UNIVERSITY OF COPENHAGEN
FACULTY OF SCIENCE

“War in Vindmølle Landsbyen”

Motivations of Wind Turbine Resistance and Support Groups and Implications for Denmark’s Climate Agenda

Abstract

The presence of resistance groups to wind turbine projects across Denmark is perceived as an obstacle to the country's achievement of carbon neutrality by 2050. In Tønder municipality, all but one wind turbine project proposal have been rejected since 1995. This paper investigates the question of the motivations of both wind turbine resistance and support groups as well as the factors that contribute to them, focusing on a small town in Tønder. Through a combination of semi-structured interviews, questionnaire, PRA, and participant observation, our study finds that contrary to commonly held perceptions of rural resistance groups as "Not in My Backyard" (NIMBYs), the motivations of both resistance and support groups to wind turbines stem from three conceptual dimensions of (mis)trust in governance, (un)even distribution of benefits, and rural decline. We utilise the environmental justice framework of Svarstad *et al.* (2011) to view these dimensions through the lenses of procedural, distributive, and sense of justice. Consequently, we argue that perceptions of procedural injustice due to a lack of trust in institutional processes and perceptions of distributive injustice due to the uneven distribution of economic benefits and power combine to create an overarching sense of injustice among the local citizens. We conclude by exploring the wider implications of resistance and support groups' activities to the reasons for the success or failure of wind projects in Denmark, positing that these perceived injustices will continue to motivate resistance groups and ultimately hinder the success of the country's green transition agenda.

In this report we use *Vindmølle Landsbyen* to refer to the town where we did our fieldwork - instead of using the real name - as we wish to respect the confidentiality and privacy of our respondents.

Acknowledgements

Our group would firstly like to express our deepest thanks to the people of Tønder municipality for their kindness, openness and understanding in helping to accommodate our fieldwork. We are also grateful to all instructors of the ILUNRM SLUSE field course at the University of Copenhagen, especially to our supervisors. Last but definitely not least, we send our love and gratitude to all our classmates within the SLUSE course for the support and camaraderie along the way.

Thank you for the memories!

Table of Contents

Abstract **1**
Acknowledgements **2**
Table of Contents **3**
List of Figures **5**
List of Tables **5**
Introduction **6**
Research Question: **7**
Literature Review and Knowledge Gap **8**
Environmental justice framework **9**
The Case of Vindmølle Landsbyen **12**
Methodology **14**
Semi-Structured Interviews 14
In-situ interviews 16
Matrix Ranking and Timelines 16
Mapping (GPS) 18
Participant Observation 18
Questionnaire 20
Results **23**
Motivations of Wind Energy Acceptance **23**
1.1 Rural decline and challenges 23
1.2 Uneven Distribution of Benefits 24
1.3 Trust and Mistrust: The role of the municipality 26
1.4 Polarisation of Views 29
Social movements and Strategies **30**
2.1 (De)legitimising Activist Strategies 31
2.2 Negative effects of Wind Turbines - Activist Articulation of Grievances 32
Cyclical Conflict: Competition for Project Approval **34**
The Success of the Sæd Project **35**
Discussion **38**
Limitations and Reflections **41**
Conclusion **42**
References **45**
Appendices **48**

List of Figures

Figure 1. Environmental Justice Framework
Figure 2. Map of existing and proposed wind turbine projects in Tønder municipality (not included in this report due to data privacy concerns).
Figure 3. Collective timeline of wind developments in Vindmølle Landsbyen
Figure 4. Graph- Position on the establishment of wind turbines
Figure 5. Bar Chart- Civil society participation in the wind energy debate
Figure 6. Matrix Ranking of "Motivations for opposing wind turbines" Informants #5 and #6
Figure 7. Bar Chart-Wind turbines have a negative effect on human health and well-being
Figure 8. Graph-Compensation from wind turbine is not advantageous for me
Figure 9. Graph-Position on the establishment of wind turbines
Figure 10. Seven Typologies of Local Participation

List of Tables

Table 1. Methods of data collection
Table 2. Mann-Whitney U test
Table 3. Ownership of wind shares among respondents from Vindmølle Landsbyen and Skærbæk vs. Sæd and Tønder.

List of Appendices

Appendix I - Synopsis
a. Research Gap and Relevance
b. Research Question
c. Objectives
d. Case Study
e. Analytical Framework
f. Data and Research Methods
Appendix II - Table of Methods
Appendix III - Technical Process
Appendix IV - Interview and Questionnaire Guide

- Interview guide for anti-wind groups
- Interview guide for pro-wind groups
- Interview guide for administrative staff
- Interview guide for local politicians
- Interview guide for developers
- Questionnaire guide

Appendix V - Matrix Ranking

Appendix VI - List of Proposed Renewable Energy Projects

Appendix VII - Statistical Analysis

Appendix VIII - Current Wind Parks Map

Introduction

The climate crisis, the current instability of the energy sector due to international political conflict, and the finiteness of fossil fuels are all key parts in creating an evermore urgent demand for renewably sourced energy. The domestic demand for green energy is rising and increasing production is detrimental to reaching the Danish climate goals (Klimarådet, 2022). In Denmark, wind is one of the most available resources to source electricity from as a renewable energy source. Outwith national interests, Denmark is signataire of the 2015 Paris Agreement and has committed to achieve a 70% reduction of greenhouse gas emission by 2030 compared to a 1990 baseline, hereunder is the pledge of that at least 50% of the total domestic energy demand must be supplied by renewable energy in 2030. Ultimately, Denmark has committed to reaching carbon neutrality by 2050 and in this effort, renewable energy will play a crucial role (EIA, 2017). The energy dimension within the green transition, while spanning globally in its scope, demands action to be taken in specific local settings. Renewable resources such as wind, traditionally understood as part of the landscape, suddenly take a commodified form and become a medium through which the distribution of power is administered and expressed (Dracklé & Krauss, 2011).

Within the Danish energy sector, the division of authority places the onus of decision-making of wind turbine projects at the municipal level (Anker *et al.*, 2015). Due to the liberalised nature of the energy sector, the local authorities must navigate the interests of both capital-intensive stakeholders and citizens of smaller means. This results in how local responses to wind turbine projects are entangled with the issue of trust in institutions and political actors as they are the central decision-makers. Crucially, the opinion of the local citizens are one of the main influences on swaying political will, as the Danish political system presupposes proximity between municipal electives and their constituents (Wustenhagen *et al.*, 2007). Thus, the central scale of determining the outcome of energy development is local in both regards.

This paper seeks to investigate the reasons underpinning the motivations why, how, and to what end wind turbine projects are perceived by local communities (see also Appendix

I). To this end, the scope of this paper is limited to wind turbine projects in Tønder municipality with a specific focus on the town of Vindmølle Landsbyen.[1]

Research Question:

What are the motivations of Vindmølle Landsbyen's resistance and support groups on the issue of wind turbines?

This will be explored together with our objectives of:

- *How do the motivations of resistance and support groups reflect the three types of justice outlined in the environmental justice framework?*
- *What social movements exist in Vindmølle Landsbyen and how are the perceptions of wind energy expressed?*
- *Who are the stakeholders involved in wind turbine projects and what are their interests?*
- *What are the main reasons for the acceptance or rejection of wind project proposals in Tønder municipality?*
- *How do local politics in Tønder municipality affect the politicisation and prioritisation of wind energy at the national level in Denmark?*

By way of outlining the town of Vindmølle Landsbyen as a microcosm of the larger conflict, we seek to encapsulate the complexity of the issue that is wind turbine development in Tønder. Firstly, the various contributions to map out local resistance to wind turbines are examined in a literature review. Herein, we address how our research question seeks to fill the gap in the literature by way of focusing on perceptions and motivations of locals gathered primarily through qualitative methods. Then, we argue how the theoretical framework of environmental justice is best suited to structure and function as a lens to analyse our findings, as it distinguishes between the three types of procedural, distributive, and sense of justice that all address the three essential dimensions in our findings: (mis)trust in governance, (un)even distribution of benefits, and rural decline. Our main area of study, the town of Vindmølle Landsbyen, is argued to be the most central area within which conflicts surrounding wind turbine projects are situated - both historically and currently. Our methodological framework

[1] This town name is a pseudonym used in this report to protect the confidentiality of our respondents

is dominated by methods of a qualitative nature: semi-structured interviews and PRA methods, which are complemented by a questionnaire and GPS mapping of a more quantitative nature. Our main findings show how local perceptions on rural decline in Tønder, a mistrust in the institutional processes due to an underlying sense of procedural injustice, and a perception of distributive injustice due to the uneven distribution of power and economic benefits are key motivating factors to both resistance and support groups. Together, these perceived distributive and procedural injustices contribute to a larger sense of injustice among the residents of Vindmølle Landsbyen.

Literature Review and Knowledge Gap

The body of empirical research on perceptions of wind farms has been successful in addressing several key questions, although the literature is more focused on describing perceptions of wind farms rather than providing substantive explanations of these (Devine-Wright, 2005; Gross, 2007; Magnani, 2021; Jobert *et al.*, 2007; Cowell *et al.* 2010). As indicated by Devine-Wright (2005), the investigative approach has mainly been oriented to market-research, NIMBYism, or environmental impact issues, with a predominant use of quantitative methods. This neglects investigating the individual thoughts of the affected people. For instance, the environmental conflict over wind energies were traditionally understood as a "Not in My Backyard" (NIMBY) syndrome - localistic interest, lack of balance in risk assessment, irrationality - or as opposition to the characteristics of wind energy - visual impact, and nature of the technology (Bonn & Dieperink, 2014). However, these explanations have the shortcomings of obscuring the real motivations behind environmental conflicts, and assuming that all opposition to RE projects is inherently wrong in the name of the green transition - thus ignoring valid claims that local populations may have around the social fairness of the green transition (Magnani, 2021). In this case, factors such as social inequalities, land tenure, wind farm ownership, or perceived (un)fairness of the process, have been identified as key to understanding legitimacy and acceptance of wind projects (Gross, 2007; Jobert *et al.*, 2007). This report attempts to bridge this gap by offering a different academic view by way of using a qualitative methodological framework. Firstly, we are interested in explaining the motivations of opposition and support of wind turbine projects through a specific content analysis of locals' statements with the aim to connect these specific

sentiments with a broader frame of political and economical reasons. As Gross (2007) and Jobert (2008), we adopted an approach that identified key motivations for the local perceptions of wind turbines projects, namely (mis)trust in governance, (un)even distribution of benefits, and rural decline.

On the other hand, other studies are focused on the factors of success in developing wind-energy projects in France and Germany, and illuminates how policy frameworks influence local acceptance, but they do not bring any evidences about the personal perceptions of the locals and how they relate to broader socio-political issues (Jobert *et al.*, 2007). Furthermore, studies such as Gross (2007) and Cowell et al. (2011) examine the topic of wind turbine development through qualitative methods, showing interesting individual perspectives through quotes from informants. However, there is still a lack of analysis about social movement involved in the wind energy topic.

While many scholars have used some elements of the Environmental Justice Framework such as procedural and distributive justice for their investigations (Gross, 2007; Magnani, 2021; Jobert *et al.,* 2007), we opted to enrich this analysis with a third element: sense of justice (Svarstad *et al.,* 2011). This different component provides a new unit of analysis by revealing the singular perception of justice of the people.

Environmental justice framework

In order to frame this research, it has employed a particular framework which deals with the complex issues regarding the environmental justice topic. The environmental justice framework (EJF) firstly emerged in the 1980s, during the rise of the environmental justice movement in the U.S, and it was applied on the establishment of toxic waste disposal and polluting industries in the areas populated by poor people and ethnic minorities (Jenkins, 2015). In this context, it was used to refer to the unequal distribution of environmental impacts, and how this inequality only harmed certain parts of the population. The conceptualisation of environmental justice has since been extended to other topics, such as management of biodiversity and impacts of climate change, while nevertheless maintaining a central focus on the justice of current environmental conditions, access to environmental resources, the decision-making process and policy outcomes for diffegtrent social groups (Jenkins, 2015; Walker, 2010; Svarstad, 2011).

Since the current study is dealing with the social conflict concerning the fairness and justice around the implementation of environmental projects, this framework can offer a solid theoretical background to critically analyse how the social acceptance of wind turbines projects is influenced by the sentiments of justice and equity. There are many scholars who referred to this particular framework to support their inquiries (Gross, 2007; Magnani, 2021; Jenkins, 2015). However, this report refers to a particular interpretation of this model, which is the one offered by Svarstad (2011). While past literature on environmental justice was mainly focused on two types of concerns, specifically those related to distributive and procedural justice, Svarstad (2011) introduces a third crucial element named the sense of justice.

Generally, most of the authors agree on the definition of distributive and procedural justice. For instance, Gross (2007) describes distributive justice as the equitable social and spatial distribution of benefits among the affected community, and Walker (2010) defines it as an analysis of who is to benefit and who is to be burdened as a result of a project, plan and policy decision. As described by Magnani (2021), distributive justice is also important because the main causes of conflict around the renewable energy production infrastructures are the reduced benefits for the general local community with respect to high and social environmental cost and the predominance of interests and profits for a small elite. In contrast, procedural justice is concerned with the fairness of the decision-making process in which all the affected people can express their opinion, be informed and influence decisions. As shown by researchers, the social acceptance of renewable energy largely depends on the transparency of the information provided at the beginning of the decision-making process and on the level of public participation (Magnani, 2021; Rolf Wustenhagen, 2007; Walker, 2010). Pretty (1995) identifies a typology of local participation that consists of seven distinct levels of involvement by local people: manipulative, passive, participation by consultation, participation for material incentives, functional, interactive, and self-mobilisation. Each of these levels offer a deeper and systematic analysis on the type of participation carried out by project developers, and it permits an appropriate understanding of the specific decision-making process.

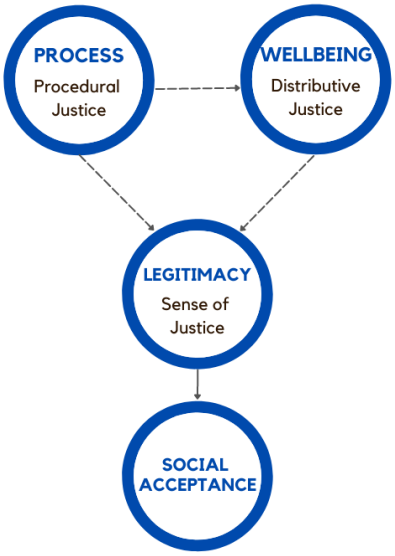


Figure 1. Environmental Justice Framework, adapted from Svarstad et al. (2011)

As mentioned above, Svarstad *et al.* (2011) enriche this justice analysis with a third element called the sense of justice. This new aspect is used to explain how affected people perceive and judge a particular intervention. The sense of justice is produced through discourses and narratives that describe the subject view of the stakeholders. Therefore, it is necessary to understand and connect this subjective view to a broader frame in order to grasp how different arguments, claims and assumptions are shaped by the other aspects of justice. Furthermore, the sense of justice is closely related to the concepts of trust. Svarstad et al (2011) note that a low level of trust and disappointment in a political system can lead people to look for alternative ways to influence the current situation. Distrust in political parties has been shown to increase personal non-institutional political participation, not the least in environmental issues, hence, investigations of the sense of justice also provide information of the trust of specific elements of governance (Svarstad 2011).

For the nature of the study, this framework is used in a distinct way than the one described by the aforementioned authors. Therefore, the sense of justice is not investigated through a discourse analysis as described by Svarstad et al (2011), but it is rather based on a content inquiry extrapolated and interpreted from interview data. These interviews provided relevant content features for our research, and they clearly express the individual justice perception on the particular argument.

The Case of *Vindmølle Landsbyen*

In the uppermost northwest corner of Tønder municipality, sharing a municipal border with Esbjerg in the North and Vadehavet to the West, is the town of Vindmølle Landsbyen (see Fig. 2). 274 people live in the town of Vindmølle Landsbyen as of 2021. While small in size, the town of Vindmølle Landsbyen houses a large-scale conflict that concerns development of wind turbine projects but when explored deeper feeds into issues of justice; rural challenges, (mis)trust in governance, and (un)even distribution of power. Tønder has unique topographical characteristics and a geographical placement that mean the municipality holds vast potential for harnessing wind as an energy resource. More specifically, Vindmølle Landsbyen was chosen as the area of research due to a historical and current presence of wind turbine proposals as well as a strong presence of local support and resistance.

The wind turbine project "Vindmølle Landsbyen Hede" functions as a central embodiment of the conflict locally referred to as the "War of Vindmølle Landsbyen". Vindmølle Landsbyen Hede is a wind farm dating back to 1995 and consists of 40 wind turbines, where 39 was, until March 2022, owned by the Swedish energy company Vattenfall, and 1 is privately owned by a local landowner. In March 2022, Eurowind bought all of Vattenfall's on-shore wind projects, which is significant since Vattenfall had a very established presence in Tønder municipality, which we will elaborate upon further (Plechinger, 2022). The reason why the Vindmølle Landsbyen Hede project is so seminal to the conflict of wind turbine developments in Vindmølle Landsbyen, and the broader area of Tønder, is due to how it was the first of its kind in the area; the first of its kind in the sense of being a large development project owned by a foreign developer and thereby subsequently has been attributed responsibility of opening the door to further upscaling of wind projects in the area. Speaking to the question of ownership, the common ownership structure of wind turbines was, until the 1990s, one of local, collective ownership - known as "vindmøllelaug". The liberalisation of the energy sector from the 1990s as well as policy reforms of the energy sector contributed to a swift change in ownership structures from collective co-ownership to centralised private ownerships by large energy companies (Rudolph and Kirkegaard 2018; Gorrono-Albizu et al. 2019).

