Houston CO₂ Workshop 2010 Recap

Michael E. Moore
Program Director-CO₂ Carbon Management Workshop

Blue Source-NACCSA-TXCCSA
Midland-Dec 9-2010
North Sea CCS: Comparative Approaches from the UK, Norway and the US

Welcome remarks by Her Majesty's Consul General Paul Lynch and Dr. Jostein Mykletun, Consul General of Norway

Track 1: CCS Regulations, Finance & Policy: Incentives and Opportunities
Chair: Dave Coleman, Business Development Leader, Carbon Capture & Storage Cleaner Energy, Americas - DNV

- UK CCS Policy Overview
  Liz Cane, First Secretary, Energy - British Embassy, Washington

- Norway CCS Policy Overview
  Mr. Kristoffer Stabrun, Adviser, Climate, Industry and Technology Department - Norwegian Ministry of Petroleum and Energy

- US Regulatory Landscape
  Tracy Hester, Professor at University of Houston Law Center, and Director of UHLC's Environment, Energy and Natural Resource Center

- The ‘One North Sea’ study
  Dr. Harsh Pershad, Energy Consultant - Element Energy, UK

Track 2: Commercializing Technology: Pathfinders for Innovation
Chair: Dr. Carl Hustad, President and CEO - CO₂-Global

- UK - Competition
  Jon Gibbins, Professor of Power Plant Engineering and Carbon Capture - University of Edinburgh

- Norway - Technology - CO₂, Storage in Hydrates with Methane Production – A Win-Win Situation
  Arne Graue, Professor - University of Bergen

- Norway - Capture
  Mrs. Liv Monica Stubholt, President & CEO, Aker Clean Carbon

- US - Nano Technology and CCS
  Andrew Barron, Professor of Materials Science - Rice University: Nano Capture Technology

- US DOE Large Scale CCS projects
EOR using Industrial CO₂ - Reservoir and Surface Monitoring, Reporting and Verification

Hosted by The Texas Carbon Capture Storage Association (TXCCSA) - Darrick Eugene, Texas Strategies Group
Sue Hovorka - TBEG MRV Program Chair Sponsorship/organizer SECARB-ED

MRV Overview of its Requirements and Needs
Sue Hovorka - TBEG - SECARB-ED and Bruce Hill – Clean Air Task Force - cost effective monitoring

GHG Reporting Subpart RR Overview
George Peridas - NRDC

Technical Aspects of MRV
Mahesh Gundappa - Blue Strategies

Methodologies Overview
Mike McCormick - PEW Center

Policy Panel Session - Lead: Darrick Eugene/TXCCSA
Insights and Comments on EPA Air and Water Regulations-Comment given and expectations what is ideal
George Peridas - NRDC; Tim O'Connor/Scott Anderson - EDF
Texas Carbon Capture Storage Association open Meeting

• Darrick Eugene, General Counsel and Texas Carbon Capture and Storage Association & Board Members + Guests
Main Workshop Day One

• Attendance figures
• Acknowledge sponsors including FlexSteel and BCCK water bottles, UK-Norwegian, Dinner at home of Norwegian Consul General Dr. Jostein Mykletun
• Acknowledge Denbury and Kinder for reception
• Acknowledge Hart
• 12:30-1:00 p.m. Keynote: Bryan Shaw, Chairman of the Texas Commission on Environmental Quality

• 1:00 - 1:30 p.m. CCS SWOT Analysis: What it will take to move forward (SWOT: Strength, Weaknesses, Opportunities, and Threats)
  Speaker: Chuck Fox, VP – Engineering/Operations - Kinder Morgan CO₂

• 1:30 - 1:50 p.m. CCS and Impacts of the EPA Regulations
  Speaker: Kipp Coddington, Partner - Mowrey Meezan Coddington Cloud LLP & General Counsel NACCSA

