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Public participation in decision making on sustainable energy transitions

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Public participation in decision making on sustainable energy transitions

LIU Lu

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university of
 groningen

Public participation in decision making on sustainable energy transitions

PhD thesis

to obtain the degree of PhD at the
University of Groningen
on the authority of the
Rector Magnificus Prof. C. Wijmenga
and in accordance with
the decision by the College of Deans.

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Contents

Chapter 1	General Introduction	9
Chapter 2	Effects of Trust and Public Participation on Acceptability of Renewable Energy Projects in the Netherlands and China	19
Chapter 3	Effects of Competence- and Integrity-based Trust on Public Acceptability of Renewable Energy Projects in China and the Netherlands	45
Chapter 4	Public Participation in Decision Making, Perceived Procedural Fairness and Public Acceptability of Renewable Energy Projects	83
Chapter 5	The More Public Influence, the Better? The Effects of Full versus Shared Influence on Public Acceptability of Energy Projects in the Netherlands and China	109
Chapter 6	General Discussion	157
	References	179
	Nederlandstalige Samenvatting (Summary in Dutch)	199
	Acknowledgements	209
	Curriculum Vitae	217
	KLI Dissertation Series	221

Chapter 1

General Introduction

1.1. Introduction

To mitigate climate change and its negative impacts, global greenhouse gas emissions need to be reduced (Davis et al., 2010). Transitioning from fossil fuels (e.g., coal, oil and gas) to renewable energy sources (e.g., solar and wind energy) can significantly contribute to the reduction of greenhouse gas emissions (European Commission, n.d.). The success of such a transition strongly depends on the successful implementation of renewable energy projects, which in turn strongly depends on public acceptability of those projects. We define public acceptability of renewable energy projects as the extent to which people evaluate those projects (un)favourably (from now on referred to as “project acceptability”). Indeed, renewable energy projects may be delayed or cancelled if there is strong public resistance (Boyd, 2017; Papazu, 2017; Shaw et al., 2015). Hence, an important question is which factors and processes affect project acceptability.

Research showed that public acceptability of decision-making process and the resulting renewable energy projects is especially low when people feel excluded from the decision-making process, while acceptability of the decision-making process and the project is higher when there are possibilities for people to be involved in decision making (Breukers & Wolsink, 2007b; Jacquet, 2015). Therefore, public participation in decision making is proposed to be a critical factor that could enhance public acceptability of the decision-making process and the resulting renewable energy projects (Bidwell, 2016). We define public participation in decision making as processes organized by responsible agents (e.g., governments, companies) to engage the public in the planning, the design, and the implementation of projects (from now on referred to as “public participation”) (Dietz & Stern, 2008). It implies public participation in the decision-making process, rather than, for example, financial participation alone (e.g., receiving payoffs from the energy that is generated). In addition, it means that public participation is organised by responsible agents, rather than citizens themselves, as for example in social movements (e.g., climate protests)

and day-to-day energy practices (e.g., deciding upon own energy provider, setting up a local energy community).

While public participation is widely expected to increase public acceptability of the decision-making process and the resulting renewable energy projects, strikingly little is known about when and how it is effective in doing so. In fact, various attempts to stimulate public participation in renewable energy projects have failed to promote public support for those projects (Colvin et al., 2016; Gross, 2007). Given the gap in the literature and the growing advocacy by practitioners for public participation in planning and designing renewable energy projects (Bidwell, 2016), we develop and test theory that explicates the conditions under which public participation is likely to affect public acceptability of the decision-making process and the resulting renewable energy projects, and the processes via which public participation is effective in enhancing public acceptability of renewable energy projects.

1.2. Key elements of public participation affecting acceptability

1.2.1 Amount of influence

A key factor to differentiate different types of participation is the amount of influence people have in the decision-making process (Arnstein, 1969). Based on the participation ladder (Arnstein, 1969), we distinguish different levels of influence: no influence (i.e., only inform citizens about the project), little influence (i.e., consultation, when citizens can provide input that will be considered in the final decisions, but cannot make the final decisions themselves), shared influence (i.e., partnership, when citizens take decisions together with other responsible agents), and full influence (i.e., when citizens make final decisions themselves).

It has been suggested that when people have at least some influence, they evaluate the decision-making process and the renewable energy projects as more acceptable compared to when they are only informed about the project with no opportunity for them to influence the decision-making process (Aitken et al., 2016; Reilly et al., 2016; Shaw et al., 2015). If people are only informed about the project or consulted, but their input is not incorporated in final decisions, this can be seen as *fake* participation,

which can even strengthen public resistance towards renewable energy projects (Colvin et al., 2016; Gross, 2007; Rand & Hoen, 2017; Terwel et al., 2012).

A popular assumption is that, more influence can result in more socially acceptable decision-making processes and resulting renewable energy projects (Aitken et al., 2016; Reilly et al., 2016; Shaw et al., 2015). Yet, we argue that more influence might not always lead to higher public acceptability of renewable energy projects. For example, the public may think that citizens involved in decision making lack expertise to make good-quality decisions about highly complex renewable energy projects; consequently, people may find the decision-making process and resulting projects less acceptable (Rossi, 1997; Tritter & McCallum, 2006). So far, it is unknown to what extent more influence might or might not lead to higher acceptability, compared to less influence, because the literature has only examined whether having influence at all, versus no influence, is associated with higher public acceptability of renewable energy projects (e.g., Reilly et al., 2016). We address this gap in the literature by studying whether full influence particularly leads to higher public acceptability of the decision-making process and resulting renewable energy projects than shared influence when citizens involved in the decision-making process can consult experts.

1.2.2 Different types of decisions: major versus minor decisions

Not only the amount of influence over the decision-making process may vary, but also the different types of decisions that the public could potentially influence when they participate in decision making about renewable energy projects (Kumar et al., 2017; San Cristóbal, 2011). Specifically, some decisions could have major implications for the public, such as choosing the location for renewable energy siting; we refer to them as *major decisions*. Other decisions may only have minor implications for the public, such as the details of the design of renewable energy infrastructure; we refer to them as *minor decisions*. Studies suggest that people care more about major decisions of renewable energy projects because these have more impact on their life and living environment compared to minor decisions (Devine-Wright, 2009; Guo et al., 2015). Hence, being able to influence minor decisions is likely to have less influence on

acceptability of the decision-making process and resulting projects, compared to being able to influence major decisions, because people may see influence over minor decisions only as tokenism or fake participation. Therefore, we hypothesise that being able to influence major decisions is more likely to lead to higher public acceptability of renewable energy projects than having only influence over minor decisions. Hence, we extend previous studies by testing the extent to which the types of decisions that people can influence affect project acceptability, besides the amount of influence people can have.

1.3. Process via which public participation affects acceptability: perceived procedural fairness

It has been proposed that when people have influence in decision making, they are more likely to perceive the decision-making process as fair, open, and transparent, as reflected in higher perceived procedural fairness, compared to when they have no influence at all (Cohen-Charash & Spector, 2001; Gross, 2007; McComas et al., 2008). We define perceived procedural fairness as the extent to which the public evaluates the decision-making process as fair, open, transparent, and taking different interests into account. Similarly, extending previous research, we argue that people perceive the decision-making process as fairer when they can influence major rather than minor decisions.

In turn, the literature suggests that perceived procedural fairness is positively associated with public acceptability of energy projects (Besley, 2010; Gross, 2007; Krütli et al., 2010; Rowlands, 2005; Siegrist et al., 2012; Walker & Baxter, 2017). That is, the more people perceive the decision making as fair, open, transparent, and representing different interests, the more acceptable they find the resulting energy project. This implies that public participation, especially when people have much influence or can influence major decisions, could increase project acceptability by enhancing perceived procedural fairness. However, this mediation relationship has not been systematically tested. Extending previous research, we employ an experimental design to test whether having much influence or having influence over major

decisions leads to higher perceived procedural fairness, and whether this, in turn, relates to higher acceptability of the project. In doing so, we extend the literature by testing whether perceived procedural fairness depends on the types of decisions the public can influence, and whether this in turn affects public acceptability.

1.4. Effects of public participation and trust on acceptability

Even though having much influence, particularly over major decisions, may enhance project acceptability, in real life people will not have influence over everything all the time; responsible agents such as governments and utility companies will take many decisions (Perlaviciute & Squintani, 2020). Then the question is whether public participation is always necessary to enhance project acceptability or if there is another route. We propose that trust in agents responsible for renewable energy projects may also play an important role in influencing project acceptability, next to public participation. We define trust as the extent to which the public evaluates the agents responsible for energy projects as reliable and honest (Merk et al., 2015; Rayner, 2010; Siegrist et al., 2012; Terwel et al., 2011; Yang et al., 2016) (from now on referred to as “trust”). If trust can serve the same function as public participation, namely incorporating public interests, then people may not even need to have influence over major decisions themselves. Particularly, even if people can only influence minor decisions, if they trust that the responsible agent will be honest about its activities and take public interests into account during decision making, public acceptability of the project may still be high.

Noteworthy, two dimensions of trust have been identified to be particularly relevant for project acceptability, namely integrity-based trust (i.e., trust in honesty and transparency of responsible agents and whether the agent considers public interests) (Braun et al., 2018; Graham et al., 2009) and competence-based trust (i.e., trust in knowledge and expertise of responsible agents) (Siegrist, 2019). However, little is known about how each of the two dimensions of trust influences project acceptability and how they work together in influencing project acceptability because as yet, the two dimensions of trust have hardly been studied together. Yet, understanding this is

critical for effective and successful implementation of renewable energy projects. For example, if one dimension of trust is more likely to influence project acceptability than the other, it seems more effective to enhance this dimension of trust when aiming to secure public support for the sustainable energy transition.

Extending previous studies, we test the relative importance of integrity- and competence-based trust in influencing project acceptability. While competence-based trust implies that the agent has the necessary knowledge and skills to design and develop the project, integrity-based trust indicates to what extent the agent will use their knowledge and skills to protect public interests. It might not be sufficient for people to trust the agents have the knowledge, as they may want to know whether the agents will use the knowledge to serve public interests. As such, we hypothesise that integrity-based trust is more likely to influence project acceptability, compared to competence-based trust.

1.5. Experimental design

As yet, the relationships between public participation and trust, on the one hand, and public acceptability of the decision-making process and resulting energy projects, on the other hand, have mostly been examined via qualitative and correlational studies (e.g., Reilly et al., 2016; Siegrist et al., 2012; Terwel et al., 2012; Yang et al., 2016) that do not allow to tease apart the cause and the effect in these relationships. For example, acceptability of the decision-making process and resulting energy projects may be high *because* people had influence, but conversely, people may also report that they had influence *because* they find the decision-making process and resulting renewable energy project acceptable, or there might be a third factor that influences both (cf. Poortinga & Pidgeon, 2005). Similarly, people may accept the decision-making process and resulting renewable energy project *because* they trust the responsible agent, but conversely, people may also trust the responsible agent *because* they find the decision-making process and resulting project acceptable, or again there could be a third factor that influences both (cf. Poortinga & Pidgeon, 2005). To address this gap in the literature and test whether more public participation and higher trust lead to higher

public acceptability of the decision-making process and resulting energy projects, we conduct experimental studies in which we systematically varied how much influence over which decisions people have in public participation, and levels of (competence- and integrity-based) trust.

1.6. Generalizability of findings in different countries and cultures

As yet, most studies on the relationships between public participation, trust, and public acceptability of the decision-making process and resulting energy project have been conducted in Western European countries and North America (e.g., Breukers & Wolsink, 2007a; Krohn & Damborg, 1999). Hence, the question remains whether public participation and trust have similar effects on public acceptability of the decision-making process and resulting energy project across different countries, in particular non-Western countries, such as East-Asian countries. To assess the extent to which our theoretical reasoning and the findings are robust and generalizable across different countries and cultures, we tested our reasoning in a Western European country, the Netherlands, and in an East-Asian country, China.

1.7. Summary

Figure 1 illustrates the overarching theoretical model that guides the research reported in this dissertation. Chapter 2 tests the main and interaction effects of the types of decisions (i.e., major vs. minor decisions) and trust on project acceptability. Chapter 3 tests the main and interaction effects of integrity- and competence-based trust on public acceptability of the decision-making process and resulting energy projects. Chapter 4 tests whether perceived procedural fairness mediates the relationship between public participation and project acceptability, and whether perceived procedural fairness is higher when people can influence major rather than minor decisions. Chapter 5 tests the effects of shared influence versus full influence on public acceptability of the decision-making process and resulting energy projects.

Figure 1: Theoretical model

Chapter 2

Effects of Trust and Public Participation on Acceptability of Renewable Energy Projects in the Netherlands and China

This chapter is based on a published paper: Liu, L., Bouman, T., Perlaviciute, G., & Steg, L. (2019). Effects of trust and public participation on acceptability of renewable energy projects in the Netherlands and China. *Energy Research & Social Science*, 53, 137-144.

Abstract: In order to mitigate climate change and its impacts, it is crucial to replace fossil fuels with renewable energy sources. The extent to which renewable energy projects can be implemented largely depends on public acceptability. We studied how public acceptability is influenced by people's trust in agents responsible for renewable energy projects and the influence that people have over decisions regarding these projects. As expected, higher trust and having influence over major decisions regarding the project led to higher project acceptability. Public acceptability was lowest when people had low trust in responsible agents and when people could only influence minor decisions regarding the project. We found a similar pattern of results in our samples in the Netherlands and China, providing initial evidence that trust in responsible agents and public influence over decisions may have similar effects on public acceptability of renewable energy projects across different countries and cultures.

Keywords: trust; participation; influence over decisions; acceptability; renewable energy projects; the Netherlands; China

2.1. Introduction

In the Paris Agreement, countries across the world agreed to reduce their greenhouse gas emissions to mitigate climate change and its impacts (UNFCCC et al., 2015). To achieve this, it is crucial to reduce the use of fossil fuels, such as coal and gas, and use more renewable energy sources, such as solar and wind power (European Commission, n.d.). Many governments have set ambitious targets to increase the share of renewables in their energy systems. For example, the Dutch government aims to increase its share of renewables to 14% (4.5% in 2013) of total energy consumption by 2020 (Sociaal-Economische Raad, 2013), while China aims for a share of 15% (12% in 2015) by 2020 (China, 2016). Yet, countries likely face many challenges to reach these goals.

One key challenge is public acceptability of renewable energy projects, namely the extent to which the public evaluates a renewable energy project favourably or unfavourably. Many renewable energy projects face public resistance, which can seriously inhibit the implementation of those projects (Devine-Wright, 2007, 2009; Guo et al., 2015; Papazu, 2017). This study aims to further our understanding of what influences public acceptability of renewable energy projects. More specifically, we investigate the extent to which (a) trust in agents who are responsible for renewable energy projects and (b) public influence over decisions regarding these projects influence public acceptability of these projects.

2.1.1. Trust in responsible agents and public influence over decisions

One key factor that is likely to influence public acceptability of renewable energy projects is trust in agents responsible for these projects, which reflects the extent to which the public evaluates the responsible agents as trustworthy (or not). Different agents can be involved in the transition to renewable energy sources, such as governments, energy companies and NGOs (Wüstenhagen et al., 2007). Usually, the public needs to rely on these agents, since often people do not initiate the project themselves and/or do not have the expertise and experience to fully understand and manage such a project. Accordingly, trust that these agents will implement and

manage the projects in a good way seems critical for the acceptability of these projects (Walker et al., 2010). Therefore, we propose that the more people trust responsible agents, the more favourably they will evaluate the relevant project.

There is evidence to suggest that trust in responsible agents is positively related to public acceptability of sustainable energy technology and renewable energy projects (Huijts et al., 2012; Perlaviciute & Steg, 2014; see for reviews De Cremer & Tyler, 2007; Siegrist et al., 2012; Yang et al., 2016). Specifically, when people have higher trust in agents who are responsible for the development of renewable energy projects, people tend to evaluate these projects as more acceptable, making it likely that these projects can be implemented more smoothly (Walker et al., 2010). In contrast, when people have lower trust in responsible agents, people tend to evaluate the projects as less acceptable (Fast & Mabee, 2015). However, as yet, the relationship between trust in responsible agents and public acceptability of renewable energy projects has mostly been examined in correlational studies that do not allow to tease apart the cause and effect in this relationship (e.g., Siegrist et al., 2012; Yang et al., 2016). For example, people may accept a project *because* they trust responsible agents, but conversely, people may also trust responsible agents *because* they find the project acceptable (cf. Poortinga & Pidgeon, 2005). To address this gap in the literature, we use an experimental design in which we expose participants to the same renewable energy project and systematically vary the level of trust in responsible agents to test the effect of trust on public acceptability of the project.

Another important factor that could affect public acceptability of renewable energy projects is public influence over decisions regarding these projects. That is, the extent to which the public can participate in the decision-making process regarding the project and the extent to which their concerns will be incorporated into the decisions. Traditional top-down decide-announce-defend approaches are likely to be ineffective in increasing public acceptability or may even reduce acceptability, as the public feel their opinions and interests are not incorporated into the decisions (Wolsink, 2007), suggesting that involvement of the public in decision-making is important.

Indeed, it has been found that when people have at least some influence over decisions, they evaluate renewable energy projects as more acceptable compared to only being informed about the project (Aitken et al., 2016; Reilly et al., 2016; Shaw et al., 2015). For example, acceptability of a marine renewable energy project was enhanced when the fishermen were able to influence the decision making, compared to top-down decision making with little opportunity for the fishermen to influence decisions (Reilly et al., 2016). Interestingly, however, we know little about whether project acceptability can also depend on the type of decisions that people can influence, as current literature mainly focuses on whether the public has influence over decisions or not (e.g. Aitken et al., 2016; Reilly et al., 2016; Shaw et al., 2015). Many different decisions are made in the development and implementation of renewable energy projects (Kumar et al., 2017; San Cristóbal, 2011). Some decisions pertain to minor issues, with small implications for the projects and society (further referred to as *minor decisions*; e.g., the specific design of renewable energy facilities), while other decisions pertain to major issues, with large implications for the projects and society (further referred to as *major decisions*; e.g., location of renewable energy facilities, see Devine-Wright, 2009; Guo et al., 2015). If we find that the type of decisions matters for project acceptability, this could be an impetus for considering early in the project where and how the public could have influence over decisions. Studies suggest that people care more about the major issues of renewable energy projects because these have more impact on their life and living environment compared to minor issues (Devine-Wright, 2009; Guo et al., 2015). Hence, although being able to influence minor decisions means the public has some influence, people may not be satisfied with such influence because they may not care about the decisions they can influence. Therefore, we hypothesise that being able to influence major, rather than only minor decisions, regarding renewable energy projects leads to higher project acceptability. To test our reasoning, we systematically vary the influence that people have over different types of decisions in an experimental study and measure how this affects project acceptability.

To our best knowledge, our study is the first attempt to systematically and experimentally test the effects of both trust in responsible agents and public influence over decisions on public acceptability of renewable energy projects. Besides testing the main effects of these factors on project acceptability, it is critical to look at their interaction. On the one hand, both high trust and influence over major decisions may be necessary to increase project acceptability. On the other hand, having one of them to be high may already increase project acceptability. One question is then whether having the other to be high has added value to project acceptability or not. Addressing this question is particularly important since previous studies showed that trust in agents who are responsible for the development and implementation of energy projects, such as energy companies and the government, is often rather low (Mumford & Gray, 2010; Ricci et al., 2010; Shaw et al., 2015). Hence, it is crucial to know whether or not public influence over major decisions can enhance public acceptability of renewable energy projects, even when trust in responsible agents is low. Similarly, if trust in responsible agents is relatively high, the question is whether having influence over major decisions rather than only minor decisions would have any additional positive effect on public acceptability of renewable energy projects. For example, it could be that if trust is high, people may not be interested in having influence over major decisions since this would cost them time and effort. Moreover, sometimes major decisions have already been made, for example by the national government; hence there is not much space for other responsible agents, such as energy companies, to give influence over major decisions to the public. It is therefore important to understand whether or not higher trust in the agent responsible for managing the project could increase project acceptability when people can only influence minor decisions.

2.1.2. Effects of trust and influence on acceptability in different countries and cultures

Another important question is to what extent trust in responsible agents and public influence over decisions regarding renewable energy projects influence public

acceptability of these projects similarly in different countries and cultures. In other words, does our proposed theoretical model hold in different countries and cultures? Testing the robustness of the model is critical for international policy making, as it reveals whether similar (or different) factors are important and hence could be targeted in interventions to increase project acceptability in different countries and cultures. As yet, most studies on public acceptability of renewable energy projects and factors driving public acceptability have been conducted in Western European countries and the United States (e.g. Breukers & Wolsink, 2007a; Krohn & Damborg, 1999). Hence, the question remains whether similar findings can be found in other countries.

To address this question, we tested our reasoning in a Western European country, the Netherlands, and in an East-Asian country, China. We expected the model to be robust across the two countries because research suggests that both trust and influence over decisions may matter for project acceptability in each country. For example, both the Netherlands and China are characterised by mostly central governance of renewable energy projects, where important major decisions are mostly made by the government (Breukers & Wolsink, 2007a; Cai & Aoyama, 2018). Therefore, people in the Netherlands and China may both be used to deferring to responsible agents to make decisions. Indeed, evidence suggests that trust in responsible agents is an important factor influencing project acceptability in both countries (Montijn-Dorgelo & Midden, 2008; Yang et al., 2016). In addition, research suggests that both in the Netherlands and China public influence in decision-making can increase support for the projects (Bernauer et al., 2016; Koornneef et al., 2008). Therefore, our proposed model may be robust across the two countries.

However, Dutch and Chinese cultures are also rather different, with, for example, the first being individualistic (Oyserman, 2006) and the latter collectivistic (Hofstede, G., Hofstede, G., & Minkov, 2010). These cultural factors might impact the (size of) the effects of trust and influence over decisions on project acceptability. For instance, research suggests that being able to influence major decisions may have a stronger

effect on project acceptability in individualistic cultures, where people typically value expressing their opinions publicly and having influence over decisions that may possibly affect them (Kim & Sherman, 2007). In contrast, people in collectivistic cultures are less willing to express their personal opinions publicly (Kim & Sherman, 2007). In collectivistic countries, people particularly await the decisions from responsible agents, such as the government (Hofstede, G., Hofstede, G., & Minkov, 2010). Yet, although there could be reasons to expect different (size of) effects of trust and influence on project acceptability in the two countries, we did not aim for comprehensive exploration of the cultural differences in this paper, but instead, to see to what extent our theoretical model is robust and generalizable across countries.

In sum, we tested the following hypotheses: (1) higher trust in responsible agents leads to higher public acceptability of renewable energy projects; (2) being able to influence major decisions regarding the project leads to higher project acceptability than only being able to influence minor decisions. We additionally studied the interaction effect of trust in responsible agents and public influence over decisions to examine whether public acceptability of renewable energy projects would be highest when trust is high and when people are able to influence major decisions. Moreover, we tested our reasoning in two different countries and cultures, namely in the Netherlands and China.

2.2. Method

2.2.1. Procedures and design

We tested our reasoning in Groningen (Study 1) and in Zhangjiakou (Study 2), which are two medium-sized cities in the north of the Netherlands and China, respectively. Both cities have experience with renewable energy project development and are planning to develop new renewable energy projects in the near future. For example, both the Province of Groningen and Zhangjiakou City have developed solar and wind power projects. Therefore, we expected that people in Groningen and in Zhangjiakou could easily imagine that there were plans to develop a renewable energy project, in particular a solar panel project, in their neighbourhood.

In both cities, we selected different neighbourhoods for data collection in order to reach people with different demographic characteristics. People were approached by the researcher or a trained volunteer at their homes and were asked to participate in a study on their opinions about renewable energy projects. If they agreed to participate, they were handed the questionnaire¹, which was later picked up upon appointment. The questionnaire was in Dutch in Groningen and in Chinese in Zhangjiakou.²

In both cities, we followed the same 2x2 between-subjects factorial design to test our hypotheses. Participants were asked to imagine that an energy company was planning to implement a solar panel project in their neighbourhood, and that they could give their opinions about the project together with other people in their neighbourhood. Next, we manipulated the level of trust in the energy company as well as whether people could influence major versus minor decisions regarding the project, as follows:³

Trust in the energy company⁴. In the low trust condition, participants read that based on their previous experience, they had low trust in the energy company that was responsible for the solar panel project. In the high trust condition, participants read that based on their previous experience, they had high trust in the energy company that was responsible for the solar panel project.

¹ Questionnaire was distributed following a blind procedure. The researcher and the volunteers did not know which condition was presented to the participant.

² The questionnaire was first designed in English. Next, for the Dutch questionnaire, two native Dutch speakers translated it into Dutch. Two other native Dutch speakers checked the questionnaire and revisions were made as appropriate. For the Chinese questionnaire, a native Chinese speaker translated the English questionnaire into Chinese. Five other native Chinese speakers checked the questionnaire and revisions were made as appropriate.

³ Before reading about the solar energy project, participants first completed a measure of their individual values (Steg et al., 2014) and of perceived values of people in their neighbourhood. Next, they evaluated acceptability of different energy sources, namely coal, gas, solar, wind, bio energy, geothermal energy, and nuclear power. All measures were included before the manipulation and were constant across the conditions. These measures are not relevant for the goals of this paper and will not be discussed further.

⁴ See Appendix A for detailed scenario description including the manipulation of trust in the energy company and public influence over decisions.

Public influence over decisions. In both the influence over minor decisions only condition and the influence over major decisions condition, participants had some influence, but the types of decisions they could influence differed. Specifically, in the influence over minor decisions only condition, we informed participants that during the decision making about the solar panel project, they could only influence some aspects of the project, such as type and colour of the solar panels to be installed, while the number and the location of the solar panels had already been decided by the energy company. In the influence over major decisions condition, we informed participants that during the decision making about the solar panel project, they could influence all aspects of the project, including the type, colour, the number, and the location of the solar panels to be installed.

2.2.2. Measures

After reading the scenarios, we asked participants to evaluate the acceptability of the solar panel project.⁵ They then answered manipulation check questions to determine whether our manipulations had the expected effects on trust in the responsible energy company and perceived influence over decisions regarding the solar panel project. Finally, participants answered some demographic questions (see Appendix B, Table 1 for detailed demographic information about the samples).

Acceptability of the solar panel project. We asked participants to what extent, on four 7-point scales (ranging from -3 to 3), they thought the solar panel project in their neighbourhood was: *very unacceptable* to *very acceptable*, *very bad* to *very good*, *very negative* to *very positive*, and *very unnecessary* to *very necessary*. We computed the mean scores on these four items, reflecting participants' acceptability of the project (the Netherlands: $M = 1.99$, $SD = 1.03$, $\alpha = .93$; China: $M = 2.12$, $SD = .86$, $\alpha = .97$)

2.2.3. Manipulation checks

⁵ There were more questions following the scenario, including evaluation of the decision-making process and evaluation of decisions made by the energy company about the solar panel project. We do not report these results because they are outside the scope of this paper.

Trust in the energy company. We asked participants to what extent, on three 7-point scales (ranging from -3 to 3), they thought the energy company that was going to implement the solar panel project in their neighbourhood was: *very unreliable* to *very reliable*, *very bad* to *very good*, and *very irresponsible* to *very responsible*. We computed the mean scores on these three items, reflecting participants' perceived trust in the energy company (the Netherlands: $M = 0.71$, $SD = 1.09$, $\alpha = .89$; China: $M = 1.37$, $SD = 1.45$, $\alpha = .98$).

Public influence over decisions. We asked participants to indicate their perception of (1) how much influence they themselves would have on decisions regarding the solar panel project and (2) how much influence people in their neighbourhood would have on these decisions. Scores could vary from 1 *very little* to 7 *very much*. We computed the mean score of the two items, reflecting perceived public influence over decisions regarding the solar panel project (the Netherlands: $M = 3.76$, $SD = 1.54$, $r = .80$; China: $M = 3.39$, $SD = 1.74$, $r = .62$).

2.3. Study 1: Effects of trust and public influence on acceptability of renewable energy projects in the Netherlands

2.3.1. Participants

In total 120 participants agreed to fill out the questionnaire, of which 95 were returned. A large part of the responses were missing in four questionnaires and were therefore excluded from the analyses, leaving 91 valid responses for further analyses. In total 45 respondents were male and 46 were female, with a mean age of 38 years ($SD = 11.63$). See Table 1 in Appendix B for detailed demographic information about the respondents in Groningen.

