Geologic Sequestration Site Stewardship

Carbon Sequestration Working Group

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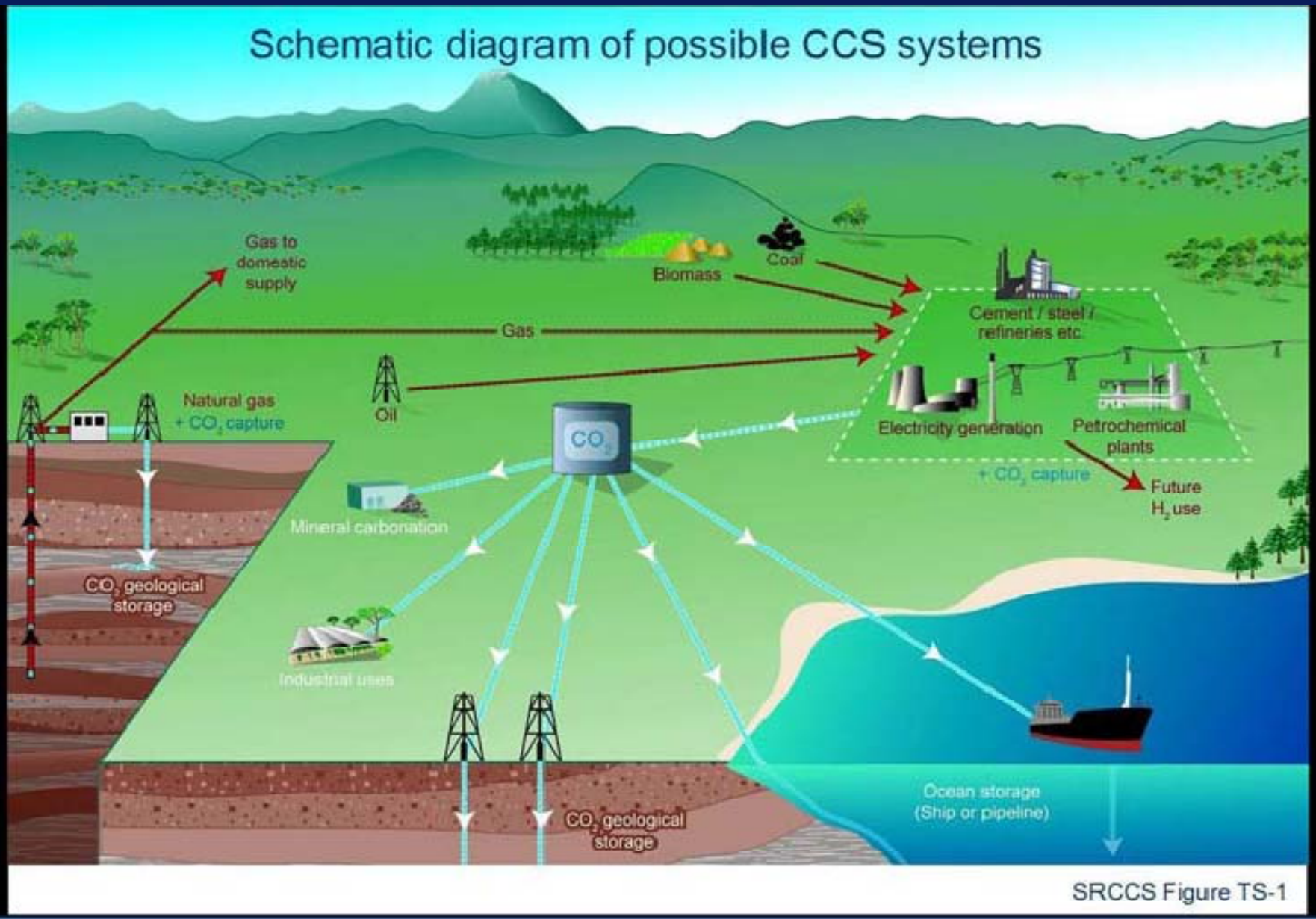
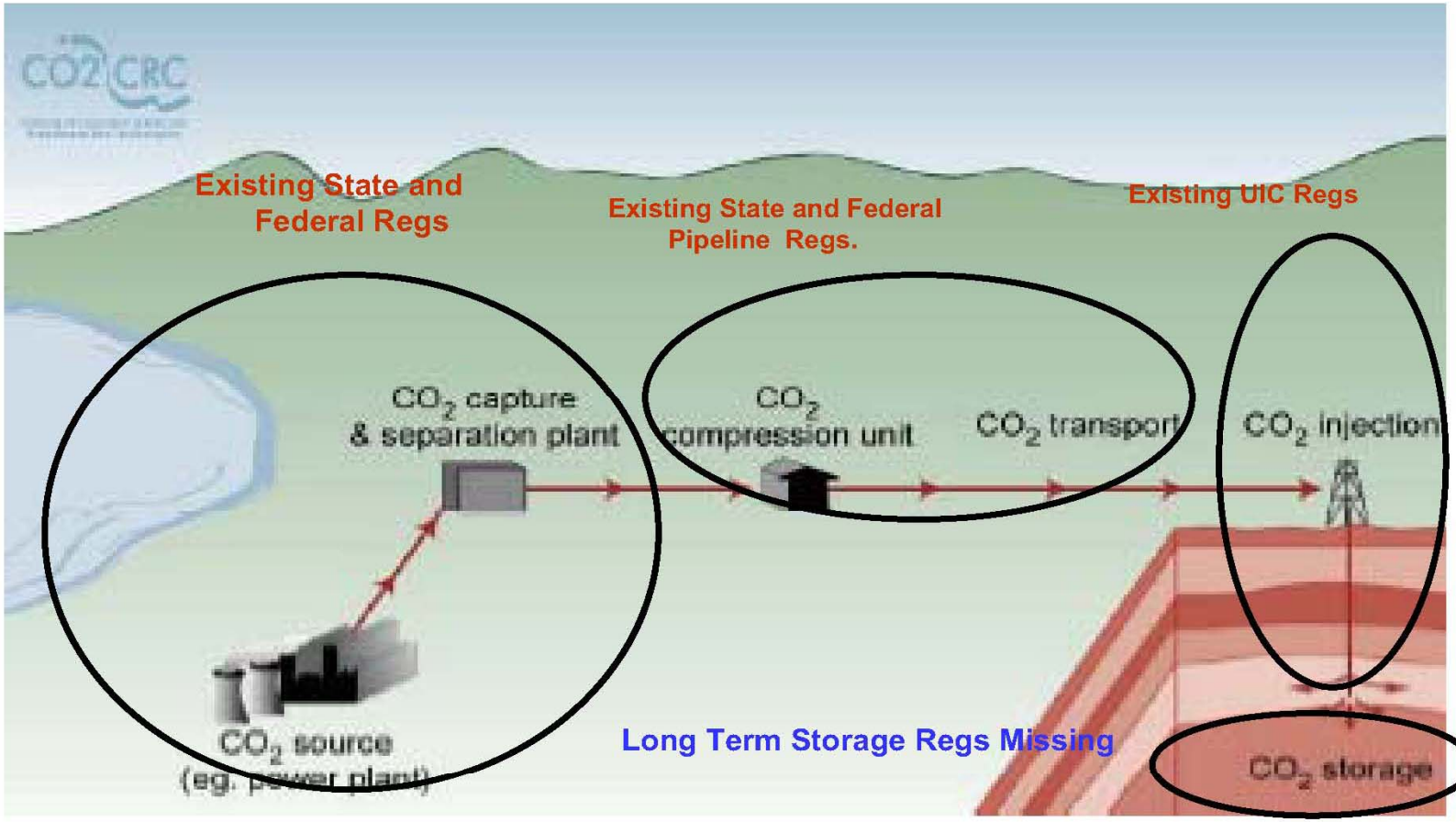
- The information presented here today is solely for educational purposes and is not intended to constitute advocacy, legal advice or conclusions of law. Except as otherwise noted, the views expressed are entirely my own and do not represent the views of Bryan Cave LLP or any of its clients. Nor am I presenting anything on behalf of any clients or organizations with which I am currently working. The sole intent is to provide information from various sources that may be helpful to the tasks before the Wyoming Carbon Sequestration Working Group.

