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It matters to be heard: Increasing the citizen acceptance of low-carbon technologies in the Netherlands and United Kingdom

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ABSTRACT

The deployment of low-carbon technologies such as carbon capture utilization and storage (CCUS) and onshore wind is essential to mitigate climate change, but may be met with resistance from local residents. In two experimental surveys (Study 1: Dutch citizens, $N = 395$; Study 2: United Kingdom citizens, $N = 240$) we investigated the importance of the quality of the voice opportunity offered to local residents in the decision-making process for acceptance of CCUS (Study 1) and onshore wind (Study 2) projects. Participants read a scenario in which they were asked to put themselves in the position of a resident in a town near which a project developer planned to implement a CCUS or onshore wind project. Depending on the experimental condition, participants read that they, as local residents, could voice their opinion and that their input was considered (genuine voice) or was not considered (pseudo voice) by the developer, or that they could not voice their opinion (no voice). As predicted, giving local residents a genuine voice opportunity resulted in higher project acceptance compared to giving a pseudo voice or no voice opportunity, due to an increase in perceived procedural fairness and trust in the project developer. Results further showed that giving a pseudo voice opportunity can be equally detrimental as giving no voice opportunity at all. The findings underline the importance of genuine voice opportunities and show that policymakers and project developers should avoid voice opportunities where residents' input is seemingly ignored.

1. Introduction

The deployment of technologies that emit low levels of CO_2 emissions, or no net CO_2 emissions, is essential to mitigate climate change [1]. These technologies include but are not limited to onshore and offshore wind, solar photovoltaic, hydropower, geothermal, nuclear, and carbon capture utilization and storage (CCUS). The current study focused on carbon capture utilization and storage (CCUS) and onshore wind as two relevant examples of low-carbon technologies implemented at the community level (see Section 1.3 for more details about the study design and both technologies). A successful transition to low-carbon technologies such as CCUS or onshore wind not only depends on the technological and economic feasibility of and political support for those technologies and projects, but also on their so called social feasibility [1]. Whether stakeholders and local communities accept CCUS or onshore wind projects is of key importance for project implementation [2–7]. There are numerous examples in recent years of how resistance from relevant stakeholders can contribute to slowing down or halting the implementation of low-carbon technology projects [6]. It is therefore imperative that we learn more about factors that may reduce or prevent local resistance to CCUS and onshore wind projects.

Public participation practices may foster the acceptability and legitimacy of low-carbon technology projects [8]. *Voice opportunities* are opportunities for local residents to express their opinions to a decisionmaker [25]. Giving local communities a voice in the design, planning, and implementation of projects can increase feelings of procedural fairness and trust in project developers, which, in turn, has the potential to increase project acceptance [2,4,5,9–27]. However, relatively little empirical attention has been given to the possibility that when local residents feel that their voiced input is not considered by project developers, providing a voice opportunity may have detrimental effects. Voice opportunities have vast qualitative differences, ranging from meaningful or genuine voice, to pseudo voice or virtually no voice. Prior empirical studies have primarily contrasted the public's responses to voice versus no voice situations, while responses to pseudo voice situations and the contrast with other types of voice opportunities have been understudied. The present research extends previous research by comparing, in a single design, public responses to different types of voice

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opportunities offered in the context of CCUS and onshore wind projects.

The questions central to the research presented in this paper are: How does the quality of the voice opportunity offered to local residents in the context of a CCUS or onshore wind project affect perceived procedural fairness of the decision-making process and trust in the project developer, and how do procedural fairness and trust subsequently affect project acceptance? We examined these questions in two experimental surveys in which we systematically varied the quality of the voice opportunity employed (genuine voice, pseudo voice, or no voice) and measured perceived procedural fairness, trust in the project developer, and project acceptance. The findings presented here seek to highlight decision-making procedures that local residents perceive to be fair, build trust, and have the potential to increase community acceptance for CCUS and onshore wind projects.

1.1. Acceptance, perceived procedural fairness and trust

We define *project acceptance* as the acceptance of specific local projects by members of communities in the immediate neighborhood of these projects [7]. *Perceived procedural fairness* refers to the extent to which local residents feel that decisions regarding the design, planning, and implementation of low-carbon technology projects that may affect them are taken in a fair way [5,11]. *Trust* has been defined as "a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behavior of another" ([28], p. 395). In this context, we consider trust in the project developer to be a belief that a project developer is able and has the intention to act in the interest of the public [10].

Prior research has shown that the extent to which people consider the project decision-making process as fair and whether they trust actors responsible for low-carbon technology projects and associated infrastructures affects their willingness to accept low-carbon technology projects in their community, such as those involving wind farms [10,12,26,27,29], solar photovoltaic systems [15], grid expansions [4,14], and CCUS [19,30–33]. Perceived procedural fairness and trust in project developers generally increase project acceptance, whereas a lack of procedural fairness in decision-making and a lack of trust in project developers have been found to play an important role in low acceptance levels of low-carbon technology projects by local communities [2–5,7,12,24,26,27,33–36].

1.2. (Pseudo) voice in decision-making

Voice refers to the opportunity to express opinions in decision-making processes [11]. Research on community participation and engagement in the context of low-carbon technologies and associated infrastructures, as well as psychological research on voice effects in decision-making, both suggest that giving local communities a voice opportunity in the design and implementation of low-carbon technology projects can increase the perception that decision-making procedures are fair, instigate trust in the project developer, and result in higher project acceptance [2,4,5,9–27,37]. People generally value voice in decision-making because expressing their views provides them with a feeling of control over their own outcomes [38]. Moreover, people may use procedural fairness information associated with voice procedures to make inferences about the decisionmaker and/or their relationship with the decisionmaker. The quality of how one is treated conveys information on whether the decisionmaker respects and values the individual in question and can be trusted [39]. The feeling that the participatory process is fair can foster trust in decision-making institutions [18,26,27,39,40], which can lead to greater acceptance [4,10,18,41,42].

However, not all voice opportunities are met with enthusiasm [13,14,26,27,43]. This is because there can be vast qualitative differences in voice opportunities. Several authors suggest that what is key for positive voice opportunity effects to occur is that residents perceive the received voice opportunity as meaningful and genuine [8–10,12–15,20,25–27,31,40,43–46]. This means that local residents need to perceive that their voiced input is acknowledged and valued enough to potentially affect project design or implementation decisions [9,10,14,20,25,27,37,45,47]. In other words, particularly when voice is accompanied by consideration (i.e., responsiveness by the project developer) and potential influence (i.e., is input reflected in the project design and implementation), voice can lead to greater perceived procedural fairness, trust in the project developer, and project acceptance [9,14,25–27,31,37,45,47–49].

