

# **Meeting 1 Summary**

**Carbon Management Infrastructure Resolution Subgroup**

**MGA Renewable Electricity, Advanced Coal & CCS Advisory Group**

**June 19-20, 2008**

**Hall of States  
Washington, DC**

# Introductions and Attendance

- Brad Crabtree of the Great Plains Institute welcomed participants and observers, thanked them for coming, and asked them to introduced themselves.

- Participants and observers present were:

*Rex Buchanan, Tom Godbold, Kristy Monk, Darlene Radcliffe, Peter Taglia, Harvey Thorleifson, Brian Warner, Cathy Woollums, Jeff Bielicki, Rob Finley, Sherry Tucker, and William Weber*

- Staff present were:

*Steve Caldwell (Pew), Brad Crabtree (GPI), Bill Dougherty (CCS), Mike Gregerson (GPI), Wick Havens (CCS), and Jennifer Johnson (GPI)*

# Background and Agenda

- Brad, Mike Gregerson and Jennifer Johnson of GPI reviewed the meeting agenda and materials.
- Brad also gave a brief overview presentation of the MGA energy and climate accords and their implementation, including the regional CO2 Management Infrastructure Resolution that this subgroup is tasked to help implement.
- Staff proposed and the group agreed to follow the meeting agenda and structure discussion and identification of action items and next steps according to the five major resolution deliverables. The remainder of this meeting summary follows that sequence.

# Deliverable 1: Regional Analysis of CO2 Enhanced Oil Recovery and Potential Energy Supply and Climate Benefits

- Staff described potential options for approach in completing the study:
  - Work with ARI to organize data and Feb 2008 reservoir screening analysis according to MGA footprint
  - Use MGA scale data and analysis from ARI as starting point to explore additional what-if assumptions, such as:
    - Higher base market price of oil
    - Commercial incorporation of new EOR practices (e.g. residual oil zone recovery now proceeding in Permian Basin)
  - GHG Accounting Issues
    - Examine and evaluate ARI analysis of average CO2 footprint of EOR oil relative to imported oil (ARI claims a 70 percent net CO2 reduction)
    - Consider analysis of CO2 with CO2 captured from ethanol for EOR.
    - Evaluate GHG impact of various deployment scenarios noted above
  - Evaluate EOR production and GHG implications of various per ton payments for net CO2 storage through EOR CCS

# Deliverable 1: Discussion of Approach

- Wide range of CO<sub>2</sub> used to recover oil. Current incentive is to get as much back out of the ground because companies pay for the CO<sub>2</sub>. If they are paid to keep it down in the field, the orientation will change to more of a focus on CO<sub>2</sub> storage rather than reuse.
- Need to incorporate analysis of the potential barriers to implementation—they are institutional, human resources, financial and regulatory (unitization issues and area of review). Very structure of the Midwest oil and gas industry is a barrier because the vast majority of players are small and poorly capitalized operations.
  - Also some older Midwest fields with that were plugged years ago that may not be appropriate for CO<sub>2</sub> EOR.
  - We also should not underestimate the fact that some fields just won't work and that we don't always know that in advance.
- GPI to take final analysis and draft narrative report
- Review of draft report by Advisory Group subcommittee
- Final report recommended to Governors steering committee

# Deliverable 1 Discussion

- GHG reduction benefits of EOR itself often overlooked in public debate. Need to consider who are the credible messengers.
- ARI study: Base case oil price is \$70 oil and \$45/ton for CO<sub>2</sub> delivered at pressure to the field
  - Analysis generally seems to hold
  - 80 percent CO<sub>2</sub> benefit is the estimate for a particular field
  - Data are partially proprietary and is therefore not totally transparent
  - Aggregated report that cannot be disaggregated to the state level
  - It would be good to have a more detailed analysis

# Deliverable 1: Next Steps

- **Agreed next steps:**
  - Rex, Tom, Bill (or someone from Denbury), Peter to review ARI paper and methodology
    - Staff to email paper to participants.
  - Conference call in July to discuss strengths and weaknesses and determine further analysis necessary to do policy analysis and development of report
- **Recommendation to GHG Advisory Group:**  
Ensure that cap-and-trade design efforts incorporate a GHG accounting system that specifically includes accounting of the net CO<sub>2</sub> impact of CCS and CO<sub>2</sub> EOR.

