
Knowledge, use and effectiveness of social acceptance measures for wind projects

Dt.: Die Kenntnis, Nutzung und Wirksamkeit von Maßnahmen zur Steigerung der Akzeptanz von Windprojekten

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1	Introduction and conceptual background	4
2	Data and methods	7
3	Results	9
3.1	Social acceptance of wind energy projects in Europe	9
3.1.1	Reactions to wind farms.....	9
3.1.2	Consequences of a lack of social acceptance.....	12
3.2	Social acceptance measures in European wind projects.....	13
3.2.1	Implementation into project design.....	13
3.2.2	Target groups and measures	15
3.3	Effectiveness of the measures on the social acceptance of wind energy projects	17
4	Conclusions and outlook	19

Abstract

Wind energy is one of the key technologies to become independent of fossil fuels. Implementation of wind energy on a local level, however, has sometimes proved to be challenging and dealing with local acceptance of onshore wind turbines has become a challenge for some projects. Communication and public involvement are seen as strategies to prevent or respond to local opposition. This paper analyses the views of a variety of experts in wind energy. It focuses on eliciting their experiences with public participation measures. Furthermore, the perceived effectiveness of the measures for the social acceptance of wind energy projects is analysed. To do so, this paper draws on an expert survey among 207 individuals across Europe linked to wind energy projects. The analysis shows that negative reactions to wind farms are reported more frequently than positive reactions. In nearly 40 % of cases, projects experience negative consequences on project development due to a lack of social acceptance, ranging from delays to changes in project plans and even termination. The vast majority of wind project developers respond to this by carrying out some kind of public participation activity at least sometimes. However, a much lower share does this systematically and the level of activity is low in early project phases. With regard to the relationship between project activities and project success, there is some support for the assumption that early and systematic involvement of the public and stakeholders is likely to reduce negative reactions.

Zusammenfassung

Windenergie stellt eine der zentralen Technologien dar, um unabhängig von fossilen Brennstoffen zu werden. Auf der lokalen Ebene stellt die Umsetzung jedoch teilweise eine Herausforderung dar und die lokale Akzeptanz von Onshore Windkraftanlagen ist zu einem zentralen Thema geworden. Kommunikation und Bürgerbeteiligung werden als Strategien gesehen, um lokaler Opposition vorzubeugen oder dieser zu begegnen. In diesem Beitrag werden die Sichtweise von unterschiedlichen Experten aus dem Bereich Windenergie sowie ihre Erfahrungen mit Maßnahmen der Öffentlichkeitsbeteiligung untersucht. Zudem wird die Wirksamkeit der Maßnahmen in Bezug auf die soziale Akzeptanz von Windenergieprojekten analysiert. Für die Analyse wird auf eine Expertenbefragung von 207 Personen im Zusammenhang mit Windenergieprojekten zurückgegriffen. Die Untersuchung zeigt, dass häufiger negative als positive Reaktionen auf Windfarmen berichtet werden. In fast 40 Prozent der Fälle hat ein Mangel an sozialer Akzeptanz negative Folgen für die Projektentwicklung, welche von zeitlichen Verzögerungen bis zum Stopp des Projekts reichen. Die große Mehrheit der Projektentwickler reagiert darauf, in dem zumindest ab und zu Aktivitäten zur Öffentlichkeitsbeteiligung durchgeführt werden. Ein viel kleinerer Anteil tut dies jedoch systematisch und in frühen Projektphasen ist nur

ein geringes Aktivitätslevel zu verzeichnen. In Bezug auf einen Zusammenhang zwischen den Aktivitäten und dem Erfolg des Projekts geben die Analysen Hinweise darauf, dass frühes und systematisches Beteiligen der Öffentlichkeit und Interessengruppen negative Reaktionen reduzieren kann.

Kurzankündigung für das Inhaltsverzeichnis (ca. 40 Wörter)

Der Beitrag untersucht auf Basis einer europaweiten Expertenbefragung die Nutzung, Wahrnehmung und die Wirkung von Maßnahmen zur Steigerung der sozialen Akzeptanz von Onshore-Windenergie durch den Windenergiesektor.

1 Introduction and conceptual background

Wind energy is one of the key technologies in the endeavour to decarbonize the energy sector (cf. European Commission 2011a). However, this implies that more wind turbines need to be set up and that more sites to place them have to be identified. In broad surveys capturing socio-political acceptance for wind energy, the public usually votes in favour of wind energy (Schuhmann et al. 2012; European Commission 2011b). Implementation on a local level has, however, sometimes proved to be more challenging. The European project WindBarriers pointed out that over 20 % of wind energy projects are delayed and nearly 20 % are seriously threatened due to appeals (Wind Barriers 2010). Thus, dealing with local acceptance of wind turbines is an issue for the wind industry (Horbaty et al 2012).

In the theoretical framework of Wüstenhagen et al. (2007) local or community acceptance refers to the acceptance of renewable energy projects on a local level by nearby inhabitant. Thus, local stakeholder, local authorities or residents are subjects of interest. Community acceptance is one of three elements which form social acceptance. The other two are socio-political acceptance which mirrors the attitude towards an issue on a general level and market acceptance which refers to market diffusion and supply / demand issues. Social acceptance as a part of renewable energy technology implementation is defined as support from variety of actors, i.e. the public, policy makers and regulators, i.e. crucial stakeholders at varying scale-levels for wind energy development (Wüstenhagen et al. 2007) which is at the centre of this study. Studies have repeatedly identified factors that can diminish local acceptance of onshore wind turbines. Research by Petrova (2016), based on an extensive literature review and case studies, clustered them along the categories visual/landscape, environmental, socioeconomic, and procedural aspects (VESPA). In addition to the visual impacts, also complaints about noise and flicker have been noted (e.g. Klæboe & Sundfør 2016) with discussions arising around potential health impacts through infrasound. Environmental aspects refer to the impact on the biosphere (e.g. Haggett 2010), including the natural habitat and wildlife. Socio-economic aspects include effects on tourism, local employment, community welfare as well as house prices but also more subjective factors like feeling at home or being attached to an area (e.g. Devine-Wright & Howes 2010; Haggett 2010). Procedural aspects refer to participation, access to information, and trustworthiness of project developers and decision-makers (Petrova 2016; Ellis & Ferraro 2016).

