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Information, Justice and Public Support for Carbon Tax-and-Dividend Policies: Experimental Evidence from Germany*

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Abstract

Carbon pricing can deliver large emissions reductions, but public opposition remains a key barrier. We study how support for carbon tax-and-transfer schemes depends on policy design and information provision in a large-scale survey experiment with German respondents. Explaining the policy mechanism robustly increases support across price levels. Information on distributional consequences raises support only when revenue recycling is sufficiently ge nerous, an d ca n se cure ma jority ap proval ev en at hi gh ca rbon prices. Individualized cost information increases support among those who overestimated costs, with no backlash for under-estimators when redistribution is high. These effects operate through distinct fairness channels: information shapes both self- and other-regarding justice perceptions, and while self-interest predicts support, other-regarding concerns — particularly for the poor — are an independent driver of policy acceptance. Our findings suggest that political feasibility hinges not only on policy design, but on making the mechanism understood and its distributional implications visible.

JEL codes: Q52 Pollution Control Adoption and Costs; Distributional Effects; Employment Effects, Q58 Government Policy, H23 Externalities, Redistributive Effects, Envi-ronmental Taxes and Subsidies
Keywords: Climate policy, distributional effects, public support, justice perceptions

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1 INTRODUCTION

Carbon pricing is widely regarded as one of the most cost-effective instruments for reducing greenhouse gas emissions (Stiglitz et al., 2017, Klenert et al., 2018, Carattini, Kallbekken, et al., 2019), yet its political implementation is constrained by persistently low public support (Carattini, Carvalho, et al., 2018, Douenne and Fabre, 2020). Empirical evidence shows that carbon pricing is less popular than regulatory or investment-based instruments (Goerg et al., 2025).

Nonetheless, carbon pricing continues to expand. For example the EU's forthcoming Emissions Trading System II (ETS II), scheduled to become fully operational in 2028, will extend carbon pricing to fuel suppliers in the buildings and road transport sectors — nearly doubling the share of EU greenhouse gas emissions covered by carbon pricing to 75 percent (European Commission, 2025). Crucially for citizen support consumer energy prices are expected to increase under ETS II (European Commission, 2025). In Germany – the context of our study – where households already face a fixed national carbon price on heating and transport fuels introduced in 2021, EU ETS II adds a potentially more ambitious price trajectory, intensifying existing concerns about affordability and distributional fairness. Uniform per-capita transfers of the revenues of carbon pricing – also known as carbon dividends – have been discussed as one method to alleviate the financial burden on poorer households. Economists often endorse such carbon tax-and-transfer schemes due to their effectiveness and progressivity (Climate Leadership Council, 2019, European Association of Environmental and Resource Economists, 2019, Stiglitz et al., 2017, Klenert et al., 2018, Carattini, Kallbekken, et al., 2019). Public support, however, is highly heterogeneous (Mohammadzadeh Valencia et al., 2024): while some studies find high backing for uniform per-capita transfers (Nowlin et al., 2020, Woerner et al., 2024), others rank them last among several options of revenue uses (Douenne and Fabre, 2020, Ewald et al., 2022). This divergence between experts' and public opinion may result from the latter's lack of knowledge and understanding about the mechanism and consequences of tax and transfer schemes, which may in turn be related to justice evaluations of such policies.

Therefore, the central question of this paper is whether informing individuals about the mechanism and consequences of carbon tax-and-transfer systems increase support for such policies. In a second step, we zoom in on the importance of justice perceptions of the policy's outcomes for oneself and others at the top and the bottom of the income distribution for policy support.

Public understanding of carbon tax-and-transfer schemes is limited and systematically biased. The distributional consequences of carbon pricing are complex and heterogeneous, with substantial variation even within income groups (Cronin et al., 2019), making it difficult for individuals to accurately assess their own gains and losses. Individuals tend to underestimate the emissions-reduction potential of carbon pricing (Douenne and Fabre, 2020, Carattini, Carvalho, et al., 2018), overestimate their own financial burden (Beiser-McGrath and Bernauer, 2019, Behringer et al., 2025, Bulut and Samuel, 2025, Carattini, Baranzini, et al., 2017), and misjudge the progressivity of per-capita rebates (Klenert et al., 2018, Carattini, Kallbekken, et al., 2019, Sommer et al., 2022, Dechezleprêtre et al., 2025). Individuals with low knowledge of carbon pricing schemes are less likely to endorse them (Maestre-Andrés, Drews, Savin, et al., 2021). Incentivized and high-information experiments often find stronger support (Woerner et al., 2024, Bachler et al., 2024, Maestre-Andrés, Drews, Savin, et al., 2021, Kallbekken et al., 2011).Public preferences on climate dividends thus seem to be highly sensitive to information, especially at high carbon prices when distributional implications are most pronounced (Carattini, Carvalho, et al., 2018).

Existing studies typically examine the impact of information about the policy's mechanism, self-interested concerns, and perceptions of distributive fairness in isolation. Little is known about how these information dimensions interact or how their effects play out under policy conditions resembling the EU ETS II, which are characterized by higher prices and limited revenue available for direct redistribution.

To address this gap we study how three complementary information treatments affect support for carbon pricing under varying policy designs, employing a large-scale online survey experiment conducted between October 2024 and January 2025 among a representative sample of 6,870 adult Germans. Respondents are assigned to a control group or different combinations of (i) a short video explaining the mechanism of carbon tax-and-transfer schemes; (ii) personalized household-level net cost estimates, based on respondents reported energy consumption, and (iii) distributional impact profiles showing respondents how each policy affects households across the income distribution, yielding eight distinct treatment groups. Support is assessed for four different policy vignettes, which arise from 2×2 design combining a low carbon price of 45€/tCO_2 - the German price level at the time of the survey, serving as a status-quo benchmark - and high carbon price of 200€/tCO_2, reflecting EU ETS II price trajectories, with redistribution shares of 20% and 80%, which equally mirror the fiscal constraints of the EU ETS II framework, with the remainder earmarked for renewable energy investment. We focus on the 200€/tCO_2 results in the main paper, as financial stakes are modest

and the information is minimal under the 45€ status-quo benchmark rate, but report all results in the appendix.

Given the central role of perceived fairness for support of hypothetical (Drews and Van Den Bergh, 2016, Jagers, Lachapelle, et al., 2021, Sommer et al., 2022) and implemented climate policies (Mildenberger et al., 2022, Muth, 2025), the study also endeavors to investigate the relevance of distributive justice concerns.

Our study makes four contributions. First, we provide the first integrated experimental assessment of how complementary information treatments jointly shape support for carbon tax-and-transfer schemes. This distinguishes our work from studies that examine each channel in isolation (Carattini, Baranzini, et al., 2017, Douenne and Fabre, 2022). Second, we construct individualized net cost estimates from respondents' reported consumption patterns and microsimulate distributional profiles across income quintiles based on nationally representative survey data, thereby providing relevant and credible information on likely household-level policy implications and distributional policy consequences. Third, by examining treatment interactions under high carbon prices with partial revenue recycling, we provide the first evidence on the conditions under which information strategies succeed or backfire in the policy environment where public acceptance of the EU ETS II is most uncertain — and where the existing literature offers the least guidance. Fourth, by distinguishing self- from other-regarding justice evaluations, we identify the specific channels through which each treatment affects support and we can disentangle the relative importance of self-regarding and other-regarding justice concerns.

Our results yield four main findings. First, explaining the policy mechanism reliably raises support for high carbon prices irrespective of the redistribution rate. Second, the effects of distributional and personalized financial information depend critically on how generous the redistribution is. Under the 80% redistribution share, both treatments improve justice perceptions and raise support. Under the 20% redistribution share, none of the treatments shift support personalized cost information can actively reduce support among individuals who under-estimated the financial burden of the policy on their own household. Third, combining mechanism and distributional information can push support above majority thresholds, even at 200€/tCO_2, but only when redistribution is generous. Fourth, both, self-interested as well other-regarding justice concerns seem to drive policy support both are updated in the face of relevant information.

The paper proceeds as follows: Section 2 presents the conceptual framework and preregistered hypotheses. Section 3 describes the experimental design and microsimulation approach. Section 4 first reports the results for each information treatment (Section 4.2). Composite effects are discussed in Section 4.3), followed by the results on the

relevance of justice perceptions (Section 4.4). Sections 5 and 6 discuss the findings and conclude.

2 CONCEPTUAL FRAMEWORK AND HYPOTHESES

To explain why public support for carbon tax-and-transfer schemes is expected to vary across policy designs and information provision, this section presents the conceptual framework and the preregistered hypotheses[1] guiding our experimental design.

2.1 Conceptual Framework

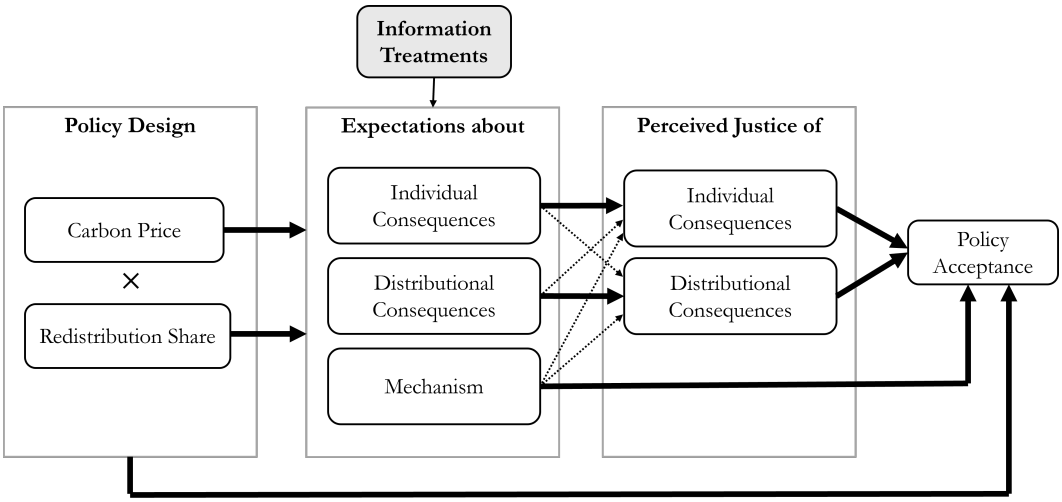
Our conceptual framework builds on work by Maestre-Andrés, Drews, and van den Bergh (2019), who synthesize the empirical literature on public support of carbon taxation. According to their framework, support for carbon tax-and-transfer schemes depends on policy design features (carbon prices and revenue use), expected individual and distributional consequences, and perceived procedural justice. These components jointly form an overall justice evaluation of the policy that ultimately determines policy support.

We extend the original model in several ways: First, we consider the perceived justice of the policy's outcomes, rather than the policy itself, arguing that specific outcomes are easier to assess than abstract policies. Second, we explicitly distinguish between implications for one's own household and for households at the top and bottom of the income distribution, reflecting evidence that shows that self- and other-regarding justice perceptions are related in distinct ways to various outcomes (Sutton and Douglas, 2005, Bègue and Bastounis, 2003, Lucas, Zhdanova, et al., 2011, Lucas, Rudolph, et al., 2014) and that people's reactions towards perceived injustice at the top and at the bottom are asymmetric (Schneider, 2019, Bellani and Bledow, 2025, Condon and Wichowsky, 2020). This is because individuals may apply different justice principles when evaluating outcomes for oneself and others and for the poor and the rich. For instance, need is typically considered when justice judgments are made (Kittel and Traub, 2024). The consideration of need-concerns in choices over carbon recycling schemes has been documented in various focus group studies (Dresner et al., 2006, Carattini, Carvalho, et al., 2018) as well as experimental research (Baute, 2025, Sommer et al., 2022). Additionally, we elicit not only the degree but also the direction of perceived injustice, that is whether a group is seen as bearing an unjustly high or unjustly low burden. The latter distinction is introduced as previous literature shows

[1]The pre-registration of this study can be found on the open science framework: https://osf.io/v23yr/overview?view_only=f730c46983444b00a8de6c18a8bd3c03.

that justice concerns are particularly relevant when they align absolute and relative self-interest (Duesenberry, 1949, Ferrer-i-Carbonell, 2005, Fehr and Schmidt, 1999).

Figure 1: Theoretical model of the influence of justice perceptions on policy support



Note: The figure shows the hypothesized theoretical associations between policy design and a) individuals' perceptions of a policy's personal and distributional consequences (which are the target of the informational treatments in this study), b) the perceived justice of these and c) policy support.

In our conceptual framework (figure 1) public support for carbon tax-and-transfer schemes thus depends on a set of underlying expectations about (i) their consequences for one's own household, (ii) their distributional consequences across income groups, and (iii) beliefs about how the policy is expected to achieve its desired effects – i.e. the policy's mechanism. In our conceptual framework expectations about the policy's consequences for oneself and others determine self- and other-regarding justice concerns – which in turn shape overall policy support, jointly with beliefs about the mechanism through which the policy operates.

Our experimental treatments are designed to target these beliefs and expectations selectively: Information on the way in which carbon-tax-and-transfer systems reduce carbon emissions while being inequality reducing informs about the policy mechanism, personalized cost information informs self-regarding justice concerns, and distributional information informs justice concerns for other income groups. Our measures of self- vs. other-regarding justice concerns allow us to disentangle different justice-related reasons for rejecting carbon tax-and-transfer schemes and to test whether and to what extent informing about the mechanism, individual or distributional consequences affects support by shifting specific justice perceptions.

2.2 Hypotheses

Information Treatment Hypotheses:

Our first information treatment targets misperception on the mechanism of the policy – i.e. how tax-and-transfer schemes create incentives to reduce carbon emissions by increasing carbon prices while addressing social justice concerns through their redistributive character. Previous studies have found a significant lack of knowledge about tax-and-transfer schemes (e.g., Kallbekken et al., 2011, Baranzini and Carattini, 2017, Douenne and Fabre, 2022). We expect that explaining the mechanism behind carbon tax-and-transfer systems increases policy support.

> **HI 1**: *Being informed about the general mechanism of carbon tax-and-transfer schemes increases policy support.*

Our second information treatment targets misperception about individual financial policy implications. We expect that the effect of informing individuals about the financial consequences of the policy on their own household depends on their previous expectations. Self-interest would suggest that informing individuals that the policy implications are more beneficial for themselves than they expected should increase policy support and vice versa.

> **HI 2**: *Personalized information about the policy's implications for one's own household increases support among respondents who overestimated their burden ex ante and decreases support among those who underestimated it.*

Our third information treatment targets misperception about distributional consequences of the policy across income groups. We expect that information showing that high-income households bear higher net burdens than low-income households will improve perceived justice for the respective groups. Ex ante, the net effect on overall policy support is ambiguous, as individuals may weigh concerns for their own group and for others differently.

> **HI 3**: *Information about the distributional effects of the policy alters overall policy support relative to the control group, but we do not posit a clear directional hypothesis.*

Interactions of treatments Our design also allows us to explore whether the information treatments interact. For instance, mechanism information may amplify the impact of personalized cost or distributional information by providing a coherent narrative that links individual and societal consequences. We do not, however, formulate strong ex-ante hypotheses about these interaction patterns and treat them as an explorative empirical question.

Justice Mechanism Hypotheses:

As outlined above, the effects of our information treatments on policy support should operate through distinct justice perceptions. Personalized cost information is expected to shift self-regarding justice concerns, whereas distributional information is expected to shift other-regarding justice concerns. This structure allows us to assess whether information increases support primarily by correcting biased expectations about the policy's outcomes for oneself and for others, or whether opposition persists even when distributive consequences are fully understood. We therefore test whether changes in justice evaluations mediate the impact of the information treatments on policy support.

Note that we do not include cross-treatment effects, where for example, information about own consequences also affects other-regarding justice concerns because individuals use the personalized information to infer likely consequences for others. Likewise, distributional information may be used to infer consequences on oneself. Moreover, informing individuals about the redistributive nature of tax-and-transfer schemes may also affect self- and other-regarding justice concerns. While acknowledging these potential cross-treatment effects, we are primarily interested in the theoretically more closely connected relationships. In particular, we examine the following mediation hypotheses:

> **HM 1:** Informing individuals about the policy implications for their own household improves [worsens] the evaluation of the policy's outcome for one's own household for over-estimators [under-estimators]. Improved reflexive justice perceptions increase policy support

> **HM 2:** Informing individuals about the distributional implications of the policy affects other-regarding justice concerns. Improved other-regarding justice concerns increase policy support.

3 EXPERIMENTAL DESIGN

To test our hypotheses, we conduct an online survey experiment using Qualtrics, recruiting respondents through a quota sample designed to approximate the adult German voting population with respect to age, gender, education, region, household income, and household size[2] (appendix table A.1). Respondents receive monetary compensation in accordance with German minimum wage regulations. After standard data-quality checks (appendix A.2), the final sample comprises 6,870 individuals. The survey is organized into four parts as outlined in figure 2.[3] First, we collect sociodemographic information and data on mobility behavior and heating energy consumption,

[2]While quotas for household size required adjustment to ensure timely fieldwork, table A.2 shows that household composition is balanced across treatment arms.

[3]The full online questionnaire can be found in the online supplementary material.

which we use to approximate respondents' households' carbon footprints. Second, respondents report their expectations about the financial implications of a hypothetical increase in carbon prices to 200€/tCO_2 both for the respondents' own household but also for households in the lowest and highest income quintiles. Third, respondents are randomly assigned to one of seven information-treatment groups or to a control group. Finally, all respondents evaluate four policy vignettes presented in random order. After each vignette, respondents assess the justice of the policy's financial consequences for their own household and for households in the bottom and top income quintiles indicating whether they consider the policy to inflict unfairly too little burden, a just fair burden, or unfairly too much burden on the respective group[4], and then state their overall support on a six-point Likert scale ranging from strongly against (1) to strongly in favor (6) providing respondents the opportunity that they don't know whether they would support the policy.

3.1 Policy Vignettes

The four policy vignettes arise from a 2x2 combination of the legal carbon price at the time of the survey (45€/tCO_2) and a hypothetical high carbon price (200€/tCO_2) and two hypothetical redistribution shares (20%, 80%).[5] In each vignette, the specified share of revenues is redistributed as an equal per-capita climate dividend, while the remainder is allocated to renewable energy investments.

The 200€/tCO_2 vignette represents a plausible price under the forthcoming EU ETS II, where market-based pricing introduces substantial uncertainty (Pietzcker et al., 2021). The redistribution shares correspond to scenarios with limited versus extensive household transfers. In practice, institutional constraints imply that only a fraction of carbon pricing revenues can realistically be returned directly to households, as revenues may also be used for complementary climate investments and administrative purposes (Union, 2023). We therefore treat the 80% redistribution scenario as representing an ambitious but still plausible upper-bound case of household revenue recycling. The equity implications of different recycling shares for German households are further documented in Hänsel et al. (2022), who show that horizontal equity considerations are central to optimal carbon tax design in the German context. All

[4]The measure of perceived fairness is adapted from the empirical social justice literature (Jasso, 2007), which frequently uses 9-point scales, with a midpoint of 0 indicating fairness of outcome, negative values indicating an unfairly too low outcome and positive values indicating an unfairly too high outcome. Although this scale is well validated (Moya and Adriaans, 2024), we simplified it to a 3-point scale in this study to reduce respondents' cognitive burden, given the complexity of the topic.

[5]The carbon price refers to CO_2 emissions from the combustion of heating and transport fuels. The study focuses on policies related to the introduction of the EU ETS II covering buildings and road transport. Emissions from electricity and district heating are already included in the EU ETS I and are therefore excluded here. The implicit CO_2 price for electricity and district heating is set to 0€/tCO_2.

respondents, independent of group assignment, are informed that the stated share of carbon pricing revenue is returned as a lump-sum climate dividend to all citizens in Germany and shows its estimated amount[6]. Finally, we inform all respondents about the relative climate effectiveness of the different policy vignettes, by ranking the policies' effectiveness in reducing emissions relative to the other policy vignettes.[7] Our control group thus constitutes a 'minimal information condition', which likely reflects a real-world scenario where likely average carbon dividends would be publicly communicated. Figures B.1a to B.1d show the basic information presented to all respondents. Appendix B.1 provides additional background on the policy scenarios, including institutional details of the EU ETS II with the accompanying constraints on revenue use as well as the rationale for the 200€/tCO_2 price assumption. It also documents the carbon price coverage, the dividend calculation logic, and the procedure used to construct the relative effectiveness ranking shown to respondents.