Acknowledgements

In preparing this presentation, I have drawn very heavily on the EPA Office of Water document entitled "**Approaches to Geologic Sequestration Site Stewardship After Site Closure"** EPA 816-B-08-002 (July 2008), one of the supporting documents for EPA's proposed underground injection control (UIC) program rule for regulation of injection for the purpose geologic sequestration, published at 73 Federal Register 43491 (July 25, 2008). I have also borrowed slides from presentations made at the Seventh Annual Conference on Carbon Capture and Sequestration in Pittsburgh May 5-8,2008.


Schematic diagram of possible CCS systems
Gas to domestic supply
Biomass
Coal
Gas
Cement / steel / refineries etc
Natural gas + CO_2 capture
Oil
CO_2
Electricity generation
Petrochemical plants
+ CO_2 capture
Future H_2 use
Mineral carbonation
CO_2 geological storage
Industrial uses
Ocean storage (Ship or pipeline)
CO_2 geological storage
SRCCS Figure TS-1

CO2 CAPTURE TRANSPORTATION AND GEOLOGIC STORAGE PROCESS



EPA's Proposed Rule for Geologic Sequestration

- EPA lays out general requirements for financial responsibility, and plans to clarify in guidance the types of financial mechanisms that owners or operators can use to meet financial responsibility requirements for new GS wells.
- EPA says the financial responsibility requirements would include provisions requiring that owners and operators demonstrate and maintain financial responsibility during operation, closure, and the post-injection site care period.
- This ensures that owners and operators have the resources to carry out activities related to closing and remediating GS sites if needed during injection or after wells are plugged, so that they do not endanger USDWs.

EPA's Rule Preamble

EPA is proposing that the rule only specify a general duty to obtain financial responsibility acceptable to the Director, and will provide guidance to be developed at a later date that describes recommended types of financial mechanisms that owners or operators can use to meet this requirement.

73 Fed. Reg. at 43529 (July 25, 2008)

§ 146.85 Financial responsibility.

- (a) The owner or operator must demonstrate and maintain financial responsibility and resources for corrective action (that meets the requirements of § 146.84), injection well plugging (that meets the requirements of § 146.92), post-injection site care and site closure (that meets the requirements of § 146.93), and emergency and remedial response (that meets the requirements of
§ 146.94) in a manner prescribed by the Director until:
- (1) The Director receives and approves the completed post-injection site care and site closure plan; and
- (2) The Director determines that the site has reached the end of the post-injection site care period.

§ 146.85 Financial responsibility
(cont'd.)

- (b) The owner or operator must provide to the Director, at a frequency determined by the Director, written updates of adjustments to the cost estimate to account for any amendments to the area of review and corrective action plan (§ 146.84), the injection well plugging plan (§ 146.92), and the post-injection site care and site closure plan (§ 146.93).
- (c) The owner or operator must notify the Director of adverse financial conditions such as bankruptcy, that may affect the ability to carry out injection well plugging and post-injection site care and site closure.

§ 146.85 Financial responsibility
(cont'd.)

- (d) The operator must provide an adjustment of the cost estimate to the Director if the Director has reason to believe that the original demonstration is no longer adequate to cover the cost of injection well plugging (as required by § 146.92) and post-injection site care and site closure (as required by § 146.93).

Stakeholder-Developed Models

Some independent organizations interested in alternatives for post injection site care and closure have developed approaches to GS site stewardship.

