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Title

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Journal

Climatic Change, 177(4)

ISSN

0165-0009

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Publication Date

2024-04-01

DOI

10.1007/s10584-024-03720-7

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Neutral and negative effects of policy bundling on support for decarbonization

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Abstract

Decarbonization policies are frequently combined with other policies to increase public support or address related societal issues. To investigate the consequences of policy bundling, we conducted a survey experiment with 2,521 U.S. adults. We examined the effects of bundling decarbonization with policies favored by liberals (social justice and economic redistribution), broad bipartisan coalitions (infrastructure), and conservatives (pausing EPA regulations) on public support and polarization. Bundling with pausing EPA regulations decreased support and polarization by reducing liberal support without significantly increasing conservative support. Bundling with social justice decreased support while increasing polarization by reducing conservative support without significantly increasing liberal support. Bundling with economic redistribution and infrastructure did not significantly change support or polarization. Policy bundling thus risks decreasing public support for decarbonization policies by alienating one ideological side of the electorate without gaining support from the other side. This risk exists even when policy bundling reduces polarization.

Keywords: political polarization, policy bundling, decarbonization, climate policy

Introduction

Given the coupling between public opinion and policy, as well as the reelection incentives of elected officials, addressing climate change requires public support for decarbonization policies. Such policies in the United States generally garner greater support from liberals than conservatives. To broaden policy support, policymakers often propose bundling emissions-reduction policies with other policies that enjoy greater support among conservatives and moderates, such as pausing new environmental regulations and revitalizing infrastructure. For instance, the bipartisan Energy Innovation and Carbon Dividend Act of 2019 (H.R. 763, which failed in committee) combined a revenue-neutral carbon tax with a pause on new Environmental Protection Agency (EPA) regulations and renewable energy funding was included in the 2021 bipartisan infrastructure bill (H.R. 3684). The underlying logic is that bundling components that appeal to conservatives and moderates will decrease polarization and increase overall public support for the bundled decarbonization policy.

Other advocates advance a bundling strategy that pairs disproportionately liberal-supported policies, such as social justice, with decarbonization to increase the scope of societal problems addressed by a single piece of legislation. For instance, the Sunrise Movement advocated for a Green New Deal, which bundled climate mitigation policies with a number of economic and social policies aimed at reducing economic and racial inequality. The logic was to increase overall support for the bundled decarbonization policy through heightened support among liberals.

Yet bundling strategies might make decarbonization policies more polarizing, even as they increase support. For example, a recent study found that bundling some non-decarbonization policies discussed in the context of the Green New Deal increased public support relative to decarbonization alone by increasing Democrats' support without affecting Republicans' support. Or bundling strategies might even reduce overall support if they alienate some supporters without attracting new supporters. Thus, assessing the effects of bundling on decarbonization policy support is a key research need. Here, we evaluate a broad set of bundling strategies, exploring whether bundling decarbonization with policies appealing to liberals, conservatives, or bipartisan coalitions can increase support for decarbonization while decreasing polarization of support.

We tested the effects of four bundling strategies in a pre-registered survey experiment of 2,521 U.S. adults. We assessed whether bundling decarbonization policy with four other policy types that appeal to different segments of the electorate increased support for the bundle relative to the decarbonization policy alone. The survey instrument and subsequent analysis focus on the content of the policy bundles rather than the size, cost, or partisan attachments. In fact, we remove partisan cues to avoid source cues that can lead to prioritization of party over policy⁹. For external validity, our treatment policies were based on real policies or proposals (Table 1). None of the

bundles increased support compared to decarbonization alone and some reduced support in our sample.

Some bundles reduced issue support polarization, which we operationalize as differences between liberals' and conservatives' support, while other bundles increased polarization. This operationalization of polarization differs from conceptualizations that are not issue-specific. Our conceptualization intends to capture whether a bundled policy treatment appeals relatively more equally to segments of the electorate than when decarbonization is presented alone.

Whether bundling policies together is likely to increase support among various segments of the electorate or the electorate as a whole depends on what the public infers from the bundling. We expect that polarization will change in the presence of the bundling treatments in comparison to the control group because the bundled policies offer ideological cues that appeal to some respondents more than others. In the absence of source cues, policy content itself provides voters with clues as to whether a policy aligns with their ideological positions. Thus, the very content of a policy may help voters to align their position with their partisan and ideological identity. Since Americans hold relatively unconstrained policy positions, their preferences on bundled policy could take a cue from a policy that appeals to their ideology.

The idea of bundling decarbonization with policies that appeal to other segments of the electorate – moderates or conservatives, rather than liberals – is to increase the support from those segments. If policies that appeal to a segment of the electorate bring the support of that portion to the combined policy, they will reduce polarization of support (regardless of their effect on the existing supporters). Thus, we expect that polarization will decrease in the moderate-appealing and conservative-appealing bundled policies (infrastructure and pausing EPA regulations) because moderate and conservative support will increase relative to the control. As a result, the gap between liberal and conservative respondents will narrow. On the other hand, we expect that polarization will increase in the liberal-appealing bundle since more liberals may support the policy and there is nothing in it to additionally appeal to moderates or conservatives. The gap in support between liberal and conservative respondents will widen.

H1: Polarization will decrease (increase) in the moderate-appealing and conservative-appealing (liberal-appealing) bundled treatments because moderates and conservatives (liberals) will like the bundle more than decarbonization alone.

The choice to bundle a policy with another policy relies on the idea that bundling can increase support, not just change polarization. Bundling policies together could improve overall support by drawing support for the bundle from different portions of the public, engaging voters who may not have previously identified as proponents of a single policy priority. This rationale would apply to bundling decarbonization with

conservative-preferred policies or policies that appeal to moderates. Overall policy support may also increase when decarbonization policy is paired with a policy that appeals to the same liberal portion of the ideological spectrum if liberal support increases but conservative support does not decrease, as Bergquist, Mildemberger, and Stokes (2020) found for economically progressive policies. The overall effect of bundling on support depends on how people respond – whether they increase support for a bundle when another policy they support is included and whether they decrease support for the bundle when a policy they oppose is added. For example, pairing decarbonization with pausing EPA regulations could increase overall support if conservatives increase their support for the bundle and liberals do not decrease their existing support for decarbonization.

H2: Pairing decarbonization policy with an additional policy that appeals to various ideological groups (liberals, moderates or conservatives) will increase overall support, driven by strengthened support from those groups.

Of course, if increased support on one side is offset by decreased support on the opposing side, overall support may decrease or not change even as polarization decreases. For example, if liberals oppose reduced regulation more than conservatives support reduced regulation, bundling that policy with decarbonization policy could reduce overall support.

To test these hypotheses, we randomly assigned a quota sample (details below) of 2,521 U.S. adults into five groups on the Qualtrics survey platform. We asked respondents to report their support for one decarbonization policy (bundled or not) at a time, for external validity over more complex conjoint analysis and consistent with public opinion organizations such as Pew Research. The four decarbonization policies appeared in the same order for all participants.

We modeled four representative decarbonization policies off of real policies that have received considerable attention in policy-making circles and the news media. They include consumer-level incentives for investing in renewable energy technologies; research and development subsidies for new energy technologies; an economy-wide tax on carbon; and a carbon-free electricity standard. Renewable incentives exist as part of several sub-national and federal decarbonization policies that incentivize the installation and use of renewable energy. Research and development subsidies for solar, wind, energy storage, and energy efficiency projects were in the \$900 billion bipartisan COVID-19 relief bill of December 2020. An economy-wide carbon tax was central to the Energy Innovation and Carbon Dividend Act of 2021 proposal that was reintroduced in the House of Representatives in April 2021 (H.R.2307). A carbon-free electricity standard, which would require the power sector to achieve 100 percent clean energy by 2035, was proposed as part of President Biden's American Jobs Plan.

The control group answered questions about their support levels for the four decarbonization policies presented alone. The four other groups answered questions about their support for each decarbonization policy (listed first) when it was bundled with one additional policy (listed second) related to pausing new EPA regulations, infrastructure, economic redistribution, and social justice. The overall design of the study is summarized in Table 1.

The four bundled policies were likewise designed for external validity and they vary in their support levels across demographic and political constituencies (national polling data is summarized in Fig. 1 and Extended Data Table 2). We included a policy that pauses new Environmental Protection Agency (EPA) regulations, which could garner support from conservative respondents who disproportionately disapprove of a strict regulatory posture on environmental issue. To represent a moderate-appealing policy, we included upgrading infrastructure like road, bridges, and rail systems, which are a frequent focus of bipartisan bills, such as the Infrastructure Investment and Jobs Act of 2022 (H.R.3684).