Recognizing qualitative differences in voice opportunities is important, as in practice, residents of nearby planned low-carbon technology projects do not always feel that project developers intend to take their input into account [9,13,14,31,43,45,47,49–51]. They may experience or perceive that the procedures to give local communities a chance to have their voices heard are not real, but instead an act of window-dressing (i.e., a sham, fake, tokenism, a paper exercise) carried out for strategic reasons or to comply with legislation, while the design and implementation of the project have already been decided before public consultation. When residents perceive a voice procedure as fake, it can negatively affect perceptions of the project and the project developer and drastically reduce the potential positive effect of giving them a voice opportunity on acceptance of the project. In this paper, we refer to procedures that provide local communities a voice opportunity while their input (in the eyes of residents) is never considered or acted upon as "pseudo voice" [9,31,48]. Important to note here is the pivotal role of *perception*: local residents may experience pseudo voice when a project developer is in fact taking their input seriously, but they may also perceive a voice situation as genuine when it is not.

Despite the recognition of the importance of offering local residents genuine voice opportunities (vs. pseudo voice opportunities) in the context of the siting of low-carbon technology projects as well as evidence indicating that residents often feel that their input is not being given consideration, there has been a lack of systematic empirical comparison of the two types of voice opportunities in the scientific literature. At the same time, we see that providing citizens with voice opportunities is increasingly considered important by policymakers and that public participation rights are now part of environmental policy making in most European countries [52]. Therefore, it is for both theoretical and practical reasons important to better understand citizen responses to different types of voice opportunities.

1.3. Overview of studies and hypotheses

Low-carbon technologies range from renewable technologies to technologies such as CCUS or nuclear. Some technologies instigate more societal debate than others, but technologies such as CCUS and nuclear, like renewable technologies, are part of EU energy and climate policy and considered key decarbonization technologies [54]. Despite the evident differences between technologies and how society feels about them, what people consider important in siting processes (voice, fairness) is likely quite similar, with comparable underlying psychological processes. To show the robustness of findings across technologies, we chose to focus on CCUS and onshore wind as two relevant examples of low-carbon technologies implemented at the community level. Despite successful implementation in some European countries, implementation of CCUS and onshore wind has been slow in others, and a lack of public support, trust in project developers, and perceived unfair decision-making are believed to play an important role in this [3,24]. Respectful engagement with local communities and participation of local residents are regarded as critical for the successful implementation of CCUS and onshore wind projects [9,13,17,37,55], but until now, no systematic analysis on the effectiveness of different types of voice opportunities (genuine voice vs. pseudo voice vs. no voice) offered to local communities in the context of these technologies has been conducted.

In two experimental surveys we examined the possibility that

positive effects of giving local residents a voice opportunity (compared to no voice opportunity) in the context of CCUS and onshore wind projects occur when this voice opportunity is genuine, and that these effects decrease when residents perceive pseudo voice [9,13,14,20,25,27,31,45,48,53]. We argue that when residents feel that the project developer's participatory process is fake and that their voiced input is not considered, it harms the perceived procedural fairness of the decision-making process and consequently, their trust in the project developer. As a result, residents are less inclined to accept the proposed project. Fig. 1 summarizes our research model.

The set-up of the two studies was comparable. Participants were asked to immerse themselves in a situation in which they lived in a town near which a project developer planned to implement a CCUS (Study 1) or onshore wind (Study 2) project. They were asked to imagine that they, as residents of the town, had attended an information meeting organized by the project developer. Participants either learned that, in that meeting, they as residents had received a voice opportunity and that the project developer had taken their input into account (genuine voice condition), that they had received a voice opportunity but that the project developer (most likely) had not taken their input into account (pseudo voice condition), or that no voice opportunity had been given at all (no voice condition). Participants then answered questions pertaining to perceived procedural fairness of the decision-making process, trust in the project developer, and project acceptance. Building on our literature review, we tested the following predictions in both studies:

Hypothesis 1. Giving local residents a genuine voice opportunity would result in higher perceived procedural fairness of the decision-making process, higher trust in the project developer, and higher project acceptance, compared to giving a pseudo voice opportunity or no voice opportunity (cf. [2,4,5,9–27,31,37,45,47–49]).

Hypothesis 2. The positive effect of giving local residents a genuine voice opportunity on project acceptance as predicted in Hypothesis 1 would be mediated by perceived procedural fairness of the decision-making process and trust in the project developer (in that order) (cf. [2–5,7,9,10,12,18,24,33–36,39–42]).

To the best of our knowledge, there is no empirical research in the context of low-carbon technology projects in which public responses to pseudo voice situations were systematically compared with responses to no voice situations (but see [27] for a comparison of no participation with alibi participation in a different context). Because of this, we did not formulate specific hypotheses regarding potential differences in perceived procedural fairness of the decision-making process, trust in the project developer, and project acceptance.

2. Study 1

In this study we tested Hypotheses 1 and 2 in the context of the siting of carbon capture utilization and storage (CCUS) infrastructure in the Netherlands. Carbon capture and utilization (CCU) and carbon capture and storage (CCS) involve capturing CO_2 emissions (e.g., from industrial processes), transporting the CO_2 (e.g., via pipelines), and either using the CO_2 as feedstock for carbon-based products (CCU) or permanently storing the CO_2 in the deep underground (CCS). The implementation of CCUS is part of energy and climate policy in several European countries, including the Netherlands [56,57]. However, the implementation of CCS has attracted considerable public opposition in the past years [3,31,58], while CCU is still at an early stage of implementation and little research into public acceptance of the technology has been conducted [58–61]. We examined whether and how citizen responses to the siting of a CO_2 transport pipeline project near their home depend on the type of voice opportunity (genuine voice vs. pseudo voice vs. no voice). For exploratory purposes, we systematically varied whether the CO_2 pipeline was part of a CCU project (i.e., the transported CO_2 would be used to produce new products) or of a CCS project (i.e., the transported CO_2 would be stored in the deep underground). This allowed us to explore if the importance of giving a genuine voice opportunity to local residents differs for different low-carbon technologies and associated infrastructures.

2.1. Method

2.1.1. Participants and design

Dutch citizens were recruited at public places and asked to complete a short paper and pencil survey in Dutch. The majority of participants were visitors of city halls of three Dutch municipalities. Participation was voluntary. Thirty-three participants were excluded from analyses: twenty-eight participants had missing data on the central outcome variables, three participants were excluded from analyses for straightlining (i.e., non-differentiated responses to large sets of items), one participant refused to read the scenario and instructions, and one participant's survey was lost by the data collectors. The remaining 395 participants (194 female, 200 male, 1 non-reported; age $M = 40.75$, $SD = 17.07$, 13 non-reported) were randomly distributed across the conditions of a 3 (Voice Opportunity: genuine voice vs. pseudo voice vs. no voice) by 2 (Infrastructure: CO_2 storage pipeline vs. CO_2 utilization pipeline) between-subjects experimental design (cell sizes ranged from 59 to 69). As a thank you, participants were informed after completion of the study that they could compete for one of four gift vouchers worth €10.

