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Acceptance of wind energy and the role of financial and procedural participation: An investigation with focus groups and choice experiments

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ABSTRACT

In the course of its transition of the energy sector Germany aims to provide 80 per cent of the power supply from renewable energy sources. Although it is projected that wind power will be the main contributor in the energy transition, due to its spatial implications it is targeted by considerable local opposition, thus jeopardising the success of many wind energy projects. Previous research has found that distributive and procedural justice issues are common factors influencing local public acceptance. This paper explores local public preferences for different forms of financial and procedural participation by means of choice experiments and focus groups. The results show that wind power projects are generally accepted by the local public if certain condition, i.e. shareholding and high levels of participation in the decision-making process are offered. Policy recommendations are given on how wind power projects should be implemented so as to counteract local opposition. Deepening the understanding of these issues is of practical importance for future wind energy development.

1. Introduction

Many European countries have set targets to increase the use of renewable energy resources so as to cut greenhouse gas emissions, and to diversify energy supplies and thus reduce the dependency on fossil fuels and nuclear power. Germany has taken resolute action to promote the expansion of renewable energy and has substantially adjusted its energy policy after the Fukushima nuclear disaster in 2011. The German Renewable Energy Act aims to generate 80 per cent of the German power supply with renewable energy sources by 2050 (German Renewable Energy Act, 2017). Given this ambitious task the country faces its greatest energy-political challenge in history. While wind power is the primary pillar of the energy transition due to suitable wind conditions in vast parts of Germany, it is at the same time a spatially relevant renewable energy source implying considerable changes to the landscape. This has – despite high levels of public support towards wind power in general – resulted in a lack of local acceptance towards local wind power projects (Huber and Horbaty, 2012; FA Wind, 2015; Köck, 2017). In the past, local opposition has caused delays or even abandonments of on-shore wind power projects, thus jeopardising the success of the German energy transition.

Local opposition towards controversial projects is a complex phenomenon that has received considerable attention in the literature. A fundamental question is why the siting of wind energy projects causes local conflicts despite an overall support for wind energy expansion. A commonly cited explanation is the so-called NIMBY (Not In My Backyard) phenomenon, suggesting that people accept a development "until they are actually confronted with it at which point they oppose it for selfish reasons" (Wüstenhagen et al., 2007, p. 2687, O'Hare, 1977, see Devine-Wright, 2009 for a detailed discussion on NIMBY). In recent years, the NIMBY assumption has been criticised to be overly simplistic, not acknowledging the complexity of controversial development plans (Wolsink, 2007, Gibson, 2005). Rather than simply being rooted in egoistic motives, local opposition is influenced by various institutional factors (Dimitropoulos and Kontoleon, 2009, Wolsink, 2007, Ek, 2006, Devine-Wright, 2005). Two aspects have been identified as particularly relevant in explaining local resistance of nearby developments: 1) distributive justice (i.e. how fairly are the cost and benefits distributed in the project outcome?) and 2) procedural justice (i.e. what are the stakeholders' opportunities to participate in the decision procedures?) In the wind energy context these aspects can be explained as follows:

- Distributive justice is concerned with the fair distribution of outcomes of projects and local opposition arises because of an asymmetric distribution of costs and benefits. While the benefits of wind power projects accrue on a national or global scale in the form of climate protection, the external costs – landscape impact, noise and potential health impacts – are borne on a local scale. In addition, the market benefits remain with the developers and do in many cases not stay in the region. Thus, residents in the vicinity of wind power projects face a negative net benefit (Scheele, 2012; Thie, 2006; Wüstenhagen, 2007). According to Jahnke et al. (2015) "belonging

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to the losers and bearing the burden so others gain profit leads to a feeling of injustice among the local public" (p. 367).

- Procedural justice focuses on the decision-making processes and an appropriate involvement of affected locals in such processes. According to Gross (2007, p. 2730) "the primary principals of procedural justice are full participation in the process, the ability to express opinions freely and to be heard (voice), being treated with respect, being given adequate information, the impartiality of the decision maker, and decisions that are responsive to information". If these elements are not properly integrated in the decisions over wind power projects, the local public has only restricted influence on how its living environment is shaped and is less likely to perceive the process as fair. Thus, the outcome of decisions over wind power projects tends not to be accepted (Wolsink, 2007). Due to lack of procedural justice even people with positive or neutral initial attitudes towards a wind energy project in their vicinity are likely to regard the outcome as illegitimate (Gross, 2007).

Unearthing the role of distributive and procedural justice in raising the acceptance towards local wind energy projects is at the heart of the research presented here. Local opposition does not only influence the course of an energy transition in individual countries, such as Germany, but also the course of renewable energy development in Europe. Thus, the topic is of considerable political relevance.

