# Public Opinion Foundations of the Clean Energy Transition\*

Alexander F. Gazmararian Princeton University<sup>†</sup> Matto Mildenberger UC Santa Barbara<sup>‡</sup>

Dustin Tingley Harvard University<sup>§</sup>

November 25, 2023

<sup>\*</sup>The authors declare that no funds, grants, or other support were received during the preparation of this manuscript. The authors have no relevant financial or non-financial interests to disclose. All authors contributed equally to all stages in this manuscript, including design, conceptualization and writing. Ethics approval and consent to participate: NA; Consent for publication:NA; Availability of materials: NA

<sup>&</sup>lt;sup>†</sup>PhD Candidate, Department of Politics. Email: afg2@princeton.edu

<sup>&</sup>lt;sup>‡</sup>Associate Professor, Department of Political Science. Email: mildenberger@polsci.uscb.edu

<sup>§</sup>Professor, Department of Government. Email: dtingley@gov.harvard.edu

#### Abstract

The attitudes and behaviors of citizens are central to the clean energy transition. However, there is often theoretical ambiguity about the role of publics, which has consequences for understanding decarbonization trajectories and the conditions that enable political reforms. Departing from previous debates, we argue that citizens are neither irrelevant nor omniscient. We use the recent turn to green industrial policy to illustrate three ways public opinion affects the clean energy transition through the ways politicians anticipate the public's responses to policies, the types of leaders elected into office over time, and the consumption decisions individuals make. Our intervention identifies new avenues for public opinion research necessitated by the transformation in climate policy approaches worldwide.

Word count: 6,320 (excluding references and tables)

## 1 Introduction

10

Moore, and Lacasse 2022; Peng et al. 2021).

Solving the climate crisis will require active participation by the public in their roles as citizens and consumers. Yet, while debates over climate and energy reform usually acknowledge the importance of publics, the conditions under which voters support or resist climate policy are too often delegated to amorphous concepts like political "will". This theoretical ambiguity has implications for researchers such as those who have invested considerable energy in modeling the technological and economic conditions under which decarbonization trajectories can be met. The public role in structuring these trajectories is complex and requires the

Publics are neither irrelevant nor omniscient. Instead, diverse publics are structured by competing interests and values, which condition how and to what effect they mobilize within policymaking debates. We argue that the recent turn to green industrial policy in the United States and Europe offers an opportunity to reconsider the role of public opinion in the clean energy transition and unpack the notion of "political will".

integration of a mature social science literature on public attitudes and behaviors (Beckage,

We identify three aspects of public opinion that affect policymaking by constraining 16 how interest groups can mobilize: the visibility of an issue, an individual's prioritization of an issue, and the public's understanding of policy benefits and costs. Rather than public opinion being irrelevant, politicians anticipate the public's responses to political reforms and 19 the potential electoral benefits or costs. Rather than being omniscient, people are uncertain about the objective costs and benefits of policies, a reality that provides latitude to interest 21 groups to frame issues at public and elite levels. Our intervention advances a more nuanced 22 understanding of individual climate policy preferences and the foundational role of public 23 opinion in the clean energy transition, showing how we can replace amorphous appeals to the importance of publics with clear statements of the conditions and mechanisms through which public opinion shapes decarbonization trajectories.

This perspective proceeds by clarifying the role that public opinion plays in climate policy with the new turn to green industrial policy. We use the landmark US Inflation Reduction Act (IRA), passed in late 2022, as an illustrative case, identifying how the bill side-stepped public opinion barriers that stymied previous reform attempts. Then we outline a research agenda on climate opinion, identifying urgent questions raised by the new politics of climate change.

## 33 Reconsidering the Role of Public Opinion in Climate

When pollsters ask Americans whether they believe global warming is happening and are

## Politics

worried about its impacts, for the last decade, a majority of the public consistently attest that climate change is happening and they are worried (Leiserowitz, Maibach, Rosenthal, and Kotcher 2022; Krosnick and MacInnis 2020), though like many issues there are patterns of partisan polarization (Egan and Mullin 2017). Still, these beliefs correspond with stated policy support: 69 percent of registered voters support transitioning the US economy from fossil fuels to clean energy by 2050 (Leiserowitz, Maibach, Rosenthal, Kotcher, et al. 2022). Despite this national consensus, leaders have largely failed to respond to public opinion 42 with meaningful climate policy. What explains this apparent disconnect (at least before the IRA) between measured climate policy preferences and national policymaking actions? US public opinion on climate issues has alternatively been characterized in a number of 45 ways. At one extreme, citizens are framed as irrelevant. In this account, public opinion rarely influences the Congressional legislative agenda. Instead, elites and interest groups dominate (Gilens and Page 2014). To the extent that the public holds coherent opinions, they follow rather than lead their elected officials (Lenz 2012). Alternatively, public opinion may matter but only in a very generalized fashion, such as a general public mood that can thermostatically reorient elite behavior but is unlikely to shape specific policy proposals or  $_{52}$  designs. $^{1}$ 

In popular debates, public opinion is often collapsed into the abstract concept of "public will". Yet, the concept of public will typically remains undefined or defined tautologically as the presence of conditions under which action is possible. This account highlights the importance of publics, but leaves unspecified the conditions and pathways through which public opinion matters.

