

**Power to the People: Democratic Pathways to Climate Policy Acceptance**

Paula Luise Seiffert

S4678494

Department of Psychology, University of Groningen

PSB3E-BT15: Bachelor Thesis

Group number 29

Supervisor: Bas Ankoné

Second evaluator: Cristhian Martínez Moreno

In collaboration with: Yasmine Veuger, Emma Syring, Chris Csölle, and Leon Lепенies

July 08, 2024

*A thesis is an aptitude test for students. The approval of the thesis is proof that the student has sufficient research and reporting skills to graduate, but does not guarantee the quality of the research and the results of the research as such, and the thesis is therefore not necessarily suitable to be used as an academic source to refer to. If you would like to know more about the research discussed in this thesis and any publications based on it, to which you could refer, please contact the supervisor mentioned*

### **Abstract**

The unprecedented challenge of climate change necessitates climate policies that can rely on public support. One suggested way to garner such support is by means of public participation. This study therefore examines the role of perceived control, deliberation, and procedural fairness in the relationship between different public participation procedures and policy acceptance of deep geothermal energy. We conducted an online vignette study using a five-condition between-subjects design with student participants, each condition varying in the type of decision-making process, resulting in the decision to implement geothermal heating at their university faculty. Analysis of variance showed that participants perceived more control in a referendum compared to a top-down procedure and a citizens' assembly, but seemed to perceive more deliberation in a citizens' assembly compared to the other procedures. Furthermore, we examined whether perceived control and perceived deliberation predict perceived procedural fairness, which in turn mediates their relationship with policy acceptance. Structural equation modeling indicated that perceived control is fully mediated by perceived procedural fairness, while perceived deliberation seems only partially mediated, with both influencing policy acceptance. We conclude that in order to increase acceptance of climate policies, public participation procedures should combine the sense of control felt in a referendum with the perceived deliberation found in citizens' assemblies.

*Keywords:* climate change, public participation, control, deliberation, procedural fairness

## **Power to the People: Democratic Pathways to Climate Policy Acceptance**

Climate change is pervasive and omnipresent, affecting various facets of our lives with far-reaching effects that are already evident today and expected to intensify in the future (IPCC, 2023). Climate mitigation and adaptation are imperative to attenuate, reverse, and adjust to, the negative consequences of a shifting climate (Lackner et al., 2022). To successfully do so, climate policies that aim to tackle these challenges are urgently needed (Gugler et al., 2021). Swift and effective implementation of such policies significantly hinges on the level of *public acceptance* - meaning the willingness of the public to support or comply with the implementation of the policy – they receive. Indeed, absence of public support for such policies frequently leads to the cancelation of (proposals for) environmental projects, which is particularly noticeable in democratic societies (Shaw et al., 2015; Nilsson, 2016).

One, political theoretically suggested, way to increase public acceptance in such societies in order to facilitate the swift transformation that is needed, concerns involving the public in the policy-making process in one way or another; often concisely referred to as *public participation* (Perlaviciute, 2020; Suphattanakul, 2018). Some studies suggest that, compared to standard top-down decision-making in which governmental officials draft and implement policies without additionally consulting citizens, public participation in climate policymaking can indeed influence public acceptability in positive ways, though the specific mechanisms via which it would do so remain scarcely studied (Carattini et al., 2019; Jacquet, 2014; Liu et al., 2020; Wolsink, 2007). This raises the question: how do participatory decision-making processes affect public acceptance of climate policies?

### **Factors influencing public acceptability**

#### ***Perceived Procedural Fairness***

Different decision-making procedures can sometimes result in higher acceptance of the same decision (Carpini et al., 2004; Porumbescu & Grimmelikhuijsen, 2017). One

mechanism that might influence this increased acceptance is *perceived procedural fairness*, here defined as the degree to which individuals perceive the decision-making process as fair, just, legitimate, and upholding ethical and moral standards (Liu et al, 2020). It has been shown that higher perceived procedural fairness enhanced project acceptability of energy projects in public decision-making (Gross, 2007; Liu et al., 2020). Essentially, when individuals believe the process is fair, they are more likely to accept the outcomes, even if they might not agree with the decision on a content level (Tyler, 2000). Perceived procedural fairness might explain the often higher acceptance of policies in public participation compared to top-down decision-making, as public participation procedures are generally seen as more legitimate and adhering to ethical principles and moral standards (Herian et al., 2012).

However, in public decision-making, many different participatory procedures exist, where the possibility seems remote that these procedures are exactly alike in their perceived fairness levels. Notably, previous research merely compares participatory procedures with standard top-down decision-making. What kind of public participation is perceived to be fairest, and would hence be most effective in increasing policy, remains entirely understudied. This is particularly relevant as related to two established predictors of perceived procedural fairness and subsequent policy acceptance - namely perceived control and perceived deliberation, which are likely to differ across the widely different types of procedural designs that can be employed when involving the public in climate policymaking (Lind et al., 1990; Šerek et al., 2021).

### ***Perceived control***

*Perceived control*, here defined as an individual's subjective belief or sense of influence within a decision-making process, seems to have influence on perceived procedural fairness. Liu et al.'s (2020) study indicates that the greater the influence individuals have, the

higher they rate perceived procedural fairness. This suggests that an increased sense of control leads people to view the procedure as fairer. Furthermore, perceived control can also be linked to the acceptability of climate policies. A study by Firestone et al. (2017) indicates that the perceived ability to influence decisions, as opposed to merely receiving information, on climate related projects, raised the acceptability of those projects. In another case study focusing on the acceptance of a marine renewable energy project in Ireland, involved participants were more willing to accept the project when they were able to influence the decision-making process, compared to when traditional methods like top-down decision-making were used (Reilly et al., 2016). Contrastingly, however, there have also been findings that suggest that more decision-making power can actually lead to lower acceptability of the respective decision (Perlaviciute et al., 2020). These contrasting findings indicate that it is crucial to look at specific procedures since studies like Firestones et al.'s (2017) conclude that more control leads to more acceptance based on a comparison between present vs. absent control, whereas Perlaviciute et al. (2020) looks at control in a more nuanced way by looking at different levels of control. Those nuanced levels of control can be achieved through different decision-making procedures. For instance, a referendum offers direct control to participants by allowing them to vote on specific issues. In contrast, a citizens' assembly, comprising randomly selected citizens debating and deciding on policy matters, gives a small group significant control. Therefore, minor procedural changes might result in variations in subsequent levels of acceptability. Overall, more control appears to be positively related to acceptance (Aitken et al., 2016; Shaw et al., 2015). Nevertheless, changes in procedural design may change other variables as well, making it important to examine different procedures.

### ***Perceived deliberation***

As mentioned above *perceived deliberation*, here defined as the perception that decision-makers actively consider all available information and carefully assess and contemplate different perspectives, can be linked to perceived procedural fairness as well. When decision-makers are seen as deliberate, carefully evaluating different perspectives, it tends to enhance the trust and confidence of those affected by the decision (Colquitt et al., 2001; Thibaut & Walker, 1975). This perception of thorough deliberation seems to signal that a process is just and equitable, thereby it might enhance overall procedural fairness. If this holds true, greater perceived deliberation would lead to higher perceived procedural fairness, which consequently might lead to higher policy acceptance, particularly since deliberation is another factor that potentially impacts policy acceptance during public decision-making. Furthermore, deliberation itself is often seen as an essential tool in public decision-making, especially since deliberating on a topic has been suggested to lead to more informed decision-making (Perlaviciute, 2021; Sanders, 2012). Research indicates that people value the careful consideration of diverse viewpoints before making decisions and are hence more inclined to accept decisions that are carefully thought through by the respective decision-makers (Garvin et al., 2001). However, research has yet to explore how people perceive the deliberation of decision-makers across different participatory procedures and the subsequent impact on policy acceptance.

### **Participatory Procedures**

In public decision-making, different types of procedural designs exist, and it seems likely that these procedures score differently on these predictors of perceived procedural fairness and subsequent policy acceptance. Therefore, this study analyses these expected differences by examining five decision-making procedures, which serve as our five experimental conditions. The most common form of public participation is a referendum, where every citizen gets a direct vote to either accept or reject a specific policy decision.

