RESEARCH **Open Access**

Lessons from the Advocacy Coalition Framework for climate change policy and politics

Kayla M. Gabehart* , Aerang Nam and Christopher M. Weible

Abstract

The world faces grand challenges that threaten our socio-economical, ecological, and political systems. Inequities, insurrections, invasions, and illiberal democracies represent a sample of the population of problems facing life as we know it. Paramount among these problems lie climate change, caused principally by human activity of burning fossil fuels. This paper offers a perspective on climate change from a "lens" in the social sciences. By analyzing applications (*n = 67*) of the Advocacy Coalition Framework (ACF) to climate change, we aim to examine patterns across these applications of the ACF, particularly concerning the characteristics of coalitions, how they behave, change policy, and learn. We conclude that future studies should examine how coalitions and beliefs can better address wicked problems in an increasingly global and interconnected world. We propose the prioritization of studying non-democratic governance arrangements and underrepresented locations of study, pairing the ACF with other theories and frameworks to address complex questions, and prioritizing normative dynamics of climate change politics.

Keywords: Policy process, Comparative public policy, Meta-review

Introduction

The world faces grand challenges that threaten socio-economical, ecological, and political systems. Inequities, insurrections, invasions, and illiberal democracies represent a sample of the population of problems facing life as we know it. Paramount among these problems lie climate change, caused principally by human activity of burning fossil fuels. A problem of global and historic proportions, climate change affects all life on Earth, and the ways we — as societies — think about, talk about, and act will shape the future on this planet. Of course, climate change does not exist independently of us. We relate to this problem. We understand the impacts of this problem through our personal and professional lived experiences. We might assign social or economic values to any nonliving and living entity affected by climate change. We might use the

natural and physical sciences to understand the severity of climate change's effects, link together explanations of its causes, and project its trajectories. Similarly, we might use the social sciences to understand better the dilemmas inhibiting or enabling collective responses.

This paper examines the political contestation over climate change through the Advocacy Coalition Framework (ACF) (Jenkins-Smith et al. 2018; Sabatier 1988). The ACF is a robust and well-tested framework that enlightens our understanding of climate change debates and policymaking by bringing attention to how individuals form coalitions and engage in various political strategies to learn and influence policy. We use the ACF as a social science "lens," or a way of understanding an issue through standardized assumptions in approaching complexity that leads to collective gains in knowledge and maybe inform how to act. This is a critical perspective for understanding climate change policy, as coalitions comprise the political forces that drive policy change or stasis sub-nationally, nationally, and internationally.

*Correspondence: kayla.gabehart@ucdenver.edu
School of Public Affairs, University of Colorado Denver, Denver, USA

The ACF emerged from political science to describe and explain contentious public policy choices, meaning the waxing and waning of political discord and dissensus over government actions and inactions. With more than thirty years of research under its theoretical umbrella, researchers have used the ACF to describe and explain how people, organizations, and governments coordinate their behavior into coalitions of allies by common beliefs and values to influence the course of society through public policy decisions. With allies come opponents, and the ACF specializes in producing knowledge about the nature of interactions between friends and foes when public policies are under dispute. Additionally, the Framework emphasizes the propensity for people and their associated coalitions to learn and adapt to signals in their environment, particularly scientific and technical information that might be produced and distributed by their allies or opponents.

The number of applications where researchers have used the ACF to understand contentious coalitional politics and policy issues counts in the hundreds worldwide (Jang et al. 2016; Li and Weible 2019; Nohrstedt and Olofsson 2016; Pierce et al. 2017; Weible 2008; Osei-Kojo et al. 2022). However, a meta-review that examines the applications of the ACF to climate change specifically has never been attempted. Because of the coalitional nature of climate change politics, this paper aims to examine what we can learn about the successes and failures of these coalitions, and how we might learn from them. The ACF is particularly well-suited to do this, considering its emphasis on coalitions and coalitional politics, as well as the variety of applications in this sample that represent a diversity of articles across various disciplines, different countries, and different governmental contexts. This paper draws insights from the ACF's research reservoir to help understand climate change and how coalitional politics either drive or inhibit policy to address climate change in a meaningful and comprehensive way. We begin with a brief synopsis of the ACF. We then review all ACF applications to climate change to date ($n = 67$) and synthesize the lessons learned from this research. We conclude by laying out an agenda for future research and some general strategies for addressing climate change from an ACF perspective.

Overview of the Advocacy Coalition Framework

To help convey the lessons from ACF applications and their applicability to climate change, particularly concerning the behavior of coalitions, we introduce the basic tenets of the "Framework."[1] Any framework is a collection of ontological concepts related to various theoretical interactions, often called "hypotheses," "principles,"

"expectations," and so on. Researchers adopt these concepts to help learn and communicate about an issue within a particular scope, as described by the types of questions typically asked and answered under the Framework (Lakatos 1978; Lauden 1978). All frameworks emerge initially from empirical observations and, over time, as evidence and insights accumulate, are updated. Sometimes this happens through refutation and confirmation of hypotheses or better-contextualized understandings of behaviors. Of course, the threat of a framework is the imposition of a conceptual lens on the context by overly distorting interpretations and shackling any emergent or contextualized insights. Thus, a framework is best applied as a complementary aid to understanding, not as a sole source. Ideally, frameworks should complement other scientific approaches, reflexively from the researcher, or both.

The ACF extends the gaze beyond traditional government institutions (e.g., a parliament or legislature, courts, executive offices, bureaucracies) to include the whirlpool of entities of the formal and informal groups and organizations who seek influence on public policies (Griffith 1939), and eventually coalesce into coalitions. These entities might include government officials (both elected and administrative), informal collections of active citizens, formally registered nonprofits, large multinational corporations, universities, think tanks, and news sources. The ACF calls those entities actively engaged in policy issues "policy actors." Ultimately, this involves fundamental questions of how people and associated groups relate to governments and vice versa, as might be found, for example, in corporatist or pluralist arguments (see McFarland 2004; Schmitter 1974). By examining the interactions among formal and informal groups or organizations within and outside of government, the ACF broadens our perspective beyond the electoral system found in democracies that often consume the attention in political science. Instead of focusing on such electoral systems, it focuses on subsets called a "policy subsystem" that deals with particular issues, such as climate change. Policy subsystems exist at national and subnational scales, especially in federally structured governments, overlap with other policy subsystems, and evolve and change over time as problem definitions shift and new ideas and people emerge.

