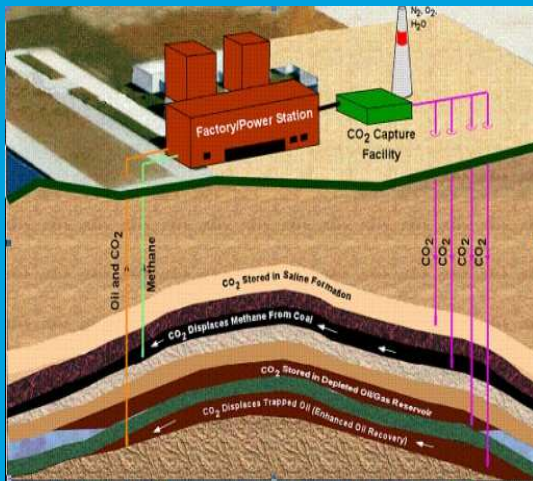


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Carbon Sequestration... Are the Risks Manageable?

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Carbon Sequestration Environmental Liabilities and Solutions

- Carbon Regulation and Policy
- Carbon Regulation Risks to Business
- Carbon Sequestration – What is it and what are the risks?
- Insurance Considerations for Carbon Sequestration



Carbon Regulation and Policy

- **Increased Regulatory Scrutiny – for purposes of this discussion – focus is on bolded legislation**
 - Massachusetts vs. EPA and greenhouse gas endangerment finding
 - Mandatory EPA reporting requirements on GHG generating facilities
 - **Waxman-Markey energy bill includes renewable requirements for utilities and provisions to reduce greenhouse gas emissions**
 - **Senate proposed CS bill which includes provisions for “liability assurance”**
 - **EPA Proposed Rules for Injection of CO2 under Safe Drinking Water Act**
 - **DOE Carbon Capture and Sequestration Program Amendments Act of 2009**
 - **Created partnerships with various states**

Carbon Regulation and Policy

- **Waxman-Markey Energy Bill**
 - Sets forth national strategy to address barriers to the commercial-scale deployment of carbon capture and sequestration
 - Establishes approach to certify and permit geologic sequestration
 - Promulgates regulations to minimize the risk of escape to the atmosphere of carbon dioxide injected for purposes of geological sequestration
 - Includes provision for Safe Climate Act including cap and reduce GHG emissions (17% by 2050)

- **Draft Senate Proposal (Casey) for Liability Transfer (concepts which may find their way into the Senate Energy Bill)**
 - Proposes requirement for “liability assurance” for projects:
 - Third Party Insurance
 - Financial mechanisms
 - Trusts
 - Bonds
 - Once active portion of project is complete, bill proposes mechanism to transfer long term liability to the state or federal government

Carbon Regulation and Policy

- Environmental Protection Agency (EPA) issued proposed rules for CO₂ geologic sequestration under the Safe Drinking Water Act. (currently in comment period)
- Primary driver for regulation is the potential for Geologic Sequestration to impact ground water through “gradual” means
 - Migration of CO₂ into aquifers
 - Impurities in the CO₂ causing introduction of contaminants into the formation
 - Displacement and migration of brines into fresh water aquifers
- Includes proposals for (among others) **financial responsibility requirements** to assure that funds will be available for:
 - Well plugging
 - Site care
 - Site closure
 - Emergency and remedial response

Carbon Regulation Risks to Business

- Increased scrutiny – both regulatory and public on GHG emissions – resulting in increase in lawsuits
- Risk of being out of compliance with permit requirements resulting in lawsuits and fines and penalties by regulators
- Clients involved in carbon capture and storage projects have increased financial and economic risks (which Tom will discuss)
- Carbon off-set project risks
- Reputation – e.g. Claims of “energy efficiency” vs. real effects on climate change



Carbon Regulation

Insurance Response to Carbon Regulation Risks to Business

- Operational Environmental Programs
- Programs for Carbon-offset projects (e.g. CPL insurance)
- De-risking and placing carbon credit delivery guarantees on carbon emission reduction projects
- Products addressing weather and/or commodity related events
- Products addressing Directors and Officers for liabilities related to climate change
- Various risk consulting activities including climate risk modeling, carbon pricing, carbon trading system strategies and design
-Among others



Carbon Sequestration

What is it and what are the risks?