# Proposed Timeline: Deliverable 1

- Complete work with ARI on basic data (Summer 08)
- Develop additional EOR scenarios and GHG implications (Fall 08)
- Draft report to Governors Steering Committee (Winter 08)

# Deliverable #2: Expanding geologic assessment

- General thrust of MGA recommendation is correct, but this group needs to specify how it ought to be implemented
  - Regional geological characterization is an appropriate role for USGS
    - Enhanced effort at assessment in those jurisdictions and regions that lack obvious and well-known sedimentary basins (MN, WI, and most of IA)
  - Also need programs that explicitly recognize the lead role of the states
- DOE partnership funding in better shape
- December 07 federal energy bill
  - Authorization: national capacity assessment of \$30 million (?) remains unfunded
    - Division of resources and how much states will receive is unclear
    - An appropriations recommendation needs to incorporate improvements to the authorization and how resources are spent in terms of a state role
- **Next step:** review Energy and Water Approps mark-up (Sen. Dorgan's subcommittee). USGS under Senator Feinstein's Interior, Environment and Related Agencies (Dorgan also on the committee). Also, Kohl, Johnson, Ben Nelson. Lamar Alexander.
  - Brad and Bill to look into details.

# Deliverable 3: Jurisdictional Regulatory Inventory

- Jennifer Johnson of GPI described her work to date in this area and presented a draft template to be used in soliciting jurisdiction information needed to conduct the inventory.
- Participants and observers then shared their suggestions as to whom from jurisdiction would be the best individual to receive the request and ensure its completion:
  - Kansas: Susan Duffy, Executive Director, KS Corporation Commission
  - Michigan: Harold Fitch, Office of Geological Survey
  - Minnesota: Marty Vadis, Dept of Natural Resource, Division of Lands and Minerals
  - Illinois: Joe Angleton, Dept of Natural Resources' Office of Mines and Minerals
  - Indiana: John Clark, Office of Energy and Defense
  - Ohio: Mark Shanahan, Director, OAQDA
  - Iowa: Roya Stanley, Office of Energy Independence
  - Cathy Woolums to check on who in Wyoming might be willing to respond.  
(the group did not have suggestions for every jurisdiction)
- The group suggested a deadline for jurisdictional responses of August 15<sup>th</sup>.

# Suggested Changes to Inventory

- The group provided the following suggestions to Jennifer for revisions to the inventory template:
  - Specify CO2 EOR and EGR under 4
  - Clarifications on 2b:
    - Ask about whether the jurisdiction has eminent domain authority for pipelines and, if so, to what types of pipelines does this authority apply
  - Changes for 8: Rename as “Property ownership”
    - Eliminate groundwater contamination
    - Groundwater rights is not necessary to include because all jurisdictions manage and regulate the resources similarly
    - Eliminate “geophysical”
    - New b: add pore space rights
  - Change for 9: Replace “liability” with “stewardship”
  - Change for 10: “Do you have a mandatory GHG reporting requirement?” is clearer than accounting linkages language.

# Deliverable 4: Regulatory Framework Discussion

- State's ability to promote economic development increasingly depends on its ability to provide industry with an infrastructure for CO<sub>2</sub> management.
- Regulatory framework for EOR is much clearer than for storage in other reservoirs such as deep saline.
- Even with the EOR side demonstrated and resolved, utilities still have regulatory and financial uncertainty relative to plant level capture of the CO<sub>2</sub>, especially when dealing with utility regulatory commissions.
- Duke pursuing a three step process: 1) FEED study regarding capture; 2) site characterization for deep saline storage feasibility; and 3) cost-benefit analysis of EOR as an option.
- Pipeline siting. Pipeline companies first look for established rights of way, but at some point, they need to acquire rights to additional land for new CO<sub>2</sub> pipelines. Thus, they are reluctant to work in states that lack eminent domain for pipelines. It provides leverage in negotiating with landowners, even if not used.