Public involvement and high quality communication have been repeatedly identified as a strategy for energy and other infrastructure or for sustainability projects to respond to local opposition or to prevent opposition in the first place by enhancing credibility and including local knowledge into project planning (Gauthier et al. 2011; Schweizer & Bovet

2016). Thus, the argument is that public involvement is based on democratic values, it is also supposed to facilitate implementation (MacArthur 2016). Involving the public in the early phases is assumed to be most promising as is using comprehensive approaches (Schweizer & Bovet 2016) as well as appropriately involving diverse stakeholders (Sheate & Partidario 2010).

Public involvement can take numerous forms and is often classified or differentiated along a continuum which varies between no involvement and information as a minimum to full power of decision making as a maximum (MacArthur 2016; see also Arnstein 1969 "ladder of citizen participation"¹). Within this paper we distinguish between three classes of public involvement:

- *Informational measures* refer to activities such as distributing brochures/leaflets or providing possibilities where citizens may ask questions. However, the full decision making power remains with those in charge of the project.
- *Consultation and dialogue with the public* includes giving the public the possibility to give feedback on the project and its specifications and that this feedback is then considered by the project team and / or relevant administration.
- *Co-decision making* means sharing the decision making process, i.e. the public is involved e.g. via a citizen vote.

Numerous publications have collected best practices or provided advice on how to conduct such a process (for an overview see Dütschke & Wesche 2014). However, criticism has been voiced as well as the effectiveness and the outcomes have been questioned (Reed 2008) while relatively little research has tried to evaluate public involvement activities in relation to project success. Success is defined in this case as the actual implementation of a wind project, preferably without a delay.

This paper aims at taking a first step in filling this gap drawing on onshore wind energy as an example: What is the view of decision-makers in charge of the future development of wind energy (such as developers, environmental organizations or administrative bodies) on approaches for public involvement? What is their level of experience? Are there any indications whether these approaches are effective? These questions are at the core of this paper and answers are explored based on an expert survey among 207 individuals across Europe linked to wind energy projects.

¹ She differentiates between different forms of public participation: non-participation (manipulation and therapy), tokenism (informing, consultation and placation) and citizen power (partnership, delegated power and citizen control). Engagement (manipulation, informing or consulting) with the public is at the lowest level and citizen control (delegated power) is on top level (Arnstein 1969).

This research was conducted as part of the WISE Power project, a project funded by the European Union to further develop the social acceptance of wind energy, aiming at significantly improving local engagement and support for wind turbines while enhancing local community participation in the planning and implementation of wind energy projects (<http://wisepower-project.eu/>). The data analysed in this paper was collected in the early phase of this project to find out more about the status quo of public involvement in the wind sector.

To start with, we will first describe the data and methods this paper is based on and then present findings on the status quo of social acceptance of wind energy projects in Europe. Afterwards the responses in how far approaches for public participation are applied will be detailed as well as the integration of these measures into project management. Finally, indications of the effectiveness of public participation measures will be given.

2 Data and methods

The expert survey was conducted in 13 EU countries (Belgium, Croatia, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Poland, Romania, Scotland / UK, Spain). It entailed both closed and open questions and explored the experience and evaluation of activities in the respondents' country and of his/her company or organisation regarding public participation and social acceptance of onshore wind energy. As the questionnaire covered a variety of topics, it was created in a modular way so that it could be individually adapted to the field of expertise of the respective respondents (Annex A.1).

The countries were selected to cover different stages of market development for wind energy (from emerging to developed wind markets). Overall, 466 potential respondents were identified and contacted. The stakeholders were identified with the aim of collecting a comprehensive picture of the issues under study for each country by combining different perspectives on wind energy project development. Thus, not only the initiators of wind energy projects - project developers (industry-driven initiatives) and cooperatives - were addressed but also administrative bodies (authorities concerned with permissions for wind farms), environmental organizations and financial institutions (e.g. bank associations, funding agencies). Wind energy cooperatives are autonomous associations of individuals who pursue the goal of financing or developing wind or more general renewable energy projects through a jointly-owned and usually democratically-controlled organisation. Thus, it is a typical business models of community wind projects (AWEA - American Wind Energy Association 2017). Overall, these different stakeholder groups surveyed can be regarded as decision-makers who are in charge of the future development of wind energy on the local to regional level.

The questionnaire was distributed as a pdf-file to be filled in electronically, however, participants also had the possibility to print it and fill it in by hand. The experts were contacted by local project partners or subcontractors via email or telephone and invited to participate in the survey. The partners were told that at least 15 respondents are to be reached per country - thereof up to 5 project developers, up to 3 authorities concerned with permissions for wind farms, up to 3 co-operatives involved in wind projects, up to 3 actors from the financial sector and up to 3 further relevant actors per country (NGOs, industry experts and local/regional/community stakeholders).

207 (44%) of the contacted stakeholders completed the questionnaire. The completed questionnaires were then directly collected by the Fraunhofer ISI, the German scientific partner in the project, for reasons of confidentiality.

On average, 15 questionnaires per country were obtained. Respondents can be grouped into six stakeholder categories which are displayed in figure 1.