We also tested bundling with two liberal-appealing policies – economic redistribution and social justice. Recent studies suggest that support for social justice policies may be concentrated among the most liberal respondents. Multiple policies were tested within these treatments to examine the robustness of the policy bundles to variations and to reduce the likelihood that any findings were specifically tied to one operationalization. For example, Bergquist, Mildemberger, and Stokes (2020) found some variation in support for different economic redistribution policies. We randomized participants in the economic redistribution group to see one of four policies commonly discussed in the context of the Green New Deal (see Table 1) paired with each decarbonization policy. In the social justice treatment, we randomized participants to see one of the three social justice policies combined with all four decarbonization policies. Support levels are averaged for all main analyses, yielding four treatment groups and one control group for this analysis.

Table 1. Treatment groups

Treatment	Description	Similar Real World Example(s)
Pausing Regulation	Pausing new EPA regulations	Energy Innovation and Carbon Dividend Act (H.R. 763, 2021)
Infrastructure	Upgrade America's roads, bridges and rail systems	Bipartisan Infrastructure Investment and Jobs Act (H.R. 3684, 2021)
Economic Redistribution	<p><i>Respondents see each of the four decarbonization policies paired with one of these randomly selected policies (each respondent may see any of the following paired with each decarbonization policy):</i></p> <ul style="list-style-type: none"> - A tax increase for households making over \$400,000 - A monthly cash payment program to citizens - A national health insurance public option - Reducing obstacles to unionized labor and creating good-paying, unionized clean energy jobs 	Discussed in context of the Green New Deal (H.Res.109, 2019)
Social Justice	<p><i>Respondents see the four decarbonization policies paired with one of the following policies (a respondent may see a different one of the following with each decarbonization policy):</i></p> <ul style="list-style-type: none"> - Creating a justice and equity commission to monitor effects of policies on marginalized communities and making recommendations to remedy those (implicit) - Creating a commission to monitor effects of policies on women and racial minorities and making recommendations to remedy those (race- and gender-explicit, with non-specific intended effects), - Awarding at least a quarter of new infrastructure contracts to women and/or racial-minority-owned businesses (race- and gender-explicit, with specific intended effects). 	Virginia's H.B.1042 (2020) and Illinois' S.B. 2920 (2016) created environmental justice commissions. Section 1005 and the Restaurant Revitalization Fund of the American Rescue Plan Act (H.R.1319, 2021) prioritized women- and/or minority-owned businesses for benefits. The Justice40 initiative requires 'disadvantaged communities' to receive 40% of the benefits of certain investments.

To validate the appeal of the policies across the ideological spectrum, Fig. 1 summarizes results of major national polls for policies similar to those in our treatments. See Extended Data Table 2 for details on the policies used for comparison and how closely they match the policies used in the study. The decarbonization, economic redistribution, and social justice policies are disproportionately supported by liberals, with decarbonization being the most popular of these. Reducing environmental regulation is disproportionately supported by conservatives and unpopular overall compared to the others. Infrastructure is largely non-partisan and relatively popular.

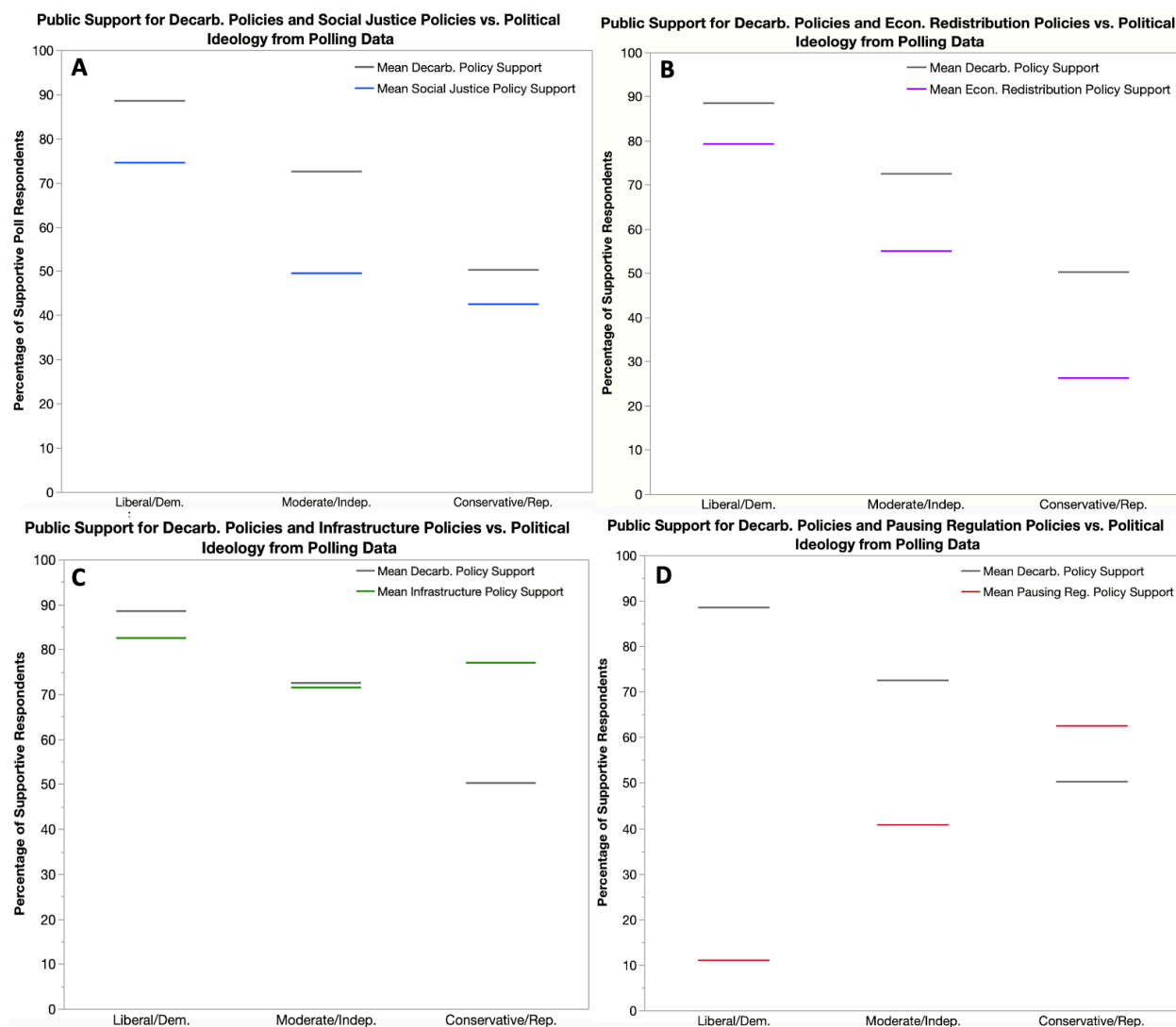


Fig 1. Polling data regarding U.S. voters' support for decarbonization policies (gray lines on each panel) and other policies considered in this study. The x-axis shows political ideology from Liberal/Democrats to Moderate/Independents to Conservative/Republicans. Polling data from the sources in Extended Data Table 2 are averaged for Liberal/Dems, Moderate/Inds, and Conservative/Reps for each of the categories. Panel A includes polling data from Citizens for Responsible Energy Solutions (CRES) February 2022 and Pew Research Center January 2022. Panel B includes polling data from CRES February 2022, Pew Research Center September 2019, and July 2020. Panel C includes polling data from CRES February 2022, YouGovAmerica January 2018, and AP-NORC July 2021. Panel D includes polling data from CRES February 2022, Pew Research Center December 2016, and February 2019.

Results

We obtained a quota sample of 2,521 U.S. adults using a Qualtrics survey that was conducted between August 26 and September 7, 2021. We sampled using quotas on gender, ethnicity, and age based on the most recent U.S. Census data, and political ideology with a 50%-50% split between liberals and conservatives on a six-point scale (Very liberal, Liberal, Somewhat liberal, Somewhat conservative, Conservative, Very

conservative). All respondents indicated their policy preferences using the following four classifications that are converted to a one-point scale in the analysis—strongly oppose (0), slightly oppose (0.333), slightly support (0.667), and strongly support (1). The main specifications include all respondents. Additional robustness checks include only registered voters in the sample.

In our sample, none of the policy bundles significantly increased support relative to decarbonization alone, either overall or among various segments of the electorate. Instead, two of the bundles (pausing regulation and social justice) reduced support and several bundles increased polarization of support between the ends of the political spectrum. Where there was a reduction in polarization of support for the bundled policy, it was driven by a reduction in support from one end of the spectrum rather than by garnering support from some respondents. We report average treatment effects (ATE) and treatment effects (TE) as averages of support across the four decarbonization policies for the main OLS specification. Four additional specifications show the treatment effects associated with support for each of the decarbonization policies separately.