# Deliverable 4: Discussion (cont.)

- Substantial efforts underway at the federal level on interstate CO2 pipeline siting.
- Jennifer shared with the group follow-up to the Indianapolis meeting and the recommendation that gasification project developers be surveyed regarding what they see as the topmost policy priorities to commercialize projects:
  - John Thompson worked with Jennifer to get the interview process started last week
  - Steve Caldwell from the Pew Center will help Jennifer staff those calls and prepare a summary for the subgroup
  - Participant suggestion that Jim Childress of GTC be included among the interviewees

# Discussion of Response to US EPA Proposed UIC Rule

- Many organizations in the field plan to be involved in responding to the UIC rule.
- It is in OMB's hands right now. EPA has handed it off.
- Discussion of how to proceed with MGA:
  - Letter from governors and premiers needs to be higher-level policy letter
  - We can start right now because we know in general what the issues will be
- Next Step: Conference call after the week of the 4<sup>th</sup> to begin the effort
  - Jennifer to organize
  - Volunteers: Cathy, Pete, Bill, Tom

# Discussion of MGA Statutory/Regulatory Template or Toolkit for Jurisdictions

- Group discussed elements of a template or toolkit of agreed necessary components of a jurisdictional statutory and regulatory framework for CO<sub>2</sub> management to be developed through MGA and used as a menu and checklist for states and the province.

## Priority Elements of Template:

- Two components, geological and legal. They probably need to be separated.
- General regional consensus on those elements that the Interstate Oil and Gas Commission does address.
- IOGC did not address:
  - Eminent domain
  - Pore space storage rights
  - Liability

# Discussion of Statutory/Regulatory Template/Toolkit

- The group helped Jennifer specify the key components to be included in the template/toolkit and how they should be organized:
  - Legal Issues:
    - Eminent domain
      - Regulated entities
      - Non-regulated entities (higher political bar in extending this authority to non-regulated entities)
      - How existing rights of way apply or not to CO2 pipelines
    - Ownership issues
      - Surface ownership and mineral rights, including issue of pore space ownership
      - How trespass is dealt with
      - Definition/classification of CO2 as commodity vs waste
    - Liability
      - Project phases (WRI is developing an approach by phase. Participant comfort with WRI process and credibility.)
      - Long-term stewardship
    - IOGCC does a good job of covering other legal issues
  - Geologic Issues
    - Use IOGCC as model. Professional geology community sees the work as sufficient.

# Deliverable 4: Next Steps

- **Future action:** Identify key education and outreach efforts to legislators, regulators and other policymakers once the MGA statutory/regulatory template is further developed
- **Next Step:** Jennifer to prepare a draft template outline/work product based on subgroup discussion before July Advisory Group meeting
  - Review and revision by participants in July

# Deliverable 5: Pipelines

- Potential for pipeline connecting Midwest CO<sub>2</sub> supply to Gulf Coast geologic reservoirs for EOR purposes. CO<sub>2</sub> from Midwest to Gulf Coast addresses an immediate need for the first major power plants with CCS, but it could also help jumpstart EOR within the Midwest itself.
- Jeff Bielicki of Harvard University presented his pipeline network optimization model (SimCCS).

# Deliverable 5: Discussion of Pipeline Optimization Modeling

- Group discussed the need for securing access to pipeline ROW data. Not readily accessible due to national security considerations.
  - PUC/PSC Commissions and DOE Regional CO2 Sequestration partnerships are both potential jurisdictional sources for this data that could be accessed through the MGA process
- Discussion of CCS business model in the context of the pipeline optimization modeling
  - EOR CCS business model might have a different pipeline network optimization than deep saline
  - Potential to model sinks where EOR and deep saline reservoirs are stacked
  - Interested in incorporating commercial/business perspective into the model. Model allows for this, but access to the necessary data is critical

# Deliverable 5: Discussion of Pipeline Optimization Modeling

- Next Steps
  - Further define potential to model various network optimizations consistent with meeting MGA CCS commercialization and CO2 reduction targets
  - Establish an advisory committee to provide real world pipeline and ROW acquisition input into the modeling effort
    - E.g. State agency staff in the region are already in discussions with some pipeline companies
  - Collaboration with Jeff Bielicki and Clean Air Task Force on Midwest pipeline optimization scenarios
    - Potential for particular focus on Illinois Basin with inclusion of Ohio and Michigan taps and CO2 contributions
  - Action: Conference call next week with Jeff, Rob, Bill Hoback, and Mike Fowler with GPI staff and Steve Caldwell to discuss modeling effort