Understanding and mitigating climate policy polarisation

Luca Henkel[1,+], Philipp Sprengholz[2,3,4,+], Cornelia Betsch[3,4,#], and Robert Böhm[5,6,#]

[1] Department of Business Economics, Erasmus University Rotterdam, The Netherlands
[2] Institute of Psychology, University of Bamberg, Germany
[3] Institute for Planetary Health Behaviour, University of Erfurt, Germany
[4] Implementation Science, Bernhard Nocht Institute for Tropical Medicine, Hamburg, Germany
[5] Faculty of Psychology, University of Vienna, Austria
[6] Department of Banking and Finance, University of Innsbruck, Austria

* Corresponding author: Luca Henkel, Erasmus University Rotterdam;
Burgemeester Oudlaan 50, 3062 PA Rotterdam, The Netherlands; E-Mail: henkel@ese.eur.nl

+ shared first authorship

shared senior authorship

Abstract

Climate change requires drastic mitigation efforts, yet public discourse around climate policies has become increasingly polarised. Across two quota-representative samples in Germany (*N*=2,116), we investigate the social identity processes underlying climate policy polarisation and examine whether policy design can serve as a tool for depolarisation. We first show that individuals form distinct opinion-based groups around their climate policy preferences, and that stronger identification with these groups is associated with biased perceptions, intergroup discrimination, and support for radical activism. We then show experimentally that *integrative policy designs*—addressing environmental goals while simultaneously acknowledging and mitigating social and economic concerns—reduce intergroup bias, particularly among individuals who initially opposed stricter policies. These findings highlight the dual potential of climate policy to shape both environmental outcomes and social dynamics. Designing policies that address diverse public concerns while maintaining effectiveness offers a promising pathway for reducing polarisation and strengthening democratic resilience in climate governance.

Keywords: climate policy, identification, polarization, policy design

Global efforts to mitigate climate change require far-reaching policies that substantially reduce greenhouse gas emissions across sectors. Such measures, ranging from carbon taxes on meat and fuel to bans on internal combustion engines or short-haul flights, have sparked intense public debate and growing societal polarisation. While ambitious climate action is widely seen as necessary, the perception of such policies as either too strict or too lenient has fuelled the emergence of ideologically opposed groups,[1,2] each increasingly defined by their position on climate governance.[3,4]

This contribution addresses a critical gap in climate policy research: although psychological and social drivers of polarisation have been well documented, the role of policy design itself as a tool for reducing polarisation remains underexplored. We argue that polarisation around climate policy is rooted in social identity processes,[5,6] where individuals form and maintain group affiliations based on shared attitudes toward climate action. These opinion-based identities not only shape how individuals interpret policies but also exacerbate intergroup conflict, especially when groups perceive each other as morally or intellectually inferior.[7,8] Importantly, identification with such groups may also distort social perception—such as overestimating the size or influence of one's own group—which may further reinforce polarised behaviour. Because opinion-based identities guide both attitudes and behaviours, the way policies are framed and structured may influence how different groups perceive and react to them, offering an underexplored lever for conflict reduction.

We propose that climate policy design can play a constructive role in countering such divisions. Drawing on Social Identity Theory[7] and Policy Feedback Theory,[9,10] we hypothesise (i) that stronger identification with polarised climate policy positions (i.e., being sceptical or ambitious with regard to climate policies) will be associated with increased polarisation and

intergroup discrimination; and (ii) that climate policies designed as fair and effective across group lines can reduce polarisation.