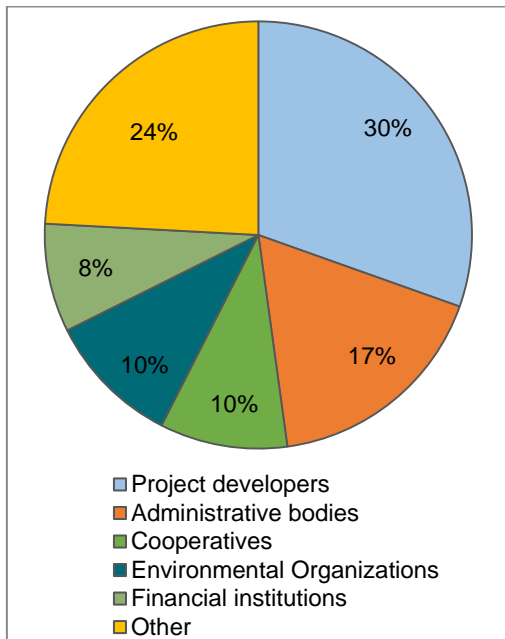


Figure 1 Organisational affiliation of the respondents (n=207)

We are not able to evaluate in how far this sample is representative for stakeholders linked to wind energy projects in Europe as no detailed statistical information is available on the composition of this group. However, the local partners involved in gathering the data and also the advisory board and the project consortium were involved in developing the research design for this survey and approved the decisions take for the sample composition. Nevertheless, the number of people interviewed is most likely too small to cover all kinds of experiences across Europe and – for example – does not allow for cross-country comparisons. However, we think it is reliable enough to explore the issues under study.

3 Results

3.1 Social acceptance of wind energy projects in Europe

3.1.1 Reactions to wind farms

Respondents who claimed to have experience in public participation activities (n=121) were asked how many wind farms resp. projects experienced relevant positive and negative reactions in the past three years (2012-2014). On average, 4.3 projects experienced positive reactions while 5.5 projects were confronted with relevant negative reactions. A t-test reveals no significant difference between the two values.

The share of projects with relevant positive and negative reactions out of all projects the organization has been involved with was calculated. On average 42.5% of all projects experienced relevant positive reactions and 39.4% of the projects experienced negative reactions.

All respondents were asked to indicate which reactions their organizations experienced with regard to wind energy projects in the last three years (2012 - 2014). They were provided with six possible positive and nine possible negative reactions by different actor groups. They could tick several of them. 14 respondents reported no public reaction, one respondent stated "I don't know". The rest, 192 respondents (93%), named at least one reaction (positive or negative).

Regarding the negative public reactions, reactions by local citizens were mentioned most often (79%) (Figure 1). The second most common response was that local opponent groups had been set up, followed by negative reactions from political stakeholders on a local level.

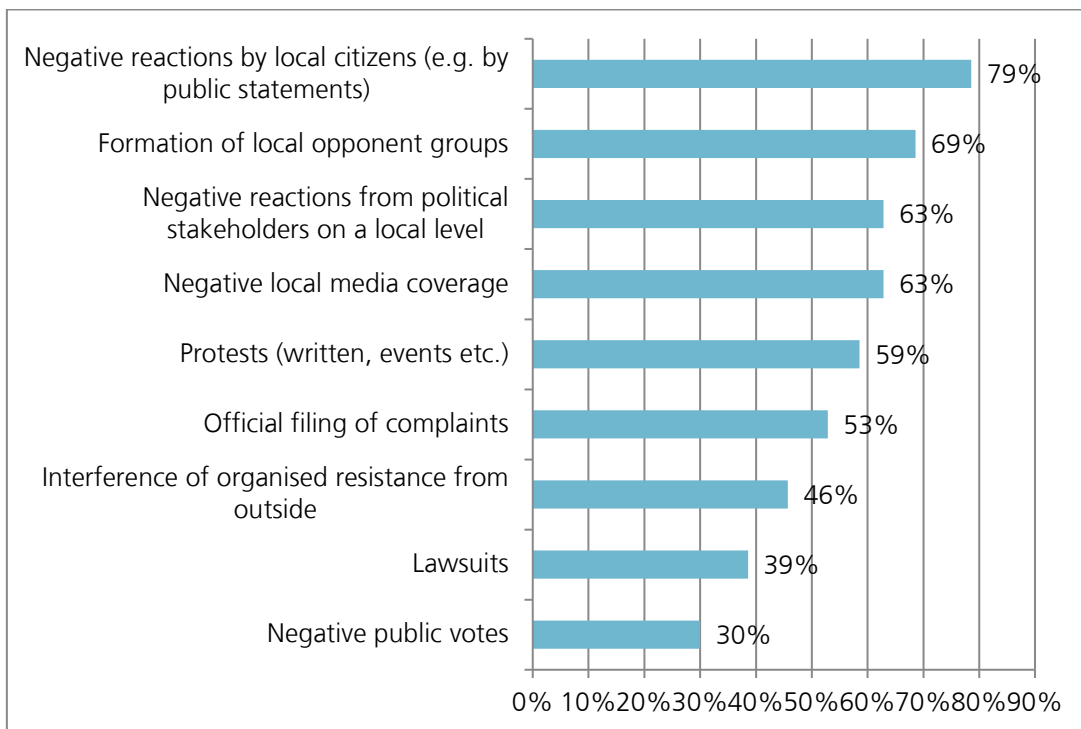


Figure 1: Negative public reactions experienced by the company or organization in the past three years (n=207, multi responses possible)

In order to explore possible interrelations, correlations between the various negative reactions were analysed. All reactions are significantly correlated (Pearson correlation coefficient). The correlation coefficient shows values between .323 and .673. The average correlation coefficient is .460. All correlations are displayed in Annex A.2 (Table 2).

