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PENNSYLVANIA DEPARTMENT OF AGRICULTURE  AGRICULTURAL BUSINESS DEVELOPMENT CENTER

*Understanding Agricultural Law Webinar Series*

# ***Understanding Agricultural Law***

## **Webinar Series**

*Understanding the Basics of*

# **Understanding the Basics of Pennsylvania's Carbon Sequestration Law**

**January 24, 2025**





# ***Understanding Agricultural Law***

## **A Legal Educational Series for General Practice Attorneys and Business Advisors Representing Agricultural and Rural Clients**

This webinar series is specifically tailored to create subject matter literacy and competence on fundamental issues of agricultural law for attorneys, advisors, and service providers to agricultural producers and agri-businesses.



# ***Understanding Agricultural Law Series:***

## **Past Topics:**

- Agricultural Labor Laws
- Leasing Farmland for Energy Development
- Local Land Use Regulation of Agriculture
- Statutory Protections for Ag Operations
- Agricultural Cooperatives
- Livestock Market Regulation
- Crop Insurance
- Federal & State Conservation Programs
- Licensing & Regulation of Direct Agricultural Product Sales
- Agricultural Finance
- PA's "Clean & Green" Tax Assessment Program
- Animal Confinement Laws
- Conservation Easements
- Landowner Immunity Statutes
- The Farm Credit System
- Milk Pricing
- Pesticides
- Seed Laws
- Fair Labor Standards Act (FLSA)
- Perishable Agricultural Commodities Act (PACA)
- Food Labeling
- Organic Production
- Buyer Default Protections for Producers
- PA's Agricultural Area Security Law

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## ***Understanding Agricultural Law Series***

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Feb. 28, 2025—**Pesticide Drift**

Mar. 24, 2025—**Clean Water Act & Ag: Impaired Waters & TMDL Process**

Apr. 25, 2025—**PA Ag Exemptions for Inheritance Tax and Real Estate Transfers**

### **Quarterly Dairy Legal Webinar Series:**

Feb. 18, 2025—4th Quarter of 2024: HPAI in Dairy Cattle: Regulatory Measures Thus Far

April 15, 2025—1st Quarter of 2025: Bovine Disease Controls: Federal and PA Laws & Regulations



# Housekeeping

- This webinar is being recorded.
- Please use the Q&A feature for questions.
- Please fill out surveys.
- CLE credits:
  - Link to CLE form will be posted in the chat
  - Please fill out form ASAP
  - Listen for code word, enter code word in the form



# *Understanding the Basics of* **Pennsylvania's Carbon Capture and Sequestration Act**

- This webinar will provide an overview of the **Capture Carbon and Storage (CCS) technology** and the **federal regulations governing CCS projects**, including EPA UIC Class VI regulations and federal financial incentives and research program.
- We will also discuss **Pennsylvania's potential for carbon capture and storage** and the law's major provisions, including the **ownership and transfer of pore space, permitting and operating procedures**, and **potential liabilities** associated with carbon dioxide storage.



