The Role of Partisanship in State Climate Policy[*]

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Abstract

What are the political determinants of state climate policy? I compare the incentives of legislatures across two domains of climate policy: the carbon intensity of the energy supply and the energy intensity of the economy. Analyzing policies and environmental outcomes from 1998 to 2020 across the United States, I find that polarization driven by Republicans is associated with worse carbon intensity and weaker climate policies. Energy intensity, on the other hand, is robust to polarization, which I attribute to shared incentives between policymakers and fossil fuel stakeholders. I suggest that the bundling of popular energy efficiency policies with controversial, yet effective renewable energy policy is necessary to sustain meaningful climate policies.

Keywords: climate politics, climate policy, political polarization

[*]Replication code available on my GitHub page. Data must be obtained manually.

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1 Introduction

Climate change is the most pressing issue of the twenty-first century. More than ever before, Americans see climate change as a personal and national security risk (Ballew et al. 2019), and want governments to act (Tyson, Funk, and Kennedy 2023). Politicians have responded to these calls: in 2020, President Joe Biden ran his successful campaign on the most aggressive climate change platform out of any major party nominee in history, and since then, has committed the United States to cutting carbon emissions to 50-52% of 2005 levels by 2030 (Lashof 2024).

Despite this progress, durable climate policy remains fraught with political obstacles. Belief in the scientific consensus that climate change is man-made still falls largely along partisan lines (McCright, Dunlap, and Marquart-Pyatt 2016; Chan and Faria 2022). Proposed policy solutions impose short-term transition costs in exchange for long-term, indeterminate benefits of reducing carbon emissions. These transition costs are usually borne by a small group of fossil fuel incumbents who devote significant resources to hamper implementation (Eisenack et al. 2021). Politicians also face short-term electoral consequences for visually or economically disruptive policies (Stokes 2016; Copland 2020).

Even when governments pass climate policy, they oftentimes face underwhelming outcomes due to poor policy feedback, state capacity, innovation, or policy design (Fransen et al. 2023). Despite this, left governments tend to perform better on environmental quality than conservatives (Wang et al. 2022). I reconcile these points by arguing that there are areas of climate policy where ideology has immediate and significant influence, and areas where ideology is overshadowed by economic interests.

I argue that energy efficiency carries private co-benefits that reduce opposition efforts. Carbon-intensive companies can adopt energy efficiency without disrupting their dependence on fossil fuels. Energy efficiency is also a cost-saving mechanism for firms and individuals, making it a politically viable, bipartisan objective. Carbon intensity, on the other hand, is only reduced through moving firms away from fossil fuel dependence. This invokes opposition as the green transition imposes transition costs onto firms and customers.

I expect liberal states to have more ambitious policies in both categories, but face implementation barriers for renewable energy that they do not face for energy efficiency. This is supported by preliminary evidence: renewable generation has been spearheaded by red and blue states (Kirk 2023), whereas energy efficiency outcomes are consistently higher among Democratic states (Berg et al. 2020). Under this model, renewable energy is deployed in response to economic incentive rather than as the consequence of legislative goals. Therefore, only energy intensity responds to changes in ideology.

To test this theory, I estimate the effect of political ideology and polarization on both carbon and energy intensities from 1998 to 2020. I then explore state climate policy regimes and their ideological determinants. I find that polarization captures much of the effect of political ideology, but that the ideological turn of the Republican Party is responsible for higher emissions and carbon intensity. Republican-led legislatures are associated with weaker renewable portfolio and energy efficiency resource standards. Despite conservative states having weaker policy regimes, energy efficiency is resistant to partisanship and polarization in the short term. I interpret my results to suggest that bundling popular energy efficiency policies with more immediately effective renewables policy would help sustain effective climate policy.

I first explore the polarization of climate change and theories of state climate policymaking. I then propose my methodology and present my results. The final section concludes.

2 Background

2.1 Polarization of Climate Change

Conservative and liberals are persistently divided on climate change (McCright, Dunlap, and Marquart-Pyatt 2016). Conservatives oppose investing in energy efficiency (Gromet, Kunreuther, and Larrick 2013), conservation campaigns, and renewable energy research (Wolters, Steel, and Warner 2020). They are also opposed to individual behavioral changes (Chan and Faria 2022). This broadly reflects across the United States: American states with more liberal citizen ideology emit less carbon dioxide (Gokkir and Barkin 2019).

Decomposing emissions reveals more nuance. Left-wing parties are associated with energy efficiency improvements (Chang, Lee, and Berdiev 2015) and increased secondary education spending (Wang et al. 2022), two investments that decrease emissions long-term. Less optimistic accounts claim that left-wing governance has a small effect on decarbonization and renewable energy targets (Thonig et al. 2021), no significant effect on the net price of fossil fuels (Martinez-Alvarez et al. 2022), and less stringent environmental policy than their partisan counterparts (Tawiah 2022). The seemingly inconsistent effect of political ideology on environmental outcomes reinforces the need for decomposition analysis.[1]

2.2 States and Climate Policy

Decarbonization is a global public good.[2] Unlike other environmental issues like water or air pollution, this conflicts with the objective of state legislatures to deliver localized benefits (Bagashka and Clark 2016). Despite this, much of America's climate policy progress has been state-centric.[3]

This is surprising for a handful of reasons. First, states do not have the incentive to decarbonize that countries do. The United States may be such a prominent emitter that nationwide action can lead to globally notable outcomes, but most states do not produce enough to make a meaningful impact on the global problem of global warming.[4] Second, they are not subject to top-down emissions regulations. There is no federal policy on carbon emissions and the EPA lacked the authority to regulate emissions until 2015.

Why, then, do states prioritize climate policy? The *climate federalism* view suggests that

[1] "Decomposition analysis" is the separation of emissions into their components, e.g. carbon intensity and energy intensity.

[2] It is non-excludeable and non-rival, and requires strong commitment from all countries (Bättig and Bernauer 2009).

[3] Rabe (2008)

[4] Engel (2006)

decarbonization becomes a legislative priority when the localized benefits of climate policy – e.g. air quality, employment opportunities – outweigh the explicit and opportunity costs of fossil fuel investment.[5] A competing theory is *polarized federalism*, whereby partisan factors increasingly dominate economic ones in determining climate policy adoption and intensity (Grumbach 2018; Trachtman 2020). Under this view, liberal states prioritize climate policy irrespective of co-benefits.

Two notable co-benefits motivate the climate federalism framework. First, legislators can benefit politically from relatively weak climate commitments. The renewable portfolio standard, for instance, is less immediately effective than other, more stringent policies, yet it swiftly delivers local co-benefits (Rabe 2008). All non-fossil fuel technologies create more jobs per unit-of-energy than coal and natural gas (Wei, Patadia, and Kammen 2010), which appeals to economic-minded voters. Second, legislators can weaponize the incomplete information of voters to benefit from gaps between climate rhetoric and tangible outcomes (Bättig and Bernauer 2009). Voluntary standards, incentive-based policies, and symbolic gestures appeal to climate-conscious voters who lack information to hold their politicians accountable for results. The costs of such policies are spread across the tax base, attracting less opposition from fossil fuel interests. A policy's weakness is commonly its strength: voters tend to prefer these ”softer” policies over those configured as mandates (Hess, Mai, and Brown 2016). Legislators, under this model, opportunistically prioritize climate policy to capitalize on localized gains and electoral support.

The clear incentive motivating the polarized federalism framework is that climate action is becoming more popular, especially among liberals. In otherwise liberal districts, climate policy is simply an act of being a responsible politician.[6] Much of the recent empirical work and preliminary evidence supports this model. Democratic states broadly outperform Republican ones in terms of energy efficiency, renewable energy consumption, and overall

[5]Much of Barry Rabe's work argues the importance of these co-benefits; see Rabe (2008) for an introduction.

