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CARBON CAPTURE AND STORAGE

FINANCING CHALLENGES AND OPPORTUNITIES

The Role of Insurance

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New profile of liabilities in CCS Projects

New technology with analogous examples

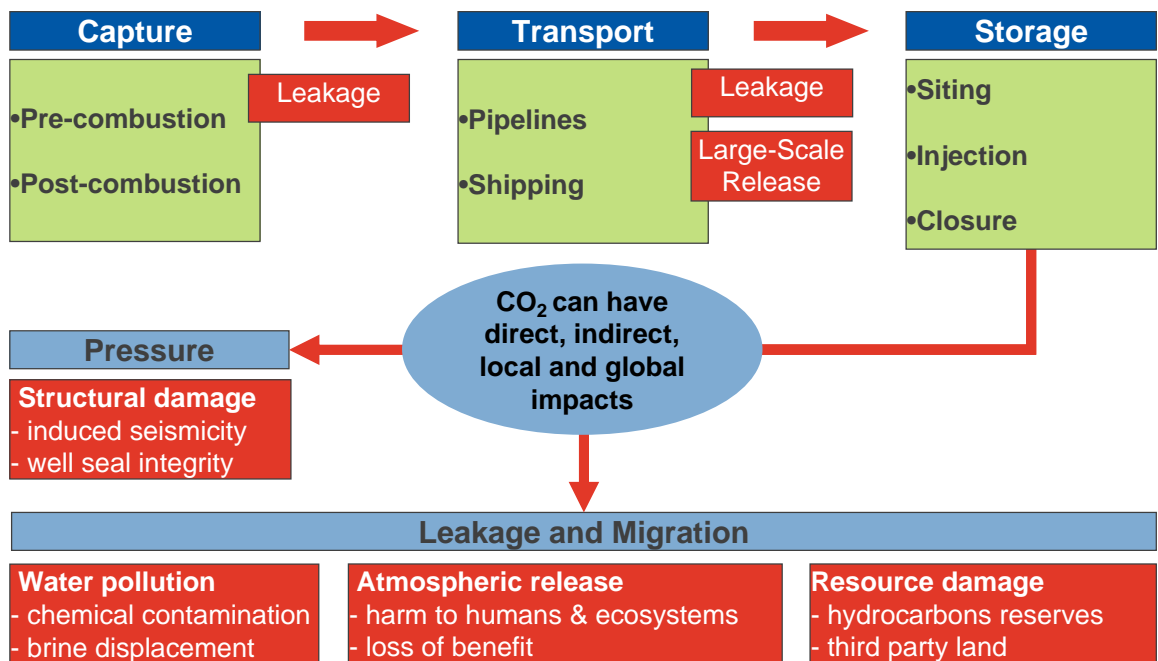
- Liabilities may extend beyond the physical boundaries of the “site”
- Liabilities will extend beyond the life of the assets
- Lack of actuarial data on performance of large scale CCS projects
- Absence of uniform international regulatory framework

BUT

- CCS has significant technological potential
- Analogous information is available for Flue Gas Stripping, Enhanced Oil Recover and Natural Gas Storage projects, and
- Commitment from global stakeholder groups to work with the insurance industry to overcome the new liability issues

Liability Management in CCS Projects

CCS Potential risks and liabilities



Risk assessment for in CCS Projects

Who will be liable for what?

Risk quantification (Significance verses Likelihood) for all aspects of a CCS project will be need to be carried out :

- What is the nature of all possible risks?
- What are the scales and likelihoods of all potential liabilities?
- Who could be an injured party?
 - Neighbouring property owners
 - Local resource owners
 - The General Public
 - The "Environment"
- Who will be liable? OR who will be best placed to shoulder the liability?
 - Operator/Developer/Owner
 - Credit benefactor
 - Government } All of these
- How will Measuring, Monitoring and Validation be undertaken?

Risk and Liability Management

Options for risk and liability management

- Liabilities incurred during design, construction and operational phases can be covered by contract and traditional risk transfer (insurance)
- Long-term liabilities will be more difficult to manage due to the lengthy timeframes and lack of experience in estimating significance of intrinsic risks:
 - Release of CO₂ into the environment
 - Damage to “the climate”
 - “Value” of carbon credits
 - Public health
 - Ecosystems
 - Resource damage (aquifer and oil & gas reserves)
 - Cross-border issues
 - Leakage of CO₂ into other regions / countries



Use of insurance

CCS project insurances

Construction phase

- Contractors' All Risk
 - Fire and explosion
 - Natural perils e.g. earthquake, water inundation
 - Adverse weather conditions
 - Accidental impact
 - Defective workmanship or materials
- Marine insurance
 - Loss or damage to vessels
 - Transport of materials by sea
- Constructional plant
 - Damage or loss of construction equipment and temporary installations
- Professional Indemnity
- Third party liability



Use of insurance

CCS project insurances

Operational phase

- Third party liability
- Employer's liability
- Contractors pollution liability
 - Occurrence form
 - Third party property damage, bodily injury and environmental damage
- Carbon credit delivery guarantee
 - Technology performance
 - Delay in start-up
 - Physical damage
 - Monitoring and Verification Errors and omissions



Use of insurance

CCS project insurances

Closure and Post-closure phases

- Post-closure liabilities unlikely to be insurable due to very long time scales and uncertainty in predicting geological behaviour
- Proposed fund for long term measurement, monitoring and verification costs provided by operator

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