We suggest that energy and technical assessments of the energy transition will benefit from engagement with a sophisticated literature on public opinion that has carefully specified the mechanisms through which voters matter in supporting or resisting policy change. These accounts move beyond debates over public opinion as negligible or omniscient factors in shaping political "will" to instead describe the conditions that mobilize the public into contentious politics.

There are at least three reasons why what the public thinks matters for the emergence of political coalitions in support of the clean energy transition. First, the objective distribution of public preferences is, at a minimum, an important input into elite incentives to act. What elites think the public wants is consequential for their decision-making (Arnold 1990), so the relationship between elite politics and public opinion needs careful consideration, including how these perceptions are constructed. Interest groups, for example, invest considerable sums to distort elite perceptions of public opinion, which contributes to inaction (Hertel-Fernandez, Mildenberger, and Stokes 2019).

Objective public opinion is also a critical input into elite perceptions. Elite perceptions
of public preferences are not only constructed by interest groups. A simple fact of politics
is that people are sensitive to costs—and lawmakers know this. Thus, whether directly or
indirectly, public opinion is critical in shaping the incentives political leaders have when
deciding to make long-term investments to address the climate crisis.

<sup>&</sup>lt;sup>1</sup>Another possibility is that apparent public support for climate policy reflects a failure of measurement strategies. Here, the public appears to support action but only in poorly designed questions that don't properly frame the costs of action.

Second, the public's climate policy preferences can affect their voting behavior, which 77 shapes the type and priorities of elected leaders over time. A foundational claim on the electoral connection in Congress is that incumbents are extremely sensitive to how their constituents react to their votes, influencing how they vote and the policies they propose (Mayhew 2004). Lawmakers who cast votes out of step with their constituents generally lose 81 re-election (Canes-Wrone, Brady, and Cogan 2002), and publics adjust their preferences in response to policy decisions (Wlezien 1995). One study of state-level support for 39 policies 83 across eight issues found that politicians are highly responsive when citizens have policyspecific opinions on salient issues, though policy may not always be congruent with these opinions due to institutions and interest groups (Lax and Phillips 2012). Studies of climate policy in particular show signs of responsiveness (Bromley-Trujillo and Poe 2020; Schaffer, 87 Oehl, and Bernauer 2022). Public opinion matters for policy outcomes.

Third, the energy transition requires that communities accept new clean energy projects and that members of the public make consumption choices aligned with decarbonization goals, such as transitioning from gas furnaces to heat pumps or buying an electric vehicle. Public opinion directly shapes these community-level development and individual-level consumption decisions (Carley et al. 2020). If people are uncertain about the benefits of green energy projects or sustainable consumption choices, that will slow the necessary steps for the energy transition.

Consequently, the design of policies must account for the dynamics of public opinion. If not, pro-climate policymakers risk deepening polarization that could undermine the energy transition (Kallbekken 2023). Reformers could inadvertently empower fossil fuel interest groups that can exploit certain policy designs to undermine public support (Mildenberger 2020), or they could generate a political environment that elevates policy opponents into office (Cooper, Kim, and Urpelainen 2018).

The turn to green industrial policy, as with the IRA, sidesteps several features of public opinion that frustrated earlier climate policymaking efforts. Previous climate reforms were

either low-salience efforts with minimal efforts by opponents to politicize incremental actions (e.g., Rabe 2004) or shaped by prevailing economic theory without consideration of political-105 economic considerations. For example, US climate policymaking from around 2001 through 106 2012 fixated on putting a price on carbon pollution, and so too has public opinion research 107 on climate policy (Fairbrother 2022). Opponents, and at times proponents, framed policies 108 as generating costs and involving sacrifices. As we review, policies that increase costs (or 109 that can generate an intuitive perception of increased costs) are often a losing political 110 proposition, even when coupled with well-intentioned designs to mask those costs. Learning 111 from the pitfalls of attempts like the Waxman-Markey cap-and-trade bill, the IRA focused 112 on creating salient benefits, which likely contributed to its success.<sup>2</sup> 113

## 114 Cost Sensitivity and Policy Support

An accumulation of evidence shows how support falls when voters focus on the costs of 115 climate policies (e.g., Drews and van den Bergh 2016; Bergquist, Konisky, and Kotcher 116 2020).<sup>3</sup> For instance, Bechtel and Scheve (2013) conducted large-scale survey experiments in 117 France, Germany, the United Kingdom, and the US that randomly varied information about 118 how much a global climate agreement would cost households each month in higher energy 119 prices. They find that an increase in costs from one to two percent of GDP reduces support for climate action by 20 percentage points. Surveys estimating the willingness of citizens to 121 pay for reductions in GHG emissions find that households would spend around \$80 annually (Kotchen, Boyle, and Leiserowitz 2013). These estimates would imply that carbon prices are 123 politically constrained to as low as \$2 to \$8 per ton of CO2 (Jenkins 2014), a far reach from 124 recent estimates that put the social cost of carbon at \$185 per ton (Rennert et al. 2022). 125 Likewise, Beiser-McGrath and Bernauer (2023) show how when individuals learn about the costs of a carbon tax, their support drops. These public opinion findings correspond with

<sup>&</sup>lt;sup>2</sup>Proposals like cap and trade are not impossible, as the 1990 CAA Amendments and regional efforts demonstrate. However, these successes relied on political conditions not present recently.

