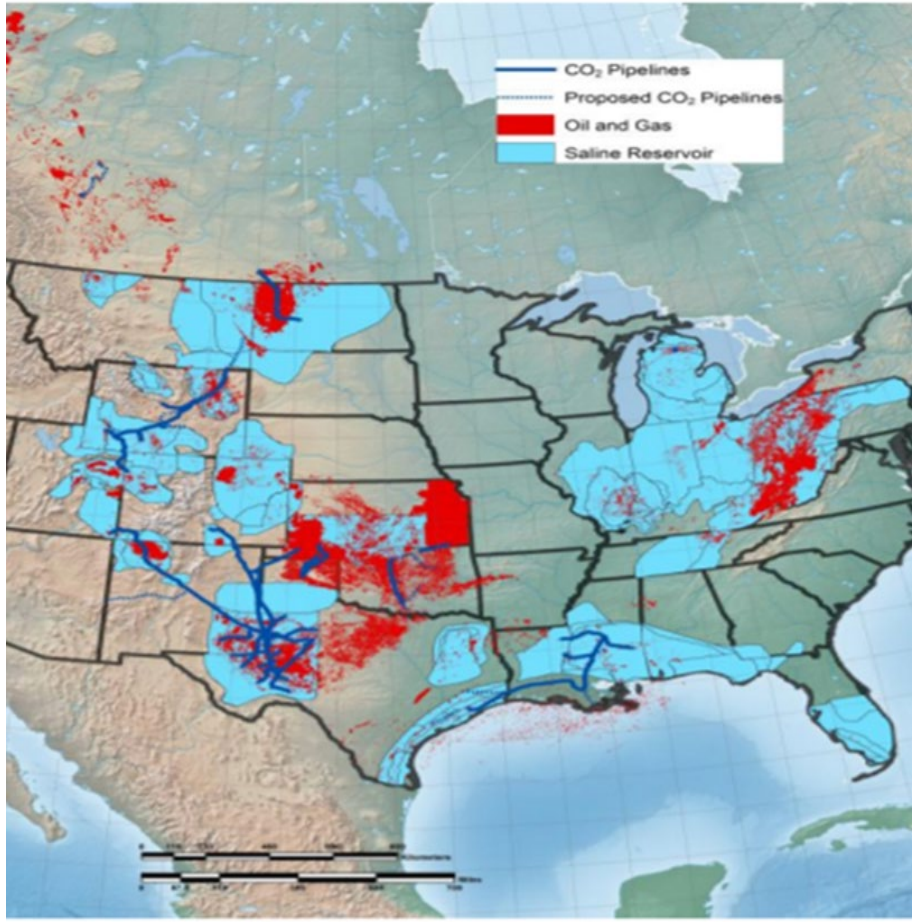
Class VI UIC Program 40 CFR Part 146 Subpart H

https://bit.ly/3ArbguF

- Primary Goals of UIC Permitting Program:
  - Protect underground sources of drinking water
  - Provide a regulatory framework for the permitting of underground injection control wells
  - No requirement to capture/sequester CO_2

- Safe Drinking Water Act does not provide authority to address all the issues presented by underground injection:
  - Capture and transport of CO_2
  - Property rights as to pore space
  - Liability transfer – short and long-term from project developer to third party (public)
  - Accounting for GHG reductions

Transportation of CO_2 /Pipelines



- If not utilized at source site, CO_2 must be compressed, transported for utilization/injection downstream
- ~ 5,200 miles of liquid CO_2 pipelines (mostly for EOR)
- Map shows pipelines in relation to OG and saline reservoirs
- Massive expansion of CO_2 pipeline network needed to transport for significant commercial CCUS.
- DOE estimates ~50,000 miles of new CO_2, lines needed in next 20 years to implement CCUS “at scale”

Transportation of CO_2 (Regulatory Issues)

- **Federal** - No current federal economic regulatory scheme for CO_2 pipelines; thus, no access to federal eminent domain powers to secure easements (exception - pipelines on federal lands subject to BLM oversight)
  - FERC has declined to regulate:
    - *Cortez Pipeline Co.*, 7 F.E.R.C. ¶ 61,024 (1979) (CO_2 not "natural gas" under NGA due to traces of methane); *Southern Gas Co.*, 115 F.E.R.C. ¶ 62,266 (2006) (natural gas pipeline abandonment in conversion to CO_2 pipeline non-jurisdictional)
  - ICC declined to regulate:
    - *Cortez Pipeline Co.*, 46 Fed. Reg. 18805 (Mar. 26, 1981) (jurisdiction only covers lines moving commodities other than "water, gas, or oil")
- **State** - CO_2 pipelines subject to state-by-state regulation with minority granting condemnation rights to carrier
- **Construction Impediments** – Permitting infrastructure as a key bottleneck to future development

Property Rights – Pore Space

- **Ownership**
  - Issues arise when fee simple interest severed into surface and mineral estate(s)
  - Injector must either own pore space, have permission from owner, or have a statutory or common-law right to use to avoid potential claims (e.g., trespass, conversion, nuisance)
  - Generally, mineral owner holds ownership interest in physical molecules of mineral (oil, gas, salt, etc.) either in place or right to recover/produce; but mineral ownership does not extend to geological structures that contain minerals beneath surface

Property Rights – Pore Space

- **Statutory Framework**
  - Federal law grants broad rights to DOI authorizing geologic storage, surface and subsurface storage leases, easements on federal lands
  - Jurisdictions with have addressed pore space ownership statutorily have favored the surface owner
  - Some states have addressed carbon sequestration and granted regulatory authority to specified agencies
  - Proposed IOGCC model statute/recommendations

Property Rights – Pore Space

- **<u>Common Law</u>**

  Unless otherwise established by federal or state law, or express right addressed in title documents, ownership of pore space is determined by state common law

