Wind Power and Public Engagement

Adopting an interdisciplinary social science approach, this book examines community reactions to wind farms to form a new understanding of what facilitates social acceptance.

Based on empirical research, *Wind Power and Public Engagement* investigates opposition to wind energy and considers the advantages as well as the limits of the co-operative model of wind farm community ownership. Giuseppe Pellegrini-Masini compares the role of co-operative schemes with community benefits schemes in increasing acceptability, and also sheds light on the impact of social factors including pro-environmental attitudes, perceived benefits and costs, place attachment, trust, as well as individuals' resources such as information and income. Five research cases are investigated in England and Scotland, including the first local, community-owned wind farm co-operative in the UK. Critically reviewing existing social research theories, the book offers a new viewpoint, integrating rational choice and environmental attitudinal theories, from which to assess and understand the social acceptability of wind energy. It also highlights new opportunities for raising consensus in communities around locally proposed wind farms.

The book will be of great interest to students and scholars of renewable energy, energy policy, environmental sociology, environmental psychology, environmental planning and sustainability in general, as well as policymakers.

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Wind Power and Public Engagement

Co-operatives and Community
Ownership

Giuseppe Pellegrini-Masini

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Foreword

When the United Nations Sustainable Development Goals were accepted by the General Assembly of the UN in 2014 the world community committed to a list of seventeen common goals, to be reached by 2030. This included goals such as the ending of poverty, affordable and clean energy, reducing inequality, gender equality, sustainable cities and communities, responsible consumption and production and climate action. To reach these goals, a change in the way energy is produced and consumed in both established and upcoming economies is of crucial importance; the energy system is the backbone of our societies. The centralised energy systems that drove the industrial revolution in Western and Eastern economies in the twentieth century have clearly reached their limits. New organisational structures need to be found to tackle the challenges of the future, including a high degree of regenerative (and often unstable) energy sources, decentralisation of energy production, a much more active role for energy consumers and a complete shift in the roles of actors in the energy system.

These substantial changes in established systems are at the very basis of what actors expect from themselves and each other in these systems. Thus, the question of how to master these transitions is not so much technological or economic, but rather a question of understanding (local) cultures, practices, values and social rules. The psychology of decision makers at all levels moves into the focus of analysis, so we are able to understand potential facilitators or barriers in these transition processes.

With only ten years to go before we must reach the Sustainable Development Goals, and also only one decade left to limit global climate change to “substantially below 2 degrees” by implementing massive cuts in CO₂ emissions, speeding up the energy transition is essential. This book highlights the new complexity of energy decisions through a comprehensive analysis of community wind farm co-operatives in the United Kingdom. It goes way beyond analysing ecological, economic and technical challenges and focuses on what co-operative models of energy production contribute to social sustainability, energy justice or democratisation of the energy system. This has clear impacts on the acceptability of energy projects that can have an invasive character in local communities, such as onshore wind parks.

The empirical work behind this book shows that community-driven energy production moves the focus from purely economic evaluations to include a more diverse set of criteria, balancing economy with negative local effects on nature or health with benefits for the global climate and considerations for alleviating fuel dependency. Those engaged in creating local co-operatives obviously consider a large set of local to global costs and benefits, which makes their judgments potentially more acceptable for local communities than decisions made by external commercial actors. A key benefit of co-operative forms of energy production for local communities seems to be that it offers community members the option of influencing operations rather than just benefitting (or suffering) from such implementation. Co-operative production thus gives community members stronger agency.

Although it appears that co-operative energy production is a viable way to greater engagement of local communities in the energy transition, it is not a silver bullet that will solve all the issues that arise with the necessary restructuring. From a bigger picture perspective, it is also interesting to interpret the results of this work concerning energy justice questions, especially distributional and procedural justice. Are co-operative energy producers per se more trustworthy with respect to just distribution of energy or revenues? Do they guarantee more just procedures in implementing projects? The Conclusions of this book analyse such questions from a policy-making perspective. *Wind Power and Public Engagement* thus makes a valuable contribution to some of the biggest challenges our societies have to face in the coming ten years – enabling communities to make fast and substantial changes.

