



A Perspective on Regulatory Developments and Public Perception

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2013 Taiwan CCSU Forum

Taipei, Taiwan

6th to 7th August 2013

www.ieaghg.org

Opening Remarks



- Regulations needs to address the public concerns with regard to CCS
- The main public concern is safety:
 - Induced seismicity
 - Damage to land/property
 - Affect on value of residence
 - Crop damage
 - Some of which can be addressed by compensation!!
- Most issues are local not global



Main areas of concern



- The primary issue is geological storage and the well infrastructure
- Then transportation via pipeline
 - May be an issue in waiting
- There is limited concern with capture and compression
 - Generally within the site boundary and no public contacts



On-shore versus offshore

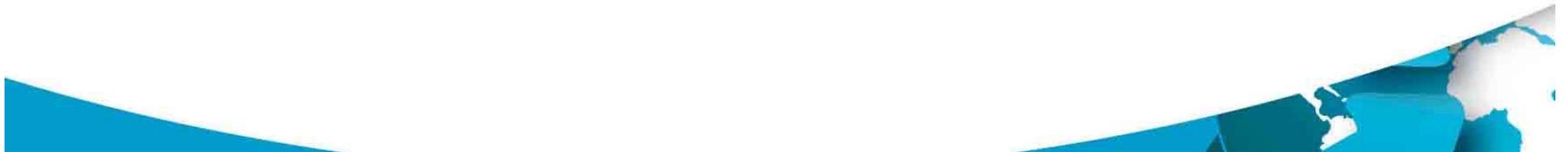


- The public perceptions issues have mostly all arisen with onshore projects:
 - Barendrecht in NL.
 - Disused on-shore oil field
- Only Japan has faced issues with public concern from the fishing lobby re offshore storage.
- Longannet project the concerns related to pipeline leakage
- A generalism - offshore storage will be easier to achieve than on-shore
 - Definitely so in Europe
 - North America all current projects are on shore

Regulatory framing for CCS



- A good regulatory framework should help build public confidence
- Focus on ensuring safety
- Not overly prescriptive
- Flexible to build in new knowledge



Principles from London and OSPAR



- CO2 stream impurities
 - “CO2 streams consist overwhelmingly of CO2. May contain incidental associated substances.” “Concentrations should be related to potential impacts on integrity of storage and transport...”
- Requirement for Risk Assessment and Management, to include:
 - Monitoring plan
 - Mitigation and remediation plan
 - Site closure plan
 - After closure, monitoring continue until probability of adverse environmental effects reduced to insignificant level.



London and OSPAR Guidelines for Risk Assessment and Management



- Scope – scenarios, boundaries
- Site selection and characterisation – physical, geological, chemical, biological
- Exposure assessment – characterisation CO2 stream, leakage pathways
- Effects assessment – sensitivity of species, communities, habitats, other users
- Risk characterisation – integrates exposure and effects - environmental impact, likelihood
- Risk management – incl. monitoring, mitigation





EC Draft CCS Directive

Enabling regulatory framework to ensure environmentally sound CCS (23 Jan 2008)

- Follows IPCC GHG Guidelines and OSPAR
- Objective is permanent storage
- Permits will be required for CCS
- Permit only if “no significant risk of leakage”
- Emphasis on site selection, characterisation, risk assessment, monitoring
- Corrective measures
- Financial security required from operator
- Liability transfer to regulatory authority “when evidence indicates contained for indefinite future” – only then may monitoring reduce or cease
- Removes regulatory barriers in other Directives – IPPC, Waste, LCPD, Water, EIA, ELD
- Capture-ready



Regulatory lessons learnt from CCS

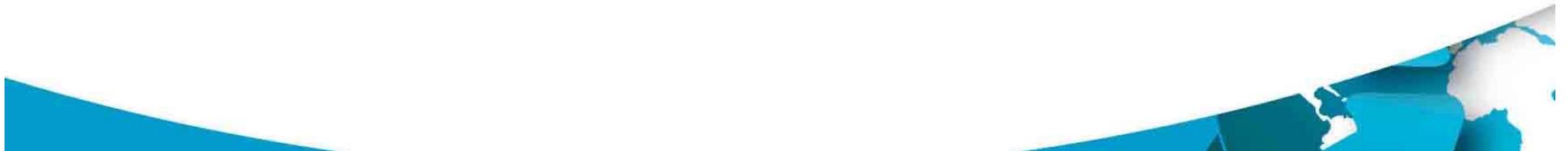


Regulatory principles for CCS to ensure environmental integrity:

- Site-by-site assessment
- Risk assessment
- Site characterisation and simulation, supported by monitoring
- CO₂ stream impurities determined by impacts on integrity

Development of regulation:

- Use the technical and scientific evidence base
- Learn from existing regulatory developments
- Benefit of having real projects to drive and test regulations



Induced seismicity in Regs?



- New issue since regulations developed
- Should be considered in risk assessment framework
- National Academy of Science in USA
 - Report on Induced Seismicity Potential in Energy Technologies published 2012
 - 3 major findings:
 - Hydraulic fracturing for shale gas – not significant risk of IS
 - Disposal of waste water – some risk, but few documented IS events
 - CCS - potential for larger events due to large injected volumes
 - Suggested risk assessment protocol necessary for CCS



So Will Regulations Change Perceptions?