2.1.2. Procedure and materials

The study was approved by the Leiden University Research Ethics Committee (2018-03-07- E. ter Mors-V1-1068). The study was described to participants as a study about a situation that could occur in the near future in a municipality in the Netherlands. After providing informed consent, participants first read a brief text that explained that global warming is caused by ever-increasing CO_2 emissions. Depending on experimental condition, they then read that a way to reduce CO_2 emissions is through the implementation of CO_2 capture and storage technology [CO_2 storage pipeline condition] or CO_2 capture and utilization technology [CO_2 utilization pipeline condition]. Next, participants were informed of a company called Syntex (a fictitious company)

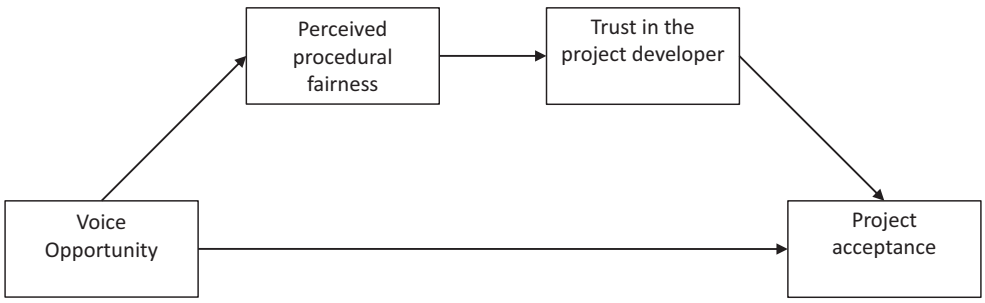

Fig. 1. Proposed mediation model.

that transports captured CO_2 from factories to an underground storage site [CO_2 storage pipeline condition] or to greenhouse gardeners [CO_2 utilization pipeline condition]. Participants then learned about Syntex plan to build a new 20 km CO_2 pipeline, which would be located near the town of Houtendal (a fictitious town). It was stated that CO_2 is not explosive and that CO_2 transport through an underground pipeline is very safe, but that the construction of the pipeline would cause local nuisance.

Participants were subsequently asked to imagine that they lived in the town of Houtendal, where Syntex was planning to build a CO_2 pipeline near their home. They learned that after the announcement of the plans, project developer Syntex had organized an information meeting for all residents of Houtendal, in which Syntex gave a presentation about the planned pipeline project and residents got the opportunity to ask questions for clarification. Participants subsequently received information about the type of voice opportunity offered that was shaped depending on their experimental condition.

Participants in the *genuine voice* condition learned that residents of Houtendal were given the opportunity to express their opinion and share their ideas about the design and implementation of the project. They also learned about a letter sent by Syntex a week after the information meeting, informing the residents that their input provided during the meeting would be taken into account. The project would be implemented, but Syntex would consider making some changes to the project. Participants in the *pseudo voice* condition received the same information about the voice opportunity offered in the information meeting, but the letter sent by Syntex informed residents that the project would be implemented as planned (i.e., without any changes being made). Participants in the *no voice* condition learned that there was no opportunity for Houtendal residents to express their opinion or share their ideas about the design and implementation of the project in the information meeting. The letter sent by Syntex informed the residents that the project would be implemented as planned (i.e., without any changes being made). The full description of the scenarios is shown in Supplementary Material A.

Participants then filled out a questionnaire that contained questions pertaining to the central outcome variables, manipulation checks, and demographic information. Upon completion of the questionnaire, participants were thanked for their participation and debriefed. Participants could sign up for the drawing of gift vouchers and for receiving an overview of the study's results.

2.1.3. Measures

Items were created by the researchers to fit the research context, but were based on relevant literature (e.g., [31,33,62]) and a pilot study. Since the study was conducted as part of a larger research project, only those measures and data relevant to the present investigation are reported here. Unless otherwise indicated, all items were presented as statements preceded by the instruction "Please indicate to what extent you disagree or agree with each of the following statements". Responses were assessed on seven-point scales (*1 = completely disagree, 7 = completely agree*). Scales were created by averaging responses to the items.

2.1.3.1. Manipulation checks. The effectiveness of the voice opportunity manipulation was checked with two separate items. *Perceived voice opportunity* was measured with: "As a resident of Houtendal, I have been provided the opportunity to voice my opinion and ideas about the design and implementation of Syntex CO_2 pipeline project". *Perceived consideration of input* was measured with: "Syntex considers the input provided by the residents of Houtendal in its plans for the CO_2 pipeline project". There was no manipulation check for Infrastructure.

2.1.3.2. Central outcome variables. Perceived procedural fairness concerning the decision-making of the CO_2 pipeline project was measured with three items ($\alpha = 0.91$): "I feel that the decision-making process is fair", "I feel that the decision-making process is just", and "I feel that the decision-making process is good". *Trust in the project developer* was measured with four items ($\alpha = 0.91$): "I trust Syntex", "Syntex is honest", "Syntex is open", and "I find Syntex trustworthy". *Project acceptance* was measured with three items ($\alpha = 0.88$): "As a resident of Houtendal, I would accept Syntex plan to build a CO_2 pipeline near Houtendal", "I think Syntex plan to build a CO_2 pipeline near Houtendal is a good idea", and "As a resident of Houtendal, I would respond positively to Syntex planned CO_2 pipeline project".

2.2. Results and discussion

Unless otherwise indicated, all scales were analyzed using separate full-factorial analyses of variance (ANOVAs), with Voice Opportunity (genuine voice, pseudo voice, no voice) and Infrastructure (CO_2 storage pipeline, CO_2 utilization pipeline) as independent variables. There were no interaction effects but several main effects. Significant main effects of Voice Opportunity were further explored using LSD post hoc tests. All significant tests are reported.

2.2.1. Manipulation checks

As intended, participants in the genuine voice condition and the pseudo voice condition to a greater extent perceived that they, as local residents, had been given the opportunity to voice their opinion about the design and implementation of the CO_2 pipeline project compared to participants in the no voice condition (see Table 1). Further, as intended, participants in the genuine voice condition to a greater extent perceived that the project developer had considered their input in its plans for the local project compared to participants in the pseudo voice condition and the no voice condition. These findings show that the voice opportunity manipulation was successful.

2.2.2. Hypotheses testing

Analyses of the central outcome variables showed main effects of Voice Opportunity that are supportive of Hypothesis 1 (see Table 1). As predicted, giving local residents a genuine voice opportunity resulted in

Table 1
Study 1 (CCUS pipeline): effects of voice opportunity.

