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Can Low-Cost Advocacy Tactics Advance Legislation?

Interest Groups and Climate Policymaking in California, 2001-2020

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Summary:

Well-resourced interest groups often have the upper hand in legislative processes. They have capacity to lobby, making routine contact with policymakers to share opinions and expertise. Yet interest groups that do not lobby have other less costly ways to communicate preferences to policymakers. We develop an index of interest group diversity and show that letters of support from smaller, less politically active groups increase the likelihood a bill passes committee, particularly when writers differ in their organizational profiles. Our investigation focuses on the struggle over policies that respond to the impacts of climate change—an issue mobilizing a huge range of organized interests and posing great risks to contemporary society. We leverage a unique opportunity to observe both lobbying and letter writing on bills introduced in the California legislature. Findings suggest that interest groups with fewer resources can be effective policy advocates in shifting policy landscapes, even when lobbying occurs.

Acknowledgements: This research was funded by the US Department of Agriculture (USDA)'s National Institute of Food and Agriculture (NIFA) (grant number 2022-67023-36381). We especially thank Sharif Amlani for collecting and organizing the lobbyist data, and Rachel Luther for her research assistance in coding interest group characteristics. We appreciate the insightful feedback from attendees of the 2024 Midwest Political Science Association (MPSA) Conference and the 2024 Environmental Politics and Governance (EPG) Conference.

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November 27, 2024

ABSTRACT

Well-resourced interest groups often have the upper hand in legislative processes. They have capacity to lobby, making routine contact with policymakers to share opinions and expertise. Yet interest groups that do not lobby have other less costly ways to communicate preferences to policymakers. We develop an *index of interest group diversity* and show that letters of support from smaller, less politically active groups increase the likelihood a bill passes committee, particularly when writers differ in their organizational profiles. Our investigation focuses on the struggle over policies that respond to the impacts of climate change—an issue mobilizing a huge range of organized interests and posing great risks to contemporary society. We leverage a unique opportunity to observe both lobbying and letter writing on bills introduced in the California legislature. Findings suggest that interest groups with fewer resources can be effective policy advocates in shifting policy landscapes, even when lobbying occurs.

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1. Introduction

Policymakers rely on interest groups to understand the preferences of industry and the mass public (Grossmann 2012), and to help resolve the costly exercise of gathering and processing copious amounts of information (Baumgartner and Jones 1993). Interest groups subsidize legislative offices with the evidence, expertise, and time required to get and keep an issue on the agenda, amend or block policy change, or secure distributive benefits like infrastructure (Lowery 2007; Kollman 1998; Baumgartner et al. 2009; Hall and Deardorff 2006; Austen-Smith 1993), and compete with one another to frame how decision makers understand an issue (Berry 2013; Ansell 2008; Struthers and Ritzler 2024; Boscarino 2016). Interest groups have as much or more influence than the public on policy decisions in the US (Gilens and Page 2014). Thus, their activity is crucial for explaining policy decisions, and is highly relevant for anticipating whether and how Congress and state legislatures address the major problems of our time. In this article, we investigate how different types of interest group activity influences the advancement of bills that respond to the impacts of climate change.

In the US, wealthy and well-connected interest groups have greater access to decision-makers and exist in more supportive policy environments than other interest groups (Gilens and Page 2014; Drutman 2015; Schlozman et al. 2012). Strongly resourced groups can afford to use “insider” tactics, making direct contact with policymakers and their staff through meetings, government-led task forces, and proceedings, often providing “usually well-edited and summarized” expert knowledge on a specific issue via testifying, writing reports, presenting research, and drafting legislation (Weiler and Brändli 2015; Dür and Mateo 2013; Kollman 1998; Austen-Smith 1993; Kagan 2024; Drutman 2015). Intensive lobbying has been associated with policy continuity (McKay 2012; Butler and Miller 2022), even in the face of strong justifications to shift away from the status quo. For example, lobbying by firms contributed to the defeat of one of the most significant federal legislative proposals on climate change, the 2009 Waxman-Markey Bill, costing society \$60 billion USD in expected damages due to unaverted extreme weather events (Downie 2017; Meng and Rode 2019).

Interest groups that seek policy change are typically ill-equipped to use insider tactics. A lack of personnel capacity, financial resources, relationships, technical and institutional knowledge, and legal flexibility to engage in political activity hamstring citizen groups and similar types of organizations from realizing their policy goals through insider tactics. These groups turn to “outsider tactics”, pressing policymakers indirectly by increasing public attention to an issue through grassroots campaigns, media, protest, advertisements, and other diffuse strategies (Beyers 2004; Kollman 1998; Nicoll Victor 2007). For example, citizen groups – from small neighborhood associations to international environmental organizations – have used these tactics to mobilize widespread public demand for climate action, making it a leading political issue worldwide (Grasso and Giugni 2022; Schaefer Caniglia et al. 2015).

However, scholars recognize that many interest groups take a full-court press approach to advocacy, employing both insider and outsider tactics, particularly in high stakes policy debates, including climate change (Fyall 2017; Mosley et al. 2023; Schaefer Caniglia et al. 2015). Some of the oldest, richest, and strongly networked interest groups, such as petroleum and gas trade associations, turn to outsider tactics like advertising to influence public attitudes toward climate and energy policy (Williams et al. 2022; Bell et al. 2019). Conversely, environmental organizations like the Friends of the Earth run media campaigns *and* reach out to legislators to share their views (Schaefer Caniglia et al. 2015). Policy problems that are hard to

define, contentious, and have the potential to redistribute wealth and liberties may present greater opportunity for smaller, less politically-active interest groups to influence policy (Phinney 2017). Yet we lack evidence on whether these interest groups can affect policy change through direct (i.e., insider) contact with policymakers.

We argue that low-cost insider advocacy tactics can increase the chances a bill makes it through the legislative process, particularly when the participating interest groups are diverse in their organizational profiles. Legislators have incentives to pay attention to communications from citizen groups, small businesses, and other organizations that do not regularly lobby (if at all) because these groups deliver viewpoints from important constituencies that may not otherwise be observed (Purdy 2012; Heaney 2014; Cluverius 2021). Moreover, diversity among interest groups signals that a proposal has widespread support and strong chances of getting through the legislative process (Bishin 2009; Phinney 2017; Lorenz 2020).

An absence of studies on the effectiveness of low-cost advocacy tactics is partly attributable to the challenge of isolating their influence relative to other pressures. A policymaking process characterized by many institutional access points and interest group pluralism generates opportunities for competition among groups for influence, but this influence can be difficult to observe. To address this challenge, we take advantage of California's disclosure laws to develop measures of both high-cost and low-cost policy advocacy. The former derives from the state's requirement that lobbyists report their activity on specific legislation quarterly. The latter stems from the California legislature allowing interest groups to write position letters to committees during bill deliberations. The list of letter writers and their stated positions are recorded in the committee bill analysis that accompanies every proposal. These two data sources allow us to test whether low-cost insider tactics can compete with high-cost lobbying to advance legislation introduced in California's lower chamber.

We focus our study on 1,914 Assembly bills that respond to sectors impacted by climate change, from 2001 to 2020. We categorize the 2,011 lobbyists and 5,713 letter writers that were active on these bills into issue areas and organizational types, and develop an *index of interest group diversity* based on the number of letter writers and the distribution of issue-organizations represented. Our analysis tests whether the diversity index corresponds with a bill passing through committee. The committee system is the gatekeeper in US federal and state legislatures. Legislators on committees develop and heavily vet bills, advancing only those that have a high likelihood of surviving chamber votes and becoming law (Cox and McCubbins 2005). Thus, lobbying and other advocacy tactics strongly influence decision making in the committee stage, where groups work particularly hard to block the policy proposals they oppose (Anzia and Jackman 2013; Drutman 2015; Hojnacki and Kimball 1998; Lorenz 2020; Box-Steffensmeier et al. 2019). The empirical trends in our study are a case in point. Whereas 41% of the bills in our analysis fail in committee, just 1% pass committee but are never brought to the floor and 2% do not pass their floor vote. The influence of interest group tactics in committee have strong implications for a bill's success over the long-run.

Results show that bills with greater diversity among letter writers are more likely to advance through the committee process, controlling for lobbying activity and conditions likely to spur legislative action on climate, such as drought severity. The strength of this relationship is greatest when well-established organizations like the League of Conservation Voters lobby a bill very little or not at all. Our findings suggest that groups limited in their capacity to have direct, intensive contact with legislators may influence outcomes when they communicate their positions through less direct, more affordable means. This finding offers nuance to the widely

accepted view that powerful interests determine policy outputs in the US, and illuminates the process by which policy regimes transform in their response to immense societal risks.

2. Lobbying (by certain groups) is pervasive and influential in policy making

Lobbying is defined here as the use of expenses to earn face-to-face contact with policymakers. While some evidence suggests that lobbying may have a muted (Wawro and Schickler 2006; Baumgartner et al. 2009; Lewis 2013) or positive relationship with policy change (Grossmann and Pyle 2013; Grasse and Heidbreder 2011), most evidence concludes that lobbying tends to weaken legislative proposals, leads to bill defeat, and favors opposition preferences (e.g., McKay 2012; Butler and Miller 2022). Lobbyists may be most effective in legislative phases that involve agenda control, such as committee (Hall and Wayman 1990; Powell and Grimmer 2016; Grossmann and Pyle 2013) and through interactions with committee chairs and ranking members (Hojnacki and Kimball 1998; Lorenz 2020). In a recent study over 26,000 bills in Colorado, Nebraska, and Wisconsin, Butler and Miller (2022) show that the bills are less likely to pass through committee when at least half the lobbyists oppose the bills, even in the presence of supporters.

Conflicting findings on how lobbying relates to policy change is attributable to the lack of data on lobbyists' positions on proposals. It is also due to heterogeneity in organizational identity across groups: Not all groups can lobby equally, and not all lobbying efforts are equally effective (Maloney et al. 1994; Dür and Mateo 2013). Differentiation between groups helps to explain why lobbying tends to align with well-resourced interests, and sets the stage for our argument that low-cost insider tactics can advance policy proposals.

Interest groups with greater resources have the capacity to hire in-house and contract lobbyists, and the ability to participate in policy subsystems over the long-term (LaPira et al. 2014; Fagan and Furnas 2024; Drutman 2015; Dür and Mateo 2013). Longstanding business and trade associations are among the most wealthy lobbyists, and extensive evidence suggests their participation can thwart and weaken policy change (Gerber 1999; Gray et al. 2009; Yackee and Yackee 2006). Drutman (2015, p. 1) concludes that “corporate lobbying expenditures increasingly dwarf the countervailing forces” at a dollar ratio of 34:1. Lobbyists that represent industry tend to maintain close relationships with decision makers, involving themselves throughout the policy process (Stokes 2020; Grumbach 2015) and spreading memorable arguments and frames that support their goals (Drutman 2015).

In this vein, business interests tend to dominate lobbying on policy proposals aimed to adapt to or mitigate the impacts of climate change. Trade groups, businesses, and electric utilities regularly lobby state venues, and are successful in their efforts to stall, retrench, or weaken climate, energy and environmental reforms (Stokes 2020; Culhane et al. 2021; Hall et al. 2024). Brulle (2018, p. 298) shows that “environmental organizations and renewable energy sectors were outspent by the corporate sectors involved in the production of fossil fuels” by a dollar ratio of 10:1, and that electric utilities, fossil fuels, and transportation interest groups were most active in lobbying climate legislation from 2006-2016. Basseches (2023) finds that investor-owned utilities have “unmatched influence” in shaping climate and energy policy due to their provision of essential services, size of the workforce, and dominion over technical expertise. Investigating over 5,000 climate-related bills across twelve states, (Hall et al. 2024) show that utilities, energy organizations, the oil and gas industry, and business associations lobbied and gave public testimony most often, but that environmental groups (including large

national-level political organizations as well as state-level advocacy organizations and smaller activist groups) accounted for the second-largest share of these insider activities.

