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# Discussion

This section aims to discuss the tendencies identified within results from a survey on social acceptance concerning the use of wind energy. They are analyzed with reference to specialized literature. Prior to this study, no research on the topic compares the current social acceptance status with the results of a similar survey in the same area conducted 10 years earlier. The outcome of our research shows that in the rural areas of Brandenburg, community members' attitudes towards the use of wind energy are in equilibrium with those who are against and who are in favor. Furthermore, attitudes have become slightly more positive when compared to the 2005 research results. On the contrary, it was also noted that people are more disturbed by wind turbines in 2016 as compared to 2005 and have a more negative perception of wind energy in their neighborhood.

## **Silent winners - acceptance is higher than ten years ago.**

The increase of social acceptance after 10 years of wind energy development is quite an unexpected outcome considering that numerous literature has argued that negative experiences over time, such as landscape degradation or physical disturbance, have worsened social acceptance (Huesca et al. 2016).

Increased awareness of the necessity and importance of wind energy can be one explanation, and according both to our survey and relevant literature, this seems to result in strong public support (Petrova, 2016). Same results can be found from several other positive changes in the answers of respondents over time, not only from the social acceptance indicators. As a first glance, participants' expectations regarding the proportion of renewable energy within the energy mix have increased; this is also true for wind energy specifically. Environmental awareness related to climate change, as well as opposition against nuclear energy, has also increased. Several environmental disasters in recent years, such as the Fukushima Daiichi nuclear disaster, or events such as extreme climate change in equator region, have awaked the people's environmental concern (Goebel et al. 2015). Environmental awareness leads people to oppose the use of fossil fuel energy in order to mitigate the effects of climate change. Opposition to nuclear energy encourages the use of non-nuclear energy, which are principally fossil fuel energy or renewable energy. When they are combined, the necessity and importance of using renewable energy naturally increase more than any other type of energy source. In addition, the respondents' demonstrated a willingness to learn more about renewable energy and there was a notable increase in the number of people who stated that they agree that wind should be kept as the prioritized source for future energy production are in accordance with the "Energiewende" (EEG 2014).

Furthermore, people are comparably more willing to accept a higher amount of wind turbines in a closer distance than 10 years ago. Lastly, people are comparably more willing to pay higher prices for clean energy. That is, the more recent group of participants are more ready to accept economic or physical disadvantages to shift to cleaner energy source compared to the past. This corresponds with the result showing an increase of social acceptance even though disturbance has been worsened. There is another curiosity: why has the mood been so negatively evaluated? It can be interpreted in terms of an economic view, particularly by the logic of collective action (Olson, 1965). According to the logic of collective action, the economic agenda - the mood of the community in our case - can be achieved by the group with stronger incentives, even if the group is a minority since the majority does

not have incentives to change the agenda. When people consider themselves as being negatively impacted by an event, they have incentives to change and improve the situation. Similarly, people who consider themselves as being positively influenced also have incentives to maintain the situation. However, as mentioned above, people who are accepting of wind energy rarely define themselves as beneficiaries but would rather overcome associated disadvantages. As a result, the group has less of an incentive to lead the charge and it is easier for the other group, who think they have been sacrificed and negatively impacted, to dominate the agenda in a negative way. This results in a more negative evaluation of the attitude toward wind energy than is realistic. In many cases, these groups strengthen their slogans in a various way including media and local activities. However, it is to be noted that socially positive attitudes towards wind energy have been threatened by many other factors. First: the influence of landscape destruction will be discussed, second will be the procedural aspects of the wind farms' planning, third, the direct benefits originated by wind energy production, and last but not least the relationship between the distance and density of wind farms.