<sup>&</sup>lt;sup>3</sup>Factors like perceived fairness and effectiveness also affect public support (Bergquist et al. 2022).

<sup>&</sup>lt;sup>4</sup>However, Borick and Rabe (2010) find Canadians have a greater willingness to pay costs.

political behavior such as Washington state's failed carbon pricing referendum (Anderson,
Marinescu, and Shor 2023) and the "Yellow Vests" movement in France (Douenne and Fabre
2022). While the public will incur some costs, political support drops as the costs rise.

While climate policy inaction also entails significant costs, these are more extreme in
the future, often outside the political time horizons of current elected leaders. Nonetheless,
a growing literature finds that direct experience with climatic extremes shapes support for
climate policy and climate science acceptance (Howe et al. 2019; Borick and Rabe 2014,
2010). However, these effects are often ephemeral (Egan and Mullin 2012, 2017), or remain
mediated by partisan politics (Hazlett and Mildenberger 2020). In other words, as the costs
of climate change manifest, the salience of policy costs has not been overtaken.

Conversely, consumers like clean energy, which the IRA seeks to expand dramatically.

Ansolabehere and Konisky (2014) amass a wealth of public opinion data on what energy

people want to use and why. They show that the attributes of energy, namely its price

and environmental harms, are the most important determinants of support, more so than

partisanship and social values. In other words, people want their electricity to be cheap

and clean, which reflects an openness to the clean energy transition but also reiterates the

public's sensitivity to costs.

Reformers recognize the salience of climate policy costs and have sought strategies to reduce the visibility or offset the magnitude of these costs (e.g., Arnold 1990). For example, carbon pricing proposals often propose to rebate revenue to citizens (Carattini, Kallbekken, 147 and Orlov 2019). However, these proposals face two challenges. First, the newly salient policy 148 benefit (a rebate) is not the most important policy objective: the real benefit is mitigating 149 the catastrophic future effects of climate change. Setting this aside, a growing set of survey 150 experiments have shown that rebates increase public support for carbon pricing both in 151 the United States and globally (Beiser-McGrath and Bernauer 2019; Jagers et al. 2021). 152 Yet, there is little evidence that these rebates—as implemented in practice in Canada and 153 Switzerland—have reshaped political support for climate policy in the face of coordinated interest group opposition (Mildenberger et al. 2022). Moreover, even simple partisan frames can erase the apparent positive effect of rebates on climate policy support (Fremstad et al. 2022). This emphasizes the importance of considering the gap between objective and subjective policy costs. It matters not only if benefits are flowing to the public but whether politically active constituents perceive these benefits. In turn, opponents often work to distort these perceptions to align the public with their interest group's preferences.

The IRA took a different approach to side-step the cost-sensitivity challenge. Instead of imposing costs on fossil energy consumers or producers, the law focused on creating benefits.

Primarily, the law will make massive investments to lower the cost of clean energy and encourage the electrification of cars and buildings. Of course, these investments must be paid for, which could burden the public. However, the political reformers behind the IRA chose to raise funds partly by closing tax loopholes. The law is also forecasted to reduce deficits in the future (CBO 2022), so voters are unlikely to be saddled with debt that would risk creating pressure for reversal (Gazmararian and Tingley 2023b).

#### Local Economic Benefits

In addition to making clean energy technologies cheaper, the IRA also generates local economic benefits such as jobs to construct renewable energy, build batteries, and install energyefficient products.<sup>5</sup> Many of these new economic opportunities are being created in Republican states, traditional opponents of action on climate change, which could have implications
for the coalitions that support the energy transition in the future (Egan and Mullin 2023).
What does the public opinion literature say about how these local economic benefits will
influence the reception of the IRA?

Studies of Americans find that framing the benefits of the clean energy transition in terms of jobs (Bayulgen and Benegal 2019) or cost savings (Gustafson et al. 2022), even among Republicans who are otherwise more skeptical of the clean energy transition (Stokes and

<sup>&</sup>lt;sup>5</sup>Energy transmission infrastructure is also crucial for decarbonization, and here local benefits are also important (Bergquist et al. 2020).

Warshaw 2017). Another survey experiment focused squarely on the local benefits, such as jobs assembling electric vehicles, finds that these benefits can lock in support for the energy transition (Gazmararian and Tingley 2023b). In a study of 24 countries, Bain et al. (2016) find that emphasizing the economic and scientific benefits of the clean energy transition can motivate individual support for actions to combat global warming, even among those skeptical of human-caused climate change. In a review of studies on public acceptance of energy projects, positive perceptions of benefits consistently correlated with support (Carley et al. 2020).

