

Perspectives on CCS

Public awareness, knowledge, perceptions
and strategies for engagement



Energy Research Centre of the Netherlands (ECN)

- Policy studies: one of many units, only non-technical
- Adviser Dutch government and EC on energy policy issues
- Multidisciplinary team of researchers.

Research areas: socio-technical innovation, energy end-user behaviour, social acceptance of new energy technologies, public perceptions on new technologies.

Research on CCS

- CATO II: Dutch national R&D programme that included social-psychological research on perceptions
- NearCO2: European FP7 research programme
Cambridge Judge Business School; Tyndal Centre Manchester; Fraunhofer Institute; Ciemat; IEEP (Institute for European Environmental Policy); ECN
- Previous projects: CREATE ACCEPTANCE (FP6)

Table of Contents

1. Public perceptions: understanding key factors affecting public perceptions; trends in perceptions over the years
2. Social acceptance: understanding what affects opinions and attitudes regarding specific projects
3. Implications of this research for communication and engagement approaches in CCS projects

1. Social psychological research: public awareness

**Marjolein de Best-Waldhofer, Suzanne Brunsting, Mia
Paukovic (ECN)**

- 21Minutes survey (2009): Topics Dutch are most worried about; Environment 12th highest ranked, climate change 14th highest ranked

Public awareness of new technology: CCS

Low awareness in Australia, USA, Japan, Canada, UK, Sweden, France, Germany, the Netherlands:

Between 4% and 29.9% can give some kind of answer as to what CCS is.

(Ashworth et al, 2006, 2009; de Best-Waldhober et al, 2006, 2008; Ha Duong et al, 2009; Itaoka et al, 2008; Reiner et al, 2006; Sharp et al, 2006)

- Dutch representative sample in 2009: “Do you know of CO₂ capture and storage (CCS)?
 - 50% never heard of
 - 45% a bit
 - 5% claims to know quite a bit

Public awareness of new technology: CCS

- Dutch representative samples in 2004, 2005, 2007, 2008:
Hardly increase in awareness over time

Knowledge

The general population does not know much about CCS, but a substantial percentage also does not know that:

- CO₂ is a greenhouse gas.....38,9%
- 95% of energy used in NL comes from coal, gas or oil.....50,7%
- generation of electricity from natural gas leads to emission of CO₂42%

Pseudo opinions

Have you heard of large, modern coal fired power plants where CO₂ is captured and stored underground?

- -no (not heard of) **68%**
- -a little 28%
- -yes 4%

Can you give this technology a grade?

- “No opinion” **27%**
- gives a grade 73%

Measuring public opinion on an unknown technology

- Many researchers inform their respondents
 - In surveys with information to read or to evaluate
 - In focus groups with experts explaining
- Both difficult and time consuming
- Risk of bias

Information-Choice Questionnaire (CATO II)

Marjolein de Best-Waldhofer, Mia Paukovic, Suzanne Brunsting

- Policy problem
- Information on policy problem and on consequences of policy options
- Decision aid

Results from the extended ICQ

- Evaluation of CCS was similar to results from the 2007 survey (N=1000); people were on average slightly negative about CCS and most people neither chose it as their preferred option nor rejected it.
- Results from the post-survey interview revealed:
 - More than half is still concerned about the safety of storage, because of
 - perceived risks
 - perceived uncertainty and lack of knowledge among experts.
 - Other remaining concerns were: hassle and safety pipelines, dislike use of fossil fuels, CCS is ‘dirty’ and complicated.
 - Questions remaining were: safety of storage, economic implications, project plans.

Focus groups (NearCO2)

Paul Upham and Thomas Roberts (and NearCO2 partners)

6 focus groups (UK, the Netherlands, Poland, Germany, Belgium and Spain).

Findings:

- commonality in opinion and concerns across the six countries
- majority of the participants: unfamiliar with the concept of CCS
- Majority: sceptical of information that they consider originating from industry or government
- Concerns: not allayed by the information provided.

Focus groups (NearCO₂)

Findings:

- Evidence of a shift from initial uncertainty about CCS to negative positions
- CCS was generally seen as an uncertain, end-of-pipe technology that will perpetuate fossil-fuel dependence.
- The participants were far from convinced that CO₂ can be stored securely for thousands of years.

Important lesson for communicating information about CCS: need to improve the level of trust between the general public and the key advocates of CCS, namely government and industry.

2. Research on social acceptance

What happened in Barendrecht?

Suzanne Brunsting, Ynke Feenstra, Tom Mikunda



Common Project Development: Decide-Announce-Defend

- Focus on permitting procedure
- Concerns addressed as legally required
- ‘Powerless’ opponents
- No discussion of alternatives/adaptations
- Information/persuasion, no participation
- Increasing public opposition
- Project delay
- Deadlock

Deadlock: Proponents vs Opponents



3. Implications for engagement and communication in CCS projects

- Case of Barendrecht and other cases (in 4 countries) in NearCO2 project
- Findings earlier work and case studies
- Lessons learned from CREATE ACCEPTANCE project

Social psychological research conclusions:

- Substantial part of the Dutch is unaware of global warming and energy transition.
- Substantial uncertainties exist in people's knowledge
- Uninformed opinions are hardly predictive of public opinion
- Stakeholders such as Shell, Greenpeace, research institutes, government, can reach consensus on information regarding consequences of options
- Opinion after information is based mostly on information, but not completely
- After valid and balanced expert information, most people are enthusiastic about efficiency, wind and biomass, but not so enthusiastic about CCS
- Communication can remove several uncertainties but some remain
- Awareness CCS in general population is slightly increasing
- This increase does not match the steep increase in media attention for CCS

Lessons:

Communication and Information

- Project developer shouldn't assume certain level of knowledge
- Communication needs to address wider themes of climate change, energy transition, not just CCS
- Need for more information about safety
- Communication should fit the information needs of diverse target groups (address concerns)
- Use of appropriate communication channels

Lessons:

Timing

- many uninformed people, subject to ‘manipulation’
→ early engagement, before polarization

Trust

- need to enhance trust between the general public and the key advocates of CCS, namely government and industry
- trust in information source → articulation of diverging views; collaborative information provision
- build trust through transparent process

Furthermore..

Is this specific for CCS?

- No: similar debates and controversies elsewhere
- Main concerns might be different: with CCS concerns about risks
- Public opinion on CCS is no predictor of local opinion regarding a specific project
- For any infrastructure development, *most* local stakeholders are 'conditional supporters'
- The process of engagement should address these conditions for these can be negotiated.
- Cost-benefit sharing mechanisms!

ESTEEM tool for CCS

- A tool to facilitate the proces of engaging local stakeholders in the project planning and development of energy projects.
- Lessons that are not yet part of the tool will be added to make it more suitable for CCS projects

Next steps in NearCO2 project:

- Translate lessons into useful practical tools for CCS project developers
- Learn more about project developers' considerations
- Generate policy recommendations

Results available: summer 2011



Near CO₂

Participation and communication
near CO₂ capture and storage operations

NearCO2 project website:

<http://www.communicationnearco2.eu/home/>

Thank you

Sylvia Breukers: breukers@ecn.nl