

MRCSP: Partnering with Industry for Large and Small Scale CCS Projects

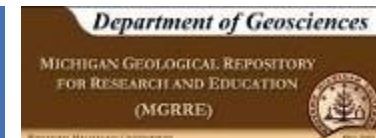
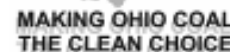
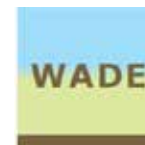


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U.S. Department of Energy NETL
Carbon Storage R&D Project Review Meeting
Pittsburgh, Aug. 20-22, 2013

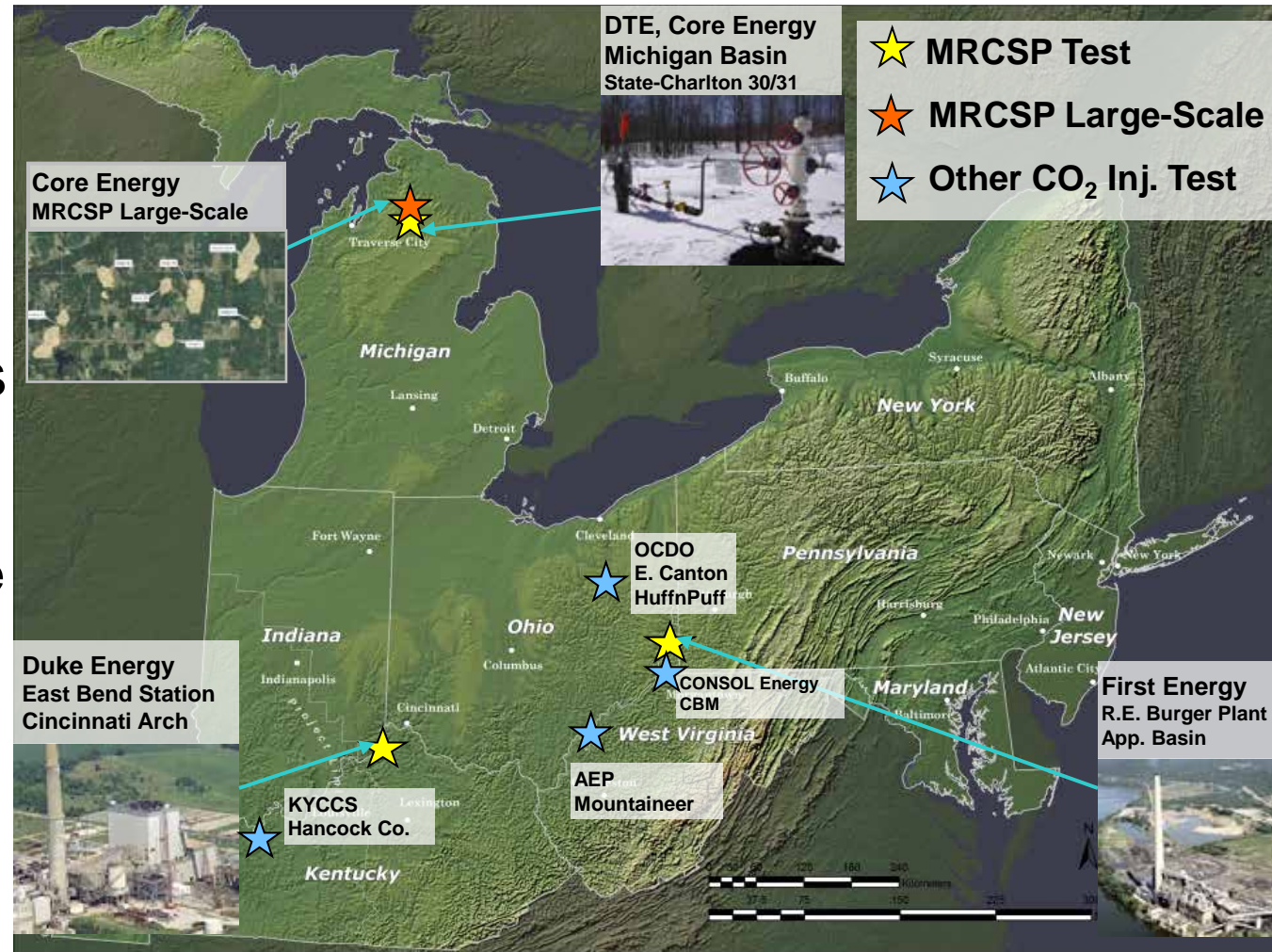


MRCSP Membership - Progress through Collaboration



Public-Private Partnerships play a key role in successful field tests

- Collaborations needed for technology advancement
- Past experience and research tells us
 - Our region has enormous storage potential
 - CCUS can be done safely and effectively



Region home to many field tests

State Geological Surveys are important partners for CCS deployment



Ø **Refine the mapping (GIS)** for sources and sinks



Ø **Help translate the results** of field testing into actionable strategies for the stakeholders in our region.