However, these benefits must materialize and appear credible to people on the ground. 188 Gazmararian and Tingley (2023b) present evidence from national, regional, and targeted sur-189 veys that reveal concerns about the local benefits of green industries, such as the share of jobs 190 that go to local workers. They also show how policy solutions such as transparency around 191 investment could lessen these worries. In practice, there will also be counter-arguments that 192 try to neutralize arguments emphasizing local economic benefits, so local economic benefits 193 may not automatically translate into greater climate policy support (Bernauer and McGrath 194 2016). 195

## 196 Policy Bundling

The IRA also bundled social programs in a way that public opinion studies predict should increase national support. For example, one study used a "conjoint" survey experiment that independently varied the attributes of a climate policy, such as whether it is bundled with social and economic reforms like affordable housing. The study found that bundling climate policy with broader social reforms can build support for climate action in the US, especially among people of color and Democrats, but not Republicans (Bergquist, Mildenberger, and Stokes 2020). These partisan reactions to policy bundling reflect the political coalitions

<sup>&</sup>lt;sup>6</sup>Other benefits from mitigation policy like public health improvement from air pollution reduction can also increase support (Myers et al. 2012).

<sup>&</sup>lt;sup>7</sup>Perceptions of environmental harm also shape public support for power plants (Ansolabehere and Konisky 2009).

that formed around the IRA, with party-line support from Democrats and opposition from Republicans.

Gaikwad, Genovese, and Tingley (2022) find similarly that the public prefers a bundle
of spending across multiple programs. Starting with the presumption that the government
had raised money through a price on carbon, the study considers how individuals allocate
spending across adaptation spending, transition assistance for impacted workers, renewable
energy infrastructure, and dividends for taxpayers. Individuals made allocations across the
categories. Further, using geographically targeted polling, the pattern of these allocations
reflects different priorities depending on how climate change and the energy transition will
impact their locality.

# Priorities for Future Public Opinion Research

## Durability

Even when climate policy passes, its long-term durability is never guaranteed. Policy losers
mobilize to repeal or retrench even modest climate policy efforts as has been seen in places
like Ontario, Canada in 2018 or Australia in 2014. Many fossil-fuel-aligned politicians in the
US have already begun laying the groundwork for the repeal of the IRA, accompanied by
government investment in expanded fossil fuel production.

Whether the public perceives the benefits of the IRA, such as new jobs and local tax revenue, as durable will matter for the law's implementation. The possibility that a new government will come to power and reverse the legislative accomplishments of its predecessor or that economic circumstances might change and hinder investment is not theoretical. Gaz-mararian and Tingley (2023b) show how this credibility challenge is salient in the public's mind: 71 percent of the national public is uncertain that the government would keep its promises to invest in their communities. Their polling of local officials across the country reveals a similar pattern, where these reversibility concerns are even more acute. If the public does not view the law's benefits as durable, communities might be less willing to embrace

the clean energy transition. Community opposition has real costs. Their acceptance is necessary to build battery assembly plants, install transmission lines, and deploy wind energy. Local opposition has already emerged to large solar projects, such as in Williamsport, Ohio (Gearino 2022).

Optimistically, there is initial evidence that the national public believes the benefits from
the IRA may stick. Gazmararian and Tingley (2023b) show in an opinion poll fielded the
month after the IRA passed that the public thinks that most companies and politicians are
unlikely to try to reverse the law. The one exception is fossil fuel companies and Republicans,
which about half of the public thought would be likely to try to reverse the IRA. However,
among Republican respondents, they were less likely to think that their party would reverse
the law, even though survey takers from other political parties were more skeptical.

This mixed picture suggests that the public is hopeful about the longevity of the law but is not yet convinced that the benefits will last. Other national surveys show that few think the IRA will accomplish its goals. For example, only 34 percent of the public think the law will reduce global warming or the cost of electricity (Leiserowitz, Maibach, Rosenthal, Kotcher, et al. 2022). This pessimism may reflect concern about the durability of benefits, potentially because interest groups might try to water down the law's implementation (Stokes 2020).

At least two other factors may contribute to policy durability. The first is bipartisanship.

The IRA passed along partisan lines—no Republican voted for it. A partisan climate law
may be better than no law at all, but how might the public's perceptions of the bill's partisan
passage impact the implementation and durability of the law?

The public opinion literature documents that voters generally prefer bipartisan policies

(e.g., Bergquist, Mildenberger, and Stokes 2020). This public preference for bipartisanship

reflects many dynamics, including an aversion to partisan extremism (Westwood 2022). Im
portantly, new research shows that the public sees bipartisan laws as more durable, which

uniquely leads to greater support for climate policy since voters think it would last and be

8But see Harbridge Malhotra, and Harrison (2014) who show that partisans may have a preference for

<sup>&</sup>lt;sup>8</sup>But see Harbridge, Malhotra, and Harrison (2014) who show that partisans may have a preference for policies supported by their own party.

more effective (Gazmararian and Tingley 2023b). Thus, the lack of bipartisanship could create concerns about the durability of the IRA, while other features of the law's design could help to counterbalance these worries.

Given growing polarization in the United States (McCarty, Poole, and Rosenthal 2006),
bipartisanship might appear as a nonviable pathway to build a political coalition for climate
policy. However, this defeatist view can often be a self-fulfilling prophecy. For example,
the public tends to underestimate the extent to which other people think climate change is
happening (Mildenberger and Tingley 2019). One study shows that when people learn of
the true level of bipartisan support for emissions mitigation, this shift in expectations can
lead to greater support for the clean energy transition (Gazmararian and Tingley 2023b).