• 1:50 - 2:10 p.m. Texas Developments: 2010-2011 Expected Legislation and Regulatory Activity
  Speaker: Darrick Eugene Partner - Texas Strategy Group & General Counsel of Texas Carbon Capture and Storage Association

• 2:10 – 3:00 p.m. IOGCC and SSEB: The States’ Latest Perspectives & Developments
  Speakers: Mark Shilling Special Counsel to SSEB and for Ken and Mike

• 3:20 – 3:50 p.m. Latest Developments Saline Formations for CO₂ Storage
  Speaker: John Tombari, President CO₂ Carbon Services, Schlumberger

• 3:50 - 4:40 p.m. CO₂-EOR and Sequestration - What it is worth to the American Economy and Energy Security; Advances in the “ROZ”
  Speakers: Mike Godec, Senior Tec Adv, Advanced Resources Inc; Steve Melzer,

• 4:40 - 5:00 p.m. Overview of the DOE Funded Large Scale CCS Projects
  Speaker: Joseph Giove III, DOE Senior Program Manager

• 5:00 – 5:20 p.m. The Texas Clean Energy Project
  Speaker: Eric Redman, President - Summit Power Group

• 5:20 - 5:40 p.m. Tenaska Trail Blazer Project
  Speaker: Jeff James, Director of Business Development - Tenaska

• 5:40 - 6:00 p.m. The HECA Project
  Speaker: Matt Toner, Carbon Storage Manager - Hydrogen Energy California LLC

• 6:00 - 6:20 p.m. Engineering Approach to Successful Geologic CO₂ Storage in Oil and Gas Fields
  Speaker: Mark Holtz, Director Global Business Development, EOR - Praxair
Keynote: Bryan Shaw, Chairman of the Texas Commission on Environmental Quality

• Big Issue with EPA and TCEQ—EPA is moving ahead on with its GHG programs, but not recognized by Texas and Texas Supreme Court ruling does not allow TCEQ to recognize the addition of GHG component of CAA

• So Texas cannot comply with EPA and EPA cannot permit in Texas

• Due to EPA’s actions, utilities burning coal may become a thing of the past so why build a business around the need for their CO₂?
Chuck Fox-Kinder Morgan SWOT Analysis

Implement Large Scale CCS to reduce CO₂ Emissions

- Strengths
  - Opportunities

- Weaknesses

- Threats
CCS and Impacts of the EPA Regulations
Speaker: Kipp Coddington, Partner - Mowrey Meezan Coddington Cloud LLP & General Counsel NACCSA

- GHG Regulations are real and must be considered—will impact funding
- CCS as BACT while only issued as a guidance has the full impact of a regulation since all new permitting will require the permittee to show why CCS as BACT is not applicable..
- EOR due to potential economic uplift could trigger CCS as BACT
Texas Geologic Sequestration Developments
Speaker: Darrick Eugene Partner - Texas Strategy Group & General Counsel of Texas Carbon Capture and Storage Association

Texas Developments

- Guiding Principles in drafting Legislation
- RRC Phase I Storage w/ Incidental Production
  - Overview of RRC Rules
  - Do No Harm Provisions
  - Preserving Primacy Provisions
- RRC Phase II Production w/ Concurrent Storage
- TCEQ E.D. Letter Requirements
- SB 1387 Study “...at the end of the rainbow”
- 2011 Legislative Agenda
IOGCC and SSEB: The States’ Latest Perspectives & Developments
Speakers: Mark Shilling Special Counsel to SSEB

• Covered SSEB and SECARB
• State and Federal political landscape post midterm elections
• State CCS related legislation: *22 states enacted, 6 pending, 12 enacted/pending
Latest Developments Saline Formations for CO₂ Storage
Speaker: John Tombari, President CO₂ Carbon Services, Schlumberger