3.2 Information Treatments

We implement three types of information treatments, which, in combination, generate seven treatment groups. The different treatments target the expectations highlighted in the conceptual framework: Expectations about *how* tax-and-transfer schemes work – i.e. the mechanism, expectations about individual financial consequences, and expectations about distributional consequences.

Mechanism treatment: A one-minute video[8] explaining the mechanism of a carbon tax-and-transfer system was shown.[9] The video describes how a carbon tax increases prices of carbon-intensive products, incentivizing reductions in their consumption and shifts to lower-carbon alternatives. It further explains that carbon tax revenues can be redistributed as a lump-sum climate dividend, reducing the net financial burden for households. The distributional logic is highlighted by addressing that low-emission households may even receive a net gain, while high-emission households experience a net loss. Respondents are also informed that the carbon price in Germany at the time of the survey was 45€/tCO_2, and that the scientific evidence indicates a required price of 210–405€/tCO_2 to meet EU emission reduction targets by 2030 (Pietzcker et al., 2021).

[6] To account for scale effects, children receive half the amount of adults in our policy vignettes

[7] The ranking is done according to the CO_2 price and redistribution share, where higher prices and lower redistribution shares result in a higher effectiveness. This leads to Policy vignette 3 (200€/tCO_2, 20% redistribution share) being the most effective, followed by, in descending order, policy vignette 4 (200€/tCO_2, 80% redistribution share), policy vignette 1 (45 €/tCO_2, 20% redistribution share), and policy vignette 2 (45 €/tCO_2, 80% redistribution share), being the least effective one in reducing emissions.

[8] The video (in German) is available under this link. The alternative text is provided in appendix B.3.

[9] Around 7 percent of the treated individuals chose to read the alternative text instead of watching the video because they could not or did not want to play the video on their device.

Distributional treatment: To illustrate the distributional implications of each policy vignette, respondents were informed about the likely changes in net household income relative to the status-quo for each income quintile. The information was illustrated graphically (see appendix B.5). To simulate the distributional effects, we use representative survey data of the German Socio-Economic Panel (Liebig et al., 2022) and estimate net effects using a microsimulation model.[10]

Financial treatment: Respondents receive information on the likely net financial effect of each policy vignette for their *own household*. Respondents' residential details and mobility patterns are used to approximate their carbon footprint from heating and fuel use.[11] Based on this estimate, we calculate the total carbon costs for each carbon price without a climate dividend. Expected per capita climate dividend resulting from each policy vignette are taken from the microsimulation model for the distributional treatment. Respondents are shown the net effects of the carbon tax and climate dividend on their own household in comparison to the status quo.

Composite treatment: Respondents are randomly assigned to receive one of these treatments or combinations thereof. As a consequence, our experimental design comprises seven treatment groups and a control group. Figure 2 illustrates these different combinations. While the individual effects of all three information treatments are interesting in themselves, we are particularly interested in composite treatment effects of different combinations of information treatments for different policy designs. In particular we are interested in the additional effects of spelling out the individual and distributional consequences of particular policy designs, in addition to simply explaining the mechanism behind tax-and-transfer schemes.

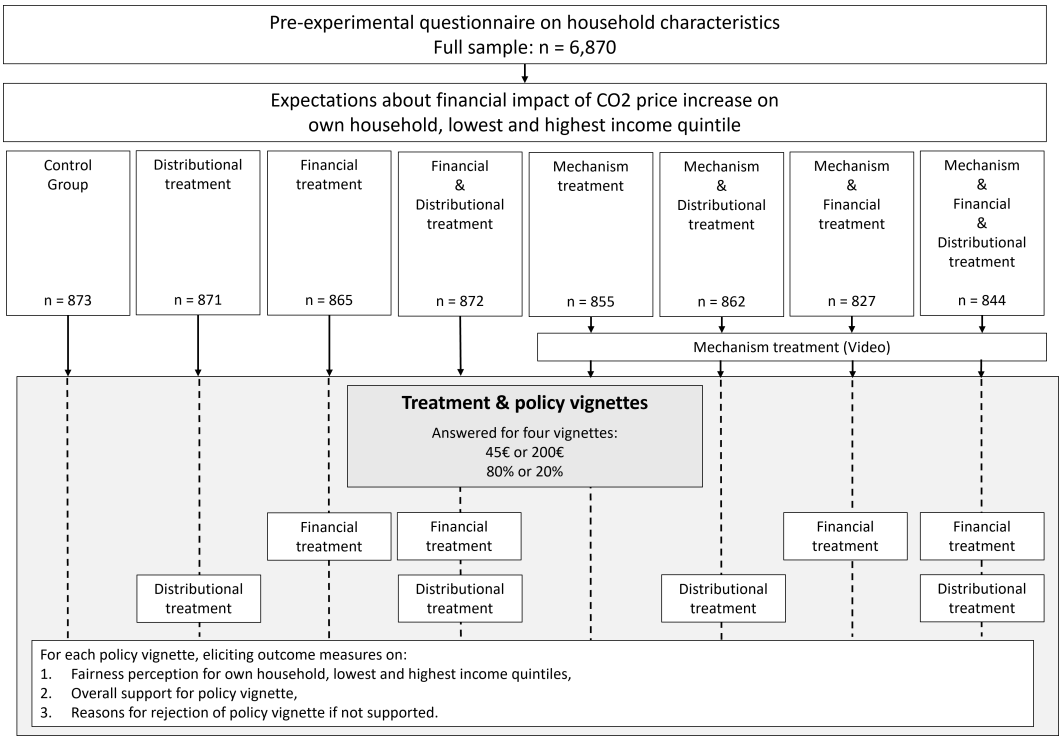
4 RESULTS

Because the difference between the policy vignettes and the status quo is minimal at 45 €/tCO_2, the informational content of the financial and distributional treatments in the low-price scenarios is limited. The effects of the financial and distributional information treatments are therefore expected—and observed—to be negligible at low carbon prices. In contrast, the high-price scenarios involve substantial financial and distributional impacts, making them more informative for identifying treatment effects. Our analyses therefore focus on the high-price vignettes, with full results for the low-price vignettes reported in the appendix.

[10] A detailed description of the microsimulation model is provided in appendix A.4.

[11] See appendix A.3 for detailed methodological information on the calculation of respondents' carbon footprints.

Figure 2: Survey flow and experimental design



Note: The figure depicts the survey flow and the different treatment groups. Note that respondents answer the grey box "Treatment and policy vignettes" for four different policy vignettes in randomized order which differ with respect to the CO_2 price and the redistribution share of the resulting revenue. The exact display of the financial and distributional implications is specific to each policy. Allocated respondents therefore see the financial and the distributional treatment four times, each time with values tailored to the specific policy vignette. The mechanism treatment on the other hand is shown only once, before respondents are shown the different policy vignettes.

4.1 Support for Carbon Tax-and-Transfer Schemes

To understand the degree of support for a high price carbon tax-and-transfer scheme absent treatments, we first report policy support among the control group. Figure 3 illustrates policy support for the high price policy vignettes. Generally, a majority of respondents oppose the introduction of a high carbon price with stronger opposition for a redistribution share of 20%.[12] An important finding is the large share of respondents who are less strongly opinionated, responding with "somewhat in favor", "somewhat opposed", or "do not know" – 50% for the low and 56% for the high redistribution scenario. This reflects a significant degree of indecision among respondents, opening up the room for information treatments to effectively change respondents' opinions.

[12]Evidence on the effect of policy design on support is presented in appendix C.1.

Figure 3: Overall policy support

Notes: The figure depicts the policy support of the control group for the high price policy vignettes where 200€/tCO_2 indicate the CO_2 price and the 20% or 80% indicate the redistribution share of revenues in form of a climate dividend. Sample size: 873.

Support is lower among older individuals, individuals with lower education, individuals heating with fossil energy sources, and those living in rural areas (table A.5 in the appendix). Concerns about the personal financial burden, general opposition to carbon pricing, and lack of perceived policy effectiveness at reducing emissions are the dominant reasons for the negative assessment (table A.4). These findings are consistent with previous studies (Carattini, Carvalho, et al., 2018, Mildenberger et al., 2022, Sommer et al., 2022, Dechezleprêtre et al., 2025, Douenne and Fabre, 2022).

4.2 Effect of Information Treatments on Policy Support

To quantify the effect of providing information on policy support, we estimate the following model separately for each information treatment. We begin by looking at the three information treatments in isolation and analyzing composite treatment effects in section 4.3.[13] More specifically, we estimate the following equation separately for each treatment group:

$$Y_{ij} = \beta_k \, \mathrm{IT}_i + \gamma \, \mathrm{X}_i + \epsilon_{ij} \tag{1}$$

where Y_{ij} is a binary measure of policy support of individual i with respect to policy vignette j, IT_i is a dummy for individual i receiving the respective information

[13] Results for the low price policy vignettes are reported in appendix D.1, E.2 and F.2. We find no significant effects of the information treatments for the low-price vignettes, with the exception of a negative effect of the distribution treatment in the high-redistribution vignette.

treatment under analysis, X_i is a vector of respondent characteristics, containing binary gender, an indicator for urbanity, age and education.[14] ϵ_{ij} is the error term of the model. In all regressions we strictly use observations from the control group and the respective treatment group. Estimates are obtained as average marginal effects from a logistic regression model, to be able to obtain sensible predictions. Treatment effects do not differ when using a linear probability model instead.

Panel A in table 1 shows that general information about the tax-and-transfer mechanism, presented in a short, animated video, increases policy support by about 6.5 percentage points, regardless of the redistribution share. After viewing the video, respondents answered two comprehension questions on its content.[15] Among respondents who answered both questions correctly, the estimated treatment effect is larger, at around 8 percentage points (see table D.2 in appendix D). In contrast, among respondents who answered at least one question incorrectly, the estimated effect is small and statistically insignificant, at around one percentage point (see table D.3). This pattern reduces concerns about experimenter demand effects of the video treatment, as the increase in policy support is concentrated among respondents who demonstrably understood the information provided, rather than reflecting a general tendency to respond in a manner consistent with the perceived intent of the video.[16]

Panel B of table 1 summarizes the effects of distributional information on policy support. When only 20% of carbon pricing revenues are redistributed, providing information on the policy's distributional implications has no statistically significant effect on support. In contrast, when the redistribution share is 80% the effect of spelling out the distributional consequences significantly increases policy support by 6.5 percentage points.

However, does this reflect genuine concern for distributive justice, or can it be explained by self-interested? Decomposing this pooled effect by individuals perceived position in the income distribution can shed some light on this question. Additional analyses reported in (table F.1 in the appendix) show that the effect is largest and statistically significant among respondents who believe they belong to the two lowest income quintiles ($\hat{\beta}_D = 0.116$, $se = 0.046$). It is smaller, but still significant, for those who perceive themselves as middle-income earners ($\hat{\beta}_D = 0.058$, $se = 0.034$) and further reduced and statistically insignificant among those who believe they belong to the two top income quintiles ($\hat{\beta}_D = 0.031$, $se = 0.059$). In the low-redistribution

[14] Individual controls are added despite randomized treatment assignment to increase precision of the estimates and to account for potential remaining imbalances in the treatment groups (Clifford et al., 2021).

[15] Each question is answered correctly by 71% to 78% of respondents, the share of respondents who answer both questions correctly is 57%. See table A.3.

[16] Carattini, Chatterjee, et al. (2025) isolate the effect of social desirability bias in an information treatment setting on carbon taxation, finding limited effects supporting the use of survey experiments in this context.

vignette, distributional information has no effect regardless of individuals' perceived income position. It thus seems that self-interest also drives the positive treatment effects we observe in the distributional treatment.

Table 1: Effects of mechanism and distributional treatments on policy support

Panel A: Mechanism treatment		
	(1)	(2)
	20% Redistribution	80% Redistribution
Treatment effect	0.066***	0.065***
	(0.023)	(0.025)
Control group mean	0.29	0.40
Respondents	1,590	1,581
Individual controls	✓	✓
Panel B: Distributional treatment		
	(1)	(2)
	20% Redistribution	80% Redistribution
Treatment effect	0.006	0.065***
	(0.023)	(0.025)
Control group mean	0.29	0.40
Respondents	1,595	1,585
Individual controls	✓	✓

Notes: Panel A reports the marginal effect of receiving an informational video explaining the general mechanism of tax-and-dividend schemes, relative to no information. Panel B reports the marginal effect of receiving information on the distributional consequences of the policy vignette, relative to the status quo. Coefficients are marginal effects from logit models predicting overall policy support (1 = in favor). All models control for respondents' age group, sex, education, and urban vs. rural living environment. Standard errors are shown in parentheses. Significance levels: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

Table 2 depicts the effect of the financial treatment on policy support. We first estimate the average treatment effect for the whole population and additionally split the sample between individuals who overestimate or underestimate the cost increase for their own household as well as those without prior.[17] See appendix E.1 for a summary of the magnitude of misperception. In the high redistribution policy vignette (Panel A of table 2) the large majority of respondents (about 80%) benefit financially. On average, providing information about this financial gain increases the policy support, by about 5 percentage points with marginal statistical significance. As hypothesized, policy support increases more strongly (12 percentage points) for treated respondents who overestimated the cost increase for their own household. In contrast, the treat-

[17] As described in section 3, we ask survey respondents how much they would estimate the cost increase to be for their own household if the CO_2 price were to increase from 45€/tCO_2 to 200€/tCO_2. We categorize respondents into under- and over-estimators based on their answer and how it compares with the information presented to them under the financial treatment, which we calculate based on their individual characteristics. We classify those who do not state any expectations as individuals with no prior.

ment effect on under-estimators is negative, but not significant. This is an important finding and is indicates that no backlash effects are to be expected from informing individuals on distributional consequences, even among those who are informed that policy consequences are worse for themselves than they had expected. For the low redistribution policy vignette, which leads to financial losses for about 85% of the sample, we find the equivalent pattern. While the average treatment effect is small and not significant, information on the likely individual policy implications increases support among over-estimators, while informing individuals who underestimated the additional costs on their household decreases support by 9 percentage points. Thus, providing distributional information may lead to backlash, in a low redistribution scenario. We alternatively split the sample between net beneficiaries and net contributors (Columns 5-6), to test whether net policy gain drives policy support, disregarding prior expectations.[18] Interestingly, informing net contributors that they would have to pay more than they are reimbursed in the low redistribution policy has no effect on the support, likely because this aligned with the individuals prior belief. In contrast in the high redistribution setting this effect is sizable and negative, albeit not significantly so due to the low precision of the estimate which results from the fact that the share of losers is relatively small in the high redistribution setting. Informing individuals who gain from the policy about their net-gain affects policy support positively (7 percentage points) in the high-redistribution scenario, where a large majority gains, but not in the low redistribution scenario.

So far, the results reveal that policy support can be swayed more robustly in the high redistribution policy vignette and most clearly by information about the general mechanism, followed by information about the distributional consequences while the financial treatment has no significant effect when pooling all respondents. Considering baseline support rates in the control group, no single information treatment would, however, suffice to secure a majority for implementing a carbon price of 200€/tCO_2.

[18] A description of the share of net beneficiaries and contributors is provided in appendix E.3.

Table 2: Effect of the financial treatment on policy support

Panel A: 80% Redistribution						
		By Misperception			By Net Payout	
	(1)	(2)	(3)	(4)	(5)	(6)
	Pooled	Over-estimator	Under-estimator	No prior	Net Gain	Net Loss
Treatment effect	0.047*	0.125**	-0.043	0.067*	0.072***	-0.074
	(0.025)	(0.054)	(0.046)	(0.036)	(0.028)	(0.058)
Control group mean	0.40	0.38	0.48	0.36	0.39	0.42
Respondents	1,569	342	470	757	1,283	269
Individual controls	✓	✓	✓	✓	✓	✓

Panel B: 20% Redistribution						
		By Misperception			By Net Payout	
	(1)	(2)	(3)	(4)	(5)	(6)
	Pooled	Over-estimator	Under-estimator	No prior	Net Gain	Net Loss
Treatment effect	0.007	0.104**	-0.094**	0.024	0.041	-0.002
	(0.023)	(0.048)	(0.043)	(0.032)	(0.060)	(0.025)
Control group mean	0.29	0.24	0.37	0.26	0.33	0.29
Respondents	1,572	343	467	762	243	1,315
Individual controls	✓	✓	✓	✓	✓	✓

Notes: The table shows the marginal effect of receiving information on personal financial consequences of a policy vignette, separately for the high redistribution share (Panel a) and the low redistribution share (Panel b). Results are only based on respondents who received the financial treatment and individuals in the control group. Estimates of marginal effects are based on logit models predicting overall policy support (1 = in favor). Results are reported for the pooled sample and separately for respondents who overestimated or underestimated the cost increase of a carbon price of 200€/tCO_2 on their own household as well as for those without prior or alternatively for net beneficiary and net contributors of the policy. All models control for respondents' age group, sex, education, and urban vs. rural living environment. This analysis only uses responses for the high-price policy vignettes. Standard errors are given in parentheses.
Significance levels: * p-value < 0.10; ** p-value < 0.05; *** p-value < 0.01

4.3 Effect of Providing Composite Treatments

Building on the previous findings, we now quantify the effect of composite information treatments that combine information about the general mechanism with spelling out the individual financial and distributional consequences of the policy. We focus on combinations with the general mechanism treatment, since a nationwide information campaign represents the most policy-relevant baseline. We are interested in whether additional, more targeted information on individual financial consequences or distributional effects shifts support beyond what the general mechanism treatment alone achieves.

Leveraging our survey design, we compare policy support between the group that only received the mechanism treatment and those that additionally received financial

and/or distributional information, enabling us to compute predicted probabilities of support for each treatment combination, derived from a logit specification with full interactions among the treatment indicators, as well as the additional effect relative to the mechanism-only group.[19] Figure 4 depicts predicted probabilities of policy support separately for the high and low redistribution vignettes, along with the additional treatment effects compared to the mechanism-only group.[20]

Consistent with our previous results, adding information about the personal financial consequences of the policy does not significantly alter support when respondents are already informed about the mechanism and prior expectations are not accounted for. This pattern holds for both redistribution regimes and remains robust when splitting the sample into over-estimators and under-estimators of the expected burden (see Table G.4 in the appendix).

In contrast, providing distributional information on top of the mechanism treatment has significant effects that depend on the share of revenues redistributed as a climate dividend. In the high redistribution vignette, distributional information raises policy support by about five percentage points relative to the mechanism-only group. Relative to the uninformed control group, this implies an overall increase of roughly 13 percentage points, raising support from about 40% to a narrow majority.[21] In the low redistribution vignette, by contrast, adding distributional information does not increase support and, if anything, slightly reduces it, although the effect is not statistically significant.

Providing both distributional and personalized financial information in addition to the mechanism treatment yields diverging effects depending on the redistribution rate. For the high redistribution vignette, the joint additional effect is marginally smaller than the effect of adding distributional information alone. For the low redistribution vignette, the composite treatment reduces overall support relative to the mechanism-only group.