  - A few cases not involving CCUS have determined that surface owner owns pore space; based on retention of all rights except those expressly granted to others, e.g., oil, gas, other minerals (not everything below surface/certain depths):
    - (WV) *Tate v. United Fuel Gas Co*., 71 S.E.2d 65 (1952) (*as long as no longer any recoverable minerals in stratum*, surface owner holds title to subsurface space for natural gas storage)
    - (TX) *Humble Oil & Refining Co. v. West,* 508 S.W.2d 812 (1974) (surface owner retained geological structures beneath surface and any structure suitable for storage of gas produced elsewhere)

Property Rights – Liability Issues

Liability Rule, Not Property Rule

- Potential liability of CO_2 well operations for claims of trespass/subsurface injury to injection tracts/migration to other tracts
- However, subsurface intrusions generally treated differently than surface trespass claims and frequently require actual and substantial damages
- While comparisons have been made to gas storage, imperfect analogy to CO_2 sequestration
- Better analogy is to underground waste-injection cases
- Underground waste-injection operations conducted under federal/state authorization (UIC) *that do not cause actual harm to adjacent properties* may be carried out without compensation to surrounding landowners due to public interest/necessity

Property Rights – Liability Issues

- When injection of fluid wastes conducted under regulatory approval, courts have modified common law relating to subsurface property by rejecting notion that property owners entitled to compensation for use of their pore space, or that they have absolute right to prevent underground migration of fluid waste into their pore space, e.g.:
  - *Chance v. BP, Inc.*, 670 N.E.2d 985 (Oh. 1996) (Chemical plant operator not required to acquire pore space rights for permitted disposal wells; subsurface property rights not absolute; no trespass absent physical damage/interference with pore space)
  - *Crawford v. Hrabe*, 44 P.3d 442 (Kan. 2002) (lessee not prohibited from injecting off-site wastewater into lessor's subsurface for secondary recovery of oil and not liable for trespass; finding orthodox rules of surface trespass not applicable to subsurface, and that injecting wastewater for EOR operations was practical/efficient use of a potentially hazardous waste product)

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Challenges to Decarbonizing Appalachia

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35 years

as an energy company in the US

~332,000

barrels of oil and gas equivalent produced each day*

2M

homes could be powered by our offshore wind developments

500+

people directly employed in the US

~500

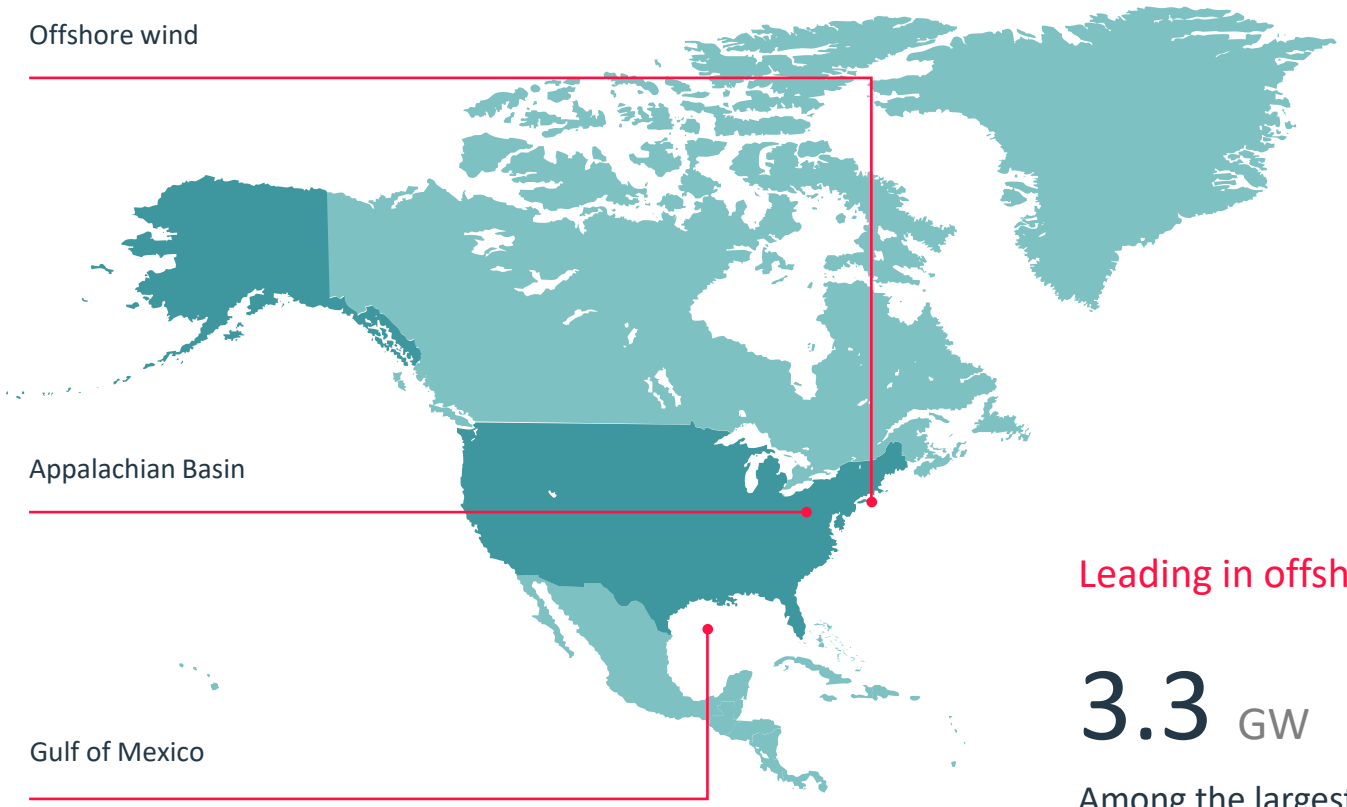
companies working with Equinor in the US YTD 2021