2.3.2. Results

2.3.2.1. Manipulation check

As expected, perceived trust was higher in the high trust condition ($M = 1.05$, $SD = 0.98$) than in the low trust condition ($M = 0.35$, $SD = 1.10$); $t(89) = -3.22$, $p = .002$. In addition, the extent to which participants thought that they themselves and their neighbours could influence the decisions regarding the solar panel project was higher

when participants read that they could influence major decisions related to the project ($M = 4.12$, $SD = 1.57$) than when they could influence minor decisions only ($M = 3.38$, $SD = 1.24$); $t(89) = -2.50$, $p = .014$.

2.3.2.2. Effects of trust and influence over decisions on project acceptability

We used ANOVA to test our hypotheses.⁶ We included the main effects of trust in the responsible energy company, public influence over decisions, and the interaction of trust and influence in the model. Results showed significant main effects of trust, $F(1, 87) = 19.68$, $p < .001$, $\eta^2 = .18$, and influence over decisions, $F(1, 87) = 9.31$, $p = .003$, $\eta^2 = .10$, on project acceptability. As predicted, participants in the high trust condition evaluated the project as more acceptable ($M = 2.39$, $SD = 0.66$) than participants in the low trust condition ($M = 1.57$, $SD = 1.19$). Also, as predicted, when participants could influence major decisions regarding the project, they evaluated the project as more acceptable ($M = 2.27$, $SD = 0.78$) than when participants could only influence minor decisions regarding the project ($M = 1.72$, $SD = 1.19$).

The main effects of trust in the responsible energy company and public influence over decisions on project acceptability were qualified by a significant interaction of trust and influence, $F(1, 87) = 10.23$, $p = .002$, $\eta^2 = .11$. As depicted in Figure 1, follow-up pairwise comparisons revealed that project acceptability was lowest when participants had low trust in the energy company and could only influence minor decisions regarding the solar panel project. Either having higher trust in the energy company or having influence over major decisions resulted in higher acceptability of the solar panel project, compared with the low trust and influence over minor decisions condition. Having both high trust in the energy company and influence over major decisions regarding the project did not have additional effects on the acceptability of

⁶ In addition to studying the effects separately for the two countries, we also conducted one ANOVA analysis with “country” as a between-subjects factor. This ANOVA analysis showed very similar results to what we found and reported in the paper based on the two separate analyses in the two countries, and yielded the same conclusions. As our aim was to replicate the study in different countries, rather than performing a comprehensive cross-country comparison, we report the results separately for the two countries.

the solar panel project in the Netherlands compared to having either high trust or influence over major decisions⁷.

Figure 1: Effects of trust in the responsible energy company and influence over decisions on project acceptability (Study 1).

Note: means of bars with different letters (a, b) significantly differ from each other ($\alpha < .05$, Bonferroni-Holm corrected), those with the same letter do not significantly differ from each other.

2.3.3. Discussion

Study 1 showed that either having high trust in the responsible energy company or being able to influence major decisions regarding the solar panel project enhanced

⁷ The pattern of the results did not change when we included gender, age, education, income and acceptability of solar energy as covariates. Therefore, we report the model results without including these as covariates.

project acceptability in the Netherlands, a Western European country with an individualistic culture. Having both high trust and influence over major decisions did not have additional effects on project acceptability compared to having either high trust or influence over major decisions. Study 2 was aimed at testing whether we could replicate these findings in an East-Asian country with a collectivistic culture, namely China.

2.4. Study 2: Effects of trust and public influence on acceptability of renewable energy projects in China

2.4.1. Participants

Again, in total 120 participants agreed to fill out the questionnaire, of which 103 were returned. A large part of the responses was missing in two questionnaires and were therefore excluded from the analyses, leaving 101 valid responses for further analyses. In total 26 respondents were male and 75 were female, with a mean age of 42 years ($SD = 9.15$). See Table 1 in Appendix B for detailed demographic information about the respondents in Zhangjiakou.

2.4.2. Results

2.4.2.1. Manipulation check

As expected, trust was higher in the high trust condition ($M = 1.71$, $SD = 1.06$) than the low trust condition ($M = 1.01$, $SD = 1.72$); $t(79) = -2.41$, $p = .018$. In addition, the extent to which participants thought that they themselves and their neighbours could influence the decisions regarding the solar panel project was higher when participants read that they could influence major decisions related to the project ($M = 3.72$, $SD = 1.64$) than when they could influence minor decisions only ($M = 3.06$, $SD = 1.44$); $t(99) = -2.16$, $p = .033$.

2.4.2.2. Effects of trust and influence over decisions on project acceptability

We again conducted an ANOVA, including the main effects of trust in the responsible energy company, public influence over decisions, and the interaction of trust and influence in the model. The results revealed significant main effects of trust, $F(1, 97) = 5.30$, $p = .023$, $\eta^2 = .05$, and influence over decisions, $F(1, 97) = 35.01$, p

$< .001$, $\eta^2 = .27$, on project acceptability. Similar to Study 1 and as predicted, participants in the high trust condition evaluated the project as more acceptable ($M = 2.25$, $SD = 0.86$) than participants in the low trust condition ($M = 1.98$, $SD = 0.84$). Also, in-line with Study 1 and as predicted, participants who read they could influence major decisions regarding the project ($M = 2.53$, $SD = 0.72$) evaluated the project as more acceptable than participants who believed they could only influence minor decisions regarding the project ($M = 1.71$, $SD = 0.79$).

Again, the main effects of trust in the responsible energy company and public influence over decisions on project acceptability were qualified by a significant interaction of trust and influence, $F(1, 97) = 5.88$, $p = .017$, $\eta^2 = .06$. Follow-up pairwise comparisons showed that the effects of trust in the responsible energy company and public influence over decisions on project acceptability followed a similar pattern as in Study 1 (see Figure 2). Again, project acceptability was lowest when participants had low trust in the responsible energy company and could only influence minor decisions of the solar panel project. When people could influence only minor decisions, having higher trust in the responsible energy company resulted in higher project acceptability. Interestingly, acceptability was highest when people could influence major decisions, irrespective of the level of trust that people had in the responsible energy company in China.⁸

⁸ The pattern of the results did not change when we included gender, age, education, income and acceptability of solar energy as covariates. Therefore, we report the model results without including these as covariates.

Figure 2: Effects of trust in the responsible energy company and influence over decisions on project acceptability (Study 2).

Note: means of bars with different letters (a, b, c) significantly differ from each other ($\alpha < .05$, Bonferroni-Holm corrected), those with the same letter do not significantly differ from each other.

2.4.3. Discussion

Results of Study 2 were mostly similar to the results of Study 1, indicating that trust in responsible agents and public influence over decisions played similar roles in affecting public acceptability of renewable energy projects in the Netherlands and China. Yet, in China, having influence over major decisions regarding the project resulted in highest project acceptability, irrespective of the level of trust that people had in the responsible energy company was low.

2.5. General discussion and conclusion

We studied the effects of trust in responsible agents and public influence over decisions on public acceptability of renewable energy projects, specifically a solar energy project, in the Netherlands and China. We extended previous research by (1) conducting an experimental study to test the causal effects of trust in responsible agents and influence over decisions regarding the project on public acceptability of renewable energy projects; (2) testing the combined effects of trust and influence over decisions on project acceptability; and (3) testing whether the effects of trust and influence over decisions on project acceptability are similar across different countries and cultures, notably the Netherlands, a Western European and individualistic country, and China, an East-Asian and collectivistic country.

We consistently found that public acceptability of the planned solar energy project was lowest when trust in the energy company responsible for the solar energy project was low and participants could only influence minor decisions regarding the project. In addition, our results demonstrated that having *either* higher trust in the responsible energy company *or* influence over major decisions regarding the project increased public acceptability of the project, in both our samples in the Netherlands and China, suggesting that the results are likely to be generalizable across different countries and cultures.

These findings provide important convergent evidence in addition to earlier correlational studies on the positive relationship between trust and project acceptability (e.g., De Cremer & Tyler, 2007; Siegrist et al., 2012; Yang et al., 2016). Our experimental study adds to this literature by causally establishing that trust in responsible agents influences project acceptability. More importantly, we extended previous research by also examining the combined effects of trust and public influence over decisions, as theory on factors driving project acceptability mostly examine these factors separately. This provides important insights into whether or not different factors need to be in place simultaneously to enhance project acceptability. Furthermore, we conducted the same study in two different countries and cultures,

providing first evidence that similar processes may play a role in influencing project acceptability in different countries and cultures.

Although both trust and influence over decisions had positive effects on project acceptability across our samples in the two countries, the strength of the effects of trust and influence over decisions on project acceptability was slightly different in our samples within the Netherlands and China. For our Dutch sample, the positive effect of trust in the responsible energy company on project acceptability was stronger than the effect of public influence over decisions on project acceptability. For our Chinese sample, it was the other way around – the effect of public influence over decisions on project acceptability ($\eta^2 = .27$) was stronger than the effect of trust in the responsible energy company on project acceptability ($\eta^2 = .05$). Perhaps in the Netherlands people prefer having someone they trust to make decisions for them, as this implies that they can spend less time and effort on public participation procedures and they believe that their interests are taken into account (Kleinman et al., 2011; Koirala et al., 2018; McLaren Loring, 2007). The stronger effect of influence in our Chinese sample could be related to the increased opportunities to influence decision making nowadays compared to the past. For example, as a result of social media development in China, people may thus treasure these opportunities and perceive influence to be more important (cf. Gil de Zúñiga, 2012; He et al., 2017; Zhou, 2011). Also, in China, energy projects are usually initiated by the government and therefore trust in an energy company could be less relevant in the planning phase. This suggests trust in the government could potentially be more relevant for public acceptability of newly developed renewable energy projects in China (Cai & Aoyama, 2018). Future studies could test the effects of trust in different agents who are responsible for renewable energy projects. Most importantly, in both countries, higher trust and influence over decisions resulted in higher project acceptability, although effect sizes for trust were stronger in the Netherlands than in China, while influence over decisions had a stronger effect size in China than in the Netherlands.

Our findings have important practical implications. Our results suggest that both trust in responsible agents and public influence over decisions regarding renewable energy projects should be considered from the very beginning of the development of these projects. Firstly, since trust is an important factor for project acceptability, if initial trust is high, it is important to keep trust in responsible agents high, and otherwise to increase trust in case when it is initially low. Secondly, it is generally believed that increasing public participation in decision-making processes is an effective way to secure public acceptability of climate policies and sustainable projects (UNECE, n.d. ; see for review Steg et al., 2015). Yet, our results showed that engaging the public in major decisions regarding the project resulted in higher public support for renewable energy projects compared to only engaging them in minor decisions. Practitioners could consider ways that can engage people in influencing major decisions regarding the project. Thirdly, given that trust in agents responsible for renewable energy development may not always be high (Mumford & Gray, 2010; Ricci et al., 2010; Shaw et al., 2015) and particularly given that it may be difficult to enhance trust in responsible agents in a short term (Ricci et al., 2010), it seems particularly important to give people a say in major decisions regarding renewable energy projects. This may not only improve public acceptability of the project as such, but engaging people in decision-making could, in many cases, lead to better decisions and improve the quality of projects by incorporating local knowledge in the development of projects (Bidwell, 2016; cf. Galvin, 2018). Giving the public a say in major decisions regarding renewable energy projects could eventually even increase people's trust in responsible agents (cf. Terwel et al., 2010). Specifically, being able to influence major decisions could make the public think that the responsible agent is transparent about its activities and is willing to consider public interests when making decisions. Future research could test this possibility.

Future research could also test under which conditions trust and public influence over decisions have most positive effects on project acceptability. For example, it could be examined whether the different types of public participation, ranging from informing

the public to citizen control over decision making, affect project acceptability differently (Arnstein, 1969). Participation forms that involve stronger public influence in decision making might be more likely to have positive effects on project acceptability than only providing information (Aitken et al., 2016; Reilly et al., 2016; Shaw et al., 2015). Also, we conceptualized trust as the extent to which the public evaluates agents who are responsible for making decisions and carrying out actions regarding renewable energy projects as trustworthy. Yet, different dimensions of trust have been distinguished in the literature, including integrity-based trust (the extent to which the public perceives responsible agents to be honest and open) and competence-based trust (the extent to which people think responsible agents have sufficient expertise and knowledge to manage the project) (Earle & Siegrist, 2006; Kim, 2005; Mayer et al., 1995; Terwel et al., 2009a, 2009b). Future (experimental) studies could examine how these different dimensions of trust influence public acceptability of renewable energy projects.

We purposely manipulated trust in responsible agents and public influence over decisions in an explicit way, to see whether the differences in project acceptability would occur as predicted by the model. Future research could manipulate both factors differently and more indirectly to further test our reasoning. For example, trust could be manipulated by varying relevant characteristics of the responsible agent, such as whether an agent is honest, transparent about its activities and caring about public interests. Also, the type of decisions that the public can influence could be embedded in more detailed description of different decisions, instead of informing participants explicitly that they could influence “some” versus “all” decisions. This also leads to an interesting question for future research to test whether different types of framing of influence over decisions would have an effect on project acceptability or not. Moreover, we did not include a control condition in this study because we were mainly interested in the effects of trust and influence over decisions on project acceptability, rather than investigating whether we could alter a current situation. Future research could conduct the study with a control condition to further examine

whether lower levels of trust/influence reduce acceptability, or it could be that higher levels of trust/influence increase project acceptability. This would be an interesting research question to see where interventions should focus on.

Interestingly, public acceptability of the solar panel project evaluated in our study was relatively high in both countries across all conditions, which may be related to the generally positive association that people have with solar power (Sütterlin & Siegrist, 2017). We chose to base our scenario on a solar power project because many communities may expect such a project in their neighbourhood in the future. Moreover, rather than focusing on a specific energy technology, our aim was to test the theoretical model on the effects of trust and influence over decisions on project acceptability. Future research could test whether similar results are found when studying more controversial renewable energy projects, such as wind power projects, or hydro-energy projects (Díaz et al., 2017; Guo et al., 2015; Papazu, 2017). Maybe when project acceptability is generally lower, having only high trust or influence over major decisions regarding the project is not sufficient to increase project acceptability – in such cases, both may be needed for higher project acceptability. Moreover, our results were based on a scenario study, which did not concern a real decision. It would be interesting for future research to test the model in field studies: analysing the relationships between trust in responsible agents and (perceived) influence over decisions, on the one hand, and public acceptability of the actual renewable energy projects, on the other hand.

Our participants were households who may expect renewable energy projects in or near their neighbourhoods in the future. Yet, one possible limitation of our samples was that they were not representative samples of the two cities we studied. For example, the sample in Groningen was not diverse in terms of education and income, while the sample in Zhangjiakou had more female than male. Yet, it was not our aim to get representative samples in both cities to conduct a comprehensive cross-cultural comparison. Our main goal of this paper was to examine the robustness of the model, which we examined by testing the model in two medium sized cities that could expect

renewable energy projects in the future in the Netherlands and China. Future research could examine whether similar findings can be found in different cities or rural areas in both countries, or with representative samples of the Dutch and Chinese population, to draw firmer conclusions about the generalizability of the findings. In addition, future research is needed to investigate the possibility that trust and influence could have different effect (sizes) in both countries with representative samples and/or in other countries and cultures.

To conclude, this paper is the first attempt to experimentally study the effects of trust in responsible agents and public influence over decisions on public acceptability of renewable energy projects. Although there were some small differences in strength of effects, the pattern of results was mostly similar in the Netherlands and China. Therefore, our paper provides first experimental evidence that trust in responsible agents and public influence over decisions may have similar effects on project acceptability across different countries and cultures. Importantly, having either higher trust in the responsible agent or influence over major decisions could be sufficient for higher project acceptability. This suggests that international policies aiming at implementing renewable energy projects that are widely supported by the public should particularly take into account trust in responsible agents and facilitate public influence over major decisions related to such projects, in order to promote a worldwide sustainable energy transition.

2.6. Appendix

Appendix A: scenarios with manipulations of trust in the responsible energy company and public influence over decisions⁹

Low influence & Low trust

Please imagine that an energy company was planning to implement a solar panel project in your neighbourhood. Together with other people in your neighbourhood, you can give your opinions about the project. During the decision-making about the solar panel project, you and your neighbours can only influence some aspects of the project, such as type and colour of the solar panels to be installed. The number and the location of the solar panels have already been decided by the energy company. Based on your previous experience, you have low trust in this energy company.

Low influence & high trust

Please imagine that an energy company was planning to implement a solar panel project in your neighbourhood. Together with other people in your neighbourhood, you can give your opinions about the project. During the decision-making about the solar panel project, you and your neighbours can only influence some aspects of the project, such as type and colour of the solar panels to be installed. The number and the location of the solar panels have already been decided by the energy company. Based on your previous experience, you have high trust in this energy company.

High influence & low trust

Please imagine that an energy company was planning to implement a solar panel project in your neighbourhood. Together with other people in your neighbourhood, you can give your opinions about the project. During the decision-making about the solar panel project, you and your neighbours can influence all aspects of the project, including the type, colour, the number and the location of the solar panels to be installed. Based on your previous experience, you have low trust in this energy company.

⁹ Dutch and Chinese translations of the scenarios are available upon request of the first author.

High influence & high trust

Please imagine that an energy company was planning to implement a solar panel project in your neighbourhood. Together with other people in your neighbourhood, you can give your opinions about the project. During the decision-making about the solar panel project, you and your neighbours can influence all aspects of the project, including the type, colour, the number and the location of the solar panels to be installed. Based on your previous experience, you have high trust in this energy company.

Appendix B:

Table 1: demographics of respondents in Groningen and Zhangjiakou

		Groningen, the Netherlands	Zhangjiakou, China
Gender	Male	45	26
	Female	46	75
Mean age (<i>SD</i>)		38 (<i>SD</i> = 11.63)	42 (<i>SD</i> = 9.15)
Education	Primary school	0	2
	Junior school	0	14
	High school	22	33
	University	68	48
	Don't want to say	1	4
Income per month (Euro/Yuan) (1.00 euro equals about 7.81 Yuan)	Less than 1500	49	8
	1500-3000	28	19
	3001-4500	4	16
	More than 4500	2	27
	Don't want to say	8	31
Living situation	Owner	15	89
	Tenant	76	7
	Other	0	5

Chapter 3

Effects of Competence- and Integrity-based Trust on Public Acceptability of Renewable Energy Projects in China and the Netherlands

This chapter is based on a published paper: Liu, L., Bouman, T., Perlaviciute, G., & Steg, L. (2020). Effects of competence-and integrity-based trust on public acceptability of renewable energy projects in China and the Netherlands. *Journal of Environmental Psychology*, 67, 101390.

Abstract: Acceptability of renewable energy projects depends on the trust people have in agents responsible for those projects. Two dimensions of trust are relevant in this respect: competence-based and integrity-based trust. Yet, the unique and interaction effects of these two dimensions of trust on project acceptability are not well understood. We conducted two experimental studies to test these effects in China and the Netherlands. As expected, higher integrity-based trust in responsible agents led to higher project acceptability in both countries. Notably, these effects were independent of the level of competence-based trust. Competence-based trust enhanced project acceptability only in China and only when integrity-based trust was low. Mediation analyses further showed that (part of) the effects of both dimensions of trust on project acceptability could be explained by people's perceptions of how the decisions were made, in both countries. Results suggest that integrity-based trust has a more profound effect on project acceptability than competence-based trust.

Keywords: Competence-based trust; integrity-based trust; public acceptability; renewable energy projects; decision making; cross-cultural

3.1 Introduction

To mitigate climate change, it is crucial to transit from fossil (e.g., coal and gas) to renewable energy sources (e.g., solar and wind) (European Commission, n.d.). The success of such transition strongly depends on public acceptability of renewable energy projects (Babiker et al., 2018; Devine-Wright, 2007, 2009; Papazu, 2017; Wüstenhagen, Wolsink, & Bürer, 2007). We define public acceptability as the extent to which people evaluate those projects (un)favourably (from now on referred to as “project acceptability”). Different agents may be involved in the development of renewable energy projects, such as governments, energy companies and NGOs (Wüstenhagen et al., 2007). The public usually has to rely on these agents, since most often people do not initiate the projects themselves and/or it is beyond the duty and ability of the public to manage such projects. Therefore, trust in responsible agents is arguably a critical factor that influences project acceptability (Merk et al., 2015; Rayner, 2010; Siegrist et al., 2012; Terwel et al., 2011; Yang et al., 2016).

Research has identified two dimensions of trust that are particularly relevant for project acceptability, namely competence-based trust (i.e., trust in knowledge and expertise of responsible agents) (Gordon, Brunson, & Shindler, 2014; Terwel, Harinck, Ellemers, & Daamen, 2009) and integrity-based trust (i.e., trust in honesty and transparency of responsible agents) (Braun et al., 2018; Graham et al., 2009). Although both dimensions of trust are suggested to be associated with project acceptability (Braun et al., 2018; Graham et al., 2009; Siegrist et al., 2012; Terwel et al., 2009a), they have not been studied together in experimental designs, leaving it unknown whether and how competence- and integrity-based trust work together in predicting project acceptability.

Yet, understanding the unique and combined effects of competence- and integrity-based trust on project acceptability is critical for effective and successful implementation of renewable energy projects. For example, if one dimension of trust is more important for project acceptability than the other, it seems more effective to enhance this dimension of trust when aiming to secure public support for the

sustainable energy transition. In addition, knowing whether and how both dimensions of trust work together provides insights in whether interventions could best focus on one or both dimensions of trust to effectively promote project acceptability. To fill this gap in the literature, our research uses an experimental design in which we systematically vary both dimensions of trust to examine the unique and interaction effects of competence- and integrity-based trust on project acceptability. Moreover, we conducted studies in China and the Netherlands, respectively, to test the robustness of our findings across countries.

3.1.1. Effects of competence- and integrity-based trust on project acceptability

We define “trust” as the extent to which the public evaluates agents responsible for renewable energy projects as trustworthy or not (Liu et al., 2019). Literature on social cognition posits that competence and integrity are two conceptually different components that people use to form their judgement of an agent, namely whether an agent is competent and has good/ill intentions (Fiske et al., 2002, 2007; Wojciszke, Dowhyluk, et al., 1998). Following this distinction, we conceptualise trust as an overarching concept that encompasses competence- and integrity-based trust (cf. Earle & Siegrist, 2006, 2008). We define competence-based trust as the extent to which responsible agents are perceived to have the relevant knowledge and expertise to implement and manage a renewable energy project. Competence-based trust is therefore mainly based on people’s evaluation of the performance and ability of responsible agents (Earle & Siegrist, 2006, 2008; Fiske et al., 2002). We define integrity-based trust as the extent to which responsible agents are perceived to be honest and transparent about their activities, and are concerned with public interests. Integrity-based trust is therefore mainly based on the perceived morality and intentions of responsible agents (Earle & Siegrist, 2006, 2008; Fiske et al., 2002). Evidence from studies employing factor analyses suggests that competence- and integrity-based trust are not only conceptually different, but can be empirically distinguished as well (e.g., Siegrist, Connor, & Keller, 2012).

Both competence- and integrity-based trust have been suggested to positively relate to public acceptability of energy-related projects. Specifically, research showed that people find energy projects, for example carbon capture and storage, more acceptable if they trust that agents responsible for the project have relevant knowledge and expertise, and thus have the competence to successfully implement the project (Terwel et al., 2009a). Similarly, the more agents are perceived to be honest and transparent about their activities, and caring about public interest – and are thus judged as having integrity – the higher is public acceptability of their proposed energy technologies, such as climate engineering (Braun et al., 2018; Graham et al., 2009; Siegrist et al., 2012). So far, studies that showed a positive association between competence- and integrity-based trust on one hand, and project acceptability on the other hand, mostly followed a correlational design (e.g., Braun et al., 2018; Siegrist et al., 2012). Hence, the causal direction of such relationships has not been established yet. Notably, a positive relationship may imply, indeed, that trust in competence and/or integrity leads to higher project acceptability, but conversely, it may also imply that people trust the agent having competence and/or integrity *because* they find the renewable energy project acceptable (cf. Poortinga & Pidgeon, 2005).

To our best knowledge, the two dimensions of trust have hardly been studied together, leaving it unknown whether one dimension of trust influences project acceptability more than the other dimension of trust. Correlational studies have suggested that perceived morality of responsible agents tends to be more strongly related to project acceptability than perceived performance of responsible agents (Earle & Siegrist, 2006; Siegrist et al., 2012). This may be because morality is associated with agents' good or bad intentions regarding public interests, and therefore used for inferring whether the responsible agent will safeguard public interests, which can affect whether the public finds the project acceptable. Competence is less indicative of the good or bad intentions of responsible agents, but more of whether agents have sufficient expertise in a specific field. Hence, competence-based trust might be less useful in inferring whether public interests will be incorporated in the project, and thus less relevant for

evaluating how acceptable they find the project (cf. De Bruin & Van Lange, 1999, 2000). This suggests that integrity-based trust, which primarily relates to the perceived morality of the responsible agent, would have a stronger effect on project acceptability than competence-based trust, which primarily relates to the performance of the agent. Similarly, social cognition literature suggests that when evaluating how trustworthy an agent is, people rely more on information on whether agents will protect one's interests than information on whether agents are capable of conducting the relevant activities (cf. Wojciszke, Bazinska, & Jaworski, 1998). Yet, the social cognition literature has not tapped into whether the same reasoning applies when evaluating activities performed by the agent, such as the implementation of energy projects. Our study takes the next step by including project acceptability as the dependent variable. Even if integrity-based trust could have a stronger effect in influencing project acceptability than competence-based trust, the question remains whether integrity-based trust would enhance project acceptability independent of the level of competence-based trust, and whether the effects of competence-based trust on project acceptability depends on the level of integrity-based trust. The social cognition literature suggests that an agent could be judged as having high integrity and low competence (and vice versa) at the same time (Fiske et al., 2002). Yet, the social cognition literature has not examined how such mixed perception of the agent affects evaluation of activities performed by the agent. To our best knowledge, the interaction effect of both dimensions of trust on project acceptability has hardly been theoretically discussed or experimentally tested. Hence, the question remains whether people would accept a renewable energy project launched by an energy company that is perceived as honest and concerned with public interests, while at the same time, it is regarded as having little experience and expertise in developing renewable energy projects. Or would the public find a project acceptable when they believe responsible agents are knowledgeable, but not as having high integrity? Relatedly, do both competence- and integrity-based trust need to be high in order for project acceptability to be high? Or would high trust in either integrity or competence already

be sufficient for higher project acceptability? To address these questions, we use an experimental design in which we expose participants to a description of a renewable energy project and systematically vary the level of trust in the competence and the integrity of responsible agents, to test the unique effects and explore the interaction effects of both dimensions of trust on project acceptability.

Additionally, we test the processes via which the two dimensions of trust influence public acceptability of renewable energy projects. Research suggests that the more people trust the responsible agent, the more acceptable they find the decision-making process related to the concrete project (De Cremer & Tyler, 2007; Siegrist et al., 2012; Tyler, 2000). We define acceptability of the decision-making process as the extent to which people evaluate the decision-making process (un)favourably. Higher acceptability of the decision-making project is in turn associated with higher acceptability of the project (Arvai, 2003; De Vente et al., 2016; Esaiasson et al., 2017; Siegrist et al., 2012). Therefore, trust in responsible agents may enhance project acceptability via increased acceptability of the decision-making process. However, no study has looked at whether the process is the same or different for the two dimensions of trust.

It is often argued that people evaluate the decision-making process positively particularly when they consider the decision-making procedures as transparent, unbiased, fair and considering different interests and concerns (Leventhal, 1980; McComas et al., 2008; Tyler et al., 2016; Visschers & Siegrist, 2012; Zoellner et al., 2008). Particularly integrity-based trust seems to be related to whether people think the agent will be transparent about its activities and will take public interests into consideration during decision making about a project (cf. Tyler, 1989, 1994). Therefore, we propose that this mediation effect is particularly likely for integrity-based trust. On the other hand, competence-based trust refers mostly to perceived knowledge and expertise of agents in developing the technology, which indicates that the agents are capable of making decisions, but does not say much about how the decisions are made and whether public interests will be considered during decision-

making process. Hence, we propose that competence-based trust is less likely to influence project acceptability via acceptability of the decision-making process.