Taken together, these results demonstrate that informing individuals about policy consequences beyond the general mechanism has meaningful effects on support, and that these effects are tightly linked to policy design. When redistribution is generous, combining mechanism and distributional information could push support above majority thresholds even for high carbon prices. In low redistribution settings, however,

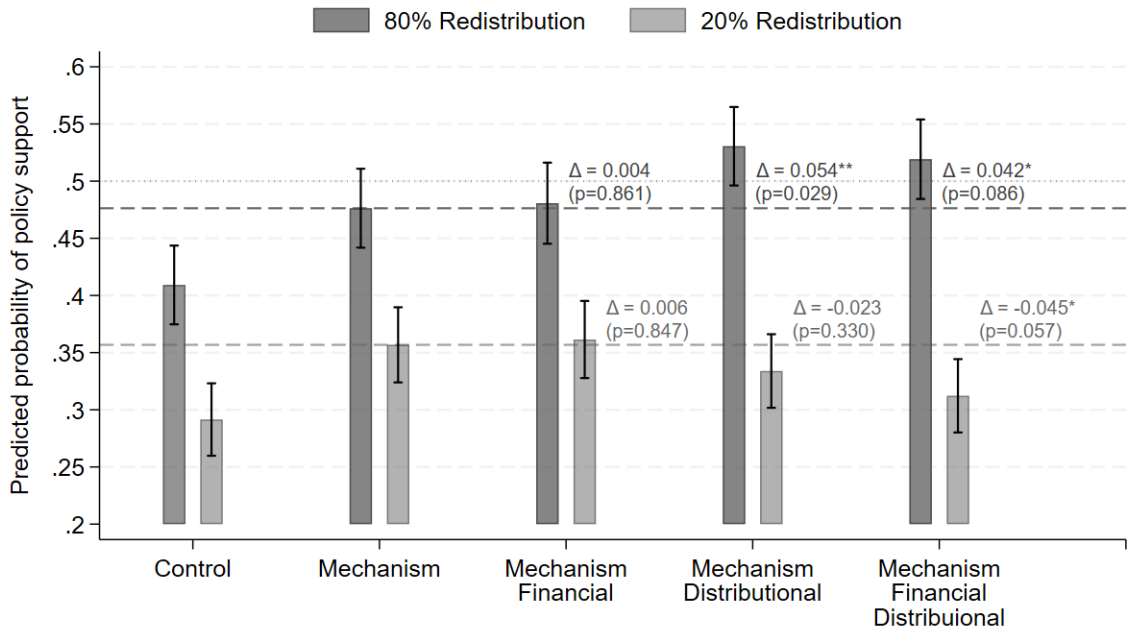
[19] See G.1 in appendix G for the results from the fully interacted logistic regression and table G.3 for the conditional marginal effects.

[20] Similar results are obtained when restricting the sample to respondents who received the mechanism treatment and computing incremental effects relative to the mechanism-only group. Results are reported in table G.5 in appendix G.

[21] See table G.5 for baseline support shares.

additional information beyond the abstract mechanism may dampen support rather than strengthen it.

Figure 4: Composite and additional treatment effects



Notes: The figure shows predicted probabilities of support for the high- and low-redistribution vignettes based on logit regressions of a binary indicator of policy support on the fully interacted treatment indicators. Full models are reported in Table G.1 in the Appendix. The additional effect of spelling out individual financial or distributional consequences, or both, in addition explaining the treatment are reported next to bars. Delta's indicate the difference to the treatment group that received only the mechanism treatment along corresponding p-values in brackets. All specifications control for respondents' age group, sex, education, and urban versus rural residence. Only results from policy vignettes with a high carbon price of 200€ are shown.

4.4 Relevance of Justice Evaluations for Policy Support

The relevance of spelling out individual financial and distributional consequences above and beyond explaining the mechanism of tax-and-transfer schemes supports the idea we formulated in our conceptual framework – namely that policy support is driven by how just the policy's outcomes are perceived to be for oneself and for others. However, the heterogeneous treatment effects of the distributional treatment also suggest that the identified treatment effects may be partly due to self-interest. While numerous studies identified *justice* concerns as key drivers of support or opposition for carbon recycling schemes (Jagers, Lachapelle, et al., 2021, Jagers, Martinsson, et al., 2019, Povitkina et al., 2021, Bergquist et al., 2022) few have tried to distinguish self-regarding from other-regarding justice concerns. Most often, respondents were simply asked to assess

the policy was just - leaving open as to what justice exactly means.[22] With the aim of extending knowledge on the relevance of self- and other-regarding justice concerns, by we ask respondents to evaluate the justice of each policy's financial impact on their own household, as well as households in the top and bottom income quintile. Respondents could answer on a three-point scale, distinguishing 'unfairly too little burden','just right', and "unfairly too much burden'. This section first reports justice perceptions of the different high-price policies in the control group and then shows how our treatments shift justice concerns for oneself, the poor and the rich. We then try to quantify the relative importance of these justice concerns for policy support and use the counterfactual framework to assess how much of the observed treatment effects can be explained through treatment induced shifts in respondents' justice concerns for themselves and others.

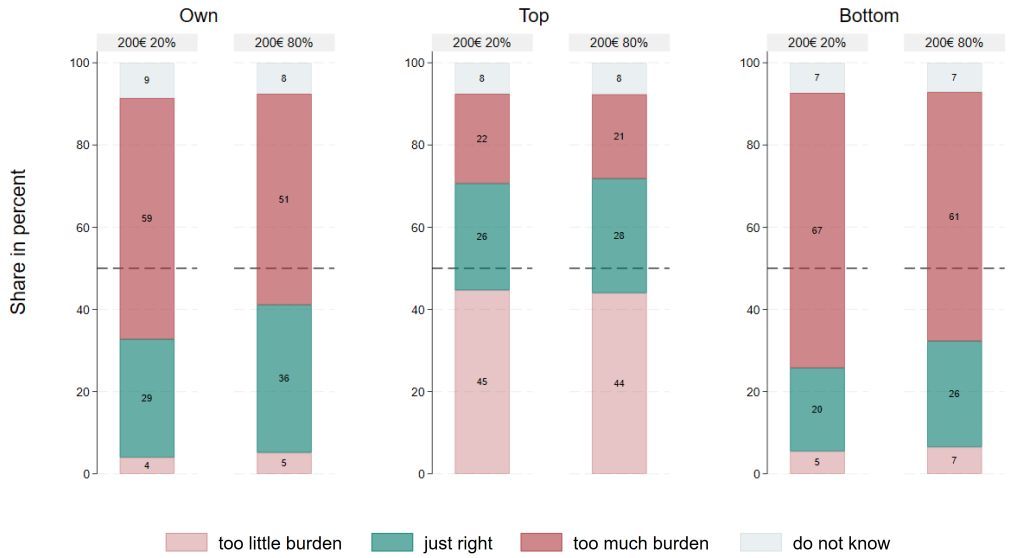
4.4.1 Justice evaluations in the control group

In the absence of additional information, respondents largely considered the high-price policy vignettes as unjust (figure 5). Specifically, low-income households were seen as bearing too much financial burden, while high-income households were assessed to be insufficiently burdened. Additional analyses (Table H.1 in the appendix) confirm that higher carbon prices and lower redistribution shares reduce the likelihood of perceiving the policy as fair for both one's own household and low-income households in a statistically significant way.

These patterns suggest that, without additional information, respondents perceive the policies as insufficiently progressive. The relatively small difference in justice ratings between the high and the low redistribution scenario further indicates that respondents may struggle to grasp the redistributive aspects of tax and transfer schemes.

[22] Jagers, Lachapelle, et al. (2021) for example asked, "Do you think this proposal would be an unfair or a fair measure?" A similar eleven-point response scale from 0 to 10 was used for this question, with extremes labeled as 'Very unfair' and 'Very fair', and the mid-point labeled as 'Neither unfair nor fair'.

Figure 5: Justice evaluations in the control group



Notes: The figure depicts self-regarding (Own) and other-regarding (Top and Bottom) justice concerns in the control group (no information treatments) for the high-price policy vignettes. Sample size: 873. The corresponding figure for the low-price scenario can be found in figure H.1 in appendix H.2.

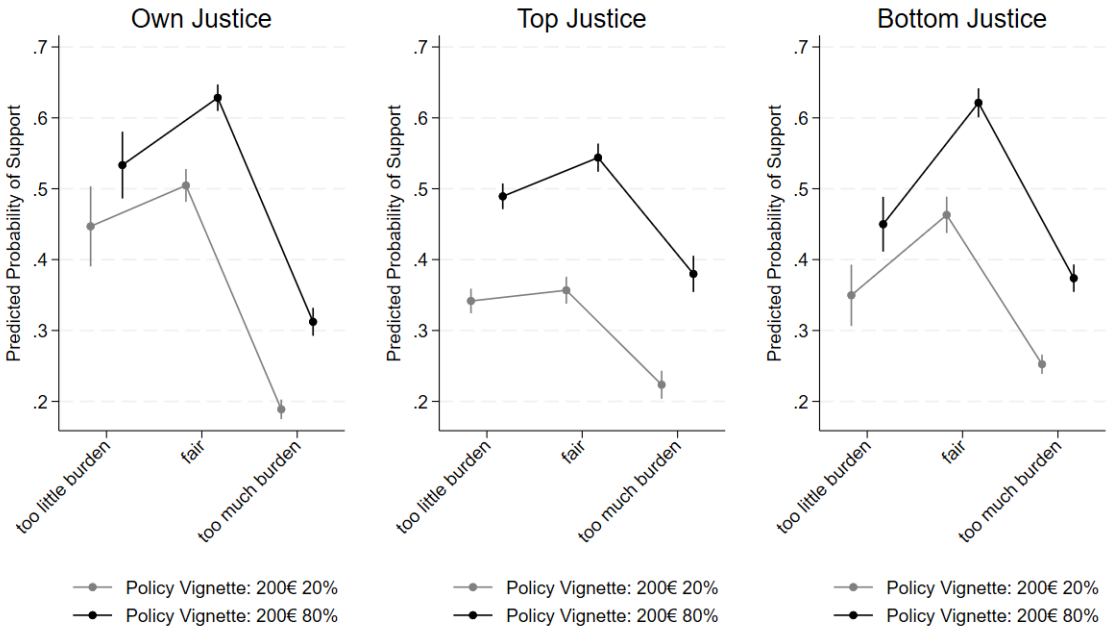
4.4.2 Relative Importance of Self- and Other-Regarding Justice Concerns

Figure 6 visualizes for each justice evaluation how the predicted probability of policy support changes with the direction of the justice evaluation. The predicted probabilities are obtained by running logit models as identified in equation 1 adding the three justice evaluations as categorical predictors, while simultaneously controlling for all information treatments and their interactions.

Policy support is consistently higher when the policy is perceived as fair, and lower when perceived as unfair (Figure 6). This pattern holds across all justice dimensions, and is particularly pronounced in the high-redistribution scenario, where all forms of perceived unfairness significantly reduce policy support (see table H.2). Under low redistribution, perceiving too little burden on oneself or the top income group is also negative but falls short of statistical significance.

Not all perceived injustice weighs equally, however. Consistent with self-centered inequity aversion (Fehr and Schmidt, 1999), disadvantageous inequity — perceiving oneself as unfairly overburdened — reduces policy support more strongly ($\hat{\beta}$ = - 0.316; se = 0.015) than advantageous inequity – perceiving oneself as unfairly burdened too little ($\hat{\beta}$ = - 0.095; se = 0.025)). While this confirms that self-interest shapes fairness concerns, the negative effect of feeling insufficiently burdened indicates that pure self-interest does not fully account for the pattern.

Figure 6: Relative importance of reflexive and non-reflexive justice evaluations



Notes: The figure shows predicted probabilities of policy support by the respondents' fairness evaluations for different anchors (own, top, bottom). Predictions are obtained fixing covariates at their mean. Full models are reported in table H.2 columns 1 and 2.

Figure 6 allows us to further assess the relative importance of self-regarding versus other-regarding justice concerns.[23] Wald tests for the high-price high-redistribution scenario reveal that the negative effects of perceiving any group as insufficiently burdened do not differ significantly from one another. For overburdening, however, a clear ranking emerges: Perceiving oneself as overburdened is most detrimental to policy support, followed by overburdening of bottom-income households — reducing support by nearly 25 percentage points — and overburdening of top-income households, which reduces support by 16 percentage points (Wald test: $\chi^2 = 8.400$, p-value $= .004$). Similarly, the negative effect of perceiving the rich as insufficiently burdened ($\hat{\beta} =$ - 0.171; se $= 0.022$) is roughly three times larger than the corresponding effect for the poor ($\hat{\beta} =$ - 0.054; se $= 0.015$; Wald test: 17.64, p-value $< .001$). Taken together, these results suggest that support for carbon tax-and-transfer policies is driven not only by self-interest but also by genuine distributive justice concerns, with a clear preference for progressivity. This preference for progressive designs as a driver of policy support is consistent with experimental evidence from Germany showing that exemptions for low-income households substantially raise acceptability of redistributive energy policies (Andor et al., 2022). Notably, the finding that perceiving any group — including the

[23] Wald tests for the equality of coefficients across all justice dimensions are reported in Table H.3 and H.4 for the high- and low-price policy vignettes, respectively.

poor — as insufficiently burdened, also reduces support points to an additional efficacy mechanism: Respondents may penalize policies they perceive as failing to achieve meaningful redistribution, regardless of who bears too little of the burden.

4.4.3 Effect of Information Treatments on Justice Perceptions

We next examine whether the information treatments affect self- and other-regarding justice concerns. In line with our pre-registered hypotheses, we test whether the financial treatment affects self-regarding justice perceptions, and whether the distributional information affects other regarding justice evaluations. Results of multinomial logit models for all three justice outcomes are presented in table 3.

As expected, the financial treatment significantly improves self-regarding justice concerns in the high-price, high-redistribution vignette, increasing the share of respondents who evaluate the policy's outcome for their own household as just by 11 percentage points while reducing the share who consider it overly burdensome by 12 percentage points. Consistent with our findings on general support, these effects are stronger among respondents who initially overestimated their costs (appendix table H.7). No significant effects are observed in the low-redistribution vignette, possibly because most respondents already anticipated higher costs under high carbon prices. The distributional treatment improves justice evaluations of the policies' consequences for households at the bottom and at top of the income distribution, with more pronounced effects in the high redistribution scenario. Despite increasing the share of respondents who consider the poor as insufficiently burdened under high redistribution and the rich as overly burdened under low redistribution, the treatment nonetheless raises the overall share of respondents who perceive the policy's consequences for these groups as fair across all scenarios.

Given that the mechanism treatment stresses the redistributive nature of tax-and-transfer schemes, it may also shape justice evaluations. We therefore report its effect on justice concerns in table H.5 in the appendix. We find that explaining the mechanism of carbon tax-and-transfer schemes reduces concerns about overburdening one's own and poor households under high redistribution, albeit to a lesser extent than the financial and distributional treatments, while most other-regarding justice concerns remain unaffected. This suggests that respondents can infer the progressive nature of carbon tax-and-transfer schemes from explanatory content. Comparing these results to the treatment effects of the financial and the distributional treatment on justice suggests, however, that spelling out the concrete consequences of a policy design has a more

Table 3: Treatment effects of financial treatment on self-regarding justice concerns, and of distributive treatment on other-regarding justice concerns

Effect of	**Financial Treatment**		**Distribution Treatment**			
	(1)	(2)	(3)	(4)	(5)	(6)
Redistribution share	80%	20%	80%	80%	20%	20%
Dependent variable:	Justice for self	Justice for self	Justice for poor	Justice for rich	Justice for poor	Justice for rich
Too little burden	0.010	0.005	0.061***	-0.128***	0.000	-0.187***
	(0.012)	(0.010)	(0.015)	(0.024)	(0.012)	(0.024)
Just right	0.111***	0.014	0.190***	0.103***	0.039*	0.079***
	(0.025)	(0.023)	(0.024)	(0.024)	(0.021)	(0.023)
Too much burden	-0.121***	-0.018	-0.252***	0.025	-0.039*	0.108***
	(0.025)	(0.024)	(0.024)	(0.021)	(0.023)	(0.023)
Observations	1,572	1,576	1,604	1,599	1,599	1,588
Individual controls	✓	✓	✓	✓	✓	✓

Notes: The table shows the marginal effects of providing respondents with information on the likely financial consequences for their own household on reflexive justice evaluations (column 1 & 2) and of showing the distributional consequences of each policy vignette on non-reflexive justice evaluations (column 3 - 6) for the high (80%) and low (20%) redistribution scenario. Only vignettes with a high carbon price of 200€/tCO_2 are used. Marginal effects are obtained based on multinomial logistic regressions. All models include only respondents from the control group and the respective treatment group. Standard errors are given in parentheses.
Significance levels: * p-value < 0.10; ** p-value < 0.05; *** p-value < 0.01

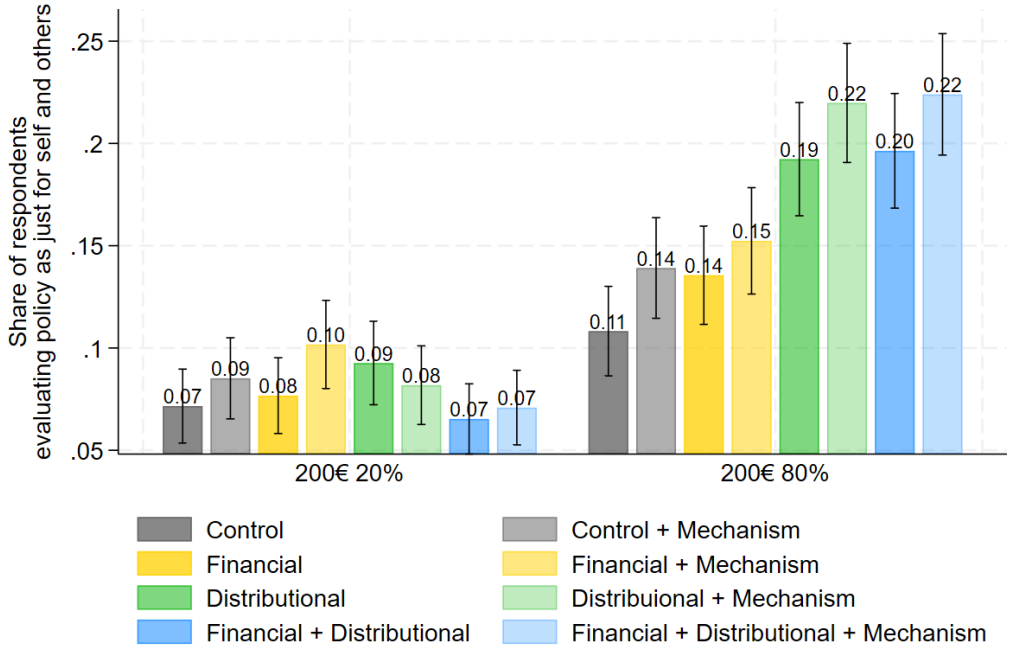
pronounced effect on both self- and other-regarding justice concerns than explaining the underlying mechanism alone.[24]

While the results above show that information treatments affect individual justice judgments, policy support may depend on the joint pattern of justice evaluations across all three dimensions. Graphical analysis reported in the appendix suggests that the treatments shift the distribution of justice profiles toward greater perceived fairness in the high-redistribution scenario (Figure H.3), with more mixed results under low redistribution (Figure H.4). Notably, the ideal profile — where the policy is perceived as fair for oneself and others simultaneously — is twice as prevalent under high redistribution (14%) as under low redistribution (7%) in the control group (figure 7). Logistic regression models estimating the probability of holding this profile (table H.8 in the appendix) show that under high redistribution, its prevalence increases significantly in

[24]Table H.6 additionally reports cross-treatment effects - i.e.,the marginal effect of financial information on other-regarding justice concerns (columns 1–4) and of distributional information on self-regarding justice concerns (columns 5–6), where we expect weaker or no treatment effects. The financial treatment is found to also affect other-regarding justice concerns, suggesting that individuals use individualized information to infer the policy's likely consequences for others. The distributional treatment likewise positively affects self-regarding justice concerns under high redistribution, plausibly because it covers the full income distribution and allows respondents to locate themselves within it. As expected, both cross-treatment effects are considerably smaller than the direct treatment effects reported in table 3, confirming that distributional information is most effective for addressing other-regarding justice concerns, while individualized financial information is most effective for self-regarding concerns.

response to information about the distributional consequences (+7 percentage points) and the policy mechanism (+3 percentage points), but not individual financial consequences. Under low redistribution, none of the information treatments significantly affect the prevalence of the ideal profile.