Generally, citizen groups tend to be disadvantaged when it comes to lobbying. Many citizen groups are designated as 501(c)(3) (“public charities”), and are less likely to lobby due to limited financial and personnel resources, a lack of political expertise, and worry over violating the tax-status rules that cap both time and funding dedicated to lobbying activities for these organizational types (Bass 2010; Berry and Arons 2005; Reid 2006; Leech 2006; Chand 2013). Disengagement from policy debates can “become self-reinforcing”, as status, relevance, and connections to decision makers wane (Buffardi et al. 2015). Organizations designated as 501(c)(6) “trade associations”, 501(c)(9) “unions”, and 501(c)(4) “social welfare organizations” are allowed to engage in unlimited lobbying, which dramatically increases the likelihood they contact legislators relative to citizen groups (Buffardi et al. 2015).

3. Why less costly advocacy tactics can increase the likelihood of policy change

While they may be unable to lobby, citizen groups and other organizations that are less politically active have cheaper means to communicate their preferences for policy change to decision makers. For example, advocates can submit public comments to regulatory agencies during rulemaking processes or write position letters to committees where legislative proposals are being considered. Although Kagan (2023) rightly notes that letter writing fits the intuition of outsider tactics because it does not depend on selective access, we contend the activity more closely resembles insider behavior because decision-makers grant interest groups access via a formal procedure, and because it represents an effort to influence decision-makers through direct (albeit less personal) interaction. Congruent with our stance, Nicoll Victor 2007, p. 836) categorizes “contacted government officials to present [their] viewpoint” as a direct tactic.

Our hypothesis on low-cost insider tactics has two components. *First, we argue that low-cost insider tactics, like writing letters of support, can increase the likelihood that proposals advance in the legislative process.* Policymakers have incentives to pay attention to messages from lower-resourced groups because they may capture the views of important constituencies that are otherwise missing from policy deliberations. Policymakers consider information from many sources to obtain a more thorough understanding of an issue (Kagan 2024; Crombez 2002). They may be especially attuned to interest groups with discursive legitimacy, or the ability to “speak on behalf of [a societally important] issue in the public sphere” (Purdy 2012, p. 411; Hardy and Phillips 1998), or an ‘influence reputation’ (Knoke 1998; Heaney 2014; Cluverius 2021). Groups limited in resources and expertise, such as grassroots organizations, play “information politics”, messaging to policymakers “what the public wants” and “how people would react to a new policy proposal”, including its popularity (Flöthe 2019, p. 3; Beyers 2004; Kollman 1998). Low-cost tactics may provide especially insightful information to policymakers who want policy reform and actively seek partnerships with advocates to advance an agenda (Mahoney and Baumgartner 2015; DeGregorio 1997). In a study of interest group endorsements listed on nearly 100,000 Dear Colleague letters between members of Congress, Box-Steffensmeier et al. (2018) show that the count of interest group endorsements increase the likelihood of bill passage.

Second, we argue that the influence of low-cost advocacy is conditional on the diversity of the participating interest groups, with greater diversity corresponding with increased likelihood of bill advancement. When interest groups from different policy domains,

backgrounds, and functions express support for a given proposal, policymakers should be more inclined to advance it. Diversity conveys to busy policymakers that demand for policy change is widespread (Schattschneider 1960; Pralle 2006; Nelson and Yackee 2012), and that a proposal has support of many sub-constituencies (Fenno 1978; Bishin 2009; Lorenz 2020), is high-quality, and viable across stages of the policy process (Phinney 2017; Lorenz 2020).

Several studies have shown that interest groups have greater success in their policy pursuits when they represent diverse interests. In a study of over 4,700 Congressional bills between 2005 and 2014, Lorenz (2020, p. 237) finds that “coalitions composed of organizations representing diverse industries, social causes, and other interests” are more determinative of a bill’s fate in committee than “large [and] moneyed coalitions”. Phinney (2017) shows collaboration between “strange bedfellows”—nonprofits representing low-income populations and better-resourced partners—drove federal welfare reform in the late 1990s. Dwidar (2022) studies the co-signing of public comments on more than 300 federal agency rules, and finds that agencies tend to favor recommendations in comments signed by multiple organizational types over coalitions of business interests. Based on hundreds of interviews with advocates, Mahoney and Baumgartner (2015, p. 202) conclude that policymakers “respond to the overall structure of conflict”, not to the resources of any one group.

The climate issue offers an ideal and important opportunity to assess whether low-cost advocacy tactics and diversity among the interest groups that use them can make a difference in policy reform. Despite the predominance of business and utility interests in this area, interest groups that have a stake in how climate change is addressed but are not routine lobbyists may wield influence. Interest groups and government offices across issue areas have jointly advocated for policies like emissions trading schemes (Hall et al. 2024). Industry (e.g., renewable energy and the utilities that rely on it) and businesses that subscribe to a “responsible investing” strategy have financial incentives to support certain policies that address climate change (Grumbach 2015; Vogel 2013; Genovese and Tvinnereim 2019; Basseches 2023). Although utilities, unions, and trade groups tend to oppose environmental groups in climate and energy policy, their positions align occasionally (Hall et al. 2024). Widespread interest group participation in a shifting policy landscape increases the possibility that less costly signals to legislators matter, even when the existing policy regime remains largely in favor.

4. Analysis

a. An empirical opportunity afforded by California legislature

We evaluate support for our hypothesis by examining interest group advocacy tactics’ effects on legislation addressing climate impacts in the California legislature. California is a compelling case for several reasons. First, the state is significantly affected by climate change, enduring severe drought and wildfires. Between 2007 and 2009 the state experienced one of its worst droughts on record, leading to reduced water deliveries from the State Water Project and severe wildfires. For the first time, California’s Governor Arnold Schwarzenegger declared a drought-related state of emergency. A more prolonged drought began in 2011 and lasted six years, prompting California’s next governor, Jerry Brown, to order a mandatory 25 percent water reduction program in 2015. Californians finally experienced some relief in 2017, which brought the wettest winter on record, filling California’s reservoirs, but also causing flooding in the northern part of the state. Climate change is heavily impacting industries important to

California's economy, especially agriculture, which is responsible for a large share of food production in the US. California's protracted and varied experience with climate impacts makes it an ideal case because many types of interest groups have a stake in policy decisions.

Second, California has long been an innovator when it comes to legislative efforts to mitigate climate change and adapt to climate impacts. In 2002, California became the first state to restrict tailpipe emissions of greenhouse gasses. In 2006, the state legislature passed The Global Warming Solutions Act (AB 32), a program that committed to reducing greenhouse gas (GHG) emissions to 1990 levels by 2020. In 2016, lawmakers strengthened this mandate, requiring a reduction in GHG emissions to 40 percent below 1990 levels by 2030. California has its own cap-and-trade program, which began in 2013 and was extended in 2017 until 2030 that offers incentives for companies to cut their emissions. In 2014, California adopted the Sustainable Groundwater Management Act (SGMA), a policy designed to manage the state's groundwater for the first time through the use of local agencies and plans with state agency oversight. Historic policy innovation across agricultural, energy, and water policy in reaction to climate change allows us to examine thousands of policy proposals that attract organized interests on both sides of the issue. In 2022, the state legislature pushed through a five-year \$54 billion package of climate measures, which included bills that sought carbon neutrality in the state by 2045, clean electricity targets of 90 percent by 2035, and 95 percent by 2045.

Third, California's legislative arrangement makes it a critical case for understanding the role of direct advocacy tactics. California has one the world's most professionalized legislatures, with extensive political and policy staff. Staff resources offer legislators considerable independence from both governors and lobbyists, and the ability to stay attentive to the concerns of citizens and grassroots issues (Maestras 2003; Cluverius 2021). However, there is plenty of evidence that policy proposals face intense external scrutiny by incumbent interest groups. Groups representing California's more than 80,000 farms, including the California Farm Bureau, are fixtures in Sacramento whenever agricultural issues are being debated. Westlands Water District, the nation's largest agricultural irrigation contractor, is both organizer and financier of efforts to preserve the flow of water from reservoirs and pumping facilities controlled by federal and state agencies. Large environmental groups are prominent in legislative debates, and have enjoyed rather favorable status in the state over the last several decades, though their expenditures are generally well below those of industry groups. If we observe interest groups having influence in California, we may observe it in other states where legislatures are less professional and/or interest groups are less active.

Fourth, while the California Assembly has had a Democratic majority for nearly 30 years, Republicans have enjoyed political leadership and policy success. A Republican (Schwarzenegger) was Governor from 2003-2011, and about 20% of all Assembly bills chaptered into law since 2001 were sponsored by a Republican member of the chamber.

Finally, California offers unique access to data on both high- and low-cost advocacy tactics that interest groups use to press legislators. The Political Reform Act of 1974 requires lobbyists to register with the state and file quarterly reports documenting any efforts to influence state legislators on a given bill. Additionally, the California legislature maintains an online database for all bills introduced since 1999. These records include committee bill analyses that list the interest groups that wrote position letters. By bringing these two sources together, we can test the influence of letter writing while accounting for lobbying activity.

a. Data sources

We first assemble a dataset of all bills introduced in the California legislature from 2001-2020 ($n = 44,109$). The bills data was scraped and merged from the California Legislative Information Website (LegInfo) and includes all Assembly and Senate Bills in each session. We then merge this data with lobbying data from Cal-Access, the repository for lobbyist activity and a critically important control in our analysis. Lobbyists in California are required to register with the California Secretary of State and file quarterly reports within each calendar quarter that they engage in lobbying activity. The Cal-Access lobbying data does not provide information on whether the lobbyist was for or against the bill. In this period, 13,005 unique individuals, firms, employers, or coalitions registered as lobbyists, filing a total of 407,334 quarterly reports. Each filing records the aggregate activity of the lobbying actor that quarter, including which bills they lobbied in that period. We expand the data so that each observation represents a unique bill-lobbying dyad ($n = 1,490,875$).

Next, we identify bills addressing sectors experiencing significant climate impacts, spanning energy, real estate and land use, agriculture, and environmental or natural resource policy. We first subset the data to include only bills sent to substantively relevant committees (Agriculture, Environmental Safety and Toxic Materials; Natural Resources; Utilities and Energy; and Water, Parks and Wildlife). This step reduces the likelihood we capture a bill whose text (as introduced) makes a single mention of a phrase like “climate change” but does not advance policy that addresses the issue. Because not all bills in these committees address climate change, we then use four keyword dictionaries (for climate, water, energy, and agriculture) to further filter the proposals, selecting committee bills that have a substantive linkage with climate change or represent sectors likely impacted by climate change. The full set of keywords can be found in Appendix A. After narrowing the sample by committee and substance, we are left with a subset of 3,295 relevant Assembly and Senate bills.

To gauge levels of support by interest groups that pursue low-cost means to influence legislators, we turn to the committee bill analyses provided by LegInfo. To register a stance on a bill, organizations or individuals can send a letter to the committee(s) in which the bill is being heard. While mailing or delivering letters was common practice in the earlier years of our analysis, interest groups can now submit letters electronically via the California Legislature Position Letter Portal¹. Position letters are summarized by committee bill analyses, an example of which is provided in Figure 1. Although we cannot assess from the bill analyses whether groups on the same side of the issue coordinate letter writing or other advocacy strategies with one another, we presume that in many cases they do. Nonetheless, these lists provide legislators with an efficient opportunity to assess the breadth of supporters.

¹ Compared to interest groups, individuals rarely write letters. They are excluded from the analysis. We cannot find a date that the electronic letter portal was established. We used the Way Back Machine to identify the first instance of the website: 2016. We examined the distribution of letters across time and found no obvious increasing trend in the number of letters sent.