[6]Engel (2006))

emissions (Berg et al. 2020; EIA 2023; Gokkir and Barkin 2019). Trachtman (2020) finds that political factors are increasingly more powerful than economic factors in determining policy adoption. Although state legislatures are less polarized than the Congress (Shor and McCarty 2011), the general divergence between Democratic and Republican state policy since 2000 suggests that this may be a more recent phenomenon (Grumbach 2018). Under this model, legislators push climate policy to meet the political demands of their constituents, without the prerequisite of localized co-benefits.

To summarize, there are two main arguments on what motivates a state to decarbonize. Legislators either promote climate policy based on expected co-benefits or the climate demands of their base. More recent work has suggested a shift towards the latter framework, with political factors increasingly taking preference over economic ones. This suggests that political ideology is a strong determinant of climate policy adoption and carbon emissions, but as previously motivated, decomposition analysis is necessary.

2.3 Carbon Intensity

There is a strong case for liberal states outperforming conservative states in the carbon intensity of the energy supply. Left-wing governments tend to promote renewable energy consumption (Arslan, Koyuncu, and Yilmaz 2023), and their voters support renewable energy technology (Clulow et al. 2021). Democratic voters support renewable energy on environmental grounds before economic ones (Gustafson et al. 2020), so under polarized federalism, liberal legislatures will respond to these demands.

The first caveat is political opposition. Voters punish green energy projects when they are disruptive, economically or visually (Stokes 2016). Renewable energy policy also tends to concentrate costs on fossil fuel incumbents, motivating obstruction efforts. While "softer" policies like subsidies have broader cost diffusion then carbon pricing or net metering, they still existentially threaten firms with assets tied to fossil fuels. These impacted groups are agile, and can swiftly redirect efforts to more favorable legislators that will fight these policies

(Grumbach 2018). This is remarkably easy for fossil fuel interests who are tasked only with upholding the status quo, and maintain financial connections to conservative movements (Kirk 2020). While the falling cost of wind and solar may outweigh this concern, Stokes (2020) contends that the low costs of maintaining existing power plants are perhaps more appealing to policymakers.

The second caveat is that the localized co-benefits of renewable energy nullify the effects of ideology. More than ever before, renewable energy is the economically desirable option: two-thirds of the energy added in 2020 from renewable sources was cheaper than the most affordable coal source (*Renewable Power Remains Cost-Competitive amid Fossil Fuel Crisis* 2022). Renewable energy generation has increased in states both with and without a renewable portfolio standard (Upton and Snyder 2017). Conservative states tend to also be larger, emptier, flatter, and warmer than liberal ones, making them geographically suitable for renewable energy development. While fossil fuel jobs demanding manual labor are geographically concentrated in the east of the country, the job gains from renewable energy are more diffuse and attract outside investment (Gazmararian and Tingley 2023). This motivates conservative legislators to support renewable energy on the basis of localized economic growth.

Whether the polarized federalism or climate federalism frameworks emerge empirically supported depends on the prioritizing of incentives. Liberal states undoubtedly have greater political will for renewable energy consumption, but they face significant resistance from voters and fossil fuel interests. Conservative legislators receive significant funding from these interests and serve electorates more culturally or economically tied to fossil fuels, but they also may see potential in energy diversification, job potential, and falling costs.

Both arguments are compelling and supported by preliminary evidence. Consequently, I expect liberal states to be more ambitious in their renewable energy policy, but their performance will ultimately be comparable to that of conservative states. In states with more polarized legislatures, carbon intensity is likely to be politicized, and worse policy and outcomes will follow as a consequence of legislative gridlock.

2.4 Energy Intensity

One argument in favor of liberal states experiencing lower energy intensity is the relative importance of individual decision-making. Liberals are far more open to climate-friendly behavior changes and are more willing to incur costs to be more energy efficient (Chan and Faria 2022; Gromet, Kunreuther, and Larrick 2013). We can then expect liberals to live their environmentalist values by using energy efficient utilities, products, and modes of transportation, like electric vehicles and public transportation. Similar opportunities to reduce one's carbon footprint through renewable energy are limited, and often limited to homeowners (solar tax credits, net metering, mandatory renewable energy option, etc.), a voter block that leans majority conservative (Hadziabdic and Kohl 2022).

An argument in favor of climate federalism is the strong co-benefits of energy efficiency for firms and customers. Voluntary efficiency programs are "by far" the least costly energy resource option for utility resource portfolios (Friedrich and Eldridge 2009). State policies like electricity and gas decoupling also reimburse companies for less product sold, rewarding companies for desirable behavior rather than punishing them. The benefits reach consumers as well: for customers of publicly-owned utilities, efficiency programs saved an average of 2.4 cents per kilowatt from 2012 to 2017 (Friedrich and Eldridge 2009). Savings from customer-funded efficiency programs are expected to offset most of the load growth by 2025 (Barbose et al. 2013). Conservative legislatures will be drawn to energy efficiency for its cost-saving outcomes, rather than on environmental grounds.

Alternatively, these shared incentives can motivate polarized federalism. Since energy efficiency is likely to avoid the political challenges of renewable energy, it is the most feasible options for liberal states to pursue immediate decarbonization. The Berg et al. (2020) score-card is dominated by Democratic states, suggesting that liberal legislatures opportunistically push energy efficiency as the most feasible objective.

Due to the preliminary evidence, I expect state legislature ideology to be a significant predictor of energy intensity, both for policy adoption and policy outcomes. Polarization is unlikely to impact either metric as conservatives can claim credit for cost-savings caused by energy efficiency.

2.5 Hypotheses

Left-wing governance is associated with reduced carbon emissions, but the underlying mechanisms are unclear. The preliminary evidence supporting a varying effect of ideology on various environmental outcomes, most notably carbon intensity and energy intensity, motivates the use of decomposition analysis to understand climate politics. This study hopes to further close that gap. Its results have strong implications for durable climate policymaking and the distributive conflict literature.

There are compelling reasons to believe that ideology could have anywhere from a marginal to a deeply influential effect on both carbon intensity and energy intensity. I suspect that renewable energy, and thus carbon intensity, follows a polarized federalism approach due to the concentrated costs on fossil fuel incumbents. Both policy adoption and environmental outcomes are likely to differ along partisan lines. Energy intensity, on the other hand, is driven by the popular adoption of energy efficiency. Liberal states are likely to capitalize on this broad appeal to pass more stringent efficiency policy, and thus achieve greater outcomes than conservative states.

H1: *Shifts rightward in state legislature ideology are associated with higher energy intensities and fewer energy intensity policies.*

H2: *Shifts rightward in state legislature ideology are not significantly associated with higher levels of carbon intensity; they are associated with fewer renewable energy policies.*

H3: *Greater polarization is associated with fewer climate policies and worse outcomes for carbon intensity, but not energy intensity.*

3 Methodology

My analysis is divided into two strands of models, corresponding with the structure of the response variable. When my dependent variable is a continous measure of environmental outcome or policy, I use a fixed effects model of the form:

$$\log(\mathrm{Y}) = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 \log(\mathrm{GDPpc}) + \sum_{i=1}^{N_{\mathrm{State}}} \gamma_i \mathrm{State}_i + \sum_{j=1}^{N_{\mathrm{Year}}} \delta_j \mathrm{Year}_j + \epsilon$$

Here, Y is the outcome measured, x_1 is the mean ideology of the state legislature, and x_2 is the mean distance between the party medians across both chambers. When my outcome variable is countable (bound between 0 and ∞), I use a Poisson regression model of the following form:

$$\log\left(\mathbb{E}[\mathrm{Y}]\right) = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 \log(\mathrm{GDPpc}) + \sum_{i=1}^{N_{\mathrm{State}}} \gamma_i \mathrm{State}_i + \sum_{j=1}^{N_{\mathrm{Year}}} \delta_j \mathrm{Year}_j + \epsilon$$

The variables are the same as above. To determine the influence of positioning, I run models that take similar form, but with different independent variables:

$$\log(\mathrm{Y}) = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 \log(\mathrm{R}) + \beta_4 \log(\mathrm{GDPpc}) + \sum_{i=1}^{N_{\mathrm{State}}} \gamma_i \mathrm{State}_i + \sum_{j=1}^{N_{\mathrm{Year}}} \delta_j \mathrm{Year}_j + \epsilon$$

$$\log\left(\mathbb{E}[\mathrm{Y}]\right) = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 \log(\mathrm{R}) + \beta_4 \log(\mathrm{GDPpc}) + \sum_{i=1}^{N_{\mathrm{State}}} \gamma_i \mathrm{State}_i + \sum_{j=1}^{N_{\mathrm{Year}}} \delta_j \mathrm{Year}_j + \epsilon$$

Here, x_1 is the median Democratic legislator's ideological positioning, x_2 is the median Republican ideological positioning, and R is a dummy variable for whether the state has a unified Republican majority across both chambers.