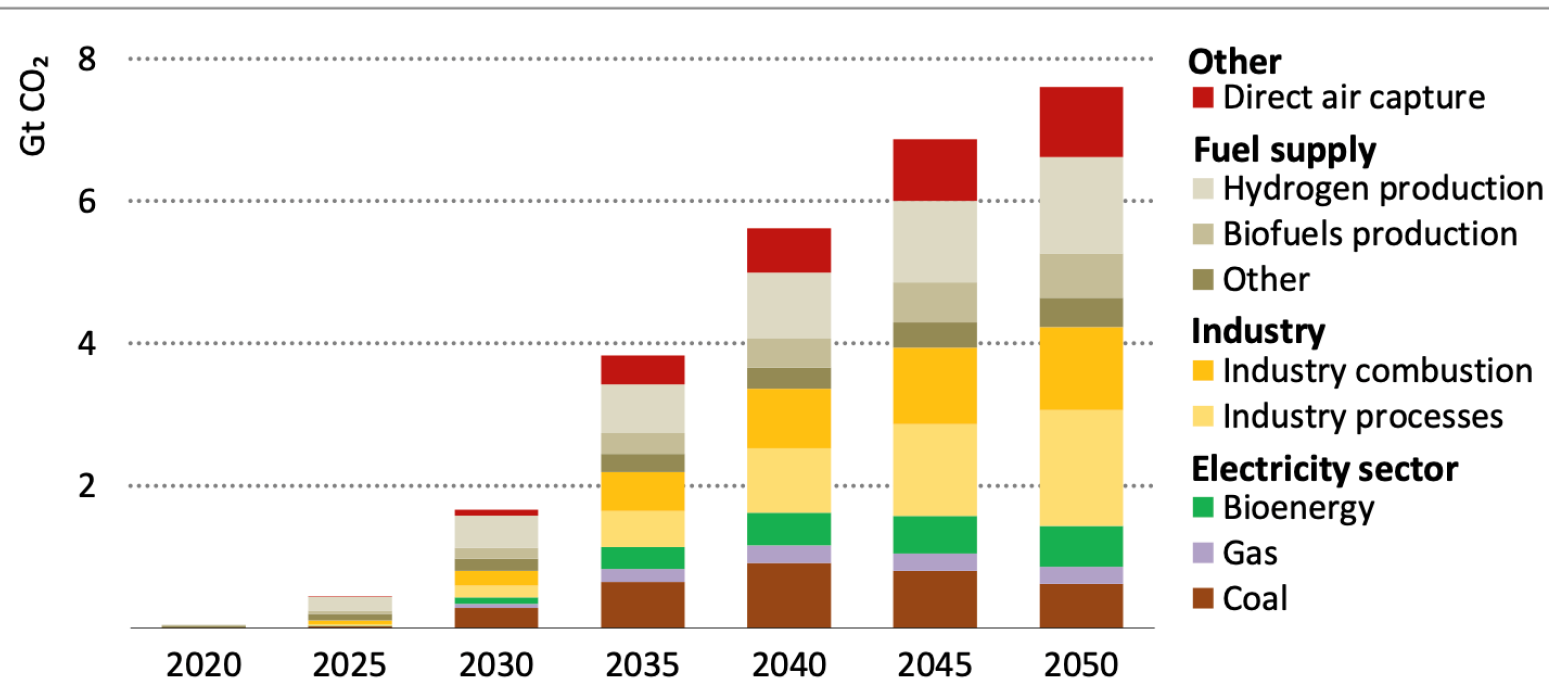
# Carbon Capture and Storage (CCS): A Path to Net Zero by 2050

- “Carbon capture, utilisation and storage (CCUS) ... are **critical to achieve net zero emissions**; rapid progress is needed by 2030. The history of CCUS has largely been one of underperformance. Although the recent surge of announced projects for CCUS and hydrogen is encouraging, the majority have yet to reach final investment decision and **need further policy support** to boost demand and facilitate new enabling infrastructure.”
- “If all announced CO<sub>2</sub> capture capacity is realised and the current growth trend continues, **global capacity could reach NZE levels by 2030**. Reducing project lead times, particularly related to the development of CO<sub>2</sub> storage, will be critical to achieve those levels.”
- *Source: International Energy Agency, [Net Zero Roadmap: A Global Pathway to Keep the 1.5°C Goal in Reach](#) (2023 update)*