The specific models that EPA reviewed include:

- Interstate Oil & Gas Compact Commission (IOGCC)
- World Resources Institute (WRI)
- International Risk Governance Council (IRGC)

Federal Mechanisms

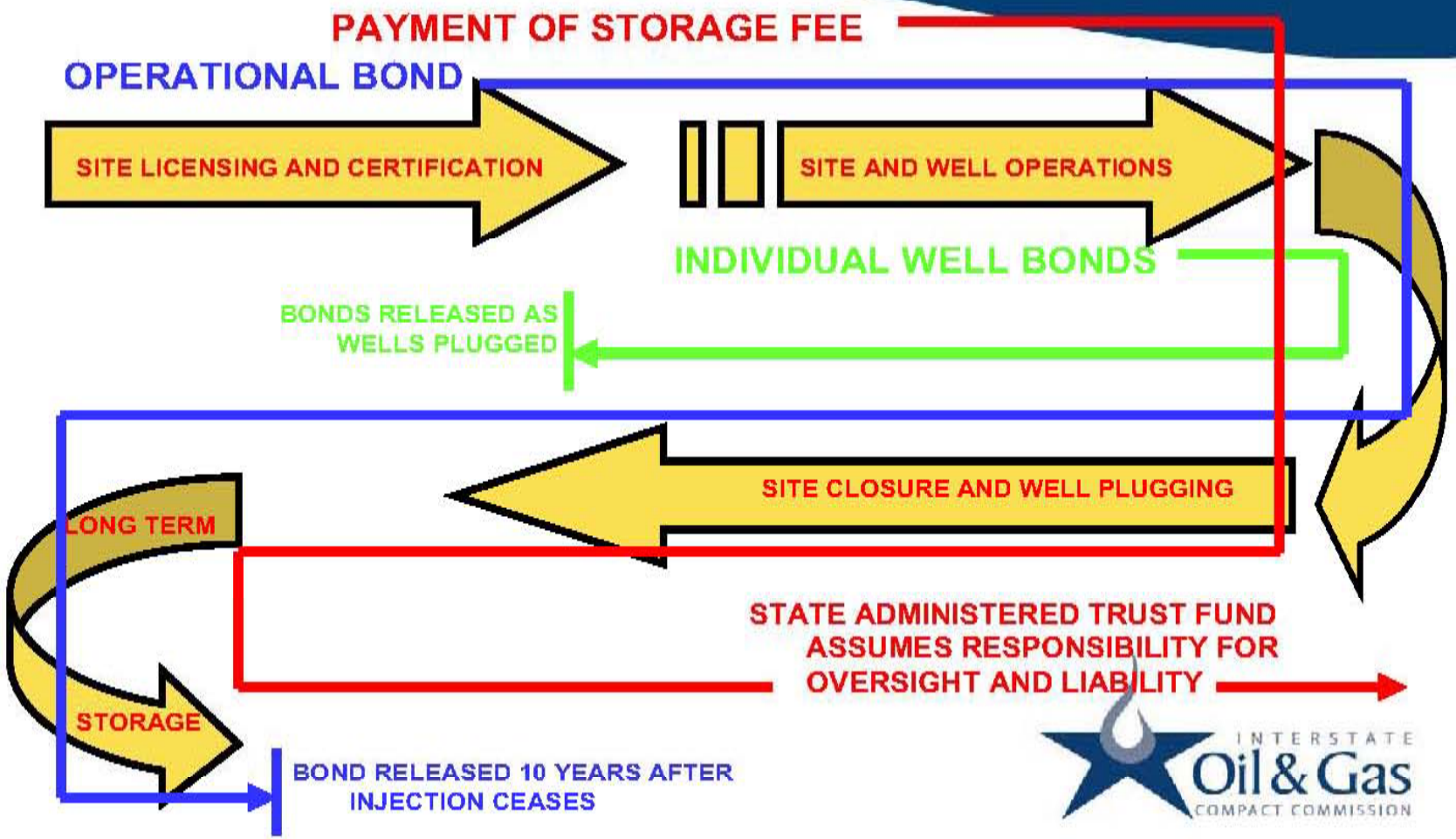
Congress has provided varying mechanisms which respond to needs in areas other than GS, but may provide useful information in considering approaches to stewardship for GS sites after site closure:

- Price-Anderson Nuclear Industries Indemnity Act of 1957
- Support Anti-Terrorism by Fostering Effective Technologies Act of 2002
- National Flood Insurance Act of 1968
- Trans-Alaska Pipeline Authorization Act of 1973 / Oil Pollution Act of 1990
- Comprehensive Environmental Response, Compensation, and Liability Act of 1980

Interstate Oil and Gas Compact Commission

- **Objective of Model**. After closure, a state or a state-contracted entity would engage in monitoring and remediation activities necessary to ensure the security of the storage site, using resources from an industry-funded, state-administered trust fund.
- EPA says the model proposed by the IOGCC is silent on the how to address potential loss or injury that may result from an adverse occurrence at a GS site.
- **Post-site-closure Stewardship Approach**. State-administered compensation fund based on existing models developed by the states for addressing abandoned and orphaned oil and gas wells.
- IOGCC concluded that states are “likely to be best positioned to provide the necessary 'cradle to grave' regulatory oversight of geologic storage of CO2.”

STATE ADMINISTERED "CRADLE TO GRAVE" CGS REGULATORY FRAMEWORK



INTERSTATE Oil & Gas COMPACT COMMISSION

Policy Considerations for IOGCC Model

1. **Funding Mechanism**. A trust fund would be funded by an injection fee (to be determined).

- This fee would be assessed to the site operator at the point of custody transfer of the CO2 from the generator to the operator and calculated on a per-ton basis.
- The model proposed by the IOGCC does not address the varying degree of risk that may exist across GS sites.
- Others have suggested that contributions to mechanisms such as trust funds for post-site-closure stewardship could be made when the site is operating, to better match the timing of costs and benefits.