• What is different about saline storage?
• Site selection and design get optimized for CO₂ containment and verification as opposed to oil recovery and cost
  • more site selection choices
  • minimal number of wells desired
  • less complex fluids (saltwater)
  • pre-injection baseline data can simplify monitoring
  • the CO₂ stream purity may differ
  • upstream operational integration considerations are different
  • need time and $$$$$ for exploration
  • must consider basin scale impacts: geomechanics
  • must demonstrate large scale non structural trapping
  • public acceptance, regulatory & liability issues
CO₂-EOR and Sequestration - What it is worth to the American Economy and Energy Security; Advances in the “ROZ”

Speakers: Mike Godec, Senior Tec Adv, Advanced Resources Inc; Steve Melzer,

Melzer Consulting

- Miss “ROZ” coming out event!
- Results are now being reported from several pilots: its real—real big! Could add another +40 billion of recoverable with CO₂ – EOR as well as provide massive sequestration capacity.
- Brownfields and greenfields
- Game changer in the Permian and possibly in Wyoming
Overview of the DOE Funded Large Scale CCS Projects
Speaker: Joseph Giove III, DOE Senior Program Manager

• Gave a rundown and update on the current large scale CCS projects
• Many are underway, did not pick the winning technologies but rather picked a variety of projects that had a likelihood of succeeding.
• EOR in seven of ten projects
The Texas Clean Energy Project
Speaker: Eric Redman, President - Summit Power Group

1. Project will be built by Siemens, Fluor, and Linde as the equipment suppliers and construction contractors. The design engineering work is well underway.

2. Air permit will be granted by December 17 -- no one requested a hearing on it (cleanest permit in Texas history).

3. The project's long-term performance & availability to be guaranteed by Siemens.

4. The project has received a $450 million cash grant from DOE and a $313 million investment tax credit from the IRS.

5. Major lender banks have been selected, and several major investors are currently in discussions to become the majority or minority owners of the project.

6. Project is on schedule for completion of permits and contracts by mid-2011, financing in fall 2011, and start of construction right after financing.

7. Project will produce 200+ megawatts of power for sale, 500,000 tpy of urea (reducing imports by 10%), and 3 million tons per year of CO2 captured for EOR, which should increase Permian Basin oil production by 6 to 9 million barrels per year.

8. 1200-1500 construction jobs expected through 2014, more than 100 permanent jobs when project is completed.
Tenaska Trail Blazer Project
Speaker: Jeff James, Director of Business Development - Tenaska

- Clean energy: a cutting-edge power plant designed to capture 85-90% of its CO₂ (300 MMSCFD)
- Water conservation: will use highly water efficient dry cooling design
- Jobs and revenue: 1,500 jobs at peak of construction - 100+ for operation
  Construction will inject more than $742 million in economic activity in Nolan County
- Enhanced energy security:
  - CO₂ for EOR in the Permian Basin - 17,500 tons per day of CO₂
  - Secure power supplies for Texans: a 600 MW (net) pulverized coal-fueled electric generating station
    powering 600,000 homes
- Expect final Air Permit by end of this year – TCEQ draft agenda December 14, 2010
- Fluor CO₂ Capture Tech, Arch Coal 35% equity interest, Global CCS Institute grant
The HECA Project
Speaker: Matt Toner, Carbon Storage Manager - Hydrogen Energy California LLC

- Commercial demo of IGCC-90%+ CO₂ Capture ~2 million tons for EOR nearby at OXY’s Elk Hills Fields- hydrogen-rich syngas to generate 250+ MW net of low carbon base-load power- Commercial ops 2016
Engineering Approach to Successful Geologic CO₂ Storage in Oil and Gas Fields
Speaker: Mark Holtz, Director Global Business Development, EOR - Praxair

Relative Final Pore Saturation States

- Gas Reservoir Pressure Maint.
- Miscible Displacement WAG
- Immiscible Displacement
- Gas Assisted Gravity Drainage
Main Workshop Day Two
8:10 - 8:50 a.m. **UK and Norwegian Activities in CCS**  
Speakers: **Mr Espen Myhra**, Energy Counselor at Norway's Embassy in Washington, D.C and **Dr. Harsh Pershad**, Senior Consultant - Element Energy UK