Figure 1: Example of Committee Bill Analysis and List of Registered Positions

<p style="text-align: right;">AB 2377 Page 1</p> <p>Date of Hearing: April 11, 2018</p> <p style="text-align: center;">ASSEMBLY COMMITTEE ON AGRICULTURE Anna Caballero, Chair AB 2377 (Irwin) – As Introduced February 14, 2018</p> <p>SUBJECT: Agriculture: Camella Environmental Farming Act of 1995: technical assistance grant program.</p> <p>SUMMARY: This bill requires the California Department of Food and Agriculture (CDFA) to establish a technical assistance grant program (TAG program) to provide funds to technical assistance providers (TAP) to work with applicants for the Healthy Soils Program (HSP), alternative manure management programs (AMMP), and the State Water Efficiency and Enhancement Program (SWEEP). Specifically, <i>this bill</i>:</p> <ol style="list-style-type: none"> 1) Make legislative findings and declarations regarding the need and benefits of agriculture's climate change mitigation programs and the need to provide greater technical assistance to framers to aid in implementation of these programs. 2) Defines the following: <ol style="list-style-type: none"> a) Grant program to mean the technical assistance grant program established, as specified; b) Programs to mean HSP, AMMP, and SWEEP, as specified; c) Technical assistance to mean outreach, education, project planning, project design, grant application assistance, or project implementation assistance provided to a farmer or rancher to improve his or her successful participation in the programs; and, d) TAPs to mean resource conservation districts, the University of California Cooperative Extension, nonprofit organizations, agricultural trade associations, and other agricultural professionals with demonstrated technical expertise in designing and implementing agricultural management practices to achieve the purposes, as specified. 	<p>REGISTERED SUPPORT / OPPOSITION:</p> <p>Support</p> <p>California Climate & Agriculture Network (Sponsor) Agriculture and Land-based Training Association American Farmland Trust California Association of Resource Conservation Districts California Association of Winegrape Growers Californians Against Waste California Certified Organic Farmers California Farm Link Carbon Cycle Institute Center for Food Safety Community Alliance with Family Farmers Community Environmental Council Ecological Farming Association Fish Friendly Farming National Center for Appropriate Technology Occidental Arts & Ecology Center Organic Valley Point blue Conservation Science Vineyard Team Wild Farm Alliance Wine Institute</p> <p>Opposition</p> <p>None on file</p> <p>Analysis Prepared by: Victor Francovich / AGRI. / (916) 319-2084</p>
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Committee bill analyses within California’s Assembly are formatted in a relatively uniform manner across the span of our data, which allows us to use automated methods to parse thousands of supporters and opponents for each bill from 2001 to 2020. We exclude Senate bills from the analysis because the formatting is prohibitively inconsistent. Our scoping decisions result in 1,914 Assembly bills, which produces 32,537 bill-lobbying dyads by 2,011 unique lobbyists² and 15,976 bill-letter dyads from 5,713 unique letter writers. Differences in size and concentration of lobbyists (fewer groups, more lobbying instances) compared to letter writers (more groups, fewer letters) provides initial evidence that these two advocacy tactics differ. In bill analyses, 74% of the observations write support letters, while the other quarter is in opposition; 72% of bills in our subset had at least one group write a position letter, and the average bill received 6 letters of support and 2 letters of opposition. The overwhelming majority of support (versus opposition) letters is another indication that lower-resourced groups are most likely to use this venue, given that they are more likely to seek policy change than incumbent interest groups.

b. Measuring influence

Our core interest is investigating whether the diversity of the groups writing letters in support of a proposal increases the likelihood of committee passage, after accounting for

² Across these 1,914 bills, there are 90,631 bill-lobbying dyads across the full legislative process. We isolate the 32,537 dyads which were filed, with certainty, during the committee stage for each bill.

lobbying activity. Thus, we first measure the *count of lobbying activity* during the committee stage. After comparing the dates of each lobbying filing to the dates that each bill exited the committee process, we sum these dyads to create a committee stage lobbying count for those instances of lobbying that we know occurred before the bill exited the committee stage. For bills that failed to pass out of the committee stage, we use the totality of lobbying on the bill as the lobbying count. The average Assembly bill in our data was lobbied 17 times during the committee stage, and 48 times across the entire legislative session. Less than 1% of these bills were not lobbied at all.

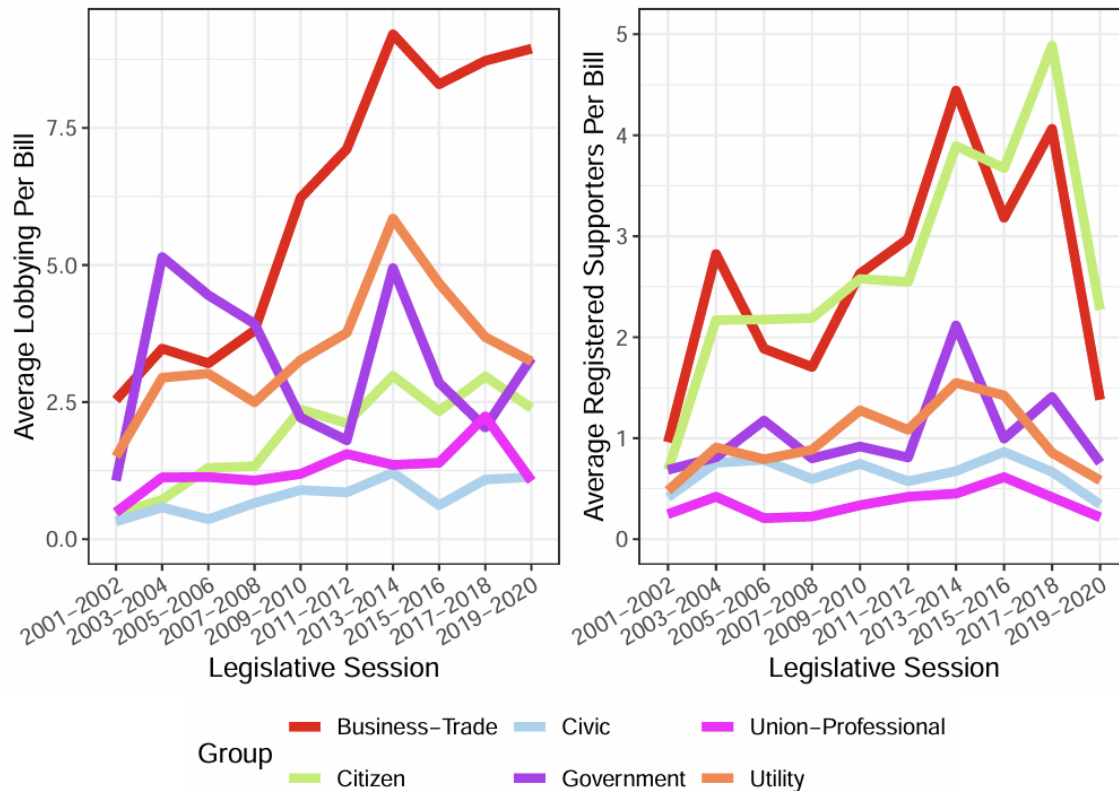
To investigate the extent to which lobbying and position taking are done by different groups and to test the diversity hypothesis, we categorize both lobbyists and letter writers into two dimensions that represent differences in agendas, resources, and capacities: *issue areas* (e.g., environment, agriculture, health), and *organizational type* (citizen groups, civic leagues, trade associations and businesses, unions and professional associations, government, utilities).

Groups are categorized into 6 organizational types and 12 issues based on their mission statements, activities, membership (e.g., individuals versus businesses), and tax status. We achieve construct validity by creating categories based on what are arguably the most perceptible differences between groups. For example, while trade associations and individual businesses differ in their resources, capacity, and political activity, we group them together as “business/trade group” because legislators likely perceive them as representing similar constituencies except when they represent vastly different sectors. Similarly, we group together organizations with relatively subtle differences in their mission if they are unlikely to be perceived as representing different sectors. For example, organizations that promote public transportation, bike infrastructure, or recycling may have several motivations and target sectors, but environmental protection is a central theme; thus, we categorize them all in the environment issue. A full description of these categories can be found in Appendix B.

Distributions of interest group types substantiate prior evidence that businesses and trade groups account for a much larger share of the high-cost advocacy tactic (lobbying) than other organizational types, with utilities and government following (See Figure 2).³ In the low-cost advocacy tactic (letter writing), citizen groups take the lead. Notably, business and trade groups also account for a large share of letter writing, which was somewhat surprising to us. Further exploration suggests that individual and smaller businesses tend to write letters, while large corporations and trade groups tend to lobby. For example, while trade groups like the Napa Valley Vintners Association and Family Winemakers of California trade groups lobbied AB 1394 (2001-2002), which addresses pest control in the grape-growing industry, small businesses such Etude Wines, Husch Vineyards, and Laurel Glen Wines wrote letters. We also find evidence that newer industries tend to use low-cost advocacy: 51% of conventional energy business/trade groups compared to 72% of clean energy business/trade groups write letters instead of lobby.

³ While the trend in recent years has been an increasing number of business/trade groups and citizen groups writing letters of support on legislation, the sharp decline in the 2019–2020 session is likely an artifact of the COVID-19 Pandemic.

Figure 2: Average number of lobbyists and registered supporters per bill, by organizational type



Research shows that interest groups are more likely to seek or achieve policy change when they are diverse in issues or organizational types (Dwidar 2022; Phinney 2017; Struthers and Ritzler 2024), but rarely are these two dimensions of difference integrated in a single metric. A diversity metric that takes into account both dimensions allows us to examine alignment across interest groups that may be strange bedfellows in climate, such as environmental citizen groups and agricultural trade associations, or utilities and renewable energy firms. We combine observed issue and organization categories to create a single typology of *issue-organization*, which produces 44 different types. Table 1 shows the frequency of letter writing among the top categories and examples of interest groups observed in the data.

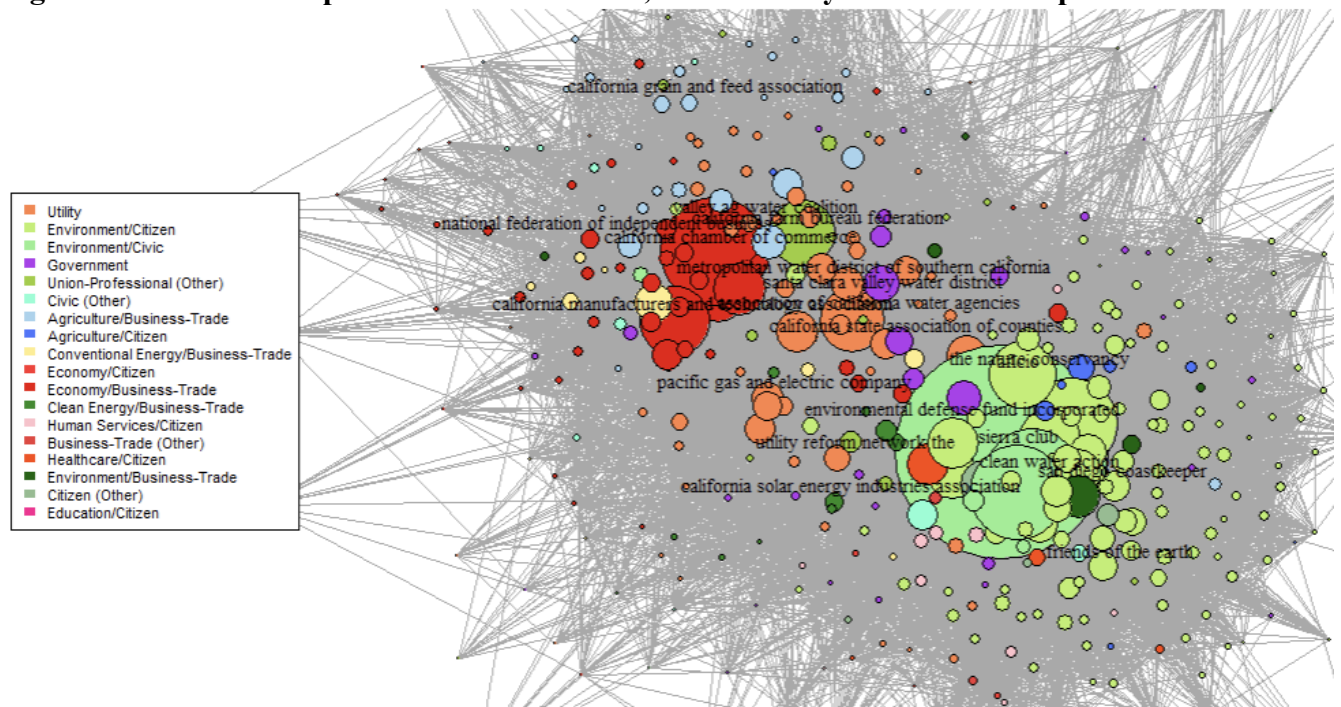
Table 1: Summary of Top Issue-Organization Types

