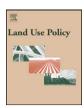
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# Exploring the landscape of wind farm developments; local area characteristics and planning process outcomes in rural England

Dan van der Horst<sup>a,\*</sup>, David Toke<sup>b,1</sup>

- a School of Geography, Earth and Environmental Science (GEES), University of Birmingham, Edgbaston, Birmingham B15 2TT, United Kingdom
- b Department of Sociology, University of Birmingham, Edgbaston, Birmingham B15 2TT, United Kingdom

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#### ABSTRACT

Despite broad public support for wind energy in principle, windfarm developments are often met with local opposition. There is theoretical, case-based and anecdotal evidence to suggest that 'the local' is relevant for planning process outcomes, but the nature and extent of this relevance is not so clear. We embark on an initial exploration of local factors that, on aggregate, may be of relevance to planning outcomes of proposed windfarms in rural England. Applying a broad scanning approach we use an existing small area GIS dataset of 117 variables related to education, health, demography, employment and housing. We identify a number of strong associations, and discuss to what extent these make sense in the light of existing literature on environmental equity and social capital, or throw up questions for further study. Notwithstanding the methodological caveats of this explorative study, and the scope for more in-depth analysis, our findings suggests that beyond the myriad of individual planning cases, the emerging land-scape of wind energy development in England is markedly uneven, and sometimes inequitable. Evidence of the latter emerges notably through the strong significance of local democratic deficit (i.e. low voter turn-out) as a predictor of a 'positive' planning outcome for windfarms and the further strengthening of predictive associations at the appeal stage.

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### Introduction

With the rapid commercial development of windpower technology in the 1990s, wind turbines have joined the list of facilities which can give rise to siting controversies. Public support for wind energy in general tends to be high but proposed wind farms have often, in the UK and elsewhere, been met with strong local opposition. This issue has sparked a growing research interest and literature about the nature and motivation of local opposition or support (e.g. Bell et al., 2005; Devine-Wright, 2005a,b; Ellis et al., 2007; Toke, 2005; Van der Horst, 2007; Warren et al., 2005; Wolsink, 1994, 2007). It is hardly a controversial hypothesis to state that who and what is found in the local area can matter for planning outcomes. Recent examples of evidence with regard to wind farms include the significant effect of distance on public opinion reported by Warren et al. (2005) and Toke's (2005) identification of factors associated with local authority planning outcomes. However there is scope for a more extensive or systematic assessment of the role of 'local' factors in planning outcomes. This paper sets out to further this area of enquiry. Our aim is to contribute to the analysis of local responses to facility siting by undertaking an initial exploration of the possible association between characteristics of the local area and wind farm planning outcomes. We do this by looking at more and different local variables and examining the potential relevance of these in a much smaller geographical area around the proposed wind farm site.

## Rationale for the analysis

The rationale for this exploration is based on two potential characteristics of siting controversies:

- 1. *Distance matters*: On average people who live nearby may play a more influential role in opposition than people living further away from the planned development.
- 2. *People matter*: Some aspects in the social/economic/demographic profile of the people living locally may be associated with the level of effective opposition.

The first siting controversy characteristic is supported by the theory of spatial discounting (Hannon, 1994), which suggests that

<sup>\*</sup> Corresponding author. Tel.: +44 121 4145525; fax: +44 121 4145528. E-mail addresses: d.vanderhorst@bham.ac.uk (D. van der Horst), d.toke@bham.ac.uk (D. Toke).

<sup>&</sup>lt;sup>1</sup> Tel.: +44 121 4158618; fax: +44 121 4146061.

on average people tend to care relatively more about the potentially negative impacts of a proposed physical development, if that development is sited relatively closer to the areas where they live, work or visit in their free time.<sup>2</sup> An inverted relationship between perceived value and physical distance (i.e. a distance decay effect) has been found in a range of studies by environmental economists (e.g. Sutherland and Walsh, 1985; Pate and Loomis, 1997; Bateman et al., 1996; Bateman and Langford, 1997) and in studies by economic geographers/spatial economists since the classical work by Von Thunen (1826; the Isolated State) who developed a mathematical model to explain why the value of land, and the market value of the crops grown on it, drops as the distance to market (town) increases. Caring more about a proposed development will motivate people to vote, lobby or demonstrate, which will increase the likelihood of influencing the planning outcomes. There are also practical reasons why nearby residents are more likely to become involved in opposition. They are most likely to be the first to learn about the proposed development, for example they can see the statutory planning notes which are put up in the area adjacent to the proposed development and activities on the proposed site may be observed. Initiating or organizing the first meetings of concerned residents can help to legitimize a person's lead role in the eyes of other residents and strengthen his/her motivation to invest extra time and effort in the protest.<sup>3</sup>

The second siting controversy characteristic should be straight-forward. We are far removed from a situation where all sections of society have the same level of efficacy, agency, financial, human and social capital to affect the outcomes of local to national political processes. The body of literature on this issue is far too big to explore here in any meaningful depth, but in the discussion section we will explore the links between the results of our analysis and the existing literature on social capital.

