

Public acceptance of wind energy and bioenergy projects in the framework of distributive and procedural justice theories: Insights from Germany, Austria and Switzerland



Dipl.-Psych. Götz Walter

Prof. Dr. Heinz Gutscher



Universität Zürich, Psychologisches
Institut, Sozialpsychologie
Binzmühlestr. 14 / Box 15
CH-8050 Zürich
T +41 44 635 72 71
www.sozpsy.uzh.ch



The Advisory House AG
Dreikönigstrasse 55
CH - 8002 Zürich
T +41 43 960 22 00
www.advisoryhouse.com

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1. Abstract

In many European countries, renewable energy projects meet with strong local opposition. While researchers in many disciplines are dealing with this issue, the lack of theory-guided research has been pointed out. This study uses the framework of distributive and procedural justice theories to qualitatively analyze interview data from wind energy and bioenergy experts in Germany, Austria and Switzerland. The framework proved to be a valuable instrument for analyzing controversies over renewable energy projects. The results give new insights into how such projects are perceived by citizens and the motivations behind opposition behaviour. Negative outcomes of renewable energy projects mainly impair citizens' standard of living, while most positive outcomes are monetary. Following the resource theory of social exchange, this incongruity indicates that renewable energy projects – despite monetary compensations – have a high potential to be seen as unjust by citizens. Furthermore, results indicate that non-native residents perceive negative outcomes more strongly by contrast with native farmers. It is proposed that romanticized attitudes of non-natives towards nature lead to this stronger perception of negative outcomes and makes them less receptive for monetary positive outcomes and procedural justice principles. Recommendations for practitioners are inferred and pathways for future research are presented.

Keywords: Wind energy, bioenergy, justice theories

2. Introduction

In many European countries, a rapid increase in energy generation from renewable resources such as solar, wind, biomass, geothermal and hydro is a key element of national sustainable energy policies and CO₂-reduction schemes. Most of potential European hydropower sites are already being exploited and the potential of geothermal energy is rather limited and impaired by high costs and risks. Thus, the increase in renewable energy generation will mainly be provided by solar energy, wind energy (onshore and offshore) and energy from biomass.

Representative opinion surveys show repeatedly high support for renewable energy on a general level. On the other hand, renewable energy projects (REPs) often meet with strong local opposition. This lack of local public acceptance has the potential to jeopardize the achievement of national renewable energy targets.

The apparent contradiction between high support rates for renewable REPs in general and strong opposition to specific REPs has been researched extensively. Under keywords such as acceptance (public, social and local), public perception, public participation, Not-in-my-backyard (NIMBY) and siting controversies, research articles have been published in diverse disciplines such as psychology, sociology, economics, geography, architecture, environmental research and politics. Important findings include the following:

- Visual impact of REPs on the landscape is an important motivation for opposition (Graham et al., 2009; Warren et al., 2005; Zoellner et al., 2008). The higher the landscape is valued by residents, the more opposition is to be expected (Devine-Wright & Howes, 2010; Van der Horst, 2007).
- High levels of public participation lead to an increase in public acceptance of REPs. Particularly an early, pro-active involvement of the public has been recommended (Loring,

2007; Upham & Shackley, 2006; Upreti & Van der Horst, 2004; Zoellner et al., 2008; Zoellner et al., 2009).

- The widely-quoted NIMBY Syndrome, namely that people have a positive attitude toward facilities like wind turbines only as long as they are not built in their own backyard, has been found not to explain the variations in opponents' attitudes and opposition behaviour adequately (Ek, 2005; Warren et al., 2005; Wolsink, 2000).

Not many examples of theory-guided research are evident in the assessment of public acceptance of REPs. Due to the interdisciplinarity, complexity and applied context of the field, this is not surprising. However, the lack of theory-guided research has been pointed out (Devine-Wright, 2007). Researchers need to look beyond simple NIMBY explanations to gain a deeper understanding of the causes of local opposition to REPs (Bell et al., 2005; Devine-Wright, 2009; Van der Horst, 2007). Devine-Wright (2009), for example, proposed a framework using the concepts of place identity and place attachment in order to explain motivational aspects of opposition behaviour.

In this study, we use distributive and procedural justice theories for researching public acceptance of REPs. These theories have been developed and honed for many decades and are well established in psychology and sociology. Gross (2007) already used these theories in her qualitative case study in an Australian community where a wind farm was to be built. While other studies researched outcome fairness and perceived justice in the siting of REPs (Walker & Devine-Wright, 2008; Zoellner et al., 2008), they did not apply more elaborate concepts of distributive and procedural justice such as distributive justice principles, differences in the perception of positive and negative outcomes, and procedural justice principles. We tested whether these concepts can be used to analyze data based on experiences of REPs' developers, operators and opponents. We focused on the technologies wind onshore and bioenergy. Our study was guided by the following research questions:

- 1) Do distributive and procedural justice theories provide an adequate framework for analyzing data based on experiences of REPs' developers, operators and opponents?
- 2) Does the framework give new insights into how renewable energy projects are perceived by citizens and the motivations behind opposition behaviour?