Nevertheless, an increasingly popular form of public participation is a citizens' assembly, a special form of participatory democracy comprising a demographically representative group of 50 to 200 individuals. Advised by experts, this group comes together to learn about, deliberate on, and make recommendations concerning specific issues (Fishkin, 2000).

In this study, we focus on the perceived control and deliberation of decision-makers, which in the case of referendums are the citizens, and in the case of citizens' assemblies are the assembly members. It is argued that citizen's assemblies involve significant control because citizens who do participate have full control, as they have influence throughout the entire process whereas others contend that referenda involve more control because everyone is allowed to participate (Duvic-Paoli, 2022; Wells et al., 2021). It should be noted that in a citizens' assembly, control is limited to a small group of participants, which contrasts with a referendum, where everyone can participate. However, in a referendum, the only decision participants can make is whether to implement a proposal that has already been developed by others. Yet, having the chance to directly vote yourself could potentially enhance your sense of control. Consequently, perceived control might be high in a referendum setting, where each voter directly influences the outcome, albeit to a minimal extent. It remains unclear with which of these perspectives public perceptions align.

Furthermore, deliberation is seen as a key component of a citizens' assembly, as it allows members ample time to reflect and critically weigh new information in dialogue with experts and fellow participants (Reuchamps et al., 2023). According to Fishkin (2000), deliberation enhances problem-solving by actively engaging and educating participants, which in turn presumably leads to more thoroughly considered decision-making. Fishkin (2019) additionally states that the assembly's diverse composition combined with additional material and expert advice will enrich the deliberative process with a variety of diverse perspectives. However, it remains unclear whether people's perceptions correspond with this



normative reasoning and, furthermore, whether these perceptions affect perceived procedural fairness and consequently contribute to policy acceptance. Contrastingly, some argue referenda exhibit a deliberative deficit (Witting et al. 2023). According to Tierney (2013), this deficit emerges because referenda often do not provide the structured opportunities for thorough reflection and discussion that are necessary for voters to make well-informed decisions. In a referendum, voters are usually presented with a straightforward yes or no choice on complex issues without a debate or detailed analysis that might occur in a citizens' assembly. Again, this is normative reasoning, and there is no literature on how people perceive this.

If indeed control and deliberation are important predictors of perceived procedural fairness and acceptance, and both citizen assemblies and referenda are high in one and low in the other, then one may think of ways in which both of these can be harnessed in a single, more or less combined, procedural design. A procedure that attempts to combine elements of both a referendum and a citizens' assembly, maybe effectively harnessing the strengths of each, is the citizens' initiative review. This process builds upon a standard referendum by incorporating a preliminary phase where a group of randomly selected citizens discusses the policy beforehand. The group then creates a pamphlet that summarizes the advantages and disadvantages of the policy, which is shared with the public, who then vote on it as they would in a standard referendum (Knobloch et al., 2019). This procedure is not widely established yet, and therefore, public perceptions of it are largely unknown.

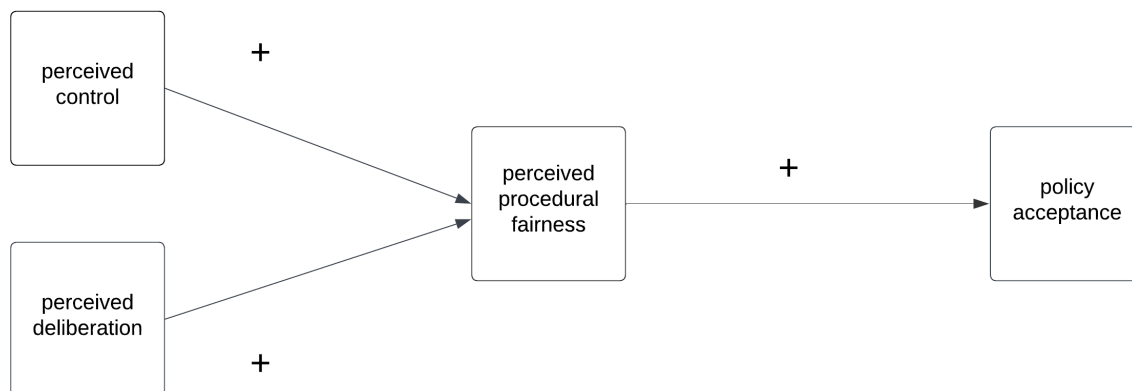
Furthermore, if deliberation is indeed important, it raises the question of whether it matters who is writing the pamphlet. Consequently, we created another condition in which experts, rather than citizens, write the pamphlet. Again, there is currently no literature on public perceptions regarding these procedures, but LeDuc (2015) suggests that the availability of information prompts people to deliberate more. Thus, in the above-mentioned procedures

where participants receive an additional pamphlet and subsequently vote on a policy matter, individuals might perceive higher deliberation, particularly in the expert-authored pamphlet scenario, as they may believe that receiving information from experts fosters more thoughtful and thorough consideration by the decision-makers (Cerovac, 2016). Regarding the level of individual perceived control between the standard referendum and the two referenda with the extra pamphlet, there are presumably no differences, as participants are engaging in the same yes or no voting process across all three scenarios. This uniformity in the decision-making process likely leads to a consistent perception of control among the participants, as their ability to influence the outcome is equally restricted to casting a vote in each condition.

Hence, we expect that perceived control of the respective decision-makers is higher in a standard referendum compared to a top-down procedure and a citizens' assembly (H1). Additionally, we hypothesized that perceived deliberation of the decision-makers is higher in a citizens' assembly compared to a top-down procedure and a standard referendum. However, when comparing the three differing referenda conditions, we expect perceived deliberation of the decision-makers to be higher when voters receive a pamphlet created by experts compared to the citizens' initiative review where the pamphlet is written by citizens or a normal referendum (H2). Finally, we hypothesize that perceived control and perceived deliberation of the decision-makers positively predict perceived procedural fairness, which consequently fully mediates the positive relationship with policy acceptance (H3) (see Figure 1).

## **Figure 1**

### *Hypothesis three*



*Note. The table visualizes how perceived control and perceived deliberation might positively predict perceived fairness which consequently positively predicts policy acceptance.*

## Method Section

### Participants

An a priori power analysis, using G\*power by Düsseldorf University, showed a minimum required sample size of 304 in order to be able to detect a medium effect size with  $B .8$  at  $A .05$ . To account for attrition and exclusion of participants, we set our intended number of responses to 350, which was not attained due to unforeseen complications which led to an actual power for the subsequent analysis of  $.4$ . Out of 128 responses, 42 were excluded for various reasons, including not providing consent, failing the attention check, not completing the study, or completing in under three minutes. This resulted in a final sample size of  $N = 86$ . The convenience sample partially consisted of 50 first-year psychology students at the University of Groningen who are required to participate in psychological studies. In return for their participation, these students gained 0.7 out of 38 credits necessary for passing this requirement. The other 36 participants concerned other students at the same faculty, who were invited to participate by the researchers using snowball sampling in their personal and professional circles.

Of the participants,  $N = 21$  (24.4%) were male,  $N = 61$  (70.9%) were female, and  $N = 4$  (4.7%) reported another gender identity. The mean age among the participants was  $M =$

21.128 ( $SD = 2.752$ ). The distribution of participants across the five conditions was as follows: top-down condition: 17; standard referendum: 16; referendum with expert pamphlet 16; citizens' initiative review: 18; and citizens' assembly: 19. On average participants needed 25.3 minutes to complete the study.

### **Study Design**

We conducted an online vignette study in Qualtrics using a five-condition between-subjects design, differing in type of decision-making procedure (top-down, standard referendum, referendum with expert pamphlet, citizens' initiative review, citizens' assembly) (see Table 1), culminating in the decision to implement geothermal heating<sup>1</sup> at the student's own university faculty.