Figure 7: Share of respondents evaluating the high-price policy vignettes as just for self and others - by Redistribution Share



Notes: The figure shows the share of respondents who consider the policy's outcomes for their own household and for households at the bottom and the top of the income distribution as fair. Uncertainty is shown in 95% confidence intervals. A corresponding figure for the low-price policy vignettes is provided in figure H.2

In sum, the findings support our hypothesis that policy support responds to changes in perceived fairness. Where treatments shifted justice perceptions, as in the high-redistribution scenario, support changed accordingly. Where perceptions of fairness remained stable, as in the low-redistribution scenario, treatment effects on support were absent.

4.4.4 Mediation of Policy Support through Justice Perceptions

To assess whether justice concerns mediate the effect of our information treatments on policy support, we examine how the conditional marginal effect of each treatment changes when justice concerns are added as controls, holding the other two treatments at zero (Table 4).[25] We hypothesized that other-regarding justice concerns mediate the

[25] For consistency with the treatment effects reported in Section 4.2, we report conditional effects from fully interacted models, as in Section 4.3, fixing the other two treatments at zero. Estimates differ slightly from those in Section 4.2 because the mediation analysis is restricted to respondents with non-missing information on justice concerns.

effect of the distributional treatment, while self-regarding justice concerns mediate the effect of the financial treatment. Both hypotheses are supported. The marginal effect of the distributional treatment becomes statistically insignificant once other-regarding justice concerns are controlled for, and the effect of the financial treatment vanishes after controlling for self-regarding justice concerns — consistent with full mediation of both effects through justice evaluations under standard identifying assumptions. These results hold when averaging over all treatment combinations rather than fixing other treatments at zero (Table H.2).

The mechanism treatment, however, tells a different story. Its effect on policy support is approximately halved but remains statistically significant after controlling for justice concerns, suggesting partial rather than full mediation. This suggests that the mechanism treatment influences policy support through multiple pathways, of which justice is only one. Since this treatment conveys information about the policy's effectiveness in reducing carbon emissions, perceived effectiveness is a natural candidate for the residual effect.

Table 4: Conditional marginal Treatment effects controlling for justice

	80% Redistribution				20% Redistribution			
Mediation	Other-regarding Justice		Self-regarding Justice		Other-regarding Justice		Self-regarding Justice	
Information Treatments (ref. untreated)								
Distributional Treatment	0.058**	-0.027			0.006	0.010		
	(0.026)	(0.023)			(0.024)	(0.021)		
Financial Treatment			0.051*	-0.002			0.003	-0.004
			(0.026)	(0.023)			(0.024)	(0.021)
Mechanism Treatment								
Fairness to Top (ref. fair burden)								
too little burden		-0.048***				-0.003		
		(0.015)				(0.014)		
too much burden		-0.226***				-0.179***		
		(0.016)				(0.014)		
Fairness to Bottom (ref. fair burden)								
too little burden		-0.197***				-0.126***		
		(0.023)				(0.028)		
too much burden		-0.391***				-0.351***		
		(0.013)				(0.015)		
Fairness to Self (ref. fair burden)								
too little burden				-0.148***				-0.067**
				(0.026)				(0.031)
too much burden				-0.451***				-0.418***
				(0.012)				(0.015)
Treatment Interaction	✓	✓	✓	✓	✓	✓	✓	✓
Individual Controls	✓	✓	✓	✓	✓	✓	✓	✓
Observations	5876	5876	5876	5876	5961	5961	5961	5961

Notes: The table shows conditoinal marginal effects of justice concerns and treatments based on logit models predicting policy support with the respective justice concerns, all treatments and their interactions and all controls based on the full sample after applying listwise deletion. Standard errors in parentheses.
Significance levels: * p-value < 0.10; ** p-value < 0.05; *** p-value < 0.01

5 DISCUSSION

From a political economy perspective, the large share of individuals who are undecided or moderately positioned on carbon tax-and-dividend schemes opens a significant opportunity window for policy communication. Our findings confirm that public support is not fixed but responds systematically to policy design and to how financial and environmental impacts are conveyed — suggesting that how carbon pricing is framed and communicated can be decisive for electoral outcomes. Across all three treatments, we observe that revenue recycling is not a secondary design choice but a precondition for communication to increase support, consistent with Klenert et al. (2018) and Jagers, Martinsson, et al. (2019).

The responsiveness of opposition to information about how carbon tax-and-transfer schemes work – which has also been demonstrated by Dechezleprêtre et al. (2025) – suggests that at least part of current opposition reflects incomplete understanding rather than fixed preferences. Roughly half of this treatment effect persists independently of justice perceptions, suggesting that understanding how carbon pricing reduces emissions matters for support in its own right. The concentration of effects among respondents who actually understood the mechanism reinforces this interpretation, and suggests that public communication holds considerable untapped potential in the carbon pricing debate.

The effect of distributional information depends critically on policy design. Here public opinion appears to respond systematically to the likely welfare effects of such a design: While carbon pricing tends to be regressive in high-income countries (Ohlendorf et al., 2021), lump-sum rebates render it progressive (Klenert et al., 2018, Fried et al., 2024). Precisely under these conditions communicating distributional consequences increases support, improving justice evaluations for oneself, the poor, and the rich alike. Treatment effects are stronger among individuals who place themselves in lower income quintiles, which suggests that distributive information accentuates self-regarding concerns, consistent with (Beiser-McGrath and Busemeyer, 2023). Yet, when a majority stands to gain financially, these self-regarding responses translate into broader support.

The effect of individualized cost information is strongly contingent on prior expectations and is consistent with a straightforward Bayesian updating logic. Respondents who overestimated policy costs increased policy support. Importantly, we find not backlash effect among under-estimators, if redistribution was high. Effect size are consistent and comparable with other studies considering slight differences in design choice (Behringer et al., 2025, Fremstad et al., 2022).

Our study extends research on the role of fairness in shaping public attitudes (Drews and Van Den Bergh, 2016, Bergquist et al., 2022, Jagers, Lachapelle, et al., 2021) by

separating self- from other-regarding concerns. While self-interest is a relevant predictor of policy support, our results also suggest that other-regarding preferences - in particular - a concern for the poor - drives policy acceptance. This is consistent with general research on the social recognition of needs (Nullmeier, 2020) and stated preferences for progressive carbon tax designs (Gevrek and Uyduranoglu, 2015, Carattini, Carvalho, et al., 2018, Baranzini and Carattini, 2017). At the same time, the reduction in policy support that is associated with "too little burden" suggests respondents may penalize policies they perceive as failing to achieve meaningful emission reductions. This aligns with previous research showing that revenue recycling is frequently rejected based on a lack of trust in its emission-reducing capability (Stadelmann-Steffen and Dermont, 2018, Duetschke and Preuß, 2022).

These findings should be interpreted in light of several limitations. First, policy support is measured in a hypothetical vignette setting capturing short-term reactions to information and may be subject to the well-known gap between stated survey preferences and real-world political behavior. While the design mirrors realistic price levels and distributional effects, we cannot assess whether effects persist over time or translate into actual political behavior — a gap that Carattini, Chatterjee, et al. (2025) begin to address in the context of actual voting on climate policy. Moreover, real-world support for carbon pricing evolves within competitive political environments in which framing, elite cues, and the credibility of revenue recycling can substantially shape public attitudes (Carattini, Carvalho, et al., 2018, Mildenberger et al., 2022, Fremstad et al., 2022). Second, policy effectiveness in reducing carbon emissions was perfectly correlated with policy design in our study, meaning we cannot fully disentangle whether respondents' choices were driven by fairness or emission reduction concerns. While our results confirm that fairness concerns are relevant, future research should seek to disentangle fairness and efficiency concerns. Third, while our decision to elicit justice perceptions prior to policy support avoids post-rationalization bias (Kunda, 1990, Lee and Holyoak, 2021, Enisman et al., 2021), it likely artificially raises the salience of justice considerations, potentially inflating the observed mediation patterns. Our estimates should therefore be interpreted as upper bounds on the mediating role of justice concerns. At the same time, this speaks to the conditional importance of justice: When made salient, justice concerns appear powerful enough to crowd out other pathways linking information to policy support. Finally, we do not examine heterogeneous treatment effects by political ideology, as the survey did not include a direct measure of ideological self-placement. Prior research consistently finds that political ideology shapes baseline support for carbon taxation, with left-leaning individuals expressing higher baseline support and right-leaning individuals exhibiting greater skepticism to-

ward environmental taxes (Maestre-Andrés, Drews, and van den Bergh, 2019, Levi, 2021). However, revenue recycling design substantially moderates ideological divides, with lump-sum rebates and fairness-enhancing framing partially narrowing partisan gaps (Beiser-McGrath and Bernauer, 2019, Jagers, Martinsson, et al., 2019, Nowlin et al., 2020). Collectively, this literature indicates that political orientation shapes baseline attitudes toward carbon pricing, but policy design —particularly visible and transparent household rebates—can meaningfully attenuate ideological opposition.

6 CONCLUSION

Ambitious carbon pricing is widely regarded as essential for meeting climate targets. In 2025, around 28% of global CO_2 emissions were covered by carbon pricing (World Bank, 2025). Yet it remains publicly contested, and even recycling revenues does not securely increase support (Mildenberger et al., 2022). This paper asks whether, and under what conditions, better information can bridge that gap. Using a large-scale survey experiment in Germany, we show that the answer depends critically on both, what information is provided and how generous the redistribution is. Our findings carry implications for how the EU ETS II, and carbon pricing more broadly, can be designed and communicated to build public acceptance.

The large share of respondents without strong prior opinions in our sample is itself informative: It implies that electoral outcomes on carbon pricing are genuinely contestable, and that communication strategies have real room to work — though caution is warranted, as political messaging in real-world settings can dampen the positive effects of redistributive framing (Fremstad et al., 2022).

The findings yield several policy-relevant implications for the design of socially acceptable carbon pricing. First, how revenues are recycled is not a secondary design choice but a central determinant of whether the policy can win public support. A high and visible redistribution share substantially increases support even at elevated carbon price levels, suggesting that policymakers may secure early support by introducing carbon pricing alongside sizable climate dividends and only later adjusting the redistribution share as abatement options expand. Where generous redistribution is not feasible, emission intensity regulations may offer an alternative route to progressive climate policy (Zhao and Mattauch, 2022). Second, transparency about the financial and distributional consequences reinforces support particularly when policy designs are progressive. Combining a clear explanation of how the scheme reduces emissions with specific distributional information is the most effective communication approach, while adding personalized financial information yields no further gains and can backfire under low redistribution. Tools that make household-level impacts and distributional

profiles salient, such as personalized cost estimators or distributional dashboards, could therefore complement public communication. Ideally, such tools should also provide information on effectiveness, as effectiveness beliefs have been identified as another key driver of support (Bergquist et al., 2022). Taken together, our results indicate that ambitious carbon prices are politically feasible when revenue use is progressive, salient, and communicated in ways that reduce misperception about who gains and who bears the burden. Absent these design features, information alone is unlikely to generate durable support.

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SUPPLEMENTARY MATERIAL

A QUOTA SAMPLING, RANDOMIZATION, AND CO_2 COMPUTATION

A.1 Quotas

Both data collection and participant recruitment took place through our implementation partner Qualtrics. Participants are selected from Qualtrics' pool of respondents based on proportional quota sampling. In the first sampling stage, only individuals aged 18 and older living in Germany are selected for the survey. Individuals accessing the survey from a non German IP address and those below age 18 are screened out. Individuals who do not pass the reCaptcha test are also screened out. Individuals who fail an attention check, those who do not enter income information and those who do not enter information about their education are also screened out of the survey. We only receive data by our implementation partner on respondents who finish the survey.

Among the eligible population proportional quota sampling was employed. Quotas for age, gender, education, residential area, household size and total net household income brackets were defined to represent major characteristics of the study population: i.e. adult individuals residing in Germany. The respective quotas are displayed in table A.1 and represent single marginal distributions in the German population in 2021. These quotas have been derived from official statistics and the Socio-Economic Panel Study (v.38.1).

Table A.1: Quotas

	Data	Quota
N	6,870	
Age group		
18–24	850 (12.4%)	10.13%
25–34	1,358 (19.8%)	17.23%
35–44	1,336 (19.5%)	17.16%
45–54	1,415 (20.6%)	20.41%
55+	1,900 (27.7%)	34.41%
Gender		
Female	3,413 (49.8%)	49.85%
Male	3,439 (50.2%)	50.15%
Education level (ISCED)		
0–2	1,223 (18.1%)	15.97%
3–4	3,634 (53.7%)	57.10%
5–8	1,909 (28.2%)	26.79%
Urban category		
Small/medium city (< 100,000)	4,053 (59.0%)	67.77%
Large city (100,000+)	2,817 (41.0%)	32.23%
Household members		
1	1,649 (24.0%)	41.1%
2	2,210 (32.2%)	33.5%
3	1,478 (21.5%)	11.9%
4	1,068 (15.5%)	9.5%
5+	465 (6.8%)	3.9%
HH net income (€)		
0–2,500	2,275 (33.1%)	40.68%
2,501–5,000	3,238 (47.1%)	36.71%
5,001–7,500	759 (11.0%)	13.35%
> 7,500	598 (8.7%)	9.26%

Notes: Quotas for household size deviate from the targeted quota, as it was necessary to relax this quota to facilitate survey completion. As A.2 shows, the household composition is comparable across treatment arms and should therefore not affect results from the information treatments.

A.2 Randomization and Data Quality

Table A.2: Randomization across treatment arms

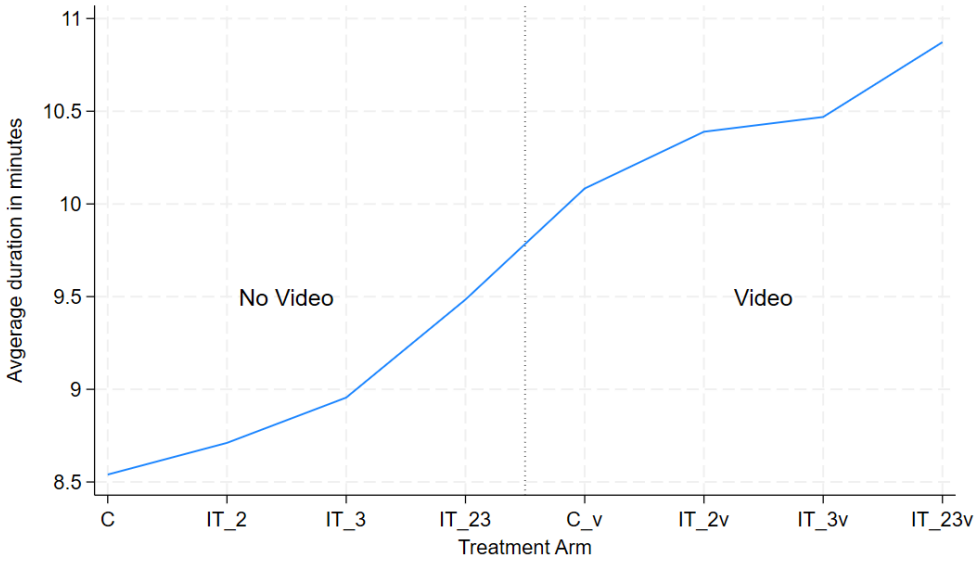
	Treatment Arm								
	C_n	IT_2_n	IT_3_n	IT_23_n	C_v	IT_2_v	IT_3_v	IT_23_v	Total
N	873 (12.7%)	865 (12.6%)	871 (12.7%)	872 (12.7%)	855 (12.4%)	827 (12.0%)	863 (12.6%)	844 (12.3%)	6,870 (100.0%)
Age	44.444 (15.502)	43.267 (15.153)	43.595 (15.649)	44.750 (15.429)	44.221 (15.519)	43.785 (15.775)	43.262 (15.244)	43.607 (14.925)	43.869 (15.402)
Gender									
Female	427 (49.0%)	420 (48.7%)	439 (50.5%)	448 (51.4%)	409 (48.0%)	421 (50.9%)	430 (50.1%)	419 (49.8%)	3,413 (49.8%)
Male	444 (51.0%)	442 (51.3%)	430 (49.5%)	423 (48.6%)	443 (52.0%)	406 (49.1%)	429 (49.9%)	422 (50.2%)	3,439 (50.2%)
HH members									
1	227 (26.0%)	221 (25.5%)	215 (24.7%)	214 (24.5%)	217 (25.4%)	180 (21.8%)	187 (21.7%)	188 (22.3%)	1,649 (24.0%)
2	291 (33.3%)	274 (31.7%)	270 (31.0%)	287 (32.9%)	260 (30.4%)	272 (32.9%)	279 (32.3%)	277 (32.8%)	2,210 (32.2%)
3	184 (21.1%)	193 (22.3%)	182 (20.9%)	184 (21.1%)	200 (23.4%)	181 (21.9%)	185 (21.4%)	169 (20.0%)	1,478 (21.5%)
4	115 (13.2%)	115 (13.3%)	143 (16.4%)	130 (14.9%)	126 (14.7%)	140 (16.9%)	151 (17.5%)	148 (17.5%)	1,068 (15.5%)
5+	56 (6.4%)	62 (7.2%)	61 (7.0%)	57 (6.5%)	52 (6.1%)	54 (6.5%)	61 (7.1%)	62 (7.3%)	465 (6.8%)
Num. children in HH									
0	557 (63.8%)	531 (61.4%)	528 (60.6%)	543 (62.3%)	512 (59.9%)	486 (58.8%)	510 (59.1%)	503 (59.6%)	4,170 (60.7%)
1	207 (23.7%)	213 (24.6%)	197 (22.6%)	199 (22.8%)	203 (23.7%)	203 (24.5%)	212 (24.6%)	184 (21.8%)	1,618 (23.6%)
2	88 (10.1%)	97 (11.2%)	113 (13.0%)	103 (11.8%)	115 (13.5%)	108 (13.1%)	111 (12.9%)	124 (14.7%)	859 (12.5%)
3	16 (1.8%)	16 (1.8%)	25 (2.9%)	21 (2.4%)	18 (2.1%)	23 (2.8%)	23 (2.7%)	24 (2.8%)	166 (2.4%)
4	5 (0.6%)	8 (0.9%)	5 (0.6%)	4 (0.5%)	6 (0.7%)	6 (0.7%)	7 (0.8%)	6 (0.7%)	47 (0.7%)
5+	0 (0.0%)	0 (0.0%)	3 (0.3%)	2 (0.2%)	1 (0.1%)	1 (0.1%)	0 (0.0%)	3 (0.4%)	10 (0.1%)
Education									
Primary, seconday school	155 (17.8%)	153 (17.7%)	141 (16.2%)	153 (17.5%)	150 (17.5%)	140 (16.9%)	161 (18.7%)	146 (17.3%)	1,199 (17.5%)
Technical college, high school	469 (53.7%)	438 (50.6%)	465 (53.4%)	431 (49.4%)	433 (50.6%)	429 (51.9%)	458 (53.1%)	424 (50.2%)	3,547 (51.6%)
No school (yet)	9 (1.0%)	12 (1.4%)	12 (1.4%)	16 (1.8%)	12 (1.4%)	10 (1.2%)	17 (2.0%)	23 (2.7%)	111 (1.6%)
University degree	222 (25.4%)	247 (28.6%)	243 (27.9%)	260 (29.8%)	250 (29.2%)	234 (28.3%)	211 (24.4%)	242 (28.7%)	1,909 (27.8%)
Other	18 (2.1%)	15 (1.7%)	10 (1.1%)	12 (1.4%)	10 (1.2%)	14 (1.7%)	16 (1.9%)	9 (1.1%)	104 (1.5%)
Urban or Rural Area									
Large City	339 (38.8%)	328 (37.9%)	374 (42.9%)	372 (42.7%)	397 (46.4%)	324 (39.2%)	351 (40.7%)	332 (39.3%)	2,817 (41.0%)
Small/Medium City	381 (43.6%)	398 (46.0%)	363 (41.7%)	366 (42.0%)	336 (39.3%)	363 (43.9%)	374 (43.3%)	379 (44.9%)	2,960 (43.1%)
Rural Area	153 (17.5%)	139 (16.1%)	134 (15.4%)	134 (15.4%)	122 (14.3%)	140 (16.9%)	138 (16.0%)	133 (15.8%)	1,093 (15.9%)
HH net income									
0-2500	302 (34.6%)	300 (34.7%)	287 (33.0%)	303 (34.7%)	290 (33.9%)	275 (33.3%)	279 (32.3%)	239 (28.3%)	2,275 (33.1%)
2501 - 5000	402 (46.0%)	377 (43.6%)	416 (47.8%)	400 (45.9%)	396 (46.3%)	394 (47.6%)	414 (48.0%)	439 (52.0%)	3,238 (47.1%)
5001 - 7500	99 (11.3%)	101 (11.7%)	85 (9.8%)	96 (11.0%)	106 (12.4%)	93 (11.2%)	84 (9.7%)	95 (11.3%)	759 (11.0%)
more than 7500	70 (8.0%)	87 (10.1%)	83 (9.5%)	73 (8.4%)	63 (7.4%)	65 (7.9%)	86 (10.0%)	71 (8.4%)	598 (8.7%)

Note: v represents the mechanism treatment (IT1), n represents that the group did not receive the mechanism treatment. Under the financial treatment (IT2) individuals received information on the financial consequences of the policy for their own household in comparison to the status quo. IT3 refers to the distributional treatment.