3.1.2. Effects of competence- and integrity-based trust on project acceptability in different countries and cultures

We test our theoretical reasoning in different countries, in order to assess the extent to which the model is robust and generalizable across different countries and cultures. There is evidence to suggest that trust in responsible agents is crucial for public acceptability of renewable energy projects across different countries and cultures (Liu et al., 2019). Yet, it is not clear to what extent the two dimensions of trust, namely competence- and integrity-based trust, influence project acceptability similarly in different countries and cultures. As yet, most studies on the relationships between (the two dimensions of) trust and public acceptability have been conducted in Western European countries (e.g., Siegrist et al., 2012; Terwel et al., 2009). Hence, the question remains the extent to which different dimensions of trust have similar or different effects on public acceptability in other countries, such as East-Asian countries. To address this question, we tested our reasoning in an East-Asian country, China, and in a Western European country, the Netherlands. We expected our theoretical reasoning to be robust across the two countries because initial evidence suggests that both dimensions of trust may matter for project acceptability in each country. For example, research suggests that people in both cultures consider the knowledge and skills of responsible agents important when evaluating acceptability of a project (Terwel et al., 2009a; Wang & Li, 2016). Therefore, we expect competence-based trust to be associated with higher project acceptability in both countries. Next, since seeking justice and caring for others are universal moral values (Kinnier et al., 2000), we expect that integrity-based trust has even a stronger positive effect on project acceptability in both countries.

In sum, we test the following hypotheses:

- Hypothesis 1: higher levels of competence- and integrity- based trust lead to higher public acceptability of renewable energy projects;

- Hypothesis 2: integrity-based trust has a stronger effect on project acceptability than competence-based trust;
- Exploratory Hypothesis 3: we additionally explored the interaction effect of both dimensions of trust on project acceptability;
- Hypothesis 4: acceptability of the decision-making process mediates the relationship between integrity-based trust and project acceptability;
- Hypothesis 5: the effects of both dimensions of trust on project acceptability are similar in China (Study 1) and the Netherlands (Study 2).

3.2 Method

3.2.1. Procedure and design

We tested our reasoning via an online survey with respondents from a pre-recruited Chinese panel (Study 1) and a pre-recruited Dutch panel (Study 2). In both countries, participants received an invitation to complete an online study about local renewable energy projects. At the end of the study, participants were thanked and received a token amount of money for their participation. The questionnaire was in Chinese in China and in Dutch in the Netherlands.¹

In both countries, we followed a 2x2 between-subjects design to test our hypotheses. Participants were asked to imagine that an energy company is planning to implement a wind energy project in the area they live in, and that they could give their opinion about the project together with other residents in this area. They were told that the energy company has already decided about the location of the wind farm and the number of wind turbines to be installed, and that they and other residents in their area can together influence some aspects of this wind energy project, such as size and

¹ The questionnaire was developed in English, and then translated into Chinese (Mandarin) by a native Chinese speaker. Eleven native Chinese speakers filled out the questionnaire to test whether all questions were clear. Revisions were made wherever needed. In addition, the same English questionnaire was translated into Dutch by a native Dutch speaker. Four native Dutch speakers checked the translation of the Dutch questionnaire to test whether all questions were clear. Revisions were made wherever needed. Importantly, changes were made consistently in the Chinese and Dutch questionnaires. Original Chinese and Dutch questionnaires can be found in Supplementary Information C and D.

colour of the wind turbines to be installed. Next, we manipulated the level of competence- and integrity-based trust in the energy company respectively, as follows:²

Competence-based trust in the energy company.³ In the low competence-based trust condition, participants read that the energy company has started to develop wind energy projects recently. The energy company has little experience, not a lot of knowledge and expertise in developing wind energy projects. In the high competence-based trust condition, participants read that the energy company has been developing wind energy projects for many years. The energy company has much experience, extensive knowledge and expertise in developing wind energy projects.

Integrity-based trust in the energy company. In the low integrity-based trust condition, we informed participants that the energy company is known as a company that is dishonest, not open and not transparent about its activities. Furthermore, they read that in the past, the energy company hardly took the interests of local residents into account when developing energy projects. In the high integrity-based trust condition, we informed participants that the energy company is known as a company that is honest, open and transparent about its activities. Next, they read that in the past, the energy company took the interests of local residents very much into account when developing energy projects.

3.2.2. Measures

After reading the scenario, we asked participants to indicate how acceptable they find the planned wind energy project in the area they live in and the decision-making process about this wind energy project. In addition, we included a manipulation check of competence- and integrity-based trust in the energy company. Besides, participants answered some demographic questions.

Acceptability of the wind energy project. We asked participants to what extent, on a 7-point scale ranging from -3 to 3, they thought the wind energy project in the area

² Before reading about the wind energy project, participants first completed a value measure (Steg et al., 2014).

³ Detailed scenario descriptions in English can be found in Supplementary Information B.

they live in was: *very unacceptable* to *very acceptable*, *very bad* to *very good*, *very negative* to *very positive*, and *very unnecessary* to *very necessary*. We computed the mean scores of these four items, reflecting participants' evaluation of the acceptability of the wind energy project (China: $M = 0.75$, $SD = 1.55$, $\alpha = .92$; the Netherlands: $M = 0.38$, $SD = 1.70$, $\alpha = .95$).

Acceptability of the decision-making process. We asked participants to what extent, on a 7-point scale ranging from -3 to 3, they thought the decision-making process about the wind energy project was: *very unacceptable* to *very acceptable*, *very bad* to *very good*, *very negative* to *very positive*, and *very unnecessary* to *very necessary*. We computed the mean scores of these four items, reflecting participants' decision-making process acceptability around the wind energy project (China: $M = 0.67$, $SD = 1.53$, $\alpha = .91$; the Netherlands: $M = -0.11$, $SD = 1.61$, $\alpha = .93$).

3.2.3. Manipulation check

Competence-based trust in the energy company. We asked participants to what extent, on a 7-point scale ranging from -3 to 3, they thought the energy company that was going to implement the wind energy project in the area they live in: *has little experience in developing wind energy projects* to *has much experience in developing wind energy projects*, and *has little knowledge in developing wind energy projects* to *has extensive knowledge in developing wind energy projects*. We computed the mean scores of the two items, reflecting participants' perceived competence-based trust in the energy company (China: $M = 0.33$, $SD = 2.30$, $r = .91$; the Netherlands: $M = 0.18$, $SD = 2.17$, $r = .92$).

Integrity-based trust in the energy company. We asked participants to what extent, on a 7-point scale ranging from -3 to 3, they thought the energy company that was going to implement the wind energy project in the area they live in: *is dishonest about its activities* to *is honest about its activities*, *is not transparent about its activities* to *is transparent about its activities*, and *took interests of local residents very little into account in the past* to *took interests of local residents very much into account in the past*. We computed the mean scores of these three items, reflecting participants' perceived trust in the energy company (China: $M = 0.02$, $SD = 2.34$, $\alpha = .97$; the Netherlands: $M = -0.04$, $SD = 2.11$, $\alpha = .95$).

3.3 Study 1: Effects of competence- and integrity-based trust on project acceptability in China

3.3.1. Participants

We received 252 valid responses for further analyses in China⁴, of which 114 were male and 138 were female, with the mean age of 33 years ($SD = 7.19$). Respondents were diverse in terms of income and regions⁵. See Supplementary Information A for detailed demographic information.

3.3.2. Results⁶

3.3.2.1. Manipulation check

As expected, perceived competence-based trust was higher in the high competence-based trust condition ($M = 2.01$, $SD = 1.04$) than in the low competence-based trust condition ($M = -2.25$, $SD = 0.75$; $t(200) = -36.65$, $p < .001$, Cohen's $d = 4.70$). In addition, perceived integrity-based trust was higher in the high integrity-based trust condition ($M = 2.07$, $SD = 0.94$) than in the low integrity-based trust condition ($M = -2.34$, $SD = 0.59$; $t(228) = -45.16$, $p < .001$, Cohen's $d = 5.62$). This suggests that our experimental manipulations were successful.⁷

⁴ 134 respondents only filled out a small part of the questionnaire and 94 respondents did not pass attention check questions. These data were excluded by the panel company and was not provided to researchers. Initial sample sizes were determined based on power analysis with medium effect size (0.25) and power (0.8), which resulted in an estimated total sample size of 179. We instructed the panel companies to reach at least 180 valid responses, which resulted in 252 valid responses in China and 188 valid responses in the Netherlands.

⁵ Respondents were from 17 provinces, 3 autonomous regions, 4 central governmental direct-controlled municipalities and 1 special administrative region of China.

⁶ The pattern of the results did not change when we included gender, age, education and income as covariates. Therefore, we report the results without including these as covariates.

⁷ As pointed out by an anonymous reviewer, the perceptions of integrity in the low-integrity condition ($M = -2.34$) may be substantially more negative than the perceptions of competence in the low-competence condition ($M = -2.25$), because of the experimental manipulations were not exactly symmetrical (e.g., “dishonest” in low-integrity conditions and “not a lot of knowledge” in low competence conditions). Yet, we tested and found that the difference between the two means is not statistically significant, $t(160) = 1.14$, $p = .26$, 95% CIs [-0.06, 0.23] (Derrick et al., 2017). This suggests that perceived integrity-based trust was not significantly lower in the low-integrity conditions than perceived competence-based trust in the low-competence conditions in Study 1 (China). We come back to this point in the Discussion.

3.3.2.2. Effects of competence- and integrity-based trust on project acceptability

A two-way ANOVA showed significant main effects of competence-based trust, $F(1, 248) = 24.98$, $p < .001$, $\eta^2 = .092$, and integrity-based trust, $F(1, 248) = 72.72$, $p < .001$, $\eta^2 = .227$, on project acceptability. Both higher competence-based trust and integrity-based trust led to higher project acceptability.

The main effects of competence- and integrity-based trust on project acceptability were qualified by a significant interaction effect ($F(1, 248) = 6.00$, $p = .015$, $\eta^2 = .024$). As depicted in Figure 1, follow-up pairwise comparisons revealed that project acceptability was lowest when both integrity-based and competence-based trust were low. Higher integrity-based trust led to higher project acceptability, both when competence-based trust was low ($p < .001$, Mean difference = 1.82, 95% CIs [1.38, 2.26]) and when competence-based trust was high ($p < .001$, Mean difference = 1.01, 95% CIs [0.53, 1.49]). Higher competence-based trust only enhanced project acceptability when integrity-based trust was low ($p < .001$, Mean difference = 1.23, 95% CIs [0.76, 1.71]). When integrity-based trust was high, having more trust in the competence of responsible agents did not lead to significantly higher project acceptability ($p = .06$, Mean difference = 0.42, 95% CIs [-0.02, 0.87]). The unique and interaction results suggest that the effect of integrity-based trust on project acceptability was stronger than the effect of competence-based trust, as expected.

Figure 1: Effects of competence- and integrity-based trust on project acceptability in China (Study 1)

Note: different letters (a, b, c) refer to significant differences in the mean scores ($\alpha < .05$); the mean scores with the same letter do not significantly differ from each other.

3.3.2.3. Moderated mediation analysis

Following Hayes's Process procedures for testing moderated mediation, we explored whether the relationship between each dimension of trust and project acceptability was mediated by decision-making process acceptability, when controlling for the other dimension of trust. Results revealed a significant moderated mediation (index = -0.49, SE(Boot) = 0.24, 95% CIs [-0.97, -0.05]).

We again found significant main effects of competence-based trust ($b = 0.98$, $p < .001$, 95% CIs [0.50, 1.45]), and integrity-based trust ($b = 1.80$, $p < .001$, 95% CIs [1.36, 2.24]), on decision-making process acceptability. The main effects of competence- and

integrity-based trust on decision-making process acceptability were qualified by a significant interaction effect ($b = -0.71$, $p = .03$, 95% CIs [-1.36, -0.06]). Follow-up pairwise comparisons revealed similar effects as for project acceptability. Specifically, higher integrity-based trust led to higher decision-making process acceptability, regardless of competence-based trust being low ($p < .001$, Mean difference = 1.80, 95% CIs [1.36, 2.24]) or high ($p < .001$, Mean difference = 1.09, 95% CIs [0.61, 1.57]). Higher competence-based trust only enhanced decision-making process acceptability when integrity-based trust was low ($p < .001$, Mean difference = 0.98, 95% CIs [0.50, 1.45]) but not when integrity-based trust was high ($p = .23$, Mean difference = 0.27, 95% CIs [-0.18, 0.71]).

When testing the full model illustrated in Figure 2, decision-making process acceptability and project acceptability were positively related ($b = 0.69$, $p < .001$, 95% CIs [0.60, 0.78]). Next, after including decision-making process acceptability in the model that examined the effects of competence- and integrity-based trust and their interaction on project acceptability, the direct effects of competence- ($b = 0.56$, $p = .002$, 95% CIs [0.20, 0.92]) and integrity-based trust ($b = 0.58$, $p = .002$, 95% CIs [0.22, 0.94]) on project acceptability were still significant, while the interaction of both dimensions of trust on project acceptability was no longer significant ($b = 0.32$, $p = .18$, 95% CIs [-0.80, 0.15]). These results indicate that the effects of competence- and integrity-based trust on project acceptability were partially mediated by decision-making process acceptability. In addition, competence- and integrity-based trust interacted with each other in influencing decision-making process acceptability, but not in influencing project acceptability after controlling decision-making process acceptability. Hence, the moderated mediation analysis revealed that integrity-based trust affected project acceptability via decision-making process acceptability, while competence-based trust affected project acceptability via decision-making process acceptability only when integrity-based trust was low.

Figure 2: Moderated mediation model of competence- and integrity-based trust, decision-making process acceptability and project acceptability in China (Study 1).

3.3.3. Discussion

Study 1 showed that both competence- and integrity-based trust enhanced project acceptability in China. As predicted, the positive effect of integrity-based trust on project acceptability was stronger when compared to that of competence-based trust. Higher trust in the integrity of the energy company led to higher project acceptability irrespective of the level of trust in the competence of the energy company. Yet, higher trust in the competence of the energy company only led to higher project acceptability

when trust in the integrity of the energy company was low. In addition, as expected, integrity-based trust enhanced acceptability of the decision-making process, which in turn led to higher project acceptability, again irrespective of the level of competence-based trust. Competence-based trust only enhanced acceptability of the decision-making process when integrity-based trust was low. Study 2 aimed at testing whether the results would be comparable in a Western European rather than an East-Asian country, namely the Netherlands.

3.4 Study 2: Effects of competence- and integrity-based trust on project acceptability in the Netherlands

3.4.1. Participants

In the Netherlands, we received 188 valid responses for further analyses.⁸ In total 111 were male and 64 were female (13 respondents did not indicate their gender), with a mean age of 59 years ($SD = 13.40$). Respondents were diverse in terms of income, regions and education. See Supplementary Information A for detailed demographic information.

3.4.2. Results⁹

3.4.2.1. Manipulation check

As expected, perceived competence-based trust was higher in the high competence-based trust condition ($M = 1.66$, $SD = 1.38$) than in the low competence-based trust condition ($M = -1.34$, $SD = 1.74$; $t(174) = -13.08$, $p < .001$, Cohen's $d = 1.91$). In addition, perceived integrity-based trust was higher in the high integrity-based trust condition ($M = 1.32$, $SD = 1.46$) than in the low integrity-based trust condition ($M = -$

⁸ In total 203 respondents only filled out a small part of the questionnaire and 55 respondents did not pass attention check questions. We analysed the data with the 55 respondents who did not pass attention check, which revealed that the results did not change.

⁹ The pattern of the results did not change when we included gender, age, education and income as covariates. Therefore, we report the results without including these as covariates.

1.59, $SD = 1.60$; $t(186) = -13.06$, $p < .001$, Cohen's $d = 1.90$). This suggests that our manipulations were successful.¹⁰

3.4.2.2. Effects of competence- and integrity-based trust on project acceptability

An ANOVA only showed a statistically significant main effect of integrity-based trust, $F(1, 184) = 5.47$, $p = .02$, $\eta^2 = .029$, on project acceptability. As depicted in Figure 3, participants in the high integrity-based trust condition evaluated the project as more acceptable than participants in the low integrity-based trust condition. The main effect of competence-based trust on project acceptability was not statistically significant, $F(1, 184) = 0.00$, $p = 1.00$. The interaction effect of competence- and integrity-based trust on project acceptability was not statistically significant either, $F(1, 184) = 0.02$, $p = .88$.

¹⁰ Similar to Study 1 (China), we found that perceived integrity-based trust ($M = -1.59$) was not significantly lower in the low-integrity conditions than perceived competence-based trust ($M = -1.34$) in the low-competence conditions in Study 2 (the Netherlands), $t(107) = 1.37$, $p = .25$, 95% CIs $[-0.11, 0.62]$. We came back to this point in the Discussion.

Figure 3: Effects of competence- and integrity-based trust on project acceptability in the Netherlands (Study 2)

3.4.2.3. Mediation analysis

To test mediation, we first checked how competence- and integrity-based trust relate to the mediator. A two-way ANOVA only showed main effect of integrity-based trust, $F(1, 184) = 16.68, p < .001, \eta^2 = .083$, on decision-making process acceptability. The main effect of competence-based trust on decision-making process acceptability was not statistically significant, $F(1, 184) = 0.71, p = .40$. The interaction effect of competence- and integrity-based trust on decision-making process acceptability was not statistically significant either, $F(1, 184) = 0.007, p = .93$. Therefore, we followed Hayes's Process procedures to test whether the positive effect of integrity-based trust on project acceptability was mediated by decision-making process acceptability in the Netherlands.

As indicated above, the effect of integrity-based trust on project acceptability ($b = 0.58$, $p = .02$, 95% CIs [0.10, 1.06]) was significant. In addition, the effect of integrity-based trust on decision-making process acceptability was significant ($b = 0.96$, $p < .001$, 95% CIs [0.51, 1.40]). Moreover, we found a significant positive relationship between decision-making process acceptability and project acceptability ($b = 0.67$, $p < .001$, 95% CIs [0.55, 0.80]). The direct effect of integrity-based trust on project acceptability was no longer statistically significant ($b = -0.06$, $p = .76$, 95% CIs [-0.46, 0.34]) after including decision-making process acceptability in the model (Sobel $z = 3.94$, $p < .001$), indicating a full mediation. As depicted in Figure 4, these results suggest that the relationship between integrity-based trust and project acceptability was mediated by decision-making process acceptability in the Netherlands.¹¹

Figure 4: Mediation model of integrity-based trust, decision-making process acceptability and project acceptability in the Netherlands (Study 2). The first coefficient below the horizontal arrow indicates the direct effect without controlling for decision-making process acceptability; the second coefficient below the horizontal arrow indicates the direct effect when controlling for decision-making process acceptability.

¹¹ The pattern of results did not change when we include competence-based trust as a covariate in the mediation analysis, so we report results without including the covariate.

3.4.3. Discussion

The effect of integrity-based trust on project acceptability in Study 2 was comparable to that in Study 1. Specifically, higher integrity-based trust in the energy company enhanced project acceptability in the Netherlands as well, and this relationship was mediated by decision-making process acceptability. Competence-based trust, however, did not have a unique positive effect on project acceptability in the Netherlands. Moreover, there was no significant interaction effect of competence- and integrity-based trust on project acceptability in the Netherlands.

3.5 General discussion

We studied the effects of competence- and integrity-based trust in agents responsible for renewable energy projects on public acceptability of these projects in China and the Netherlands. We extended previous research by (a) conducting an experimental study to test the main effects and to explore the interaction effect of competence- and integrity-based trust in responsible agents on project acceptability (Hypothesis 1 and 2; Exploratory Hypothesis 3), (b) testing whether decision-making process acceptability particularly mediates the effect of integrity-based trust on project acceptability (Hypothesis 4), and (c) testing the effects of competence- and integrity-based trust on project acceptability in an East-Asian country (i.e., China) and a Western European

country (i.e., the Netherlands), in order to test the robustness and the generalizability of the results (Hypothesis 5).

In both countries, we found that higher levels of integrity-based trust enhanced project acceptability irrespective of the level of trust in the competence of responsible agents. Competence-based trust only influenced project acceptability in China and only when trust in the integrity of the responsible agent was low. Hence, integrity-based trust, as reflected perceiving a responsible agent is honest, transparent and caring for public interests, seems to have a more profound effect in influencing project acceptability than competence-based trust, as reflected perceiving a responsible agent as experienced, knowledgeable and having expertise. This finding extends previous correlational studies that showed a stronger association between perceived morality of a responsible agent and project acceptability than between perceived performance of the agent and project acceptability (Earle & Siegrist, 2006; Siegrist et al., 2012), by teasing apart the cause and effect relationship in an experimental design. In addition, our study extends previous social cognition literature which theorised that the integrity of an agent is more prominent than the competence of the agent in evaluating the agent as such (Fiske et al., 2002), by establishing that the same pattern applies for evaluating activities performed by the agent (public acceptability of renewable energy projects in our study).

Moreover, we reasoned that integrity-based trust implies to people that the decision-making process will be done in a good way, taking public interests into account. This reasoning was supported by the finding that integrity-based trust enhanced how acceptable people found the decision-making process, which in turn was associated with higher project acceptability, in both China and the Netherlands. This finding suggests that in both countries, the more people trust the agent will be transparent about its activities and will consider public interests, the more they find the decision-making process acceptable, which in turn leads to higher acceptability of the renewable energy project. This corresponds previous literature that argues people evaluate decision-making process favourably particularly when it is fair, transparent

and represents different interests (Leventhal, 1980; McComas et al., 2008; Tyler et al., 2016; Visschers & Siegrist, 2012; Zoellner et al., 2008). In China, acceptability of the decision-making process also partially mediated the relationship between competence-based trust and project acceptability, but only when integrity-based trust was low. Thus, in China, when people do not trust the agent as having integrity, seeing the agent as competent leads to higher acceptability of the decision-making process and in turn to higher acceptability of the project. Indeed, literature from different research lines suggests that people's evaluation of decision-making process also depends on whether the decision making is well-structured (Bujar et al., 2017) and incorporates accurate knowledge (Bharati & Chaudhury, 2004). Future research could examine how different dimensions of trust influence people's evaluation of different aspects of the decision making, and how this further relates to project acceptability.

Interestingly, competence-based trust only had a significant effect on acceptability of decision making and acceptability of the project in China, but not in the Netherlands. One possible reason could be that in China, some serious technical problems happened with the development of large renewable energy projects in the past. For example, the famous hydro-energy project Three Gorges Dam in China has been claimed to be related to local environment degradation, such as water loss (Guo et al., 2012). Such cases might have led the public to consider the competence of responsible agents as very important (and not always given) when evaluating acceptability of renewable energy projects, particularly when they have little trust in the integrity of agents. This may be less the case in the Netherlands and people may assume (or take it for granted) that energy companies are anyway sufficiently competent in developing renewable energy projects (Vian, 2006). Future cross-country comparison studies are needed to examine why the differences in the effect of competence-based trust on project acceptability in China and the Netherlands occurred, and explore whether country-specific factors and/or cultural factors (e.g., collectivistic culture versus individualistic culture) can explain these differences.

Importantly, this was the only difference found between China and the Netherlands, and in general, the patterns of the results were very similar across the two countries.

Our findings have important practical implications. Many energy companies are trying to improve their image as caring about public interests, for example, through promotions in the media (Shell Global & ExxonMobil, n.d.), and to communicate their competence in the energy domain (ExxonMobil, n.d.; Shell Global, n.d.). The former strategy seems particularly important, as our results suggest that (perceived) integrity of these energy companies might be more important for public acceptability of their projects than (perceived) competence. An important next question is how project acceptability can be improved when perceived integrity-based trust in these agents is low. Our results suggest that investing in the decision-making process could help in gaining project acceptability. For example, engaging the public in decision-making procedures may enhance public acceptability of renewable energy projects. As, the pattern of results found in China and the Netherlands was similar, such approaches are likely to be effective in different countries and cultures. Moreover, research suggests that improving public perception of the decision-making process might also help to improve public perception of the agents' integrity (Jahansoozi, 2006); future research could test this possibility.

It should be noted that the manipulations of low competence- (e.g., not a lot of knowledge) and low integrity-based trust (e.g., dishonest) were not exactly symmetrical. We did not use an extremely strongly negative framing in our manipulation of low competence-based trust for the following reasons. First, we wanted to make the scenario realistic. Notably, it might not be credible to participants that an extremely incompetent company can be in charge of a wind energy project. Second, we were concerned that an extremely strongly negative framing of competence-based trust might interfere too much with the manipulation of integrity-based trust. That is, the fact that the company takes up the project without having any knowledge on this topic might be perceived as a sign that the company does not have integrity; a basic competence-based trust might therefore be a pre-requisite for integrity-based trust.

We controlled possible interaction between both dimensions of trust by explicating both dimensions of trust in all conditions. Future research could employ experimental design to test whether and how the level of perceived one dimension of trust would affect perception of the other dimension of trust. Importantly, the manipulation check results (see Footnote 7 and Footnote 10) suggest our manipulations were successful to a similar extent: In both studies, perceived low integrity-based trust was not significantly lower in the low-integrity conditions than perceived low competence-based trust in the low-competence conditions. Yet, to make the experimental manipulations more symmetrical, future research could apply a less strongly negative manipulation of low integrity-based trust (e.g., not always honest, not always open and transparent about its activities, and not always considered local interests in the past), to match the less strongly negative manipulation of low competence-based trust.

We studied acceptability of a wind energy project, which may be perceived to be less risky than some other types of renewable energy projects, such as geothermal energy projects (Carr-Cornish & Romanach, 2014; Swofford & Slattery, 2010). An interesting question is whether competence-based trust becomes more important when a renewable energy project is perceived to be associated with more risks, such as earthquakes associated with geothermal energy production or floods in case of braking dams of hydro-power stations, or whether in such cases integrity-based trust becomes even more important, namely that the responsible agent is trusted to take the decisions that best incorporate public interests. Future research is needed to address this question.

To conclude, this research is the first to experimentally study the unique and interaction effects of competence- and integrity-based trust in agents responsible for renewable energy projects on public acceptability of these projects. Our study yields two important findings. First, as expected, integrity-based trust was key to enhancing project acceptability in China and the Netherlands, whereas competence-based trust only enhanced project acceptability in China, and only when integrity-based trust was low. Second, in line with our hypothesis, the effect of integrity-based trust on project

acceptability was mediated by decision-making process acceptability in both countries. When integrity-based trust was low, the effect of competence-based trust on project acceptability was also mediated by decision-making process acceptability in China. This provides first empirical evidence that integrity-based trust is likely to be of primary importance for project acceptability across countries and cultures, compared to competence-based trust, as integrity-based trust implies if people think the decisions will be taken in a way that secures public interests. International policies aiming at implementing renewable energy projects that would be widely supported by the public, could particularly consider the integrity of agents responsible for renewable energy projects, to secure acceptability of such projects, as to promote a worldwide sustainable energy transition.

3.6 Appendix

Appendix A

Table 1: demographics of respondents in China and the Netherlands

		China		The Netherlands	
Gender	Male	114		111	
	Female	138		64	
	Missing	0		13	
Mean age (<i>SD</i>)		33 (<i>SD</i> = 7.19)		59 (<i>SD</i> = 13.40)	
Education	Primary school	0		1	
	Junior school	3		4	
	High school	11		49	
	University	238		120	
	I do not want to say	0		1	
	Missing	0		13	
Income per month (Yuan in China/Euro in the Netherlands) (1.00 euro equals about 7.81 Yuan)		Less than 2500	3	Less than 1500	8
		2500-5000	15	1500-3000	57
		5001-7500	33	3001-4500	46
		7501-10000	63	4501-6000	26
		More than 10000	138	More than 6000	7
		I do not want to say	0	I do not want to say	31
		Missing	0	Missing	13
Total		252		188	

Appendix B: Scenarios with manipulations of competence- and integrity-based trust in the responsible energy company in English

Scenario 1: Low competence-based trust & low integrity-based trust

(China: 62 participants; the Netherlands: 50 participants)

Please imagine that an energy company is planning to implement a wind energy project in the area you live in. You can give your opinions about the project together

with other residents in this area. The energy company has already decided about the location of the wind farm and the number of the wind turbines to be installed. You and other residents in this area can together influence some aspects of this wind energy project, such as the size and the colour of the wind turbines to be installed.

