

Wind Energ. Sci. Discuss., author comment AC2
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Reply on RC2

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Author comment on "Public acceptance of wind energy – concepts, empirical drivers and some open questions" by Michael Ruddat, Wind Energ. Sci. Discuss.,
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Thank you too very much for the detailed response. It will also definitely help to improve the quality of the article. Especially because your review takes a different focus on the text than reviewer#1.

There is actually only one representative telephone survey with a sample size of 2006 that asked for the acceptance of solar farms, wind farms and high-tension power lines in 500 m distance to the respondents' home. The acceptance typology of Schweizer-Ries et al. was applied on this data using corresponding items.

I revised the acceptance definition to be more comprehensive: "Acceptance means a positive evaluation of a topic (like wind energy, wind turbines or wind parks) by individuals under certain circumstances (e. g. cultural or institutional context) that can have consequences for individual behaviour. Correspondingly, non-acceptance means a negative evaluation of a topic by individuals under certain circumstances that can have consequences for individual behaviour. If there is no clear positive or negative attitude towards the topic (e.g. ambivalence, non-attitude), we speak of tolerance that can have consequences for individual behaviour (but perhaps not so much as the endpoints of the continuum)." I hope this is better now.

Of course, it must be "decades" and not "centuries". That was a translation error. Thank you for the hint.

The reasons for the different positive or negative perceptions of the visual effects of wind turbines (line 112) are not very much detailed in the literature as far as I know it. Here are some examples:

"Whether wind turbines spoil or enrich the scenery, is a matter of taste" (Krohn and Dambourg 1999: 956).

"Existing empirical studies have indicated public support for turbines that are painted neutral colours and merge with the landscape. [...] In an extensive study of seven UK wind farm locations with 1286 respondents, they noted that 62% of respondents agreed that wind turbines symbolized 'a sign of progress', whereas 15% agreed that they symbolized a 'harking back to the past' and 16% agreed that turbines represented a combination of bot" (Devine-Wright 2005: 128f).

"Perhaps the issue revolves not around seeing a turbine per se, but rather around more aesthetic and socially constructed phenomena that account for how individuals evaluate a turbine's appearance and fit within the landscape. Based on our regression analysis, attitudes move from negative to positive as respondent attitudes move from not liking the look of the turbines and thinking they fit badly within the landscape to liking the look and believing they fit well" (Hoen et al. 2019: 9)

"The visual impact of a wind energy landscape is indeed important, but this impact will fluctuate greatly across unique locations and societies. Levels of environmental concern will surely differ by location and will depend greatly on local context and place attachment" (Swofford and Slattery 2010: 2514).

But I believe that the information about the possibility of negative as well as positive perception of the visual effects is indeed of some value because it highlights the variability of evaluations.

Thank you very much for the hint concerning the Pasqualetti paper. Indeed, it is a more qualitative description of the situation back in 2001 and explicitly marked as an essay. In that sense it may not be directly comparable to the other studies used in the review. But I found it to be very enriching especially because of the detailed descriptions in it (and he gives good reasons for his opinion). In addition, the results do not contradict other research results but complement them. And yes, the paper is not up to date but I think it is useful in a review process to incorporate data from many points in time, especially to see if there is some variation associated with the time dimension. For example, articles from 1999 to 2019 mention the different positive or negative perceptions of the visual effects of wind turbines (see citations above), so the finding can be seen as very robust. But I will make a notice to the subjective dimension of the Pasqualetti paper and see if I find some other, more up to date work concerning the perceptions of wind farms in Europe and the US. I would be thankful for hints with respect to literature from this special field.

I find it difficult to judge about the relative importance about the main factors discussed in my paper. That's why I list them equally in the discussion section. Wolsink makes a clear judgement that may be right (and his work is very prominent and often cited, so the finding may have stood the test of time). Other researchers point to other factors (e.g. benefits or financial participation that fit to the economic dimension you mentioned). Taking into consideration that wind turbines become bigger and move closer to residential areas, the visual impact may become even more important.