We conducted interviews with experts in Germany, Austria and Switzerland. In Germany there is a high deployment rate of wind energy and bioenergy plants alike. In Austria and Switzerland, the deployment rates of wind energy and bioenergy plants are significantly lower. For details see Table 1.

Table 1: Renewable energy data Austria, Germany, Switzerland

	Share of electricity from renewable sources in gross electricity consumption 2008 (in percent)	Share of renewable energy in gross final energy consumption 2008 (in percent)	Share of renewable energy in gross final energy consumption Target 2020 (in percent)	Installed electricity capacity of wind energy 2008 (in megawatt)	Installed electricity capacity of bioenergy (wood, wood-waste, biogas) 2008 (in megawatt)
Austria	65 ^a	29 ^a	34 ^a	995 ^b	2'145 ^a
Germany	14 ^a	9 ^a	18 ^a	23'903 ^b	3'224 ^a
Switzerland	53 ^c	19 ^c	No target	14 ^b	40 - 60 ^d

a Eurostat b EWEA c BfE Switzerland d Estimate based on BfE data

3. Theoretical background: Distributive and procedural justice theories

Distributive justice theories are rooted in Adams' equity theory (Adams, 1965). They explain when outcome distributions of specific resources (e.g. money, information, goods and services, but also insults, hatred and misinformation) are perceived to be fair and when they are not. The degree of perceived outcome fairness influences a number of additional variables, including outcome acceptance and legitimacy. Fairness is assessed by comparing the outcome distribution against justice principles. The most notable principles used in literature are (1) equity, (2) equality and (3) need (Sabbagh & Schmitt, 1998; Skitka et al., 2003; Törnblom & Ahlin, 1998). Firstly, the equity principle states that the outcomes have to be perceived as proportional to the inputs. Secondly, equality implies that all persons involved get an equal share of the outcome. Thirdly, the need principle proposes that persons who benefit the most from the distributed resource should be favoured in the outcome distribution. In different settings, different justice principles are perceived to be fair. For example, the equity principle is mainly salient in economic-oriented competitive relationships, while the equality principle is mainly salient in cooperative relationships emphasizing solidarity and harmony (Sabbagh & Schmitt, 1998, p. 385).

Resources are either positively or negatively valenced. Positively valenced resources are sought after by recipients, while negatively valenced resources are avoided. Furthermore, the same resource can be seen as positive by one recipient and as negative by the other. For example, while one resident sees a wind turbine as a neutral addition to the landscape, another resident might see the same wind turbine as a horrid industrial manifestation. Greater weight is assigned to negatively than to positively valenced outcomes (Törnblom & Vermunt, 1999). Moreover, it has been argued that "in comparison to justice judgements of positive outcome distributions, those regarding negative outcomes are more primary and simpler (less differential) and are experienced more strongly, in an emphatic and overstated manner" (Sabbagh & Schmitt, 1998, p. 390).

Outcome favourability refers to "whether one receives a positive rather than a negative result" (Skitka et al., 2003). So, it focuses on personal gain, and has to be clearly distinguished from the concept of outcome fairness. In a meta-analysis, Skitka et al. (2003) found that outcome fairness has a stronger effect than outcome favourability on a number of variables, including outcome satisfaction, organizational commitment and organizational citizenship.

Procedural justice theories can be grouped into (1) structural models and (2) interactional models. Firstly, structural models focus on how structural procedure characteristics influence perceived justice. In their study about perceived fairness in trial procedures, Thibaut & Walker (1975) found that the distribution of process control and decision control accounted for differences in perceived justice. Process control was defined as a disputant's control over the presentation of evidence, and decision control as a disputant's control over the actual decision made. Leventhal (1980) developed six procedural justice principles which are still widely used in research. These six principles are consistency, bias suppression, accuracy, correctability, ethicality and representativeness. Secondly, interactional (or relational) models focus on interactional aspects of procedures which are seen as being relevant for stable long-term relationships with authorities. Tyler and Lind (1992) developed three principles for judging the fairness of authorities: standing, neutrality and trust. A summary of relevant procedural justice principles is given in Table 2.

Table 2: Procedural justice principles

Structural justice principles after Leventhal (1980), as described in Tyler & Lind (1992)	Consistency	Allocation procedures should be applied consistently across people and over time.
	Bias suppression	Personal self-interest and blind allegiance to narrow preconceptions should be prevented.
	Accuracy	Decisions must be based as far as possible on good information and informed opinion.
	Correctability	Opportunities must exist to modify and reverse decisions.
	Ethicality	The allocation process must be compatible with prevailing moral and ethical standards.
	Representativeness	The allocation process must represent the concerns of all important subgroups and individuals.
Interactional justice principles after Tyler & Lind (1992)	Standing	Standing leads people to examine their encounters with authorities for evidence that they are being treated with politeness and dignity and that their person and their rights are being respected.
	Neutrality	Evidence of bias or discrimination can constitute a powerful threat to one's self-image. Evidence of fundamental dishonesty or incompetence can threaten the basic assumptions of the authority social system, negating the assumption that those in power will behave in a reasonable, predictable fashion.
	Trust	Concern about authorities' intentions leads people to examine their encounters with authorities for evidence of trustworthiness, i.e., to look for signs of ethical behaviour, and intention to act fairly, and benevolence.

