

Justice-Powered Energy Futures: Public Acceptability, Climate Justice and Responsibility

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PSB3E-BT15: Bachelor Thesis

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July 2, 2023

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Abstract

The climate emergency requires an energy transition that complies with limiting global warming to 1.5 °C to avoid devastating consequences for nature and humanity. The aim of his paper was to answer the question “What morality-based psychological constructs predict public acceptability of two realistic future energy scenarios?” by means of a survey study. This thesis provides preliminary support for the relevance of global climate justice endorsement and perceived personal responsibility in relation to the acceptability and preference of Dutch future energy scenarios. Individuals with stronger climate justice beliefs were more supportive of the ambitious scenario (TRANSFORM). Perceived personal responsibility had a mediating role in the association of climate justice beliefs and the acceptability of energy scenarios. These results suggest that fostering climate justice beliefs and a stronger sense of responsibility to address climate change could positively impact people’s acceptability of ambitious energy transitions. Future studies can contribute to a comprehensive understanding of the human dimensions of climate change and inform acceptable, ambitious, just and effective energy transitions.

Keywords: public acceptability, future energy scenarios, climate justice, personal responsibility

Justice-Powered Energy Futures: Public Acceptability, Climate Justice and Responsibility

The climate emergency is a defining issue of our time, requiring urgent action to secure our planet's future. To limit the adverse effects of human-made climate change, keeping the global temperature increase below 1.5°C is crucial. Achieving this requires a significant reduction in global anthropogenic CO₂ emissions, with a target of at least 45% by 2030 compared to 2010 (IPCC, 2018). The Paris Agreement, signed by leaders of 193 countries, including the Netherlands, acknowledges this need for action (Government of the Netherlands, 2022).

In the Netherlands, the commitment to reach net-zero emissions by 2050 necessitates a drastic energy system change, which involves consideration of different scenarios (Scheeper et al., 2022). This thesis aims to explore public acceptability and preference for energy systems change, focusing on the concepts of climate justice endorsement and perceived personal responsibility. Through a survey study, the relationship between these constructs will be examined. The importance of energy system change will be emphasized, hypotheses will be presented, and the current research will be introduced. Finally, the results and implications of the study will be discussed.

Transforming the Energy System

The energy sector is responsible for about three-quarters of greenhouse gas emissions globally, making it the most critical sector requiring a drastic transition to achieve net zero emissions (UNEP, 2022). This necessitates a fundamental change in the energy system, extending beyond traditional renewable sources such as wind and solar. Scenarios are developed by scientists from various disciplines to assess how future energy demand can be met, considering factors such as energy production, transportation systems, economic growth, and

consumer behaviour (IPCC, 2018). TNO, a Dutch research institute, has constructed specific scenarios for the Netherlands, achieving a 55% greenhouse gas emissions reduction by 2030 and 100% by 2050 (for a detailed description refer to Figure A1, Appendix A) (Scheeper et al., 2022).

Public support is crucial for the successful implementation of such system changes (Perlaviciute et al., 2021; Scheeper et al., 2022). Opposition to renewable energy sources, for instance, onshore wind power in Germany, can hinder the energy transition, perpetuating reliance on fossil fuels and accelerating climate change (Wüstenhagen et al., 2007). Civic support is considered a key driver for a rapid transition to low-carbon systems (Kern & Rogge, 2016). In fact, a report commissioned by the German government emphasizes that public acceptability will be the primary currency for achieving net-zero energy transitions (Pfluger et al., 2017). Scholars have explored various factors influencing public acceptability of future energy scenarios and policies, here defined as people's evaluative attitude of the (un)favorability of a scenario, including responsibility attributions, fairness perceptions, efficacy, and messaging (Huijts et al., 2012). Additionally, constructs like climate justice may be significant in acceptability discussions.

The relevance of climate justice beliefs in the climate debate will be explored, as social movements including "Fridays for Future" persistently advocate for "Climate Justice Now!". Climate justice, coined by NGO CorpWatch in 1999 and further developed through the Bali Principles of Climate Justice in 2002, addresses the fact that the climate emergency was caused primarily by the Global North. Here, countries have benefited from exploitative systems while bearing fewer negative consequences (UNEP, 2022; Wiseman, 2021). Vulnerable countries and communities, which contributed the least to the crisis, suffer the most from its already existential

consequences, such as extreme weather and pollution. This resembles a political and activist motivation for climate justice.

In the psychological domain, scholars have framed climate justice as a social justice issue entailing moral concern and (tangible) obligations towards the vulnerable (e.g. nations, societal groups, and individuals) (Bulkeley et al., 2014; Coady & Corry, 2013; Newell et al., 2020). Further, climate justice principles reflect biospheric and altruistic (self-transcendent) values. These values are associated with the acceptability of sustainable energy alternatives and the prioritization of collective outcomes (Pearson et al., 2021). Due to the relatedness of self-transcendent values and climate justice beliefs, similar associations to the acceptability of energy scenarios may be found. Beyond climate justice endorsement this paper investigates the construct of perceived personal responsibility to address climate change.

To date, the dynamics of climate justice and perceived personal responsibility of the public and their relationship with the acceptability of future energy scenarios have not been investigated, a gap in the literature this thesis aims to narrow. The central research question is: What morality-based psychological constructs predict the public acceptability of two realistic future energy scenarios?

Public Acceptability of Future Energy Scenarios

This study will be investigating the acceptability of two energy scenarios, ADAPT and TRANSFORM which are designed to fulfil the Netherlands' pledge to reach net-zero emissions by 2050 (Scheeper, 2022). ADAPT involves reducing CO₂ emissions with minimal impact on the energy sectors while maintaining job security and a comfortable lifestyle. Fossil fuels with carbon capture and storage and biomass import are widely accepted in this scenario and sustainability is not prioritised beyond the achievement of international agreements. On the other

hand, in the TRANSFORM scenario citizens and businesses are aware of their energy usage and encouraged to make sustainable changes. The government supports the transition to a new energy-efficient economy, making far-reaching decisions to implement new technologies and circularity. Further, the transportation system achieves a substantial reduction in greenhouse gas emissions, with limited use of carbon capture and storage and biomass (see Figure A1, Appendix A) (Scheeper et al., 2022).

TRANSFORM is thus more ambitious, requires more individual effort and reaches climate targets sooner than ADAPT. Accordingly, the acceptability and preference of the scenarios may be influenced by justice and morality-based constructs, such as climate justice beliefs and responsibility attributions (Klößner, 2013; Pearson et al., 2021).

Theoretical Context

Global Climate Justice Endorsement

In academia, climate justice is commonly understood as being comprised of the dimensions (1) rights, (2) recognition, (3) distributive justice, (4) procedural justice, and (5) intergenerational justice, which should inform policy-making on all climate and rights issues of our time (Bulkeley et al., 2014; Schlosberg, 2012). To illustrate these dimensions, take the 2019 campaign by El Pueblo Para El Aire, a community-led organization in California which addressed the poor air quality in their community caused by the fossil fuels industry. They demanded that the state and local governments take action to reduce air pollution and improve air quality, as well as to hold polluting industries accountable for their harmful impacts on the community's health and well-being. The campaign recognized (1) a healthy environment and clean air as fundamental human rights, (2) the disproportionate impacts of environmental racism on communities of colour, (3) the unequal distribution of pollution and its health impacts, (4) the

importance of community participation in decision-making processes related to air quality, and (5) the long-term impacts of air pollution on future generations (Greenaction, 2023). This illustrates how in synthesising the political and psychological understanding, global climate justice can be conceptualised as an endorsable construct. It represents a comprehensive, dynamic justice framework with five dimensions which entails moral concern (Bulkeley et al., 2014, Pearson et al., 2021).