	Genuine voice	Pseudo voice	No voice	*F*	*p*	η_p^2
	M (*SD*) $n = 132$	*M* (*SD*) $n = 128$	*M* (*SD*) $n = 135$			
Manipulation checks						
Perceived voice opportunity	5.33^a (1.41)	4.90^b (1.67)	2.29^c (1.74)	138.74	<0.001	0.42
Perceived consideration of input	4.40^a (1.50)	2.50^b (1.42)	1.96^c (1.47)	101.40	<0.001	0.34
Central outcome variables						
Perceived procedural fairness	4.55^a (1.44)	3.53^b (1.52)	3.10^c (1.46)	33.56	<0.001	0.15
Trust in the project developer	4.08^a (1.29)	3.47^b (1.37)	3.34^b (1.30)	11.85	<0.001	0.06
Project acceptance	$4.48^{a\dagger}$ (1.40)	$4.14^{b\dagger}$ (1.63)	4.03^b (1.56)	3.12	0.045	0.02

Note. Responses were assessed on seven-point scales, with higher scores reflecting higher perceived voice opportunity, perceived consideration of input, perceived procedural fairness, trust in the project developer, and project acceptance, respectively. Means within rows with different superscripts differ significantly at $p < 0.05$. Different superscripts accompanied by † denote a marginally significant difference ($p < 0.10$).

higher perceived procedural fairness and higher trust in the project developer compared to giving a pseudo voice opportunity or no voice opportunity. Further, project acceptance was (marginally) significantly higher when local residents were given a genuine voice opportunity compared to a pseudo voice opportunity ($p = 0.069$) or no voice opportunity. Interestingly, while participants in the pseudo voice condition reported higher perceived procedural fairness compared to participants in the no voice condition, no difference between conditions was found in trust in the project developer or project acceptance. These results demonstrate the importance of giving a genuine voice opportunity to residents living near planned CCUS projects, and the detrimental effects of giving a pseudo voice opportunity or no voice opportunity at all. The absence of interaction effects of Voice Opportunity and Infrastructure further suggests that the importance of giving a genuine voice opportunity may be similar for different low-carbon technologies and associated infrastructures. We tested the robustness of the findings of Study 1 further in Study 2.[1]

In Hypothesis 2, we predicted that the positive effect of giving local residents a genuine voice opportunity on project acceptance as predicted in Hypothesis 1 would be mediated by perceived procedural fairness and trust in the project developer (in that order). To examine the predicted sequential indirect effect, we conducted PROCESS bootstrapping multiple mediation analysis (Hayes' PROCESS macro for SPSS, model 6; 5000 bootstraps) with Voice Opportunity as independent variable, project acceptance as dependent variable, and perceived procedural fairness and trust in the project developer as mediating variables. Two dummy-coded variables (D1 and D2) were created for the use of bootstrapping with a multicategorical independent variable. Specifically, D1 represented the genuine voice condition vs. the pseudo voice condition, and D2 represented the genuine voice condition vs. the no voice condition. The results of the analysis are presented in Fig. 2.

The results revealed a sequential mediation effect on project acceptance via perceived procedural fairness and trust in the project developer for both dummies (D1 boot indirect effect = −0.15, $SE = 0.06$, CI [−0.28, −0.05]; D2 boot indirect effect = −0.22, $SE = 0.07$, CI [−0.39, −0.08]). For both dummies, the (marginally significant) effect of Voice Opportunity on project acceptance was no longer significant after controlling for perceived procedural fairness and trust in the project developer. To conclude, as predicted, the results showed that giving local residents a genuine voice opportunity (vs. a pseudo voice opportunity or no voice opportunity) resulted in higher project acceptance because it increased the perceived procedural fairness of the decision-making process and trust in the project developer.[2]

[1] Infrastructure had a significant effect on project acceptance, $F(1, 389) = 18.04$, $p < 0.001$, $\eta_p^2 = 0.04$, but no effects on perceived procedural fairness or trust in the project developer. Participants who had been informed that the CO_2 pipeline was part of a CCU project (i.e., that the transported CO_2 would be used for the production of new products) reported higher project acceptance ($M = 4.53$, $SD = 1.49$) compared to participants who had been informed that the CO_2 pipeline was part of a CCS project (i.e., that the transported CO_2 would be stored in the deep underground) ($M = 3.89$, $SD = 1.52$). This suggests that the way residents feel about the siting of an onshore CO_2 pipeline project near their community may depend on the purpose of the transported CO_2. Residents may respond more favorably in terms of project acceptance to CCU infrastructure projects compared to CCS infrastructure projects. These findings are in line with those from recent studies conducted in Germany showing that citizens in Germany perceive CCU significantly more positively than CCS [55,56].

[2] An additional PROCESS mediation analysis showed indirect effects of Voice Opportunity on trust in the project developer through perceived procedural fairness. After controlling for perceived procedural fairness, the effects of Voice Opportunity on trust in the project developer were no longer significant. An additional PROCESS mediation analysis also showed an indirect effect of perceived procedural fairness on project acceptance through trust in the project developer. After controlling for trust in the project developer, the effect of perceived procedural fairness on project acceptance was no longer significant.

3. Study 2

Study 1 demonstrated positive effects of giving residents living near a planned carbon capture utilization and storage (CCUS) project a genuine voice opportunity (versus a pseudo voice or no voice opportunity) on perceived procedural fairness of the decision-making process, trust in the project developer, and, although less strongly, project acceptance. Results further indicate that giving a pseudo voice opportunity to local residents can be equally detrimental as giving no voice opportunity at all. With this second study we aimed to replicate these findings and extend them in two ways.

In Study 1, pseudo voice was operationalized implicitly: participants could conclude from the description that the project developer had not taken their voiced input into account, but they could also conclude that the project developer *had* considered their input, but that it was not necessary or realistic to make changes to the project. On average, participants seemed to go for the more skeptical interpretation of the ambiguous situation and appeared to interpret the situation as a pseudo voice situation (see their responses to the *perceived consideration of input* check, Table 1). These results first of all suggest that suspicions of pseudo voice may easily be activated among residents living near low-carbon technology projects. They further raise the questions of how residents would respond to situations in which they *are* certain and convinced that the project developer had not considered their voiced input, and how these responses compare to their responses to the voice opportunities as examined in Study 1. Addressing these questions is important because the prevalence and strength of pseudo voice perceptions are likely to differ across situations [43,47,51,63]. Depending on situational variables, citizens may interpret a voice opportunity offered as either genuine, as deceitful and fake, or they may feel uncertain about its veracity.