The ACF assumes these entities (people and organizations) will form alliances (called "advocacy coalitions") based on shared values and beliefs and realize those values and beliefs in society, often through public policy. The ACF models these in a belief system wherein the most important for forming and maintaining coalitions are "policy core beliefs," a collection of general values and beliefs about causes, problem severity, policy preferences, and more. Resistant to change, policy core beliefs are the glue that binds coalitions together. Examples of policy core beliefs include belief

---

[1] This synopsis of the ACF is based on more detailed accounts, see Jenkins-Smith et al. (2018).

Gabehart *et al. Climate Action*   (2022) 1:13

Page 3 of 14

in the severity and anthropomorphic causes of climate change, valuing the welfare of those affected, preferences over mitigation and adaptation policies, and more. Unlike political parties, advocacy coalitions are rarely formal entities (Weible and Ingold 2018). Their networks vary from deliberate coordination of political activities to implicit alliances where allies settle into roles and niches that complement each other. For instance, some coalition "members" might deploy outsider tactics by organizing protests and shaping public discourse, while others might deploy insider tactics by working with governments to design regulations.

Many social science theories begin from a positive pole of human nature with baseline assumptions of existing cooperation, trust, and willingness to communicate in collaborative settings, simplistic portrayals of people who quickly access and process information and knowledge without biases. The ACF begins from the opposite and negative pole. In more adversarial settings, it assumes that people respond to threats by viewing their allies as angels and opponents as devils, processing information through value-based biases, and an unwillingness to compromise (Gronow et al. 2022; Sabatier et al. 1987). Thus, advocacy coalitions tend to show stability over time (Markard et al. 2015; Sotirov et al. 2021; Szarka 2010; Winkel et al. 2011; Weible et al. 2020), "learning" from information tends to reinforce positions than change them (Weible et al. 2022), and policy change is inhibited by intransigent political conflict (Elgin 2015a, b).

It is not that people cannot reach collective decisions; instead, nontrivial barriers obstruct the expression of what might be deemed a more virtuous side of human nature. Change under the ACF can be rare. Policy change is most likely to occur, from an ACF perspective, through changing circumstances in the policy subsystem exploited by one or more advocacy coalitions. Coalitions might exploit events or shocks happening outside or inside a policy subsystem (e.g., Nohrstedt and Weible 2010). Alternately, opposing coalitions might choose to negotiate, particularly when they have exhausted all other options and are dissatisfied with the status quo. Learning too might lead to changes in policy, especially during moments of intermediate intensities of conflict and when the decision-making setting is based on fair and transparent rules of information exchange.

The ACF posits testable hypotheses (see Jenkins-Smith et al. 2018). Instead of listing each of them with elaborations, we synthesize them in the following vignette:

In high conflict situations, policy actors will coordinate their political behaviors among allies in advocacy coalitions to influence public policy while their opponents will do the same. Coalesced by their policy core beliefs and showing stability over time, these advocacy coali-

tions engage in debates and argumentations, with most learning occurring among individuals within the same advocacy coalition. However, this usually leads to more reinforcement than a change in their beliefs. In contrast, learning rarely occurs between coalitions, possibly leading to changes in beliefs. Some policy actors, particularly policy brokers, might facilitate cross-coalition learning and the possibility of agreement on policies. Given the friction in policymaking, advocacy coalitions need to exploit opportunities through events internal and external to the policy subsystem, the rare situations of cross-coalition learning, and sometimes negotiated agreements to achieve their policy goals.

Not all applications of the ACF test and explore this entire vignette. Oftentimes, an application might focus on forming advocacy coalitions or exploring the factors preceding an instance of policy change. However, a population of applications offers a means to assess more of this vignette to learn through refutation and confirmation, better incorporate in the vignette what has been missed, and articulate what we know, including the level of confidence and gaps in knowledge. Using the ACF, we aim to determine what this framework has taught us about coalitions and how coalitional politics operate in climate change policy in policy domains and locations across the globe.

Methods and materials

This analysis is based on sixty-seven empirical applications of the ACF to climate change across the globe. Only peer-reviewed journal articles were included in this sample, excluding doctoral dissertations, book chapters, and policy reports and analyses (see also Pierce et al. 2017; Weible et al. 2009).

Our sampled articles specifically examine applications of the ACF to climate change policy at the subnational, national, and/or international level and, in some cases, in a comparative context. While these articles may address policy realms including energy, forestry, water, etc., they are included in the sample as the coalitions in those subareas impact climate change policy.

Articles were collected between October and December 2021. A search was first conducted using the library database with the following search parameters: (1) the search terms "Advocacy Coalition Framework" and "climate change," "climate," or "global warming" in the abstract or the keywords; (2) English-language only publications; and (3) limited to peer-reviewed journal articles. No additional filters were included. This initial search yielded a sample of forty-six articles. We then searched Google Scholar with the same search terms, though because Google Scholar has fewer search delimiting options, these search terms

returned articles with the keywords anywhere in the text of the article. By manually combing through several hundred additional articles and excluding those obtained through the library database and those that did not fit our established criteria, the Google Scholar search yielded an additional twenty-one articles, for a total sample of sixty-seven empirical applications.[2]

We used the library database, our institution's research repository, in the first stage as it facilitated the filtering out of work that did not accurately reflect our search criteria. However, by conducting a further search through an unfiltered Google Scholar search, we are confident that we have included all relevant articles that the library database search may have excluded.

We included only peer-reviewed articles for the following reasons: to maintain consistency with similar studies (Pierce et al. 2017); to avoid the possibility of duplication of similar ideas from the other non-peer-reviewed formats, such as dissertations or conference papers; and practically, to increase the ease of systematic analysis from numerous climate change studies by facilitating document sharing and limiting document length.

To analyze applications, we adapted a codebook to facilitate comparison (see the Table 2 in Appendix). The codebook was created based on previous codebooks used for systemic review of ACF applications (Jang et al. 2016; Li and Weible 2019; Pierce et al. 2017; Weible et al. 2009). We added the category "Type of Response" (mitigation, adaptation, transition, or general response) to capture the type of response employed by pro-climate coalitions to combat climate change and climate change-related issues.[3] To ensure reliability, coding was done in small batches across the authors, shared, and examined for consistency. Our analysis drew on the constant comparison method (Glaser 1969). The main points and key arguments were summarized, articles were then read thoroughly to discern the details and methodology that yielded the key lessons, and, finally, synthesized findings were reported below in the "Discussion: analyzing coalitions and coalitional politics from the ACF applications about climate change" section.

Results: summarizing the ACF applications on climate change

We summarize the results of the sixty-seven ACF applications in three sections: a summary of ACF applications, a summary of ACF theoretical components and approaches, and a summary of how climate change is addressed across the articles.