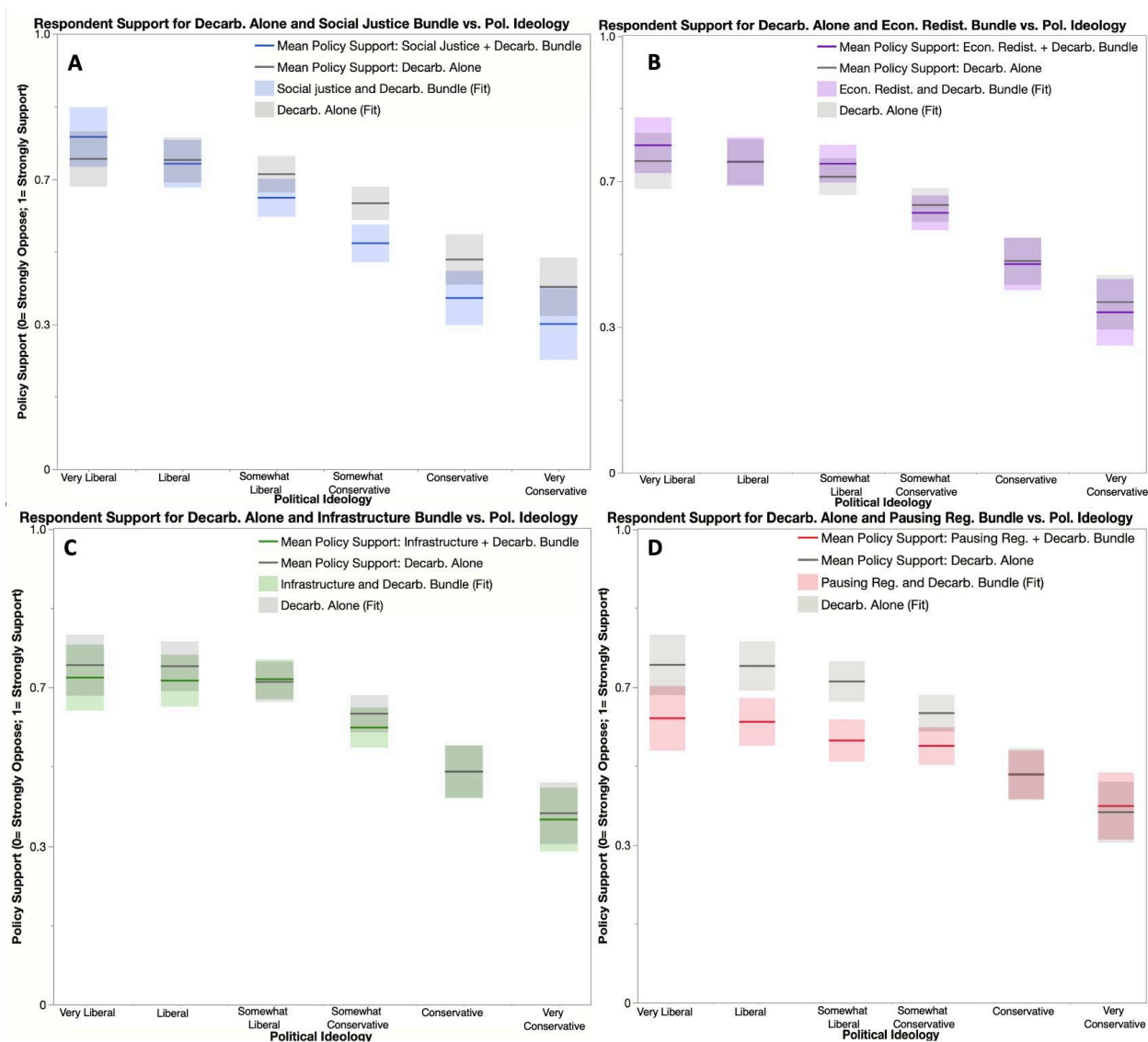


Fig 2. Respondent policy support for decarbonization policies presented alone and in bundles with additional policies which vary in their support across political ideology (liberal to conservative). Support levels are shown on a scale with four levels ranging from 0 (Strongly oppose), 0.333 (Slightly oppose), 0.667 (Slightly support), and 1 (Strongly support). Bolded lines signify the mean support levels for each political ideology group. The shaded regions represent 95% confidence intervals. Panel A shows support for social justice policy. Panel B shows support for economic redistribution policy. Panel C shows support for infrastructure policy. Panel D shows support for pausing EPA regulation.

Polarization

We consider differences in policy support according to respondents' political ideology in each treatment group by regressing policy support on the treatment groups with an interaction term for respondents' political ideology (see SI Table 3 for the results of this OLS estimation). Figure 2 shows respondents' average support for decarbonization policies presented alone (shaded in gray) and bundled with social justice (Fig. 2a), economic redistribution (Fig. 2b), infrastructure (Fig. 2c), and pausing

EPA regulations (Fig. 2d). They show the patterns of policy support for self-identified very liberal to very conservative respondents for each treatment group. The y-axes show policy support from strongly oppose to strongly support.

Partially consistent with H1, issue support polarization decreased in the conservative-appealing bundle. However, it was driven by a loss in liberal respondents' support without significant gains in conservative respondents' support. Support for the pausing EPA regulation bundle was significantly lower than support for decarbonization policy alone among liberal respondents (Treatment Effect (TE) for very liberal respondents is -0.11, $p = 0.06$; TE for liberals is -0.12, $p = 0.001$; TE for somewhat liberal respondents is -0.12, $p = 1.2 \times 10^{-5}$) and it was not higher among conservative respondents (TE for very conservative respondents is 0.03, $p = 0.66$; TE for conservatives is 0.00, $p = 0.94$; TE for somewhat conservative respondents is -0.07, $p = 0.004$).

On the other end of the ideological spectrum, support polarization increased as expected in one of the liberal-appealing bundles; however, it was driven by a loss in conservative respondents' support without significant gain in liberal respondents' support. Support for the social justice bundle was significantly lower than support for decarbonization policy alone among conservative respondents (TE for conservatives is -0.09, $p = 0.05$; TE for somewhat conservative respondents is -0.09, $p = 0.001$) and support was not higher among liberal respondents compared to the decarbonization policies presented alone (TE for very liberal respondents is 0.05, $p = 0.36$; TE for liberals is -0.01, $p = 0.72$; TE for somewhat liberal respondents is -0.05, $p = 0.06$). As predicted by H1, support polarization increased when decarbonization policy was bundled with liberal-appealing policy.

Lastly, in contrast to the predictions in H1, the economic redistribution (liberal-supported) and infrastructure (moderate-supported) bundles did not significantly change polarization because they did not increase or decrease liberal or conservative respondents' support. Liberal respondents who saw the economic redistribution bundle did not have significantly different support levels than those who saw the decarbonization policies in isolation (TE for very liberal respondents is 0.04, $p = 0.52$; TE for liberals is 0.00, $p = 0.93$; TE for somewhat liberal respondents is 0.03, $p = 0.26$). Nor did conservative respondents have different levels of support for the economic redistribution bundle compared to the decarbonization policies presented alone (TE for very conservatives is -0.02, $p = 0.72$; TE for conservatives is 0.00, $p = 0.88$; TE for somewhat conservative respondents is -0.01, $p = 0.48$). Likewise, liberal respondents did not have different levels of support for the infrastructure bundle than decarbonization alone (TE for very liberal respondents is -0.03, $p = 0.66$; TE for liberals is -0.04, $p = 0.37$; TE for somewhat liberal respondents is 0.00, $p = 0.81$) nor did conservative respondents (TE for very conservative respondents is -0.01, $p = 0.97$; TE for

conservatives is 0.00, $p = 0.91$; TE for somewhat conservative respondents is -0.03, $p = 0.25$).

Table 2 illustrates the differences in support levels between liberal and conservative respondents in the different treatment conditions. Very liberal and liberal respondents were grouped and very conservative and conservative respondents were grouped. We used two-sample, two-tailed t -tests to calculate the differences and assess whether support polarization – the difference between their average support levels as defined for the purposes of this study – increased or decreased in each bundling strategy. The difference in support between liberal and conservative respondents in the control group is 0.27 on a one point scale (Table 2; row 1, column 5). This difference increased with policy bundles designed to appeal to liberals, to 0.35 in the social justice treatment group and to 0.29 in the economic redistribution group. For policy treatments that appeal to moderates and conservatives, issue support polarization slightly decreased in the infrastructure group to 0.23 and decreased to 0.14 in the pausing regulation group.