# Carbon Capture and Storage (CCS): A Path to Net Zero by 2050

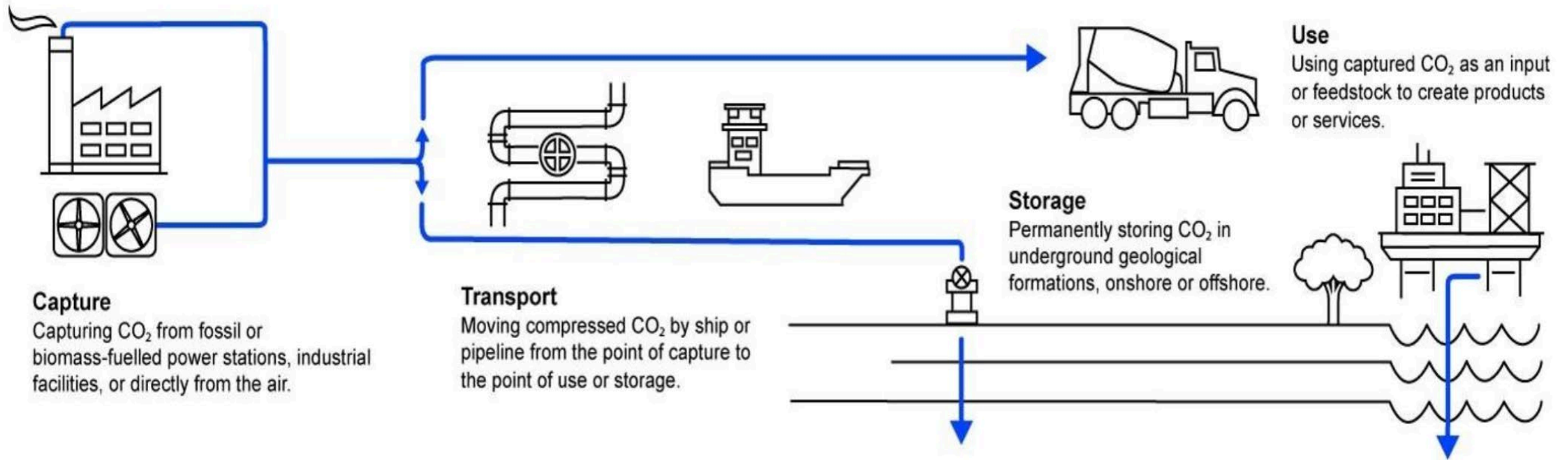
**Figure 2.21** ▶ Global CO<sub>2</sub> capture by source in the NZE







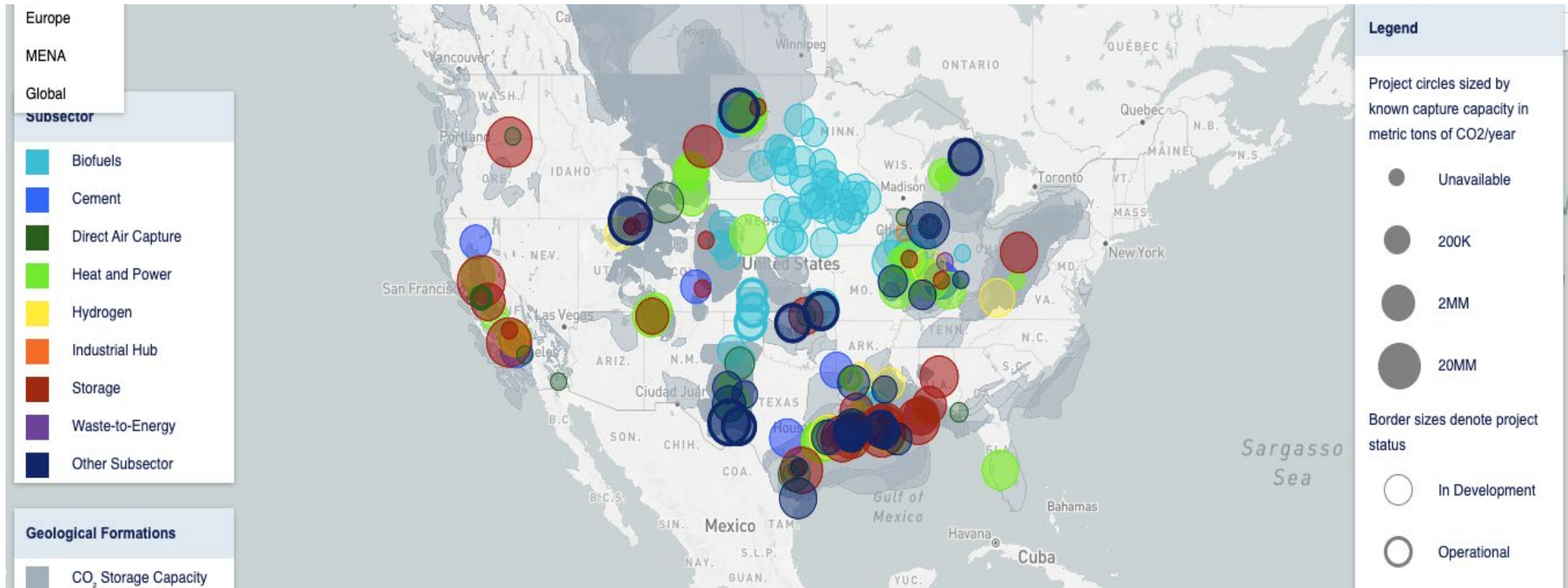
# Carbon Capture and Storage (CCS) Technology