Instead, the political logic of the IRA, which used benefits to create allies, may hinge on whether the public recognizes those benefits and, therefore, politicians receive an electoral reward. There is a well-documented challenge in American politics where the public does not always recognize the benefits provided by the government, what Mettler (2011) calls the "submerged state." The lack of traceability can paradoxically lead citizens to oppose policies of which they are beneficiaries.

In the context of the IRA, politicians should have incentives to try to claim credit.

However, the allocation of credit is difficult, especially in a federal system where the implementation of the IRA will involve local, state, and federal actors (Arceneaux 2006; Konisky 2011). Democrats who ushered through the law will want to take credit for the local benefits.

However, they might need to share the credit with Republican governors, for example, to encourage them to accelerate the clean energy transition in their state. Some politicians may even deny the IRA's role despite benefiting because of fear of electoral consequences.

Who the public ultimately rewards will shape the incentives of political elites to advance or forestall decarbonization.

## 281 Consumer Demand for New Technologies

Implementing the IRA and successfully driving a society-wide energy transition will require
more than climate-friendly politicians and decision-makers. The public will also be critical
since there must be rapid consumer uptake of household-level clean energy technologies.
The IRA subsidizes many of these technologies, partially through grant programs and often
via uncapped tax credit provisions. In the latter case, the speed of consumer technology
adoption will determine the overall size and impact of the legislation.

Some research has been done on consumer sentiment towards solar PV and electric vehicles. However, even here, our understanding of public opinion is incomplete. And when it comes to US attitudes towards other electrification technologies promoted by the IRA, like heat pumps, induction stoves, and household energy storage, we know almost nothing systematic (Gromet, Kunreuther, and Larrick 2013; Lesic et al. 2019).

In general, we still require a more nuanced understanding of how price, comfort, and 293 health considerations shape consumer sentiment. What are the optimal ways to engage the public in the clean energy transition and combat misinformation about new technologies 295 that incumbent fossil fuel interests are disseminating? We also need to understand how 296 consumer sentiment toward household electrification will interact with partial politics. To 297 date, clean energy uptake has often been bipartisan, structured by costs and not ideology 298 (Mildenberger et al. 2022). The dynamics of IRA implementation will depend on whether 290 this trend continues or whether ideological considerations dominate, as we may be seeing 300 with gas stove politics at the current moment. 301

#### $_{\scriptscriptstyle{02}}$ Environmental Justice

The IRA has provisions that begin to address the decades of environmental pollution that
have disproportionately fallen on Black, Brown, and Indigenous communities. Interestingly,
there exists little systematic work on public opinion and environmental justice. Existing

9See Carley and Konisky (2020) on the justice and equity implications of the clean energy transition.

polling finds nominal support from most Americans to increase funding for low-income communities and communities of color that are disproportionately harmed by pollution (Carman et al. 2022). However, we suspect that as with support for climate mitigation policy, actual support for climate justice policies might be lower if survey-takers had to consider the costs of these initiatives. Indeed, one study shows that Americans do not know much about environmental inequalities and only exhibit marginal support for policy tools that could begin to address environmental racism (Bugden 2022).

When it comes to the IRA, an obvious starting point is to understand whether individuals
whom the IRA hopes to help perceive the law's provisions as having a positive impact over
time. Do they see more opportunities for employment in new green sectors? Do they notice
improvements in environmental quality in their community? How do objective measures of
changes in environmental quality map onto self-reports of daily conditions? What are the
next steps that members of environmental justice communities think should be taken?

319

320

321

322

327

ments

Another line of inquiry departs from the IRA and asks about additional approaches to attempt to solve inequities highlighted by environmental justice scholarship. For example, Gazmararian and Tingley (2023a) are exploring how to overcome historical racial and wealth inequities in rooftop solar adoption. Specifically, they are examining a potential program to enable households with excess electricity from rooftop solar to donate their net-metering proceeds to build renewable energy in under-served communities. The hypothesis is that this policy design could create support for addressing inequitable access to rooftop solar.

# Globalization, Green Industrial Policy, and Carbon Border Adjust-

Policy designs to win public support for the energy transition at home will also have international ramifications that could spill over to affect public opinion in unforeseen ways. For example, provisions in the IRA like "Buy America" incentives that are popular domestically run up against long-standing commitments to global free trade. Many of the US' trading partners have pursued similar industrial policies. Globalization itself has It will be crucial to understand how the public weighs the benefits from the clean energy transition versus the gains from free trade.<sup>10</sup>

At the same time, there is a growing move by nations that have taken ambitious actions 335 on climate change to level the playing field at home for domestic businesses. Specifically, 336 these countries are imposing so-called "carbon border adjustments" and related tools to 337 make foreign businesses pay an equivalent price for the carbon dioxide emissions embedded 338 in their goods. Otherwise, there is a fear that domestic businesses will shift to locations where 339 they would not have to comply with more stringent climate protections. However, relatively 340 little is known about how the public will respond to trade policies. On the one hand, they could be supportive because these policies would level the playing field for domestic firms. On the other hand, these policies would increase costs for domestic consumers. These are 343 consequential trade-offs to understand. The large literature on public opinion and trade policy will serve as a helpful launching point.