8:50 - 9:50 a.m. **Roundtable on Developments in Geologic Sequestration**  
Moderator: **Judd Swift**, Principal - Swift Global Results LLC  
Panelists: **John Harju**, Associate Director - EERC; **Grant Bromhal**, Research Group Leader - Geosciences Division - DOE's National Energy Technology Laboratory; **Robert Finley**, Director - Advanced Energy Technology Initiative - University of Illinois

9:50 - 10:10 a.m. **Federal Indemnification Proposed Legislation and Highlights**  
Speaker: **Kipp Coddington**, Partner - Mowrey Meezan Coddington Cloud LLP and General Counsel – NACCSA

11:00 - 11:30 a.m. **Building CCS Project Capability through Knowledge Sharing**  
Speaker: **Crispin Walker**, CCS Projects Manager - Global CCS Institute

11:30 a.m. - 1:00 p.m. **Networking Luncheon** - Michael E. Moore, Introducing the keynote speaker

12:30 - 1:00 p.m. **2nd Day Keynote Address** - Tracy Evans, President/COO, Denbury Resources, Inc.

1:00 – 1:40 p.m. **The Future of EOR and Carbon Management**  
Panelists: **George Peridas** - NRDC; **Susan D. Hovorka**, Senior Research Scientist at the Texas Bureau of Economic Geology at UT and the principle investigator of the Gulf Coast Carbon Center

1:40 – 2:00 p.m. **CO₂ Compression**  
Speaker: **Jason J. Sowels**, Engineered Product Sales - American Warrior

2:00 – 2:20 p.m. **Trinity CO₂ and Recent Developments in the Permian Basin**  
Speaker: **Barry Petty**, CEO - Trinity CO₂

2:40 – 3:00 p.m. **CCS Developments**  
Speaker: **David Coleman**, Business Development Leader, Carbon Capture & Storage - DNV Energy North America

3:00 – 3:20 p.m. **Legal and Regulatory Overview for Global CCS Projects**  
Speaker: **Tom Russial**, US Carbon Sequestration Council

3:20 – 3:40 p.m. **North American CCS Methodologies Development**  
Speaker: **Mike McCormick**, PEW Center

3:40- 4:00 p.m. **Industrial CO₂ Sources for EOR/Sequestration**  
Speaker: **Ray Hattenbach**, VP Blue Strategies

4:20 - 4:40 p.m. **What’s Going on at the EPA with Carbon Management in Texas?**  
Speaker: **Patrick Kelly**, EPA Region 6 Dallas

4:40 – 5:00 p.m. **Latest Carbon Market Developments-WCI-RGGI-AB 32-MGGRA and CCS**  
Speaker: **David M. "Max" Williamson**, Counsel - Andrews Kurth LLP
**UK and Norwegian Activities in CCS**

Speakers: Mr Espen Myhra, Energy Counselor at Norway's Embassy in Washington, D.C and Dr. Harsh Pershad, Senior Consultant - Element Energy UK

- CCS not only energy solution for Nor CO₂-EOR useful but not emphasized
- Major analysis show north sea map, says public awareness/support for CO₂-EOR limited a lot of work to do here
- Lot of focus on moving continental and UK CO₂ to the North Sea give link to study

In the ‘Very High’ scenario, CCS in the North Sea region could deliver up to 8% of Europe’s CO₂ reduction requirement by 2030.
Roundtable on Developments in Geologic Sequestration
Moderator: Judd Swift, Principal - Swift Global Results LLC
Panelists: John Harju, Associate Director - EERC; Grant Bromhal, Research Group Leader-- Geosciences Division - DOE's National Energy Technology Laboratory; Robert Finley, Director - Advanced Energy Technology Initiative - University of Illinois