Issue-Organization Type	Frequency	% of Total.	Example Groups
Environment/Citizen	3,493	21.9%	Environmental Defense Fund Friends of the Santa Clara River
Economy/Business-Trade	2,340	14.7%	California Manufacturers and Technology Association Brentwood Hand Car Wash
Government	1,989	12.5%	Rural County Representatives of California City of Anaheim
Utility	1,913	12%	Association of California Water Agencies Pixley Irrigation District
Agriculture/Business-Trade	1,130	7.1%	California Forestry Association Earl's Organic Produce
Environment/Civic	998	6.3%	Sierra Club Recreational Fishing Alliance
Human Services/Citizen	646	4%	Leadership Counsel for Justice and Accountability National Housing Law Project
Clean Energy/Business-Trade	451	2.8%	California Wind Energy Association Suntech America
Conventional Energy/Business-Trade	408	2.6%	Western States Petroleum Association Pacific Ethanol Inc
Environment/Business-Trade	408	2.6%	WateReuse Association Aqua Kleen
Agriculture/Citizen	302	1.9%	California Native Plant Society Berkeley Food Institute
Agriculture/Union-Professional	293	1.8%	California Farm Bureau Federation California Beekeeper's Association

Descriptive patterns in the support letters data help to justify our measurement approach and provide new evidence on divergence in advocacy tactics among interest groups. By transforming the letter writer data into non-directional dyads, we can create an interest group network, where the size of the node represents the number of times the issue-organization appears in the data and the edges represent any time two groups took the same position (support or opposition) on a bill. Figure 3 shows the network of the 433 most active organizations in the data.⁴ Three clear communities emerge: those of environmental organizations (citizen groups and civic leagues) on the right, business and trade associations (agricultural, economy, and conventional energy) on the left, and utilities and governments in between. The most central (i.e., connected) nodes among environmental organizations include the Sierra Club and the Natural Resources Defense Council. For business and trade groups, these include the California Chamber of Commerce and the California Farm Bureau Federation. Despite separation between these communities, large environmental organizations find themselves on the same side as trade associations occasionally. For example, 18% of the 316 dyadic pairs involving Clean Water Action (a prominent environmental citizen group that does not appear in the lobbying data) and business/trade groups are positions in agreement.

⁴ The full network comprises 466,729 organization-organization dyads. We subset the data to pairs in which organizations took the same position, and for only those actors who sent five or more position letters between 2001 and 2020. This subset contains 57,436 dyads.

Figure 3: Network of top letter writers on the 1,914 Assembly bills in our sample



We develop an *index of interest group diversity* to test our hypotheses. This index is built from the product of two dimensions of bill-supporting advocacy that are highly but imperfectly correlated (see Figure 4a): (1) how many letters of support are received from groups advocating for a bill (plotted on the vertical axis) and (2) the distribution of issue-organizations represented among organizations that lobby over the bill (plotted on the horizontal axis). We calculate this second component of the index through an effective number of issue-organizations represented among the letter-writers on the bill. Every group in our data is coded with a unique issue-organization type (as shown in Table 1), and for each bill we observe how many supporting organizations appear in each category. So, for instance, there could be ten letters of support on a hypothetical bill, which came from five different issue-organizational types. However, suppose six of the ten letters came from conventional-energy organizations, while groups from the four other represented categories submitted one letter apiece. This is a set of letter-writers who are concentrated in one issue area (conventional energy), and so this component of the index should reflect that concentration. In the example just offered, we would have an *effective* number of issue-organizations equal to 2.5⁵. This is the same measurement problem for which the effective number of parties was developed (Laakso and Taagepera, 1979), which has now become the standard way of capturing how fragmented or concentrated a party system is—weighting parties by their own size so that bigger ones contribute more to the index than the smallest ones. It is also identical to an inverse of the Herfindahl-Hirschman index (HHI) used to measure concentration of firms in an industry, and

⁵ The calculation of an effective number is as follows: Take the squared share of each group’s contribution to the whole (here, issue type among all letters on the bill), sum the shares, and take the reciprocal. The full formula is shown below.

has been applied to measure diversity in media attention and interest group comments on proposed rules (Boydston et al. 2014; Dwidar 2022).

As the horizontal dimension of Figure 4 shows, the distribution of the effective number is rather skewed, with a high tendency of bills that receive letters of support to have index values in the 1–4 range, and a relatively small number with more than 5. A standard way to deal with such a distribution of a variable is to take its logarithm, in which case we do not erroneously consider the difference of one unit between 7 and 8 (a 14% increase) to be identical to that between 2 and 3 (a 50% increase). However, some bills have no supporters. An effective number, per se, cannot be zero and a log of zero is not defined, yet we do not want to drop these bills from our sample. Thus we enter these bills with a value of zero, and take the logarithm of the effective number, plus 1, when developing our full index of diversity.

As Figure 4 also shows, most bills receive anywhere from zero to fewer than twenty five letters of support, while a few receive a hundred or even over 200. To capture the wide range of this scale but also to remain cognizant of the clustering at low to moderate values, small differences among which are likely also salient, we take the square root when including this in our diversity index.

The correlation between the two components is relatively high at 0.43, which partly explains why we do not enter these variables as separate terms in a regression. However, there is a significant conceptual basis for making a single index as well. The index of diversity should be highest for bills that have both (1) a greater number of issue-organizations (measured by the effective number) among all their supporters and (2) a greater number of non-lobbying (and possibly less-powerful) actors declaring support.

Finally, some interest groups lobby *and* write letters of support. In total, 991 interest groups in our sample appear in both the lobbying and letter writing data. Groups tend to stay in their lane. However, 19% (2,996) of the 15,976 letters we observe come from an interest group that frequently lobbies the legislature. To capture the more dominant players, we (1) calculate the median number of bills lobbied by each actor in each session, and (2) count the total number of lobbyist-writers on a given bill whose activity was greater than or equal to this value in the previous session. This measure identifies the most active *lobbyist-writers* without counting lobbying activity that has yet to occur. We add a 1 to the letters component of the diversity index to prevent the measure from taking a 0 for bills where all supporters were also major lobbyists⁶. This amendment strengthens the intuition of the diversity index by de-emphasizing the behavior of advocates that make direct contact with legislators, while still capturing the overall structural differences among letter writers.

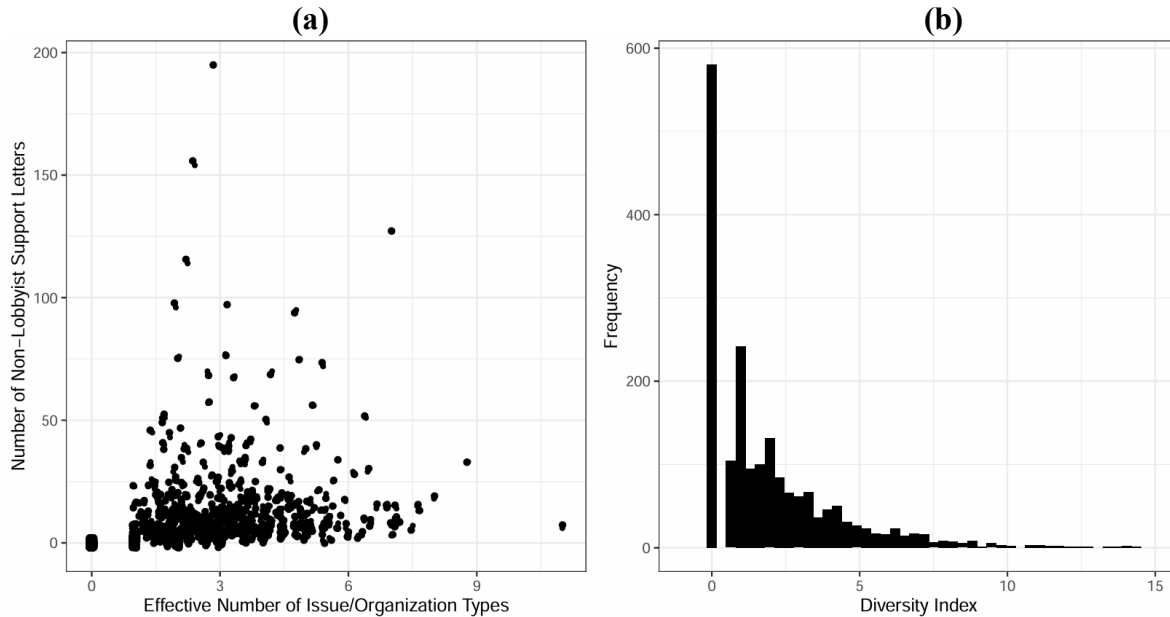
To capture these two manifestations of diversity, we take the product of these two components, such that its calculation is as follows:

⁶ The following example illustrates the logic: If a bill has 10 supporters, and 5 of them were major lobbyists the prior session, then the additional support bonus it will receive would come only from those 5 supporters who didn't lobby. If a bill has 10 supporters, and all 10 are counted as major lobbyists, then the bill has 0 non-lobbyist supporters. If we did not add one to the square root, those bills with 0 lobbyist-supporters would also have a diversity index of 0.

$$D = \begin{cases} \log\left(\frac{1}{\sum_{i=1}^n p_i^2} + 1\right) \times (\sqrt{S+1}) & n \geq 1 \\ 0 & n = 0 \end{cases}$$

where n is the number of unique issue-organizations writing letters of support on a given bill and p_i^2 is the square of each issue-organization's proportion of supporting letter writers, and S is the total number of supporting letter writers who were not major lobbyists in the prior session. Bills that did not receive letters of support take a value of 0. Figure 4b shows the distribution of the diversity index.

Figure 4: Scatterplot of inputs to the diversity index (a) and the distribution of the diversity index (b)



c. Controls and statistical approach

Our dependent variable is whether the bill passed through the committee process. Among the 1,914 bills in our sample, 1,154 (60.3%) made it through committee.

In addition to our three measures of advocacy tactics (*diversity index*, *number of lobbyist support letters*, *number of lobbying instances*), we include several control variables in our models. First, we control for characteristics of the legislator who sponsored the bill, including their party (*Democrat*), whether they serve in a *leadership* role, or are *member* or *chair* of a relevant committee. Each of these characteristics may influence the likelihood of a bill passing to the next stage (e.g., Adler 2005; Moore and Thomas 1991; Anderson, Box-Steffensmeier, and Sinclair-Chapman 2003). Third, we control for the *number of substantive committees* that each bill was referred to, as well as the *days into the year* the bill was introduced – prior literature has shown that bills introduced earlier in a session have more favorable legislative outcomes (e.g., Loomis 1993; Krutz 2005). Finally, we control for long-

and short-term climate effects that reflect public attention to climate impacts: the *average drought conditions* in California during the prior 3-year period per the Standardized Precipitation Index (SPI) to account for long-term climate impacts, and the *count of extreme, billion-dollar weather events* in the prior year, per the National Oceanic and Atmospheric Administration (NOAA), to account for short-term climate events.