To deepen and expand our understanding of citizen responses to pseudo voice situations, in Study 2 we differentiated between *implicit pseudo voice* (a condition identical to the pseudo voice condition in Study 1), and *explicit pseudo voice*. Explicit pseudo voice was shaped in such a way that participants were certain that the project developer had not considered their voiced input. In Study 2 we again tested Hypotheses 1 and 2. Furthermore, in extension of Study 1, we explored the possibility that residents who are certain that the project developer has not considered their voiced input (explicit pseudo voice) would report lower perceived procedural fairness and less trust in the project developer, compared to residents whose voice opportunity is relatively ambiguous and open to interpretation (implicit pseudo voice). When local residents invest time and resources in decision-making, only to conclude that the voice procedure followed is fake, they may experience strong feelings of unfairness and a lack of trust in the project developer, resulting in lower project acceptance. Giving a pseudo voice opportunity to residents may even be *more* detrimental than giving them no voice opportunity at all.

To test the robustness of the findings from Study 1, in Study 2 we examined our hypotheses in the context of another low-carbon technology, namely onshore wind, and among citizens from another country, namely citizens from the United Kingdom (UK). The implementation of onshore wind is part of energy and climate policy in many European countries, including the UK [54]. While citizens have a positive attitude towards wind energy in general, the implementation of onshore wind at a local level is met with opposition [13,17,24,34,37,64,65]. We examined whether and how citizen responses to the siting of an onshore wind park near their home depend on the type of voice opportunity offered (genuine voice, implicit pseudo voice, explicit pseudo voice, or no voice).

3.1. Method

3.1.1. Participants and design

United Kingdom (UK) citizens were recruited through the crowdsourcing program Prolific Academic and participated in an online survey

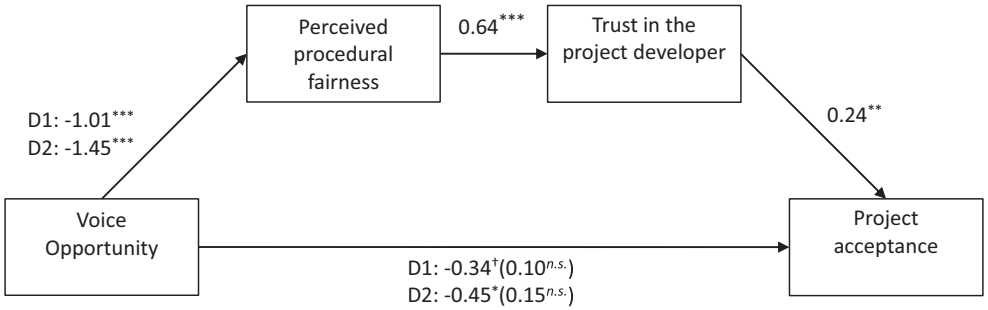

Fig. 2. Study 1 (CCUS pipeline): Effect of Voice Opportunity on project acceptance as sequentially mediated by perceived procedural fairness and trust in the project developer. D1: genuine voice (0) vs. pseudo voice (1); D2: genuine voice (0) vs. no voice (1). Weights are unstandardized regression coefficients. $*p < 0.05$, $**p < 0.01$, $***p < 0.001$, † = marginally significant ($p < 0.010$), *n.s.* = not significant.

created and hosted on the Qualtrics survey platform. Forty participants were excluded from the analyses for failing comprehension checks linked to the scenarios provided. Failure rates were somewhat higher in the no voice condition (17 out of 60, 28.3 %) compared to the other experimental conditions (9.0–11.1 %, $zs \geq 2.51$, $ps \leq 0.012$), which suggests the scenario may have been somewhat more difficult to grasp in the no voice condition. The main conclusions remained the same when we repeated the analyses with all participants included.

The remaining 240 participants (159 female, 78 male, 2 'other', 1 non-reported; age $M = 34.40$, $SD = 13.81$, 3 non-reported) were randomly distributed across four experimental conditions (Voice Opportunity: genuine voice vs. implicit pseudo voice vs. explicit pseudo voice vs. no voice; cell sizes ranged from 43 to 72). Participants were paid £1.05 for their participation.

3.1.2. Procedure and materials

The study was approved by the Leiden University Research Ethics Committee (2021-03-02-E. ter Mors-V2-3024). Study 2 largely followed the procedure used in Study 1, except that the study was conducted online, focused on a local wind farm project, and included both an implicit and an explicit pseudo voice condition. After providing informed consent, participants read background information and a scenario (see Supplementary Material B for full texts). They first read a brief text that explained that climate change is caused by ever-increasing CO_2 emissions and that emissions in the UK can be reduced through the siting of onshore wind farms. Then, participants were asked to imagine that they lived in the rural town of Willowdale (a fictitious town), where a company called UniWind (a fictitious company) was planning to build a wind farm near the entrance of the town. The wind farm would obstruct the town's view of the countryside. They learned that after the announcement of the plans, project developer UniWind had organized an information meeting for the residents of Willowdale in which UniWind gave a presentation about the planned wind farm project, and in which residents got the opportunity to ask questions about the project. Participants subsequently received information about the type of voice opportunity offered that was shaped depending on their experimental condition. Participants in the *genuine voice* condition learned that residents of Willowdale were given extensive opportunity to express their opinion and share their ideas about the design and implementation of the project. They also learned about a letter sent by UniWind a week after the information meeting, informing the residents that their input provided during the meeting would be taken into account. The project would be implemented, but UniWind would make some changes to the project in response to the input provided. Participants in the pseudo voice conditions received the same information about the voice opportunity offered in the information meeting, but the content of the letter sent by UniWind differed. Participants in the *implicit pseudo voice* condition learned that UniWind had informed the residents that the project would be implemented as planned, without any changes being made to the project. Although participants could conclude from this information that their input was not taken into account, this was not explicitly stated. Participants in the *explicit pseudo voice* condition learned that UniWind had informed the residents that their input provided during the meeting would not be taken into account and that UniWind would not make any changes to the project in response to the input provided. Finally, participants in the *no voice* condition learned that Willowdale residents did not get any opportunity to express their opinion or share their ideas about the design and implementation of the project in the information meeting. The letter sent by UniWind informed the residents that the project would be implemented as planned, without any changes being made to the project.

Next, participants answered questions pertaining to the central outcome variables, manipulation checks, attention checks, and demographic information. Upon completion of the study, participants were thanked for their participation, debriefed, and paid.

3.1.3. Measures

Since Study 2 was conducted as part of a larger research project, only those measures and data relevant to the present investigation are reported here. The measures used in Study 2 were similar to those in Study 1, with the exceptions that we used five-point instead of seven-point response scales, that the scales assessing perceived procedural fairness and trust in the project developer contained a few different items, and that we slightly altered the phrasing of the manipulation check items. Unless otherwise indicated, all items were presented as statements preceded by the instruction "Please indicate to which extent you, as a resident of Willowdale, agree or disagree with each of the following statements." Responses were assessed on five-point scales (*1 = completely disagree*, *5 = completely agree*). Scales were created by averaging responses to the items.