Before entering the survey, respondents have to pass a reCAPTCHA check and basic bot detection in order to start answering the survey. The survey duration increases monotonically with increasing survey complexity. Individuals in the control group have the lowest survey duration, while those receiving all information treatments have the highest, see figure A.1 for the average duration across all treatment arms. Pooling the entire sample, the median survey duration is nine minutes. Individuals with a survey duration of less than three minutes are screened out by the implementation partner and are not part of the raw sample. At the beginning of the survey, respondents have to answer a basic attention check,[26] which is passed by 94.81% of the total sample. Those failing the attention check are excluded from all analyses.

Each policy vignette is answered in two frames. In the first frame, individuals receive all the information on the specific policy vignette as well as the additional information treatments. Respondents then have to answer a basic multiple-choice question where they have to select the correct price and redistribution share combination for this specific policy vignette. When respondents answer incorrectly, they are informed that the response is wrong and have to correct their choice. Progression in the survey is only possible once the correct policy vignette has been selected.[27] In the second frame, all information about the policy vignette is repeated for reference, and outcomes are elicited.

Figure A.1: Average survey duration



Notes: Outliers above the 95th quintile of survey duration were excluded for this plot. Treatment arms are ordered with increasing complexity i.e., treatment arms to the right on the x-axis were displayed more information. The video shown had a duration of 1:04 minutes. Individuals with a survey duration of three minutes were screened out by the implementation partner and are not part of the raw sample.

[26] Respondents are asked to click on the replies "1" and "4".
[27] We observe the time spent on this frame as well as the total number of clicks on this frame.

Table A.3: Questions of understanding of the mechanism treatment (IT1)

	Summary
N	3,389
Video understanding on carbon price	
Incorect answer	517 (15.5%)
Correct answer	2,594 (77.7%)
Does not know	229 (6.9%)
Video understanding on climate dividend	
Incorect answer	581 (17.5%)
Correct answer	2,375 (71.3%)
Does not know	373 (11.2%)

Notes: See the full questionnaire in the online appendix for the exact question text. The video is only shown to half the respondents. Among those who receive the video treatment 91% watch the video, while 9% indicate that they cannot watch the video and are shown the video text instead. Note that progression in the survey is only possible after 60 seconds for those with the video and after ten seconds for those with the text. The figure depicts the share of respondents answering the question of understanding correctly.

Table A.4: Rejection reasons in the control group by policy

	45€ 20%	45€ 80%	200€ 20%	200€ 80%
Financial burden own household	44	39	54	51
Against CO2 pricing	42	44	40	41
Green Infrastructure	11	13	8	13
Burden too high for poor	17	17	20	16
Higher CO2 prices	8	8	4	5
No climate effect	25	26	23	24
Other reason	3	3	2	2
N against	469	418	575	481
N Total	838	838	838	838

Note: Only individuals that opposed the introduction of the policy could state the reason why they opposed it. Respondents could select multiple reasons for their opposition. The table reports the share that reported each category among those that opposed the introduction of the policy.

Table A.5: Association of covariates with overall policy support control group

	(1) Overall support
Age	.
	.
Age 25-34	-0.006
	(0.047)
Age 35-44	-0.099**
	(0.049)
Age 45-54	-0.059
	(0.048)
Age 55+	-0.144***
	(0.046)
Female	-0.021
	(0.026)
Uni	0.047
	(0.030)
Income	.
	.
2501 - 5000	0.002
	(0.031)
5001 - 7500	-0.004
	(0.047)
more than 7500	0.120**
	(0.056)
City	0.037
	(0.028)
Renewable heating	0.068*
	(0.037)
Car	-0.057
	(0.045)
Tenant	0.018
	(0.029)
Constant	0.483***
	(0.069)
Observations	3,075
Respondents	798

Note: The outcome variable is a binary indicator that takes on the value of 1 if respondents indicated that they would support the implementation of a policy (pooling very in favor, in favor, slightly in favor) and 0 if respondents opposed the implementation of the policy. Only data from the control group is used, where we pool across all four policy vignettes but control for the price and share. Standard errors are clustered on the respondent level. Baseline category for age are those aged 18 - 24, for income the baseline is 0 - 2500.
Significance Levels: * p-value < 0.10; ** p-value < 0.05; *** p-value < 0.01

A.3 Calculation of Respondent-specific Carbon Footprint

For each respondent i and policy vignette j, we calculate the respondent's household's net burden from the respective policy package as follows:

$$\begin{aligned} \text{Net Dividend}_{ij} = \text{Dividend}_{ij} \times N_{adults} + 0.5 \times N_{children} \\ - \text{price}_{ij} \times (CO_2heat_j + CO_2mob_j) \end{aligned} \tag{2}$$

Household's carbon emissions are a sum of carbon emissions based on mobility (CO_2mob_j) and heating (CO_2heat_j) as discussed below. The size of the dividend for policy vignette j is calculated using a microsimulation model as described in section A.4.

Mobility

Carbon emissions from mobility are calculated based on respondents' information on the number of cars they own and their respective monthly fuel expenditures. We differentiate between fuel types and present the option to chose for each owned vehicle fuel costs from diesel, petrol, E10, autogas and electricity. We divide these costs by the average fuel prices in 2023 and compute the amount of fuel consumed. This value is then converted into CO_2 emissions using the relevant conversion factors. The exact values used in these calculations are given in table A.6.[28].

Table A.6: Emission factors and prices for fuel in 2023

Fuel Source	**Emission Factor** (in tons of CO^2 per lt)	**Price** (in EUR per lt)
Diesel	0.00266	1.722
Petrol	0.00228	1.849
E10	0.00226	1.791
Autogas	0.00146	1.10
Electricity (kwh)	0.000434	0.52

[28] Emission factors were derived for electricity from https://www.umweltbundesamt.de/sites/default/files/medien/1410/publikationen/2023_05_23_climate_change_20-2023_strommix_bf.pdf, for petrol and E10 from https://www.umweltbundesamt.de/sites/default/files/medien/479/publikationen/cc_28-2022_emissionsfaktoren-brennstoffe_bf.pdf, for electricity and autogas from https://www.bafa.de/SharedDocs/Downloads/DE/Energie/eew_infoblatt_co2_faktoren_2022.pdf?__blob=publicationFile&v=6. Diesel and E10 prices were obtained from https://www.adac.de/verkehr/tanken-kraftstoff-antrieb/deutschland/kraftstoffpreisentwicklung/#spritpreise-2011-bis-2023, petrol prices from https://de.statista.com/statistik/daten/studie/776/umfrage/durchschnittspreis-fuer-superbenzin-seit-dem-jahr-1972/, autogas prices from https://www.adac.de/verkehr/tanken-kraftstoff-antrieb/alternative-antriebe/autogas/, and electricitity prices are calculated using the average price from the following four sources: https://www.lichtblick.de/presse/ladesaeulencheck-2020-strom-tanken-bleibt-ein-abenteuer/, https://de.statista.com/statistik/daten/studie/882563/umfrage/strompreise-an-e-auto-ladesaeulen-nach-betreiber-in-deutschland/ and https://www.lichtblick.de/ladesaeulencheck2023/

Heating

Carbon emissions from heating are predicted using a regression approach based on respondents' information on the number of people in the household (npers), the square meter of the dwelling (sqm), the income bracket of the household, and the main type of energy which the household uses for heating and warm-water production. Respondents whose heating system mainly used fossil fuels could additionally indicate whether they also use solar energy or renewable energy as a source of heating or warm-water production. We use data from the German Socio-Economic Panel (SOEP v.38.1) to obtain the regression weights, which allow us to predict household carbon emissions from heating for the respondents in our survey.

In 2020 respondents of the SOEP were asked a comprehensive set of questions on the energy sources of their heating systems and their heating related expenditures. Combining this information with average prices of the respective energy source in the SOEP survey year, and resource specific emission factors allows to derive the heating related carbon emissions for the representative SOEP survey population. In line with the legal regulations on carbon-taxation, we assume emission factors of 0 for heating derived from solar energy, renewable energy sources (wood and biomass) and environmental heat. Since electricity is not subject to carbon taxation, we also assume an emission factor of 0 for other heating systems that use electricity as their main energy source. As the SOEP questionnaire was fielded in 2020 and respondents reported their expenditures for the previous year, we use emission factors and prices for 2019 (see table A.7). Emission factors used in our calculations were derived from Juhrich (2022).[29].

Table A.7: Emission factors and prices

Energy Source	**Emission Factor** (in tons of CO_2 per kwh)	Price (in EUR per kwh)
Gas	0.000201	.0679
Liquid Gas	0.000239	.0684
Oil	0.000266	.0680
Coal	0.000359	.0497
District Heat	0.000280	

Table A.8 shows a number of alternative specifications using the number of persons in the household, the square meter of the dwelling, the household's income and the type of heating as predictors of household's carbon emissions. These variables account for roughly 40 percent of the observed variation in carbon emissions from heating with

[29] https://www.bafa.de/SharedDocs/Downloads/DE/Energie/eew_infoblatt_co2_faktoren_2022.pdf?__blob=publicationFile&v=6

fossil fuels. Model based predictions of carbon emissions and the calculated predictions reach moderate correlation rates of 0.6 on average. We decided to base the formula we use to predict the impact of a particular policy on a particular household on the regression weights obtained in Model 3. The model is chosen because it explains the highest share of the variation in household emissions from heating with fossil fuels while not depending on income information. Equation 3 describes how we construct the households carbon emissions which are subject to carbon pricing - which is then used to calculate the net burden or benefit of the carbon tax-and-transfer scheme as indicated in equation 2 above.

$$
\begin{aligned}
CO_2heat_j = & -1.916288 \\
& + 1.791785 \text{ for 2 person hh} \\
& + 2.652545 \text{ for 3 person hh} \\
& + 3.263583 \text{ for 4 person hh} \\
& + 3.81411 \text{ for 5 person hh} \\
& + 4.198562 \text{ for hh with six and more persons} \\
& + 0.0578538 \times \frac{\text{sqm}}{\text{npers}} \\
& - 0.0001221 \times (\frac{\text{sqm}}{\text{npers}})^2 \\
& + 1.071575 \text{ for hh using gas as main energy source} \\
& + 2.005308 \text{ for hh using liquid gas as main energy source} \\
& + 2.955629 \text{ for hh using oil as main energy source} \\
& + 2.927866 \text{ for hh using coal as main energy source} \\
& + 1.561346 \text{ for hh using district heat as main energy source} \\
& + 0 \text{ for hh using environment heat as main energy source} \\
& + 0 \text{ for hh using solar heat as main energy source} \\
& + 0 \text{ for hh using electricity as main energy source} \\
& + 0 \text{ for hh using other renewable energy sources as main energy source} \\
& - 0.7820946 \text{ for hh using fossil fuels as main energy source who also use solar heating} \\
& - 0.9917422 \text{ for hh using fossil fuels as main energy source who additionally use wood}
\end{aligned}
\tag{3}
$$

Table A.8: Regression models to predict carbon emissions from heating

	Model 1 sqm b (se)	Model 2 sqm & inc b (se)	Model 3 sqm^2 b (se)	Model 4 sqm & inc^2 b (se)	Model 5 sqm^2&inc b (se)	Model 6 sqm^2&inc^2 b (se)
Number of individuals in household						
1	0.000	0.000	0.000	0.000	0.000	0.000
	(.)	(.)	(.)	(.)	(.)	(.)
2	1.710***	1.660***	1.792***	1.653***	1.743***	1.740***
	(0.045)	(0.045)	(0.045)	(0.045)	(0.045)	(0.045)
3	2.404***	2.363***	2.653***	2.367***	2.599***	2.598***
	(0.066)	(0.066)	(0.067)	(0.066)	(0.068)	(0.068)
4	2.919***	2.882***	3.264***	2.898***	3.209***	3.211***
	(0.074)	(0.075)	(0.077)	(0.076)	(0.079)	(0.079)
5	3.393***	3.340***	3.814***	3.373***	3.735***	3.743***
	(0.128)	(0.131)	(0.130)	(0.132)	(0.133)	(0.133)
6 and more	3.712***	3.678***	4.199***	3.738***	4.128***	4.145***
	(0.198)	(0.200)	(0.199)	(0.201)	(0.201)	(0.202)
Household characteristics						
Square Meter p.c.	0.034***	0.032***	0.058***	0.032***	0.056***	0.056***
	(0.001)	(0.001)	(0.002)	(0.001)	(0.002)	(0.002)
Square Meter p.c. (squared)			-0.000***		-0.000***	-0.000***
			(0.000)		(0.000)	(0.000)
Household income p.c. (in 500 €)		0.006**		0.022***	0.002	0.008
		(0.002)		(0.006)	(0.002)	(0.006)
Household income p.c. (squared)				-0.000**		-0.000
				(0.000)		(0.000)
Type of heating						
Gas	1.071***	1.058***	1.072***	1.059***	1.065***	1.065***
	(0.108)	(0.108)	(0.107)	(0.108)	(0.107)	(0.107)
Liquid Gas	2.043***	2.113***	2.005***	2.114***	2.082***	2.083***
	(0.135)	(0.137)	(0.134)	(0.137)	(0.136)	(0.136)
Oil	2.955***	2.928***	2.956***	2.929***	2.930***	2.931***
	(0.110)	(0.110)	(0.108)	(0.110)	(0.109)	(0.109)
Coal	2.906***	2.674***	2.928***	2.697***	2.692***	2.700***
	(0.184)	(0.183)	(0.182)	(0.183)	(0.181)	(0.181)
District Heat	1.494***	1.464***	1.561***	1.466***	1.532***	1.532***
	(0.113)	(0.114)	(0.112)	(0.114)	(0.113)	(0.113)
Wood (additional)	-0.944***	-0.944***	-0.992***	-0.950***	-0.993***	-0.994***
	(0.066)	(0.067)	(0.065)	(0.067)	(0.066)	(0.066)
Solar (additional)	-0.735***	-0.706***	-0.782***	-0.709***	-0.763***	-0.763***
	(0.085)	(0.085)	(0.084)	(0.085)	(0.085)	(0.085)
Constant	-0.953***	-0.939***	-1.916***	-1.085***	-1.829***	-1.873***
	(0.121)	(0.124)	(0.138)	(0.135)	(0.140)	(0.146)
Model Fit						
r2	0.389	0.387	0.401	0.387	0.399	0.399
N	9840	9224	9840	9224	9224	9224
Corr (Pred,Orig)	0.6080	0.6034	0.6164	0.6042	0.6164	0.6141

Calculation of own dividend for non-responders and outliers

Square meters are missing or outliers: For respondents who do not answer the question on the square meters of their dwelling, we impute the size of their homes by assigning them the median size of the dwelling for the respective household size, separately for home-owners and tenants according to table A.9.[30] We also use median values for individuals who enter values that are below the first, and higher than the 99th percentile of what is observed in the SOEP in 2020.

Table A.9: Replacement Values for non-responses and outliers for size of dwelling

Owner	HH size	Obs	Mean	Median	P1	P99
Yes	1	1,109	106	100	40	260
Yes	2	2,909	127	120	57	280
Yes	3	1,103	137	130	66	270
Yes	4	1,238	147	140	74	300
Yes	5	462	166	160	89	360
Yes	6 and more	163	179	165	95	320
No	1	3,712	62	60	15	140
No	2	3,122	82	76	40	180
No	3	1,250	92	85	49	200
No	4	1,004	101	95	48	192
No	5	349	105	100	30	200
No	6 and more	159	116	114	57	230

Note: Average dwelling size and number of observations in the SOEP in 2020 for tenants and owners by household size.
Source: SOEP v.38.1

Type of heating is missing: For respondents who do not report the type of heating they have, or who report that they do not know their heating system, we assign a weighted average of the regression weights of model 3. The weights which are used to construct the average consider the share of households that use the respective heating type and are obtained from SOEP data (see table A.10 below). This means that non-respondents are attributed an average regression weight of 1.474.

Fuel expenditure is missing: For respondents who do not report their fuel expenditure, we assign average fuel expenditures given in table A.11 based on the number of cars owned. The weights which are used to construct the averages consider the share of households and individuals in the SOEP data that are representative of the broader population in Germany.

[30] Median dwelling size is calculated based on SOEP (v.38.1) using information from 2020. The averages reported in the SOEP are in line with patterns observed in micro-census data (to be found here https://www.destatis.de/DE/Themen/Gesellschaft-Umwelt/Wohnen/Tabellen/tabelle-wo4-wohnflaeche.html).

Table A.10: Weight for emission factors for non-responders on heating type

Obs	Share	
Gas	16,634	0.470
Liquid Gas	16,634	0.032
Oil	16,634	0.215
District Heat	16,634	0.153
Coal	16,634	0.011

Table A.11: Imputed average fuel expenditures for missing information

Number of cars owned	Average fuel expenditure (€ per year)
1 car	1,095
2 cars	2,202
3 cars	2,929
4 cars and more	3,465

A.4 Micro-simulation of Distributional Implications

The distributional effects of higher energy prices and of compensation via a flat-rate, per capita climate dividend are simulated using 2020 household survey data from the German Socio-Economic Panel (SOEP) (Liebig et al., 2022). The SOEP is a representative longitudinal panel of German households, providing detailed information on household composition and living conditions. In 2020, the survey included comprehensive questions on energy expenditure for heating and mobility. Based on these expenditure data, we estimate household fuel consumption by dividing expenditure by average prices within relevant consumption bands, accounting for household size, building age, and floor space. Aggregating these estimates across households and applying survey weights, we validate our consumption estimates against data from the German National Accounts and Environmental Accounts. Household-level fuel consumption is then multiplied by fuel-specific CO_2 emission intensity factors to calculate total CO_2 emissions from heating and vehicle fuels at the household level. This approach has been applied in previous work assessing carbon pricing and climate dividends in Germany (Bach, Buslei, et al., 2023, Bach, Hamburg, et al., 2024, Bach, Engelhardt, et al., 2025).