60M

invested in innovation and and US Startups**

*First 6 months of 2022

Equinor US - Delivering on our net zero commitment



High value, low carbon production

1 bcf/d in Appalachia

Marcellus

- One of our largest gas assets
- Less than 1 kg of CO_2 per barrel in 2021 for our operated acreage
- Operating Partners: Chesapeake and Southwestern

Leading in offshore wind

3.3 GW

Among the largest US development portfolios

Exploring new value chains

60 million USD

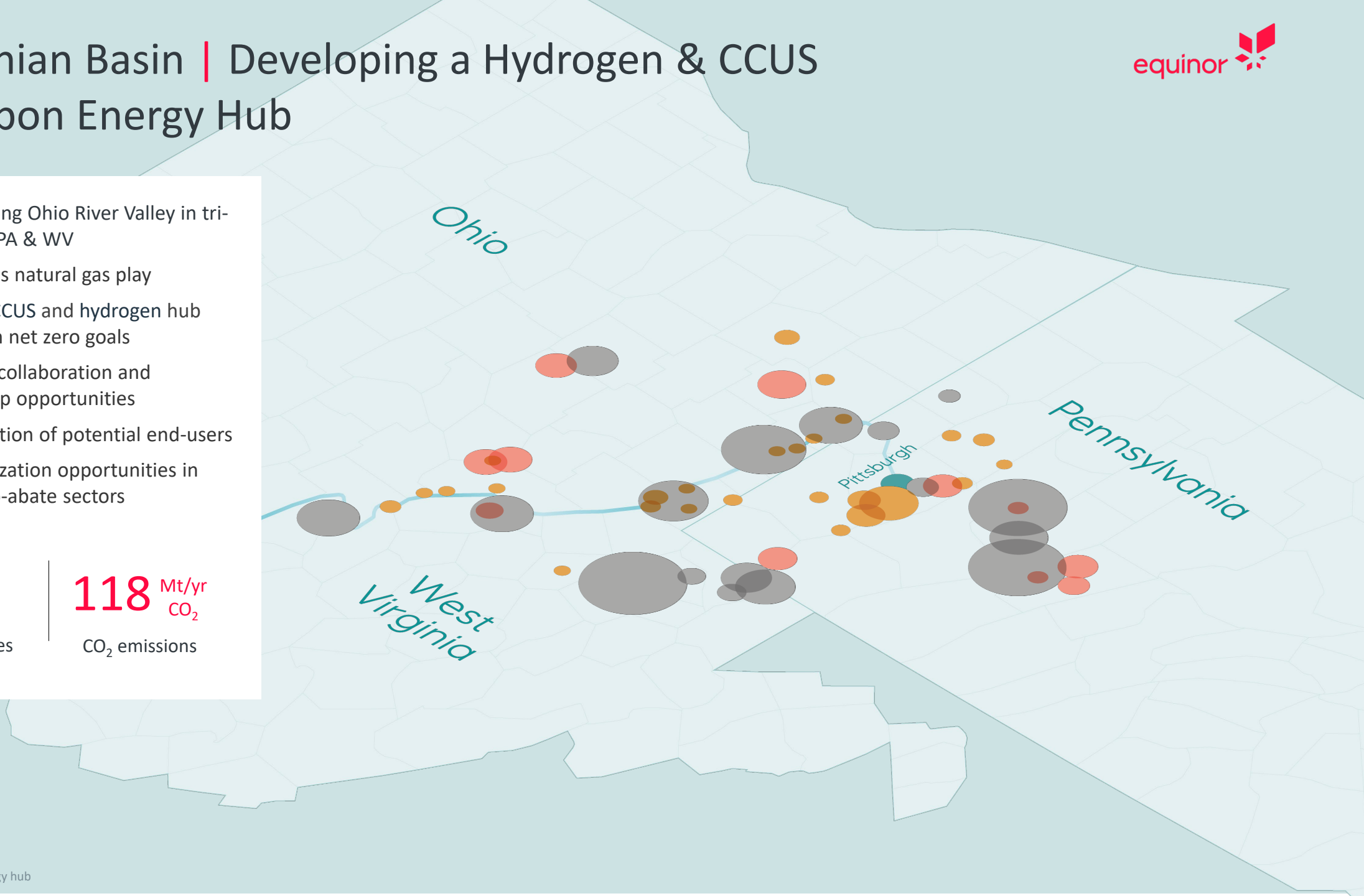
Investing in innovation and US startups

Appalachian Basin | Developing a Hydrogen & CCUS Low Carbon Energy Hub

- Region along Ohio River Valley in tri-state OH, PA & WV
- World class natural gas play
- Regional CCUS and hydrogen hub aligns with net zero goals
- Extensive collaboration and partnership opportunities
- Concentration of potential end-users
- Decarbonization opportunities in difficult-to-abate sectors

72 facilities

118 Mt/yr CO_2 CO_2 emissions



Challenges to Decarbonizing Appalachia

- Policy framework –State level (e.g. PA H2 tax credit)
- Establishing Class VI Primacy in each state
- Land acquisition and pore space ownership
- Royalty expectations
- Geology and reservoir potential
- Infrastructure build-out
- Market dynamics

Holly Hannold
External Affairs Director
U.S. Energy Transition Projects

Environmental Justice and CCUS

Kathy G. Beckett

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Federal Interagency Working Group on Environmental Justice

- "Federal agencies must identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations."
- Executive Order 12898.