With the data described above, we estimate a series of binary logistic regressions, assessing the likelihood that a bill passes through the committee stage. Binary logistic regression is most appropriate for data with two possible outcomes (Long and Freese 1997), and is commonly used to analyze bill success or failure in the legislative process (Bratton 2006; Gamm and Kousser 2013; Wallace 2014; Makse 2024).⁷ We run two model specifications, one additive and one multiplicative. In the multiplicative model, we interact the diversity index with the number of major lobbyist support letters. We expect diversity to have a weaker effect on committee passage as the number of major lobbyists writing letters increases. Our additive model is estimated with the following functional form:

$$\Pr(\text{Passage}_i = 1) = \text{logit}^{-1}(\alpha_i + \beta_1 \text{Diversity Index}_i + \beta_2 \text{Number of Lobbyist Support Letters}_i + \beta_3 \text{Number of Lobbying Instances}_i + X_{il} + S_i + \epsilon_i)$$

where the most important independent variables in the models include the (1) diversity index, (2) number of major lobbyists who wrote letters of support on the bill, and (3) the cumulative amount of lobbying at the time of exiting the committee stage.⁸ Each model includes our vector of controls, X_{il} , and session-level fixed effects, S_i .

5. Results

Table 2 contains the odds ratios and confidence intervals for the independent variables and control from our main specifications. Odds ratios are generated by exponentiating coefficients; above (below) 1 indicates a positive (negative) relationship between the covariate and committee passage. We plot predicted probabilities for more intuitive interpretation, particularly the interaction term. Model 1 is additive; Model 2 is interactive. Model 3, as we explain in greater depth below, contains a subset of bills that were only sent to one substantive committee. Each model offers similar results, and strongly supports our hypothesis.

⁷ Butler & Miller (2022) use a linear probability model in their analysis of lobbying and bill passage. We test our main specification with OLS in Appendix Table C7 and find that our results are robust to this approach.

⁸ We subtract any instances in which major lobbyists wrote support letters *and* lobbied on the bill during the committee stage from the cumulative amount of lobbying to avoid double counting of these groups.

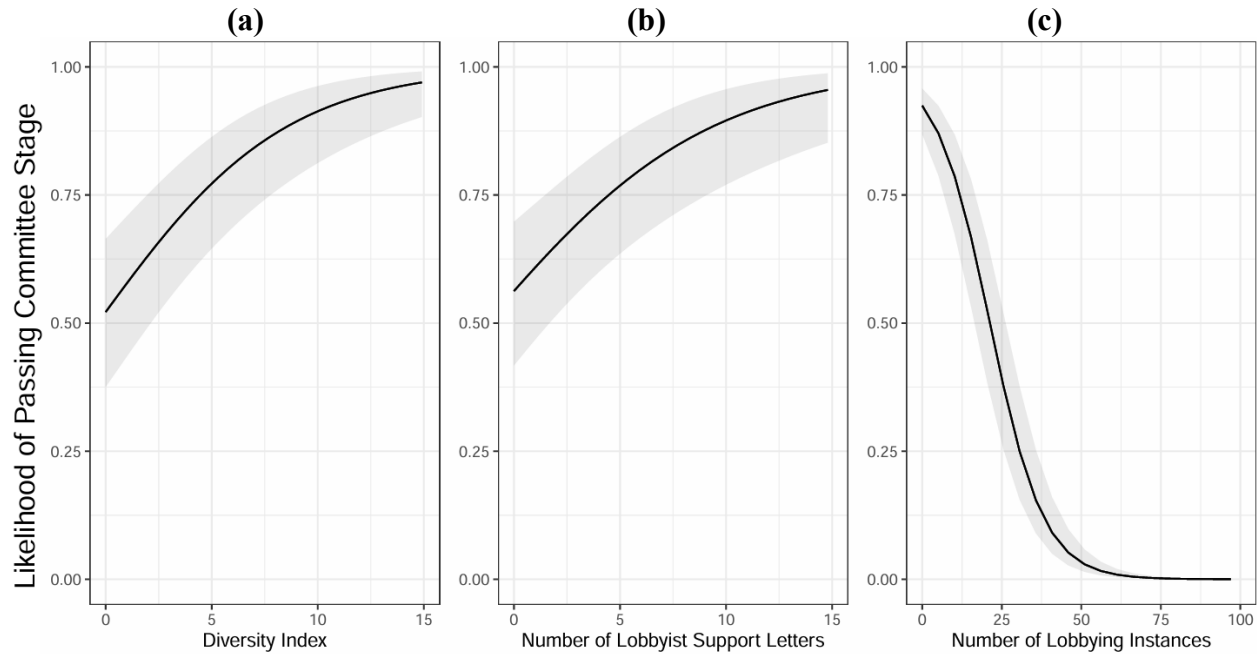
Table 2: Odds Ratios of Passing Committee Stage

	<i>Dependent variable:</i>		
	Passed Committee Stage		
	(1)	(2)	(3)
Diversity Index	1.255*** (1.153, 1.370)	1.352*** (1.241, 1.480)	1.392*** (1.242, 1.563)
Number of Lobbyist Support Letters	1.209*** (1.107, 1.323)	1.406*** (1.265, 1.565)	1.367*** (1.194, 1.571)
Number of Lobbying Instances	0.889*** (0.877, 0.900)	0.890*** (0.878, 0.901)	0.892*** (0.878, 0.905)
Democrat	3.793*** (2.878, 5.016)	3.828*** (2.897, 5.077)	4.260*** (3.090, 5.907)
Leadership	2.104** (1.162, 3.951)	2.070** (1.138, 3.904)	1.424 (0.745, 2.831)
Committee Chair	1.271 (0.749, 2.203)	1.228 (0.720, 2.136)	0.958 (0.526, 1.789)
Committee Member	1.077 (0.817, 1.424)	1.085 (0.820, 1.438)	1.065 (0.770, 1.479)
Number of Committees	1.121 (0.848, 1.487)	1.127 (0.850, 1.499)	
Lagged Extreme Events	1.059 (0.836, 1.343)	1.041 (0.820, 1.323)	1.023 (0.778, 1.345)
Lagged Average Drought	1.024*** (1.007, 1.041)	1.024*** (1.007, 1.041)	1.026** (1.006, 1.047)
Days Into Year	0.970*** (0.961, 0.979)	0.970*** (0.961, 0.979)	0.974*** (0.964, 0.984)
Diversity Index X Number of Lobbyist Support Letters		0.966*** (0.953, 0.977)	0.958*** (0.938, 0.982)
Session Fixed Effects	Yes	Yes	Yes
Observations	1,914	1,914	1,407
Log Likelihood	-806.646	-795.205	-600.775
Akaike Inf. Crit.	1,655.293	1,634.410	1,243.551

Note: This table shows odds ratios, the exponentiated coefficients of logistic models, of a bill passing out of the committee stage. Confidence intervals of the odds ratios are in parentheses. *p<0.1; **p<0.05; ***p<0.01

We turn to Model 1 first. Figure 7a plots the predicted probability of passage across the diversity index. Holding all other variables at their means, shifting the diversity index from 0 to 7 (the 5th to the 95th percentile) increases the likelihood of committee stage passage from around 52% to 84%. While a diversity score of 0 means a bill receives no letters of support during the committee stage, bills that score a 7 have received a wide range of support letters in varying arrangements. Recall that the diversity index represents low-cost advocacy in many forms. For instance, AB 1124 (2011-2012), which concerns a program to fund energy efficiency improvements for low-income households, scores a 7.01, a value generated from 51 non-lobbyist supporters and 1.6 effective issue-organizations. AB 2909 (2017-2018), a bill that exempts small-scale poultry farmers from inspections, scores a 7.03, but with 23 support letters and 3.2 effective issue-organizations. These findings suggest that movement from no low-cost advocacy toward diverse low-cost advocacy is associated with a much greater likelihood of committee success, controlling for lobbying.

Figure 7: Predicted probability of committee stage passage by key explanatory variables

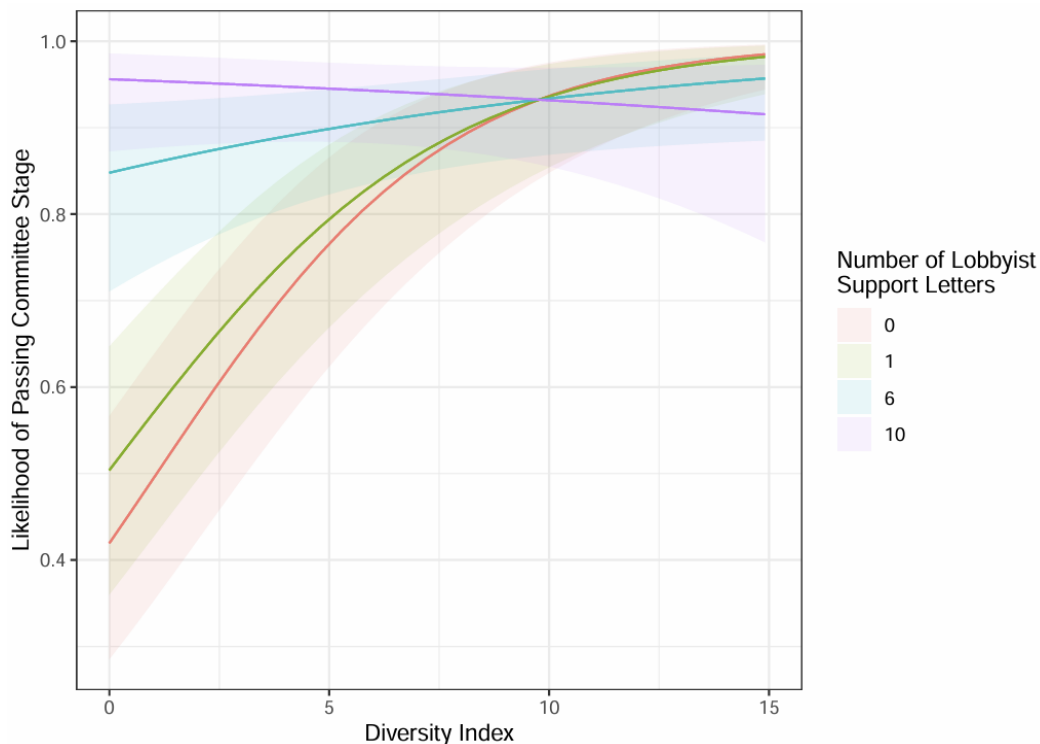


The relationship between the number of major lobbyists who write support letters on a bill, and that bill's likelihood of passage, is also positive and significant. Predicted probabilities are plotted in Figure 7b. For each additional major lobbyist who writes a support letter on a bill, that bill is 1.2 times as likely to pass out of the committee stage.

Lobbying, on average, appears to have a strong association with bill failure. For each additional instance of lobbying before the end of the committee stage, a bill is around 89% as likely to pass committee. In Figure 7c, we show the predicted probabilities moving along the range of committee-stage lobbying activity, holding all other covariates at the means. Bills ignored by lobbyists make it through the committee stage more than 80% of the time. However, bills that receive 50 or more instances of lobbying are predicted to have almost no chance of reaching the chamber floor. This result is consistent with the prior evidence showing that lobbying typically preserves the status quo.