3.1.3.1. Manipulation checks. As in Study 1, the effectiveness of the voice opportunity manipulation was checked with two separate items. *Perceived voice opportunity* was measured with: "As a resident of Willowdale, I feel that there was enough opportunity to voice my opinion on the design and implementation of the wind farm project". *Perceived consideration of input* was measured with: "I feel that UniWind will take the views and opinions of the community of Willowdale into account when implementing the wind farm project".

3.1.3.2. Central outcome variables. Perceived procedural fairness concerning the decision-making process of the wind farm project was measured with three items ($\alpha = 0.90$): "I feel the decision-making process is fair", "I feel the decision-making process is open and transparent", and "I feel that UniWind treats the residents of Willowdale fairly". *Trust in the project developer* was measured with four items ($\alpha = 0.89$): "I trust UniWind", "UniWind is honest", "As resident of Willowdale, I am willing to let UniWind make decisions for me", and "UniWind will not mislead the residents of Willowdale". *Project acceptance* was measured with three

items (α = 0.91): "I would accept UniWind's plan to build a wind farm near Willowdale", "I think UniWind's plan to build a wind farm near Willowdale is a good idea", and "I would respond positively to UniWind's plan to build a wind farm near Willowdale".

3.2. Results and discussion

Unless otherwise indicated, all scales were analyzed using separate analyses of variance (ANOVAs), with Voice Opportunity (genuine voice, implicit pseudo voice, explicit pseudo voice, no voice) as independent variable. Table 2 presents an overview of the tests. Significant main effects of Voice Opportunity were further explored using LSD post hoc tests, unless otherwise indicated. All significant tests are reported.

3.2.1. Manipulation checks

Since the assumption of homogeneity of variance was not met for the manipulation checks (unequal variances in combination with unequal group sizes), we report the obtained Welch's adjusted *F* ratio with Games-Howell post hoc tests (see Table 2). As intended, participants in the genuine voice condition and the two pseudo voice conditions to a greater extent perceived that they, as local residents, had received enough opportunity to voice their opinion about the design and implementation of the wind farm project compared to participants in the no voice condition (see Table 2). Further, as intended, participants in the genuine voice condition to a greater extent perceived that the project developer would take the views and opinions of the local community into account when implementing the wind farm project compared to participants in the two pseudo voice conditions and the no voice condition. These findings show that the voice opportunity manipulation was successful. Finally, as expected, the results showed that participants in the explicit pseudo voice condition to a lesser extent perceived that the project developer would take the views and opinions of the local community into account than participants in the implicit pseudo voice condition. The perceived consideration of input in this condition was in fact equal to that in the no voice condition.

3.2.2. Hypotheses testing

ANOVAs on the central outcome variables showed main effects of Voice Opportunity supportive of Hypothesis 1 (see Table 2). We predicted and found that giving local residents a genuine voice opportunity resulted in higher perceived procedural fairness, higher trust in the project developer, and higher project acceptance compared to giving an implicit pseudo voice opportunity, an explicit pseudo voice opportunity, or no voice opportunity. Largely consistent with the findings of Study 1, the results further showed that while perceived procedural fairness was higher among participants in the implicit pseudo voice condition compared to the no voice condition, and trust in the project developer was also marginally significantly higher ($p = 0.093$), no difference in project acceptance between the implicit pseudo voice and the no voice condition was found. Moreover, extending Study 1, participants who were explicitly informed that their voice opportunity had been a farce (explicit pseudo voice) did not differ from participants in the no voice condition on either of the three central outcome variables. Finally, as expected, perceived procedural fairness and trust in the project developer were lower in the explicit pseudo voice condition compared to the implicit pseudo voice condition. No difference between the implicit and explicit pseudo voice condition in project acceptance was found.

To conclude, these results replicate and extend those observed in Study 1. As in Study 1, Study 2 demonstrates the importance of giving a genuine voice opportunity to residents living near planned low-carbon technology projects and the detrimental effects of giving a pseudo voice or no voice opportunity at all. In extension of Study 1, the detrimental effects of giving a pseudo voice opportunity were found to be somewhat stronger for participants who were beyond doubt that their input had not been considered by the project developer (explicit pseudo voice) compared to participants who suspected this might be the case but were less certain (implicit pseudo voice).

In Hypothesis 2 we predicted that the positive effect of giving local residents a genuine voice opportunity on project acceptance as predicted in Hypothesis 1 would be mediated by perceived procedural fairness and trust in the project developer (in that order). To examine the predicted sequential indirect effect, we conducted PROCESS bootstrapping multiple mediation analysis (Hayes' PROCESS macro for SPSS, model 6; 5000 bootstraps) with Voice Opportunity as independent variable, project acceptance as dependent variable, and perceived procedural fairness and trust in the project developer as mediating variables. Three dummy-coded variables (D1, D2, and D3) were created for the use of bootstrapping with a multicategorical independent variable. As in Study 1, D1 represented the genuine voice condition vs. the implicit pseudo voice condition, and D2 represented the genuine voice condition vs. the no voice condition. In extension of Study 1, D3 represented the genuine voice condition vs. the explicit pseudo voice condition. The results of the analysis are presented in Fig. 3.

The analysis revealed a sequential mediation effect on project acceptance via perceived procedural fairness and trust in the project developer for all three dummy variables (D1 boot indirect effect =

Table 2
Study 2 (onshore wind farm): effects of voice opportunity.

	Genuine voice	Pseudo voice (implicit)	Pseudo voice (explicit)	No voice	F^1	*p*	est. $\omega^2/\eta p^2$
	M (*SD*) *n* = 61	*M* (*SD*) *n* = 72	*M* (*SD*) *n* = 64	*M* (*SD*) *n* = 43			
Manipulation checks							
Perceived voice opportunity	3.74^{a} (1.12)	3.07^{b} (1.14)	2.58^{b} (1.33)	1.42^{c} (0.63)	71.90	<0.001	0.58
Perceived consideration of input	3.20^{a} (1.14)	2.06^{b} (1.05)	1.39^{c} (0.83)	1.47^{c} (0.67)	40.32	<0.001	0.32
Central outcome variables							
Perceived procedural fairness	3.54^{a} (0.85)	2.50^{b} (0.99)	1.83^{c} (0.80)	1.74^{c} (0.66)	54.10	<0.001	0.41
Trust in the project developer	2.89^{a} (0.80)	$2.25^{b\dagger}$ (0.88)	1.93^{c} (0.84)	$1.98^{c\dagger}$ (0.80)	16.70	<0.001	0.18
Project acceptance	3.57^{a} (0.89)	3.17^{b} (1.03)	3.01^{b} (1.01)	3.15^{b} (1.12)	3.48	0.017	0.04

Note. Responses were assessed on a five-point scale, with higher scores reflecting higher perceived voice opportunity, perceived consideration of input, perceived procedural fairness, trust in the project developer, and project acceptance, respectively. [1]Welch's *F* and est. ω^2 for manipulation checks: $F(3, 130.05)$ and $F(3, 127.71)$, respectively. Means within rows with different superscripts differ significantly at $p < 0.05$. Different superscripts accompanied by † denote a marginally significant difference ($p < 0.10$). We used LSD post hoc tests, except for the manipulation checks, where Games-Howell post hoc tests were used, see Section 3.2.1.

