

RESEARCH ARTICLE

Time to talk about values, time to say no: What drives public participation in decision-making on abstract versus concrete energy projects?

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Abstract

One way to develop more socially acceptable energy projects is by engaging people with different values (i.e., guiding principles in people's lives) from early on in decision-making. However, people with different values may want to participate at different times of decision-making. When energy projects are still abstract (e.g., national renewable energy targets), people with strong biospheric values (i.e., caring about the environment) and altruistic values (i.e., caring about others) may want to participate. Whereas when projects become concrete (e.g., a local wind park), people with strong egoistic values (i.e., caring about personal resources) and hedonic values (i.e., caring about comfort and pleasure) may want to participate. In two field studies in the same region, we found that biospheric and altruistic values were indeed most strongly associated with people's willingness to participate in abstract decision-making. At a local project level, the more people were against the project, the more they wanted to participate, irrespective of their values. We conclude that simply inviting people to participate in decision-making does not yet guarantee that different public values will be represented, and we draw recommendations for better incorporating values in energy decision-making.

Introduction

In order to limit global warming, it is critical to drastically cut the CO₂ emissions of energy systems [1]. This requires transitioning from fossil fuels to cleaner energy sources (e.g., renewables) and reducing energy demand through behavioural changes (e.g., less flying, reducing the consumption of animal products). Such energy system transformations will inevitably impact on people's lives, by affecting everyday behaviours (e.g., commuting, diet), physical environment (e.g., building renewable energy infrastructure), welfare (e.g., energy costs), and geopolitical situation (e.g., resource conflicts), among others. As such, the sustainable energy transition will have consequences for what people find important in their lives, in particular

identification of the participants, given the small geographical area of the study. There are ethical restrictions on sharing the de-identified dataset, because the study participants signed an informed consent indicating that the data will only be used for research purposes. Access to data is therefore restricted to researchers only, in order to align with the informed consent, which is according to the requirements of the Research Ethics Committee that issued the ethical approval for this study. Access to the data has to be requested via the dataset at DataverseNL (<https://doi.org/10.34894/AFY1HV>), curated by the University of Groningen Digital Competence Centre (UG DCC) on behalf of the authors. All requests for access via DataverseNL will be sent to the UG DCC and permission for re-use can be granted by the UG DCC on behalf of the authors. For questions, please contact the UG DCC at dcc@rug.nl.

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their values [2–4]. In order to develop socially acceptable energy systems, it is critical to consider people's values in energy decision-making.

It is not a given, however, that different public values are considered in decision-making on the energy transition. Experts and policymakers tend to primarily focus on climate targets and technical feasibility, oftentimes overlooking the wider implications of energy systems for different values in society. One widely advocated strategy to better incorporate public values in energy policies and projects is by engaging the public in decision-making, known as public participation [5, 6]. While people can engage with energy decision-making in various forms (e.g., bottom-up movements, consumer decisions [7]), here we focus particularly on invited public participation, namely processes organized by responsible parties (e.g., elected officials, government agencies, other public- or private-sector organisations) to deliberately engage the public in energy decision-making [8].

Public participation in energy matters is mandated under regulatory frameworks such as the Aarhus Convention in Europe and the Escazú Agreement in South and Central America. Under such regulatory frameworks, however, there is no reference to which public values must be engaged when organising public participation processes. The common rationale is that if people participate, important public values will automatically be represented. This assumption, however, is unjustified and likely naïve, as it does not consider people's own preferences for public participation. We propose that the extent to which different values get represented in public participation procedures depend on the linkage between people's own values and their willingness to participate, as shown below.

Values and the willingness to participate in energy decision-making

Energy transitions can have implications for four types of people's values, which serve as guiding principles in people's lives: biospheric values—caring about nature and the environment, altruistic values—caring about the well-being of society and other people, egoistic values—caring about personal resources, such as money and status, and hedonic values—caring about personal pleasure and comfort [4, 9]. Research has established that when thinking about energy system change, people draw upon their core values: the extent to which they expect negative or positive consequences for what they value will determine which changes they find acceptable or not [2, 10–12]. The way energy transitions are implemented can have consequences for other values too, in particular openness to change and traditionalism values [10, 13], for example when new energy generation technologies are introduced. Yet, here we focus firstly on the outcomes that the energy transitions may have for values related to nature, others, people's own resources and comfort. Altruistic, biospheric, egoistic and hedonic values are universal, meaning that most people find these values to some extent important [13]; these four types of values have been distinguished in different countries and across different groups in society [9, 14]. Therefore, although some (groups of) individuals may find some of these values more important than others, the entire value set needs to be considered when aiming for energy systems that would be supported widely in society.

Strikingly, however, it has not been studied how values influence people's willingness to participate in decision-making on the energy transition. If people perceive decision-making as having consequences for their core values, they may be more willing to participate than when they do not (yet) see how the decisions made could impact on their values [15]. If people with certain values are more willing to participate than people with other values, there may be asymmetry in values that are represented in participation procedures. This seems like an irony of public participation—even if the public themselves participate, some public values may still be overlooked in decision-making, hindering the potential to develop energy policies and

projects that could be accepted widely in society. The current research is the first to investigate the relationships between people's values and their willingness to participate in energy decision-making.

Decision-making chain: From abstract policies to concrete projects

We study the extent to which different values motivate people to participate at different times of decision-making. Law distinguishes in this regard three levels of decision-making: policies → plans → specific decisions [16, 17]. The former levels influence the latter levels in the chain of decision-making. For example, when authorising a wind energy park (i.e., a specific decision), discussions about the national renewable energy targets and whether to choose for wind rather than nuclear energy are no longer open for debate, legally speaking [16, 17]. Such macro policy options are usually only open for discussion when abstract energy policy choices are made (e.g., in national energy policies and plans). This implies that the later in the decision-making people participate, the fewer options are available to be discussed. As a result, people may perceive participation at this level as fake, which can fuel public resistance against the decision-making process and its outcomes [18–20]. To remedy for such negative consequences of public participation, many have argued that public participation should take place from early on in decision-making, to ensure that the concrete projects that come out of it have already taken people's important values into account [21, 22].