“Distributive and procedural justice factors interactively combine to influence individuals' reactions to their encounters with other people, groups, and organizations” (Brockner & Wiesenfeld, 1996, p. 189). They shouldn't be researched separately, instead they should be “conceived as a Gestalt, a structured unity” (Törnblom & Vermunt, 1999, p. 60). Nowadays, research focuses on theoretical explanations of interactions between distributive and procedural justice. Törnblom & Vermunt (2007) worked towards an integration of distributive justice, procedural justice and Foa's resource theory of social exchange. They proposed defined interactions between particularistic (status, love and services) and universalistic (information, money and goods) resource classes and procedural and distributive justice principles. Among other aspects, this gave new insights into exchangeability of resources in distributive justice scenarios: “The more distal/inappropriate the ‘outcome resource’ is to the ‘input resource’ (i.e. the greater the discrepancy), the greater the magnitude of perceived injustice” (ibid., p. 329). For example, if a person's status is impaired, universalistic resources like money are not an appropriate response and are perceived as unjust. Another theoretical development was made by Skitka (2002). In her value protection model, she proposes that when people have a strong moral

conviction that a given outcome is right or wrong, procedural justice loses its effect on perceived justice.

4. Method

Eighteen expert interviews were conducted with developers, developer/operators, municipal officials, opponents to wind energy projects and mediators of bioenergy projects. All of the participants had been active in the renewable energy sector for some time and could draw upon experiences from diverse projects in their particular field. The developers were employed either at utilities or at specialized renewable energy development companies. The developer/operators, on the other hand, were participants responsible for the development and operation of renewable energy power plants (e.g. technical directors). The municipal officials were all employed in one south German community and responsible for the approval of renewable energy projects. In addition, interviews were conducted with two opponents who were engaged in non-local citizens' initiatives against wind energy projects. Finally, one participant was a mediator in diverse bioenergy projects. Table 3 lists the interviewees.

Table 3: Participants

Number	Description	Technology
1	German developer/operator	Wind/biomass
2	German developer	Wind
3	German developer	Wind
4	German developer	Wind
5	German developer/operator ^a	Biomass
6	German developer	Biomass
7	German developer	Wind/biomass
8	German developer	Wind/biomass
9	German municipal official	Wind ^b
10	German municipal official	Wind ^b
11	German municipal official	Wind ^b
12	German opponent	Wind
13	German mediator	Biomass
14	German opponent	Wind
15	Swiss developer/operator	Biomass
16	Swiss developer/operator	Wind/biomass
17	Austrian developer/operator	Wind
18	Austrian developer/operator	Biomass

a In addition landlord of several wind farm sites

b The interview mainly concerned a solar project. However, experiences about wind energy sitings were also provided.

Participants were recruited via the business network of the consultancy The Advisory House and via the first author's personal network. A standardized information sheet was given to the participants in advance. No other information was distributed.

The interviews were conducted face-to-face by the first author and took one to two hours. A semi-structured approach was used which followed the focuses and interests of the participants. An identical set of questions was used in every interview. The interview outline followed the archetypical

triangular shape from the general to the specific (e.g. Hurworth, 1996). In a short warm-up phase, general questions were asked (description of REPs experienced, general experience with regulatory authorities, developers, developer/operators and opponents). Then, more detailed questions followed (reasons for developing and opposing REPs, intensity of conflicts). At the end of the interview, key questions were asked (typical conflict processes, activities used to influence acceptance, success factors of REPs, needs for action).

The interviews were audio-recorded and transcribed for qualitative analysis. Three participants did not assent to audio-recording; their interviews were recorded in writing instead.

The qualitative analysis followed an exploratory approach. All transcripts were coded by allocating relevant participants' statements to three preset categories: (1) distribution of negative outcomes, (2) distribution of positive outcomes, and (3) procedural justice principles. Within each of these categories, data were thematically grouped, as shown in sections 4 and 5.

The qualitative analysis was conducted in German. Participants' statements included in this article were translated using a dynamic approach, focusing on the essential thought expressed by participants.