But how does an individual's endorsement of global climate justice affect their acceptability of national energy scenarios? A lack of insight into the structurally unjust nature of the climate crisis may prevent individuals from perceiving urgency and necessity for drastic (energy) systems change, thus failing to support governmental action. Conversely, endorsing global climate justice entails recognising that the historic and current consumption patterns (e.g. in the Netherlands) are negatively affecting more vulnerable people globally and future generations (Byrne & Portanger, 2014; Pearson et al., 2021). This recognition of injustice may be related to a greater awareness of the responsibilities of polluting actors and their beneficiaries to carry out and support a just energy transition.

To reduce the negative consequences caused by heavy polluters like the Netherlands, transitioning to a carbon-neutral energy system is crucial. The ambition level of the energy scenario determines how much the transition will impact an individual's life. For instance, the TRANSFORM scenario necessitates changes in consumer energy demand (e.g. energy use during off-peak hours) (Scheeper, 2022). While such adjustments may be perceived as burdensome, individuals endorsing global climate justice may recognize their necessity and the social, environmental, and justice-related global benefits system-wide changes facilitate.

As observed in social movements, actors holding climate justice beliefs understand the

injustice of people, for instance in the Global South, bearing the burden of their comfortable (carbon-intense) lifestyle (Bührle & Kimmerle, 2021; Piispa & Kiilakoski, 2022). Such endorsement of global climate justice may facilitate the acceptability of the national future energy systems ADAPT and TRANSFORM, as both are aligned with the Dutch commitment to achieve net-zero emissions by 2050 (Scheeper et al., 2022; Schlosberg, 2012). Hence, the first hypotheses are:

H1a: Endorsement of global climate justice is associated with higher acceptability of the future national energy scenario ADAPT.

H1b: Endorsement of global climate justice is associated with higher acceptability of the future national energy scenario TRANSFORM.

Perceived Personal Responsibility to Address Climate Change

In psychology, perceived personal responsibility to act can be conceptualised as the individuals' self-attribution of responsibility, here, to address climate change ¹. Of the different conceptualisations of personal responsibility, the focus in this paper is on treatment responsibility (i.e. obligation) (e.g. “I have a moral obligation towards vulnerable populations to address climate change”) (Kalch et al., 2021; Syropoulos & Markowitz, 2021). Such self-ascribed treatment responsibility is found to be an action-oriented and intrinsically motivating psychological mechanism (Kalch et al., 2021). Indeed, Bührle and Kimmerle (2021) found such perceived responsibility to be conducive to collective action for climate mitigation. Further,

¹ Responsibility attributions in the climate change discourse have given rise to multiple theories from various disciplines. The current study will focus on a psychological conceptualisation of individual responsibility. It must be acknowledged that individuals hold limited control over the systemic dynamics of the climate crisis. However, academics agree that the difficulty with responsibility attributions does not justify inaction of individuals (Sardo, 2023). For a bibliography of theories relevant to the discussion of responsibility attributions view Appendix C. Though important, they are omitted from the discussion as the nuance required is beyond the scope of this paper. Interdisciplinary approaches are necessary.

Syropoulos and Markowitz (2021) suggest that a stronger sense of responsibility to act on behalf of future generations (e.g. advocating for those who currently lack the ability to do so themselves) promotes a willingness to take intergenerational justice-driven action. Empirical evidence also suggests that perceived personal responsibility plays a crucial role in pro-environmental decision-making, including support for sustainable policies, indicating a potential association with the acceptability of future energy systems (Klößner, 2013; Syropoulos & Markowitz, 2022).

Given the present evidence, it can be posited that an association exists between self-ascribed responsibility to act on climate change and the endorsement of global climate justice. Considering both constructs' associations with public acceptability, a mediating relationship may be present. Accordingly, the relationship between endorsing climate justice and accepting future energy scenarios could be explored via perceived personal responsibility to address climate change.

To illustrate, endorsing climate justice involves recognizing global responsibility attributions (e.g. to heavy polluters such as fossil fuel companies and their enablers), while also necessitating self-reflection as a beneficiary of those systems, and moral concern (Coady & Corry, 2013; Pearson et al., 2021). Such justice beliefs may contribute to a sense of perceived personal responsibility to address climate change. This action-oriented attribution may then be related to the expressed acceptability of a particular scenario. Accordingly, strong climate justice beliefs may facilitate the acceptability of drastic energy system change via the perceived personal responsibility to address the climate crisis. This reasoning lays the foundation for the proposed mediation hypotheses:

H2a: The positive effect of global climate justice endorsement on the acceptability of national

future energy scenario ADAPT is mediated by the perceived personal responsibility to address climate change.

H2a: The positive effect of global climate justice endorsement on the acceptability of national future energy scenario TRANSFORM is mediated by the perceived personal responsibility to address climate change.

Preferability of an Energy Scenario

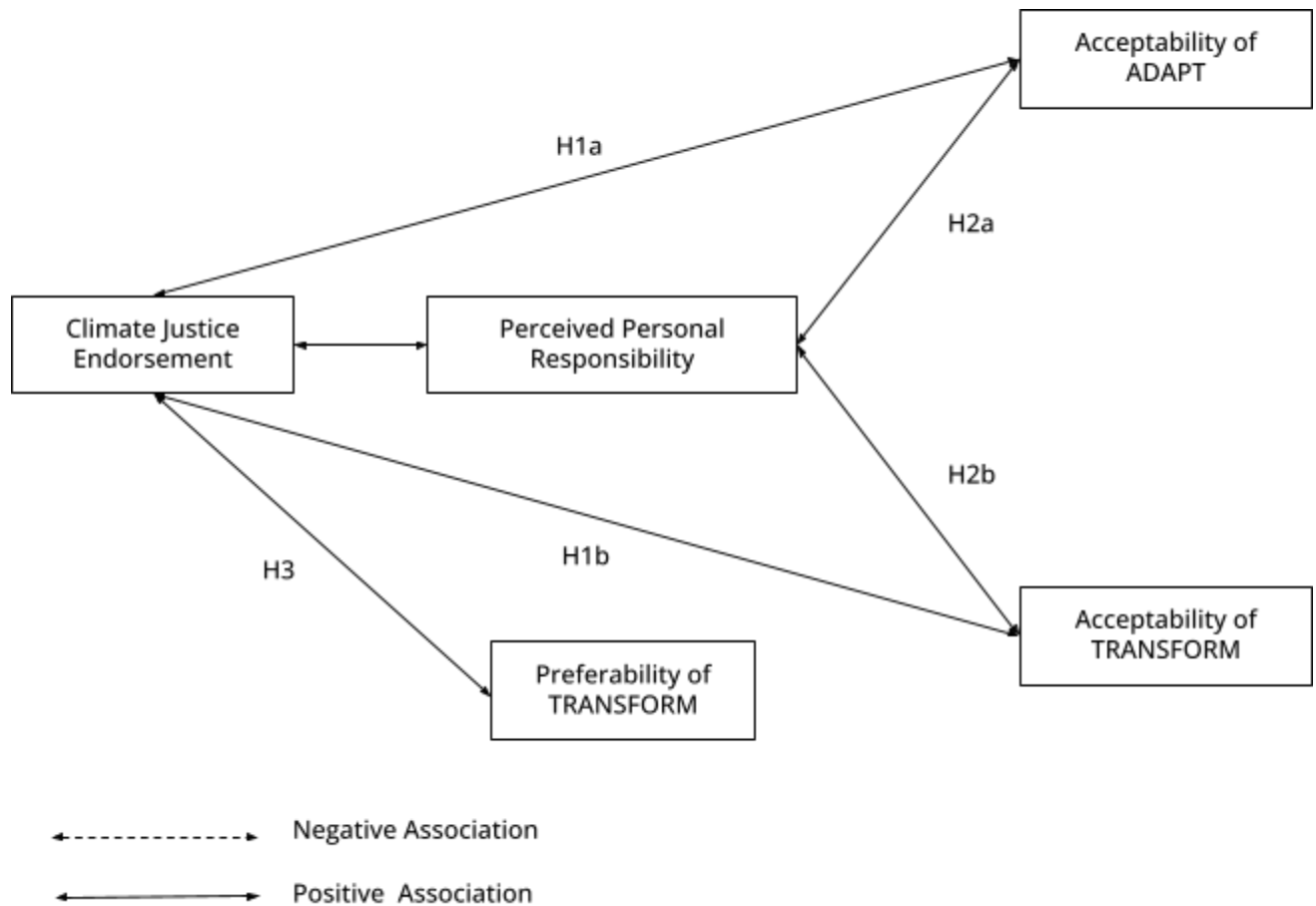
Social movements frequently demonstrate their endorsement of climate justice by demanding ambitious climate action, such as “Extinction Rebellions” demand for net zero by 2025. Thus, not only could people who strongly endorse global climate justice have higher acceptability levels of future energy scenarios than people who do not endorse such principles (H1a,b), but the degree to which people endorse climate justice might also influence which of the two future scenarios people prefer. Consequently, high climate justice endorsers may express a preference towards a more ambitious future energy scenario. As established, endorsing global climate justice entails concern for the adverse effects and injustices of climate change (Pearson et al., 2021). TRANSFORM accomplishes a substantial reduction of fossil fuel demand and has better long-term sustainability than ADAPT, therefore TRANSFORM is more aligned with a just energy transition (Scheeper et al., 2022). Further in line with climate justice beliefs, research suggests that concern for climate change and intergenerational justice is related to motivation to act upon it (Bührle & Kimmerle, 2021). More motivation and ambition of citizens are required in TRANSFORM as compared to ADAPT. Thus, a preference towards the former may be expressed when climate justice is strongly endorsed.