Summary of ACF applications

The summary of the applications is reflected in Fig. 1. There is a substantial uptick in applications of the ACF to climate change beginning around 2010–2011. From 2000, the publication year of the first climate change application, to 2009, only five applications were published, a mean of 0.5 articles per year. This is compared to sixty-two applications published between 2010 and 2021, a mean of 5.2 articles per year. This uptick potentially indicates increased concern in the social sciences regarding environmental issues and, perhaps more likely, the usefulness of the ACF to study and address these issues.

The data that indicate both author and study locations are heavily skewed towards Europe and North America. The applications represent thirty-three studies in Europe and eighteen in North America, with fifty papers by authors representing institutions in Europe and twenty-two in North America. Applications in Asia represent the next largest number of author and study locations at eight and eleven, respectively, though Asia, Africa, Australia, and South/Central America are underrepresented. Since we only reviewed articles published in English, this phenomenon may be of language origin.

The sample includes three articles where climate change is studied as a global problem, reflecting its transboundary nature. These geographic gaps in the research represent potential for future research. Namely, more work is necessary in Asia, Africa, and South/Central America, as a larger proportion of the world's most vulnerable populations live on these continents and will be most acutely impacted by climate change.

The majority of the applications were published in policy, political science, or environmental science journals (*n=43*). The remaining twenty-four applications represent journals across a range of disciplines, including public administration and management (*n=5*), sustainability (*n=5*), energy (*n=7*), ecology (*n=3*), sociology (*n=1*), and technology (*n=1*). The remaining two applications were published in interdisciplinary journals. Thus, despite its foundations and roots in policy process research, the ACF demonstrates portability, indicating its usefulness in studying complex questions about climate change across disciplines.

Figure 1 shows a sharp increase in applications of the ACF to climate change after 2010. However, few applications occur in Asia, Africa, Australia, and South/Central America. The use of the ACF to analyze climate change as a global problem rarely happens. The ACF also shows portability outside its home disciplines, political science, and related public administration and management fields.

---

[2] While we did meet many of the PRISMA criteria (Page et al. 2021), we did not specifically use the PRISMA approach, as we relied on an established method used in similar studies (e.g., Pierce et al. 2017; Weible et al. 2009, Li and Weible 2020). Though we did not perform a meta-analysis, we have clear and replicable criteria to include or exclude articles in our population and to develop our codebook.

[3] The code form is available upon request from the authors.
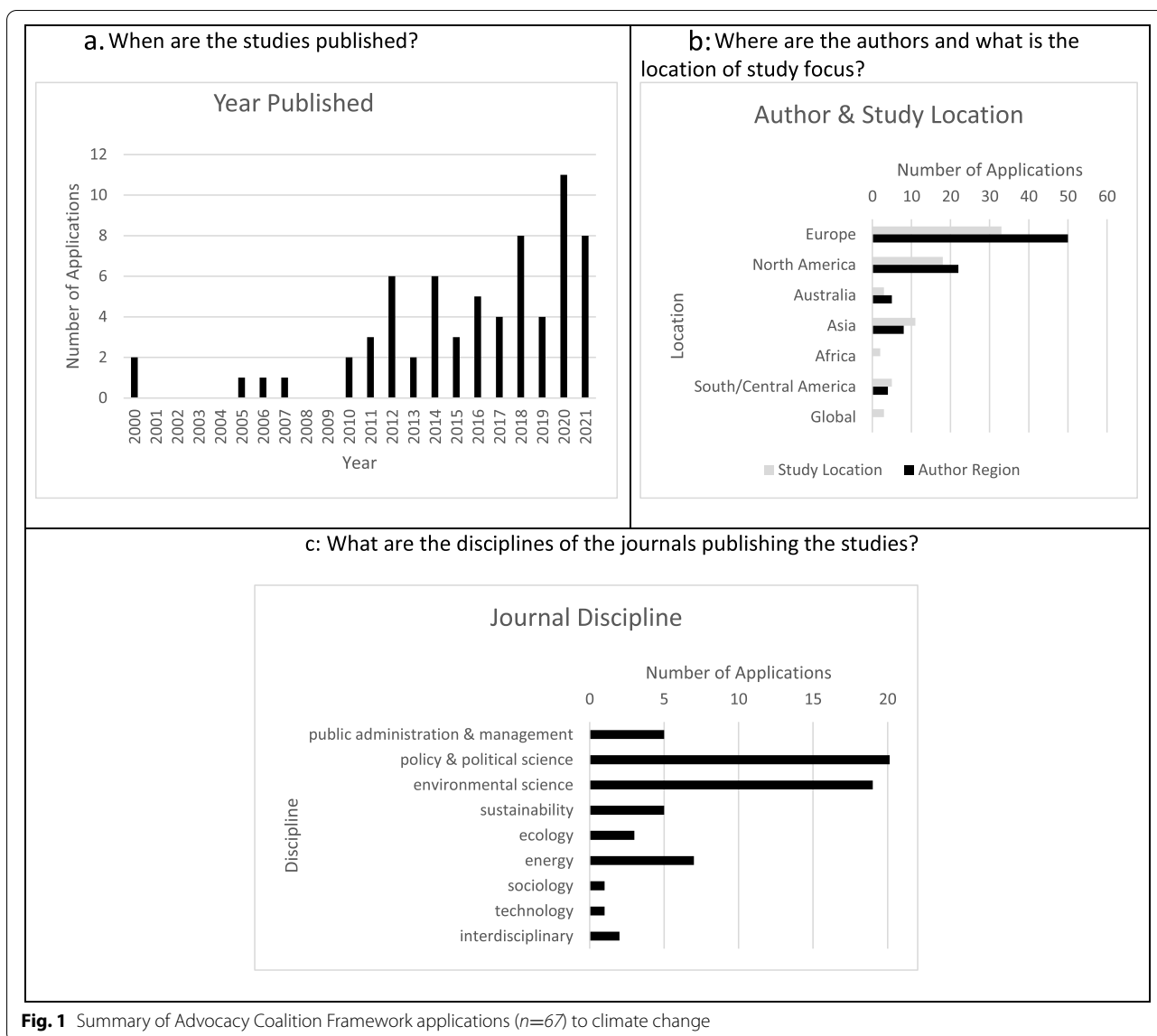
Fig. 1 Summary of Advocacy Coalition Framework applications (*n=67*) to climate change

Summary of ACF theoretical components and theoretical approaches

While the depth of the utilization of the ACF varies across the applications, the sample of articles explores three primary theoretical components of the ACF as described in the aforementioned vignette: advocacy coalitions and beliefs, policy change, or policy-oriented learning. Table 1 summarizes the breakdown of theoretical components.