Functioning of the CO<sub>2</sub> value chains  
© IEA, 2024



# CCS Activity Across the United States





# EPA UIC Class VI Regulations

- **Safe Drinking Water Act (SDWA)** – the U.S. Environmental Protection Agency (EPA) regulates the underground injection of CO<sub>2</sub> for storage under the **Underground Injection Control (UIC) Program**. Class VI wells are specifically designed for **CO<sub>2</sub> geological sequestration**.
  - A Class VI permit is required to ensure safe and effective storage; see [U.S. EPA, Class VI – Wells used for Geologic Sequestration of Carbon Dioxide](#)
  - States have the option to seek **primacy** for the UIC Class VI program, giving them authority to regulate CO<sub>2</sub> injection wells within their jurisdiction under EPA standards.
- Key elements of Class VI Well regulations
  - Site selection and permitting
  - Well design and construction
  - Operational requirements
  - Monitoring, reporting, and verification
  - Post-injection site care
  - Risk management



# Financial Incentives and Programs

- **The 45Q tax credit for carbon sequestration; [26 U.S.C. 45Q](#)**
  - Updated in 2022 under the [2022 Inflation Reduction Act \(IRA\)](#)
  - Eligible facilities—**industrial, power and direct air capture facilities**
    - Facilities must meet specific **annual carbon capture thresholds**:
      - Industrial & power facilities: **12,500** metric tons of CO<sub>2</sub> per year
      - Electricity-generating facilities: **18,750** metric tons per year with at least 75% capture efficiency
      - Direct air capture facilities: **1000** metric tons of CO<sub>2</sub> per year
    - Must meet **prevailing wage and apprenticeship standards**
  - **Credit per ton** for CO<sub>2</sub> geologic storage in geologic formations
    - Industrial & power facilities: **\$85** per metric ton in saline formations
    - Direct air capture facilities: **\$180** per metric ton in saline formations
  - Projects starting **before January 1, 2033**, can claim the credit for **12 years** after operations begin.



# Financial Incentives and Programs

- [Title 17 Innovative Energy Loan Guarantee Program](#)
  - Projects must be **located in the U.S.**
  - Must be **energy-related** (13 statutory defined technologies, including carbon capture and sequestration technologies)
  - Must deploy a **new or significantly improved technology**
  - Must show the **ability to repay** loan principal and interest
  - Must include a **plan for community engagement**, addressing economic, social, environmental, and equity considerations
- Title 17 loan **cannot exceed 80%** of the estimated eligible project costs
- Projects **cannot benefit from prohibited forms of federal support** (excluding certain tax credits, such as the 45Q tax credit)