Model 2 includes the interaction term that tests whether the importance of diversity decreases as the presence of more powerful actors among supporters rises. We find support for this conjecture. Figure 8 shows that the diversity index is null for those bills with 10 or more major lobbyist supporters. However, when few lobbyists engage in low-cost advocacy tactics, the diversity index is as or more strongly associated with committee passage than in the additive model. When interest groups that rarely if ever lobby are the only ones writing in support, the likelihood of bill success increases from 42% to 86% moving from a diversity score of 0 to 7 (the 5th to the 95th percentile). These results are particularly meaningful given that among bills that received letters of support, over half had 0-1 lobbyist letter-writer.

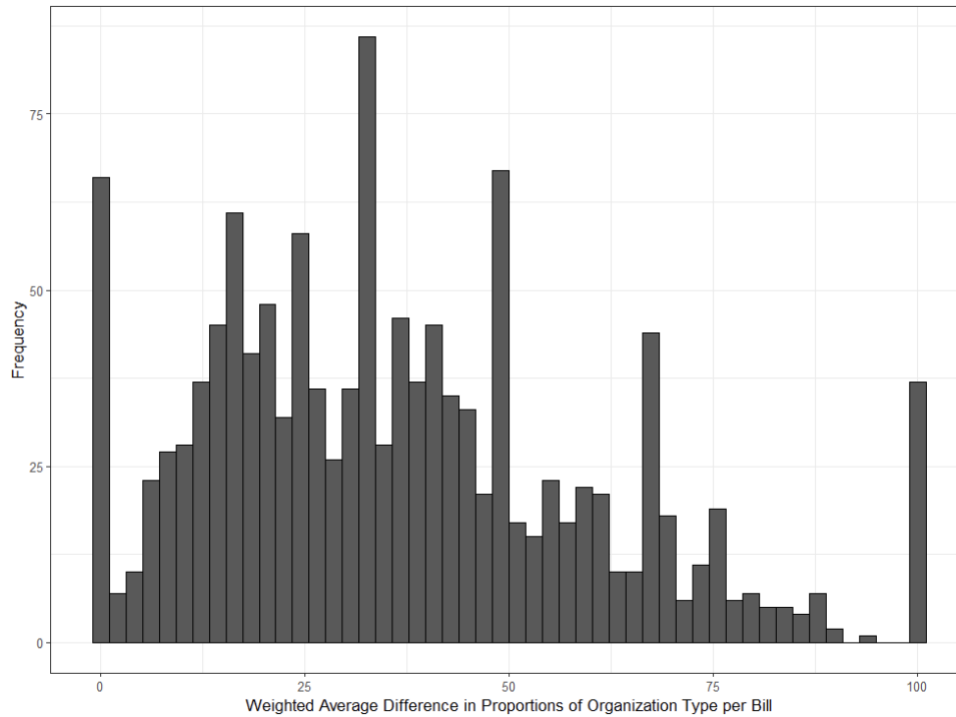
Figure 8: Predicted probability of committee stage passage by diversity, conditional on groups that support and lobby



We control for the number of times a routine lobbyist writes a letter to account for the possibility these letters, as opposed to letter writing by other groups, explains passage. Yet this strategy does not account for the unobservable balance of positive versus negative lobbying overall. Although previous studies suggest it is less likely, lobbying may be more positive than negative on a given bill, and may nullify the influence of letter writing and the diversity index.

One way to consider the scope of this potential problem is to compare the distribution of lobbyist types to the distribution of letter writer types. Bills with close matches (e.g., 60% citizen groups, 40% government among *both* lobbyists and letter writers) may indicate greater positive lobbying. Bills with clear differences between types of supporters and lobbyists (e.g., 60% citizen groups and 40% government letter writers, compared to 70% businesses and 30% utilities) may indicate greater negative lobbying. We calculate the difference between organizational types across tactics and plot them in Figure 9 (see Appendix D for a description of this calculation). For most bills in our sample, the balance of lobbyists and letter writers is rather distinct. Among bills that are lobbied and receive letters of support, only 66 cases (5%) have no difference in group types between tactics, and 301 cases (23%) have a 1-20% difference. A distribution with rather few matches increases our confidence that supportive lobbying is not strongly confounding the diversity index.

Figure 9: Frequency of differences between the organizational types of interest groups that lobby and write letters



Exploring the bills that differ in their interest group arrangements illuminates the various mechanisms underlying the relationship between the diversity index and committee passage. Among bills where businesses account for a large share of lobbying and citizen groups a large share of letter writing are those that stipulate regulatory provisions: for example, requiring producers to submit stewardship plans if they make single-use primary household batteries (AB 488, 2013-2014), consider their packaging’s life cycle impacts (AB 283, 2009-2010), or adhere to building codes that advance zero net energy construction (AB 30, 2017-2018). In each of these instances, the diversity index was above average and the legislative committee(s) advanced the bill. These examples are emblematic of the typical policy processes we think of when it comes to contentious issues, where lower-resourced interest groups use letters to send a strong signal that reform is necessary despite industry pushback.

Other bills are more distributive in nature. Among the bills with greater similarities among interest groups that lobby and write letters are AB 2377 (2017-2018), which allocates funding for technical assistance to farmers and ranchers, and AB 416 (2013-2014), which establishes the Local Emission Reduction Program to provide grants for projects that reduce greenhouse gases and create local jobs and energy resources. In both cases, citizen groups, civic leagues, and/or utilities lobby *and* write support letters. Here again, the diversity index is above average and the bills pass the committee stage. Unlike the previous cases, these bills may not invoke strong opposition. While it is difficult in this case to test whether diversity in low-cost advocacy promotes bill progression in cases where lobbyists and letter writers may be on the same side, the idea is theoretically tractable. Interest groups that do not lobby can write letters of support to convey greater hype for a non-confrontational bill, which may increase its chances of staying on the agenda.

a. Robustness checks

One potential bias in our models is the inclusion of bills that go through multiple committees. The diversity index for these bills may reflect a multi-issue or more comprehensive legislative proposal. Although we account for this possibility by controlling for the number of substantive committees a bill goes through, we check for potential bias by restricting our sample to the 1,407 bills that were only referred to a single substantive committee in Model 3. The results are essentially identical with this alternative specification.

We consider several additional parameterizations. First, we evaluate whether the powerful effect of supporter diversity we observe is an artifact of the measure itself. In Appendix Table C1, we show the results of three additional models that deploy alternate versions of the diversity score. Model 1 (Appendix Table C1) is identical to our fully specified model, which measures diversity as the effective number of issue-organizations. The measures in Model 2 and 3 (Appendix Table C1) calculate the effective number of groups based *solely* upon our 12 issue areas, and upon our 6 organizational categories, respectively. The effects are relatively consistent across the board, suggesting that no matter how we define the diversity in low-cost advocacy, having support from a greater number of organizational sectors or substantive areas makes bills more likely to pass through the committee stage.

Second, we test an unweighted version of the diversity index, measured solely as the logged effective number of issue-organizations (see Appendix Table C2). In this model, we add a separate control for the number of letter writers (excluding major lobbyist letter writers). Moving from the 5th to 95th percentile of this unweighted diversity measure (from a value of 0 to 1.72) predicts an increase in likelihood of passing out of committee from 40% to over 99%. While this model suggests a stronger role of diversity than our fully specified model, the weighted measure better accounts for the interplay between the diversity groups and the total number of groups writing letters

Third, we test a model in which two of our core organization types—citizen and civic groups—are collapsed into a single category. While 501(c)(3) citizen groups and 501(c)(4) civic leagues operate differently within the political landscape, it is possible that our diversity measure overestimates the perceived differences between these groups by legislators. For instance, the Sierra Club is a 501(c)(4), while the Environmental Defense Fund is a 501(c)(3), and lawmakers may not perceive diversity between the two. Merging civic leagues and citizen groups reduces the number of issue-organization types to 35. In Appendix Table C3, we show that modeling diversity across this reduced spectrum does not substantially impact our findings.

Fourth, we investigate the role of legislative staffers on our results. Committee bill analyses where letter writers are recorded are compiled by committee staffers, which may exercise discretion in list creation. In Appendix Table C4, we introduce staffer-fixed effects to our model, measured across the 61 unique staffers who wrote analyses for our five committees of interest. Our findings are robust to the inclusion of these additional effects, suggesting that the findings do not depend on the construction of committee bill analyses.

Fifth, to ensure that our results are not driven by one particular bill, we run an additional robustness check on our results, systematically removing one bill at a time and rerunning our main model. Across these 1,914 models, the raw coefficients and p-values for the diversity of supporters are nearly identical—the mean coefficient value is 0.227, with a standard deviation of 0.001. We can look at the two models with the greatest deviation: those that omit AB 958 from 2019-2020, and AB 2006 from 2003-2004. In the case of the former, The California

Organic-to-School Pilot Program was an outlier bill that received 138 registered support letters and did not pass the committee stage. The latter, The Reliable Electric Service Act of 2004, made it through the committee stage with only 1 supporter. In Appendix Table C5, we show the odds ratios of our results when we exclude these two bills, respectively. While the magnitude of the diversity score is higher without the former bill, and slightly lower without the latter, they do not fundamentally change our findings.

Finally, we test an alternate version of our lobbyist-letter writer measure. In the main analysis, the variable is the number of major lobbyists who wrote letters of support on the bill, with major lobbyists defined as those in the median-or-above of lobbying activity in the prior session. In Appendix Table C6, this measure is calculated as the number of actors who wrote letters of support *and* lobbied on the same bill during the committee stage. While this variable is no longer significant in the additive model under this specification, the effects in the interactive model are largely the same as in Table 2, at a slightly weaker magnitude.

6. Discussion and conclusion

Interest groups have a wide range of insider and outsider tactics at their disposal. However, resources, capacity, legal frameworks, and history with the legislature shape the extent that interest groups can have direct political communication with policymakers. Many groups do not, and cannot, lobby. We ask whether other less direct insider tactics, such as letter writing, can overcome the advantages lobbyists have in the US political context. We answer our question by focusing on bills that respond to climate change—an issue mobilizing interest groups with varying goals, resources, and prior experience in political advocacy. Our research helps to fill a gap in the research on smaller players, who often rely on outsider tactics or other venues like local government to meet their policy goals (Riverstone-Newell 2012).

We find strong evidence that the diversity of supporters writing letters to legislative committees is associated with the passage of legislation through committee, after accounting for lobbying activity and other controls, including extreme weather and sponsorship by party leadership. Results suggest that low-cost advocacy tactics—when done in tandem with members of different constituencies—can promote policy change, perhaps even well-resourced interest groups make efforts to maintain the status quo. Our study goes beyond lobbying, providing rich descriptive evidence on the broader interest group dynamics concerning legislation responding to climate change. We provide new evidence that different kinds of interest groups use high- or low-cost tactics. For example, while business and trade groups lobby much more than citizen groups, citizen groups write more letters than most other groups.

The influence of diversity among letter-writers on committee passage is strongest when lobbyists stick to lobbying, which is more common than any other advocacy arrangement we observe. When many interest groups that lobby regularly also write letters that claim a position on legislation, the influence of less politically active or lower-resourced groups washes out. This pattern indicates that their participation may not be necessary for enhancing the prospects of policy change when there are extensive support signals coming from major players.

While we cannot determine whether advocates coordinate their position taking, the strength of the diversity index implies that allyship between groups that vary in their strengths and resources can be influential. Our findings also pose new questions around coordination. Although coalition formation can increase the likelihood of policy victory (e.g., Nohrstedt et al. 2023), our work suggests intensive coordination among interest groups may not be wholly

necessary to send a strong signal to policymakers. This may be good news for advocates with resource constraints that make coalition building difficult. On this point, we wonder whether how information is provided—in California’s case, the presentation of groups on a single legislative document—shapes diversity’s influence. Can legislators infer the breadth and dimensions of support, absent a clear and rather comprehensive summary device?

On mechanisms, anecdotes from our data suggest low-cost advocacy may serve different purposes in bill advancement. In some cases, advocates may write letters to compete with a large or powerful opposition lobby. In others, letter writing may complement positive lobbying, extending the list of supporters without much effort. These anecdotes can be used to build theory on the insider tactics of interest groups that rarely lobby, which would deepen our understanding of organizations that primarily use outsider tactics or who advocate sparingly.

