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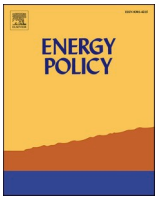

Why municipalities reject wind power: A study on municipal acceptance and rejection of wind power instalments in Sweden

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ABSTRACT

This article explores municipal acceptance of wind power in Sweden and draws conclusions on the basis of semi-structured interviews with municipal decision-makers, together with analysis of documents and statistical data. In line with previous research, it demonstrates that wind power opposition is more complex than just a NIMBY effect. The attitudes of local residents influence municipal decision-makers, but may also act to augment and mobilize opposition. Perceptions of distributional injustice, generated by the lack of local economic benefits and the geographically uneven deployment of wind and hydropower, are also relevant in explaining community and municipal acceptance. Moreover, municipal acceptance depends on national political discourses, economic aspects, institutional settings, regulations and sociopolitical factors. To overcome acceptance barriers, the article argues for the need of some kind of formal compensation schemes, directed to both local communities and the municipality. The authority of the municipality to levy taxes on wind power could potentially rectify perceptions of energy injustice between different geographic regions, stimulate higher approval rates, and motivate municipalities to assume a role as an intermediary, accommodating different, and sometimes conflicting, local, national, and global interests.

1. Introduction

Wind power has rapidly developed in Sweden. The installed effect increased almost ten times between 2001 and 2021 (Swedish Energy Agency, 2021a). However, there has been a downturn in the wind power licensing approval rate in recent years, mainly due to municipal rejections (Westander, 2021). In an international comparison, Sweden has a fairly decentralized planning process, and according to the Environmental Code and the planning monopoly of the municipalities, construction permits need municipal approval, colloquially referred to as the 'municipal veto'. In several of the 290 Swedish municipalities, wind power has become a highly contentious issue, and at the national level, public support for wind power has declined while attitudes are polarized between conservative and liberal and left-leaning voters (Jönsson, 2022). Conflicts have also emerged with Sami communities, who protest against the interference of wind power on reindeer herding and their livelihood (Lawrence, 2014; Ek and Matti, 2015).

Local opposition against wind power installations is not unique to Sweden but a phenomenon that has emerged in several countries (Wüstenhagen et al., 2007; Sovacool and Lakshmi Ratan., 2012). One can assume that the social acceptance barriers to wind power have similar origins in Sweden as in other economically developed democratic countries, although context-specific factors cannot be excluded, particularly related to the decision-making authority of the municipalities (Pettersson et al., 2010; Söderholm et al., 2007; Lauf et al., 2020; Ramasar et al., 2022). In these terms, Sweden is comparable with its neighbouring countries, Norway, Finland, and Denmark. However, unlike these countries, operators in Sweden are not required to pay any property or corporate tax to the host municipality, nor do they need to compensate local communities. The recent development of wind power has furthermore occurred in a geographically uneven pattern, with a concentration in a few sparsely populated municipalities in the north of Sweden. These aspects may have implications on acceptance, potentially giving rise to a perception of energy injustice between regions, municipalities, and populations within Sweden.

This article aims to explore municipal decision-makers' motivations for rejecting or accepting wind power licensing. The municipal decision-making process is of particular interest in this context, capturing the interplay between different local interests, communities, and agents. Municipalities have a central role in the energy transition, as the

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construction and development of renewable energy infrastructure are connected to urban planning and, in the Swedish context, it relies on municipal consent. Municipalities are, nevertheless, as pointed out by Inderberg et al. (2019), a neglected study object in relation to wind power siting and acceptance.

The focus of this study is, accordingly, municipal acceptance, which can be defined as the motivations of municipal decision-makers to reject or approve wind power applications. It aims specifically to explore the geographic distribution of wind power instalments and benefits in Sweden and analyzes the influence these aspects may have on municipal acceptance. The general question this article aims to answer is whether geographic dimensions of unfairness affect local decision-making on wind power licensing. In doing so, the article explores the following two questions. (1) What aspects influence municipal decisions on wind power projects? (2) What types of community benefits and compensation are judged to have an impact on decisions on wind power licensing?

The article is based on semi-structured interviews with key municipal decision-makers and an analysis of documents, reports, and statistics. It is arranged in seven sections. Following this introduction, an overview of relevant literature is presented, the wind power development in Sweden, and the material and methods laid out. Thereafter, results, analytic discussion and conclusions are presented.

2. Literature overview

2.1. Social acceptance of wind power

In the early phases of wind power development, the issue of social acceptance was essentially neglected. The reason for the neglect was, according to Wüstenhagen et al. (2007), the high level of public support for wind power, which led developers to ignore the attitudes of local communities. Their article identified community acceptance as one of three dimensions of social acceptance besides socio-political and market acceptance. It is now fairly well documented that the physical intrusion of wind power in the landscape may generate negative attitudes and prompt opposition among local communities (Krekel and Alexander, 2017; Dugstad et al., 2020; Carley et al., 2020). The reasons why certain local communities oppose wind power sitings, while others welcome them, are not entirely clear, and consequently, there are uncertainties regarding what kind of measures can most efficiently contribute to overcoming social acceptance barriers (Wijk et al., 2021). Research shows that opposition to wind power is far more complex than just a matter of NIMBYism (not in my backyard) (Wolsink, 2007; Horst, 2007; Aitken, 2010a). The reactions of people exposed to wind power turbines are dependent on differing context-specific variables such as place attachment (Devine-Wright, 2009), political identity (Vuichard et al., 2019; Roddis et al., 2018), or psychological and socioeconomic factors (Huijts et al., 2012; Bertsch et al., 2016).

Studies suggest that socioeconomic consequences of wind power investments are of great relevance for acceptance. Individuals who benefit economically from wind power tend to be less concerned by the visual or audial impact (Greene and Geisken, 2013; Mulvaney et al., 2013; Slattery et al., 2012; Hamilton et al., 2018; Downey et al., 2022) and less guided by ideological preferences (Hoen et al., 2019). However, the economic output of wind power investments for local communities, in terms of employment and economic development, is limited (Aldieri et al., 2020), and for this reason, the distribution of burdens and benefits can influence acceptance. If the profits from wind power turbines are transferred to national governments or international corporations, their presence in the local landscape can be perceived as a manifestation of energy injustice or resource exploration (Jenkins et al., 2016). Accordingly, several studies suggest that social acceptance of wind power is associated with perceptions of distributional justice and that opposition to wind power can be addressed by various arrangement for financial participation or compensation (Toke, 2005; Wijk et al., 2021).

In empirical research on wind power development, the perception of procedural justice has also been identified as a factor influencing social acceptance, together with fair and just arrangement of distributions of benefits (Walker et al., 2014; Brennan and Van Rensburg, 2016; Knauf, 2022). Individuals who perceive the decision-making processes as unfair, non-transparent, or illegitimate are more likely to oppose them (Gross, 2007). Aspects such as access to information, democratic participation, and trust in the responsible public institutions and wind power corporation is of relevance (Liebe et al., 2017).

2.2. Compensation or community benefits

When installing wind power infrastructure, landowners are usually compensated, while communities living nearby are not necessarily entitled to any compensation. Various types of compensation have been developed in different countries to respond to local opposition to wind power sitings. Initially, informal agreements between wind power operators and local communities were common, such as community funds designated for investments in local infrastructure or civil society activities. Over time, governments have adopted formal compensation options, such as guidelines or requirements for contributions to community funds, incitements for co-ownership, discounted electricity or local property or corporate taxes imposed on wind power operators. The effect of various types of compensation on social acceptance depends on contextual factors, making comparisons between countries or individual cases difficult (Wijk et al., 2021).

People may accept wind power turbines close to their homes if they receive direct economic compensation, although the type and level of the compensation matters (Lamy et al., 2020; García et al., 2016). Studies suggest that financial compensation can positively impact acceptance (Hoen et al., 2019; Brannstrom et al., 2022; Parkins et al., 2022; Walker et al., 2014; De Luca et al., 2020; Hamilton et al., 2018). Political ideology, environmental concerns, and attitudes toward wind power are also relevant for acceptance and the size and number of wind power turbines (Knauf, 2022; Vuichard et al., 2019). Evidence indicates that wind power co-owned by local communities enjoy greater acceptance than those owned by corporations (Liebe et al., 2017; Radtke et al., 2022).

On the other hand, research indicates that informal agreements on compensation may negatively affect social acceptance, particularly if they are perceived as bribes (Walker et al., 2017; Cass et al., 2010). Wind power corporations are often in superior positions in the negotiation, asserting their power and formulating agreements that may favour their interests (Maleki-Dizaji et al., 2020). Informal agreements can cause disputes within the local communities concerning the level of compensation, who should be entitled to it, and to what types of activities it should be distributed (Aitken, 2010b; Rudolph et al., 2017). Some of these negative aspects of community benefits refer specifically to their informal character, and studies suggest that formal compensation governed by local or municipal administrations are perceived as more legitimate (Walter, 2014; De Luca et al., 2020).