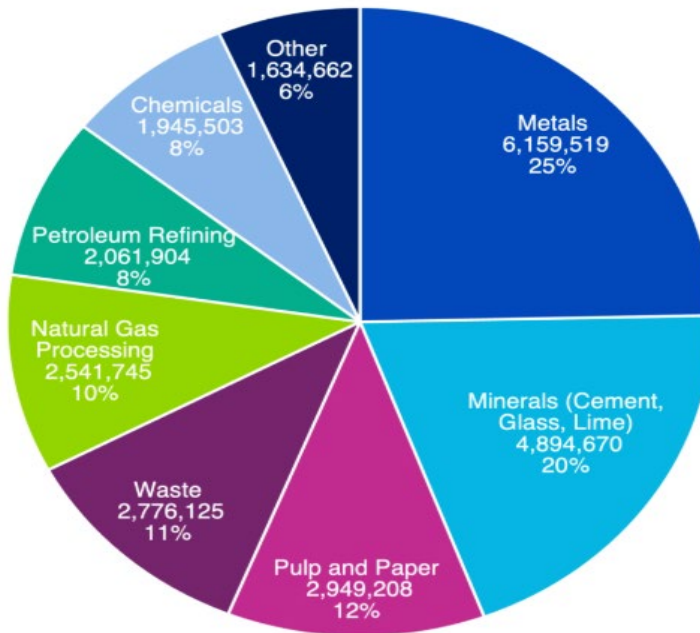
# Financial Support for Research Activities

- The [2021 Bipartisan Infrastructure Law](#) allocated \$8.5 billion to support CCS activities, including building new CCS facilities.
- The U.S. Department of Energy’s (DOE) Office of Clean Energy Demonstrations (OCED) selects and funds CCS projects through two main research programs.
  - [Carbon Capture Demonstration Projects Program](#)—supports projects transitioning to full-scale commercial CO2 capture and storage.
  - [Carbon Capture Large-Scale Pilots](#)—funds early-stage projects testing large-scale carbon capture technologies.
- Recent funding initiatives:
  - February 2023: [announced](#) \$1.7 billion funding for six CCS demonstration projects; \$820 million for up to ten CCS pilot projects.
  - December 2024: [announced](#) up to \$1.3 billion funding for 10 CCS projects.



# CCS Opportunities in Pennsylvania

Figure 1: Pennsylvania's 2022 Industrial Emissions (Excluding Electricity Generation)



*CATF Analysis of EPA GHGRP data*



# CCS Opportunities in Pennsylvania

- The Pennsylvania Geological Survey estimates Pennsylvania’s deep saline aquifer CO2 storage capacity around 2.4 billion metric tons; the U.S. Department of Energy estimate Pennsylvania’s saline storage potential at 17.34 billion metric tons, “enough capacity to sequester the equivalent of all of PA’s direct CO2 emissions in 2022 – or approximately 100 million metric tons of CO2 every year for the next 170 years.”
- The best formations for CO2 storage (saline aquifers) in Pennsylvania are the Lockport and Knox formations, with a combined theoretical capacity of 510 to 1,640 million metric tons.
- Other potential storage options in Pennsylvania include depleted oil and gas fields, and possibly the Marcellus and Utica shale formations.
- *Source: [Understanding carbon capture and storage prospects in Pennsylvania](#), Clean Air Task Force (April 2024); [A New Look at Carbon Capture and Storage Opportunities in Pennsylvania](#), a report prepared for the Clean Air Task Force (April 2024)*