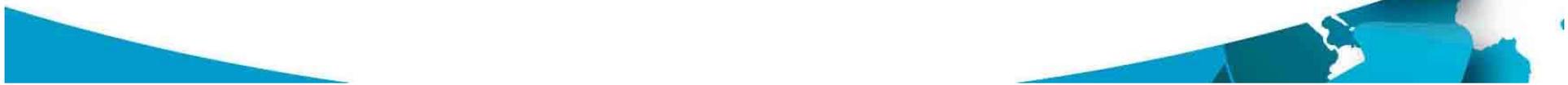


BURIED TROUBLE

saying "no to CO₂," are just one roadblock facing carbon sequestration — a strategy that could help prevent dangerous climate change. **Richard Van Noorden** investigates.

Injecting 400,000 tonnes of carbon dioxide shopping mall was always going to be a tough sell, so it proved when the Dutch minister of economic affairs, Maria van der Hoeven, came to Parliament in December to explain why she had rejected the proposal, made by the petro-

investors are uncertain about its viability at large scale. "There is lots of research and lots of talking, but little real progress," says Hilco de Coninck, who works on climate change at the Energy research Centre of the Netherlands. "That slow pace is especially hard on the strategy has a limited life."



So what do we need to do?



- Understand what the public wants to know to allay concerns
 - IEAGHG study on key messages for communication to key stakeholders
 - Briefing notes and Information Papers
- Develop best practise on how to deliver these messages to address public concerns.
 - IEAGHG Social Science Research Network



Communication Needs for Key Stakeholders



- CO₂: What is it?
 - Asking general public to remember science lessons from years back... need to start with basics.
- CCS... what's that?
 - Great variety of knowledge, location specific
 - Need to fill gaps
- Common concerns:
 - Environmental impact,
 - Leakage & monitoring,
 - Health & safety



Briefing Note Topics



- What is CO₂?
- Setting the Scene for CCS
- Brief history of CCS
- Source-store matching
- How is CO₂ captured
- Costs of CCS
- Infrastructure needs
- Natural CO₂ sources
- Storage & site integrity
- Impacts of leaks onshore
- Impacts of leaks offshore
- Monitoring
- Legal issues
- Public Opinion



Social Science Research Network



- Aims:

“To foster the conduct and dissemination of social science research related to CCS in order to improve understanding of public concerns as well as improve the understanding of the processes required for deploying projects”

- Steering Committee

- 10 people from 8 countries
- Chair – Peta Ashworth, CSIRO, Australia

- 3 meetings held to date



Conclusions to date

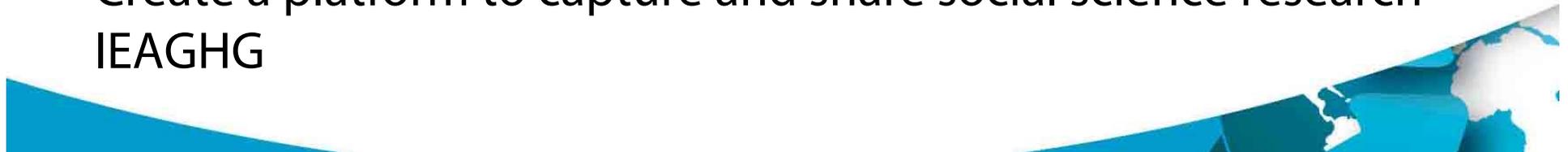


- We now know how to do public engagement for CCS and role of different actors
- Perceptions of CCS more powerful than knowledge, but knowledge does play a role in shaping attitudes
 - Important to discuss CCS in the broader context of energy, climate change and provide knowledge on the basics e.g. CO₂ properties.
- Much has been done, and though more research needed, it is important that lessons are being used and applied
 - Translation is needed of social science research, particularly from scientists to policy makers
- Care is needed to debunk myths, and avoid misinformation
- Host community compensation is no panacea but it can help prevent or solve facility siting controversies
- Social science research is similar to geological research on CO₂ storage, as it is site specific, and more sites are needed to develop understanding.

Recommendations



- Encourage exchange of information on new research
- Need more sites
- Further multidisciplinary social science research, bringing other dimensions of social science together on key issues such as risk communication, community compensation.
- Need for more applied research on sites with monitoring experiences to assess development of perceptions and attitudes as projects develop
- Apply the research results through translation and dissemination across cultures, and monitor.
- Promote energy literacy
- Create a platform to capture and share social science research – IEAGHG



Public Perception of CO₂ Pipelines



- **Public perception of CO₂ pipeline transport has received little attention in research so far**
 - No direct experience of large pipelines in EU
 - Experience in USA/Canada – but how well does this translate globally
- **Appropriate time for IEAGHG to consider public perception of CO₂ pipelines**
 - Understand & address people's concerns to avoid project delays/cancellations
 - Translate experience from existing NG & CO₂ pipelines
 - Assist in building public awareness campaigns/tools
 - Explore how extension of existing pipeline systems might be perceived



Summary



- Regulations will go some way to address public concerns on CO₂ storage
 - Don't underestimate CO₂ pipeline issues
- Need to address key concerns
 - Briefing Papers and Information Sheets
 - Free to organisations globally to translate into national languages
- Need to start public consultation early in project
- Most issues will be local in nature
- Get locals on board from outset and monitor though out





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- Call for papers 27th September 2013
- Deadline for abstracts 10th January 2014
- Registration opens 7th March 2014
- Authors notified 2nd May 2014
- Early bird closes 13th June 2014



Thank you, any Questions?

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