Across the applications, fifty-six (61% of theoretical components) address either coalitions and beliefs or both, over twice the frequency of use of the other two theoretical components. Twenty-four applications address either policy change (26%), and twelve address policy learning (13%). Thus, in terms of applications to climate change, the ACF is most often used to analyze coalitions and

their beliefs. This suggests that while the ACF includes several other well-tested assumptions and hypotheses, its emphasis on coalitions and their beliefs resonates the most across social science disciplines regarding using the ACF as a tool. It also indicates the importance of coalitions in climate change policy.

Table 1 ACF theoretical components across studies

ACF theoretical emphasis	Frequency	Percentage
Coalitions and beliefs	56	61%
Policy change	24	26%
Policy-oriented learning	12	13%
Total	**92**	**100%**

May have addressed one or more of the theoretical emphases; thus, the total (*n* = 92) exceeds the total number of articles in the sample (*n* = 67)
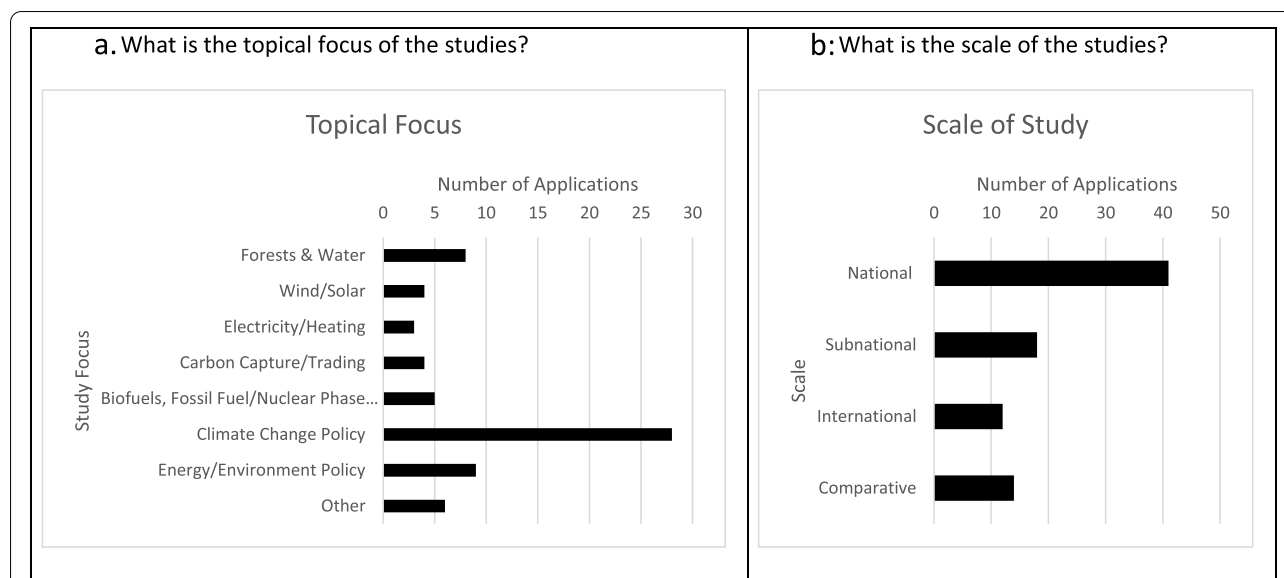
Fig. 2 Summary of how climate change is studied

The applications represent a variety of theoretical approaches to applying the ACF. Forty-three articles explicitly utilize the ACF without much modification as the theoretical lens, and six of those also add adaptations or additions. Twenty-four articles combine the ACF with other frameworks and theories. These include, for example, transition studies (Akerboom et al. 2020; Haukkala 2018), comparative politics (Aamodt 2018; Aamodt And Stensdal 2017), resource dependency theory (Elgin 2015a, b), stakeholder analysis (Koivisto 2014), actor-centered institutionalism (Hughes and Meckling 2017), and institutional path dependency (Gralepois et al. 2016), among others. Additionally, one article adapted the ACF using elements of social justice theory (Malloy and Ashcraft 2020), indicating the need to explore further the normative elements of coalitions, namely emotions and values beyond just beliefs. This, combined with other theories, suggests the flexibility of the ACF in terms of being utilized in conjunction with other theories to answer complex questions that perhaps move past one aspect of climate change policymaking. Such flexibility and portability make the ACF particularly useful in studying actor-focus, coalitional politics.

Summary of how climate change is studied

The applications vary in how they approach climate change in terms of the subsystem topic of focus, the scale of the study, the type of response (mitigation, adaptation, energy transition, or undefined/general response), and methodology, as shown in Fig. 2.

While the primary focus of all sixty-seven articles is larger climate change policy, thirty-nine articles explore this via a topical issue focus (see Fig. 2a), including forests and water (*n=8*); wind and solar (*n=4*); electricity and heating (*n=3*); carbon capture and emission trading (*n=4*); biofuels, fossil fuels, and nuclear phase-out (*n=5*); energy and environmental policy (*n=9*); and other topics including agriculture, risk management and mitigation, and air pollution (*n=6*). This finding emphasizes the interconnected nature of climate change as a problem, as its consequences impact various realms of national policymaking, a range of ecological systems, and an array of energy domains.

The scale of these climate change studies varies, from a subnational to international focus (see Fig. 2b). The majority of articles (*n=41*) explore climate change on a national scale. Eighteen explore issues at the subnational level and twelve at the international level. Fourteen articles take a comparative approach, primarily at the national level, though two articles compare subnational and multinational issues. This is notable as the ACF is most often used to analyze national or subnational issues. However, its wide use to address climate change implicates the global nature of climate change as a policy issue and suggests the ACF is well-suited to address coalitions that coalesce around policy problems at this level.

The articles' topical foci other than climate change policy specifically have a national or subnational scale of focus (Fig. 2b). The vast majority explore issues in countries with federalist systems where power is distributed vertically from federal down to local governments, perhaps indicating that there are equally interesting scenarios related to other environmental issues, that examining national-level climate policy is difficult, or that climate policy is less-developed at the national level in federal arrangements, as

is the case in the USA, for example. The exception to this trend is articles exploring the Netherlands or the Scandinavian countries, which do not have federal systems but represent articles in this subsample that explore topical foci outside climate change policy (*n=14*).

The types of responses to climate change vary across the sample. While nineteen articles did not explicitly identify the type of climate change response explored in the study, the remaining forty-eight explicitly explore one or more types of responses: mitigation (*n=33*), adaptation (*n=17*), or energy transition (*n=21*). However, the definitions of mitigation and adaptation, and to a lesser degree transition, vary across articles and are open to the author's interpretation of the particular policy or issue they are exploring. This suggests that definitions and goals regarding the consequences of climate change, whether they be mitigating or adapting, are unclear. This may have implications for policy clarity.