For CO_2 pricing, we assume a full pass-through of higher prices from producers to consumers and simulate the associated costs in a static model, i.e., assuming no behavioral adjustment in consumption. This approach partially overestimates the direct impact of carbon prices. However, if consumers adjusted their behavior, associated costs would arise, so the resulting effects on real income or welfare are likely not sub-

stantially smaller than those predicted by the static model. This modeling choice is motivated by the lack of reliable, differentiated elasticities for large, persistent price increases in heating and vehicle fuels across income groups. Indirect price effects on non-fuel consumption goods are also not modeled; these effects are expected to be small to moderate, as the most affected sector would be transport services, which would likely translate only modestly into consumer prices. This microsimulation model was previously used to assess the distributional implications of carbon pricing for the German Federal Environment Agency which is required by law to evaluate the distributional consequences of carbon pricing (Schrems et al., 2022).

We split the representative sample of German households into five groups based on equivalence-weighted income to illustrate the average effect of each policy scenario across the income distribution. All results are expressed relative to the status quo, defined as a carbon price of €45 per ton and no climate dividend.

B BACKGROUND ON POLICY VIGNETTES AND INFORMATION TREATMENTS

B.1 Additional Details on Policy Vignettes

This appendix provides additional background on the policy scenarios used in the vignettes presented to respondents.

Policy Design Hypotheses

The carbon price and the revenue redistribution share shape different dimensions of the policy's distributional consequences. The carbon price determines the absolute magnitude of payments—higher prices increase both tax burdens and dividend payments—whereas the redistribution share determines the degree of progressivity by allocating a larger or smaller fraction of revenues equally across households. Individuals may misperceive both components: The absolute financial burden or benefit associated with the tax, and the extent to which the scheme is progressive. Varying both parameters in our experimental design allows us to disentangle these two dimensions and to study how each interacts with information treatments. Keeping information constant, we expect that policy features affect accept as follows:

> **HP 1a**: *Policy support decreases as the price increases (keeping the redistribution share constant).*
>
> **HP 2a**: *Policy support decreases as the redistribution share decreases (keeping the price constant).*
>
> **HP 3a**: *Policy support decreases with a higher price. This reduction is stronger for the lower redistribution shares.*

Institutional Context and Price Assumptions

At the time of the survey, the German national carbon price for heating and transport fuels was 45 €/tCO_2. This price applies to direct emissions from gas, heating oil, petrol, and diesel. Fuels used for electricity generation and district heating were not subject to this national price because these sectors were already covered under the EU Emissions Trading System (ETS I). For this reason, the implicit carbon price for electricity and district heating is treated as 0 €/tCO_2 in the experiment.

From 2027 onward, these sectors will enter the new EU ETS II, where the carbon price will be determined by market forces rather than by a fixed national schedule. Several projections suggest that ETS II prices may substantially exceed current levels;

values above 150 - 200€/tCO_2 are considered plausible under ambitious European climate trajectories (Pietzcker et al., 2021). The high-price vignette of 200 €/tCO_2 therefore represents a reasonable forward-looking scenario.

A small share of respondents was surveyed in early January 2025, shortly after the statutory price increase to 55 €/tCO_2. These respondents were instructed to answer all vignette questions as if the price were still 45 €/tCO_2. Robustness checks confirm that excluding these respondents does not affect the results.

Revenue Use and Social Climate Fund Constraints

At the time of data collection, revenues from carbon pricing in Germany were earmarked primarily for public investment in energy-efficiency programs, renewable infrastructure, and industrial decarbonization. Direct transfers to households (e.g., climate dividends) were not in effect.

From 2027 onward, a fraction of carbon revenues will contribute to the EU Social Climate Fund (SCF), designed to mitigate regressive impacts of carbon pricing across member states. The SCF allocation is capped at 65 billion € for 2027–2032 and distributed to countries according to a needs-based formula. Member states may use up to 37.5% of their SCF allocation for direct income transfers; the remainder must support decarbonization and energy-poverty measures.

Because ETS II revenues will accrue both to the SCF and to national budgets, but the future carbon price is uncertain, the total revenue available for direct redistribution is likewise uncertain. The 20% and 80% revenue-recycling shares in the vignettes capture two stylized, policy-relevant scenarios: (i) low redistribution (20%), in which most revenues remain earmarked for public investment; and (ii) high redistribution (80%), in which most revenues are returned as climate dividends after accounting for SCF contributions and administrative costs.

Dividend Calculation and Household Adjustments

In all vignettes, dividends are distributed equally across residents, with adults receiving the full amount and children receiving half the adult amount. Equal per-capita distribution is chosen because it represents the canonical benchmark in economic models of tax-and-transfer schemes and the most widely discussed policy option in the German public debate.

Dividend amounts shown to respondents are calculated using revenue estimates from the respective carbon price and redistribution share. These calculations rely on fuel consumption patterns derived from the German Socio-Economic Panel (SOEP), together with standardized assumptions about population size and average emissions

from heating and transport fuels. Dividend values presented in the survey are rounded to the nearest euro for ease of comprehension.

Effectiveness Ranking of the Four Policy Scenarios

Respondents are shown a simple ranking of the relative emission-reduction effectiveness of the four policy vignettes. The ranking does not include numerical emission reductions, only the relative ordering:

1. 200 €/tCO_2, 20% redistribution,
2. 200 €/tCO_2, 80% redistribution,
3. 45 €/tCO_2, 20% redistribution,
4. 45 €/tCO_2, 80% redistribution.

This ordering reflects that higher carbon prices create stronger incentives to reduce emissions and that, for a given price, allocating a larger share of revenue to public investment strengthens these incentives in the short run. Respondents see only the qualitative ranking; the numerical reasoning is documented here for completeness.

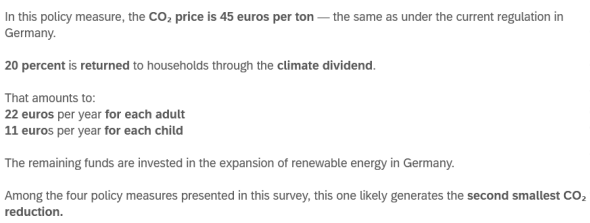
Coverage of Fuels and Emission Sources

The carbon price in the vignettes applies exclusively to direct emissions from heating fuels (e.g., natural gas, heating oil) and transport fuels (petrol and diesel). Indirect emissions from electricity and district heating are excluded for the reasons noted above. Respondents are informed only about aspects directly relevant to household finances (fuel costs and the climate dividend).

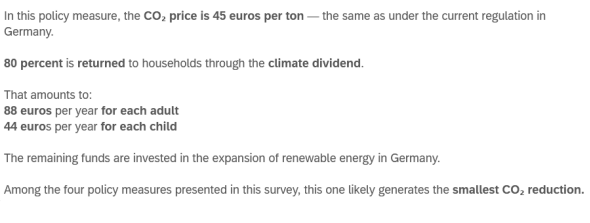
B.2 Policy Vignettes Shown to All Respondents

Figure B.1: Policy vignettes shown to all respondents

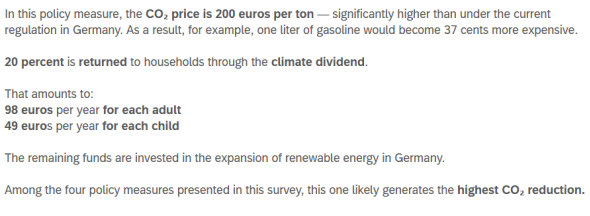
(a) 45 €/tCO$_2$, 20% Redistribution support



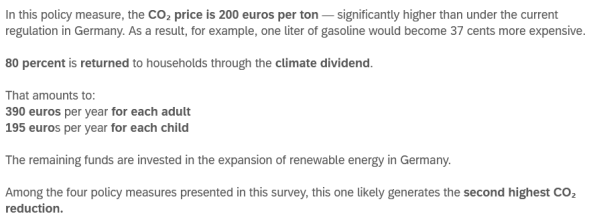
(b) 45 €/tCO$_2$, 80% Redistribution



(c) 200€/tCO$_2$, 20% Redistribution



(d) 200€/tCO$_2$, 80% Redistribution



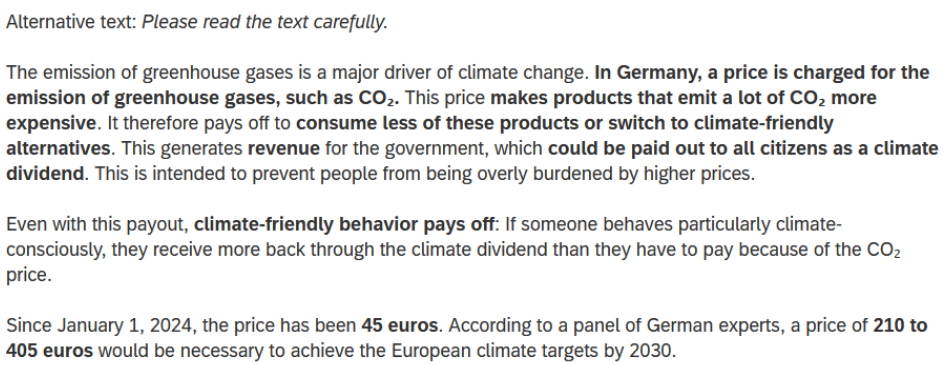
Notes: The figures show the basic information that all respondents irrespective of treatment group assignment received about each of the respective policy vignettes.

B.3 Mechanism Treatment

The full video (in German) can be accessed via this link.

Individuals could also choose to read the text of the video. The display of the alternative text looked as follows to respondents:

Figure B.2: Alternative text to the video in the mechanism treatment



B.4 Financial Treatment

Figure B.3: Personalized financial information treatment

Impact on Your Household

Based on your information about car usage and your heating, we have estimated the effect of the policy measure described above on your household:

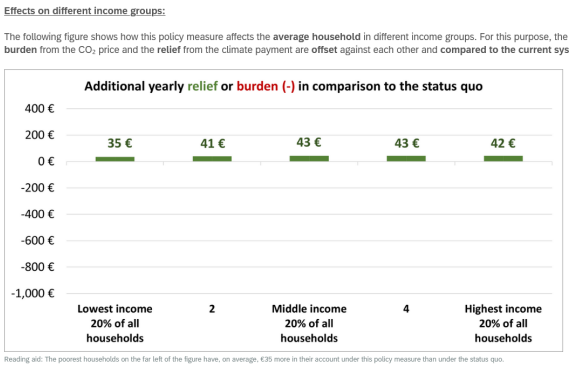
Compared to the current regulation, your household has **XY€ more/less available per year.**

How fair do you consider the measure described above for your own household?

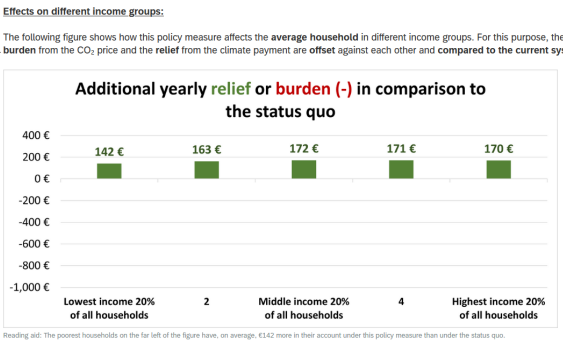
B.5 Distributional Treatment

Figure B.4: Distributional treatment

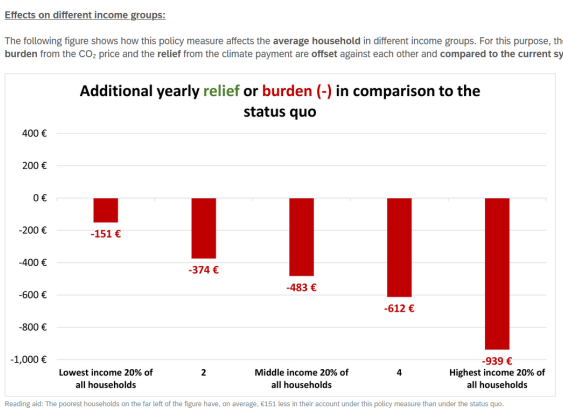
(a) 45 €/tCO_2, 20% Redistribution



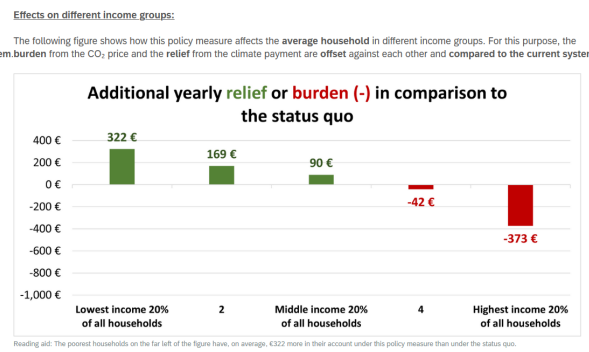
(b) 45 €/tCO_2, 80% Redistribution



(c) 200€/tCO_2, 20% Redistribution



(d) 200€/tCO_2, 80% Redistribution



C ADDITIONAL ANALYSIS ON POLICY CHARACTERISTICS

C.1 Policy Support

In table C.1, we formally analyze how policy support depends on the carbon price and the redistribution share through a regression model with respondent fixed effects.[31] For this analysis, we pool the entire sample of respondents across all treatment groups and exploit within-individual variation. Our marginal effects are obtained from a multinomial logistic regression model with random effects, where we control for the share and the price. No further controls are included. Marginal effects can be interpreted as the effect of moving from the high redistribution share to the low rate, while holding prices fixed, or, respectively, as moving from the low to the high price while holding the redistribution share fixed. We find a sizable negative effect of a high carbon tax and a low redistribution share on overall policy support. Support is about 10 percentage points lower when the price is increased from 45€/tCO_2 to 200€/tCO_2. Similarly, reducing the redistribution share from 80% to 20% significantly reduces support by 8 percentage points. The statistically significant interaction between high price and low redistribution indicates that the decline in policy support from increasing the price from 45€/tCO_2 to 200€/tCO_2 is even greater when redistribution is low.

[31] As in the remaining paper, we aggregate opposition and being in favor of the policy into a dummy variable as the central outcome variable. The few responses indicating "Don't know" are coded as missing.

Table C.1: Effect of policy characteristics on policy support

	(1) OLS FE	(2) OLS FE
Price 200	-0.102***	-0.070***
	(0.014)	(0.019)
Share 20	-0.082***	-0.051***
	(0.014)	(0.018)
Interaction		-0.063**
		(0.025)
Observations	3,226	3,226
Respondents	838	838

Note: Table C.1 is based on a multivariate OLS regression. It shows the effect of a higher price of 200€/tCO_2 instead of 45 €/tCO_2 and of the lower redistribution share of 20% instead of 80% on policy support (Column 1). The outcome variable is a dummy for being in favor (pooling all responses with the outcome very in favor, in favor, slightly in favor) of the implementation of the proposed policy vignette. Column 2 includes an interaction term between the price and the redistribution share. Both specifications include individual-level fixed effects. No further controls are included. Standard errors are clustered at the respondent level for all specifications. The sample includes only individuals in the control group.
Significance Levels: * p-value < 0.10; ** p-value < 0.05; *** p-value < 0.01

D ADDITIONAL ANALYSES ON THE MECHANISM TREATMENT

D.1 Low Price

Table D.1: Effect of mechanism treatment on support (binary outcome)

	(1) 20% Redistribution b/se	(2) 80% Redistribution b/se
Treatment effect	0.013	0.018
	(0.025)	(0.025)
Control group mean	0.42	0.48
Respondents	1,575	1,573
Individual controls	✓	✓

Notes: The table shows the marginal effect of receiving an informational video about the general mechanism of tax-and-dividend schemes vs. not receiving this information. Coefficient estimates are based on logit models with a dummy of overall policy support as the outcome variable. The models only include respondents from the control group and the treatment group that has received the mechanism treatment, but no further information treatments. All models control for the respondents' age group, sex, education, and urban vs. rural living environment.
Significance levels: * p-value < 0.10; ** p-value < 0.05; *** p-value < 0.01

D.2 Average Treatment Effect by understanding

Table D.2: Effect of mechanism treatment on policy support for those who understood the mechanism (binary)

	High-price, Mechanism Understood	
	(1) 20% Redistribution b/se	(2) 80% Redistribution b/se
Treatment effect on treated	0.078***	0.077***
	(0.028)	(0.029)
Control group mean		
Respondents	1,268	1,259
Individual controls	✓	✓

Notes: The table shows the marginal effect of receiving an informational video on the general mechanism of tax-and-dividend policies vs. not receiving this information for the low (1) and high redistribution vignettes (2) for the subgroup of respondents in the treatment group who answered two questions on the mechanism of tax-and-transfer schemes correctly after having received the mechanism treatment. Coefficient estimates are based on logit models with overall policy support recoded to a binary variable (1 = slightly in favor to strongly in favor) as the outcome variable. The models only include respondents from the control group, and the group that has watched the video or read the alternative text, but not received any other information treatments. All models control for respondents' age group, sex, education, and urban vs. rural living environment. Standard errors are given in parentheses.
Significance levels: * p-value < 0.10; ** p-value < 0.05; *** p-value < 0.01

Table D.3: Effect of mechanism treatment on policy support for those who incorrectly answered questions of understanding

	High-price, Mechanism not Understood	
	(1)	(2)
	20% Redistribution	80% Redistribution
	b/se	b/se
Treatment effect	0.011	0.022
	(0.034)	(0.037)
Control group mean		
Respondents	1,028	1,027
Individual controls	✓	✓

Notes: The table shows the marginal effect of receiving an informational video on the general mechanism of tax-and-dividend policies vs. not receiving this information for the low (1) and high redistribution vignettes (2) for the subgroup of respondents in the treatment group who answered at least one of two questions on the mechanism of tax-and-transfer schemes incorrectly after having received the mechanism treatment. Coefficient estimates are based on logit models with overall policy support recoded to a binary variable (1 = slightly in favor to strongly in favor) as the outcome variable. The models only include respondents from the control group, and the group that has watched the video or read the alternative text, but not received any other information treatments. All models control for respondents' age group, sex, education, and urban vs. rural living environment. Standard errors are given in parentheses.
Significance levels: * p-value < 0.10; ** p-value < 0.05; *** p-value < 0.01

E ADDITIONAL ANALYSES ON THE FINANCIAL TREATMENT

E.1 Misperception

Table E.1 presents an overview of summary statistics of the respondents in each of these categories for the control group and the financial treatment group combined. Half of our respondents do not provide an estimate of the expected cost increase. For those who do, 20.9% estimate their cost increase to be on average 1448 € and thereby strongly overestimate the increase. The remaining 28.1% of respondents on average estimate their cost increase to be 210 € and thereby underestimate their cost increase. So, while the share of respondents who underestimate the likely cost increase is slightly larger than the share of those who overestimate it, in absolute terms, the degree of overestimation is stronger than the degree of underestimation.

E.2 Low Price

Low Price Policy Vignettes

Although respondents receive minimal additional information by the financial treatment in the low price policy vignettes, we still expect treatment effects on both outcome

Table E.1: Simulated and expected cost increase due to high carbon price

	Over-estimators	Under-estimators	No prior expectation
Number of individuals	361	486	878
Share of total sample (%)	20.9	28.1	50.9
Expected cost increase (€)	1448	210	-
	(1655)	(167)	-
Simulated cost increase (€)	373	581	511
	(304)	(204)	(262)

Notes: The table provides descriptive statistics for the simulated cost increase (i.e., the information we treated respondents with) as well as the expected cost increase that is elicited from respondents before treatment. Half of the respondents do not provide an estimate. Shares are based on respondents from the control and the financial treatment group only. Combined sample size: 1725.

variables, as gains in comparison to the status quo are more salient to treated individuals. We expect that

> **HI 2a low price**: *Being informed about the likely implications of the policy for one's own household (IT2) should increase policy support for policies which combine the current carbon price with a redistribution scheme.*

Marginal effects of having received the financial treatment on general policy support (binary) are reported in table E.2.