Policy Considerations for IOGCC Model

2. **Fund Administration**. The IOGCC model does not explicitly address state jurisdiction for GS sites that cross state boundaries, but states have addressed similar issues in addressing production from oil and gas reservoirs.
3. **Nature of risk**. Not explicitly addressed.
4. **Degree of Financial Responsibility**. After site closure (as defined), the liability for ensuring that the site remains a secure storage site during the post-site-closure period would transfer to the state.
5. **Fosters Project Development**. Not explicitly addressed.

World Resources Institute Issue Brief

- **Objective of Model**. Ensure that adequate funds for post-site-closure stewardship are readily accessible, if and when needed; avoid imposing excessive barriers to projects that have public benefits; and ensure that risks are borne by those who share in the benefit of GS.
- **Liability Model**. Considers two options: (1) federal indemnity and (2) hybrid approach.

Source: World Resources Institute Issue Brief: Liability and Financial Responsibility Frameworks for Carbon Capture and Sequestration, WRI Issue Brief Carbon Capture and Sequestration, No. 3

WRI Issue Paper - Policy Considerations

1. **Funding Mechanism**. A federal indemnity program, which may be "limited to a discrete set of pilot projects designed to test the parameters and scope of CCS technology, and limited only to discrete risks...."
2. **Fund Administration**. *Not Addressed*
3. **Nature of risk**. Assumes risks continue to diminish after site closure.
4. **Fosters Project Development**. This WRI Brief suggests this objective may be best met by different approaches as the technology matures.

WRI Issue Paper - Policy Considerations

5. Degree of Financial Responsibility. Under a performance-based standard of liability transfer, the project owner, operator or developer could be required to re-assume financial responsibility (and attendant liability) if the GS site fails to maintain prescribed standards at set monitoring periods over time.

While the WRI issue paper acknowledges the importance of fostering CCS technologies, the authors caution that "an indemnity program for CCS projects should clearly articulate limits of liability and be accurately priced – the public should not be asked to unnecessarily subsidize private development and implementation of CCS technologies indefinitely."

The WRI issue brief suggests that the transfer of post-site-closure responsibility could be performance-based (when site performance achieves certain predetermined metrics) or prescriptive (for example, a certain number of years after site closure).

International Risk Governance Council

- The International Risk Governance Council (IRGC) prepared an issue brief that focuses on all aspects of regulation for carbon capture and storage (CCS).
- Report does not present a model for post-site-closure stewardship of GS sites,
- Includes concepts intended to inform discussion of the design of such models.
- Authors identify principles relevant to GS site stewardship:
  - Regulations should
    - encourage responsible operation and investment,
    - balance stability and predictability with flexibility and adaptability to new scientific information,
    - be based on solid technical findings and
    - provide ease of implementation for both regulators and industry.
  - In addition, it is important to equitably balance the risks of CCS between public and private actors.

International Risk Governance Council

- Regulations should balance the needs of all stakeholders through the project cycle, including:
  - the public--including concerns associated with climate change and economic competitiveness, including the cost of electricity
  - site developers, who need an approach that is both legal and profitable
  - climate regime administrators
  - insurers--the ability of insurers and reinsurers to assess risk will depend on which activities they are asked to cover and the limits on liability (if any) provided under national, state, or provincial law
  - financial underwriting companies, which will require that CCS be profitable, and will require clarification of ownership and responsibility for injected CO2, among other matters.

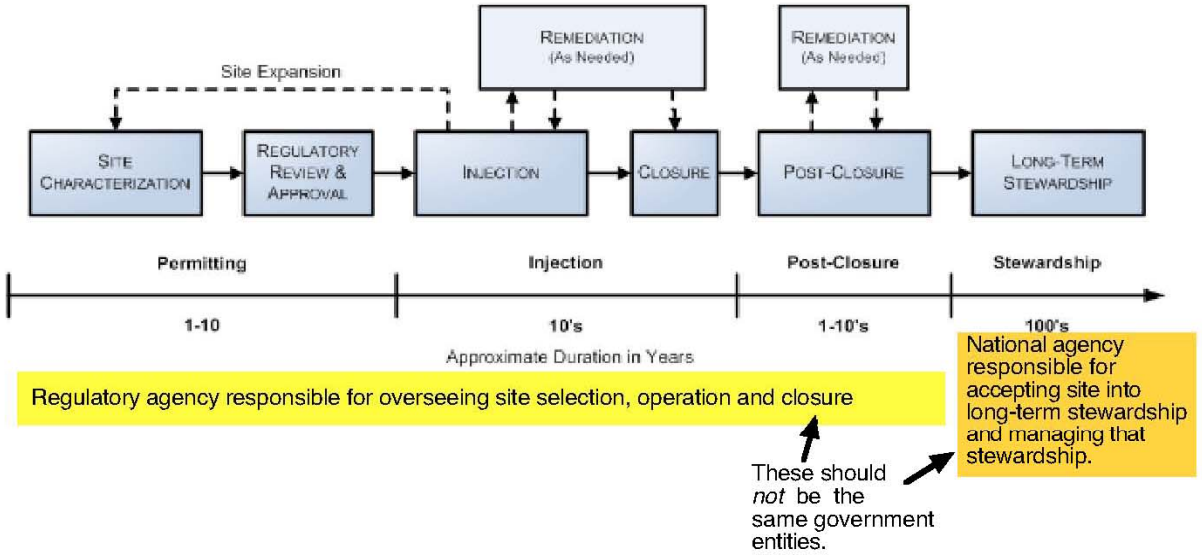
International Risk Governance Council

- **Responsibility after site closure.** The IRGC recommendations assume that "[p]ublic assumption of long-term responsibility will probably be required at some point after site closure, conditional upon proof that CO2 storage is behaving predictably, as nations are the only entities that can make credible commitments over such long storage time periods."
  - Special arrangements for post-site-closure stewardship may also be considered for a limited number of demonstration projects.
  - The report also suggests that if public assumption of long-term responsibility does occur, regulations would need to specify the technical requirements both
    - to qualify for ownership transfer and
    - for when the transfer may take place.