5. Results concerning distributive justice

5.1 Distribution of negative outcomes

Different negative outcomes associated with bioenergy and wind energy projects were named. Concerning bioenergy, developers have to deal with the following negative outcomes as perceived by citizens: (1) increase in traffic, (2) unpleasant smells, (3) high levels of noise, (4) exhaust gas exposure, (4) dust, (5) landscape impact, and (6) unsustainable use of raw materials. Traffic is seen as the most controversial negative outcome. In the context of wind energy projects, the following negative outcomes as perceived by citizens were named: (1) landscape impact, (2) high levels of noise, (3) shadow impact, (4) infraschall, (5) bird strikes, (6) drop in real estate value and (7) creating unrest in communities. While landscape impact is the most controversial issue by far, it is significant that causing unrest is seen as a negative impact on its own. As one interviewee put it: "Wind power divides communities like no other form of energy"([5]¹ German developer/operator).

In addition to technical solutions to these issues, participants named four factors which affect perceived negative outcomes of REPs directly. These are (1) project size, (2) an elaborate master plan, (3) measures to minimize landscape impact, and (4) a strong foundation of REPs in overall energy policy.

Firstly, it has been said for both bioenergy and wind energy projects that "what fail are big projects, if you try for the biggest, the best, these are the ones that fail very often" ([16] Swiss developer/operator). In bioenergy, this was named as being linked with the ratio of heat and electricity generation:

There is a general acceptance of small heat plants. Small is beautiful. These are still widely accepted. The bigger the dimensions and particularly if electricity generation is involved, then acceptance problems by all means occur. ([5] German developer/operator)

In the case of wind energy, the number of wind turbines was said to be critical: "It is very counterproductive if you work with too high numbers of wind turbines in the preliminary project development" ([5] German developer/operator).

¹ The number in square brackets at the end of each quotation is the participant number as shown in Table 3.

Secondly, participants stated that an elaborate master plan is essential to increase acceptance in bioenergy projects. Such a plan has the potential to mitigate most of the associated negative outcomes:

Biomass stands and falls with the conclusiveness of the master plan. Raw materials have to be available nearby, the heat client has to be nearby, and the site [...] has to be located as well as possible in the eyes of concerned neighbours. If these factors are met, projects can be realized. ([5] German developer/operator)

Thirdly, measures to minimize landscape impact have to be taken both in bioenergy and wind energy projects. While these measures are mostly required by law as a prerequisite for planning approval, participants emphasized the difficulty of mitigating the perceived landscape impact of wind turbines:

Whether or not I plant a ten-meter tree there somewhere, and this is a big and very expensive tree, and behind this tree there is a 150 meter high wind turbine, that doesn't really make any difference. ([4] German developer)

Fourthly, participants are of the opinion that a clear national energy policy promoting renewable energy backed by public support by politicians at all levels leads to a lower valence of negative outcomes. This is especially important since one of the main arguments of opponents is that renewable energies cannot contribute adequately to national energy generation schemes due to their inefficiency. Participants from the three countries stated different experiences here. In Austria, such overall political support is apparently already practised:

Continuously, starting with the highest political actors, namely the ministry of economics, ministry of environment, continuing down to the local level, there is the denomination that wind energy has to be advanced, according to the Ökostromgesetz. ([17] Austrian developer/operator)

In Germany, the situation is not perceived as positive. Participants frequently mentioned lack of open public support by politicians at all levels and inconsistencies in energy policy.

Energy policy is all in a tumble, nuclear power no, nuclear power yes, perhaps coal power a little bit longer, perhaps a little gas as well, but please no dependency on Russian gas imports. ([1] German developer/operator)

These past years politicians haven't felt like telling people inconvenient truths and informing them about what really lies ahead. ([5] German developer/operator)

In Switzerland, the overall energy policy also seems to be a matter of debate:

There are many [...] who say we want to keep Switzerland as it is now, as a museum. These couple of wind turbines, better to build them in Germany. [...] These people are the most difficult to convince, because there are different perspectives, and [...] to say a wind turbine in Germany or on the North Sea makes more sense, in fact that's true. And if you say Switzerland and these landscapes are then protected for biodiversity, you can hold that view, that is stringent and makes sense. ([16] Swiss developer/operator)

5.2 Valences of negative outcomes in different groups

Valences of negative outcomes of REPs seem to vary greatly across society. Two such variations were named repeatedly by participants, namely (1) differences between people who live close to wind turbines and people who do not, and (2) differences between farmers and non-natives.