- Public Participation
- Regional Engagement
- Title VI of the Civil Rights Act of 1964
- National Environmental Policy Act
- Native Americans/Indigenous Peoples
- Rural Communities Engagement
- Impacts from Climate Change
- Impacts from Commercial Transportation (Goods Movement)
- Strategy and Implementation Progress Reports

Environmental Justice
Energy Development - Community

- Foster strong partnerships with the community to manage environmental justice conditions (impacts on air, water, soil)
- Enhance the resiliency of a community (improved roads, tax base, good work, financing, investors, education impetus, etc.)
- Facilitate meaningful community engagement to identify key risks and vulnerabilities impacting its local citizens. (climate change, depression, unemployment/underemployment)
- Drive assessment of fair treatment for all people
- Promote management of area impacts from historic and future development activities consistent with environmental laws, regulations, and policies

Justice40

- "For the first time in our nation's history, the Federal Government has made it a goal that 40 percent of the overall benefits of certain Federal investments flow to disadvantaged communities that are marginalized, underserved, and overburdened by pollution. President Biden made this historic commitment when he signed Executive Order 14008 within days of taking office."

Meaningful Involvement of Community

- All Justice40 covered programs are required to engage in stakeholder consultation and ensure that community stakeholders are meaningfully involved in determining program benefits. Covered programs are also required to report data on the benefits directed to disadvantaged communities.
- July 20, 2021 Memorandum for The Heads of Departments and Agencies From: Shalanda D. Young, OMB; Branda Mallory, CEQ; and Gina McCarthy, National Climate Advisor
  (whitehouse.gov/wp-content/uploads/2021/07/M-21-28.pdf)
  - Defines key terms of art: "community", "disadvantaged",
  - Lists covered programs and investments

What is a covered Justice40 Investment?

- Covered Federal investments include any
  - grant or procurement spending,
  - financing,
  - staffing costs, or
  - direct spending or benefits to individuals for a covered program in a Justice40 category.

Priorities for Justice40

(White House Environmental Justice Advisory Council)

1. Decrease energy burden in disadvantaged communities (DACs)
2. Decrease environmental exposure and burdens for DACs
3. Increase parity in clean energy technology (e.g., solar, storage) access and adoption in DACs
4. Increase access to low-cost capital in DACs
5. Increase clean energy enterprise creation and contracting (MBE/DBE) in DACs
6. Increase clean energy jobs, job pipeline, and job training for individuals from DACs
7. Increase energy resiliency in DACs
8. Increase energy democracy in DACs

USDOE Disadvantaged Communities Reporter

energyjustice.egs.anl.gov

- This tool is intended to allow users to explore and produce reports on census tracts that the U.S. Department of Energy (DOE) has categorized as disadvantaged communities, or DACs, pursuant to Executive Order (EO) 14008 - Tackling the Climate Crisis at Home and Abroad
- The Office of Management and Budget (OMB)'s Interim Guidance defines a *community* as either:
  1. A group of individuals living in geographic proximity (such as a census tract)
  2. A geographically dispersed set of individuals (such as migrant workers or Native Americans), where either type of group experiences common conditions
- To be considered a DAC, a census tract must rank in the 80th percentile of the cumulative sum of the 36 burden indicators and have at least 30% of households classified as low-income