Traditional approaches to depolarisation, such as de-categorisation, re-categorisation, or intergroup contact, have shown mixed success, particularly in highly politicised contexts.[11,12] In contrast, we advance a policy-centred perspective: when policies are designed to integrate concerns from both sides of the ideological divide, they may function as depolarising instruments. This aligns with research from negotiation dynamics, which demonstrates that integrative ("win-win") strategies enhance trust and produce more durable outcomes than distributive ("win-lose") approaches that reinforce zero-sum thinking.[13] Accordingly, we suggest that the deliberate design of inclusive climate policies may not only advance emission reduction goals but also help repair fractured public consensus—an increasingly vital condition for effective and sustained climate governance. If integrative policies are able to reduce greenhouse gas emissions while avoiding the perception of penalising sceptical or vulnerable citizens, they may appeal to a broader spectrum of the public and reduce antagonism between opposing camps. If policy design can reduce these identity-driven divisions, it becomes not merely a technical or economic challenge, but a strategic tool for depolarisation and democratic resilience.

Building on this theoretical framework, we used two quota-representative German samples to investigate the social identity dynamics that shape attitudes toward climate policy. We first examined how identification with opposing climate policy opinion groups—those who view current measures as too strict versus too lenient—relates to biased perceptions and discriminatory behaviours toward the respective outgroups. We then explored whether a climate policy framed as both fair and effective—a form of integrative policy design—can reduce polarisation between these groups. The results show (i) that indicators of polarisation are strongly linked to identity-based group alignment, and (ii) that this polarisation can be attenuated when policies address

climate mitigation goals while also acknowledging concerns about economic or social costs. These findings underscore the potential of policy design both to reduce emissions and at the same time foster social cohesion in the face of escalating climate conflict.

Results

In the first quota-representative sample of N = 1,014 German adults we assessed participants' identification with and perception of climate policy opinion groups.

Roots of climate policy polarization

As Figure 1A shows, a majority of participants self-assigned to one of two large oppositional groups: those who believed current climate policies go too far (38%, *sceptical* group) and those who believe such policies do not go far enough (38%, *ambitious* group). In total, 19% believed that the current climate policies were exactly right (*satisfied group*), while 5% indicated that they did not care about the topic at all (*disengaged* group). Substantial shares of members reported high levels of group identification (average of > 4 on a 7-point scale): 63% in the sceptical, 53% in the ambitious, 61% in the satisfied, and 35% in the disengaged groups were highly identified. Thus, climate policy opinions are well described as social group memberships, with variations in the level of group identification, both within and between groups.

As highly identified people are more likely to interact with people in the same opinion-based group,[14,15] we assessed whether people perceived their ingroups as larger as they actually are. Biased perceptions of relative group sizes matter, as perceived group size can affect how much people comply with the behaviours shown by the group,[16] potentially fostering polarisation. Figure 1B shows that, indeed, the perceptions of group sizes were biased: participants in all groups tended to underestimate the actual size of the ambitious group (estimated: 17% to 35%; actual: 38%), while they overestimated the size of the disengaged group (estimated: 15% to 27%; actual: 5%). Furthermore, participants estimated the size of their respective ingroup as larger compared to

participants of the other groups. For instance, while members of the sceptical group assumed that, on average, 54% of the German population shared their opinion, participants of the other groups estimated lower shares for this opinion (estimated: 28% to 36%; actual: 38%).