International Risk Governance Council

- **Locating regulatory responsibility.** The report suggests that it is not clear whether the same regulatory entity that is responsible for permitting through site closure should also assume long-term oversight responsibility, noting that industry would prefer the continuity of a single regulator but a separate regulatory entity would be more objective in assessing whether to accept transfer of liability to the public.
- **Slow long-term leakage.** IRGC suggests that in the event such leakage were to occur, it would create liabilities within a climate regime even if it presents no health or local environmental hazard, and that policymakers will need to provide technically grounded guidance
  - on acceptable levels of CO2 leakage from storage, and
  - on definitions of leakage.

Separation of responsibilities

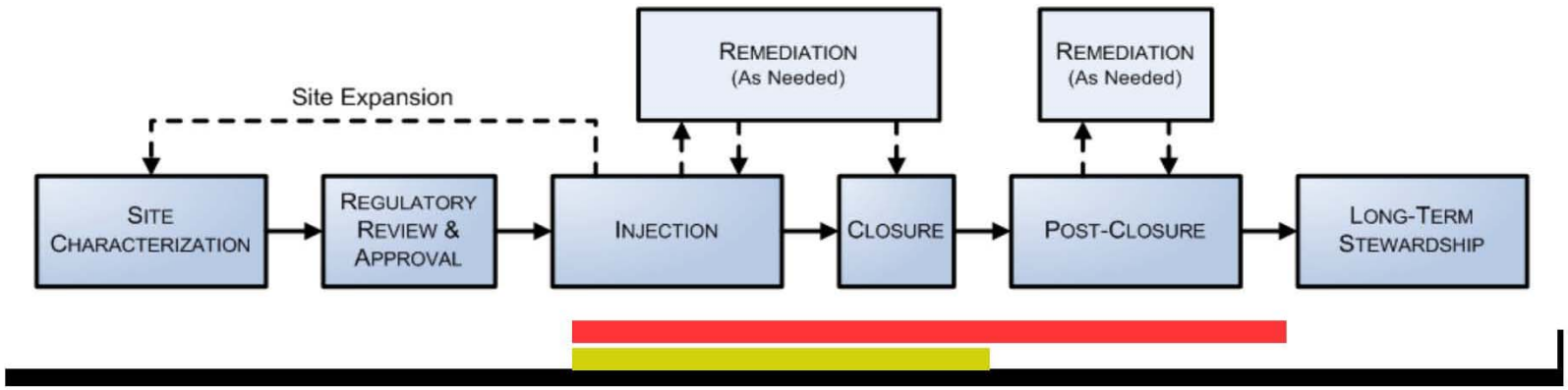


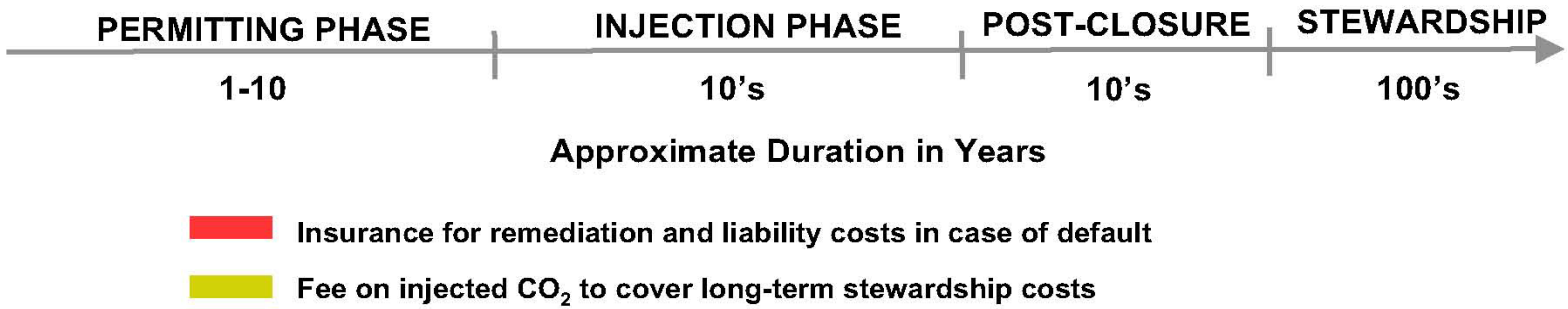
In order to avoid conflicting incentives, the government agency responsible for long-term stewardship should *not* be the same agency responsible for the approval of new sites and regulatory oversight during the operation and closure phases of existing sites.

IRGC Post-site-closure stewardship expenses

- Expenses for long-term care of CCS sites must be funded during site operations, which could be accomplished through operator payments into a national stewardship sinking fund, and that such a risk-pooling approach may be most efficient.
- Alternatively, an operator could pay into a dedicated fund for each site although the report notes that if each site must accumulate enough money to cover a worst-case remediation scenario such an approach would be unnecessarily expensive.
- The discussion concludes with the observation that “linking funding of long-term CCS liabilities to the industries that generate CO2 will allow cost internalization by industry. Additionally, it is wise for industry as a whole to maintain responsibility, because of inevitable information asymmetries: even with high levels of transparency, industry will know more about CCS than regulators.”

