

## Assignment\_WT-Noise SentimentAnalysis

<b>Client</b>	Niels Adema
<b>Related project</b>	PhD project Noise annoyance
<b>Start date</b>	September 2024
<b>Suitable for training course(s)</b>	(International) Communicatie, CMD, E4S.
<b>Learning Community</b>	ENTRANCE

### Assignment description

#### Introduction

Wind turbine noise has been found to increase annoyance and cases have been reported of sleep disturbance. Noise annoyance frequently tops the list of annoyances and is very often a key issue during the process from planning to operation. Even though wind turbines are almost completely silent from 400m distance onwards, complaints about noise are always present and can form a barrier for new projects. This may be due to ‘special audible characteristics’ in wind turbine noise people experience. However, it is not known exactly which part of the sound people find most annoying and how and when the sound is perceived. Second, this may be due to the fact that using current noise standards focusing on dB(A) levels at dwellings means transforming a social problem into a technical measurement issue. Furthermore, annoyance is something personal, some people have it, while others at the same circumstance do not experience any annoyance. Finally, wind park owners have to deal with disinformation on social media and news articles on wind turbine noise harboring mixed sentiments amongst inhabitants.

### Assignment

A recent study tracked the experience and perception of inhabitant near 4 large onshore wind parks in the Netherlands before, during, and after the realization of these parks [1]. Wind turbine sound was found to be an important part of resistance of wind parks. The researchers used questionnaires for people living near these parks. A potential is then however lost to acquire data from people who post their experiences with wind turbine sound online and how people are informed through news articles and social media. For our study we aim to answer the following question:

Can we characterize the general public view of Dutch people on wind energy projects? How does this change over time and how does it change with location? What can project developers and owners learn from social and news media in their technical approach to combat wind turbine

noise and for their communication strategy to increase public acceptance of wind turbine projects.

### Methodology

- Assess News/Social media posts to discover how people perceive wind turbines in general using Lexicon based methods for sentiment analysis [2]. A tool to be used for this analysis is Meltwater. These methods have been used before in research on general opinion from large twitter/news databases. For example for tracking the sentiment of COVID-19 vaccines over multiple months[3]. Or assessing Alaskans' perceptions and opinions about energy consumption and renewable energy using tweets from the Alaska region (geotagged) for a few years [4].
- Analyze use of words related to perception of wind turbine sound. Think of terms as "swishing", "humming", "whistling", "thumping" (for the Dutch case we will of course translate these word into Dutch descriptions). Few studies are present in which such descriptions are asked for wind turbine noise but it is common in other studies to analyze/show relations between phrasing and how often words are used in articles/tweets [4].
- Even though noise is a large issue, literature suggest annoyance may be an effect of overall dissatisfaction with the planning process, no financial compensation, limited input in the design of the park, and bad handling of complaints [1]. How often do these issues pop-up in online posts and in news articles and what do people say about this. Categorization of themes (topic modeling) has been done before in research and can show how related above mentioned topics are relevant for wind turbine annoyance/acceptance [5].
- Differentiate above mentioned research topics for different wind parks in the Netherlands. How can we use geotagged posts and find people based on postal code or another similar method? This is of high interest as some wind parks are dealing with significant resistance (Wind park N33) and others which are owned 100% by local energy initiatives and farmers (Wind park Zeewolde) do not have significant resistance. Important lessons can be learned from both sides in the participation process and how much noise is an issue in both farms.
- Are specific events mentioned when inhabitants experience excessive annoyance such as shut-down or start-up, what about time of annoyance (night/evening, morning, daytime), do people mention if they are inside/outside, is there mentioning of activities (for example sitting in garden, having a barbeque etc.)

- Provide an overview of parameters of social media posts: what time of day do people post about annoyance, which area do the posts come from, demographic of people tweeting.

With this research the professorship wind energy and the professorship sustainable communication hopes to form a clearer view of the general opinion of wind turbine noise. And furthermore, a good dataset and analysis on the perception of wind turbine noise. This study will be of high importance to not only determine the technical mitigation strategies needed to limit noise annoyance in future and current projects but also strengthen the strategies for wind park owners in engaging with the local inhabitants and battle misinformation.

## References

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## General information

<b>Final Product</b>	Research report
<b>Location</b>	ENTRANCE / EAE
<b>Parties involved</b>	Professorship Windenergy and the Professorship Communication, Behaviour & The Sustainable Society
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