In summary, the above section has detailed that (a) there are a number of reasons why local council planning decisions for wind-farm development may differ between locations, and that (b) there may be a range of local area variables which might act as (proxy or direct) indicators for those factors in the decision making process which help to produce these differential planning outcomes. There is thus scope for analyzing a range of local area variables to see if possible indicators can be found, and if so, how these can be interpreted. The method adopted for doing this, is presented in the next section of this paper. This is followed by the results section, which is in turn followed by the interpretation of the findings which will be discussed in two separate sections, relating to the concepts of social capital and environmental inequality respectively. The penultimate section highlights the methodological limitations, and is followed by the conclusions.

#### Methods

Exploring the characteristics of the local area vis-a-vis the outcomes of the planning process for wind farms can be done both for the first planning decision but also for any subsequent appeals. We set out to identify possible differences between local areas where windfarm proposals were rejected (or rejected on appeal)

and local areas where these proposals have been approved (or approved on appeal). The previous section provided a fairly broad justification for this exploratory study in terms of the criteria which might matter so we felt it is neither sensible nor desirable to start from a single argument or hypothesis about potentially relevant indicators. Instead of formulating expectations about significant associations between named local variables and planning outcomes, we choose to cast our net as widely as we practically could, using the 'SECRA' dataset, produced by Huby et al. (2005, 2006) at the Stockholm Institute in York.<sup>4</sup> Using a Geographical Information System (GIS) analysis to characterise rural England, the SECRA dataset contains 117 variables about education, health, demography, employment and housing at the lower level Super Output Area (LSOA). LSOA is a new spatial level of aggregation for the basic Output Area used for the dissemination of the 2001 UK population census data. Rural LSOAs in England contain about 1500 people on average, which is about 5 Output Areas combined (Huby et al., 2005). Because LSOAs tend to be smaller areas than wards or local authority areas, we expect (see Assumption 1) that they are a more appropriate scale of analysis of local opposition to a siting proposal.

We constructed a database of wind power planning cases in England in the 1991–2006 period using databases from the British Wind Energy Association (BWEA). We believe that this includes most of the cases in England in the period up to 2005. We have used only those in rural areas (i.e. urban areas excluded) in order to ensure compatibility of the rural LSOA dataset. Because the SECRA database was limited to England we excluded cases in Wales and Scotland from this study.

There are 77 cases in the data set altogether, listed in Appendix A. Two cases had appeals pending, leaving 75 cases used at the post appeal level and 77 cases at the local authority decision level. At the local authority level 40 cases were approved compared to 37 refused. At the appeal level 48 were approved and 27 cases were refused. Fig. 1 shows the distribution of cases around England.

We selected those LSOAs that contained the proposed windfarm sites and grouped them into two categories; accepted or refused. We carried out a statistical analysis to investigate the possible occurrence of significant differences between 'accepted windfarm LSOAs' and 'rejected windfarm LSOAs'. Considering the exploratory nature of this study, we have endeavored to strike a balance between the quantitative analysis and the qualitative discussion about the interpretation and the relevance of the patterns found. By limited ourselves to basic statistics, we hope to draw less attention to the detailed technicalities of the analysis and more

<sup>&</sup>lt;sup>2</sup> This should be seen as a pattern which can be expected to be found on aggregate (i.e. at the population level); it is not a pattern that is necessarily found for each individual (case). It would be an 'ecological fallacy' to expect that observed individuals will act in accordance with aggregate/population behaviour.

<sup>&</sup>lt;sup>3</sup> There is some anecdotal evidence to suggest that protest leaders often live particularly close to the proposed development; David Toke, pers. comm. Related to fieldwork carried out for his paper (Toke, 2005); Gerda Speller (University of Surrey) pers. commun., regarding two biomass energy proposals in the UK (ESRC project 'beyond NIMBYism'); Jay (2005) in his protesters handbook 'Not in our back yard').

<sup>&</sup>lt;sup>4</sup> We are grateful to the research team in York for making the SECRA data and reports available on-line: We are grateful to the research team in York for making the SECRA data and reports available on-line: We are grateful to the research team in York for making the SECRA data and reports available on-line: We are grateful to the research team in York for making the SECRA data and reports available online: We are grateful to the research team in York for making the SECRA data and reports available on-line: We are grateful to the research team in York for making the SECRA data and reports available on-line: We are grateful to the research team in York for making the SECRA data and reports available on-line: We are grateful to the research team in York for making the SECRA data and reports available online: We are grateful to the research team in York for making the SECRA data and reports available on-line: We are grateful to the research team in York for making the SECRA data and reports available on-line: We are grateful to the research team in York for making the SECRA data and reports available on-line: We are grateful to the research team in York for making the SECRA data and reports available online: We are grateful to the research team in York for making the SECRA data and reports available on-line: We are grateful to the research team in York for making the SECRA data and reports available on-line: We are grateful to the research team in York for making the SECRA data and reports available on-line: We are grateful to the research team in York for making the SECRA data and reports available on-line: We are grateful to the research team in York for making the SECRA data and reports available on-line: http://www.sei.se/relu/secra/datasets.html.

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