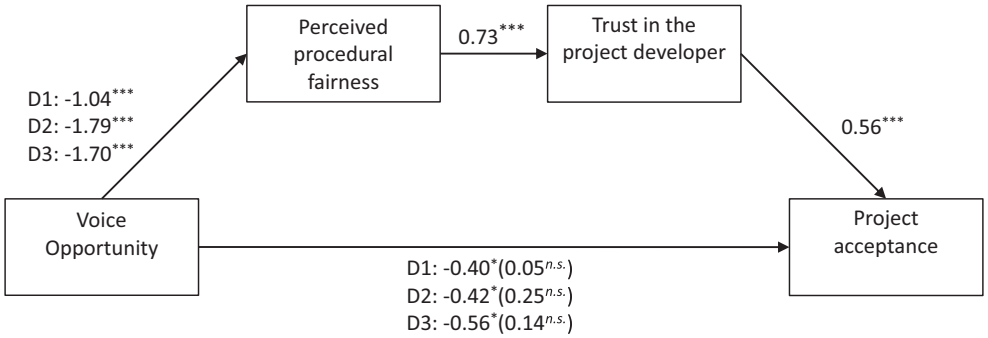

Fig. 3. Study 2 (onshore wind farm): Effect of Voice Opportunity on project acceptance as sequentially mediated by perceived procedural fairness and trust in the project developer. D1: genuine voice (0) vs. implicit pseudo voice (1); D2: genuine voice (0) vs. no voice (1); D3 genuine voice (0) vs. explicit pseudo voice (1). Weights are unstandardized regression coefficients. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$, *n.s.* = not significant.

−0.42, *SE* = 0.10, *CI* [−0.65, −0.24]; D2 boot indirect effect = −0.73, *SE* = 0.15, *CI* [−1.05, −0.46]; D3 boot indirect effect = −0.70, *SE* = 0.14, *CI* [−0.99, −0.44]). For each dummy variable, the effect of Voice Opportunity on project acceptance was no longer significant after controlling for perceived procedural fairness and trust in the project developer. As predicted, and replicating and extending the results of Study 1, giving local residents a genuine voice opportunity (vs. an implicit pseudo voice opportunity, an explicit pseudo voice opportunity, or no voice opportunity) had a positive effect on project acceptance because it increased the perceived procedural fairness of the decision-making process and trust in the project developer.[3]

4. Discussion

Public acceptance of low-carbon technology projects is of key importance for mitigation of climate change, but these projects may be met with resistance from local residents [1,5,6]. In the current research, we focused on how acceptance of carbon capture utilization and storage (CCUS) and onshore wind projects is affected by the quality of the voice opportunity offered to local residents in the decision-making process of projects. The results of two experiments offer converging support for the central prediction that the quality of the voice opportunity offered affects perceived procedural fairness and trust in the project developer, which in turn determines project acceptance. We predicted and found that giving local residents a genuine voice opportunity resulted in higher project acceptance compared to giving local residents a pseudo voice or no voice opportunity, due to an increase in perceived procedural fairness and trust in the project developer. Results further showed that giving residents a pseudo voice opportunity can be equally detrimental as giving no voice opportunity at all. Findings were robust across different types of low-carbon technology projects (CCUS infrastructure in Study 1; onshore wind farm in Study 2) and samples (Dutch citizens in Study 1; United Kingdom citizens in Study 2).

4.1. Theoretical implications

Our research contributes to existing literature in several ways. It is among the first to systematically directly compare citizen responses to different types of voice opportunities offered in the context of low-carbon technology projects. As such, it extends previous empirical research on voice effects which has primarily focused on the contrast between public responses to voice versus no voice situations. Despite warnings in the literature on public acceptance of low-carbon technology projects that pseudo voice situations are to be avoided [9,13,14,20,50], the questions of how residents living near planned projects respond to pseudo voice situations and how these responses compare with those to genuine or no voice opportunities offered to local residents, remained relatively unanswered to date. As demonstrated by the results presented in this paper, local residents need to perceive a voice opportunity as meaningful and genuine in order to foster the acceptability of low-carbon technology projects. Moreover, when residents suspect that their input is not taken into account and they are not taken seriously, a voice opportunity can become as ineffective as no voice opportunity at all.

Both experiments included an implicit pseudo voice condition that was ambiguous in the sense that it did not state whether the project developer had considered residents' input or not, which is comparable to citizens' experiences in actual project siting processes. Thus, the project developer could have ignored residents' voiced input, but could also have taken their input seriously yet not acted upon it for good reasons. Interestingly, on average, participants seemed to go for the more skeptical interpretation of the ambiguous situation and appeared to interpret the situation as a pseudo voice situation.

How can we explain citizens' skepticism about voice opportunities as found in the present research? A possible explanation is that in the face of uncertainty, people rely on heuristics when making judgments about the fairness of decision-making procedures [30,63,66,67]. Low-carbon technology projects are characterized by high uncertainty and ambiguity among local residents, for example regarding impacts on communities (i.e., local risks and benefits) [68,69], but also regarding the position of local communities in decision-making [31,40,47]. In the absence of direct information indicating that voice opportunities offered are genuine, residents may base their judgments of the voice procedure on contextual or personal information, such as their general (dis)trust in institutional actors or their previous participatory experiences [70]. Research has shown that people often have a priori low trust in companies and policymakers responsible for low-carbon technology projects [10,30,40,71]. They may also have encountered pseudo voice in other situations in the past or have heard about bad participatory experiences from significant people in their lives. Residents' distrust in stakeholders and bad previous experiences likely contribute to a negative interpretation of voice opportunities.

In both studies, we found that participants in the implicit voice condition thought the decision-making process was more fair than participants in the no voice condition, whereas no differences were found in trust in the project developer or acceptance of the low-carbon technology project. The difference in perceived procedural fairness is

[3] An additional PROCESS mediation analysis showed indirect effects of Voice Opportunity on trust in the project developer through perceived procedural fairness. After controlling for perceived procedural fairness, the effect of Voice Opportunity on trust in the project developer was no longer significant for D1, but the effect was still significant for D2 and D3, indicating partial mediation. An additional PROCESS mediation analysis also showed an indirect effect of perceived procedural fairness on project acceptance through trust in the project developer. After controlling for trust in the project developer, the effect of perceived procedural fairness on project acceptance was no longer significant.

consistent with prior research showing that the public believes that participation should be used to increase fairness and justice by giving voice to interests that might be absent in non-participatory processes [72], as well prior research showing that giving people a voice in decision-making increases perceived procedural fairness [5,67]. However, extending previous research, our findings suggest that simply having a voice may not always be enough to create satisfaction with a decision-making process [20,27]. The positive effect of voice on perceived procedural fairness vanished when citizens were convinced that their voiced input had not been taken into account by the decisionmaker and giving residents a pseudo voice opportunity became as detrimental as giving no voice opportunity at all.

