FutureGen

Sequestration and FutureGen in Illinois

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Questions Regarding FutureGen and Geological Sequestration

- Where will the CO$_2$ go and how do we know it will stay there?
- Who is responsible for making sure it stays there?
- If it comes to the surface, what will it do?
- If it does leak, how will we know that and who will fix it?
- We have a number of abandoned industrial plants in the area already, so after this gasification plant shuts down, who takes care of the CO$_2$?
- How far will the CO$_2$ spread and where does the salt water go?
- What happens if there is an earthquake?
Illinois Basin Geological Focus

Illinois Basin Emissions: >276 mmt CO$_2$/yr
Mattoon and Tuscola FutureGen Sites

- Predominantly farm land
- Some familiarity with industrial facilities and coal mining or quarrying
- Knowledge of hydraulics related to equipment
Sequestration at Mattoon and Tuscola
Mt. Simon Sandstone Reservoir

- Mt. Simon Sandstone is used for natural gas storage in Champaign County, IL at 4,000 to 4,200 ft.
- Mt. Simon core has been recovered from a few deep exploration wells, such as this sample from near Salem, IL at 8,467 ft drilled in 1966.
CO$_2$ Storage in Sandstone Reservoir Pore Space

Pore space

Pin head

Sand grain
Shale Caprock (Reservoir Seal)

No pore space visible
General CO\textsubscript{2} Injection: Caprock/Seal Integrity

Shale Seal

Sandstone Reservoir

State of Illinois
**FutureGen**

**Poster Development**

- Versatile poster set
  - Technical meetings
  - Public events
  - School events

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**State of Illinois**

**Carbon Sequestration in the Illinois Basin**

**Energy from Coal in the Illinois Basin**

**Carbon Capture and Sequestration: Bridging the Gap**

**Common Greenhouse Gases**

- Carbon dioxide (CO₂)
- Nitrous oxide (N₂O)
- Methane (CH₄)

**Global Warming**

- Increased greenhouse gases
- Warmer temperatures
- More frequent extreme weather events

**Carbon Sequestration**

- Geologic sequestration
- Oceans
- terrestrial uptake
Sequestration Model

- Demonstrates
  - Illinois Basin stratigraphy
  - Sequestration in deep saline reservoir
  - Enhanced oil recovery
- Discussion Opportunities
  - Enhanced coal bed methane
  - Sedimentary rocks
  - Porosity, permeability
  - Global warming, greenhouse gases

State of Illinois
Illinois Basin geology contains multiple seals for carbon dioxide (CO$_2$) above the Mt. Simon Sandstone. Monitoring other sandstones above the Mt. Simon Sandstone can provide warning of any problems.