Tracing back to Vindmølle Landsbyen Hede, in 2015 the then-project owner, Vattenfall, applied to establish new turbines of 180 metres, which is triple the size of the previous turbines, as well as creating a new project at Vindmølle Landsbyen Haved consisting of 48 turbines across the Tønder and Esbjerg municipal border - here 29 turbines situated in Tønder municipality and 19 in Esbjerg (Møller, 2017). 2015 is a landmark year in the history of Vindmølle Landsbyen as this is when supporting and opposing groups of wind turbine projects had established and tensions were running high (see Fig. 3). The obligatory institutional process developers must see through to be allowed to establish any wind turbine projects in Denmark are outlined in national political guidelines but the judging of criteria of all proposals and the final decision-making is situated within the local municipality (see Appendix III).

In 2016, the first wind turbine project was established in Tønder since the 1990s. The project consisted of six turbines of a height of 150m near the town of Sæd (Iwersen, 2017). Sæd is a town of 181 people located 2 km from the town of Tønder towards the Danish-German border. The project was developed by Vestas, a Danish-owned energy company. The developers negotiated a compensation scheme with local community groups, primary local negotiator was Sæd-Ubjerg, to funnel funds to the locals who lived near the project. While a local compensation scheme is a criteria within the proposal process, specifics are not outlined by the authorities and thus the negotiations falls totally between the developer and the local community, who may or may not organise together. Furthermore, the official guidelines demand that local communities, identified by way of geographic distance to any given project, are offered to buy in a minimum 20% of ownership-shares (Anker et al., 2015). Here, Tønder municipality has doubled this criteria to a minimum of 40% share-ownership must be offered to locals (See Appendix III) Apparently, the Sæd project did not cause a lasting rift in the local community, however, this development did not quell the divisions within Vindmølle Landsbyen. The current social landscape of Vindmølle Landsbyen is one of severe division between the two groups. Social ties are altered due to the conflict, locals in both groups are sharing feelings of being under siege, and the proposal process sees repeated proposals that have previously been denied but companies persist in recycling, thereby extending the current circumstances. The institutional and political conditions have created a

stand-still that only exacerbates the conflicts among citizens as tensions rise alongside time passing.

Methodology

1. Semi-Structured Interviews

Our field work investigation primarily consisted of interviews conducted with representatives of various stakeholder groups. Interviews were conducted in a location of the interviewees' choosing and generally lasted 1.5-2.5 hours. Before every interview, we asked for consent to use their name, to quote them, and to audio-record the interview. Almost interviewees but two did not wish to be named and/or quoted. At least two group members were present for every interview: one group member was responsible for leading the interview and asking the written questions, while one was responsible for note-taking and asking additional questions. Other group members assisted by taking supplementary notes, taking the lead on the interactive timeline and PRA sections, translating between Danish and English, and/or asking additional questions.

We were interested in interviewing people identified as relating to one or more of the following stakeholders: "Pro-Wind Turbine Projects," "Anti-Wind Turbine Projects," the Tønder regional municipality, landowners, and companies working in the renewable energy sector. We established initial contact using Facebook and/or email and had identified key informants before arriving in Tønder. However, we were also able to both discover interview opportunities through the snowball-sampling method as we asked interviewees for other relevant contacts. The snowball-sampling allowed us to establish a certain trust with some of our interviewees. However, there were cases of interviewees expressing reluctance to speak completely openly on the topic due to occupational sensitivities.

Our interview questions arose from the literature review and involved key thematic areas related to our research question and framework (see Appendix IV for interview guide and Appendix VI for matrix ranking). We designed the questions to address different aspects of each thematic area, but we encouraged our interviewees to speak freely and thus let the "flow" of the interview guide our questioning and timing. Although the general structure of our interview guides did not significantly change over the course of our fieldwork, we added or edited questions on a case-by-case basis to tailor them both to the specific background of

our interviewee and to our own shifting focus of investigation. The interviews conducted over the first week of the fieldwork provided an ample amount of qualitative data and the focus was broadened to include interviewees' perceptions of why most wind project proposals had failed in Tønder municipality over roughly the past two decades.

Informant alias	**#1**	**#2 & #3**	**#4**	**#5 & #6**	**#7 & #8**	**#9**	**#10**	**#11**	**#12**	**#13**	**#14**
Method	SSIK	IUI	SSI	SSI	SSI	SSIK	SSIK	IUI	SSI	PO	PO
Date	1/3 2022	1/3 2022	3/3 2022	4/3 2022	4/3 2022	6/3 2022	8/3 2022	8/3 2022	9/3 2022	9/3 2022	9/3 2022
Matrix Ranking	N	N	Y	Y	N	N	Y	N	N	N	N
Timeline	N	N	Y	Y	N	N	Y	N	N	N	N

Table 1. Methods of data collection. Legend: SSI = semi-structured interview, SSIK = semi-structured interview with key informant, IUI = in-situ, unstructured interview, PO = participant observation. See also Appendix II.

2. In-situ interviews

Over the course of our fieldwork, we conducted in-situ interviews in an improvised, informal manner with two separate informants. The opportunity to talk to these informants had been unforeseen yet the interviews adhered as closely as possible to our chosen thematic areas and relevant past interview questions. Our first in-situ interview was crucial in "snowballing" our investigation, as it led us to a chain of further, semi-structured interviews.

3. Matrix Ranking and Timelines

Participatory Rural Appraisal (PRA) is a broad term encompassing various methodological practices. Here, we used the methods of 'matrix ranking and scoring' and creating cognitive timelines. Due to the nature of our interviews, where the passions and emotive responses to the issue of wind turbines easily dominated the interview, the method of a matrix ranking created a tangible data set for us to compare between informants and to wider literature.

The use of PRA methods in general add value to a methodological framework in the form of a unique visual component to data sets. Due to the more physical task of both the matrix ranking as well as the construction of the timeline, we receive data beyond our own note taking and audio recordings. Both methods, matrix ranking and timeline, convey data in a way where points and arguments are able to be visually and physically linked, ranked, and reflected upon in connection to one another. The methodological practice of matrix ranking is used to measure the relative importance of factors contributing to the informant's stance on wind turbine projects. By virtue of the method, the informant ranks factors they determine is the most to least influential on their opinions on a defined issue. Timelines created by various informants give researchers insights into the events, phenomena, and chronology that shapes and influences the given research issue. Due to the nature of our research question, which pertains to subjective phenomena like motivations, attitudes, and perceptions, the visual component often created a more tangible understanding of the interlinkedness of the many points raised in our interviews.

Practically, we integrated the matrix ranking and timelines into the format of the interviews, rather than have it as a separate activity. We sought to mitigate this step from interviewee to active participant by introducing the PRA at the beginning of the interview and then returning to it towards the end. This way, the informant had time to become acquainted with our intentions. While the informant is interviewed, we have one researcher from the group extract specific takeaways targeted around our research question. Examples of these are: "poses danger to birds", "disrupts natural landscape", or "good for local economy" (see Appendix VI). These key points were written in marker on post-it notes, which allowed them to be moved and manipulated at the behest of the informant. Crucially, a marker and post-its

were also placed near the informant and an invitation to add their own contributions were extended. At the end of the interview we reiterate how the informant is welcome to add key points to the post-its or take away any that are deemed insignificant or not reflective of their stance.Then, the informant was asked to rank the post-its from most to least importance. We did not practise a rigid regime in the creation of the ranking, and post-its were allowed to be put next to one another to signify equal importance. Placing this method at the end of the interview also served as a way to summarise and ensure that we had captured the points the informants felt to be most significant. When constructing the timeline, we mirrored the way we conducted the matrix ranking. During the interviews, one researcher noted down notable events and dates mentioned explicitly by the interviewee; e.g. "2018 - Vattenfall initiated local community meeting in Vindmølle Landsbyen". At the end of the interview, and after the matrix ranking, we would have the informant review the accumulated post-its and in plenary would place them on a "timeline" drawn on poster paper (see Appendix VI). We decided to only build timelines with key stakeholders and informants, with a final result of three distinct timelines.

This allowed us to synthesise a collated timeline of the most notable events surrounding the wind turbine issue in Vindmølle Landsbyen/Tønder municipality over the past three decades, using events that multiple interviewees could all independently attest to. Additionally, we made sure to both keep the individual separate timelines and consider different ways we could group and compare/contrast them, such as timelines from the perspectives of supporters of wind turbines vs. those of opposers, or the municipal politicians' timeline vs. that of their constituents.

4. Mapping (GPS)

According to the purpose of this study, the use of the GPS-method has been considered as a valuable tool to implement the research in different ways. Essentially, the GPS has been used to mark the waypoints of the interviewed households and the closest wind farms to Vindmølle Landsbyen in order to observe any correlation between the proximity to the wind turbines and the particular predisposition of the households towards them. Moreover, geo-localization of the proposed projects have also been marked to obtain a deeper

understanding of the geographical context. The coordinates of the reported proposed projects have been extrapolated from a document released by the Tønder municipality.

A map was created from the data recorded to illustrate a detailed profile of the study area. Finally, the independent field map has been compared with an official map presented by the Danish Government in the "Styrelsen for dataforsyning og effektivisering" to cross-check the acquired data (Appendix VIII).

5. Participant Observation

To complement the data gathered through the methods outlined above, we had the opportunity to send a member of our group to be present in a meeting of local landowners who all owned land in the area of Sejersbæk Kog. In this meeting, nine landowners were discussing the possibility of collectively establishing wind turbine projects in their properties, given the momentum for RE projects in Tønder. The meeting was at the home of one of the landowners and the meeting was called at his initiative.The host had also invited a consultant from a South Jutland consultancy firm. So, while it was evident that the participants knew one another as the atmosphere was often dominated by inside jokes, personal storytelling, or informal remarks between two or more participants, the presence of the consultant aso conveyed the seriousness to which the landowners approached this potential project. Our presence there was as observant-researcher, which entailed note-taking and no active participation in the meeting itself. This opportunity was extremely valuable for our research as it allowed us to triangulate the data that we had already gathered, to get a deeper understanding of the internal dynamics involved in the process of establishing wind turbines and to create new contacts with landowners in the region.

A second form of participant observation was performed as the group was invited for an informal dinner with two couples from the anti-wind turbine groups. The dinner was planned after the first in-situ interview and the initiative came from the interviewees themselves, thanks to the level of trust established over previous interviews. It was not recorded, nor were notes taken, as the aim was to retain the informal, warm and friendly atmosphere for the hosts to speak freely about their thoughts and opinions. We aimed to gain a deeper contextual understanding of the interviewees and the seriousness of the debate in an informal setting.

The third and last form of observation is that of live streamed city council meetings on the 24th and 31st of March, as well as selected recorded meetings from 2014 to present day, which pertained to discussing the Sæd, Vindmølle Landsbyen Hede and Haved projects. The meetings are open to the public, but one of our key informants extended a specific invitation and emphasised their significance to our research. The livestreams aid to triangulate our understandings of the formal and political processes within the municipal and institutional aspect of wind turbine projects. This mode of observation removes the researcher completely from the situation being observed, which is unlike the previously outlined participant observation methods.

6. Questionnaire

We decided to apply a questionnaire in order to understand the general opinions of the broader population in Tønder than what was possible from interviews. The questionnaire allowed us to gather quantifiable data on the wider, local communities of Tønder municipality to complement our interview data. The aim was to gather a relatively large number of respondents in order to analyse our sample group through a statistical lens, thereby further diversifying our research methods. We collected 260 responses in total (see Appendix VII).

The structure was intended to be simple and to encourage the respondents to engage and respond to the full questionnaire. It followed 31 thematically arranged questions following a sequence similar to the interview guides. An introduction to the project was led by five formal screening questions including age, gender, education, postal code and employment at the beginning of the questionnaire. The questionnaire was also designed and edited to be as brief as possible, while retaining the questions most central to our study.

The questions comprehensively inquired respondents' opinions on wind turbines, including their perceived benefits and drawbacks. The questionnaire ended with an option to leave a contact for further interview and a thanks for participation. All questions followed a multiple-choice structure, except for the question regarding the respondent's postal code. An option of an 'other' box was offered in questions where deemed necessary.

We pre-tested the questionnaire with friends, relatives, and supervisors to avoid grammatical mistakes, confusing or unclear questions and technical issues. SurveyXact was

chosen as the preferred survey software due to its trustworthiness, options for layout and question setup.

6.1 Sampling strategy

The questionnaire was estimated to take about 10 minutes and was completely anonymous unless the respondent added their phone number, name or email to be further contacted. About 25 questionnaires were completed in person by members of the group approaching people at the local pub in Vindmølle Landsbyen and by ringing doorbells in Vindmølle Landsbyen and Sæd. Respectively, the total population is 274 for Vindmølle Landsbyen (2021) and 181 for Sæd (2007). The rest of the respondents were accumulated via links in Facebook posts in private and public groups, including Tønder municipality with a total population of 37.050 people. We reached out to a number of the Facebook groups a week in advance to create awareness of ourselves, the project and the upcoming questionnaire, as well as to accumulate more respondents. For the purpose of our analysis, we used 276 of the completed surveys.

Roughly ten pro and anti Facebook groups were used to disseminate the questionnaire. The questionnaire was also shared with two of our interviewees who agreed to distribute the questionnaires further.

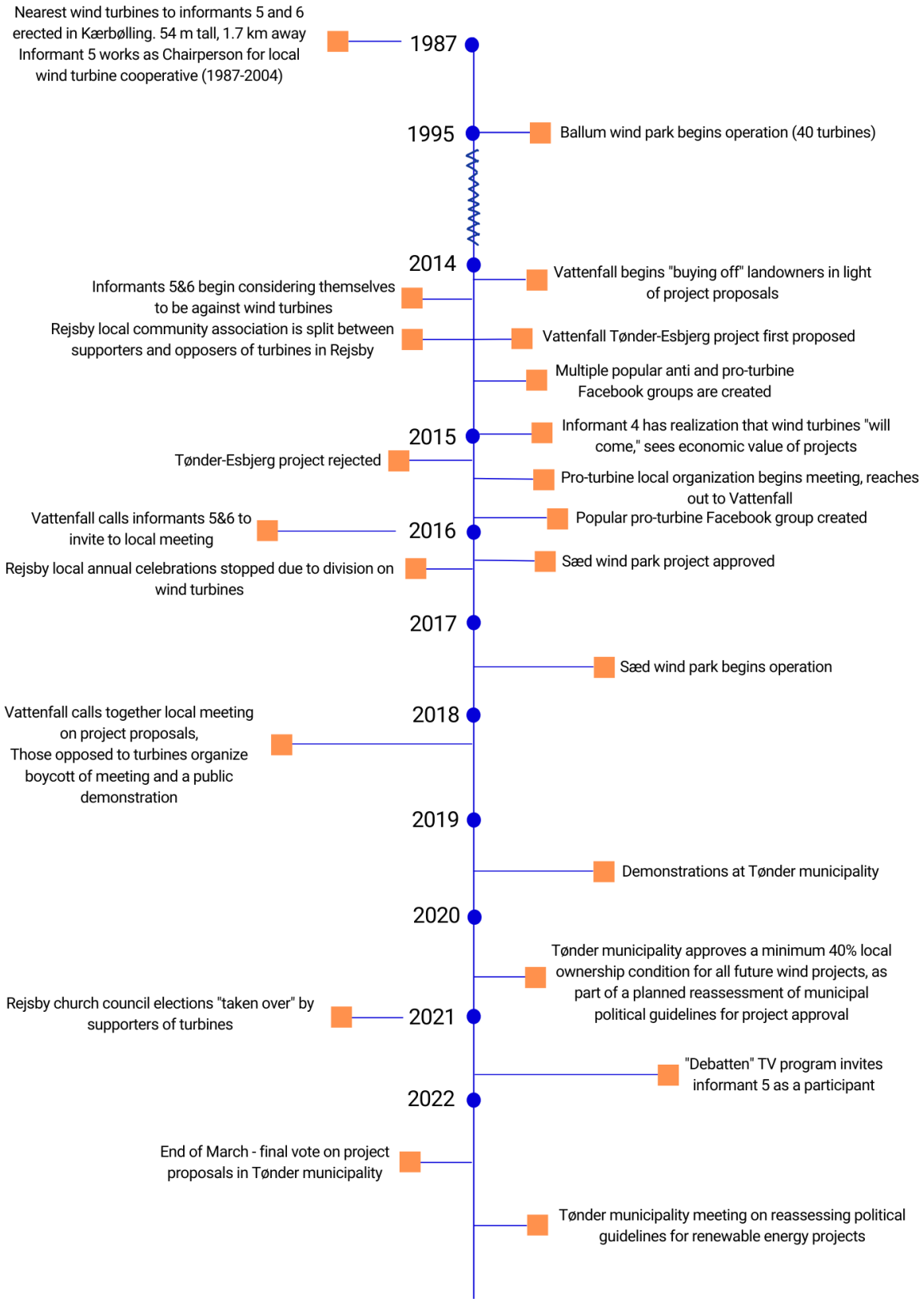


Fig 3. Collective timeline of wind developments in Vindmølle Landsbyen

Results

The timeline presented in figure 3 is the result of our group's synthesis of the three timelines we compiled in collaboration with the respective interviewees: a key informant in favour of turbines (#4), key informants against turbines (#5 and #6), and a municipal politician. Compiling these three different perspectives gives us a more varied understanding of the history of wind projects and social movements in Tønder municipality and Vindmølle Landsbyen from a local viewpoint. As the timeline shows, a majority of the events surrounding the wind turbine conflict occurred in the period of 2014-2016, with the proposal of the Tønder-Esbjerg project, the beginning of local cleavages, and the creation of influential social media groups on either side of the conflict.