Studies show that corporate, production, or property taxes on wind power benefiting the municipality may impact both community and municipal acceptance. Inderberg et al. (2019) demonstrate that municipal decision-makers perceive taxation as a form of compensation for the relative unfairness of the exploitation of landscapes. Municipal taxation can also influence community acceptance, at least if it benefits the local economy (Germeshausen, Lienhoop 2018; Lamy et al., 2020; Slattery et al., 2012). Vuichard et al. (2019) show, on the other hand, that people living close to wind power installations tend to prefer direct compensation, while the wider groups of inhabitants favour collective solutions.

3. Wind power development in Sweden

The development of wind power has been rapid and intensive in Sweden, and between 2011 and 2021, electricity annually generated by

wind increased from around 6 to 27 TWh (see Fig. 1), or about a fourth of Sweden's electricity consumption, while the installed effect was 12,1 GW (GW) in 2021. The reasons for this development are decreasing investment cost, which fell by around 70 per cent in 2008–2019, and an influx of international capital (Swedish Energy Agency, 2021b). A so-called electricity certification system introduced in 2003 has also benefited renewable energy production (Swedish Energy Agency, 2023). The geographic conditions for further development are also favourable, and according to the projections of the Swedish Energy Agency, wind power could constitute 40 per cent of the energy mix by 2040, making wind power the dominant source of electricity generation .

However, the expansion of land-based wind power has been unevenly distributed over Sweden, with a concentration in sparsely populated regions in the north of Sweden and slow development in the south. To motivate investments in areas where demand is high and production low and to lessen transmission constraints, Sweden was divided in 2011 into four bidding zones or so-called "electricity price areas". However, the reform has not affected the imbalance in the energy system, partly due to the uneven expansion of wind power (Strandberg, 2022). In 2021, only 15 per cent of the total wind energy was produced in the southern electricity price area. Ten municipalities in northern Sweden were producing 41 per cent of the total wind power production (see Fig. 2).

In recent years, there has been a downturn in new wind power licensing, which can be explained by fewer applications for construction permits and lower approval rates. According to the Swedish Environmental Code, larger wind power sitings need approval by the regional authority regarding the environmental implications, while all constructions ultimately require the municipality's consent (Larsson et al., 2014). The only exceptions are offshore wind power outside the municipal geographic area. The government can also overrule municipal decisions if the municipality has failed to consider national interests, although such a procedure has not been enforced (SOU, 2021:53, p. 48). The wind power branch claims that acquiring a license has become more difficult and fewer suitable places are made available (Swedish Energy Agency, 2021a). The rates of municipal approval differ between electricity price areas, with substantially lower rates in the southern regions (see Fig. 3).

According to an analysis of the 276 registered applications between 2014 and 2021, representing 5455 turbines, 45 per cent were approved, and 55 per cent were rejected or withdrawn (Westander, 2021). Approximately 2640 wind power turbines were declined, and the municipal veto rejected 51 per cent of those. Another 24 per cent were rejected on environmental concerns, and the remaining due to conflicts with the armed forces, reindeer herding and other aspects. The rate of municipal approvals has fluctuated between different years, and in 2021, about 80 per cent of the applications were rejected (see Fig. 4).

Although it is difficult to draw definite conclusions of a trend stretching over just a few years, studies suggest that the municipal veto and insufficient incentives can explain the low approvals (Wretling et al., 2022). In 2021, a government inquiry proposed changes to the provisions in the Environmental Code, restricting the municipal authority in these matters to a decision that had to be delivered at the initial phase of the planning process (SOU, 2021:53). The proposal was widely criticized by the conservative-leaning opposition and voted down in the parliament (Sveriges Riksdag, 2022). However, the inquiry recommended that the government develop a formal compensation system, arguing that compensation could be regarded as a democratic issue. In 2022, a second government inquiry was accordingly commissioned with a mandate to present proposals on how to motivate the municipalities' participation in wind power development; however, it was prevented from presenting proposals regulating taxation (Dir, 2022:27).

3.1. Compensation for wind power in Sweden

There are no formal compensation arrangements in place in Sweden, and wind power operators are not required to pay any taxes to the host municipality. The operators are paying lease to property owners, who can benefit from wind power, while the wider community is not entitled to compensation. There is also a national property tax on wind power, which is set at 0.2 to 0.5 per cent of the taxation value of the wind power installation, or approximately 0.4 euros per MWh for new investments. Wind power can generate local employment and revenues through labour taxes; however, jobs are mainly created in the instalment phase, while maintenance requires few employees (Aldieri et al., 2020). In northern Sweden, municipalities also experience a revenue leakage due to commuting (Ejdemo and Söderholm, 2015).

It has been suggested that the authority to levy taxes on wind power should be transferred to the municipalities to motivate local decision-makers to approve wind power projects (DN Debatt, 2021; Svenska Dagbladet, 2018). It has also been argued that taxation similar to that paid by operators in Finland or Norway should be introduced in Sweden (FSV, 2022). The property tax in Finland is calculated on the basis of the cost of construction; however, it is substantially higher than the national property tax in Sweden. Local taxation of wind power in Norway is set at

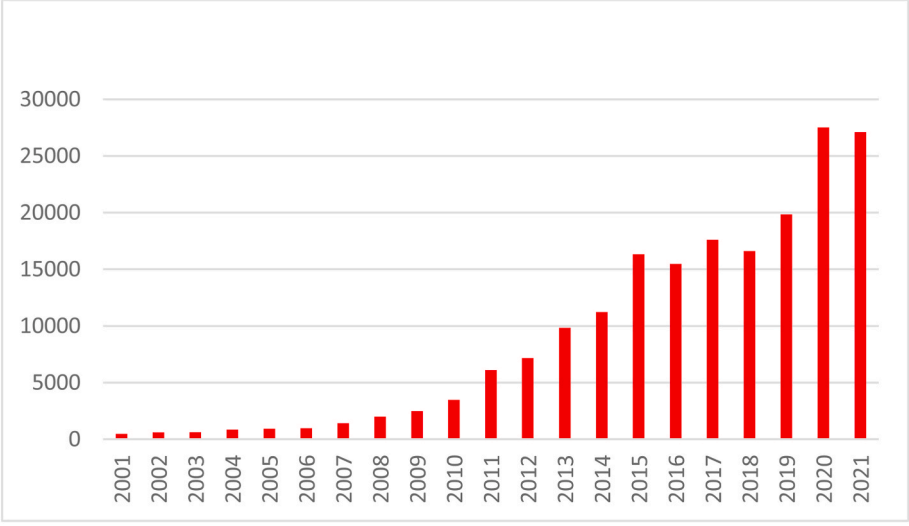

Fig. 1. Generation of electricity from wind power (GWh).
Source: Swedish Energy Agency. Antal verk, installerad effekt och elproduktion, hela landet, 1982–2021.

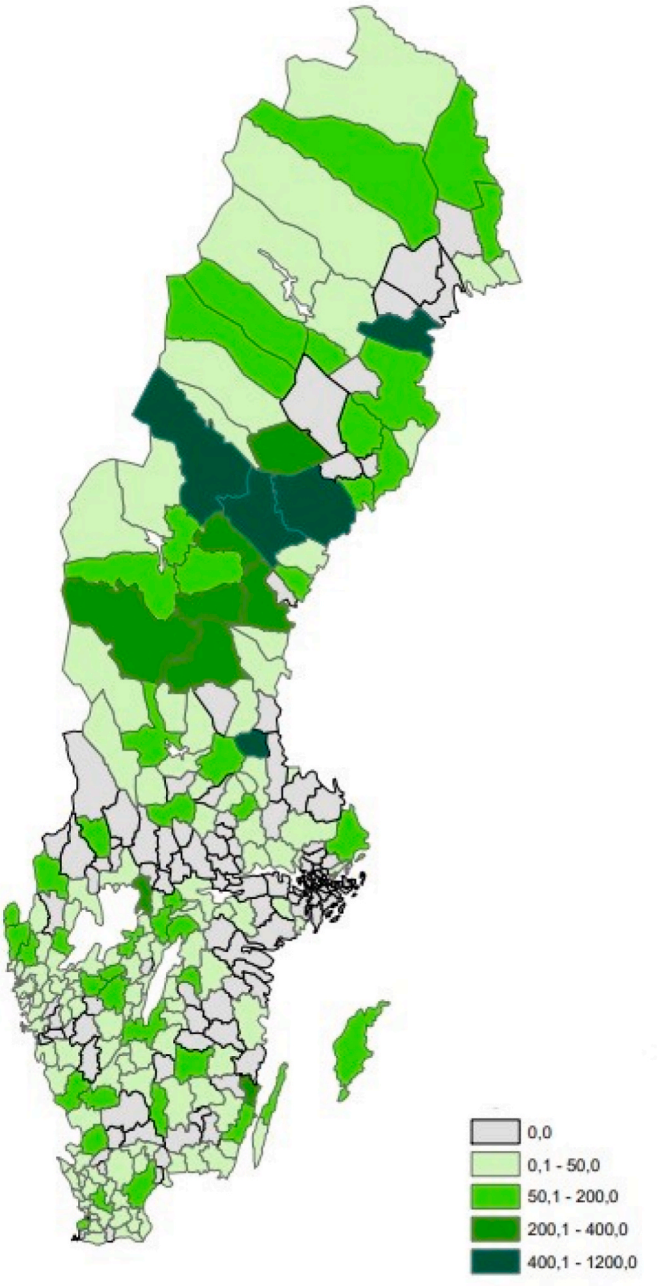

Fig. 2. Installed wind power effect per municipality (MW).
Source: Swedish Energy Agency. Antal verk, installerad effekt och elproduktion, hela landet, 1982–2021.

