Landscape and Environment: Social Acceptance of Wind Energy in Apulia and Basilicata Regions

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Abstract

The present paper is centred on the issue of social (or public) acceptance of renewable energy. Due to the climate change at global level, governments are showing an increasing interest in the adoption of renewable energy policies. Nonetheless, social acceptance to renewable energy still represents an obstacle to these policies. This is particularly true for wind energy. Generally, a wind farm project could alter the aesthetic view of a territory and rise an active opposition to its development. Furthermore, the lack of knowledge and the lack of trust towards the technology and the institutions could undermine a wind energy project. The paper critically reviews the public acceptance of renewable energy with a particular emphasis on wind energy, and examines the main factors determining the success or the failure of a wind energy project and their importance to support the decision making process. The issue of social acceptance is studied through a survey carried out in the regions of Apulia and Basilicata, in the South of Italy. The rationale behind the choice of these regions is that they are represent, particularly in the case of Apulia, a large portion of the wind energy installation capacity in Italy. Additionally, an ANOVA analysis is performed to assess whether similarities exist across these regions. Finally, the social acceptance of wind energy is discussed in the light of the particular territorial context of the two regions.

Keywords

Social acceptance, Renewable energy, Wind energy, ANOVA, Apulia, Basilicata.

1. Introduction

Over the last decades, renewable energy technologies have seen a rapid development worldwide. In Europe, this development is supported by the latest advances of the climate change strategies beyond Kyoto.

One of the main reasons of climate change is the increasing global warming at global

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scale. High concentrations of CO_2, CH_4, CFCs, halons, N_2O, ozone and peroxy-acetylnitrate in the atmosphere trap heat radiated from the earth's surface and raises the surface temperature (Panwar *et al*. 2011).

Air pollution and heat waves weaken crop production and alter animal reproductive performance and production, metabolic and health status, and immune response. In addition, other processes, such as desertification, polluted inland waters, acid rains and insufficient waste treatment and disposal, reduce the carrying capacity of the environment. In order to meet the requirements of the Kyoto Protocol and the Paris Agreements, the European Union established a target of greenhouse gas emission reduction by all member countries (European Commission, 2014).

In Italy, about 30 per cent of the national energy production uses renewable sources. There exists a well-developed national market of renewable energy and several potential perspectives for future developments. Therefore, wind energy plays a key role to support sustainable development. The sustainability criterion of energy technologies is based on the following dimensions which should be met simultaneously: ecological sustainability; economic sustainability; social sustainability; political sustainability (Assefa, Frostell, 2007). The ecological sustainability concerns the conservation of the natural capital. The economic sustainability concerns the efficiency of the economic systems to ensure a continuous socially equitable, quantitative, and qualitative progress. The social sphere of sustainability includes fairness in terms of distribution and opportunity, and adequate provision of social services including health and education, gender equity, and political accountability and social involvement in the decision-making process. Finally, the political sustainability provides to satisfy an overall framework of national and international governance.

What is the potential implication in terms of social acceptance of the sustainable development of renewable energy? The purpose of the present work is to illustrate the main issues affecting the public acceptance of wind energy through a pilot survey carried out in two regions, Apulia and Basilicata, in the South of Italy. The particular territorial context of these regions seems to favour the development of wind energy. The northern part of these regions, particularly that of the Apulia, is characterised by extensive and specialised agriculture and low population density. In the last thirty years, this peculiarity, more than climatic conditions, has favoured the implementation of wind farms that are nowadays a large portion of wind energy production (in terms of capacity) at national level.

The paper is structured as follows: the first two sections deal with a background of renewable energy market (i.e. wind farms) and the social acceptance of wind energy, respectively. The third section describes the pilot case study conducted in Apulia and Basilicata; the fourth section illustrates the obtained results. Finally, the final section discusses and concludes the work.