The energy company has started to develop wind energy projects recently. The energy company has little experience, and not a lot of knowledge and expertise in developing wind energy projects. The energy company is also known as a company that is dishonest, not open and not transparent about its activities. In the past, the energy company hardly took the interests of local residents into account when developing energy projects.

Scenario 2: High competence-based trust & low integrity-based trust

(China: 55 participants; the Netherlands: 38 participants)

Please imagine that an energy company is planning to implement a wind energy project in the area you live in. You can give your opinions about the project together with other residents in this area. The energy company has already decided about the location of the wind farm and the number of the wind turbines to be installed. You and other residents in this area can together influence some aspects of this wind energy project, such as the size and the colour of the wind turbines to be installed.

The energy company has been developing wind energy projects for many years. The energy company has much experience, extensive knowledge and expertise in developing wind energy projects. On the other hand, the energy company is known as a company that is dishonest, not open and not transparent about its activities. In the past, the energy company hardly took the interests of local residents into account when developing energy projects.

Scenario 3: Low competence-based trust & high integrity-based trust

(China: 76 participants; the Netherlands: 43 participants)

Please imagine that an energy company is planning to implement a wind energy project in the area you live in. You can give your opinions about the project together with other residents in this area. The energy company has already decided about the

location of the wind farm and the number of the wind turbines to be installed. You and other residents in this area can together influence some aspects of this wind energy project, such as the size and the colour of the wind turbines to be installed.

The energy company has started to develop wind energy projects recently. The energy company has little experience, and not a lot of knowledge and expertise in developing wind energy projects. On the other hand, the energy company is known as a company that is honest, open and transparent about its activities. In the past, the energy company took the interests of local residents very much into account when developing energy projects.

Scenario 4: High competence-based trust & high integrity-based trust

(China: 59 participants; the Netherlands: 57 participants)

Please imagine that an energy company is planning to implement a wind energy project in the area you live in. You can give your opinions about the project together with other residents in this area. The energy company has already decided about the location of the wind farm and the number of the wind turbines to be installed. You and other residents in this area can together influence some aspects of this wind energy project, such as the size and the colour of the wind turbines to be installed.

The energy company has been developing wind energy projects for many years. The energy company has much experience, extensive knowledge and expertise in developing wind energy projects. The energy company is also known as a company that is honest, open and transparent about its activities. In the past, the energy company took the interests of local residents very much into account when developing energy projects.

Appendix C: Original version of Chinese (Mandarin) Questionnaire

您对风力发电项目的看法是什么？

以下是关于一个风力发电项目的描述。我们希望了解您对这个项目的看法。

请您认真阅读材料，并回答全部问题。

情景 1: 低经验 & 低诚实度

请您想象一下，一家电力公司准备在您居住的地区建设一个风力发电场。您可以与您居住地区的其他居民一起向这家电力公司表达您对这个风力发电项目的看法。这家电力公司已经决定了这个风力发电场的位置和即将安装的风车的数量。您和您居住地区的其他居民可以共同决定这个风力发电项目的一些内容，例如即将安装的风车的尺寸和颜色。

这家电力公司最近刚开始从事风力发电项目。这家电力公司几乎没有相关经验，也没有很多关于风力发电项目的知识和专业技术。这家电力公司还被认为是一家不诚实的、对活动不公开和不透明的公司。以往，这家电力公司在发展能源项目时，很少关心当地居民的利益。

情景 2: 高经验 & 低诚实度

请您想象一下，一家电力公司准备在您居住的地区建设一个风力发电场。您可以与您居住地区的其他居民一起向这家电力公司表达您对这个风力发电项目的看法。这家电力公司已经决定了这个风力发电场的位置和即将安装的风车的数量。您和您居住地区的其他居民可以共同决定这个风力发电项目的一些内容，例如即将安装的风车的尺寸和颜色。

这家电力公司已经从事了很多年风力发电项目。这家电力公司具有丰富的经验，大量关于风力发电项目的知识和专业技术。另一方面，这家电力公司被认为是一家不诚实的、对活动不公开和不透明的公司。以往，这家电力公司在发展能源项目时，很少关心当地居民的利益。

情景 3: 低经验 & 高诚实度

请您想象一下，一家电力公司准备在您居住的地区建设一个风力发电场。您可以与您居住地区的其他居民一起向这家电力公司表达您对这个风力发电项

目的看法。这家电力公司已经决定了这个风力发电场的位置和即将安装的风车的数量。您和您居住地区的其他居民可以共同决定这个风力发电项目的一些内容，例如即将安装的风车的尺寸和颜色。

这家电力公司最近刚开始从事风力发电项目。这家电力公司几乎没有相关经验，也没有很多关于风力发电项目的知识和专业技术。另一方面，这家电力公司被认为是一家诚实的、对活动公开和透明的公司。以往，这家电力公司在发展能源项目时，非常关心当地居民的利益。

情景 4: 高经验 & 高诚实度

请您想象一下，一家电力公司准备在您居住的地区建设一个风力发电场。您可以与您居住地区的其他居民一起向这家电力公司表达您对这个风力发电项目的看法。这家电力公司已经决定了这个风力发电场的位置和即将安装的风车的数量。您和您居住地区的其他居民可以共同决定这个风力发电项目的一些内容，例如即将安装的风车的尺寸和颜色。

这家电力公司已经从事了很多年风力发电项目。这家电力公司具有丰富的经验，大量关于风力发电项目的知识和专业技术。这家电力公司还被认为是一家诚实的、对活动公开和透明的公司。以往，这家电力公司在发展能源项目时，非常关心当地居民的利益。

如果您已经认真阅读了材料，您可以开始回答问题了。

我们希望了解您对这个**风力发电项目**的看法。

1. 我认为我居住地区的这个**风力发电项目**：

非常不能接受	-3	-2	-1	0	1	2	3	非常能够接受
非常不好	-3	-2	-1	0	1	2	3	非常好
非常消极	-3	-2	-1	0	1	2	3	非常积极
非常没有必要	-3	-2	-1	0	1	2	3	非常有必要

2. 我认为这个风力发电项目的**决策过程**:

非常不能接受	-3	-2	-1	0	1	2	3	非常能够接受
非常不好	-3	-2	-1	0	1	2	3	非常好
非常消极	-3	-2	-1	0	1	2	3	非常积极
非常没有必要	-3	-2	-1	0	1	2	3	非常有必要

3. 材料描述的这家**电力公司**:

几乎没有风力发电项目的经验	-3	-2	-1	0	1	2	3	有很多风力发电项目的经验
有很少的关于风力发电项目的知识	-3	-2	-1	0	1	2	3	有大量关于风力发电项目的知识
对公司的活动是不诚实的	-3	-2	-1	0	1	2	3	对公司的活动是诚实的
对公司的活动是不透明的	-3	-2	-1	0	1	2	3	对公司的活动是透明的
在过去的活动中很少关心当地居民的利益	-3	-2	-1	0	1	2	3	在过去的活动中非常关心当地居民的利益

Appendix D: Original version of Dutch Questionnaire

Wat is uw mening over een windmolenproject?

Hieronder geven we een beschrijving van een windmolenproject. We zijn benieuwd naar uw mening over dit project. Lees alstublieft de tekst goed en beantwoord alle vragen.

Scenario 1: lage competentie & lage integriteit

Stel dat een energiebedrijf van plan is om een windmolenpark te bouwen in het gebied waarin u woont. Samen met andere bewoners van dit gebied kunt u uw mening geven

over dit windmolenproject. Het energiebedrijf heeft al besloten waar het windmolenpark wordt gerealiseerd en hoeveel windmolens er worden geplaatst. U en de andere bewoners in uw woonomgeving kunnen invloed uitoefenen op sommige aspecten van het windmolenproject, zoals de grootte en kleur van de windmolens die worden geplaatst.

Het energiebedrijf is net begonnen met het realiseren van windmolenprojecten. Het energiebedrijf heeft weinig ervaring, en niet veel kennis en expertise in het ontwikkelen van windmolenprojecten. Ook staat het energiebedrijf bekend als een bedrijf dat oneerlijk, gesloten en niet transparant is over haar activiteiten. In het verleden heeft het energiebedrijf weinig rekening gehouden met belangen van omwonenden bij het ontwikkelen van energieprojecten.

Scenario 2: hoge competentie & lage integriteit

Stel dat een energiebedrijf van plan is om een windmolenpark te bouwen in het gebied waarin u woont. Samen met andere bewoners van dit gebied kunt u uw mening geven over dit windmolenproject. Het energiebedrijf heeft al besloten waar het windmolenpark wordt gerealiseerd en hoeveel windmolens er worden geplaatst. U en de andere bewoners in uw woonomgeving kunnen invloed uitoefenen op sommige aspecten van het windmolenproject, zoals de grootte en kleur van de windmolens die worden geplaatst.

Het energiebedrijf bouwt al jarenlang windmolenprojecten. Het energiebedrijf heeft veel ervaring, kennis en expertise in het ontwikkelen van windmolenprojecten. Het energiebedrijf staat daarentegen ook bekend als een bedrijf dat oneerlijk, gesloten en niet transparant is over haar activiteiten. In het verleden heeft het energiebedrijf weinig rekening gehouden met belangen van omwonenden bij het ontwikkelen van energieprojecten.

Scenario 3: lage competentie & hoge integriteit

Stel dat een energiebedrijf van plan is om een windmolenpark te bouwen in het gebied waarin u woont. Samen met andere bewoners van dit gebied kunt u uw mening geven over dit windmolenproject. Het energiebedrijf heeft al besloten waar het windmolenpark wordt gerealiseerd en hoeveel windmolens er worden geplaatst. U en de andere bewoners in uw woonomgeving kunnen invloed uitoefenen op sommige aspecten van het windmolenproject, zoals de grootte en kleur van de windmolens die worden geplaatst.

Het energiebedrijf is net begonnen met het realiseren van windmolenprojecten. Het energiebedrijf heeft weinig ervaring, en niet veel kennis en expertise in het ontwikkelen van windmolenprojecten. Het energiebedrijf staat daarentegen ook bekend als een bedrijf dat eerlijk, open en transparant is over haar activiteiten. In het verleden heeft het energiebedrijf veel rekening gehouden met belangen van omwonenden bij het ontwikkelen van energieprojecten.

Scenario 4: hoge competentie & hoge integriteit

Stel dat een energiebedrijf van plan is om een windmolenpark te bouwen in het gebied waarin u woont. Samen met andere bewoners van dit gebied kunt u uw mening geven over dit windmolenproject. Het energiebedrijf heeft al besloten waar het windmolenpark wordt gerealiseerd en hoeveel windmolens er worden geplaatst. U en de andere bewoners in uw woonomgeving kunnen invloed uitoefenen op sommige aspecten van het windmolenproject, zoals de grootte en kleur van de windmolens die worden geplaatst.

Het energiebedrijf bouwt al jarenlang windmolenprojecten. Het energiebedrijf heeft veel ervaring, kennis en expertise in het ontwikkelen van windmolenprojecten. Ook staat het energiebedrijf bekend als een bedrijf dat eerlijk, open en transparant is over haar activiteiten. In het verleden heeft het energiebedrijf veel rekening gehouden met belangen van omwonenden bij het ontwikkelen van energieprojecten.

Als u de tekst zorgvuldig hebt gelezen, kunt u de vragen nu beantwoorden.

We willen graag uw mening over dit **windmolenproject**.

1. Ik vind dit windmolenproject in het gebied waarin ik woon:

heel onacceptabel	-3	-2	-1	0	1	2	3	heel acceptabel
heel slecht	-3	-2	-1	0	1	2	3	heel goed
heel negatief	-3	-2	-1	0	1	2	3	heel positief
heel onnodig	-3	-2	-1	0	1	2	3	heel nodig

2. Ik vind **het besluitvormingsproces** binnen dit windmolenproject:

heel onacceptabel	-3	-2	-1	0	1	2	3	heel acceptabel
heel slecht	-3	-2	-1	0	1	2	3	heel goed
heel negatief	-3	-2	-1	0	1	2	3	heel positief
heel onnodig	-3	-2	-1	0	1	2	3	heel nodig

3. Het **energiebedrijf** dat is beschreven in de tekst:

heeft weinig ervaring in het ontwikkelen van windmolenprojecten	-	-	-	0	1	2	3	heeft veel ervaring in het ontwikkelen van windmolenprojecten
heeft weinig kennis over het ontwikkelen van windmolenprojecten	-	-	-	0	1	2	3	heeft veel kennis over het ontwikkelen van windmolenproject
is oneerlijk over haar activiteiten	-	-	-	0	1	2	3	is eerlijk over haar activiteiten
is niet transparant over haar activiteiten	-	-	-	0	1	2	3	is transparant over haar activiteiten
heeft in het verleden weinig rekening gehouden met belangen van omwonenden	-	-	-	0	1	2	3	heeft in het verleden veel rekening gehouden met belangen van omwonenden

Chapter 4

Public Participation in Decision Making, Perceived Procedural Fairness and Public Acceptability of Renewable Energy Projects

This chapter is based on a published paper: Liu, L., Bouman, T., Perlaviciute, G., & Steg, L. (2020). Public participation in decision making, perceived procedural fairness and public acceptability of renewable energy projects. *Energy and Climate Change*, 1, 100013.

Abstract: Public participation in decision making has been widely advocated by scholars and practitioners to secure public support for sustainable energy projects. Yet, it is unclear via which processes public participation in decision making may affect public acceptability of energy projects. We hypothesise that public participation in decision making is likely to increase project acceptability when it enhances perceived procedural fairness. Moreover, we hypothesise that perceived procedural fairness is higher when people can participate and influence major rather than only minor decisions of the project. We conducted three experimental studies in the Netherlands to test these hypotheses, with renewable energy projects as a case in point. As expected, public participation in decision making increased perceived procedural fairness, particularly when people could influence major decisions of the project. In turn, higher perceived procedural fairness enhanced public acceptability of the projects. Interestingly, when controlling for perceived procedural fairness, public participation in decision making had no effect (Study 2) and even a negative effect (Study 1 and 3) on project acceptability, particularly when people could influence major decisions. We conclude that public participation in decision making can enhance project acceptability if people can influence major decisions and perceive the decision making as fair. Next, our findings point out that there may be other processes instigated by public participation in decision making that can influence project acceptability. We discuss the theoretical and practical implications of our findings.

Keywords: public participation; decision making; perceived procedural fairness; acceptability; renewable energy projects

4.1. Introduction

To mitigate climate change and its negative impacts, global CO₂ emissions need to be reduced (Davis et al., 2010). Transitioning from energy production based on fossil fuels (e.g., coal, oil and gas) to energy production based on renewable energy sources (e.g., solar and wind energy) could significantly contribute to the reduction of global CO₂ emissions (European Commission, 2019). The success of such a transition strongly depends on public acceptability of renewable energy projects (Babiker et al., 2018; Devine-Wright, 2007, 2009; Liu et al., 2020a; Wüstenhagen et al., 2007) since renewable energy projects may be halted or cancelled if there is strong public resistance (Boyd, 2017; Papazu, 2017; Shaw et al., 2015). Hence, an important question is which factors affect public acceptability of renewable energy projects.

We define public acceptability of renewable energy projects as the extent to which the public evaluates those projects (un)favorably; from now on, we refer to this as “project acceptability”. It has been found that project acceptability is typically low when traditional top-down decide-announce-defend approaches are followed with little opportunity for the public to influence decision making (Wolsink, 2007). On the contrary, it has been suggested that project acceptability is higher when the public can influence decision making (Breukers & Wolsink, 2007b; Jacquet, 2015). Hence, public participation in decision making is a critical factor that could enhance project acceptability (Bidwell, 2016; Horst et al., 2002; Liu et al., 2019; Van Der Schoor et al., 2016). We define public participation in decision making as the extent to which the public is involved in decision making and could influence decisions of a renewable energy project.

Although public participation in decision making seems critical for project acceptability, to our best knowledge, it is not clear yet via which process(es) public participation in decision making affects project acceptability. Such knowledge is important as it provides critical insights into when public participation in decision making may or may not increase project acceptability. It has been suggested that public participation in decision making might affect project acceptability via perceived

procedural fairness (Gross, 2007; McComas et al., 2008). Yet, empirical evidence to support this reasoning is lacking. We define perceived procedural fairness as the extent to which the public evaluates the decision making as fair, open, transparent and taking different interests into account. To fill the gap in the literature, we conducted a series of experimental studies to test whether public participation in decision making enhances project acceptability by increasing perceived procedural fairness. In addition, as explained below, we tested whether perceived procedural fairness depends on which decisions of a renewable energy project people can influence in decision making, namely major versus minor decisions of the project.

4.1.1. Public participation in decision making and perceived procedural fairness

It has been proposed that public participation in decision making can enhance perceived procedural fairness (Cohen-Charash & Spector, 2001; Gross, 2007; McComas et al., 2008). That is, the more people can influence decision making, the more likely they are to perceive the decision-making process as fair, open and transparent. In turn, perceived procedural fairness is positively associated with public acceptability of energy projects (Besley, 2010; Gross, 2007; Krütli et al., 2010; Rowlands, 2005; Siegrist et al., 2012; Walker & Baxter, 2017). That is, the more people perceive the decision making as fair, open, transparent and representing different interests, the more acceptable they find the related energy project. On the basis of the above, we hypothesise that public participation in decision making affects perceived procedural fairness, which would, in turn, affect project acceptability.

Yet, the relationship between public participation in decision making about renewable energy projects and perceived procedural fairness has mostly been examined via qualitative (e.g., Gross, 2007; Ottinger et al., 2014; Zoellner, Schweizer-Ries, & Wemheuer, 2008) or correlational studies (e.g., Firestone et al., 2018; Walker & Baxter, 2017) that do not allow teasing apart the cause and the effect in this relationship. For example, people may indeed consider the decision making to be fair *because* they can influence the decision making, but conversely, people may also report that the public

was able to influence the decision making *because* they already considered the decision making to be fair and/or the relevant project to be acceptable (cf. Poortinga & Pidgeon, 2005). To test the causal relationships, we use an experimental design that allows figuring out whether indeed changes in participation lead to changes in perceived procedural fairness and eventually project acceptability. Specifically, we test whether public participation in decision making leads to higher perceived procedural fairness compared to *no* public participation in decision making, and whether this, in turn, relates to higher project acceptability (Study 1).

4.1.2. Having influence over major versus minor decisions and perceived procedural fairness

We next study whether perceived procedural fairness depends on the type of decisions of a renewable energy project that people can influence when they participate in decision making. People could potentially influence many different decisions when they participate in decision making about renewable energy projects (Kumar et al., 2017; San Cristóbal, 2011). Importantly, some decisions could have major implications, such as the location of renewable energy facilities; we refer to them as *major decisions*. Other decisions would only have minor implications, such as the specific design of renewable energy facilities; we refer to them as *minor decisions* (Devine-Wright, 2009; Guo et al., 2015; Liu et al., 2019). We expect that perceived procedural fairness is higher when people can influence major decisions, compared to minor decisions, of a renewable energy project. Specifically, having influence over minor decisions might give people the impression that only some of their trivial interests are taken into account, which have little impacts on their life (Devine-Wright, 2009; Guo et al., 2015). There is some initial evidence to suggest that having influence over major decisions leads to higher project acceptability compared to only having influence over minor decisions (Liu et al., 2019). Yet, this study did not investigate whether perceived procedural fairness could explain this relationship. We address this gap by testing whether having influence over major, rather than minor, decisions of a project leads to higher perceived procedural fairness, and whether this, in turn, leads to higher project

acceptability (Study 2 and 3). The findings promise important practical implications. In practice, public participation procedures are oftentimes limited to public influence over minor decisions. Yet, with the increasing advocacy for public participation in decision making (Bidwell, 2016), there are new initiatives where people have more influence in decision making, for example in the project “Wind platform: An Exploration” in the Netherlands (Windplatform: Een verkenning; <https://Www.Windplatform groningen.Nl/>, n.d.), where citizens and developers together decide upon the design of wind turbines and the distribution of costs and benefits. With public participation in decision making entering the policy agendas on renewable energy, it is highly important and timely to better understand the effects of public influence over different decisions of the project on perceived procedural fairness and project acceptability.

To sum up, we test two hypotheses. First, we hypothesise that public participation in decision making affects public acceptability of renewable energy projects via perceived procedural fairness (Hypothesis 1). Second, we hypothesise that public participation is particularly likely to enhance perceived procedural fairness and project acceptability when people can influence *major*, versus only *minor*, decisions of the project (Hypothesis 2). We test the hypotheses step-by-step in three experimental studies using student samples. Across the experiments, we gradually increased the relevance of the renewable energy project and the participation procedures in order to test the robustness of our findings. On the one hand, public participation, particularly when people can influence major decisions of a project, may increase project acceptability when people think about abstract/hypothetical projects because this makes them particularly think about the benefits of participation. However, this may be less so when people learn they have to participate themselves because in that case they may also consider the costs of participation, such as the time and effort they would need to invest (Eyal et al., 2009). On the other hand, it could be that people appreciate the opportunity to participate and having influence over major decisions of the project particularly when they learn that they would participate in the decision making (rather

than thinking about a hypothetical situation), and as a result, they may evaluate the decision making as more fair, and the project as more acceptable. Accordingly, we studied whether our proposed reasoning holds when people consider projects where the general public will be invited to participate but they themselves do not necessarily have to participate (Study 1), as well as for projects where they themselves would be invited for participation (Study 2) and for projects where they would need to participate (Study 3).

4.2. Study 1: Effects of public participation on project acceptability via perceived procedural fairness

Study 1 tests whether public participation in decision making affects project acceptability via perceived procedural fairness (H1). This was tested in the context where the participants do not necessarily have to participate themselves.

4.2.1. Participants

We recruited 222 participants¹, of which 129 did not pass the manipulation check (see below) and were thus excluded from the analysis.² Two responses were excluded because of missing data on key variables, leaving 90 valid participants for further analysis. In total 34 participants were male and 56 were female, with a mean age of 22 years ($SD = 2.92$).

4.2.2. Procedure and design

Participants first read that the local municipality wants to promote the use of renewable energy and has assigned an energy company to develop a wind energy project in a park outside the city center. Next, following a between-subjects design, we systematically varied whether the public could participate in decision making about the project, as described in Table 1.

¹ Specifically, 25 participants were recruited from a first-year university psychology student participant pool. The other 196 participants were recruited by distributing a link to the questionnaire via Facebook and WhatsApp, most of whom were also university psychology students.

² The pattern of results did not change when we included participants who did not pass the manipulation check in the analysis.

Table 1: Manipulation of public participation in decision making

Manipulation	Text
Public participation in decision making	The energy company has decided to invite the public to join a collaborative decision-making board for this project. This board will take all decisions regarding the project, such as the size of the facilities and the location of the wind park. The board will consist of 50% company representatives and 50% representatives of different citizen groups, such as young families, elderly people, and students like you.
No public participation in decision making	The energy company will take all decisions regarding the project, such as the size of the facilities and the location of the wind park. The public will not participate in the decision-making process.

4.2.3. Measures

After reading the scenario, participants first completed a manipulation check. Next, they indicated to what extent they find the decision making fair, and to what extent they find the resulting project acceptable, respectively. Afterward, participants were asked to provide their demographics.

Manipulation check. Participants were asked to indicate who could participate in decision making about the project. Four options were provided a) the local municipality, b) the energy company (correct answer in condition when the public could not participate), c) the public, and d) a board consisting of representatives of the energy company and the public (correct answer in condition when the public could participate).

Perceived procedural fairness. We asked participants to rate on a 7-point scale ranging from 1 *strongly disagree* to 7 *strongly agree* to what extent they agree with the following statements: (1) opinions of the public are taken into account sufficiently in the decision-making process, (2) in the decision-making process, local interests are taken into account sufficiently, (3) the decision-making process is free of bias, (4) the

decisions will be made based on accurate information, and (5) the decision-making procedures uphold ethical and moral standards (Leventhal, 1980; McComas et al., 2008; Zoellner et al., 2008). We computed the mean score on these five items, reflecting perceived procedural fairness ($M = 3.73$, $SD = 1.08$, $\alpha = .82$). For mean scores in each condition, see Table 2.

Project acceptability. We asked participants to what extent, on a 7-point scale ranging from 1 to 7, they thought the project would be: *very unacceptable* to *very acceptable*, *very bad* to *very good*, *very negative* to *very positive*, and *very unnecessary* to *very necessary*. We computed the mean score on these four items, reflecting participants' evaluation of acceptability of the project ($M = 4.96$, $SD = 1.31$, $\alpha = .92$). For mean scores in each condition, see Table 2.

Table 2: Mean scores of perceived procedural fairness and project acceptability across conditions (Study 1)

		Study 1	
		<i>M</i>	<i>SD</i>
Perceived procedural fairness	Public participation in decision making	4.27**	0.97
	No public participation in decision making	3.05**	0.79
Project acceptability	Public participation in decision making	5.03	1.41
	No public participation in decision making	4.88	1.19

Note: ** implies significant difference between means at $p < .001$

4.2.4. Results and discussion

Following Hayes's process procedures for testing mediation, we examined whether perceived procedural fairness mediated the relationship between public participation in decision making and project acceptability. As expected, public participation in decision making (versus *no* public participation in decision making) resulted in higher perceived procedural fairness ($b = 1.22$, $p < .001$, 95% CIs [0.85, 1.60]). Also, we found a significant positive relationship between perceived procedural fairness and project acceptability ($b = 0.65$, $p < .001$, 95% CIs [0.37, 0.93]). Yet, public

participation in decision making did not have a significant direct effect on project acceptability ($b = 0.14, p = .61, 95\% \text{ CIs } [-0.41, 0.70]$). Interestingly, after including perceived procedural fairness in the model, public participation in decision making was significantly negatively related to project acceptability ($b = -0.65, p = .036, 95\% \text{ CIs } [-1.26, -0.04]$; Sobel $z = 3.70, p < .001$), as depicted in Figure 1. This suggests that public participation in decision making not only may increase perceived procedural fairness, but also has other consequence(s) that may decrease rather than increase project acceptability. We come back to this in the general Discussion. In sum, the results of Study 1 showed that public participation in decision making increased perceived procedural fairness, and this, in turn, led to higher project acceptability.

Figure 1: Effect of public participation in decision making on perceived procedural fairness and project acceptability (Study 1). The first coefficient below the horizontal arrow indicates the direct effect of public participation on acceptability, without controlling for perceived procedural fairness; the second coefficient indicates the direct effect when controlling for perceived procedural fairness.

* $p < .05$, ** $p < .001$

4.3. Study 2: Effects of types of decisions on project acceptability via perceived procedural fairness

Study 2 tests whether having influence over major rather than minor decisions of the project enhances perceived procedural fairness and in turn project acceptability (H2). The renewable energy project in Study 1 might not have been very relevant for students and students might not have considered that they could actually participate. Hence, to increase the relevance of the project and participation procedures for students, this time, we focused on a renewable energy project at students' own university where only students would be invited to participate in the decision making.

4.3.1. Method

4.3.1.1. Participants

In total, 200 questionnaires were distributed via a first-year university psychology student participant pool, of which 182 filled out the questionnaire. We removed responses of 40 participants that failed the manipulation check (see below), leaving 142 participants for further analysis³, of which 32 were male and 110 were female, with a mean age of 20 years ($SD = 1.87$).

4.3.1.2. Procedure and design

We again followed a between-subjects design. The participants first read that their faculty “aims to stop using fossil fuels, such as oil, coal, and gas, and only use renewable energy sources, such as solar and wind energy, in order to mitigate climate change and protect the environment. To realize this ambition, the faculty is considering moving all lectures to buildings outside the city center, because these buildings are more energy-efficient, generate their own solar energy, and are located near wind turbines. Furthermore, to make optimal use of the renewable energy, lectures will be spread more throughout the day, starting earlier (around 7:00 am) and finishing later (around 10:00 pm).⁴ Moreover, lectures will be scheduled in weekends

³ The pattern of results did not change when we included participants that did not pass the manipulation check in the analysis.

⁴ Current lectures at the faculty start at 9:00 am and end at 5:00 pm.

(either on Saturday or Sunday).” Hence, the project would have direct consequences for students and thus was presumably more relevant for students.

The participants then read that a small opinion poll among students of the faculty that was conducted in the previous year showed that about half of the students were in favor of this project because it benefits the environment and helps to limit climate change, while the other half opposed this project because it is inconvenient for students. We indicated that given these different opinions, the faculty would like to involve students in decision making about this project, and that the faculty would organize meetings with students to discuss their preferences and concerns. We emphasized that if the participants want to influence the decision making, it is very important that they attend these meetings, particularly due to the almost equally split opinions among students.