an even higher level, and according to the power branch, investors are therefore reluctant to develop wind power in Norway (Uminski, 2022).

Several types of informal benefit arrangements exist in Sweden, and community funds that can be used by communities living close to wind power sitings are common. Community funds are negotiated between the wind power operator and the local community, and the compensation is either paid per wind power turbine or upon a percentage of the generated electricity (Swedish Energy Agency, 2021c). In few municipalities, wind power operators are contributing to the economic association Garantia, which offers a micro financial infrastructure for business enterprises in rural areas.

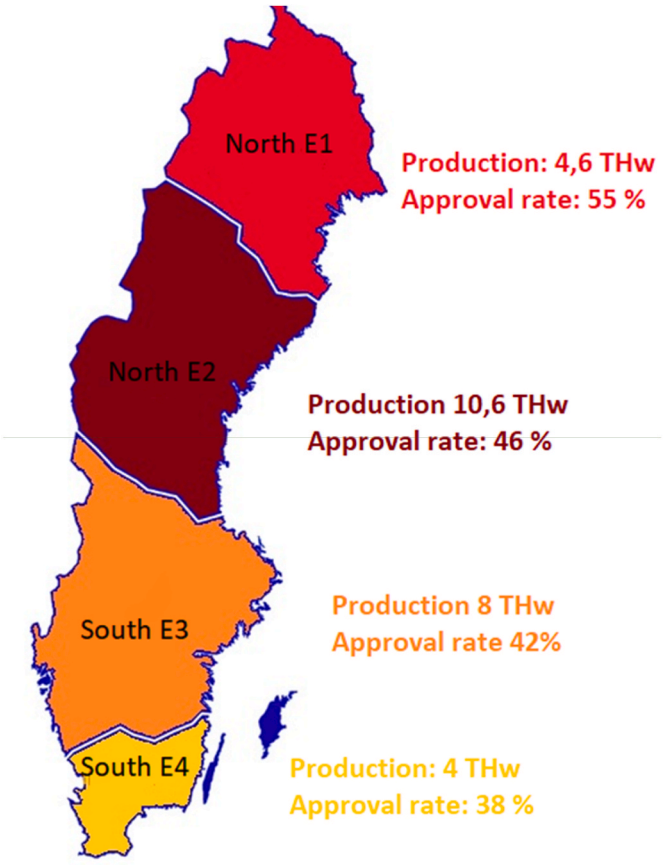

Fig. 3. Distribution of wind power generation and municipal approval rated between electricity price areas.
Source: Swedish Energy Agency, 2021. Nulägesbeskrivning - vindkraftens förutsättningar. Underlag till Nationell strategi för en hållbar vindkraftsutbyggnad.

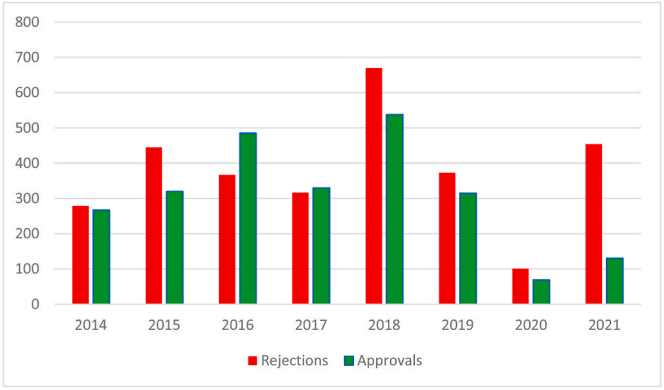

Fig. 4. Municipal approval rate of wind power applications (number of turbines).
Source: Westander (2021). Statistik om vindkraftsärenden 2014–2020.

4. Method and material

This study focuses on municipal acceptance and is undertaken by semi-structured interviews with municipal decision-makers, analysis of official documents, statistics of wind power deployment, reports, and media coverage. Twenty interviews were conducted with politicians in 18 municipalities in Sweden between October and December 2022 (appendix 2). The intention was to cover all types of municipalities,

focusing on those that have either approved or rejected several wind power applications or have experienced conflicts related to wind power projects. Nine of the municipalities were from the two northern energy regions and nine from the two southern. Six municipalities had dealt with offshore wind power, four belonged to the top ten producers, and five had systematically rejected wind power projects.

Municipal decisions on wind power are usually prepared by the municipal committee responsible for construction or environmental issues, and the municipal board takes the final decision (Swedish Energy Agency, 2021c). To get direct access to the decision-making process, the board president (the mayor) was approached, and in the case of rejection or no response, interview requests were sent to the deputy president or the head of the committee responsible for construction or environmental issues. The board president was interviewed in 13 municipalities, the committee president in 5, and two additional interviews were conducted with deputy presidents.

The interviews were semi-structured (Adams, 2015), and the interviewees received a set of questions in advance by email. The interview followed that structure but allowed for discussion on issues appearing in the conversations (appendix 1). The interviews were undertaken by the author, using Zoom or Teams, and took between 30 and 45 min. Before each interview, each municipality's specific situation was analysed regarding wind power development, rejections, and potential disputes. The interviewees were asked to respond to questions regarding the local situation, reasons for approval and rejection, and experience and attitudes to different forms of compensation. They also received information on the background and purpose of the research and agreed to the terms of the interview. Quotes and statements were anonymized in the final stages of the analyzing process.

The methodological approach applied in the analyzing process is that of grounded theory, meaning that the data was reviewed with inductive reasoning, and in this exercise, a few subthemes were coded beside the main themes, related to statements expressing significant concepts, beliefs, and values (Birks and Mills, 2011). The interviews were transcribed and coded thematically based on key arguments for rejections and attitudes to various types of compensation. The coding was done by the author in three rounds using structural coding (Saldaña, 2013). The results were communicated to the governmental inquiry on incitements for wind power development in two brief policy reports to make the results of the study available for the policy-making process.

5. Results

5.1. Aspects influencing municipal approval of wind power projects

Discussing the reasons for approving wind power applications with the interviewees, the main motivations given were of an altruistic character. The most common arguments stated were contributions to climate change mitigation and a fossil-free energy system. While these motivations were emphasized by several of the interviewees, sometimes referring to the climate targets adopted by the municipalities, others could not state any explicit motivations at all.

However, a few of the interviewed politicians from the northern municipalities claimed that local residents were positively inclined to wind power, arguing that they had acknowledged its economic benefits. This was particularly the case in small rural municipalities, where wind energy installations had allegedly generated employment in otherwise economically deprived areas. In a few municipalities, the access to clean and cheap energy had also attracted new industries, and in at least three municipalities, there were investments ongoing in hydrogen gas production. According to some of the interviewed politicians, these economic outcomes affected the attitudes of municipal decision-makers and the local communities.

> The discussion about the wind farm has now turned into a discussion which is not about producing energy and transporting it away from here, but about producing energy and refining it further. In this case, you are looking at hydrogen gas.

In most municipalities, particularly in the southern municipalities, the interviewees claimed that wind energy had no relevance for the local economy, and the municipal decision-makers had no economic motivations to accept wind power. This aspect and the lack of compensation seem to influence decision-makers. When asked about the political consequences of rejecting a wind power application, more or less all interviewees responded that they had nothing to lose while political parties approving wind power project could be punished in the elections.