Our research question investigates local motivations in supporting or opposing wind turbine projects in Tønder municipality, and which factors shape these perceptions. To this, we will present through our findings how competing narratives from the anti- and pro- groups fall within the themes of rural decline, (un)even distribution of benefits, and (mis)trust in governance. This will be followed by an analysis of how social movements have articulated these motivations in their strategies, the ongoing political gridlock around wind proposals and comparison of two opposite cases of wind acceptance: Vindmølle Landsbyen and Sæd.

1. Motivations of Wind Energy Acceptance

1.1 Rural decline and challenges

The fear of becoming a "ghost village" is shared by both anti- and pro- wind activists in Vindmølle Landsbyen as the town lacks public infrastructure, such as schools and parks, social services, and jobs to attract young workers. However, the role that wind turbines should play in addressing this challenge differs for both groups. For wind supporters, turbines are unavoidable given the national corporate and political interest for Tønder´s wind potential. Thus, wind is seen as a resource to be exploited to revitalise the rural economy of the kommune, which no longer can derive benefits from traditional activities such as small-scale farming.

"We cannot fight against this [wind turbines] forever (..) they will come whether we want it or not, so let's get as much as we can out of it"

Pro-wind activist, informant #4

Opposite to this view, anti-groups believe that wind turbines are not the way to bring about local benefits, instead, they perceive that the wind sector is an extractive business model set to enrich a small number of big energy corporations and land-owners which is just bringing division and health concerns to the local community. To anti- activists, wind turbines are exacerbating the demographic challenge and negatively impacting local tourism by degrading the natural "virtues" and "uniqueness" of Tønder´s wild and quiet landscape.

"We are living from tourists and they don't want to come when there are too many windmills"

Anti-wind activist, informant #6

"[Wind turbines] can be a part of depopulating these areas because it is the minority of people who are willing to live next to these wind parks"

Holger Petersen (Ø), Tønder municipal council meeting, 30/04/2015

1.2 Uneven Distribution of Benefits

The centralization of power structures within the wind energy sector, together with the historical and ongoing unequal distribution of wealth derived from wind production among residents is key to understanding motivations to welcome or reject wind proposals. For anti-groups, there is a perception of corporations, politicians and land-owners as greedy, extractive and hypocritical, thus, not having the best interests of the community or the climate at heart:

"*[energy companies, politicians and pro-groups] don't care about the climate (...) they just want to get money."*

Vindmølle Landsbyen anti-wind activist, informant #6

"Why is it our job as a municipality to help Vattenfall in making billions just because they pay pennies to local community groups?"

Holger Petersen (Ø), Tønder municipal council meeting, 30/04/2015

Neoliberalism in relation to the green transition is also key to understanding the strong anti-corporate narrative present among wind opponents.

> *"The solution is not to use more energy, but to produce less in the first place."*
>
> Anti-wind activist, informant #7

The rejection of the current top-down and growth-oriented wind energy model can be contrasted with the cooperative renewable energy model prevalent from the 1970s through the early 2000s which was based on community ownership. Informant #6 used to be the chairperson for a local wind turbine cooperative and highlights how this model enabled wealth sharing and a feeling of communal cohesion as opposed to the current neoliberalized market. Contrastingly, wind supporters articulate a perspective on the current model as a way of distributing benefits within the structures of a capitalist system; here, compensation schemes are the mechanisms that see to it that local communities and individual landowners are compensated for wind turbine developments:

> *"the only problem [with wind turbines in my backyard] is that I don't earn anything on them"*
>
> Pro-wind activist, informant #4

> *"Luckily there are many people who would like to have wind turbines ""in our backyard"" as long as it happens in a way where the community is both benefiting and listened to"*
>
> Response from questionnaire

Sharing this understanding of wind as a means to improve and redistribute wealth to rural areas, a local politician takes this argument one step further. We need to accelerate the green transition, he claims, however, it needs to be done in a just way. For this purpose, he argues that within the frames of the current economic system, the ownership of wind supply should be democratised and dispersed to the community level as much as possible. In turn, this would bring sufficient funds to Tønder to fight the demographic challenges in the region, and

would place it as a frontrunner in the energy transition:

> *"I think the small local communities are part of shaping and developing the future climate challenges in a positive direction."*
>
> Response from questionnaire

1.3 Trust and Mistrust: The role of the municipality

The municipality plays a considerable role in the ongoing conflict in Vindmølle Landsbyen because it is responsible for the decision-making process on wind projects. In this regard, Tønder Municipality created local guidelines in 2020 in addition to the national guidelines (see Appendix I) in order to support sustainable energy development by enhancing social acceptance of wind energy projects through an increased obligatory percentage of shares offered to locals from 20% to 40%. However, due to internal municipal and citizen conflict, nearly all wind energy projects have been rejected since 1995. The only project that has been implemented since is the wind farm in Sæd, a village situated close to the German border.
According to our informants' claim, this inefficiency is mainly due to politicians rejecting proposals due to the fear of not being re-elected:

> *"We cannot fully trust the politicians. Politicians [are] possibly worried about reelection, opposition makes up a large constituency* (...) *Municipality is not mediating the conflict correctly"*
>
> Anti-wind activist #5 and #6
>
> *" There is a lack of decision and action from the municipality"*
>
> Anti-activist #7
>
> *"The politicians are afraid that if 'I take a decision here [in favour of wind projects], they won't vote for me the next them"*
>
> Pro-wind activist #4

It is interesting to notice that both sides agree on the ineffectiveness of the municipality and they also explain it through the same motivation. Moreover, other informants also argue how

the lack of institutional governance stimulates the companies to act independently by offering large sums to landowners to get their support.

> *"There are so many invented compensation schemes on top of what is outlined in the official guidelines [and this] creates competition on who can get most and who can give the least"*
>
> Informant #9

This quote links how the lack of procedural justice and a mistrust in governance contributes to exacerbating perceptions of distributive injustice. In line with this, Informant #8 noted how the municipality, by disregarding the potential health effects of wind turbines, had failed to provide a compensation scheme for the damage of wind turbines to their wellbeing. As a result from this institutional indifference, our informant became disillusioned with the wind proposal model and decided to join an anti- wind group:

> *"Then I became an opponent of wind turbines."*
>
> Anti-wind activist, #8

Lack of responsibility and transparency in this case seem to be creating frustration from the opposition possibly fuelling their concerns further. This stigmatisation of the anti-wind people tends to be reproduced and exacerbated in the discourse of the pro-wind people.
Another central aspect adding to the reason for institutional ineffectiveness is the personal emotional dispute between the local government members. Informant #1 boils it down to one word: "Rævekager", which he explains as a detrimental reason for the lack of political collaboration on the issue of wind projects. This point is also corroborated by the local politician as he attributes community-based conflicts as one of the main reasons for rejection of projects. This particular issue has also been raised by our interviewees:

> *"[...] jealousy is one of the main reasons why all proposals fail"*
>
> Landowner - Informant #12

As expressed by the informants, this inactivity from the local municipality could encourage the national government to centralise the decision-making process, with the risk to impose even a stronger top-down process and lose local political agency in negotiating the potential economic benefits. The new developments of 22 proposals getting initial approval in the city council on the 31/03/2022, signifies how this perceived threat has shifted opinions and political collaboration in Tønder Municipality:

"If we don't do it, Christiansborg [national parliament] will do it"

Anita Uggerholt Eriksen (T),
Tønder municipal council meeting, 31/03/2022

""We know that a demand from Christiansborg will come at some point (...) without the same level of ambitions as we have", "

Martin Iversen (V),
Tønder municipal council meeting, 31/03/2022

Therefore, before the March 31st council meeting, the issues related to inactivity, the internal conflict and the personal issues within the local government has brought a sense of mistrust within the municipality, stimulating the conflict and leaving the citizens to do the work for them by convincing each other. This sentiment of distrust induces people to directly blame the municipality for its inactivity:

> *"The municipality is the number one reason that the people of Tønder cannot benefit from the most major resource for Tønder that is wind"*
>
> Landowner - Informant #12

While our interview data argue towards the conflict on turbine projects in the community being so great that politicians fear supporting them, the questionnaire's results show differently on the same matter (Figure 4). The majority of the respondents — more than 50% — are for the establishment of wind turbines in Tønder Municipality.

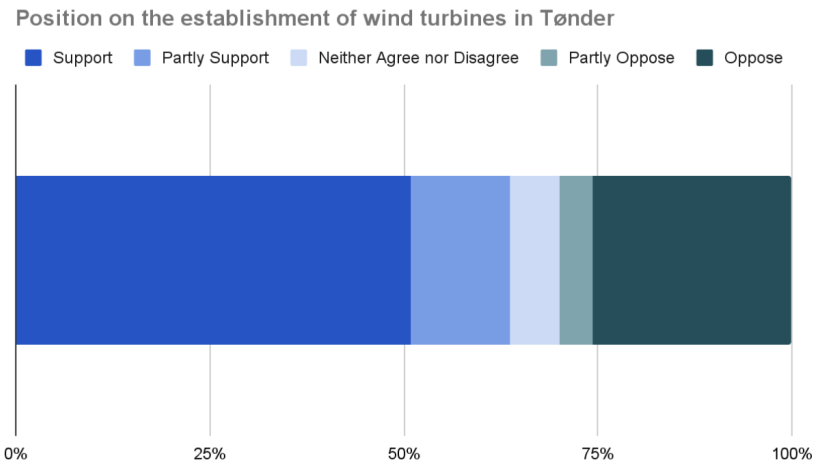


Figure 4. The percentages of respondents answering the question 'What is your position on the establishment of wind turbines in the municipality of Tønder'. N=250

1.4 Polarisation of Views

For the reasons mentioned above, there has been a gradual polarisation of views which has resulted in a deep division within the community in Vindmølle Landsbyen, where members of both sides will refuse to speak to each other:

"Some people turn around when they see my car"

Pro-wind activist, informant #4

"Children [from anti- and pro- families] are not allowed to play together anymore"

Anti-wind activist, informant #5 or #6

As informant #4 put it, people are "so high up in their tree" that they cannot see beyond the conflict to make compromises or to trust the role of the municipality in mediating this conflict. This tension is also felt in the municipality. According to a civil servant of Tønder´s Technical and Environment Administration, it is difficult to get people to collaborate and decide what is best for their community, and how to allocate money from wind projects.

Our survey data mirrors this polarisation of views. As Table 2 presents, support or opposition to wind energy is the dividing factor for people's perceptions of other concerns such as the

extent to which turbines disrupt landscapes or biodiversity, or whether it could be a threat to health, clearly shown by the high prevalence of statistically significant results within the category of "Anti/Pro Position" at p<.001. Furthermore, contrary to our own preconceptions, there was no statistically significant relationship between the extremeness of views and the commonly used social stratifications of age and gender.

	Gender	Age	Anti/Pro Position
	Z	Z	Z
Disrupted views	-.110	-.351	-10.308**
Threat to biodiversity	-.727	-1.393	-10.230**
Noise pollution	-1.207	-.269	-10.049**
Light pollution	-.086	-.759	-9.968**
Health concerns	-.277	-.307	-11.204**
Decrease property value	-1.313	-1.400	-9.115**
Polluting supply chain	-1.064	-1.292	-9.022**
Insufficient compensation	-1.129	-.052	-4.596**
Corporations overlook locals	-.669	-.193	-9.845**
Threat to farming	-1.599	-.305	-10.537**
Total	257	80	231

* Statistically significant at p<.05
** Statistically significant at p< .001

Table 2. Mann-Whitney U test comparing whether the mean of two-level indicators: gender (M v. W), age (<26 v. 65<) and opinion of wind turbines (acceptance v. rejection) lead to a difference in the mean of how they perceive potential concerns around wind energy.

2. Social movements and Strategies

One of the objectives of this research was to analyse how locals' perceptions of wind are expressed through civil resistance. This section will explore the contrast between identified motivations to support or reject wind among our respondents, against how they

actually articulate their grievances in Facebook groups and protests. These "strategic narratives" will be explored through looking at the rhetoric used for claiming the negative effects of turbines and the forms of protest and opposition creating wind conflicts at local and national level.

2.1 (De)legitimising Activist Strategies

The differences in strategies are distinct between the pro- and anti-wind groups. Pro-wind activist, informant #4, drew up this distinction as exemplified by the actions the two groups express themselves through.

> *"We try not to be involved in the demonstrations (...) We will not go on that level for it."*
>
> Pro-wind Informant #4

Here, the informant distinguishes how anti-groups lose legitimacy because they utilise forms of civil disobedience to express their concerns. Instead, to the pro-groups, direct engagement with policy-makers – in coordination with industry representatives – are the preferred strategies to bring about their desired political change.

> *"When we go two ways [pro-groups and companies talking separately to politicians] we get more understanding from the politicians"*
>
> Pro-wind Informant #4

On the other hand, the anti-groups emphasise how they are pushed to methods of civil disobedience, like public demonstrations and banner-dropping, due to feeling unheard or disregarded by the institutional powers on the issues of wind turbines.

As it can be observed in Figure 5, anti- groups make a very active use of social media groups such as Facebook to express opinions and create debates and discussions. Protests against windmills peaked around 2016-2018 which is when informant #5 explained that they started using Facebook as a platform to spread information about the different negative effects of wind turbines (see Figure 3).

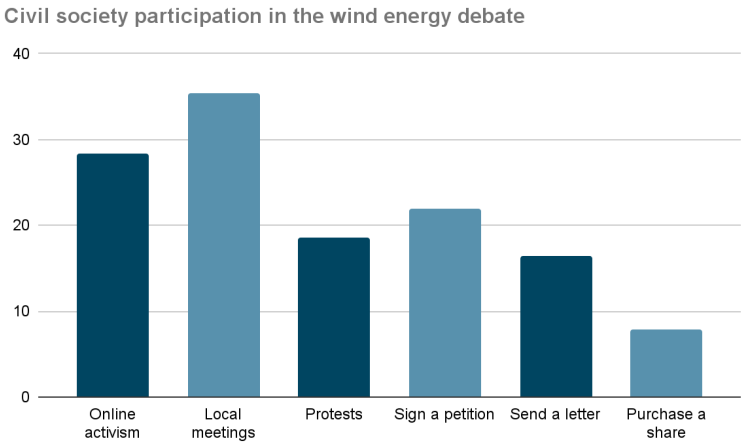
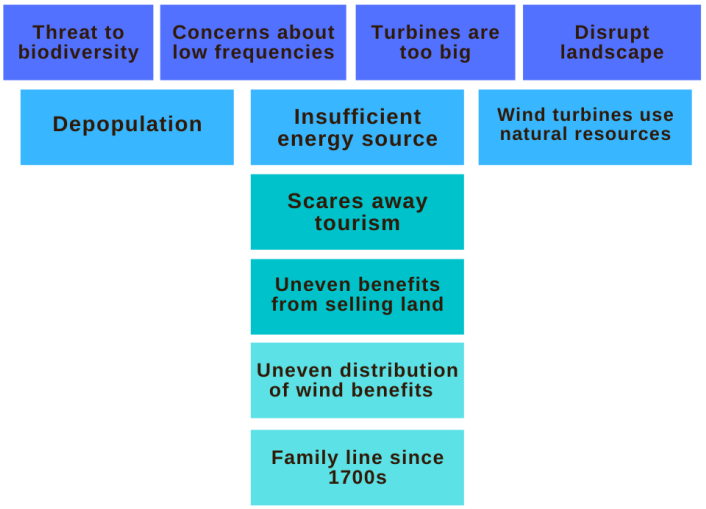


Figure 5. The percentages of pro and anti- respondents answering the question "Have you participated in any *of the activities below related to wind projects?"*

2.2 Negative effects of Wind Turbines - Activist Articulation of Grievances

While our interviews were overwhelmingly centred on questions of (un)even wealth distribution, rural decline and (mis)trust in governance, our survey results (Figure 7) and matrix ranking (Figure 6) shows that their claims do not align with the factors expressed when asked to rank main motivations for opposing wind turbines. At interview with informant #5 and #6 the top three motivations for opposing wind turbines in their matrix were; 'Danger to Birds', 'Disrupt Natural Landscape' and 'Worries about Low Frequency Noise'(see figure 6).



**Dark blue = higher importance. Light blue = less importance*

Figure 6. Matrix Ranking of "Motivations for opposing wind turbines" Informants #5 and #6

Several of the informants (#2, 3, 5, 6, 7 and 8) referred to a Portuguese researcher, Dr Mariana Alves-Pereira, who claims to have proved the health effects on humans from low frequency noise. The informants often referred to her as to legitimise the health effects from wind turbines. (Fig. 7).