Covering the costs





International Risk Governance Council

- **Industry credibility.** "Efforts to secure public assumption of long-term liability must take care to avoid damaging the industry's credibility. Arguments to transfer responsibility from project operators to the government too quickly, too completely, or without adequately funding post-transfer care, run the risk of undermining public acceptance."
- **Insurance industry.** The IRGC report observes that insurance companies could play an important role in structuring the financial mechanisms to cover potential post-site-closure liabilities.
- This is a work in progress; IRGC is continuing its effort and will produce a more comprehensive analysis and recommendations.

International Risk Governance Council

"One clear consensus that emerged from [our project] workshop was that before developing a final regulatory regime we need to *learn* from real-world experience so that we do not create regulations that lock-in inappropriate features, or ignore key issues."

Granger Morgan, Project Coordinator

May 7, 2008

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Price-Anderson Nuclear Industries Indemnity Act of 1957

- **Program Objective**. Price-Anderson enacted in 1957 to achieve two objectives:
  1. Ensure that adequate funds would be available to satisfy liability claims of members of the public for personal injury or property damage in the event of a catastrophic nuclear accident; and
  2. Help encourage private investment in commercial nuclear power by placing a cap, or ceiling on the total amount of liability each holder of a nuclear power plant license faced in the event of a catastrophic accident.
  - Over the years, the "limit of liability" for a catastrophic nuclear accident has increased the insurance pool to over $10 billion.

Price-Anderson Liability Model

- Indemnification and limitation of liability
    1. site-specific private insurance,
    2. industry-wide pooled insurance
    3. federal indemnity

Price-Anderson – 1. Funding Mechanism

- Three-tiered coverage system, which requires licensed nuclear facilities to maintain both site-specific liability insurance (Tier 1) and industry-pooled liability insurance (Tier 2).
- In the event that the private claims against a licensee exceed the amounts available in both the site-specific individual insurance and the industry-pooled insurance, the federal government (Tier 3) provides the licensee with indemnity.

Price-Anderson – 3 Tier Structure

Tier 1 (individual financing) individual nuclear plant must obtain primary insurance coverage up to a mandated level (currently $300 million) from private sources. Demonstration can be in the form of private insurance, self-insurance or other proof of financial responsibility.

Tier 2 (pooled-industry insurance) requires payment of 'retrospective premiums' of $15 million per year up to a maximum of $95.8 million per incident for each of its plants, in the event that claims exceed the amount of Tier 1 financing. Licensees are required to maintain one of six types of guarantees for payment of retrospective premiums (e.g. surety bonds).

Tier 3 (federal indemnity) indemnifies licensees from liability arising from nuclear incidents, once the individual and industry caps are reached

* All claims filed to date under the Price-Anderson model have been covered through the individual financing under Tier 1.

Price-Anderson – Policy Considerations

2. **Fund Administration**. Funds are readily accessible and distributed under individual and collective insurance policies established under Tier 1 and Tier 2.
3. **Nature of risk**. Nuclear power is characterized by a low probability of risk, but potential catastrophic loss or injury. The Price-Anderson Act provides financial protection during operating life of a nuclear facility.
4. **Degree of Financial Responsibility**. Plant operators maintain insurance and guarantees with a combined value of over $10 billion.
5. **Fosters Project Development**. Currently 104 nuclear facilities are licensed to operate in the U.S.

Support Anti-Terrorism by Fostering Effective Technologies Act of 2002

- **Program Objective.** The Support Anti-Terrorism by Fostering Effective Technologies Act (SAFETY) was enacted in 2002, to provide critical incentives for the development and deployment of anti-terrorism technologies by providing liability protections for providers of "qualified anti-terrorism technologies."

SAFETY Act - Liability Model

- Exclusive jurisdiction in federal court for suits against sellers of "Qualified Anti-Terrorism Technology" (QATT).
- A limitation on the liability of sellers of QATT to a specified amount of liability insurance coverage for each QATT
- Sellers not required to obtain more liability insurance coverage than is reasonably available "at prices and terms that will not unreasonably distort the sales price" of the technology.
- Beyond that limit of liability, indemnity is provided for claims arising out of, relating to, or resulting from an act of terrorism, where QATT has been deployed.
- Indemnity is fully transferable; that is, the Seller can transfer indemnity to entities that have the right to manufacture, use, or sell QATT.
- Length of indemnity is capped between five and eight years, as determined by the Under Secretary.
- Prohibition on joint and several liability such that sellers can only be liable for the percentage of non-economic damages that is proportionate to their responsibility, along with other liability limitations.

SAFETY Act - Policy Considerations

1. **Funding Mechanism**. Insurance premiums paid by sellers of QATT, subject to limitations described above.
2. **Fund Administration**. Funds are available up to the liability limits of the individual policies maintained by sellers of QATT, which vary depending on the product-specific level of coverage mandated by the Homeland Security Secretary.
3. **Nature of risk**. Risks under SAFETY are characterized by a low probability of occurrence, but potentially high magnitude of damages. The probability of risk under SAFETY is dependent on the likelihood of largely unpredictable, catastrophic events (e.g., a terrorist attack). The magnitude of damages may be a function of factors such as design, manufacturing, and testing, among other factors.

SAFETY Act - Policy Considerations

4. **Degree of Financial Responsibility**. Under SAFETY, the insurer bears financial responsibility for claims made up to the limit of liability of the sellers' insurance coverage. Because information on claims made against insurance policies required under SAFETY is not publicly available, it is unclear how insurance policy limits compare to the magnitude of claims.
5. **Fosters Project Development**. Under SAFETY, the Department of Homeland Security approved the 200th Qualified Anti-Terrorism Technology on February 21, 2008.

1968 National Flood Insurance Act (NFIA)

NFIA Program Objective:

- More effectively indemnify individuals for flood losses through insurance;
- Reduce future flood damage through State and community floodplain management regulations; and
- Reduce federal expenditures for disaster assistance and flood control.

Liability Model. Pooled insurance model. Insurance coverage is capped by the statute.