The question is however, to what extent people with different values participate at different levels of decision-making. Construal theory in social psychology would imply that, due to their abstract nature, values motivate people to participate at the abstract level of decision-making, and not at the concrete level of decision-making [23, 24]. Yet, we argue it is not the abstractness or concreteness of the decision-making per se, but rather the extent to which people relate the decision-making to their values. Specifically, early in decision-making, when energy projects are still abstract, people may particularly recognise the relevance for their altruistic and biospheric values. At this stage, climate and energy issues are highly complex due to their broad scale (e.g., global climate change), long-term consequences (e.g., future generations), and interconnectedness of different actors (e.g., governments, industry, citizens), and as such lending few direct references to people's daily lives [25]. Consequently, most attention in policymaking and public communication is likely paid to the urgency to reduce global warming and meeting the emission reduction targets. As a result, particularly people who more strongly endorse altruistic and biospheric values may want to participate early in decision-making. Consequently, implications of the energy transition for nature, the environment, and the society at large are likely to be brought up in participatory procedures.

When projects become concrete, however, implications for egoistic and hedonic values may become more salient, such as visual impact, noise, and possible effects on house values. In addition, some consequences for biospheric and altruistic values may come forward that had not been considered in the discussion focused on broader climate goals at the beginning, for example the fact that wind turbines might threaten local flora and fauna [26]. Consequently, even though there might have been public engagement earlier in decision-making, people facing the consequences of concrete energy projects (e.g., local communities) may feel that their important values had not been sufficiently addressed, which could trigger local resistance. The opposite might also hold—if at concrete project level mostly people with strong egoistic and hedonic values participate, the wider public's sentiment might be that participatory practices fail to represent the wide spectrum of public values. In both cases, the decision-making process—although participatory—might not deliver energy policies and projects that could rely on public support. The literature had already done a great job in uncovering possible differences

between public support for climate policies in general versus concrete projects, namely that people take different things into account and hence acceptance at a general level does not yet mean acceptance at a local level [27, 28]. New to the literature, we argue that public participation procedures play an important role in sustaining—or even giving roots to—these clashes, namely by causing a certain asymmetry of which values are being discussed at which level of decision-making. To uncover such possible challenges for public participation, and going beyond the construal theory, we explore the links between people's values and their willingness to participate at different levels of decision-making.

Project acceptability and the willingness to participate in decision-making

According to the loss aversion theory, people are more likely to act if they anticipate losses than gains [29]. People may therefore be more willing to participate in decision-making when they perceive a threat rather than support for their core values [15]. Initial evidence suggests that opponents of energy projects are indeed more willing to participate in decision-making on those projects than supporters [18, 30–32]. These studies have not investigated the role of values, however. We propose that project acceptability could boost the asymmetry of values represented in public participation procedures.

Project acceptability refers to the extent to which people evaluate energy projects favourably or unfavourably [33]. People generally accept energy projects that have favourable consequences for their core values, whereas they oppose projects that threaten their core values [33]. The stronger their altruistic and biospheric values, the more acceptable people find renewable energy projects, probably because such projects are seen as good for the environment and for the society in the long run [10, 11]. Whereas the stronger their egoistic and hedonic values, the less acceptable people find renewable energy projects, probably because such projects are often associated with higher energy prices and intermittent energy supply [10, 11].

At the abstract-level decision-making, there are no concrete projects being planned yet. Even if people with strong egoistic and hedonic values may oppose renewable energy projects, they may not feel the urge to act at this level. Yet, specifically because nothing is planned yet, this might create possible losses for people with strong altruistic and biospheric values, for example if renewables are not incorporated enough in the policy for energy transition. For example, people participate in climate protests because they are worried that current policies neglect the risks of climate change for future generations, vulnerable populations, the society at large (i.e., threats to altruistic values) and for nature and the environment (i.e., threats to biospheric values) [34]. Extrapolating from these findings, we propose that also in invited participatory practises this could further increase the likelihood that particularly altruistic and biospheric values, rather than egoistic and hedonic values, are represented at the early stage of decision-making. In contrast, at the concrete project level, the stronger their egoistic and hedonic values, the less acceptable people may find local renewable energy projects, and hence the more they may be willing to participate in decision-making. To find out, we will study whether acceptability of renewable energy in general and concrete renewable energy projects in particular mediates the relationships between people's values and their willingness to participate at an abstract- versus concrete-level decision-making, respectively.

Current research

To sum up, we test the relationships between people's values and their willingness to participate in energy decision-making at abstract and concrete level. We define abstract and concrete projects in both legal and in practical terms. Legally speaking, a project is concrete when it requires a specific decision, which will lead to a change in real life, such as an authorization to

build a wind park (Article 6 Aarhus Convention). At an abstract level, policies and plans by their legal nature only set the framework for adopting the specific decision. They are abstract because by definition they do not lead to changes in real world. For example, stating in a policy document that more wind parks should be built does not yet lead to the construction of wind parks, as long as no spatial embedment plans have been drafted and no permits have been issued. In practise, concrete projects always contain more detail, such as the effects of wind parks for local communities, whereas abstract policies and plans may focus on boarder environmental goals for example. We expect that altruistic and biospheric values are more strongly associated with people's willingness to participate at the abstract level of decision-making, whereas egoistic and hedonic values are most strongly associated with the willingness to participate at the concrete level, and that project acceptability might mediate these relationships.

We used a real-life setting and a quasi-experimental design. For the abstract-level decision-making, we studied people's willingness to participate in decision-making on the energy transition in the province of South-Holland, the Netherlands. At the time of the study, policies and plans were being developed that would steer the energy transition in the province of South-Holland. The territory of the province was divided into seven energy regions, each of which were developing their own policies and plans. We targeted all seven regions in our research. Regional peculiarities aside, the content of the regional energy strategies was mostly comparable and focused mostly on renewables, onshore wind and solar energy in particular. We collaborated with the Province of South-Holland to determine what where the energy options in the regional energy strategies and which options were open for debate at which level of decision-making.

For the concrete-level decision-making, we studied people's willingness to participate in decision-making on building an onshore wind park in one of the municipalities of the province of South-Holland—the municipality of Gorinchem. Onshore wind energy was one of the macro-options mentioned in abstract terms in the regional energy strategy of the energy region Alblasserwaard where the municipality of Gorinchem is located. By the time of the study the Municipality of Gorinchem had identified the possibility to develop a wind park in an industrial area called Avelingen, located very nearby the inhabited area of Gorinchem. The Municipality was organising public participation procedures regarding the possibility to develop this wind park. For this research, we collaborated with the Municipality of Gorinchem, which informed us about the timeline of the participatory procedure and the plans for the wind park.