2. The theoretical context

There has been an increasing debate in the last 30 years, and particularly in the last 15 years, about the potential barriers to the development of renewable energy due to questions relative to public acceptance. The rise of asymmetries between stakeholders, policy makers and the general public about landscape issues and socio-economic benefits has brought the question to the attention of the scientific international community. The debate, so far, strongly focuses on the empirical evidences worldwide and critical assessments of the conceptualization of acceptance, including, for example, economic (markets), regulatory and technological (innovation) aspects (Longo *et al*., 2008).

As discussed by Wolsink (2012), a process of innovation, such as that of wind energy, produces, among actors and markets, two levels of acceptance of its key aspects. Firstly, the acceptance of socio-economic conditions needed for the implementation of wind farms; and secondly, the acceptance of the effects due to the innovation process. A particular stream of international scientific evidence is based on the evaluation of public or social acceptance (Bergmann *et al.*, 2008) as one of the main factors affecting the success of renewable energy projects. On the one hand, there is evidence of largely approved benefits such as competitiveness, sustainability, lower energy costs, and energy independence. On the other hand, local communities often tend to contrast the development of renewable energies due to the relevant costs suffered by the society. For example, the relative aesthetic impacts and impacts on the territory in relation to the spatial location of installations can undermine the viability of some projects (Bujdosó *et al.*, 2012).

This argument is particularly relevant in the context of an efficient renewable power assessment in the energy market. Public acceptance of the trade-off between landscape conservation and renewable energy constitutes a key issue for the development of renewable energies. Carlman (1984) was a pioneering author to consider public acceptance of wind energy. She argued that siting wind turbine was also a matter of public, political, and regulatory acceptance. Wüstenhagen *et al.,* (2007) distinguish three dimensions of social acceptance, namely:

- socio-political acceptance, which is the public acceptance at a general level, including policies and technological aspects;
- community acceptance, which is the specific acceptance of siting decisions and renewable energy projects by local stakeholders, particularly residents and authorities;
- market acceptance, which is the process of market adoption and diffusion of an innovation.

The focus of the present paper highlights community acceptance, as presented in the following section.

3. Social perception and behaviour

Three factors explain public acceptance of wind energy: personal factors (age, gender, class, income); social-psychological factors (knowledge and direct experience, environmental and political beliefs, place attachment); and contextual factors (technology type and scale, institutional structure and spatial context) (Devine-Wright, 2007). This classification is based on the environmental psychological theory, that analyses psychological and non-psychological influences upon environmental attitudes and behaviour.

The most common effect of the above factors on public acceptance is the NIMBY (Not in My Back Yard) phenomenon, and may results in social conflict and economic losses. Enevoldsen, Sovacool (2016) identify four types of social opposition to wind energy:

- NIMBY 1, as a positive attitude to wind energy installations in general, but a negative attitude to installations in the immediate vicinity;

- NIMBY 2, as a generally negative attitude towards wind energy;
- NIMBY 3, as a positive attitude to plans for future developments of wind power, that turns into a negative attitude in the case that turbines are implemented in the immediate vicinity;
- NIMBY 4, as a negative attitude to the planning procedure in general, rather than to wind energy.

However, according to Devine-Wright (2005), there is limited empirical support for the NIMBY hypothesis. Indeed, many studies indicate higher levels of support for the development of wind farms at local level, in comparison to a regional or national level. In this case, the phenomenon is named PIMBY (Please in My Back Yard). It occurs when a project is regarded as beneficial and viewed positively by the neighbouring communities.

To favour PIMBY, trust is a key issue in all facility siting issues. The perceived fairness is, to a large extent, affected by how the potential risks are defined, how the information about these risks is disseminated, and how the risks are managed. Risk research reveals, through the 'asymmetry principle' concept, that trust is fragile, as it is typically slowly created and rapidly destroyed. Risk depends on perceived competence and intentions, particularly when decisions are made in view of planned benefits for some people within the community at the perceived expense of others.