H3: Endorsement of global climate justice is positively related to a preference for the more ambitious national future energy scenario TRANSFORM over the ADAPT scenario.

Refer to Figure 1 for an overview of the hypotheses.

Figure 1

Overview of the Hypotheses



Methodology

Individual Note

The data for this research was collected for individual bachelor's theses of five students. As the individual theses investigate separate variables, those relevant to this thesis are included, while the others are omitted from the discussion. Here the focus lies on global climate justice endorsement (GCJE), perceived personal responsibility (PPR), acceptability of two future energy

scenarios (ADAPT and TRANSFORM), and preferability between said scenarios. The anonymized raw and working data, preregistrations of sample sizes and primary analyses, changes to the initially planned analyses and supplemental materials, such as the script and questionnaires are available on the OSF Platform, where the study was pre-registered (https://osf.io/uskrp/?view_only=664b676ed28c4827a4a97c0aa38685a2).

Participants

For this study, data from a total of 323 participants were collected. Based on an a priori G*power analysis, the desired sample size for the present study was 152 (Linear Multiple Regression: Fixed Model, power = .80, expected effect size of $f^2 = .053$ at $\alpha = .05$). The effect size was chosen as it indicates a moderate effect, which we decided would be meaningful to our research. With a final working sample size of 185, this desired sample size was met.

Overall, 138 (43%) participants were excluded from the main analysis. First, 33 responses (10%) were excluded because their consent was missing and four (1%) as they declined consent. Six responses (2%) were excluded as they failed the first attention check. Another four (1%) were excluded as they did not indicate age, thus the minimum participation age of 16 could not be confirmed. Further, 85 participants (26%) were excluded because responses on the seriousness check were missing. Lastly, six responses (2%) were removed because they did not respond to all variables relevant to this thesis. No outliers were excluded. The final sample for the analysis consisted of 185 participants of which 112 (61%) identified as women, 69 (37%) as men, two (1%) as non-binary/third-gender and two whose gender identity is unknown. The participants ages ranged from 16-20 years (36 %) to 61-70 years old (1%), of which the majority of participants were below the age of 26 (86%). Of the included participants, 160 were living in the Netherlands, and 106 were Dutch citizens. Moreover, 93 participants were

first-year psychology students at the University of Groningen.

The online questionnaire was accessible in two ways, employing the methodology of convenience sampling. First, participants of the snowballing method were invited by the researchers via WhatsApp and Instagram stories. They were encouraged to further share the questionnaire within their social networks. The survey could be accessed through a generated link to the digital survey platform Qualtrics XM (Qualtrics, Provo, UT) for no compensation. Second, SONA participants were invited on the SONA platform, through which they accessed the survey. SONA participants had the requirements of medium-advanced English ability and were compensated with 0.4 SONA credits. All participants were required to be a minimum of 16 years old. Informed consent to their data being used for the current research was given by all included participants. Data collection via snowballing took place from the 3rd and via SONA from the 8th until the 23rd of May 2023. These dates differ from those preregistered. During data collection, it became apparent more time than anticipated was needed for all researchers to achieve desired sample sizes. Data collection was closed once they were met. The time range for survey completion was large, at 14.3 minutes median time (SD = 224.13 minutes).

Materials

A new scale was developed to measure the independent variable global climate justice endorsement. To the best of the researchers' knowledge, no instrument measuring the construct existed previously. The scale contains five items, to which agreement was rated on a 7-point Likert scale (1= *strongly disagree*, 7= *strongly agree*). Each item addressed one of the five dimensions of global climate justice, for example, the dimension of intergenerational justice was measured by asking for agreement to the statement: "The ability of one generation to meet their needs must not compromise the ability of the following generation to meet their own needs". The

other dimensions are rights, recognition, procedural justice and distributive justice (Bulkeley et al., 2014). Of the total score, higher values indicate a higher endorsement of global climate justice. The scale resulted in a Cronbach's alpha of $\alpha = .78$, indicating good internal consistency. For the complete scale see Figure A2 (Appendix A).

The mediator variable perceived personal responsibility to address climate change was measured by a single face-validity item, asking for agreement to the statement "I feel a personal responsibility to reduce climate change". Responses were measured using a 7-point Likert scale (1= *strongly disagree*, 7= *strongly agree*), as adapted from Syropoulos and Markowitz (2021).

Scenario ADAPT was called "Scenario A" and scenario TRANSFORM was called "Scenario B", as to avoid the name of scenarios influencing responses (e.g. participants interpreting the names). Each scenario was presented via summarising bullet points, a graph on the energy supply factors (2018 vs. 2050) and a table summarising the most important economic changes. For each scenario, participants evaluated their perceived acceptability, positivity, and goodness of the scenarios on a 7-point Likert scale (e.g. for the item acceptability 1= *very unacceptable*, 7= *very acceptable*) to form one acceptability score, as derived from Liu et al. (2020). This resulted in Cronbach's alpha of $\alpha = .92$ for the acceptability of ADAPT and $\alpha = .89$ for the acceptability of TRANSFORM, indicating high internal consistency for both variables.

Lastly, preferability between scenarios was assessed after having read and rated the acceptability of both scenarios and viewing a summary of key differences between the scenarios. Participants responded to the question: "Which scenario do you prefer?" with the answer options "*Scenario A*" or "*Scenario B*" (see Figure A3, Appendix A).

Procedure and Design

The faculty ethics committee granted fast-tracked ethical approval, which means this

study was exempt from the ethical review due to the low risks involved in participating. First, participants were provided with the research information, which informed them that “the purpose of the present research [was] to explore participants' acceptability of future energy scenarios” and asked for informed consent. The survey continued by asking for demographic information (age, gender, student status, nationality, country of residency) and a forced response to an attention check which encouraged thorough reading of the survey and honest responses. Then, participants completed (among others) the climate justice endorsement scale and perceived personal responsibility measure. Following, the first scenario was presented and the acceptability measurement relating to this scenario. After the second scenario was introduced, the acceptability measurement relating to this scenario was similarly presented. The order of the scenarios was randomised. Subsequently, key differences between the scenarios were presented after which participants indicated their preference. The study ended with a seriousness check, asking participants whether they had answered the survey truthfully and felt that the researchers should include their data. Lastly, participants had the option to leave a comment. After completion, participants were thanked for their participation.