## Conclusion Conclusion

Public opinion is crucial for the policies elites support, the types of leaders and their priorities over time, and the clean energy decisions of consumers. This perspective reflects on how scholarship about climate change and public opinion illuminates the prospects of the turn to green industrial policy. Notably, these efforts, such as the IRA, heeded the public's sensitivity to the costs of policies and focused primarily on creating local benefits.

Scholars should also be attentive to the ways in which the nascent energy transition itself further transforms climate politics. As citizens experience the economic benefits from the IRA, will support grow for more ambitious climate policy? The strategy of the law is to provide local economic benefits from renewable energy production and reduced energy costs,

<sup>&</sup>lt;sup>10</sup>There is initial evidence for EV subsidies that the public does not support restricts on automaker eligibility for these credits (Lim et al. 2022), which would suggest that economic nationalism may not be an effective messaging strategy.

with many of these benefits going to areas that historically opposed action on climate change.

A rigorous approach to understanding change in preferences would be to establish a survey panel—repeated surveys of the same individual—that could track changes over time at the individual level. Scholars could pair this panel data with high-resolution spatial data on the distribution of benefits from the IRA to study in real time how the benefits of the law shape public opinion or not. The idea of policies shaping public opinion has a long tradition in the study of so-called "feedback effects" (e.g., Campbell 2012).

The longevity and success of green industrial policies will depend on whether the public and interest groups embrace their benefits. This may not be automatic in the case of efforts like the IRA due to the bill's partisan nature, credibility challenges faced by all political reforms, and the dynamics of credit claiming. Yet, much remains to be studied, including the law's environmental justice provisions, and the public's preferences when it comes to the tension between green industrial policy and the international trade regime. These mechanisms and conditions offer a more clear statement of the importance of public opinion than existing amorphous appeals to public opinion's importance.

## References

- Anderson, Soren, Ioana Marinescu, and Boris Shor. 2023. "Can Pigou at the Polls Stop
- Us Melting the Poles?" Journal of the Association of Environmental and Resource
- Economists 10 (4): 903–945.
- Ansolabehere, Stephen, and David Konisky. 2014. Cheap and Clean: How Americans Think
- about Energy in the Age of Global Warming. MIT Press.
- Ansolabehere, Stephen, and David M. Konisky. 2009. "Public Attitudes Toward Construction
- of New Power Plants." Public Opinion Quarterly 73 (3): 566–577.
- Arceneaux, Kevin. 2006. "The Federal Face of Voting: Are Elected Officials Held Accountable
- for the Functions Relevant to Their Office?" Political Psychology 27 (5): 731–754.
- Arnold, R. Douglas. 1990. The Logic of Congressional Action. Yale University Press.
- Bain, Paul G., et al. 2016. "Co-Benefits of Addressing Climate Change Can Motivate Action
- around the World." Nature Climate Change 6, no. 2 (2): 154–157.
- Bayulgen, Oksan, and Salil Benegal. 2019. "Green Priorities: How Economic Frames Af-
- fect Perceptions of Renewable Energy in the United States." Energy Research & Social
- see Science 47:28–36.
- Bechtel, Michael, and Kenneth Scheve. 2013. "Mass Support for Global Climate Agreements
- Depends on Institutional Design." Proceedings of the National Academy of Sciences 110
- 389 (34): 13763–13768.
- Beckage, Brian, Frances C. Moore, and Katherine Lacasse. 2022. "Incorporating Human
- Behaviour into Earth System Modelling." Nature Human Behaviour 6, no. 11 (2022):
- <sup>392</sup> 1493–1502.

- Beiser-McGrath, Liam F, and Thomas Bernauer. 2023. "How Do Pocketbook and Distribu-
- tional Concerns Affect Citizens' Preferences for Carbon Taxation?" Journal of Politics
- Forthcoming.
- 2019. "Could Revenue Recycling Make Effective Carbon Taxation Politically Feasible?" Science Advances 5, no. 9 (2019): eaax3323.
- Bergquist, Magnus, et al. 2022. "Meta-Analyses of Fifteen Determinants of Public Opinion about Climate Change Taxes and Laws." *Nature Climate Change* 12 (3): 235–240.
- Bergquist, Parrish, David M. Konisky, and John Kotcher. 2020. "Energy Policy and Public Opinion: Patterns, Trends and Future Directions." *Progress in Energy* 2 (3): 032003.
- Bergquist, Parrish, Matto Mildenberger, and Leah Stokes. 2020. "Combining Climate, Economic, and Social Policy Builds Public Support for Climate Action in the US." Environmental Research Letters 15 (054019).
- Bergquist, Parrish, et al. 2020. "Backyard Voices: How Sense of Place Shapes Views of LargeScale Energy Transmission Infrastructure." Energy Research & Social Science 63 (2020):
  101396.
- Bernauer, Thomas, and Liam F. McGrath. 2016. "Simple Reframing Unlikely to Boost Public Support for Climate Policy." *Nature Climate Change* 6, no. 7 (7): 680–683.
- Borick, Christopher P., and Barry G. Rabe. 2010. "A Reason to Believe: Examining the Factors That Determine Individual Views on Global Warming\*: Factors That Determine Individual Views on Global Warming." Social Science Quarterly 91 (3): 777–800.
- 2014. "Weather or Not? Examining the Impact of Meteorological Conditions on Public Opinion Regarding Global Warming." Weather, Climate, and Society 6 (3): 413–424.

