WILLNGNESS TO ACCEPT LOCAL WIND ENERGY DEVELOPMENT: DOES THE COMPENSATION MECHANISM MATTER?

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Overview

Whereas there is widespread public support for increasing renewable energy supply generally, and wind power more specifically, wind farm developments are often met with local resistance (e.g. Devlin 2005). The development of wind power presents a clear conflict between the dispersed societal benefits and the concentrated local costs, and while the general benefits may dominate the local costs, wind development plans are often overturned because of local opposition. Wind farming has well-documented impacts on local communities.

Environmental valuation studies have attempted to measure the externality costs associated with wind farming. This literature comprises hedonic pricing (e.g. Heintzelman and Tuttle (2012) and Jensen et al. (2014)), and stated preference studies (e.g. Aravena et al. (2014) and Landry et al. (2012)). The bulk of these valuation studies report local welfare losses due to wind farm interventions. The derived estimates are useful for identifying where the highest impacts of a given project lie and in proving input in to calculations that seek to determine the social value of wind farming. They are also suggestive of the level of compensation, i.e. cash transfers an individual or a household may demand when faced with impacts from a windfarm project, e.g. at the planning stage of a project.

Existing environmental valuation studies have a strong focus on the household's tradeoff between the negative impacts of wind farming and private compensation measures. While useful for several purposes, such an approach fails to address relevant considerations. In particular, compensation to local communities does not have to be limited to individual payments. In some instances, the provision of a (local) public good can be a viable form of reparation to local communities — e.g., see Cass et al. (2010) and Cowell et al. (2011). Though given little attention in the literature, economic theory provides a well-developed framework for such compensation. Public goods and local public goods are often under-supplied due to coordination problems and institutional failures, and it should be unsurprising that some individuals prefer this form of reparation settlement. Compensation in this case occurs at two different levels: first, it corrects an institutional failure that prevents a local public good from being provided and, second, like private compensation, it increases overall welfare.

Most stakeholders accept that communities affected by wind power development should be compensated. However, the most effective mechanism for providing compensation remains unclear. By implementing a stated preference approach in a local community in western Norway, this study aims to contribute to the understanding of households' tradeoffs between wind farming impacts and private versus public compensation.

Methods

In this study we used a stated preference approach to examine the welfare impacts of wind farming in the municipality of Sandnes, Norway. To investigate local preferences we implemented a Choice Experiment (CE) that sites a hypothetical wind park in the municipality of Sandnes in Western Norway. Households chose among different alternatives, where each alternative was characterized by three attributes: visual impact of the wind farm, a deduction of the electricity bill or private compensation, and the provision a local public sports facility.

Results

We found that the welfare loss experienced by a household located in the vicinity of the wind farm (< 4Km) is only slightly higher than that experienced by a household who uses the deployment area for recreational purposes (but lives farther away from the deployment site, typically >10Km, or local recreational users). About 35 % of the welfare losses experienced by these two types of households are non-use values. Our results highlight that while there has been an emphasis on impacts on local communities, non-NIMBY (not-in-my-back yard) factors such as

recreational and non-use values may be significant and should be given explicit consideration in the welfare analysis of wind farming.

These results are based on willingness to accept measures that are typically used in the environmental valuation literature. On the other hand, we have emphasized that compensation does not have to be restricted to individual payments (or private compensation). It may also take the form of a local public good (or public compensation). We found that Sandnes residents would trade lower levels of private compensation for higher levels of provision of a local public sports facility. Thus, compensation in terms of the local public good appears to be lower than in terms of private compensation. Further, the willingness to accept in terms of the local public good appears to be generally lower than in terms of private compensation. The result is particularly important as it suggests that welfare measures derived in the environmental valuation literature, may over-estimate local resistance to wind energy development. Among the reasons why compensation in the form of a local public good should be given explicit consideration as a form of compensation in wind farming include: 1) Local public goods are often under-supplied and have the potential to generate considerable individual and communal welfare gains; 2) Non-excludability of local public goods allows coverage of a large number of households; 3) Wind energy developers may serve as possible facilitators in the process of coordinating contributions to a local public good or service.

Conclusions

The main findings of this study are:

- Resistance from local inhabitants to wind power development depends on the compensation mechanism.
- Welfare measures derived in the environmental valuation literature might over-estimate local resistance to wind energy development.
- Local households accept wind farming with lower public than private compensation.
- The result may be explained by under-provision of local public goods.

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