My threshold for significance is a p-value below 0.05 after clustering standard errors by region. Because each state and year combination has only one observation, it is not recommended to cluster by state, and as I expect common patterns of weather and geography to confound, controlling for region seems justified. My results are purely observational and do not carry causal merit. Every model includes the logged `GDPPerCapita` as a control, as this completes the function of emissions. Economic output is likely to be correlated with technology adoption and investment capability, so it is doubly motivated.

I propose separate models using lagged polarization and ideology variables. For these, the state legislature variables are compared with outcomes of the following one or two years, depending on the lag.

4 Results

State legislatures have become more polarized over time, with both parties drifting away from the center. The mean ideology has become more conservative over time.

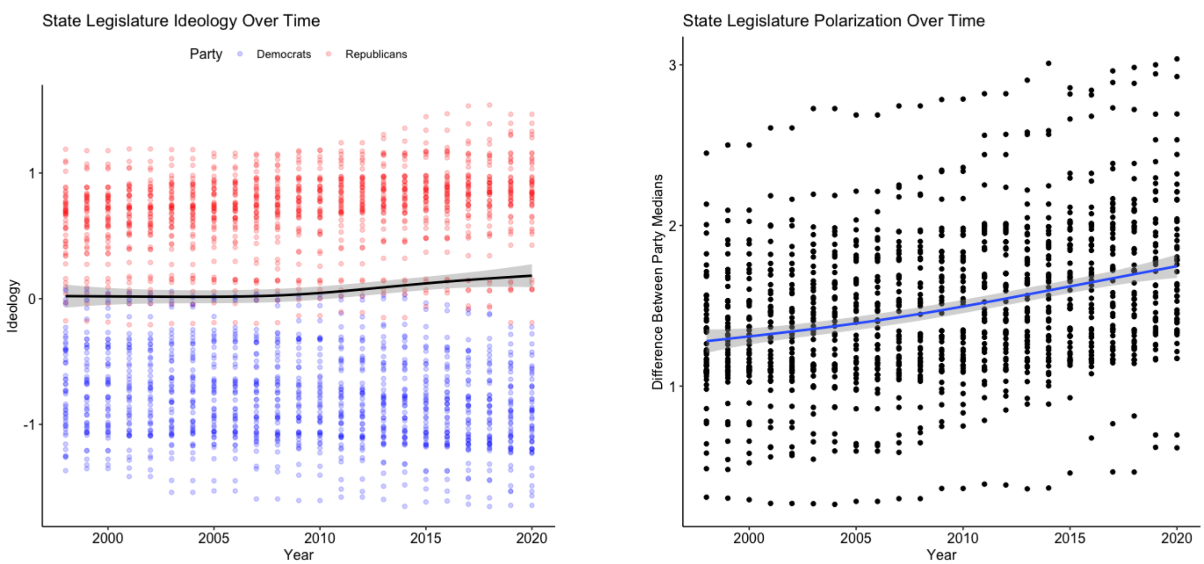

Figure 1: Ideology and Polarization Over Time

Environmental performance has generally improved over time. Energy efficiency has improved, especially in liberal legislatures, but country-wide as well. Carbon intensity has fallen slightly, with a slightly stronger negative slope for liberal legislatures. Left-of-center states begin the sample with lower levels of energy intensity, which I hope to capture through state and year fixed effects.

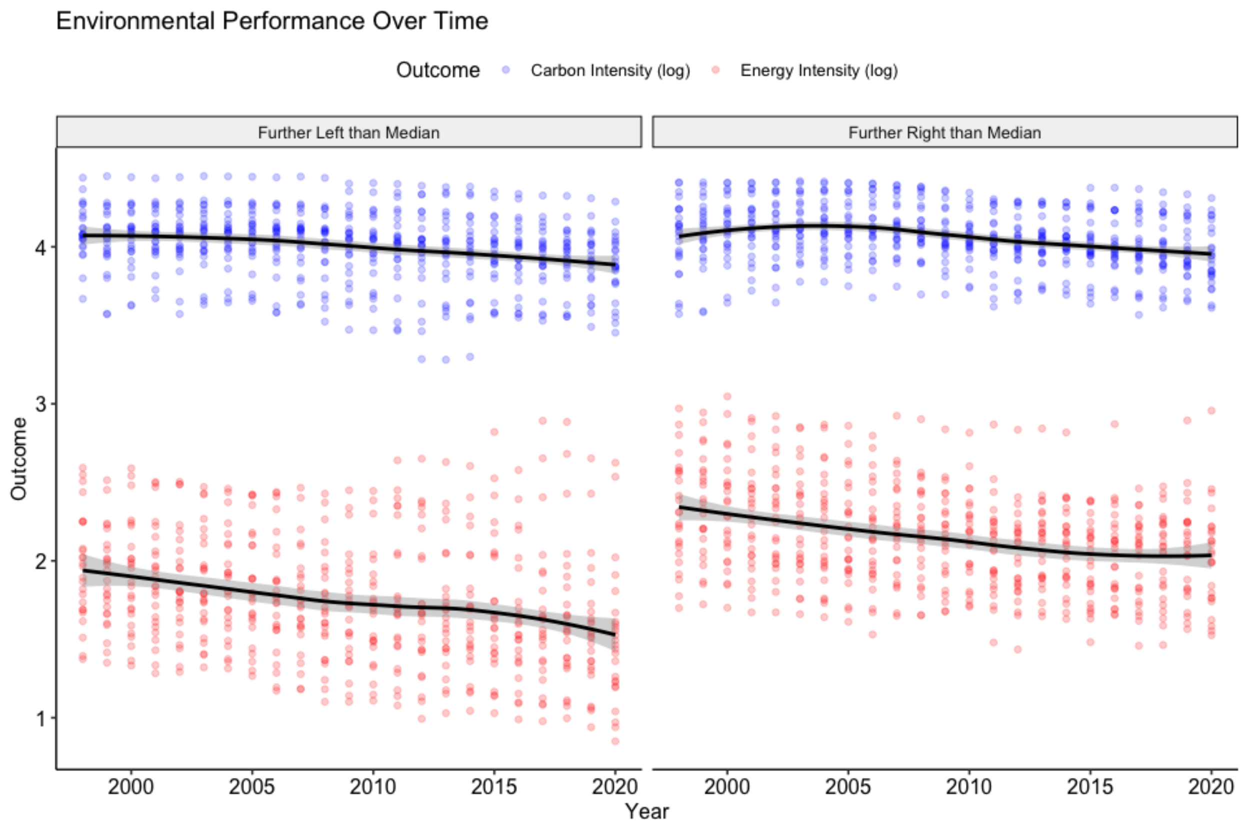

Figure 2: Environmental Performance by Ideological Position

All states have adopted more climate policies over time, but legislatures which are ideologically positioned left-of-center adopt nearly twice as much by the end of the sample. Carbon policies seem to have been adopted sooner in both left and right-of-center states, with energy policies following, likely correlating with technological developments. The counts suggest that climate policy is steadily moving towards greater stringency in all domains.