The first difference is due to the experience of people who live near wind turbines, who find that many negative outcomes are not as strong as expected:

Briefly speaking, people who live nearby a wind turbine or have a wind turbine in their community realize after a short time that this nonsense they have been told is completely unsubstantiated, concerning noise, shadow impact, dead birds and God knows what. ([8] German developer)

Secondly, in both bioenergy and wind energy projects participants expressed their opinion that farmers and other people who are acquainted with agricultural processes are not as likely to oppose REPs as people who we labelled as 'non-natives', meaning that they have moved out of the cities in order to enjoy a more natural and quiet lifestyle:

If the population is familiar with agricultural processes, acceptance of biogas facilities is much higher compared to [...] installing biogas facilities in regions where the population is not prepared. On the contrary, [the population] has often moved into the outskirts of congested areas of cities to have recreation and a counterbalance to the congested area. And then the potential for protests against any kind of technical facilities [...] is accordingly high. ([6] German developer)

Farmers have already experienced very much change in this area, basically, [...] and they are not as sensitive. Someone who has just moved into the countryside with this idea, I've built a nice cottage in the country, I want my peace and quiet, who probably lived in cities for years before, reacts apparently much, much more sensitively, while farmers have already experienced the construction of high voltage lines and the complete change in agriculture. ([3] German developer)

Participants see differing attitudes towards nature as the main reason for different valences of negative outcomes between farmers and non-natives:

The old Goethe: You only see what you know. This is true here as well. Unfortunately there are some people running around who believe that they are protecting the landscape, but they don't know the first thing about landscapes, except that they have a highly-romanticized landscape in their minds. ([8] German developer)

Interestingly, as far as bioenergy plants in Austria are concerned, this difference in valences seems to be almost nonexistent, as one developer/operator stated: "In our case, this is negligible, the neighbourhood problem" ([18] Austrian developer/operator). According to this specific developer/operator, this is due to a more down-to-earth attitude towards nature in Austria:

Perhaps this is associated with a slightly different approach towards forests we have in Austria compared to Germany and perhaps especially to Bavaria. [...] We have always said that in Bavaria there is a Green behind every tree. ([18] Austrian developer/operator)

5.3 Distribution of positive outcomes

Named positive outcomes of REPs were mostly monetary. Relatively few positive outcomes are distributed during the planning and construction of REPs. Examples are employing local planning engineers and architects and commissioning local companies to build roads.

The major part of positive outcomes is distributed during operation. In both bioenergy and wind energy projects, named positive outcomes were (1) commissioning local companies to maintain infrastructure and (2) profit participation models. Further positive outcomes associated only with bioenergy projects were (3) procuring fuel supply locally and (4) delivering heat to industrial and private consumers. Further positive outcomes associated only with wind energy projects were (5) effects on tourism and (6) lease payments to landowners.

Firstly, commissioning local companies to maintain infrastructure is mainly a factor in bioenergy projects. As far as wind energy is concerned, one participant stated that he employed neighbours as wind farm supervisors, but even then not much money is distributed. This issue was highlighted by the statement of another participant:

Wind projects are easy, there is not much locally. [...] I think the argument that many jobs are created locally is not decisive. ([16] Swiss developer/operator)

Secondly, profit participation models have been more widely used in bioenergy projects, mostly in the form of communal investments. However, profit sharing in wind energy projects is on the rise, namely in the form of citizens' wind turbines and energy cooperatives:

For example, in some projects with seven wind turbines [...], two are turned into citizens' wind turbines which are developed and constructed at cost price. Then, a closed fund is created, and the community decides who is allowed to participate and who is not. ([2] German developer)

Thirdly, procuring fuel supply locally has been named as an important measure for increasing public acceptance in bioenergy projects: "We support the agricultural region, the farms nearby. At the end of the day, it's all about preserving the cultural landscape." ([6] German developer).

Fourthly, delivering heat to industrial and private consumers seems to give all stakeholders, namely the community, citizens and local companies, the possibility to connect directly with the project.

Fifthly, while effects of wind farms on tourism are not common, they can have positive outcomes for communities suitably located:

There were considerable tourist effects in this community. We are very close to France and Switzerland, and unbelievably many people arrived especially from France to see what these [wind turbines] look like in reality. ([8] German developer)

Sixthly, lease payments to landowners in wind energy projects were named as significant benefits. However, they are often not perceived as being distributed fairly: "If someone doesn't get a wind turbine on his land and the neighbour gets one, then he is financially at a disadvantage. This has to be dealt with" ([17] Austrian developer/operator).

Generally, one major objection in both bioenergy and wind energy projects is that companies earn too much money with REPs and not enough of these profits stay within the community. "The problem is too much profit" ([16] Swiss developer/operator):

People view it critically that you can earn money with such facilities. [...] They say that these are outside investors who come and do this only for the high profits. And then typically the locust debate comes up. ([5] German developer/operator)

It is all about profit in this country of ours. In this capitalism it is only about profit and not about people, not about nature. Nature is being destroyed. ([12] German opponent)

Especially wind project developers were pinpointed for their high profits. "If you look at the project developers who have been on the market for some time, most of them live very well, most are millionaires" ([1] German developer/operator).

6. Results concerning procedural justice

6.1 The role of communities

The importance of community leaders in the context of public acceptance cannot be underestimated. Participants concur that without the support of community leaders, REPs don't have a chance of being approved: "Generally you can say [...] that a project only has a chance locally if the mayor or the political community stand behind it" ([16] Swiss developer/operator).

