Public Opinion Foundations of the Clean Energy Transition

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Introduction

Public opinion is at the heart of climate 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 *perceptions* of public preferences. In this way, it is an important factor shaping the incentives political leaders have in deciding to make long-term investments to address the climate crisis. Second, the public's climate policy preferences can shape voting behavior, shaping the type and priorities of elected leaders over time. Third, the energy transition will require the communities to accept new clean energy projects and the public to make consumption choices aligned with decarbonization goals, be that transitioning from gas furnaces to a heat pump or buying an electric vehicle. Public opinion directly shapes these community-level development and individual-level consumption decisions.

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 (e.g., Kallbekken 2023). Reformers could inadvertently empower fossil fuel interest groups that can exploit certain policy designs to undermine public support (e.g., Mildenberger 2020), or they could generate a political environment that elevates policy opponents into office (e.g., Cooper, Kim, and Urpelainen 2018). This memo discusses what cutting-edge public opinion research says about how to build durable political climate coalitions and uses this literature to reflect on the prospects for the landmark Inflation Reduction Act (IRA).

This analysis is particularly critical because the political logic of the IRA sidesteps several features of US 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-economic considerations. For example, US climate policymaking from around 2001 through 2012 fixated on putting a price on carbon pollution. Opponents, and at times proponents, framed policies as generating costs and involving sacrifices. As we review in this memo, policies that increase costs (or that can generate an intuitive perception of increased costs) are a losing political proposition, even when coupled with well-intentioned designs to mask those costs. Learning from the pitfalls of attempts like the Waxman-Markey cap-and-trade bill, the IRA focused on creating salient benefits, which likely contributed to its success.[1]

However, we raise four questions about the future of the IRA where public opinion will be crucial: the consequences of the bill's partisan passage, beliefs about the durability of the clean energy benefits, the politics of credit-taking for the law's benefits, and how the law will shape consumer preferences for clean energy technologies. We assemble initial answers to these questions based on the latest climate opinion studies. Then, we conclude with a discussion of areas where future public opinion research is needed, including environmental justice, international competitiveness and green industrial policy, and climate policy preference change.

Public Opinion Foundations of the IRA

When pollsters ask Americans whether they believe global warming is happening and are worried about its impacts, for the last decade, a majority of the public consistently answered in the affirmative–climate change is happening and they are worried (Leiserowitz, Maibach, Rosenthal, and Kotcher 2022a). These beliefs correspond with stated policy support: 69 percent of registered voters supported transitioning the US economy from fossil fuels to clean energy by 2050 (Leiserowitz, Maibach, Rosenthal, and Kotcher 2022b).

Yet despite this national consensus, leaders have largely failed to respond to public opinion with meaningful climate policy. What explains this apparent disconnect (at least before the IRA) between measured climate policy preferences and national policymaking actions? Public opinion scholarship offers several possibilities. At one extreme, public opinion may be irrelevant. In this account, public opinion rarely influences the Congressional legislative agenda. Instead, elites and interest groups dominate (e.g., Gilens and Page 2014). To the extent that the public holds coherent opinions, they follow rather than lead their elected officials (e.g., Lenz 2012). Alternatively, public opinion may matter but only in a very generalized fashion—general public

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[1] 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.

mood can thermostatically reorient elite behavior but is unlikely to shape specific policy proposals or designs.[2]

Our read is that these criticisms are misplaced. In thinking about the role of public opinion in shaping elite strategy, what ultimately matters is what elites *think* the public wants (e.g., Arnold 1990). For this reason, interest groups invest considerable sums to distort elite perceptions of public opinion, which contributes to inaction (e.g., Hertel-Fernandez, Mildenberger, and Stokes 2019). However, it is not all elite distortion. Objective public opinion is also a critical input into elite perceptions. A simple fact of politics is that people are sensitive to costs, and lawmakers know this.

Cost Sensitivity and Policy Support

An accumulation of evidence shows how support falls when voters consider the costs of climate policies. For instance, Bechtel and Scheve (2013) conducted large-scale survey experiments in France, Germany, the United Kingdom, and the United States that randomly varied information about how much a global climate agreement would cost households each month in higher energy 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 pay for reductions in GHG emissions find that households would spend around $80 annually (e.g., Kotchen, Boyle, and Leiserowitz 2013). These estimates would imply that carbon prices are politically constrained to as low as $2 to $8 per ton of CO_2 (Jenkins 2014), a far reach from recent estimates that put the social cost of carbon at $185 per ton (Rennert et al. 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). However, these effects are often ephemeral (Egan and Mullin 2012), or remain mediated by partisan politics (Hazlett and Mildenberger 2020; Gazmararian and Milner 2022). In other words, as the costs of climate change realize, 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 determinant of support, more so than partisanship and social

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[2] 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.

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, and Orlov 2019). However, these proposals face two challenges. First, the newly salient policy benefit (a rebate) is not the most important policy objective: the real benefit is mitigating the catastrophic future effects of climate change. Setting this aside, a growing set of survey experiments have shown that rebates increase public support for carbon pricing both in the United States and globally (Beiser-McGrath and Bernauer 2019). Yet, there is little evidence that these rebates—as implemented in practice in Canada and Switzerland—have reshaped political support for climate policy in the face of coordinated interest group opposition (Mildenberger, Lachapelle, et al. 2022). Moreover, even simple partisan frames can erase the apparent positive effect of rebates on climate policy support (Fremstad et al. 2022).