Participants were asked to give informed consent and provide their demographics as well as some background information such as personal values and familiarity with energy technologies (see Appendix B for full overview of measured items, but not included in the present analysis). Next, they were randomly allocated to one of the five conditions. In the beginning, participants were instructed to "*imagine that, in order to combat climate change, the Behavioral and Social Science (BSS) faculty wants to implement a policy to reduce its carbon footprint*". Next, they were presented with a description of one the five procedures, which were kept the same as much as practically possible varying across only those factors that are part of the current study focus (see Table 1; see Appendix A for full vignettes). Depending on the condition, participants received details about the policy-making process, including who within the faculty would draft the policy and who would be involved in making the subsequent decision. To ensure the scenarios were realistic and relatable for the participants, we made slight adaptations to the original procedures to better fit the specific

---

<sup>1</sup> We selected geothermal heating as our focus because it is presumably unfamiliar to most people, likely minimizing pre-existing strong opinions and thereby reducing variance attributable to prior biases.

context of this study. In the present study, the procedures are represented as follows: The top-down condition involves the faculty board making the decision. The standard referendum has students voting on the policy. The referendum with an expert pamphlet includes students voting after receiving an expert-written voter pamphlet. The citizens' initiative review features again students voting after receiving a pamphlet written by a representative student panel. Lastly, the citizens' assembly consists of a randomly selected group of students, who vote on the matter. After having read the first part of the scenario, about the procedure only, participants were asked to fill in a questionnaire about perceptions of the procedure, which included, amongst others, perceived control, perceived deliberation and perceived procedural fairness (see Appendix B for full overview of items measured, but not included in the present analyses). Afterwards, they were presented with the second part of the scenario, which elaborated upon the decision of the procedure mainly the implementation of geothermal energy at the faculty, after which they were asked to answer questions regarding their perceptions about the outcome, including, amongst others policy acceptance (see Appendix B for full overview of items measured, but not part of the scope of the present study).

**Table 1**

*Description of conditions*

| Condition                             | Policy drafters | Decision makers (policy implementation) | Deliberation potential upon implementation                                           |
|---------------------------------------|-----------------|-----------------------------------------|--------------------------------------------------------------------------------------|
| Top-down procedure                    | Faculty board   | Faculty Board                           | Deliberation by board members                                                        |
| Standard referendum                   | Faculty board   | All BSS Students                        | Deliberation by voting students                                                      |
| Referendum with expert voter pamphlet | Faculty board   | All BSS students                        | To foster deliberation by voting students, they receive a voter pamphlet summarizing |

|                             |                                                                                                     |                  |                                                                                                                                                                                                                      |
|-----------------------------|-----------------------------------------------------------------------------------------------------|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Citizens' initiative review | Faculty board                                                                                       | All BSS students | policy pros and cons made by an expert review panel<br>To foster deliberation by voting students, they receive a voter pamphlet summarizing policy pros and cons made by a student review panel supported by experts |
| Student assembly            | Student assembly members who are representative students, randomly selected from the entire faculty | Student assembly | Deliberation of student assembly members                                                                                                                                                                             |

---

*Note.* The full vignettes can be found in appendix A.

## Measures

### *Perceived control*

This variable was measured using a 7-point Likert item (1 = *completely disagree*, 7 = *completely agree*), on which participants indicated the extent to which they agreed with the following statement: “*I would be able to affect the decision that is made*” ( $M = 3.81$ ,  $SD = 1.393$ ).

### *Perceived deliberation*

This variable was measured with two 7-point Likert scale items (1 = *completely disagree*, 7 = *completely agree*; combined  $\alpha = .829$ ). Participants were asked to what extent they agree that decision-makers “*carefully weigh and balance different pros and cons of different policy options*”, and “*carefully reflect on different environmental policies from different angles*”. We computed the mean score on these two items, reflecting perceived deliberation ( $M = 4.913$ ,  $SD = .933$ ).

### ***Perceived procedural fairness***

This variable was measured with four 7-point Likert scale items (1 = *completely disagree*, 7 = *completely agree*;  $\alpha = .853$ ). Participants were asked to what extent they agree that this way of decision-making “*is fair*”, “*is just*”, “*is legitimate*”, and “*upholds ethical and moral standards*”. We computed the mean score on these four items, reflecting perceived procedural fairness ( $M = 5.223$ ,  $SD = .939$ ).

### ***Policy acceptance***

This variable was measured using a single 7-point Likert scale item, ranging from 1 (*very unacceptable*) to 7 (*very acceptable*), on which participants answered to the question. “*Considering the scenario you have read, how un/acceptable would you find implementing deep geothermal heating at the faculty?*” ( $M = 5.15$ ,  $SD = 1.342$ ).

### ***Attention Check***

The attention check is constituted by a seven-point Likert scale ranging from completely agree (1) *over neither disagree nor agree* (4) to completely agree (7). The participant is asked to select completely agree and fails if they do not.

## **Results**

To test our hypotheses, we conducted several analyses using the statistical software SPSS (Version 28.0) and Amos (Version 27.0).

For all analyses of variance (ANOVA) carried out (see below), we conducted a series of assumption checks to ensure that the requirements for ANOVAs were met. Our study design ensured independent random samples. Q-Q plots of the residuals for the variables used in this analysis appeared to approximate normality and deviations and scatterplots used to assess linearity and homoscedasticity revealed no deviations from these assumptions. Despite significant Shapiro-Wilk tests, indicating deviations from normality across groups, the sufficiently large sample size justifies proceeding with the analysis (Uttley, 2019). To test our

last hypothesis, we conducted structural equation modeling (SEM). To be able to run this analysis, we ruled out multicollinearity by examining the variance inflation factor, which was 1.002 - an acceptable value according to O'Brien (2007). For the following analyses, we used a significance level of .05.

### **Hypothesis 1: Perceived Control**

We expected that people will perceive the decision-makers as having more control in a standard referendum compared to a top-down procedure or a citizens' assembly. This was tested using a one-way ANOVA to compare the levels of perceived control among the conditions. The ANOVA results revealed significant differences between the procedures ( $F(2,49) = 4.795, p = .013, \eta^2 = .164$ ). Post hoc comparisons using the Bonferroni correction indicated that the mean score for perceived control was significantly higher ( $p = .013$ ) in the standard referendum condition ( $M = 4.19, SD = 1.471$ ) compared to the top-down procedure ( $M = 2.82, SD = 1.074$ ). The mean score for the citizens' assembly ( $M = 3.79, SD = 1.36$ ) was higher than that of the top-down condition. However, this difference was according to the post hoc comparisons not statistically significant.

### **Hypothesis 2: Perceived Deliberation**

Next up, we hypothesized that perceived deliberation of the decision-makers is higher in a citizens' assembly compared to a top-down procedure and a standard referendum which was tested by running a one-way ANOVA to compare the levels of perceived deliberation among the conditions. Descriptive statistics showed that the mean perceived deliberation score was highest for the citizens' assembly condition ( $M = 5.21, SD = 0.962$ ), followed by the top-down procedure ( $M = 5.059, SD = 1.144$ ) and the standard referendum ( $M = 4.375, SD = 0.856$ ). Again, the ANOVA revealed marginally not significant differences between the conditions ( $F(4,81) = 2.091, p = .09, \eta^2 = .094$ ). Additional post hoc comparisons using Bonferroni correction also indicated no significant differences between the conditions.



No significant differences were found between the referendum conditions, namely the standard referendum ( $M = 4.38$ ,  $SD = 0.86$ ), the referendum with expert voter pamphlet ( $M = 4.75$ ,  $SD = 0.77$ ), and the citizens' initiative review ( $M = 4.64$ ,  $SD = 1.00$ ).

### **Hypothesis 3: Mediation Model**

Finally, our last hypothesis was tested using structural equation modeling. We hypothesized that the perceived control and deliberation of the decision-makers would positively predict perceived procedural fairness, which, in turn, fully mediates the positive relationship with policy acceptance.

#### ***Mediation Analysis***

We ran different specifications of models in a theory-informed, data-driven, stepwise manner (see Tables 2 and 3) to examine different mediation possibilities. Model one (M1) is the hypothesized full mediation model, model two (M2) is a complete partial mediation, model three (M3) is a full mediation for perceived control and a partial mediation for perceived deliberation, and model four (M4) is a full mediation for perceived control while perceived deliberation directly predicts policy acceptance.