# CCS Opportunities in Pennsylvania

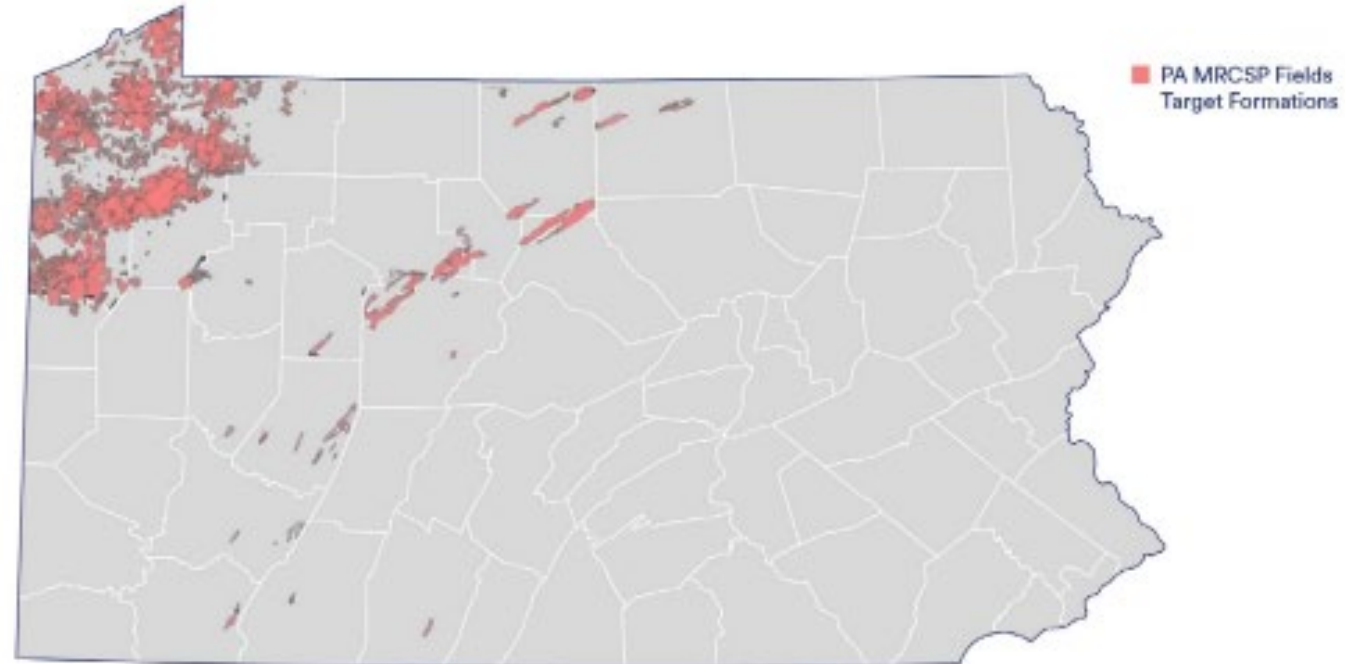
Table 2: Summary of Potential Theoretical CO2 Storage Capacity in Saline Aquifers in Pennsylvania<sup>7</sup>

Target Information	Depth Range (feet)	Assumed Porosity (%)	Assumed CO <sub>2</sub> Density (pounds per cubic foot)	Assumed Storage Efficiency (%)	Total Storage Capacity (thousand metric tons)	Storage Capacity in Areas Above 2.0 metric tons per square mile (thousand metric tons)	Percent of Capacity in Areas Above 2.0 metric tons per square mile
Onondaga	1,000 - 6,500	8.3	calc from depth map	7.4	5,471	0	0.0%
				24	8,474	1,641	19.4%
Oriskany	0 - 7,000	7.8	calc from depth map	7.4	2,398	0	0.0%
				24	10,100	57	0.6%
Bass Islands	See Note	13.2	33.67	7.4	4,376	0	0.0%
				24	10,947	0	0.0%
Lockport	See Note	4.7	45.46	7.4	112,507	112,021	99.6%
				24	337,522	337,522	100.0%
Medina	2,000 - 10,000	6.9	calc from depth map	7.4	15,847	0	0.0%
				24	48,685	23,848	49.0%
Knox	5,000 - 15,000	10.8	calc from depth map	7.4	401,400	401,400	100.0%
				24	1,304,267	1,304,267	100.0%
				7.4	541,999	513,421	94.7%
				24	1,719,995	1,667,335	96.9%



# CCS Opportunities in Pennsylvania

**Figure 3: Oil Fields in Pennsylvania**





# Pennsylvania Act 87 of 2024

- Senate Bill 831, introduced by state Senator Gene Yaw in June 2023, was signed into law by Governor Josh Shapiro in July 2024, becoming the [Pennsylvania Carbon Capture and Sequestration Act](#) (Act 87 of 2024).