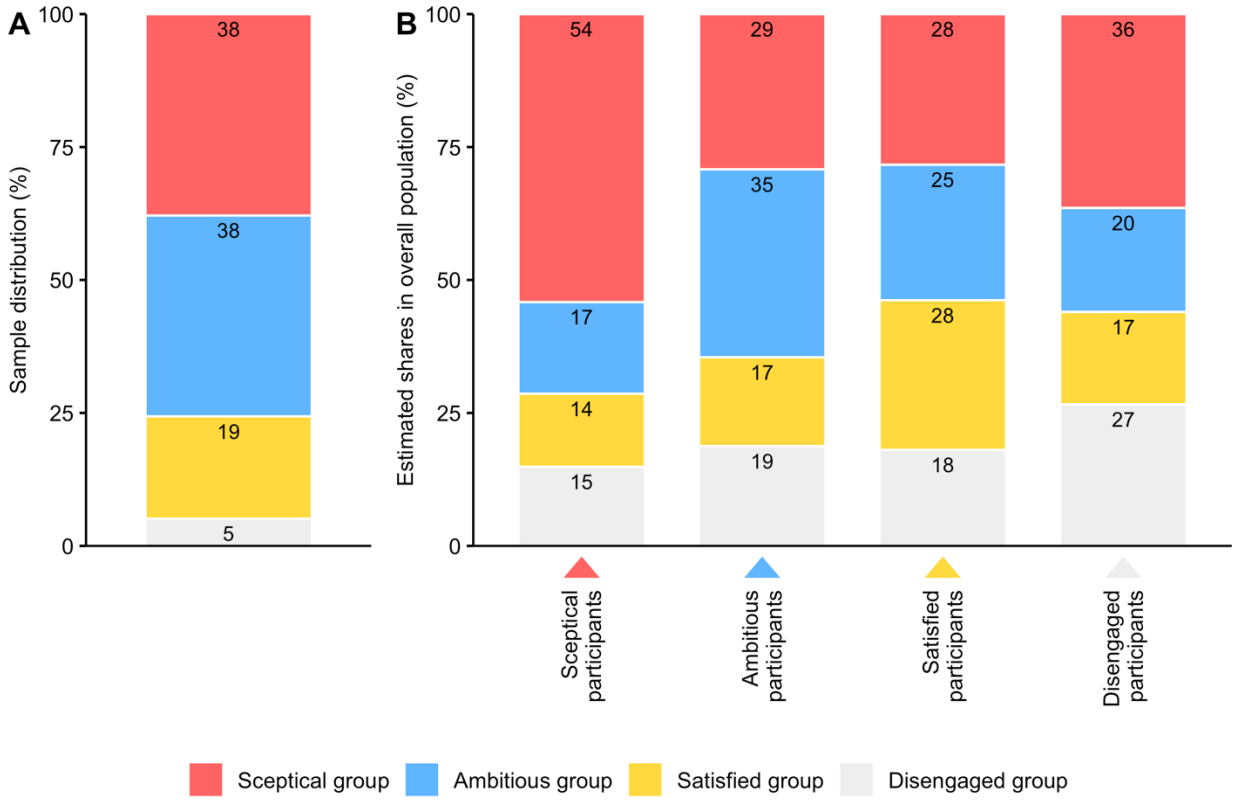

Figure 1. Actual and perceived sizes of climate policy opinion groups.

Note: In a survey of $N = 1{,}014$ German participants, (A) most participants perceived the government's climate policy as going too far (sceptical group) or not going far enough (ambitious group), while smaller shares perceived it as just right (satisfied group) or did not care about climate policy at all (disengaged group). Depending on their own group membership, the participants differed in how they estimated (B) the shares of the respective opinion groups in the overall population.

Importantly, participants with higher levels of identification estimated larger ingroup shares in the sceptical ($r = .20$, $p < .001$) and ambitious ($r = .20$, $p < .001$) groups. The correlations were not significant for the other two groups (both ps $> .119$), which in part can be attributed to the smaller group sizes. Interestingly, sceptical participants estimated a smaller size of the

oppositional ambitious group with increasing group identification (r = –.17, p < .001), while identification did not significantly affect the ambitious participants in estimating the share of the sceptical group (r = –.06, p = .224). Overall, these results indicate that identification with climate policy opinion groups is systematically related to biased and self-serving estimations of ingroup and outgroup sizes.

Discrimination

To investigate how climate policy opinion groups relate to intergroup bias and discrimination, we employed an incentivised behavioural paradigm. Specifically, participants completed a series of four dictator games in which they were asked to allocate 100 Euro between themselves and an anonymous recipient identified as a member of one of four climate policy opinion groups: the sceptical, ambitious, satisfied, or disengaged group (presented in random order). The task was financially incentivised to elicit genuine behavioural preferences, allowing us to assess whether participants systematically favoured members of their own opinion group (ingroup bias) or discriminated against members of opposing groups. Participants across all climate policy opinion groups exhibited clear ingroup bias: on average, they allocated substantially more money to members of their own group (M = 45.95 Euro, SD = 25.39 Euro) than to members of opposing groups (pooled M = 24.44 Euro, SD = 20.08 Euro, t[4055] = 35.3, p < 0.001, d = 0.62). Figure 2 depicts this behavioural pattern of reduced generosity toward outgroup members, which reflects systematic intergroup discrimination.