Focusing consistently on the same area for abstract- and concrete-level decision-making, namely the province of South-Holland, enabled us to keep other factors such as the cultural, geographic, and socio-economic characteristics of the locality constant while testing our hypotheses. We focused on real-life decision-making that is relevant for local inhabitants who participated in this research, which strengthens the external validity of this research.

Study 1: Values and public participation in abstract-level decision-making.

Methods

Ethics statement

This research was approved by the Ethics Committee of Psychology at the Faculty of Behavioural and Social Sciences at the University of Groningen (research code: PSY-2021-S-0009). Written consent was obtained from the research participants.

We carried out a questionnaire study among the residents of the province of South-Holland. Data collection took place in December 2020 –April 2021. The data was collected using

the Dutch pre-paid panel Panelinzicht, where we set quotas based on the actual proportion of residents per municipality in the province of South-Holland, to ensure a representative distribution of participants across all seven energy regions. Participants could fill in the survey online, which took them about 30 minutes. In addition, a few responses were collected by students of a local university who approached people in their networks and randomly posted the (links to the) questionnaires in their neighbourhood in the province of South-Holland. After excluding entries without informed consent, responses that contained nonsensical text in the open comments section, and responses that contained no data for any of the survey variables, the final sample size was 1750 (some participants skipped some questions; see Table 1 for the number of participants, N , for whom the relevant data was available). Among the participants who answered the respective demographic questions, the age varied from 16 to 93 ($N = 1611$; $M = 58.12$, $SD = 16.36$); 46.3% were women, 53.2% were men, 0.4% indicated “other” gender ($N = 1619$); 1.5% had completed primary education, 84.6%—secondary or vocational education, and 12.1%—higher education ($N = 1594$); 7.3% had monthly household income lower than 1000 euros, 53.6%—between 1000 and 3000 euros, 31.5%—between 3000 and 5000 euros, and 7.6%—more than 5000 euros ($N = 1568$).

The questionnaire was introduced to participants as a survey on their opinion about the energy transition in the province of South-Holland. The participants learned that by 2050 the province of South-Holland aims to replace fossil fuels with more sustainable energy sources. Next, we gave examples of various energy projects at an abstract level that could play a role in the sustainable energy transition, and asked how acceptable participants found these different projects. For the purposes of this research, we focus on public acceptability of onshore wind turbines and solar parks (i.e., a field with many solar panels), since the Province of South-Holland indicated these two forms of renewable energy generation as the main two options for all seven energy regions.

Materials

See Table 1 for the descriptive statistics of the employed scales

Values. Participants’ altruistic, biospheric, egoistic, and hedonic values were measured using a shorter version of the Schwartz’s [13] value scale, validated previously [35, 36]. Participants indicated on a 9-points scale how important they find different values as guiding

Table 1. Reliability scores (Cronbach’s α), means (M), standard deviations (SD), and available sample sizes (N) for the employed scales.

	α	M	SD	N
Values				
Altruistic	.832	5.191	1.270	1714
Biospheric	.915	4.962	1.461	1712
Egoistic	.791	2.291	1.411	1686
Hedonic	.868	4.795	1.445	1725
Acceptability				
Solar	.913	4.800	1.626	1690
Wind	.923	4.463	1.657	1688
Willingness that the public participates				
Informed	.918	6.100	1.141	1627
Have a say	.930	5.758	1.329	1623
Co-decide	.954	5.530	1.490	1619
Decide	.963	4.674	1.746	1627

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principles in their lives, from -1 (*against my principles*) to 0 (*not important*) to 7 (*of supreme importance*). Four items measured altruistic and biospheric values each, five items measured egoistic values, and three items measured hedonic values; we averaged these items to compose the respective value scales.

Abstract-project acceptability. Based on previous research [37–40], participants reported on a seven-points scale how acceptable (1 *very unacceptable*– 7 *very acceptable*) and necessary (1 *not at all necessary*– 7 *very necessary*) they consider generating energy in the province of South-Holland by means of *solar parks* (a field with many solar panels) and *onshore wind turbines*. The two items for each energy project were averaged to compose acceptability scales for solar and wind energy, respectively.

Willingness to participate in decision-making. We operationalized four levels of public participation in decision-making: being informed, having a say, co-deciding, and deciding, representing different levels of decision-making power initially distinguished in the seminal participation ladder [41]. Previously, willingness to participate has been measured at three levels of decision-making power: being informed, having a say, and deciding [16]. We built on and extended this measure by adding the willingness to co-decide, as particularly this level of decision-making power was found to be most likely to increase public acceptability of energy projects [40]. Noteworthy, in the real-life setting where the current study was embedded, the Province of South-Holland was not initiating any events to engage the public in decision-making on the energy transition across the seven energy regions (i.e., abstract level). Asking how much people themselves would like to participate at such abstract level of decision-making might have introduced a confound in case people thought it is too unrealistic that they themselves could participate. Instead, we asked to what extent it is desirable (1 *not at all desirable*– 7 *very desirable*) and necessary (1 *not at all necessary*– 7 *very necessary*) to engage the inhabitants of the province of South-Holland in general in decision-making about the energy transition in their province, namely to *inform*, to *give them a say*, to let them *co-decide*, and to let them *take decisions themselves*. We composed four scales of the willingness that the public participates at these different levels, respectively, by averaging the scores on perceived desirability and necessity for each level.

Results

The mean scores for abstract-level acceptability of solar fields and onshore wind turbines were above the mid-point of the scale. This is in line with previous findings, such as from the European Social Survey [42], that people are generally more positive than negative towards renewable energy sources. Also, in line with the previous findings [16], the participants were very willing that the public is informed and, a little less, can have a say and co-decide about the energy transition in their province, and to a lesser extent that the public themselves can decide on the energy transition. Table 2 shows the correlations between the studied variables.

Values and the willingness that the public participates in decision-making

As expected, at the abstract policy level, stronger altruistic and biospheric values were associated more with the willingness that the public participates than hedonic and egoistic values (Table 2). Noteworthy, altruistic and biospheric values were primarily associated with the willingness that the public participates at lower levels of decision-making (i.e., moderate positive correlation with the willingness to be informed and somewhat weaker positive correlation with the willingness to have a say) rather than at higher levels of decision-making power (i.e., weak positive correlation with the willingness to co-decide and no significant correlation with the willingness to decide). Hedonic values were only weakly positively correlated with the

Table 2. Correlations (Pearson’s *r*) between the studied variables.