4.2. Limitations and directions for future research

There are a few limitations to our studies that need to be addressed. First, we employed a scenario approach in which participants were presented with a hypothetical situation. This method is particularly useful to examine causal effects of variables that are naturally confounded or difficult to manipulate [73]. At the same time, it raises the question of whether the results generalize to situations in which people are confronted with plans for low-carbon technology projects in their own residential area. In those situations, people are arguably more personally involved, more concerned about adverse local impacts, and more attached to the siting location. Given their involvement and their personal investments made in response to the announced local low-carbon technology project, local residents may find genuine voice opportunities for communities even more important and respond more negatively to pseudo voice situations or no voice situations. If anything, the current findings are probably a conservative estimate of how citizens would react to voice opportunities for low-carbon technology projects in which they are directly involved.

In our research, we sampled citizens from the Netherlands and the United Kingdom (UK), two countries that are relatively similar in their characteristics (western, educated, rich, democratic), and found consistent results across samples. For future studies it would be relevant to expand the scope to other countries, with varying demographics, technological experiences, political systems, and cultural norms. It could be interesting to examine whether people from cultures with high or low power distance (i.e., the extent to which less powerful people consider it legitimate that power is distributed unequally; Hofstede, 1980) differ in their reactions to the voice opportunity scenarios examined in the present research. The Netherlands and the UK have low power distance cultures [74]. Based on previous research [75,76], citizens from high power distance cultures might respond more favorably to pseudo voice and no voice situations compared to citizens from low power distance cultures.

The two studies in the current paper varied in a number of respects, which may impede interpretation of some of the effects. Specifically, we varied the type of technology (CCUS vs. onshore wind) as well as the sample (Dutch citizens vs. UK citizens), while keeping constant the basic study design and materials. These different set-ups were chosen to demonstrate the generizability of findings across different types of low-carbon technologies and samples. Nonetheless, the fact that the methodological approach in Study 2 in several respects differed from that in Study 1 can be considered a limitation or at least an opportunity for future research.

Future research could also investigate the role of citizens' expectations regarding voice opportunities offered to local communities. It seems likely that expectations regarding community voice and participation in the design and implementation of low-carbon technology projects affect how local residents perceive and respond to voice opportunities. A violation of these expectations may negatively impact perceptions of the project developer and the project [10,43,62,77]. For example, if residents expect to be able to influence important decisions about the design and implementation of a low-carbon technology project (e.g., the location of a wind farm), but in reality are only able to give their opinion on minor issues (e.g., the paint and coating of the wind turbines), they may respond negatively to the opportunity to have their voice heard [15]. We recommend that future empirical research investigates the potential moderating role of citizens' expectations about voice opportunities on their responses to actual voice opportunities offered. If such expectations indeed play the important role we suspect, then further research could examine whether active management of citizens' voice expectations in the form of timely communication and engagement by project developers can help to narrow the voice expectation-reality gap and increase acceptance for low-carbon technology projects.

The present research demonstrates that community acceptance of low-carbon technology projects is influenced by the quality of voice opportunities offered to local residents, the perceived procedural fairness of decision-making processes, and trust in project developers. However, a variety of other contextual and psychological factors can influence community acceptance of low-carbon technology projects as well. The factors include but are not limited to the perceived local impacts of projects (e.g., in terms of health, safety, the landscape, the local economy), local residents' values, and their place identity and place attachment [2,3,5,16,24,26,35,61]. Future research could examine whether and how the type of voice opportunity given to local residents interacts with these other project acceptance factors.

4.3. Conclusions and practical implications

To conclude, this experimental research is among the first to systematically compare public responses to different types of voice opportunities in the context of the siting of low-carbon technology projects. The current research highlights the importance of providing genuine voice opportunities to residents living near planned projects for perceived procedural fairness, trust in the project developer, and project acceptance. Our findings warn against situations in which residents receive no voice opportunity at all, and against pseudo voice situations in which residents are consulted but do not perceive their input is considered by the project developer. Our findings further suggest that when direct information about the sincerity of a voice opportunity is lacking, suspicions of pseudo voice are easily activated among residents, negatively affecting their perceived procedural fairness of the decision-making process, trust in the project developer, and project acceptance.

Our findings have important implications for policy and project development. Policymakers and project developers may be ambivalent about public participation [49] and may only provide participation opportunities to local residents living near planned low-carbon technology projects when required by law. At the same time, citizens who may be affected by low-carbon technology projects want to be treated fairly and have a seat at the table when decisions that impact them are made, and failing to give them a voice can lead to community resistance to planned projects. Furthermore, until now, community engagement or public participation practices that involve providing local publics with information through some form of consultation have been most prevalent, but they provide local residents with very limited influence and thus are unlikely to meet the conditions necessary for positive voice effects to occur [9,27,37,40,43,44,46,49,50]. This problem may be overcome by using more collaborative and empowering forms of community engagement that involve dialogue and interaction, and that ensure that residents' input is meaningfully addressed [9,27,37,44,49,50]. An important element here is that it must be made transparent how residents' voiced input was used and handled. Good and constant feedback provides evidence of impact and shows residents that they are being heard and taken seriously. Feedback also prevents unwarranted perceptions of pseudo voice, i.e., residents suspecting pseudo voice when in fact the voice opportunity is genuine. For example, a project developer, in response to concerns about noise associated with the construction of new infrastructure, may double check the expected

number of decibels produced with experts, get a reassuring answer, and conclude that no amendments to the project plan are required. If the local resident who has expressed concern about noise is only informed of the decision (the project is carried out as planned) without having received information about the steps taken by the developer, pseudo voice can be suspected, with potentially detrimental effects.

Policymakers, decisionmakers, and the general public likely hold different views on why the public should be involved and what is intended by public participation [72,78]. According to recent research [72], the general public particularly values participation as a means to increase fairness and justice by voicing interests that might be missing from non-participatory decision processes and is less supportive of instrumental views of participation (e.g., participation as a means to foster community acceptance; participation as a means for more efficient decisions; participation to comply with legal requirements). Professionals, however, are most supportive of instrumental goals [78]. Goal orientations may have an impact on citizens' participation expectations and their level of satisfaction with the specific public participation practices used [72]. When designing participation practices, it may be essential for policymakers and decisionmakers to explicitly discuss participation goals with a wide range of stakeholders [72,78] and to select methods of participation that are fit to achieve them [46].

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Declaration of competing interest

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Data availability

Data will be made available on request.

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