**Indirect effects.** In all models, the indirect effect of perceived deliberation on policy acceptance through procedural fairness was not significant, although very close to significance. However, the indirect effect of perceived control on policy acceptance through procedural fairness was significant, suggesting that procedural fairness mediates the relationship between perceived control and policy acceptance.

**Direct effects.** Contrasting to the insignificant indirect effects of perceived deliberation on policy acceptance, the direct effects are significant. This indicates that while procedural fairness might not mediate the effect, perceived deliberation still has a direct impact on policy acceptance. Contrastingly, the direct effect of perceived control on policy

acceptance is insignificant, indicating that perceived control does not have a direct effect on policy acceptance when procedural fairness is accounted for.

**Table 2**

*Mediation Analysis*

| Model | Effects         | Pathway       | B     | $\beta$ | S.E.  | p-value |
|-------|-----------------|---------------|-------|---------|-------|---------|
| M1    | Direct effect   | PD → PA       | -     | -       | -     | -       |
|       |                 | PC → PA       | -     | -       | -     | -       |
|       | Indirect Effect | PD → PPF → PA | .074  | .054    | 0.062 | .067    |
|       |                 | PC → PPF → PA | .069  | .072    | .0037 | .013    |
| M2    | Direct effect   | PD → PA       | .412  | .302    | 0.159 | .004    |
|       |                 | PC → PA       | -.138 | -.143   | 0.101 | .202    |
|       | Indirect Effect | PD → PPF → PA | .068  | .050    | 0.052 | .054    |
|       |                 | PC → PPF → PA | .064  | .066    | 0.040 | .021    |
| M3    | Direct effect   | PD → PA       | .413  | .303    | 0.162 | .007    |
|       |                 | PC → PA       | -     | -       | -     | -       |
|       | Indirect Effect | PD → PPF → PA | .058  | .043    | 0.049 | .060    |
|       |                 | PC → PPF → PA | .054  | .056    | 0.034 | .026    |
| M4    | Direct effect   | PD → PA       | .413  | .307    | 0.110 | .007    |
|       |                 | PC → PA       | -     | -       | -     | -       |
|       | Indirect Effect | PD → PPF → PA | -     | -       | -     | -       |
|       |                 | PC → PPF → PA | .056  | .059    | 0.035 | .025    |

*Note. Variables: perceived deliberation (PD), perceived control (PC), perceived procedural control (PPF), policy acceptance (PA). B: unstandardized coefficient.  $\beta$ : standardized coefficient. SE: bootstrapped standard error. Bootstrap Sample = 5,000.*

**Table 3**

*Model Fit for Specification*

| Model | CFI            | RMSEA          | SRMR  | AIC    |
|-------|----------------|----------------|-------|--------|
| M1    | 1 <sup>2</sup> | 0 <sup>3</sup> | .0169 | 26.198 |
| M2    | .639           | .174           | .1032 | 32.723 |
| M3    | .992           | .032           | .0402 | 26.174 |
| M4    | .879           | .101           | .0797 | 27.599 |

*Note.* CFI = Comparative fit index, RMSEA = Root Mean Square Error of Approximation, SRMR = Standardized Root Mean, AIC = Akaike Information Criterion

**Model comparison**

Several fit indices were calculated to evaluate which model fits the best (see Table 3). For the proposed model M1 the fit indices indicate a mostly poor fit between the model and the data (Hu and Bentler, 1999). Overall, M3 shows to have the best fit across all model indices with values within acceptable ranges. Judging from the fit indices of the various models, it appears plausible that perceived control partially mediates perceived fairness. Removing the path between perceived deliberation and perceived procedural fairness does not improve the fit indices, suggesting that this relationship likely exists but may not have reached significance due to limited statistical power.

Overall, the results (see Tables 2 and 3) indicate full mediation for perceived control and most likely partial mediation for perceived fairness.

**Path coefficients**

Path coefficients, their standard errors (SE), and significance levels of the final model (M3) are as follows. The path from perceived control to perceived procedural fairness was significant ( $\beta = .172$ ,  $SE = 0.069$ ,  $p = .013$ ), indicating a positive relationship. Perceived

<sup>2</sup> The indicated model fit of 1 is highly unlikely and is most probably due to a statistical anomaly.

<sup>3</sup> The indicated model fit of 0 is highly unlikely and is most probably due to a statistical anomaly.

deliberation almost significantly predicts perceived procedural fairness ( $\beta = .183$ ,  $SE = 0.098$ ,  $p = .061$ ), while the direct path to policy acceptance is highly significant ( $\beta = .413$ ,  $SE = 0.137$ ,  $p = .003$ ). Lastly, perceived procedural fairness significantly predicts policy acceptance ( $\beta = .317$ ,  $SE = 0.144$ ,  $p = .028$ ).

## Discussion

Climate change is a pressing challenge that demands urgent action, necessitating public acceptance of climate policies for effective mitigation and adaptation. It has been shown that public decision-making procedures can enhance this acceptance, yet not all participatory methods seem to be equally effective. Therefore, the present study aimed to investigate the workings and effects of different participatory approaches on climate policy acceptance, in order to identify the key factors that drive the acceptance of public decision-making by means of an online between-subjects vignette study.

We expected that perceived control of the decision-makers is higher in a standard referendum compared to a top-down procedure and a citizens' assembly. The findings of our study support this, as participants in the standard referendum condition perceived that the students voting in the referendum have more control during the decision-making process compared to those in the other conditions. Our findings align with previous literature suggesting that referenda provide citizens with a tool to directly influence policy outcomes and enhance their control over the legislative process (Butler & Ranney, 1994). The additional value of our findings lies in showing that people actually perceive a referendum as providing them with a certain degree of control. However, it is also argued that citizens' assemblies allow for more substantive participation and control over decision-making, whereas referendums often reduce complex issues to a simple yes or no vote (Fung, 2003). This might be theoretically true but according to our study, people perceive it differently. Thus, if the goal is to ensure that people feel a sense of control in a public participation procedure, our

results suggest implementing decision-making processes similar to a referendum. People may feel a greater sense of control in a referendum because each voter has a direct and equal say in the decision-making process, directly influencing the final outcome. In contrast, in a citizens' assembly, the public might feel less involved since decision-making power is concentrated within the assembly rather than distributed across the entire electorate. Therefore, future participatory procedures should ensure that individuals can exert direct influence without intermediaries, even if this influence is minor. However, the results should be interpreted with caution, as this study was conducted within a specific university context with a potentially biased sample, limiting the generalizability of the findings. Future research should test whether similar studies yield consistent results in different countries, including especially non-democratic nations, where outcomes might differ significantly.

Next, we posited that perceived deliberation of the decision-makers is higher in a citizens' assembly compared to a top-down procedure and a standard referendum. The results show that the differences between the conditions were marginally not significant. Notably, the mean of perceived deliberation was the highest, aligning with our expectations. According to political theorists, citizens' assemblies provide a fertile environment for high-quality deliberation (Gastil, 2013). However, our study suggests that this opinion is not necessarily shared by the perception of the participants of our study. This discrepancy could stem from methodological limitations, such as a small sample size, or from a more content-specific explanation: students may neither expect nor trust their peers to engage in thorough deliberation. This potential explanation of lack of trust is supported by the statistical means of the conditions. The standard referendum condition, where students are potentially deliberating, has the lowest mean, while the top-down condition, where faculty board members are deliberating, has a mean similar to that of the citizens' assembly.

It might be the case that students lack confidence in their regular fellow students' ability to deliberate effectively, especially in comparison to the faculty board and citizens' assembly, whose role is to carefully consider policy decisions. Furthermore, students might view their peers as less competent in certain tasks. Notably, peer assessments are often perceived as less reliable and informed compared to those conducted by faculty members, who are seen as more experienced and knowledgeable in policy matters (Kerman et al., 2023; Melser et al., 2020). This perception may explain why the referendum condition, which includes regular peers, is perceived as lower in deliberation. Future research should investigate whether using a larger and more representative sample would yield clearer and more statistically significant results.

