GLOBAL CCS INSTITUTE

CHALLENGES IN COMBINING CCS AND CO2-EOR

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PROJECT OVERVIEW

‘Bridging the Gap’: Legal and Regulatory Study

- Component of wider EOR study undertaken by the Institute:
  - Economic, technical and commercial aspects underway;
  - Completion in late 2013.
- Legal and regulatory element considered present L&R regimes for EOR, as well as emerging models of CCS legislation.
- Focuses upon the ‘gap’ between the two regimes:
  - opportunities for incorporating A-CO_2 into EOR activities;
  - transitioning from EOR to full-scale storage activity.
- Study completed and final report to be released in June 2013.

LEGAL AND REGULATORY REGIMES FOR EOR

Commentary

- Law and regulations for EOR operations are well-characterised, particularly in the United States and Canada.
- CO_2 injections carried out under the auspices of existing legal and regulatory frameworks for extractive industries:
  - Permitting regimes for oil and gas operations;
  - Large body of case law in some jurisdictions.
- Elements of regimes are similar to those being developed for CCS operation, but clear distinctions remain.
- Historically, monitoring and verification activities are primarily applied to optimise oil production – not to demonstrate conformance or permanence of storage.

EXISTING LEGAL AND REGULATORY REGIMES

US Model

- Contractual and regulatory model in-place, which has evolved over a period of time
- State law governs a number of aspects of EOR operations:
  - Purchase and sale of CO_2; aspects of pipeline regulation; financial security; orphan wells programmes.
- Federal law – although largely administered by States – addresses:
  - Pipeline safety standards; CO_2 injection wells (Class II); exemptions under environmental liability legislation.
- Transitional model established under UIC/EPA rules:
  - EOR operators able to transition to new Class VI well;
  - Transition guidance still to be released by the EPA.

EXISTING LEGAL AND REGULATORY REGIMES

Canadian and European Models

- EOR regulated in Canada by both federal and provincial regulators:
  - Broadly similar to US model, but with several nuances;
  - Property rights key difference.
- Limited EOR operations in Europe:
  - EOR deployed in Hungary in the 1970s;
  - Operations regulated under existing oil and gas law and regulation.

EMERGING LEGAL AND REGULATORY REGIMES

Commentary

- CCS legislation proposed and increasingly adopted in many jurisdictions globally.
- Legislation focused in many instances upon emissions reduction objective, with potential for accommodating CO_2-EOR activities:
  - Opportunities for transition (US federal approach).
- Notable variations in approach between jurisdictions surveyed:
  - Stand-alone framework or piecemeal;
  - Waste management or commodity.

EMERGING LEGAL AND REGULATORY REGIMES

European developments

- EU Storage Directive establishes a detailed legal and regulatory framework for CCS.
- EOR activities included within the scope of the Directive if combined with the geological storage of CO_2 (Recital 20).
- Directive effectively recognizes that when EOR operations are combined with geologic storage, the CO_2 recycled during EOR operations remains in a closed loop.
- Transposition has seen variations in implementation of Directive;

  - UK approach to EOR under Energy Act 2008 (*Armeni, C., UCL-CCLP, United Kingdom Case Study Report, 2011).*

EMERGING LEGAL AND REGULATORY REGIMES

US Approach – federal and state initiatives

- Legislation aimed at facilitating and permitting CO_2 storage – particularly on integrating A-CO_2 into pre-existing EOR activity.
- Legislative activity at the state level addresses amongst other issues:
  - Preservation of title and treatment of CO_2 as a commodity;
  - Recycling or re-use of stored CO_2;
  - Ownership of the pore space;
  - Certification of CO_2-EOR as storage;
  - Standards for closure of a storage site;
  - Transfer of liability.
- Federal level: Class VI wells and Subpart RR Reporting.

CONCLUSIONS

Addressing the key challenges

- Potential for transitioning from CO_2-EOR operations toward pure storage operations:
  - perhaps intermediate stages of optimising EOR operations for increased A-CO_2 storage;
  - encourage deployment of CCS by leveraging-off EOR activities.
- Significance of an approach that considered the potential storage scenarios for CO_2 – activities and types of CO_2 utilised.
- Despite useful models and the development of pathways, several issues still to be addressed.

CONCLUSIONS

Identifying the pressure points

- Base storage during EOR operations:
  - Certifying CO_2 storage as secure and permanent storage
  - Verifying the volumes stored (US state examples)
- *Incidental* to *incremental* during EOR operations*:*
  - Possible changes where the aim is maximising storage
  - Benefits of GHG reductions?
- *Incremental* storage post EOR operations:
  - Property rights, MMV and issues of use and re-use.
- Legislation governing access to infrastructure.
- Post-closure responsibility and liability requirements.

CONCLUSIONS

Finding a way forward

- Report identifies some principal points of contention likely to require particular focus in any jurisdiction seeking to integrate the CO2-EOR storage option into a broader policy for promoting CCS:
  - Recycling and re-use of injected CO2
  - Agreement on the scope of liability
  - Monitoring requirements
  - Competitive disadvantages

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