5.2. Aspects influencing municipal rejections of wind power projects

The interviewees generally expressed three main motivations for rejecting wind power projects: local opposition triggered by aesthetic, visual, or audial disturbance, ideologically or politically based arguments, and arguments referring to distributional and procedural justice. The stated reasons for rejections were often found in a combination of these aspects. Moreover, the negative impact on the local environment or the local economy (tourism, fishing, or reindeer herding) was mentioned as well as dissatisfaction with the wind power investor or developer. Very few interviewees claimed that they had any negative attitudes toward wind power, although personal preferences appear to influence some of the responses.

5.2.1. Aesthetic, visual or audial disturbance

Virtually all the decision-makers interviewed in this study stated that the interference in the landscape caused by wind power and the disturbances experienced by residents living nearby could trigger local dissatisfaction. Several of them said they had personally met or been contacted by nearby residents who viewed wind power as an unwelcome element in the landscape and complained about noise and light disturbances. Local residents were also concerned about the effect of wind power on property prices.

> My phone and email were almost jammed, despairing people who saw their local environment being destroyed. So, there was an awful lot of resistance, …there is concern about noise and about the impact of infrasound and so on.

Local opposition differed depending on the location of the wind power installation, the size of the turbines, the use of flashlights, and the level of noise. Wind power projects in areas with sensitive nature or areas often visited by local residents would trigger more negative responses. An argument made by several politicians was that the distance from urban areas or the coastline had a significant impact on attitudes. This proximity effect was more common in the south of Sweden and more densely populated municipalities. On the other hand, politicians from municipalities with large concentrations of wind power claimed that it was becoming increasingly difficult to find sparsely inhabited areas, arguing that the opposition against wind power had increased as its development intensified.

> The more wind power you have developed and the more experience you gain from living near a wind farm, the more critical you become.

> As more and more companies want to establish themselves and as more spinners come up, many people think that it is simply too much. There will be too much intrusion into our local environment when you build so many wind power plants.

On the other hand, several interviewees argued that wind power experience is subjective, and the reactions differ between different groups of residents. Some of them stated that it was commonly just a few individuals who strongly opposed wind power installations, and they would sometimes form protest groups that would mobilize opposition among other residents. Judging from the responses, the negative

attitudes of people living next to wind power plants were nevertheless influencing municipal acceptance. However, the opposition needed to be actively mobilized and organized, and such activities differed from one project to another.

5.2.2. Ideologically or politically based arguments

Several of the interviewees claimed that municipal acceptance is, to a large extent, defined by the ideological position of local politicians. There was a clear divide between conservative politicians, who are more skeptical towards wind power, and liberal and left-leaning, who express more tolerant attitudes. Some of the interviewees claimed, however, that this polarization is not necessarily manifested at the local level. Others stated that there were cases in which local politicians acted to exploit and mobilize the opposition among local residents. In this sense, the aesthetic and physical disturbance of wind power were often combined with ideologically motivated opposition.

> The physical and the political often go together. There are citizens who are bothered and who are used by political forces.

> It's enough if one, four, five local residents oppose. Then they will start a Facebook group and then they (politicians) catch on. They say they are listening to the people, and then there will be resistance. Then they will demand the municipality to use its veto.

The conflicts at the local level had, in some cases, become aggressive. Wind power projects were debated on social media, where it took on a relatively hostile expression, often with misleading facts and fake visual images of projects. Some interviewed politicians said they had been objects of hate campaigns or threats. They argued that local residents would initially not have a clear position on wind power but would be influenced by the public debate or the activities of local protest groups. When conflicts arise at the local level, residents with positive or indifferent attitudes to wind power prefer not to become involved and would thereby allow vocal residents to influence the debate. Several interviewees claimed moreover that individual politicians would often swing towards a negative position for fear of being punished in the local elections, although they initially had no outspoken attitude on wind power. The national debate also influenced local politics, and a few interviewees stated they felt uncomfortable with their party's stance at the national level.

> As you know, the wind power issue has become so polarized. It has almost become religious in a way that you probably couldn't believe in your wildest imagination in 2010. But yes, it has gotten worse and worse with each election, really. And this election was probably the election when most people actually put their foot down and said that for now, so be it. And it has to do with, I think, the compensation issue. It is absolutely crucial.

Regardless of their attitudes toward wind power, more or less all of the interviewees agreed that the polarization was problematic and had generated a situation in which it was difficult to deal with decisions on wind power sitings. The polarization and politicization of the issue seem to have affected the arguments for or against wind power. While a few interviewees stated that wind power caused problematic conflicts with the fishing industry and tourism, others downplayed such aspects, claiming that individual politicians deceitfully used this as an argument against wind power.

5.2.3. Distributional justice

Judging from the interviews, there is a geographic divide in the arguments for rejecting wind power investments. While politicians in the southern parts of the country were often referring to wind power as an aesthetically unwelcome intrusion in the landscape, politicians in the northern parts were more likely to refer to arguments of fairness and injustice. Politicians in municipalities in northern Sweden claimed that people felt their land was being exploited by wind power without getting anything in return. The socioeconomic deprivation in these municipalities and the experience of the expansion of hydropower in the 1950s and 1960s added to the sense of wind power being another exploitation of the natural resources.

> Roughly calculated, maybe we consume five per cent of the energy produced here, and the rest is transferred somewhere else …. in other words, looking at the volume of energy that is produced and exported at the same time as having, I must say, quite tough to be able to, for example, keep the community services running.

> I think you can backtrack all the way to the expansion of the hydropower and people have a feeling that, well, nothing comes back to the communities from the hydropower … it also feels a little unfair that wind power should then be allowed to take up so much space in our land, while we get so little in return.

> Yes, that is perhaps one of the main arguments actually, and in addition to that, we are Sweden's next largest hydropower municipality … And many who have experienced that journey feel that this (wind power) will just be a repetition of the same story. First, they destroyed our rivers, and now they are going to destroy the rest of the landscape as well.

Residents living close to wind power sitings might be disturbed by their physical presence in the landscape, regardless of where they live; however, several politicians argued that the energy system's unfairness amplified the discontent. In the municipalities in northern Sweden, the perception of relative injustice was a decisive factor; however, in these municipalities, economic returns of wind power were often more tangible, influencing both municipal and community acceptance, regardless of the perception of unfairness.

5.2.4. Procedural justice

The anchoring and consultation process before the initiation of the project was considered to be important. Some projects were rejected based on the investor's unserious conduct, and several interviewees stated that investors had sometimes approached the municipality with a rather aggressive attitude without taking environmental aspects or the concerns of the local residents into proper consideration. Investors who had ensured that local communities were receiving proper information and who had actively reached out and addressed the concerns of the local communities were in a better position to be accepted. On the other hand, a poorly conducted consultation could negatively influence local acceptance, as it could become an occasion for dissatisfaction to arise. However, two interviewees stated that protest groups had used the consultations to mobilize opposition.

A problematic aspect in this regard was the unclear role of the municipalities in the consultation process. Stakeholder involvement is a part of the formal land-use planning process, which can include public hearings and information sharing; however, they usually do not include a discussion on community benefits. Moreover, several projects are just included in detailed development plans with no hearing requirements (Liljenfeldt and Pettersson, 2017; Waldo and Klintman, 2010). While some of the politicians stated that the municipalities would facilitate the consultation between the investor and the local communities, others were unwilling to get too engaged in the process. Since the municipalities had no vested interests in the process, they could not justify spending resources on the process. Others said that they had been reluctant to negotiate aspects related to community funds, not wanting to be seen to unduly push any of the parties into an economically unfavourable agreement and expose themselves to criticism.

> The background is that the expansion of wind power has been like the wild west. It has been completely unregulated. It is an agreement between the landowner and developer. … and people have been run over … Had there been legislation that stipulated that the municipality must contact the developer and, within the framework of this,

you must jointly do something for the local residents … Now it is like voluntary work.

The local communities would thus often negotiate the terms of compensation on their own. However, in some sparsely populated municipalities, the communities were often poorly organized, making negotiation and administration challenging. The wind power companies would, therefore, often approach the municipalities, asking them to participate. Several of the interviewees stated furthermore that they also felt that the municipality ended up in an inferior position in relation to wind power companies, which were often international corporations. They had greater resources and access to law firms, while the administration of the municipalities was limited to a few civil servants.

5.3. Compensation and municipal decisions on wind power licensing

The experiences and attitudes of different types of compensation of the interviewees were primarily restricted to voluntary community benefits, if such existed at the local level, and to a potential introduction of municipal property tax on wind power. A few of the municipalities had considered the potential effect of alternative solutions, such as local co-ownership. Some had evaluated the possibility of investing in wind power, and in a few cases, wind power was owned by the municipal energy company. However, the option of increasing municipal ownership was ruled out since new and larger wind power turbines were considered too capital intensive, and such investments' financial risk was too high for municipalities.