The lack of perceived differences in deliberation among the three referenda conditions is unanticipated. It appears that from the public perception perspective, the presence of a voter pamphlet or its authorship does not significantly impact the perceived deliberation in a referendum. However, the means do show slight variations, with the referendum featuring the expert pamphlet being rated the highest, which aligns with our hypothesis. The non-significant differences could be attributed to the manipulation being too weak and the small sample size. Therefore, once again, further research with a larger sample is needed to determine if these small observed differences become more pronounced.

Finally, we expected that perceived deliberation and perceived control jointly predict perceived procedural fairness, which in turn fully mediates the relationship with policy acceptance. The SEM results provided partial support, with perceived control fully mediating, whereas perceived deliberation most likely partially mediating, the relationship with policy acceptance through perceived procedural fairness. However, the indirect effect is small and just not significant, indicating that the primary influence of perceived deliberation on policy acceptance is mainly direct. The full mediation effect of perceived control suggests that when

people feel like they have more control in a decision-making process, they are more likely to accept the resulting decision, but this is contingent on their perception of high procedural fairness. This is consistent with Tyler and Lind (1992) who state that procedural fairness is a critical component in ensuring compliance with decisions. Furthermore, Lind and Tyler (1988) emphasize that both perceived control and fairness are crucial for acceptance, with fairness often serving as a necessary condition. On top of that, our research adds that control is important across different participatory procedures. This implies that even if a procedure is well-designed, it will likely not gain acceptance unless it includes some form of participant control. It appears that people value control in every context, making it a vital component of democracy. Therefore, it would be insightful to conduct this study in non-democratic countries to compare the results.

The partial mediation effect of perceived deliberation suggests that when individuals believe that decision-makers carefully consider their choices, they are more likely to accept the resulting policy. This acceptance is not dependent on perceived procedural fairness. The non-significant correlation between perceived deliberation and perceived procedural fairness is plausible, as it may not be intuitive that thoughtful consideration alone makes the decision process appear fairer. While deliberation is a valuable component of decision-making, it alone seems to not guarantee perceptions of procedural fairness. Procedural fairness might be influenced by various procedural elements and achieving it may require a holistic approach that includes but is not limited to deliberation. However, it is plausible that if people believe decisions are thoroughly deliberated, they perceive the outcomes as higher quality, leading to greater acceptance. It has been shown that deliberative processes lead to higher quality decision-making, often resulting in greater acceptance of outcomes (Fishkin, 2011, Gastil, 2000). Our findings support this and demonstrate that people also perceive deliberative processes as enhancing decision quality and acceptance. Consequently, incorporating

deliberative components in participatory decision-making procedures will most likely lead to higher policy acceptance. It could be that people perceive that, regardless of the ethical implications, if a decision needs to be made quickly and procedural fairness cannot be fully maintained, acceptance may still be high if it is sufficiently emphasized that the procedure involves thorough deliberation. Future research could investigate which procedures are perceived as high in deliberation, where qualitative research might be a good tool because it allows for an in-depth exploration of participants' experiences and provides contextual insights that quantitative methods might miss. This approach can uncover the specific elements that contribute to the perception of high deliberation, especially since deliberation is a complex concept that requires a nuanced understanding of various influencing factors.

The primary limitation of our study is the smaller-than-expected sample size, which reduces the study's statistical power and necessitates careful interpretation of the results. Nevertheless, the fact that significant results were still obtained speaks to the robustness of the model and the validity of the reasoning. As with a lot of studies, the extent to which you can generalize the results to other contexts is limited. The study was conducted only at the faculty level, which may not fully capture how people perceive or behave in the context of nationwide climate policy decisions. However, we attempted to make the scenarios as realistic as possible by carefully phrasing them and limiting the study to BSS students to ensure a real-life connection. Nevertheless, despite these limitations, our research provides valuable insights into addressing challenges such as climate change. This study contributes to understanding the critical elements that need to be considered when designing participatory decision-making processes to enhance acceptance. Overall, it is essential to ensure that all three variables - control, deliberation, and fairness - are effectively integrated into a participatory procedure. It appears that to enhance control, more referenda should be implemented, while for improving deliberation, more citizens' assemblies are recommended.



It is up to future research to design and test new variations of participatory procedures that take into account the findings of this research.

To successfully fight one of the greatest crises of our time -climate change- we must collaborate and collectively support climate policies. By leveraging these insights from this study, more effective participatory methods can be designed, fostering stronger public acceptance of climate policies and subsequent climate action. It is imperative to act now, using this knowledge to create more widely accepted climate policies, thereby driving collective efforts to make sure our planet is still livable for future generations.

## References

- Aitken, M., Haggett, C., & Rudolph, D. (2016). Practices and rationales of community engagement with wind farms: awareness raising, consultation, empowerment. *Planning Theory & Practice*, 17(4), 557–576. <https://doi.org/10.1080/14649357.2016.1218919>
- Carattini, S., Kallbekken, S., & Orlov, A. (2019). How to win public support for a global carbon tax. *Nature*, 565(7739), 289–291. <https://doi.org/10.1038/d41586-019-00124-x>
- Carpini, M. X. D., Cook, F. L., & Jacobs, L. R. (2004). Public Deliberation, Discursive Participation, and Citizen Engagement Review of the Empirical Literature. *Annual Review of Political Science*, 7(1), 315–344. <https://doi.org/10.1146/annurev.polisci.7.121003.091630>
- Cerovac, I. (2016). The role of experts in a democratic society. *Journal of Education, Culture and Society*, 7(2), 75–88. <https://doi.org/10.15503/jecs20162.75.88>
- Colquitt, J. A., Conlon, D. E., Wesson, M. J., Porter, C. O. L. H., & Ng, K. Y. (2001). Justice at the millennium: A meta-analytic review of 25 years of organizational justice research. *Journal of Applied Psychology*, 86(3), 425–445. <https://doi.org/10.1037/0021-9010.86.3.425>
- Duvic-Paoli, L. (2022). Re-imagining the making of climate law and policy in citizens' assemblies. *Transnational Environmental Law*, 11(2), 235–261. <https://doi.org/10.1017/s2047102521000339>
- Butler, D., & Ranney, A. (1994). Referendums around the world. In *Google Books*. The AEI Press. [https://books.google.nl/books?id=GXV-HFnk\\_9wC&printsec=frontcover&hl=nl&source=gbs\\_ge\\_summary\\_r&cad=0#v=onepage&q&f=false](https://books.google.nl/books?id=GXV-HFnk_9wC&printsec=frontcover&hl=nl&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false)

- Firestone, J., Hoen, B., Rand, J., Elliott, D., Hübner, G., & Pohl, J. (2017). Reconsidering barriers to wind power projects: community engagement, developer transparency and place. *Journal Environmental Policy Planning/Journal of Environmental Policy and Planning*, 20(3), 370–386. <https://doi.org/10.1080/1523908x.2017.1418656>
- Fishkin, J. S., Luskin, R. C., & Jowell, R. (2000). Deliberative polling and public consultation. *Parliamentary Affairs*, 53(4), 657–666. <https://doi.org/10.1093/pa/53.4.657>
- Fishkin, J. S. (2011). *When the people speak: deliberative democracy and public consultation*. Oxford University Press. <https://doi.org/10.1093/acprof:osobl/9780199604432.001.0001>
- Fishkin, J. S. (2019). Democracy when the people are thinking: deliberation and democratic renewal. In *proceedings of the American philosophical* (Vol. 163, Issue 2). <https://www.amphilsoc.org/sites/default/files/2020-03/attachments/Fishkin.pdf>
- Fung, A. (2003). Survey article: Recipes for Public Spheres: Eight Institutional design choices and their Consequences. *The Journal of Political Philosophy*, 11(3), 338–367. <https://doi.org/10.1111/1467-9760.00181>
- Garvin, D. A., Harvard University, Roberto, M., & Bryant University. (2001). What You Don't Know about Making Decisions. *Harvard Business Review*. <https://doi.org/10.1109/EMR.2003.1207056>
- Gastil, J. (2000). By popular demand. Revitalizing representative democracy through deliberative elections. In *University of California Press*. <https://www.ucpress.edu/book/9780520223653/by-popular-demand>
- Gastil, J., & Richards, R. (2013). Making Direct Democracy Deliberative through Random Assemblies. *Politics & Society*, 41(2), 253–281. <https://doi.org/10.1177/0032329213483109>