Statistical Analysis

The data was analysed using descriptive statistics, correlation analyses, linear regression analyses, mediation analyses and logistic regression analysis to test the hypotheses. Correlation analysis was used to examine the bivariate relationships between GCJE, PPR, and scenario acceptability. Linear regression analysis was used to test the hypotheses (H1a, H1b), with the acceptability of ADAPT and TRANSFORM as dependent variables, and GCJE as the independent variable.

Further, mediation analysis using Hayes Process Macro (Hayes, 2022) was used to assess

the effect of GCJE (independent variable) on scenario acceptability (dependent variable) via PPR (mediator). Although only one mediation hypothesis was preregistered, this was altered to perform the analysis correctly, therefore two mediation hypotheses (H2a and H2b) were tested. Lastly, logistic regression was performed to assess the association between GCJE and the preference between the scenarios (dependent variable) (H3). Assumptions for each model were checked. The normality of residuals of GCJE and acceptability measures was slightly violated. As variable transformation attempts were unsuccessful it was decided to still run the analyses, which complicates results as will be discussed. All analyses were conducted using the statistical software package IBM SPSS Statistics (Version 28).

Results

Descriptive Statistics

Please refer to Table 1 for the descriptive statistics and correlations of the relevant variables. The descriptive statistics offer an overview of the central tendencies and variability observed within the sample. All variable means were skewed to the left and the normality of residuals was slightly violated. Log transformation, square-root method and transformation of the inverse scores were performed. However, these did not improve the normality of residuals, therefore the original variables were analysed. The results should be interpreted with caution. No outliers were excluded for hypotheses tests and the other assumptions relevant to the statistical analyses were met.

Table 1

Descriptive Statistics and Correlations for Variables

Variable	N	M	SD	1	2	3	4	5
1.GCJE Score	185	5.93	.79	–	–	–	–	–

2.Perceived Personal Responsibility	185	5.17	1.37	.45*	–	–	–	–
3.Acceptance of ADAPT	185	4.36	1.31	-.20*	-.21*	–	–	–
4.Acceptance of TRANSFORM	185	5.68	1.04	.36*	.41*	-.01	–	–

Note. *. Correlation is significant at the 0.01 level (2-tailed)

GCJE Score = Global Climate Justice Endorsement Score

Relationship between Global Climate Justice Endorsement and Acceptability of Scenarios

To test the hypothesis that global climate justice endorsement is associated with higher acceptability of the scenario ADAPT (H1a), a simple linear regression analysis was performed, which yielded a significant relationship between GCJE and acceptability of ADAPT ($R^2 = .04$, $F(1,183) = 7.57$, $p = .007$). Contrary to expected, GCJE was associated with lower acceptability of ADAPT ($\beta = -.20$, $p = .007$). Therefore, H1a is not supported.

To test the hypothesis that climate justice endorsement is associated with higher acceptability of the scenario TRANSFORM (H1b), a simple linear regression analysis was performed, which showed a significant association between GCJE and acceptability of TRANSFORM ($R^2 = .13$, $F(1,183) = 26.60$, $p < .001$). As expected, participants who showed higher GCJE had higher acceptability of TRANSFORM ($\beta = .36$, $p < .001$) than participants low in GCJE, supporting H1b. For SPSS output of the linear regressions refer to Appendix B.

Perceived Personal Responsibility as a Mediator in the Relationship of Global Climate Justice Endorsement and Acceptability of Scenarios

It was hypothesised that the positive effect of global climate justice endorsement on acceptability of ADAPT is mediated by the perceived personal responsibility to address climate change (H2a). This hypothesis built on H1a, which was rejected as the opposite direction was

found with GCJE being negatively associated with the acceptability of ADAPT. Still, we proceeded with the Process mediation analysis to assess the mediating role of PPR on the relationship between GCJE and the acceptability of ADAPT. The results revealed a significant, negative indirect effect of GCJE on the acceptability of ADAPT via PPR (Path $a*b$), contrary to the hypothesised positive effect. In other words, individuals with higher GCJE expressed higher perceived personal responsibility, which was associated with them expressing lower acceptability for ADAPT. Furthermore, the direct effect of GCJE on the acceptability of ADAPT in the presence of the mediator PPR (Path c') was not found significant. Hence, PPR completely mediates the negative relationship between GCJE and the acceptability of ADAPT. Therefore, individuals' GCJE is not related to their acceptability of ADAPT when PPR is held constant. The total effect is significant, meaning the combined influence of GCJE via PPR is still significant in explaining the variation in the acceptability of ADAPT. However, the explained variance is relatively low (4%). H2a is rejected as the relationship between GCJE and the acceptability of ADAPT is negative. The mediation analyses summaries are presented in Table 2 and Figure 2.

Additionally, it was hypothesised that the positive effect of global climate justice endorsement on acceptability of TRANSFORM is mediated by the perceived personal responsibility to address climate change (H2b). The mediation analysis revealed a significant indirect effect of GCJE on the acceptability of TRANSFORM (Path $a*b$), supporting H2b. This suggests that individuals with higher GCJE expressed higher perceived personal responsibility, which was also associated with expressing higher acceptability for TRANSFORM. Furthermore, the direct effect of GCJE on acceptability of TRANSFORM in the presence of the mediator was found significant (Path c'). This indicates that GCJE has a direct influence on the acceptability of TRANSFORM, independent of the mediating role of PPR. Therefore, PPR partially and

complementarily (the product of the direct effect and the indirect effect is positive) mediated the relationship between GCJE and acceptability of TRANSFORM. The total model effect is significant, however, only explains 13% of the variance in acceptability of TRANSFORM. This suggests that other factors beyond GCJE and perceived responsibility to act are involved in explaining the acceptability of TRANSFORM.

Table 2

Mediation Results with Perceived Personal Responsibility as the Mediator

Effect	<i>b</i>	<i>se</i>	<i>R</i> ²	<i>t</i>	Sig.	95% <i>CI</i> [LL, UL]
Acceptability ADAPT						
a: GCJE → PPR	0.78	.11	.20	6.81	<.001	[0.56,1.01]
b: PPR → ADAPT	-1.48	.01	.06	-1.91	.06	[-0.30, <0.01]
c (total): GCJE → ADAPT	-0.33	.12	.04	-2.75	.01	[-0.57, -0.09]
c' (direct): GCJE→ ADAPT	-0.22	.13	–	-1.61	.11	[-0.48, 0.05]
ab (indirect) GCJE→ PPR→ ADAPT _a	-0.12	.06	–	–	–	[-0.24, <-0.01]
Acceptability TRANSFORM						
a: GCJE → PPR	0.78	.11	.20	6.81	<.001	[0.56, 1.01]
b: PPR → TRANSFORM	0.23	.06	.20	4.16	<.001	[0.12, 0.34]
c (total): GCJE → TRANSFORM	0.47	.09	.13	5.16	<.001	[0.29, 0.65]
c' (direct):GCJE→ TRANSFORM	0.29	.10	–	2.94	<.005	[0.09, 0.48]
ab (indirect) GCJE → PPR→ TRANSFORM _a	0.18	.07	–	–	–	[0.06, 0.33]

Note. GCJE = Global Climate Justice Endorsement Score, PPR= Perceived Personal

Responsibility Score, ADAPT= Acceptability of ADAPT scenario, TRANSFORM=

Acceptability of TRANSFORM scenario.

CI= Confidence Interval, LL= Lower Level, UL= Upper Level.