When accounting for polarization, there is no significant relationship between political ideology and any environmental outcome observed.[7] Polarization between the two parties, however, is associated with between 4.7 and 5.4% higher levels of both per capita emissions and carbon intensity. Notably, there is minimal relationship between polarization and energy intensity, suggesting that energy efficiency faces less obstruction than renewable energy.

[7]Regression results including second lag for policy outcomes and no lag for environmental outcomes in Appendix Bs. They are excluded here for brevity and due to the theoretical time expected to observe an effect.

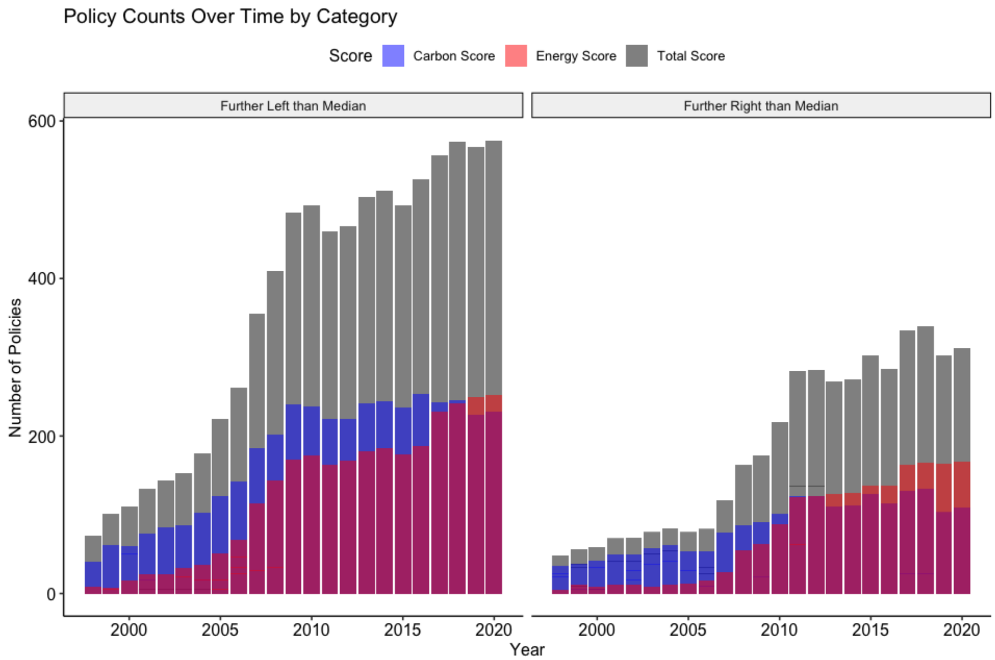

Figure 3: Policy Counts by Ideological Position

These results alone do not reveal a partisan relationship due to the insignificance of ideology. The lagged variables have greater significance, which is expected as the effects of a legislative session are unlikely to manifest until the following years, when policies are enacted and implemented.

Polarized states tend to pass more climate policy, as the terms for both current year and prior year polarization are significant. The effect fades when observing polarization two years prior, theoretically attributed to how policy regime evolves faster than the targeted outcomes. Higher polarization is associated with between 1.17 and 1.25 times more climate policies being adopted in a given year. These results do not cleanly fit into a theory due to the lack of direction, but they are surprising nonetheless. Polarization is not associated with fewer carbon policies, which invalidates part of my third hypothesis.

Ideology is significant when analyzing two specific continuous measures of policy: the mandated percentage of the renewable portfolio standard, and the mandated energy efficiency resource standard. A shift towards a more liberal state legislature is associated with an increase of between 4.9 and 5.2% in the renewable portfolio standard, an increase in the

DV	Term	Estimate	Clustered S.E.	p
log(EmissionsPerCapita)	Ideology (Lag 1)	-0.01	0.01	0.43
log(EmissionsPerCapita)	Polarization (Lag 1)	0.06	0.02	0.00***
log(EmissionsPerCapita)	Ideology (Lag 2)	-0.01	0.01	0.24
log(EmissionsPerCapita)	Polarization (Lag 2)	0.05	0.01	0.00***
log(CarbonIntensity)	Ideology (Lag 1)	-0.01	0.01	0.27
log(CarbonIntensity)	Polarization (Lag 1)	0.05	0.02	0.02**
log(CarbonIntensity)	Ideology (Lag 2)	-0.01	0.01	0.28
log(CarbonIntensity)	Polarization (Lag 2)	0.06	0.02	0.00***
log(EnergyIntensity)	Ideology (Lag 1)	0.02	0.02	0.19
log(EnergyIntensity)	Polarization (Lag 1)	-0.01	0.02	0.63
log(EnergyIntensity)	Ideology (Lag 2)	0.02	0.02	0.24
log(EnergyIntensity)	Polarization (Lag 2)	-0.02	0.03	0.55

Table 1: Estimates Controlling for Ideology, Polarization, and GDP per Capita

DV	Term	Estimate	Clustered S.E.	p
Score	Ideology	0.01	0.04	0.78
Score	Polarization	0.22	0.07	0.00***
Score	Ideology (Lag 1)	0.03	0.05	0.56
Score	Polarization (Lag 1)	0.16	0.08	0.04*
Carbon Score	Ideology	-0.04	0.06	0.50
Carbon Score	Polarization	0.12	0.17	0.47
Carbon Score	Ideology (Lag 1)	-0.02	0.08	0.83
Carbon Score	Polarization (Lag 1)	0.08	0.15	0.59
Energy Score	Ideology	-0.01	0.07	0.89
Energy Score	Polarization	0.06	0.23	0.81
Energy Score	Ideology (Lag 1)	0.01	0.08	0.86
Energy Score	Polarization (Lag 1)	-0.01	0.24	0.97

Table 2: Estimates Controlling for Ideology, Polarization, and GDP per Capita

energy efficiency resource standard of between 0.32 and 0.34%. Increasing levels of polarization are associated with approximately 5% lower gasoline taxes. While outside the scope of this study, the gasoline tax is highly publicized and visible, which may condemn it to less compromise.

While we can infer the importance of polarization, these results on their own do not reveal much about directionality. When controlling for the ideological positioning of both major parties, as well as a dummy variable for Republicans holding unified majorities, more right-wing Republican ideological positioning is associated with between 9.7 and 11.5% higher per

DV	Term	Estimate	Clustered S.E.	p
RPS	Ideology	-4.87	1.22	0.00***
RPS	Polarization	-2.35	2.15	0.28
RPS	Ideology (Lag 1)	-5.22	1.35	0.00***
RPS	Polarization (Lag 1)	-1.67	2.26	0.46
EERS	Ideology	-0.32	0.09	0.00***
EERS	Polarization	-0.21	0.56	0.71
EERS	Ideology (Lag 1)	-0.34	0.09	0.00***
EERS	Polarization (Lag 1)	-0.17	0.62	0.78
GasTax	Ideology	0.00	0.00	0.19
GasTax	Polarization	-0.05	0.01	0.00***
GasTax	Ideology (Lag 1)	0.00	0.00	0.53
GasTax	Polarization (Lag 1)	-0.05	0.01	0.00***

Table 3: Estimates Controlling for Ideology, Polarization, and GDP per Capita

capita emissions. All three lag terms are significant for per capita emissions, although none are significant for carbon intensity or energy intensively alone. The dummy variable for a unified Republican majority is only significant with a two-year lag, and is associated with a minimal negative change in emissions.