- Gugler, K., Haxhimusa, A., & Liebensteiner, M. (2021). Effectiveness of climate policies: Carbon pricing vs. subsidizing renewables. *Journal of Environmental Economics and Management*, *106*, 102405. <https://doi.org/10.1016/j.jeem.2020.102405>
- Gross, C. (2007). Community perspectives of wind energy in Australia: The application of a justice and community fairness framework to increase social acceptance. *Energy Policy*, *35*(5), 2727–2736. <https://doi.org/10.1016/j.enpol.2006.12.013>
- Herian, M. N., Hamm, J. A., Tomkins, A. J., & Zillig, L. M. P. (2012). Public participation, procedural fairness, and evaluations of local governance: the moderating role of uncertainty. *Journal of Public Administration Research and Theory*, *22*(4), 815–840. <https://doi.org/10.1093/jopart/mur064>
- Hu, L., & Bentler, P. M. (1999b). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, *6*(1), 1–55. <https://doi.org/10.1080/10705519909540118>
- Intergovernmental Panel on Climate Change. (2023). *Climate Change 2023: Synthesis report* (Core Writing Team, H. Lee, & J. Romero, Eds.; pp. 35–115). <https://doi.org/10.59327/IPCC/AR6-9789291691647>
- Jacquet, J. B. (2014). The rise of “Private participation” in the planning of energy projects in the rural United States. *Society & Natural Resources*, *28*(3), 231–245. <https://doi.org/10.1080/08941920.2014.945056>
- Kerman, N. T., Banihashem, S. K., & Noroozi, O. (2023). The relationship among students’ attitude towards peer feedback, peer feedback performance, and uptake. In *Social interaction in learning and development* (pp. 347–371). [https://doi.org/10.1007/978-3-031-29411-2\\_16](https://doi.org/10.1007/978-3-031-29411-2_16)

- Knobloch, K. R., Barthel, M. L., & Gastil, J. (2019). Emanating Effects: The impact of the Oregon Citizens' Initiative review on voters' political efficacy. *Political Studies*, 68(2), 426–445. <https://doi.org/10.1177/0032321719852254>
- Lackner, M., Sajjadi, B., & Chen, W. (2022). Introduction to climate change Mitigation and adaptation. In Springer eBooks (pp. 3–21). [https://doi.org/10.1007/978-3-030-72579-2\\_169](https://doi.org/10.1007/978-3-030-72579-2_169)
- LeDuc, L. (2015). Referendums and deliberative democracy. *Electoral Studies*, 38, 139–148. <https://doi.org/10.1016/j.electstud.2015.02.007>
- Lind, E. A., Kanfer, R., & Earley, P. C. (1990). Voice, control, and procedural justice: Instrumental and noninstrumental concerns in fairness judgments. *Journal of Personality and Social Psychology*, 59(5), 952–959. <https://doi.org/10.1037/0022-3514.59.5.952>
- Lind, E. A., & Tyler, T. R. (1988). The social psychology of procedural Justice. In *Critical issues in social justice*. <https://doi.org/10.1007/978-1-4899-2115-4>
- 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. <https://doi.org/10.1016/j.egycc.2020.100013>
- Melser, M. C., Lettner, S., Bawert, A., Puttinger, C., & Holzinger, A. (2020). Pursue today and assess tomorrow - how students' subjective perceptions influence their preference for self- and peer assessments. *BMC Medical Education*, 20(1). <https://doi.org/10.1186/s12909-020-02383-z>
- Nilsson, A., Hansla, A., Heiling, J. M., Bergstad, C. J., & Martinsson, J. (2016). Public acceptability towards environmental policy measures: Value-matching

- appeals. *Environmental Science & Policy*, 61, 176–184. <https://doi.org/10.1016/j.envsci.2016.04.013>
- O’Brien, R. M. (2007). A caution regarding rules of thumb for variance inflation factors. *Quality and Quantity*, 41(5), 673–690. <https://doi.org/10.1007/s11135-006-9018-6>
- Perlaviciute, G., & Squintani, L. (2020). Public participation in climate policy making: toward reconciling public preferences and legal frameworks. *One Earth*, 2(4), 341–348. <https://doi.org/10.1016/j.oneear.2020.03.009>
- Perlaviciute, G. (2021). Contested climate policies and the four Ds of public participation: From normative standards to what people want. *Wiley Interdisciplinary Reviews. Climate Change*, 13(1). <https://doi.org/10.1002/wcc.749>
- Porumbescu, G. A., & Grimmelikhuijsen, S. (2017). Linking Decision-Making Procedures to decision acceptance and citizen Voice: Evidence from two studies. *American Review of Public Administration*, 48(8), 902–914. <https://doi.org/10.1177/0275074017734642>
- Reilly, K., O’Hagan, A. M., & Dalton, G. (2016). Moving from consultation to participation: A case study of the involvement of fishermen in decisions relating to marine renewable energy projects on the island of Ireland. *Ocean & Coastal Management*, 134, 30–40. <https://doi.org/10.1016/j.ocecoaman.2016.09.030>
- Reuchamps, M., Vrydagh, J. & Welp, Y. (2023). De Gruyter Handbook of Citizens’ Assemblies. In *De Gruyter eBooks*. <https://doi.org/10.1515/9783110758269>
- Sanders, D. (2012). The effects of deliberative polling in an EU-wide experiment: Five mechanisms in search of an explanation. *British Journal of Political Science*, 42(3), 617–640. <https://doi.org/10.1017/s0007123411000494>
- Šerek, J., Mužík, M., Lomičová, L., & Juhová, D. S. (2021). How a direct vote and public deliberation contribute to the legitimacy of political decision-making: examining

- situational and individual-level moderators. *Acta Politica*, 57(4), 687–709. <https://doi.org/10.1057/s41269-021-00217-4>
- Shaw, K., Hill, S., Boyd, A. D., Monk, L., Reid, J., & Einsiedel, E. (2015). Conflicted or constructive? Exploring community responses to new energy developments in Canada. *Energy Research & Social Science*, 8, 41-51. <https://doi.org/10.1016/j.erss.2015.04.003>
- Suphattanakul, O. (2018). Public participation in decision-making processes: concepts and tools. *Journal of Business and Social Review in Emerging Economies*, 4(2), 221–230. <https://doi.org/10.26710/jbsee.v4i2.213>
- Thibaut, J. W., & Walker, L. (1975). *Procedural justice : a psychological analysis*. Procedural Justice : A Psychological Analysis - Ghent University Library. <https://lib.ugent.be/catalog/rug01:001876843>
- Tierney, S. (2013). Using electoral law to construct a deliberative referendum: moving beyond the democratic paradox. *Election Law Journal*, 12(4), 508–523. <https://doi.org/10.1089/elj.2013.0203>
- Tyler, T. R., & Lind, E. A. (1992). A relational model of authority in groups. In *Advances in experimental social psychology* (pp. 115–191). [https://doi.org/10.1016/s0065-2601\(08\)60283-x](https://doi.org/10.1016/s0065-2601(08)60283-x)
- Tyler, T. R., & Blader, S. L. (2003). The group engagement model: procedural justice, social identity, and cooperative behavior. *Personality and Social Psychology Review*, 7(4), 349–361. [https://doi.org/10.1207/s15327957pspr0704\\_07](https://doi.org/10.1207/s15327957pspr0704_07)
- Tyler, T. R. (2000). Social justice: outcome and procedure. *International Journal of Psychology*, 35(2), 117–125. <https://doi.org/10.1080/002075900399411>

- Uttley, J. (2019). Power analysis, sample size, and assessment of Statistical Assumptions—Improving the evidential value of lighting research. *Leukos*, *15*(2–3), 143–162. <https://doi.org/10.1080/15502724.2018.1533851>
- Wells, R., Howarth, C., & Brand-Correa, L. I. (2021). Are citizen juries and assemblies on climate change driving democratic climate policymaking? An exploration of two case studies in the UK. *Climatic Change*, *168*(1–2). <https://doi.org/10.1007/s10584-021-03218-6>
- Witting, I., Wagenaar, C., & Hendriks, F. (2023). Improving referendums with deliberative democracy: A systematic literature review. *International Political Science Review*. <https://doi.org/10.1177/01925121231210048>
- Wolsink, M. (2007). Wind power implementation: The nature of public attitudes: Equity and fairness instead of ‘backyard motives.’ *Renewable & Sustainable Energy Reviews*, *11*(6), 1188–1207. <https://doi.org/10.1016/j.rser.2005.10.005>



## Appendix A

### Vignettes

The following section presents the five vignettes as the participants read them, including the top-down condition, the standard referendum condition, the referendum with an expert pamphlet condition, the referendum with a student pamphlet condition, and the student's assembly condition. The names of some of the measured items are displayed in italics, with a complete list of items provided in Appendix B.