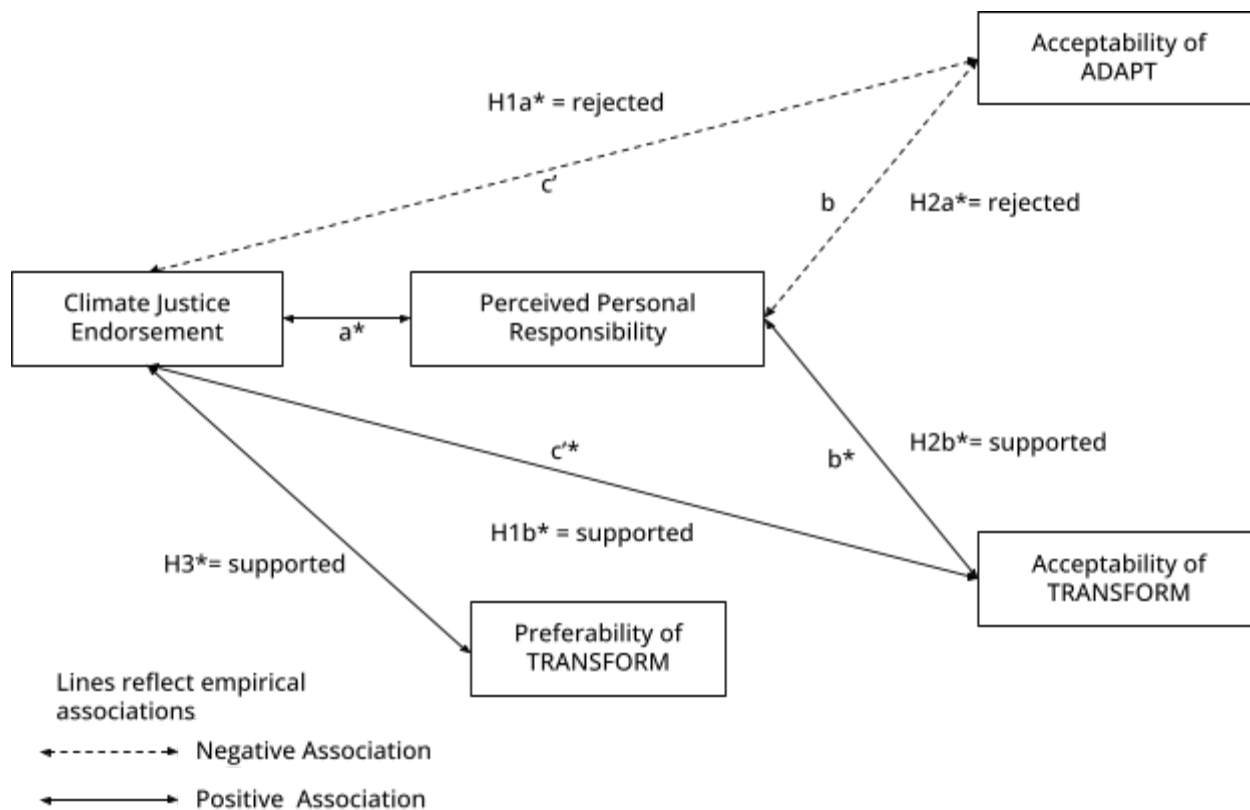
a = Bootstrap (5000)

Preference of Scenario

Lastly, it was hypothesised that global climate justice endorsement would be related to a preference for the scenario TRANSFORM over ADAPT (H3). A logistic regression was performed to ascertain the effects of GCJE on the likelihood that participants preferred the TRANSFORM scenario. The logistic regression model was statistically significant ($\chi^2(1) = 21.024, p < .001$). The model explained 16% (Nagelkerke R^2) of the variance in preference. Higher GCJE was associated with an increased likelihood of exhibiting a preference for TRANSFORM over ADAPT (Exp(B) = .01, $p = <.001$, 95% CI [1.76; 4.52]). Thus, the results of the logistic regression support H3. All assumptions of the logistic regression were met. For logistic regression SPSS output refer to Table B5 and Table B6 (Appendix B).

Figure 2

Overview of Hypotheses Results



Note. * significant effect

Discussion

Research Objectives

The objective of this research was to investigate morality-based psychological constructs in relation to the public acceptability of two realistic future energy scenarios designed to achieve the Dutch emission targets for 2050 (Government of the Netherlands, 2022). The role of climate justice beliefs has not previously been studied in this context. Perceived personal responsibility to address climate change was assumed to explain the association of climate justice beliefs and the acceptability of future energy scenarios.

The findings suggest that when individuals support global climate justice, they are more likely to approve of the ambitious TRANSFORM scenario and less likely to approve of the ADAPT scenario. Additionally, the perceived obligation of individuals to address climate change

appears to play a role in the relationship between climate justice endorsement and approval of both scenarios.

Global Climate Justice Endorsement and Acceptability

Contrary to hypothesised, stronger climate justice beliefs did not indicate higher acceptability of the ADAPT scenario, despite its goal to achieve the Dutch emissions target for 2050. The observation of stronger global climate justice beliefs indicating lower acceptability of ADAPT may be attributed to concerns about the sustainability of the scenario as it for instance continues to heavily rely on fossil fuels as part of the energy mix (composition of energy technologies). People who hold strong climate justice beliefs may interpret such elements as having high collective costs as it has negative long-term impacts on the environment. Further, low acceptability may be explained by the public perceiving the scenario as globally (distributively and procedurally) unjust, which has previously been associated with low acceptability of energy transition proposals (Evenson et al., 2018). When considering the political roots of climate justice it becomes apparent that ADAPT insufficiently addresses most demands. One could for instance argue that the dimension of procedural justice is not met since fossil fuels are continuously employed, even though the general public expresses dislike for its continued use (Poortinga et al., 2018). The dimension of intergenerational justice is not fulfilled as net zero is estimated to be achieved only through the employment of carbon capture and storage, a technology that has to date failed to produce the necessary effects (Scheeper et al., 2022). Thus, future generations are left to deal with the effects of more climate-damaging fossil fuel emissions.

Such evaluations of the mentioned energy technologies align with previous research showing that individuals with strong self-transcendent values evaluate carbon capture and

storage unfavourably, as it is typically perceived as an ‘end-of-pipe’ solution associated with large collective costs (Perlaviciute & Steg, 2014). Instead, they prioritize the collective well-being of vulnerable populations, future generations (altruistic values and justice principles), and the rights of nature (biospheric values), which manifested in greater acceptability for energy alternatives that benefitted the collective outcome (Syropoulos & Markowitz, 2022). Thus, strong climate justice endorsers may view the ADAPT scenario as inadequate at effectively and justly transitioning the energy system and addressing the challenges of the climate emergency.

The current evidence of strong climate justice beliefs relating to higher acceptability of the TRANSFORM scenario supports the aforementioned proposition (H1b). While conveying urgency and ambition, the TRANSFORM scenario necessitates an energy mix that aligns more with the principles of climate justice. For instance, biomass (which requires large quantities of import from other countries, again creating disadvantage) will only be used if absolutely necessary. The results are further in line with findings of procedural justice perceptions facilitating greater acceptability of sustainable energy scenarios (Colvin et al., 2016; Evensen et al., 2018; Huijts et al., 2012). For instance, the aspect of decreasing extra-national emissions from aviation and shipping of the TRANSFORM scenario may be perceived as procedurally (and/or distributively) just and thus increase acceptability.

Deriving from this line of reasoning, a preference for the TRANSFORM over the ADAPT scenario by climate justice endorsers becomes apparent, supporting H3. This preference is consistent with research indicating higher public acceptability for energy portfolios that include more renewable energy sources and fewer fossil fuels (Scheer et al., 2017). Given the fervent aspirations of social movements and the inclination towards ambitious and transformative energy transitions, it is unsurprising that scenarios upholding a system more

similar to the current (unjust) system are met with rejection from individuals who strongly endorse climate justice. We suggest that individuals with strong climate justice beliefs have a heightened awareness of the imperative nature of energy transitions and potentially perceive a greater sense of urgency in this regard, resulting in greater acceptability and preference for TRANSFORM. The specific components and qualities of global climate justice endorsement should be further investigated to substantiate these assumptions.