Social impact implies the change of individual well-being and interaction among individuals. It is referred to different levels of needs, which Assefa, Frostell (2007) classify as follow:

- way of life (how they live, work, play);
- culture (shared beliefs, customs, values);
- community (stability, cohesion, services, and facility);
- political systems (participation in decisions);
- environment (availability, quality, and access);
- health and well-being;
- personal and property rights;
- fears and aspirations (perception of safety, and future).

In order to assess the above social indicators, the authors aggregate them into three broader indicators, namely knowledge, perception, and fear about future energy technology. The result of this setting is, in general, a positive opinion of respondents towards energy technologies. However, it has also been observed an evident difficulty for respondents to engage in basic discussions and decisions about specific technologies because of a low level of information and knowledge. In this case, consumer preferences remained attached to established (i.e. fossil fuel) technologies.

In order to identify inputs to the planning and decision-making process, Stigka *et al.* (2014) argue about the relationship between environmental attitude and behaviour. The authors underline the importance to investigate the attitudes of electricity consumers, since these attitudes are the foundations of their behaviour. Three specific parameters causes public behaviour: (a) information by the public, (b) public perception and position, and (c) fear, danger or anxiety, which are positively correlated with the level of ignorance.

Numerous actors appear to be involved in RES projects, including local communities, local agencies, investors, nongovernmental organizations, and local information networks. Although these actors have different attitudes and conflicting interests, they should find ways to cooperate and reach a general consensus on public acceptance to wind energy.

4. The case study

A particular example of Italian wind development is to be found in the regions of Apulia and Basilicata. This area contains a very high number of wind energy installations, which represents about 45% of national wind farms (GSE, 2016). It is reasonable to believe that this is also an area with controversial issues in terms of social acceptance to wind energy. On the one hand, there are high levels of social consensus towards the technology under consideration, as well as towards other renewable sources. This is supported by the results of the theoretical consensus found in the investigations carried out at the national level. On the other hand, there also exists a latent or manifest - though not exclusively local - dissent and even a conflictual feeling in relation to the installation of wind farms in specific territorial contexts.

As discussed above, the international literature has supported this view in terms of the NIMBY syndrome. In our pilot survey, we investigate whether dissent is based exclusively on local interests or is linked to more complex issues that arise with specific reference to the features of the territory under investigation, its management and the relative choice, supported by the regional authority, of wind energy location.

The survey was carried out on a sample of residents in the Apulia and Basilicata. The interviewees assessed the importance of the main impacts generally discussed in the literature about wind energy developments.

Table 1 summarises the main attributes and sub-attributes considered in the survey.

Tab. 1. Perceived attributes and sub-attributes of wind energy developments.

Aesthetic impact	Environmental impact	Economic impact	Functional efficiency	Noisiness	Inadequacy of institutions
Number of turbines	Management impact	Maintenance costs	Useful life	Turbine distance	Misinformation
Turbines distance	Implementation impact	Implementation costs	Amount of energy production	Turbine dimension	No transparency of public procurement
Turbines dimension	Dismantling impact	Dismantling costs	Average daily operation	Number of turbines	Lack of benefit knowledge
Turbines colour	Faunal alteration	Profit			
Location	Agriculture production alteration				

Our sample size is represented by 176 respondents as shown in table 2.

Tab. 2. Socio-demographic information of the sample.

Variable	Obs.	Freq.	Perc.	Mean	Std. dev.
Gender	176				0.5
Male		91	52		
Female		85	48		
Age	176			2.64	1.02
18-25		17	10		
26-35		76	43		
36-50		42	24		
51-65		35	20		
>65		6	3		
Education	176				0.75
Elementary/Junior high school degree		17	10		
High school degree		74	42		
Bachelor degree		74	42		
Post-graduate degree		11	6		
Employment	176				
Employee		103	58		
Self-employed/ Entrepreneur		16	9		
Student		26	15		
Unemployed		24	14		
Retired		7	4		

5. Discussion and results: analysis of variance

Interviewees have shown a medium-high perception of the importance of wind energy issues proposed in the survey. Compared to other attributes, participants showed a very high perception of the following aspects: ‘functional efficiency’, ‘inadequacy of institutions’ and ‘economic impact’ (table 3). ‘Environmental impact’ and ‘aesthetical impact’ seemed less perceived factors compared to other attributes (table 3). In other words, respondents particularly care about the quality of wind energy technology and the costs that it implies. Consequently, landscape and environmental aspects would represent minor aspects in relation to a well-managed wind farm.