The interactional justice principle 'neutrality' is crucial here. Renewable energy companies are not neutral and are not perceived as such: "Of course we are not objective, because we want to implement a project there" ([4] German developer). Thus, especially when opposition arises, community leaders perceived as neutral by citizens are in a key position. They can arbitrate in conflicts where developers and developer/operators are already viewed as hostile outsiders. Participants stated that this is even more important than open support for a project:

I prefer having the local council or the community as a neutral partner who can arbitrate meetings and decisions by contrast with someone who took sides openly for a project. That's because if opposition arises, a mayor or community who has openly taken sides for a project from the start can't help as much as a community or a citizen who has a certain neutrality and can respond critically towards a project as well. ([16] Swiss developer/operator)

6.2 Building trust and improving citizens' standing

Since renewable energy companies are not perceived as neutral, they have to focus on the other interactional justice principles to enhance their legitimacy. Thus, they have to build trust within communities and to improve citizens' standing. Participants named five measures for promoting procedural justice: (1) keeping information simple, (2) assuring high levels of transparency and accuracy, (3) taking citizens' fears seriously, (4) correcting project parameters according to citizens' wishes, and (5) sustaining long-term relationships with communities.

Firstly, participants stated that information has to be matched to citizens' level of knowledge in order to have any effect. This refers to the interactional justice principle 'standing'. "In my opinion that's the way to do it, explaining things non-technically so that everyone can understand" ([1] German developer/operator).

Secondly, it seems important to ensure high levels of transparency and accuracy. This refers to the structural justice principles 'accuracy' and 'ethicality' as well as the interactional justice principle 'trust'. If project facts are held back, they will not stay hidden for long: "People have time to find out the truth. [...] Opponents also have access to experts" ([16] Swiss developer/operator).

Thirdly, participants stated that citizens' and officials' fears have to be taken seriously and be dealt with thoroughly. This refers to the interactional justice principle 'standing'. This is not easy; arguments presented by the opposition do not necessarily refer to the real issues:

I wouldn't look at the arguments, but at what drives them, what are they afraid of, what do they actually stand to lose. And I believe that is the only way to really solve the conflict eventually. ([15] Swiss developer/operator)

Fourthly, it was highlighted that, whenever possible, project parameters should be changed to accommodate citizens' and officials' wishes. This refers to the structural justice principle 'correctability':

There has to be a personal contact who is trustworthy and who has the authority to promise certain things, to promise additional measures, whatever, and to abide by those promises. Thus, trustworthiness and personification of the whole project are the real issues. ([1] German developer/operator)

This is easier in bioenergy projects, since more compensatory measures are available, e.g. filter technologies, sound absorbers and schedules for wheel loaders.

Fifthly, sustaining long-term relationships with communities was named. This refers to the interactional justice principles 'standing' and 'trust'. Since in bioenergy projects this is taken care of through ongoing operations, extra efforts have to be made especially in wind energy projects:

So, keep at it, talk to the mayor at regular intervals. [...] Normally, I visit the mayor of every wind turbine at least every six months. ([1] German developer/operator)

6.3 Differences between developer/operators and developers

As regards 'trust' and 'standing', there is one kind of company that appears to be perceived as less legitimate than other companies. These are wind project developers.

In bioenergy projects, interaction with the community is crucial during operation. So, procedural justice is being promoted in order to secure a long and stable relationship with the community:

We stick to open and honest and simple argumentation, because we are going to be sitting there for the rest of our lives, and you have to keep the show running somehow. ([18] Austrian developer/operator)

The same cannot be said for wind energy projects. Furthermore, unlike in the case of bioenergy, where operating companies usually develop a project themselves or commission a general contractor, many wind energy projects are engineered by specialised project development companies and are later sold to investors. So, wind project developers do not necessarily have an interest in long-term and stable relationships with the communities where their facilities are located. Potentially, this means that they do not place as much emphasis on procedural justice as do bioenergy project developers, or even as utilities active in wind power development. Several participants employed at utilities voiced this opinion:

But I think that's a different approach by utilities, to communicate the whole thing more openly, compared to a project developer who presents things perhaps more positively than they are in reality. I think that we [utilities] can't afford to say that you won't hear the wind turbines. ([4] German developer)

This argument is supported by statements of both interviewed German opponents: They saw their main adversaries in wind project developers, not utilities:

Plainly, these are gold digger companies that were founded because they realized you can earn outrageous amounts of money with wind energy. Of course, we don't have any contact with them at all, because we are their biggest enemies and they are ours. ([12] German opponent)

Some project developers are aware of this problem and emphasize long-term relationships with communities. As one wind project developer stated:

Apart from that we are interested in sustainability and longevity of our relationship with our projects. We put great emphasis on this. Often we get the chance to buy a plot of land where wind turbines

are erected, and then we are [...] connected to the project in the long term as landlords. ([2] German developer)

6.4 The problem with early involvement

All participants are of the opinion that it is a critical success factor to engage the public actively:

Opposition usually arises when people are overrun and are not asked, not actively involved. ([2] German developer)