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Introduction

While the transition to a new energy system based on the wide deployment of renewables has become an undisputed necessity for our societies, many questions remain in terms of how energy should be delivered. Will nations and regions adopt policies that seek to maximise energy justice (Jenkins *et al.*, 2017) and energy equality (Pellegrini-Masini, 2019) through diffused ownership of renewable energies? Or will they reproduce the concentrated ownership of the current energy production system?

Technologies such as solar photovoltaic, whose middle-class affordability has already been demonstrated, will most likely play a role in the energy transition towards an energy system centred on prosumerism. Yet this might not be the case for large solar plants, wind turbines or hydroelectric systems, all of which present substantial upfront costs that are a barrier to citizen ownership.

Still, the possibility for citizens to be part of the energy transition, not only as consumers but also as owners, is a significant step towards a more just energy system and one that reduces energy inequalities.

We know that energy consumption is largely unequal, not only across countries but also within them (Pachauri and Spreng, 2012). This trend reflects differences in income distribution, but it also reveals a vast problem with environmental equality and justice.

As the UN Human Rights Council (2019) has compellingly stated:

Perversely, the richest, who have the greatest capacity to adapt and are responsible for and have benefitted from the vast majority of greenhouse gas emissions, will be the best placed to cope with climate change, while the poorest, who have contributed the least to emissions and have the least capacity to react, will be the most harmed. The poorest half of the world's population—3.5 billion people—is responsible for just 10 percent of carbon emissions, while the richest 10 percent are responsible for a full half. A person in the wealthiest 1 percent uses 175 times more carbon than one in the bottom 10 percent.

(p. 6)

This situation will create a significant and challenging policy problem for years to come. Perpetuating this state of affairs would be at odds with the core values

2 Introduction

of Western democracies and the procedural or formal equality principle that defines democratic systems and processes. Further, it would run counter to the substantive or distributional equality principle that is to some extent guaranteed by many democracies, whose constitutions provide for the right of citizens to satisfy their basic needs.

Recent conceptualisations of energy equality (Pellegrini-Masini, 2019) have argued for the need to establish greater equality of opportunity in using energy services and consuming energy or embodied energy. The desirability of greater “equality of opportunity” can be defended on both moral (Sen, 1980) and empirical (Wilkinson and Pickett, 2009) grounds. Egalitarian societies earn positive high rankings regarding many different quality-of-life indicators, ranging from health to crime to environmental care (Wilkinson and Pickett, 2009) and high-income countries appear to produce fewer emissions per capita (Jorgenson *et al.*, 2015; Jorgenson *et al.*, 2016; Knight *et al.*, 2017). Despite some concern regarding the economic efficiency of egalitarian societies (Okun, 2015), recent research shows that high inequality negatively affects economic growth and that redistributive policies do not hinder growth (Cingano, 2014).

Arguably, the energy transition should not only deliver environmental sustainability but should also be economically and socially sustainable, thereby addressing energy inequality and delivering energy justice more broadly.

The goals of equitable, sustainable energy have already been put forward by European states, as the EU Commission (2019, p. 6) recently confirmed: “The clean energy transition must be fair and socially acceptable to all”.

Community energy initiatives, particularly community wind farm co-operatives, are a way to contribute to a new economy of energy production in which producers (consumers who participate in the production process) are the norm rather than the exception. However, co-operatives are not devoid of challenges and can face similar obstacles to those experienced by other types of community energy initiatives. Specifically, community energy schemes risk creating a divide between individuals who have the financial means and the ability to join them and those who do not (Jenkins, 2019).

This book adopts an interdisciplinary social science approach to examine the factors that influence the acceptability of wind farms and wind farm co-operatives. Specifically, it addresses the following questions: What are the variables that influence participation in wind farm-co-operatives? Can wind farm co-operatives facilitate the acceptance of wind farm development at the pre-construction stage? How do co-operatives compare with other community wind farm schemes? What can be learned about the social acceptability of wind farms and renewable energy infrastructure more generally from previous research on the acceptability of wind farms and wind farm co-operatives? And finally, how might policy address resistance to renewable energy infrastructure?

Chapter 1 reviews the literature on citizen participation, activism, and pro-environmental behaviours that theoretically frame the extensive range of variables that affect participation in wind farm co-operatives. In fact, participation in a

wind farm co-operative can be both a pro-environmental behaviour and a type of environmental activism.