Ø **Identify promising reservoirs** for geological storage including off shore areas along the east coast.



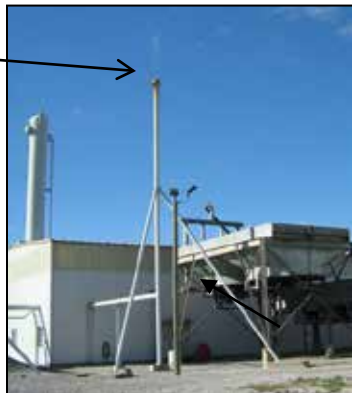
Ø **Identify opportunities** for potential piggy-backing operations (logging, coring, and/or seismic) to collect geological data that would otherwise be lost





Industry provide infrastructure needed to support CO₂ injection

Gas processing plant, source of pure CO₂



600 T/d Compressor



5000 Foot Deep Test Well Drilled in November 2006



180 feet of core taken

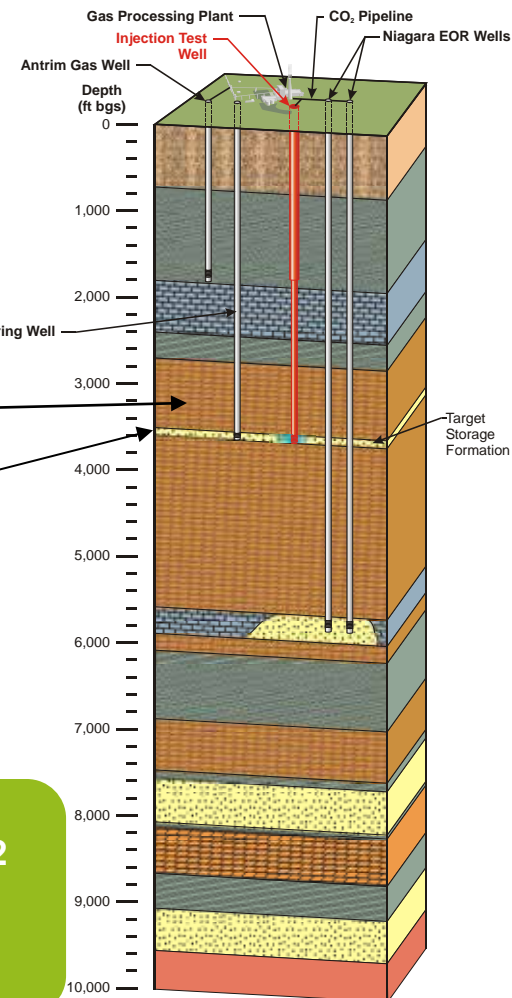


Injection well head

60,000 t CO₂ injected at Michigan

Confining Layer:
Amherstburg Limestone

Injection Target:
Bass Islands Dolomite 3,500 ft Saline Formation



Industry relationships with the community can help execute projects



Open houses, facility tours, and briefings needed to successfully permit seismic surveys, well installation and CO₂ injection

Information sharing improves understanding of CCS in the Region

FirstEnergy

Battelle



Ohio

Development
Services Agency

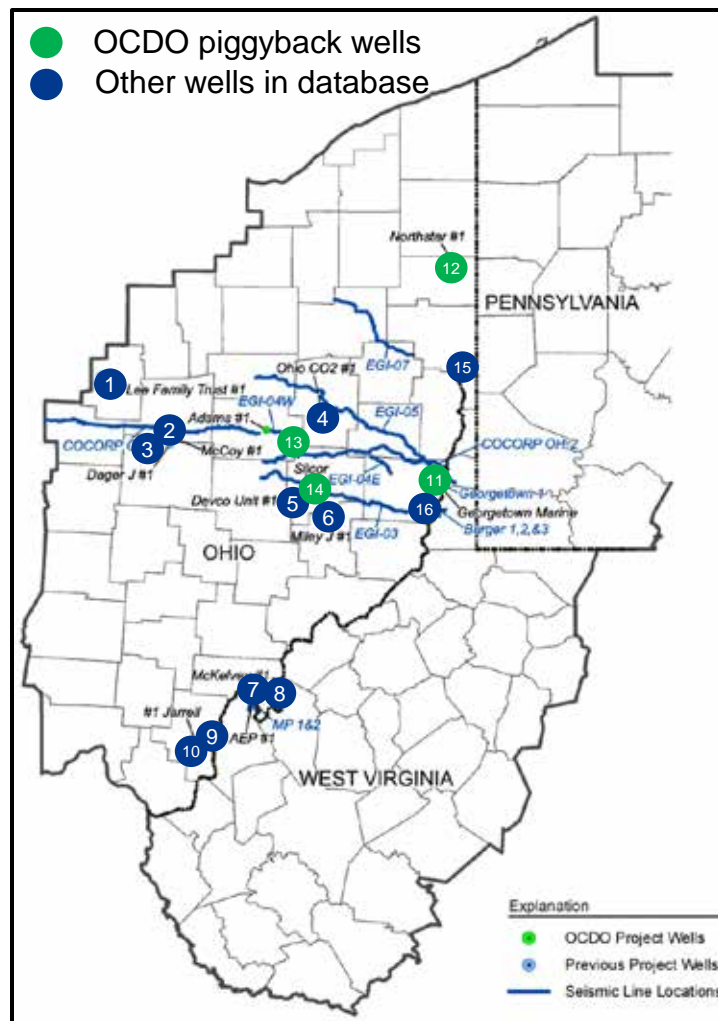
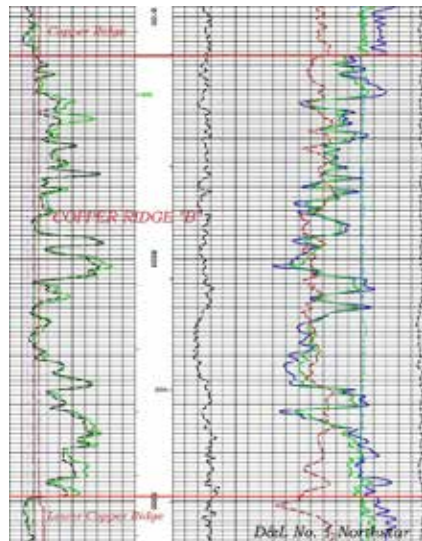
Schlumberger