The majority of these ACF applications to climate change utilize qualitative (*n=40*) or mixed methods (*n=19*), though there are a few quantitative applications (*n=8*) (see Kammerman and Angst 2021). Data sources include documents and reports, news media, surveys, interviews, and researcher observations, among others. More quantitative studies would help expand our knowledge of coalitions and coalitional behavior.

Discussion: analyzing coalitions and coalitional politics through ACF applications to climate change

A deeper analysis of ACF applications to climate change provides a wealth of knowledge regarding coalitions in climate change policy. These key lessons and takeaways are explored in depth by posing four questions: (1) *What are the characteristics of advocacy coalitions involved in climate change?* (2) *How do coalitions behave?* (3) *How effective have coalitions been in achieving policy change?* And (4) *To what extent—if at all—are coalitions learning and adapting?* This analysis also largely confirms what the ACF has found across various contexts and applications in that coalitions tend to fight over time to achieve policy dominance for their position. The section concludes with possible directions for future research.

What are the characteristics of advocacy coalitions involved in climate change?

The structure of coalitions is crucial in understanding how policy actors coalesce around climate change as a policy issue, pursue policy solutions, and interact with allies and opponents. Regardless of subsystem and governing system, most applications identified two advocacy coalitions. These coalitions tended to represent either a pro-climate position in favor of mitigation or adaptation policies or an anti-climate position in opposition to climate-conscious policies.

Depending on the topical foci explored, these coalitions differed in their specific policy preferences and structure. In other words, pro- and anti-climate coalitions manifest in a panoply of coalitional descriptions. Highlights include:

- Pro- and anti-coal phase-out coalitions in the Netherlands (Akerboom et al. 2020)
- Pro-oil status-quo coalition and anti-oil challenging coalitions in Norway (Bang and Lahn 2020)
- Fossil fuel and sustainability coalitions in the Dutch electricity sector (Dekker and van Est 2020)
- Economy first and pro-environment coalitions in the energy debate in Victoria Australia and in Sweden (Edmonds 2020; Newell 2018)
- A status-quo economic coalition and energy security coalition in Hawaii (Edmonds 2020)
- Pro-economy and pro-ecology coalitions in Swiss climate policy (Ingold 2011; Ingold and Fischer 2014; Ingold and Gschwend 2014)

The descriptions reflect the choice of the researcher to concentrate their study on a part of the complexity of climate-related issues and the diversity of political forces that have mobilized around climate change issues in different parts of the world. It, thus, lends evidence of the rippling effects of climate change politics in any governing system, from electricity to energy security (Dekker and van Est 2020; Edmonds 2020; Lindberg and Kammermann 2021; Rietig 2016; Roßegger and Ramin 2012).

The pro-climate conscious coalition often included environmentalists, environmental and climate non-governmental organizations, research institutes, pro-climate politicians and bureaucrats and green parties, academia, non-profits, and environmentally friendly business (Aamodt 2018; Aamodt and Stensdal 2017; Edmonds 2020; Elgin 2015a, b; Higa et al. 2020; Stensdal 2014; Weiss et al. 2017).

The anti-climate coalition was generally composed of pro-business/industry and pro-economic growth groups that emphasized the negative economic impacts of policies to deal with climate change (Aamodt and Stensdal 2017; Bulkeley 2000; Edmonds 2020; Higa et al. 2020; Ingold 2011; Ingold and Fischer 2014; Ingold and Gschwend 2014; Ingold and Varone 2012; Kukkonen et al. 2017; Kukkonen et al. 2018; Markard et al. 2015; Niederberger 2005; Rietig 2016; Roßegger and Ramin 2012; Ruysschaert and Hufty 2020; Winkel et al. 2011; Ydersbond 2018). These groups often represented the status quo, opposed to transitioning away from fossil fuels (Akerboom et al. 2020; Babon et al. 2014; Bang and Lahn 2020; Gottschamer and Zhang 2020;

Hudson 2019; Pollak et al. 2011; Wagner and Ylä-Anttila 2018).

While business and industry typically sided with the anti-climate coalition, this was not always the case in countries with more advanced transitions to renewables where business and industry benefitted from furthering climate-friendly development, as is the case in several European Union countries (Dekker and van Est 2020; Lindberg and Kammermann 2021; Patt, val Vliet, Lilliestam, and Pfenninger 2019; Szarka 2010). Additionally, green business was often identified as a member of the pro-climate conscious coalition in studies with a subnational focus (Elgin and Weible 2013; Knox-Hayes 2012). Differing from other coalitions, Edmonds (2020) presents a particularly unique case in Hawaii in which the status-quo coalition is being challenged by an energy security coalition led by the public utility interested in diversifying the composition of the island's energy grid.

When researchers identify more than two coalitions, they often identified an independent or adaptation coalition consisting of government affiliates or scientists (Gronow et al. 2019; Gronow and Ylä-Anttila 2016; Kukkonen et al. 2017; Niederberger 2005; Ulmanen et al. 2015). Governments siding with either the pro- or anti-climate coalition vary across applications. However, legitimation of a coalition via government action and/or legislation improves the success of coalitions in terms of their hegemony in the climate change policy space (Francesch-Huidobro and Mai 2012; Karapin 2012; Li 2012; Kwon and Hanlon 2016; Lovell 2007; Pollak et al. 2011; Roßegger and Ramin 2012).

Some applications indicated that government support for pro-climate conscious coalitions is critical to promote their acceptance by the general public; the push for centralization is critical to achieving legitimation, then decentralization is necessary to promote subnational implementation (Haukkala 2018; Mann and Gennaio 2010; Milhorance et al. 2021; Niederberger 2005; Stensdal 2014;). Government support for anti-climate conscious coalitions has the potential to severely hinder pro-climate coalition progress, particularly when business and industry are affiliated with the anti-climate coalition (Gronow and Ylä-Anttila 2016; Ylä-Anttila et al. 2020). Evidence from Indonesia and Vietnam indicates that governmental actors may also be more influential than other actors at influencing belief change (Gronow et al. 2021).

How do coalitions behave?
The ACF expects advocacy coalitions, given their value-based origins, will show stability over time, an argument confirmed across many settings and studies (Weible et al. 2020). When looking at coalition behavior across the applications, in many cases, coalitions and their policy

core beliefs remain stable over time (Markard et al. 2015; Sotirov et al. 2021; Szarka 2010; Winkel et al. 2011). Additionally, congruence on policy core beliefs appears to sustain coalitions and bind together actors with shared beliefs, sometimes for decades (Ingold 2011; Ruysschaert and Hufty 2020). From a different perspective, inter-coalition instability characterized by policy core belief incoherence compromises coalitions, even with dense network ties (Gronow et al. 2019).