Using an OLS specification that includes an interaction between bundling treatment and political ideology, we calculated the difference between the differences in Table 3. Only the pausing regulation treatment difference was significantly lower than the treatment group difference (Table 3; 0.13(0.05), $p = 0.004$). The social justice treatment difference approaches statistical significance (Table 3; -0.08(0.05), $p = 0.08$) and the other differences show a directional relationship but are not statistically significant.

Table 2. Mean policy support among liberal and conservative respondents. Two-sample t -tests show the differences between the mean support levels for the control and treatment groups. The top row shows the control group, which saw decarbonization policies in isolation.

Treatment group	Liberal respondent mean policy support	Cons. respondent mean policy support	p-value t-value df	Difference between liberal and conservative respondents
Decarb. Alone (Control)	0.71 $n = 125$	0.44 $n = 130$	$p = 2.5e-14$ $t = -9.09$ $df = 252.15$	0.27
Decarb. + Social Justice	0.725 $n = 134$	0.37 $n = 99$	$p = 2.2e-16$ $t = -9.78$ $df = 178.01$	0.35
Decarb. + Econ. Redistribution	0.73 $n = 132$	0.44 $n = 105$	$p = 2.8e-14$ $t = -8.18$ $df = 26.16$	0.29

Decarb. + Infrastructure	0.68 <i>n</i> = 123	0.45 <i>n</i> = 123	<i>p</i> = 4.3e-11 <i>t</i> = -6.91 <i>df</i> = 243.54	0.23
Decarb. + Pausing Reg.	0.59 <i>n</i> = 131	0.46 <i>n</i> = 125	<i>p</i> = 3.3e-05 <i>t</i> = -4.23 <i>df</i> = 249.56	0.13

Table 3. Results from Extended Data Table 3. The difference between the differences expressed in Table 2, column 5 are presented with standard errors in parentheses followed by the p-values.

Treatment group	Treatment group differences between liberal and conservative respondents compared to control group difference (0.27)
Decarb. + Social Justice	-0.08 (0.05) <i>p</i> = 0.08
Decarb. + Econ. Redistribution	-0.02 (0.05) <i>p</i> = 0.64
Decarb. + Infrastructure	0.03 (0.05) <i>p</i> = 0.46
Decarb. + Pausing Reg.	0.13 (0.05) <i>p</i> = 0.004

Overall Support

In no case did bundling increase overall support; bundling always either reduced overall support or had no effect. Table 4 presents the results of five OLS models that show how policy support (dependent variable) changes with the addition of each bundled policy compared to the control group independent of political ideology. The dependent variables in the first four models separate policy support for each decarbonization policy. The fifth model (main OLS specification, in green) specifies the average of the support levels for the four decarbonization policies as the dependent variable, which illustrates a robust concept of decarbonization policy instruments at play in policy-making spaces across the country. Treatment effects are reported for the main specification.

Bundling the decarbonization policies with policies that appeal to moderate and conservative ideological portions of respondents resulted either in no change or a decrease in overall support, opposite to the predictions of H2. Bundling a moderate policy (infrastructure) with decarbonization policies resulted in no significant change in

support (Table 4; Change in Average Policy Support (ATE) = -0.01, *standard error* (s.e.) = 0.01) and bundling a policy with an incongruent ideological cue (pausing EPA regulation, a conservative policy) resulted in a significant decrease in overall support (Table 4; ATE = -0.08, s.e. = 0.01).

Bundling liberal policies (economic redistribution and social justice indicators) with the decarbonization policies also resulted in decreases in overall support or no change. There was no significant increase in overall support for decarbonization policies when bundled with economic redistribution policies (Table 4; ATE = 0.00, s.e. = 0.01). There was a significant decrease in overall support for decarbonization policies when bundled with policies with a social justice focus (Table 4; ATE = -0.05, s.e. = 0.02), which represents a substantial decline in support on the one-point scale. The bundling strategies have substantive and statistically similar treatment effects on policy support for all four policies.

Consistent with the polling data, conservative respondents are less supportive of decarbonization policy than liberal respondents. In comparison to very liberal respondents, somewhat conservative (Table 4; Change relative to very liberal respondents (Δ) = -0.13, s.e. = 0.02), conservative (Table 4; Δ = -0.24, s.e. = 0.02), and very conservative (Table 4; Δ = -0.33, s.e. = 0.03) respondents support decarbonization policies significantly less. The research and development policy and the clean electricity standard garnered the highest baseline support levels (0.77, s.e. = 0.02) while the carbon tax garnered the lowest baseline support (0.65, s.e. = 0.03).

Table 4. Respondent policy support by treatment group controlling for political ideology. The control group that evaluated decarbonization policies alone and very liberal-identifying respondents are the reference categories. The first four models treat support for each decarbonization policy as separate dependent variables and the fifth model (main specification) treats average support across the four decarbonization policies as the dependent variable. Estimates are listed first followed by robust standard errors.

	Carbon Tax Support	R+D Funding Support	Renewable Incentive Support	CES Support	Average Policy Support (Main Specification)
(Intercept)	0.65*** (0.03)	0.77*** (0.02)	0.74*** (0.02)	0.77*** (0.02)	0.73*** (0.02)
Decarb. + Econ Redistribution	0.02 (0.02)	0.01 (0.02)	-0.02 (0.02)	0.01 (0.02)	0.00 (0.01)
Decarb. + Infrastructure	0.01 (0.02)	-0.02 (0.02)	-0.02 (0.02)	-0.02 (0.02)	-0.01 (0.01)
Decarb. + Pausing Regulation	-0.07*** (0.02)	-0.06*** (0.02)	-0.08*** (0.02)	-0.08*** (0.02)	-0.08*** (0.01)
Decarb. + Social justice	-0.04* (0.02)	-0.06** (0.02)	-0.06** (0.02)	-0.04* (0.02)	-0.05** (0.02)

Political Ideology: Liberal	-0.02 (0.03)	-0.02 (0.02)	-0.01 (0.02)	-0.05 (0.02)	-0.02 (0.02)
Political Ideology: Somewhat liberal	-0.05 (0.03)	-0.03 (0.02)	-0.05* (0.02)	-0.09*** (0.02)	-0.05** (0.02)
Political Ideology: Somewhat cons.	-0.13*** (0.03)	-0.12*** (0.02)	-0.09*** (0.02)	-0.20*** (0.02)	-0.13*** (0.02)
Political Ideology: Conservative	-0.22*** (0.03)	-0.22*** (0.03)	-0.18*** (0.03)	-0.33*** (0.03)	-0.24*** (0.02)
Political Ideology: Very conservative	-0.28*** (0.03)	-0.34*** (0.03)	-0.27*** (0.03)	-0.41*** (0.03)	-0.33*** (0.03)
R ²	0.09	0.12	0.07	0.15	0.15
Adj. R ²	0.08	0.11	0.07	0.15	0.15
Num. obs.	2521	2521	2521	2521	2521

***p < 0.001; **p < 0.01; *p < 0.05

Discussion

Our experiment examined the effects of bundling additional policies on support for decarbonization policies, both overall and by ideological groups, through a randomized survey experiment on a quota sample of 2,521 U.S. adults. We tested the hypothesis that bundling decarbonization policies with other policies could lead to increased overall support from a broader coalition of voters than the original decarbonization policy proposed alone. Instead, we found that bundling either has no impact or decreases overall policy support across the four treatments.

The polarization dynamics also did not play out as predicted, or as often posited by advocates of policy frameworks. The difference between very liberal and very conservative respondents decreased in the pausing EPA regulations treatment and increased in the social justice treatment. In both cases, the change in polarization was driven by the loss of some segments of respondents without significant gains from the respondents on the opposite end of the political spectrum. Crucially, decreased polarization did *not* lead to increased overall support. Since bundling is one way for policymakers to expand the scope of political conflict to include new segments of the public in a supportive coalition, we also might expect some individuals who originally supported the policy to lessen their support as a result of this expansion.

The psychological effects of negativity bias may explain why decreased polarization did not increase support in our sample. Psychology research suggests that individuals weigh negative attributes, or losses, more heavily in their evaluations of information. Relatedly, loss aversion within prospect theory posits that individuals

expect pain of losses to outweigh pleasure of equivalent gains. Negativity bias could lead to lower support if those who supported the policy alone reduce their support because of their aversion to the additional policy. Bundles made up of policies that are supported by individuals from opposite ends of the ideological spectrum may trigger negativity bias, particularly because partisanship is important to individuals' social identities²⁹. At the least, our respondents do not appear to simply look within a bundle for a policy they might support without consideration of its other elements.