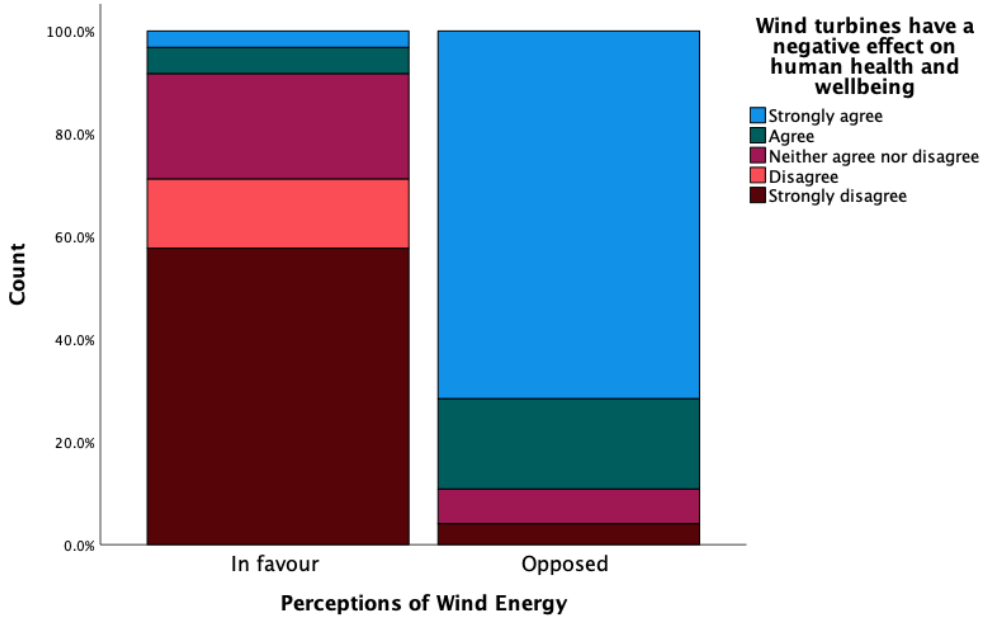


Figure 7. The percentages of respondents answering the question "Wind turbines have a negative effect on human health and wellbeing" divided by whether they support or reject wind turbines in Tønder.

3. Cyclical Conflict: Competition for Project Approval

The procedural ineffectiveness of the local government together with the organised opposition to wind turbines have resulted in where every six months developers present their proposals to the administration, only to end up all rejected, with the exception of the project in Sæd, as we elaborate on below. This process is particularly draining to civil society; wind supporters are not getting any projects approved while anti- groups have to spend time and energy mobilising every year against these recurring proposals.

"We have succeeded several times to shoot down proposed projects (...) [But] it wears us out as non-hired people."

Anti-wind activist, informant #7

"By principle, they [developers] are allowed to propose the exact same project every six months. And every half year the kommunal bestyrelse have to decide and we have to oppose them every half year."

Anti-wind activist, informant #8

Energy companies in turn, continue to try to gather support or what is sometimes perceived as "buy off" locals in each political cycle. In some instances, developers will compete against each other to get locals on their side by offering higher compensations than their competitors.

4. The Success of the Sæd Project

As described previously, the wind turbine project near Sæd from 2016 is the only project to successfully pass the process from proposal to establishment since 1995. Furthermore, the project concerns six 150 m tall wind turbines, which are significantly larger than any other on-shore wind turbines in Tønder municipality. In line with our research objective of investigating reasons for acceptance or rejection of wind projects in the area, we seek to uncover why the project in Sæd was successful when all other proposals have been rejected since 1995.

Informant #9, a key informant with insights into the development of the Sæd project, argued that the success of this project is directly linked to the proximity of Sæd to the German border (less than 2 km), where German authorities have erected multiple large wind turbines over the last decade. Hereto, he notes how German authorities had looked into establishing more turbines near Sæd at the same time and of the same type as those in Sæd, without any involvement of the town's locals in the process.

"The geography of this project is the main reason it went through"

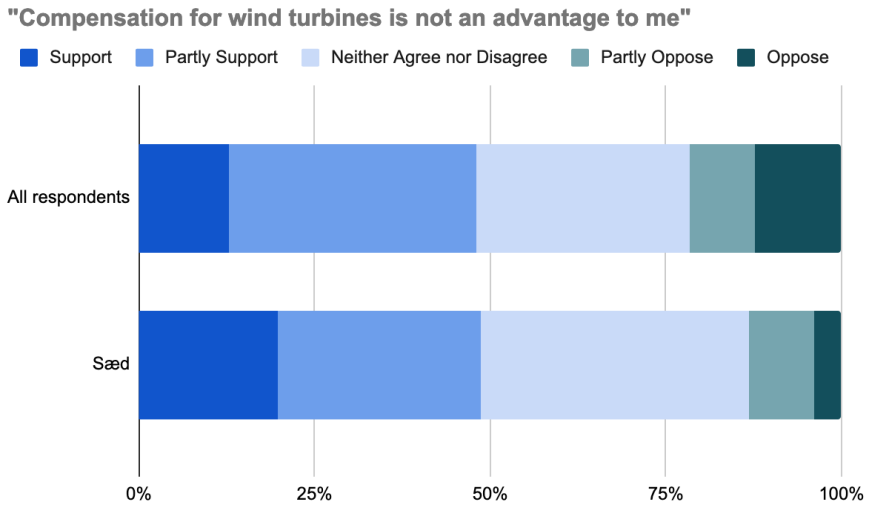
Key informant #9

Informant #9 adds how his strategy when starting the process of contacting the local community was to identify the "Tordenskjoldsoldater", which he defines as key informal local

leaders that carry authority and is an actor that the rest of the community trusts. In Sæd, informant #9 emphasises how crucial it was that these informal local leaders were supportive of wind turbine projects. Furthermore, the communicative strategies in Sæd were characterised in opposition to resistance groups

> *"My strategy is always to deliver the most knowledge and facts as possible"* and *"[resistance groups] can make everything up that fits into their narrative [and use these false narratives as ammunition"*
>
> Informant #9

Adding to the reasons for the success of the Sæd project, key informant #10, argues that the negotiations between the local community groups and the developer during the proposal process resulted in local perception of a fairness of distribution of benefits. Our questionnaire data shows a larger portion of respondents from Sæd agrees that they recognise how wind turbine projects can create benefits to locals (Figure 8). This is further corroborated by the in-situ interviews conducted in Sæd that all pointed to the physical manifestations of the compensation schemes related to the wind turbine projects: community-owned half-way houses, road pavement, and community activities.



* Comparison between the full sample, N=250, and respondents corresponding to the postal code 6270 for Sæd and Tønder, N=78

Figure 8. Results of the question 'Compensation for wind turbines is not an advantage to me' divided in all respondents and respondents within the postal code of Sæd. Note here that the postal code of Sæd also covers Tønder.

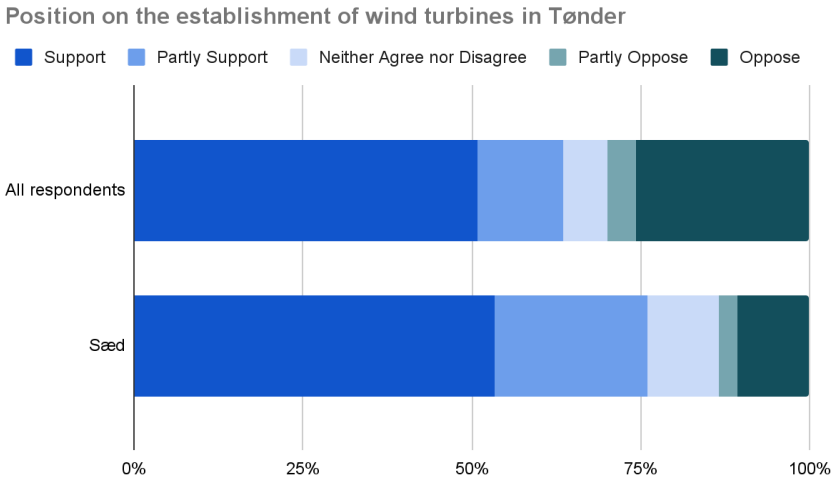
Informant #10 also argues how the success of the Sæd project exemplifies how local ownership of wind turbine projects are central to projects' success as it fosters local support. However, this point of local ownership being a part of the Sæd project's success story is not reflected in our questionnaire data (Table 3). Here, the percentage of residents who own shares in turbines in Sæd is lower than that of all respondents and of locals of Vindmølle Landsbyen.

	All respondents	Vindmølle Landsbyen (and Skærbæk)*	Sæd (and Tønder)**
Own shares of wind turbines	8.2%	9.4%	5.1%
Do not own shares of wind turbines	91.8%	90.6%	94.9%
Total	268	64	78

*Respondents corresponding to the postal code 6780
** Respondents corresponding to the postal code 6270

Table 3. Ownership of wind shares among respondents from Vindmølle Landsbyen and Skærbæk vs. Sæd and Tønder.

Contrasting our questionnaire data, informant #7 expressed that he believed "all local shares were sold" in the Sæd project. Thus, the informants centre the criteria of local stake-ownership as a key factor contributing to the success of the Sæd project despite actual local share-ownership not being reflected in our questionnaire data.



* Comparison between the full sample, N=250, and respondents corresponding to the postal code 6270 for Sæd and Tønder, N=78

Figure 9. The percentages of respondents answering the question 'What is your position on the establishment of wind turbines in the municipality of Tønder?'.

From our questionnaire, it is clear that the opposition of wind turbines is far smaller in the area of Sæd than responses from all of Tønder and thus the establishment of the Sæd project can only be concluded to not cause more conflict or division but rather the opposite (Figure 9).

Discussion

In effect, our results show that the NIMBYism argument that is favoured in the literature as the main driver of resistance against wind turbine projects is wholly lacking as an explanation for local resistance (Bonn & Dieperink, 2014). Instead, our results provide a three part structure to explain the motivations of local resistance and support: (mis)trust in governance, (un)even distribution of benefits, and the larger socio-political context of rural decline, which align with the findings of Gross (2007) and Jobert et al., (2007). Added to this, the climate crisis and internationally-bound pledge towards a green transition, specifically adds pressure and urgency to solving the tensions that are endemic within the Danish context of wind turbine development. We argue that Denmark will fail in achieving its goals of green

transition as they currently stand, as long as a lack of regulation by the municipal government ultimately continues to motivate resistance to wind projects.

We will now proceed to utilise the EJF as an analytical lens to evaluate our findings through the concepts of procedural, distributive, and sense of justice. Looking through the lens of procedural justice, the accounts of mistrust in governance can be argued to be expressions of lacking "democratic fundament" (Svarstad et al. 2011: 9). Both anti- and pro-groups and questionnaire data detailed the lack of feeling included in the decision-making process. The conceptualisation of energy democracy pins this point to the fact that by tradition, liberalised energy governance is dominated by experts and political authorities, which in the case of Vindmølle Landsbyen has left communities feeling that democratic virtues are expunged from the issues of wind turbines (Szulecki, 2018). The lack of democratic virtues within the current system ties directly into the local perceptions of (in)justice and lifts the conflict from being centred on wind turbines to a conflict of ideological nature where the sense of justice is reflected through the lack of presence of democratic values. The distributive leg of the EJF centres the perception of uneven distribution of benefits that permeates our interview data. In Svarstad et al. (2011), EJF outlines how the concept of benefits concerns the asymmetries of who carries the burdens and who gains from a given situation. Herein, the situation pertains to the perceived burdens of wind turbine developments and, even more so, on the perceived lack of justice in the mechanics of distributing the benefits in terms of wealth. Here, distributive justice is connected to the procedural, as the case in Denmark, the powers of governance is situated in the municipality. The liberalisation of the energy sector in Denmark secures the path dependence of the development of energy production into hegemonic economic structures. Here, the structures of ownership of wind turbines are pointed to as the central space on which the distributive justice can be ensured (Hoicka *et al.*, 2021).

The renewable energy sources inherently encompass the opportunity for decentralised power structures by way of the scattered manifestations of energy sources and their minimised distance between production and consumer. In effect, wind turbines can promote a more just distribution of accessibility and ownership of energy production, while its fossil counterparts perpetuate a centralised energy sector within which power is hierarchically distributed due to the extensive infrastructure that demand intensive capital capacity (Goldthau, 2014).

Therefore, the green transition of the energy sector contains an integrated opportunity for democratic governance and strengthening of democratic practice across a sector of vital significance like the energy sector. However, this opportunity demands a reassessment of energy policies and governance to come into effect otherwise the structures already in place will perpetuate the centralising patterns of the status quo (Yaqoot *et al.*, 2016).

From our findings the motivation for opposing or supporting the establishment of wind turbines are highly influenced by procedural and distributive justice. Pretty (1995) outlines seven typologies for local participation in the decision-making process. It can be stated that the decision-making process of wind turbine projects fall into the so-called "participation by consultation", in which people participate by being consulted or by answering questions. External agents, in this case the municipality, define problems and information gathering processes, and control analysis of feedback. This process does not assign people any share in decision-making, and professionals are not required to adhere to people's views (Pretty 1995).

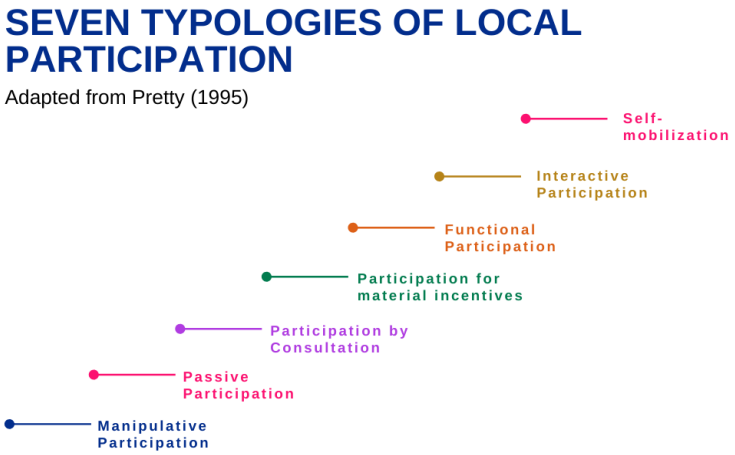


Figure 10. Seven Typologies of Local Participation, adopted from Pretty (1995).

Overall, it can be stated that our findings are in line with the reviewed literature - outwith the significance attributed to NIMBYism - since the main causes of conflict on renewable energies infrastructures are the perceived asymmetry of the benefits for the local communities with respect to the dominant of interest and profit for a small elite (Magnani, 2021; Gross, 2007; Jobert et al., 2008, Devine-Wright, 2004; Wustenhagen, 2008).

As we can observe, even in the context of Vindmølle Landsbyen, perceptions of distributive injustice, coupled with local perceptions of a lack of procedural justice stemming from municipal political ineffectiveness, create a larger sense of injustice among Vindmølle Landsbyen locals with regards to the handling of the wind energy issue by companies and government, motivating resistance to local wind project development. As Rudolph and Kirkegaard (2019) conclude their article titled "Making Space for Wind Turbines": "A structural problem in a village is not a problem of the village. It is a much wider problem of the inequalities and uneven development created by intensified neoliberal drivers in [the] planning and energy market" (655).

These connotations of distributive and procedural justice have differently shaped the sense of justice within the Vindmølle Landsbyen community. Thus, while the anti-interviewees feel to be victims of an unequal distributive justice since they claim that the benefits are going out of Tønder, the pro-informants firmly think that wind energy projects would enhance the local economy through an equal distribution of benefits among the community, hence they feel that companies and municipalities offer a good level of distributive justice.

Limitations and Reflections

Before embarking on the field trip itself, our conceptions of the project centred a targeted focus on resistance and support groups, as the primary unit of research. However, when data collection began, the diversity of stakeholders involved in the wind turbine issues became apparent and we expanded the scope of our research to include private companies, institutional, and political actors. To this, we contacted the mayor in Tønder and a Vattenfall representative for an interview, however to no avail. Had these interviews been successful the results and discussion would have been able to develop with more perspectives and arguments from all sides of the debate.

Due to the limited scope of this project, time constraints, and the nature of our objectives, we condensed the PRA method to fit into a one-time meeting with informants, otherwise usually practised in links of three. This compressed practice of PRA could have hindered PRA data collection as we had limited time to cover a high volume of information.

We experienced a significant language barrier in participation and interpretation of interviews as only two-fifths of our group were native Danish speakers and many of our respondents felt more comfortable being interviewed in Danish. This affected the way we communicated with our informants as it was harder to grasp exact expressions and at times limited our work in the sense that not all researchers could communicate with the informants.

Generalisations from our questionnaire can not be done beyond our sample, as randomization of respondents may have been skewed due to the informant-led distribution of our surveys in Facebook groups. Adding to the limitations of our survey, multiple choice questions lacked the option to respond "I don't know". Hence, those respondents who were not informed enough on the topic to form an opinion, may have chosen the option of "I neither agree nor disagree" instead, potentially skewing our results to give the impression that a larger portion did not hold any strong opinions on the matter rather than show the actual polarisation of responses.

Including the postal code in the questionnaire was very beneficial to be able to leave out respondents outside of Tønder municipality and also to separate Vindmølle Landsbyen and Sæd to allow us to compare the two. Also, the issue of wind turbine projects is inherently geographically anchored, however a limitation to the study is the fact that Sæd and Tønder and Vindmølle Landsbyen and Skærbæk share a postal code respectively. Therefore, in the section on the Sæd project, we were unable to isolate responses from Sæd precisely. This could potentially skew the results of the questionnaire, meaning that the conclusions drawn from it in relation to Sæd must be approached with some apprehensiveness.

Conclusion

The question on wind turbines in Vindmølle Landsbyen is a conflict that extends far beyond the scope of energy politics. It has divided the community and civil society as well as the political arena of the municipality of Tønder. Concerns of the green transition and energy accessibility lose direct relevance when discussing the wind turbine development; instead, distributions of benefits are found to be a key motivational factor. To this, the environmental justice framework provides the analytical lenses to understand these perceptions and how they interlink. In terms of answering our research question, we find that concerns about rural decline and depopulation and perceptions of distributive justice by way of unequal

distribution of power in the decision-making process and economic benefits tied to wind turbine projects are the overbearing motivation to resistance groups. Contrastingly, support groups emphasise the potential gain of economic distributive powers by local communities and rural revival if they embrace project proposals by large-scale developers. Thus, we can conclude that while different in their stances and activities regarding wind turbines, both groups share interests in the same key challenges affecting their area.