In conjunction with coherent policy core beliefs, broad collaboration among allies also appears to be important in maintaining stable coalitions (Howe et al. 2021; Ingold and Fischer 2014). Interacting with allies, consensus building, advanced information management, and cooperation structures facilitated effective collaboration and broadening coalitions (Gronow and Ylä-Anttila 2016; Gronow et al. 2019; Ingold and Fischer 2014; Satoh and Gronow 2021). Policy brokers can also play a significant role in mediating beliefs and facilitating collaboration, as can organizational resources and influence (Gronow and Ylä-Anttila 2016; Ylä-Anttila et al. 2020). On the other hand, in terms of interacting with opponents, Elgin (2015a, b) suggests a roughly equal number of interactions with both allies and opponents, though extreme beliefs present a barrier to interactions and any potential coordination or cooperation. However, across the articles, interactions with opponents are understudied. Moving forward, a study of cross-coalitional dynamics is important for understanding the factors that prevent collaboration and for examining directions for overcoming group cleavages.

How effective have coalitions been in achieving policy change?
Regarding coalition effectiveness and policy change, broad coalitions appear to be more effective when taking advantage of a critical juncture, policy window, or opportunity structure (Aamodt 2018; Aamodt and Stensdal 2017; Edmonds 2020; Setiadi and Lo 2016; Wellstead, Davidson, and Stedman 2006; Ydersbond 2018). In terms of operationalizing such effectiveness, Ruysschaert and Hufty (2020) identify four criteria that indicate effective coalitions; they "1) sustain an action for over a decade; 2) learn from own past failures marked by the evolution of their policy core beliefs; 3) take an advantage over economic power by acting strategically and timely when changes occurred; and 4) closely monitor and disseminate knowledge and learning, helping the coalition to change its behavior and act strategically" (p. 1). Opportunity windows can take the form of existing environmental movements (Aamodt and Stensdal 2017), changing of government, and new scientific information (Aamodt and Stensdal 2017; Stensdal 2014). This confirms expectations that events, broadly defined, do not lead to policy change

Gabehart *et al. Climate Action*   (2022) 1:13

Page 9 of 14

by themselves; they require a coalition to exploit them, and even when this happens, policy change remains difficult and infrequent due to the difficulties associated with implementing sweeping political change, particularly in the face of path-dependent economic interests.

Both internal (von Malmborg 2021) and external shocks can catalyze these opportunities, though stable coalitions are more resistant to external shock (Knox-Hayes 2012; Markard et al. 2015). For example, Markard et al. (2015) show that while coalitions in Switzerland currently remain stable after debate surrounding energy sources and the country's energy transition was sparked following the Fukushima nuclear disaster, belief heterogeneity in support of the transition to clean, non-nuclear energy has solidified among the public. This leaves a window open for the pro-ecology coalition to solidify their position in the face of widespread public uncertainty around nuclear energy and a desire to transition to clean and safe energy sources. Similarly, public protest can also create policy windows and legitimate coalitions (Lintz and Leibenath 2020). The role of public pressure, however, necessitates more exploration in the context of climate change and the ACF, particularly in regard to the conditions that facilitate effective public protest, and how those protests intersect with coalitional politics.

Recent research by Gottschamer and Zhang (2020) on the renewable electricity transition in California indicates that when two stable and strong coalitions compete for dominance in a policy space, such competition drives policy instability and volatility, where policy decisions are inconsistent as are "policy enactment and lifespan" (p. 1). In this scenario, the fossil-fuel lobby is generally successful at repealing renewable incentives, but electricity capacity issues are simultaneously driving the uptake of renewables. The authors acknowledge the novelty of this finding and identify it as an area for future research.

Research also indicates that policy change can be catalyzed by interested policy brokers when they have a reasonable amount of political power and influence and can feasibly mediate across coalitions (Faling and Biesbroek 2019; Higa et al. 2020; Ingold 2011; Ingold and Varone 2012; Ylä-Anttila et al. 2020). For example, in Swiss Climate policy, policy change in stalemate situations is only possible when mediated by a policy broker (Ingold 2011; Ingold and Varone 2012).

To what extent—if at all—are coalitions learning and adapting?

Across the applications, coalitions appear to be undergoing a moderate amount of learning, as identified by the authors of the sample articles, though for the most part, coalitions often remain stable and, to some degree, stagnant if policy learning is not catalyzed by, for example,

network connection, cooperation, and information sharing (Bulkeley 2000; Gronow et al. 2021; Pattison 2018; Ylä-Anttila et al. 2020). Consensus building, changes in public opinion, and scientific and expert knowledge are the most common drivers of policy learning in this sample. Consensus building across opposing coalitions can also help to change belief systems (Szarka 2010; von Malmborg 2021). As discussed above, shifts in public opinion can also force learning and belief change (Bang and Lahn 2020). Additionally, scientific knowledge and analytically traceable issue discussion in a professionalized forum can also facilitate belief change (Stensdal 2014; Ulmanen et al. 2015).

While science, as often depicted as an objective and politically neutral form of knowledge, can play an impartial and independent role (Hansen 2013; Ingold and Gschwend 2014; Niederberger 2005; Swarnakar, Rajshri, and Broadbent 2021), these applications echo the broader observations of science politicization (Ingold and Gschwend 2014; Kukkonen et al. 2017; Litfin 2000; Niederberger 2005; Rietig 2016). Scientist and science-based experts (along with their associated scientific, technical, and expert-sourced information and knowledge) serve and interact with anti- and pro-climate change coalitions. Given the importance of science as a source of legitimacy in making government decisions (e.g., the discourse "based on science"), it becomes the raw materials in contributing content found in debates, argumentations, and acts of persuasion in circles of allies within a coalition, in back-and-forth debates between coalitions, and in seeking influence in shaping shifts in attention, problem perceptions, and policy preferences among the public and in forming the choices and non-choices of governments. Indeed, research on environmental issues under the ACF documents how scientists become more central within a coalition network the higher the conflict, showing both the need for scientific information in political debates and how that same scientific information might wrap policy conflict in a façade of scientific and technical uncertainty and disagreement when the foundations of such policy conflicts source to value-based disagreements (Sabatier and Zafonte 2001; Weible et al. 2010).

In climate change issues, scientists and experts sometimes assume the role of strategic policymakers, though their role is largely impacted by subsystem politics (Ingold and Gschwend 2014). Coalitions tend to fit science into their particular beliefs and selectively incorporate that which fits their beliefs and agendas (Hansen 2013; Litfin 2000). In other words, this suggests a link between the standpoints found in scientific disciplines and policy actor beliefs, so environmentalists might align with ecologists while pro-business affiliates might align with economists (Barke and Jenkins-Smith 1993; Weible and Moore 2010).

