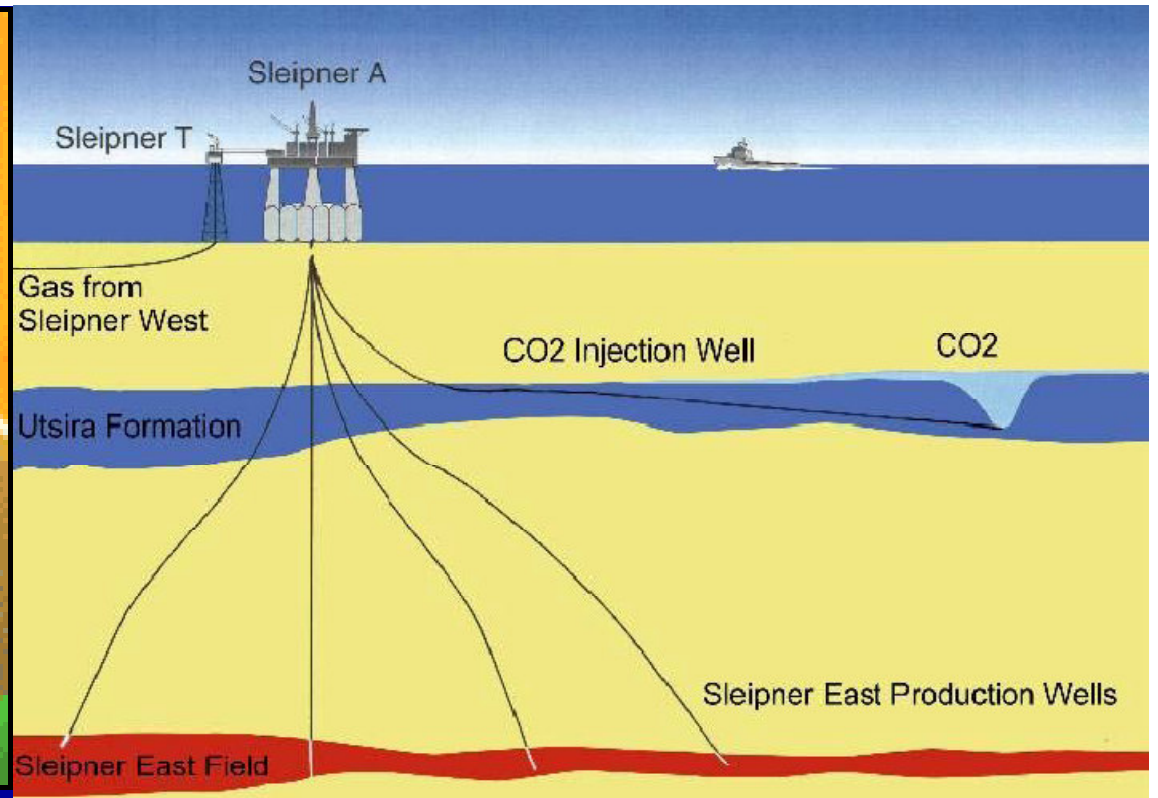


Carbon capture
has arrived...



Challenges in Communicating Carbon Dioxide Capture and Storage

David M Reiner
Judge Business School

8 September, 2009

Why Should We Worry about Public Communications?

- Importance of images and the need to construct compelling storylines
- Impacts of myths, uncertainties and (mis)apprehensions
- Impacts of trust on siting or subsidies when communicating complicated technical issues



Chancellery, Berlin, 25 March, 2009

Dangers of Getting It Wrong

- “If they will really follow through on this ridiculous plan, I will definitely move,”
 - “Anne” from Barendrecht
- “It would be a pity if such a test does not proceed because of local opposition. I am very concerned”
 - Environment Minister Cramer

Barendrecht Carnisselande



'Saline Formations' or Aquifers?

- **Q** A lot of local residents would like to know, “Why do we have to learn all this under Barendrecht?”

A When the government asked us to find affordable demonstration projects that can be executed quickly, we looked for an existing source of pure CO₂ that had potential storage nearby. [...] We then had to decide whether to store in an underground saltwater deposit known as an aquifer or in small, depleted gas fields. As there is a lot of geological knowledge about gas fields and not an awful lot about aquifers, and because ground water moves but natural gas has been stored in the gas field without moving over millions of years, the natural choice was to store in gas fields.