We can conclude that the issue of wind turbine development is one that extends beyond determinants like age, occupation, and gender. Instead, the topic of wind turbines becomes a question of ideological nature, as it connects to the larger abstractions of democracy, justice, and equality. The interviews emphasised the seriousness of this conflict and that the motivating factors for supporting or opposing the projects does not evolve around green energy nor disturbance to wildlife and landscape. Additionally, the frequently debated NIMBYist paradigm was not significant in our findings, instead the issue of injustice of distribution of benefits and the lack of transparency in decision-making - therefore trust at municipality level - were crucial.

Furthermore, the scalar proportions of the issue means that while all decision-making is local, pressures by national strategies affect the political agenda greatly on the issue of wind turbines. To this, the local scale remains the central space on which the conflict plays out; it is where the burdens and benefits are created and it is at the local scale at which they tangibly affect peoples' lives.

Looking outward, as 22 proposals have been accepted at the first step of the approval process on March 31st, this only emphasises the need to create a more just process wherein the affected peoples' must feel heard and one that tackles the uneven distribution of benefits that is perceived to be inherent to the current process. However, changing official guidelines to include democratic, participatory, and transparent qualities will not mend the pre-existing damage in communities like Vindmølle Landsbyen. This damage speaks to the responsibility of national, regional, and local political powers to address the limitations to the current energy regime.

We have argued that the underlying factors tied to three kinds of injustice are the key to understanding the motivations of both resistance and support groups in Vindmølle Landsbyen, and that this resistance alongside the existing structural factors within the

institutions for political and economic decision-making ultimately hinders the acceptance of projects by municipal leadership. As long as these conditions for injustice persist, the politicisation and prioritisation of renewable energy projects by the Danish national government for its green agenda are ultimately rendered ineffective in Tønder municipality. Instead, the continued failure of projects prompts further frustration within the national government, which may cause it to further centralise decision-making processes on wind projects and remove rural residents' agency and power in project negotiations. Ultimately, this fuels negative perceptions of both public and private institutions among rural populations and fulfils a destructive cycle of stigmatisation, mistrust, and perceived injustice, perpetuating the motivations of both resistance and support groups of wind projects. Tønder's position as a battleground for the wind turbine debate, including specifically Vindmølle Landsbyen, also places it implicitly at the forefront of this debate on the national level. Therefore, the continuation of this cycle carries local, regional, national, and even global implications: concepts such as rural-urban conflict and procedural, distributive, and sensed injustices towards rural populations by neoliberal actors and ineffective governments continue to pervade discussions of the externalities and politics of energy extraction.

References

Cowell, R., Bristow, G., & Munday, M. (2011). Acceptance, acceptability and environmental justice: the role of community benefits in wind energy development. *Journal Of Environmental Planning And Management*, *54*(4), pp. 539-557.

Devine-Wright, P. (2005). Beyond NIMBYism: towards an integrated framework for understanding public perceptions of wind energy. *Wind Energy*, *8*(2), pp. 125-139.

Dracklé, D. & Krauss, W. (2011) Ethnographies of Wind and Power. *Anthropology News.*

EIA. (20*17). Energy Policies of IEA Countries: Denmark 2017 Review*. Available at: https://www.iea.org/reports/energy-policies-of-iea-countries-denmark-2017-review [accessed 1 April 2022].

Goldthau, A. (2014). Rethinking the governance of energy infrastructure: Scale, decentralization and polycentrism. *Energy Research & Social Science*, *1*, pp. 134-140.

Gorroño-Albizu, L., Sperling, K., & Djørup, S. (2019). The past, present and uncertain future of community energy in Denmark: Critically reviewing and conceptualising citizen ownership. *Energy Research &Amp; Social Science*, *57*, pp. 101231.

Gross, C. (2007). Community perspectives of wind energy in Australia: The application of a justice and community fairness framework to increase social acceptance. *Energy Policy*, 35(5), pp. 2727-2736.

Hoicka, C., Lowitzsch, J., Brisbois, M., Kumar, A., & Ramirez Camargo, L. (2021). Implementing a just renewable energy transition: Policy advice for transposing the new European rules for renewable energy communities. *Energy Policy*, 156, pp. 112435.

Hvelplund, F., Østergaard, P. A., and Meyer, N., (2017). Incentives and Barriers for Wind Power Expansion and System Integration in Denmark, *Energy Policy*, 107, pp. 573–584.

Iwerson, U. (2017). 'Vindmøller rummer store muligheder for lokalområdet. Jydske Vestkysten. Available at: https://jv.dk/artikel/vindm%C3%B8ller-rummer-store-muligheder-for-lokalomr%C3%A5det [accessed 1 April 2022].

Jenkins, K, McCauley, D., Heffron, R., Stephan, H., and Rehner, R. (2016). Energy Justice: A Conceptual Review. *Energy Research & Social Science*, 11, 2016, pp. 174–182.

Jobert, A., Laborgne, P., & Mimler, S. (2007). Local acceptance of wind energy: Factors of success identified in French and German case studies. *Energy Policy*, 35(5), pp. 2751-2760.

Klimarådet. (2022). 'Statusrapport 2022: Danmarks nationale klimamål og internationale forpligtelser', Klimaraadet. Available at: https://klimaraadet.dk/da/rapporter/statusrapport-2022 [accessed 1 April 2022].

Magnani, N. (2021). Civil Society and Conflicts Over Renewable Energies Beyond the NIMBY Syndrome. *Understanding The Energy Transition*, pp. 27-52.

Plechinger, M. (2022). Eurowind køber Vattenfalls danske projekter. Retrieved 1 April 2022, from https://energiwatch.dk/Energinyt/Renewables/article13807428.ece

Pretty, J. 1995. Participatory learning for sustainable agriculture. World Development 23(8), pp. 1247-1263.

Rudolph, D., & Kirkegaard, J. (2018). Making Space for Wind Farms: Practices of Territorial Stigmatisation in Rural Denmark. *Antipode*, *51*(2), 642-663.

Szulecki, K. (2018). 'Conceptualising energy democracy', *Environmental Policy*, 27(1), pp. 21-41.

Tolnov Clausen, L., & Rudolph, D. P. (2019). (Dis)embedding the Wind - On People-Climate Reconciliation in Danish Wind Power Planning. Journal of Transdisciplinary Environmental Studies, 17(1).

Tønder Municipality Council Meeting, 31/03/2022. Available here: https://toender.kommune-tv.dk/watch/6044 (accessed 1 April 2022).

Tønder Municipality Council Meeting, 30/04/2015. Available here: https://toender.kommune-tv.dk/watch/221 (accessed 1 April 2022)

Walker, G. (2010). Environmental justice, impact assessment and the politics of knowledge: The implications of assessing the social distribution of environmental outcomes. *Environmental Impact Assessment Review*, *30*(5), pp. 312-318.

Wüstenhagen, R., Wolsink, M., & Bürer, M. (2007). Social acceptance of renewable energy innovation: An introduction to the concept. *Energy Policy*, *35*(5), pp. 2683-2691.

Yaqoot, M., Diwan, P., & Kandpal, T. (2016). Review of barriers to the dissemination of decentralized renewable energy systems. *Renewable And Sustainable Energy Reviews*, 58, pp. 477-490.

Appendices

Appendix I - Synopsis

g. Research Gap and Relevance
h. Research Question
i. Objectives
j. Case Study
k. Analytical Framework
l. Data and Research Methods

Appendix II - Table of Methods
Appendix III - Technical Process
Appendix IV - Interview and Questionnaire Guide

- Interview guide for anti-wind groups
- Interview guide for pro-wind groups
- Interview guide for administrative staff
- Interview guide for local politicians
- Interview guide for developers
- Questionnaire guide

Appendix V - Matrix Ranking
Appendix VI - List of Proposed Renewable Energy Projects
Appendix VII - Statistical Analysis
Appendix VIII - Current Wind Parks Map

Appendix I - Synopsis

Research Gap and Relevance

The alarms of the climate crisis are sounding and the echoes are resonating in Denmark. As part of the Paris Agreement in 2015, Denmark pledged to reduce national greenhouse gas emissions by 70% by 2030. To this, Denmark adopted national plans in alignment with the Paris Agreement that, as well as 70% reduction 2030, includes the pledge of achieving climate neutrality by 2050 (Klima-, Energi- og Forsyningsministeriet, 2020). The last few decades, the Danish energy sector has increased in the generation and use of renewable energy (RE), particularly wind power, which is a market dominated by wind turbine giants such as Siemens, Vestas or Orsted. In 2019, 47% of the energy consumed in the country came from wind sources. A percentage that is set to increase after the ratification of the climate goals of both international and national nature (Gronholt-Pedersen, 2020; Energistyrelsen, 2011).

As part of the overarching national climate plans, the Tønder municipality has committed to become a key player in the green energy transition. Over the past years, the region has received numerous renewable energy project proposals, specially from the wind sector, resulting in the construction of 248 wind turbines with a total installed capacity of 175 MW. Yet, these recent developments have also been matched with increased social tensions and organized civil opposition to wind energy installations.

The questions of local (un)acceptance of wind projects have been largely explored in sociological studies. In the literature, environmental conflicts over wind energies were traditionally understood as "Not in My Backyard" (NIMBY) syndrome - localistic interest, lack of balance in risk assessment, irrationality - or as opposition to the characteristics of wind energy - visual impact, nature of the technology (Bonn & Dieperink, 2014). However, these explanations have the shortcomings of obscuring the real motivations behind environmental conflicts, and assuming that all opposition to RE projects is inherently wrong in the name of the green transition - thus ignoring valid claims that local populations may have around the social fairness of the green transition (Magnani, 2021).

Beyond these narrow understandings of environmental conflict, current research has identified key concerns that decrease the likelihood of local acceptance of wind projects such as top-down decision-making processes, or the presence of external wind farm developers entering into highly profitable business agreements with local elites, which in turn reinforce existing social inequalities and do not guarantee benefits for locals (Hughes, 2021). In this case, factors such as social inequalities, land tenure, wind farm ownership, or perceived (un)fairness of the process, have been identified as key to understanding legitimacy and acceptance of wind projects (Gross, 2007; Jobert et al., 2017).

The question of distributive justice is not only explored in the literature from a social class perspective, but also from an urban-rural divide. Like in many other European countries, Denmark is characterized by regional inequalities, with rural areas having an aging and low-density population as opposed to urban centers. Local opposition to RE in rural areas is often linked to concerns of unfairness around this regional division. In this sense, researchers argue that public opposition is more likely to occur when the local population perceives wind farms as a "foreign" imposition that poses a threat to the identity and attachment that they have towards the territory (Hughes, 2021; Magnani, 2021).

As described above, tensions and conflicts centered around wind projects cannot be understood through exclusive lenses like NIMBYism but rather demands a closer look at the social, economic, and environmental aspects they encompass. In Denmark, sociological research on this topic has focused on social representations and internal dilemmas to wind power in rural areas (Upham & Johansen, 2020). Yet, little attention has been paid to how locals have been organizing and articulating

their demands collectively. To contribute to this growing body of literature, our research focuses on Vindmølle Landsbyen, a small but politically divided parish within the Tønder municipality where local residents have been actively campaigning for and against wind turbines.

Research question

To explore the issue of social acceptance of wind energy in Vindmølle Landsbyen and the competing perspectives and articulations in this environmental conflict, our study asks the following question:

What are the motivations of Vindmølle Landsbyen's resistance and support groups on the issue of wind turbines?

Under this broader research question, our study has identified several sub-questions or objectives that we will seek to address in our data collection and analysis:

Objectives

Motivations of resistance and support groups

- What are the determining factors that have led to social conflict in the Vindmølle Landsbyen community?
- What has the organizational structure and historical development of both resistance and support groups in Vindmølle Landsbyen been like over the course of wind project development in the area?

Procedural and distributive justice

- What are the degrees of participation by local people and stakeholders and which forms of participation are accessible to the local population?
- How just do residents of Vindmølle Landsbyen/Tønder municipality perceive their processes of local political participation and decision-making to be?
- Who are the most relevant stakeholders involved in and around wind projects (local municipality, private sector, land owners, local residents, resistance groups, pro-groups, etc) and what are their respective interests?
- What is the distribution of costs and benefits to major actors around the issue?

Social movements and social conflict

- What are the motivating factors of resistance/support groups as social movements?
- How has the politicization and prioritization of wind energy at the national level in Denmark

affected local politics in Vindmølle Landsbyen?

- How are community members' perceptions of wind projects expressed through civil resistance and support groups?

Landscape and geographic analysis

- What is the effect of wind turbines on local perceptions of the landscape?
- What is the geographical distribution of wind turbines and wind farms, and their proximity to households in Vindmølle Landsbyen?

Case Study: Vindmølle Landsbyen

Parish of 371 inhabitants at the upper North-West part of Tønder Kommune. While a small parish, there are strong opinions on both ends of the spectrum on the matter of RE projects - in particular on the question of establishing on-shore windmills. There are records of the local community of Vindmølle Landsbyen expressing attitudes on windmill projects through demonstrations, petitions, posters and op-eds in local newspapers. Meanwhile, people not located in Vindmølle Landsbyen are also joining the debate contributing to tensions felt by locals in Vindmølle Landsbyen. Due to the history of past projects as well as newly proposed windmill projects, the local population of Vindmølle Landsbyen is likely to have first-hand experience on the potential issues of renewable energy projects. Furthermore, the decades-long tensions within Vindmølle Landsbyen concerning windmill projects makes the site an interesting area of research, as it allows examining how attitudes change or strengthen over time, incorporating a temporal component within our research. While we are interested in the current attitudes and motivations of the people of Vindmølle Landsbyen, perceptions are inherently situated in a historical context and previous experiences with windmill projects will inevitably sway and affect attitudes in one way or the other. Also, in a small community, such as Vindmølle Landsbyen, social ties and community structures may also play a significant role in creating or perpetuating resistance or support groups of the windmill projects. Thus, Vindmølle Landsbyen serves as a complex case study that can expose the many nuances of community resistance and support of RE projects.

The amount of op-eds, Facebook groups, and articles on establishing windmills in Vindmølle Landsbyen will also allow us to gauge key conflicts and tensions within this particular area. Although online materials are not exhaustive in terms of preparing us for our field trip, they can inform our work in developing interview questions, questionnaires, and aid in identifying key stakeholders within Vindmølle Landsbyen parish. Due to the time constraints of the project, it is very beneficial to have a preliminary list of interviewees and key themes to investigate. Also, focusing on Vindmølle Landsbyen serves as a micro-expression of the attitudes that may surround windmills projects. With

Vindmølle Landsbyen geographically and culturally close to other towns and parishes that are in the midst of similar developments, the research can be expanded to encompass a comparative angle or be replicated elsewhere in the future. However, the scope of this research is determined by the time and resource constraints as well as the connections we build with the people of and outside Vindmølle Landsbyen. Expanding upon the social implications of windmill projects presupposes a lens at the local scale as we seek to investigate the particular attitudes, perceptions, and arguments of people affected by wind projects.

Analytical Frameworks

Environmental Justice Framework:

This framework will be used to study the distinctions within the environmental justice issues. The authors draw two main different types of justice: **procedural and distributive**. The first encompasses evaluation of the fairness of the process of decision making, while the second implies judgment of distributions of people of negative and positive outcomes (cost and benefit). Furthermore, this framework has been enriched with a third element called **sense of justice**, which detects the way that affected people perceive and judge the intervention.

Using the environmental justice framework, we aim to provide a snapshot of the three different types of environmental justice within the Vindmølle Landsbyen community, through the lens of past and proposed wind energy projects in the area and the decision-making processes surrounding them

- Analysis of the effectiveness of avenues for local political participation
- Analysis of the "fairness" of the distribution of benefits stemming from wind energy project development in the area (stakeholders)
- Analysis of the overall "sense of justice"/legitimacy perceived by members of the local community

Data and Research Methods

- Survey/questionnaire (online, SurveyXact/ Google Forms) - To understand the factors that influence:
  - Residents' experiences and sources of procedural and distributive environmental justice
  - Residents' resistance to/support of wind energy projects in the Vindmølle Landsbyen area
  - Residents' perceptions of relevant stakeholders and their respective interests

- Focus group - To understand the motivations of resistance/support groups through an analytical lens of social movements
- Semi-structured, informal, and in-situ interviews - To gain a deeper understanding of selected stakeholders' positions and experiences, to investigate constituents' perceptions of their local decision making processes, as well as historical context of the wind energy question in Vindmølle Landsbyen in order to create a rudimentary local timeline of events.
- Cognitive Mapping: to be implemented as a part of interviews and focus groups interviews. A precedent for using cognitive mapping to examine public attitudes towards issues pertaining to energy infrastructure is present in Uphan and Pérez (2015); cognitive mapping "seeks to understand how humans make sense of their world by structuring concepts by contrast and similarity, organizing them in a hierarchical structure" (2015: 590). Perceptions and attitudes are complex to articulate and cognitive mapping can be utilised to bridge the gap between explicit and implicit attitudes and perceptions towards wind projects.
- Stakeholder analysis - To map out the most relevant and influential parties surrounding the question of wind energy development in Vindmølle Landsbyen, as well as their respective driving interests in relation to sub-themes based on our research objectives and the distribution of costs and benefits between them
- Participant observation - To gain our own firsthand accounts of the dialectic/political discourse regarding opposition to/support for proposed RE projects, with the goal of achieving an understanding of the most discussed/debated factors and topics related to RE projects in Vindmølle Landsbyen and the broader Tønder municipality.
- Landscape analysis - To assess the natural, cultural and aesthetic values of the Resby landscape for community members and how they have been impacted by the wind turbines project.
- GPS data - To map locations of stakeholders, interviews, respondents, possibly of proposed wind projects, borders of the research area/town of Vindmølle Landsbyen.