Key NRAP Focus for First Generation Risk Profile Development

- Receptors
  - Groundwater/Atmosphere
  - perform systematic realizations across ranges in key parameters
  - develop robust abstractions of responses as functions of key parameters
  - develop robust protocol for integrating between multiple simulations
  - evaluate assumption of negligible coupling between sub-systems
- Ground Motion
  - develop robust numerical models for simulating ground deformation as function of stress changes
  - perform systematic realizations across ranges in key parameters
  - develop robust abstractions of responses as functions of key parameters
  - develop robust protocol for integrating between multiple simulations

Release/Transport
- Wellbores
  - perform systematic realizations across ranges in key parameters
  - conduct robust analyses of effective wellbore permeabilities observed in various environments
  - develop time-varying permeability models
- Faults/Fractures
  - perform systematic realizations across ranges in key parameters
  - conduct robust analyses of effective permeabilities for various types of seals
  - develop time-varying permeability models
- Develop coupled geomechanics models to estimate change in permeability

Storage Reservoirs
- Pressure/ Saturation/ Stress
  - develop robust protocols for testing materials on multiple simulators
  - develop abstractions for pressure-saturation evolution for coupled flow-reaction-geomechanics

Early Phase III Project Timeline
Illinois Basin-Decatur Site: Major Elements Completed
- UIC permit application submitted: January 2008
- UIC permit hearing: October 08
- UIC permit finalized: January 27, 2009
- Injection well drilled: February 14-May 4, 2009
- Geophone well drilled: November 2009
- Injection well completed: November 2009
- 3D seismic survey completed: January 2010
- Compression equipment delivered: Mar-Apr 2010
- Monitoring well: drilled, cased: Sept.-Nov 2010

DVD Documentaries
Over 4000 DVDs distributed!
Federal Indemnification Proposed Legislation and Highlights

Speaker: Kipp Coddington, Partner - Mowrey Meezan Coddington Cloud LLP and General Counsel – NACCSA

Starting Assumptions

- CCS projects will not occur in the absence of a liability solution during the post-closure stewardship period
  - Site liabilities/responsibilities are infinite, time wise
  - Companies do not last forever
  - Will it help advance CCS to inform impacted citizens that Company X will be there for them in the year 2393 to process claims?
  - No existing mechanisms – no insurance
  - Not to be confused with financial assurance under UIC
EPA: Overview of the Finalized UIC Geologic Sequestration Regulations
Speaker: Mary Rose (Molly) Bayer, Geologist/GS Co-Team Leader for UIC Program, Office of Ground Water and Drinking Water, EPA

- Emphasized they did not impact Class II and to make sure CO₂ EOR under Class II was doable for sequestration to be able to encourage growth and use for CCS projects

Additional Information

- EPA Geologic Sequestration of Carbon Dioxide Website: http://water.epa.gov/type/groundwater/uic/wells_sequestration.cfm


Building CCS Project Capability through Knowledge Sharing

Speaker: Crispin Walker, CCS Projects Manager - Global CCS Institute

LSIPS BY STORAGE

INSTITUTE SUPPORTED PROJECTS

- Tenaska/Entergy Nelson 6 CCS Project
- Pioneer Project, TransAlta
- Tenaska Trailblazer Energy Center
- Rotterdam CCS Network Project, RCI
- Romanian CCS Demonstration Project, ISPE
- Callide Oxyfuel Project, OTPL*
- CarbonNet, Victorian Government

* Letter of Intent
Keynote Tracy Evans, President/COO, Denbury Resources, Inc. CO₂ EOR and CCS – An Optimist’s View

Sees 12-15 bcf of CO₂ injections in 10-15 yrs from current 3bcf
Discussed States programs, EPA UIC, GHG Reporting, Pores Space, Liability, Land Acquisition
The Future of EOR and Carbon Management
Panelists: George Peridas - NRDC; Susan D. Hovorka, Senior Research Scientist at the Texas Bureau of Economic Geology at UT and the principle investigator of the Gulf Coast Carbon Center

Regional results (lower 48)

NEMS model looks at technology costs and decisions by power region out to 2030.