Considering the positive reactions, most of the respondents experienced positive reactions by political or other societal stakeholders on a local level (84%). 55 (79%) stated there were positive reactions by local citizens and 53 (76%) named positive local media coverage.

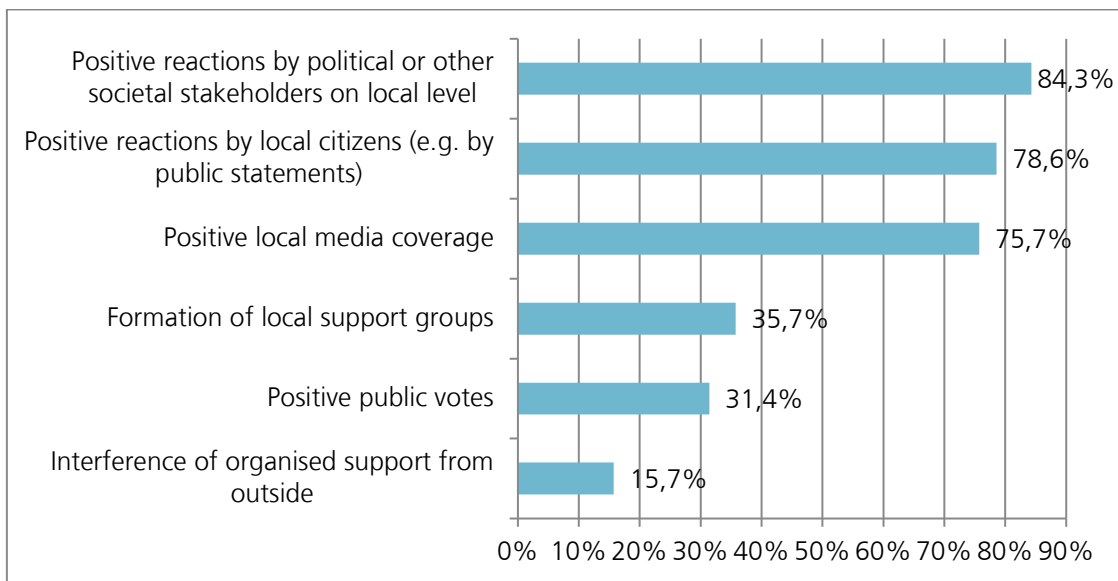


Figure 2: Positive public reactions experienced by the company or organization in the past three years (n=207, multi responses possible)

Regarding the positive reactions there are some significant interrelations as well, but they are not as strong as those between the different negative reactions. The correlation coefficient shows values between .126 and .452 and the average correlation coefficient is .303. The correlations are shown in Table 3 in annex A.2.

In sum, more negative than positive reactions were reported. This is confirmed by an index variable: The index for the negative resp. positive reactions summarises all negative resp. positive reactions which are weighted by the number of answer categories. The index variable can show values between zero and 7.5.

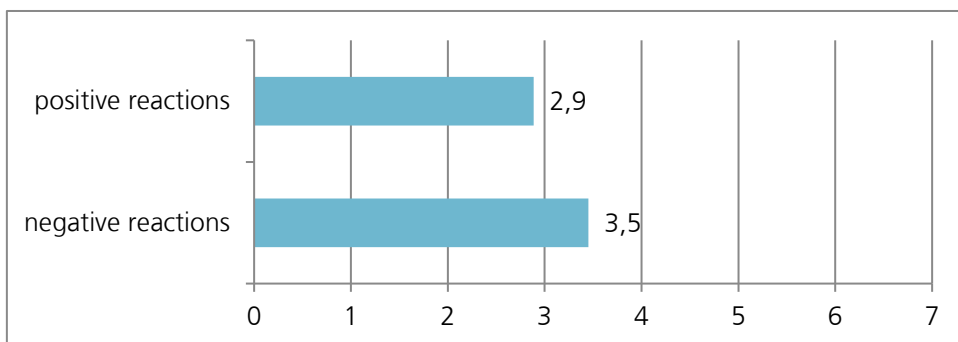


Figure 3: Weighted averages of positive and negative reactions

The index values for the positive and the negative reactions differ significantly ($T=3.143$, $p<.01$).²

² One-sample t-test.

However, there is a significant positive correlation between these index variables (.51). Thus, the more positive reactions are reported the more negative ones are reported and vice versa.

Besides the different reactions to wind farms we also asked for the main positive as well as the main negative issues raised in relation to wind power projects in the past three years the company or organization was involved. The respondents were provided with eight possible positive and twelve possible negative issues and were asked to tick all issues that came up repeatedly³ (Wesche et al. 2015). The negative issue which was raised most often is the visual impact on the landscape; noise and impact on local ecosystems and wildlife are further negative issues which were experienced by the respondents (Wesche et al. 2015). In order to analyse if negative issues are interrelated with the negative reactions displayed in Figure 1, correlations were calculated. There is a significant positive correlation between negative reactions by local citizens and the issues “visual impact on landscape” (.572) and “noise” (.571). Further issues raised are “impact on local ecosystem and wildlife” (.487) and “local economic disadvantages” (.449). Negative reactions from political stakeholders on a local level are often associated with the problem of “local economic disadvantages” (.538) and “impact on local ecosystem and wildlife” (.476). Thus, it is related to certain groups which issues are raised predominantly, i.e. with citizens’ reactions issues on different levels are associated (environment, visual and noise impacts and socioeconomic aspects). Furthermore, there is a relation between negative reactions of stakeholders and economic and environmental aspects, i.e. more “rational” aspects. The respondents also stated what kind of positive issues were raised in relation to wind power. The advantages of wind energy which were named most often are local economic benefits and CO₂-emission reduction (Wesche et al. 2015).