	Biospheric	Egoistic	Hedonic	Accept. Solar	Accept. Wind	Informed	Have a say	Co-decide	Decide
Altruistic	.736**	.071**	.466**	.242**	.253**	.364**	.289**	.216**	.048
Biospheric	1	.095**	.389**	.250**	.282**	.339**	.254**	.195**	.048
Egoistic		1	.290**	.016	.043	-.079**	-.031	-.020	.076**
Hedonic			1	.089**	.056*	.183**	.135**	.123**	.070**
Accept. Solar				1	.650**	.080**	-.017	-.034	-.081**
Accept. Wind					1	.051*	-.091**	-.123**	-.142**
Inform						1	.680**	.553**	.257**
Have a say							1	.831**	.554**
Co-decide								1	.665**

Note: Correlations higher than 0.1, namely with at least 1% of overlap between the variables, are marked in bold, ranging from small ($0.1 < r < 0.3$) to moderate ($0.3 < r < 0.5$) to large ($0.5 < r < 0.7$) correlations.

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willingness that the public is informed, has a say, and co-decides, whereas egoistic values were not at all meaningfully correlated with the willingness that the public participates at any level of decision-making.

To further investigate the strength of these relationships, we conducted four multivariate analyses of variance (MANOVA) with the four types of values as covariates, respectively, and the willingness that the public is informed, has a say, co-decides, and decides about the energy transition as dependent variables. The overall models were significant for all values (altruistic: $F(4, 1568) = 66.825, p < .001, Wilk’s \Lambda = .854$; biospheric: $F(4, 1564) = 54.290, p < .001, Wilk’s \Lambda = .878$); egoistic: $F(4, 1544) = 7.214, p < .001, Wilk’s \Lambda = .982$; hedonic: $F(4, 1577) = 14.869, p < .001, Wilk’s \Lambda = .964$). As seen in Table 3, altruistic and biospheric values had medium positive effects on the willingness that the public is informed and has a say, whereas these values had small effects on the willingness that the public can co-decide and no effects on the willingness that the public can decide about the energy transition. Hedonic values had only small positive effects on the willingness that the public is informed, has a say, and co-decides, and no effects on the willingness that the public decides, whereas the effects of egoistic values on the willingness that the public participates at any level of decision-making were all practically equal to zero.

Abstract-project acceptability and the willingness that the public participates in decision-making

At the abstract decision-making level, no concrete energy project was yet being considered. Nevertheless, we found a weak negative correlation between public acceptability of onshore wind turbines in general and the willingness that the public can participate at abstract-level decision-making, in particular with higher levels of decision-making power (Table 2).

Table 3. The strength of associations between values and the willingness that the public can participate in decision-making, as indicated by the MANOVA *B* coefficients and, in brackets, the effect sizes (η^2).

	Informed	Have a say	Co-decide	Decide	Interpretation effect size (η^2):
Altruistic	.329 (.134)	.299 (.082)	.254 (.047)	.059 (.002)	< .01 Zero
Biospheric	.263 (.116)	.229 (.065)	.198 (.038)	.052 (.002)	0.01 Small
Egoistic	-.062 (.006)	-.029 (.001)	-.021 (.000)	.095 (.006)	0.06 Medium
Hedonic	.149 (.035)	.121 (.017)	.127 (.015)	.084 (.005)	0.14 Large

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Specifically, the less acceptable people found onshore wind turbines, the more they wanted that the public can co-decide and decide about the energy transition. Acceptability of solar parks was not meaningfully associated with the willingness that the public participates in decision-making. As expected, altruistic and biospheric values were positively correlated with public acceptability of solar parks and onshore wind turbines (Table 2).

We tested whether acceptability of onshore wind turbines mediates the relationships between people's altruistic and biospheric values and their willingness that the public can co-decide and decide about the energy transition, for which we used the PROCESS macro for SPSS with a 95% bias-corrected bootstrap confidence interval with 5000 bootstrap samples. The indirect effects were significant, although the confidence intervals were close to including zero (co-decide: altruistic values: $a_i b_i = -.0583$, 95% bias-corrected bootstrap CI [-.0796 to -.0399], biospheric values: $a_i b_i = -.0579$, 95% bias-corrected bootstrap CI [-.0777 to -.0398]; decide: altruistic values: $a_i b_i = -.0593$, 95% bias-corrected bootstrap CI [-.0830 to -.0376], biospheric values: $a_i b_i = -.0586$, 95% bias-corrected bootstrap CI [-.0811 to -.0374]). When acceptability was included in the regression equation, altruistic and biospheric values were slightly more strongly and positively associated with the willingness that the public participates (altruistic: $\beta_{co-decide} = .2652$, $t = 10.5803$, $p < .0001$ and $\beta_{decide} = .0902$, $t = 3.5145$, $p = .0005$; biospheric: $\beta_{co-decide} = .2493$, $t = 9.7779$, $p < .0001$ and $\beta_{decide} = .0963$, $t = 3.7047$, $p = .0002$) than when acceptability was not included (altruistic: $\beta_{co-decide} = .2156$, $t = 8.7366$, $p < .0001$ and $\beta_{decide} = .0474$, $t = 1.8817$, $p = .0601$; biospheric values: $\beta_{co-decide} = .1922$, $t = 7.7388$, $p < .0001$ and $\beta_{decide} = .0473$, $t = 1.8780$, $p = .0606$). The findings might point out to suppression effects [43], namely that project acceptability could somewhat weaken the willingness to participate among people with strong altruistic and biospheric values, yet the effects should be interpreted with caution given that all confidence intervals for mediation analyses were close to including zero.

Discussion

Overall, the findings point out to the possibility of an incomplete representation of different values at abstract-level decision-making on energy. People with strong altruistic and biospheric values were more willing that the public is informed, has a say, and, to a lesser extent, can co-decide about the energy transition, whereas hedonic values were weakly associated and egoistic values were not at all associated with the willingness that the public could participate in decision-making. In addition, we found initial evidence that already at abstract-level decision-making, opponents of energy projects—specifically onshore wind turbines—might want the public to be able to (co-)decide about the energy transition, which until now was only shown for concrete energy projects [31]. Interestingly, whereas altruistic and biospheric values were mostly associated with the willingness that the public is informed and can have a say, project opposition was associated with the willingness that the public can co-decide and decide about the energy transition.