Tab. 3. Descriptive statistics of attributes.

Variable	Obs.	Mean	Std. Dev.	Min	Max
Aesthetic impact	176	3.22	1.208	1	5
Environmental impact	176	3.18	1.318	1	5
Economic impact	176	3.57	1.135	1	5
Functional efficiency	176	3.85	1.147	1	5
Noisiness	176	3.50	1.168	1	5
Inadequacy of the institutions	176	3.77	1.21	1	5

A critical issue of wind energy development throughout Italy is bureaucracy and the approval time of a plant. 87% of respondents perceive a long approval time as an obstacle to wind energy development. However, more incentives and savings in the energy bill could compensate for long approval times.

Table A1 shows the correlation matrix of sub-attributes considered in the survey. All sub-attributes, except 'turbines colour', result positively correlated to other sub-attributes. 'Turbines colour', is, in fact, correlated with other sub-factors belonging to the same category (Aesthetical impact) only. 'Faunal alteration' presents a high correlation value with 'implementation costs' (0.60) and with the 'amount of energy production' (0.62). This means that an increase of the perceived importance of these two factors would favour an increase of the faunal alteration perception.

An interesting aspect is the high correlation value between 'management costs'-'misinformation' (0.62) and 'lack of benefit knowledge' (0.60); and between 'dismantling costs' and 'misinformation' (0.61). These results would support the close link between economic aspects and public information and knowledge in terms of social perception. An efficient participation of citizens to the developments of local renewable energy policies could drive social perception to accurately weigh public benefits relatively to the costs. Moreover, 'misinformation' and 'lack of benefit knowledge' are positively correlated with 'useful life' (0.63), 'amount of energy production' (0.61 and 0.71, respectively) and 'average daily operation' (0.61 and 0.63, respectively).

We would argue that a positive perception of functional efficiency could be supported by a public dissemination of information about these aspects.

The present section illustrates an analysis of variance among group of respondents to infer on potential differences of social acceptance. Respondents are grouped according to 'genre', 'age' and 'importance of location'. The creation of these sub-groups needs an aggregation of data to obtain unbiased results. In particular, the 'genre' group considers the sample split between male and female respondents. The 'age' group takes into account five classes of age as described in Table 2. The 'importance of location' group considers the sample divided into 'not at all important', 'slightly important', 'moderately important', 'very important', and 'extremely important'. The analysis of variance (ANOVA) is used to test the differences existing between the mean values of two or more groups or the mean values within groups. The null hypothesis considers that all groups are random samples of the same population and it helps to test whether differences in respondents' perceptions exist relatively to the location and the wind farms under study.

Table 4 shows the main results of the ANOVA test. Each row indicates the relevant sub-factors provided by respondents during the survey and are aggregated into macro-factors to carry out the ANOVA analysis. It also illustrates the statistical values of the Fisher test (F-test) and the Bartlett test. The F-test tests the differences between or within sample means. Indeed, the Bartlett test tests the null hypothesis of equal variance across groups. Each of the two tests are computed over the relevant groups (i.e. genre, age and importance of location).

Bartlett's test results are not statistically significant for the majority of considered factors. In other words, the null hypothesis is not rejected and the ANOVA method is statistically valid. The main results of the F-test suggest that the existence of differences between or within groups is present in few cases only, except in the sub-group 'importance of location'. This would suggest an overall homogeneity in the respondents' perception for wind farms in both regions.