Importantly, the extent of discrimination varied across the four groups. It was weakest among disengaged participants, who showed little differentiation between in- and outgroup members (pooled M = –4.86 Euro, SD = 24.37 Euro, t[155] = -1.99, p = 0.05). Discrimination was moderate among the satisfied (pooled M = –15.78 Euro, SD = 22.66 Euro, t[584] =-13.76, p < 0.001) and the ambitious (pooled M = –22.00 Euro, SD = 26.83 Euro, t[1148] = -24.68, p < 0.001)

and strongest among sceptical participants (pooled M = –26.20 Euro, SD = 30.71 Euro, t[1151] = -25.91, p < 0.001), who allocated the least to ideological outgroups. Notably, ambitious and satisfied participants treated each other relatively equitably, suggesting perceived psychological proximity between these two groups. In contrast, the disengaged were consistently discriminated against by both sides of the polarised spectrum.

The strength of group identification played a key role: stronger identification with either the sceptical or ambitious group was associated with greater intergroup discrimination (r = –.36 and –.28, respectively; both ps < .001), a pattern not observed among the other two groups. These findings provide behavioural evidence that opinion-based identities around climate policy not only structure perceptions but also drive real-world discriminatory behaviour—particularly in highly identified and polarised segments of the population.

Figure 2. Discrimination behaviour as a function of group membership.

Note: Each violin plot shows the distribution of intergroup bias scores for participants in each of the four climate policy opinion groups. Bias scores represent the difference in Euros allocated to ingroup versus outgroup members in an incentivised dictator game. Negative values indicate greater favouritism toward the ingroup (i.e., intergroup discrimination). Dots represent group means with 95% confidence intervals. Participants in the sceptical and ambitious groups displayed the highest levels of intergroup discrimination, while those in the disengaged group showed little to no bias.

Support for radical activities

Given the strong ingroup bias observed in allocation behaviour, we further examined whether group identification also predicts support for more radical ingroup actions—such as protests or civil disobedience aimed at influencing climate policy in either direction. To assess this, ambitious and sceptical participants were presented with a vignette describing an extreme subgroup aligned with their views but pursuing its goals through disruptive means (e.g., road blockades). About 17% of the ambitious participants (22% of the sceptical participants) (rather) endorsed the activities by the extreme subgroup, 8% (11%) were (rather) willing to join a demonstration organized by the subgroup, and 8% (10%) were (rather) willing to donate money for the legal defence of a subgroup member. Regression analyses of group membership (comparing sceptical with ambitious participants), group identification, and their interaction revealed significant main effects of group identification on subgroup support ($\beta = 0.41$, $p < 0.001$), willingness to demonstrate ($\beta = 0.37$, $p < 0.001$), and donate ($\beta = 0.34$, $p < 0.001$; all other effects were not significant, ps > 0.715). These findings suggest that beyond shaping attitudes and perceptions, group identification may mobilise individuals to support—at times even materially—radical actions aligned with their climate policy stance.

Voluntary climate protection

Beyond conflict-related behaviours, we also examined whether opinion groups differ in their willingness to voluntarily engage in climate protection. Participants were presented with a carbon offset donation task in which they were asked to allocate a hypothetical amount of 180 Euro—sufficient to offset the average annual CO_2 emissions of a German citizen—between themselves and a certified offsetting project. Ambitious and satisfied participants donated substantially more on average (111.51 Euro and 95.36 Euro, respectively) than the disengaged and

sceptical participants (61.07 Euro and 61.05 Euro, respectively). As shown in Figure 3, these group differences became more pronounced as identification increased, suggesting that group identity shapes not only antagonistic behaviour, such as discrimination or support for radical actions, but also constructive engagement with climate solutions. In sum, identity appears to channel climate-relevant behaviour along the lines of group norms—amplifying support for mitigation in some groups and reinforcing disengagement or resistance in others.

