The potential of host community compensation in CCS facility siting

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Background

- Local public opposition is an obstacle to siting facilities such as power plants, wind farms, prisons and other instances of ‘locally unwanted land use’ (LULU) (see O’Hare et al., 1983; Schively, 2007)
- The siting of carbon capture and storage (CCS) facilities is no exception in this regard (e.g., Terwel et al., 2012)
- Local costs versus non-local benefits
- Host community compensation may help to adjust this imbalance and help to prevent or resolve (CCS) facility siting controversies
Host community compensation

- Host community compensation can be defined as a form of equity adjustment aimed at correcting imbalances between regional benefits and local burdens associated with the siting of new or expanded facilities (Himmelberger et al., 1991)

- Compensation measures may be used to… (Carnes et al., 1982):
  - …mitigate potential problems resulting from the construction or operation of a facility (e.g., property value guarantees)
  - …compensate for (actual or perceived) cost incurred in the case of an incident (e.g., contingency funds)
  - …reward the local community for assuming risks and costs to meet non-local need (e.g., the improvement of local infrastructure)
Compensation and CCS

- The potential of offering host community compensation in the context of CCS has been explicitly and implicitly recognized in the literature (e.g., Brunsting et al., 2011; Kuijper, 2011)
- However, to date, there is no empirical research that has examined the effectiveness of host community compensation in a CCS setting. CATO-2 research aims to fill this gap
- First step: a review of the effectiveness of host community compensation in the broader facility siting literature (as discussed in Ter Mors et al., submitted to IJGCGC)
Review: factors influencing the effectiveness of compensation

- Monetary versus non-monetary compensation
- Perceived risk of the facility
- The size of the compensation offer
- Initial local opinions about proposed facilities
- Expansion versus greenfield sites
- Community versus individual compensation
Monetary versus non-monetary compensation

- Some studies suggest that direct monetary payments to individuals can increase facility acceptance (e.g., Bacot et al., 1994; Groothuis et al., 2008)

- A more common finding is that:
  - Monetary compensation does not lead to a substantial increase in local support for proposed facilities (e.g., Claro, 2007; Ferreira & Gallagher, 2010; Frey et al., 1996)
  - In-kind or public goods compensation is better received and considered more appropriate than offering cash to individuals or host communities (e.g., Claro, 2007; Kunreuther & Easterling, 1996; Jenkins-Smith & Kunreuther, 2001)
Example: Claro (2007)

- Siting of a sanitary landfill with local impacts (i.e., 600 trucks per day and some bad smells during rainy periods)
- Experimental study: monetary compensation versus public goods compensation versus no compensation (control condition)
- Willingness to vote in favor of the project (percent of respondents voting ‘yes’ to the landfill becoming reality)
  - monetary (6.5%) < no compensation (10.5%) < public goods (14.9%)
- Perceived appropriateness of the compensation offers (1 = very inappropriate, 4 = very appropriate)
  - monetary compensation ($M = 2.09$) and no compensation ($M = 1.89$) < public goods compensation ($M = 3.06$)
Why do people respond more favorably to non-monetary compared to monetary compensation?

- **Bribe effect**: “a negative feeling that appears within individuals as soon as they are offered money to accept a [...] facility within their community” (Claro 2007, p. 91). Occurs when people feel they are being bought of and/or perceive that (morally) inappropriate trade-offs between risks to health or safety and cash payments are being made.

- **Crowding out of public spirit hypothesis** (Frey et al., 1996): the intrinsic motivation of individuals to act out of civic duty or public spirit is diminished by (financial) compensation and thus may crowd out local support for siting the facility.
- **Cognitive demand explanation**: people may find public goods a more relevant and easier trade-off than cash.

- **Mitigation explanation** (Mansfield et al., 2002): public goods compensation may mitigate (i.e., ‘fix’) the physical and psychological detriments inflicted on the community by the public harm (more so than monetary compensation)
  - E.g., additional health clinics in response to increased health risks
  - E.g., the built of a community centre to restore neighborhood image
Perceived risk of the facility

- The effectiveness of compensation in facility siting may be limited when it comes to facilities that the public regards as particularly risky (e.g., Jenkins-Smith & Kunreuther, 2001).
- When people are concerned about the facility creating severe risks to health, safety, or the environment, compensation offers may be more effective when preceded or accompanied by risk mitigation measures (e.g., Carnes et al., 1982; O’ Hare et al., 1983; Portney, 1985).
Example: Jenkins-Smith & Kunreuther (2001)

- Experimental study: acceptability of a prison, a landfill, an incinerator, or a nuclear waste repository
- Compensation offer: economic benefits to residents living within 50 miles of the facility
- This compensation measure substantially increased the acceptance of the ‘low-risk’ facilities (+13.1, +23.8%), but had limited effect in case of a ‘high risk’ nuclear facility (+2.8%)
- Compensation measures were considered more acceptable for the two ‘low risk’ facilities ($M = 2.38, 2.21$) than for the two ‘high risk’ facilities ($M = 2.65, 2.98$) ($1 = completely acceptable, 7 = completely unacceptable$)
Example: Carnes et al. (1983, see Kunreuther & Easterling, 1996)

- Local acceptance of a nuclear waste repository increased from 26 percent to 41 percent when a monetary incentive (i.e., substantial payments to members of a host community) was accompanied by a package of safety and participation measures (i.e., independent monitoring and giving local authorities shutdown power should problems occur).
Recommendations/future directions

- Research needed to understand *why* compensation is effective (or not)
  - More d.v.’s; inclusion of process variables; studies with an experimental design
- Increasing external validity
  - More onsite studies; longitudinal research; non-citizen samples (e.g., local politicians, public representatives)
- Other factors to consider
  - Timing (e.g., compensation before or after a siting decision has been made)
  - Single compensation measure versus a package of measures
  - Who offers the compensation (trust)
  - Citizen participation in host fee negotiation
  - Institutionalized versus voluntary compensation
Conclusions

- While host community compensation is no panacea, it can help to prevent or solve facility siting controversies.
- Research is needed on why and when compensation measures work, fail, or have no (net) effect on public acceptance of facilities.
- Research is needed to confirm the potential of host community compensation in the specific context of CCS.
Thank you for your attention

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