The perception of the remaining sub-factors is statistically significant at 95% confidence interval (C.I.) among different levels of importance of location. No factor appears statistically significant among different age classes. This means that the social perception would be somehow similar across age classes. As for the perceived differences in the genre group, 'turbine dimension' and 'management impacts' appear both statistically significant (90% C.I).

Tab. 4. Analysis of variance (including Bartlett's test) between groups in the sample: genre (male vs female), age (18-25 vs 26-35 vs 36-50 vs 51-65 vs >65), importance of location (not at all important, slightly important, moderately important, very important, extremely important).

		Fisher test			Bartlett test (χ^2)		
		Genre	Age	Importance of location	Genre	Age	Importance of location
Aesthetic impact	Number of turbines	0.59 (0.44)	1.92 (0.11)	25.62 **(0.00)****	1.25 **(0.26)**	2.78 **(0.60)**	24.12 (0.00)
	Turbines distance	2.10 (0.15)	0.79 (0.53)	21.56 **(0.00)****	0.06 **(0.81)**	1.30 **(0.86)**	6.64 **(0.16)**
	Turbines dimension	2.95 **(0.09)***	1.19 (0.32)	39.25 **(0.00)****	0.67 **(0.41)**	3.68 **(0.45)**	15.70 (0.00)
	Turbines colour	0.35 (0.56)	0.33 (0.86)	11.88 **(0.00)****	0.03 **(0.87)**	2.12 **(0.71)**	19.63 (0.00)
	Location	1.36 (0.25)	1.84 (0.12)		1.24 **(0.27)**	4.42 **(0.35)**	
Environmental impact	Management impact	2.73 **(0.10)***	0.25 (0.91)	9.21 **(0.00)****	0.02 **(0.89)**	1.19 **(0.88)**	11.13 (0.03)
	Implementation impact	0.23 (0.63)	0.31 (0.87)	14.76 **(0.00)****	0.53 **(0.47)**	1.65 **(0.80)**	8.34 **(0.08)**
	Dismantling impact	0.96 (0.33)	0.41 (0.80)	20.48 **(0.00)****	0.01 **(0.92)**	1.11 **(0.89)**	12.15 (0.02)
	Faunal alteration	0.22 (0.64)	0.64 (0.63)	16.79 **(0.00)****	0.10 **(0.75)**	1.07 **(0.90)**	15.24 (0.00)
	Agriculture production alteration	0.73 (0.39)	0.18 (0.95)	8.81 **(0.00)****	0.01 **(0.90)**	0.71 **(0.95)**	7.94 **(0.09)**
Economic impact	Maintenance costs	1.21 (0.27)	0.57 (0.68)	8.03 **(0.00)****	0.06 **(0.80)**	0.72 **(0.68)**	3.89 **(0.42)**