Search

OR

TRACT

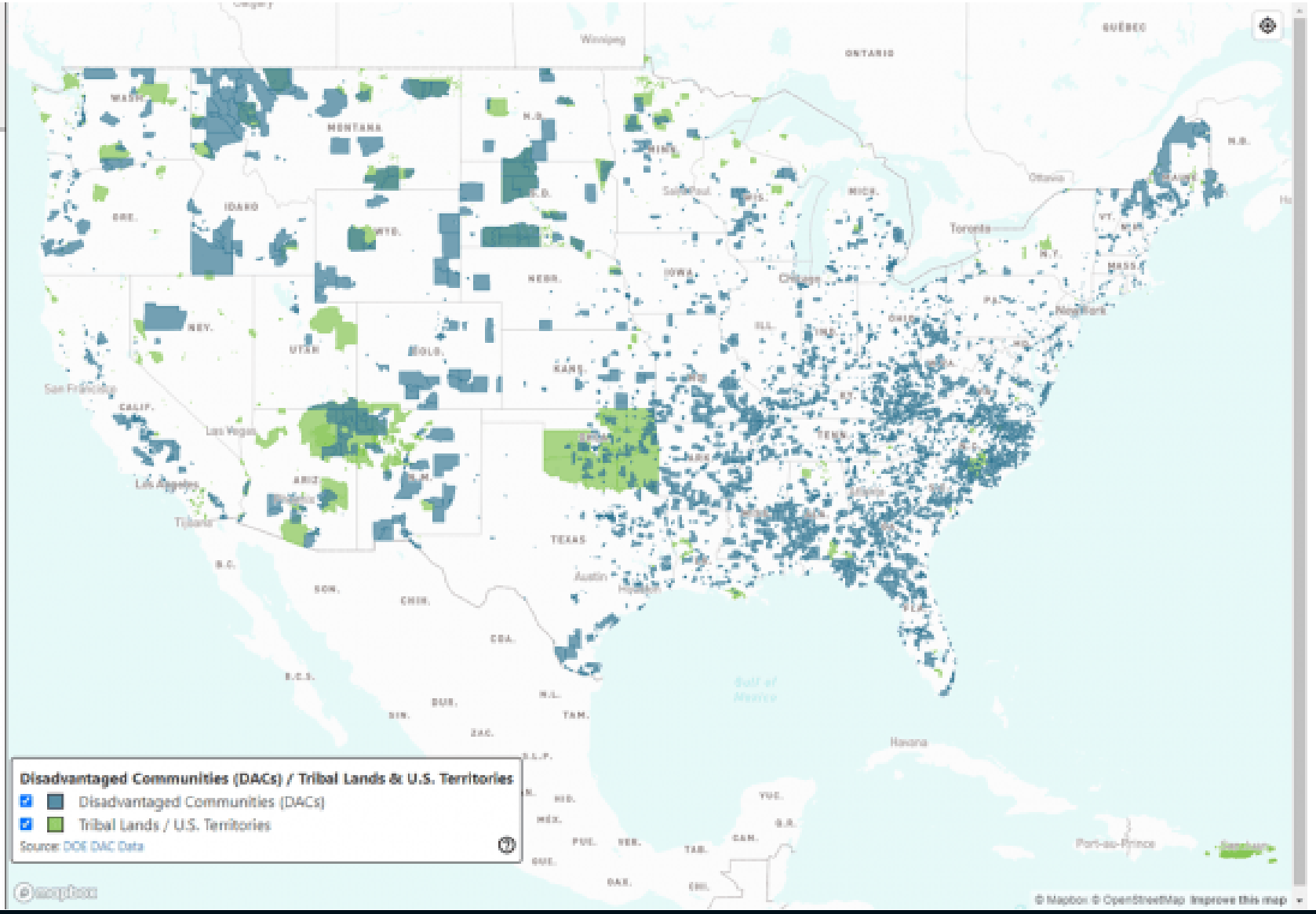
TRACT 45031010100

- City: Society Hill
- County: Darlington
- State: SC
- Population: 2,707
- DAC Status: **Disadvantaged**

National Ranking: 83% **State Ranking:** 86%

Indicator	National Percentile	Value
Mobile Home	99%	47%
Energy Burden	98%	8%
Internet Access	97%	40.1%
Single Parent	96%	81%
Unemployed	96%	15%
Transportation Costs	92%	34%
Less HS Education	91%	26%
Low Income Population	88%	56%
Cancer Risk	85%	138%
PM2.5	77%	32.76 µg/m³

Full Report



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Disadvantaged Community Indicators

https://www.energy.gov/justice40

- **Energy Burden**: energy burden (costs to household); non-grid-connected heating fuel; Outage duration; Outage events; and Transportation costs
- **Environmental and Climate Hazards:** cancer risk, climate hazards loss of life estimates; diesel; homes built before 1960; NPL proximity; PM2.5; RMP proximity; Traffic proximity; TSDF proximity; water discharge
- **Socio-Economic Vulnerabilities:** commute, disabled population, food desert, homelessness, housing costs, incomplete plumbing, internet access, job access, less HS education, linguistic isolation, low-income population, mobile home, no vehicle, parks, population 65 and older, renters, single parent, unemployed, uninsured
- **Fossil Dependence:** coal employment and fossil energy employment

What is a Justice40 covered program?

- A “covered program” is a Federal Government program that falls in the scope of the Justice40 initiative because it includes investments that can benefit disadvantaged communities across one or more of the following seven areas: climate change, clean energy and energy efficiency, clean transit, affordable and sustainable housing, training and workforce development, remediation and reduction of legacy pollution, and the development of critical clean water and wastewater infrastructure
- Existing and new programs created by President Biden’s Inflation Reduction Act, the Bipartisan Infrastructure Law, and the American Rescue Plan that make investments in any of these categories can also be considered Justice40 covered programs

USDOE List of Justice40 Programs

- Advanced Research Projects Agency – Energy
- Bonneville Power Administration
- Federal Energy Management Program
- Grid Deployment Office
- Loan Programs Office
- Office of Clean Energy Demonstrations
- Office of Cybersecurity, Energy Security, and Emergency Response
- Office of Economic Impact and Diversity
- Office of Electricity
- Office of Energy Efficiency and Renewable Energy
- Office of Environmental Management
- Office of Fossil Energy
- Office of Science
- Office of State and Community Energy Programs
- Office of Technology Transitions
- Southeastern Power Administration
- Western Area Power Administration

Inflation Reduction Act

- **Make it in America**. For the first time ever, the Inflation Reduction Act establishes Make it in America provisions for the use of American-made equipment for clean energy production. The law provides expanded clean energy tax credits for wind, solar, nuclear, clean hydrogen, clean fuels, and carbon capture, including bonus credits for businesses that pay workers a prevailing wage and use registered apprenticeship programs.
- **Build American** clean energy supply chains, by incentivizing domestic production in clean energy technologies like solar, wind, carbon capture, and clean hydrogen
- **Support American workers** with targeted tax incentives aimed at manufacturing U.S.-sourced products such as batteries, solar, and offshore wind components, and technologies for carbon capture systems

U.S. Department of Energy Bipartisan Infrastructure Law Program & Funding

- Carbon Capture Technology Program, Front-end Engineering Design for Carbon Dioxide Transport (FOA due 11/28/22)
- Carbon Capture Demonstration Projects Program (FOA due 21/5/22)
- Carbon Storage Validation and Testing (FOA due 11/28/22)

American Rescue Plan

- Relief from home energy costs and public health outcome disparities from pollution (and the COVID-19 pandemic) particularly to disproportionate environmental or public health harms and risks in minority populations or low-income populations, through grants, contracts and other the Clean Air Act, Safe Drinking Water Act, CERCLA, and the Energy Policy Act

Federal Agencies Are Working to Demonstrate Determinants of EJ Accomplishments

- "By September 30, 2023, all EPA programs that work in and with communities will do so in ways that are community driven, coordinated and collaborative, support equitable and resilient community development, and provide for meaningful involvement and fair treatment of communities with environmental justice concerns." p. 33, EPA Strategic Plan 2022-2026.
- CCUS projects need to consider creating such illustrative determinants

October 12, 2022
EPA Letter of Concern on EJ/Civil Rights to Louisiana Environmental and Health Agencies

- Civil rights compliance, Informal Resolution Agreement
  - Initial fact finding on implementation of Louisiana Air Program
  - Duty to inform and make recommendations to the public about prevention and reduction of health threats and air toxics exposures
  - Based on facts it is suggested that the agency's actions and inactions have resulted and will continue to result in disparate adverse impacts on Black residents of St. John the Baptist Parish, St. James Parish, and the Industrial Corridor