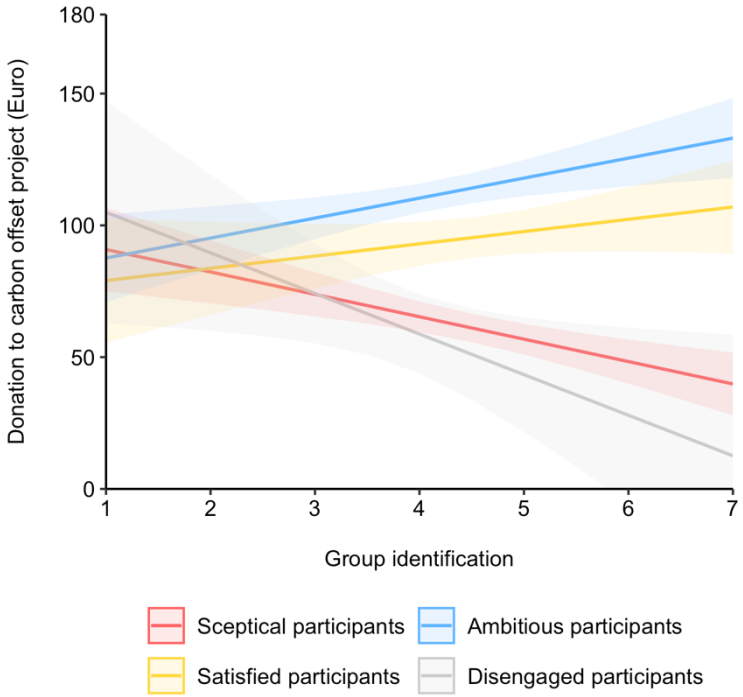

Figure 3. Donations to CO_2 compensation project.

Note: Results from a multiple linear regression of climate policy opinion group, group identification, and the interaction predicting the amount of money that participants were willing to donate to a carbon offset project if they had 180 Euro (R^2 = .176). The ribbons visualise 95% confidence intervals.

Reducing polarization by integrative policies

The observed polarisation fuelled conflict between opinion-based groups. In the real world, this may threaten societal cohesion, but it may also impede political negotiation about climate

protection and thus slow down progress towards the net-zero transition. Reducing such polarisation is therefore critical, given that climate scientists increasingly emphasise the importance of broad public support and political cooperation as prerequisites for effective and timely mitigation efforts.[17] As outlined above, one promising approach lies in the design of climate policies themselves. Rather than treating polarisation as a fixed barrier to climate action, a policy-centred perspective suggests that policies can actively shape public attitudes and social group dynamics over time.[9,10] Previous research indicates that opposition to climate policy is often related to concerns about personal costs—such as rising prices, restrictions on mobility, or changes to lifestyle and consumption patterns.[18] This highlights the potential of integrative policy designs—those that address environmental goals while simultaneously acknowledging and mitigating social and economic concerns. By contrast, distributive policy designs, which are perceived as imposing one-sided costs on specific groups, may reinforce perceptions of injustice and deepen existing divides. Procedural as well as distributive fairness have been shown to be a relevant factor in policy acceptance.[19,20] To test this idea, we conducted an explorative vignette experiment with another quota-representative sample of $N = 1{,}102$ German adults who had previously identified with either the ambitious or sceptical climate opinion group. After assessing participants' level of group identification, they were randomly assigned to one of three experimental conditions.