*Background measures: demographics, values, technologies familiarity, ...*

Next, you will be presented with a description of certain situation. Please read the text carefully. Afterwards, you will be asked to answer some questions about it.

#### **Intro**

Imagine that, in order to combat climate change, the BSS faculty needs to implement a policy to reduce its carbon footprint.

#### **Conditions**

##### *Top-down condition*

Imagine that, in order to combat climate change, the BSS faculty needs to implement a policy to reduce its carbon footprint.

This is being decided by the **BSS faculty board**.

Specifically, the **BSS faculty board members suggest and discuss several options** to reduce the faculty's carbon footprint. One of these options concerns *deep geothermal heating*; a technology that heats buildings with warmth that is naturally present at 500 meters or more below the earth's surface.

After discussing amongst each other, the board puts the *geothermal heating* option up for a board vote. **All board members can vote on whether the policy will be implemented.**

*Measures: perceived group values, trust, procedural acceptance, ...*

[topdown outro]

Now, imagine that **a majority of the board members voted in favour** of implementing deep geothermal heating at the faculty. Deep geothermal heating will therefore be implemented at the faculty.

*Remaining measures: perceptions of decision, ...*

### ***Referenda conditions***

This is being decided by means of a **faculty-wide referendum**.

Specifically, the **BSS faculty board members suggest and discuss several options** to reduce the faculty's carbon footprint. One of these options concerns *deep geothermal heating*; a technology that heats buildings with warmth that is naturally present at 500 meters or more below the earth's surface.

After discussing amongst each other, the board puts the *geothermal heating* option up for a faculty-wide referendum vote: **all students at the BSS faculty can vote on whether the policy is implemented.**

*[no review]*

*Measures: perceived group values, trust, procedural acceptance, ...*

[pamphlet intro]

Before the referendum takes place, **all students are provided with a voter pamphlet**; a one-page report that summarises pros and cons of implementing deep geothermal heating at the faculty.

**expert review**

This voter pamphlet was **produced by an expert review panel**.

Specifically, various experts were invited to take part in the panel. The **panel members met for several consecutive weekends to review** the geothermal policy proposal. After discussing amongst each other, the panel members summarised the pros and cons that they deemed most important into a one-page pamphlet.

*Measures: perceived group values, trust, procedural acceptance, perceptions of pamphlet, ...*

**student review**

This voter pamphlet was **produced by a student review panel**.

Specifically, students were invited to take part in the panel. **50 students were randomly selected from the entire faculty, by lottery**. This lottery used quotas to select a ‘mini-public’ that mirrors the wider population: the panel’s percentages of different groups of people (of different age, gender, nationality, etc.) were similar to these groups’ percentages in the broader population. For example, if 30% of the faculty are first year students, about 30% of the assembly members are also first year students.

Supported by various experts, the **panel members met for several consecutive weekends to review** the geothermal policy proposal. After discussing amongst each other, the panel members summarised the pros and cons that they deemed most important into a one-page pamphlet.

*Measures: perceived group values, trust, procedural acceptance, perceptions of pamphlet, ...*

[referendum outro]

Now, imagine that a **majority of the students that took part in the referendum voted in favour** of implementing deep geothermal heating at the faculty. Deep geothermal heating will therefore be implemented at the faculty.

*Remaining measures; perceptions of decision, ...*

**Citizens assembly condition**

This is being decided by means of a **student assembly**.

Specifically, students were invited to take part in the assembly. **50 students were randomly selected from the entire faculty, by lottery**. This lottery used quotas to select a ‘mini-public’ that mirrors the wider population: the panel’s percentages of different groups of people (of different age, gender, nationality, etc.) were similar to these groups’ percentages in the broader population. For example, if 30% of the faculty are first year students, about 30% of the assembly members are also first year students.

Supported by various experts, the **assembly members met for several consecutive weekends to suggest and discuss several options** to reduce the faculty’s carbon footprint.

One of these options concerns *deep geothermal heating*; a technology that heats buildings with warmth that is naturally present at 500 meters or more below the earth’s surface.

After discussing amongst each other, the assembly puts the *geothermal heating* option up for an assembly vote. **All assembly members can vote on whether the policy is implemented.**

*Measures: perceived group values, trust, procedural acceptance, ...*

[assembly outro]

Now, imagine that a **majority of the assembly members voted in favour** of implementing deep geothermal heating at the faculty. Deep geothermal heating will therefore be implemented at the faculty.

*Remaining measures: perceptions of decision, ...*

## Appendix A

### Full list of items

The following variables were measured during the study but are not all part of the scope of the present paper. Variables are listed in order of appearance.

#### Background measures

Before we start the study, we would like to know a little bit more about who you are. Please answer the following questions as truthfully and accurately as possible.

[age]

Please indicate your age: ...

[gender]

Please indicate your gender: ...

[nationality]

Please indicate your nationality: ...

[personal values]

Below are several statements that describe a certain hypothetical person; specifically, about their values, what they generally find important in life. On a scale from 1 to 7, please indicate the extent to which you consider this person to be **dis/similar to you yourself**.

“It is important to this person ...”

... to prevent environmental pollution

... to protect the environment

... to respect nature

... to be in unity with nature

... for everyone to have equal opportunities

... to take care of those people who are worse off

... to have fun

... to enjoy life's pleasures

... to be influential

... to work hard and be ambitious

1 – very dissimilar to me; 4 – neither dissimilar nor similar to me; 7 very similar to me

[energy technology familiarity]

Below are several energy sources and/or technologies. On a scale from 1 to 7, please indicate the extent to which you are **familiar with them**.

Wind turbines

Natural gas

Deep geothermal heating

Oil

Solar panels

Coal

Hydrogen

Nuclear energy

1- never heard of it; 4 - know it a little; 7 - know it very well

[eco-guilt; pre]

Next, we are interested in your feelings in relation to climate change. On a scale from 1 to 7, please indicate the extent to which you dis/agree with the following statements.

I feel ...

- ... guilty for not paying enough attention to the issue of climate change
- ... like I should be doing more than I have done to address the problem climate change
- ... I sufficiently fulfil my duty to alleviate climate change [R]

1 – completely disagree; 4 – neither disagree nor agree; 7 – completely agree

[conformity; behavioural, affective]

Finally, we are interested in how you generally relate to others. On a scale from 1 to 7, please indicate the extent to which you dis/agree with the following statements.

- I tend to go along with my friends when I have to quickly decide on something
- I often ignore the advice of my peers
- Fitting in with my group is important to me
- I don't care what people in my inner circle think of me

1 – completely disagree; 4 – neither disagree nor agree; 7 – completely agree

On the next page, you will be presented with a description of a certain situation. Please read the text carefully. Afterwards, you will be asked to answer some questions about it.

### **Measures after first part of vignette**

The following questions are about *your thoughts about the situation described above.*

Before we ask you about the situation in general, we are interested in your perceptions of the people involved in the situation in particular.

[deliberativeness/diversity/value alignment/influence/trust[integrity&competence]/descriptive representation/substantive representation, indiv., coll.]

The following questions are about the [board members/students] that [developed the policy/pamphlet/participated in the [referendum/panel/assembly]]. On a scale from 1 to 7, please indicate the extent to which you dis/agree with them.

I feel that [*decisionmakers*] ...