This paper delves deeply into how the ideological appeal of bundled policies shapes overall opinion and issue support polarization. A previous study found that bundling climate policies to policies similar to those in our economic redistribution treatment significantly increased support by increasing support among liberal respondents without decreasing support among conservative respondents. We also found that bundling with economic redistribution increased liberal support and decreased conservative support by a smaller amount (Fig. 2B), but neither effect was significant in our study. The effects of this type of bundle on support therefore merit further study.

These results raise their own puzzle. Our results, combined with evidence that legislators reject compromise when they fear voter retribution and that those voters who punish compromise are subsets of the primary electorate, would suggest that legislators might want to avoid bundling. Yet, they seem to regularly combine policies together. Many policies pass via omnibus legislation or bundled legislation despite this evidence that bundling risks reducing support. A primary goal of bundling policies together may be to gain votes from specific legislators via logrolling rather than gaining public support. Thus, why legislators decide to bundle policies together and how the public opinion elements of bundling play out in the representational relationship are ripe areas for research on the dynamics of policy bundling.

Future empirical studies could investigate these features and their mechanisms more fully. First, further research could examine the symmetry of our findings by starting out with an originally conservative policy. While we aim to test a broad range of policies with various goals and appeal across the ideological spectrum bundled with decarbonization policy, there are more that could be tested to better understand the mechanism of policy bundling beyond decarbonization policy research. We also did not measure attitudes toward bundled policies independent of decarbonization policies, which precludes the examination of how the two portions are integrated. Future experiments could measure these attitudes to see how they compare to public opinion polling data on the bundled policy issues.

Additionally, there are potential interacting mechanisms that may shape opinion, including strength of the partisan signal in a treatment and policy complexity. Our results suggest that individuals may decrease their support for policies that appeal to the other end of the ideological spectrum even without the presence of explicit partisan cues or

other potential factors such as cost. Additional studies should use similar treatments and incorporate these variables to better control for how respondents react to their presence in policy design.

Lastly, future research should explore the heterogeneity of policy bundling dynamics at the subnational level. Recent literature explores the differences between states in decarbonization policy successes and failures. Bills in these analyses include multiple provisions – some climate-related and others social-justice or economically targeted. Understanding differences in policy bundling success at the state level can help policy makers better tailor bundling efforts for specific political situations and build on existing research.

When addressing climate change and other pressing societal issues in politically feasible and lasting ways, it is important to understand how proposing multiple policies at the same time could contribute to or detract from broad public support coalitions. Bundling may risk decreasing overall policy support *even when the additional policy reduces polarization*. These results highlight that an overly optimistic approach to bundling might backfire, losing support from some subsets of the electorate without increasing it among the target populations. The current findings suggest that bundling decarbonization policies with other policies (liberal, conservative, or moderate) has no effect or reduces support. They also suggest that reduced polarization does not necessarily translate to increased overall support. When bundling policies together that appeal to different portions of the ideological spectrum reduces what we call issue support polarization, it does so at the cost of reduced support among those who supported the original decarbonization policy, rather than by increasing the support from others. We caution that our findings are not a prescription to avoid bundling various policies together. Rather they empirically highlight some of the risks associated with policy bundling. They also indicate that there is much more to understand about this strategy.

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Methods

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Questionnaire Design

Our survey experiment tested whether various types of policy bundling increase decarbonization policy popularity in general and across political ideology. Respondents to the survey were randomly assigned to one of five groups. One group was asked to answer questions about their support levels for four decarbonization policies presented alone (control) and the remaining groups were asked to answer questions about their support for each decarbonization policy when bundled with an additional policy (treatment groups including the economic redistribution, social justice, infrastructure, and pausing regulation bundling strategies: decarbonization policy listed first; additional

policy listed second). Each respondent answered questions regarding their support levels for each of the four decarbonization policies, either bundled or alone. The four decarbonization policies appeared in the same order for all participants. The dependent variable was policy support, which was measured on a four-point likert scale spanning from 0 to 1 in the analysis.

To what extent would you support the following policies?
 (Strongly oppose; 0, slightly oppose; 0.3333, slightly support; 0.6667, strongly support; 1)

Following the four policy support questions, participants indicated how much they perceive that each of the policies would affect their household economic well-being and how important their views on these policies are to their identities (not analyzed here). Participants were asked about their political ideology (Very liberal; Liberal; Slightly liberal; Slightly conservative; Conservative; Very conservative). Lastly, participants were presented with demographic questions (age, gender, ethnicity, household income, education level, voting registration status, twitter usage). Age, gender, and ethnicity questions appear at the beginning of the survey as per Qualtrics quota guidelines for representative sampling. Political affiliation questions appeared at the end of the questionnaire to avoid priming respondents (see Extended Data Table 1 for full variable descriptions). Participants also answered questions about each policy's perceived effect on their economic situation and importance to their identity (not analyzed here).

Statistical Approach: Main analysis

First, balance checks were performed on the main respondent demographic and political identity variables – political ideology, age, gender, income, or ethnicity. There is no evidence of substantive or statistically significant differences across treatment and control groups with respect to their covariate profiles (Extended Data Table 4).

We used a series of Ordinary Least Squares (OLS) models with indicator variables for treatment groups to compare the policy support levels of the treatment groups to the control group. In the main specification, we regress the average decarbonization policy support across the four decarbonization policies onto the treatment variable, controlling for political ideology (Table 3). To analyze and visualize the support levels by political ideology, we ran an OLS estimation with an interaction term for political ideology (Extended Data Table 3; Figure 2). We used the average support across the four policies as the dependent variable for analyses underlying Figure 2.

Robustness Checks

We estimated a robustness check with party identification instead of political ideology, weighted according to 2020 American National Election Study (ANES) party identification²⁹. Democrats were slightly overrepresented, while Republicans and Independents were slightly underrepresented in our sample. The five models in Extended Data 5 show policy support for each of the four decarbonization policies (models 1-4) and support for those policies averaged (model 5) as a function of bundling treatment and party affiliation. Party affiliation and political ideology are correlated (correlation coefficient = 0.54) and the results are consistent across the weighted party affiliation and political ideology (used in main analysis) measures.

We specified the same models using the political ideology predictor from the main analysis grouped into three bins. Very liberal and Liberal respondents were assigned 'Liberal,' Very conservative and Conservative respondents were assigned 'Conservative,' and Somewhat liberal and Somewhat conservatives were assigned 'Moderate' (Extended Data Table 6). This specification shows that there are negligible differences in magnitudes of bundling treatment coefficients with no changes in direction or statistical significance.

Additional Robustness Checks

The results were similar when restricting the sample to registered voters (Extended Data Table 7 column 1). Patterns of support among respondents who are registered to vote may better represent the electoral situation faced by legislators. An additional linear probability model was performed with policy support coded as a binary support/oppose variable to estimate a relationship that better represents the decision a respondent might have to make (e.g., for a ballot initiative) (see Extended Data Table 8 column 2), which returns similar results as the main specification in Table 3. The negative coefficients associated with social justice and pausing regulations bundles were slightly larger and the coefficients associated with Republicans and Democrats were slightly larger in their respective negative and positive directions (Extended Data Table 9 column 2).

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Acknowledgements: We thank members of the Burgess lab at the University of Colorado for comments on previous drafts. We thank members of the Environmental Politics Workshop at UCSB for comments on previous drafts. We acknowledge funding from the Cooperative Institute for Research in Environmental Sciences' Innovative Research Program.

Author contributions: R. M., L.A-S., and M.G.B. designed the survey. R.M. and M.G.B. performed the survey. R.M., S.E.A., L.V.B., and M.G.B. designed the analysis. R.M. analyzed the data. R.M., S.E.A., L.V.B., L.A-S., and M.G.B. wrote the paper.

Competing interests: The authors declare no competing interests.

Data Availability

Raw data is subject to controlled access. Participants in this study consented to their data being stored securely with the research team and did not consent to their data being shared. Code for data analysis is available on request.