Regular Program of the NFIP

1. **FEMA authorizes the sale of additional flood insurance** in the community up to the Regular Program limits.
2. **Community implements** adopted floodplain management measures.
3. **FEMA arranges for periodic community assistance visits** with local officials to provide technical assistance regarding complying with NFIP floodplain management requirements.
- **4. Local officials may request flood map updates** as needed. FEMA evaluates requests, encourages cost-sharing, and issues revised maps as priorities dictate.

NFIA – Policy Considerations

1. **Funding Mechanism**. Insurers issue insurance policies for flood coverage to eligible property owners. Premiums collected under these policies are deposited into the National Flood Insurance Fund. Any claims made under these policies (as well as any administrative costs) are paid from the Fund.

   In addition to funds collected from premiums, NFIP has the authority to borrow funds from the US Treasury to cover potential shortfalls in the Fund. Borrowed funds must be repaid with interest. As of August 2007 over $17.5 billion was owed to the U.S. Treasury by the NFIP.

2. **Fund Administration**. Funds are administered by the Federal Emergency Management Agency (FEMA), and distributed in response to eligible claims made under the insurance policies.

NFIA – Policy Considerations

3. Nature of Risk. For the National Flood Insurance Program the probability of risk (i.e., the probability of flood damage) varies depending on the magnitude of the naturally occurring weather event.

- Moreover, the extent of damage varies depending on the risk mitigation strategies undertaken by municipalities, states and homeowners.
- Similarities exist between the nature of risks covered by NFIA and GS. For example, management practices would be expected to minimize the probability, number, and severity of claims made against the National Flood Insurance Fund.

NFIA – Policy Considerations

4. Degree of Financial Responsibility. Private sector insurers pay claims using funds generated from premium payments. In specific cases, the federal government subsidizes the insurance premiums.

*For a number of reasons, primarily claims experience that is very different than predicted when premiums were established, **claims have substantially exceeded premium income.**

5. Fosters Project Development. [The purchase of flood insurance is mandatory as a condition of receipt of federal or federally-related financial assistance for acquisition and/or construction of buildings in Special Flood Hazard Areas of any participating community.]

Trans-Alaska Pipeline Authorization Act of 1973 / Oil Pollution Act of 1990

- **Program Objective**. The Trans-Alaska Pipeline Authorization Act (TAPAA) of 1973 authorized the development and construction of a major pipeline in order to facilitate delivery of oil from the Alaska's North Slope to domestic markets.
- The TAPAA states "early development and delivery of oil and gas from Alaska's North Slope to domestic markets is in the national interest because of growing domestic shortages and increasing dependence upon insecure foreign sources."
- TAPAA established a long-term liability and financial responsibility model.
- In 1990 Congress passed the Oil Pollution Act (OPA), which generally consolidated the liability and compensation schemes of the TAPAA and other federal oil pollution laws and authorized the use of the Oil Spill Liability Trust Fund (OSLTF), which consolidated the funds supporting the TAPAA and other federal oil pollution laws.

OPA/OSTLF Liability Model

- A responsible party's liability for removal costs and damages is limited, unless the incident is caused by gross negligence or willful misconduct or is the result of violation of an applicable federal regulation.
- Liability limits related to oil spills were established for holders of the pipeline right of way or permits.
- Liability limits for vessel owners are based on a formula that considers the vessel type and tonnage.
- Liability limits for onshore facilities, offshore facilities, and deepwater ports are set at established amounts.

OPA/OSTLF Liability Model

- If a responsible party pays or incurs removal (e.g. oil spill cleanup) costs or damages in excess of an applicable liability limit, the responsible party may present a claim to the OSLTF for compensation of the excess amount.
- Expenditures from the Fund for any one oil pollution incident are limited to $1 billion or the balance of the Fund, whichever is less.
- Natural resource damage assessments and claims in connection with any one incident are limited to $500 million of the $1 billion per incident limit.
- Limitations on liability were modified by the OPA.
- To better address funding needs, the OSLTF has been subdivided into an Emergency Fund and a Main Fund.
- Emergency Fund ensures rapid and effective response to oil spills without requiring further Congressional appropriations.
- Through this portion of the OSLTF, up to $50 million is provided each year to fund removal activities and to initiate natural resource damage assessments.
- Emergency Fund also includes carryover money from prior years.

OPA/OSTLF Policy Considerations

1. **Funding Mechanism.** The OSLTF receives funds from four primary sources:

   (a) an oil tax (five cents a barrel on domestically produced or imported oil collected from the oil industry; this is suspended when the fund reaches $1 billion but may be reinstated by Congress if the fund falls below this amount);
   (b) interest on fund principal;

   (c) cost recovery from responsible parties; and

   (d) penalties (civil penalties assessed to responsible parties).

OPA/OSTLF Policy Considerations

- OSTLF has the authority to borrow funds from the U.S. Treasury to cover potential shortfalls in the Fund.
- In 2005, the Energy Policy Act of 2005 increased the borrowing limit of the OSTLF to $2.7 billion.
- At the same time, a five-cents per barrel tax was reinstated with a cap on the collection of fees once the fund maximum is reached (the balance of OSLTF is mandated to be between $2 billion and $2.7 billion).
- If OTSLF funds fall below $2 billion, collection of per-barrel tax resumes.

OPA/OSTLF Policy Considerations

2. **Fund Administration.** Federal On-Scene Coordinators can access OSTLF funds up to an established amount for immediate removal, mitigation, or prevention of a discharge. States also can be reimbursed by the OSTLF for removal and monitoring costs incurred during oil spill response and cleanup efforts.
3. **Nature of Risk.** The liability model established by the TAPAA, and later revised by the OPA, provides financial protection during the active use of the Trans-Alaska Pipeline by owners and operators. Similarities exist between the nature of risks covered by OPA and GS. For example, operating decisions made by pipeline owners and operators will affect the likelihood, magnitude, and timing of claims made against the OSTLF.