5.3.1. Community funds

When it comes to the effect of community funds on community acceptance, the attitudes of the interviewed politicians differed. While some stated they had contributed to overcoming acceptance barriers, others were less convinced. Judging from the interviews, community funds seem to have impacted the attitudes of affected communities in rural, sparsely populated, and economically deprived areas. What mattered was the economic compensation and other kinds of services, such as the construction and restoration of roads, snow ploughing, and installing fiber connections. Some politicians confessed that the municipality had limited resources for maintaining the infrastructure and delivering general welfare services, and community benefits were welcomed in these aspects.

And even if they have these community funds, often a relatively small amount of money in total, they still make a difference at the local level … in this municipality, there are somewhat special conditions, and just something like being able to maintain the infrastructures in a such a large area, of course, can be challenging at times, and there the community funds can actually mean a lot.

Several interviewees argued, however, that the community funds had little impact on acceptance. It was considered to be too small, and some referred to it as "petty cash". The local residents could even be offended by the compensation, which could be seen as a type of bribery compared to the impact on the local landscape of wind power and the economic benefits the turbines generated for the investors and land owners; the payment was considered to be exceptionally low.

And of course, it's nice to get a few hundred thousand a year that you can use to develop the area, but it's petty cash if you can put it that way … that's probably also partly why they get upset.

While it was stated that the compensation needed to be increased, others argued that a high level of compensation could be problematic. The local community often lacked organizational capacity to receive and deal with larger sums, and in several areas, there were no existing civil society organizations representing the local community. According to some interviewees, the informal administration of community benefits could trigger disputes between local residents, particularly regarding the distribution of the funds. Others claimed that communities were initially pleased with the compensation distributed, but dissatisfaction could grow over time when basic welfare services were not improved.

They have lost jobs in the area. Preschools have been closed, public transport does not work … yes, of course, it is positive that they get money that they can build swimming jetties and windbreaks for hunting. But if I'm being really honest … this is not what people really want. They want a preschool, they want accessible public transport, satisfactory elderly care. Welfare services and that is not what they get from this money.

In these aspects, community benefits could be seen as insufficient compensation for the absence of public services, which people expect the municipality or the government to deliver. A few interviewees argued in this connection that municipal taxation, combined with community funds, would be the most effective measure to generate acceptance.

A more complex situation would occur for municipalities dealing with offshore wind power. In these cases, it was difficult to define the community affected since wind power sitings visible from the land would concern a larger number of residents. In one of the studied municipalities, the wind power investor had agreed to transfer one per cent of the profits to a municipal fund, which would be used for development projects along the coastline. According to one of the interviewed politicians, the compensation from the offshore projects would contribute considerably to the area; however, the local authorities failed to communicate how the project would benefit the area. Following two local referendums, in which a marginal majority voted against the projects, the municipality terminated the applications. None of the studied municipalities had accepted any offshore projects, and the actual effect of compensation in these contexts is thus unclear.

5.3.2. Municipal taxation

Several interviewees argued that municipalization of the national property tax, paid by wind power companies, would have the greatest influence on municipal acceptance, and also be easier to administer and communicate to citizens. Taxation would be a practical instrument to address unfairness in the energy system, it was argued, and many of them stated accordingly that a taxation in line with the model used in Finland, could influence both municipal and community acceptance.

From my perspective, I think it's easier to argue, for example, for a change when it comes to property tax and to municipalize it because then you can sort of see and point out very clearly that, yes, the level of property tax depends on x number of wind turbines.

Even though several of the interviewees argued for a transfer of the authority to levy taxation, they were not convinced that it would affect residents living close to wind power sitings and those with a negative attitude toward wind power. Some of them thought that local residents would have difficulties seeing the connection between increased tax revenues at the local level and the investment itself. It would, therefore, be necessary for municipalities to invest in the affected area. The most suitable system would thus be a combination of municipal property tax and some kind of community fund allotted to residents living close to wind power sitings. On the other hand, some believed that a municipal property tax would probably affect acceptance more broadly since many citizens are indifferent or express mild opposition, and they would be more positive if the investment generated a broader economic return to the municipality. Taxation would give the municipality full responsibility for the planning process, making it easier for them to negotiate with investors and represent the affected communities.

If the municipality would be reimbursed, then it will be up to the municipality to actually compensate those who live nearby … And then maybe that's where you would have to renovate the public bath,

> or invest in the school, or expand the road lighting, or asphalt the roads, or something.

Authorizing the municipality to levy taxes on wind power would, above all, motivate local politicians to approve projects. Furthermore, several argued that if the consequences of rejections would have economic implications in terms of lower tax revenues, it would be easier to convince the local electorate. The motives for obstructions and mobilization of protest groups would be weaker. Even though municipal taxation might not change the minds of the most affected communities, it would impact urban voters, one of the interviewed politicians argued, whose numeric strength matters in the elections.

> Five eligible voters out in some village somewhere compared to the other twenty thousand, who would look at this and say, "My God, look at what we will get from the money". That's the way most politicians will calculate it.

However, the arguments for municipal taxation were significantly stronger in northern Sweden's municipalities. In the southern municipalities, the potential tax revenues would have less of an impact on the local economy since they have fewer turbines and a more prosperous local economy. According to the respondents, the opposition to wind power in these municipalities seems to be more profound and linked to both the preservation of the landscape and an ideologically motivated attitude toward wind power. Nevertheless, several of them confessed that taxation could have an impact, even though the revenues would need to be at very high level to affect community and municipal acceptance. Acceptance would still be dependent on aspects such as the distance from the coastline and the impact on tourism. Municipal taxation was also argued to be the most appropriate compensation for offshore wind power projects.

6. Analytic discussion

With the declining prices of renewable energy technologies, the prospects of tackling global warming and swiftly transferring away from fossil fuels have become more realistic. However, as this study illustrates, the deployment of renewable energy infrastructure occurs at the local level, where it may have harmful local environmental impacts and trigger social and political disputes. If local perspectives are not taken into consideration, the energy transition might thus be stalled. Even though local communities and municipalities are sometimes depicted as barriers in the climate transition, this study echoes previous research showing that opposition is far more complex than simple NIMBYism (Wolsink, 2007; Horst, 2007; Aitken, 2010a). The intrusion of wind power in the local landscape may generate discontent, particularly in more densely populated areas. Municipalities are, however, not necessarily rejecting wind power upon concerns expressed by a majority of the municipal constituency but, according to several of the interviewees, rejections are often prompted by the aggressive opposition of the few. Scholars have also contested the concept of acceptance for not capturing the nuances between support and opposition (Batel et al., 2013; Kyselá et al., 2019), and to a certain extent, this study validates such criticism.

Although local decision-makers interact with and listen to affected residents and might be influenced by attitudes expressed by local communities, they are also acting to influence these attitudes. In some cases, they may even mobilize opposition and augment attitudes expressed by a few active citizens. National discourses and economic aspects furthermore influence local politicians, as well as the conduct of the investors, the institutional setting, regulations, and sociopolitical factors. Separating community, socio-political, and market acceptance as three different analytic aspects, as envisaged by Wüstenhagen et al. (2007), might thus be misleading. The complexity of these concepts must be observed when exploring social acceptance. This conclusion is consistent with Cowell et al. (2011) and Rudolph et al. (2017), who express similar criticism of the vague definition of local communities, and their geographic and political remits.

This study concludes that without any type of formal compensation, municipalities essentially lack a vested interest in licensing wind power. Wind power is not a labour-intensive energy source; investments generate few local economic benefits. Municipal decision-makers have little to lose when terminating applications, while motivations for endorsement are weak. Under such circumstances, the opposition of vocal protest groups or the ideological position of influential political parties at the local level may significantly impact municipal acceptance.

These aspects might also explain why wind power is unevenly developed across Sweden. Environmental conditions are more favourable for wind power in certain areas in the northern parts of Sweden, but it is also plausible that demographic and socioeconomic factors could explain the spatial concentration of wind power sitings. Wind power is mostly located in areas with a weak capacity to organize opposition. In line with the conclusions of Liljenfeldt and Pettersson (2017), this study suggests that the limited economic benefits generated by wind power, such as job creation and community funds, are likely to influence community acceptance in areas with a population with weak socioeconomic resources.

The study indicates, moreover, that the concentration of wind power in the northern parts of the country, and the low level of economic return, have given rise to a perception of energy injustice between regions, which may affect municipal decisions on wind power licensing and the effectiveness of various types of compensations. In these municipalities, wind power development, along with hydropower, is seen as a kind of exploitation of the landscape, which is used to generate economic profits that are returned neither to local communities nor municipalities. In the southern parts, wind power is opposed mainly based on visual disturbance, and ideological arguments often substantiate these attitudes. These findings are obviously context-specific for Sweden, but similar conclusions have been drawn by Inderberg et al. (2019) and may certainly be applicable to countries with identical political settings and socio-geographic conditions.