Chapter 2 presents the specific variables that influence citizens' participation in wind farm co-operatives. Variables regarding types of perceived costs and benefits associated with wind farm siting, along with contextual and personal resource variables, are discussed. Further, the chapter examines co-operative schemes within the context of community energy schemes and their implications for wind farm acceptability. Finally, the theoretical framework that informed the empirical research presented in the book is outlined.

Chapter 3 presents the multimethod research design, based on a triangulation approach, along with details about the cases surveyed and the specific methods used.

Chapter 4 analyses interviews conducted with stakeholders of Westmill Wind Farm in Oxfordshire, Britain's first community-owned co-operative wind farm. The Westmill case provides compelling evidence on the strengths and the limits of the co-operative model, and reveals the profound impact that variables such as trust can have in shaping local debates and influencing levels of acceptability.

Many of the variables discussed in the analysis of the qualitative study also appear in Chapter 5, which presents the results of a multi-site survey conducted in four Scottish cases. The chapter provides a quantitative analysis of the wide range of variables, detailing how they correlate with the acceptability of proposed wind farms and their relative importance in influencing acceptability. It also examines additional variables regarding respondents' opinions about the co-operative model. The large number of variables surveyed (57) and their nature make this research distinctive, although they restricted the scope of the analysis to a limited range of statistical tests.

Chapter 6 discusses the survey results, examining the different groups of variables surveyed and, within each group, the specific variables that chiefly influenced opinions about the wind farm and the co-operative model. While some earlier assumptions about the role of pro-environmental attitudes are challenged, the chapter underlines the importance of perceived costs and benefits and, above all, "trust" as key determinants of the acceptability of wind farms.

While much can be said in support of co-operative wind farms and, to some extent, against them, this research shows that respondents were predominantly favourable towards wind farm co-operatives and to being offered the opportunity to participate in such a scheme, along with the provision of community benefits.

Certainly, community benefits are not a secondary issue. Instead of dismissing them as an unworthy policy provision of dubious morality, which could "crowd-out" environmental morale, it is time to advocate for a complementary approach (Frey, 1999) that strengthens pro-environmental attitudes and extrinsic motivations towards the goal of making onshore wind farms more acceptable. Such a pragmatic approach would be anything but immoral, not only because it would favour an overdue energy transition, but also because it could address issues of energy justice at various levels, including that of citizen compensation for facility siting (Corvino *et al.*, 2019).

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the long term, self-interest—which De Young (2000, p. 515) identifies as a form of “intrinsic satisfaction”—could keep a subject actively committed to a certain behaviour. De Young (2000, p. 521) holds the opinion that competence is a key aspect of intrinsic satisfaction: “People find unpleasant and thus avoid situations in which they cannot advance or utilize their competence.”

Final remarks about the literature on environmentally responsible behaviour

The following conclusions can be drawn from the literature that has been reviewed on ERBs:

- 1 ERBs have different determinants depending on the kind of behaviour that we consider.
- 2 Different behaviours could share the same determinants, but the relative effect on influencing behaviours would vary from one kind of behaviour to another.
- 3 Information and environmental awareness alone are not able to predict ERBs.
- 4 Attitudes alone are insufficient to predict ERBs, but they have more predictive power when the considered behaviours do not incur costs from situational barriers and strong disadvantages (for example, money and time costs).

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benefits concerning a hypothetical behaviour, such as supporting or opposing a proposed wind farm or joining a wind farm co-operative.

The influence of costs and benefits on participatory behaviours and environmentally responsible behaviours (ERBs) is widely acknowledged (e.g. Whiteley and Seyd, 1996; Stern, 2000; Diekmann and Preisendörfer, 2003; Simmons and Birchall, 2003). Therefore, following Stern (2000), “perceived costs” and “perceived benefits” are considered as psychological variables in the theoretical framework outlined in this section. The adoption of the labels “perceived costs” and “perceived benefits” instead of “costs” and “incentives” underlines the assumption that what ultimately influences behavioural intentions are neither objective “costs” nor objective “benefits”, but rather the subjective perception of these costs and benefits. To explain individuals’ choices of whether to engage in ERBs, the significance of their perceived benefits and costs was indicated:

We argue that acting a pro-environmental behaviour is the result of an individual choice which follows a subjective cost–benefit analysis. This cost–benefit analysis is influenced primarily by the goal orientation of an individual at a certain point in time, which is in turn ultimately determined by the level of satisfaction of their needs. Secondly by the availability of financial resources and the level of knowledge and information that an individual holds about the best course of action to achieve their main goal(s).