	Implementation costs	0.22 (0.64)	0.08 (0.99)	7.61 **(0.00)****	0.07 **(0.79)**	0.45 **(0.98)**	5.81 **(0.21)**
	Dismantling costs	0.08 (0.77)	0.23 (0.92)	12.90 **(0.00)****	0.00 **(0.98)**	2.70 **(0.61)**	6.72 **(0.15)**
	Profit	1.63 (0.20)	1.71 (0.15)	3.82 **(0.00)****	0.07 **(0.80)**	3.52 **(0.48)**	2.04 **(0.73)**
Functional efficiency	Useful life	0.24 (0.63)	0.20 (0.94)	10.77 **(0.00)****	3.29 **(0.07)**	2.70 **(0.61)**	10.31 (0.04)
	Amount of energy production	0.13 (0.72)	0.39 (0.81)	13.01 **(0.00)****	2.65 **(0.10)**	0.56 **(0.97)**	21.73 (0.00)
	Average daily operation	0.02 (0.88)	0.49 (0.74)	13.15 **(0.00)****	0.08 **(0.78)**	2.08 **(0.72)**	11.72 (0.02)
Noisiness	Turbine distance	1.17 (0.28)	0.93 (0.45)	8.91 **(0.00)****	0.16 **(0.69)**	4.52 **(0.34)**	6.10 **(0.19)**
	Turbine dimension	0.41 (052)	1.10 (0.36)	11.09 **(0.00)****	0.00 **(0.94)**	1.42 **(0.84)**	2.70 **(0.61)**
	Number of turbines	0.00 (0.99)	0.59 (0.67)	12.69 **(0.00)****	0.08 **(0.78)**	2.82 **(0.59)**	9.64 (0.05)
Inadequacy of the institutions	Misinformation	0.17 (0.68)	0.05 (0.99)	13.33 **(0.00)****	0.01 **(0.90)**	2.99 **(0.56)**	15.75 (0.00)
	No transparency of public procurement	0.04 (0.83)	0.28 (0.89)	3.61 **(0.01)****	0.05 **(0.82)**	1.89 **(0.76)**	3.89 **(0.42)**
	Lack of benefit knowledge	0.13 (0.71)	0.36 (0.84)	7.03 **(0.00)****	0.62 **(0.43)**	4.13 **(0.39)**	9.32 (0.05)

5. Conclusions

This paper proposes a pilot analysis of community perception about wind farm developments to test the issue of social acceptance, with a focus on the regions of Apulia and Basilicata in the South of Italy. The aim of the study was to assess the main factors affecting resident perception and the existence of a NIMBY phenomenon as potential obstacle for wind energy projects, as discussed by the international literature.

The homogeneity of the sample explains a relatively common perception about issues and benefits of wind energy in the considered area. However, differences in the residents' perception are visible in terms of location of wind farms. This would support the emotional (i.e. the sentimental, identity-based) attitude of residents to their territory (Jobert *et al*., 2007; Enevoldsen, Sovacool, 2016). Aesthetic impact of wind farms would be considered a minor attribute compared to other issues proposed. This result seems interesting because it differs from those presented in the larger part of the literature (Strazzera *et al.*, 2012; Sunak, Madlener, 2016). Local communities would care most towards economic aspects and technological efficiency of wind farms rather than other aspects; and would like to achieve more information about social benefits.

The obtained results suggest relevant policy indications for wind energy markets. In particular, citizens' participation and dissemination of information among the public could re-address bottom-up knowledge toward wind farms. To overcome the NIMBY phenomenon, local community would need to have adequate information on social costs and benefits of each wind energy project that the decision maker plans to implement on the territory. The dissemination of information on social benefits/costs occurred in the territories of both Apulia and Basilicata is an aspect insufficiently pursued, in the past years, by the regional authority. The presence of asymmetric information across communities in the territories under investigation explains the difference in the resident's perception in terms of location of wind farms. This latter aspect underlines the importance of the sentiment of the people and their identities towards territories which are traditionally rich of 'landscape diversity' across the regions. Moreover, an increasing dissemination of information about net social benefits would create additional motivations to favour sustainable development initiatives. Our results also showed that the environmental attribute would be considered of minor importance compared to other aspects.

We could argue that the adoption of turbines of modern technology could address or re-address current functional efficiency and environmental sustainability issues. An adequate environmental impact assessment and dissemination of information are key in this context to preserve the identity of the territories and promote innovation and sustainable initiatives for the local communities.

Tab. 5. Correlation matrix of sub-factors affecting wind farm social acceptance.