### **In comparison, people who have higher acceptance believed landscape destruction due to wind turbines is less harmful.**

A landscape where wind turbines were seen as “beautiful symbols of modern dynamism of ugly monsters spoiling beautiful nature” (Jolivet et al. 2010: 6750) or “monstrous eyesores” (Groth et al. 2014: 257) can be perceived by the communities as a subjective loss of value. The scenery in rural areas in Brandenburg is characterized by a flat topography, with a view of vastness and the presence of elements such as villages, fields, lakes, roads, barns but also plenty of wind turbines. Most of all in the surroundings of the villages, the contrast is remarkable between agricultural and energy production elements. The presence of wind turbines is part of the daily life of the Brandenburg rural areas dwellers: indeed the frequency analysis found that 70% of respondents believe in the statement “wind turbines destroy the landscape”. Through a chi-square test was found that those who corroborated this statement are likely to oppose the use of wind energy. It can be compared with the case study from Jones which found similar tendencies: the respondents concerned about landscape had a lower acceptance of wind energy; although in this case the analysis showed an even stronger relationship between the two answers (Jones et al. 2010). Therefore, the perception of landscape destruction is associated with both psychological and physical factors. The presence of wind turbines affected the majority of respondents negatively, and in comparison with the 2005 results, the quantity has even increased. The results of the qualitative analysis showed that most comments to open questions regarded the perceived physical impacts. It can be assumed that the respondents do not view the wind turbines as belonging to the landscape. Different concerns result in the local resistance towards wind energy but, as there is “no ‘technical fix’ for the problem of landscape impact” (Bell et al. 2005:470 in Jones et al. 2009:4611), during the planning phase, siting with more consideration of wind turbine visibility is required to achieve higher social acceptance.

### **Correct timing and interactive communication are the nuts and bolts of quality information.**

The influence of procedural factors on the social acceptance of wind energy is highly explored in scientific research. The majority of literature cited the factors related to public participation; among them the accessibility and adequacy of information. The focus here will be kept on information for public participation and on the procedural step of public consultation. Information is a factor that can empower the population and influence future decision-making (Arstein 1969). Since it influences the

perception of procedural fairness, "Proper information and prior consultation is essential for the local communities" (Huesca-Pérez, Sheinbaum-Pardo & Köppel 2016:961). This concept is relevant to the public participation phases in environmental impact assessment because of "where people have been shown to accept negative outcomes if the decision-making process was fair" (Skitka et al. 2003 in Gross 2007:2730). However, Petrova (2016) highlights that participation cannot suffice to be improved as the acceptance is always the result of a complex interplay of several factors. The results of timing and the scale of information were assessed through the frequency analysis. The first analysis found the dissatisfaction of respondents, since the majority perceived that they had access to the information only when everything was already decided or too late. Moreover they have been not at all or insufficiently informed during the planning process. Thus, the possibility that these findings could influence social acceptance was identified and analyzed through the chi square test. Our results show that whilst the people who felt informed too late, or when everything was already decided were more likely to be against the use of wind energy. This is in contrast to the people who felt they were informed early, in which case nobody was against it. Furthermore, we can conclude that the more the respondents feel poorly informed, the more they are against the use of wind energy. The consultation process is felt not to be adequate and it strongly influences the fact that some respondents are not accepting of the use of wind energy. These results can be compared with the case study of Gross where: "those in favor were more likely to see the process as fair and the outcome as legitimate [acceptable], whereas those who were opposed or neutral expressed dissatisfaction with the process and did not regard the outcome as acceptable or legitimate." (Gross 2007: 2733) In the end, improving the quantity and the timing of information would be a fundamental strategy for an administration that intends to increase social acceptance of the use of wind energy: processes that are perceived to be unfair or undemocratic can lead to protests, damaged relationships and divided communities (Groth & Vogt 2014; Gross 2007).