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Supplementary Information

Extended Data Table 1. Variable descriptions

Policy support	Dependent variable	Four-point scale where respondents indicate if they strongly oppose (0), somewhat oppose (0.3333), somewhat support (0.6667), or strongly support (1) decarbonization policies.
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Treatments	Independent variable	Specifies the treatment group a respondent is randomly assigned to: Economic redistribution, Infrastructure, Reducing regulation, Social justice, Decarbonization policies alone (control group)
Political Ideology	Independent variable	Very liberal, Liberal, Somewhat liberal, Somewhat conservative, Conservative, Very conservative
Ethnicity	Not analyzed here	Binary form: 1= white, 0= non-white Categorical form: non-white groups separated
Gender	Not analyzed here	0 = female, 1= male
Household income	Not analyzed here	Less than \$19,000 Between \$20,000 and \$49,000 Between \$50,000 and \$79,000 Between \$80,000 and \$99,000 Between \$100,000 and \$150,000 Over \$150,000
Age	Not analyzed here	Groups: 18-29, 30-49, 50-69, >70
Perceived policy importance to economic well-being	Not analyzed here	My household would lose substantially My household would lose a little My household would not gain or lose My household would gain a little My household would gain substantially
Perceived policy importance to respondents' identities	Not analyzed here	Not at all important Slightly important Moderately important Very important

Extended Data Table 2. Polling data sources used to create Figure 1 are listed below beginning with their category, the poll question, and the source. All categories have multiple polls that indicate the views of respondents who self-identify as liberal/Democrats, moderate/Independents, and conservative/Republicans, which are averaged in Figure 1. Democrats support decarbonization, economic redistribution, and social justice policies more than Republicans. Republicans support reducing environmental regulation more than Democrats. Infrastructure garners broad support.

Corresponding Category	Poll Question Description	Source
Climate policy		
General	Percentage of U.S. adults who say we should take steps towards carbon neutrality by 2050	Pew Research Center; January 2022
Consumer incentive	Do you support/oppose providing tax credits for individuals and companies that invest in clean energy generation in the U.S.?	Citizens for Responsible Energy Solutions (CRES); February 2022
R and D Funding	Do you support/oppose increasing federal government investment in research and development to accelerate the adoption of better storage technologies?	Citizens for Responsible Energy Solutions (CRES); February 2022
Standard by 2030	Do you support/oppose putting in place a federal mandate to eliminate the use of all energy produced from fossil fuels by 2030?	Citizens for Responsible Energy Solutions (CRES); February 2022
Tax on fossil fuel production	Do you support/oppose an increase taxes on the production of oil, gas, and natural gas to pay for programs to reduce emissions?	Citizens for Responsible Energy Solutions (CRES); February 2022
Infrastructure	Do you support or oppose increasing federal spending for roads, bridges, mass transit, and other infrastructure?	YouGovAmerica; January 2018
	Should funding for roads, bridges, and ports be part of President Biden's infrastructure proposal?	AP-NORC; July 2021
Reducing environmental regulation	Percentage of Americans who say stricter environmental laws and regulations cost too many jobs and hurt the economy	Pew Research Center; Dec 2016
	Percentage of Americans who say stricter environmental laws and regulations hurt the economy.	Pew Research Center; Feb 2019
Economic Redistribution		
Unions	Percentage who say the large reduction in the percentage of workers represented by unions has been bad for the country	Pew Research Center; Sept 2019
Raise taxes on wealthy households	Percentage who say tax rates on household income over \$250,000 should be raised	Pew Research Center; Sept 2019
University basic monthly income	Percentage who say they would favor the federal gov providing a universal basic income of about \$1,000 per month for all adult citizens, <u>whether or not</u> they work	Pew Research Center; July 2020
Health insurance: public option	Percentage who say that it is the federal government's responsibility to make sure all Americans have healthcare coverage	Pew Research Center; Sept 2019
Social Justice indicators	Percentage of voters who support the Environmental Justice for All Act (introduces and strengthens measures to protect low-income communities and communities of color from pollution)	Data for Progress; Sept 2020
	Would you support/oppose the creation of an independent Office of Climate and Environmental Justice Accountability to ensure that communities on the front lines of pollution and climate change have voices in the legislative process?	Data for Progress; Sept 2020

Extended Data Table 3. OLS models associated with Figure 2a-2d show heterogeneous treatment effects by political ideology. Bundling treatment is interacted with political ideology measured from Very liberal, Liberal, Somewhat liberal, Somewhat conservative, Conservative, to Very conservative. The reference groups include the control and very liberal respondents. Policy support (dependent variable) spans from 0= Strongly oppose, 0.333= Slightly oppose, 0.667= Slightly support, 1= Strongly support. Coefficients are presented followed by standard errors and significance levels.

	Average Policy Support by Political Ideology
(Intercept)	0.71***(0.04)
Decarb. + Econ Redistribution	0.04 (0.06)
Decarb. + Infrastructure	-0.03 (0.06)
Decarb. + Pausing Regulation	-0.11 (0.06)
Decarb. + Social justice	0.05 (0.05)
Political Ideology: Liberal	0.00 (0.05)
Political Ideology: Somewhat Liberal	-0.04 (0.05)
Political Ideology: Somewhat Conservative	-0.10*(0.05)
Political Ideology: Conservative	-0.23***(0.05)
Political Ideology: Very Conservative	-0.32***(0.06)
Decarb. + Econ Redistribution*Pol. Ideology: Liberal	-0.04 (0.07)
Decarb. + Infrastructure*Pol. Ideology: Liberal	-0.01 (0.07)
Decarb. + Pausing Regulation*Pol. Ideology: Liberal	-0.01 (0.07)
Decarb. + Social justice*Pol. Ideology: Liberal	-0.06 (0.07)
Decarb. + Econ Redistribution*Pol. Ideology: Somewhat Liberal	-0.01 (0.06)
Decarb. + Infrastructure*Pol. Ideology: Somewhat Liberal	0.03 (0.07)
Decarb. + Pausing Regulation*Pol. Ideology: Somewhat Liberal	-0.01(0.07)
Decarb. + Social justice*Pol. Ideology: Somewhat Liberal	-0.10 (0.06)
Decarb. + Econ Redistribution*Pol. Ideology: Somewhat Conservative	-0.05 (0.06)
Decarb. + Infrastructure*Pol. Ideology: Somewhat Conservative	-0.00 (0.07)
Decarb. + Pausing Regulation*Pol. Ideology: Somewhat Conservative	0.04 (0.07)
Decarb. + Social justice*Pol. Ideology: Somewhat Conservative	-0.14*(0.06)
Decarb. + Econ Redistribution*Pol. Ideology: Conservative	-0.04 (0.07)
Decarb. + Infrastructure*Pol. Ideology: Conservative	0.03 (0.07)
Decarb. + Pausing Regulation*Pol. Ideology: Conservative	0.11 (0.07)
Decarb. + Social justice*Pol. Ideology: Conservative	-0.14*(0.07)
Decarb. + Econ Redistribution*Pol. Ideology: Very Conservative	-0.06 (0.08)
Decarb. + Infrastructure*Pol. Ideology: Very Conservative	0.02 (0.08)
Decarb. + Pausing Regulation*Pol. Ideology: Very Conservative	0.14 (0.08)
Decarb. + Social justice*Pol. Ideology: Very Conservative	-0.11(0.09)
R ²	0.17
Adj. R ²	0.16
Num. obs.	2521

***p < 0.001; **p < 0.01; *p < 0.05

Extended Data Table 4. Balance checks on covariates across treatment groups (full data). Decarbonization policy seen alone is the reference subgroup. No significant variation is present between treatment groups with respect to demographic and political worldview or party affiliation covariates.

	Age	Gender	Ethnicity	Political Ideology	Party ID: Dem	Party ID: Rep	Party ID: Ind
Intercept	2.29*** (0.04)	0.49*** (0.02)	0.55*** (0.02)	0.50*** (0.01)	0.42*** (0.02)	0.28*** (0.02)	0.30*** (0.02)
Econ Redist.	0.10 (0.06)	0.01 (0.03)	-0.02 (0.03)	-0.02 (0.02)	0.00 (0.03)	0.02 (0.03)	-0.02 (0.03)
Infrastructure	-0.01 (0.06)	0.03 (0.03)	0.01 (0.03)	-0.00 (0.02)	-0.03 (0.03)	0.02 (0.03)	0.01 (0.03)
Pausing Reg	0.08 (0.06)	-0.01 (0.03)	0.00 (0.03)	-0.00 (0.02)	-0.03 (0.03)	0.04 (0.03)	-0.02 (0.03)
Social Justice	0.04 (0.06)	0.00 (0.03)	0.03 (0.03)	-0.03 (0.02)	0.00 (0.03)	-0.02 (0.03)	0.01 (0.03)
R ²	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Adj. R ²	0.00	-0.00	-0.00	0.00	-0.00	0.00	-0.00
Num. obs.	2521	2503	2521	2521	2323	2323	2323

***p < 0.001; **p < 0.01; *p < 0.05

Extended Data Table 5. OLS estimations with policy support as the dependent variable (0= Strongly oppose, 0.333= Slightly oppose, 0.667= Slightly support, 1= Strongly support). The control group that evaluated decarbonization policies alone is the reference and it is compared to the economic redistribution, infrastructure, pausing regulation, and social justice bundles. Party affiliation is the predictor instead of political ideology and is weighted according to 2020 ANES party identification. Independents are the reference group for party affiliation. The first four models treat support for each decarbonization policy (Carbon Tax, Research and Development (R + D) Funding, Renewable Energy Incentives, and Carbon-free Electricity Standard (CES)) as separate dependent variables with coefficients and standard errors in parentheses. The fifth column uses average support across decarbonization policies as the dependent variable.