Table E.2: Effect of the financial treatment on policy support (binary outcome): Low price

	(1) 45€ 20% b/se	(2) 45€ 80% b/se
Treatment effect	0.026	0.015
	(0.025)	(0.025)
Respondents	1,578	1,565
Observations	1,578	1,565
Vignette controls	✓	✓
Individual controls	✓	✓

Notes: Coefficient estimates are based on a logit model predicting overall policy support (1 = slightly in favor to strongly in favor). Model controls for the redistribution share and the respondent's sociodemographics (age group, sex, education, and urban vs. rural living environment). Results are only based on respondents who did not receive any other information treatment.
Significance Levels: * p-value < 0.10; ** p-value < 0.05; *** p-value < 0.01

In line with our expectations, the treatment has a small but positive impact on policy support: The share of those who are in favor of the policy is slightly higher (2 percentage points) among respondents who were informed about the net impact of the policy on their own household than among those who did not receive the information. However, the difference between the treatment groups is statistically insignificant.

E.3 Share of Winners and Losers

Table E.3: Cost increase due to high carbon price

	Responses	% of sample	Mean	Median	sd	p10	p90
20% Winner	259	14.9	181	178	107	50	302
20% Loser	1,448	83.3	-371	-339	182	-613	-171
80% Winner	1,411	81.2	464	371	376	80	972
80% Loser	295	17.0	-186	-137	170	-385	-23

Notes: The table provides descriptive statistics for the treatment information (simulated carbon dividend for policy vignette - calculated cost increase based on survey questions) separately for respondents who win or lose under the different redistribution shares.

In the low redistribution policy vignette, winners get on average roughly 180 € back, while 83.3 percent of the respondents who would lose under this policy would experience a cost increase of roughly 372 € per year (SD = 183). If 80 percent of the revenues of the carbon price of 200 € were redistributed, 81 percent of our respondents would be net beneficiaries of the policy, gaining on average 464 € per year (SD = 376)

F ADDITIONAL ANALYSES ON THE DISTRIBUTIONAL TREATMENT

F.1 By Perception of the Own Position in the Income Distribution

Table F.1: Effect of distributional treatment by self placement in the income distribution

Panel A: High Redistribution 80%				
	(1) Pooled	(2) Lowest	(3) Middle	(4) Top
Treatment effect	0.065***	0.116**	0.058*	0.031
	(0.025)	(0.046)	(0.034)	(0.059)
Control group mean	0.40	0.40	0.40	0.40
Respondents	1,585	463	812	285
Individual controls	✓	✓	✓	✓
Panel B: Low Redistribution 20%				
	(1) Pooled	(2) Lowest	(3) Middle	(4) Top
Treatment effect	0.006	0.011	0.017	-0.002
	(0.023)	(0.040)	(0.031)	(0.056)
Control group mean	0.29	0.29	0.29	0.29
Respondents	1,595	465	823	285
Individual controls	✓	✓	✓	✓

Notes: The table depicts the marginal effect on policy support of having received the distributional information treatment. Lowest refers to individuals placing themselves in the lower two quintiles of the income distribution, middle refers to self placement in the 3rd quintile and top refers to the top two quintiles of the income distribution.

F.2 Low Price

Table F.2: Effect of the distributional treatment on policy support (binary outcome): Low price policy vignettes

	(1) IT 3: 45 20	(2) IT 3: 45 80
Treatment effect	-0.010	-0.053**
	(0.024)	(0.025)
Control group mean	0.42	0.48
Respondents	1,595	1,580

Notes: The Table shows the marginal effect of having received information on the distributional consequences of the policy vignette in comparison to the status quo, vs. not having received this information. Results are reported for the low price vignette and separately for the low and high redistribution share. Coefficient estimates are based on logit models predicting overall policy support (1 = slightly in favor to strongly in favor). All models control for the respondents' age group, sex, education, and urban vs. rural living environment.
Significance levels: * p-value < 0.10; ** p-value < 0.05; *** p-value < 0.01

G ADDITIONAL ANALYSES ON THE COMPOSITE EFFECTS

Table G.1: Full Treatment Interaction Model

	High Price		Low Price	
	80%	20%	80%	20%
Mechanism Treatment	0.275***	0.304***	0.083	0.069
	(0.102)	(0.109)	(0.102)	(0.103)
Distributional Treatment	0.264***	0.016	-0.211**	-0.050
	(0.102)	(0.112)	(0.102)	(0.103)
Mechanism × Distributional	-0.045	-0.119	0.229	0.034
	(0.143)	(0.154)	(0.144)	(0.145)
Financial Treatment	0.193*	0.052	0.054	0.108
	(0.103)	(0.112)	(0.102)	(0.103)
Mechanism × Financial	-0.175	-0.032	0.090	0.004
	(0.145)	(0.154)	(0.146)	(0.147)
Distributional × Financial	-0.123	-0.056	0.063	-0.175
	(0.144)	(0.157)	(0.144)	(0.145)
Mechanism × Distributional × Financial	0.059	-0.066	-0.143	0.390*
	(0.203)	(0.218)	(0.204)	(0.206)
Constant	-0.262**	-0.534***	0.420***	0.262**
	(0.120)	(0.128)	(0.120)	(0.120)
Individual controls	✓	✓	✓	✓
Pseudo R^2	0.010	0.017	0.017	0.018
Log-likelihood	-4,329.37	-3,901.23	-4,284.55	-4,240.33
Observations	6,317	6,343	6,287	6,279

Notes: The table shows the results of logistic regressions based on a model including all treatments and their interactions for the high and the low redistribution environment. Results are based the full sample of respondents. Standard errors are given in parentheses. Average marginal effects are presented in table G.2. Significance levels: * p-value < 0.10; ** p-value < 0.05; *** p-value < 0.01

Table G.2: Full Treatment Interaction Model: Average Marginal Effects

	High Price		Low Price	
	80%	20%	80%	20%
Mechanism Treatment	0.044***	0.045***	0.051***	0.045***
	(0.012)	(0.012)	(0.012)	(0.012)
Distributional Treatment	0.048***	-0.019*	-0.025**	-0.006
	(0.012)	(0.012)	(0.012)	(0.012)
Financial Treatment	0.014	-0.002	0.023*	0.029**
	(0.013)	(0.012)	(0.012)	(0.012)
Observations	6,317	6,343	6,287	6,279

Notes: The table shows the average marginal effects of all three information treatments based on the results of logistic regressions based on a model including all treatments and their interactions for the high and the low redistribution environment (see table G.1). Results are based the full sample of respondents. Standard errors are given in parentheses.
Significance levels: * p-value < 0.10; ** p-value < 0.05; *** p-value < 0.01

Table G.3: Full Treatment Interaction Model: Conditional Marginal Effects

	High Price		Low Price	
	80%	20%	80%	20%
Effect of Mechanism Treatment				
Distributional = 0, Financial = 0	0.067*	0.065*	0.020	0.017
	(0.025)	(0.023)	(0.025)	(0.025)
Distributional = 1, Financial = 0	0.057**	0.039***	0.076*	0.025
	(0.025)	(0.023)	(0.025)	(0.024)
Distributional = 0, Financial = 1	0.025	0.059**	0.042***	0.018
	(0.025)	(0.024)	(0.025)	(0.025)
Distributional = 1, Financial = 1	0.028	0.018	0.063**	0.120*
	(0.025)	(0.023)	(0.025)	(0.025)
Effect of Distributional Treatment				
Mechanism = 0, Financial = 0	0.064*	0.003	-0.051**	-0.012
	(0.025)	(0.023)	(0.025)	(0.025)
Mechanism = 1, Financial = 0	0.054**	-0.023	0.004	-0.004
	(0.025)	(0.023)	(0.025)	(0.025)
Mechanism = 0, Financial = 1	0.035	-0.008	-0.036	-0.054**
	(0.025)	(0.023)	(0.025)	(0.025)
Mechanism = 1, Financial = 1	0.038	-0.049**	-0.015	0.049***
	(0.025)	(0.024)	(0.025)	(0.025)
Effect of Financial Treatment				
Mechanism = 0, Distributional = 0	0.047***	0.011	0.013	0.026
	(0.025)	(0.023)	(0.025)	(0.025)
Mechanism = 1, Distributional = 0	0.004	0.005	0.035	0.027
	(0.025)	(0.024)	(0.025)	(0.026)
Mechanism = 0, Distributional = 1	0.017	-0.001	0.028	-0.016
	(0.025)	(0.023)	(0.025)	(0.024)
Mechanism = 1, Distributional = 1	-0.011	-0.022	0.016	0.080*
	(0.025)	(0.023)	(0.025)	(0.025)

Notes: The table shows the conditional marginal effects for each of the three information treatments depending on the state of the other two treatments. Results are based on the results of logistic regressions based on a model including all treatments and their interactions (see columns 1 and 2 table G.1). Results are based the full sample of respondents. Standard errors are given in parentheses.
Significance levels: * p-value < 0.10; ** p-value < 0.05; *** p-value < 0.01

Table G.4: Additional effect of the financial treatment on policy support - decomposition by prior expectations

Panel A: 80% redistribution share				
	(1) pooled	(2) over-estimators	(3) under-estimators	(4) no prior
Treatment effect	0.003	0.023	0.017	-0.015
	(0.025)	(0.056)	(0.047)	(0.036)
Control group mean	0.48	0.46	0.51	0.47
Respondents	1,551	320	467	750
Individual controls	✓	✓	✓	✓

Panel B: 20% redistribution share				
	(1) pooled	(2) over-estimators	(3) under-estimators	(4) no prior
Treatment effect	0.008	0.033	0.061	-0.028
	(0.024)	(0.053)	(0.046)	(0.034)
Control group mean	0.36	0.37	0.34	0.38
Respondents	1,560	321	465	760
Individual controls	✓	✓	✓	✓

Notes: The table shows the marginal effect of having received information on the general mechanism of a carbon tax and transfer policy as well as information about the personal financial consequences of a policy vignette vs. not having received these information, separately for the high redistribution share (Panel a) and the low redistribution share (Panel b). Results are only based on respondents who received the mechanism treatment together with the financial treatment and the individuals in the control group. Estimates of marginal effects are based on logit models predicting overall policy support (1 = in favor). Results are reported for the pooled sample (Column 1) and separately for respondents who overestimated the cost increase of a carbon price of 200€/tCO_2 on their own household (Column 2), respondents who underestimated the cost increases (Column 3), and respondents who had no prior expectations (Column 4). All models control for respondents' age group, sex, education, and urban vs. rural living environment. This analysis only uses responses for the high-price policy vignettes. Standard errors are given in parentheses.
Significance levels: * p-value < 0.10; ** p-value < 0.05; *** p-value < 0.01

Table G.5: Additional effect of treatments on recipients of the mechanism treatment

Panel a) 80% redistribution share				
	(1)	(2)	(3)	(4)
Effect of mechanism treat.	0.065***			
	(0.025)			
Add. effect of financial treat. over mechanism		0.003		
		(0.025)		
Add. effect of distributional treat. over mechanism			0.059**	
			(0.025)	
Add. effect of financial and distributional treat. over mechanism				0.043*
				(0.025)
Composite effect	0.065	0.068	0.121	0.112
Composite standard errors	0.025	0.025	0.025	0.025
Observations	1,581	1,551	1,591	1,584
Individual controls	✓	✓	✓	✓
Panel b) 20% redistribution share				
	(1)	(2)	(3)	(4)
Effect of mechanism treat.	0.066***			
	(0.023)			
Add. effect of financial treat. over mechanism		0.008		
		(0.024)		
Add. effect of distributional treat. over mechanism			-0.023	
			(0.023)	
Add. effect of financial and distributional treat. over mechanism				-0.045*
				(0.024)
Composite effect	0.066	0.069	0.041	0.022
Composite standard errors	0.023	0.023	0.023	0.023
Observations	1,590	1,560	1,598	1,592
Individual controls	✓	✓	✓	✓

Notes: The table shows the additional effect of the information treatments in the high-price policy vignettes, conditional on respondents already having received the mechanism treatment for the high redistribution share (Panel a) and the low redistribution share (Panel b). Column (1) repeats the pure effect of the mechanism treatment from table **??**. Column (2) reports the additional effect on policy support when the financial treatment is also provided. In this case, individuals who received only the mechanism treatment are compared with individuals who received both the mechanism and financial treatments. Likewise, Column (3) reports the additional effect of the distributional treatment, and Column (4) reports the additional effect of receiving both the distributional and the individual treatment. Composite treatment effects are shown at the bottom of each table. Significance levels: * p-value < 0.10; ** p-value < 0.05; *** p-value < 0.01

H ADDITIONAL ANALYSES ON JUSTICE

H.1 Effect of policy characteristics on justice concerns

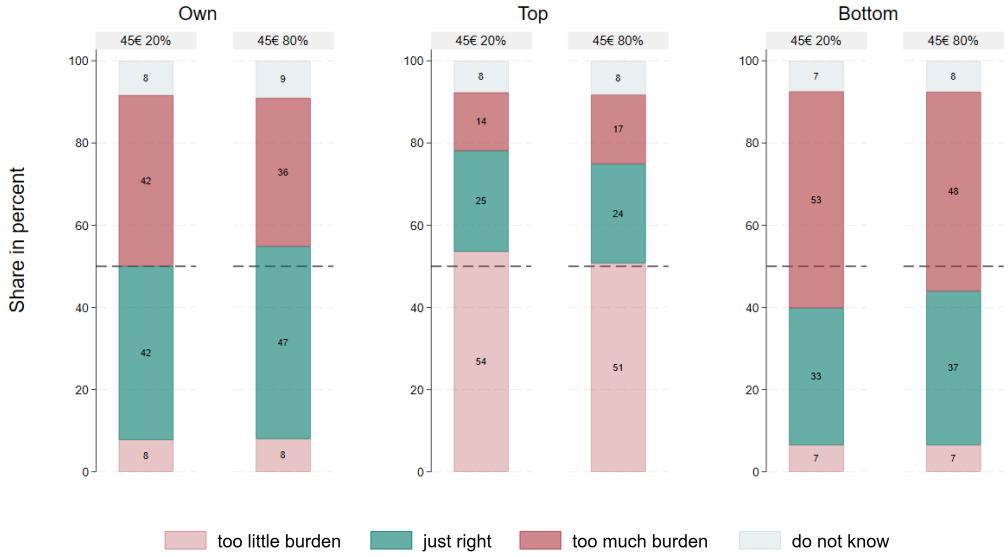
Table H.1: Effect of policy characteristics on justice perception

	(1) Own 200.price	(2) Bottom 200.price	(3) Top 200.price	(4) Own 20.share	(5) Bottom 20.share	(6) Top 20.share
Too little	-0.037***	-0.006	-0.088***	-0.008	-0.005	0.017
	(0.008)	(0.008)	(0.012)	(0.008)	(0.007)	(0.012)
Just right	-0.134***	-0.132***	0.028**	-0.065***	-0.053***	-0.008
	(0.015)	(0.015)	(0.014)	(0.014)	(0.014)	(0.013)
Too much	0.171***	0.138***	0.059***	0.072***	0.058***	-0.008
	(0.015)	(0.014)	(0.010)	(0.014)	(0.014)	(0.009)
Respondents	844	845	840	844	845	840
Observations	3,199	3,235	3,220	3,199	3,235	3,220

Notes: The table shows the marginal effects of the policy characteristics on justice perceptions (i.e., moving from 45€ to 200€ or from 80% redistribution of revenues to 20% while holding the respective other parameter fixed), obtained from a multinomial logistic regression model. Standard errors are clustered on the respondent level and given in parentheses. Only data from the control group is used to estimate the model.
Significance Levels: * p-value < 0.10; ** p-value < 0.05; *** p-value < 0.01

H.2 Results on Justice for the low price scenario

Figure H.1: Justice evaluations in the control group



Notes: Figure H.1 depicts self-regarding (Own) and other-regarding (Top and Bottom) justice concerns in the control group (no information treatments) for the low-price policy vignettes. Sample size: 873.

H.3 Effect of justice concerns on policy support

Table H.2: Effect of perceived justice on policy support: Full model results

Dependent Variable	**Policy Support (binary)**			
Price	High: 200€/tonCO^2		Low: 45€/tonCO^2	
Redistribution Share	80%	20%	80%	20%
Justice for Self (ref fair)				
too little burden	-0.095***	-0.058	-0.175***	-0.146***
	(0.025)	(0.030)	(0.022)	(0.022)
too much burden	-0.316***	-0.317***	-0.305***	-0.296***
	(0.015)	(0.015)	(0.016)	(0.016)
Justice for Top (ref fair)				
too little burden	-0.054***	-0.016	-0.092***	-0.092***
	(0.014)	(0.013)	(0.014)	(0.015)
too much burden	-0.164***	-0.133***	-0.091***	-0.104***
	(0.017)	(0.014)	(0.021)	(0.021)
Justice for Bottom (ref fair)				
too little burden	-0.171***	-0.113***	-0.133***	-0.107***
	(0.022)	(0.025)	(0.024)	(0.024)
too much burden	-0.248***	-0.210***	-0.153***	-0.173***
	(0.015)	(0.015)	(0.015)	(0.015)
Information Treatments (ref fair)				
Distribution Treatment	-0.005	0.003	-0.040***	-0.032**
	(0.012)	(0.011)	(0.012)	(0.012)
Financial Treatment	-0.017	-0.002	0.009	0.018
	(0.011)	(0.010)	(0.012)	(0.012)
Mechanism Treatment	0.027*	0.031**	0.034**	0.035**
	(0.011)	(0.010)	(0.012)	(0.012)
Treatment Interactions	✓	✓	✓	✓
Individual controls	✓	✓	✓	✓
Goodness of Fit				
Pseudo R^2	0.207	0.211	0.133	0.146
Log-likelihood	-3,228	-2,934	-3,516	-3,455
Observations	5,876	5,961	5,852	5,873

Notes: The table shows average marginal effects of justice concerns and treatments based on logit models predicting policy support with justice concerns, all treatments and their interactions and all controls based on the full sample after applying listwise deletion. Standard errors in parentheses.
Significance levels: * p-value < 0.10; ** p-value < 0.05; *** p-value < 0.01

Table H.3: Wald tests on significant differences of coefficients for the high-price policy vignettes

	80% Redistribution				20% Redistribution			
	β_A	β_B	χ^2	p-value	β_A	β_B	χ^2	p-value
Within Anchor								
Own little vs much	-0.439	-1.480	72.657	0.000	-0.256	-1.623	97.201	0.000
Top little vs much	-0.284	-0.864	43.829	0.000	-0.090	-0.843	68.295	0.000
Bottom little vs much	-0.822	-1.197	11.773	0.001	-0.576	-1.132	19.185	0.000
Within Direction								
Own vs Bottom (little)	-0.439	-0.822	4.950	0.026	-0.256	-0.576	2.431	0.119
Own vs Top (little)	-0.822	-0.284	1.181	0.277	-0.576	-0.090	1.093	0.296
Top vs Bottom (little)	-0.284	-0.822	17.643	0.000	-0.090	-0.576	10.250	0.001
Own vs Bottom (much)	-1.480	-1.197	6.296	0.012	-1.623	-1.132	17.618	0.000
Own vs Top (much)	-1.197	-0.864	28.388	0.000	-1.132	-0.843	42.232	0.000
Top vs Bottom (much)	-1.480	-0.864	8.400	0.004	-1.623	-0.843	5.901	0.015
Across Anchor & Direction								
Own(much) vs Bottom(little)	-1.480	-0.822	27.749	0.000	-1.623	-0.576	50.064	0.000
Own(much) vs Top(little)	-1.480	-0.284	151.490	0.000	-1.623	-0.090	226.934	0.000
Own(little) vs Top(much)	-1.480	-0.822	31.106	0.000	-1.623	-0.576	32.188	0.000
Own(little) vs Bottom(much)	-1.480	-0.284	8.789	0.003	-1.623	-0.090	12.931	0.000
Top(much) vs Bottom(little)	-0.864	-0.822	0.078	0.780	-0.843	-0.576	2.597	0.107
Top(little) vs Bottom(much)	-0.284	-1.197	63.608	0.000	-0.090	-1.132	77.054	0.000

The first column indicates the pair of justice concern coefficients being compared, with $\hat{\beta}_A$ and $\hat{\beta}_B$ reporting the odds ratios for the first and second mentioned justice concern in each row, respectively. Wald tests assess whether these two coefficients differ significantly from one another. All tests are based on logistic regression models estimating the odds of policy support as a function of perceived justice evaluations for own, bottom, and top income households (reference category: Just right), fully interacted treatment indicators, and individual controls (gender, urban/rural residence, age, education).