Our research offers a methodological contribution as well. Previous studies that have used the effective number of groups to measure diversity or similar concepts did not incorporate the total number of items. That omission may be sensible for certain research questions. But weighing the effective number of issue-organizations according to the extent of total support received allows us to more directly represent the search dynamic likely at play when legislators consider bill viability: the *who*, and by *how much*. Our approach to diversity can be deployed to other settings where the decision maker is concerned with the extent of activity, in addition to group-level characteristics.

The study has several limitations. The most obvious is the lack of position information on lobbyists. While position data would allow us to more precisely estimate the effect of low-cost advocacy tactics, lobbyists often lack a stated position because they often work to shape the way a problem is understood and to modify proposals to their liking. Many works have been published with the same limitation, emphasizing that the coefficient on lobbying is an average across some unobservable level of positive versus negative lobbying. We interrogate the possibility that supportive lobbyists advance policy change, not letter writing. Our matching approach shows that there are perceptible differences between the types of groups that lobby and write letters, implying that bills that received positive lobbying are not overrepresented in our sample.

In similar regard, a lack of position data prevents us from estimating the diversity of lobbyists, which presumably influences the power of this high-cost tactic. While we hope future research can take up this issue, we are not concerned that diversity among lobbyists would upend our results. Diversity among lobbyists likely has similar influence on bill outcomes as diversity among letter-writers, but it may be less common among opposition lobbyists who have fewer incentives to build an inter-organizational and inter-issue coalition to achieve their objectives.

A second limitation stems from the necessity to subset legislation. Choosing bills that represent a cross-cutting issue like climate change is an imperfect science. Given the number of observations, our selection strategy has likely avoided systematic bias in the types of bills we analyze. More broadly, the patterns we observe may not hold in other issue domains. Issues with fewer distributive implications, or that involve greater agreement among interest groups, may not invoke the competition for agenda control that produces enough low-cost advocacy to observe its effect given opposition. Future research should investigate whether the patterns we find exist in other issues, perhaps in California for direct comparison. The data sources we use in this study are publicly available.

Similarly, our results rest on a few assumptions about unobserved interest group behavior. It is possible that interest groups we observe only writing letters or only lobbying may have lobbied or wrote letters on a bill not captured in our sample. We assume that we capture a representative distribution, particularly because our results are robust when we drop individual bills from the analysis. Similarly, we observe two of several insider tactics. Interest groups can take other actions, like participating in committee hearings. Although we do not account for the full scope of interest group activity, we assume interest groups that provide public testimony are likely captured in at least one of the two activities we study. Further, our model does not account for the power of any one group. It is possible that the participation of a single group, like Pacific Gas & Electric Company (PG&E) or the Almond Board of California, makes a big difference in the likelihood of passage. Investigating that possibility is best answered through other methods.

Finally, the influence of low-cost advocacy detected in California may not be present in other states, the US Congress, or agency rulemaking. We speculate that the dynamic we observe may occur elsewhere and in other venues, particularly on legislation related to climate change. Legislatures and agencies have increasingly strong incentives to deliver policies that resolve or mitigate climate impacts, especially as new industries, local governments, and utilities prefer reform. That said, environmental organizations have enjoyed a favorable policy regime over many decades in California, which increases their ability to meet their policy goals (Hall et al. 2024). Letter writing and similar activities may be less effective in Republican states, in states where demand for climate action and environmental protection is weaker, or depend on the assembly of groups advocating for reform. Institutional arrangements and policies that shape decision makers' options and electoral or career ambitions likely condition receptiveness to interest groups with comparatively less political power. Additional research is needed to better understand the conditions under which interest groups that do not lobby can influence policy processes directly by other means.

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APPENDICES

APPENDIX A: Keyword Dictionaries

We subset our sample of 1,914 bills using both keywords and committee membership. We built a dictionary of 141 partial and full keywords, which we matched within the full text of each bill as introduced. These keywords are divided among four dictionaries: water (47 terms), climate (7 terms), energy (12 terms), and agriculture (75 terms). Below, we include the full corpus of each dictionary.

Water Dictionary: "drought", "water scarc", "water avail", "water storage", "reservoir", "dam", "dams", "desal", "water recyc", "water supp", "water use", "water alloc", "water reuse", "irrigat", "rainfall def", "dry", "water effici", "water price", "water system", "water resource", "water conservat", "water table", "groundwater", "water author", "water manage", "saved water", "extract water", "water utilit", "water entitlement", "water project", "water sustain", "water salin", "water reform", "water plan", "water secur", "water market", "water provid", "water grant", "water diver", "water crisis", "water right", "precipitation", "water basin", "water flow", "environmental flow", "water demand", "flood control"

Climate Dictionary: "climate change", "climate adapt", "climate impact", "climate crisis", "wildfire", "sea level rise", "climate resilience"

Energy Dictionary: "energy", "solar", "wind", "renewable", "natural gas", "oil", "propane", "biofuel", "greenhouse gas", "carbon emis", "climate mitig"

Agriculture Dictionary: "alfalfa", "almond", "pistachio", "citrus", "orange", "lemon", "lime", "avocado", "corn", "cotton", "beans", "fallow", "grain", "grape", "melon", "squash", "cucumber", "onion", "garlic", "walnut", "peach", "apricot", "strawberry", "blackberry", "raspberry", "potato", "rice", "safflower", "sunflower", "tomato", "sugarbeet", "olive", "wine", "livestock", "dairy", "cow", "cattle", "milk", "poultry", "eggs", "chicken", "artichoke", "plum", "fig", "persimmon", "pomegranate", "raisin", "lettuce", "broccoli", "carrot", "celery", "pepper", "berry", "vegetable", "fruit", "timber", "forest", "biofuel", "beer", "crop loss", "subsidence", "orchard", "vineyard", "agricultural preserve", "agricultural producer", "agricultural grower", "crop", "agricultural commod", "landowners", "farmers market", "agribusiness", "farm", "food product", "feed", "apple"

APPENDIX B: Issue and Organization Categories

We code lobbyist and letter-writing groups by their *organization type* and *issue area*. The full list of categories, and the kinds of groups within them, are listed below.

Organization Type

1. Business and trade associations
2. Citizen groups (including foundations and social clubs)
3. Civic leagues
4. Government (local, state, federal agencies or departments; elected officials; tribes; non-utility special districts such vector control, park, conservation, fire, air quality, transit, and school districts; associations of governments)
5. Professional associations and unions (including farm labor organizations)
6. Utilities (service entities charged with delivering essential public services like energy, water for irrigation or drinking, communications, sanitation, garbage collection; associations of utilities).

Issue Area

1. Agriculture (including forestry, fisheries, hunting, beer, wine, fairgrounds, and food processing)
2. Conventional energy production and distribution (oil, gas, electricity)
3. Clean energy (solar, wind, nuclear, biogas, biochar, electric vehicles, batteries and storage)
4. Environment (including conservation, climate change, environmental justice, public transportation and biking, recreation including recreational fishing)
5. Economy (conventional auto and rail, retail, restaurants, entertainment, tech, real estate and property, manufacturing, mining, construction, finance, taxation, chambers of commerce)
6. Education
7. Law and emergency services (policing, criminal justice, fire, pest and disease control)
8. Human services (including identity-serving organizations, affordable housing, social justice, poverty, and gun control)
9. Healthcare
10. Politics (public mobilization, parties, general policy, lobbying firms, election oversight, courts)
11. Consumer protection
12. Waste management

For each actor, we combine their organization type and issue area to create a unique issue/organization type. Groups with an organization type of government or utility, or an issue area of politics, have an issue/organization type matching that respective code. The complete list of issue/organization types is listed below.

Issue/Organization Type

1. Agriculture/Business-Trade
2. Agriculture/Citizen

3. Agriculture/Civic
4. Agriculture/Union-Professional
5. Clean Energy/Business-Trade
6. Clean Energy/Citizen
7. Clean Energy/Civic
8. Clean Energy/Union-Professional
9. Consumer Protection/Business-Trade
10. Consumer Protection/Citizen
11. Consumer Protection/Civic
12. Consumer Protection/Union-Professional
13. Conventional Energy/Business-Trade
14. Conventional Energy/Citizen
15. Conventional Energy/Civic
16. Conventional Energy/Union-Professional
17. Economy/Business-Trade
18. Economy/Citizen
19. Economy/Civic
20. Economy/Union-Professional
21. Education/Business-Trade
22. Education/Citizen
23. Education/Civic
24. Education/Union-Professional
25. Environment/Business-Trade
26. Environment/Citizen
27. Environment/Civic
28. Environment/Union-Professional
29. Government
30. Healthcare/Business-Trade
31. Healthcare/Citizen
32. Healthcare/Civic
33. Healthcare/Union-Professional
34. Human Services/Business-Trade
35. Human Services/Citizen
36. Human Services/Civic
37. Human Services/Union-Professional
38. Law and Emergency/Business-Trade
39. Law and Emergency/Citizen
40. Law and Emergency/Union-Professional
41. Politics
42. Utility
43. Waste Management/Business-Trade
44. Waste Management/Citizen

APPENDIX C: Robustness Checks

Table C1: Odds Ratios of Passing Committee Stage: Alternate Specifications of Diversity Index

	<i>Dependent variable:</i>		
	Passed Committee Stage		
	(1)	(2)	(3)
Diversity Index: Issue/Org Type	1.352*** (1.241, 1.480)		
Diversity Index: Issue Type		1.435*** (1.303, 1.589)	
Diversity Index: Org Type			1.520*** (1.368, 1.696)
Number of Lobbyist Support Letters	1.406*** (1.265, 1.565)	1.399*** (1.261, 1.556)	1.370*** (1.223, 1.538)
Number of Lobbying Instances	0.890*** (0.878, 0.901)	0.889*** (0.877, 0.901)	0.890*** (0.878, 0.902)
Democrat	3.828*** (2.897, 5.077)	3.858*** (2.918, 5.120)	3.857*** (2.915, 5.123)
Leadership	2.070** (1.138, 3.904)	2.065** (1.133, 3.904)	2.015** (1.105, 3.811)
Committee Chair	1.228 (0.720, 2.136)	1.241 (0.728, 2.162)	1.238 (0.725, 2.159)
Committee Member	1.085 (0.820, 1.438)	1.089 (0.823, 1.443)	1.071 (0.808, 1.421)
Number of Committees	1.127 (0.850, 1.499)	1.122 (0.846, 1.494)	1.135 (0.855, 1.512)
Lagged Extreme Events	1.041 (0.820, 1.323)	1.038 (0.817, 1.319)	1.038 (0.817, 1.320)
Lagged Average Drought	1.024*** (1.007, 1.041)	1.024*** (1.006, 1.041)	1.024*** (1.006, 1.041)
Days Into Year	0.970*** (0.961, 0.979)	0.970*** (0.961, 0.979)	0.970*** (0.961, 0.979)
Diversity Index (Issue/Org) X Number of Lobbyist Support Letters	0.966*** (0.953, 0.977)		
Diversity Index (Issue) X Number of Lobbyist Support Letters		0.961*** (0.947, 0.974)	
Diversity Index (Org) X Number of Lobbyist Support Letters			0.957*** (0.941, 0.973)
Session Fixed Effects	Yes	Yes	Yes
Controls	Yes	Yes	Yes
Observations	1,914	1,914	1,914
Log Likelihood	-795.205	-792.337	-789.783
Akaike Inf. Crit.	1,634.410	1,628.675	1,623.566

Note:

*p<0.1; **p<0.05; ***p<0.01

Table C2: Odds Ratios of Passing Committee Stage: Weighted vs. Unweighted Diversity Index