In the integrative policy condition, participants were presented with a hypothetical government policy introducing a new income tax targeting high-income individuals only. The revenue would be used to support climate-friendly behaviours among the general population—for example, by expanding public transport or subsidising environmentally sustainable heating systems. The policy was framed as a meaningful contribution to climate protection that avoided placing undue burdens on ordinary citizens, thereby integrating the goals and concerns of both groups. As justification, the policy emphasised that high-income individuals produce significantly

higher emissions, warranting a more targeted tax approach. In the distributive policy condition, participants were presented with an alternative income tax scenario, this time levied on middle-income individuals. The policy was expected to have only a limited impact on climate protection. The justification for exempting high-income individuals was that they already face substantial tax burdens and might relocate abroad if further taxed. This scenario thus redistributed the burden without aligning with climate goals or broader fairness concerns. Participants in the control condition received no policy information. After the experimental manipulation, we assessed both policy approval and intergroup discrimination.

Intergroup discrimination was measured as in Study 1 using two incentivised behavioural allocation tasks. Participants were asked to divide 100 Euro between themselves and another person who either held the same climate policy position (ingroup member) or the opposing view (outgroup member). Participants in the integrative policy condition showed significantly lower levels of intergroup discrimination compared to those in the control condition (integrative: $M = 16.10$, $SD = 26.75$; control: $M = 20.49$, $SD = 27.78$; $t[714.29] = -2.17$, $p = 0.031$, $d = -0.16$), representing a 21% reduction. This effect was primarily driven by increased generosity toward outgroup members (which accounted for 74% of the observed difference) rather than reduced allocations to ingroup members (26%). Notably, the effect of the integrative policy was stronger among sceptical participants, who reduced their intergroup discrimination by 6.03 Euro (29%) compared to the control condition. In contrast, ambitious participants reduced their discrimination by 2.35 Euro (12%).

By comparison, the distributive policy condition did not significantly affect intergroup discrimination (distributive: $M = 18.55$, $SD = 28.57$; $t[761.09] = -0.95$, $p = 0.34$, $d = -0.07$). Similar to the integrative condition, sceptical participants showed a greater behavioural response

(–16%), while ambitious participants reduced their bias by only 1%; however, neither of these differences were statistically significant (both *ps* > 0.25).

A linear regression analysis predicting both sceptical and ambitious participants' intergroup bias from group identification, experimental condition and their interaction revealed that group identification was a significant predictor of discriminatory behaviour ($\beta = 7.16$, $p < 0.001$). The marginally significant interaction term ($\beta = -2.98$, $p = 0.07$) suggests that individuals with strong group attachment are somewhat more responsive to integrative policy framings: in the integrative policy condition, the average discrimination of highly identified participants (group identification above median) declined by 27% (from 27.44 Euro to 20.01 Euro; $t[332.22] = -2.38$, $p = 0.02$, $d = -0.26$). Among those with weaker identification, the reduction was smaller (15%) and not statistically significant (from 14.64 Euro to 12.51 Euro; $t[378.5] = -0.84$, $p = 0.40$, $d = -0.09$).

Increased support for integrative policies

We also assessed whether the integrative policy not only reduced intergroup bias but could garner broad support—a key criterion for democratic implementation. Indeed, the integrative policy also received substantially higher mean approval. On a 7-point scale, average support for the integrative policy ($M = 4.17$, $SD = 2.11$) was significantly greater than for the distributive policy ($M = 2.05$, $SD = 1.51$; $t[594.19] = 15.24$, $p < 0.001$, $d = 1.17$). Nearly half of participants (48%) expressed approval of the integrative policy (rating > 4), compared to just 9% for the distributive version. Importantly, support for the integrative policy was observed not only among ambitious participants (70% approval), but also among 31% of sceptical participants—suggesting that integrative designs can resonate across polarised segments.

Participants' estimates of public support closely mirrored actual approval rates. For the integrative policy, the average perceived support was 47%—nearly identical to observed approval.

In contrast, support for the distributive policy was overestimated (31% perceived vs. 9% actual), though it was still perceived as substantially less popular. These results indicate that integrative policies not only attract broader support but are also recognised as more socially acceptable—both of which are critical for political viability.