(Pellegrini-Masini, 2007, p. 3)

Therefore pro-environmental attitudes play a role, along with other value-based assessments regarding the cost and benefits of a considered behaviour, because acting pro-environmentally might produce the benefit of avoiding cognitive dissonance with one’s pro-environmental attitudes (Thøgersen, 2004).

The pre-eminence of perceived costs and benefits in determining the acceptability of renewable energy installations has been more recently supported by a comprehensive literature review. This stresses the relevance of contextual factors, along with environmental attitudes, in determining the acceptance of energy alternatives, thereby suggesting that this approach might be a viable theoretical standpoint which could further the explanation of the acceptance of energy infrastructure (Perlaviciute and Steg, 2014).

Notes

- 1 The authors limit themselves to defining it as follows: “A concern that wind development would introduce general unwanted change to the community ...” (Jones and Eiser, 2009, p. 4611).
- 2 “To deliver on its targets WAG [Welsh Assembly Government] planning guidance identified seven Strategic Search Areas ... suitable for large-scale wind energy development, amounting to a significant concentration of development potential on specific, remote areas of rural Wales” (Munday *et al.*, 2011, p. 2).

- 3 The acronym NIMBY, i.e. “not in my back yard”, is defined as “a colloquialism signifying one’s opposition to the locating of something considered undesirable in one’s neighborhood” (Kinder, 2016).
- 4 While there is no classification of wind farms based on size, the Scottish Government (2009) considers commercial farms to be of 20 MW or more.
- 5 <https://energy4all.co.uk/>.

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and 6–10 km from the wind farm sites.⁸ Overall, a total of 1000 households were selected. Following recommended research practice (Edwards *et al.*, 2002), several steps were adopted in order to increase the response rate. The selected households received a first letter along with a questionnaire and a prepaid stamped envelope. The letter introduced the research purpose and stressed the national importance of public opinion to the energy policy debate. After a week, a reminder letter was sent, and after another week, a third and final letter with another copy of the questionnaire and an additional prepaid stamped envelope was mailed.

The questionnaire was kept as short as possible in order to achieve a better response rate, in keeping with Edwards *et al.*'s (2002) determination that questionnaire length was the fourth most important characteristic in determining response rate. The questionnaire was limited to three pages, printed on both sides, and used Arial font size 10 for readability's sake, as suggested by Bradburn *et al.* (2004b).

Data from returned questionnaires was entered in SPSS (Statistical Package for the Social Sciences). Data quality was later checked by randomly selecting 50 questionnaires in order to cover the entire questionnaire set uniformly. When a mistake was identified in the questionnaire's entered variables, adjacent questionnaires (cases in SPSS) were also checked. Each questionnaire had 51 variables; over 2500 variables were checked and only 6 mistakes were found, i.e. the error rate was 0.24 per cent.

The questionnaire had a 31.5 per cent response rate: 315 questionnaires returned of 1000 mailed. The response rate in itself was an improvement over the pilot questionnaire's 17.5 per cent response rate and compares favourably with other postal survey research on onshore wind farms, many of which had lower response rates—e.g. only 13.3 per cent in the case of Swofford and Slattery, (2010).

Notes

1 Available at: <https://energy4all.co.uk>.

2 Available at: <http://simd.scotland.gov.uk/map>.

3 The percentage of "population income deprived" was calculated using data for the following categories of citizens:

- number of adults (aged 16–59) receiving Income Support (Department for Work and Pensions [DWP], April 2005)
- number of adults (aged 60 plus) receiving Guaranteed Pension Credit (DWP, May 2005)
- number of children (aged 0–15) dependent on a recipient of Income Support (DWP, April 2005)
- number of adults receiving (all) Job Seekers Allowance (DWP, April 2005)
- number of children (aged 0–15) dependent on a recipient of Job Seekers Allowance (all) (DWP, April 2005)
- number of adults and children in Tax Credit families on low incomes (Her Majesty's Revenue & Customs [HMRC], August 2006).