Science and expert knowledge can function as an informal (Hansen 2013) or formal component of a coalition. Science, like government, can also be a driver for climate change policy in some contexts, as was the case in China and Brazil, where scientific knowledge regarding climate change pushed the government to transition rapidly towards more sustainable environmental policies and practices (Aamodt 2018; Aamodt and Stensdal 2017; Stensdal 2014). In many contexts, science-driven climate change policy also incorporates expert actors across sectors and local, national, and international decision-making levels (Ingold and Fischer 2014). Though we lack controls and measures across these political systems, the evidence reinforces expectations that the constructive, instrumental, and destructive use of science depends on the political system being collaborative, adversarial, or authoritative (Jenkins-Smith 1990; Weible 2008).

While the literature supports consensus building, changes in public opinion, and scientific and expert knowledge as drivers of policy learning, the processes and mechanisms that drive learning remain poorly understood. Additionally, as suggested by Gronow et al. (2021), future research should prioritize analyzing whether mature policy subsystems and their associated coalitions are more resistant to policy learning than nascent ones. Additionally, research should also prioritize whether interdependencies regarding climate change and its associated issues across scales (i.e., subnational, national, international) are forcing policy change, as Litfin (2000) asserts, "the twin phenomena of economic globalization and the internationalization of environmental affairs are blurring the distinction between some policy subsystems and the international arena. Thus advocacy coalitions should be understood as operating increasingly along 'the domestic-foreign frontier'" (p. 236).

Summary: coalitions and climate change

In sum, the applications of ACF on climate change essentially confirm the vignette laid out in the summary of the framework but with nuances. First, we tend to find competing coalitions (usually two) that form around shared values and beliefs and remain stable over time. These coalitions consist of a plurality of policy actors inside and outside government. Second, we confirm the ACF's pathways to policy change involving coalitions capitalizing on the circumstances and overcoming change resistance. Third, we see learning and science furled into politics, leading to belief reinforcement across coalitions as scientific knowledge is politicized and used piecemeal to support the positions of various coalitions.

The nuances of climate change emerge in the diversity of coalitions and the elevated importance of science and experts in these politics (compared to, for example,

issues anchored more to morality issues). Climate change also mobilizes coalitions across a broad range of subsystem issues, from forests and water to nuclear phase-outs to energy systems, and in forums across scales from the subnational to global.

Conclusion

This paper aimed to examine climate change through the research guided by the ACF in order to specifically examine how coalitions and coalitional politics succeed or fail regarding climate change policy. Using sixty-seven applications of the ACF to climate change, we analyzed how climate change as a contentious policy issue has catalyzed coalition formation and how these coalitions behave, spur policy change, and learn and adapt. Through a close examination of these applications, both through our bibliometric and coalition and coalitional politics analyses, we examined what we know, what we can reasonably study more deeply, and lessons for moving forward. Moving forward, we recommend focusing on the following three areas in future research agendas: the prioritization of understudied contexts such as non-democratic governance arrangements and underrepresented locations of study, the combination of the ACF with other theories and frameworks to address complex questions, and the prioritization of the study of normative dynamics of climate change politics.

An agenda for future research

First, while our bibliometric analysis of our applications of the ACF to climate change reveals a great deal about how coalitions form, the actors that comprise coalitions, their beliefs, how they behave, and whether or not they learn, there remains a wealth of unexplored and underexplored directions for future research. More applications are needed in underrepresented areas, notably Africa, Asia, South and Central America, and non-democratic contexts, as the ACF does not assume a democratic governance system (Aamodt and Stensdal 2017). Future studies could also examine how governmental arrangements impact coalitions and their effectiveness, as most current literature is focused on democratic governance systems. More applications are needed that specifically explore the role of science, how coalitions communicate with opponents, the role of public pressure, and the "domestic-foreign frontier" (Litfin 2000). Longitudinal studies provide a viable lens through which to study coalition adaptation and the mechanisms that drive policy learning, particularly in regard to policy learning that results in cross-coalitional cooperation and/or policy change.

Second, applications of the ACF to climate change should continue to supplement it with other theories and frameworks to fill particular theoretical needs, particularly transition studies, comparative environmental studies, and

political process studies. Our bibliometric analysis indicated that this happens frequently across social science disciplines in studies that employ the ACF. For studying climate change, these additional frames of inquiry appear to supplement the explanatory power of the ACF in a meaningful way. Climate change is a complex, transboundary problem, and thus, research questions are inherently nuanced and may necessitate pulling from various corners of social science for frameworks and theories that can adequately be utilized together to address such questions.

Finally, ACF applications to climate change should prioritize the study of more normative dynamics. Namely, none of the applications addresses the role of emotions in coalition building or their impact on policy, though recent scholarship highlights the role of emotions in policy and politics (Durnová 2018; Durnová 2019; Durnová 2022; Pierce 2021). While understudied empirically, emotions undergird all of our decisions, both individually and collectively, and contribute to belief formation. One article in the sample (Malloy and Ashcraft 2020) combined the ACF with social justice theory to examine and integrate just climate adaptation that considers and includes the voices and needs of the most vulnerable, whom climate change will impact most acutely (see Heikkila and Jones 2022). These and other normative questions are necessary to explore to understand belief formation, belief change, and belief reinforcement to continue pushing both the ACF and what we know about climate change forward.

What can the ACF teach us about climate change?
We end this paper with recommendations on how the ACF can inform how society responds to climate change. First, we need to recognize our tendency to oversubscribe to the angelic side of humanity and undersubscribe to the wicked side of humanity. Of course, people are capable of altruism, cooperation, and trust in some circumstances. Yet, when values are in dispute, we tend to exhibit polarization, coalitional politics, political uses of information, and belief reinforcement. Thus, in the face of pressing climate-related consequences, rather than moving toward grand political action, global inaction instead leaves the impacts of climate change to compound as it worsens.

Second, starting from the more wicked side of humanity, we realize that more information might not lead to change but exacerbate differences. We are better off focusing on our underlying differences in values, realizing how those values are furled into identities. The strategy then becomes less about adding more information to the debate, but more about establishing a path towards the aforementioned situation where people have the trust, cooperation, shared understanding, and institutional setting to discuss differences. We will never remove advocacy coalitions from our politics, nor should we remove

the deliberative dynamics that accompany coalitions, but we can minimize their tendencies to inhibit collective action. This also requires investing in our broader political environment, including addressing threats to democracies; extreme economic inequities; and racial, ethnic, and other forms of discrimination. It also involves nurturing leaders as brokers, co-production of knowledge, and establishing settings conducive to learning and negotiations (Jenkins-Smith et al. 2018; Torfing et al. 2021).