Study 2: Values and public participation in concrete-level decision-making.

Methods

Ethics statement

This research was approved by the Ethics Committee of Psychology at the Faculty of Behavioural and Social Sciences at the University of Groningen (research code: PSY-2122-S-0133). Written consent was obtained from the research participants.

We conducted a questionnaire study among the inhabitants of the municipality of Gorinchem living within a 500m-2000m distance from where the wind park would potentially be

sited. Data gathering took place in two phases, which corresponded to two key moments in the Municipality's initiated public participation activities regarding the possibility of placing the wind turbines. The first phase of data gathering took place in February-March 2022, at the very beginning of the participatory process. In this period, the Municipality organised first an information webinar, which was livestreamed. There is no information available about how many persons partook to that event; the videorecording is available on Youtube and shows that 874 persons looked at the video. Secondly, a webinar was organised to discuss the results of the first round of research into various aspects of the wind park project. Again, we do not have the data about the exact number of participants during the live meeting; the videorecording on Youtube shows 28 views. The second phase of data gathering took place in September, 2022, after the Municipality had presented the results of the various studies performed to better understand the pros and cons of the possible wind turbines, including an assessment of the potential impacts on nature and the results from our research from the first phase on the perceptions of the inhabitants. Specifically, in August-September 2022, the Municipality sent 8500 letters to local inhabitants about the plans for the wind park, organised a social media campaign (the Municipality estimated the reach of 20.000) and an information market, and launched a Swipocracy app to reach young people (i.e., some questions about the project, with the possibility to swipe left and right for agreement or disagreement). For this latter strategy the Municipality reported that 283 young people used the app. In general, the Municipality's summary report about public participation of October, 2022 indicated that only a small group actively participated, potentially due to COVID, according to the authors of the report. We started the second phase of data gathering right after the completion of the participatory activities organised by the Municipality.

In Phase 1, residents received a letter with a short description of the research, a link to the online survey, and a personal login code for the survey. For random assignment, we sent letters to all uneven addresses of the targeted region. In Phase 2, we sent letters with the invitation to the survey to people from Phase 1 who indicated they wanted to participate again in this research. In addition, in Phase 2 we used a door-to-door procedure, where trained research assistants approached people at home asking whether they would like to participate in this research. We went to even addresses in the Gorinchem municipality. It should be noted that in Phase 2 the target area was reduced in size as the Municipality of Gorinchem had reduced the size of the Avelingen area considered suitable for onshore windmills, following the results of the first round of environmental and technical studies. If people wanted to participate, they were handed a leaflet with the link to the online survey and a personal login code. The questionnaire was almost identical in both phases; filling in the survey took about 20-25min. Upon filling in the survey people received a 5 euros voucher for a local bakery.

After excluding entries in the online questionnaire without the informed consent, responses that contained nonsensical data in the comments section, and responses that contained no data for any of the survey variables, the final sample size was 857 in Phase 1 (out of the total of 6500 sent letters; response ratio = 13.18%) and 314 in Phase 2 (out of the total 1508 approached addresses; response ratio = 20.82%). Some participants skipped some questions; Table 3 shows the number of participants, N , for whom the relevant data was available. Among the participants who answered the respective demographic questions, the age from participants varied from 17 to 98 in Phase 1 ($N = 759$; $M = 56.06$, $SD = 15.76$) and from 18 to 84 in Phase 2 ($N = 289$; $M = 58.92$, $SD = 15.37$). In Phase 1, 38.2% were women, 54.7% were men, 0.6% indicated "other" ($N = 767$), and in Phase 2, 30.6% were women, 69% were men, 0.3% indicated "other" ($N = 297$). In Phase 1, 0.8% had completed primary education, 75.8%—secondary or vocational education, and 17.7%—higher education (2 participants indicated "no education", and 16 indicated "other", $N = 743$). In Phase 2, 1% had completed primary education, 74.4%—

secondary or vocational education, and 18.2%—higher education (7 participants indicated “other”, $N = 285$). In Phase 1, 1.8% had household income lower than 1000 euros per month, 25.4%—between 1000 and 3000 euros, 45.4%—between 3000 and 5000 euros, and 27.4% more than 5000 euros ($N = 736$). In Phase 2, 2% had household income lower than 1000 euros per month, 14.2%—between 1000 and 3000 euros, 37.9%—between 3000 and 5000 euros, and 27.4% more than 5000 euros ($N = 241$).

Materials

Table 4 shows the descriptive statistics for the relevant measures in both research phases.

Values

People’s altruistic, biospheric, egoistic, and hedonic values were measured in the same way as in Study 1.

Specific-project acceptability

As in Study 1, participants reported on a seven-points scale how acceptable (1 *very unacceptable*– 7 *very acceptable*) and necessary (1 *not at all necessary*– 7 *very necessary*) they find it to develop wind turbines in Avelingen. In addition, because there were concrete plans to develop the wind turbines in this area, we asked participants how much they were against or in favour (1 *very much against*– 7 *very much in favour*) of developing wind turbines in Avelingen. The scores across the three items were averaged to compose the project acceptability scale.

Willingness to participate in decision-making

Since the municipality of Gorinchem was actually organising public participation events where everyone from the municipality could participate, we asked how much participants themselves were willing to participate in decision-making. Participants indicated to what extent they find it desirable (1 *not at all desirable*– 7 *very desirable*) and necessary (1 *not at all necessary*– 7 *very necessary*) to be informed, and to be able to *have a say, influence the decisions, and decide themselves* about the wind turbines in Avelingen. We composed four scales of willingness to participate at these different levels, respectively, by averaging the scores on perceived desirability and necessity for each item.

Table 4. Reliability scores (Cronbach’s α), means (M), standard deviations (SD), and available sample sizes (N) for the employed scales.