For further details see: Office of the Chief Statistician (2009).

4 Data available from: www.sns.gov.uk/default.aspx [Accessed 19 October 2010].

5 From www.sns.gov.uk/ [Accessed 25 October 2010]:

The Scottish Index of Multiple Deprivation (SIMD) provides a relative ranking of the data zones in Scotland from 1 (most deprived) to 6505 (least deprived) based on a weighted combination of data in the domains of Current Income, Housing, Health, Education, Skills and Training, Employment and Geographic Access and Crime (SIMD 2006 onwards).

6 Data available at: www.sns.gov.uk/default.aspx [Accessed 19 October 2010].

7 The Scottish Government Urban Rural Classification provides a standard definition of rural areas in Scotland. It distinguishes between urban, rural and remote areas, based on a core definition of rurality which defines settlements of 3000 or fewer people as rural, and aims to assist understanding of the issues facing these areas. The Scottish Government has used the classification to improve the rural evidence base. It distinguishes between the following six categories: (1) large urban areas; (2) other urban areas; (3) accessible small towns; (4) remote small towns; (5) accessible rural areas; and (6) remote rural areas. For further information see the Scottish Government website: www2.gov.scot/urbanrural.

8 Addresses were identified using the Royal Mail's Postal Address file.

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respondents (one activist opponent and two councillors who opposed the wind farm) exhibited scepticism about this kind of enterprise, which they viewed as less efficient than traditional organisations. Other interviewees expressed positive opinions towards co-operatives, and stressed the democratic and more socially just character of these enterprises. This issue was not perceived as central in the debate about the local wind farm; nevertheless, opponents suggested that the co-operative scheme was a sort of propagandistic move, or even a way to disguise the promoter's subjective interests.

Finally, the interview transcripts offered further evidence against the continued usage of the NIMBY label as argued by Wolsink (2007). In fact, the egoistic motives assumed by the term NIMBY contrast with the sense of fairness displayed in wind farm opponents' answers: they rejected the possibility of installing the turbines elsewhere. This typology of opponents, which is not captured in Wolsink's (2007) classification, represented the vast majority of opponents' answers that I collected. Hence, despite its consistency with previous research (Wolsink, 2007), this analysis supports a further type of opposition, whose motivation appears to be a sense of fairness that emerges not only as a desire not to be discriminated against, but also to reject "damaging" wind farms elsewhere that might be equally close to local communities.

In conclusion, the analysis supported the framework proposed in Chapter 2, which integrates rational choice and socio-psychological theories. This appears to be a potentially useful theoretical approach for deepening our understanding of opposition to wind farms; it probes the interaction between attitudes, perceived costs and benefits and their relation to individuals' personal resources, while confirming the relevance of several issues identified in previous research on wind farms.

Notes

- 1 Midcounties Co-operative is the UK's largest independent co-operative, with over 700,000 members. It operates a range of businesses in food, travel, healthcare, funerals, childcare, energy, post offices, flexible benefits and telecoms. It generated a revenue of £1.18 billion in the financial year 2018–2019. See www.midcounties.coop/siteassets/reports/18_19_Annual_Report.
- 2 The Westmill Wind Farm weblog has since been removed from the internet, hence it is not possible to reference it. The blog was copied in 2006 and used as material for the qualitative analysis, along with the interview transcripts.

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Final remarks

This chapter has presented the results of the postal survey of residents living within the vicinity of four proposed wind farm sites in Scotland and discussed their relative significance, as evaluated by appropriate statistical tests. The extent to which the results obtained support the theoretical framework developed in Chapter 2 is discussed in the next chapter.

Notes

- 1 The test initially came with a warning about its validity due to reaching the maximum number of iterations; it was therefore rerun with an increased number of iterations in the SPSS options tab. I couldn't find any advice against this, not even in the SPSS online guidelines, which simply recommend using a number of iterations of non-negative integer (IBM Knowledge Center, 2012). Marôco's (2007) simple advice is to increase the numbers of step-halving when a similar warning is shown about the maximum number of step-halving being reached.
- 2 Even in this case, as in the previous ordinal regression analysis, the first execution of this statistic returned a warning about its validity due to reaching the maximum number of step-halving. So this number was increased in the option tab of the SPSS ordinal regression test, as suggested by Marôco (2007).