*“... It is in the public interest to promote the geologic storage of carbon dioxide ...*

*The capture and geological storage of carbon dioxide will benefit this Commonwealth and the global environment by reducing greenhouse gas emissions and will help to ensure the viability of the energy and power industries of this Commonwealth, to the economic benefit of Pennsylvania and its residents.”*

Key opportunities:

- Access to billions in federal carbon capture funds
- Potential for clean hydrogen hub development



# Clean Hydrogen Hubs

- Funded by the U.S. DOE OCED Regional Clean Hydrogen Hubs Program
  - [Appalachian Hydrogen Hub \(ARCH2\)](#)
    - \$30 million federal funding for Phase 1; part of a \$925 million federal cost share (West Virginia, Ohio, Pennsylvania)
    - [Project Factsheet](#)
  - [Mid-Atlantic Hydrogen Hub \(MACH2\)](#)
    - \$18.8 million federal funding for Phase 1; part of a \$750 million federal cost share (Delaware, New Jersey, Pennsylvania)
    - [Project Factsheet](#)



# Pore Space Ownership

- **What is pore space?**
  - Pore space refers to the empty cavities in underground rock layers that can be used for storing substances, such as CO<sub>2</sub>.
- **Who owns pore space?**
  - **Surface property owners** own the pore space beneath the land, even if mineral rights are separated.
- **Transfer of rights**
  - When surface land is sold, pore space rights are included unless previously separated.
  - Transfers must clearly describe the location and layers of pore space
  - If there is a conflict, **mineral rights take precedence over pore space rights.**
- **Public land considerations**
  - For pore space under public land, the government must provide notice, hold public hearings, and consider public input before making decisions.



# Shared Pore Space Ownership, Forced Pooling

- **Shared ownership**
  - CCS project developers need **agreements from 60%-75% of pore space owners** to proceed
  - A collective storage order can be requested from the Environmental Hearing Board if full agreement is not reached
  - **Good-faith** efforts to contact all owners are required
- **Forced pooling & compensation**
  - Non-consenting owners can be included in the agreement by the Secretary of the Environmental Hearing Board
  - **Fair market value compensation** is guaranteed for their pore space
- **Surface access**
  - A collective storage order **does not grant automatic rights** to use surface land
- **Restrictions on collective storage orders for certain types of land:** government-owned land, land under conservation or preservation easements, charitable land, and open space-designated land.



# Seismic Exploration

- **Seismic survey**
  - CCS project developers must conduct seismic surveys around proposed storage sites as part of obtaining a UIC Class VI permit
- **Seismic monitoring requirements**
  - CCS developers must install seismic monitoring systems near storage sites
  - If monitoring detects seismic activity above acceptable levels, developers must notify the Secretary of Environmental Protection
  - If a risk analysis shows permanent seismic monitoring is unnecessary, the Secretary may approve reliance on national or state systems for long-term monitoring instead.



# Permitting

- **UIC Class VI permit requirements**
  - CCS project developers must secure a UIC Class VI permit and comply with all state and federal regulations
- **Environmental Quality Board regulations**
  - Establishes criteria to ensure projects protect natural resources, public health, and safety
  - Requires assessments of community impact, especially for environmental justice areas.
- **The PA Department of Environmental Protection’s (DEP) Role in Permitting**
  - *“The Department may condition or deny a permit based on the criteria specified in the regulations”*—the law suggests that DEP could apply for primacy to manage UIC Class VI permits in Pennsylvania. Currently, the EPA handles these permits directly.
  - DEP is authorized to charge fees to support oversight and enforcement
- **Protection of mineral resources**
  - Projects must not interfere with extracting valuable minerals





# Ownership of Injected Material

- CCS project developers retain ownership of the injected CO<sub>2</sub> and other substances
- Developers bear all rights, benefits, responsibilities, and liabilities for the stored material
- **Pore space owner protections**
  - Pore space owners are **not liable** for the effects of CO<sub>2</sub> injection or other substances simply because of their ownership.