Research phase:	α		M		SD		N	
	1	2	1	2	1	2	1	2
Values								
Altruistic	.739	.841	5.793	5.614	1.043	1.280	755	290
Biospheric	.845	.890	5.606	5.497	1.184	1.386	750	290
Egoistic	.753	.758	2.426	2.329	1.503	1.497	748	283
Hedonic	.843	.827	4.931	4.734	1.532	1.589	750	291
Acceptability wind park	.961	.974	2.860	2.999	2.187	2.331	796	298
Willingness to participate								
Inform	.915	.897	6.012	6.000	1.453	1.323	769	300
Have a say	.947	.907	5.729	5.786	1.624	1.515	782	299
Co-decide	.954	.931	5.702	5.741	1.673	1.552	783	299
Decide	.970	.973	5.031	5.079	2.059	1.986	783	299

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Results

As seen in Table 4, acceptability of the wind turbines was below the mid-point of the scale in both phases, suggesting the plans to develop wind turbines in this area were rather controversial. Participants wanted to be informed, have a say, and co-decide about the wind turbines, and to a somewhat lesser extent, but still rather strongly, to decide about the wind turbines.

Table 5 shows the correlations between the studied variables.

Values and the willingness to participate in concrete decision-making

As seen from Table 5, there were small positive correlations in Phase 1 between altruistic values and the willingness to decide about the wind park, and between hedonic values and the willingness to co-decide and decide about the wind park; values were further not meaningfully associated with the willingness to participate in local decision-making in neither study phase. To test this further, we conducted four multivariate analyses of variance (MANOVA) in each study phase, with the four types of values as covariates, respectively, and the willingness to be informed, have a say, co-decide, and decide about the wind park as dependent variables. In both study phases, the overall models were not significant for all values (see S1 Text for the MANOVA output), except for hedonic values in Phase 1 ($F(4, 703) = 3.020, p = .017, \text{Wilk's } \Lambda = .983$). The stronger their hedonic values, the more people wanted to co-decide ($\beta = .107, p = 0.009, \eta^2 = .010$) and decide themselves about the wind turbines in Avelingen ($\beta = .169, p < 0.001, \eta^2 = .016$); the effects were small in both cases.

Concrete-project acceptability and the willingness to participate in decision-making

Acceptability of the wind park was significantly and negatively associated with the willingness to participate in decision-making, in both study phases (Table 5). To further investigate these relationships, we conducted in each study phase a multivariate analysis of variance (MANOVA) with project acceptability as a covariate and the willingness to be informed, have a say, co-decide, and decide about the wind park as dependent variables (Table 6). The overall models were significant in Phase 1 ($F(4, 743) = 85.459, p < .001, \text{Wilk's } \Lambda = .685$) and Phase 2 ($F(4, 285) = 43.408, p < .001, \text{Wilk's } \Lambda = .621$). The less people accepted the wind park, the more they wanted to participate in decision-making; these effects got larger as the level of the decision-making power increased.

Table 5. Zero-order correlations (Pearson's *r*) between the studied variables, above for study phase 1 and below for study phase 2.

	Biospheric	Egoistic	Hedonic	Acceptability wind park	Inform	Have a say	Co-decide	Decide
Altruistic	.596** .744**	.124** .088	.289** .327**	-.035 .108	.061 .060	.097** .060	.096** -.010	.110** -.052
Biospheric	1	.143** .164**	.236** .353**	.054 .129*	.034 .020	.027 .013	.033 -.021	.040 -.068
Egoistic		1	.379** .371**	.015 -.005	-.051 .004	-.012 .064	.023 .062	.052 .074
Hedonic			1	-.050 -.096	.039 .004	.077* .047	.106** .105	.135** .060
Acceptability wind park				1	-.195** -.244**	-.481** -.511**	-.519** -.553**	-.529** -.571**
Inform					1	.579** .649**	.531** .542**	.399** .366**
Have a say						1	.881** .835**	.706** .621**
Co-decide							1	.776** .744**

Note: Correlations higher than 0.1, namely with at least 1% of overlap between the variables, are marked in bold, ranging from small ($0.1 < r < 0.3$) to moderate ($0.3 < r < 0.5$) to large ($0.5 < r < 0.7$) correlations.

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Table 6. The strength of associations between project acceptability and the willingness to participate in decision-making, as indicated by the MANOVA *B* coefficients and, in brackets, the effect sizes (η^2).

	Phase	Informed	Have a say	Co-decide	Decide	Interpretation effect size (η^2):
Acceptability wind park	1	-.128 (.037)	-.353 (.228)	-.393 (.266)	-.491 (.272)	< .01 Zero 0.01 Small
	2	-.140 (.060)	-.332 (.259)	-.369 (.307)	-.488 (.325)	0.06 Medium 0.14 Large

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In Phase 2, biospheric values were positively associated with the acceptability of the wind park (Table 4), and we therefore tested in Phase 2 whether project acceptability mediates the relationship between biospheric values and the willingness to participate in decision-making. The confidence intervals for the indirect effects were very close to including zero (informed: $a_i b_i = -.0287$, 95% bias-corrected bootstrap CI [-.0574 to -.0025]; have a say: $a_i b_i = -.0701$, 95% bias-corrected bootstrap CI [-.1330 to -.0086]; co-decide: $a_i b_i = -.0767$, 95% bias-corrected bootstrap CI [-.1455 to -.0064]; decide: $a_i b_i = -.1017$, 95% bias-corrected bootstrap CI [-.1970 to -.0127]), and biospheric values remained unrelated to the willingness to participate in decision-making when controlling for project acceptability ($\beta_{informed} = .0470$, $t = .8380$, $p = .4028$; $\beta_{have\ a\ say} = .0834$, $t = 1.4931$, $p = .1365$; $\beta_{co-decide} = .0518$, $t = .9290$, $p = .3537$; $\beta_{decide} = .0068$, $t = .0948$, $p = .9246$), leading us to conclude that project acceptability did not mediate the relationship between biospheric values and the willingness to participate in concrete-level decision-making.

Discussion

Overall, values were not associated with the willingness to participate in decision-making about a local wind energy project, except for a small positive correlation between hedonic values and the willingness to (co-)decide in Phase 2. In contrast, project acceptability was a strong predictor of the willingness to participate. The less acceptable people found the project, the more they wanted to participate, especially with higher levels of decision-making power.

General discussion

The sustainable energy transition will affect many things that are of value to people—taking such value impacts into account in decision-making is critical for developing socially acceptable energy policies and projects [2, 3, 15, 22]. A widely advocated strategy to better incorporate public values in energy policies and projects is by stimulating public participation from early on in decision-making [8, 15, 21, 44]. We argued, however, that simply inviting people to participate does not yet ensure that different values will be represented throughout the chain of decision-making. The current study on what motivates people to participate in decision-making points out to possible incomplete representation of values in participatory practises.

