



Regulatory and Legal Issues: Development of an Enabling Legal Framework for Carbon Capture & Storage in the EU

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Impacts and risks to be managed

Capture

- ‘Global’ risk of CO₂ leakage from capture plant
- Accident hazard presented by presence of large volumes of pressurised CO₂
- Emissions of other pollutants to various media (SO_x, NO_x, waste (e.g. from scrubbing solvent))
- Impacts from increased fuel transport and production (e.g. increased mining)
- Any other concerns from construction and operation of the capture process

Transport

- ‘Global’ risk of CO₂ leakage from pipeline
- Accident hazard presented by presence of large volumes of pressurised CO₂
- Impacts of pipeline construction and maintenance on the environment and landscape



Impacts and risks to be managed

Storage

- Global risk of CO₂ leakage
- Above-ground siting, construction etc;
- Local EHS risks:
 - Effects of CO₂ release (asphyxiation and ecosystem impacts)
 - Effects of impurities
 - Mobilisation of metals or other substances present in the sub-surface
 - Physical effects: ground heave, induced seismicity, displacement of groundwater resources
 - Accident hazard posed by large volumes of pressurised CO₂



Elements required in a regulatory framework

- **Enforcement of risk assessment and management procedures, including standards on design, construction, operation and closure**
 - **Verification procedures to ensure consistent application of standards, in particular for storage site selection**
 - **Provision for termination of operations where severe problems are identified (and conditions on termination)**
 - **Arrangements for operator insolvency (for storage site)**
 - **Arrangements for any leakage that occurs**
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Practical approach in EU: managing the risks

Main issue is geological storage

(Capture and transport will largely fall under existing regulatory systems – outstanding issue is accident hazard from compressed CO₂ (SEVESO?))

Risk management framework for storage set out in IPCC Guidelines 2006:

- Model expected behaviour of CO₂, and only use the site if have demonstrated expected permanence of storage
- Monitor to check that CO₂ behaves as expected
- Seal and close when risks of future leakage insignificant.

How best to make operational?

- Inclusion in Emissions Trading TS monitoring and reporting guidelines
 - Further requirements:
 - Existing legal provisions (IPPC, EIA, SEA, SEVESO etc)
 - Waste legislation
 - Free-standing legal framework
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Inclusion in the EU Emissions Trading Scheme

- ETS is first line of incentivisation for CCS
 - Current view is that installation plus capture, transport and storage can be opted in together under Article 24
 - No additional allocation for capture, transport and storage
 - ⑩ Monitoring and reporting guidelines adopted by the Commission (on the basis of a draft prepared by the opting-in state), and verification arrangements made.
 - ⑩ Separate rules could be established for combustion+capture, transport, and storage, and could be generic where variation between projects is unlikely.
 - ⑩ COM must be satisfied with risk management and liability arrangements
 - ⑩ These must be consistent with the developing EU regulatory framework.
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Practical approach in EU: managing the risks

Issues covered by inclusion in the ETS

- Possibly, characterisation, selection, operation, closure and post-closure of storage site, on the basis that these are relevant for CO₂ containment
- Monitoring and reporting obligations for CO₂ – ‘chain of custody’ for CO₂ from source to storage

Issues still to be covered

- Local environment, health and safety risks
- Arrangements for operator insolvency
- Termination of operations in case of severe problems
- Arrangements for leakage?



Leakage

- Sites should be designed for zero leakage, but there must be clear responsibility for damage if leakage does occur.
- Should cover both local damage to the environment, and emissions credited under ETS which subsequently escape.
- Possible options:
 - Environmental Liability Directive for local damage?
 - Obligation to buy emission credits for any leakage?
 - Transfer of liability to state? Conditions?



Removing barriers

Water

- Problem: Article 11.3.j prohibits storage in aquifers, because it bans discharges into groundwater
- Solution: amend article to allow CO₂ storage in aquifers permanently unsuitable for other purposes.

Waste

- Currently, CO₂ storage probably counts as waste disposal because the substance won't be used again
- If the Landfill Directive applies, it prohibits CCS, because it bans injection of liquid waste to landfill
- Other issues such as CO₂ transport may also interact with waste legislation.
- Classification as waste limits regulatory options at Member State level (waste law has to be used; mining law is ruled out).
- Solution: if waste regime applies, assess whether it provides added value.
 - If so, remove any barriers to CCS.
 - If not, disapply.



Making CCS mandatory?

- **Target in Communication on Sustainable Power Generation from fossil fuels communication**
 - All new post-2020 must use CCS
 - All new prior to 2020 must be capture-ready and retrofit rapidly after 2020

- **Impact assessment**
 - What would we regulate: coal, gas, all fossil fuels, only large installations?
 - Cost of regulating?
 - Practicality of regulating?
 - Optimal retrofitting schedule for capture-ready plant
 - Effect on structure of energy market

Legal options for regulation

- IPPC, LCP, new legal framework



Summary

- Main issue for risk management is storage site
 - For capture and transport, accident hazard?
- ETS first option for regulation as well as incentivisation
- Supplement as necessary using existing legislation, waste legislation or separate framework
- Ensure responsibility for leakage is in place
- Making CCS mandatory?