7. Conclusions and policy implications

By interviewing municipal decision-makers in Sweden, this study has explored the municipal acceptance of wind power installations and the effectiveness of various types of compensation. It is impossible to draw any definite conclusions on the basis of 20 interviews with local politicians. However, the differences in the responses of the interviewed politicians reveal certain factors relevant to municipal acceptance. According to the interviews, the three main reasons for municipal rejections of wind power are aesthetical, visual, and audial disturbance, ideological and political motivations, and distributional and procedural justice aspects. Judging from the responses, these aspects are overlapping and may reinforce each other. The attitudes expressed by local communities are often mobilized and articulated by political or economic forces.

Previous research has shown that local communities in Sweden regard wind power as an unwelcomed exploitation of the landscape, associated with colonial approaches (Lawrence, 2014), and this study partly validate such findings. The results indicate that community and municipal acceptance is connected with perceptions of energy injustice generated by the geographically uneven deployment of wind and hydropower. To generate acceptance, wind power must bring local economic returns in terms of compensation, job creation, or other local paybacks, benefiting both the community living close to the wind power sitting and the host municipality.

Regarding the types of compensation that are judged to be effective in influencing municipal decisions, the study has primarily explored community funds and municipal taxation. To what extent community funds influence community acceptance seems to depend on the level of compensation, how it is distributed, and procedural aspects, such as the consultation process undertaken prior to construction. This article

indicates, as shown in several other studies, that informal community funds are associated with several difficulties, such as bribery effects (Walker et al., 2017; Cass et al., 2010). When wind power investors compensate local communities upon informal arrangements, they are providing certain public services without a proper democratic mandate. This could undermine the legitimacy of the compensation, which has also been suggested by Upham and García Pérez (2015).

The study further concludes that the participation of the concerned residents and the municipality is important to overcome acceptance barriers. If the municipality is not motivated to engage in this exercise, communities might not have a legal entity acting on their behalf, making them exposed to the arbitrary conduct of wind power investors and operators. The article consequently argues for the merits of municipal taxation since it could encourage the municipality to approve wind power projects and assume responsibility for the policy process. Taxation is thus a measure that could help address perceptions of procedural and distributional injustice.

Allowing municipalities to levy a property tax will not defeat all kinds of local acceptance barriers, particularly if revenues do not benefit residents close to wind power turbines. It may also be an ineffective incentive in prosperous municipalities, where energy injustice is not a major factor behind municipal opposition. Nevertheless, a conclusion that can be drawn from this study is that lucid, predictable, and transparent legal and financial instruments stipulating a just and balanced distribution of responsibilities and benefits are of great importance for social acceptance. The energy transition is an exercise with several democratic implications, as it concerns power relations between different political and economic forces at the local, national and global levels. Municipal involvement in this process is of importance since the municipality can constitute a democratic arena where some of the environmental and socioeconomic concerns of the energy transitions can be addressed and where the different, and sometimes conflicting, local, national and global interests can be accommodated.

A handful of interviews with local politicians do not provide sufficient empirical evidence for these findings. Rather, the interview results indicate that further research, preferably by survey experiments, could explore whether and to what extent the perception of unfairness between regions in Sweden is an important factor determining rejections of wind power in certain municipalities and how this aspect is influencing the effectiveness of types of different compensation.

Declaration of competing interest

No conflict of interest statement.

Data availability

The authors do not have permission to share data.

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Interview template

- Tell me about the development of wind power in your municipality. Could say anything about why for the municipality has approved and/or rejected decisions in the past? (referring to specific cases).
- Could talk about the local responses to wind power projects? Has there been or opposition and disputes and what would say have been the main reasons behind community acceptance/resistance?
- Is it mostly people living nearby who are opposing wind power? Could you tell me anything what kind of political impact the attitudes of local communities have had?
- Has there been any local community benefits or compensation schemes? How are the compensation schemes negotiated and arranged?
- What kind of influence have they had on community acceptance?
- What kinds of economic benefits are wind power investments generating for the municipality?
- What kinds of community benefits or compensations schemes would according to you have an impact on community and municipal acceptance?
- How would you compare the different types of compensations publicly discussed; local community funds (bygdemedel), direct financial compensation, municipalization of property tax, reduces electricity price, or local ownership of wind power?

Appendix 2. Overview of interviews

Region	Municipality	Installed effect (MW)	Comments
North E1	Vilhelmina	4 MW	Low development – major projects on going.
North E1	Åsele	395	Major development, modest conflict
North E1	Storuman	146 MW	Modest development, major conflict
North E2	Strömsund	475 MW	Major development, some conflict
North E2	Sollefteå (2 interviews)	493 MW	Major development, with major conflicts
North E2	Ånge	232 MW	Major development, modest conflict
North E2	Härnösand	119 MW	Land-based approved, rejected offshore
North E2	Ljusdal	247 MW	Major development, modest conflict
North E2	Söderhamn (2 interviews)	–	Two major offshore projects rejected
South E3	Malung	32 MW	Major development, major conflict
South E3	Arvika	–	Land-based project rejected
South E3	Öckerö	–	Offshore project rejected
South E3	Ulricehamn	17 MW	Modest development
South E4	Ljungby	–	Two landbased project rejected
South E4	Vetlanda	169 MW	Major development, landbased project rejected
South E4	Falkenberg	172 MW	Major onshore development, offshore debated
South E4	Kristianstad	98 MW	Major onshore development, offshore rejected
South E4	Trelleborg	–	One offshore rejected, second debated

References

Adams, William, 2015. Conducting semi-structured interviews. https://doi.org/10.1002/9781119171386.ch19.

Aitken, Mhairi, 2010a. Why we still don't understand the social aspects of wind power: a critique of key assumptions within the literature. Energy Pol. 38 (4), 1834–1841. https://doi.org/10.1016/j.enpol.2009.11.060.

Aitken, Mhairi, 2010b. "Wind Power and Community Benefits: Challenges and Opportunities." Energy Policy, the Socio-Economic Transition Towards a Hydrogen Economy - Findings from European Research, with Regular Papers, 38 (10), pp. 6066–6075. https://doi.org/10.1016/j.enpol.2010.05.062.

Aldieri, Luigi, Grafström, Jonas, Sundström, Kristoffer, Concetto Paolo Vinci, 2020. Wind power and job creation. Sustainability 12 (1), 45. https://doi.org/10.3390/su12010045.

Batel, Susana, Devine-Wright, Patrick, Tangeland, Torvald, 2013. Social acceptance of low carbon energy and associated infrastructures: a critical discussion. Energy Pol. 58 (July), 1–5. https://doi.org/10.1016/j.enpol.2013.03.018.

Bertsch, Valentin, Hall, Margeret, Weinhardt, Christof, Wolf, Fichtner, 2016. Public acceptance and preferences related to renewable energy and grid expansion policy: empirical insights for Germany. Energy 114 (November), 465–477. https://doi.org/10.1016/j.energy.2016.08.022.

Birks, Melanie, Mills, Jane, 2011. Grounded Theory: A Practical Guide. SAGE Publications.

Brannstrom, Christian, Santos Leite, Nicolly, Lavoie, Anna, Gorayeb, Adryane, 2022. What explains the community acceptance of wind energy? Exploring benefits, consultation, and livelihoods in coastal Brazil. Energy Res. Social Sci. 83 (January), 102344 https://doi.org/10.1016/j.erss.2021.102344.

Brennan, Noreen, Van Rensburg, Thomas M., 2016. Wind farm externalities and public preferences for community consultation in Ireland: a discrete choice experiments approach. Energy Pol. 94, 355–365. https://doi.org/10.1016/j.enpol.2016.04.031.

Carley, Sanya, Konisky, David, Atiq, Zoya, Land, Nick, 2020. Energy infrastructure, NIMBYism, and public opinion: a systematic literature review of three decades of empirical survey literature. Environ. Res. Lett. 15 (September) https://doi.org/10.1088/1748-9326/ab875d.

Cass, Noel, Walker, Gordon, Devine-Wright, Patrick, 2010. Good neighbours, public relations and bribes: the politics and perceptions of community benefit provision in renewable energy development in the UK. J. Environ. Pol. Plann. 12 (3), 255–275. https://doi.org/10.1080/1523908X.2010.509558.

Cowell, Richard, Gill, Bristow, Munday, Max, 2011. Acceptance, acceptability and environmental justice: the role of community benefits in wind energy development. J. Environ. Plann. Manag. 54 (4), 539–557. https://doi.org/10.1080/09640568.2010.521047.

Dagbladet, Svenska, 2018. Bygden måste få ta del av vindkraftens miljarder" | SvD Debatt. February 4, 2018, sec. Debatt. https://www.svd.se/a/KvpE9E/bygden-maste-fa-ta-del-av-vindkraftens-miljarder. Retrieved, 2023-05-11.