Early in decision-making when energy projects were still abstract, people were most wanting to participate if they strongly endorsed altruistic and biospheric values. This could be because the policymaking at this stage focuses mostly on broad sustainability goals, such as reducing climate change and its negative consequences for the society. It is typically not discussed at this stage what implications the broad energy policies would have for people's daily lives, such as energy bills, energy infrastructure, and daily energy use. As a result, people may not (yet) see the decision-making as relevant for their egoistic and hedonic values, and therefore not want to participate if they strongly endorse these values. This might strengthen the so-called “social gap” or the “national-local gap” between high public acceptance of renewables in

general versus local opposition to concrete renewable energy projects [27, 28]. Research shows that when assessing abstract energy projects, people may not consider specific drawbacks related to the siting and operation of concrete projects—they only consider such drawbacks when the projects become concrete, which might lead them to oppose the projects [45]. Our research provides the first evidence that similar processes can carry over to participatory decision-making. Specifically, early in decision-making, people may discuss implications particularly for their altruistic and biospheric values, rather than for their hedonic and egoistic values. Once the policies turn into projects, people therefore may still have the feeling that not all of their values were represented in decision-making. As such, public resistance against local energy projects might remain despite the fact that public participation took place early in decision-making.

In decision-making on a concrete, local wind energy project, especially project acceptability was strongly related to the willingness to participate. The less acceptable people found the project, the more they wanted to participate in decision-making, replicating previous findings that opponents of a local wind energy project were most willing to participate in decision-making [31]. New to the literature, we showed that at a concrete project level, opposition to the project was a stronger motivator for people to participate in decision-making than their values. This might have to do with the policy discourse around public participation in renewable energy siting. The dominant rationale among practitioners for organising public participation at this level is to create public support for already pre-defined projects [46, 47]. Consequently, people may perceive public participation procedures as an attempt to “sell” them the project, and their own participation as a way to say “no” to the project. This might especially be the case when community acceptability of a certain project is already low, as we indeed observed in this study. Especially then framing—even if implicitly—participation procedures as a “Yes” or “No” battle might mobilize opponents to participate.

Relatedly, we observed that altruistic, biospheric, and, to a lesser extent hedonic values were associated with people’s willingness to be informed, have a say, and co-decide about the energy transition, rather than with the willingness to take decisions themselves. In contrast, project opposition was most strongly associated with people’s willingness to decide themselves about the wind energy project. This might point out to different ways how people may act in public participation procedures, depending on whether they are motivated by their values or by how acceptable they find the project. Notably, a widely recommended form of public participation is deliberation, which entails that participants actively process balanced information, weigh and reflect on different arguments, and justify their own perspectives [48]. Judging from the current findings, if people participate in decision-making out of their values, they may be open to consider different types of information and to co-create decisions together with others. If, however, project opposition is driving them, people may only want to be able to decide against the project. Research has shown that people were most willing to participate if they thought a wind energy park could not be accepted under any conditions—and thus not willing to deliberate—rather than if they thought the project could be acceptable if certain conditions were met [31]. Our research extends these findings by showing that values may be the key to deliberation—people may be more likely to deliberate if they see the decision-making as relevant for their broader values, rather than just as a way to say “no” to a project.

From the first impression the findings seem in line with what the construal theory would predict, namely that values primarily influence the willingness to participate at an abstract project level. Yet, our findings extend the construal theory by showing that not all values motivate people to participate at the abstract level, suggesting that it is the value relevance rather than the level of abstractness or concreteness per se that motivates people to participate. This is

an important paradigm shift that presents values as a key factor for interventions aimed at increasing the effectiveness of participatory practices, as explained below.

Practical implications

Our findings have implications for the legal framework on public participation, as well as for day-to-day practices in organising public participation on energy matters. From a legal perspective, regulators should not blindly maintain the rule that options discussed with the public at abstract level of the decision-making chain do not need to be discussed again with the public during the development of specific projects. Our findings point out that, even if the public participates, the discussion at an abstract level might not be encompassing all different values, and “new” values may become relevant further down in the decision-making chain. The regulatory approach aims at ensuring stability of decision-making (i.e., options discussed earlier cannot be re-discussed later), which is considered to foster clarity about policies and regulation (i.e., legal certainty principle; [17]). This is an important public goal, but in the field of public participation in energy decision-making, it seems hindering the effective incorporation of public values in developing energy policies and projects. Alternative, more flexible, frameworks should be considered and tested to see how the effectiveness of public participation can be increased while in keeping with legal certainty.

From the perspective of policy-makers, our findings show the importance of making abstract levels of decision-making more concrete, for example by referring to specific developments like a concrete wind park at a specific location. Such a concretisation of the plans could help making the implications of the proposed plan and related concrete projects on egoistic and hedonic values more visible, possibly motivating people to discuss these values at a level of the decision-making chain when macro-options are still open.

Finally, our findings suggest that at the level of concrete projects, the instrumental approach to public participation can potentially lead to counterproductive results. Public participation is generally meant to serve three major goals: normative—citizens can influence decisions that affect them; substantive—decisions are enriched with the unique knowledge and expertise of citizens; and instrumental—increased public acceptability of the decision-making process and its outcomes [49]. Research shows that people generally think that public participation should have normative goals (e.g., create opportunities for fair discussion, identify what is most important for the public) more than instrumental goals (e.g., decrease costs for implementing a decision, avoid delays in implementing a decision) [50]. Focusing narrowly on increasing acceptability at a level of decision-making in which project opposition is the main driver for public participation will only put decision-makers in the difficult position of having to decide between halting the project or upsetting the participants, with potential long-term negative effects on trust in decision-makers. Bringing normative and substantive goals more to the forefront of public participation practices could lead to such practices being more open for participants’ discussion of different values, which could in turn increase the deliberative potential of such practices.

Limitations and future research

The current findings are important as they shed light on factors that could jeopardise the effectiveness of public participation in reaching more socially acceptable energy policies and projects. Yet, more research is needed to establish the validity and generalizability of the findings, and to identify the conditions under which different values are either more or less likely to be represented in participatory practices.

To ensure external validity of the findings, we adjusted the measures of the willingness to participate to the real-life context of public participation at different levels of decision-making.