Appendix II - Table of Methods

Table with an overview of applied methods.

Method	**Amount**
Interviews (semi-structured)	7

In-situ interviews	4
Participant observation	2
Matrix ranking	3
Timeline	3
GPS mapping	25 points on map
Questionnaire	276

Appendix III - Technical Process

Technical Process- Political Guidelines

The installation of onshore wind turbines is prescribed by the Danish Planning Act, while the local municipalities are in charge of planning the projects and assessing the environmental impacts (Anker et al 2015). For larger wind turbines above 150 m, the Ministry of Environment is the main authority. The national planning framework establishes a precise guideline to follow in order to implement a wind energy project. Overall, the procedure is divided into three main areas: 1) Planning Requirements, 2) Impact Assessment, 3) RE policies measures. The planning requirements refers to spatial and physical planning of wind turbines, and they include a strategic planning that identifies the area of designation, the expected numbers and height of wind turbines the distance to the dwellings, and a project planning which consists in a local plan with the information such as the precise number, siting and height of an individual project *(PA: Planning Act – consolidated Act no. 587/2013 (bekendtgørelse af lov om planlægning) Executive Order no. 1590/2014 on planning for and permits to wind turbines (bekendtgørelse om planlægning for og tilladelse til vindmøller)* . Both of the plannings require a period of public consultation of minimum 8 weeks. In this frame, the municipality also needs to satisfy all the permit requirements for the installation of the project.

On the other hand, the impact assessment tool is characterised by a variety of evaluation frameworks that should provide the relevant information about a potential impact of the projects. The two most important assessment tools are the Strategic Environmental Assessment (SEA) and the Environmental Impact Assessment (EIA). They assess the environmental characteristics of areas likely to be significantly affected and the likely significant effects on the environment, including biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, materials assets, cultural heritage and landscape. However, while the SEA refers to an area plan, the EIA is an

assessment of individual projects and it requires 8 weeks of public consultation to be approved. Furthermore, they both need to respect the requirements of EU Directives. (*EA Act: Environmental Assessment Act – consolidated Act no. 939/2013 (bekendtgørelse af lov om miljøvurdering af visse planer og programmer) Executive Order 1102/2009 on consultation of concerned authorities (bekendtgørelse om berørte myndigheder og om offentliggørelse efter lov om miljøvurdering af planer og programmer) EP Act: Environmental Protection Act – consolidated Act no. 879/2010 (bekendtgørelse af lov om miljøbeskyttelse). Executive Order no. 1284/2011 on noise from wind turbines (bekendtgørelse om støj fra vindmøller – vindmøllebekendtgørelsen)*

The third step, instead, is concerned with distributive justice and the distribution of benefits to affected communities. From the 1st January 2009, the Danish government approved the Renewable Energy Act that introduced four policy measure aimed at increase local acceptance of wind turbine projects: 1) the compensation scheme to neighbours; 2) the co-ownership scheme; 3) the community benefit scheme (green scheme); and 4) the guarantee fund for local ownership initiatives (Anker et al 2015). This section is controlled by the companies, which are in charge of implementing all of the four schemes and get in touch with the local stakeholders. (explain how companies work from interview, quote in distributive justice)

The compensation scheme determines the amount of indemnity from developer to owners of dwellings for loss of property value above 1 % . In the period from 2010-2012 the average compensation for loss of property value was DKK 100,500 (13,500 EURO) ; more recent figures indicate an average 127,000.29 compensation of DKK (Anker et al 2015). The Valuation Authority defines the loss of property value on the basis of an individual assessment, while the developer organises a public meeting either four weeks before the expiry of the 8 week consultation period regarding the EIA statement, or 4 weeks after a decision that an EIA is not required.

The co-ownership scheme establishes a minimum of 20% of ownership shares to the permanent local citizen living within a radius of 4.5km from the wind turbine. The developer should organise public meetings in order to gather information about the local context. On the other side, the green scheme provides funding for local projects that enhance landscape or recreational values or promote cultural and informative activities (quote preben, Sæd). Finally, the guarantee scheme provides guarantees for loans to preliminary investigations by local wind turbine owner associations. *RE Act: Renewable Energy Act – consolidated Act no. 122/2015 (bekendtgørelse af lov om fremme af vedvarende energi) Executive Order no. 273/2009 on the compensation scheme (bekendtgørelse om værditab på fast ejendom ved opstilling af vindmøller) Executive Order no. 400/2009 o0n the administration of green scheme subsidies (bekendtgørelse om administration af tilskud til grøn ordning) Executive Order no. 1476/2010 on impact assessment re. Natura 2000 areas and protection*

of species (bekendtgørelse om konsekvensvurdering vedrørende internationale naturbeskyttelsesområder samt beskyttelse af visse arter ved projekter om etablering m.v. af elproduktionsanlæg og elforsyningsnet på havet). Executive Order 68/2012 on EIA of offshore electricity producing installations (bekendtgørelse om vurdering af virkninger på miljøet (VVM) ved projekter om etablering af elproduktionsanlæg m.v. på havet). Executive Order 73/2013 on technical certification of wind turbines (bekendtgørelse om teknisk certificeringsordning for vindmøller)

Appendix IV - Interview and Questionnaire Guide

Interview Guides

1. Questions for pro-wind turbine group members
2. Questions for anti-wind turbine group members
3. Questions for local politicians
4. Questions for administrative staff
5. Questions for developers

Questions for pro-turbine group members

General

1. We are a group of Masters students from the University of Copenhagen, and our goal is to research the ongoing debate in Vindmølle Landsbyen and Tønder municipality regarding the proposal, development, and expansion of wind turbine projects in the area. We highly appreciate the opportunity to be able to speak with you because we want to make sure that we can hear from the local residents of the town about their lives and opinions, separately from the local and commercial politics.

2. Where do you live?

3. How long have you been living in Vindmølle Landsbyen?

4. What is your occupation?

5. Timeline

6. How has the land tenure structure and distribution of land/natural resources changed in the municipality over the past several decades? How do you feel this relates to the history of wind turbine development on rural land?

Resistance/support groups

7. Generally, would you say that you are for or against the development of wind turbines in Vindmølle Landsbyen parish?

8. Why?

9. Are you involved in any social movements or community groups regarding wind turbines here? Have you taken part in any demonstrations or voiced your opinion publicly in any way?

10. If so, could you tell us more about the history of the group, its structure and leadership, where it's based, and the main types of actions the group does?
(If not, why not? Is there something about these groups or their methods that you disagree with?)

11. Would you say that you fully agree with the goals of this group? Do you feel that they are successful in these goals?

12. Which part or parts of their main philosophy/argument do you best relate to?

13. What do you think of the opposing groups regarding wind turbines and their members? Why?

<u>Decision-making process</u>

14. Do you feel that your local municipality and representatives are doing a good job?

15. Do you feel that they have any effect? If so, what kind?

16. Do you feel that your local representatives make the decision-making process regarding wind turbines fair for you and your community? Why/why not?

17. Do the people of Vindmølle Landsbyen get a chance to voice their concerns? If so, how, where, and when? How often?

18. Have any wind turbine companies offered you financial compensation? If so, please describe the experience and interactions.

<u>Stakeholders</u>

19. Who would you say gains from wind turbine development, and who do you think ultimately has to bear the costs?

<u>Suggestions and alternatives</u>

20. Do you generally agree with wind energy as a solution to the climate crisis? If not, what is the most suitable solution in your opinion and do you think that Vindmølle Landsbyen can make a difference?

Interactive elements

21. Introduce interactive element. Present cards with broad thematic areas of concern (Livelihood (home and land), physical disturbances, financial livelihood, economic development (jobs), political views, climate change) and cards with main actors (Danish national government, government of Tønder municipality, energy companies and wind turbine developers (with examples), the people of Vindmølle Landsbyen, you). Also present blank sticky notes for the interviewee's thoughts.
    Ask the interviewee to sort the cards by their perceived associations and to link them in any way that they feel is appropriate. They do not have to use all the cards. If they have additional thoughts or details they would like to add, they can write on sticky notes and stick them to/between the cards.

22. Timeline (we can switch these around)

23. Is there anything you would like to ask us?

Questions for anti-windmill group members

General

1. We are a group of Masters students from the University of Copenhagen, and our goal is to research the ongoing debate in Vindmølle Landsbyen and Tønder municipality regarding the proposal, development, and expansion of wind turbine projects in the area. We highly appreciate the opportunity to be able to speak with you because we want to make sure that we can hear from the real local residents of the town about their real lives and opinions, separately from the local and commercial politics.

2. Where do you live?

3. How long have you been living in Vindmølle Landsbyen?

4. What is your occupation?

5. Timeline

6. How has the land tenure structure and distribution of land/natural resources changed in the municipality over the past several decades? How do you feel this relates to the history of wind turbine development on rural land?

Resistance/support groups

7. Generally, would you say that you are for or against the development of wind turbines in Vindmølle Landsbyen parish?

8. Why?

9. What would you say is your biggest concern among these reasons?

10. Are you involved in any social movements or community groups regarding wind turbines here? Have you taken part in any demonstrations or voiced your opinion publicly in any way?

11. If so, could you tell us more about the history of the group, its structure and leadership, where it's based, and the main types of actions the group does?
(If not, why not? Is there something about these groups or their methods that you disagree with?)

12. Would you say that you fully agree with the goals of this group? Do you feel that they are successful in these goals?

13. Which part or parts of their main philosophy/argument do you best relate to?

14. What do you think of the opposing groups regarding wind turbines and their members? Why?

<u>Decision-making process</u>

15. Do you feel that your local municipality and representatives are doing a good job?

16. Do you feel that they have any effect? If so, what kind?

17. Do you feel that your local representatives make the decision-making process regarding wind turbines fair for you and your community? Why/why not?

18. Do the people of Vindmølle Landsbyen get a chance to voice their concerns? If so, how, where, and when? How often?

19. Do you feel that they have any effect? If so, what kind?

<u>Stakeholders</u>

20. Who would you say gains from wind turbine development, and who do you think ultimately has to bear the costs?

21. Do you generally agree with wind energy as a solution to the climate crisis? If not, what is the most suitable solution in your opinion and do you think that Vindmølle Landsbyen can make a difference?

Interactive

22. Introduce interactive element. Present cards with broad thematic areas of concern (Livelihood (home and land), physical disturbances, financial livelihood, economic development (jobs), political views, climate change) and cards with main actors (Danish national government, government of Tønder municipality, energy companies and wind turbine developers (with examples), the people of Vindmølle Landsbyen, you). Also present blank sticky notes for the interviewee's thoughts.
    Ask the interviewee to sort the cards by their perceived associations and to link them in any way that they feel is appropriate. They do not have to use all the cards. If they have additional thoughts or details they would like to add, they can write on sticky notes and stick them to/between the cards.

23. Is there anything you would like to ask us?

Questions for administrative staff

1. How long have you been working for Tønder municipality?

2. What is your role in the administration? What issues do you generally deal with?

3. What is your experience with wind turbine development projects?

4. Help us establish the historical context of the wind turbine issue in this area, and in Denmark as a whole. What notable events and developments have happened to your best knowledge within the past few decades? (Timeline)

5. How has the land tenure structure and distribution of land/natural resources changed in the municipality over the past several decades? How do you feel this relates to the history of wind turbine development on rural land?

6. What is the municipality's specific role within wind turbine development projects?

7. How closely do the municipality and the Danish energy sector cooperate within this process?

8. Does the private sector give any incentives to the people of Tønder municipality when wind energy projects are proposed? If so, what is the municipality's role in these incentives?

9. How successful do you feel the municipality is in realizing these incentives?

10. How does the decision-making process work within the administration? What opportunities do constituents have to express their concerns (publicly/privately), and how influential do you feel them to be?

11. Do you feel that wind turbine development projects in the area have been generally successful in recent years? Why/why not?

12. Do you feel that the circumstances in Tønder municipality have changed since the introduction of wind projects in the area?

13. Is there anything you would like to ask us?

Interview Local Politician

1. How long have you been working for Tønder municipality?

2. What is your role in the administration? What issues do you generally deal with?

3. What is your party affiliation?

4. What is your experience with wind turbine development projects?

Timeline

5. What notable windmill projects and developments have been rejected in the past decade and what are the main reasons for these rejections? (Project-line)

6. What shaped this politician's disagreement/ antagonism regarding the projects?

7. What has your administration been doing to promote renewable energy in the area? What is the leadership's role within this process?

8. Were there specific events that influenced people's perceptions of windmills?

Decision-making process

9. How is the decision-making body for approval of wind energy projects organized? How are members elected to the board?

10. Where can we access documentation of past board decisions?

11. What are the biggest obstacles to approval of wind energy projects in Tønder municipality?

12. Can you recall why the project in Sæd-Ubjerg was approved, as opposed to all other proposals over the past several years?

13. Is it all about people's decisions? Or also municipalities have an influence?

14. What would this support from gov look like to you?

15. How much of your administration's policy, in your opinion, is influenced by the initiatives of the Danish national government?

16. To what extent do you collaborate with renewable energy companies in developing wind energy projects, and how do you distribute responsibilities in this process?

Resistance and support groups

18. People are afraid of having bigger windmills – how do you deal with this?

19. Conditions of the grid?

20. How much of your administration's policy, as well as of the rate of approval of wind project proposals, is influenced by the actions and rhetoric of opposition groups? Support groups?

21. What are the opportunities that constituents / people have to influence the decision-making process around the approval / rejection of wind-turbine proposals?

22. We talked to locals in Sæd who expressed their unwillingness to buy shares for windturbine projects. Why do you think people are not interested in buying these shares?

23. Do you believe there is a social conflict within the municipality (civilians) on the topic of wind turbine development? How significant do you believe it to be? What do you think about the conflict?

Questions for Developers

1. Role in the Company and in the Sæd Project

2. How long have you been working for NRGi renewables?

3. What is your role in the company? What issues do you generally deal with?

4. We have been told that you used to work as well for Ecopartner ApS which operated the Sæd project. What was your role in this project?

Technical Insights

5. How did you decide on Sæd for the location of this project? Were you considering any other locations?

6. How was the environmental impact assessment conducted and which variables were taken into account? (e.g. noise thresholds, health concerns, blade shadow, biodiversity, visual impact, etc)
    a. From our surveys we have seen that a large number of people are concerned with the environmental impact of producing wind turbines, was this variable considered in your EIA?

7. We went to the energy hut next to the park and saw that this project was able to cover the needs of about 16.000 households. Was this energy going towards meeting the energy demand of Tønder? or outside the region?

8. How was revenue from the project distributed between the company, the municipality, and the local community?
    a. What % of the revenue was agreed that the company would keep for profit, and how much would go towards the local community or the municipality?

Relationship between company-municipality

9. How closely did your company cooperate with the municipality regarding the Sæd project?'

10. Did the municipality have any role in mediating these incentives / contracts?

11. How was the process of acquiring / renting the land where the windmills are currently placed?

12. Was there a local plan and communal plan developed for the project? Did you take part in this process? What do these plans usually involve?

Company-Local Decision-Making process

13. Did your company give any incentives or compensation to the people of Sæd? If so, how were these incentives agreed upon?
    a. Are these compensations agreed through a written contract? or are they verbal agreements? If so, where are the records kept: company, municipality, or locals?

14. Did you hold any consultation meetings with local residents? What opportunities do constituents have to express their concerns (publicly/privately), and how influential were their voices in the final project?
    a. *How long was this project proposed for and did it change over the course of its proposal?*

15. Did you collaborate with the Sæd-Ubjerg local community group and the wind energy education group VidenOmVind in the development of the project? What was their role?

16. What do you think is the reason why this project has been successful? (as opposed to other rejected proposals in the area).

17. Do you feel that the circumstances in Tønder municipality have changed since the introduction of wind projects in the area?

18. Is there anything you would like to ask us?

Questionnaire Guide

Tak for at deltage i vores spørgeskema undersøgelse!

Vi er fem studerende fra Københavns Universitet som udarbejder en undersøgelse om vindmølleprojekter i Danmark.

Vi ønsker at opnå viden om de lokale meninger og holdninger i Tønder kommune og vil værdsætte dit svar på følgende spørgsmål. Det er estimeret til at tage omkring 10 minutter.

Alle data holdes anonymt.

Hvilket køn identificerer du dig med?
(1) ❍ Kvinde
(2) ❍ Mand
(3) ❍ Ikke-binær
(4) ❍ Andet: _____

Hvad er din alder?

	(1) ❍ <25 år	(2) ❍ 26-35 år	(3) ❍ 36-45 år	(4) ❍ 46-55 år	(5) ❍ 56-65 år	(6) ❍ 65+ år

Hvad er dit postnummer?