EPA Case Study of EJ

- EPA Complaint No. 01R-22-R6 (LDEQ and the Denka Facility)
  - Exposures to chloroprene concentrations under air permitting program
  - EPA has significant concerns that Black residents and school children living and/or attending school near the Denka facility have been subjected to discrimination through LDEQ's actions and inactions in implementation of its air pollution control permit

EPA Case Study of EJ

- EPA Complaint No. 02R-22-R6 (LDH and the Denka Facility)
  - LDH neither implemented the commitments it made in connection with reviews and studies of chloroprene exposure risk nor made meaningful recommendations to educate and protect community members from elevated cancer risks as indicated by its own research and required by its implementing regulations

EPA Case Study of EJ

- EPA Complaint No. 04R-22-R6 (LDEQ and the Industrial Corridor and the Formosa Facility)
  - Census tracts with the highest cancer risks from air toxics in Louisiana are almost exclusively within the Industrial Corridor and also have a high percentage of Black population
  - EPA has significant concerns that LDEQ's air permitting program may be causing or contributing to the cancer and toxicity risk from air toxics for residents living near the proposed Formosa facility and that these risks appear to be borne disproportionately by Black residents

EPA Recommendations to State Agencies

- Update overdue permit renewals and insure all appropriate permits are active (rather than stayed and appealed) and conduct cumulative impact analysis
- Cumulative Impact Minimum Actions:
  - Consider input from stakeholders
  - Consider baseline cumulative risk burden or impact due to multiple pollutant exposures and non-pollutant stressors (race, employment, social determinants of health)
  - Consider impacts from any facility mutagenic carcinogen emissions on lifelong residents who have been exposed as children
  - Provide evidence-based recommendations for maximizing potential positive health impacts and minimizing and/or avoiding potential adverse impacts to include measures to reduce emissions below current baseline
- Hire a professional risk communicator to assist in providing residents complete and accurate health risk information (e.g. cancer risk)

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CCUS Issues That Challenge Progress – IOGCC Modeling Program

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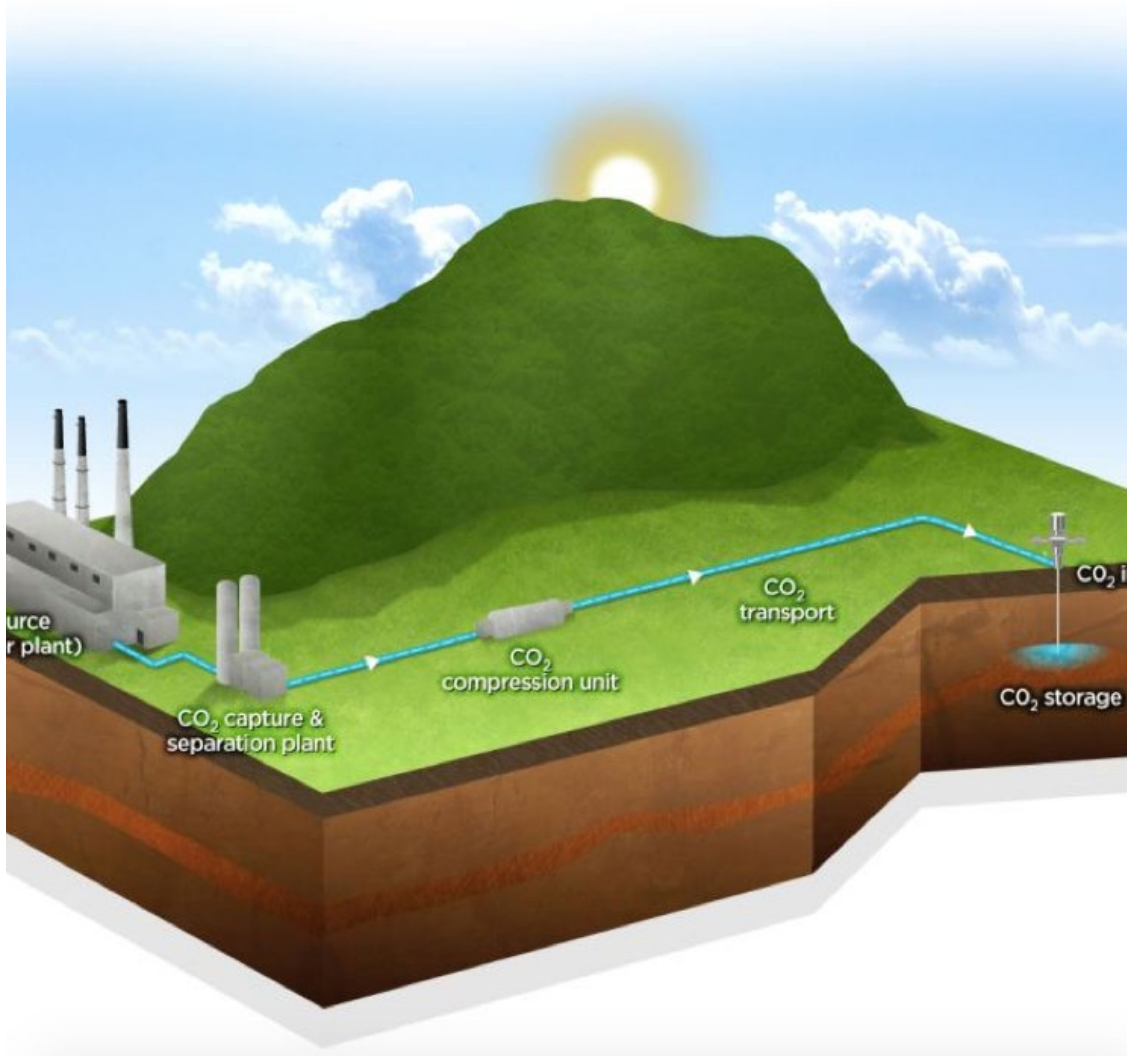