Digging Deeper

- **Q** But what is there to be learned under Barendrecht?

A CCS is a safe technique in itself, and it will be carried out with so many safeguards that it can be used anywhere, even in residential areas. This is what we want to prove with Barendrecht. The fact that it is a very small project is an advantage, since its first stage will be completed in three years and all learning points will have been demonstrated and proved, at a reasonable cost. After that, it is time to start on big projects, both on land and under the sea.

- Margriet Kuijper, Shell Manager of Carbon Capture and Storage Projects and Studies, *Oil Voice*, 27 July 2009

Voices of Opposition

- “If they try to do this on my land then the police will have to come and drag me away,” **Asger Møller Madsen, Jutland, Denmark**
- "Shell is calling it a demonstration project, we think its a trial. And with a trial, in the end, things can go different than based and expected on model calculations. Why should you take that risk in a dense populated area?
Simon Zuurbier, Barendrecht Alderman
- "If there's a leak and you have a 1- to 2-meter-high level of CO₂, every animal, every human being within this zone will die," **Stephan Klose, Brunsbüttel, Germany**

Voices of Opposition II

- Greenville, Ohio is the proposed site of one of the 7 large-scale CO2 Sequestration Demonstration projects - to pump 1 M tons of CO2 into the saline aquifer - AND it is one of the areas that sits on top of a **Sole Source Aquifer** - an even greater reason consider the risks involved with burying supercritical CO2 underground FOREVER! One of the most important aquifers, in regards to contamination is a Sole Source Aquifer. The contamination of any aquifer, not just sole source aquifers, greatly effects surrounding communities. The Great Miami Aquifer, that Greenville is part of, is one of the nation's LARGEST drinking water aquifers
- <http://citizensagainstco2sequestration.blogspot.com>



Opposition Tactics

- Formal NGO opposition has been relatively minor
- Into the void, opposition has been more “grassroots”, creative and focused on opposition to coal
- Many opponents will focus on local siting issues and tap into more general concerns over NUMBY

WARNING

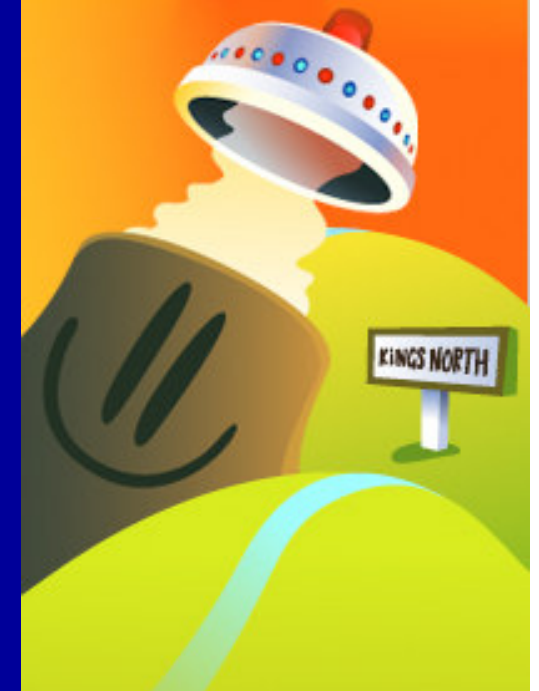
Unproven technology

Will increase the UK's emissions by 5%

CSS may never work

Enormous implications for the UK's ability to meet promised emissions reductions targets

Coal-fired power stations undermine the UK's leadership position on climate change



Reactions to PR Campaigns



Engaging the Public on a Budget: Using Humour, Creativity, Imagery

ev-eon
Generally Carbonated Water

**Bottled
CO₂**

**Keeping YOU
& our planet
COOL!***

***just don't burp, breath or
pass wind, otherwise you
may cause climate change.**

<http://ev-eon.com/>

Early Lessons from One of Our Projects

- FENCO-ERA project on “Scrutinizing the impact of CCS communication on the general and local public” funded by six European governments
- Comparative study in each country on the effectiveness of CCS communication using focus groups and an individual Information-Choice-Questionnaire survey