Typically, neighbours and their worries are ignored by the planner at first. That is the biggest mistake that always happens. ([1] German developer/operator)

However, attitudes differ on when to involve the public. It has been claimed that the public should be approached very early, even before the regulatory authorities:

At least as we see it, dealing with opposition starts with open sessions, where we give citizens the opportunity to discuss the project with us, in the run-up, before it goes to the regulatory authorities. [...] And this is where we first hear about potential opposition, opponents, opponents' arguments, and I have to say, this has proved valuable, because a lot can already be solved during these discussions. ([17] Austrian developer/operator)

Usually, the procedure is to accomplish as many facts as possible and then inform the public. I think it would be more sensible to hold maybe an open consultation in the local gym during the planning phase, just when a piece of land has become applicable, and to inform the public then. ([1] German developer/operator)

Other participants identified drawbacks of involving the public too early and raised further issues concerning the participation process.

Talking to people early is important, but not too early, because then I start a discussion that isn't necessary. ([15] Swiss developer/operator)

Normally, protests are toughest at the beginning of project planning, when not many facts are known about a project yet, even at the project developers. ([6] German developer)

It all boils down to the question: who should be informed first. And that is always the key question. Do I first inform the landowners and get their approval, then the community and get its approval, then environmental groups? [...] We haven't found the best way yet. ([16] Swiss developer/operator)

Furthermore, community leaders seem to have their own understanding of the proper number of information sessions:

Actually, [...] sometimes we ask local politicians whether we should conduct an information event or inform the public anyway, and they say no. [...] This is a tendency of politicians, not to involve the public too much. ([4] German developer)

6.5 The "invalid argument" of landscape protection

In Austria and Germany, landscape protection is dealt with when planning authorities allocate land for wind turbines. Once the land has been allocated, it is quite difficult to oppose wind turbine sitings: "So if priority land for wind turbines has been allocated, it is very difficult to oppose wind turbines there, because you can only bring admissible arguments" ([2] German developer).

So, when land already has been allocated, landscape protection is no longer a valid issue, although it is still the main concern of citizens: “Well, arguments concerning landscape are usually brought in connection with tourism, but that is a soft argument, and that doesn’t get through” ([2] German developer). The result is that citizens strategically use other arguments when they are actually mainly concerned about landscape impact: “They use arguments such as nature protection, but the real issue is landscape” ([1] German developer/operator).

Though possibilities for public participation are provided in the planning procedure, this separation has the potential to violate the structural justice principle ‘representativeness’. This is especially the case if the legitimacy of land planning procedures is in question, as in Germany:

And presumably this workgroup is like a basar, [...] and I fear that basic planning principles are not being followed, they just say, for example, we aren’t planning any wind parks on our side of the district boundaries, so please don’t plan any wind parks on your side, either. ([2] German developer)

Wind plants were raised to the regional planning level, and a planning obligation was introduced in Baden-Württemberg. Normally it is up to the planning authority to decide whether to plan or not. This clearly shows that another objective than only planning was being followed. ([8] German developer)

7. Discussion

7.1 Achieving distributive justice in renewable energy projects

When comparing resource classes of negative and positive outcomes associated with REPs, it becomes evident that they differ in one critical characteristic: With the exception of decreasing real estate value, all negative outcomes fall into particularistic resource classes; they are arguably congruent with the resource class ‘status’. In contrast, most positive outcomes are monetary and classify as universalistic resources. Since universalistic resources are seen as an inappropriate answer to impairments of particularistic resources (Törnblom & Vermunt, 2007), most compensatory measures associated with REPs have the potential for being seen as unjust by citizens, even when allocated in large quantities and in a fair manner.

One possible solution to this issue is to distribute positive outcomes which also fall into particularistic resource classes. Even if not explicitly named by our participants, one important example of such positive outcomes of REPs is enhancing citizens’ ‘status’ by supplying personal satisfaction through their contribution to fighting global warming and protecting the environment. In order to facilitate the distribution of such positive outcomes, the communal level seems to be central: the environmental relevance of local REPs should be promoted within communities, so that citizens can see themselves as part of a small group which distinguishes itself by protecting the environment. Examples of such promotional campaigns are the 100% renewable energy regions project in Germany and the label ‘energiestadt’ for cities in Switzerland. Beyond that, one interesting prospect is described by two participants who reported on developers’, communities’ and industrial clients’ efforts to develop energy schemes which allow cost-effective regional usage of electricity without using feed-in tariffs. It seems plausible that the experience of consuming regional electricity from local renewable energy plants, not only physically but also in billing, will qualify as a particularistic positive outcome in its own right with many citizens. The potential of such energy schemes will rise in line with new technical developments, such as smart grids, electromobility and power storage.