3.1.2 Consequences of a lack of social acceptance

In this section we analyse the effects of a lack of social acceptance on the project development. For this question the answers of project developers and cooperatives who claimed to have experience in public participation activities (n=75) are analysed. 56% have experienced delays and stops of wind farms in the past three years (2012-2014) whereas 29% indicated they did not experience any problems due to a lack of social acceptance (Figure 4).

³ The positive and negative issues were derived from a review of best practices, guidelines and toolkits on social acceptance in the wind energy sector. This review was part of the WISE Power project and its results are described in Deliverable 2.1 (Dütschke & Wesche 2014).

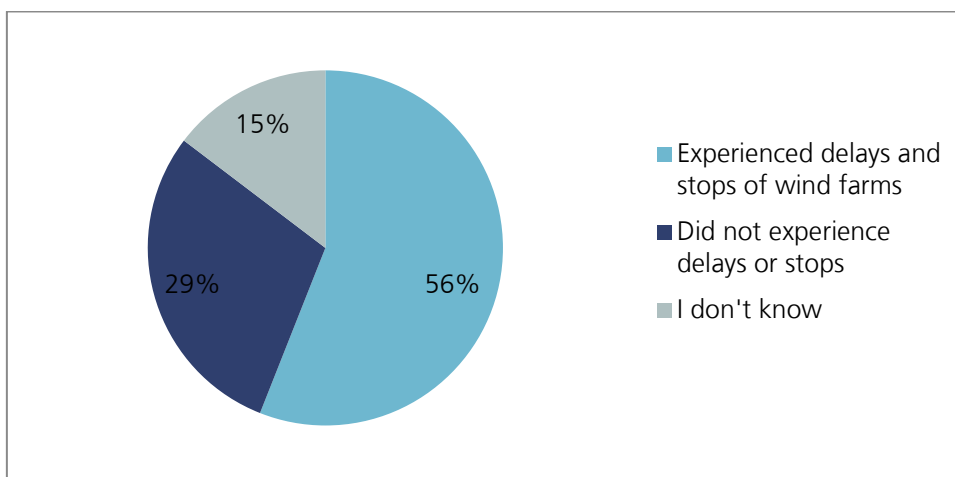


Figure 4: Experience of delays and stops of wind farms due to a lack of social acceptance (project developers and cooperatives with experience with public participation activities (n=75)).

Those who experienced delays and/or stops of wind farms indicated how many projects were influenced by the lack of social acceptance in the past three years. On average respondents reported on 2.4 projects which were delayed without changes and 1.9 projects which were delayed with changes to original plans in the past three years. One project on average was stopped due to the lack of social acceptance.⁴

In a second step the share of delayed or stopped projects out of all projects the organization has been involved with was calculated. On average 16.3% of all projects were delayed without changes, 15.7% of the projects were delayed with changes and another 7.5% of projects were stopped.⁵ This means, that overall nearly 40% of projects encounter consequences with implications for project development, i.e. this is the same rate as identified by the WindBarriers project whose findings were cited in the introduction (WindBarriers 2010).

3.2 Social acceptance measures in European wind projects

3.2.1 Implementation into project design

We analyse different indicators from the survey in order to find out in how far measures for social acceptance are part of standard project management activities. We therefore

⁴ There is quite a high number of missing values in these questions; the remaining sample is 41 - 51 respondents.

⁵ Again there is quite a high number of missing values in these questions; the remaining sample is 41 - 50 respondents.

analyse (1) in how far public participation strategies are part of the usual project management in the different phases of the lifetime of a wind farm in the respondent's country, (2) if there is a standard procedure for carrying out public participation activities in the organizations, (3) if resources are allocated systematically, (4) which societal stakeholders are involved in social acceptance strategies and (5) if existing knowledge to foster social acceptance is known or applied.

58 % of the developers and cooperatives who claimed to have experience with public participation activities stated that elements of public participation are part of the usual procedure during planning, building and operating wind farms in their country. 29% indicated, these measures are sometimes applied in their country and 5% answered with "no". Overall this indicates that implementing public participation measures is perceived as common and widely used.

Those 72 respondents actually involved in project development and engaged in conducting public participation measures were asked if their company or organization has a standard procedure or guideline for conducting public participation activities. It turns out that 41% of the respondents stated they do not have a certain procedure to deal with social acceptance issues. 29% indicated their companies have such a defined procedure and follow it regularly and 12% of the respondents stated the existing guideline or standard procedure is not regularly applied. 17% were unsure or stated this is not relevant. If there are standard procedures in use they report that they have been developed internally, often drawing on information generated from discussions with interest groups.

The allocation of resources for participation and communication activities during project development, i.e. time, money and expertise, is always part of project planning for half of the sample, 17% indicated specific resources are allocated under certain conditions. 12% declared, resources are hardly or never allocated. 19% were unsure or stated this is not relevant.

Published advice and guidelines to foster social acceptance are hardly applied. In the questionnaire six such advice-giving documents were presented to the respondents (e.g. by the International Energy Agency, the Centre for Sustainable Energy et al. or the project GPWind). The respondents were asked whether they are aware of them. Nearly 80% have never applied any of them and 43% of the respondents do not even know any of these guidelines.