Equivalent models for policy counts show that increasingly left Democratic ideological positioning is associated with 1.25 times as many climate policies year over year. There is no significant effect for policies specifically targeting energy efficiency or carbon intensity, suggesting that the difference may be composed of symbolic or specifically targeted policies.

The continuous measures of policy are deeply polarized. Democratic ideological positioning shifting towards the left is associated with an increase in the renewable portfolio standard by between 7.83 and 7.65%, and an increase of between 3 and 5% in the gasoline tax. Rightward shifts in Republican positioning, in turn, are associated with decreases of between 4.4 and 5.9% in the gasoline tax. Unified Rep. leadership is associated with an RPS between 2.7 and 3% weaker. The energy efficiency resource standard does not significantly respond to ideological positioning or leadership in any scenario estimated.

Odds ratios reveal a strong relationship between conservative ideology and less stringent

DV	Term	Estimate	Clustered S.E.	p
log(EmissionsPerCapita)	Median Dem. Ideology (Lag 1)	0.02	0.03	0.50
log(EmissionsPerCapita)	Median Rep. Ideology (Lag 1)	0.11	0.02	0.00***
log(EmissionsPerCapita)	Unified Rep. Majority (Lag 1)	-0.00	0.01	0.50
log(EmissionsPerCapita)	Median Dem. Ideology (Lag 2)	0.02	0.03	0.56
log(EmissionsPerCapita)	Median Rep. Ideology (Lag 2)	0.09	0.03	0.00***
log(EmissionsPerCapita)	Unified Rep. Majority (Lag 2)	-0.01	0.00	0.01**
log(CarbonIntensity)	Median Dem. Ideology (Lag 1)	-0.05	0.06	0.38
log(CarbonIntensity)	Median Rep. Ideology (Lag 1)	0.06	0.06	0.37
log(CarbonIntensity)	Unified Rep. Majority (Lag 1)	-0.00	0.01	0.92
log(CarbonIntensity)	Median Dem. Ideology (Lag 2)	-0.07	0.06	0.21
log(CarbonIntensity)	Median Rep. Ideology (Lag 2)	0.06	0.06	0.32
log(CarbonIntensity)	Unified Rep. Majority (Lag 2)	-0.00	0.01	0.81
log(EnergyIntensity)	Median Dem. Ideology (Lag 1)	0.04	0.03	0.17
log(EnergyIntensity)	Median Rep. Ideology (Lag 1)	0.01	0.03	0.87
log(EnergyIntensity)	Unified Rep. Majority (Lag 1)	0.02	0.02	0.26
log(EnergyIntensity)	Median Dem. Ideology (Lag 2)	0.05	0.03	0.13
log(EnergyIntensity)	Median Rep. Ideology (Lag 2)	-0.00	0.04	0.95
log(EnergyIntensity)	Unified Rep. Majority (Lag 2)	0.01	0.02	0.35

Table 4: Estimates Controlling for Party Positioning and GDP per Capita

climate policies.[8] Softer policies like energy efficiency incentives, weak renewable standards, and soft decoupling policy are predicted well by a rightwards shift in ideology. As expected, more stringent policies like net metering, renewable standards with greater coverage, and greenhouse gas caps become less likely as ideology shifts right.

5 Discussion

Polarization is associated with higher levels of per capita emissions and carbon intensity. Alternative model specifications show that the rightwards shift in the Republican Party captures much of the association in higher emissions, and that Republican majorities are associated with weaker renewable portfolio standards. Chamber-wide shifts in ideology to the right are associated with a climate policy regime characterized by voluntary and incentive-based programs, rather than the mandates of more liberal states.

[8] No lags are used in this model.

DV	Term	Estimate	Clustered S.E.	p
RPS	Median Dem. Ideology	7.83	3.21	0.01**
RPS	Median Rep. Ideology	4.53	4.47	0.31
RPS	Unified Rep. Majority	-2.95	1.08	0.01**
RPS	Median Dem. Ideology (Lag 1)	7.65	3.16	0.02*
RPS	Median Rep. Ideology (Lag 1)	4.90	4.77	0.30
RPS	Unified Rep. Majority (Lag 1)	-2.96	1.24	0.02*
EERS	Median Dem. Ideology	0.75	0.70	0.28
EERS	Median Rep. Ideology	0.41	0.63	0.52
EERS	Unified Rep. Majority	-0.19	0.12	0.10
EERS	Median Dem. Ideology (Lag 1)	0.69	0.77	0.37
EERS	Median Rep. Ideology (Lag 1)	0.39	0.72	0.59
EERS	Unified Rep. Majority (Lag 1)	-0.20	0.12	0.09
GasTax	Median Dem. Ideology	0.05	0.01	0.00***
GasTax	Median Rep. Ideology	-0.04	0.02	0.05*
GasTax	Unified Rep. Majority	0.00	0.01	0.96
GasTax	Median Dem. Ideology (Lag 1)	0.04	0.01	0.00***
GasTax	Median Rep. Ideology (Lag 1)	-0.06	0.02	0.01**
GasTax	Unified Rep. Majority (Lag 1)	-0.00	0.01	0.78

Table 5: Estimates Controlling for Party Positioning and GDP per Capita

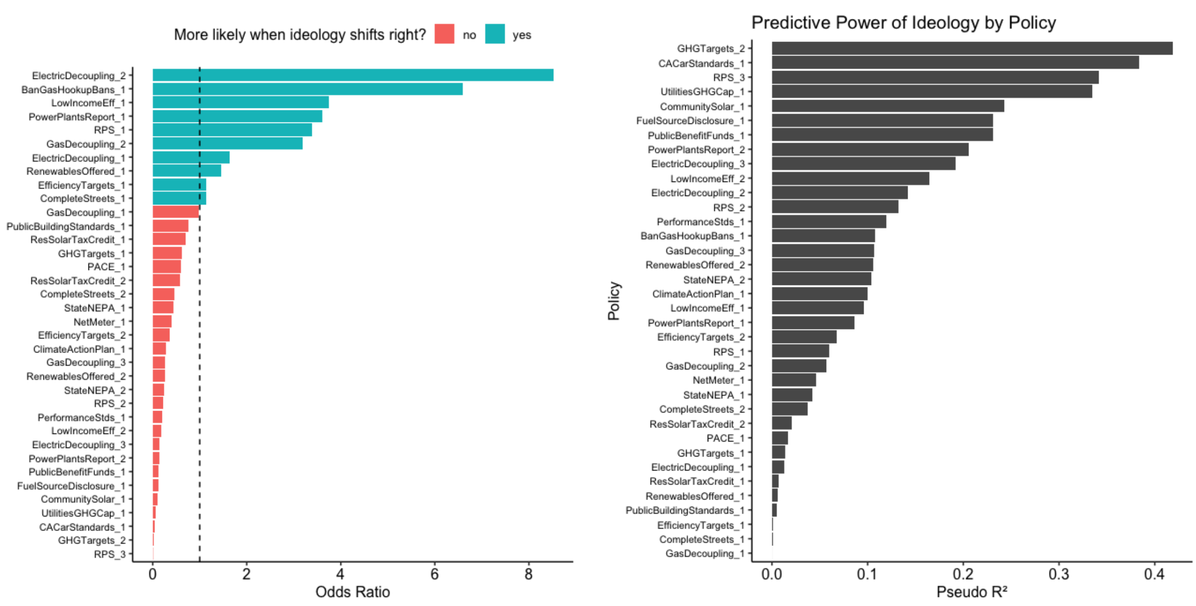

Figure 4: Analysis of Individual Policy Adoption

My findings reveal much about the polarization of specific climate policies. A state having greenhouse gas targets through statutory or public utility commission order was the policy

