POLICY, LEGAL AND REGULATORY ISSUES IN CARBON CAPTURE AND STORAGE (CCS)

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Why are Policy, Legal and Regulatory issues so important?

Critical issues identified by CCS business and financial experts:

- Where is the value from CCS?
- What is an appropriate government role?
- How can viable markets related to CCS be created?
- How can commercial risks be managed?
- How can cost be reduced along the value chain?
- How can we build the necessary commercial expertise?

Risk due to immature/uncertain framework is a major constraint.
Stakeholders have varied interests:

- Source industries
- Service providers
- Local residents
- Agriculture
- Environmental NGOs
- Other industries and local businesses
- Financial community
- Government agencies
- Academic and research community

What is the appropriate balance among these interests?
Rationale for CCS

CCS will eventually effectively, safely and affordably reduce the impact of fossil fuel production and use on climate change.

**Fundamental Issue**

*Given this rationale and the interests of stakeholders, what is the role of government, its policies, laws and regulations?*
Legal-regulatory issues arise in each component of CCS.

Some of the issues…

**Capture from CO₂ Source**
- Health & Safety
- Reporting of captured CO₂
- Property rights in CO₂

**Transport**
- Health & Safety
- Pipeline ownership
- Third-party access

**Geologic Storage**
- Licensing
- Reporting
- Injection rights
- Monitoring
- Liability

**Common Considerations**
- Permitting process at each stage
- Coordination of different stages
- Categorization of CO₂ emissions
- Multiple jurisdictions
These issues vary with time and go beyond closure for storage.

<table>
<thead>
<tr>
<th>Project Element</th>
<th>Project Phase</th>
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<tbody>
<tr>
<td></td>
<td>Planning</td>
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<tr>
<td>Capture</td>
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<tr>
<td>Transportation</td>
<td></td>
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<tr>
<td>Storage</td>
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Some further complications:

- Different parties own obligations at each stage.
- Some of the legal basis has yet to be set.
- Applicable laws not developed with CCS in mind.
- Different legal/regulatory entities are involved.
- Legal/regulatory process is starting to happen.
- Regulation developed for near-term options, not longer-term options.
Key Policy, Legal, and Regulatory Issues

- Over-Arching
  - Incentives/disincentives for CCS
  - Classification of CO₂
  - Public involvement and support
  - Relationship to existing oil and gas regulations
  - Protection of the international marine environment

- Planning
  - “Capture-ready” requirements
  - Siting and permitting
  - Intellectual property/technology transfer

- Operation
  - Industrial and public safety
  - Resource protection
  - Measurement, Monitoring and Verification
  - Proper closure

- Closure and Beyond
  - Long-term liability and responsibilities
  - Measurement, Monitoring and Verification
Key Policy, Legal and Regulatory Issues

- **Over-arching**
  - Incentives/disincentives for CCS
  - Classification of CO₂
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- **Planning**
  - “Capture-ready” requirements
  - Siting and permitting
  - Intellectual property/technology transfer

- **Operation**
  - Industrial and public safety
  - Resource protection (groundwater, minerals, etc.)
  - Measurement, Monitoring and Verification
  - Proper closure

- **Closure and Beyond**
  - Long-term liability and responsibilities
  - Measurement, Monitoring and Verification

Topics to be discussed today.
Incentives/Disincentives for CCS

- **Incentives:** Why would anyone want to do CCS?
  - **Business perspective:** How does CCS create value?
  - **Public policy perspective:** How do we motivate investment in CCS? How much should society pay? Who should pay? Is the playing field level for different carbon management options?
  - **Types of incentives:** Carbon credits, CDM, tax incentives, etc.

- **Disincentives:** What could inhibit CCS?
  - Classification of CO$_2$ as a “waste”
  - Unresolved liabilities
  - Uneconomic costs
  - Uncertainty
Classification: Is CO₂ a waste or pollutant under existing laws?

- Many environmental laws and regulations (including international treaties to protect the marine environment) were enacted before CO₂ became a concern.

- Issues:
  - Is CO₂ covered under these laws?
  - Is the treatment of CO₂ appropriate?
  - How does this affect CCS?
## Public Support: Enabler or Roadblock?