Functional efficiency			Noisiness			Inadequacy of the institutions		
Useful life	Amount of energy producti	Average daily operatio	Turbin e distanc	Turbine dimensio n	Number of turbines	Misinformati on	No transparency of public	Lack of benefit knowledge
1.00								
0.72**	1.00							
0.76**	**0.81****	1.00						
0.51*	0.54*	0.52*	1.00					
0.60**	0.54*	0.58*	**0.65****	1.00				
0.59*	**0.65****	0.59*	**0.76****	**0.70****	1.00			
0.57*	**0.61****	0.61**	0.57*	0.55*	0.57*	1.00		
0.45*	0.49*	0.41*	0.41*	0.34*	0.39*	**0.61****	1.00	
0.63**	**0.71****	**0.63****	0.52*	0.47*	0.57*	**0.70****	0.55*	1.00

	Aesthetic impact					Environmental impact				Economic impact			
	Number of turbine	Turbines distanc	Turbines dimens	Turbines colour	Location	Management impact	Implementation impact	Faunal alteration	Agriculture producti	Maintenance costs	Implementation costs	Dismantling costs	Profit
Number of turbines	1.00												
Turbines distance	**0.69****	1.00											
Turbines dimension	**0.68****	**0.64****	1.00										
Turbines colour	0.36*	0.40*	0.41*	1.00									
Location	**0.60****	0.57*	**0.68****	0.45*	1.00								
Management impact	0.42*	0.42*	0.38*	0.11	0.39*	1.00							
Implementation impact	0.53*	0.47*	0.50*	0.16	0.49*	**0.80****	1.00						
Dismantling impact	0.49*	0.51*	0.48*	0.15	0.54*	**0.71****	**0.80****						
Faunal alteration	0.40*	0.40*	0.49*	0.27	0.52*	0.53*	**0.66****	1.00					
Agriculture production	0.31*	0.33*	0.42*	0.25	0.40*	0.58*	**0.65****	**0.83****	1.00				
Maintenance costs	0.28	0.39*	0.39*	0.14	0.40*	0.57*	0.56*	0.50*	0.51*	1.00			
Implementation costs	0.28	0.41*	0.49*	0.17	0.38*	0.53*	0.53*	**0.60****	0.55*	**0.74****	1.00		
Dismantling costs	0.29	0.43*	0.42*	0.24	0.47*	0.46*	0.53*	0.53*	0.51*	**0.63****	**0.68****	1.00	
Profit	0.25	0.29	0.21	0.12	0.27	0.31*	0.45*	0.42*	0.36*	0.50*	0.52*	0.47*	1.00
Useful life	0.45*	0.44*	0.37*	0.19	0.44*	0.44*	0.52*	0.50*	0.39*	0.50*	0.50*	0.50*	0.42*
Amount of energy	0.40*	0.40*	0.42*	0.25	0.47*	0.42*	0.56*	**0.62****	0.51*	0.56*	0.59*	0.47*	0.54*
Average daily operation	0.33*	0.43*	0.41*	0.18	0.47*	0.40*	0.50*	0.57*	0.46*	0.58*	0.56*	0.50*	0.45*
Turbine distance	0.46*	0.47*	0.36*	0.27	0.40*	0.43*	0.50*	0.47*	0.39*	0.50*	0.52*	0.48*	0.46*
Turbine dimension	0.54*	0.55*	0.55*	0.26	0.45*	0.43*	0.57*	0.49*	0.45*	0.43*	0.53*	0.53*	0.34*
Number of turbines	0.49*	0.45*	0.49*	0.22	0.47*	0.40*	0.55*	0.53*	0.47*	0.50*	0.51*	0.46*	0.48*
Misinformation	0.35*	0.36*	0.38*	0.12	0.46*	0.46*	0.57*	0.58*	0.55*	0.62**	0.59*	**0.61****	0.43*
No transparency of	0.37*	0.32*	0.21	0.10	0.27	0.42*	0.44*	0.40*	0.33*	0.32*	0.42*	0.42*	0.41*
Lack of benefit	0.31*	0.35*	0.28	0.12	0.36*	0.46*	0.53*	0.54*	0.50*	**0.60****	0.52*	0.48*	0.50*

	Aesthetic impact	Environmental impact	Economic impact	Functional efficiency	Noisiness	Inadequacy of the institutions

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