Perceived Personal Responsibility as Part of the Equation

People who more strongly endorsed global climate justice expressed higher perceived personal responsibility, which related to lower expressed acceptability for ADAPT, in contrast to hypothesis H2a. When individuals hold strong climate justice beliefs, they tend to perceive more obligation to address climate change. Additionally, the responsibility perceived relates to the acceptability evaluation of an energy scenario, as an individual's perceived obligation to act is a psychological mechanism informing their evaluation of a scenario as (un)favourable (Syropoulos & Markowitz, 2021). Simply holding climate justice beliefs without a corresponding sense of responsibility does not associate with acceptability ratings in this model.

The negative relationship between climate justice beliefs and acceptability of ADAPT via self-ascribed responsibility may be due to the scenarios ambition level and energy mix. The ADAPT scenario may not be perceived to align with the ambitions and principles of climate justice (e.g. large imports of biomass). Thus, when global climate justice is endorsed, the obligation to act according to these beliefs is stronger, and associates to negative evaluations of the scenario.

However, caution should be exercised due to the small effect size, which suggests the involvement of additional factors or potential chance findings. It is important to note that the

study design does not allow for causal inferences, necessitating further research to validate these preliminary findings and investigation of the mechanisms and nuances of the constructs.

Contrastingly, when climate justice beliefs were strong, the acceptability of the TRANSFORM scenario was higher, which may be partially due to the higher perceived responsibility. Individuals whose justice beliefs align more with TRANSFORM, which requires more behaviour change and achieves more ambitious goals beyond national net-zero targets, tend to find it more acceptable. Because effortful behaviour change is needed, people may be more supportive of the scenario if they perceive themselves as obliged to act. This finding aligns with prior research by Syropoulos and Markowitz (2021), which demonstrated positive associations between justice-related issues, including taxation policies of fossil fuel-emitting companies, perceived personal responsibility toward future generations, and pro-environmental engagement, highlighting the role of responsibility as a mechanism.

However, considering the moderate total effect of the model, it appears that other factors may be more influential. Further investigations should explore the attribution of personal responsibility in the environmental context, particularly as the methodology employed in this study does not allow for causal claims or controlling for responsibility attributions to other actors (e.g. fossil fuel industry). These preliminary findings require validation and exploration of the underlying mechanisms through subsequent research. The effects of global climate justice endorsement could be investigated in an experimental design, manipulating justice endorsement by for instance making real-life examples of vulnerabilities and injustices salient.

Implications

This discussion extends knowledge of the human dimensions of climate change attitudes. The study's findings have implications for understanding justice and morality-based

psychological constructs, namely climate justice endorsement and perceived personal responsibility and their association with public acceptability of future energy scenarios. The research contributes to the literature on whole energy system changes, emphasizing a general public preference for more ambitious energy transitions.

The findings provide initial evidence that climate justice endorsement is a measurable construct which should be developed further. Importantly, climate justice endorsement is not merely a belief system but a framework that guides practical action in addressing climate change, thus it bridges the conceptual to the practical value of research. Greenaction (2023) exemplifies how the climate justice framework can inform climate action and Bulkeley et al. (2014) discuss how energy-related policies in Berlin should be improved by including all dimensions of the framework. Such examples can inform future researchers' exploration of the action-oriented nature of climate justice endorsement which is pertinent to all climate, social and justice issues.

The study has practical implications for climate justice education and responsibility development. The discussion implies the need to integrate climate justice principles into climate mitigation and adaptation policies and energy system changes, firstly to increase public acceptability and secondly to transition to a just world (Newell et al., 2020). Moreover, the findings call for further research to develop and explore the action-oriented nature of climate justice endorsement.

Limitations

Several limitations must be noted. The global climate justice endorsement scale constructed is not yet validated, and though it demonstrated good reliability, a more elaborate scale validation process is necessary to determine discriminatory and convergent validity. In addition, climate justice was conceptualised as a global notion, which may have not been

relevant enough to relate to national energy scenarios (Bulkeley et al., 2014). This may have contributed to the relatively low effect sizes. Considering urban climate justice provides an alternative to applying the framework that should be considered in future research. Furthermore, the construct of perceived personal responsibility may lack nuance. Responsibility attributions in the climate change debate are complicated and politically charged. The simple conceptualisation in this thesis does not address the necessary nuances sufficiently, therefore, more research into the nature of the construct and intersectional theorising is necessary.

Regarding a statistical limitation, the use of mediation analysis in a correlational study design is subject of debate, and no causal implications can be drawn from the methods employed (Hayes, 2022). Thus, this research should be seen as a preliminary exploratory project rather than a significant contribution to the body of research.

Methodological limitations include that the scenarios discussed were specific to the Netherlands, which might have made them appear less relevant to participants outside of the country. Moreover, the high attrition rate may have introduced bias as consequential variations of data may have been lost. To illustrate, it is possible that people less interested in climate change decided to drop out, therefore biasing the results towards people who have strong environmental interests.

Lastly, there are limitations concerning the presented future energy scenarios themselves. For instance, the scenarios were rather complicated, especially for people who are not familiar with energy discussions (e.g. the implications of CCS and biomass import). Additionally, they were rigid and did not allow for much interpretation. Previous studies allowed for more engagement and liberty for participants to choose personalised energy mixes (Allen & Chatterton, 2013). The lack of such liberties may have led participants to be less differentiated in

their evaluation of the current scenarios.

Conclusion

In this study, we explored the influence of morality-based psychological constructs on the public's acceptance of Dutch energy scenarios aimed at reducing carbon emissions and meeting climate goals. Our findings revealed that global climate justice endorsement is significantly related to the acceptability of future energy scenarios. Strong support for climate justice was associated with greater acceptance of the ambitious TRANSFORM scenario and lower acceptability of the ADAPT scenario, possibly due to concerns about its long-term sustainability and effectiveness in addressing the climate crisis. The results also indicated a preference for the TRANSFORM scenario.

Additionally, we investigated the role of perceived personal responsibility in mediating the relationship between climate justice endorsement and scenario acceptability. Our findings revealed a modest mediating effect of perceived personal responsibility. These findings provide insights into the factors influencing public acceptability and preference for different energy scenarios.

It is important to acknowledge the limitations of this study, including the complicated nature of the scenarios and their limited relevance to many participants. Future research should aim to overcome these limitations and explore additional variables to enhance our understanding of the psychological aspects of public attitudes towards future energy systems and thus the human dimension of the energy transition. By integrating climate justice principles and fostering a sense of intrinsic responsibility to act, the energy transition may contribute to a just and globally equitable transformation.

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Appendix A

Figure A1

The Scenarios as Presented in the Questionnaire

Scenario Introduction

The energy sector is the largest contributor to greenhouse gas emissions which are driving climate change. To address this, the Netherlands pledged to reach **net zero emissions by 2050**, for which future energy scenarios have been developed. Future energy scenarios are calculations of how energy consumption, demand and production must change while considering factors such as changing environmental effects, growing population, sustainability goals and international cooperation. All while the Dutch economy continues to grow at the same rate. Here, we present **two realistic future energy scenarios** for the Netherlands: the scenario A and B.

Presentation of Scenario A

Below are several graphs and information on Scenario A. **Please read the descriptions carefully to understand the scenarios.** You will be asked a series of questions about the details of the scenario and its advantages, disadvantages and acceptability. Note: **hover over** underlined words for more information about the concept.