3.2.2 Target groups and measures

The groups that are most often involved in participation and communication processes are the local political authority, the local administration, the local public, and the permitting authority (Figure 5). Groups that are less regularly addressed include the local economy but also citizen associations or the media. It is important to note that involvement of as many groups as possible is not a value in itself, but that it is more important to choose an appropriate range (cf. Sheate & Partidario 2010)

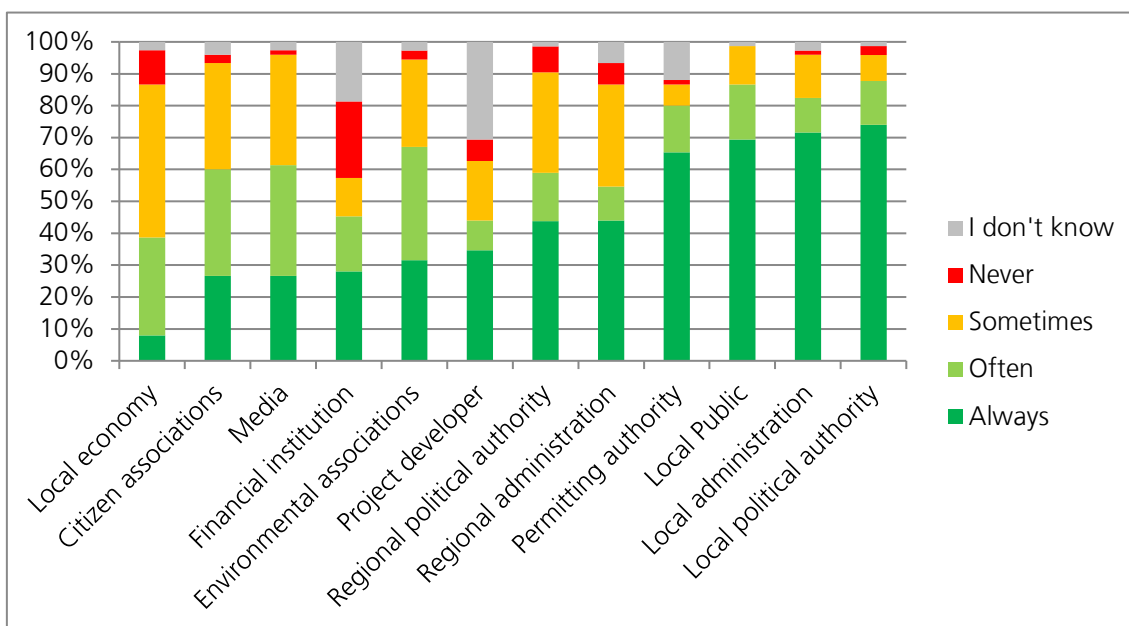


Figure 5: Groups and actors usually involved in participation and communication processes (project developers and cooperatives with experience with public participation activities (n=75))

Thus, even if the respondents are aware of the challenge regarding social acceptance they often lack professionalization with regard to social acceptance measures, e.g. only less than a third uses a specific guideline for social acceptance measures and in many cases only some of the actor groups are involved in the projects.

In a next step, the design of these measures was investigated in more detail. Three different approaches with regard to public involvement were explained to the respondents: informational measures, consultation and dialogue with the public and co-decision-making.

The 75 project developers and representatives from cooperatives with experience of public participation activities were asked which of these options are part of the usual procedure during different project phases (from project preparation to operation; they could tick all options that apply for each phase). Informational measures are often applied

in the construction and in the spatial and technical planning process. Consultation measures as well as co-decision-making are particularly used in the permitting process and also in the spatial and technical planning process. Thus, in the spatial and technical planning and in the permitting process the share of respondents reporting on social acceptance measures is the highest. In the phase of project preparation, 67% state, they do not apply any public participation measures (

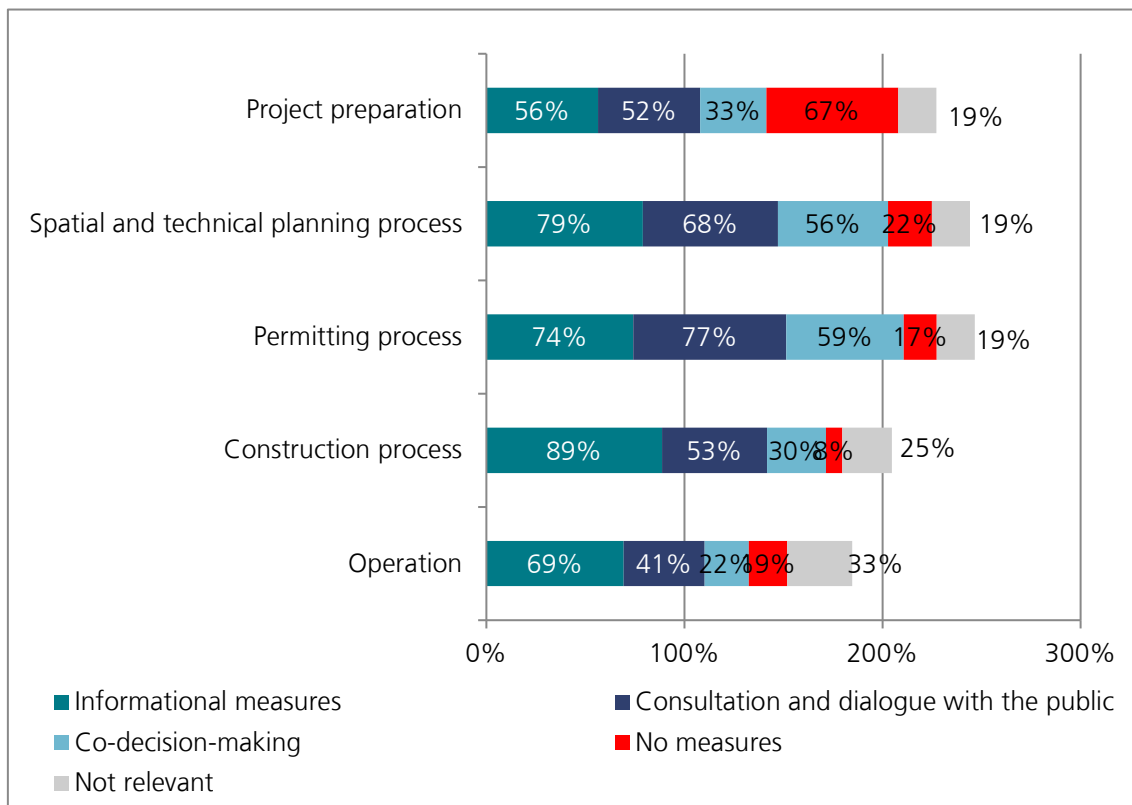


Figure 6).