Next, we varied the type of decisions, namely *major* versus *minor*, that participants could influence when they participate in the decision making⁵, as described in Table 3.

⁵ We also manipulated the amount of time that participants would need to invest in participating in decision making to address another question, namely whether people’s willingness to participate in decision making depends on the amount of time investment needed, and whether the effect of having influence over major versus minor decisions on willingness to participate depends on the amount of time that needs to be invested. We found that our manipulation of time investment did not affect participants’ willingness to participate in decision making. In addition, we did not find any main effect of time investment ($F(1, 138) = 0.04, p = .84, \eta^2 < .001$) nor an interaction effect with having influence over major versus minor decisions ($F(1, 138) = 0.24, p = .62, \eta^2 = .002$) on perceived procedural fairness. Also, we did not find any main effect of time investment ($F(1, 138) = 0.03, p = .86, \eta^2 < .001$) nor an interaction effect with having influence over major versus minor decisions ($F(1, 138) = 0.89, p = .35, \eta^2 = .006$) on project acceptability. Furthermore, the pattern of results of the mediation analysis in Study 2 did not change when we included the manipulation of time investment as a covariate in the model, therefore, we report the results without including time investment as a covariate.

Table 3: manipulation of having influence over major versus minor decisions

Manipulation	Text
Having influence over major decisions	During the decision making, together with other students, <i>you will have a say on all aspects of the project</i> , such as whether or not lectures will be moved to the campus outside the city center, whether or not classes will start early in the mornings, whether they will end late in the evenings, and whether there will be classes in the weekends. You could also propose alternative projects for making the faculty more sustainable.
Having influence over minor decisions	The faculty has already decided that all lectures will be moved to the campus outside the city center. During the decision making, together with other students, <i>you will have a say on some aspects of the project</i> , such as whether the morning classes will start at 7:00 am or 8:00 am, whether evening classes will finish at 9:00 pm or 10:00 pm, and whether to schedule the classes on Saturdays or Sundays.

Note: The same words were in bold and italics in the questionnaire, as presented in Table 3.

4.3.1.3. Measures

After reading the scenario, participants first completed a manipulation check and then indicated to what extent they find the project acceptable. Next, they indicated to what extent they find the decision making fair. Afterward, participants were asked to provide their demographics.

Manipulation check. We asked the participants which aspects of the project they could influence. They had to select one of two options, namely a) some aspects (correct answer in condition when the public had influence over minor aspects), versus b) all aspects (correct answer in condition when the public had influence over major aspects).

Project acceptability. We adopted the same measure as in Study 1. We computed the mean score on the four items reflecting participants' evaluation of acceptability of the project ($M = 0.74$, $SD = 1.38$, $\alpha = .81$). For mean scores in each condition, see Table 4.

Perceived procedural fairness. In Study 2, we adopted a more precise measure of perceived procedural fairness based on the literature (Tyler et al., 2016; Visschers & Siegrist, 2012). We asked participants to what extent, on a 7-point scale ranging from -3 to 3, they thought the decision-making process about this project was: *very unfair* to *very fair*, *totally not open* to *very open*, *totally not transparent* to *very transparent*, and *not at all taking different interests into account* to *very much taking different interests into account*. We computed the mean score on these four items, reflecting perceived procedural fairness ($M = 0.84$, $SD = 1.58$, $\alpha = .89$). For mean scores in each condition, see Table 4.

Table 4: Mean scores of perceived procedural fairness and project acceptability across conditions (Study 2 and Study 3)

		Study 2		Study 3	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Perceived procedural fairness	Having influence over <i>major</i> decisions	1.55**	1.48	1.38**	1.36
	Having influence over <i>minor</i> decisions	0.23**	1.41	0.51**	1.45
Project acceptability	Having influence over <i>major</i> decisions	1.09*	1.45	0.77	1.59
	Having influence over <i>minor</i> decisions	0.42*	1.25	0.98	1.64

Note: * implies significant difference between means in each study at $p < .05$, ** implies significant difference between means in each study at $p \leq .001$

4.3.4 Results and discussion

Following Hayes's process procedures for testing mediation, we examined whether the effect of having influence over *major* versus *minor* decisions on project acceptability was mediated by perceived procedural fairness. As expected, having influence over major (versus minor) decisions resulted in higher perceived procedural fairness ($b = 1.32$, $p < .001$, 95% CIs [0.84, 1.79]). Also, there was a significant positive relationship

between perceived procedural fairness and project acceptability ($b = 0.48, p < .001$, 95% CIs [0.35, 0.62]). Moreover, having influence over major (versus minor) decisions significantly increased project acceptability when we did not control for perceived procedural fairness ($b = 0.67, p = .004$, 95% CIs [0.22, 1.12]). The direct effect of having influence over major decisions on project acceptability was no longer statistically significant ($b = 0.03, p = .87$, 95% CIs [-0.39, 0.46]) after including perceived procedural fairness in the model (Sobel $z = 4.29, p < .001$), indicating a full mediation (Figure 2). In sum, Study 2 showed that having influence over major decisions of the project increased perceived procedural fairness, which in turn enhanced project acceptability.

Figure 2: Effect of having influence over major versus minor decisions on perceived procedural fairness and project acceptability (Study 2). The first coefficient below the horizontal arrow indicates the direct effect without controlling for perceived procedural fairness; the second coefficient indicates the direct effect when controlling for perceived procedural fairness.

4.4. Study 3: Effects of types of decisions on project acceptability via perceived procedural fairness

Study 3 further tests whether having influence over major rather than minor decisions of the project enhances perceived procedural fairness and in turn project acceptability (H2). In Study 2, the participants may not necessarily have thought that they themselves would participate, but rather assumed that other students might participate, and thus they might not have considered that they themselves would have to invest time and effort in the decision making. In Study 3, we aimed to test the robustness of the findings while emphasizing even more that student themselves would need to participate, by asking them to sign up for participation.

4.4.1. Method

4.4.1.1. Participants

Again, 200 questionnaires were distributed via the first-year university psychology student participant pool. Only participants who did not participate in Study 2 were offered the opportunity to participate in Study 3. Eventually, 162 participants filled out the questionnaire, of which 160 completed all questions. We removed responses of participants that failed the manipulation check, leaving 129 participants for further analysis,⁶ among whom 35 were male and 94 were female, with a mean age of 21 years ($SD = 2.55$).

4.4.1.2. Procedure, design, and measures

We first included three measures to emphasize that the student themselves would need to participate in decision making. Specifically, participants were asked to indicate whether they want to participate in a meeting in which they could influence the aspects of this project mentioned in the manipulation. They were offered two options: a) yes, I want to participate in the meeting (25 participants chose this option), and b) no, I do not want to participate in the meeting (104 participants chose this option).

⁶ The pattern of results did not change when we included participants that did not pass the manipulation check in the analysis.

Second, if the participants chose to participate in the meeting, they were asked to indicate at which time slots they would be able to attend the meeting, and to provide an email address to receive the invitation with further details on the meeting. Third, we asked participants to indicate whether they would like to receive some information on the project to prepare for the meeting. They were offered two options: a) yes, I would like to receive the information (29 participants chose this option), and b) no, I would not like to receive the information (100 participants chose this option). Again, if they indicated they want to receive the information, they were asked to provide an email address to receive the information.

For all other aspects, Study 3 was identical to Study 2.⁷ Again, we computed the mean score of the relevant items to form the scale of project acceptability ($M = 0.88$, $SD = 1.61$, $\alpha = .92$), and perceived procedural fairness ($M = 0.93$, $SD = 1.47$, $\alpha = .89$). For mean scores in each condition, see Table 4.

4.4.2. Results and discussion

Again, Hayes's process procedures for testing mediation revealed that having influence over *major* (versus *minor*) decisions resulted in higher perceived procedural fairness ($b = 0.86$, $p < .001$, 95% CIs [0.37, 1.35]). Also, there was again a significant positive relationship between perceived procedural fairness and project acceptability ($b = 0.67$, $p < .001$, 95% CIs [0.51, 0.84]). This time the direct effect of having influence over major decisions on project acceptability was not statistically significant ($b = -0.21$, $p = .47$, 95% CIs [-0.77, 0.36]). Interestingly, having influence over major decisions led

⁷ We again manipulated time investment in Study 3 to address the same research question as mentioned in footnote 6. We again found that our manipulation of time investment did not affect participants' willingness to participate in decision making. In addition, we did not find any main effect of time investment ($F(1, 125) = 0.004$, $p = .95$, $\eta^2 < .001$) nor an interaction effect with having influence over major versus minor decisions ($F(1, 125) = 0.24$, $p = .63$, $\eta^2 = .002$) on perceived procedural fairness. In addition, we did not find any main effect of time investment ($F(1, 125) = 0.11$, $p = .74$, $\eta^2 = .001$) nor an interaction effect with having influence over major versus minor decisions ($F(1, 125) = 0.04$, $p = .85$, $\eta^2 < .001$) on project acceptability. Moreover, the pattern of results of the mediation analysis in Study 3 did not change when we included the manipulation of time investment as a covariate in the model, therefore, we report the mediation results without including time investment as a covariate.

to lower project acceptability when including perceived procedural fairness in the model ($b = -0.79$, $p = .0015$, 95% CIs $[-1.27, -0.31]$; Sobel $z = 3.17$, $p = .0015$), as illustrated in Figure 3. These results are similar to the results of Study 1, and suggest that besides increasing perceived procedural fairness, having influence over major decisions might have other consequences that may actually decrease project acceptability. We discuss this finding in more detail in the general Discussion. In sum, Study 3 replicated the finding of Study 2 that having influence over major decisions of the project increased perceived procedural fairness and this, in turn, led to higher project acceptability.

Figure 3: Effect of having influence over major versus minor decisions on perceived procedural fairness and project acceptability (Study 3). The first coefficient below the horizontal arrow indicates the direct effect without controlling for perceived procedural fairness; the second coefficient indicates the direct effect when controlling for perceived procedural fairness.

4.5. General conclusion and discussion

We studied whether public participation in decision making enhances perceived procedural fairness and public acceptability of renewable energy projects. Next, we tested whether perceived procedural fairness mediates the relationship between public participation in decision making and public acceptability of renewable energy projects. Moreover, we tested whether perceived procedural fairness is higher when the public could participate and particularly have influence over major decisions, rather than minor decisions of the project.

Results of Study 1 showed that public participation in decision making increased perceived procedural fairness, and this, in turn, enhanced project acceptability, compared to *no* public participation in decision making at all. This finding provides important causal evidence in addition to earlier qualitative (e.g., Gross, 2007; Ottinger et al., 2014) and correlational studies (e.g., Firestone et al., 2018; Walker & Baxter, 2017) on the positive relationship between public participation in decision making and perceived procedural fairness. Next, results of Study 2 and Study 3 showed that particularly having influence over major decisions of a renewable energy project led to higher perceived procedural fairness, compared to having influence over only minor decisions of the project, and this, in turn, led to higher project acceptability. This finding extends previous research by examining why having influence over major decisions has a positive effect on project acceptability (Liu et al., 2019): having influence over major decisions enhances perceived procedural fairness, which in turn affects project acceptability. Interestingly, our findings were consistent across the three studies that varied in the extent to which the project and participation procedures were relevant for participants, so irrespective of whether it was emphasized that participants would participate themselves.

Interestingly, when controlling for perceived procedural fairness, public participation in decision making had no effect (Study 2) and even a negative effect (Study 1 and 3) on project acceptability, particularly when people could influence major decisions. These results suggest that public participation in decision making, particularly when

having influence over major decisions, may not only have positive effects on project acceptability by enhancing perceived procedural fairness, but might have other consequences as well that may even reduce project acceptability. Future research is needed to test whether this negative effect can be replicated, and which other decisions of public participation might account for it. Since we did not find any effect of time investment on project acceptability in our studies, this negative association is unlikely to be caused by how much time the participants need to invest in participation. One possible reason for this negative association could be that people may think citizens have little competence and expertise to make decisions about renewable energy projects, because renewable energy projects are typically rather complex (Brummer, 2018; Khwaja, 2004; Knudsen et al., 2015; Rossi, 1997), and this may eventually decrease people's acceptability of a project in which the public has a significant say. Future research could explore this possibility.

Our findings have important practical implications. Specifically, the results show that project acceptability is higher when people perceive the decision-making process as fairer. Importantly, one way to enhance perceived procedural fairness is to involve people in decision making, and particularly by enabling people to influence decisions over major decisions of the project. In addition, although public participation in decision making has been widely considered beneficial for developing more socially acceptable renewable energy projects (Bidwell, 2016; Horst et al., 2002; Liu et al., 2019; Van Der Schoor et al., 2016), our results suggest that involving people in decision making and particularly in influencing major decisions, may not always enhance project acceptability. Though we were unable to detect why this is the case in this research, practitioners should be aware of the possibility that allowing people to influence decision making on (major decisions of) renewable energy projects may result in lower project acceptability. Future research is needed to clarify what could account for the possible negative effect of public participation on acceptability, and practitioners could take those into consideration when designing participation

strategies. For example, practitioners may need to provide expert support to ensure expertise when involving the public in influencing decision making.

Some limitations need to be considered. Using student samples may limit the generalizability of our findings, in particular regarding the mean scores obtained. Specifically, students may in general be more favourable of renewable energy projects. Yet, we see no theoretical grounds to assume that public participation, perceived procedural fairness and project acceptability will relate differently to each other when examining general population samples than students. Still, future studies are needed to test whether the findings can be replicated with representative samples.

We conducted experimental studies, which are rare in the literature, but are much needed in order to secure internal validity and to obtain insights in how public participation, perceived procedural fairness and project acceptability are causally related. At the same time, real-life energy projects may present different circumstances than those in our controlled experiments. Obviously, real-life situations differ on many more factors than on the level of participation alone, which could influence the relationships studied here. Also, although we tried to make the projects and participation procedures as relevant and realistic as possible, these were still hypothetical scenarios. Accordingly, responses may not fully reflect a real-life situation in which individuals would actually be confronted with the project. Future research is needed to test the external validity of our findings in real-life situations where people are actually involved in the decision-making processes, including correlational studies, longitudinal studies, and field (quasi) experiments. Furthermore, our studies did not contain a comparison of *no* public participation in decision making versus having influence over minor decisions of the project. Future research could test whether having any influence would already have positive effects on perceived procedural fairness and project acceptability, or whether the public would prefer better no influence rather than influence over only minor decisions.

To conclude, our research is the first to experimentally show that public participation in decision making, particularly when people can influence major decisions, leads to

higher perceived procedural fairness, and this, in turn, leads to higher project acceptability. Meanwhile, we found that next to the positive effect of public participation on perceived procedural fairness, public participation, particularly having influence over major decisions, may have negative consequences that may result in lower project acceptability. Future studies could examine via which other processes (next to perceived procedural fairness) public participation in decision making affects public acceptability of renewable energy projects in positive or negative ways. Such knowledge can contribute to a more thorough understanding of how and why public participation in decision making affects public acceptability of renewable energy projects.

4.6. Appendix

Table 3: the relationship (Pearson's correlations) between public participation in decision making, perceived procedural fairness, and project acceptability in all studies

Study 1	Perceived procedural fairness	Project acceptability
Public participation in decision making	.72** (<.001)	.06 (.61)
Perceived procedural fairness		.32* (.002)
Study 2	Perceived procedural fairness	Project acceptability
Having influence over major versus minor decisions	.42** (<.001)	.24* (.004)
Perceived procedural fairness		.56** (<.001)
Study 3	Perceived procedural fairness	Project acceptability
Having influence over major versus minor decisions	.29** (.001)	-.06 (.47)
Perceived procedural fairness		.54** (<.001)

* $p < .01$, ** $p < .001$ (p-values are reported in brackets)

Chapter 5

The More Public Influence, the Better? The Effects of Full versus Shared Influence on Public Acceptability of Energy Projects in the Netherlands and China

This chapter is based on a published paper: Liu, L., Bouman, T., Perlaviciute, G., & Steg, L. (2021). The more public influence, the better? The effects of full versus shared influence on public acceptability of energy projects in the Netherlands and China. *Energy Research & Social Science*, 81, 102286.

Abstract: Public participation in decision making is considered an important factor that could enhance public acceptability of decision-making process and resulting decisions on renewable energy projects. Yet, little is known about *when* and *how* public participation can enhance public acceptability. In two experimental studies where no real decisions were taken, we compare the effect of shared influence versus full influence (either with or without expert support) on public acceptability of the decision-making process, the decisions to be taken, and the resulting energy projects. Results showed that having full influence over decision making (e.g., citizen control) did not lead to higher public acceptability of the decision-making process, final decision and resulting project, compared to having shared influence (e.g., partnership). Respondents perceived the public as not having sufficient expertise to develop energy projects and believed that full influence would lead to lower quality decisions, which may explain why full influence did not enhance public acceptability. Interestingly, the decision-making panel comprising both experts and citizens was evaluated as having more expertise and more capable to take high quality decisions, compared to a decision-making panel comprising only citizens and even when citizens could consult experts. The pattern of results was very consistent in the Netherlands and China.

Keywords: public participation; amount of influence; decision making; public acceptability; energy projects

5.1. Introduction

One crucial strategy to mitigate climate change and its negative impacts is to transit from fossil fuels (e.g., coal and natural gas) to renewable energy sources (e.g., solar and wind energy) (European Commission, n.d.). The success of such a transition depends on public acceptability of renewable energy projects (Babiker et al., 2018; Demski et al., 2019; Devine-Wright, 2007, 2009; Liu et al., 2020a; Wüstenhagen et al., 2007), which we define as the extent to which people evaluate renewable energy projects (un)favourably. Indeed, renewable energy projects may be delayed or even cancelled if they face strong public resistance (Boyd, 2017; Papazu, 2017; Shaw et al., 2015; Vallejos-Romero et al., 2020). Hence, an important question is which factors affect public acceptability of renewable energy projects.

Public participation in decision making is considered an important factor that could enhance public acceptability of the decision-making process and the resulting decisions on renewable energy projects (Bidwell, 2016; Horst et al., 2002; Liu et al., 2019; Van Der Schoor et al., 2016). We define public participation in decision making as processes organized by responsible agents (e.g., governments, companies) to involve the public in the planning, design, and implementation of projects. Initial evidence suggests that public acceptability of the decision-making process, the resulting decisions, and the resulting energy projects is indeed higher when people are involved in the decision making than when they are not involved (Jacquet, 2015), while public resistance may particularly occur if people feel excluded from the decision making (Gross, 2007; Wolsink, 2007).

Although public participation in decision making is generally considered beneficial for enhancing public acceptability of the decision-making processes and energy projects, little is known about *when* and *how* public participation in decision making can enhance public acceptability of the decision-making process, of decisions to be taken, and of resulting energy projects. We propose that one important aspect of public participation that determines its effects on public acceptability is the amount of influence the public could have in the decision-making process. Specifically, public

participation may not increase acceptability if people have no or little influence in the decision-making process, whereas public participation may enhance acceptability of the decision-making process and resulting decisions on renewable energy projects when the public can significantly influence the decision making. In two experimental studies, we test whether providing people with full influence (i.e., citizen control) leads to higher public acceptability of the decision-making process, and decisions to be taken and resulting renewable energy projects, compared to shared influence (i.e., partnership), and whether this is particularly likely the case when the public can rely on expert support. To examine the generalisability of the effects across populations, we conducted the studies in two geographically and culturally different contexts, namely the Netherlands and China.

5.1.1. Effects of public influence in decision making on public acceptability

The seminal participation ladder classifies public participation according to the amount of influence the public has in the decision-making process (Arnstein, 1969). At the lowest level of the participation ladder is *no* influence (e.g., providing information only), followed by forms of participation with relatively *little* influence, where people can provide their opinions and their input is incorporated in final decisions, but they cannot make the final decisions themselves (e.g., consultation). At the higher levels of the ladder is *shared* influence, in which case people co-decide on the planning and design of projects with other responsible agents (e.g., partnership). At the top of the ladder is public participation with *full* influence, in which case the public makes final decisions themselves (e.g., citizen control). We conceptualize these types of public participation as no influence, little influence, shared influence, and full influence. Figure 1 illustrates how our conceptualization of different amounts of influence relates to Arnstein's participation ladder.

Figure 1. Illustration of current research and Arnstein's participation ladder

Literature indicates that having influence in decision making enhances public acceptability of the decision-making processes, the final decisions and resulting energy projects compared to having no influence at all. For example, people evaluated the decision-making process about a wind energy project in the United States as fairer (Firestone et al., 2018), and the resulting decisions on the wind energy projects as more acceptable, when people were consulted about their opinions on the energy projects, and when their opinions were incorporated into decisions, compared to only being informed about the projects (Aitken et al., 2016; Shaw et al., 2015). Similarly, people evaluated the decision-making process and the related marine energy project in the island of Ireland more favorably when they made decisions together with responsible agents than when decisions were taken by responsible agents with no opportunity for the public to influence the decision making (Reilly et al., 2016). In fact, if people are consulted, but their input is not incorporated in final decisions, this can

be seen as *fake* participation, which makes people perceive the decision-making process as unfair which may fuel public resistance towards those energy projects (Colvin et al., 2016; Gross, 2007; Rand & Hoen, 2017; Terwel et al., 2012).

Hence, research suggests that having influence enhances public acceptability compared to having no influence at all. Yet, the question remains whether how much influence people have in the decision making matters for public acceptability of the decision-making process and resulting decisions and energy projects. A popular assumption is that the more influence the public has in decision making, the more acceptable they will evaluate the decision-making process and resulting decisions and renewable energy projects (Aitken et al., 2016; Reilly et al., 2016; Shaw et al., 2015), as best illustrated by Arnstein's participation ladder (Figure 1) (Arnstein, 1969). Arguably, people may have better chances to shape the decisions and projects to be in line with their preferences and guarantee that their interests and concerns are taken into account when they have more influence in the decision making (Cherry et al., 2017; Gunderson & Yun, 2021; Israel et al., 2015), and they may thus be more in favor of those decisions and projects. This popular assumption would imply that public participation with the highest amount influence (i.e., full influence) leads to highest public acceptability of the decision-making process, the decisions to be taken, and the resulting renewable energy projects compared to lower amounts of influence.

So far, this popular assumption has not been systematically tested. In addition, there is some initial evidence to suggest that the public may not necessarily favor full influence over final decisions about renewable energy projects. Instead, they seem to prefer to only have little or shared influence in decision making about renewable energy projects, such as wind energy projects in Germany (Langer et al., 2017; Perlaviciute & Squintani, 2020; Smith & McDonough, 2001; Tyler, 2000). For example, in a study in the Netherlands, people preferred that the public is consulted about sustainable energy transitions rather than that decisions are fully made by the public themselves (Perlaviciute & Squintani, 2020).

One possible reason for why people do not prefer to have full influence is that they think citizens involved in the decision making lack competence and expertise (e.g., knowledge) to take good quality decisions about renewable energy projects. We use “expertise” to describe the knowledge of public representatives and other agents who will take decisions. Renewable energy projects are typically rather complex, and the planning and implementation of such projects may require professional expertise (Ahn et al., 2012; Koirala et al., 2016; F. G. N. Li & Pye, 2018; Sorman et al., 2020) which an average citizen may not have (Pandey & Sharma, 2021; Rossi, 1997; Tritter & McCallum, 2006).

This may imply that full influence will particularly result in higher acceptability of the decision making and resulting decision when people believe the decision-making panel has sufficient expertise. One way to secure citizens involved in the decision-making process have sufficient expertise to decide on renewable energy projects is by providing expert support, in which case those citizens can consult experts about the design of and any other issues related to those energy projects (Brummer, 2018; Knudsen et al., 2015; Krütli et al., 2010; Sperling, 2017). If expert support is provided, the public may perceive that citizens involved in the decision-making process have more expertise and may therefore perceive their final decisions as of higher quality. We therefore hypothesise that full influence particularly leads to higher public acceptability of the decision-making process and resulting decisions and energy projects than shared influence when citizens involved in the decision-making process can consult experts.

Another important question is whether more public influence indeed *causes* higher public acceptability of the decision-making process, and of resulting decisions and renewable energy projects. As yet, the relationship between public influence in decision making and public acceptability of the decision-making process, and the resulting decisions and energy projects has mostly been examined via qualitative (e.g., (Reilly et al., 2016)) and correlational studies (e.g., (Terwel et al., 2012)) that do not allow to tease apart the cause and effect in this relationship. For example, public

acceptability of renewable energy projects may be high *because* people could influence the decision making, but conversely, people may also report that they had influence in the decision making because they find the decision making and/or the renewable energy project acceptable, or there may be a third factor that influences both (cf. (Poortinga & Pidgeon, 2005)). To address this gap in the literature, we will conduct experimental studies in which we specifically vary the amounts of influence (i.e., shared influence versus full influence) people have in decision making and test their effects on public acceptability of the decision-making process and resulting decisions and renewable energy projects.

As yet, most studies on public participation and public acceptability of renewable energy projects have been conducted in Western European countries and North America (e.g., (Firestone et al., 2018; Langer et al., 2017; Stober et al., 2021)). Hence, the question remains whether similar findings can be found in other countries. To address this question, we test our reasoning in a Western European country, the Netherlands, and in an East-Asian country, China. We expect to find similar results in both countries because research suggests that public influence in decision-making can increase support for the projects in both the Netherlands and China (Bernauer et al., 2016; Koornneef et al., 2008; Liu et al., 2019). However, Dutch and Chinese cultures are also often considered rather different, with, for example, the first being individualistic (Oyserman, 2006) and the latter collectivistic (Hofstede, G., Hofstede, G., & Minkov, 2010). These cultural factors might impact how much public influence is desirable and thus impact the effects of public influence on project acceptability. For instance, research suggests that having more influence may have a stronger effect on project acceptability in individualistic cultures, where people typically value having a say over decisions that may possibly affect them (Kim & Sherman, 2007). In contrast, in collectivistic countries, people particularly await the decisions from responsible agents, such as the government (Hofstede, G., Hofstede, G., & Minkov, 2010), rather than wanting the public to have much influence.

In sum, we aim to test whether full influence particularly leads to higher public acceptability of the decision-making process and resulting decisions and energy projects than shared influence when citizens involved in the decision-making process can consult experts. We first conducted a pilot study with a student sample in the Netherlands to (1) replicate the previous findings from the literature that having at least some influence leads to higher acceptability of the decision-making process and the project compared to having no influence, (2) pre-test the manipulations of shared influence and full influence, respectively, to be used in Study 1 & 2, (3) examine the internal validity of the measures of acceptability of the decision-making process, the final decision and the resulting energy project. Next, Study 1 aims to test the effect of shared versus full influence on acceptability of a hypothetical wind energy project in the Netherlands among a general population sample, and to test whether full influence particularly enhances acceptability when expert support is provided. Study 2 tests if the findings in Study 1 can be replicated in an East-Asian country, China.

5.2. Pilot study: Effects of public influence on public acceptability in the Netherlands

5.2.1. Method

5.2.1.1. Procedure and participants

In total, 210 first-year university psychology students were invited to participate in the pilot study¹. Eventually, 204 participants completed the study. We excluded responses of participants who did not pass the attention check (see below), leaving 114 responses for further analysis.

5.2.1.2. Design

¹ The participants were recruited via the university's participant pool. They were informed that the study aims to understand students' opinion about the university's renewable energy project. At the end of the study, students were informed that the study was in fact about their opinion on participation procedures about the project, and they were given the opportunity to delete their data at this stage. Filling out the questionnaire took about 15 minutes; by filling in the questionnaire, the students got a credit for their study program. An informed consent was obtained beforehand.

We followed a between-subjects design with four experimental conditions with increasing amounts of public influence, namely 1) no influence, 2) little influence, 3) shared influence, and 4) full influence. Students were randomly assigned to one of the four conditions.

Participating students first read that their faculty aims to replace the use of fossil fuels with renewable energy sources, which will have implications for them. Specifically, we indicated that the faculty is considering to move all lectures to buildings outside the city center, which use renewable energy, and to schedule lectures longer throughout the day and week. Next, the participants learned that, according to an opinion poll, about half of the students were in favor of the project because it benefits the environment and helps limiting climate change, while the other half opposed to this project because it is inconvenient for students. Following this, we manipulated the amounts of influence in decision making about the project², as described in Table 1.