- Injection of liquid (under pressure) CO₂ into the subsurface
- Risks include “traditional” operational risks
 - First party risks related to the loss of property
 - Third party risks in the event that your operation causes damage to others
 - Business interruption in the event of a property loss
- Risks also include “pollution risks”
 - Catastrophic loss of carbon from the subsurface
 - Ground water damage resulting from...
 - Release of metals or organic constituents from the rock formations due to “acidifying” in the presence of carbon
 - Release of carbon into shallower formations (i.e. well casing failures)
 - Release of contaminants which are impurities in the carbon
 - Displacement of salt water into freshwater aquifers as a result of injecting the carbon.

Carbon Sequestration

What is it and what are the risks?

- Remediation costs associated with ground water contamination....deep formations can be very costly to remediate
- Third party liabilities resulting from property damage or bodily injury caused by geologic sequestration “pollution event”
- Cost of plug and abandonment of the operation at close exceeds expectations
- Cost of liability associated with catastrophic loss of CO2
- Financial impact to business if CO2 credits are traded or banked
 - Replace first party credits
 - Reputational risk if not replaced
 - Inflation in carbon trading market results results in replacement costs higher than expected



Carbon Sequestration Insurance Considerations for Carbon Sequestration

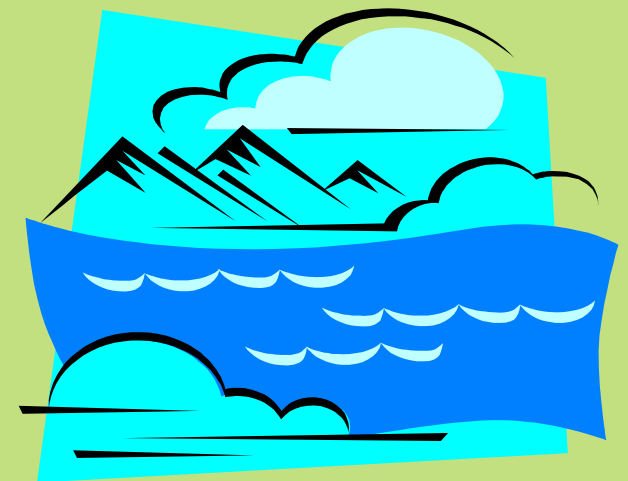
“Traditional Risks”

- Property Policies readily available (years of experience with similar operations)
- Casualty Program Considerations
 - Is a catastrophic loss sudden and accidental?
 - Maintain sudden and accidental coverage in casualty program
 - AEGIS typically used for Power/Energy/Utility clients, but will exclude “disposal” which AEGIS defines as applying to sequestration
 - Traditional Casualty programs will not cover gradual pollution events and will not provide first party clean up coverage.



Carbon Sequestration Insurance Considerations for Carbon Sequestration

- Pollution aspects of geologic sequestration are insurable
 - Traditional environmental insurance markets have forms which lend themselves to covering these gradual losses
 - Precedent for writing similar risks through insuring subsurface gas storage facilities
 - Market has responded and has underwritten pilot scale programs
 - Specialty form available which provides sudden and accidental, transportation, control of well, gradual pollution coverage and nominally financial assurance
- Limits of Liability?
 - Dependent on project (considerations)
 - Depth of sequestration
 - Presence of shallow aquifers
 - High consequence area?




Carbon Sequestration Insurance Considerations for Carbon Sequestration

Financial Assurance – Likely to be required (debate is time frame)

- Letters of Credit (LOCs)
 - Dependent on finances
 - May be difficult for smaller players to acquire
 - Impacts to cash flow
 - Collateral?
- Surety
 - Precedent for surety markets to accept risk in plug and abandonment of oil wells
 - Dependent on financials of client
 - Value of surety will be dependent on collateral and/or cost of LOC
- Insurance
 - Structured as a guaranteed fixed price contract with excess coverage for overrun
 - Forms are available (either specialty CO2 form or traditional environmental stop loss forms)
 - Debate regarding time frame of financial assurance affects ability of this to be used as an option
 - 50 Year time frame proposed by EPA is not insurable except in smaller time frames
 - 10 Year time frame in “Casey” Senate Bill is insurable





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