# Liability

- **Damage claim**
  - The claimant must prove that CO2 injection or migration caused harm to a person, animal, or property due to the project developer's **negligence**.
- **Legal action and compensation**
  - Property owners or lessees harmed by CO2 injection or migration can take legal action
  - They may seek compensation, including:
    - General and special damages
    - Punitive damages
    - Attorney fees
    - Injunctive relief



# The Carbon Dioxide Storage Facility Fund

- **Fund structure**
  - CDSFF established within the State Treasury to support carbon sequestration projects.
  - Includes a restricted account for long-term monitoring and management post-closure.
- **Fund purpose**
  - Cover costs for processing permit applications, regulating facilities during construction, operation, and preclosure, determining necessary storage capacity.
  - Long-term facility management after project completion (via the restricted account)
- **Developer fees**
  - CCS project developers must pay a **fee per ton of CO<sub>2</sub> injected for storage**
  - Fee set by the Environmental Quality Board, reflecting anticipated regulation and monitoring costs
  - **Fee distribution: 50% to the CDSFF and 50% to the restricted account.**
  - Penalties for violations and funds from financial responsibility mechanisms also contribute to the CDSFF.



# Certification of Project Completion

- Certificate issued **10 to 50 years** after the last CO2 injection.
- **Transfer of ownership**
  - Upon certification, the company **gives up ownership** of the stored CO2 and injection equipment to the Commonwealth.
  - **No compensation** to the company for this transfer.
- **Commonwealth's responsibility**
  - Assumes **liability and responsibility** for the stored CO2.
  - Responsible for **long-term monitoring and management** of the stored CO2 until a federal oversight system is in place.
- **Exceptions to responsibility**
  - Commonwealth **not liable** if:
    - Company violated rules/regulations during the project (and the legal timeframe for action has not expired).
    - CO2 leakage threatens drinking water due to the company's actions.
    - Funds for post-closure issues are insufficient.



# CCS Laws in Selected States

- **2024 Key State Actions (new or expanded CCS laws)**
  - **Alabama:** signed [House Bill 327](#) (May 2, 2024)
  - **Alaska:** signed [House Bill 50](#) (October 9, 2024)
  - **Colorado:** expanded CCS framework with [House Bill 24-1346](#) (May 21, 2024)
  - **Illinois:** passed [Senate Bill 1289](#) (July 18, 2024)
- **Regional Overview (Mid-Atlantic states)**
  - **Delaware:** no dedicated CCS legislation
  - **New Jersey:** no CCS-specific legislation
  - **New York:** supports CCS for industrial applications
  - **Maryland:** includes CCS in climate action plan
  - **Virginia:** promotes CCS research and development
  - **West Virginia:** passed CO2 sequestration bill (2009).
    - On January 17, 2025, the state [received](#) EPA approval to manage Class VI well permits.

Check out the CCUS State Legislative Tracker by Arnold & Porter.



### Status of state, territory, and tribal primacy and program revision applications



	<b>Phase I:</b> Pre-Application Activities	<b>Phase II:</b> Completeness Review and Determination	<b>Phase III:</b> Application Evaluation and Proposed Rulemaking	<b>Phase IV:</b> Final Rulemaking and Codification
<b>Primacy Applications</b>	AK-Class VI	AZ-Classes I-V		
<b>Program Revision Applications</b>	OK-Class VI MS-Classes III, V, and VI WV-Classes I-V PR-Classes I-V TX-Class VI UT-Class VI AL-Class VI CO-Class VI			WV-Class VI



***Thank you for joining us!***

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