

# **CO<sub>2</sub> Pipeline Transportation Health and Safety Regulation**

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# Pipeline transport of hazard materials



- Over 22,000 km of pipelines designated as ‘major accident hazard pipelines’ in the UK alone
- 6,800 km of high pressure natural gas pipelines in the UK
- Risks controlled;
  - pipelines designed, constructed and operated to appropriate standards
  - land use planning controls around pipelines
  - emergency response



## Experience of handling CO<sub>2</sub>

- CO<sub>2</sub> Enhanced Oil Recovery (EOR) first applied in Scurry County, Texas in 1972 and has used successfully throughout the Permian Basin.
- Various storage projects
  - Statoil's Sleipner project in the North Sea (1996)
  - BP/Sonatrach/Statoil's In-Salah project in Algeria (2004)
  - StatoilHydro Snohvit project (April 2008)
  - Pilot storage projects at Frio (Texas), Otway Basin (Australia) and Nagaoka (Japan)
- CO<sub>2</sub> pipeline transportation an established practice
  - 3,000 miles of CO<sub>2</sub> pipelines in the US

# Scaling up

- IEA estimates 6Gt CO<sub>2</sub> pa could be captured and stored by 2050<sup>1</sup>
- **That is the equivalent of approximately 6000 Sleipner projects.**
- We need to consider the impact of significant pipeline networks:
  - transporting CO<sub>2</sub> close to or above its critical pressure as a dense phase fluid
  - transporting ‘impure’ CO<sub>2</sub> captured from multiple sources
  - transporting CO<sub>2</sub> through densely populated regions to storage sites.

Notes

<sup>1</sup>IEA June 2006, Energy Technology Perspectives Scenarios and Strategies

## Controlling the risks

- How should we regulate the safety aspects of large scale, high pressure CO<sub>2</sub> transport?
- How can duty holders demonstrate compliance?

# Challenges

- To adequately assess the risks we need to be able to:
  - anticipate foreseeable accident scenarios and;
  - accurately predict the consequences of these hazardous events.
- To adequately control the risks we need to develop and apply appropriate standards for
  - pipeline design, construction and operation etc.
  - land use planning controls
  - emergency response arrangements