Overview

1. IOGCC model program
2. Lesson Learned
3. IOGCC review process
4. Pore space
5. Next steps

IOGCC Legal and Regulatory Guide

September 25, 2007

- Basic principals:
  1. It is in the public interest to promote geologic storage of CO_2 in order to reduce CO_2 emissions
  2. Pore space should be managed as a resource, and not a waste
  3. Storage rights are a matter of state law
  4. Eminent domain and unitization should be available for site acquisition
  5. Post-closure funds
  6. Based on case law survey surface owners should be declared owners of pore space
  7. Protect other stakeholders from damage

Lessons learned:

1. Pore space ownership options: surface owners, mineral owners or public usage
2. Consistency among the states/provinces in determining who owns the pore space
3. Implications of court decisions and CCUS legislation
4. Implications on pore space ownership of (a) Sequestered CO_2 having sufficient value to justify its extraction (b) liability of sequestered CO_2 being imposed on the owner of the pore space and value of CO2 credits
5. Implications on pore space ownership options of the development of Hydrogen Hubs across the county and the need for related CO_2 sequestration / utilization
6. Assessment of agreements among states related to CCUS projects that impact on multiple jurisdictions that may have different pore space ownership

IOGCC Review Process

Legal and Regulatory Committee

Chair: Reice Haase, North Dakota Industrial Division

Fall 2022 Panel

Additional Committee Meetings

Recommendations to full Compact May 2023

Review of States With Statutory Law Addressing Both Pore Space Ownership and Unitization

California

- In September 2022, California enacted legislation on both ownership and unitization
- Cal. Pub. Res. Code D.34, Pt. 8
  - § 71461(a)(2) creates a 75% unitization requirement
  - § 71462(a) grants ownership of any geologic storage reservoir to the surface owner, unless that estate has been severed and separately conveyed out
  - § 71462(b) states that "[t]he ownership of a geologic storage reservoir may be conveyed in the manner provided by law for the transfer of mineral interests in real property. No agreement or instrument conveying a mineral or other interest underlying the surface shall act to convey ownership of a geologic storage reservoir unless the agreement explicitly conveys that ownership interest."
- No case law discussing pore space ownership

Kentucky

- In 2011, Kentucky enacted legislation on both ownership and unitization
  - KRS § 353.800(8) grants pore space to surface owners
  - KRS § 353.806(2) creates a 51% unitization requirement
- No case law discussing pore space ownership; case law appears limited to natural gas storage and extraction

Montana

- Montana enacted legislation on both ownership and unitization in 2009,
  - § 82-11-112 allows for cooperative agreements with other state governments if a project were to cross state boundaries
  - § 82-11-180(3) states "if the ownership of the geologic storage reservoir cannot be determined from the deeds or severance documents related to the property by reviewing statutory or common law, it is presumed that the surface owner owns the geologic storage reservoir"
  - § 82-11-204 creates a 60% unitization requirement
- The Montana Supreme Court held in 2011 that pore space belongs to surface owners
  - *Burlington Res. Oil & Gas Co., LP v. Lang & Sons Inc.*, 259 P.3d 766,770 (Mont. 2011) (finding that an oil and gas operator was entitled to dispose of wastewater produced in unit operations in the pore space belonging to a surface owner with an interest in the unit and that the surface owner failed to prove damages)

North Dakota

- North Dakota enacted legislation on both ownership and unitization in 2009
  - N.D.C.C § 47-31-03 grants title to pore space to the owner of the surface estate
  - N.D.C.C § 47-31-05 prohibits the severance of the pore space from the surface estate
  - N.D.C.C § 38-22-08 creates a 60% unitization requirement
- In 2022, the North Dakota Supreme Court found portions of a law allowing use of pore space for saltwater disposal unconstitutional. Northwest Landowners v North Dakota, Case No 2022 ND 150, N.D. Sup Ct.

West Virginia

- In May 2022, West Virginia enacted legislation on both ownership and unitization
  - § 22-11B-4 also creates a 75% unitization requirement
  - § 22-11B-10 also allows for cooperative agreements with other state governments if a project were to cross state boundaries
  - § 22-11B-18 grants ownership of the pore space to the surface owners, and also creates a rebuttable presumption that "prior to the effective date of this article, that the pore space remains vested with the surface owner" where there is not a clear and unambiguous transaction that indicates otherwise
- No cases specifically pertaining to pore space

Wyoming

- In 2008 Wyoming enacted legislation on pore space ownership. W.S. § 34-1-152 grants pore space ownership to the surface owner and allows it to be severed from the surface and separately conveyed
- In 2009 W.S. § 35-11-316 created an 80% unitization requirement
- No case law related to pore space ownership or unitization

States With Statutory Law On Ownership But Not Unitization

Indiana

- In July 2022, Indiana enacted legislation that addressed pore space ownership
  - Ind. Code § 14-39-2-3 grants pore space to surface owners
  - Legislation does not address pooling
- 2019 legislation related to a pilot project authorized eminent domain to acquire pore space rights. IC 14-39-7
- No case law discussing pore space ownership

Utah

- In May 2022, Utah enacted legislation that addressed pore space ownership
  - Utah Code § 40-6-20.5 grants pore space to surface owners
  - Legislation does not address pooling
- No case law discussing pore space ownership

States With Law On Unitization But Not Pore Space ownership

Mississippi

- Undecided as to pore space ownership
- No legislation granting pore space ownership
- 2022: MS Code § 53-11-9 does create a 51% unitization requirement
- No case law discussing pore space ownership