DV	Term	Estimate	Clustered S.E.	p
Score	Median Dem. Ideology	-0.22	0.07	0.00***
Score	Median Rep. Ideology	0.17	0.11	0.12
Score	Unified Rep. Majority	0.05	0.06	0.42
Score	Median Dem. Ideology (Lag 1)	-0.11	0.08	0.19
Score	Median Rep. Ideology (Lag 1)	0.17	0.13	0.19
Score	Unified Rep. Majority (Lag 1)	0.05	0.07	0.41
Carbon Score	Median Dem. Ideology	-0.11	0.13	0.40
Carbon Score	Median Rep. Ideology	0.02	0.15	0.87
Carbon Score	Unified Rep. Majority	-0.01	0.05	0.85
Carbon Score	Median Dem. Ideology (Lag 1)	-0.04	0.16	0.80
Carbon Score	Median Rep. Ideology (Lag 1)	0.03	0.11	0.79
Carbon Score	Unified Rep. Majority (Lag 1)	0.01	0.06	0.83
Energy Score	Median Dem. Ideology	-0.05	0.33	0.88
Energy Score	Median Rep. Ideology	0.08	0.20	0.70
Energy Score	Unified Rep. Majority	0.05	0.04	0.21
Energy Score	Median Dem. Ideology (Lag 1)	0.10	0.34	0.77
Energy Score	Median Rep. Ideology (Lag 1)	0.08	0.22	0.71
Energy Score	Unified Rep. Majority (Lag 1)	0.05	0.07	0.42

Table 6: Estimates Controlling for Party Positioning and GDP per Capita

best predicted by ideology – with an odds ratio near zero.[9] Whether a state adopts car emission standards at or above the level of California, mandatory RPS standards at 100%, or a greenhouse gas cap on the utilities sector are all predicted well by ideology, with an odds ratio of less than 0.1. Conservative states are more likely than liberal states to adopt non-decoupling incentives for utilities to sell less electricity, prohibit natural gas hookup bans, and offer low-income energy efficiency programs that spend less than $6.50 per resident. The least polarizing policies were performance-based compensation for utilities that sell less gas, complete streets planning guides, voluntary efficiency targets, green building requirements, voluntary renewable energy offerings, and state-approved local solar tax credits – all of these policies had less than 0.01% of their variance explained by ideology.

These findings perhaps explain why there is no relationship between ideology and policy adoption for either carbon or energy intensities. As my scores are simply counts of relevant

[9] The odds ratio tells us the multiplicative relationship between the odds of the DV being 1 and one-unit increase in the IV. Less than 1 indicates a negative relationship, equal to 1 suggests no relationship, and more than 1 indicates a positive relationship.

policy, it is entirely possible to have a high score composed of weak policies, and a low score composed of stringent policies. This is a weakness that can be resolved in future work using latent variable or factor analysis methods, similar to Bergquist and Warshaw (2023), where the policy data originate.

These results, as is, support the theory that policies configured as mandates are much less politically feasible than voluntary policies or incentives. Action plans, state equivalents to NEPA, and non-binding RPS policies are also considerably bipartisan, which is harmonic with how softer policies deliver political rewards without tangible changes. Mandatory efficiency standards, gas decoupling incentives, state-mandated solar tax credits, and net metering are all policies that are slightly more controversial yet maintain some bipartisan appeal.[10] Durable climate policy tends to appeal to the economic doctrines of state legislators. Whether a weak policy is preferable to no policy is outside the scope of this study.

My results closely align with recent case studies that highlight the distributive conflict between fossil fuel incumbents and the clean energy coalition. Arizona was three years into net metering and two years into an energy efficient resource standard when a fossil fuel-backed Republican slate swept all five seats on the Arizona Corporate Commission. Following an ad campaign sponsored by Arizona's largest utility to turn customers against net metering, legal challenges ensued. This culminated with a new monthly charge on new solar customers, and an abrupt fall in new solar installations by over 75% per quarter (Stokes 2020). Despite the Republican coalition being skeptical of anthropogenic climate change and opposed to net metering, the energy efficiency resource standard survived until its expiration. From 2010-2019, energy efficiency investments cut the state's greenhouse gas emissions by more than 17 million metric tons, saved ratepayers more than $1.4 billion, and accrued nearly $4 in total benefits for every $1 spent (Climate XChange 2023). Energy efficiency policies can survive where renewable energy doesn't.

My results also fit comfortably in the broader climate politics literature. First, energy

[10] Less than 10% of variation can be explained by ideology.

efficiency being resistant to polarization is not new: Trachtman (2020) finds a similar phenomenon, and similarly argues that energy efficiency is less immediately threatening to the fossil fuel industry. Renewable energy is deeply political, in spite of localized co-benefits, aligning the findings with the polarized federalism framework.

Second, my results on carbon intensity support both polarized federalism and the distributive conflict framework. Ideology is a strong predictor of stringent renewable energy support and other policies that dissuade firms and customers from fossil fuels. This incites opposition efforts from the fossil fuel industry, which can swiftly mobilize to outspend and replace pro-renewable energy candidates. Further research is necessary to determine whether this or long time horizons are responsible for the null effect of ideology on carbon intensity. The significance of Republican ideological positioning provides cautious support for the prior hypothesis.

This study faces several limitations. First, my use of the Shor and McCarty (2022) index assumes that environmental outcomes respond to slight, continuous changes in state legislature ideology. While a continuous measure of ideology is a new contribution to the literature, it could be that a broader, categorical distinction between ideologies is better suited. Second, renewable energy takes time to deploy, and a two year lag may not sufficiently capture the effect of political ideology. Third, my measure of climate policy is naive in assuming that all layers of stringency should be weighted equally. More complex factor analysis or latent variable methods are likely better suited to assign relative value to each policy, but were outside the feasibility of this project. These results are purely observational and do not carry causal merit.

6 Conclusion

Politicians face incredible difficulties in passing sustainable and effective climate policy. I provide evidence that the ambitious policy of liberal states is muted in the short-term by

Republican-driven polarization. Energy efficiency, out of the policies and outcomes studied, is the most robust to polarization for both policy adoption and tangible outcomes.

My most significant contribution to the literature is my comparison of policy adoption and environmental outcomes. My findings support the dominant view that energy efficiency has broader bipartisan appeal than renewable energy. The stringency of climate policy is impacted by Republican-driven polarization, which reflects conservative economic principles, and this mostly impacts per capita emissions through higher levels of carbon intensity.

There are numerous practical applications that can help promote politically feasible decarbonization. Legislators should bundle controversial renewable energy measures that attract opposition from fossil fuel stakeholders with energy efficiency incentives that appease them. States should also value legally binding targets, even if they must sacrifice ambition, for the sake of achieving tangible results. Finally, states can afford to be overly ambitious when setting efficiency targets, as they are resistant to shocks in partisanship and welcomed in industries traditionally opposed to climate policy. Future work should ameliorate the measurement issues of this study, and more broadly, focus on what transition assistance or side payments are effective in winning over fossil fuel interests. While energy efficiency can deliver significant reductions in emissions, renewable energy is a central piece of the puzzle that cannot be neglected.

Climate policy is incredibly difficult to sustain, and the global community cannot afford to wait for a solution to appear out of thin air. Incremental improvements that are tailored to the political realities of states can and have added up in the long-term. My results contain reason for hope: despite not having a clear incentive to do so, states are undeniable leaders in decarbonization. Climate policy has grown in scope over the past twenty years, even in unfavorable political environments. Advocates, policymakers, and researchers must waste no time in continuing a durable pathway to a clean energy future.