Table 1. Manipulation of amount of public influence in decision making

Amount of public influence	Text
No influence	Students will not participate in the decision making about this project.
Little influence	The faculty plans to invite students to discuss about all aspects of the project. Your participation is important particularly due

² We also manipulated whether participants thought that they would be randomly selected to participate in the decision making, to examine if public acceptability of the decision-making process, the final decision, and the resulting project depends on whether people think that they themselves would have to participate in decision making. Results showed that whether or not participants would have to participate did not interact with the amount of influence in affecting acceptability of the decision-making process, nor acceptability of the final decision, nor acceptability of the renewable energy project. We therefore do not elaborate on this point further. One possible reason for this finding could be that people might already be satisfied when they were aware that the decision will be made in a participatory way, even if they themselves do not participate (Arvai, 2003).

	to the almost split opinions. Opinions of the participating students will be seriously considered by the faculty. Yet, the faculty will make final decisions on all aspects of the project.
Shared influence	The faculty plans to invite students to discuss about all aspects of the project. Your participation is important particularly due to the almost split opinions. The faculty and the participating students will make final decisions on all aspects of the project together.
Full influence	The faculty plans to invite students to discuss about all aspects of the project. Your participation is important particularly due to the almost split opinions. The participating students will make final decisions on all aspects of the project.

5.2.1.3. Measures

After reading the scenario, participants indicated how acceptable they find the decision-making process, the resulting final decision and the renewable energy project.

Acceptability of the decision-making process. We asked the participants to indicate on a 7-point scale (ranging from -3 to 3), to what extent they think the decision-making process about the project was: *very unacceptable* to *very acceptable*, *very bad* to *very good*, and *very negative* to *very positive*. We computed the mean scores on these three items; higher scores reflect higher acceptability of the decision-making process ($M = 0.72$, $SD = 1.29$, $\alpha = .87$)³.

Acceptability of the final decision. We asked the participants to indicate on a 7-point scale (ranging from -3 to 3), to what extent they believed the final decision that would come out of the decision-making procedure would be: *very unacceptable* to *very acceptable*, *very bad* to *very good*, and *very negative* to *very positive*. We computed the mean

³ Mean scores, standard deviations, and number of cases for all dependent variables across conditions (with all participants and with only valid participants) for all three studies can be found in Supplementary Information D.

scores on these three items; higher scores reflect higher acceptability of the final decision ($M = 0.64$, $SD = 1.39$, $\alpha = .93$).

Acceptability of the project. We asked the participants to indicate on a 7-point scale (ranging from -3 to 3), to what extent they think the project resulting from the decision-making procedure would be: *very unacceptable* to *very acceptable*, *very bad* to *very good*, *very negative* to *very positive*, and *very unnecessary* to *very necessary*. We computed the mean scores on these four items; higher scores reflect higher acceptability of the project ($M = 1.53$, $SD = 1.40$, $\alpha = .92$).

5.2.1.4. Attention check

Next, the participants completed an attention check. In the no influence condition, we asked participants to indicate whether students will participate in the decision making about this project. Participants who wrongly answered the attention checks were excluded from the analysis. The correct answer was that students will not participate (78.57% valid response rate, $N = 22$). In the other three conditions, we asked participants who will make the final decision about the project. They had to select one of three options, namely “The faculty” (correct answer in little influence condition, 50.88% valid response rate, $N = 29$), “The faculty and the participating students together” (correct answer in shared influence condition, 83.05% valid response rate, $N = 49$), and “The participating students” (correct answer in full influence condition, 23.33% valid response rates, $N = 14$).⁴

5.2.2. Results: Acceptability of the decision-making process, the final decision and the project

A one-way between-subjects ANOVA revealed a significant difference in acceptability of the decision-making process across the four conditions, $F(3, 110) = 3.67$, $p = .015$, $\eta^2 = .091$. Post-hoc comparisons using the LSD test showed that in all conditions in which the public could influence decision making, namely little influence ($p = .011$, 95% CIs [0.21, 1.61]), shared influence ($p = .002$, 95% CIs [0.40, 1.67]), and full influence (p

⁴ The pattern of results did not change when invalid responses were included in the analysis.

= .049, 95% CIs [0.002, 1.69]), acceptability of the decision-making process was significantly higher than when the students could not influence the decision-making process at all (Figure 2).

One-way between-subjects ANOVAs revealed that there were no significant differences in acceptability of the final decision across conditions, $F(3, 110) = 1.20, p = .312, \eta^2 = .032$, nor in acceptability of the project across the conditions, $F(3, 110) = 0.65, p = .584, \eta^2 = .017$.

Figure 2. Mean scores and standard deviations of acceptability of the decision-making process, acceptability of the final decision, and acceptability of the project (Pilot study)

Note: different letters (a, b) indicate significant differences in the mean scores within each measure ($\alpha < 0.05$); the mean scores with the same letter do not significantly differ from each other within each measure.

5.2.3. Discussion

The pilot study replicated findings from previous studies that having at least some influence leads to higher acceptability of the decision-making process compared to having no influence at all, but we did not find any differences across conditions for acceptability of the decisions and project. Also, we did not find differences in acceptability of the decision-making process between the little, shared and full influence conditions.

It is likely that our manipulations were not optimal. Specifically, the manipulations might have not been strong enough for participants to tell how much influence the students and the faculty each can have in decision making, and thus it was unclear who are the agents to take the final decisions. Based on the insights gained from the pilot study, we improve and strengthen the manipulations in Study 1 and 2.

Specifically, we explicitly distinguish “who will be involved in decision-making process” from “who makes the final decision” (see Table 2). We include a manipulation check of the amount of influence people can have in decision making in Study 1 and 2 to check if the improved manipulations work successfully.

Moreover, Study 1 and 2 aim to test whether full influence may enhance acceptability compared to shared influence when the public can rely on expert support.

Furthermore, Study 1 and 2 use a regional wind energy project rather than a faculty renewable energy project, with representative Dutch and Chinese samples instead of a student sample, to establish the generalisability of the findings.

5.3. Study 1: Effects of public influence and expert support on public acceptability in the Netherlands

Study 1 aims to test whether full influence would lead to higher public acceptability of the decision-making process, the resulting decisions and energy projects, compared to shared influence, when people would be provided with expert support in the Netherlands, among a general population sample.

5.3.1. Method

5.3.1.1. Procedure and participants

We conducted an online questionnaire study with respondents from a pre-recruited Dutch panel. Participants received an invitation to complete an online study about local renewable energy projects; an informed consent was obtained beforehand. Participants received a token amount of money for their participation. The questionnaire was in Dutch.⁵ We received 215 valid responses for further analyses⁶, of which 109 were male and 106 were female, with the mean age of 56 years ($SD = 17.44$). See Supplementary Information A for detailed demographic information.

5.3.1.2. Design

The study followed a between-subjects design. All participants first read that a wind energy project is being planned to be developed in the area they live in and a decision-making panel will be formed to discuss and take decisions about all aspects of this project. Next, participants were randomly assigned to one of the three experimental conditions, namely shared influence, full influence, and full influence with expert support, as illustrated in Table 2.

Table 2. Manipulation of public influence in decision making and whether expert support is provided

Shared influence	Who will be involved in decision-making process? Half of the members of the decision-making panel would be experts from an energy company and the other half will be residents in the area you live in. Residents in the decision-making panel can ask experts from the energy company for advice on this wind energy project. The energy company has been developing wind energy projects for many years. The energy company has much experience, extensive knowledge, and expertise in developing wind energy projects.
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⁵ The questionnaire was developed in English, and then translated into Dutch by a native Dutch speaker. One other native Dutch speaker checked and provided feedback for the translation of the Dutch questionnaire. Revisions were made wherever needed. The original Dutch questionnaire can be found in Supplementary Information B.

⁶ Initial sample sizes were determined based on power analysis with medium effect size (0.25) and power (0.8), which resulted in an estimated total sample size of 159. We instructed the panel companies to reach at least 210 valid responses.

	<p>Who makes the final decision?</p> <p>The residents and experts from the company who take part in the decision-making panel will together make the final decision on all aspects of the wind energy project.</p>
Full influence	<p>Who will be involved in decision-making process?</p> <p>All members of the decision-making panel would be residents in the area you live in.</p> <p>Who makes the final decision?</p> <p>Residents who take part in the decision-making panel will together make the final decision on all aspects of the wind energy project.</p>
Full influence with expert support	<p>Who will be involved in decision-making process?</p> <p>All members of the decision-making panel would be residents in the area you live in.</p> <p>Expert support</p> <p>Residents in the decision-making panel can ask experts from the energy company for advice on this wind energy project. The energy company has been developing wind energy projects for many years. The energy company has much experience, extensive knowledge, and expertise in developing wind energy projects.</p> <p>Who makes the final decision?</p> <p>Residents who take part in the decision-making panel will together make the final decision on all aspects of the wind energy project.</p> <p>The experts from the energy company are NOT part of the decision-making panel and they will NOT decide on the wind energy project.</p>

At the end, participants were told that the wind energy project will be implemented based on the final decision taken by the decision-making panel.

5.3.1.3. Attention check

In all three conditions, we first asked participants who will make the final decision according to the text they read. They had to select one of the three options, namely a) Only the energy company (incorrect answer in all conditions), b) Only residents

(correct answer in full influence condition and full influence with expert support condition), and c) The energy company and residents together (correct answer in shared influence condition). In the shared influence condition and full influence with expert support condition, we further asked participants whether residents could ask experts from an energy company for advice, according to the text they read. The right answer was that they can ask for advice. Participants who wrongly answered the attention check questions were excluded from analysis. The attention check question resulted in 90.90% ($N = 70$), 92.31% ($N = 72$), 92.41% ($N = 73$) valid response rate for the shared influence condition, the full influence condition and the full influence with expert support condition, respectively.⁷

5.3.1.4. Measures

Manipulation check of public influence in decision making. In order to examine whether our manipulation of public influence worked, we asked the participants to indicate on a 7-point scale (ranging from -3 not at all to 3 very much), how much influence they thought residents in the area they live in have over the final decision about this project ($M = 0.99$, $SD = 1.38$).

Acceptability. We used the same measures as in the pilot study of (1) **acceptability of the decision-making process** ($M = 1.36$, $SD = 1.32$, $a = .88$), (2) **acceptability of the final decision** ($M = 1.18$, $SD = 1.38$, $a = .95$), and (3) **acceptability of the project** ($M = 1.31$, $SD = 1.46$, $a = .95$).

Explorative measures. We included two additional measures to explore whether providing expert support could have the potential benefits as we argued in the Introduction, to better understand why providing expert support could lead to higher public acceptability of the decision-making process and resulting decisions and renewable energy projects. Specifically, we explored whether providing expert support would enhance perceived expertise of the decision-making panel and enhance the perceived quality of the final decision taken by the decision-making panel. Moreover,

⁷ The pattern of results did not change when all participants were included in the analysis.

we examined the extent to which these potential benefits are associated with higher acceptability of the decision-making process and resulting decisions and renewable energy projects. ***Perceived expertise of the decision-making panel*** was measured by asking the participants to indicate on a 7-point scale (ranging from -3 not at all to 3 very much), to what extent they think the decision-making panel: *has sufficient experience with wind energy projects*, and *has sufficient knowledge about wind energy projects*. We computed the mean scores on the two items; higher scores reflect higher perceived expertise of the decision-making panel ($M = 0.50$, $SD = 1.53$, $r = .85$). We measured ***perceived quality of the final decision*** by asking the participants to indicate on a 7-point scale, to what extent they think the final decision about the wind energy project made by the decision-making panel would be *of very low quality* (-3) to *very high quality* (3) ($M = 1.07$, $SD = 1.39$).

5.3.2. Results

5.3.2.1. Manipulation check results

A one-way between-subjects ANOVA revealed a significant difference in perceived public influence across conditions, $F(2, 212) = 7.78$, $p = .001$, $\eta^2 = .068$. Post-hoc comparisons using LSD test showed that perceived influence was significantly higher when the public could have full influence, either without ($M = 1.01$, $SD = 1.48$; $p = .032$, 95% CIs [0.04, 0.93]) or with expert support ($M = 1.41$, $SD = 1.12$; $p < .001$, 95% CIs [0.44, 1.32]), than when the public and experts would make the final decision together ($M = 0.53$, $SD = 1.40$). There was no significant difference between both full influence conditions ($p = .076$, 95% CIs [-0.84, 0.04]). These results suggest that our manipulation of public influence was successful.

5.3.2.2. Main results

A one-way between-subjects ANOVA revealed that there was no significant difference in acceptability of the decision-making process across conditions, $F(2, 212) = 0.17$, $p = .842$, $\eta^2 = .002$. This suggests that providing expert support for full influence did not enhance acceptability of the decision-making process compared to shared influence or full influence without expert support (Figure 3). Similarly, one-way

between-subjects ANOVAs revealed that there was no significant difference in acceptability of the final decision across conditions, $F(2, 212) = 0.40, p = .673, \eta^2 = .004$ and no significant difference in acceptability of the project across conditions, $F(2, 212) = 0.74, p = .478, \eta^2 = .007$ (see Figure 3).

Figure 3. Mean scores and standard deviations of acceptability of the decision-making process, acceptability of the final decision, and acceptability of the project (Study 1)

5.3.2.3. Explorative analyses

A one-way between-subjects ANOVA revealed a significant difference in perceived expertise of the decision-making panel across conditions, $F(2, 212) = 17.87, p < .001, \eta^2 = .144$. Post-hoc comparisons using a LSD test showed that perceived expertise of

the decision-making panel was highest when citizens and experts would make the final decision together, compared to when citizens could have full influence either with ($p < .001$, 95% CIs [0.77, 1.71]) or without expert support ($p < .001$, 95% CIs [0.76, 1.70]). Interestingly, we did not find that the possibility to consult experts increased the perceived expertise of the decision-making panel comprising only residents, compared to the shared influence condition ($p = .972$, 95% CIs [-0.46, 0.47]) (Figure 4).

A one-way between-subjects ANOVA revealed that, overall, there was no significant difference in perceived quality of the final decision across conditions, $F(2, 212) = 2.68$, $p = .071$, $\eta^2 = .025$. Yet, as illustrated in Figure 4, perceived quality of the final decision appeared higher when citizens and experts would make the final decision together (i.e., shared influence) compared to when citizens would make the final decision and could consult experts (full influence with expert support); post-hoc comparisons using LSD test showed that this difference was significant ($p = .022$, 95% CIs [0.08, 0.99]). This result suggests that people think the quality of decisions would be higher if experts and the public would make decisions together rather than when experts would merely advise citizens.

Figure 4. Mean scores and standard deviations of perceived expertise of the decision-making panel and perceived quality of the final decision (Study 1)

Note: different letters (a, b) indicate significant differences in the mean scores within each measure ($\alpha < 0.05$); the mean scores with the same letter do not significantly differ from each other within each measure.

Relationships between perceived expertise, perceived decision quality, and public acceptability

We next explored whether perceived expertise of the decision-making panel and perceived quality of the final decision are related to public acceptability. Pearson's correlations (Table 3) showed that both higher perceived expertise of the decision-making panel and particularly higher perceived quality of the final decision were

related to higher acceptability of the decision-making process, acceptability of the final decision and acceptability of the renewable energy project.

Table 3. Relationship (Pearson's correlations) between potential benefits of expert support and public acceptability (Study 1)

	Perceived quality of the final decision	Acceptability of the decision- making process	Acceptability of final decision	Acceptability of project
Perceived expertise of decision- making panel	.64** ($p < .001$)	.37** ($p < .001$)	.56** ($p < .001$)	.41** ($p < .001$)
Perceived quality of the final decision		.56** ($p < .001$)	.84** ($p < .001$)	.67** ($p < .001$)

** $p < .001$ (p-values are reported in brackets)

5.3.3. Discussion

The results showed that public acceptability of the decision-making process, the final decision and the energy project was not higher when the public could have full influence and could consult experts, compared to when the public and experts would make the final decision together and compared to full influence without expert supports. The explorative analyses suggest that one possible reason for this finding could be that providing expert support for a decision-making panel comprising only citizens did not yield the expected benefits: it did not result in higher perceived expertise of the decision-making panel, nor in higher perceived quality of the final decision in our study. Still, higher perceived expertise of the decision-making panel and higher perceived quality of the final decision were associated with higher acceptability of the decision-making process and resulting decisions and projects. These findings suggest that full influence (i.e., citizen control) did not result in higher

acceptability of the decision-making process, the resulting decisions, and the wind energy project compared to shared influence (i.e., partnership), even when expert support was provided.

5.4. Study 2: Effects of public influence and expert support on public acceptability in China

Study 2 tests if the findings in Study 1 can be replicated in an East-Asian country, China.

5.4.1. Participants

We tested our reasoning via an online questionnaire study with respondents from a pre-recruited Chinese panel⁸. Study 2 followed the exact same procedure and design as Study 1. The questionnaire was in Chinese⁹. Applying the same attention check as in Study 1, we received 244 valid responses for further analyses¹⁰ (83 valid participants for the shared influence condition, 78 valid participants for the full influence condition, 83 valid participants for the full influence with expert support condition), of which 116 were male and 128 were female, with the mean age of 30 years ($SD = 7.89$). See Supplementary Information for detailed demographic information. We included the same measures as in Study 1. We included the single measure of the manipulation check of perceived public influence ($M = 1.82$, $SD = 1.01$). We

⁸ The participants recruitment strategies were identical in Study 1 and 2, namely participants were from pre-recruited panel companies. We employed different local panel companies in each country, given the companies' good reputation for data collection in each country. The differences in sample characteristics between the two countries are mainly due to the pre-recruited panel differences. Specifically, it is a common phenomenon for pre-recruited Chinese panels that most often young and well-educated people participate.

⁹ The same English questionnaire was translated into Chinese (Mandarin) by a native Chinese speaker. One other native Chinese speaker checked and provided feedback on the translation. Revisions were made wherever needed. Importantly, changes were made consistently in the Dutch and Chinese questionnaires. The Chinese translation of the questionnaire can be found in Supplementary Information C.

¹⁰ The same attention check questions were used as in Study 1. Participants who wrongly answered the attention check questions were excluded from analysis. This time, invalid data were excluded by the panel company and were not provided to researchers, and thus we were unable to calculate valid response rates for each condition nor to provide attention check results.

computed the mean scores of the three items reflecting public acceptability of the decision-making process ($M = 1.55$, $SD = 1.08$, $\alpha = .73$), the three items reflecting public acceptability of the final decision ($M = 1.63$, $SD = 1.03$, $\alpha = .79$), and the four items reflecting public acceptability of the project ($M = 1.76$, $SD = 1.11$, $\alpha = .85$). We also computed the mean scores on the two items reflecting perceived expertise in the decision-making panel ($M = 0.47$, $SD = 1.72$, $r = .87$). We again included the single item measure of perceived quality of the final decision ($M = 1.34$, $SD = 1.35$).

5.4.2. Results

5.4.2.1. Manipulation check results

A one-way between-subjects ANOVA revealed a significant difference in perceived public influence across conditions, $F(2, 241) = 3.67$, $p = .027$, $\eta^2 = .030$. Post-hoc comparisons using LSD test showed that perceived public influence was significantly higher when the public could have full influence either without ($M = 1.95$, $SD = 1.07$; $p = .020$, 95% CIs [0.06, 0.68]) or with expert support ($M = 1.94$, $SD = 0.94$; $p = .021$, 95% CIs [0.06, 0.67]), than when the public and experts would make the final decision together ($M = 1.58$, $SD = 0.99$). This suggests that our manipulation of public influence in decision making was again successful.

5.4.2.2. Main results

One-way between-subjects ANOVAs revealed that there were no significant differences in acceptability of the decision-making process across conditions, $F(2, 241) = 1.07$, $p = .346$, $\eta^2 = .009$, and no significant differences in acceptability of the project across conditions, $F(2, 241) = 1.65$, $p = .194$, $\eta^2 = .014$. Providing expert support for full influence did not enhance acceptability of the decision-making process and acceptability of the project compared to shared influence or full influence without expert support (Figure 5).

Yet, a one-way between-subjects ANOVA revealed a significant difference in acceptability of the final decision across conditions, $F(2, 241) = 7.18$, $p = .001$, $\eta^2 = .056$. As illustrated in Figure 5, post-hoc comparisons using the LSD test indicated that acceptability of the final decision was lowest when citizens could have full

influence but could not consult experts, which was significantly lower than when people would make decisions together with experts ($p < .001$, 95% CIs [-0.91, -0.29]), and marginally significantly lower than when people would make decisions themselves and could ask experts for support ($p = .051$, 95% CIs [-0.62, 0.001]). We did not find acceptability of the final decision to differ between the shared influence and the full influence with expert support conditions ($p = .064$, 95% CIs [-0.02, 0.60]).

Interestingly, there was a trend (but non-significant) towards acceptability of the final decision to be higher in the shared influence condition compared to the full influence condition either with or without expert support. The result suggests that the final decisions are more acceptable when people believe the experts have some influence over decisions than when experts were not involved in the decision making.

Figure 5. Mean scores and standard deviations of acceptability of the decision-making process, acceptability of the final decision, and acceptability of the project (Study 2)

The more public influence, the better? The effects of full versus shared influence on public acceptability of energy projects in the Netherlands and China

Note: different letters (a, b) indicate significant differences in the mean scores within each measure ($\alpha < 0.05$); the mean scores with the same letter do not significantly differ from each other within each measure.

5.4.2.3. Explorative analyses

A one-way between-subjects ANOVA revealed a significant difference in perceived expertise of the decision-making panel across conditions, $F(2, 241) = 70.28, p < .001, \eta^2 = .368$. Post-hoc comparisons using the LSD test showed that people thought the decision-making panel had more expertise when citizens and experts would make the final decision together compared to when citizens would have full influence with ($p < .001, 95\% \text{ CIs } [1.91, 2.75]$) and without expert support ($p < .001, 95\% \text{ CIs } [1.61, 2.46]$) (Figure 6). This means that people perceived the expertise of the decision-

making panel to be highest when experts would take decisions together with the public.

A one-way between-subjects ANOVA revealed a significant difference in perceived quality of the final decisions across conditions, $F(2, 241) = 6.57, p = .002, \eta^2 = .052$. As illustrated in Figure 6, post-hoc comparisons using LSD test showed that perceived quality of the final decision was highest when citizens and experts would make the final decision together; it was significantly higher than when citizens would have full influence but could not consult experts ($p < .001$, 95% CIs [0.33, 1.15]). Providing expert support for full influence significantly increased the perceived quality of the final decision compared to full influence without expert support ($p = .015$, 95% CIs [0.10, 0.92]), but did not significantly increase perceived quality of the final decision compared to shared influence ($p = .266$, 95% CIs [-0.63, 0.18]).

Figure 6. Mean scores and standard deviations of perceived expertise of the decision-making panel and perceived quality of the final decision (Study 2)

Note: different letters (a, b) indicate significant differences in the mean scores within each measure ($\alpha < 0.05$); the mean scores with the same letter do not significantly differ from each other within each measure.

Relationships between perceived expertise, perceived decision quality, and public acceptability

Pearson's correlations (Table 4) showed that, again, both higher perceived expertise of the decision-making panel and particularly higher perceived quality of the final decision were significantly related to higher acceptability of the decision-making process, acceptability of the final decision and acceptability of the renewable energy project.

Table 4. Relationship (Pearson's correlations) between potential benefits of expert support and public acceptability (Study 2)

	Perceived quality of the final decision	Acceptability of the decision- making process	Acceptability of final decision	Acceptability of project
Perceived expertise of decision- making panel	.43** ($p < .001$)	.25** ($p < .001$)	.36** ($p < .001$)	.17* ($p = .008$)
Perceived quality of the final decision		.57** ($p < .001$)	.77** ($p < .001$)	.61** ($p < .001$)

* $p < .05$, ** $p < .001$ (p-values are reported in brackets)

5.4.3. Discussion

Result of Study 2 were in general comparable to results of Study 1. Specifically, acceptability of the decision-making process, the final decision and the project was not higher when the public would make the final decision themselves and could consult experts compared to when the public and experts would make the final decision

together. Again, providing expert support in the full influence condition did not increase the perceived expertise of citizens involved in decision making, and did not increase perceived quality of the final decision compared to the shared influence condition. Moreover, results again showed that higher perceived expertise of the decision-making panel and perceived quality of the final decision were associated with higher public acceptability of the decision-making process and resulting decisions and renewable energy projects. In conclusion, full public influence (i.e., citizen control) did not lead to higher acceptability of the decision-making process and the resulting decisions of the wind energy project, compared to shared influence (i.e., partnership), even when expert support is provided. The decision-making panel comprising both experts and citizens was again evaluated as having most expertise and most capable to take high quality decisions.

5.5. General conclusion and discussion

We conducted two experimental studies to examine the effects of shared influence versus full influence (either with or without expert support) on public acceptability of the decision-making process, resulting decisions and renewable energy projects in the Netherlands and China. We extended previous research by (1) testing under which conditions (i.e., with vs. without expert support) full influence (e.g., citizen control) enhances public acceptability compared to shared influence (e.g., partnership), (2) employing an experimental design which enables us to test the causal effect of public influence in decision making on public acceptability of the decision-making process and resulting decisions and projects, and (3) conducting the study in different contexts, namely in a Western European country (i.e., the Netherlands) and an East-Asian country (i.e., China), to test the generalisability of the findings.

A pilot study replicated the previous findings from the literature that having at least some influence leads to higher acceptability of the decision-making process compared to having no influence at all (Aitken et al., 2016; Reilly et al., 2016; Shaw et al., 2015). Extending previous work, we experimentally demonstrated that perceiving the public would have influence indeed causes higher public acceptability of the decision-making

process compared to perceiving the public having no influence at all. This also provides congruent empirical evidence to the literature which proposes that meaningful public participation that incorporates public input in decision making would be more beneficial for public acceptability compared to public participation processes where the public is only informed about the project (e.g., (Colvin et al., 2016)).

We hypothesised that compared to shared influence (e.g., partnership), full influence (e.g., citizen control) can lead to higher public acceptability of the decision-making process, of the resulting decisions and energy projects when citizens involved in decision making could consult experts. Specifically, we hypothesised that people may assume that the public does not have sufficient expertise to make high-quality decisions on energy projects, and providing expert support would enhance people's perceived expertise of the decision-making panel and the perceived quality of decisions to be taken by the panel (Eaton et al., 2017; Ruostetsaari, 2017). Yet, contrary to our expectation, full public influence (i.e., citizen control) did not lead to higher acceptability of the decision-making process, the resulting decisions, and the wind energy project, compared to shared influence (i.e., partnership), even when expert support is provided. This could be due to that we did not find that consulting experts increases the perceived expertise of the decision-making panel who would take decisions. In other words, the decision-making panel comprising both experts and citizens was evaluated as having more expertise and being more capable to take high quality decisions, compared to a decision-making panel comprising only citizens, even when those citizens could consult experts. It is possible that people think experts' knowledge will not be well transferred to citizens, or that citizens will not (be able to) effectively incorporate experts' knowledge when experts would merely advise citizens, and that better decisions are made when the public makes decisions together with experts. Future research is needed to study what are effective strategies to enhance perceived expertise of a decision-making panel comprising only citizens and to increase perceived quality of the decisions to be taken by such a panel, and whether

this would increase public acceptability of the decision-making processes, the resulting decisions, and energy projects.

In Study 1 and 2, we only included a shared influence condition and full influence (either with or without expert support) conditions, but we did not include a condition in which people would have no influence at all (e.g., only informing the public about the project). This is because our main aim was to see whether full influence enhances acceptability above and beyond shared influence, but not to compare full influence with no influence at all. Yet, future research could test if having full influence (e.g., citizen control) may even backfire – decrease acceptability of the resulting decisions and energy projects – compared to no influence at all, by systematically varying all different amounts of influence people can have in participatory procedures about renewable energy projects, for example ranging from no influence, to little influence, to shared influence and to full influence.