**Appalachian Basin
Test provided a
deep well point in a
complex area**

***CO₂ Supply System evaluation team included EPRI
Additional Contributions by Numerous Other MRCSP Members***

Piggybacking on drilling and seismic survey activities provide geologic data for modeling



3D/3C seismic data

- Core Energy (MI)

Advanced Wireline Logs

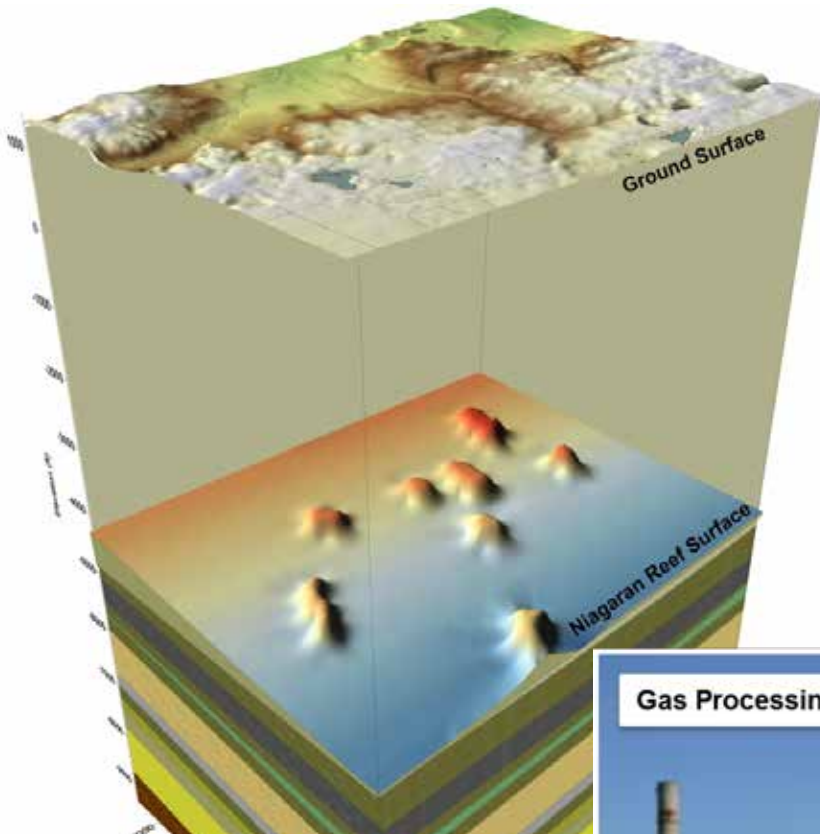
- Cutter Well (OH)
- Tuscarawas (OCDO)
- Cargas Well (MI)
- Duke Well (IN)

Seismic Line Purchase

- Eastern Ohio
- Northern Michigan

State Agencies like OCDO also crucial for MRCSP success

Oil and Gas Infrastructure critical for enabling CCS R&D for Phase III



- Core Energy has 7 CO₂-EOR fields in varying life stages
- Considerable in-kind cost sharing through existing wells, geological characterization efforts and other infrastructure

CORE ENERGY, LLC



O&M at 1,000 t/day
has begun.
More than 200,000
tCO₂ injected.

CCS is also about job creation

Over 10 years MRCSP has drilled several multimillion \$ wells, hired dozens of vendors, and collaborated with universities, state agencies, and others.