_____
_____
_____
_____
_____
_____

Hvor længe har du boet i Tønder kommune?
(1) ❍ 0-1 år
(2) ❍ 2-5 år
(3) ❍ 6-10 år
(4) ❍ 11-20 år
(7) ❍ 20-30 år
(5) ❍ 30+ år
(6) ❍ Hvis du ikke bor i Tønder kommune, hvilken er du så bosat i: _____

Hvad er din hovedbeskæftigelse?
(7) ❍ Ansat i den offentlige sektor
(8) ❍ Landbrug
(21) ❍ Selvstændig (ikke landbrug)
(20) ❍ Ansat i den private sektor (ikke landbrug)
(5) ❍ Pensionist (eller førtidspensionist/uarbejdsdygtig)
(19) ❍ Studerende
(4) ❍ Jobsøgende
(18) ❍ Andet _____

Hvad er dit højest fuldførte uddannelsesniveau?
(1) ❍ Folkeskolen
(3) ❍ HF, HHX, STX eller HTX
(4) ❍ Professionsbachelor
(9) ❍ Erhvervsuddannelse
(6) ❍ Universitet

Hvad er din boligsituation?
(1) ❍ Ejer egen bolig
(3) ❍ Andelsbolig
(2) ❍ Lejer bolig
(4) ❍ Andet: _____

Kan du se vindmøller fra dit hjem?
(1) ❍ Ja
(2) ❍ Nej

Hvad er din holdning til etablering af vindmøller i Tønder kommune?
(1) ❍ Jeg støtter det
(2) ❍ Jeg støtter til dels
(3) ❍ Jeg hverken støtter eller modsætter mig
(4) ❍ Jeg støtter det ikke til dels
(5) ❍ Jeg støtter det ikke

Vindmøller forstyrrer udsigten til naturen.
(5) ❍ Meget enig
(1) ❍ Til dels enig
(9) ❍ Hverken enig eller uenig
(6) ❍ Til dels uenig
(7) ❍ Meget uenig

Vindmøller forstyrrer biodiversiteten
(1) ❍ Meget enig
(2) ❍ Til dels enig
(3) ❍ Hverken enig eller uenig
(4) ❍ Til dels uenig
(5) ❍ Meget uenig

Vindmøller forsåger støjforurening.
(1) ❍ Meget enig
(2) ❍ Til dels enig
(3) ❍ Hverken enig eller uenig
(4) ❍ Til dels uenig
(5) ❍ Meget uenig

Vindmøller forsåger lysforurening.

(1) ❍ Meget enig
(2) ❍ Til dels enig
(3) ❍ Hverken enig eller uenig
(4) ❍ Til dels uenig
(5) ❍ Meget uenig

Vindmøller har en negativ effekt på menneskers helbred og velbefindende.
(1) ❍ Meget enig
(2) ❍ Til dels enig
(3) ❍ Hverken enig eller uenig
(4) ❍ Til dels uenig
(5) ❍ Meget uenig

Vindmøller har en negativ effekt på mit hus/ejendoms værdi.
(1) ❍ Meget enig
(2) ❍ Til dels enig
(3) ❍ Hverken enig eller uenig
(4) ❍ Til dels uenig
(5) ❍ Meget uenig

Produktionen og/eller bortskaffelsen af vindmøller skader miljøet.
(1) ❍ Meget enig
(2) ❍ Til dels enig
(3) ❍ Hverken enig eller uenig
(4) ❍ Til dels uenig
(5) ❍ Meget uenig

Kompensation for vindmøller er ikke en fordel for mig.
(2) ❍ Meget enig
(1) ❍ Til dels enig
(3) ❍ Hverken enig eller uenig
(4) ❍ Til dels uenig
(5) ❍ Meget uenig

Vindenergiselskaber overser lokalsamfund og deres meninger.
(1) ❍ Meget enig
(2) ❍ Til dels enig
(3) ❍ Hverken enig eller uenig
(4) ❍ Til dels uenig
(5) ❍ Meget uenig

Vindmøller har en negativ effekt på landbrugsdyr.
(1) ❍ Meget enig
(2) ❍ Til dels enig
(3) ❍ Hverken enig eller uenig
(4) ❍ Til dels uenig
(5) ❍ Meget uenig

Vindmøller producerer energi som er direkte til fordel for lokalsamfundet.
(1) ❍ Meget enig
(2) ❍ Til dels enig
(3) ❍ Hverken enig eller uenig
(4) ❍ Til dels uenig
(5) ❍ Meget uenig

Vindmøller medbringer økonomiske fordele til vores lokalsamfund.
(1) ❍ Meget enig
(2) ❍ Til dels enig
(3) ❍ Hverken enig eller uenig
(4) ❍ Til dels uenig
(5) ❍ Meget uenig

Vindmøller giver mig en økonomisk fordel.
(1) ❍ Meget enig
(2) ❍ Til dels enig
(3) ❍ Hverken enig eller uenig
(4) ❍ Til dels uenig
(5) ❍ Meget uenig

Vindmøller er en vigtig del af Danmarks energiuafhængighed.
(1) ❍ Meget enig
(2) ❍ Til dels enig
(3) ❍ Hverken enig eller uenig
(4) ❍ Til dels uenig
(5) ❍ Meget uenig

Vindmølleenergi er en mulighed for Tønder kan være frontløber for klimakrisen.
(1) ❍ Meget enig
(2) ❍ Til dels enig
(3) ❍ Hverken enig eller uenig
(4) ❍ Til dels uenig
(5) ❍ Meget uenig

Vindmøller er en positiv del af landskabet i Tønder kommune.
(1) ❍ Meget enig
(2) ❍ Til dels enig
(3) ❍ Hverken enig eller uenig
(4) ❍ Til dels uenig
(5) ❍ Meget uenig

Vindmøller producerer grøn energi til fordel for mit lokal samfund.
(1) ❍ Meget enig
(2) ❍ Til dels enig
(3) ❍ Hverken enig eller uenig

(4) ❍ Til dels uenig
(5) ❍ Meget uenig

Jeg ser vindmøller som en af de bedste energikilder over andre alternativer.
(1) ❍ Meget enig
(2) ❍ Til dels enig
(3) ❍ Hverken enig eller uenig
(4) ❍ Til dels uenig
(5) ❍ Meget uenig

Hvordan mener du, at Danmark kan opnå målet om klimaneutralitet i 2050?
(1) ❑ Landvindmøller
(2) ❑ Havvindmøller
(3) ❑ Solceller
(4) ❑ Geotermisk energi
(5) ❑ Vandkraft (fra andre lande)
(6) ❑ Atomkraft
(7) ❑ Fortsætte med at bruge fossile brændsler såsom kul, olie og gas
(8) ❑ Andet: _____

Har du deltaget i aktiviteter i forbindelse med vindmølleprojekter? (Vælg gerne flere)
(1) ❑ Nej
(2) ❑ Ja, jeg er medlem af online grupper, såsom Facebook, relateret til vindmølleprojekter.
(4) ❑ Ja, jeg har deltaget i lokale forsamlinger/møder/arrangementer.
(5) ❑ Ja, jeg har været en del af demonstrationer.
(3) ❑ Jeg har deltaget i andre intitiativer relateret til vindmølle projekter (venligst uddyb). _____
(6) ❑ Ja, jeg har skrevet under på underskriftsindsamlinger om vindmølleprojekter.
(7) ❑ Ja, jeg har skrevet eller været medafsender på læserbrev(e).
(8) ❑ Ja, jeg har investeret økonmisk/købt andel i et vindmølleprojekt

Hvis du har deltaget i nogle af forrige nævnte aktiviteter, følte du da at dine holdninger var velrepræsenteret? Hvorfor/hvorfor ikke?
(1) ❍ Ja: _____
(2) ❍ Nej: _____
(3) ❍ Andet: _____
(4) ❍ Ikke deltaget

Føler du at den lokale kommune forstår og lytter til dine holdinger og meninger om vindmølleprojekter i Tønder kommune?
(1) ❍ Kommunen tager mine meninger og holdninger seriøst
(2) ❍ Det meste af tiden er kommunen repræsentativ i forhold til mine holdninger
(5) ❍ Det ved jeg ikke
(3) ❍ Jeg føler ikke altid min mening er repræsenteret
(4) ❍ Min holdning til vindmøller er aldrig repræsenteret på kommunalt niveau

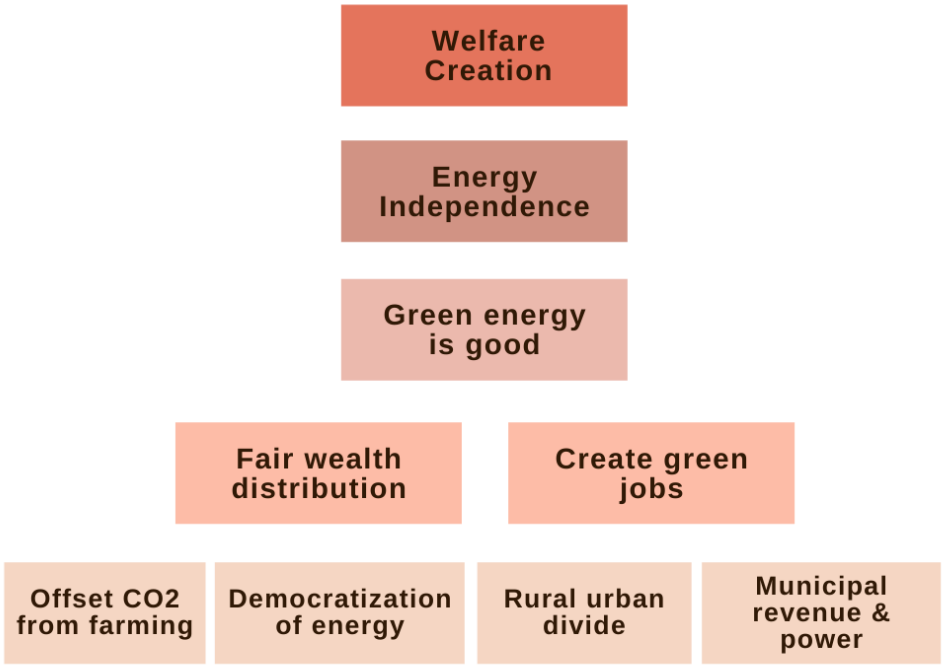
Vi vil gerne vide mere om dine meninger om vindmølleprojekter i Tønder kommune. Hvis du er villig til at deltage i et mere dybdegående interview udfyld gerne din kontaktinformation herunder. Mange tak på forhånd.

(1) ❍ Telefon nummer, e-mail eller anden form for kontaktinformation: _____

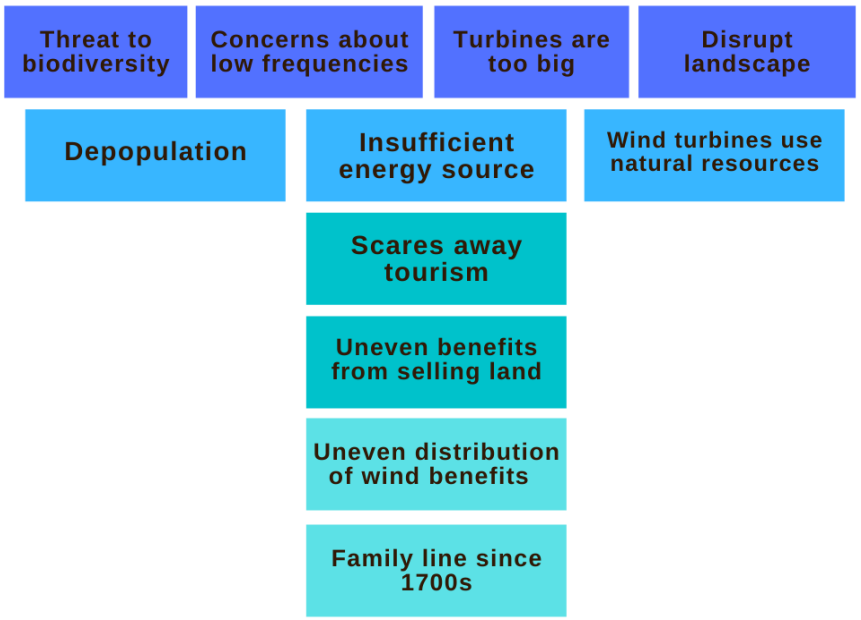
(2) ❍ Nej tak

Tusind tak for at deltage i vores spørgeskemaundersøgelse, dine svar er yderst værdsat.

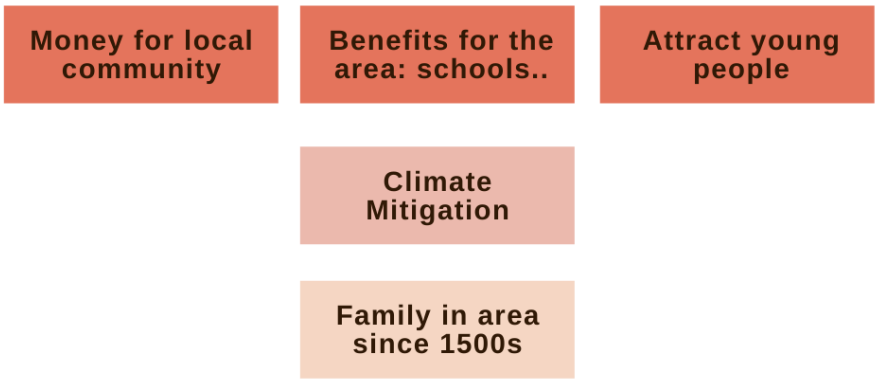
Appendix V - Matrix Rankings



Matrix Ranking 1 - "Motivations for supporting wind turbines"Informant #10



Matrix Ranking 2 - “Motivations for opposing wind turbines” Informants #5 and #6



Matrix Ranking 3 - “Motivations for supporting wind turbines”Informant #4

Appendix VI - Proposed renewable energy Projects

List of current proposals for renewable energy projects in Tønder municipality, December 2021

VE Ansøgninger 2021 - 17.12.2021

Nr.	Type	Effekt MW	Areal ha	Antal	Højde M	Firma	VE-ansøgninger	Modtaget	koordinater	Område
1	Solceller	193	158	-	-	Obton	Lovrup Solenergipark	06.12.2021	490872.04 6111055.46	Lovrup
2	Vindmøller	25		5	150	Paul W Dall	Installering af 5 stk 150 meter høje vindmøller	13.12.2021	499591.00 6094749.84	Ellehus
3	Solceller	2	2			Anders Matzen	Fornyelse af tidligere beviget landzonetilladelse	14.12.2021	504455.59 6121109.82	Toftlund
4	Hybrid	80	55	6	150	NRGi	Energilandskab placeret mellem Døstrup, Drengsted og Lovrup	14.12.2021	490049.26 6106764.65	Drengsted/Døstrup/Lovrup
5	Vindmøller	40		9	150	NRGI	9 Vindmøller mellem Borg og Visby	14.12.2021	483924.27 6098726.48	Visby/Borg
6	Solceller	100	100			Unison Energy Partners ApS	Solcellepark ved Husum-Ballum	14.12.2021	480556.63 6102568.72	Husum-Ballum
7a	Solceller	60	74			European Energy	Solcelleanlæg ved Kæpslundvej	14.12.2021	489484.86 6110555.60	Vinum
7b	Solceller	70	81			European Energy	Solcelleanlæg ved Duborgvej	14.12.2021	479967.90 6098843.51	Hjerpsted
7c	Solceller	100	122			European Energy	Solcelleanlæg ved Sindetvej	14.12.2021	512596.50 6107468.92	Agerskov
8	Solceller	10	11			Jens Lund	Solcelleanlæg på Rejsby Hede	14.12.2021	479658.24 6099100.77	Rejsby Hede
9	Solceller	86	98			Better Energi A/s	Solceller ved Borg	15.12.2021	488229.11 6099388.36	Borg
10	Solceller	35	43			Unison Energy Partners ApS	Solcellepark Ved Løgumkloster	15.12.2021	498144.15 6100001.73	Løgumkloster
11	Solceller	54	65			Better Energy A/S	Solceller ved Mollerup	15.12.2021	486290.48 6097886.87	Mollerup
12	Solceller	300	555			GreenGo Energy A/S	Solenergianlæg ved Tyvse	15.12.2021	493321.13 6097338.32	Tyvse
13	Solceller	100	182			GreenGo Energy A/S	Solenergianlæg nord for Bredebro	15.12.2021	490050.73 6102678.42	Bredebro
14	Solceller	75	71			Obton A/S	Vollum Solenergipark	15.12.2021	487409.63 6103871.63	Vollum
15	Hybrid	173	190	10	180	Eurowind Project A/S	Energipark Vollum Enge	15.12.2021	486022.54 6106051.24	Vollum
16	Hybrid	68	45	8	150	Eurowind Project A/S	Energipark Gasse Hede	15.12.2021	490415.93 6115594.11	Gasse Hede
17	Vind	38		9	150	Momentum Gruppen A/S	Ny Vindpark Arrild	15.12.2021	496921.05 6110037.31	Arrild
18	Solceller	61	60			Kvarts & Co. ApS.	Bredebro solcellepark	15.12.2021	489519.49 6102042.08	Bredebro
19	Solceller	92	90			W3 Construction ApS	Solpark Brøns ApS	15.12.2021	482281.57 6117384.77	Brøns
20	Vindmøller	84		15	180	Vattenfall	Vindmøllepark Rejsby Hede	15.12.2021	479224.28 6099604.71	Rejsby Hede
21	Vindmøller	108		18	180	Vattenfall	Vindmøllepark Haved	16.12.2021	485193.31 6120239.66	Haved
22	Vindmøller	X		X	X	Jens Kristiansen	Vindmølleområde St. Emmerske	16.12.2021	495581.83 6091592.93	St. Emmerske

(Koordinater i UTM zone 32N (epsg:25832))

Appendix VII - Statistical Analysis

Figure 4. The percentages of respondents answering the question ´What is your position on the establishment of wind turbines in the municipality of Tønder?´. N=250

```
FREQUENCIES VARIABLES=for_against_wind
  /STATISTICS=RANGE MINIMUM MAXIMUM MEDIAN MEAN MODE
  /ORDER=ANALYSIS.
```

Statistics

Hvad er din holdning til etable

N	Valid	250
	Missing	25
Mean		2.41
Median		1.00
Mode		1
Range		4
Minimum		1
Maximum		5

Hvad er din holdning til etablering af vindmøller i Tønder kommune?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Jeg støtter det	127	46.2	50.8	50.8
	Jeg støtter til dels	32	11.6	12.8	63.6
	Jeg hverken støtter eller modsøtter mig	16	5.8	6.4	70.0
	Jeg støtter det ikke til dels	11	4.0	4.4	74.4
	Jeg støtter det ikke	64	23.3	25.6	100.0
	Total	250	90.9	100.0	
Missing	System	25	9.1		
Total		275	100.0		

Table 2. Mann-Whitney U test comparing whether the mean of two-level indicators: gender (M v. W), age (<26 v. 65<) and opinion of wind turbines (acceptance v. rejection) lead to a difference in the mean of how they perceive potential concerns around wind energy.

