



Risk Perceptions of Carbon Sequestration

Gabrielle Wong-Parodi

October 28, 2008

BSCSP 2008



UC Berkeley

What do we need to know to successfully deploy carbon sequestration?

- **Technology validated**
- **How to regulate (process and injection)**
- **General public perceptions**
- **Host community perceptions**

Why are understanding perceptions important?

Public acceptance of large-scale infrastructure is a *necessary* component for technology adoption



(Fruedenberg and Pastor 1992; Beirele 1999; Shively 2007)

How do we figure out what are people's perceptions of sequestration?

Methods	Interview, focus groups	Survey
Question	What does it mean to host a carbon sequestration project?	Are you in favor of carbon sequestration?
Sampling	Non-probability	Probability
Strength	Valid (true for the participant)	Generalizable and reliable (scale-up to general population)

How should information be presented to participants?

Lessons learned from Risk Communication Theory:

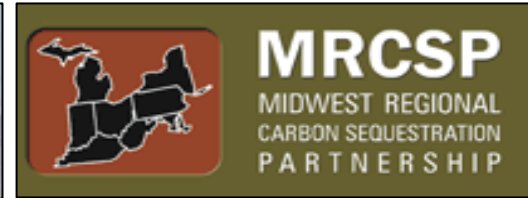
- Description of technology is based on a systematic expert model
 - Reflect interdisciplinary scientific literature
- Technical information presentation is based on formative research with members of target population
 - Use language that lay people understand
 - Characterize relevant gaps and misconceptions

(Mental Models Approach described by Lauren Fleishman, RECS 2008)

What does the general public think of sequestration?

- A majority of the public:
 - has a low level of awareness and understanding of tech ^{1, 2, 3, 4, 5}
 - does not make the connection between tech and global climate change ⁶
 - is negative ^{6, 7} to slightly positive ^{2, 4, 5} about the tech
- Public opinion changes after providing information on CCS
 - With more information, surveys find decreased support for tech ^{7, 8}
 - The public may be more accepting when information
 - focuses on the relative benefits of tech (relative to other low-carbon technologies) ^{2, 8}
 - is provided by sources that are perceived as more credible ^{9, 10}
 - is consistent with the perceived goals of the communicator (source) ^{9, 10}

What do host communities think of sequestration?



- Qualitative methods –focus groups and interviews in host communities in California, Ohio, Texas, New Mexico and Washington DC [jointly developed focus group protocol]
- Findings – In all cases, **social factors**, such as existing low socioeconomic status, desire for compensation, benefits to the community and past experience with government *were of greater concern than concern about the risks of the technology itself.*

Based on these data, key management questions for the public are:

- How can we have a say in what happens? Who is in charge? Will the process be fair and will anyone listen to us?
- What will happen if something goes wrong? Can we trust the project developers and the government to take care of any problems—what have our previous relationships with these entities shown us?
- What is the benefit to our community? How does the proposed project fit into or improve our way of life?

Conclusions

– General public:

- The public wants to talk about tech in comparison to other low- and no-carbon technologies as part of a low-carbon energy portfolio ^{1, 5, 7}
- To make more informed decisions, they need to know comparative costs of tech and other carbon reducing technologies

– Host communities:

- Social site characterization should be done alongside a technical site characterization
- Site specific communication/negotiation/compensation strategies should be adopted that address the community's perception of the risk and its history

References

1. Ashworth, P, Littleboy, A, Pinsarski, A, Beath, A & Thambimuthu K. *Proc. of the 8th Int'l Conference on Greenhouse Gas Control Technologies. Trondheim, Norway. June 22, 2006.*
2. Curry, T, Reiner, D, Figueiredo, M & Herzog, H (2005). "A Survey of Public Attitudes towards Energy and Environment in Great Britain". MIT LFEE 2005-001 WP. Found online: http://sequestration.mit.edu/pdf/LFEE_2005-001_WP.pdf
3. Daamen , D, De Best-Waldhober, M, Damen K, & Faaij A.. *Proceedings of the 8th Int'l Conf. on Greenhouse Gas Control Technologies. Trondheim, Norway. June 21, 2006.*
4. De Best-Waldhober, M, Daamen, D & Faaij, A. *Proceedings of the 8th International Conference on Greenhouse Gas Control Technologies. Trondheim, Norway. June 22, 2006.*
5. Sharp, J. (2005). "Public Attitudes Toward Geological Disposal of Carbon Dioxide in Canada". Report No. 384, Simon Fraser University ,148 pp.
6. Renner, D, Curry, T, Figueiredo, M, Herzog, H, Ansolabehere, S, Itaoka, K, Johnsson, F, & Odenberger, M. (2006). *Environ. Sci. Technol.*, 40, 2093 -2098.
7. Palmgren , C., Morgan, G., Bruine de Bruin, W. & Keith, D. et al. (2004) *Environ. Sci. Technol.*, 38, 6441-6450.
8. Itaoka, K, Saito, A & Akai, M. *Proc. of the 7th Int'l Conf. on Greenhouse Gas Control Technologies. Vancouver, Canada. September 2004.*
9. Terwel, B, Harinck, F, Ellemers, N, & Daamen, D. *Proceedings of the 8th International Conference on Greenhouse Gas Control Technologies. Trondheim, Norway. June 22, 2006.*
10. Ter Mors, E, Weenig, M, Ellemers, N & Daamen, D. *Proceedings of the 8th International Conference on Greenhouse Gas Control Technologies. Trondheim, Norway. June 22, 2006.*

Thank you

- **Professor Isha Ray (UC Berkeley)**
- **Professor Alex Farrell (in memoriam)**
- **Lauren Fleishman (CMU)**
- **Work supported by the University of California Energy Institute and the Westcoast Regional Carbon Sequestration Partnership**
- **Sarah Wade and Judith Bradbury (MRCSP); Tarla Rai Peterson (SWP)**

Contact information

Gabrielle Wong-Parodi

310 Barrows Hall, UC Berkeley

Berkeley, CA 94720

gwongpar@berkeley.edu

510-642-1640