TEAM PENNSYLVANIA

PA Energy Horizons Cross-Sector Collaborative

Fact Sheet: Property Rights in Pore Space

Overview

Carbon capture, utilization and storage (CCUS) is the process of capturing carbon dioxide (CO_2) emissions, which can then be transported to other facilities for use or safely injected into pore space – the empty space contained within deep geological formations. That storage reservoir becomes permanent when the pore space rock is sealed to prevent the upward migration or "leakage" of CO_2 to the atmosphere.

CCUS is identified as a critical component to achieve the goal of emissions reduction globally and is anticipated to be a particularly relevant approach for sectors of the economy where few other clean technology pathways exist. The geology of Pennsylvania's subsurface makes the state a potentially strong candidate for various CCUS applications, but legal issues around the pore space and property rights will need to be addressed for the economic and environmental benefits of CCUS to positively impact Pennsylvania.

Background

Pore Space in Pennsylvania

Pennsylvania's pore space has been the target of industry operations for the better part of two centuries. Oil and gas have been extracted from our sedimentary rocks since 1859; natural gas has been temporarily stored in subsurface formations throughout western Pennsylvania since the late 1930s; and wastewater has been permanently disposed of in subsurface rocks since the 1960s. These resource extraction and storage activities have provided a large majority of the information we now use to evaluate Pennsylvania's subsurface rocks for CO_2 storage potential.

There are two types of carbon storage systems that may be targeted for the permanent storage of CO_2: Depleting or depleted oil and/or gas reservoirs (within the first one to two miles of the subsurface), and deeper, more laterally extensive saline formations (at depths of 5,000 feet or more). Pennsylvania's collective potential CO_2 storage capacity of these reservoirs is estimated to be 2.2 billion metric tonnes. However, potential storage resources must be proven locally, at the site level, to refine expectations for the scale, safety, and operating conditions for CO_2 storage projects.

Policy Considerations

Key policy questions stem primarily from the issue of property ownership and the rules (or lack thereof) to guide how to deal with the practical elements of CO_2 injection when there are multiple, competing uses of land and mineral resources.

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Pore Space Ownership

Most U.S. states adhere to the legal principle that ownership of the surface estate includes ownership of the mineral estate, or everything else below the surface property. This is known as the "American Rule," which states that the surface owner also owns the underground pore space below the surface area. The American Rule is also recommended by the Interstate Oil and Gas Compact Commission and is followed by California, Louisiana, Michigan, Montana, New Mexico, New York, Oklahoma, Texas, and West Virginia. While it is likely that the American Rule would prevail in Pennsylvania, the rights to pore space have not been specifically defined, and the state's history of natural resource extraction has led to occasional conflict among actors seeking use of overlapping mineral estates.

Mineral-Pore Space Conflicts

In situations where the owner of an underground mineral estate is a different entity than the owner of the underground pore space, conflicts can arise between these competing interests. Further, when two or more owners have separate rights to minerals and/or pore space the law is not clear. Without clarification, it could be difficult to resolve the following situations:

- Could an oil or gas company inject CO2 into the pore space as a "reasonable use" of the mineral estate, without compensating the surface-level owner?
- Could a surface-level owner using or leasing the pore space for carbon storage block any interference by mineral owners?

Landowner Consent for Pore Space Access

The multitude of small landowners across Pennsylvania and the comparatively expansive area in which underground CO2 storage could occur means that rights of access to pore space will likely require the consent of more than one surface landowner. While federal eminent domain authority is used by owners/operators of underground natural gas storage, the implications of eminent domain are unclear in the context of underground CO2 storage.

States also have different interpretations on whether federal eminent domain authority allows the acquisition of private land for carbon storage or transportation. The concept of compulsory or forced pooling is increasingly being sought by states to provide clarity on the amount of landowner consent that is required before pore space access is granted. Using this approach, if a sufficient majority of landowners consent to pore space use, the remaining landowners can be forced to grant pore space access in exchange for compensation.

In Pennsylvania, no statutory guidance exists to address the issue of landowner consent.

Resources

- Global CCS Institute, Pore Space Rights – U.S. Overview, May 2022

The work products and areas of focus are the result of collaboration, and while they reflect the broadest possible set of views they do not imply a full endorsement by every participant of the Pennsylvania Energy Horizons Cross-Sector Collaborative.