Another way to mitigate particularistic negative outcomes is to influence the valence of negative outcomes directly. This should be seen as an addition to a fair distribution of negative outcomes. Our results indicate that valences of negative outcomes seem to differ greatly between native farmers and

non-native residents. These differences seem to be due to different attitudes towards nature in the two groups, namely purpose-oriented in the first and romanticized in the second group. These findings are in concordance with the framework of disruption to place attachment (Devine-Wright, 2009; Devine-Wright & Howes, 2010), and with the community fairness network (Gross, 2007) which labels non-natives as 'moral objectors'. However, our study goes beyond these two frameworks by describing regional subpopulations in detail in which the probability of encountering opposition behaviour differs significantly, and by proposing that moral convictions (Skitka, 2002) of non-natives about nature lead to a low public acceptance towards REPs and makes them less receptive for monetary positive outcomes of REPs and procedural justice principles. For these findings to be of use in future REP controversies, quantitative research is needed which focuses on the intricacies of non-natives' motivation to engage in opposition behaviour. Intercultural aspects could also be of interest, as the results of our study indicate.

Considering positive outcomes, the importance of a fair allocation thereof for achieving high public acceptance of REPs has frequently been highlighted by researchers (Toke, 2005; Walker & Devine-Wright, 2008; Zoellner et al., 2009). Our study identified two possible impairments of the equity principle: Firstly, citizens see high profits made by developers and operators as a violation of equity: Why should only the renewable energy companies profit from REPs, when the citizens have to live with the negative outcomes? Secondly, distributing profits to a small number of citizens alone is perceived as a violation of equity as well. This is a concern in wind projects especially, since distributing profits to landlords alone has a high potential for being seen as unfair by neighbours or even by the community as a whole (Gross, 2007). Developers and operators in all three countries are aware of these issues and place emphasis on the distribution of positive outcomes: regional investment strategies like community investments in bioenergy projects and citizens' wind turbines are already practised. Politically, this issue is also being dealt with: in Germany, one important step taken was to allocate the major part of business tax revenue to the community where the wind turbine is located, rather than to the community where the operator has its headquarters.

7.2 Achieving procedural justice in renewable energy projects

When outcome fairness cannot be achieved, procedural fairness can function as a substitute to achieve high levels of perceived justice (Brockner & Wiesenfeld, 1996). This study has identified obstacles to meeting procedural justice principles, especially in wind energy projects.

Wind energy developers potentially place not as much emphasis on building 'trust' within communities and enhancing citizens' 'standing' as other companies that also operate wind turbines. So, while such companies ensure lively competition and rapid development of wind energy, their short-term profit focus can prove an obstacle to satisfying interactional justice principles. Two possibilities for countering this problem are for community leaders to insist on long-term relationships with their developers and for investors and operators to insist on appropriate public participation when buying facilities from wind project developers. It is important to note that not all wind project developers neglect procedural justice; on the contrary, some project developers are in the front line when it comes to regional rooting of renewable energies.

The most important issue for local opponents to wind energy projects is landscape impact (Warren et al., 2005; Wolsink, 2000). Especially in Germany, the planning process involved in designating wind energy areas has been criticized for its intransparency and frequent exercise of influence by politicians not motivated by landscape issues, leading to an impairment of structural justice principles. Planning procedures for designating wind energy areas should be adapted to enhance procedural justice, e.g. by including more stakeholders. One positive example is the Austrian federal state Burgenland where

a sophisticated and easy-to-understand planning framework for wind turbines has been passed. The framework was developed cooperatively by the federal state government, planning authorities, communities, nature and environmental protection groups and wind turbine operating companies. As one wind turbine developer and operator stated, this resulted in insignificant levels of local opposition being encountered in Burgenland.

More extensive research is needed to decide about an optimal public participation process. The findings of this study emphasize the importance of what Aitken (2010) labelled “meaningful participation” (ibid., p. 1839) for public acceptance of REPs. Similar requests have been made by other researchers as well (Cass & Walker, 2009; Upreti, 2004; Zoellner et al. 2008, Zoellner et al., 2009). A simple call for early involvement is seen as controversial in this study and needs to be specified in detail in order to be of true value in REP siting controversies.

8. Conclusion

In concordance with Gross (2007), we found that procedural and distributive justice theories proved to be a valuable instrument for analysing controversies over REPs. The results give new insights into how REPs are perceived by citizens and the motivations behind opposition behaviour. Application of the theories was easy; the statements made by the interviewees could be readily categorized using the theoretical framework. The data proved to be very homogenous, resulting in many statements of similar content by different participants.

This study has certain limitations regarding criteria such as overrepresentation of Germany and developers and operators. It should be seen as a further step in the development of a theoretical framework which can explain adequately the multiple dimensions of public acceptance regarding REPs.

Also, while we can hint at possible interactions between positive as well as negative outcome fairness and procedural fairness, a qualitative analysis does not lend itself to analyzing interaction effects. In the next step, quantitative, hypothesis-guided research is needed on the effects of REP distributive and procedural justice characteristics on public acceptance measures.

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