*Here the hover option is indicated by **highlighting** of the terms

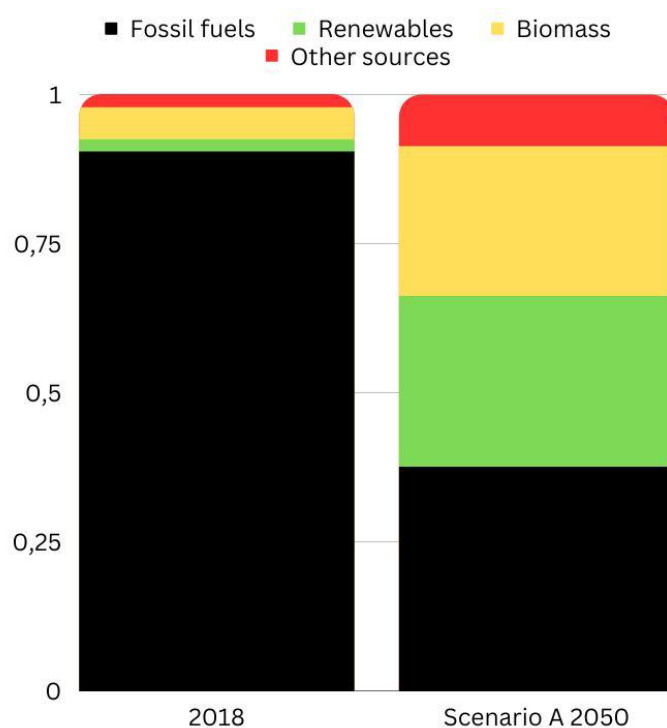
In scenario A:

- The Netherlands builds on **its current strengths** and works to reduce its CO2 emissions.
- National security is a priority, which means maintaining employment rates and their current way of life are important goals.
- While sustainability is important, the country will still rely on some non-renewable energy sources such as fossil fuels.
- The energy system will be transformed to be carbon neutral, but this transformation will have a relatively small impact on energy use in **industrial sectors**
- The government will take the lead in guiding citizens and companies towards the energy transition, using policy measures such as insulation standards for new buildings.
- Despite growth in **mobility demand** and industrial production, efforts will be made to reduce

greenhouse gas emissions from international aviation and shipping by 50%.

- The Netherlands will use large imports of biomass as an energy source to help transition to a carbon-neutral energy system.

The below graph indicates the percentages of Dutch energy supply sources in 2018 compared with those projected by scenario A in 2050.



The table below provides you with more detailed information on the scenario.

	Scenario A
National greenhouse gas reduction target	2030: 55% 2050: 100%
Greenhouse gas reduction target international flying and shipping	2050: 50%
Fossil fuel prices	Constant after 2030
Energy demand	
• Industry	↑
• Service sector	↑
• Agriculture sector	↑
Industry production	↑
Mobility demand*	
• Domestic	↑
• International	↑
Biomass availability**	
• Domestic	+++
• Imports	+++
Use CO2 capture and storage (CCS)***	+++
Use coal-fired power plants	No

↑ means growth, ↓ shrinkage and ↑↑ extra growth, +++ means large, ++ moderate and limited availability

Explanation of terms

* **Mobility demand:** transportation (e.g. cars, buses, trains, bicycles)

** **Biomass availability:** availability of organic matter for energy production (e.g. wood, vegetable and garden waste, sewage)

*** **CO2 capture and storage:** technology capturing and storing CO2 underground or in long-term storage facilities (e.g. gas reservoirs, deep ocean sediments)

Presentation of Scenario B

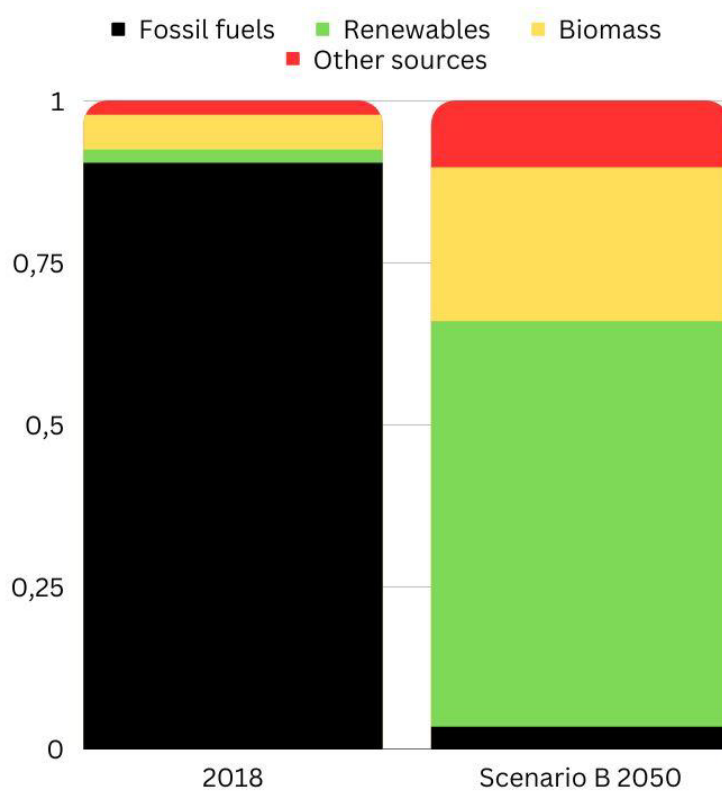
Below are several graphs and information on Scenario B. **Please read the descriptions carefully to understand the scenarios.** You will be asked a series of questions about the details of the scenario and its advantages, disadvantages and acceptability. Note: hover over underlined words for more information about the concept.

In scenario B:

- The Netherlands relies on its strong knowledge and innovative business community to transition to cleaner energy sources.
- The country focuses on using renewable technologies while also developing a **more circular economy**, which helps reduce energy usage.

- The government plays an important role in facilitating and promoting the adoption of sustainable technologies.
- People become more aware of their energy usage and make changes to reduce their carbon footprint. This includes behaviour like eating less meat and choosing seasonal foods.
- New technologies, such as electric and hydrogen-powered transportation, are welcomed and encouraged.
- The demand for energy decreases as people's mobility behaviour changes and industries shift towards less energy-intensive processes.
- Companies are making big changes to become more sustainable.
- The service sector grows as the economy shifts towards more sustainable, circular practices.
- The agricultural sector switches to more sustainable energy sources, such as solar panels, wind turbines and geothermal energy for farm operations.
- To meet international climate goals, international aviation and shipping are required to reduce their greenhouse gas emissions by 95%.
- Carbon Capture and Storage is only used to a limited extent, and biomass is only used if no other options are available.

The below graph indicates the percentages of Dutch energy supply sources in 2018 compared with those projected by scenario B in 2050.



The table below provides you with more detailed information on the scenario.