	<i>Dependent variable:</i>	
	Passed Committee Stage	
	(1)	(2)
Unweighted Diversity of Groups	3.481*** (2.644, 4.603)	
Number of Support Letters	1.007 (0.991, 1.022)	
Diversity Index		1.352*** (1.241, 1.480)
Number of Lobbyist Support Letters	1.106** (1.018, 1.205)	1.406*** (1.265, 1.565)
Number of Lobbying Instances	0.894*** (0.882, 0.905)	0.890*** (0.878, 0.901)
Democrat	3.919*** (2.951, 5.226)	3.828*** (2.897, 5.077)
Leadership	2.087** (1.143, 3.955)	2.070** (1.138, 3.904)
Committee Chair	1.261 (0.738, 2.201)	1.228 (0.720, 2.136)
Committee Member	1.051 (0.791, 1.399)	1.085 (0.820, 1.438)
Number of Committees	1.135 (0.853, 1.516)	1.127 (0.850, 1.499)
Lagged Extreme Events	1.022 (0.803, 1.302)	1.041 (0.820, 1.323)
Lagged Average Drought	1.022** (1.005, 1.040)	1.024*** (1.007, 1.041)
Days Into Year	0.971*** (0.962, 0.980)	0.970*** (0.961, 0.979)
Session Fixed Effects	Yes	Yes
Controls	Yes	Yes
Observations	1,914	1,914
Log Likelihood	-777.764	-806.646
Akaike Inf. Crit.	1,599.528	1,655.293

Note: *p<0.1; **p<0.05; ***p<0.01

Table C3: Odds Ratios of Passing Committee Stage: Collapsing Civic and Citizen Organization Types

	<i>Dependent variable:</i>	
	Passed Committee Stage	
	(1)	(2)
Diversity Index	1.392*** (1.273, 1.530)	1.352*** (1.241, 1.480)
Number of Lobbyist Support Letters	1.403*** (1.265, 1.558)	1.406*** (1.265, 1.565)
Number of Lobbying Instances	0.890*** (0.878, 0.901)	0.890*** (0.878, 0.901)
Democrat	3.870*** (2.928, 5.135)	3.828*** (2.897, 5.077)
Leadership	2.071** (1.137, 3.908)	2.070** (1.138, 3.904)
Committee Chair	1.239 (0.727, 2.159)	1.228 (0.720, 2.136)
Committee Member	1.082 (0.818, 1.435)	1.085 (0.820, 1.438)
Number of Committees	1.121 (0.845, 1.492)	1.127 (0.850, 1.499)
Lagged Extreme Events	1.039 (0.819, 1.321)	1.041 (0.820, 1.323)
Lagged Average Drought	1.024*** (1.006, 1.041)	1.024*** (1.007, 1.041)
Days Into Year	0.970*** (0.961, 0.979)	0.970*** (0.961, 0.979)
Diversity X Support Letters by Lobbyists	0.963*** (0.950, 0.975)	
Session Fixed Effects	Yes	Yes
Civic and Citizen Collapsed?	Yes	No
Controls	Yes	Yes
Observations	1,914	1,914
Log Likelihood	-793.282	-806.646
Akaike Inf. Crit.	1,630.563	1,655.293
<i>Note:</i>	*p<0.1; **p<0.05; ***p<0.01	

Table C4: Odds Ratios of Passing Committee Stage: Staffer Fixed Effects

	<i>Dependent variable:</i>	
	Passed Committee Stage	
	(1)	(2)
Diversity Index	1.352*** (1.241, 1.480)	1.160*** (1.058, 1.276)
Number of Lobbyist Support Letters	1.406*** (1.265, 1.565)	1.234*** (1.126, 1.358)
Number of Lobbying Instances	0.890*** (0.878, 0.901)	0.883*** (0.869, 0.896)
Democrat	3.828*** (2.897, 5.077)	3.661*** (2.678, 5.027)
Leadership	2.070** (1.138, 3.904)	2.061** (1.090, 4.059)
Committee Chair	1.228 (0.720, 2.136)	1.401 (0.789, 2.541)
Committee Member	1.085 (0.820, 1.438)	1.040 (0.762, 1.421)
Number of Committees	1.127 (0.850, 1.499)	0.907 (0.646, 1.278)
Lagged Extreme Events	1.041 (0.820, 1.323)	1.106 (0.849, 1.440)
Lagged Average Drought	1.024*** (1.007, 1.041)	1.016 (0.996, 1.036)
Days Into Year	0.970*** (0.961, 0.979)	0.970*** (0.960, 0.979)
Session Fixed Effects	Yes	Yes
Staffer Fixed Effects	No	Yes
Controls	Yes	Yes
Observations	1,914	1,914
Log Likelihood	-806.646	-689.567
Akaike Inf. Crit.	1,655.293	1,541.135
<i>Note:</i>	*p<0.1; **p<0.05; ***p<0.01	

Table C5: Odds Ratios of Passing Committee Stage: Sensitivity Analysis

	<i>Dependent variable:</i>		
	Passed Committee Stage		
	(1)	(2)	(3)
Diversity Index	1.255*** (1.153, 1.370)	1.296*** (1.188, 1.419)	1.244*** (1.139, 1.362)
Number of Lobbyist Letters	1.209*** (1.107, 1.323)	1.199*** (1.098, 1.314)	1.214*** (1.112, 1.331)
Number of Lobbying Instances	0.889*** (0.877, 0.900)	0.888*** (0.876, 0.899)	0.889*** (0.877, 0.900)
Democrat	3.793*** (2.878, 5.016)	3.792*** (2.875, 5.022)	3.799*** (2.883, 5.025)
Leadership	2.104** (1.162, 3.951)	2.079** (1.144, 3.920)	2.057** (1.135, 3.867)
Committee Chair	1.271 (0.749, 2.203)	1.250 (0.736, 2.170)	1.269 (0.748, 2.201)
Committee Member	1.077 (0.817, 1.424)	1.089 (0.825, 1.442)	1.078 (0.818, 1.425)
Number of Committees	1.121 (0.848, 1.487)	1.139 (0.860, 1.514)	1.123 (0.850, 1.490)
Lagged Extreme Events	1.059 (0.836, 1.343)	1.063 (0.838, 1.349)	1.062 (0.838, 1.347)
Lagged Average Drought	1.024*** (1.007, 1.041)	1.024*** (1.007, 1.042)	1.024*** (1.007, 1.041)
Days Into Year	0.970*** (0.961, 0.979)	0.970*** (0.961, 0.979)	0.970*** (0.961, 0.979)
Session Fixed Effects	Yes	Yes	Yes
Controls	Yes	Yes	Yes
Observations	1,914	1,913	1,913
Log Likelihood	-806.646	-799.660	-806.280
Akaike Inf. Crit.	1,655.293	1,641.320	1,654.560

Note:

*p<0.1; **p<0.05; ***p<0.01

Table C6: Odds Ratios of Passing Committee Stage, Alternate Measure of Lobbying-Registered Groups

	<i>Dependent variable:</i>	
	Passed Committee Stage	
	(1)	(2)
Diversity Index	1.426*** (1.315, 1.553)	1.566*** (1.429, 1.723)
Number of Lobbyist Support Letters	0.993 (0.879, 1.121)	1.351*** (1.149, 1.586)
Number of Lobbying Instances	0.892*** (0.880, 0.903)	0.893*** (0.881, 0.904)
Democrat	3.828*** (2.908, 5.057)	3.846*** (2.913, 5.097)
Leadership	2.038** (1.132, 3.807)	1.928** (1.066, 3.615)
Committee Chair	1.360 (0.805, 2.348)	1.320 (0.777, 2.292)
Committee Member	1.080 (0.820, 1.425)	1.073 (0.812, 1.420)
Number of Committees	1.175 (0.891, 1.555)	1.177 (0.889, 1.563)
Lagged Extreme Events	1.052 (0.832, 1.330)	1.031 (0.813, 1.307)
Lagged Average Drought	1.022** (1.005, 1.040)	1.023*** (1.006, 1.040)
Days Into Year	0.969*** (0.960, 0.978)	0.969*** (0.960, 0.978)
Diversity Index X Number of Lobbyist Support Letters		0.931*** (0.909, 0.954)
Session Fixed Effects	Yes	Yes
Observations	1,914	1,914
Log Likelihood	-815.982	-801.940
Akaike Inf. Crit.	1,673.964	1,647.881
<i>Note:</i>	*p<0.1; **p<0.05; ***p<0.01	

Table C7: OLS Probability of Passing Committee Stage

	<i>Dependent variable:</i>	
	Passed Committee Stage	
	(1)	(2)
Diversity Index	0.027*** (0.005)	0.043*** (0.006)
Number of Lobbyist Support Letters	0.021*** (0.005)	0.047*** (0.007)
Number of Lobbying Instances	-0.011*** (0.0005)	-0.011*** (0.0005)
Democrat	0.229*** (0.021)	0.223*** (0.021)
Leadership	0.075* (0.040)	0.064 (0.040)
Committee Chair	0.047 (0.038)	0.039 (0.037)
Committee Member	0.020 (0.021)	0.021 (0.021)
Number of Committees	0.0001 (0.020)	0.0003 (0.020)
Lagged Extreme Events	0.010 (0.017)	0.005 (0.017)
Lagged Average Drought	0.004*** (0.001)	0.004*** (0.001)
Days Into Year	-0.003*** (0.001)	-0.003*** (0.001)
Diversity X Support Letters by Lobbyists		-0.005*** (0.001)
Session Fixed Effects	Yes	Yes
Controls	Yes	Yes
Observations	1,914	1,914
R ²	0.355	0.367
Adjusted R ²	0.348	0.360
Residual Std. Error	0.395 (df = 1893)	0.391 (df = 1892)
F Statistic	52.125*** (df = 20; 1893)	52.282*** (df = 21; 1892)

Note:

*p<0.1; **p<0.05; ***p<0.01

APPENDIX D: Organization Type Proportion Calculation

This appendix describes the calculation of the Weighted Average Difference in Proportions of Organization Types per Bill between lobbying and letters of support, on pages 19-20 in the main text. In this analysis of similarities in lobbying and letter writing organizations, we focus on organizational type as opposed to issue area because distinctions between organizational types represent the clearest differences between groups. The difference in organizational type between lobbying and letters of support is calculated as the following weighted average,

$$P_b = \frac{\sum_{i=1}^n \left(\left(\left| \sum_1^m L_{ib} - \sum_1^k S_{ib} \right| \right) \left(\left| \frac{\sum_1^m L_{ib}}{\sum_1^q L_b} - \frac{\sum_1^k S_{ib}}{\sum_1^r S_b} \right| \right) \right)}{\sum_{i=1}^n \left(\left| \sum_1^m L_{ib} - \sum_1^k S_{ib} \right| \right)}$$

where P is the weighted average difference in proportion, b is a given bill, i is organization type, n is the total number of organization types active on a bill across lobbying and letters of support, L is a lobbying instance, S is a letter of support, m is the number of lobbying instances for a given organization type on a given bill, k is the number of letters of support for a given organization type on a given bill, q is the number of lobbying instances for a given bill, and r is the number of letters of support for a given bill.

For each bill, we determine the percentage of lobbying and support letters by organization type. We bin together citizen and civic groups, and governments and utilities, for this analysis. Across the majority of bills, the proportions are divided among a combination of businesses/trade groups, citizen/civic groups, and governments/utilities. Next, we take the absolute difference in proportion across each category for each bill. For example, if 30% of the lobbyists on a bill were businesses, and 10% of the support letter writers were businesses, this value would be a 20% difference. Finally, we calculate a weighted average of these differences across each organization bin. The weights are the absolute difference in frequency of a given category between the two activities. If the aforementioned bill had 10 businesses lobbying, and 4 businesses in support, a weight of 6 would be applied to the 20% difference. This weight emphasizes larger differences in the number of organizations using the two tactics.