### **Providing direct benefit: food for the crying kids.**

One of the biggest advantages and motivation of developing wind energy is to mitigate climate change. Wind energy development also helps achieving energy security and helps to stop using nuclear power as energy source. Furthermore, these advantages are beneficial to everybody in the country, even everybody in the world actually! This characteristic of wind energy development provides local residents with a victim mentality that they are sacrificed for a greater good, due to the free ride of all other people in the world (Olsen 1965). The benefit of wind energy development goes to everybody even though the land nearby their residence was used. When we think of this in an opposite way, it is obviously a better idea to take a free ride on wind energy development in another place instead of one's own place, so that one can get the shared benefit without paying any cost. That is to say, there is less incentive for local people to invest in wind energy development in their area. The relevance of direct benefits in the rural areas of Brandenburg was assessed through frequency analysis and it was found that the respondents are interested in economic benefits (such as job opportunity, profitability, revenue for municipalities) rather than in environmental benefits. This was also stated in the case study of Coporale and De Lucia (2015), where the respondents would consider "mostly the economic benefits when determining their preference for a wind project on the territory" (Coporale et al. 2015:1384). The findings addressed the opponents' view that the direct benefits are limited for the community and could therefore influence social acceptance. This hypothesis was tested through a chi square analysis and it was found that if the respondents perceive direct benefits from wind energy, they support the use of wind energy more. In case of direct benefit, free riding is impossible since it is directly and quite exclusively for local people, unlike most of other advantages of wind energy. This is a crucial point. It offsets the local residents' victim mentality of being sacrificed and provides fruits of the development, mostly in the form of economic benefit. The case study of

Warren, where the respondents stated that they would be supporters of the use of wind energy if they have access to economic benefits is also aligned to the research results (Warren et al. 2010). Consequently, the promotion of direct benefits could increase the acceptance level. However, the enhancement of the understanding of wind energy development, more than just in economic terms, is required to increase social acceptance level without improving economic compensation. In this case, direct benefits can be extended to broader terms which cover various values such as environmental and social benefit as well as economic benefits.

### **Is distance relevant only as a physical factor or also for distributive justice?**

Much of the opposition to the use of wind energy takes place on the local scale. However, some literature states that distance is an indifferent factor (Hübner 2013; Hübner & Pohl 2015; Groth & Vogt 2014; Petrova 2016). The frequency analysis showed that the majority of respondents estimate they live at most 1.600m of wind turbines and that it would be acceptable to have 1 to 10 wind turbines in the surroundings of their house. These results were considered as possibly influencing the social acceptance. Therefore, the GIS analysis and the chi square test were employed. Superficially, no difference was found in acceptance levels at different distances. Here we used the scale of municipality as well as villages. Nevertheless, there was no significant trend found. On the other hand, respondents have intensively complained about many other technological factors such as visibility, noise and flickering. That is, either the sample of the scale is too close to result in differences and respondents actually believe that distance should be further, or distance is really not a matter if the complained about factors could be improved. While visibility was described in the literature as the main cause for community opposition (Cowell 2010; Groth & Vogt 2014), other authors (Jobert et al. 2007; Firestone et al. 2012) found out that it is not always a significant factor and that people that see the wind turbines daily don't feel more disturbed than those that see them only seldomly (Petrova 2016). Furthermore, in the case of density, there is a significant relationship to social acceptance, when it is estimated at the municipal level. In the scale of the village, it was significant when the data was analyzed together with distance. The results are due to distributive justice as well as physical factors. (For example, the southern part of Germany has much fewer wind turbines than the northern part of Germany). The reason for this is mainly due to the physical conditions of the area such as wind speed, but also the social conditions such as regulation of the minimum distance from a residential area. Rural people believe that these varying conditions facilitate unequal distribution of the wind turbines. In this vein, Groth & Vogt (2016), as indicated in the statement "[i]f we have to hear and see them every day, which I do, it would at least be nice to benefit from them" (Groth & Vogt 2016:257). In addition, Guo et al. (2015) linked social acceptance of wind farms at the province scale to the expected economic benefits, which overcome the environmental impacts on a local scale. As a result, people want balanced development and proper compensation.

### **Conclusion**

Considering the research [limitations](#), some recommendations could be drawn up but no sole solution is reasonable to address the complexity of social acceptance. The [comparison](#) of the findings on Brandenburg rural areas to the research on the Potsdam urban area will further develop the overall discussion.

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