Nebraska

- No legislation, proposed or enacted, granting pore space ownership
- 2021: Neb. Rev. Stat. § 57-1610(13) does create a 60% unitization requirement
- No case law discussing pore space ownership

States With Proposed Legislation

Illinois

- Undecided as to pore space ownership
- HB4370 introduced in 2020 but did not pass
  - Would have given pore space to the surface owners, and
  - Allow for 50% unitization
- No case law discussing pore space ownership

Pennsylvania

- Undecided as to pore space ownership
- Pennsylvania Senator Gene Yaw plans to introduce the Pennsylvania Geologic Storage of Carbon Dioxide Act
  - Proposed legislation would give pore space to surface owners
  - Proposed legislation would create a 60% unitization requirement
- No cases specifically pertaining to pore space; cases limited to gas storage issues

South Dakota

- Undecided as to pore space ownership
- SB63 (2020) did not pass
  - would have given pore space to the surface owners,
  - would prohibit severing surface ownership from pore space
  - would allow leasing of pore space
- No case law discussing pore space ownership

States With Indirect Case Law

Alaska

- Undecided as to pore space ownership
- No legislation granting pore space ownership
- Case law regarding pore space is built around statutory interpretation
  - *City of Kenai v. CINGSA,* 373 P.3d 473 (Alaska 2016) (where the court interprets the term “minerals” used in the Alaska Land Act to include “pore space” and hold that “subsurface pore space and attendant storage rights were reserved to the state”)

Louisiana

- Case law indicates that in Louisiana, pore space belongs to the surface owner
  - *S. Natural Gas Co. v. Sutton*, 406 So. 2d 669, 671 (La. Ct. App. 1981) (holding that pore space storage rights belong to the owner of the surface estate)
  - *Miss. River Transmission Corp v. Tabor*, 757 F.2d 662 (5th Cir. 1985) (holding that surface owners owns the right to subsurface storage)
- No legislation granting pore space ownership
- LA Rev Stat Section 30:1104.C(1) no reservoir capable of producing minerals in paying quantity may be used unless all owners agree

Michigan

- Case law indicates that the pore space belongs to the surface owner
  - *Department of Transportation v. Goike*, 560 N.W. 2d 365 (MichApp. 1996) (holding that once underground storage space has been cleared of minerals and gas being stored there by the mineral right holder awaiting extraction, the space then belongs to the surface estate owner)
- No legislation granting pore space ownership

New Mexico

- Undecided as to pore space ownership
- No legislation granting pore space ownership
- Case law is limited to the mineral estate holder's right to extract the mineral, and the bounds of an injection permit as to the movement of salt water between tracts
  - *Jones-Noland Drilling Co. v. Bixby*, 282 P. 382,383 (N.M. 1929) (holding that a mineral lessee only has the right to use the soil for mineral extraction purposes)
  - *Synder Ranches, Inc. v. Oil Conservation Comm'n of State of N.M.*, 798 P.2d 587,590 (holding that a license to inject salt water into a disposal well does not authorize trespass, or other tortious conduct, by a licensee)

Ohio

- Undecided as to pore space ownership
- No legislation granting pore space ownership
- No case law discussing pore space ownership
- Case law is limited to analysis of deeds
  - *Chartiers Oil Co. v. Curtiss,* 24 Ohio C.D. 106 (1911) (finding that right of storage should not exceed what "may be incidental to the immediate production and marketing of oil")
  - *Moore v. Indian Camp Coal Co*., 80 N.E. 6, 8 (Ohio 1907) ("the mine owner has the right to use how he may choose, but without injury to the owner of the soil, the space left by the extraction of the mineral, so long as it remains a mine")

Texas

- Undecided as to pore space ownership
- No legislation granting pore space ownership
- 2009: Subtitle D, Title 3, Chapter 120.002: stored CO2 is the property of the storage operator
- Case law is limited to mineral ownership
  - *Lightning Oil v. Anadarko E&P Onshore*, 530 S.W.3d 39 (Tex. 2017) (holding that although "the surface owner owns and controls the mass of earth undergirding the surface, those rights do not necessarily mean it is entitled to make physical intrusions into formations where minerals are located and remove some of the minerals")

States Without Guidance

Alabama

- Ala. Admin. Code r. 335-6-8-.27(6) states that a Class VI Well Permit does not grant any property rights or privileges
  - There is no language that clarifies pore space ownership or unitization

Arizona

- Ariz. Admin. Code § 18-9-J656 sets "criteria and standards for underground injection control programs to regulate any Class VI carbon dioxide geologic sequestration injection wells"

- There is no language that clarifies pore space ownership or unitization

Colorado

- Undecided as to pore space ownership
- No legislation granting to pore space ownership
- No case law discussing pore space ownership
- An interagency taskforce has been created to focus on issues related to carbon capture and storage

Idaho

- In 2002,created a Carbon Sequestration Advisory Committee. I.C. §§ 22-5201 et seq. Also created a Carbon Sequestration Assessment Fund I.C. § 22-5206.

- No language addressing pore space ownership or unitization

Oklahoma

- Okla. Stat. tit. 27A, § 3-5-101, also known as the Oklahoma Carbon Capture and Geologic Sequestration Act does not address ownership of pore space or unitization

Nevada

- Nevada is part of the West Coast Regional Carbon Sequestration Partnership (WESTCARB) led by the California Energy Commission
  - This organization's mission is to "validate the feasibility, safety, and efficacy of carbon storage"
- There is no legislation, enacted or proposed, that explores pore space ownership or unitization

Initial Observations

- Support for surface ownership of pore space
- Little value from court cases thus far
- Need for additional state legislation
- Additional collaboration among states/H2 Hub
- Address credit for CO2 capture
- Address ownership of stored CO2
- Others

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Q&A Session

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