	Carbon Tax Support	R + D Funding Support	Renewable Incentive Support	CES Support	Avg Policy Support
(Intercept)	0.52*** (0.02)	0.65*** (0.02)	0.60*** (0.02)	0.57*** (0.02)	0.59*** (0.01)
Decarb + Econ Redistribution	0.03 (0.02)	0.01 (0.02)	-0.01 (0.02)	0.01 (0.02)	0.01 (0.02)
Decarb + Infrastructure	0.02 (0.02)	-0.01 (0.02)	-0.02 (0.02)	-0.02 (0.02)	-0.01 (0.02)
Decarb + Pausing Regulation	-0.06** (0.02)	-0.05* (0.02)	-0.06** (0.02)	-0.07** (0.02)	-0.06*** (0.02)
Decarb + Social justice	-0.03 (0.02)	-0.05* (0.02)	-0.05* (0.02)	-0.03 (0.02)	-0.04* (0.02)
Party ID: Democrat	0.11*** (0.02)	0.10*** (0.01)	0.12*** (0.01)	0.14*** (0.02)	0.12*** (0.01)
Party ID: Republican	-0.10*** (0.02)	-0.11*** (0.02)	-0.05** (0.02)	-0.13*** (0.02)	-0.10*** (0.01)
R ²	0.09	0.09	0.06	0.12	0.13
Adj. R ²	0.08	0.09	0.06	0.12	0.13
Num. obs.	2323	2323	2323	2323	2323

*** p < 0.001; ** p < 0.01; * p < 0.05

Extended Data Table 6. OLS estimations with policy support as the dependent variable (0= Strongly oppose, 0.333= Slightly oppose, 0.667= Slightly support, 1= Strongly support). The control group that evaluated decarbonization policies alone is the reference and it is compared to the economic redistribution, infrastructure, pausing regulation, and social justice bundles. Political ideology is the predictor and is grouped as follows: Somewhat liberals and somewhat conservatives= moderate, very liberal and liberal = liberal, very conservative and conservative = conservative. Moderates are the reference group for political ideology. The first four models treat support for each decarbonization policy (Carbon Tax, Research and Development (R + D) Funding, Renewable Energy Incentives, and Carbon-free Electricity Standard (CES)) as separate dependent variables with coefficients and standard errors in parentheses. The fifth column uses average support across decarbonization policies as the dependent variable.

	Carbon Tax Support	R + D Funding Support	Renewable Incentive Support	CES Support	Avg Policy Support
(Intercept)	0.56*** (0.01)	0.69*** (0.01)	0.66*** (0.01)	0.62*** (0.01)	0.63*** (0.01)
Decarb + Econ Redist	0.02 (0.02)	0.01 (0.02)	-0.02 (0.02)	-0.01 (0.02)	0.004 (0.02)
Decarb + Infrastructure	0.01 (0.02)	-0.02 (0.02)	-0.02 (0.02)	-0.02 (0.02)	-0.01 (0.02)
Decarb + Pausing Reg	-0.07*** (0.02)	-0.06*** (0.02)	-0.08*** (0.02)	-0.08*** (0.02)	-0.07*** (0.01)
Decarb + Social justice	-0.04* (0.02)	-0.05** (0.02)	-0.06** (0.02)	-0.04* (0.02)	-0.05** (0.02)
Political Ideology: Liberal	0.08*** (0.02)	0.06*** (0.01)	0.07*** (0.01)	0.12*** (0.01)	0.08*** (0.01)
Political Ideology: Cons.	-0.15*** (0.02)	-0.19*** (0.02)	-0.14*** (0.03)	-0.22*** (0.02)	-0.17*** (0.01)
R ²	0.075	0.097	0.066	0.134	0.133
Adj. R ²	0.073	0.095	0.064	0.132	0.131
Num. obs.	2521	2521	2521	2521	2521

*** p < 0.001; ** p < 0.01; * p < 0.05

Extended Data Table 7. Column 1 shows the results of OLS estimation with registered voters only on the 0 (Strongly oppose), 0.333 (Slightly oppose), 0.667 (Slightly support), 1 (strongly support) scale. Column 2 shows the results of OLS estimation using a binary support (1) /oppose (0) dependent variable. Coefficients are listed first followed by standard errors.

	Registered Voter Policy Support	Binary Support/Oppose DV
(Intercept)	0.75*** (0.02)	0.81*** (0.02)
Decarb. + Econ Redistribution	-0.00 (0.02)	-0.01 (0.02)
Decarb. + Infrastructure	-0.02 (0.02)	-0.03 (0.02)
Decarb. + Pausing Regulation	-0.08*** (0.02)	-0.10*** (0.02)
Decarb. + Social justice	-0.04** (0.02)	-0.08*** (0.02)
Political Ideology: Liberal	-0.04 (0.02)	0.00 (0.03)
Political Ideology: Somewhat liberal	-0.07*** (0.02)	-0.03 (0.02)
Political Ideology: Somewhat cons	-0.15*** (0.02)	-0.12*** (0.02)
Political Ideology: Conservative	-0.26*** (0.02)	-0.27*** (0.03)
Political Ideology: Very conservative	-0.36*** (0.02)	-0.37*** (0.03)
R ²	0.17	0.12
Adj. R ²	0.17	0.12
Num. obs.	2238	2521
*** p < 0.001; ** p < 0.01; * p < 0.05		

Supplementary Information.

Assessing support for climate policies questionnaire

Quota questions (3) appear at the beginning of each group's question block

What is your age? (drop down menu to select age)

What gender do you identify most with? (Male; female; Non-binary/third gender; Other; Prefer not to say)

What is your ethnicity? (Hispanic or Latino/a; Black or African American; Native American American Indian or Native Hawaiian; Asian or Pacific Islander; Middle Eastern or North African; White; Non-Hispanic White; Other; Prefer not to answer)

Policy preference questions

Group 1: Climate policies are shown alone

To what extent would you support the following policies? (ranked choices include Strongly oppose; Oppose; Support; and Strongly support)

Policy 1: Economy-wide tax on carbon with revenue going back to taxpayers in the form of monthly checks

Policy 2: Funding for research and development of new energy technologies, technologies that remove carbon from the atmosphere, and other innovations through federal government agencies like the Department of Energy

Policy 3: Personal or property tax incentives for households and businesses that invest in renewable energy systems or energy efficiency technologies

Policy 4: A national 80 percent carbon-free electricity requirement by 2030

Would you be willing to consider voting for a candidate that disagrees with you on each of these policies? (answer choices for each policy include: Yes; Maybe. It depends on their other positions; and No)

How do you think each of these policies would affect the economic situation of your household?

(answer choices for each policy include: My household would lose substantially; My household would lose a little; My household would not gain or lose; My household would gain a little; My household would gain substantially)

How important are your views on each of these policies to your identity?

(answer choices for each policy include: Very important; Moderately important; Slightly important; and Not at all important)

Group 2: Climate policies are shown with policies that reduce regulation

To what extent would you support the following policies? (ranked choices include Strongly oppose; Oppose; Support; and Strongly support)

Policy 1: Economy-wide tax on carbon with revenue going back to taxpayers in the form of monthly checks AND pause new Environmental Protection Agency (EPA) regulations

Policy 2: Funding for research and development of new energy technologies, technologies that remove carbon from the atmosphere, and other innovations through federal government agencies like the Department of Energy AND pause new Environmental Protection Agency (EPA) regulations

Policy 3: A personal or property tax incentive for households and businesses that invest in renewable energy systems or energy efficiency technologies AND pause new Environmental Protection Agency (EPA) regulations

Policy 4: A national 80 percent carbon-free electricity requirement by 2030 AND pause new Environmental Protection Agency (EPA) regulations

Would you be willing to consider voting for a candidate that disagrees with you on each of these policies? (answer choices for each policy include: Yes; Maybe. It depends on their other positions; and No)

How do you think each of these policies would affect the economic situation of your household?

(answer choices for each policy include: My household would lose substantially; My household would lose a little; My household would not gain or lose; My household would gain a little; My household would gain substantially)

How important are your views on each of these policies to your identity?