Debatt, D.N., 2021. "Låt skatten på vindkraftverk stanna i glesbygden". December 10, 2021. https://www.dn.se/debatt/lat-skatten-pa-vindkraftverk-stanna-i-glesbygden/ (Retrieved, 2023-05-11).

De Luca, Elena, Nardi, Cecilia, Giuffrida, Laura Gaetana, Krug, Michael, De LucaDi Nucci, Maria Rosaria, 2020. Explaining Factors Leading to Community Acceptance of Wind Energy. Results of an Expert Assessment. Energies 13 (8), 2119. https://doi.org/10.3390/en13082119.

Devine-Wright, Patrick, 2009. Rethinking NIMBYism: the role of place attachment and place identity in explaining place-protective action. J. Community Appl. Soc. Psychol. 19 (6), 426–441. https://doi.org/10.1002/casp.1004.

Dir, 2022. Stärkta incitament för utbyggd vindkraft". Kommittédirektiv från Klimat- och näringslivsdepartementet, 27. https://www.regeringen.se/rattsliga-dokument/kommittedirektiv/2022/04/dir.-202227 (Retrieved 2023-05-11).

Downey, Sean S., Greenberg, Pierce, Vinton, M., 2022. Explaining Resident Attitudes toward Wind Energy Development in the Sandhills." *Undefined*. https://www.semanticscholar.org/paper/Explaining-Resident-Attitudes-toward-Wind-Energy-in-Downey-Greenberg/b8554bd5b56a37d8af78d54a503477ce6c62707c.

Dugstad, Anders, Grimsrud, Kristine, Kipperberg, Gorm, Lindhjem, Henrik, Navrud, Ståle, 2020. Acceptance of wind power development and exposure - not-in-anybody's-backyard. Energy Pol. 147 (September), 111780 https://doi.org/10.1016/j.enpol.2020.111780.

Ejdemo, Thomas, Söderholm, Patrik, 2015. Wind power, regional development and benefit-sharing: the case of Northern Sweden. Renew. Sustain. Energy Rev. 47 (July), 476–485. https://doi.org/10.1016/j.rser.2015.03.082.

FSV, 2022. "Glesbygden måste gynnas". January 7, 2022. https://fsv.nu/glesbygden-maste-gynnas/.

García, Jorge H., Cherry, Todd L., Kallbekken, Steffen, Torvanger, Asbjørn, 2016. Willingness to accept local wind energy development: does the compensation mechanism matter? Energy Pol. 99, 165–173. https://doi.org/10.1016/j.enpol.2016.09.046.

Greene, John, Geisken, Mark, 2013. Socioeconomic impacts of wind farm development: a case study of Weatherford, Oklahoma. Energy, Sustain. Soc 3 (December). https://doi.org/10.1186/2192-0567-3-2.

Gross, C., 2007. Community perspectives of wind energy in Australia: the application of a justice and community fairness framework to increase social acceptance. Energy Pol 35 (5), 2727–2736. https://doi.org/10.1016/j.enpol.2006.12.013.

Hamilton, Lawrence C., Bell, Erin, Hartter, Joel, Salerno, Jonathan D., 2018. A change in the wind? US public views on renewable energy and climate compared. Energy, Sustain. Soc 8 (1), 11. https://doi.org/10.1186/s13705-018-0152-5.

Hoen, Ben, Firestone, Jeremy, Rand, Joseph, Elliot, Debi, Hübner, Gundula, Pohl, Johannes, Ryan, Wiser, Lantz, Eric, Ryan Haac, T., Kaliski, Ken, 2019. Attitudes of U.S. Wind turbine neighbors: analysis of a nationwide survey. Energy Pol. 134 (November), 110981 https://doi.org/10.1016/j.enpol.2019.110981.

Horst, Dan van der, 2007. NIMBY or not? Exploring the relevance of location and the politics of voiced opinions in renewable energy siting controversies. Energy Pol. 35 (5), 2705–2714. https://doi.org/10.1016/j.enpol.2006.12.012.

Huijts, N.M.A., Molin, E.J.E., Steg, L., 2012. Psychological factors influencing sustainable energy technology acceptance: a review-based comprehensive framework. Renew. Sustain. Energy Rev. 16 (1), 525–531. https://doi.org/10.1016/j.rser.2011.08.018.

Inderberg, Tor Håkon Jackson, Rognstad, Helga, Saglie, Inger-Lise, Gulbrandsen, Lars H., 2019. Who influences windpower licensing decisions in Norway? Formal requirements and informal practices. Energy Res. Social Sci. 52 (June), 181–191. https://doi.org/10.1016/j.erss.2019.02.004.

Jenkins, Kirsten, McCauley, Darren, Heffron, Raphael, Stephan, Hannes, Rehner, Robert, 2016. Energy justice: a conceptual review. Energy Res. Social Sci. 11 (January), 174–182. https://doi.org/10.1016/j.erss.2015.10.004.

Jönsson, Erik, 2022. Vindkraftsopinionen i skuggan av ett vindkraftverk. I Ulrika Andersson, Henrik Oscarsson, Björn Rönnerstrand & Nora Theorin (red) Du sköra nya värld. Göteborg: SOM-institutet, Göteborgs universitet.

Knauf, Jakob, 2022. Can't Buy Me acceptance? Financial benefits for wind energy projects in Germany. Energy Pol. 165 (June), 112924 https://doi.org/10.1016/j.enpol.2022.112924.

Krekel, Christian, Alexander, Zerrahn, 2017. Does the presence of wind turbines have negative externalities for people in their surroundings? Evidence from well-being data. J. Environ. Econ. Manag. 82 (March), 221–238. https://doi.org/10.1016/j.jeem.2016.11.009.

Kyselá, E., Ščasný, M., Zvěřinová, I., 2019. Attitudes toward climate change mitigation policies: a review of measures and a construct of policy attitudes. Clim. Pol. 19, 878–892. https://doi.org/10.1080/14693062.2019.1611534.

Lamy, Julian, Bruine de Bruin, Wändi, Inês, M., Azevedo, L., Granger Morgan, M., 2020. Keep wind projects close? A case study of distance, culture, and cost in offshore and onshore wind energy siting. Energy Res. Social Sci. 63 (May), 101377 https://doi.org/10.1016/j.erss.2019.101377.

Larsson, Stefan, Emmelin, Lars, Vindelstam, Sandra, 2014. Multi–level environmental governance: the case of wind power development in Sweden. Soc. Stud. 6 (2), 291–312. https://doi.org/10.13165/SMS-14-6-2-04.

Lauf, Thomas, Kristina, Ek, Gawel, Erik, Lehmann, Paul, Söderholm, Patrik, 2020. The regional heterogeneity of wind power deployment: an empirical investigation of land-use policies in Germany and Sweden. J. Environ. Plann. Manag. 63 (4), 751–778. https://doi.org/10.1080/09640568.2019.1613221.

Lawrence, Rebecca, 2014. Internal colonisation and indigenous resource sovereignty: wind power developments on traditional saami lands. Environ. Plann. Soc. Space 32 (6), 1036–1053. https://doi.org/10.1068/d9012.

Liebe, Ulf, Anna, Bartczak, Meyerhoff, Jürgen, 2017. A turbine is not only a turbine: the role of social context and fairness characteristics for the local acceptance of wind power. Energy Pol. 107 (August), 300–308. https://doi.org/10.1016/j.enpol.2017.04.043.

Lienhoop, Nele, 2018. Acceptance of wind energy and the role of financial and procedural participation: an investigation with focus groups and choice experiments. Energy Pol. 118 (July), 97–105. https://doi.org/10.1016/j.enpol.2018.03.063.

Liljenfeldt, Johanna, Pettersson, Örjan, 2017. Distributional justice in Swedish wind power development – an odds ratio analysis of windmill localization and local residents' socio-economic characteristics. Energy Pol. 105 (June), 648–657. https://doi.org/10.1016/j.enpol.2017.03.007.

Maleki-Dizaji, Pouyan, Nicoletta del Bufalo, Di Nucci, Maria-Rosaria, Krug, Michael, 2020. Overcoming barriers to the community acceptance of wind energy: lessons learnt from a comparative analysis of best practice cases across Europe. Sustainability 12 (9), 3562. https://doi.org/10.3390/su12093562.

Mulvaney, Kate, Woodson, Patrick, Prokopy, Linda, 2013. Different shades of green: a case study of support for wind farms in the rural midwest. Environ. Manag. 51 (March) https://doi.org/10.1007/s00267-013-0026-8.