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 (e.g., Gazmararian and Tingley 2023b).

Local Economic Benefits

In addition to making clean energy technologies cheaper, the IRA also will usher in local economic benefits such as jobs to construct renewable energy, build batteries, and install energy-efficient products. What does the public opinion literature say about how these local economic benefits will influence the reception of the IRA? One study of Americans finds that framing the benefits of the clean energy transition in terms of jobs can garner public support, even among Republicans who are otherwise more skeptical of the clean energy transition (Stokes and 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).

However, these benefits must materialize and appear credible to people on the ground. Gazmararian and Tingley (2023) present evidence from national, regional, and targeted surveys that reveals concerns about the local benefits of green industries, such as the share of jobs that go

to local workers. They also show how policy solutions such as transparency around investment could lessen these worries.

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 can independently vary 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 United States, 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 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.

Public Opinion Challenges of IRA

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; Gazmararian and Tingley 2023).[3] This public preference for bipartisanship reflects many dynamics, including an aversion to partisan extremism (Westwood 2022). Importantly, 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 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.

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[3] But see Harbridge, Malhotra, and Harrison (2014) who show that partisans may have a preference for policies supported by their own party.

Given growing polarization in the United States (e.g., 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).

Durability

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. Gazmararian and Tingley (2023) 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 (2023) 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 (e.g., Stokes 2020).

Credit Claiming

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). 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. Yet, who the public ultimately rewards will shape the incentives of political elites to advance or forstall decarbonization.

Consumer Demand for New Technologies

Implementing the IRA (and successfully driving a society-wide energy transition) will require rapid consumer uptake of household-level clean energy technologies. The IRA subsidizes many of these technologies, partially through grant programs and often through 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, though even here our understanding of public opinion is incomplete. By contrast, we know almost nothing systematic about US attitudes towards other electrification technologies promoted by the IRA, like heat pumps, induction stoves, and household energy storage (Gromet, Kunreuther, and Larrick 2013; Lesic et al. 2019).

A Future Research Agenda

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 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 y 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?

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 Adjustments

For decades, the United States and other countries have opened their economies to international trade. To do so, international institutions like the World Trade Organization (WTO) arose to facilitate credible commitments to trade liberalization reforms. However, as countries turn toward green industrial policy to accelerate their energy transitions, these domestic provisions increasingly clash against international commitments to free trade. For example, one pillar of the WTO is that countries should not implement laws that unfairly impact foreign but not domestic companies. Yet, provisions in the IRA like "Buy America" incentives may conflict with this principle—and certainly America's trading partners think it runs afoul. However, many of these trading partners have pursued similar industrial policies. Efforts to provide credible local economic benefits to domestic constituents in the IRA and elsewhere run up against international commitments to free trade (Gazmararian and Tingley 2023b, Ch 9). It will be crucial to understand whether the public will prioritize these domestic benefits versus sacrifices their country might have to make abroad.[4]

At the same time, there is a growing move by nations that have taken ambitious actions on climate change to level the playing field at home for domestic businesses. Specifically, these countries are imposing so-called "carbon border adjustments" and related tools to make foreign businesses pay an equivalent price for the carbon dioxide emissions embedded in their goods.

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[4] There is initial evidence for electric vehicle 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.

Otherwise, there is a fear that domestic businesses will shift to locations where they would not have to comply with more stringent climate protections. However, relatively 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 consequential trade-offs to understand.

The clash between green industrial policy and the international trade architecture, taking place against the backdrop of communities left behind by globalization, could usher in changes in how individuals weigh the benefits and costs of free trade as well as climate policy. By considering these two areas in tandem, scholars could begin to unpack trade-offs and spillovers between the issue areas. For example, people who are reluctant to support climate policies might be more supportive if they come with measures to insulate the country against exposure to globalization. Conversely, individuals in communities that benefit from green investments might think they would benefit from greater economic integration with new markets abroad for products manufactured in the United States.

Consumer Sentiment

We need to develop a far more sophisticated understanding of how price, comfort, and 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 that incumbent fossil fuel interests are disseminating? We also need to understand how consumer sentiment toward household electrification will interact with partisan politics. To date, clean energy uptake has often been bipartisan, structured by costs and not ideology (Mildenberger, Howe, et al. 2022). The dynamics of IRA implementation will depend on whether this trend continues or whether ideological considerations dominate, as we may be seeing with gas stove politics at the current moment.

Climate Policy Preference Change

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, 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).

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 memo reflects on how scholarship about climate change and public opinion illuminates the prospects of the IRA. Notably, the landmark climate law heeded the public's sensitivity to the costs of policies and focused primarily on creating local benefits. However, the longevity and success of the law will depend on whether the public and interest groups embrace the IRA's benefits. We show how this may not be automatic 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, the public's preferences when it comes to the tension between green industrial policy and the international trade regime, and whether the benefits from the law will build new pro-climate constituencies.

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