In line with our expectation, we found that both higher perceived expertise of the decision-making panel and higher perceived quality of the decisions enhanced public acceptability of the decision-making process, acceptability of the final decision and acceptability of the project. Noteworthy, perceived quality of the decisions was more strongly related with acceptability of the decision-making process, of the decision to be taken and of the project to be developed, than perceived expertise of the decision-making panel, in both countries. This is probably because perceived expertise indicates if those involved in the decision-making panel have sufficient knowledge, but this does not guarantee that the knowledge will be used effectively when taking decisions. Moreover, perceived quality of decisions may depend on many aspects, such as technical quality, using reliable information, as well as incorporation of different values in decision making, among others. This is also reflected in our finding that perceived expertise and quality of decisions are positively, but not very strongly, related in both studies. Hence, the decision-making process, the resulting decisions and the project to be developed are particularly more acceptable if people think that decisions makers will use their expertise in a way that can best serve public interests.

We defined “expert support” as coming from a hypothetical energy company and we described the company as highly competent across conditions. Yet, people’s trust in different organizations may differ (X. Li & Tilt, 2019), and this may affect if providing such expert support would increase project acceptability. For example, people may find it less important to consult experts when the responsible agent is trustworthy. Future research could test whether similar or different results are found when citizens take decisions together with (or merely consult) experts from different organizations, such as the government, research institutes (e.g., universities), and NGOs.

In general, the patterns of results were very consistent in the Netherlands and China. Our findings in both countries challenge the common assumption that the more public influence, the higher project acceptability, and imply that public participation may have similar effects in both countries. This contradicts earlier research suggesting that people in the Netherlands may want to have more influence in decision making than people in China (Kim & Sherman, 2007), which would imply that public participation may have different effects on public acceptability in both countries. Future research could test whether similar results would be found in other countries and cultures.

It worth noticing that the respondents evaluated hypothetical energy projects, implying that no actual decisions were taken and the energy projects would not be actually implemented. This might have made it relatively difficult for the respondents to evaluate how acceptable they would find the resulting decisions and energy projects. Also, the respondents did not actually experience the extent to which the public can influence and shape decisions through public participation, which could affect the results. Hence, the results on acceptability of decisions and projects should be interpreted with care. Notably, we employed experimental design to control for other potential factors that may affect project acceptability as to rule out alternative explanations, and to establish the cause and the effect between public influence and project acceptability. We provided the first evidence to challenge the common assumption that the more public influence the higher project acceptability. Yet, the

strength of experimental designs comes with the drawback that it is a simplification of reality and presenting hypothetical situations without real consequences. Future research is needed to test our hypotheses with real energy projects and real public participation procedures where actual decisions will be taken and in which many other factors may be at play, by employing other research designs, such as correlational studies, longitudinal studies, and field (quasi) experiments, in order to enhance the external validity of our findings. Moreover, we tested our hypotheses for specific energy projects (e.g., wind energy project in Study 1 and 2). Research suggests that public participation has similar effects on acceptability of different types of energy projects (Reilly et al., 2016; Shaw et al., 2015). Still, future studies are needed to test our hypotheses with other types of energy projects to draw firmer conclusions about the generalizability of our findings.

We examined the effect of shared influence and full influence (either with or without expert support) on public acceptability. Yet, the aspects of the project that people could influence may also matter for public acceptability of the decision-making process and the final decision and the resulting project. Specifically, being able to influence major aspects of the project that have important implications for people's life and living environment (e.g., the location of a wind park) may increase public acceptability more compared to only being able to influence some minor aspects of the project (e.g., color of wind turbines) (Liu et al., 2019). In our studies, we kept the aspects of the project people could influence constant across conditions, by indicating that people could influence all aspects of the project. Future studies could test how the amount of influence and which aspects of the project people can influence work together in affecting public acceptability, to test whether the effect of amount of influence on project acceptability depends on which aspects people can influence, and the other way around. For example, it may be that more public influence backfires and even decreases public acceptability, if the influence can only be exercised over minor decisions, because it implies that people invest time in participation but still cannot guarantee that their major interests and concerns are addressed. Similarly, public

acceptability may be higher if people could influence aspects that are truly important to them, even if they would not have full control over those aspects and do not take decisions themselves, because people think the likelihood that their major concerns are addressed is already high. Future research could explore these possibilities.

In this paper, we focused on the instrumental arguments for increasing public influence in energy projects, namely increasing public acceptability of energy projects (Liu et al., 2020b). Interestingly, we showed that full influence (e.g., citizen control) did not result in higher public acceptability of the energy projects compared to shared influence (e.g., partnership), even when expert support was provided. Yet, this does not mean that citizens should not have (full) control over decision making about energy projects, as higher amounts of public influence over decision making may have other benefits. For example, normative arguments stress that public participation is an end in itself (Bidwell, 2016), and it is the citizens' right in a democratic society to be engaged in decision making about affairs that impact them (Fiorino, 1990; Stirling, 2014). In addition, substantive arguments stress that diverse citizens can not only bring in multifaceted local knowledge that experts may otherwise miss, but also bring in a greater range of perspectives and concerns, and thereby public participation could help to reach better quality decisions about renewable energy projects (Bidwell & Schweizer, 2020). Future research could look at how different amounts of public influence can facilitate the realizations of these benefits of public participation.

Our findings have important practical implications. First and foremost, we found that people might find the decision-making process less acceptable when not giving any influence to the public, and this finding is in line with other correlational studies in which people evaluate real-life renewable energy projects (Aitken et al., 2016; Firestone et al., 2018; Shaw et al., 2015). Yet, providing more influence to citizens did not necessarily lead to higher public acceptability of the decision-making process, of the resulting decisions and energy projects in our studies. This is important for practitioners to bear in mind when developing energy policies, particularly given the increasing advocacy of more public influence in decision making about renewable

energy projects (Bidwell, 2016). For example, citizen control could take place in community energy initiatives where citizens decide about the project, and there may be more efforts for citizen control as energy systems decentralize. Our research suggests that people may not necessarily favor citizens taking the decisions and this may not increase acceptability of the project. Future research is needed to test if our findings can be replicated with real-life energy projects where citizens have real control over the decisions. Moreover, people are more likely to positively evaluate the decision-making processes around energy projects when they believe those involved in the decision-making panel have higher expertise, and when they believe the decisions to be taken would be of higher quality. Practitioners therefore need to take care that different agents (e.g., public representatives, experts) involved in decision making are believed to have sufficient expertise and try to maximise the quality of the decisions to be taken. Importantly, the decisions may not only need to be of high technical quality, but also need to represent different values and concerns of the public (Perlaviciute, 2019), to enhance public acceptability of the decision-making process and the project. To conclude, this research tested the effect of shared influence versus full influence (either with or without expert support) on public acceptability of the decision-making process, the resulting decisions and energy projects. Our findings provide first evidence to challenge the common assumption that the more influence the public has in the decision making, the more acceptable they find energy projects. Rather, our findings suggest that it is important for citizens to have some, but not necessarily full, influence in decision making, and that practitioners need to secure that those involved in decision making (e.g., public representatives, experts) are believed to have sufficient expertise to make high quality decisions, in order to enhance public acceptability of the decision-making processes and resulting energy projects.

5.6. Appendix

Appendix A

Table One: demographics of respondents in China and the Netherlands

		The Netherlands		China	
Gender	Male	109		116	
	Female	106		128	
Mean age (<i>SD</i>)		56 (<i>SD</i> = 17.44)		30 (<i>SD</i> = 7.89)	
Education	Primary school	2		0	
	Junior school	25		0	
	High school	158		6	
	University	29		236	
	I do not want to say	1		2	
Income per month (Euro in the Netherlands/Yuan in China) (1 euro equals about 7.8 Yuan)	Less than 1500	15		Less than 4000	8
	1500-3000	74		4000-8000	43
	3001-4500	74		8001-12000	60
	4501-6000	14		12001-16000	62
	More than 6000	5		More than 16000	67
	I do not want to say	33		I do not want to say	4
Total		215		244	

Appendix B: Original version of Dutch Questionnaire for Study 2

Shared influence	Een windenergieproject (energie geproduceerd door windturbines)
	<ul style="list-style-type: none"> Beeld u in dat er plannen zijn voor de ontwikkeling van een windenergieproject in het gebied waar u woont. Er wordt een besluitvormingspanel gevormd om dit windenergieproject te bespreken en besluiten hierover te nemen.
	Wie wordt er betrokken bij het besluitvormingsproces over dit

	<p>windenergieproject?</p> <ul style="list-style-type: none"> • De ene helft van de leden van het besluitvormingspanel bestaat uit experts van een energiebedrijf, de andere helft bestaat uit bewoners in het gebied waar u woont. Het panel is daarom een "besluitvormingspanel voor Energiebedrijf en Bewoners". • Het "besluitvormingspanel voor Energiebedrijf en Bewoners" zal samen alle aspecten van het windenergieproject bespreken, zoals de locatie van het windpark, het aantal te installeren windturbines, de grootte en de kleur van de windturbines die moeten worden geïnstalleerd. • Bewoners in het besluitvormingspanel kunnen experts van het energiebedrijf om advies vragen over dit windenergieproject. • Het energiebedrijf ontwikkelt al jarenlang windenergieprojecten. Het energiebedrijf heeft veel ervaring, kennis en expertise in het ontwikkelen van windenergieprojecten. <p>Wie neemt het definitieve besluit?</p> <ul style="list-style-type: none"> • De bewoners en experts van het energiebedrijf die deelnemen aan het "besluitvormingspanel voor Energiebedrijf en Bewoners" nemen samen het definitieve besluit over alle aspecten van het windenergieproject. <p>Wat gebeurt er nu?</p> <ul style="list-style-type: none"> • Het windenergieproject zal precies zo worden geïmplementeerd als is besloten door het "besluitvormingspanel voor Energiebedrijf en Bewoners"
Full influence	<p>Een windenergieproject (energie geproduceerd door windturbines)</p> <ul style="list-style-type: none"> • Beeld u in dat er plannen zijn voor de ontwikkeling van een windenergieproject in het gebied waar u woont. • Er wordt een besluitvormingspanel gevormd om dit windenergieproject te bespreken en besluiten hierover te nemen.

	<p>Wie wordt er betrokken bij het besluitvormingsproces over dit windenergieproject?</p> <ul style="list-style-type: none"> • Alle leden van het besluitvormingspanel zijn bewoners uit het gebied waar u woont. Het panel is daarom een "Bewonersbesluitvormingspanel". • Het "Bewonersbesluitvormingspanel" zal alle aspecten van het windenergieproject bespreken, zoals de locatie van het windpark, het aantal te installeren windturbines, de grootte en de kleur van de windturbines die worden geïnstalleerd. <p>Wie neemt het definitieve besluit?</p> <ul style="list-style-type: none"> • De bewoners die deelnemen aan het "Bewonersbesluitvormingspanel" nemen samen het definitieve besluit over alle aspecten van het windenergieproject. <p>Wat gebeurt er nu?</p> <ul style="list-style-type: none"> • Het windenergieproject zal precies zo worden geïmplementeerd als is besloten door het "Bewonersbesluitvormingspanel".
Full influence with expert support	<p>Een windenergieproject (energie geproduceerd door windturbines)</p> <ul style="list-style-type: none"> • Beeld u in dat er plannen zijn voor de ontwikkeling van een windenergieproject in het gebied waar u woont. • Er wordt een besluitvormingspanel gevormd om dit windenergieproject te bespreken en besluiten hierover te nemen. <p>Wie wordt er betrokken bij het besluitvormingsproces over dit windenergieproject?</p> <ul style="list-style-type: none"> • Alle leden van het besluitvormingspanel zijn bewoners in het gebied waar u woont. Het panel is daarom een "Bewonersbesluitvormingspanel". • Het "Bewonersbesluitvormingspanel" zal alle aspecten van het

windenergieproject bespreken, zoals de locatie van het windpark, het aantal te installeren windturbines, de grootte en de kleur van de windturbines die moeten worden geïnstalleerd.

Ondersteuning door experts

- Bewoners in het besluitvormingspanel kunnen experts van het energiebedrijf om advies vragen over dit windenergieproject.
- Het energiebedrijf ontwikkelt al jarenlang windenergieprojecten. Het energiebedrijf heeft veel ervaring, kennis en expertise in het ontwikkelen van windenergieprojecten.

Wie neemt het definitieve besluit?

- De **bewoners** die deelnemen aan het “Bewonersbesluitvormingspanel” nemen het definitieve besluit over alle aspecten van het windenergieproject.
- De experts van het energiebedrijf maken GEEN deel uit van het besluitvormingspanel en besluiten NIET over het windenergieproject.

Wat gebeurt er nu?

- Het windenergieproject zal precies zo worden geïmplementeerd als is besloten door het “**Bewonersbesluitvormingspanel**”.

Het is heel belangrijk dat de tekst duidelijk voor u was. Beantwoord daarom de volgende twee vragen.

Wie neemt volgens de tekst die u heeft gelezen het definitieve besluit over het windenergieproject?	A. Alleen het energiebedrijf B. Alleen bewoners C. Het bedrijf en de bewoners samen
Kunnen volgens de tekst die u heeft gelezen bewoners experts van een energiebedrijf om advies vragen over dit windenergieproject?	A. Ja, bewoners kunnen experts om advies vragen. B. Nee, bewoners kunnen GEEN experts om advies vragen.

We willen graag uw mening weten over het geplande windenergieproject in het gebied waar u woont.

In welke mate vindt u dat <u>het besluitvormingsproces</u> over dit windenergieproject:	1) heel onacceptabel is- heel acceptabel is 2) heel slecht is - heel goed is 3) heel negatief is - heel positief is	Scale -3 to 3
Alles bij elkaar genomen, vind ik dat <u>het definitieve besluit</u> over het windenergieproject genomen door het besluitvormingspanel zou ...:	1) heel onacceptabel zijn - heel acceptabel is 2) heel slecht zijn - heel goed zijn 3) heel negatief zijn - heel positief zijn 4) van zeer lage kwaliteit zijn – van zeer hoge kwaliteit zijn	Scale -3 to 3
In welke mate vindt u <u>het windenergieproject</u> :	1) heel onacceptabel - heel acceptabel 2) heel slecht - heel goed 3) heel negatief - heel positief 4) heel onnodig – heel nodig	Scale -3 to 3
In welke mate denkt u dat <u>het besluitvormingspanel</u> :	1) voldoende ervaring met windenergieprojecten heeft (helemaal niet – heel veel) 2) voldoende kennis over windenergieprojecten heeft (helemaal niet – heel veel)	Scale -3 to 3
Alles bij elkaar genomen, hoeveel invloed denkt u dat <u>bewoners in het gebied waar u woont</u> hebben over het definitieve besluit over dit windenergieproject?	1) helemaal niet – heel veel	Scale -3 to 3

Appendix C: Original version of Chinese (Mandarin) Questionnaire for Study 3

Shared influence	<p>一个风能项目（使用风力制造能源）</p> <ul style="list-style-type: none">请您设想：一个风能项目正计划在您居住的地区开发。一个决策小组将会被成立，以讨论和决定该风能项目的事项。 <p>谁将参与该风能项目的决策过程？</p> <ul style="list-style-type: none">决策小组的一半成员将会是一家能源公司的专家，另外一半将是您居住地区的居民。该小组因此被称为“能源公司和居民决策小组”。“能源公司和居民决策小组”将共同讨论与这个风能项目有关的所有事项，例如风力发电场的位置、即将安装的风车的数量、风车的尺寸和颜色。决策小组中的居民可以向这家能源公司的专家征询有关该风能项目的建议。这家能源公司已经从事了很多年风能项目，公司有丰富的经验，拥有大量关于风能项目的知识和专业技术。 <p>谁做出最终决定？</p> <ul style="list-style-type: none">参与到“能源公司和居民决策小组”中的居民和能源公司的专家将共同对这个风能项目的所有事项做出最终决定。 <p>接下来会发生什么？</p> <ul style="list-style-type: none">这个风能项目将完全按照“能源公司和居民决策小组”做出的决定实施。
	<p>Full influence</p> <p>一个风能项目（使用风力制造能源）</p> <ul style="list-style-type: none">请您设想：一个风能项目正计划在您居住的地区开发。一个决策小组将会被成立，以讨论和决定该风能项目的事项。

	<p>谁将参与该风能项目的决策过程？</p> <ul style="list-style-type: none"> 决策小组的全部成员将由您居住地区的居民组成。该小组因此被称为“居民决策小组”。 “居民决策小组”将讨论与这个风能项目有关的所有事项，例如风力发电场的位置、即将安装的风车的数量、风车的尺寸和颜色。 <p>谁做出最终决定？</p> <ul style="list-style-type: none"> 参与到“居民决策小组”中的居民将共同对这个风能项目的所有事项做出最终决定。 <p>接下来会发生什么？</p> <ul style="list-style-type: none"> 这个风能项目将完全按照“居民决策小组”做出的决定实施。
Full influence with expert support	<p>一个风能项目（使用风力制造能源）</p> <ul style="list-style-type: none"> 请您设想：一个风能项目正计划在您居住的地区开发。 一个决策小组将会被成立，以讨论和决定该风能项目的事项。 <p>谁将参与有关该风能项目的决策过程？</p> <ul style="list-style-type: none"> 决策小组的全部成员将由您居住地区的居民组成。该小组因此被称为“居民决策小组”。 “居民决策小组”将讨论与这个风能项目有关的所有事项，例如这个风力发电场的位置、即将安装的风车的数量、风车的尺寸和颜色。 <p>专家支持</p> <ul style="list-style-type: none"> 决策小组中的居民可以向一家能源公司的专家征询有关该风能项目的建议。 这家能源公司已经从事了很多年风能项目，公司有丰富的经

	<p>验，拥有大量关于风能项目的知识和专业技术。</p> <p>谁做出最终决定？</p> <ul style="list-style-type: none">• 参与到“居民决策小组”中的居民将对这个风能项目的所有事项做出决定。• 能源公司的专家不属于决策小组的一部分，这些专家不能对该风能项目做出决定。 <p>接下来会发生什么？</p> <p>这个风能项目将完全按照“居民决策小组”做出的决定实施。</p>
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以上材料对您来说含义清晰非常重要。请您回答以下两个问题。

根据您所阅读的材料，谁将做出这个风能项目的最终决定？	1) 只有能源公司 2) 只有居民 3) 能源公司和居民共同
根据您所阅读的材料，居民能否向能源公司的专家征询有关该风能项目的建议？	1) 能。 2) 不能。

我们想知道您对您居住地区正在计划的这个风能项目的看法。

您在多大程度上认为该风能项目的 决策过程 ：	1) 非常不能接受 – 非常能够接受 2) 非常不好 – 非常好 3) 非常消极 – 非常积极	量表 -3 至 3
综合考虑所有因素，我认为由决策小组做出的有关这个风能项目的 最终决定 将会是：	1) 非常不能接受的 – 非常能够接受的 2) 非常不好的 – 非常好的	量表 -3

	3) 非常消极的 – 非常积极的 4) 质量非常低的 – 质量非常高的	至 3
您在多大程度上认为 该风能项目 ：	1) 非常不能接受 – 非常能够接受 2) 非常不好 – 非常好 3) 非常消极 – 非常积极 4) 非常没有必要 – 非常有必要	量表 -3 至 3
您在多大程度上认为 决策小组 ：	1) 在风能项目方面有充足的经验（完全没有 – 有非常多） 2) 在风能项目方面有充足的知识（完全没有 – 有非常多）	量表 -3 至 3
综合考虑所有因素，您认为 您居住地区的居民 对该风能项目的最终决定有多少影响力？	1) 根本没有影响力 – 有非常多影响力	量表 -3 至 3

Appendix D: Number of cases, Means, and Standard Deviation of all dependent variables across conditions (with all participants and with only valid participants, respectively)

Pilot study

		Acceptability of decision making			Acceptability of final decision			Acceptability of the project		
		Number	Mean	SD	Number	Mean	SD	Number	Mean	SD
No influence	All participants	28	0.27	1.70	28	0.42	1.90	28	1.67	1.40
	Valid participants	22	-0.06	1.76	22	0.24	2.00	22	1.78	1.51
Little influence	All participants	52	0.95	1.19	52	0.87	1.26	52	1.52	1.42
	Valid participants	29	0.85	0.97	29	0.98	0.98	29	1.64	1.32
Shared influence	All participants	58	1.07	1.18	58	0.78	1.26	58	1.49	1.39
	Valid participants	49	0.97	1.21	49	0.65	1.30	49	1.44	1.47
Full influence	All participants	60	0.75	1.37	60	0.70	1.40	60	1.48	1.54
	Valid participants	14	0.79	0.80	14	0.55	1.17	14	1.18	1.15

Study 1

		Acceptability of decision making			Acceptability of final decision			Acceptability of the project		
		Number	Mean	SD	Number	Mean	SD	Number	Mean	SD
Shared influence	All participants	77	1.41	1.44	77	1.37	1.27	77	1.44	1.44
	Valid participants	70	1.32	1.46	70	1.27	1.24	70	1.35	1.45
Full influence	All participants	78	1.31	1.19	78	1.21	1.38	78	1.41	1.36
	Valid participants	72	1.33	1.22	72	1.20	1.42	72	1.44	1.40
Full influence with expert support	All participants	79	1.38	1.32	79	1.02	1.49	79	1.10	1.50
	Valid participants	73	1.44	1.30	73	1.06	1.48	73	1.15	1.53

		Perceived expertise			Quality of decision		
		Number	Mean	SD	Number	Mean	SD
Shared influence	All participants	77	1.37	1.08	77	1.36	1.31
	Valid participants	70	1.33	1.05	70	1.34	1.19
Full influence	All participants	78	0.15	1.55	78	1.06	1.48
	Valid participants	72	0.10	1.59	72	1.06	1.52
Full influence with expert support	All participants	78	0.14	1.53	78	0.79	1.37
	Valid participants	73	0.09	1.55	73	0.81	1.41

Study 2 (Note: invalid participants in Study 2 were excluded by the panel company and were not provided to researchers)

		Acceptability of decision making			Acceptability of final decision			Acceptability of the project		
		Number	Mean	SD	Number	Mean	SD	Number	Mean	SD
Shared influence	Valid participants	83	1.65	0.93	83	1.92	0.78	83	1.80	0.94
Full influence	Valid participants	78	1.41	1.19	78	1.32	1.22	78	1.58	1.33
Full influence with expert support	Valid participants	83	1.59	1.10	83	1.63	0.97	83	1.89	1.02

		Perceived expertise			Quality of decision		
		Number	Mean	SD	Number	Mean	SD
Shared influence	Valid participants	83	1.92	0.74	83	1.65	1.22
Full influence	Valid participants	78	-0.12	1.61	78	0.91	1.55
Full influence with expert support	Valid participants	83	-0.42	1.61	83	1.42	1.18

Chapter 6

General Discussion

Transitioning from fossil energy sources (e.g., coal, oil and gas) to renewable energy sources (e.g., solar and wind) can significantly contribute to the reduction of greenhouse gas emissions (Commission & European Commission, n.d.) and, thereby, the mitigation of climate change and its negative impacts (Masson-Delmotte et al., 2018). In order to transit from fossil to renewable energy sources, renewable energy projects need to be implemented. The successful implementation of renewable energy projects strongly depends on public acceptability, reflecting the extent to which people evaluate an energy project (un)favourably (from now on referred to as “project acceptability”). Accordingly, it is important to understand which factors influence project acceptability.

Public participation in decision making can be an important factor enhancing public acceptability of the decision-making process and resulting renewable energy project, because it can ensure that public interests and concerns are taken into account. Public participation in decision making refers to processes organized by responsible agents (e.g., governments, companies) to engage the public in the planning, the design, and the implementation of energy projects (Dietz & Stern, 2008). In this PhD dissertation, we developed and tested theory that explicates under what conditions and via which process(es) public participation in decision making affects public acceptability of the decision-making process and resulting renewable energy project.

Specifically, in this dissertation we addressed three important questions. First, we investigated under what conditions public participation enhances acceptability of the decision-making process and resulting renewable energy project. Literature suggests that the amount of influence the public can have (i.e., no influence, little influence, shared influence, full influence; as further explained later) in the decision making is important for acceptability of the decision-making process and resulting project, and proposed that acceptability is higher when people have more influence as this increases the likelihood that people’s concerns are taken into account. The amount of influence reflects the extent to which people can have a say over and decide upon decisions about the energy project to be developed. Extending previous research, we

hypothesised that not only the amount of influence, but also the type of decisions people can influence affects project acceptability. We expected that project acceptability is higher when people can influence major decisions of the project (rather than only minor decisions) because this increases the likelihood that their key concerns are addressed.

Second, we studied the underlying process(es) via which public participation affects project acceptability. We hypothesised that public participation is likely to affect project acceptability by influencing perceived procedural fairness, which reflects the extent to which people evaluate the decision making as fair, open, and transparent. When people can participate in the decision making, they are more likely to think that the decision-making process is transparent, and that their interests and concerns are taken into account; higher perceived procedural fairness could in turn enhance project acceptability.

Third, we examined to what extent trust in the agent responsible for the project affects project acceptability. We hypothesised that project acceptability is higher when people have high trust in the responsible agent because they may assume that trustworthy agents will take their interests and concerns into account. This implies that high trust also signals that public interests are taken into account, and that if trust is high, people may even no longer feel the need to participate in decision making to secure that their interests are considered. This suggests that having either high trust or public participation over major decisions may already lead to higher project acceptability, as both give people the feeling that their interests and concerns are taken into account. Since trust in the integrity of the agent mostly implies that the agent will protect people's interests, we further hypothesised that trust in the integrity of the agent is more important for project acceptability than trust in the competence of the agent.

6.1. Influence over major decisions increases project acceptability

While it is generally assumed that public participation increases project acceptability, strikingly little is known about when public participation is most likely to do so. The

literature suggests that the more influence people have in the decision making, the more acceptable people find the resulting projects (Aitken et al., 2016; Reilly et al., 2016; Shaw et al., 2015). Arguably, more influence increases the likelihood that people's interests and concerns are taken into account, and as a result people are likely to find the resulting projects more acceptable. The literature so far has focused on how much influence people can have and how this affects project acceptability (e.g., Aitken et al., 2016; Reilly et al., 2016; Shaw et al., 2015). We proposed that it is also critical to consider what type of decisions people can influence as this is also likely to affect project acceptability. Specifically, we hypothesised that being able to influence major decisions can increase project acceptability more than only being able to influence minor decisions, as the former increases the likelihood that people's main concerns are addressed.

First, we examined the effect of type of decisions people can influence on project acceptability. There are many decisions the public could potentially influence in decision making about energy projects. Some decisions could have major implications for people, such as choosing the location for renewable energy siting; we refer to them as *major decisions*. Other decisions may only have minor implications for people, such as the colour of solar panels; we refer to them as *minor decisions*. People may feel their concerns are better taken into account when they can influence major decisions rather than only minor decisions.

In Chapter 2, we tested the effect of the type of decisions that people can influence on acceptability of a hypothetical solar energy project that would be established in their neighbourhood. We kept the amount of influence people could have over different types of decisions constant. As expected, we found that people evaluated the project as more acceptable when they had the opportunity to participate in decision making and could influence major decisions, such as the location and the amount of the solar panels to be installed, compared to when they could only influence minor decisions, such as the type and the colour of the solar panels to be installed. We thus for the first

time showed that the type of decisions people can influence is critical for project acceptability.

Next, we examined the effect of amount of influence on public acceptability of the decision-making process and the resulting project. In Chapter 5, we tested whether people find an energy project and the decision-making process about the project more acceptable when they have more influence in the decision making. We kept the type of decisions people could influence constant, by indicating that people could influence all decisions about the project. Yet, we systematically varied how much influence the public could have in the decision making. Specifically, based on the seminal public participation ladder (Arnstein, 1969), we distinguished between having no influence (i.e., citizens being only informed about the project), little influence (i.e., consultation, when people can provide input that will be considered in the final decisions, but cannot make the final decisions themselves), shared influence (i.e., partnership, when people take decisions together with other responsible agents), and full influence (i.e., when people make final decisions themselves).

In line with the popular assumption, having influence led to higher acceptability of the decision-making process, compared to having no influence at all. Yet, in contrast to what is generally assumed, our results showed that acceptability of the project did not differ for different amounts of influence. Notably, project acceptability was not higher when people would decide themselves than when people would take decisions together with the responsible agents. One possible reason is that renewable energy projects are typically complex and planning and implementing such projects requires professional expertise (Ahn et al., 2012; Koirala et al., 2016; F. G. N. Li & Pye, 2018; Sorman et al., 2020), and citizens often lack such expertise which may result in poorer quality decisions (Pandey & Sharma, 2021; Rossi, 1997; Tritter & McCallum, 2006). Accordingly, we hypothesised that full influence leads to higher acceptability of the decision-making process and the resulting project compared to shared influence only when expert support is provided. Interestingly, we found that full influence did not lead to higher acceptability of the decision-making process nor higher project

acceptability, compared to shared influence, even when expert support was provided. Yet, exploratory analyses showed that higher perceived expertise of the decision-making panel and particularly higher perceived quality of decisions to be taken were indeed associated with higher acceptability of the decision-making process and project acceptability.