The Fenco Team

Germany

Forschungszentrum Jülich GmbH

Wuppertal Institute for Climate

Greece

Centre for Research and Technology Hellas

University of Macedonia, Economic and Social
Sciences Department

Netherlands

Leiden University

Norway

Stiftelsen SINTEF

UK

British Geological Survey

University of Cambridge

Romania

National Geology and Geoecology

Institute for Studies and Power Engineering

National School of Public Administration

Structure of Focus Groups

- Designed for three groups of 10-12 from a mix of age, gender, occupation, education
- Expert presentation in four parts: General intro to climate change, Intro to CCS, Technology 1 and then Technology 2
- Focus group discussions held without expert present facilitated by external moderator
- Detailed individual questionnaire administered immediately after session

Two Technology Options

- Technology 1 – Cluster of Four Coal-Fired Power Plants with CO₂ Capture and Storage’
 - 1000 km of onshore pipeline
 - Taken offshore by pipeline to a well characterised aquifer with 350 years of storage available
- Technology 2 – One Gas Turbine Power Plant with CO₂ Capture and Storage’
 - Essentially zero onshore pipeline
 - Taken offshore by pipeline to less well known field that can store at least a lifetime’s worth of CO₂

Focus Group Findings: Climate Change

- Concern with information overload – often ignore climate stories but feel uneducated and find it difficult to know how to combat it.
- Concern by some that media hype portraying global warming as a ‘disaster’ was exaggerated.
- Public response felt to be quite slow because of absence of “real damages”
- More focused on shorter term issues that might be of direct concern such as terrorism “**look for tomorrow rather than one hundred years from now**”

Focus Group Findings: CCS

- General agreement that CCS technology was a good 'stop gap' measure, in order to buy time to develop viable renewable technologies,
- The group expressed worry that storing CO₂ could not be secure, and it could leak out: "it's like when you tidy your room quickly and you push things under the bed until you run out of space and it all spills out... later there'll be trouble".
- Many felt that implementing CCS technology could prove difficult due to NIMBY attitudes
- Overall preference for either a global effort to initiate CCS, or a global effort using an alternative technology, rather than simply implementing CCS in the UK,

Focus Group Findings: Technology 1

- Concern that if only 99% of CO₂ injected retained over 1000 years after 1000 years leaks might intensify global warming
- Major concern was rising energy bills, particularly the elderly felt less able to cope with price rises.
- UK not self sufficient in coal, so prices could also be volatile, Technology was also seen as having benefits if UK mines were to reopen, particularly important in our current economic climate: “it’s a money making exercise, everything is in life”.
- Concern over whether or not the government would inform us if there were any leaks and maintain funding for monitoring
- Preferable to invest in technologies more effective in the long- term, such as renewables. Technology could buy us time to research other options “best of a bad lot”.

Focus Group Findings: Technology 2

- Overall the aquifer in was viewed as less well researched, and therefore not as safe as technology 1
- Many preferred shorter pipeline, but overall option seen as less desirable because of lower volume of CO₂ abated and smaller project creates fewer jobs
- Significant worry over price volatility (read Russia) subjecting ourselves to “**economic terrorism**”

General Themes Emerging

- Discussion of extreme risk aversion of British public regarding any new technology
- Concerns over possibility of terrorism
- Concerns over implications for food chain
- Emphasis on actions of other countries such as China, Russia
- Aquifer discussion highlighted uncertainty avoidance
- “Love affair” with advanced technology perceived as one of major challenges to reducing emissions so general support that changing supply was more realistic

Questionnaire Results

- Technology 1 (cluster of 4 coal plants) judged far more favourably than Technology 2 (1 natural gas plant) but sizable minority opposed both
- Variation across groups in response to 15 questions testing information retention from session although almost all understood aquifer lifetime issues
- Widespread misperception in one group that Tech 2 costs were higher

General Conclusions

- Public is largely unaware and attitudes are mixed
- Little effort to develop public communications materials. Opposition to Coal/CCS in Germany, Denmark, Australia, Netherlands, US and elsewhere has come from small grassroots organisations (or activated individuals) with little support from mainline NGOs
- Window of opportunity to develop materials before first projects commissioned has largely been wasted

Thanks!

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