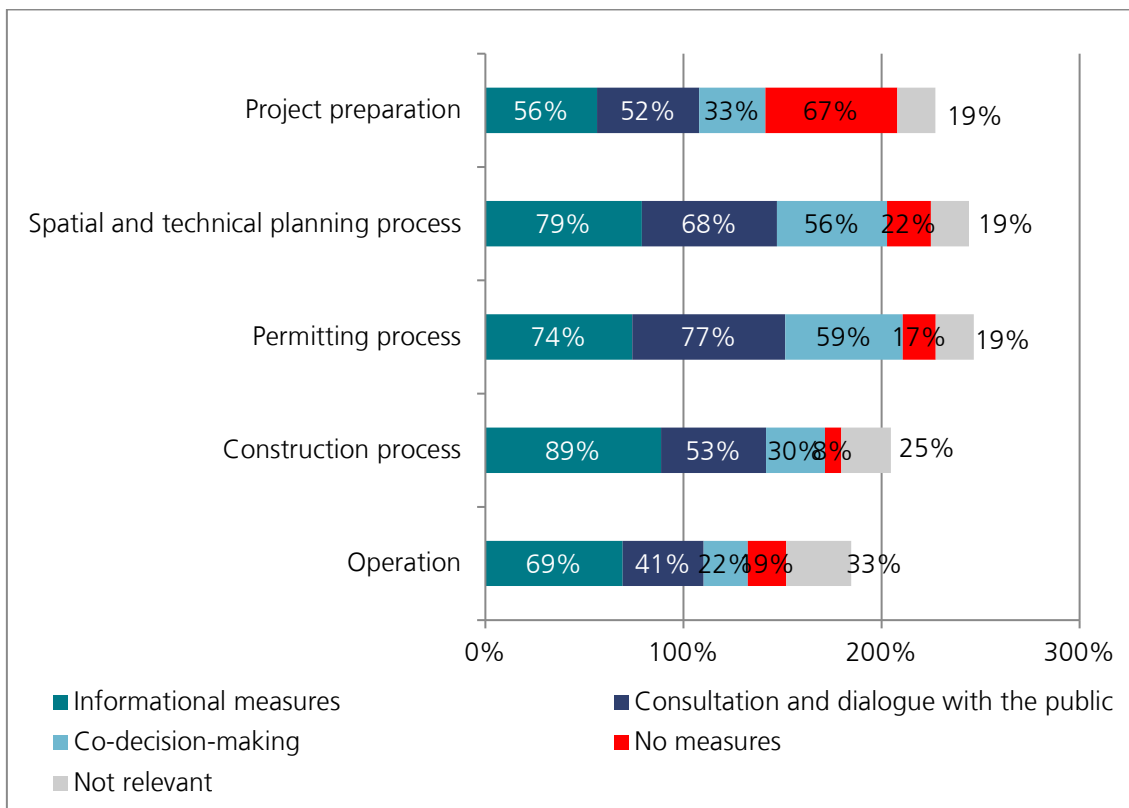


Figure 6: Use of informational, consultation and co-decision-making measures in different project phases (project developers and cooperatives with experience of public participation activities (n=75)).

3.3 Effectiveness of the measures on the social acceptance of wind energy projects

It is an important albeit hardly studied question if social acceptance management is worthwhile, i.e. enhancing the probability of project success. Thus, we explore our data in this direction. On the one hand we refer to the questions “Existence of a standard procedure for public participation” and “Allocation of resources for public participation” and correlate them to the perception of negative and positive reactions to projects. We assume that a higher level of public participation management, i.e. standard procedures and budget should be related to a lower frequency of observing negative reactions and a higher frequency of observing positive reactions if taking these measures positively influences project acceptance.

The statistical results point out that there are in facts several negative correlations between the existence of a standard procedure as well as resource allocation and the occurrence of negative reactions (Table 1). Thus, this supports our assumption. However,

with regard to positive reactions we do not observe any statistically significant relationship but an unexpected one: The existence of a standard procedure for social acceptance management is negatively correlated with organised support from outside (Table 1). A discussion of these findings will follow in the next chapter.

		Engagement in public participation activities for wind energy projects	
Observed reactions to projects		Existence of standard procedure (yes/no)	Resources allocated (yes/no)
Negative Reactions	Local citizens		-.490**
	Political stakeholders	-.405**	
	Local opponent groups		-.396**
	Organised resistance from outside		-.299**
	Protests	-.324**	-.324**
	Filing of complaints		-.371**
	Local media coverage		-.326**
Positive reactions	Local citizens		
	Political stakeholders		
	Local support groups		
	Organised support from outside	-.289**	
	Local media coverage		
	Public votes		

Table 1: Correlations between professionalization, public participation measures and positive and negative reactions to wind farms (* = $p < .1$; ** = $p < .05$; *** = $p < .001$) (project developers and cooperatives with experience of public participation activities (n=75)).