- Bromley-Trujillo, Rebecca, and John Poe. 2020. "The Importance of Salience: Public Opinion and State Policy Action on Climate Change." *Journal of Public Policy* 40 (2): 280–304.
- Bugden, Dylan. 2022. "Environmental Inequality in the American Mind: The Problem of Color-Blind Environmental Racism." Social Problems (2022): spac005.
- Campbell, Andrea Louise. 2012. "Policy Makes Mass Politics." Annual Review of Political

  Science 15, no. 1 (2012): 333–351.
- Canes-Wrone, Brandice, David Brady, and John Cogan. 2002. "Out of Step, Out of Office."

  American Political Science Review 96 (1): 127–140.
- Carattini, Stefano, Steffen Kallbekken, and Anton Orlov. 2019. "How to Win Public Support for a Global Carbon Tax." *Nature* 565 (7739): 289–291.
- Carley, Sanya, and David M. Konisky. 2020. "The Justice and Equity Implications of the Clean Energy Transition." *Nature Energy* 5 (8): 569–577.
- Carley, Sanya, et al. 2020. "Energy Infrastructure, NIMBYism, and Public Opinion: A Systematic Literature Review of Three Decades of Empirical Survey Literature." Environmental Research Letters 15 (9): 093007.
- Carman, Jennifer, et al. 2022. Exploring Support for Climate Justice Policies in the United

  States. Yale Program on Climate Change Communication, 2022.
- CBO. 2022. Estimated Budgetary Effects of H.R. 5376, the Inflation Reduction Act of 2022.

  2022.
- Cooper, Jasper, Sung Eun Kim, and Johannes Urpelainen. 2018. "The Broad Impact of a Narrow Conflict: How Natural Resource Windfalls Shape Policy and Politics." *Journal* of Politics 80 (2): 630–646.
- Douenne, Thomas, and Adrien Fabre. 2022. "Yellow Vests, Pessimistic Beliefs, and Carbon

  Tax Aversion." American Economic Journal: Economic Policy 14 (1): 81–110.

- Drews, Stefan, and Jeroen C.J.M. van den Bergh. 2016. "What Explains Public Support for
- <sup>441</sup> Climate Policies? A Review of Empirical and Experimental Studies." Climate Policy 16
- 442 (7): 855–876.
- Egan, Patrick, and Megan Mullin. 2012. "Turning Personal Experience into Political Atti-
- tudes: The Effect of Local Weather on Americans' Perceptions about Global Warming."
- Journal of Politics 74 (3): 796–809.
- (1): 209-227.
- Opportunity?" PS: Political Science & Politics, 1–6.
- <sup>450</sup> Fairbrother, Malcolm. 2022. "Public Opinion about Climate Policies: A Review and Call for
- More Studies of What People Want." *PLOS Climate* 1 (5): e0000030.
- Fremstad, Anders, et al. 2022. "The Role of Rebates in Public Support for Carbon Taxes."
- Environmental Research Letters 17, no. 8 (2022): 084040.
- 454 Gaikwad, Nikhar, Federica Genovese, and Dustin Tingley. 2022. "Creating Climate Coali-
- tions: Mass Preferences for Compensating Vulnerability in the World's Two Largest
- Democracies." American Political Science Review 116 (4): 1165–1183.
- 457 Gazmararian, Alexander F., and Dustin Tingley. 2023a. "A New Polycentric Model to Ex-
- pand Renewable Energy Access." Unpublished Manuscript.
- 459 . 2023b. Uncertain Futures: How to Unlock the Climate Impasse. Cambridge Univer-
- sity Press.
- 461 Gearino, Dan. 2022. "In the End, Solar Power Opponents Prevail in Williamsport, Ohio."
- ABC, 2022.

- Gilens, Martin, and Benjamin I. Page. 2014. "Testing Theories of American Politics: Elites,

  Interest Groups, and Average Citizens." Perspectives on Politics 12 (3): 564–581.
- Gromet, Dena M., Howard Kunreuther, and Richard P. Larrick. 2013. "Political Ideology
   Affects Energy-Efficiency Attitudes and Choices." Proceedings of the National Academy
   of Sciences 110, no. 23 (2013): 9314–9319.
- Gustafson, Abel, et al. 2022. "The Durable, Bipartisan Effects of Emphasizing the Cost
  Savings of Renewable Energy." Nature Energy 7, no. 11 (11): 1023–1030.
- Harbridge, Laurel, Neil Malhotra, and Brian F. Harrison. 2014. "Public Preferences for Bipartisanship in the Policymaking Process: Public Preferences." Legislative Studies Quarterly
   39 (3): 327–355.
- Hazlett, Chad, and Matto Mildenberger. 2020. "Wildfire Exposure Increases Pro-Environment
  Voting within Democratic but Not Republican Areas." American Political Science Review 114 (4): 1359–1365.
- Hertel-Fernandez, Alexander, Matto Mildenberger, and Leah Stokes. 2019. "Legislative Staff and Representation in Congress." American Political Science Review 113 (1): 1–18.
- Howe, Peter, et al. 2019. "How Will Climate Change Shape Climate Opinion?" *Environmen-*tal Research Letters 14 (11): 113001.
- Jagers, Sverker C., et al. 2021. "Bridging the Ideological Gap? How Fairness Perceptions