- By 2030:
  - 69-108 GW of CCS plants deployed
  - 410-530 million tons of CO₂ captured per year
- CO₂-EOR included but not linked to CCS deployment. Geologic reservoir data not included.
- As early as 2026, however, enough CCS is deployed to meet the total CO₂ demand for EOR in the lower 48.
- EOR potential of 3-3.6 million barrels per day by 2030, 40% of current imports.
CO$_2$ Compression
Speaker: Jason J. Sowels, Engineered Product Sales - American Warrior

• **RECIPROCATING COMPRESSORS FOR CO$_2$ GAS COMPRESSION**
• 1. TYPES OF COMPRESSION SOLUTIONS
• 2. PROPER CO$_2$ COMPRESSION SIZING
• 3. MATERIALS AND CORROSION CONTROL
• 4. SYSTEM DESIGNS FOR SUCCESSFUL CO$_2$
• OPERATIONS
Trinity CO₂ and Recent Developments in the Permian Basin
Speaker: Barry Petty, CEO & President - Trinity CO₂ Investment Holdings LLC

Warning!
The law of unintended consequences is an adage or idiomatic warning that an intervention in a complex system always creates unanticipated and often undesirable outcomes
Case Histories
New Mexico Pit Rules / Cap and Trade Program
State NIMBY
It’s a sticky problem--lets solve it cooperatively!
Promoting Anthropogenic CO₂ for EOR is a public/business win-win
And . . . Let’s Mindfully think about Solutions
CCS Matters ......it’s all about the risk part
Speaker: David Coleman, Business Development Leader, Carbon Capture & Storage - DNV Energy North America

• What gets U.S. CCS where it needs to be by 2050
• -- A few “givens”
• S. C. C = Storing the Captured Carbon
• ..then rationalizing the entire process
• So...how can we solve who owns storage rights.......... 
• ...and then who is liable for all that stored CO₂.....
• .... paying the freight
• ...A bit about risks - Conclusions

• Governmental help with developing CCS industry is not like before. No inherent value for CO₂
• - 20-25 worldwide projects need FULL COST funding............
• - Industry cannot plan for CCS with NO clear picture of carbon price
• Power plants plan decades into the future for demand.......how will fossil based and
• renewable technologies co-exist ... esp. 2050 to 2100......
• BASIN WIDE storage issues need addressing........Takes drilling wells to actually
determine what can be stored where. At same time as we are proving up small (1MMt/yr)
projects..BASIN WIDE issues must be solved.
• Storage / Sequestration safety: What is enough.....what is too much.......too little.
• Who decides? Should CCS storage be nationalized? ..do we need 1000 years?
• Who is in Charge? Who Should be? Is there a coherent plan? Can we leave this to “THE MARKET”
North American **CCS Methodologies Development**
Speaker: Mike McCormick PEW Center

- The Scope of the methodology
- Focus on GHG emissions measurement, monitoring, and reporting for CCS projects
- Present policy neutral accounting methodologies
- Covering CO₂ capture, transport, and storage
- Applicable to multiple types of capture sites and saline aquifer and EOR storage sites
- CCS Workgroup: ~30 participants from industry, federal and state agency, NGOs

- Project developers: use to quantify and characterize the GHG reductions associated with a CCS project
- Federal and state agency: use to inform development of rules and procedures for CCS projects
- Investors interested in a common platform with which to evaluate GHG reduction claims from CCS projects
- Other stakeholders interested in ensuring the environmental integrity of CCS projects
PEW’s Partners

Business Environmental Leadership Council
## Industrial CO₂ Sources for EOR/Sequestration