OPA/OSTLF Policy Considerations

4. **Degree of Financial Responsibility.** Under the TAPAA/OPA, the private sector retains financial responsibility for claims made up to the established limits of liability.
   - Pipeline right-of-way or permit holders, offshore facilities, vessels, and deepwater ports are required to maintain evidence of financial responsibility.
   - Claims for removal costs and damages may be asserted directly against the guarantor providing evidence of financial responsibility.
5. **Fosters Project Development.** Over 15 billion barrels of oil have been transported through the pipeline since construction completion in 1977.

Comprehensive Environmental Response, Compensation, and Liability Act of 1980

Program Objective. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as Superfund, was enacted by Congress on December 11, 1980.

This law created a tax on the chemical and petroleum industries and provided broad Federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment.

CERCLA Liability Model

- Compensation fund model.
- Statute imposes strict and joint and several liability on potentially responsible parties (PRPs).
- Responsible parties are liable for damage to injured natural resources.
- CERCLA also provides indemnity to remediation contractors working at Superfund sites.

CERCLA Policy Considerations

1. Funding Mechanism. Superfund compensation trust fund financed by:

- The Superfund tax levied on industry.
  - The tax included: a petroleum excise tax, a chemical feedstock tax, and a corporate environmental tax (CEIT).
  - The taxing authority expired in 1995. Over five years, $1.6 billion was collected.
- Costs recovered on behalf of the Superfund under CERCLA, as well as interest, fines, penalties and punitive damages assessed under CERCLA.
- Appropriations from the US Treasury.
- Cleanups are also funded by Potentially Responsible Parties (PRPs), who have made commitments since program inception in excess of $20 billion.

CERCLA Policy Considerations

2. **Fund Administration**. Funds disbursed from Superfund under the terms of Section 111 of the Act to pay for cleanups and related program activities, primarily based on eligibility criteria which target the most seriously contaminated sites. In 2002, EPA requested creation of a Superfund Subcommittee, under the auspices of the National Advisory Council for Environmental Policy and Technology (NACEPT), to provide guidance on program progress criteria, among other issues. EPA also implemented new Superfund environmental indicators concurrent with the NACEPT process.
3. **Nature of risk**. The Superfund trust fund was designed to consider the risk that project owners, operators, and developers may no longer exist at the time a liability occurs. In addition CERCLA supposes that risks to human health and the environment can be reduced through sound operating decisions by site owners, operators and developers. The magnitude of damages varies widely under CERCLA, depending on the nature and the extent of the hazardous release.

CERCLA Policy Considerations

4. **Degree of Financial Responsibility**. Through the Superfund tax levied on industry, the private sector contributed approximately $6.3 billion in taxes to the fund between 1993 and 2002. When a past owner or operator of a site is identified, it retains liability for the site under Section 107 of the Act.
5. **Fosters Project Development**. *Not Applicable.*

Characteristics of Stewardship Approaches

EPA has identified five characteristics it says are likely to be key components of any stewardship approach:

1. Funds that are available in appropriate amounts,
2. Funds that the responsible party can collect, manage, and disburse,
3. Fund values that are tailored to the risk of the project,
4. Appropriate owner/operator incentive to reduce risk, and
5. Absence of barriers that could deter beneficial projects.

1. Available Funding

- Because GS for long-term storage is a new practice, it may be difficult to estimate the appropriate amount of funds that may be required at either an individual site or collectively at all sites.
- A primary challenge for post-site-closure stewardship is ensuring adequate funds are available if needed. It is equally important to avoid collecting excessive funds, which would be economically inefficient.
- Potential GS approaches may need to consider site-specific issues which may influence funding needs such as geologic characteristics, site design, management practices, and the nature of nearby human populations and ecosystems.

2. Administrative ability to collect, manage and disburse dedicated funds

- Federal and/or state entities must be able to readily access the funds in the amounts and timing necessary.
- Many state and federal agencies lack authority to collect, manage and disburse dedicated (i.e., earmarked) funds.
- For example, funds received by a state typically are deposited into a state's general fund, and the amount of funds that a state legislature appropriates for the purpose may not match the funds required to pay for costs associated with site stewardship. In such cases, legislation establishing a dedicated fund or similar arrangement may be necessary.

3. Approach appropriate to GS project risk

- Risks associated with GS sites after site closure will likely decline over time and the possibility of an adverse occurrence will likely increase as the number of sites grows.
- An approach for addressing post-site-closure stewardship for GS may be designed to address risks of this nature.

4. Ensure that owners and operators bear appropriate responsibility

- Approach should ensure that owners and operators bear appropriate responsibility for the financial consequences of site selection, design, and operational decisions.
- Approach for addressing post-site-closure stewardship for GS should ensure that any liability protection extended to owners and operators does not result in the unintended consequence of reducing their incentive to appropriately consider environmental/public health risks in the design, siting and operation of GS sites.
- [Approach should not cause responsible owners to incur liabilities for the failings of irresponsible owners.]

5. Approach should not deter development

- Approach should not deter development of projects that have public benefits.
- Approaches should not result in excessive barriers to commercial-scale development of GS, or deprive the general public of the benefits of reduced CO2 emissions due to GS technologies.

Other Considerations - Jurisdiction.

- Approaches should consider applicable provisions of federal and state law.
- The nature of an adverse occurrence and attendant loss or injury will influence where the jurisdiction lies (federal and/or state), and thereby influence which (if any) party can transfer or assume liability.

Cross-Boundary Considerations.

- Approaches should consider how to administer funds for GS sites that cross state boundaries.
- For example, designers of approaches to post-site-closure stewardship may consider establishing sub-limits by site and/or by state.
- If so, a key consideration would be the basis for establishing such sub-limits, and whether these sub-limits would change over time to account for corresponding changes in GS risk(s).

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