Cultural theory is definitely transferable across countries. This is maybe the main purpose of it: Comparing different cultural biases in different countries and the consequences for risk perception. I didn't mean anything else with mentioning it at that point of the article. But if there are clear different biases, the national research results are not transferable or at least not that easy transferable. I hope I could clarify this possible misunderstanding.

Yes, offshore in the sense "somewhere on the ocean" means not to be seen or at least only seen as a very small, non-disturbing part of the horizon. I will add this.

Thank you for the remark about NIMBY. Actually, I was wondering to mention it at all because there has been so much discussion about it and readers could say "Oh my god, not again, please". But I decided to incorporate the main arguments and counter-arguments as short as I could because it is still important. This importance lies in my view especially in the argument of Bell et al. For reasons of brevity, I would prefer to let it stand as it is.

Definitions or concepts of trust within the referenced literature:

„Throughout its development, social trust was based on similarity of cultural values, and this was communicated within cultural groups by narratives constructed by community leaders. Social trust was socially based. [...] Social trust, in our interpretation, can be based on any values-whatever happens to be salient to a person at a certain time, in a given context.“ (Earle and Cvetkovich 1995: 19 / 105).

Butler et al.: No own definition of trust.

„Three types of factors that might affect trust – competence, care and consensual values – are proposed. Alliteration aside, these encompass the factors hypothesized in the literature. The first two are means to the ends (e.g. health and safety) that principals (e.g., citizens) presumably want agents (e.g. corporate or government officials) to achieve on their behalf, and for which trust in the agent might be warranted or needed. Consensual values can be either means or ends: means to the extent that (for example) someone with egalitarian values believes that egalitarian groups are most able to achieve health and safety; ends to the extent that equality is desirable regardless of health and safety trends.“ (Johnson 1999: 326)

„Trust in communication refers to the generalized expectancy that a message received is true and reliable and that the communicator demonstrates competence and honesty by conveying accurate, objective, and complete information.“ (Renn and Levine 1991: 179, accentuation in original)

Slovic 1993: No own definition of trust.

Wüstenhagen et al. 2007: No own definition of trust.

„Soziales Vertrauen wird dabei als Bereitschaft verstanden, sich auf andere zu verlassen und dabei das Risiko einer Enttäuschung in Kauf zu nehmen. In diesem Sinne ist Vertrauen immer "grundlos. [...] Vertrauen kann als Persönlichkeitsmerkmal betrachtet werden [...] Gewisse Personen zeigen eine stärkere Neigung, Vertrauen zu schenken als andere Personen. [...] Interpersonelles Vertrauen basiert auf direkten Interaktionen. Der Interaktionspartner kann beobachtet werden; Feedback ist also möglich. Dieses Merkmal fehlt beim sozialen Vertrauen.“ (Siegrist 2001: 22 / 28 / 30, please let me know if there is a transition necessary)

„These results are not contrary to our perspective that trust should be viewed as a unidimensional construct ranging from trust to distrust.“ (Siegrist 2000: 196)

„Social trust is acquired actively in a repeating mutual process. In contrast to confidence, it is based on continued experience distinguished by certain qualities, e.g. credibility, honesty, reliability, a feeling of responsibility etc. [...] institutional trust is based on the perception and evaluation of specific performance: social institutions - industry, politics and authorities, the media, science and experts, but also environmental and consumer agencies - fulfill specific functions respectively, where the origin, research and communication, regulation and control of risks is concerned. According to his opinion, trust is not based on >vague< faith, but, more robustly, on experienced performance, based upon which trust is granted or withdrawn.“ (Zwick and Renn 2002: 45 / 46)

I hope this helps for a better understanding. For reasons of brevity I couldn't incorporate them into the chapter. Because of that, the short definition of Bellaby was used. Of course, a detailed discussion of trust would be worthwhile, but there is simply not enough room here.

One possible explanation for the contradicting results with respect to the big energy companies (in fact the big four in Germany, E.ON, RWE, EnBW and Vattenfall) could be

the perception that these companies don't really support the energy transition. Actually, we had this result in focus groups (see Ruddat, M. / Sonnberger, M. (2015): *Wie die Bürgerinnen und Bürger ihre Rolle bei der Energiewende sehen*. In: *et - Energiewirtschaftliche Tagesfragen*, 1/2 / 2015, S. 121-125). I will add this in a footnote.