  Mediate the Effect of Revenue Recycling on Public Support for Carbon Taxes in the

  United States, Canada and Germany." Review of Policy Research 38 (5): 529–554.
- Jenkins, Jesse. 2014. "Political Economy Constraints on Carbon Pricing Policies: What Are
  the Implications for Economic Efficiency, Environmental Efficacy, and Climate Policy
  Design?" Energy Policy 69:467–477.

- Kallbekken, Steffen. 2023. "Research on Public Support for Climate Policy Instruments Must Broaden Its Scope." *Nature Climate Change* (2023).
- Konisky, David. 2011. "Public Preferences for Environmental Policy Responsibility." *Publius:*The Journal of Federalism 41 (1): 76–100.
- Kotchen, Matthew J., Kevin J. Boyle, and Anthony A. Leiserowitz. 2013. "Willingness-to-Pay and Policy-Instrument Choice for Climate-Change Policy in the United States." *Energy Policy*, Special Section: Long Run Transitions to Sustainable Economic Structures in the European Union and Beyond, 55 (2013): 617–625.
- Krosnick, Jon A., and Bo MacInnis. 2020. Climate Insights 2020: Overall Trends. Resources for the Future, 2020.
- Lax, Jeffrey R., and Justin H. Phillips. 2012. "The Democratic Deficit in the States." American Journal of Political Science 56 (1): 148–166.
- Leiserowitz, Anthony, Edward Maibach, Seth Rosenthal, and John Kotcher. 2022. Climate

  Change in the American Mind, April 2022. Yale Program on Climate Change Commu
  nication, George Mason University Center for Climate Change Communication.
- Leiserowitz, Anthony, Edward Maibach, Seth Rosenthal, John Kotcher, et al. 2022. Climate

  Change in the American Mind: Politics & Policy, December 2022. Yale Program on

  Climate Change Communication.
- Lenz, Gabriel S. 2012. Follow the Leader? University of Chicago Press.
- Lesic, Vedran, et al. 2019. "Comparing Consumer Perceptions of Appliances' Electricity Use to Appliances' Actual Direct-Metered Consumption." Environmental Research Communications 1, no. 11 (2019): 111002.
- Lim, Sijeong, et al. 2022. "Distributional Concerns and Public Opinion: EV Subsidies in the
  U.S. and Japan." Energy Policy 164:112883.

- Mayhew, David R. 2004. Congress: The Electoral Connection. Yale University Press.
- McCarty, Nolan, Keith T. Poole, and Howard Rosenthal. 2006. Polarized America: The

  Dance of Ideology and Unequal Riches. MIT Press.
- Mettler, Suzanne. 2011. The Submerged State: How Invisible Government Policies Undermine American Democracy. University of Chicago Press.
- Mildenberger, Matto. 2020. Carbon Captured: How Business and Labor Control Climate

  Politics. MIT Press.
- Mildenberger, Matto, and Dustin Tingley. 2019. "Beliefs about Climate Beliefs." British

  Journal of Political Science 49 (4): 1279–307.
- Mildenberger, Matto, et al. 2022. "Limited Impacts of Carbon Tax Rebate Programmes on Public Support for Carbon Pricing." *Nature Climate Change* 12 (2): 141–147.
- Myers, Teresa A., et al. 2012. "A Public Health Frame Arouses Hopeful Emotions about Climate Change." Climatic Change 113 (3): 1105–1112.
- Peng, Wei, et al. 2021. "Climate Policy Models Need to Get Real about People Here's How." Nature 594, no. 7862 (2021): 174–176.
- Rabe, Barry George. 2004. Statehouse and Greenhouse: The Emerging Politics of American

  Climate Change Policy. Brookings Institution Press.
- Rennert, Kevin, et al. 2022. "Comprehensive Evidence Implies a Higher Social Cost of CO2."

  Nature 610, no. 7933 (2022): 687–692.
- Schaffer, Lena Maria, Bianca Oehl, and Thomas Bernauer. 2022. "Are Policymakers Responsive to Public Demand in Climate Politics?" *Journal of Public Policy* 42 (1): 136–164.
- Stokes, Leah. 2020. Short Circuiting Policy: Interest Groups and the Battle Over Clean
  Energy and Climate Policy in the American States. Oxford University Press.

- Stokes, Leah, and Christopher Warshaw. 2017. "Renewable Energy Policy Design and Framing Influence Public Support in the United States." *Nature Energy* 2 (8): 17107.
- Westwood, Sean J. 2022. "The Partisanship of Bipartisanship: How Representatives Use

  Bipartisan Assertions to Cultivate Support." *Political Behavior* 44 (3): 1411–1435.
- Wlezien, Christopher. 1995. "The Public as Thermostat: Dynamics of Preferences for Spending." American Journal of Political Science 39 (4): 981–1000.