In Study 1, where the Province of South-Holland was not initiating any concrete public participation events, we asked how much in general participants thought that the public should participate at such abstract level of decision-making. In Study 2, where there were concrete opportunities for public participation offered by the Municipality of Gorinchem, we asked how much people themselves would like to participate. While fitting the real-life context, the differences in measures put some limits on internal validity, as people may think differently about public participation in general versus their own participation. For example, one might argue that people with strong biospheric may fear that broad public participation could be a threat to renewable energy projects. Our findings do not support this alternative explanation, however, as we still found a positive relationship between biospheric values and the willingness that the public participates in Study 1, and in Study 2 we found that particularly project resistance—rather than project acceptance rooted in biospheric values—was motivating people to participate themselves. Nevertheless, it is important for future research to study the relationships between values and people's own willingness to participate at abstract-level decision-making, for example with hypothetical scenarios or in real-life cases whenever public participation at this level is organised, as in the case of referenda or events like the French *Convention Citoyenne pour le Climate*.

Relatedly, more work is needed to validate the measure of people's willingness to participate in decision-making. Extending previous research where the willingness to participate was measured at three levels—being informed, having a say, and deciding [16], we added the level of co-deciding, as a recent study has shown this might be the most important level for increasing public acceptability of energy projects [40]. Our results showed that the four dimensions correlated positively with each other, yet the correlations, as well as the means of the willingness to be informed, have a say, co-decide and decided varied, supporting that they are distinct levels of decision-making, in line with our theorising. Future research could test the convergent validity of the willingness to participate measure by examining how well it correlates with theoretically related constructs, for example participatory efficacy (i.e., beliefs that one's participation will make a difference; [51]), and predictive validity, in particular how well it explains the actual public participation. There might be an intention-behaviour gap between people's willingness to participate and their actual participation, for example because people face constraints such as not having the time to come to participation events. Future research could test under which conditions and which values predict actual public participation most strongly.

We focused on one specific region, namely the province of South-Holland in the Netherlands. It was a relevant target area for our research question, because at the abstract level we could cover seven different regions with their own energy strategies. Besides, the fact that there was a concrete wind project planned in one of the municipalities gave us a unique opportunity to study abstract- and concrete-level decision-making in the same region, thereby controlling for many confounding factors that would occur if different regions were targeted for each level of decision-making. Yet, more research is needed to test whether the findings are generalizable to different regions and in different countries. If any differences in findings occur, this could shed light on the possible effects of various geographical, cultural, political, and socio-economic factors on the potential to incorporate different public values in participatory decision-making on energy matters.

Next, we focused only on solar fields and wind energy in the study on abstract-level decision-making, and only on wind energy in the study on concrete-level decision-making. Again, this fitted the context of our research, because solar and wind were the main energy sources considered by the Province of South-Holland. Besides, by studying one and the same energy source at the abstract- and concrete-level decision-making we could

prevent confounding factors related to different types of energy sources. Yet, it is equally relevant to study what motivates people to participate in decision-making on other renewable energy sources that might be important in other countries and regions, for example geothermal energy, hydro-energy, and biomass. We already saw some differences in the current data—opposition to onshore wind turbines, but not to solar fields, was related to the willingness to participate in abstract-level decision-making. Plans for local wind energy projects are often controversial and trigger local resistance, which could explain why wind opposition was such a strong driver of the willingness to participate. Indeed, previous evidence of the negative relationship between project acceptability and the willingness to participate also comes from wind parks [31]. Future research is needed to test whether and to what extent opposition is an important driver of public participation in decision-making on other renewable technology siting, including projects varying in the level of public acceptability.

In this research, egoistic and hedonic values were not related to project acceptability nor the willingness to participate in decision-making on a concrete project level. This is surprising, given that particularly at this level people may consider the consequences for their egoistic and hedonic values, such as visual impact, noise, and reduced house values because of the nearby wind turbines. Research shows that egoistic and hedonic values can be related to acceptability of energy projects with concrete local consequences, such as gas extraction that causes local earthquakes in the Netherlands [52]. Future research is needed to test when and how different values influence public acceptability of abstract versus concrete projects, and, importantly, the willingness to participation in decision-making on those projects. Also, future research is needed to test whether the negative association between project acceptability and the willingness to participate at an abstract level can be replicated. This is the first time that this relationship was tested at an abstract level, and we found initial evidence that even when no concrete project plans are in place, opponents of certain developments, in this case wind parks, may already be more inclined to participate than supporters. The relationship was weak, which is not surprising given that there are no concrete project plans yet; however more evidence is needed to substantiate whether this relationship indeed holds.

Another valuable avenue for future research is to test how values connect to people's preferences for different forms of public participation and of decision-making more generally. On the one hand, the extent to which people want to participate can depend on how much they recognise decision-making as relevant for their core values, as argued in this paper. On the other hand, different forms of decision-making, participatory or not, might appeal to varying extent to people with different values. Notably, the stronger their altruistic values, the more people supported normative goals of participatory practices, related to deliberating all issues important to the public, whereas the stronger their egoistic values, the more people supported instrumental goals, related to the cost- and time-effectiveness of decision-making [50]. Our finding that altruistic values were most strongly related to the willingness to be informed and consulted could reflect that for people strongly endorsing these values it is indeed important to have a wide discussion, without one party—including the public—dominating. One potential reason why we did not find a relationship between egoistic values and preferences for public participation could be because this form of participation is seen as lengthy and not the most efficient, which might not appeal to people with strong egoistic values. Building on the current study and previous research [50], future research could test how the perceived value relevance and the form of (participatory) decision-making, respectively, as well as their interaction, connect to the willingness to participate among people with different values.

Conclusions

To conclude, altruistic and biospheric values may dominate in public participation practices early on in energy decision-making, which could have ripple effects on public acceptability later on, if people think their egoistic and hedonic values had not been properly represented. At a concrete project level, on the other hand, a broader value discussion might be hindered by people primarily wanting to say “no” to the project. Creating more room in the legal framework to discuss different values at different times, specifying the outcomes of abstract energy policies for people’s daily lives, and moving away from a purely instrumental approach to participatory decision-making could potentially foster the inclusion of public values in energy decision-making through public participation.

Supporting information

S1 Text. MANOVA output for non-significant models with the four types of values as covariates and the four types of public participation as dependent variables.
(DOCX)

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