- ... carefully weigh and balance different pros and cons of different policy options
- ... carefully reflect on different environmental policies from different angles



- ... are diverse
- ... find the same things important in life as me
- ... have the same values as I have
- ... have considerable influence over the decision that is being made
- ... can significantly steer the outcome of the decision-making process in a certain direction
- ... are honest and sincere
- ... take different interests into account
- ... are competent
- ... have the right knowledge and expertise
- ... are similar to me
- ... resemble BSS students at large
- ... have the same policy preferences as I have
- ... have the same policy preferences as BSS students
- ... act in my interest
- ... act in the interest of BSS students

1 – completely disagree; 4 – neither disagree nor agree; 7 – completely agree

[identification]

I identify with [*decisionmakers*]

1 – completely disagree; 4 – neither disagree nor agree; 7 – completely agree

Next, we are interested in your perceptions of the overall situation.

[perceived control/voice; individual, collective /attention/respect]

Considering the situation described above, on a scale from 1 to 7, please indicate the extent to which you dis/agree with the following statements.

I feel that, in a situation described above, ...

- ... I would be able to affect the decision that is made
- ... BSS students would be able to affect the decision that is made
- ... I would be able to express my thoughts on the matter at hand
- ... BSS students would be able to express their thoughts on the matter at hand
- ... I would feel heard and listened to
- ... I would feel taken seriously
- ... I would be treated with respect and dignity

1 – completely disagree; 4 – neither disagree nor agree; 7 – completely agree

[attention check]

Please select ‘completely agree’ to show you are paying attention to this question.

1 – completely disagree; 4 – neither disagree nor agree; 7 – completely agree

[perceived subjective representation; individual, collective]

“In decision-making contexts, people sometimes talk of ‘being represented’. In the context of the situation described above, on a scale from 1 to 7, to what extent would you dis/agree with the following statements?”

I feel that, in a situation described above, ...

- ... I would be represented
- ... faculty students and staff would be represented

1 – completely disagree; 4 – neither disagree nor agree; 7 – completely agree

[decision perceptions; complexity, impact]

The following questions are about your perceptions of the policy that is up for decision. On a scale from 1 to 7, please indicate the extent to which you dis/agree with the following statements.

I feel that **the decision on deep geothermal heating at the faculty** ...

- ... is a complex one
- ... is of a highly technical character
- ... can have considerable impact on BSS students
- ... doesn't involve any significant implications for BSS students [R]

1 – completely disagree; 4 – neither disagree nor agree; 7 – completely agree

[democratic ideals/perceived procedural fairness/substantive procedural dimension/constructive procedural dimension/creativity/procedural acceptance, pre]

“The following questions are about *your opinions about the way of decision-making described above*. On a scale from 1 to 7, please indicate the extent to which you dis/agree with the following statements.“

I find that this way of decision-making ...

- ... is open and transparent
- ... is unbiased
- ... is inclusive
- ... treats people as equals
- ... holds decision-makers accountable for their actions
- ... is democratic
- ... is fair
- ... is just
- ... is legitimate
- ... upholds ethical and moral standards
- ... can lead to decisions that are made based on the right knowledge and expertise
- ... can lead to effective solutions for difficult problems

- ... is able to identify a shared common ground in a diverse mix of perspectives
- ... can settle conflicts of interests
- ... can bring in new and original ideas for ways in which climate change might be addressed
- ... is a good way to come to decisions
- ... is acceptable

1 – completely disagree; 4 – neither disagree nor agree; 7 – completely agree

[pamphlet perceptions]

The following questions are about your thoughts about the voter pamphlet that the [expert/student] review panel produced. On a scale from 1 to 7, please indicate the extent to which you dis/agree with the following statements.

I think that the information on the voter pamphlet would be ...

- ... accurate; the pamphlet presents information that is factually correct
- ... understandable; the pamphlet discusses policy characteristics that referendum voters can make sense of
- ... relevant; the points addressed by the pamphlet align with what BSS students would want to know
- ... diverse; the pamphlet addresses various kinds of aspects of the proposal

1 – completely disagree; 4 – neither disagree nor agree; 7 – completely agree

[policy opinion; pre]

Now, we are interested in your own opinion about deep geothermal heating at the faculty.

On a scale from 1 to 7, how negative or positive is your opinion about deep geothermal heating at the faculty?

1 - very negative; 4 – neutral; 7 – very positive

And, on a scale from 1 to 7, how un/certain are you of your opinion?

1 – very uncertain; 4 – neither uncertain nor certain; 7 – very certain

[willingness to participate]

Finally, the following questions are about your thoughts on participating in the referendum yourself.

On a scale from 1 to 7, how important do you find it that you yourself participate in this referendum on an environmental decision?

1 – very unimportant; 4 ... neither unimportant nor important; 7 – very important

And, on a scale from 1 to 7, how likely is it that you yourself would actually participate in this referendum on an environmental decision?

1 – very unlikely; 4 ... neither unlikely nor likely; 7 – very likely

### **Measures after second part of vignette**

Now, we are interested in your thoughts about the decision to implement deep geothermal heating at the faculty. On a scale from 1 to 7, please indicate the extent to which you dis/agree with the following statements:

[decision perceptions; collective will, favourability, environmental impact, risk perceptions]

Implementing deep geothermal heating at the faculty ...

- ... reflects the will of the BSS students
- ... serves my interests
- ... serves the interests of the BSS students
- ... reduces the faculty's carbon footprint considerably
- ... involves significant risks for the environment
- ... involves significant risks for BSS students
- ... involves considerable annoyances for BSS students

1 – completely disagree; 4 – neither disagree nor agree; 7 – completely agree

[policy opinion; post]

Considering the decision to implement deep geothermal heating at the faculty, on a scale from 1 to 7, how negative or positive would your opinion be about deep geothermal heating at the faculty?

1 - very negative; 4 – neutral; 7 – very positive

And, on a scale from 1 to 7, how un/certain would you be of your opinion?

1 – very uncertain; 4 – neither uncertain nor certain; 7 – very certain

[policy acceptance]

Considering the scenario you have read, how un/acceptable would you find implementing deep geothermal heating at the faculty?

1 – very unacceptable; 4 – neither unacceptable nor acceptable; 7 – very acceptable

[procedural fairness/procedural acceptance, post]

Now, considering the decision to implement deep geothermal heating at the faculty, what would be your overall evaluation of the entire decision-making process you have read about?

On a scale from 1 to 7, please indicate the extent to which you dis/agree with the following statements.

I find that this way of decision-making ...

- ... is fair

- ... is a good way to come to decisions

- ... is acceptable

1 – completely disagree; 4 – neither disagree nor agree; 7 – completely agree

[participation/contribution]

Considering the scenario you just read, on a scale from 1 to 7, how much would you dis/agree with the followings statements?

For the following questions, please imagine that you yourself [had voted in the referendum/were selected as a member in the student review panel, as well as had voted in the referendum/were selected as a member in the assembly]. On a scale from 1 to 7, how much would you dis/agree with the followings statements?

On a scale from 1 to 7, to what extent do you feel you would have participated in the decision-making process leading up to the implementation of deep geothermal heating at the faculty?

1 - not at all participated; 4 - somewhat participated; 7 -participated a lot

And, on a scale from 1 to 7, how much would you dis/agree with the followings statements?

[My voting in the referendum/My student review panel membership as well as voting the referendum/My assembly membership] ...

- ... would have helped advance remedies against global warming
- ... would be a considerable contribution to the solving of climate change

1 – completely disagree; 4 – neither disagree nor agree; 7 – completely agree

[eco-guilt, post]

And, considering [the scenario/that you voted in the referendum/were selected as a member in the student review panel, as well as had voted in the referendum/were selected as a member in the assembly], what would you be feeling in relation to climate change afterwards?

On a scale from 1 to 7, please indicate the extent to which you dis/agree with the following statements.

I would feel ...

- ... guilty for not paying enough attention to the issue of climate change
- ... like I should be doing more than I have done to address the problem climate

change

- ... I sufficiently fulfil my duty to alleviate climate change [R]

1 – completely disagree; 4 – neither disagree nor agree; 7 – completely agree