Discussion

Our findings offer both concerning and hopeful insights into the role of group identity in climate politics. On the one hand, we show that people form opinion-based groups around their views on climate policy, and that identification with these groups predicts several behaviours known to fuel societal polarisation. Consistent with prior research in other domains, individuals with strong group identification were more likely to surround themselves with like-minded others,[12] overestimate their ingroup's size and influence,[10] discriminate against ideological outgroups,[13] and express support for extreme activist behaviours aligned with their views.[14] These identity-driven processes risk escalating intergroup tensions, obstructing political negotiation, and delaying the societal transformations necessary for achieving carbon neutrality.

On the other hand, our results point to a promising path forward: polarisation is not inevitable. In particular, climate policy design itself could act as a tool for depolarisation. In our experimental test, participants exposed to an integrative policy—one that combined effective climate action with sensitivity to economic fairness—exhibited significantly reduced intergroup bias. This effect was especially pronounced among sceptical individuals, who initially opposed stricter regulation. These findings suggest that even in highly polarised contexts, climate-related divisions can be softened through well-designed policies that speak to the values and concerns of divergent groups.

Our findings complement emerging evidence that integrative policy designs—those that combine climate mitigation with redistributive fairness—are more likely to receive public support

in politically divided societies. Recent cross-national surveys show robust majority support for global climate schemes that include equal revenue redistribution.[17] Our study extends this literature in a crucial and new point, demonstrating not only increased approval but, importantly, also reduced discriminatory behaviour in response to integrative policy design.

Several limitations should be noted. First, our data were collected in Germany, a context marked by both high emissions and increasing political polarisation. While this makes it a relevant case, future studies should explore how these dynamics unfold in other countries. Second, although some of our measures relied on self-report, the key outcome of intergroup discrimination was assessed using incentivised behavioural tasks, reducing concerns about social desirability. Finally, we tested a single, hypothetical policy. In real-world settings, the reconciling effects of integrative policy design could be even stronger, especially when policies are communicated more vividly or embedded in broader narratives of fairness and effectiveness.

Taken together, our findings demonstrate that personal identification with climate policy positions relates to societal divisions—but also that these divides can be bridged. Integrative climate policy designs that combine environmental ambition with social fairness not only reduce intergroup bias but also enjoy greater public support. Designing and implementing such policies is not merely a technical task. It is central to ensuring democratic resilience and sustaining societal cohesion in the face of an accelerating climate crisis.

Methods

In the first data collection, we assessed participants' opinion on climate policy and group identification; had them estimate the relative shares of the different groups and play four dictator games to estimate intergroup discrimination. Finally, we tested their voluntary climate protection intention by a carbon-offset task and support for radical actions. In the second data collection, climate policy opinion and identification were assessed, followed by an experimental manipulation

of policy design. We then collected policy approval and intergroup bias employing two dictator games.

Participants

Participants of the first data collection were surveyed in August 2023 and recruited from a non-probabilistic German sample (N = 1,014), which was quota representative for age × gender, and federal state with regard to the German adult population.[21] The participants were 51% male (49% female) and aged 18 to 74 years (M = 45.47, SD = 15.90). Participants from the second data collection were surveyed in January 2025 and recruited from a non-probabilistic German sample (N = 1,102), which was quota representative for age × gender, and federal state with regard to the German adult population. The participants were 50% male (50% female) and aged 18 to 74 years (M = 46.12, SD = 15.26). Satisfied and disengaged participants were not admitted to the survey, so the whole sample was either ambitious (47%) or sceptical regarding climate policies (53%).