Parkins, John, Anders, Sven, Meyerhoff, Jürgen, Holowach, Monique, 2022. Landowner acceptance of wind turbines on their land: insights from a factorial survey experiment. Land Econ. 98 (November), 674–689. https://doi.org/10.3368/le.98.4.012521-0008R1.

Pettersson, Maria, Kristina, Ek, Söderholm, Kristina, Söderholm, Patrik, 2010. Wind power planning and permitting: comparative perspectives from the Nordic countries. Renew. Sustain. Energy Rev. 14 (9), 3116–3123. https://doi.org/10.1016/j.rser.2010.07.008.

Radtke, Jörg, Yildiz, Özgür, Roth, Lucas, 2022. Does energy community membership change sustainable attitudes and behavioral patterns? Empirical evidence from community wind energy in Germany. Energies 15 (3), 822. https://doi.org/10.3390/en15030822.

Ramasar, Vasna, Busch, Henner, Brandstedt, Eric, Rudus, Krisjanis, 2022. When energy justice is contested: a systematic review of a decade of research on Sweden's conflicted energy landscape. Energy Res. Social Sci. 94 (December), 102862 https://doi.org/10.1016/j.erss.2022.102862.

Roddis, Philippa, Carver, Stephen, Dallimer, Martin, Norman, Paul, Guy, Ziv, 2018. The role of community acceptance in planning outcomes for onshore wind and solar farms: an energy justice analysis. Appl. Energy 226 (September), 353–364. https://doi.org/10.1016/j.apenergy.2018.05.087.

Rudolph, David, Haggett, Claire, Aitken, Mhairi, 2017. Community benefits from offshore renewables: the relationship between different understandings of impact, community, and benefit. Environ. Plan. C Politics Space 36 (March), 239965441769920. https://doi.org/10.1177/2399654417699206.

Saldaña, Johnny, 2013. The Coding Manual for Qualitative Researchers, vol. 2. SAGE Publ, Los Angeles, Calif.

Slattery, Michael C., Johnson, Becky L., Swofford, Jeffrey A., Pasqualetti, Martin J., 2012. The predominance of economic development in the support for large-scale wind farms in the U.S. Great plains. Renew. Sustain. Energy Rev. 16 (6), 3690–3701. https://doi.org/10.1016/j.rser.2012.03.016.

Söderholm, Patrik, Kristina, Ek, Pettersson, Maria, 2007. Wind power development in Sweden: global policies and local obstacles. Renew. Sustain. Energy Rev. 11 (3), 365–400. https://doi.org/10.1016/j.rser.2005.03.001.

SOU, 2021. En rättssäker vindkraftsprövning, 2021:53. Betänkande av utredningen. Elanders, Stockholm.

Sovacool, Benjamin K., Lakshmi Ratan, Pushkala, 2012. Conceptualizing the acceptance of wind and solar electricity. Renew. Sustain. Energy Rev. 16 (7), 5268–5279. https://doi.org/10.1016/j.rser.2012.04.048.

Strandberg, Hans, 2022. Reformen skulle öka elproduktionen i syd – det blev tvärtom." Publicerad 2022-01-21. https://www.dn.se/ekonomi/reformen-skulle-oka-elproduktionen-i-syd-det-blev-tvartom/. Retrieved 2023-05-11.

Sveriges Riksdag, 2022. Betänkande 2021/22:MJU28. Tidigt kommunalt ställningstagande till vindkraft. Retrieved 2023-05-11. https://www.riksdagen.se/sv/dokument-och-lagar/dokument/betankande/tidigt-kommunalt-stallningstagande-till-vindkraft_h901mju28/.

Swedish Energy Agency, 2021a. "Nulägesbeskrivning - vindkraftens förutsättningar. Underlag till Nationell strategi för en hållbar vindkraftsutbyggnad.".

Swedish Energy Agency, 2021b. Nationell strategi för en hållbar vindkraftsutbyggnad. Rapport framtagen i samarbete med Naturvårdsverket. ER 2021:2.

Swedish Energy Agency, 2021c. Åtgärder för lokal nytta vid vindkraftsetableringar. Underlag till Nationell strategi för en hållbar vindkraftsutbyggnad.

Swedish Energy Agency, 2023. Elcertifikatsystemet. https://www.energimyndigheten.se/fornybart/elcertifikatsystemet/. Retrieved 2023-05-11.

Toke, Dave, 2005. Explaining wind power planning outcomes:: some findings from a study in England and Wales. Energy Pol. 33 (12), 1527–1539. https://doi.org/10.1016/j.enpol.2004.01.009.

Uminski, Kamil, 2022. Hetsigt kring ny skatt på norsk elproduktion - second Opinion. https://second-opinion.se/hetsigt-kring-ny-skatt-pa-norsk-elproduktion/. (Accessed 25 October 2022). Retrieved, 2023-05-11.

Upham, Paul, Pérez, Jesús García, 2015. A cognitive mapping approach to understanding public objection to energy infrastructure: the case of wind power in Galicia, Spain. Renew. Energy 83 (November), 587–596. https://doi.org/10.1016/j.renene.2015.05.009.

Vuichard, Pascal, Stauch, Alexander, Dällenbach, Nathalie, 2019. Individual or collective? Community investment, local taxes, and the social acceptance of wind energy in Switzerland. Energy Res. Social Sci. 58, 101275 https://doi.org/10.1016/j.erss.2019.101275.

Waldo, Åsa, Klintman, Mikael, 2010. Attityder Och Delaktighet Vid Etablering Av Vindkraft till Havs, vol. 6351. Swedish Environmental Protection Agency.

Walker, Benjamin J.A., Wiersma, Bouke, Bailey, Etienne, 2014. Community benefits, framing and the social acceptance of offshore wind farms: an experimental study in England. Energy Res. Social Sci. 3 (September), 46–54. https://doi.org/10.1016/j.erss.2014.07.003.

Walker, Benjamin J.A., Duncan, Russel, Kurz, Tim, 2017. Community benefits or community bribes? An experimental analysis of strategies for managing community perceptions of bribery surrounding the siting of renewable energy projects. Environ. Behav. 49 (1), 59–83. https://doi.org/10.1177/0013916515605562.

Walter, Götz, 2014. Determining the local acceptance of wind energy projects in Switzerland: the importance of general attitudes and project characteristics. Energy Res. Social Sci. 4 (December), 78–88. https://doi.org/10.1016/j.erss.2014.09.003.

Westander, 2021. Statistik om vindkraftsärenden 2014–2020. https://svenskvindenergi.org/wp content/uploads/2021/05/Statistik-om-vindkraftsarenden-2014-2020.pdf. Retrieved 2023.01.24.

Wijk, Josef van, Fischhendler, Itay, Rosen, Gillad, Herman, Lior, 2021. Penny wise or pound foolish? Compensation schemes and the attainment of community acceptance in renewable energy. Energy Res. Social Sci. 81, 102260 https://doi.org/10.1016/j.erss.2021.102260.

Wolsink, Maarten, 2007. Wind power implementation: the nature of public attitudes: equity and fairness instead of 'backyard motives. Renew. Sustain. Energy Rev. 11 (6), 1188–1207. https://doi.org/10.1016/j.rser.2005.10.005.

Wretling, Vincent, Balfors, Berit, Mörtberg, Ulla, 2022. Balancing wind power deployment and sustainability objectives in Swedish planning and permitting. Energy, Sustain. Soc 12 (December). https://doi.org/10.1186/s13705-022-00376-y.

Wüstenhagen, Rolf, Wolsink, Maarten, Jean Bürer, Mary, 2007. Social acceptance of renewable energy innovation: an introduction to the concept. Energy Pol. 35 (5), 2683–2691. https://doi.org/10.1016/j.enpol.2006.12.001.

Further reading

De Luca, Elena, Cecilia, Nardi, Laura Gaetana, Giuffrida, Michael, Krug, Maria, Rosaria Di Nucci, 2020. Explaining factors leading to community acceptance of wind energy. Results of an expert assessment. Energies 13 (8), 2119. https://doi.org/10.3390/en13082119.

Germeshausen, Robert, Heim, Sven, Wagner, Ulrich, J., 2021. Support for Renewable Energy: the Case of Wind Power ZEW Discussion Papers 21-074 ZEW -. Leibniz Centre for European Economic Research.

Kristina, Ek, Matti, Simon, 2015. Valuing the local impacts of a large scale wind power establishment in northern Sweden: public and private preferences toward economic, environmental and sociocultural values. J. Environ. Plann. Manag. 58 (8), 1327–1345. https://doi.org/10.1080/09640568.2014.922936.

Nyheter, Dagens, 2022. Reformen skulle öka elproduktionen i syd – det blev tvärtom. January 21, 2022, sec. Ekonomi. https://www.dn.se/ekonomi/reformen-skulle-oka-elproduktionen-i-syd-det-blev-tvartom/.