### Reasons the Audience Can Be Hostile

<table>
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<tr>
<th>Factors</th>
<th>More Hostility</th>
<th>Less Hostility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Catastrophic potential</td>
<td>Grouped in time and space</td>
<td>Scattered in time and space</td>
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<tr>
<td>Level of familiarity</td>
<td>Uncommon</td>
<td>Very common</td>
</tr>
<tr>
<td>Level of understanding</td>
<td>Not well understood by science</td>
<td>Well understood by science</td>
</tr>
<tr>
<td>Level of personal control</td>
<td>Controlled by a trusted individual</td>
<td>Controlled by the source</td>
</tr>
<tr>
<td>Voluntariness</td>
<td>Involuntary</td>
<td>Voluntary</td>
</tr>
<tr>
<td>Effects on children</td>
<td>More likely to affect children</td>
<td>Less likely to affect children</td>
</tr>
<tr>
<td>Moral relevance</td>
<td>Relevant</td>
<td>Not relevant</td>
</tr>
<tr>
<td>Timing of effects</td>
<td>Immediate effects</td>
<td>Delayed effects</td>
</tr>
<tr>
<td>Identity of victims</td>
<td>Closely related</td>
<td>Statistical victims</td>
</tr>
<tr>
<td>Level of dread</td>
<td>Greatly feared</td>
<td>Aesthetic</td>
</tr>
<tr>
<td>Level of trust in institutions</td>
<td>Distrust</td>
<td>Trust</td>
</tr>
<tr>
<td>Amount of media attention</td>
<td>Highly popularized</td>
<td>Seldom mentioned</td>
</tr>
<tr>
<td>History of accidents</td>
<td>Well-known accidents</td>
<td>No accidents</td>
</tr>
<tr>
<td>Equity (fairness)</td>
<td>Viewed as unfair</td>
<td>Viewed as fair</td>
</tr>
<tr>
<td>Distribution of benefits</td>
<td>Benefits distributed unequally with risk</td>
<td>Benefits distributed equally with risk</td>
</tr>
<tr>
<td>Reversibility</td>
<td>Damage irreversible</td>
<td>Damage reversible</td>
</tr>
<tr>
<td>Personal stakes</td>
<td>Strong</td>
<td>Weak</td>
</tr>
<tr>
<td>Origin</td>
<td>Artificial</td>
<td>Natural</td>
</tr>
<tr>
<td>Level of uncertainty</td>
<td>Unknown to science</td>
<td>Known to science</td>
</tr>
<tr>
<td>Tone of message</td>
<td>Too positive</td>
<td>Objective</td>
</tr>
<tr>
<td>Organisational attitude</td>
<td>Organisation ignores</td>
<td>Organization seeks out concerns and acknowledges concerns</td>
</tr>
<tr>
<td>Degree of change in lifestyle</td>
<td>Sharp change from normal</td>
<td>Little change from normal</td>
</tr>
<tr>
<td>Degree of understanding of process/data</td>
<td>Process/data presentation too complex</td>
<td>Process/data presentation aimed at audience</td>
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</table>
Capture-Ready Facilities

➢ The idea—build a plant now without capture and add capture later when the technology is better developed and more affordable.
  – An intuitive concept, but what does it really mean?

➢ Perspectives differ…
  – Policy perspectives: Will requirements produce benefits?
  – Business perspective: Options—what are they worth?
  – Environmental NGO perspective: Will CCS really happen?

Should capture-ready facilities be required?
Proposed IEA Definition of “Capture Ready Plant”

- A plant which can include CO₂ capture when the necessary regulatory or economic drivers are in place.
- Avoids “stranded assets” and “carbon lock in.”
- Developers should consider all factors including:
  - A study of options for capture and potential pre-investments
  - Inclusion of sufficient space
  - A reasonable route to CO₂ storage
- Competent permitting authorities should be provided with sufficient information to judge

Source: IEA Greenhouse Gas Progamme
What is the appropriate balance between these interests?
Post-closure: Who ensures that the CO$_2$ remains where it is supposed to be?

- How much continued monitoring is needed?
- Who has responsibility for
  - Ongoing monitoring,
  - Any needed remediation, and
  - Compensating any damages?
- What long-term liability does the project operator have?

_How can post-closure risks be managed?_
"Legal Frameworks for CO₂ Storage Update and Recommendations for Future Work”

By International Energy Agency, based in part on joint IEA-CSLF Workshops on Legal Aspects of Underground Storage of CO₂