4 Conclusions and outlook

In this paper we studied in how far public participation measures are used in wind farm development and how they are implemented within projects. We do this drawing on responses from an European expert survey across individuals involved in wind farm development. We find that negative responses are reported more frequently than positive ones by the respondents, but both occur regularly. The arguments observed by study respondents which are discussed pro and contra wind farms are also highly similar to those already discussed in the literature (see introductory section). Overall in nearly 40 % of cases, projects experience negative consequences on project development due to a lack of social acceptance, ranging from delays to changes in project plans and even termination. This rate is similar to the estimation from the earlier WindBarriers project. Overall, there are interrelations between reactions perceived – those experts who report more negative reactions are also more likely to report positive ones and vice versa. A possible explanation for this is that some respondents are more sensitive to perceiving and / or remembering reactions to projects or more involved in debated projects than others. Furthermore, projects eliciting discussions might also increase the probability that arguments from both sides are part of the debate.

Thus, the emergence of acceptance issues is a regularly occurring issues in relation to wind farms. It turns out that only a minority states that public participation measures are uncommon in relation to wind farms (5 %). However, of those involved implementing these measures, only a smaller share reports to do so systematically. Only around 40 % state that they have defined standard procedures for public participation and even if such a procedure exists a lower share admits to follow it regularly. Allocating resources for these activities is also not a fixed part of the project planning process for a majority. This is in line with findings from Canada: A case study with five Ontario wind projects revealed that public participation was limited and practices still remain heterogeneous (Jami & Walsh 2017). Overall this points out that there is room for improvement towards higher levels of professionalism in the wind sector. Looking into the details how public participation strategies are designed it turns out that they are mainly targeted at the local political authority, the local administration, the local public, and the permitting authority. The activities for public participation usually start with the spatial and technical planning and during the permitting process, i.e. the level of activity is low during project preparation. This implies that the project developers and cooperatives mainly apply measures of public participation when the project has officially started, however, public opposition may have already emerged at this stage (see also Jami & Walsh 2017 on this issue). In addition, some groups are more likely to be targeted than others. This leads to the question whether project developers have already found the appropriate level of involving different stakeholder groups. We cannot answer this question based on our data, but interpret the

data in such a way that there is likely room for improvement, e.g. by more regularly involving the local economy as important players in communities.

In a last step of data analyses presented here we evaluate if we find indications that public participation strategies are successful in a sense that they increase social acceptance. As a measure of social acceptance we use the frequency of negative and positive reactions towards projects and correlate them with the statement if an organization has a standard procedure for public participation or regularly allocates resources. We find that both are related to lower levels of observed negative reactions, however, no support for our assumption regarding positive reactions. As outlined above, the perception of negative and positive reactions is also correlated to each other, i.e. some respondents report more reactions of both types. Thus, if positive reactions are more likely in case of negative reactions this might be part of an explanation why we do not find a positive relationship with public participation activities. If interpreted along these lines the unexpected correlation that organised support from outside seems to occur less often in case of more professional public participation activities also seems to be less surprising: Potentially, external support happens mostly in response to local resistance and thus does not occur if local opposition is not emerging.

However, these interpretations need to be taken with care as there are several limitations to our study which have to be discussed as well. The data was collected via a survey in different European countries. Self-selection effects might result in a bias in the sample, i.e. only those stakeholders might have participated in the survey who perceive social acceptance of wind farms as an important issue and who were confronted with negative reactions in the past. Stakeholders who never experienced negative reactions to wind farms before might not see the purpose of a study analysing social acceptance measures in the context of wind projects and consequently might not take part in the survey. However, as several studies highlight the relevance of social acceptance management (e.g. Gauthier et al. 2011; Schweizer & Bovet 2016), it can be assumed that the majority of projects and stakeholders have experienced those problems. Additionally, the data was collected by national representatives who received extensive information on how to choose meaningful respondents. Another issue is that negative experiences might be remembered more vividly, especially if they were experienced personally and / or impacted project success. Taken together, this sample may lead to an overestimation of negative responses to projects.

Regarding our results on the relationships between engagement in public participation and reactions to projects, it is important to note that we only estimated correlations, i.e. inferring a causal relationship is not possible. There is some ground to argue that it is not very likely that receiving fewer negative reactions leads to the implementation of

more public engagement measures but that the reverse is more likely. However, it is also possible that those developers who conduct projects in a more professional way are more successful in all aspects and that more public engagement is only a minor issue in this. Finally, it can be argued that for example environmental organizations might be more critical regarding the development of wind energy on a local level, i.e. that the different groups surveyed hold different, maybe biased views by definition. However, in this study it was not the aim to survey their opinion with regard to wind energy but to collect input on experiences in terms of social acceptance of wind energy projects and increasing validity by combining views of different stakeholder groups.

In this paper, project success is defined as actual implementation with or without a delay. Besides the fact that a project that has to be stopped has obviously not been successful there are other criteria for judging project success. For example, criteria could also be related to the sustainability of a project, i.e. combining measures of the economic, social and environmental impact of the project outcome to evaluate project success.

Drawing conclusions from this paper, we would like to outline three issues: (1) Local acceptance for wind farms has become a challenge for many projects and the stakeholders involved are aware of this challenge. (2) While measures are implemented to increase acceptance and improve communication with the public and other stakeholders there is room to further improve it by doing it more systematically. (3) We find some very preliminary indications that such measures contribute to project success, however, more research is needed in this field.

Acknowledgements

The research leading to these results has received funding from the European Union's Intelligent Energy - Europe Programme (WISE Power Project) (IEE/13/528/SI2.674872).

Table 2: Correlations between various negative reactions to wind farms

	Positive reactions by local citizens	Positive reactions from political stakeholders	Local support groups	Organized support from outside	Positive local media coverage	Positive public votes
positive reactions by local citizens		,372**	,421**	,162*	,382**	,324**
Positive reactions from political stakeholders			,311**	,177*	,401**	,163*
Local support groups				,452**	,405**	,355**
Organized support from outside					,126	,245**
Positive local media coverage						,253**
Positive public votes						

Table 3: Correlations between various positive reactions to wind farms

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