Measures

Opinion on climate policy and group identification. Participants were asked to state their position on the German federal government's climate policy by selecting whether it was (i) going too far (sceptical group), (ii) not going far enough (ambitious group), (iii) exactly right (satisfied group), or (iv) not of interest to the participant (disengaged group). Identification with the respective group was assessed using the 5-item measure adapted from Henkel et al.[22] (sample item: "I am proud to belong to the group of people for whom the federal government's climate policy is going too far/does not go far enough/is just right/who don't care about the federal government's

climate policy", measured on a 7-point scale from "do not agree at all" to "very much agree", Cronbach's $\alpha = .73$).

Population estimates of climate policy support. Participants were asked to estimate how many people in Germany belonged to each of the four opinion groups. For each group, participants entered a percentage from 0 to 100 under the condition that the sum of all percentages equal 100.

Intergroup discrimination in dictator games. In the first data collection, participants played four games. They were asked to distribute 100 Euro between themselves and a person believing that the German government's climate policy is (i) going too far (sceptical person), (ii) not going far enough (ambitious person), (iii) exactly right (satisfied person), or (iv) not of interest (disengaged person). In the second data collection participants played only two games, one with an ambitious and one with a sceptical other person. The games were presented in random order and incentivised by the random selection of one decision by one participant for payout (in case the participant had assigned money to another person, this person was also selected randomly for payout). Intergroup discrimination was measured as the difference between the amounts distributed to outgroup and ingroup members.

Voluntary climate protection intention. Participants (first sample only) were asked to imagine distributing 180 Euro between themselves and a donation to atmosfair, a charitable organization that engages in CO_2 emission offsetting (21). They were told that the amount of 180 Euro was sufficient to offset the annual CO_2 emissions of an average German, based on the World Bank estimate of Germany for the year 2019 (22).

Support for radical subgroups. The sceptical and ambitious participants in the first sample were presented with a five-sentence description of a hypothetical subgroup. The sceptical participants received a description of the "freedom fighters," who sought the continued use of fossil fuels and demanded that citizens freely decide how they travel, heat, and eat. The ambitious

participants received a description of the "climate fighters," who sought an immediate phase-out of fossil fuel use and demanded environmentally friendly travel, heating, and eating. Both subgroups were described as drawing attention to their causes by organising demonstrations in many cities, damaging party buildings, and blocking roads to the German parliament. After reading the respective subgroups' descriptions, the participants were asked to assess the subgroup's position on climate policy as an encoding check. They were then asked how much they supported their actions (on a 7-point scale ranging from "I completely reject it" to "I strongly endorse it"), how likely it was that they would join a demonstration organized by them in the upcoming weeks, and how likely it was that they would donate money to help fund the legal defence of a group member who was recently arrested and charged with criminal damage (these two items were assessed on a 7-point scale ranging from "not at all" to "definitely").

Experimental policy design manipulation. Participants in the second sample were randomly assigned to one of three conditions. In the *integrative* policy condition, they should imagine that the government introduces a new income tax that helps to finance effective climate mitigation measures of ordinary people but is only paid be citizens with a yearly income above 150,000 Euro. In the *distributive* policy condition, participants also read about a proposed income tax, but this was to be paid by everyone with a yearly income between 20,000 and 150,000 Euro and expected to finance rather *distributive* climate mitigation measures. The control group received no such information. For the original and translated vignettes, see the online supplement.

Policy approval. Participants in the *integrative* and *distributive* policy conditions were asked to evaluate the proposed policy on a 7-point scale from "very bad" to "very good." They were further asked to estimate how many of those participants who asked for stricter or less strict climate polices perceived the proposed policy as rather good (i.e., answered with values > 4).

Ethics

The study was conducted in accordance with German Psychological Association guidelines. Ethical clearance was obtained from the University of Erfurt's institutional review board (#20220525), and all participants provided informed consent to use and share their data for scientific purposes without disclosure of their identities. Participants were compensated for their participation by a panel provider. The study did not use deception.

Data availability

Data and analysis scripts are available at https://osf.io/uykng/.

Author contributions

All authors designed the research. LH and PS performed the data analysis and drafted the manuscript, which was revised and approved by all authors.

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Competing interests

The authors declare no competing interests.

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