(answer choices for each policy include: Very important; Moderately important; Slightly important; and Not at all important)

Group 3: Climate policies are shown with infrastructure-related policies

To what extent would you support the following policies? (ranked choices include Strongly oppose; Oppose; Support; and Strongly support)

Policy 1: Economy-wide tax on carbon with revenue going back to taxpayers in the form of monthly checks AND upgrade America's road, bridge, and rail systems

Policy 2: Funding for research and development of new energy technologies, technologies that remove carbon from the atmosphere, and other innovations through federal government agencies like the Department of Energy AND upgrade America's road, bridge, and rail systems

Policy 3: A personal or property tax incentive for households and businesses that invest in renewable energy systems or energy efficiency technologies AND upgrade America's road, bridge, and rail systems

Policy 4: A national 80 percent carbon-free electricity requirement by 2030 AND upgrade America's road, bridge, and rail systems

Would you be willing to consider voting for a candidate that disagrees with you on each of these policies? (answer choices for each policy include: Yes; Maybe. It depends on their other positions; and No)

How do you think each of these policies would affect the economic situation of your household? (answer choices for each policy include: My household would lose substantially; My household would lose a little; My household would not gain or lose; My household would gain a little; My household would gain substantially)

How important are each of your views on these policies to your identity? (answer choices for each policy include: Very important; Moderately important; Slightly important; and Not at all important.

Group 4: Climate policies shown with policies related to jobs and economic progressivism

To what extent would you support this policy? (ranked choices include Strongly oppose; Oppose; Support; and Strongly support)

Policy 1: Economy-wide tax on carbon with revenue going back to taxpayers in the form of monthly checks

Policy 2: Funding for research and development of new energy technologies, technologies that remove carbon from the atmosphere, and other innovations through federal government agencies like the Department of Energy

Policy 3: A personal or property tax incentive for households and businesses that invest in renewable energy systems or energy efficiency technologies

Policy 4: A national 80 percent carbon-free electricity requirement by 2030

Randomized pairing with the following four policies.

AND reducing obstacles to unionized labor, and creating good-paying, unionized clean energy jobs

AND a tax increase for households making over \$400,000

AND a monthly cash payment program to citizens

AND a national health insurance public option

Would you be willing to consider voting for a candidate that disagrees with you on each of these policies? (answer choices for each policy include: Yes; Maybe. It depends on their other positions; and No)

How do you think each of these policies would affect the economic situation of your household? (answer choices for each policy include: My household would lose substantially; My household would lose a little; My household would not gain or lose; My household would gain a little; My household would gain substantially)

How important are your views on these policies to your identity? (answer choices for each policy include: Very important, Moderately important, Slightly important, and Not at all important.

Group 5: Climate policies shown with social justice related policies

- Subgroup 1

To what extent would you support the following policies? (ranked choices include Strongly oppose; Oppose; Support; and Strongly support)

Policy 1: Economy-wide tax on carbon with revenue going back to taxpayers in the form of monthly checks AND creating a commission to monitor effects of policies on women and racial minorities and making recommendations to remedy those

Policy 2: Funding for research and development of new energy technologies, technologies that remove carbon from the atmosphere, and other innovations through federal government agencies like the Department of Energy AND creating a commission to monitor effects of policies on women and racial minorities and making recommendations to remedy those

Policy 3: A personal or property tax incentive for households and businesses that invest in renewable energy systems or energy efficiency technologies AND creating a

commission to monitor effects of policies on women and racial minorities and making recommendations to remedy those

Policy 4: A national 80 percent carbon-free electricity requirement by 2030 AND creating a commission to monitor effects of policies on women and racial minorities and making recommendations to remedy those

Would you be willing to consider voting for a candidate that disagrees with you on each of these policies? (answer choices for each policy include: Yes; Maybe. It depends on their other positions; and No)

How do you think each of these policies would affect the economic situation of your household?

(answer choices for each policy include: My household would lose substantially; My household would lose a little; My household would not gain or lose; My household would gain a little; My household would gain substantially)

How important are your views on each of these policies to your identity?

(answer choices for each policy include: Very important; Moderately important; Slightly important; and Not at all important)

- Subgroup 2

To what extent would you support the following policies? (ranked choices include Strongly oppose; Oppose; Support; and Strongly support)

Policy 1: Economy-wide tax on carbon with revenue going back to taxpayers in the form of monthly checks AND awarding at least a quarter of new infrastructure contracts to women and/or racial-minority-owned businesses.

Policy 2: Funding for research and development of new energy technologies, technologies that remove carbon from the atmosphere, and other innovations through federal government agencies like the Department of Energy AND awarding at least a quarter of new infrastructure contracts to women and/or racial-minority-owned businesses.

Policy 3: A personal or property tax incentive for households and businesses that invest in renewable energy systems or energy efficiency technologies AND awarding at least a quarter of new infrastructure contracts to women and/or racial-minority-owned businesses.

Policy 4: A national 80 percent carbon-free electricity requirement by 2030 AND awarding at least a quarter of new infrastructure contracts to women and/or racial-minority-owned businesses.

Would you be willing to consider voting for a candidate that disagrees with you on each of these policies? (answer choices for each policy include: Yes; Maybe. It depends on their other positions; and No)

How do you think each of these policies would affect the economic situation of your household?

(answer choices for each policy include: My household would lose substantially; My household would lose a little; My household would not gain or lose; My household would gain a little; My household would gain substantially)

How important are your views on each of these policies to your identity?

(answer choices for each policy include: Very important; Moderately important; Slightly important; and Not at all important)

- Subgroup 3

To what extent would you support the following policies? (ranked choices include Strongly oppose; Oppose; Support; and Strongly support)

Policy 1: Economy-wide tax on carbon with revenue going back to taxpayers in the form of monthly checks AND creating a justice and equity commission to monitor effects of policies on marginalized communities and making recommendations to remedy those

Policy 2: Funding for research and development of new energy technologies, technologies that remove carbon from the atmosphere, and other innovations through federal government agencies like the Department of Energy AND creating a justice and equity commission to monitor effects of policies on marginalized communities and making recommendations to remedy those

Policy 3: A personal or property tax incentive for households and businesses that invest in renewable energy systems or energy efficiency technologies AND creating a justice and equity commission to monitor effects of policies on marginalized communities and making recommendations to remedy those

Policy 4: A national 80 percent carbon-free electricity requirement by 2030 AND creating a justice and equity commission to monitor effects of policies on marginalized communities and making recommendations to remedy those

Would you be willing to consider voting for a candidate that disagrees with you on each of these policies? (answer choices for each policy include: Yes; Maybe. It depends on their other positions; and No)

How do you think each of these policies would affect the economic situation of your household?

(answer choices for each policy include: My household would lose substantially; My household would lose a little; My household would not gain or lose; My household would gain a little; My household would gain substantially)

How important are your views on each of these policies to your identity?

(answer choices for each policy include: Very important; Moderately important; Slightly important; and Not at all important)

Demographic Information Questions

How would you characterize your political worldview? (choices include: Very Liberal; Liberal; Somewhat Liberal; Somewhat Conservative; Conservative; Very Conservative)

Generally speaking, do you think of yourself as a Republican, Democrat, Independent, or something else? (choices include: Republican; Democrat; Independent; Something else; Prefer not to say)

Which of these describes your total household income per year? (choices include: Less than \$19,000; Between \$20,000 and \$49,000; Between \$50,000 and \$79,000; Between \$80,000 and \$99,000; Between \$100,000 and \$150,000; Over \$150,000; Prefer not to answer)

What is the highest degree or level of school you have completed? *If currently enrolled, indicate your highest degree received.* (choices include: Some high school/ no diploma; High school graduate, diploma or the equivalent; Some college credit/ no degree; Trade/technical/vocational training; Associate degree; Bachelor's degree; Master's degree; Professional degree; Doctorate degree)

What state do you currently live in? (drop down menu with states)

Are you currently registered to vote? (choices include: I am registered to vote in the state where I live; I am registered to vote in a different state; I am not registered to vote at all)

Which of the following statements best describes your Twitter usage? (choices include: I do not have an account; I have an account but I rarely tweet; I tweet weekly and most of my tweets are political; I tweet weekly and most of my tweets are *not* political; I tweet daily and most of my tweets are political; I tweet daily and most of my tweets are *not* political)

End of Survey Message

Thank you for taking part in this survey. Should you have any follow up questions, comments, or concerns, please contact Renae Marshall at renae.marshall@colorado.edu.

Debrief

The purpose of our study is to collect information about participants' individual policy preferences and demographic information. We want to better understand what kinds of climate-related policies receive different levels of support and why. This study will provide insights to policymakers and others looking to address climate change and other competing economic and social challenges facing our society.