As far as I know there are no differences between the creation or function of trust in the domain of wind energy compared to other technologies simply because trust is a general concept. The factors influencing the building of trust (for example showing or proving competence, objectivity in communication, see Renn and Levine 1991) can be used in any domain. But there are certain components in the chapter about fairness and participation that can have special impacts on trust. I will try to make these connections a little bit more clearer.

Concerning a risk-based approach again I find it difficult to judge about the relative importance about the main factors discussed in my paper. I see them all in all as being equally important. And yes, of course, there are qualitative risk characteristics that are important for the perception and evaluation of risks (see the work in the tradition of the psychometric paradigm). But these incorporate personal and societal risks and benefits, respectively, as well. The question is how big have the benefits to be to outweigh the risks? And does benefit always mean monetary benefit or something else? There are some connections to the point in the discussion when it comes to distributional fairness (line 374ff.). So, I have that in mind.

The studies cited in the paragraph about participation are mainly with respect to wind energy (from line 313 up to line 329 at least). The results reported here are the things they have to add to the participation point. Of course, it is a rather rough overview, but for reasons of brevity I had to make a selection. Or did you mean something else with your question?

Schweizer-Ries and colleagues report results of three focus groups conducted with citizens, planners investors as well as administrators and politicians in Germany in 2009. The question was how citizens could best participate financially in local as well as regional renewable energy projects (wind, solar, biomass and water) and what effects this participation has for acceptance. Results showed that trust in the developer, the approval of the project by the administration before advertising the possibility of financial contribution, a robust calculation of the project, regularly information about the returns and the setting of a minimum and a maximum value, respectively, for the individual contribution are some of the success factors. Although lower minimum values can lead to a broader participation, this may be a problem for the robust calculation of the project. Special projects for small and big investors, respectively, seem to be advisable. One example for financial participation formats are regional customer funds initiated by the regional energy supplier. These funds are exclusively for customers and guarantee a return without a risk for the customers. The saving deposit normally lies between 500 Euro and 10.000 Euro for five years enabling nearly everyone to participate in the project (Schweizer-Ries et al. 2010: 97ff.).

Krohn and Dambourg write with respect to financial participation: "In Denmark there is a tradition for wind co-operatives, where a group of people share a wind power plant. In that respect Sydthy municipality is quite unique with 58 per cent of the households having one or more shares in a cooperatively owned wind turbine. Regarding the general attitude towards wind turbines, the picture is clear. People who own shares in a turbine are significantly more positive about wind power than people having no economic interest in the subject. Members of wind co-operatives are more willing to accept that their neighbour erect a turbine" (Krohn and Dambourg 1999: 956).

Hübner et al. refer to the possibility of citizens to buy shares on local energy projects (e.g.

wind parks). This possibility should be communicated early and transparently. Like Schweizer-Ries and colleagues they argue that lower minimum values for the individual contribution are better for a broader participation. Collectives allow for equal participation of every member irrespective of the individual contribution. This is a gain in fairness and can have positive effects on acceptance of local energy projects (Hübner et al. 2020: 27f).

ELM and SARF are simply two examples for models or frameworks that try to incorporate different research findings (ELM) or approaches (SARF). The question is if it is possible to develop a corresponding model for the acceptance of wind energy.

I totally agree with you stating a need for more social science research in the field of acceptance of wind energy since the solutions for a lot of research problems have not yet been found. But I am not sure if a review article is the right place for such a normative statement. Additionally, I myself am a social scientist and would perhaps profit from such funding, so I am of course biased. But maybe the editors could give a short information about whether or not such a statement they see as appropriate.

I think, my view on central open questions is being described in the discussion section already. For example, the development of suitable types of participation concepts for certain siting processes would be a great advancement in my view since it would help to give more structure and reliability in the social aspect of siting processes and probably help in gaining local support. So, this is one example for further research.

You are definitely right with the dominance of onshore wind in the literature. Like my review shows, there is some research done with offshore wind, so some of the results may apply to this, too (e.g. in case of the proximity hypothesis). But, yes, I will point to this discrepancy in the discussion section.