To date there is a dearth of research on how financial and procedural participation models affect local acceptance and which mix of the two aspects may lead to a reconciliation of interests. While financial participation currently receives considerable attention in the political debate (despite lacking empirical evidence regarding the impact of financial participation on acceptance) in Germany, procedural participation appears to play an inferior role in policymaking even though empirical findings suggest that public involvement increases local acceptance (Bovet and Lienhoop, 2015; Köck, 2017). Understanding the role of procedural and distributive justice for acceptance is of considerable value for the design of best-practice wind energy implementation. As the design and implementation of financial and procedural participation involves considerable costs (e.g. payments to residents, expensive participatory decision-making processes), knowledge about the benefits of models that mitigate procedural and distributive injustice is essential in order to justify expensive planning processes. To this end the paper aims to answer the following research questions:

1. How does the local public value new forms of financial and procedural participation in wind energy planning and implementation?
2. What is the direction and strength of local preferences for financial participation in wind energy projects?
3. What is the direction and strength of local preferences for different levels of personal participation in the planning and decision process?

Based on the findings policy recommendations will be formulated on how financial and procedural policy features could be integrated in wind power decision-making processes. The scope of the research presented here is limited to Germany. Since preferences are context-dependent, our results do not represent the local public views in other countries. However, challenges surrounding distributive and procedural justice in decisions on wind energy projects are akin to other densely populated countries, where wind turbines are close to settlements thus imposing negative externalities on the local public. Thus, the results presented here can provide important intuitions to policy makers in countries similar to Germany.

2. Background

The existing literature on the acceptance of wind energy is extensive and includes both qualitative and quantitative research from different disciplines such as environmental psychology and economics. Overall, there appears to be a focus on the physical properties of wind turbines and environmental factors affecting the acceptance of wind energy projects. For instance, numerous empirical studies have examined physical aspects, such as the height of turbines (Meyerhoff et al., 2010; Dimitropoulos and Kontoleon, 2009), the size of the wind farm (Dobers et al., 2015; Dimitropoulos and Kontoleon, 2009; Meyerhoff et al., 2010), the distance to settlement (Dobers et al., 2015; Meyerhoff et al., 2010), the location (Ek and Persson, 2014; Van der Horst, 2007), and offshore versus on-shore (MacMillan et al., 2006). In terms of environmental aspects, studies have investigated the wildlife and visual impacts of wind farms (Meyerhoff et al., 2010; Bergmann et al., 2006; Alvarez-Farizo and Hanley, 2002; Kosenius and Ollikainen, 2013).

Far fewer studies have empirically explored the influence of institutional aspects on acceptance. While only one study has touched the role of distributive justice (Ek and Persson, 2014), the existing research appears to mainly focus on procedural justice. Sagebiel et al. (2014), Bergmann et al. (2006), Dimitropoulos and Kontoleon (2009), and Ek and Persson (2014) elicited preferences for extended consultation of the public. Public participation in the planning process was analysed by Wolsink (2007), Swofford and Slattery (2010), Jones and Eiser (2010), Devine-Wright (2005) and Dimitropoulos and Kontoleon (2009). Finally, Gross (2007) explored how a perceived lack of fairness affects views towards local wind energy projects.

Acceptance of wind energy raises justice issues that can be understood through the concept of energy justice. While the concept arose out of justice questions related to conventional energy sources its application on renewable energies is a recent field of research (Banerjee et al., 2017). Energy justice research applies justice principles to the various aspects surrounding energy supply (e.g. energy policy, energy systems, energy production and consumption) and explores its social implications (Jenskins et al., 2016). It can be defined as "a global energy system that fairly distributes both the benefits and burdens of energy services, and one that contributes to more representative and inclusive energy decision-making" (Sovacool et al., 2017, p.1). The three most common tenets of energy justice relate to distributive, procedural and recognition-based aspects (for further philosophical groundings to energy justice see Sovalcool and Dworkin, 2014). Research in this field has explored distributive injustices on a global scale, i.e. with respect to energy poverty (e.g. Boardman, 2013) and how siting of energy infrastructures affects communities (Endres, 2009). The recognition-based tenet investigates whether certain social groups (e.g. ethnic minorities, indigenous groups, disabled or old people) are misrepresented or ignored in decisions over new energy infrastructures (e.g. Pastor et al., 2001, Liddell and Morris, 2010). Finally, research on procedural justice has mainly classified types of procedural injustices, pinpointed mechanisms of exclusion (see Gibson-Wood and Wakefield, 2013) and identified mechanisms of inclusion (Jenskins et al., 2016) in the context of fair decision-making procedures. According to Banerjee et al. (2017) "renewable energy technologies are increasingly being promoted for their environmental and social benefits" (p. 1). In their review of existing studies they find that renewable energy mitigates energy injustice in terms of providing intergenerational climate change benefits. While other dimensions of energy justice are not inherent to renewable energies, justice implications seem to be related to technology choice, scale, siting, and form of ownership. Thus, renewable energy developments promote energy justice when they are decentralised rather than centralised, when siting avoids environmentally and culturally important areas, and when their design allows for public involvement (Banerjee et al., 2017)

Despite the fact that justice is highly relevant to the successful implementation of wind energy projects, as yet there is very little systematic research on actual policy forms that promote acceptance. The existing empirical research papers touching on distributive and procedural justice focus on 1) monetary payments from wind energy