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Appendix A. Policy Classifications

Table 7: Policies from Bergquist and Warshaw (2023)

Code	Description	Levels	Category
ClimateActionPlan	Does the state have a plan that details steps it will take to address climate change?	0/1	Both
CommunitySolar	Does the state have a community solar program?	0/1	Both
CACarStandards	Does the state adopt California's car emissions standards (which are more stringent than the federal level)?	0/1	Both
UtilitiesGHGCap	Does the state have a binding cap on greenhouse gas emissions in the utility sector (e.g. RGGI, WCI)?	0/1	Carbon
BanGasHookupBans	Does the state prohibit local bans on gas hook-ups in buildings?	0/1	Carbon
PublicBenefitFunds	Does the state have a public benefit fund for renewable energy and energy efficiency?	0/1	Both
FuelSourceDisclosure	Does the state require electricity providers to disclose their fuel sources?	0/1	Carbon
PerformanceStds	Does the state have performance standards designed to reduce CO2 emissions?	0/1	Carbon

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Table 7 continued from previous page

Code	Description	Levels	Category
NetMeter	Does the state have net metering (which credits solar owners for electricity added)?	0/1	Carbon
PACE	Has the state authorized Property Assessed Clean Energy programs?	0/1	Both
PubBuildingStandards	Does the state have energy efficiency and other green building requirements for public buildings?	0/1/2	Energy
CompleteStreets	Does the state have complete streets policies?	0/1/2	Energy
EfficiencyTargets	Does the state have energy efficiency targets?	0/1/2	Energy
ResSolarTaxCredit	Does the state have a tax credit for residential solar installations?	0/1	Carbon
StateNEPA	Does the state have its own version of the federal National Environmental Policy Act?	0/1/2	Both
PowerPlantsReport	Does the state require all power plants to register and record their emissions?	0/1/2	Carbon
GHGTargets	Does the state have a goal for emission reduction levels by a certain time period?	0/1	Both
LowIncomeEff	Does the state have energy efficiency programs for low-income individuals?	0/1/2	Energy

Continued on next page

Table 7 continued from previous page

Code	**Description**	**Levels**	**Category**
RenewablesOffered	Does the state require utilities to offer customers electricity generated from renewable sources?	0/1	Carbon
ElectricDecoupling	Does the state compensate utilities for selling less electricity?	0/1/2/3	Energy
RPS	Does the state have renewable portfolio standards?	0/1/2/3	Carbon
GasDecoupling	Does the state compensate utilities for selling less gas?	0/1/2/3	Energy

Appendix B. Full Regression Tables

DV	Term	Estimate	Clustered S.E.	p
log(EmissionsPerCapita)	Ideology	-0.00	0.01	0.65
log(EmissionsPerCapita)	Polarization	0.06	0.02	0.00***
log(EmissionsPerCapita)	Ideology (Lag 1)	-0.01	0.01	0.43
log(EmissionsPerCapita)	Polarization (Lag 1)	0.06	0.02	0.00***
log(EmissionsPerCapita)	Ideology (Lag 2)	-0.01	0.01	0.24
log(EmissionsPerCapita)	Polarization (Lag 2)	0.05	0.01	0.00***
log(CarbonIntensity)	Ideology	-0.00	0.00	0.40
log(CarbonIntensity)	Polarization	0.05	0.02	0.03*
log(CarbonIntensity)	Ideology (Lag 1)	-0.01	0.01	0.27
log(CarbonIntensity)	Polarization (Lag 1)	0.05	0.02	0.02**
log(CarbonIntensity)	Ideology (Lag 2)	-0.01	0.01	0.28
log(CarbonIntensity)	Polarization (Lag 2)	0.06	0.02	0.00***
log(EnergyIntensity)	Ideology	0.02	0.01	0.10
log(EnergyIntensity)	Polarization	-0.00	0.02	0.87
log(EnergyIntensity)	Ideology (Lag 1)	0.02	0.02	0.19
log(EnergyIntensity)	Polarization (Lag 1)	-0.01	0.02	0.63
log(EnergyIntensity)	Ideology (Lag 2)	0.02	0.02	0.24
log(EnergyIntensity)	Polarization (Lag 2)	-0.02	0.03	0.55

Table 8: Estimates Controlling for Ideology, Polarization, and GDP per Capita

DV	Term	Estimate	Clustered S.E.	p
Score	Ideology	0.01	0.04	0.78
Score	Polarization	0.22	0.07	0.00***
Score	Ideology (Lag 1)	0.03	0.05	0.56
Score	Polarization (Lag 1)	0.16	0.08	0.04*
Score	Ideology (Lag 2)	0.04	0.04	0.36
Score	Polarization (Lag 2)	0.12	0.09	0.17
Carbon Score	Ideology	-0.04	0.06	0.50
Carbon Score	Polarization	0.12	0.17	0.47
Carbon Score	Ideology (Lag 1)	-0.02	0.08	0.83
Carbon Score	Polarization (Lag 1)	0.08	0.15	0.59
Carbon Score	Ideology (Lag 2)	-0.01	0.09	0.91
Carbon Score	Polarization (Lag 2)	0.06	0.14	0.65
Energy Score	Ideology	-0.01	0.07	0.89
Energy Score	Polarization	0.06	0.23	0.81
Energy Score	Ideology (Lag 1)	0.01	0.08	0.86
Energy Score	Polarization (Lag 1)	-0.01	0.24	0.97
Energy Score	Ideology (Lag 2)	0.05	0.09	0.63
Energy Score	Polarization (Lag 2)	-0.06	0.21	0.79

Table 9: Estimates Controlling for Ideology, Polarization, and GDP per Capita

DV	Term	Estimate	Clustered S.E.	p
RPS	Ideology	-4.87	1.22	0.00***
RPS	Polarization	-2.35	2.15	0.28
RPS	Ideology (Lag 1)	-5.22	1.35	0.00***
RPS	Polarization (Lag 1)	-1.67	2.26	0.46
RPS	Ideology (Lag 2)	-5.56	1.36	0.00***
RPS	Polarization (Lag 2)	-1.26	2.94	0.67
EERS	Ideology	-0.32	0.09	0.00***
EERS	Polarization	-0.21	0.56	0.71
EERS	Ideology (Lag 1)	-0.34	0.09	0.00***
EERS	Polarization (Lag 1)	-0.17	0.62	0.78
EERS	Ideology (Lag 2)	-0.34	0.11	0.00***
EERS	Polarization (Lag 2)	-0.11	0.68	0.87
GasTax	Ideology	0.00	0.00	0.19
GasTax	Polarization	-0.05	0.01	0.00***
GasTax	Ideology (Lag 1)	0.00	0.00	0.53
GasTax	Polarization (Lag 1)	-0.05	0.01	0.00***
GasTax	Ideology (Lag 2)	0.00	0.00	0.92
GasTax	Polarization (Lag 2)	-0.05	0.01	0.00***