	Scenario B
National greenhouse gas reduction target	2030: 55% 2050: 100%
Greenhouse gas reduction target international flying and shipping	2050: 95%
Fossil fuel prices	Constant after 2030
Energy demand	
• Industry	↓
• Service sector	↑↑
• Agriculture sector	↓
Industry production	↓
Mobility demand*	
• Domestic	↓
• International	↓
Biomass availability**	
• Domestic	++
• Imports	++
Use CO2 capture and storage (CCS)***	+
Use coal-fired power plants	No

↑ means growth, ↓ shrinkage and ↑↑ extra growth, +++ means large, ++ moderate and + limited availability

Explanation of terms

* **Mobility demand:** transportation (e.g. cars, buses, trains, bicycles)

** **Biomass availability:** availability of organic matter for energy production (e.g. wood, vegetable and garden waste, sewage)

*** **CO2 capture and storage:** technology capturing and storing CO2 underground or in long-term storage facilities (e.g. gas reservoirs, deep ocean sediments)

Figure A2

Global Climate Justice Endorsement Measure

The following items were presented to measure endorsement of global climate justice

1. Safety from the effects of climate change and protection from danger are human rights and rights of nature, they must be protected and considered in all climate mitigation and adaptation discussions. (Rights)
2. The peoples and countries whose basic needs are the most vulnerable to the effects of climate change must be recognised. (Recognition)
3. Technologies to mitigate climate change must be distributed fairly, meaning priority must

be given to those who are affected by climate change the most right now. (Distributive Justice)

4. Vulnerable countries and communities must participate in climate negotiations and discussions that affect them. (Procedural Justice)
5. The ability of one generation to meet their needs must not compromise the ability of the following generation to meet their own needs. (Intergenerational Justice)

Figure A3

Presentation of the Preference Measure as in the Questionnaire

Scenario Preferability and Feasibility

After having read about both scenarios, please now recall the information and indicate your preference

As a reminder, both scenarios achieve 95% greenhouse gas reductions by 2050, however, key differences between the two scenarios are summarised here:

- In "Scenario A" the use of fossil fuels decreases but remains essential to the energy supply, whilst in "Scenario B" fossil fuels are phased out almost entirely and renewables become the largest source of energy
- Dutch greenhouse gas emissions **outside of the Netherlands** are reduced by 50% in "Scenario A" and by 95% in "Scenario B"
- **Mobility demand** continues to increase in "Scenario A" and decrease in "Scenario B"
- "Scenario A" is less ambitious and requires less public support and individual effort than "Scenario B", meaning more lifestyle changes are part of "Scenario B"

	Scenario A	Scenario B
Which of the two scenarios do you prefer?	<input type="radio"/>	<input type="radio"/>

Appendix B

SPSS Outputs

Linear Regression Analysis for Hypothesis 1a

Table B1

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.20 ^a	.04	.03	1.129

Note. a Predictors: (Constant), GCJE Score

b. Dependent Variable: Scenario A acceptance Score

Table B2

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	6.33	.72	—	8.78	<.001	4.9	7.75
	GCJE Score	-.33	.12	-.20	-2.75	.007	-.57	-.09

Note. a. Dependent Variable; Scenario A acceptance Score

Linear Regression Analysis for Hypothesis 1b

Table B3

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
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1	.36 ^a	.13	.12	.97
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Note. a Predictors: (Constant), GCJE Score

b. Dependent Variable: Scenario B acceptance Score

Table B4

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	2.90	.54		5.34	<.001	1.83	3.98
	GCJE Score	0.47	.09	0.36	5.16	<.001	0.29	0.65

Note. a. Dependent Variable; Scenario B acceptance Score

Logistic Regression Analysis for Hypothesis 3

Table B5

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	181.95a	.11	.16

Note. a Estimation terminated at iteration number 5 because parameter estimates changed by less than .001

IV= Global Climate Justice Endorsement (GCJE)

DV= Preference between ADAPT and TRANSFORM

Table B6*Variables in the Equation*

		B	SE	Wald	df	Sig.	Exp (B)	95% CI for EXP (B)	
								Lower	Upper
Step 1 ^a	GCJE Score	1.04	0.24	18.52	1	<.001	2.82	1.76	4.53
	Constant	-4.83	1.38	12.33	1	<.001	0.01		

Note. a. Variable (s) entered on step 1: GCJE Score

IV= Global Climate Justice Endorsement (GCJE)

DV= Preference between ADAPT and TRANSFORM

Appendix C

Suggested Readings about Responsibility Attributions in the Climate Crisis

The following are sources to give an overview of the interdisciplinary relevance of responsibility attributions in the climate justice debate.

Who is Responsible?

Griffin, P. (2017). *The Carbon Majors Database - CDP Carbon Major Report 2017*. CDP Worldwide.

<https://cdn.cdp.net/cdp-production/cms/reports/documents/000/002/327/original/Carbon-Majors-Report-2017.pdf?1501833772>

One hundred companies are responsible for 71% of the industrial greenhouse gas emissions since 1988. The CDP Carbon Major Report highlights this and other realities of the systemic issues of the climate emergency. The purpose of the report is to encourage transparency and accountability, thus also being related to climate justice.

Gore, T. (2020) *Confronting Carbon Inequality - Putting climate justice at the heart of the COVID-19 recovery*. Oxfam.

<https://oxfamilibrary.openrepository.com/bitstream/handle/10546/621052/mb-confronting-carbon-inequality-210920-en.pdf>
<https://doi-org.proxy-ub.rug.nl/10.1177/1474885120955148>

To highlight the individual level of responsibilities: the following report by Oxfam and the Stockholm Environment Institute (SEI) reveals the extreme carbon inequality in recent decades. It illustrates how rich individuals have both causal and treatment responsibility.

Loach, M. (2023). *It's not that radical* (1st ed.). Penguin Random House.

Michaela Leach reviews the history of the climate crisis and responsibility attributions in her book “It’s not that radical”. She highlights the systemic nature of the crisis and its roots in colonialism, white supremacy and capitalism. By looking at the history of emissions, she illustrates for instance how the Global North is responsible for 92 % of excess carbon emissions (emissions that are responsible for the climate emergency), with the USA being responsible for 40% alone, a phenomenon that she refers to as “atmospheric colonialism”. She also delves into the history of the carbon footprint, which was invented by the fossil fuels industry to individualise responsibility and deflect from their own. This is particularly relevant in psychology as “blaming” individuals for individual high-emission behaviour is not appropriate, instead, treatment responsibility can be used to motivate support for system transformation. Further, there are different levels at which responsibilities can be evaluated. There is for instance the global, as well as the national level, which relates to global and national perspectives of Climate Justice.

Theories of Responsibility

Cerutti, F. (2010). Defining Risk, Motivating Responsibility and Rethinking Global Warming. *Science and Engineering Ethics*, 16(3), 489-499.

<https://doi-org.proxy-ub.rug.nl/10.1007/s11948-009-9176-8>

Political philosopher Furio Cerutti discusses the nuances of responsibility in the climate change discourse.

Jang, S. M. (2013). Framing responsibility in climate change discourse: Ethnocentric attribution bias, perceived causes, and policy attitudes. *Journal of Environmental Psychology*, 36, 27-36. <https://doi.org/10.1016/j.jenvp.2013.07.003>

The psychologist Jang lays out the nuances of the public perceptions of responsibility attributions.

Sardo, M. C. (2023). Responsibility for climate justice: Political not moral. *European Journal of Political Theory*, 22(1), 26–50.

<https://doi-org.proxy-ub.rug.nl/10.1177/1474885120955148>

A political perspective on responsibilities in the climate change discourse.

Liang, X., Tsai, J., Mattis, K., Konieczna, M., & Dunwoody, S. (2014). Exploring attribution of responsibility in a cross-national study of TV news coverage of the 2009 United Nations climate change conference in Copenhagen. *Journal of Broadcasting & Electronic Media*, 58(2), 253-271. <https://doi.org/10.1080/08838151.2014.906436>

The media has a large impact on how responsibilities in the climate change discourse are portrayed to the public. The importance of message framing of responsibility is studied in the presented research by Liang and colleagues (2014).

Climate Justice and Responsibility

Runnymede Trust and Greenpeace UK, ‘Confronting Injustice: Racism and the Environmental Emergency Report’ (2022).

<https://www.runnymedetrust.org/publications/confronting-injustice-racism-and-the-envir>

[onmental-emergency](#)

The Racism and Environmental Emergency Report details the colonial past and present of the environmental emergency, with a focus on the contributions of the British Empire to the climate crisis. Due to the Netherlands' colonial past, this lens is also relevant to consider in the Dutch context. It discusses topics from the dept crisis to carbon offsets and fair distributions. Thus, it is a report about climate justice that promotes a just transition, including a just energy transition.