Grouping Variable: Gender

```
NPAR TESTS
  /M-W= WN_views WN_biodiversity WN_noisepollution WN_lighpollution WN_health
WN_propertyvalue
        WN_production WN_compensation WN_corporations WN_cattle BY gender(1 2)
  /MISSING ANALYSIS.
```

Ranks

	whats your gender	N	Mean Rank	Sum of Ranks
Vindmøller forstyrrer udsigten til naturen	Kvinde	111	120.98	13428.50
	Mand	131	121.94	15974.50
	Total	242		
Vindmøller forstyrrer biodiversiteten	Kvinde	121	123.61	14957.00
	Mand	132	130.11	17174.00
	Total	253		
Vindmøller forsåger støjforurening	Kvinde	123	122.37	15051.00
	Mand	132	133.25	17589.00
	Total	255		
Vindmøller forsåger lysforurening	Kvinde	122	127.40	15542.50
	Mand	131	126.63	16588.50
	Total	253		
Vindmøller har en negativ effekt på menneskers helbred og velbefindende.	Kvinde	123	126.73	15587.50
	Mand	132	129.19	17052.50
	Total	255		
Vindmøller har en negativ effekt på mit hus/ejendoms værdi	Kvinde	124	122.42	15179.50
	Mand	132	134.22	17716.50
	Total	256		
Produktionen og/eller bortskaffelsen af vindmøller skader miljøet.	Kvinde	124	133.45	16548.00
	Mand	132	123.85	16348.00
	Total	256		
Compensation for wind turbines is not an advantage for me	Kvinde	125	134.17	16771.50
	Mand	132	124.10	16381.50
	Total	257		
Vindenergiselskaber overser lokalsamfund og deres meninger	Kvinde	125	132.11	16514.00
	Mand	132	126.05	16639.00
	Total	257		
Vindmøller har en negativ effekt på landbrugsdyr	Kvinde	125	121.64	15205.50
	Mand	132	135.97	17947.50
	Total	257		

Test Statistics[a]

	Vindmøller forstyrrer udsigten til naturen	Vindmøller forstyrrer biodiversiteten	Vindmøller forsåger støjforurening	Vindmøller forsåger lysforurening	Vindmøller har en negativ effekt på menneskers helbred og velbefindende.	Vindmøller har en negativ effekt på mit hus/ejendoms værdi	Produktionen og/eller bortskaffelsen af vindmøller skader miljøet.	Compensation for wind turbines is not an advantage for me	Vindenergiselskaber overser lokalsamfund og deres meninger	Vindmøller har en negativ effekt på landbrugsdyr
Mann-Whitney U	7212.500	7576.000	7425.000	7942.500	7961.500	7429.500	7570.000	7603.500	7861.000	7330.500
Wilcoxon W	13428.500	14957.000	15051.000	16588.500	15587.500	15179.500	16348.000	16381.500	16639.000	15205.500
Z	-.110	-.727	-1.207	-.086	-.277	-1.313	-1.064	-1.129	-.669	-1.599
Asymp. Sig. (2-tailed)	.912	.467	.227	.932	.782	.189	.287	.259	.504	.110

a. Grouping Variable: whats your gender

Grouping Variable: Age

NPAR TESTS
/M-W= WN_views WN_biodiversity WN_noisepollution WN_lighpollution WN_health WN_propertyvalue

WN_production WN_compensation WN_corporations WN_cattle BY age(1 6)
/MISSING ANALYSIS.

Ranks

	whats your age group	N	Mean Rank	Sum of Ranks
Vindmøller forstyrrer udsigten til naturen	<26	20	36.28	725.50
	65<	49	34.48	1689.50
	Total	69		
Vindmøller forstyrrer biodiversiteten	<26	29	44.03	1277.00
	65<	49	36.82	1804.00
	Total	78		
Vindmøller forsåger støjforurening	<26	30	39.13	1174.00
	65<	49	40.53	1986.00
	Total	79		
Vindmøller forsåger lysforurening	<26	29	41.43	1201.50
	65<	48	37.53	1801.50
	Total	77		
Vindmøller har en negativ effekt på menneskers helbred og velbefindende.	<26	30	44.50	1335.00
	65<	49	37.24	1825.00
	Total	79		
Vindmøller har en negativ effekt på mit hus/ejendoms værdi	<26	30	39.02	1170.50
	65<	49	40.60	1989.50
	Total	79		
Produktionen og/eller bortskaffelsen af vindmøller skader miljøet.	<26	30	44.15	1324.50
	65<	49	37.46	1835.50
	Total	79		
Compensation for wind turbines is not an advantage for me	<26	31	40.34	1250.50
	65<	49	40.60	1989.50
	Total	80		
Vindenergiselskaber overser lokalsamfund og deres meninger	<26	31	41.11	1274.50
	65<	49	40.11	1965.50
	Total	80		
Vindmøller har en negativ effekt på landbrugsdyr	<26	31	41.47	1285.50
	65<	49	39.89	1954.50
	Total	80		

Test Statistics[a]

	Vindmøller forstyrrer udsigten til naturen	Vindmøller forstyrrer biodiversiteten	Vindmøller forsåger støjforurening	Vindmøller forsåger lysforurening	Vindmøller har en negativ effekt på menneskers helbred og velbefindende.	Vindmøller har en negativ effekt på mit hus/ejendoms værdi	Produktionen og/eller bortskaffelsen af vindmøller skader miljøet.	Compensation for wind turbines is not an advantage for me	Vindenergiselskaber overser lokalsamfund og deres meninger	Vindmøller har en negativ effekt på landbrugsdyr
Mann-Whitney U	464.500	579.000	709.000	625.500	600.000	705.500	610.500	754.500	740.500	729.500
Wilcoxon W	1689.500	1804.000	1174.000	1801.500	1825.000	1170.500	1835.500	1250.500	1965.500	1954.500
Z	-.351	-1.393	-.269	-.759	-1.400	-.307	-1.292	-.052	-.193	-.305
Asymp. Sig. (2-tailed)	.725	.164	.788	.448	.161	.759	.196	.959	.847	.760

a. Grouping Variable: whats your age group

Grouping Variable: For/Against Wind Turbines

```
NPAR TESTS
  /M-W= WN_views WN_biodiversity WN_noisepollution WN_lighpollution WN_health
WN_propertyvalue
        WN_production WN_compensation WN_corporations WN_cattle BY dummy_for_against(1
2)
  /MISSING ANALYSIS.
```

Ranks

	dummy_for_against	N	Mean Rank	Sum of Ranks
Vindmøller forstyrrer udsigten til naturen	for	152	143.01	21737.00
	against	73	50.52	3688.00
	Total	225		
Vindmøller forstyrrer biodiversiteten	for	157	145.85	22899.00
	against	74	52.66	3897.00
	Total	231		
Vindmøller forsåger støjforurening	for	157	145.53	22848.00
	against	74	53.35	3948.00
	Total	231		
Vindmøller forsåger lysforurening	for	156	144.54	22547.50
	against	74	54.29	4017.50
	Total	230		
Vindmøller har en negativ effekt på menneskers helbred og velbefindende.	for	156	147.84	23062.50
	against	74	47.33	3502.50
	Total	230		
Vindmøller har en negativ effekt på mit hus/ejendoms værdi	for	157	142.62	22392.00
	against	74	59.51	4404.00
	Total	231		
Produktionen og/eller bortskaffelsen af vindmøller skader miljøet.	for	157	142.54	22379.50
	against	74	59.68	4416.50
	Total	231		
Compensation for wind turbines is not an advantage for me	for	157	129.32	20303.50
	against	74	87.74	6492.50
	Total	231		
Vindenergiselskaber overser lokalsamfund og deres meninger	for	157	145.03	22769.00
	against	74	54.42	4027.00
	Total	231		
Vindmøller har en negativ effekt på landbrugsdyr	for	157	146.60	23016.50
	against	74	51.07	3779.50
	Total	231		

Test Statistics[a]

	Vindmøller forstyrrer udsigten til naturen	Vindmøller forstyrrer biodiversiteten	Vindmøller forsåger støjforurening	Vindmøller forsåger lysforurening	Vindmøller har en negativ effekt på menneskers helbred og velbefindende.	Vindmøller har en negativ effekt på mit hus/ejendoms værdi	Produktionen og/eller bortskaffelsen af vindmøller skader miljøet.	Compensation for wind turbines is not an advantage for me	Vindenergiselskaber overser lokalsamfund og deres meninger	Vindmøller har en negativ effekt på landbrugsdyr
Mann-Whitney U	987.000	1122.000	1173.000	1242.500	727.500	1629.000	1641.500	3717.500	1252.000	1004.500
Wilcoxon W	3688.000	3897.000	3948.000	4017.500	3502.500	4404.000	4416.500	6492.500	4027.000	3779.500
Z	-10.308	-10.230	-10.049	-9.968	-11.204	-9.115	-9.022	-4.596	-9.845	-10.537
Asymp. Sig. (2-tailed)	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001

a. Grouping Variable: dummy_for_against

Figure 5. The percentages of pro and anti- respondents answering the question "Have you participated in any of the activities below related to wind projects?"

Har du deltaget i aktiviteter i forbindelse med vindmølleprojekter? - Ja, jeg har deltaget i lokale forsamlinger/møder/arrangementer.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	166	60.4	64.6	64.6
	Yes	91	33.1	35.4	100.0
	Total	257	93.5	100.0	
Missing	System	18	6.5		
Total		275	100.0		

Har du deltaget i aktiviteter i forbindelse med vindmølleprojekter? - Ja, jeg har været en del af demonstrationer

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	215	78.2	81.4	81.4
	Yes	49	17.8	18.6	100.0
	Total	264	96.0	100.0	
Missing	System	11	4.0		
Total		275	100.0		

Har du deltaget i aktiviteter i forbindelse med vindmølleprojekter? - Jeg har deltaget i andre intitiativer relateret til vindmølle projekter (venligst uddyb)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	247	89.8	92.9	92.9
	Yes	19	6.9	7.1	100.0
	Total	266	96.7	100.0	
Missing	System	9	3.3		
Total		275	100.0		

Har du deltaget i aktiviteter i forbindelse med vindmølleprojekter? - Ja, jeg har skrevet under på underskriftsindsamlinger om vindmølleprojekter

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	206	74.9	78.0	78.0
	Yes	58	21.1	22.0	100.0
	Total	264	96.0	100.0	
Missing	System	11	4.0		
Total		275	100.0		

Har du deltaget i aktiviteter i forbindelse med vindmølleprojekter? - Ja, jeg har skrevet eller været medafsender på læserbrev(e)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	222	80.7	83.5	83.5
	Yes	44	16.0	16.5	100.0
	Total	266	96.7	100.0	
Missing	System	9	3.3		
Total		275	100.0		

Har du deltaget i aktiviteter i forbindelse med vindmølleprojekter? - Ja, jeg har investeret økonmisk/købt andel i et vindmølleprojekt

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	246	89.5	92.1	92.1
	Yes	21	7.6	7.9	100.0
	Total	267	97.1	100.0	
Missing	System	8	2.9		
Total		275	100.0		

Figure 7. The percentages of respondents answering the question "Wind turbines have a negative effect on human health and wellbeing" divided by whether they support or reject wind turbines in Tønder.

```
FREQUENCIES VARIABLES=WN_health
  /STATISTICS=RANGE MINIMUM MAXIMUM MEDIAN MEAN MODE
  /ORDER=ANALYSIS.
```

Statistics

Vindmøller har en negativ effe

N	Valid	256
	Missing	19
Mean		3.30
Median		3.00
Mode		5
Range		8
Minimum		1
Maximum		9

Vindmøller har en negativ effekt på menneskers helbred og velbefindende.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Meget enig	60	21.8	23.4	23.4
	Til dels enig	27	9.8	10.5	34.0
	Hverken enig eller uenig	47	17.1	18.4	52.3
	Til dels uenig	24	8.7	9.4	61.7
	Meget uenig	97	35.3	37.9	99.6
	9	1	.4	.4	100.0
	Total	256	93.1	100.0	
Missing	System	19	6.9		
Total		275	100.0		

Figure 8. Results of the question 'Compensation for wind turbines is not an advantage to me' divided in all respondents and respondents within the postal code of Sæd. Note here that the postal code of Sæd also covers Tønder.

```
FREQUENCIES VARIABLES=WN_compensation
  /STATISTICS=RANGE MINIMUM MAXIMUM MEDIAN MEAN MODE
  /ORDER=ANALYSIS.
```

Statistics

Compensation for wind turbine

N	Valid	258
	Missing	17
Mean		2.73
Median		3.00
Mode		2
Range		4
Minimum		1
Maximum		5

Compensation for wind turbines is not an advantage for me

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Meget enig	33	12.0	12.8	12.8
	Til dels enig	91	33.1	35.3	48.1
	Hverken enig eller uenig	78	28.4	30.2	78.3
	Til dels uenig	24	8.7	9.3	87.6
	Meget uenig	32	11.6	12.4	100.0
	Total	258	93.8	100.0	
Missing	System	17	6.2		
Total		275	100.0		

Kompensation for vindmøller er ikke en fordel for mig

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Meget enig	15	19.2	19.7	19.7
	Til dels enig	22	28.2	28.9	48.7
	Hverken enig eller uenig	29	37.2	38.2	86.8
	Til dels uenig	7	9.0	9.2	96.1
	Meget uenig	3	3.8	3.9	100.0
	Total	76	97.4	100.0	
Missing	System	2	2.6		
Total		78	100.0		

Table 3. Ownership of wind shares among respondents from Vindmølle Landsbyen and Skærbæk vs. Sæd and Tønder.

Frequencies for all respondents

Statistics

Har du deltaget i aktiviteter i f

N	Valid	268
	Missing	8
Mode		0
Range		1
Minimum		0
Maximum		1

Har du deltaget i aktiviteter i forbindelse med vindmølleprojekter? - Ja, jeg har investeret økonmisk/købt andel i et vindmølleprojekt

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	246	89.1	91.8	91.8
	Yes	22	8.0	8.2	100.0
	Total	268	97.1	100.0	
Missing	System	8	2.9		
Total		276	100.0		

Frequencies for postal code = 6780. Vindmølle Landsbyen and Skæbæk

Statistics

Har du deltaget i aktiviteter i f

N	Valid	64
	Missing	3
Mode		0
Range		1
Minimum		0
Maximum		1

Har du deltaget i aktiviteter i forbindelse med vindmølleprojekter? - Ja, jeg har investeret økonmisk/købt andel i et vindmølleprojekt

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	58	86.6	90.6	90.6
	Yes	6	9.0	9.4	100.0
	Total	64	95.5	100.0	
Missing	System	3	4.5		
Total		67	100.0		

Frequencies for postal code = 6270. Sæd and Tønder

Statistics

Har du deltaget i aktiviteter i f

N	Valid	78
	Missing	0
Mode		0
Range		1
Minimum		0
Maximum		1

Har du deltaget i aktiviteter i forbindelse med vindmølleprojekter? – Ja, jeg har investeret økonmisk/købt andel i et vindmølleprojekt

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	74	94.9	94.9	94.9
	Yes	4	5.1	5.1	100.0
	Total	78	100.0	100.0	

Figure 9. The percentages of respondents answering the question 'What is your position on the establishment of wind turbines in the municipality of Tønder?'. Comparison between all respondents vs Sæd (and Tønder)

Frequencies for postal code = 6270. Sæd and Tønder

Statistics

Hvad er din holdning til etable

N	Valid	75
	Missing	3
Mean		1.95
Median		1.00
Mode		1
Range		4
Minimum		1
Maximum		5

Hvad er din holdning til etablering af vindmøller i Tønder kommune?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Jeg støtter det	40	51.3	53.3	53.3
	Jeg støtter til dels	17	21.8	22.7	76.0
	Jeg hverken støtter eller modsøtter mig	8	10.3	10.7	86.7
	Jeg støtter det ikke til dels	2	2.6	2.7	89.3
	Jeg støtter det ikke	8	10.3	10.7	100.0
	Total	75	96.2	100.0	
Missing	System	3	3.8		
Total		78	100.0		

Frequencies for all respondents - see Appendix V, figure 4.

Appendix VIII - Map

Styrelsen for Dataforsyning og effektivisering "Current Wind Parks Map". Source: https://dataforsyningen.dk/data/3814