**Speaker:** Ray Hattenbach VP Blue Strategies

### Summary

**Industrial Sources of CO₂**

<table>
<thead>
<tr>
<th>Source</th>
<th>Flue Gas % CO₂</th>
<th>CO₂ MMSCF/D</th>
<th>Capture Cost $/ton</th>
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<tbody>
<tr>
<td>Ammonia Plant</td>
<td>98⁺</td>
<td>0-37</td>
<td>~ $19*</td>
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<tr>
<td>Hydrogen Plant</td>
<td>95⁺</td>
<td>24</td>
<td>~ $19*</td>
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<tr>
<td>Ethylene Oxide</td>
<td>98⁺</td>
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<tr>
<td>Ethanol Plant</td>
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<td>Cement Plant</td>
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<td>56</td>
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<tr>
<td>Steel Mill</td>
<td>15-20</td>
<td>184</td>
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</tbody>
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* Cost of dehydration and compression
What’s Going on at the EPA with Carbon Management in Texas? Climate Change and CAA
Speaker: Patrick Kelly, EPA Region 6 Dallas

- **Step 1. (January 2, 2011 – June 30, 2011)**
  - Only sources currently subject to the PSD permitting program (i.e., those that are newly-constructed or modified in a way that significantly increases emissions of a pollutant other than GHGs) would be subject to permitting requirements for their GHG emissions under PSD.
  - For these projects, only GHG increases of 75,000 tpy or more of total GHG, on a CO2e basis, would need to determine the Best Available Control Technology (BACT) for their GHG emissions.
  - Similarly for the operating permit program, only sources currently subject to the program (i.e., newly constructed or existing major sources for a pollutant other than GHGs) would be subject to title V requirements for GHG.
  - During this time, no sources would be subject to Clean Air Act permitting requirements due solely to GHG emissions.

- **Step 2. (July 1, 2011 to June 30, 2013)**
  - Step 2 will build on Step 1. In this phase, PSD permitting requirements will cover for the first time new construction projects that emit GHG emissions of at least 100,000 tpy even if they do not exceed the permitting thresholds for any other pollutant.
  - Modifications at existing facilities that increase GHG emissions by at least 75,000 tpy will be subject to permitting requirements, even if they do not significantly increase emissions of any other pollutant.
  - In Step 2, operating permit requirements will, for the first time, apply to sources based on their GHG emissions even if they would not apply based on emissions of any other pollutant. Facilities that emit at least 100,000 tpy CO2e will be subject to title V permitting requirements.
  - EPA estimates that about 550 sources will need to obtain title V permits for the first time due to their GHG emissions. The majority of these newly permitted sources will likely be solid waste landfills and industrial manufacturers. There will be approximately 900 additional PSD permitting actions each year triggered by increases in GHG emissions from new and modified emission sources.
Latest Carbon Market Developments - WCI-RGGI-AB 32-MGGRA and CCS
Speaker: David M. "Max" Williamson, Counsel - Andrews Kurth LLP

State/Regional Climate Initiatives

California A.B. 32 (Global Warming Solutions Act)
- Mandatory 80% cuts; trading allowed but discretionary
- CARB / Cal-EPA rulemaking ongoing

Western Climate Initiative
- 9 western states and provinces; starts 1/1/12
- Offset papers, but participation lacking

Regional Greenhouse Gas Initiative (RGGI)
- Electric utilities in 10 Northeast states (Maine to Maryland)
- CO2 only; 233 power plants

Midwestern Greenhouse Gas Reduction Accord
- 6 states, 1 province
- Little progress

Linked thru North American Climate Initiative (NACI)?
Wow--The End!!

Michael E. Moore

- VP External Affairs and Business Development CCS
- Blue Source LLC

- Executive Director
- North American Carbon Capture Storage Association
- WWW.NACCSA.Org

- VP and Founding member Board of Directors
- Texas Carbon Capture Storage Association
- WWW.TXCCSA.Org

- mmoore@bluesource.com

- Tel: 281-668-8475

- www.bluesource.com