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opposition by ensuring that the perceived costs of wind deployment are minimised, while its perceived potential benefits are maximised.

In this regard, in 2014, the then UK Department of Energy and Climate Change (DECC) outlined a “community energy strategy” (DECC, 2014), which attempted to address the issue of availability of resources to engage in community schemes and aimed to make community ownership widely available for renewable energy developments. A voluntary scheme was encouraged led by the “shared ownership taskforce” (DECC, 2015b), a consultation group including commercial developers and representatives of community organisations. The UK Government stated that if this approach failed, the provision of shared ownership would be made mandatory for any commercial development (DECC, 2015a).

In Scotland, by contrast, the Scottish Government (2018) has recommended, since 2015, that developers offer shared ownership for all renewable energy projects above 50kW. This position has been further strengthened by a communication by Scotland’s chief planner, John McNairney (2015), who, in a letter addressed to the heads of planning at Scottish planning authorities in November 2015, stressed the significance of shared ownership. Although shared ownership does not form part of the material considerations in determining the acceptability of a project in planning terms, it is nevertheless important because the economic and socio-economic impacts of a project are relevant material considerations.

In conclusion, while a growing number of policymakers now understand the importance of community benefits and community ownership, a number of ambiguities remain regarding both the policy discourse and national legislation concerning these schemes. A clear policy choice that makes community benefits and the provision of shared ownership schemes mandatory for each renewable energy project would help in making renewable developments more acceptable, and in enabling a positive role for citizens in the energy transition.

National legislation making community and shared ownership schemes mandatory would also support an energy justice policy approach based on the tenets of distributional and procedural justice (McCauley *et al.*, 2013), thereby advancing an egalitarian view of energy policy (Pellegrini-Masini, 2019; Pellegrini-Masini *et al.*, 2020).

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equality, not only because this could be argued to be morally desirable (Pellegrini-Masini *et al.*, 2020) but because they appear to motivate citizens towards acceptance and participation (Drews and van den Bergh, 2016).

Finally, holding together procedural justice and fairness while shaping energy policy related benefits and costs in order to build extrinsic motivations (along with intrinsic ones) leads to the choice of implementing distributionally just policies which would favour the many over the few. Energy equality along with energy sufficiency (Pellegrini-Masini, 2019) will need to drive the transition if the current energy injustices, often related to economic inequality at the global level (Gore, 2015) and within countries (Galvin and Sunikka-Blank, 2018; Galvin, 2019), are to be addressed. Distributional justice policies leading towards more egalitarian societies will most likely support a per capita decrease in carbon emissions in high-income countries (Jorgenson *et al.*, 2016; Knight *et al.*, 2017), and might increase pro-environmental behaviours (Carlisle and Smith, 2005; Wilkinson and Pickett, 2010), while increasing quality of life in general (Wilkinson *et al.*, 2010). In this respect, citizens' support for community benefit schemes and the co-operative model of shared ownership of wind farms confirmed in this research supports the idea that distributionally just energy policies at the community level (and beyond) are both desirable and necessary.

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- 16 Have you ever thought about any possible link between opposition or support and local ownership of a wind farm?

If not clear to the interviewee, it was rephrased as follows:

Do you think that local ownership of wind farms may influence levels of opposition or support for wind farms? How?

- 17 Wind turbines are sometimes controversial and local opposition is often present. Could the local ownership of the wind farm with its revenue put back into the local community compensate for the perception of local negative consequences of a wind farm, such as noise and visual impact?

IV– Perception of factors influencing participation in community owned co-operatives

This question aimed to answer research question 2: “Which factors influence participation in farm cooperatives? How are they related to one another?”.

- 18 Have you ever discussed in your group/organisation/institution what could motivate or prevent local residents to purchase shares in a local co-operative wind farm? What do you think about it?

It was impossible to prompt all the factors raised in the literature review; therefore, leaving the question completely open appeared to be the most reasonable choice.

Note

- 1 During the development of the research project it was decided not to pursue this research question further.