Table H.4: Wald tests on significant differences of coefficients for the low-price policy vignettes

	80% Redistribution				20% Redistribution			
	β_A	β_B	χ^2	p-value	β_A	β_B	χ^2	p-value
Within Anchor								
Own little vs much	-0.757	-1.346	28.221	0.000	-0.631	-1.341	43.195	0.000
Top little vs much	-0.440	-0.433	0.006	0.940	-0.445	-0.507	0.447	0.504
Bottom little vs much	-0.606	-0.698	0.676	0.411	-0.487	-0.802	7.749	0.005
Within Direction								
Own vs Bottom (little)	-0.757	-0.606	0.859	0.354	-0.631	-0.487	0.754	0.385
Own vs Top (little)	-0.606	-0.440	6.474	0.011	-0.487	-0.445	2.197	0.138
Top vs Bottom (little)	-0.440	-0.606	1.665	0.197	-0.445	-0.487	0.107	0.744
Own vs Bottom (much)	-1.346	-0.698	31.020	0.000	-1.341	-0.802	21.740	0.000
Own vs Top (much)	-0.698	-0.433	45.289	0.000	-0.802	-0.507	40.027	0.000
Top vs Bottom (much)	-1.346	-0.433	4.643	0.031	-1.341	-0.507	5.396	0.020
Across Anchor & Direction								
Own(much) vs Bottom(little)	-1.346	-0.606	30.892	0.000	-1.341	-0.487	40.195	0.000
Own(much) vs Top(little)	-1.346	-0.440	88.981	0.000	-1.341	-0.445	85.636	0.000
Own(little) vs Top(much)	-1.346	-0.606	0.267	0.605	-1.341	-0.487	2.194	0.139
Own(little) vs Bottom(much)	-1.346	-0.440	5.416	0.020	-1.341	-0.445	0.789	0.374
Top(much) vs Bottom(little)	-0.433	-0.606	1.240	0.265	-0.507	-0.487	0.015	0.903
Top(little) vs Bottom(much)	-0.440	-0.698	6.013	0.014	-0.445	-0.802	10.923	0.001

The first column indicates the pair of justice concern coefficients being compared, with $\hat{\beta}_A$ and $\hat{\beta}_B$ reporting the odds ratios for the first and second mentioned justice concern in each row, respectively. Wald tests assess whether these two coefficients differ significantly from one another. All tests are based on logistic regression models estimating the odds of policy support as a function of perceived justice evaluations for own, bottom, and top income households (reference category: Just right), fully interacted treatment indicators, and individual controls (gender, urban/rural residence, age, education).

H.4 Effects of the Information Treatments on Self- and Other-Regarding Justice Concerns

Table H.5: Treatment effects of the mechanism treatment on self- and other-regarding justice concerns

Effect of	**Mechanism Treatment**					
	(1)	(2)	(3)	(4)	(5)	(6)
Redistribution share	80%	80%	80%	20%	20%	20%
Dependent variable:	Justice for self	Justice for poor	Justice for rich	Justice for self	Justice for poor	Justice for rich
Too little burden	-0.005	0.008	0.020	0.004	0.013	0.050**
	(0.011)	(0.013)	(0.025)	(0.011)	(0.013)	(0.025)
Just right	0.066***	0.036	-0.006	0.016	0.008	-0.029
	(0.025)	(0.023)	(0.023)	(0.024)	(0.021)	(0.022)
Too much burden	-0.061**	-0.044*	-0.015	-0.020	-0.020	-0.020
	(0.025)	(0.024)	(0.021)	(0.024)	(0.023)	(0.021)
Observations	1,567	1,579	1,570	1,565	1,578	1,580
Individual controls	✓	✓	✓	✓	✓	✓

Notes: The table shows the marginal effect of receiving an informational video on the general mechanism of tax-and-transfer schemes vs. not receiving this information on self- and other-regarding justice concerns for policy vignettes implementing a carbon price of 200€/ton CO_2 together with a redistribution share of 80% or 20%. Coefficient estimates are based on multinomial logit models with perceived justice of the policy outcome as the outcome variable. All models control for respondents age group, sex, education and urban vs. rural living environment.
Significance Levels: * p-value < 0.10; ** p-value < 0.05; *** p-value < 0.01

Table H.6: Treatment effects of financial treatment on other-regarding justice concerns, and of distributional treatment on self-regarding justice concerns

Effect of	**Financial Treatment**				**Distribution Treatment**	
	(1)	(2)	(3)	(4)	(5)	(6)
Redistribution share	80%	80%	20%	20%	80%	20%
Dependent variable:	Justice for poor	Justice for rich	Justice for poor	Justice for rich	Justice for self	Justice for self
Too little burden	-0.008	0.056**	-0.014	0.002	0.007	0.014
	(0.012)	(0.025)	(0.011)	(0.025)	(0.012)	(0.011)
Just right	0.062***	-0.001	-0.027	0.042*	0.067***	0.011
	(0.023)	(0.023)	(0.020)	(0.023)	(0.025)	(0.023)
Too much burden	-0.054**	-0.056***	0.041*	-0.044**	-0.074***	-0.024
	(0.024)	(0.020)	(0.022)	(0.021)	(0.025)	(0.024)
Observations	1,584	1,578	1,586	1,581	1,581	1,575
Individual controls	✓	✓	✓	✓	✓	✓

Notes: The table shows the marginal effect of receiving information on the policy vignette's likely financial consequences for oneself (vs. not receiving this information) on other-regarding justice concerns (columns 1 - 4) and of receiving distributional information (vs. not receiving this information) on self-regarding justice concerns (columns 5 - 6). Coefficient estimates are based on multinomial logit models with perceived justice of the policy outcome as the outcome variable. All models control for respondents age group, sex, education and urban vs. rural living environment.

Significance levels: * p-value < 0.10; ** p-value < 0.05; *** p-value < 0.01

Table H.7: Effect of the financial treatment on self-regarding justice concerns by expected costs

	a) 80% redistribution share			
	(1) pooled b/se	(2) over b/se	(3) under b/se	(4) no prior b/se
Too little	0.010	0.043	-0.051**	0.026*
	(0.012)	(0.028)	(0.025)	(0.015)
Just right	0.111***	0.178***	0.063	0.106***
	(0.025)	(0.053)	(0.046)	(0.036)
Too much	-0.121***	-0.222***	-0.012	-0.132***
	(0.025)	(0.052)	(0.045)	(0.036)
Observations	1,572	348	473	740
Individual controls	✓	✓	✓	✓
	b) 20% redistribution share			
	(1) pooled b/se	(2) over b/se	(3) under b/se	(4) no prior b/se
Too little	0.005	0.004	0.007	-0.004
	(0.010)	(0.022)	(0.023)	(0.011)
Just right	0.014	0.094*	-0.038	-0.002
	(0.023)	(0.051)	(0.043)	(0.034)
Too much	-0.018	-0.099*	0.032	0.006
	(0.024)	(0.052)	(0.043)	(0.034)
Observations	1,576	346	469	751
Individual controls	✓	✓	✓	✓

Notes: The Table shows the marginal effects of providing respondents with information on the likely consequences of the respective policy vignette on their own household on respondents' self-regarding justice concerns. Panel a) shows the marginal effects for the 200€/tCO_2 and 80% redistribution vignette, Panel b) shows marginal effects for the 200€/tCO_2 and 20% redistribution vignette. Marginal effects were obtained based on multinomial logistic regressions with reflexive justice as the outcome variable. All models include only respondents from the control group and the group that received only the financial treatment. Column (1) reports the average treatment effect on all respondents. Columns (2) to (4) report treatment effects distinguishing by respondents' prior expectations about the financial consequences of an increase in the carbon price to 200€/tCO_2 for their own household. All models control for respondent characteristics.
Significance levels: * p-value < 0.10; ** p-value < 0.05; *** p-value < 0.01

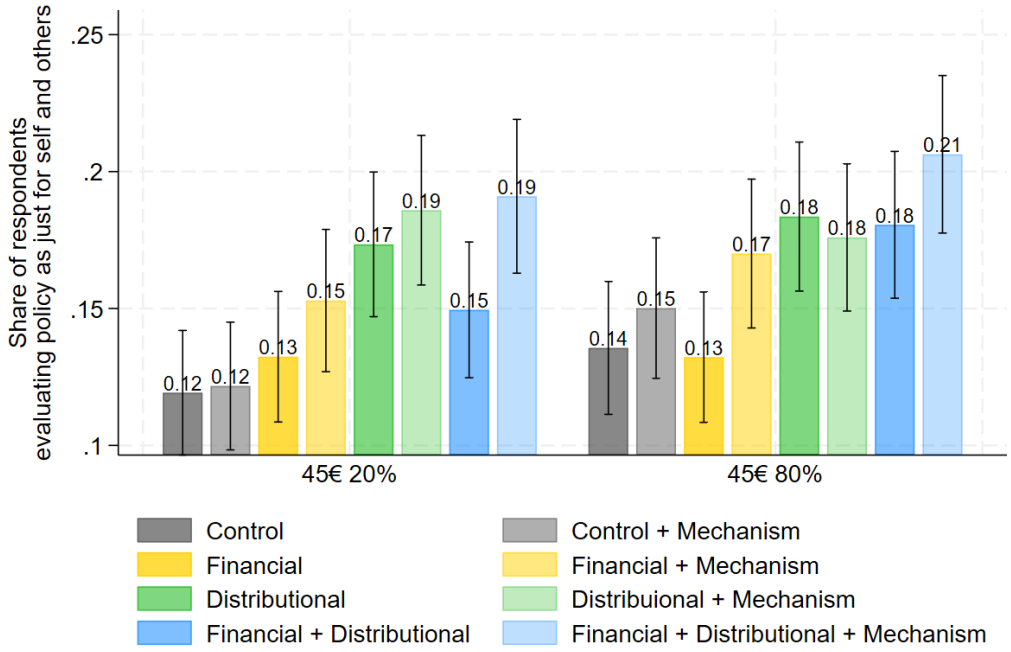
H.5 Justice Evaluation Profiles

Table H.8: Treatment effects on probability of evaluating the policy vignette as just for oneself and others

	High Price		Low Price	
	80% b/se	20% b/se	80% b/se	20% b/se
Mechanism Treatment	0.027***	0.010	0.018*	0.019**
	(0.010)	(0.007)	(0.010)	(0.009)
Distributional Treatment	0.074***	-0.006	0.041***	0.045***
	(0.010)	(0.007)	(0.010)	(0.009)
Financial Treatment	0.012	-0.003	0.008	0.005
	(0.010)	(0.007)	(0.010)	(0.009)
Reference group mean	0.11	0.07	0.14	0.12
Respondents	6,037	6,100	6,022	6,064
Individual controls	✓	✓	✓	✓

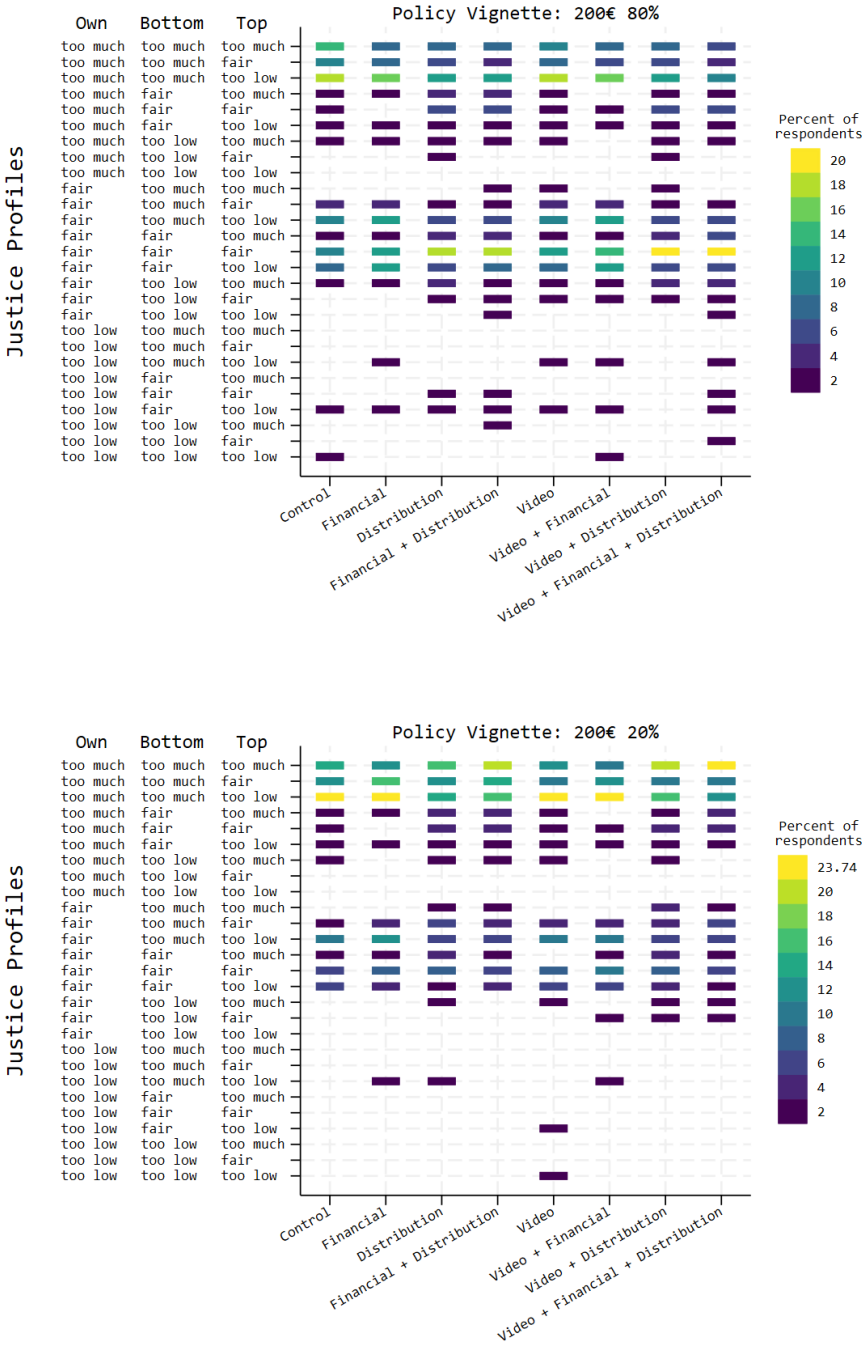
Notes: The table reports average marginal effects from logistic regression models estimating the probability that respondents perceive the policy as just across all three dimensions simultaneously (own, bottom, and top income households). The fully interacted model includes all three treatment indicators (financial, distributional, and mechanism treatment) and individual controls (gender, urban/rural residence, age, education). The reference group mean reports the share of control group respondents perceiving the policy as fully just. Separate models are estimated for each policy vignette.
Significance levels: * p-value < 0.10; ** p-value < 0.05; *** p-value < 0.01

Figure H.2: Share of respondents evaluating the low-price vignettes as just for self and others - by Redistribution Share



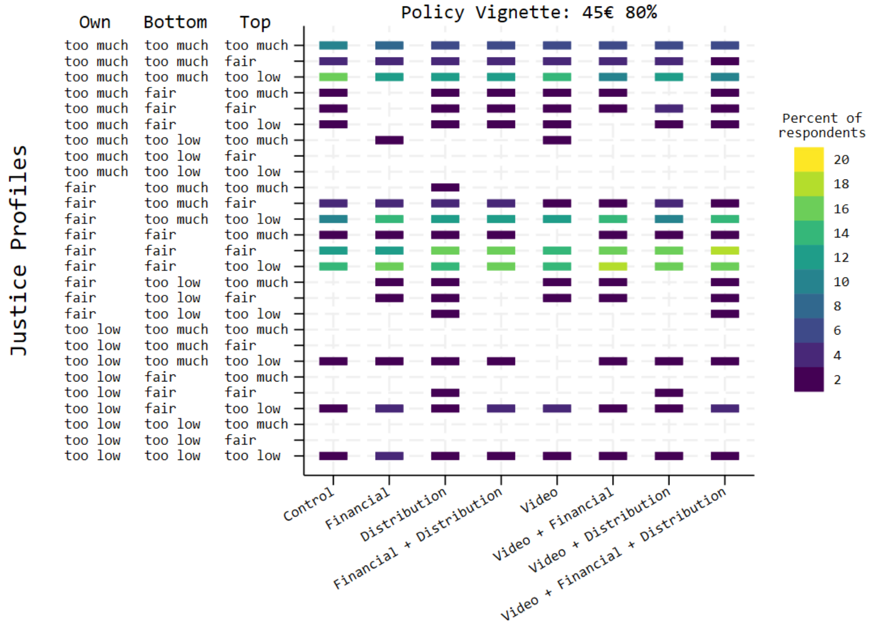
Notes: The figure shows the share of respondents who consider the policy's outcomes for their own household and for households at the bottom and the top of the income distribution as fair. Uncertainty is shown in 95% confidence intervals.

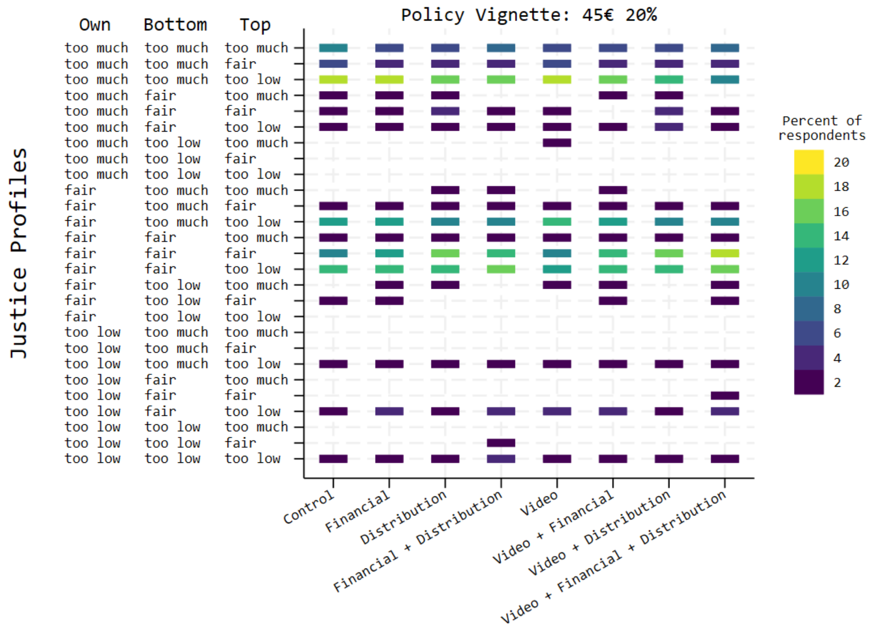
Figure H.3: Justice Evaluation Profiles by Treatment Group - High price policy vignettes



Notes: The figure displays the share of respondents with particular justice profiles in each treatment group for the high-price policy vignettes. Justice profiles held by less than 1% of the respondents were dropped from the graph for easier interpretability.

Figure H.4: Justice Evaluation Profiles by Treatment Group - Low price policy vignettes





Notes: The figure displays the share of respondents with particular justice profiles in each treatment group for the low price policy vignettes. Justice profiles held by less than 1% of the respondents were dropped from the graph for easier interpretability.