Table 10: Estimates Controlling for Ideology, Polarization, and GDP per Capita

DV	Term	Estimate	Clustered S.E.	p
log(EmissionsPerCapita)	Median Dem. Ideology	0.03	0.03	0.38
log(EmissionsPerCapita)	Median Rep. Ideology	0.12	0.02	0.00***
log(EmissionsPerCapita)	Unified Rep. Majority	-0.00	0.01	0.95
log(EmissionsPerCapita)	Median Dem. Ideology (Lag 1)	0.02	0.03	0.50
log(EmissionsPerCapita)	Median Rep. Ideology (Lag 1)	0.11	0.02	0.00***
log(EmissionsPerCapita)	Unified Rep. Majority (Lag 1)	-0.00	0.01	0.50
log(EmissionsPerCapita)	Median Dem. Ideology (Lag 2)	0.02	0.03	0.56
log(EmissionsPerCapita)	Median Rep. Ideology (Lag 2)	0.09	0.03	0.00***
log(EmissionsPerCapita)	Unified Rep. Majority (Lag 2)	-0.01	0.00	0.01**
log(CarbonIntensity)	Median Dem. Ideology	-0.04	0.06	0.46
log(CarbonIntensity)	Median Rep. Ideology	0.06	0.06	0.30
log(CarbonIntensity)	Unified Rep. Majority	0.00	0.01	0.82
log(CarbonIntensity)	Median Dem. Ideology (Lag 1)	-0.05	0.06	0.38
log(CarbonIntensity)	Median Rep. Ideology (Lag 1)	0.06	0.06	0.37
log(CarbonIntensity)	Unified Rep. Majority (Lag 1)	-0.00	0.01	0.92
log(CarbonIntensity)	Median Dem. Ideology (Lag 2)	-0.07	0.06	0.21
log(CarbonIntensity)	Median Rep. Ideology (Lag 2)	0.06	0.06	0.32
log(CarbonIntensity)	Unified Rep. Majority (Lag 2)	-0.00	0.01	0.81
log(EnergyIntensity)	Median Dem. Ideology	0.04	0.03	0.29
log(EnergyIntensity)	Median Rep. Ideology	0.00	0.03	0.94
log(EnergyIntensity)	Unified Rep. Majority	0.02	0.01	0.13
log(EnergyIntensity)	Median Dem. Ideology (Lag 1)	0.04	0.03	0.17
log(EnergyIntensity)	Median Rep. Ideology (Lag 1)	0.01	0.03	0.87
log(EnergyIntensity)	Unified Rep. Majority (Lag 1)	0.02	0.02	0.26
log(EnergyIntensity)	Median Dem. Ideology (Lag 2)	0.05	0.03	0.13
log(EnergyIntensity)	Median Rep. Ideology (Lag 2)	-0.00	0.04	0.95
log(EnergyIntensity)	Unified Rep. Majority (Lag 2)	0.01	0.02	0.35

Table 11: Estimates Controlling for Party Positioning and GDP per Capita

DV	Term	Estimate	Clustered S.E.	p
RPS	Median Dem. Ideology	7.83	3.21	0.01**
RPS	Median Rep. Ideology	4.53	4.47	0.31
RPS	Unified Rep. Majority	-2.95	1.08	0.01**
RPS	Median Dem. Ideology (Lag 1)	7.65	3.16	0.02*
RPS	Median Rep. Ideology (Lag 1)	4.90	4.77	0.30
RPS	Unified Rep. Majority (Lag 1)	-2.96	1.24	0.02*
RPS	Median Dem. Ideology (Lag 2)	7.97	3.79	0.04*
RPS	Median Rep. Ideology (Lag 2)	5.73	6.20	0.36
RPS	Unified Rep. Majority (Lag 2)	-2.74	1.42	0.05*
EERS	Median Dem. Ideology	0.75	0.70	0.28
EERS	Median Rep. Ideology	0.41	0.63	0.52
EERS	Unified Rep. Majority	-0.19	0.12	0.10
EERS	Median Dem. Ideology (Lag 1)	0.69	0.77	0.37
EERS	Median Rep. Ideology (Lag 1)	0.39	0.72	0.59
EERS	Unified Rep. Majority (Lag 1)	-0.20	0.12	0.09
EERS	Median Dem. Ideology (Lag 2)	0.63	0.82	0.44
EERS	Median Rep. Ideology (Lag 2)	0.42	0.74	0.57
EERS	Unified Rep. Majority (Lag 2)	-0.20	0.11	0.06
GasTax	Median Dem. Ideology	0.05	0.01	0.00***
GasTax	Median Rep. Ideology	-0.04	0.02	0.05*
GasTax	Unified Rep. Majority	0.00	0.01	0.96
GasTax	Median Dem. Ideology (Lag 1)	0.04	0.01	0.00***
GasTax	Median Rep. Ideology (Lag 1)	-0.06	0.02	0.01**
GasTax	Unified Rep. Majority (Lag 1)	-0.00	0.01	0.78
GasTax	Median Dem. Ideology (Lag 2)	0.03	0.01	0.00***
GasTax	Median Rep. Ideology (Lag 2)	-0.07	0.03	0.01**
GasTax	Unified Rep. Majority (Lag 2)	-0.00	0.00	0.63

Table 12: Estimates Controlling for Party Positioning and GDP per Capita

DV	Term	Estimate	Clustered S.E.	p
Score	Median Dem. Ideology	-0.22	0.07	0.00***
Score	Median Rep. Ideology	0.17	0.11	0.12
Score	Unified Rep. Majority	0.05	0.06	0.42
Score	Median Dem. Ideology (Lag 1)	-0.11	0.08	0.19
Score	Median Rep. Ideology (Lag 1)	0.17	0.13	0.19
Score	Unified Rep. Majority (Lag 1)	0.05	0.07	0.41
Score	Median Dem. Ideology (Lag 2)	-0.03	0.12	0.78
Score	Median Rep. Ideology (Lag 2)	0.17	0.17	0.31
Score	Unified Rep. Majority (Lag 2)	0.05	0.06	0.42
Carbon Score	Median Dem. Ideology	-0.11	0.13	0.40
Carbon Score	Median Rep. Ideology	0.02	0.15	0.87
Carbon Score	Unified Rep. Majority	-0.01	0.05	0.85
Carbon Score	Median Dem. Ideology (Lag 1)	-0.04	0.16	0.80
Carbon Score	Median Rep. Ideology (Lag 1)	0.03	0.11	0.79
Carbon Score	Unified Rep. Majority (Lag 1)	0.01	0.06	0.83
Carbon Score	Median Dem. Ideology (Lag 2)	0.02	0.19	0.91
Carbon Score	Median Rep. Ideology (Lag 2)	0.06	0.10	0.57
Carbon Score	Unified Rep. Majority (Lag 2)	0.01	0.06	0.86
Energy Score	Median Dem. Ideology	-0.05	0.33	0.88
Energy Score	Median Rep. Ideology	0.08	0.20	0.70
Energy Score	Unified Rep. Majority	0.05	0.04	0.21
Energy Score	Median Dem. Ideology (Lag 1)	0.10	0.34	0.77
Energy Score	Median Rep. Ideology (Lag 1)	0.08	0.22	0.71
Energy Score	Unified Rep. Majority (Lag 1)	0.05	0.07	0.42
Energy Score	Median Dem. Ideology (Lag 2)	0.18	0.34	0.60
Energy Score	Median Rep. Ideology (Lag 2)	0.11	0.26	0.67
Energy Score	Unified Rep. Majority (Lag 2)	0.05	0.08	0.52

Table 13: Estimates Controlling for Party Positioning and GDP per Capita

Appendix C. Replication Guide

Acquire the Bergquist and Warshaw (2023) replication file, and place the folder entitled `replication` in the project directory. Obtain the regions data set from GitHub user `cphalpert` and place in the `data` folder, named `regions from cphalpert.csv`. Download the aggregated April 2023 update to (Shor and McCarty 2011) and place in the `data` folder, named `shormccarty2023.dta`. Carbon intensity and energy intensity data must be obtained from the Energy Information Administration, and placed as indicated in the `replication_preprocessing.Qmd` script. Both were obtained from the EIA's State Energy Data System (SEDS). Since they come in Excel files, you must save the individual `.csv` files. No further cleaning is necessary as it is done in the preprocessing script. Current $ GDP is from the Bureau of Economic Analysis Interactive Data System. The tables are the annual GDP by state in current U.S. dollars. Population is drawn from the St. Louis Fed's FRED database, in a data set of total population including armed forces.

Run the scripts in order: `replication_preprocessing.Qmd`, `replication_policy.Qmd`, `replication_models.Qmd`, and `replication_analysis.Qmd`. Tables are generated in the modeling script but must be manually extracted before running the next code chunks. Figures are generated in the policy and analysis scripts.

Please report any issues to `brandenb@ucla.edu`.