To sum up, we found that giving people the opportunity to influence major (versus minor) decisions led to higher project acceptability, whereas increasing the amount of influence as such, including full influence over decisions, did not increase project acceptability compared to shared influence, even when provided with expert support. It seems that it is not so much the amount of influence, but merely the type of decisions that people can influence, that is important for project acceptability, as the latter signals to what extent people's major concerns are addressed.

The findings have important theoretical implications. Studies on public participation have mostly focused on the amount of influence people have over decisions, assuming the more influence, the higher the acceptability of the decision-making process and the resulting project. We reasoned and found that having more influence as such is not the only – and possibly not even the most important – aspect of public participation that can enhance acceptability. Rather, it is the type of decisions that people can influence that seems to be particularly important: project acceptability is higher when people can influence major rather than minor decisions as this implies that people's major concerns are more likely to be addressed. This is an important finding, suggesting that merely providing people with more influence may not have the widely expected positive effects on acceptability of the decision-making process and resulting energy project. Rather, giving people the opportunity to influence decisions that truly matter to them is likely to be more effective in enhancing project acceptability.

Future studies could test how the amount of influence and type of decisions work together in affecting acceptability of the decision-making process and resulting project, examining their relative importance for acceptability of the decision-making process

and resulting project, and testing whether the effect of amount of influence on acceptability of the decision-making process and resulting project depends on the type of decisions people can influence, and the other way around. For example, it may be that more influence will backfire and decrease acceptability of the decision-making process and resulting project if citizens can only exercise control over minor decisions, because it implies that people invest time and effort in participation but still cannot guarantee that their major interests and concerns are taken into account. Similarly, acceptability of the decision-making process and resulting project may be higher if people can influence decisions that are truly important to them, even if they do not have full control over those decisions and do not make these decisions themselves, because people think the likelihood that their major concerns are addressed is already high.

6.2. Public participation affects project acceptability via perceived procedural fairness

Next, we examined via which process(es) public participation affects project acceptability. If people find a project more acceptable when they think their interests and concerns are taken into account, public participation could increase project acceptability by enhancing perceived procedural fairness. We defined perceived procedural fairness as the extent to which the public evaluates the decision making as fair, open, and transparent and taking public interests into account. When people participate in decision making, they are more likely to think the decision-making process is fair (Cohen-Charash & Spector, 2001; Gross, 2007; McComas et al., 2008). Higher perceived procedural fairness, in turn, is positively associated with public acceptability of energy projects (Besley, 2010; Gross, 2007; Krütli et al., 2010; Rowlands, 2005; Siegrist et al., 2012; Walker & Baxter, 2017). That is, the more people perceive the decision making as fair, open, and transparent, the more acceptable they find the related energy project. This implies that public participation could increase project acceptability by enhancing perceived procedural fairness. The full mediation relationship has not yet been systematically tested.

We examined our model in three studies in Chapter 4. First, we examined if having any influence over decisions (e.g., partnership in the concerning study), compared to only being informed about the project, enhances perceived procedural fairness and in turn project acceptability, among a student sample who evaluated the acceptability of a hypothetical wind energy project that would be established in the area they live in. As expected, we found that people perceived the decision-making process to be fairer when they could take all decisions together with the responsible agent, versus when they would only be informed about the project by the responsible agent, and this in turn increased project acceptability.

Next, we examined if having influence over major rather than minor decisions enhances perceived procedural fairness and in turn project acceptability among a student sample who evaluated the acceptability of a hypothetical renewable energy project that would be established at their university. As expected, people perceived the decision-making process to be fairer when they could influence major rather than only minor decisions, and this in turn increased project acceptability. As such, we demonstrated for the first time that public participation can enhance project acceptability by increasing perceived procedural fairness. Accordingly, we found support for our reasoning that public participation enhances project acceptability because people more strongly believe their interests and concerns are taken into account, particularly when they can influence major decisions of a project.

Interestingly, we found that when controlling for perceived procedural fairness, having shared influence decreased project acceptability, compared to when the public was only informed about the project. Also, when controlling for perceived procedural fairness, being able to influence major instead of minor decisions led to lower project acceptability. This suggests that more public participation not only has positive impacts (e.g., making more likely that people's concerns are taken into account), but might also have negative impacts (e.g., citizens taking decisions may be seen as not having the right expertise, as shown in Chapter 5), which may decrease project acceptability.

To sum up, as expected, we found that more public participation increased perceived procedural fairness, which in turn enhanced project acceptability. This supports our reasoning that public participation enhances project acceptability because people more strongly believe that their interests and concerns are taken into account. However, at the same time, both more influence and having influence over major decisions could also instigate other processes, some of which may reduce project acceptability. For example, if citizens alone take decisions, people may think that there is not enough expertise among citizens and have doubts about the quality of the decisions taken by those citizens. Future research could study what other potential positive and negative impacts of public participation are, and how these impacts affect project acceptability.

6.3. Trust and project acceptability

We proposed that people may also believe that their interests and concerns are taken into account when they trust the agent responsible for the project. We expected that project acceptability is higher when people have high rather than low trust in the responsible agent, as people are likely to believe that trustworthy agents will take their interests and concerns into account. We defined trust as the extent to which the public evaluates the agents responsible for energy projects as reliable. We experimentally tested whether higher trust increased project acceptability in Chapter 2 among a general population sample who evaluated the acceptability of a hypothetical solar energy project that would be established in their neighbourhood. As expected, we found that higher trust in the responsible agent results in higher project acceptability (Chapter 2). We extend previous studies that typically studied the relationship between trust and project acceptability with correlational design (De Cremer & Tyler, 2007; Siegrist et al., 2012; Yang et al., 2016) by providing important convergent causal evidence: higher trust increases project acceptability.

We next expected that when trust is high, people may feel less need to participate in decision making. Specifically, if people trust the agent, they may think that their key interests and concerns will be taken into account, and thus there is no need to invest time and effort for themselves to participate. Hence, we expected that having either

high trust or influence over major decisions could enhance project acceptability as both increase the likelihood that people's concerns are addressed. To our best knowledge, no study so far has examined how project acceptability is affected by trust and public participation together. Yet, studying the combined effects of trust and public participation on project acceptability provides critical insights into whether high trust could “compensate” for the lack of participation, and vice versa. We studied the effects of both – trust in responsible agents and influence over major and minor decisions – on project acceptability in Chapter 2.

As expected, we found that higher trust in the responsible agent led to higher project acceptability, even when people could only influence minor decisions (Chapter 2). Similarly, having influence over major decisions led to higher project acceptability compared to having influence over minor decisions only, even when people had low trust in the responsible agent. Having both influence over major decisions and trusted agents did not have much added value in enhancing project acceptability in our studies. Not surprisingly, people found the project least acceptable when they could only influence minor decisions *and* when they had low trust in the responsible agent. So, people found the project more acceptable when they *either* had the opportunity to influence major decisions rather than only minor decisions, *or* when they had higher trust in the responsible agent who would plan and implement the project. The results suggest that letting people influence major decisions may not be the only route to enhance project acceptability. Having trusted agents to develop and manage the project can be another route to enhance project acceptability, as this also implies people's interests and concerns are taken into account. These findings suggest that influence over major decisions and trust serve the same purpose: they enhance the belief that people's interests and concerns are taken into account.

The next question is what makes an agent trustworthy? Research has identified two dimensions of trust are particularly relevant when people evaluate if the agent is trustworthy, namely competence-based trust (i.e., trust in knowledge and expertise of responsible agents) (Gordon, Brunson, & Shindler, 2014; Terwel, Harinck, Ellemers,

& Daamen, 2009) and integrity-based trust (i.e., trust in honesty and transparency of responsible agents) (Braun et al., 2018; Graham et al., 2009). Our findings in Chapter 4 supported our reasoning that people find the project more acceptable when the procedure is more fair and public interests are taken into account. These findings suggest that integrity-based trust may be particularly important for project acceptability, as it is about if the agent has good intentions to take people's interests and concerns into account. Yet, competence-based trust may also play a role in project acceptability as higher perceived expertise of the decision-making panel was associated with higher project acceptability. Hence, we expected that higher levels of both dimensions of trust would enhance project acceptability, but that integrity-based trust has a particularly strong effect on project acceptability. Arguably, while competence-based trust implies that the agent has the necessary knowledge and skills to design and develop the project, integrity-based trust could determine whether the agent will use its knowledge and skills to protect public interests and address people's concerns.

Importantly, competence-based trust and integrity-based trust have thus far been studied separately, leaving it unknown whether and which dimension of trust is more important for project acceptability. Moreover, the question remains how both dimensions of trust interact in influencing public acceptability of energy projects. Notably, would people accept a renewable energy project launched by an agent that is perceived as honest and concerned with public interests, even when the agent is regarded as having little experience and expertise in developing renewable energy projects? And would the public find a project acceptable when they believe responsible agents are knowledgeable, but not having high integrity? We set out to address these questions by studying the main effects, as well as the interaction effect, of competence- and integrity-based trust on project acceptability in Chapter 3, among a general population sample who evaluated a hypothetical wind energy project that would be established in the area they live in.

As expected, we found that people considered the project more acceptable when they thought the responsible agent who would develop the project is honest and cares

about public interests (i.e., high integrity-based trust), compared to when they thought the agent is dishonest and does not care about public interests (i.e., low integrity-based trust), irrespective of how knowledgeable people thought the agent was (i.e., competence-based trust). Higher competence-based trust, on the other hand, only increased project acceptability when integrity-based trust was low, but had no added impact on project acceptability when integrity-based trust was high (Chapter 3). These findings suggest that integrity-based trust has a more profound effect on project acceptability than competence-based trust: higher levels of integrity-based trust increase project acceptability irrespective of the level of competence-based trust. This implies that it may be particularly important to secure the agent is judged as having integrity, as this implies that the agents will use their knowledge to protect public interests and address public concerns.

Furthermore, trust in those taking the decisions could affect how much influence people prefer citizens to have in participatory decision making. Trust in those taking decisions may depend on the extent to which people think their values are similar to the responsible agent and/or other citizens (Siegrist et al., 2003). When one believes the responsible agent and/or other citizens do not share the same values as they do (e.g., perceive other people care less about the environment than they do), they may not prefer that only the responsible agent or only citizens take decisions, as this may increase the likelihood that the outcomes violate, rather than meet, one's own values. This could explain why some people do not prefer full citizen control over decision making, as shown in Chapter 5. Future research could study how trust in those taking decisions, particularly perceived value similarities between themselves and the responsible agent and or other citizens, influence when and how people want to participate in decision making about renewable energy projects.

To sum up, next to people having influence over major decisions, having trusted agents to take the decisions could also increase project acceptability. Our research is the first to show that public participation and trust could enhance project acceptability independently of each other. Both public participation and trust may affect project

acceptability by influencing the extent to which people believe their interests and concerns are taken into account. Moreover, we found that integrity-based trust enhanced project acceptability more than competence-based trust, as the former mostly refers to that people trust their interests are taken into account. This suggests that integrity-based trust may also affect project acceptability by influencing perceived procedural fairness, similar as we found for public participation (cf. De Cremer & Tyler, 2007); future research needs to test this possibility. Competence-based trust is particularly important for project acceptability when integrity-based trust is low. Importantly, either public participation or trust in agents responsible for renewable energy projects could be independent routes to enhance project acceptability.

6.4. Establishing the cause and the effect

So far, the relationships between public participation and trust, on the one hand, and project acceptability, on the other hand, have mostly been examined via qualitative and correlational studies (e.g., Reilly et al., 2016; Siegrist et al., 2012; Terwel et al., 2012; Yang et al., 2016). While providing important insights into the strength and direction of the relationships, these studies do not allow to tease apart the cause and the effect. We therefore conducted experimental studies where we systematically varied how much influence people would have in the decision making, which decisions people could influence, and levels of (competence- and integrity-based) trust, in different studies, in order to test their effects on project acceptability.

Our studies demonstrated that changes in the level of public participation and trust indeed caused changes in project acceptability (Chapter 2, 3, 4, 5). This suggests that project acceptability will be higher *because* people can influence major rather than only minor decisions of the project. Similarly, project acceptability is higher *because* people have higher trust in the responsible agent, particularly when they more strongly believe the agent to be honest and reliable.

Yet, experimental designs have some limitations. Notably, to ensure experimental control, we presented respondents with hypothetical projects, responsible agents, and decision-making procedures, which may limit the external validity of our findings.

Future studies are needed to test whether the findings would be replicated when studying real-life projects where people are actually involved (or not) in decision making, including correlational studies, longitudinal studies, and field (quasi) experiments, in order to establish the external validity of our findings.

6.5. Generalizability of findings

Most studies on the relationships between public participation, trust and project acceptability have been conducted in Western European countries and North America (e.g., Breukers & Wolsink, 2007a; Krohn & Damborg, 1999). It is important to understand whether similar factors and processes influence project acceptability in non-Western countries, such as East-Asian countries. We tested our reasoning in a Western European country, the Netherlands, and in an East-Asian country, China, in order to assess the extent to which the findings are robust and generalizable across different countries and cultures. In general, we found very similar patterns of results across all studies in both countries, which suggests that public participation and trust may have similar effects on project acceptability in both countries (Chapter 2, 3, 5). Given the large cultural and geographical differences between the two countries, the results suggest that our findings are likely to be generalizable across different countries and cultures. This implies that similar factors could be targeted in international policy making for global sustainable energy transitions. Yet, more studies are needed in other countries and cultures to draw firmer conclusion about the generalizability of the findings.

6.6. Practical implication

Our findings have important practical implications. First, we found that people find renewable energy projects more acceptable when they can influence major decisions about those projects rather than only minor decisions (Chapter 2), while having full influence as such did not increase acceptability of the decision-making process and resulting project compared to shared influence (Chapter 5). Hence, if practitioners are keen on involving the public in decision making to enhance the acceptability of projects, it is important to give people the opportunity to influence major rather than

only minor decisions, as the former makes it more likely that people's main concerns are taken into account. For example, we found that being able to influence decisions such as the location of a wind park led to higher project acceptability than being able to influence only minor decisions such as the colour of wind turbines. It seems that giving full influence to people may not be very necessary to enhance project acceptability; letting people decide together about the major decisions of the project and taking public input into account might already lead to higher project acceptability. Even when citizens were provided with the opportunity to consult experts, full influence (e.g., citizen control) did not lead to higher acceptability of the decision-making process and the project compared to shared influence (e.g., partnership).

Second, we found that higher trust in responsible agents enhances project acceptability, as trustworthy agents are more likely to take public interests and concerns into account (Chapter 2). This suggests that public participation and trust play a similar role: both imply people's concerns are addressed and thus could enhance project acceptability. Indeed, we found that having either high trust in the responsible agent or giving people influence over major decisions led to higher project acceptability (Chapter 2). Our findings suggest that practitioners may not necessarily have to achieve both – giving the public influence over major decisions *and* securing high trust in responsible agents – for securing higher project acceptability, as having one of them already may increase the likelihood that people feel their concerns are addressed. We further found that particularly integrity-based trust was important to secure project acceptability, while trust in the competence of the agent is only important when integrity-based trust was low (Chapter 3). Interestingly, currently, energy companies commonly communicate their competence in the energy domain (e.g., ExxonMobil, n.d.; Shell Global, n.d.). Our results suggest that strengthening and showing their commitment to care about and consider public interests, namely their integrity, might be more important to increase project acceptability.

6.7. Conclusions

In conclusion, we proposed that project acceptability is higher if people feel their concerns are taken into account in decision making on energy projects. We found evidence for this reasoning in different ways. First, people may think their interests are taken into account when they can participate in decision making, and we indeed found that public participation led to higher project acceptability. Project acceptability was particularly high when people could influence major rather than only minor decisions; the former increase the likelihood that people's major concerns are addressed. Second, we found that public participation enhanced project acceptability by enhancing perceived procedural fairness, which reflects the extent to which people think the decision-making process is fair and public concerns are taken into account. Yet, public participation may not always be a silver bullet to increase acceptability of the decision-making process and resulting project, as full influence (e.g., citizen control) did not enhance acceptability of the decision-making process and resulting project compared to shared influence, even when expert support was provided. Third, we found that higher trust in the responsible agent also enhanced project acceptability. Particularly high integrity-based trust enhanced project acceptability, providing further support that project acceptability is higher when people think public concerns are taken into account. We found that high competence-based trust merely enhanced project acceptability when integrity-based trust was low. All in all, we showed that both public participation and trust can enhance the belief that people's interests and concerns are taken into account, thereby enhancing public acceptability of renewable energy projects which is critical to accelerate a sustainable energy transition.

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Nederlandstalige Samenvatting

De transitie van fossiele energiebronnen (bijvoorbeeld steenkool, olie en gas) naar hernieuwbare energiebronnen (bijvoorbeeld zonne- en windenergie) kan in belangrijke mate bijdragen aan de vermindering van de uitstoot van broeikasgassen en daardoor aan de beperking van de klimaatverandering en de negatieve gevolgen daarvan. Om de overstap van fossiele naar hernieuwbare energiebronnen te kunnen maken, worden verschillende hernieuwbare energieprojecten ontwikkeld. De succesvolle implementatie van zulke projecten hangt echter af van de mate waarin mensen deze projecten acceptabel vinden, omdat beleidsmakers niet geneigd zijn om projecten door te voeren die niet aanvaardbaar zijn voor het publiek. Daarom is het belangrijk om inzicht te krijgen in welke factoren van invloed zijn op de mate waarin mensen hernieuwbare energieprojecten acceptabel vinden.

In dit proefschrift stellen wij dat de maatschappelijke acceptatie van hernieuwbare energieprojecten afhangt van de mate waarin mensen kunnen participeren in de besluitvorming. We veronderstellen dat mensen hernieuwbare energieprojecten meer acceptabel vinden wanneer ze denken dat er beter rekening wordt gehouden met de belangen en zorgen van mensen, wat waarschijnlijk meer het geval is wanneer mensen kunnen participeren in de besluitvorming. We noemen de deelname van het publiek aan de besluitvorming over energieprojecten “publieksparticipatie”.

We hebben eerst onderzocht wanneer publieksparticipatie de acceptatie van hernieuwbare energieprojecten kan vergroten. Wij stelden voor dat niet alleen de mate waarin het publiek inspraak heeft, maar ook welk type beslissingen die het publiek kan beïnvloeden invloed hebben op de acceptatie van hernieuwbare energieprojecten. Wij veronderstelden dat inspraak vooral leidt tot meer acceptatie wanneer men invloed kan uitoefenen op belangrijke in plaats van minder belangrijke beslissingen, aangezien dat in het eerste geval de kans groter is dat er rekening wordt gehouden met de belangrijkste zorgen van mensen. Zoals verwacht vond men hernieuwbare energieprojecten meer acceptabel als men dacht invloed te kunnen uitoefenen op belangrijke beslissingen (bijvoorbeeld de locatie van het windpark) in plaats van minder belangrijke beslissingen (bijvoorbeeld de kleur van windturbines). Echter,

volledige invloed hebben op beslissingen leidde niet tot hogere acceptatie van hernieuwbare energieprojecten dan weinig (bijvoorbeeld raadpleging van het publiek) en gedeelde (waarbij verantwoordelijke partijen en het publiek samen beslissingen nemen) invloed. Dit suggereert dat meer invloed op de besluitvorming niet alleen positieve effecten (bijvoorbeeld meer kans dat rekening wordt gehouden met de zorgen van mensen) maar ook negatieve effecten heeft op de acceptatie van het project (bijvoorbeeld omdat minder goede beslissingen worden genomen omdat het publiek niet voldoende expertise heeft). Toekomstig onderzoek zou kunnen bestuderen welke andere mogelijke positieve en negatieve effecten van publieke participatie er zijn, en hoe deze effecten de acceptatie van hernieuwbare energieprojecten beïnvloeden.

Vervolgens onderzochten we via welk(e) proces(sen) publieksparticipatie de acceptatie van hernieuwbare energieprojecten beïnvloedt. Onze hypothese was dat inspraak ertoe leidt dat mensen vinden dat er meer rechtvaardige procedures worden gevolgd, wat vervolgens de acceptatie verhoogt. Het betrekken van mensen bij besluitvorming vergroot de kans dat het besluitvormingsproces transparanter en eerlijker is en dat er meer rekening wordt gehouden met de belangen van het publiek. Dit kan de waargenomen procedurele rechtvaardigheid verhogen, waardoor de hernieuwbare energieprojecten als meer acceptabel kunnen worden gevonden. Wij vonden inderdaad dat publieke participatie leidt tot meer acceptatie van hernieuwbare energieprojecten door toename van de procedurele rechtvaardigheid.

Daarnaast verwachtten we dat hernieuwbare energieprojecten meer acceptabel worden gevonden als men meer vertrouwen heeft in de partijen die de beslissingen nemen. Als men meer vertrouwen heeft in verantwoordelijke partijen, is de kans groter dat deze partijen rekening houden met de belangen en zorgen van mensen, wat kan leiden tot meer acceptatie. Daarnaast veronderstelden we dat wanneer mensen meer vertrouwen hebben in verantwoordelijke partijen, ze het minder nodig vinden om zelf deel te nemen aan de besluitvorming omdat ze erop vertrouwen dat er al rekening wordt gehouden met hun belangen en zorgen. We vonden inderdaad dat men hernieuwbare

energieprojecten meer acceptabel vond naarmate men meer vertrouwen had in de verantwoordelijke partijen, ook al mensen weinig invloed hadden op de besluitvorming.

We veronderstelden dat twee dimensies van vertrouwen invloed kunnen hebben op de acceptatie van hernieuwbare energieprojecten: vertrouwen in de integriteit en vertrouwen in de competentie van de verantwoordelijke partijen. We veronderstelden dat vertrouwen in de integriteit van de verantwoordelijke partijen meer invloed heeft op de acceptatie van hernieuwbare energieprojecten dan vertrouwen in hun competentie, omdat vooral vertrouwen in de integriteit van partijen het idee geeft dat er rekening wordt gehouden met de belangen en zorgen van mensen. Daarnaast verwachtten wij dat vertrouwen in de competentie van verantwoordelijke partijen een rol kan spelen in publieke acceptatie, omdat een gebrek aan competentie kan leiden tot verkeerde beslissingen.

We verwachtten ook een interactie tussen beide dimensies van vertrouwen bij het beïnvloeden van acceptatie. Vertrouwen in de competentie van verantwoordelijke partijen betekenen dat deze partijen voldoende kennis en vaardigheden hebben om het project te ontwerpen en te ontwikkelen. Maar men moet ook kunnen vertrouwen op de integriteit van die partijen, omdat dit de garantie geeft dat deze partijen hun kennis en vaardigheden zullen gebruiken om de belangen van mensen te beschermen en goed om te gaan met de zorgen van mensen. Zoals verwacht, vinden mensen hernieuwbare energieprojecten meer acceptabel wanneer ze in sterkere mate verwachten dat de partijen die het project ontwikkelen en implementeren eerlijk zijn en publieke belangen in overweging nemen (d.w.z. hoog vertrouwen in de integriteit van de verantwoordelijke partijen), ongeacht hoe deskundig mensen de verantwoordelijke partijen vinden (d.w.z. vertrouwen in de competentie van de verantwoordelijke partijen). Meer vertrouwen in de competentie van verantwoordelijke partijen leidde alleen tot meer acceptatie wanneer men weinig vertrouwen had in de integriteit van de verantwoordelijke partijen, maar had geen invloed op de publieke acceptatie wanneer men veel vertrouwen had in de integriteit van verantwoordelijke partijen. Deze

bevindingen laten zien dat het vertrouwen in de integriteit van verantwoordelijke partijen meer invloed heeft op de acceptatie van hernieuwbare energieprojecten dan vertrouwen in de competentie van verantwoordelijke partijen.

Ons onderzoek levert een belangrijke bijdrage aan de kennis over publieksparticipatie bij besluitvorming over energietransitie en publieke acceptatie van hernieuwbare energieprojecten. Tot nu toe zijn de relaties tussen publieke participatie en vertrouwen enerzijds en publieke acceptatie van hernieuwbare energieprojecten anderzijds meestal onderzocht via kwalitatieve en correlatieve studies. Wij hebben experimentele studies uitgevoerd waarin we systematisch de mate waarin mensen invloed hadden over verschillende typen beslissingen, en de mate van competentie en integriteit van verantwoordelijke partijen varieerden, en onderzochten welke invloed dit had op de acceptatie van projecten. Door gebruik te maken van een experimentele opzet konden we vaststellen wat oorzaak en gevolg is. Onze studies toonden aan dat veranderingen in de mate van publieke participatie en vertrouwen inderdaad leiden tot veranderingen in acceptatie van hernieuwbare energieprojecten.

De meeste studies naar de relaties tussen publieke participatie, vertrouwen en acceptatie van hernieuwbare energieprojecten zijn uitgevoerd in West-Europese landen en Noord-Amerika. Wij hebben onze redenering getoetst in een West-Europees land, Nederland, en in een Oost-Aziatisch land, China, om na te gaan in welke mate de bevindingen robuust zijn en generaliseerbaar zijn naar verschillende landen en culturen. In het algemeen vonden we vergelijkbare patronen van resultaten in alle studies in beide landen, wat suggereert dat publieke participatie en vertrouwen vergelijkbare effecten hebben op de acceptatie van hernieuwbare energieprojecten in beide landen.

Onze bevindingen hebben belangrijke praktische implicaties. Ten eerste, om draagvlak voor hernieuwbare energieprojecten te vergroten door het publiek inspraak te geven in de besluitvorming, is het belangrijk dat mensen de kans krijgen om invloed uit te oefenen op belangrijke in plaats van alleen op minder belangrijke beslissingen. Verder is het belangrijker dat men enige invloed kan uitoefenen op de besluitvorming in

plaats van geen invloed, maar veel invloed leidt niet noodzakelijkerwijs tot meer acceptatie dan weinig invloed. Mensen raadplegen over de belangrijke beslissingen over het project en rekening houden met de belangen en zorgen van mensen kan leiden tot een hogere acceptatie van duurzaam energieprojecten. Een andere manier om mensen het gevoel te geven dat er rekening wordt gehouden met de zorgen en belangen van mensen, is door te zorgen dat de verantwoordelijke partijen betrouwbaar worden gevonden. Als de verantwoordelijke partijen betrouwbaar worden gevonden, heeft publieke participatie minder invloed op acceptatie van energieprojecten. Een van de twee – of mensen betrekken bij besluitvorming of zorgen dat verantwoordelijke partijen betrouwbaar zijn – lijkt al genoeg om mensen het gevoel te geven dat er rekening wordt gehouden met hun zorgen en acceptatie te verhogen. In de praktijk communiceren partijen zoals energiebedrijven vaak vooral over hun competentie op het gebied van energieprojecten. Onze resultaten suggereren dat het versterken en tonen van de integriteit van verantwoordelijke partijen, namelijk dat ze betrokken zijn en rekening houden met publieke belangen, belangrijker kan zijn om de acceptatie van hernieuwbare energieprojecten te verhogen dan het vergroten van op competentie gebaseerd vertrouwen.

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Curriculum Vitae

Lu Liu (1991) completed her Bachelor and Master in China Agricultural University, during which she was involved in various research projects that cover rural planning, poverty alleviation, marginalized groups empowerment, and environment protection. These research and field survey experiences made her discover her special interests in studying the relationship between people and the environment from an individual perspective. In 2016, she started a PhD program in the Environmental Psychology Department at the University of Groningen, the Netherlands, under the supervision of Prof Linda Steg, Dr Goda Perlaviciute, and Dr Thijs Bouman. Her research focuses on public participation in decision making about sustainable energy transition, trust in responsible agents, perceived procedural fairness, public acceptability of renewable energy projects. Her research experiences in both China and the Netherlands enable her to conduct cross-cultural comparison studies. She presented her research at multiple international conferences and workshops. In addition, she published all the chapters in this PhD thesis during her PhD study. She also taught academic writing courses and gave guest lectures during the PhD. Lu now continues doing research at the Environmental Psychology Department in the University of Groningen.

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