Third, we must also recognize the increasing interconnectedness of humanity and its wicked problems across geographic scales of inquiry. The most insidious problems of society—climate change, poverty, income disparity—are increasingly global problems. Even subnational issues in these areas can have ripple effects in a globalized, international arena. Appropriately addressing these global issues will require us to examine our own beliefs, coalitions, and behavior towards our opponents and analyze and internalize how we can restructure these to acknowledge the macro-level nature of these wicked problems. In other words, the ACF's focus on a policy subsystem mostly neglects the impacts of climate change across other societal issues. We need to broaden our lens by examining the interconnected parts that comprise the climate change issue. This might require analysis of climate change, not just the associated and regularly studied environmental issues (as shown in Fig. 2a) but also associated and rarely studied socio, cultural, and economic issues.

The ACF and its applications to climate change demonstrate that coalitions can indeed learn, change, and collaborate across belief cleavages. Particularly in the European context, lessons abound regarding pro-climate conscious coalitions successfully achieving dominance, mobilizing public support for climate-friendly behavior, and implementing successful energy transitions. While it is difficult, pro-climate policy change is possible across government arrangements and types. For example, China has demonstrated the possibilities of coalitions harnessing scientific knowledge to drive climate-conscious behavior in non-democratic contexts. California and Hawaii in the USA present subnational success stories in a federalist system. We should prioritize these lessons in dealing with climate change, advising policymakers, and creating and implementing policy. We should analyze what works and what does not and how coalitions can spearhead innovative, inclusive solutions in developing countries and areas where climate change will most acutely impact the most vulnerable of the world.

Moreover, the ACF also presents important lessons outside of public policy regarding how individuals and groups of individuals that coalesce around a particular set of beliefs treat each other within coalitions, how they treat their allies, and how they treat their opponents. Beyond studying policy and politics, the

Gabehart *et al. Climate Action*   (2022) 1:13

Page 12 of 14

ACF allows us to understand human and group interactions, how we treat one another when deeply held beliefs are at stake, and the consequences therein. The ACF could feasibly be adapted to examine such human interaction across a range of social sciences, most notably, sociology, psychology, and economics, in the context of the research questions and methods of those particular disciplines. The flexibility and portability of the ACF allow for such use in various disciplines. Thus, whether in policy studies or in the human interactions that drive many decisions inside and outside of policy, wicked problems require complex, nuanced solutions, and the ACF seems to be well-suited to help us discern how coalitions can achieve these solutions.

Appendix

Table 2

Table 2 Coded categories for the analysis of ACF applications

Coding variable	Coding categories
Basic information	Title Author(s) Full Citation Publication year Journal Author location Publication location Abstract
Theoretical	ACF theoretical focus Outline of hypotheses
Empirical	Subsystem topic Territorial scope (i.e., subnational, national, etc.) Location Empirical description (of coalitions) Climate change response type (i.e., mitigation, adaptation) Lessons learned
Methodological	Data type and methods of data collection Clarity of methods Methods of analysis

Code availability
Not applicable.

Authors' contributions
The author(s) read and approved the final manuscript.

Funding
Not applicable.

Availability of data and materials
The codebook is included in the Table 2 in Appendix.

References

Aamodt S (2018) The ability to influence: a comparative analysis of the role of advocacy coalitions in Brazilian climate politics. Rev Policy Res 35:372–397. https://doi.org/10.1111/ropr.12282

Aamodt S, Stensdal I (2017) Seizing policy windows: policy influence of climate advocacy coalitions in Brazil, China, and India, 2000-2015. Glob Environ Chang 46:114–125. https://doi.org/10.1016/j.gloenvcha.2017.08.006

Akerboom S, Botzen W, Buijze A, Michels A, van Rijswick M (2020) Meeting goals of sustainability policy: CO2 emission reduction, cost-effectiveness and societal acceptance. An analysis of the proposal to phase-out coal in the Netherlands. Energy Policy 138:111210. https://doi.org/10.1016/j.enpol.2019.111210

Babon A et al (2014) Advocacy coalitions, REDD+, and forest governance in Papua New Guinea: how likely is transformational change? Energy Soc 19:16. https://doi.org/10.5751/ES-06486-190316

Bang G, Lahn B (2020) From oil as welfare to oil as risk? Norwegian petroleum resource governance and climate policy. Climate Policy 20:997–1009. https://doi.org/10.1080/14693062.2019.1692774

Barke RP, Jenkins-Smith HC (1993) Politics and scientific expertise: scientists, risk perception, and nuclear waste policy. Risk Anal 13:425–439. https://doi.org/10.1111/j.1539-6924.1993.tb00743.x

Bulkeley H (2000) Discourse coalitions and the Australian climate change policy network. J Indexing Metrics 18:727–748. https://doi.org/10.1068/c9905j

Dekker R, van Est R (2020) The convergence of electricity and digitalisation in the Netherlands. TATuP. https://doi.org/10.14512/tatup.29.2.31

Durnová A (2018) Understanding emotions in policy studies through Foucault and Deleuze. Politics Govern 6:95–102. https://doi.org/10.17645/pag.v6i4.1528

Durnová A (2019) Understanding emotions in post-factual politics. Edward Elgar Publishing. https://doi.org/10.4337/9781788114820

Durnová A (2022) Making interpretive policy analysis critical and societally relevant: emotions, ethnography and language. Policy Polit 50:43–58. https://doi.org/10.1332/030557321X16129850569011

Edmonds E (2020) Climate policy, energy resources and subnational policy-making: comparative policy study of Hawaii and Victoria. J Compar Policy Anal: Res Pract 22:191–206. https://doi.org/10.1080/13876988.2019.1699698

Elgin DJ (2015a) Utilizing hyperlink network analysis to examine climate change supporters and opponents. Rev Policy Res 32:226–245. https://doi.org/10.1111/ropr.12118

Elgin DJ (2015b) Cooperative interactions among friends and foes operating within collaborative governance arrangements. Public Adm 9:769–787 https://doi-org.aurarialibrary.idm.oclc.org/10.1111/padm.12167

Elgin DJ, Weible CM (2013) A stakeholder analysis of Colorado climate and energy issues using policy analytical capacity and the advocacy coalition framework. Rev Policy Res 30:114–133. https://doi.org/10.1111/ropr.12005

Faling M, Biesbroek R (2019) Cross-boundary policy entrepreneurship for climate-smart agriculture in Kenya. Pol Sci 52:525–547. https://doi.org/10.1007/s11077-019-09355-1

Fisher DR, Leifeld P, Iwaki Y (2013) Mapping the ideological networks of American climate politics. Clim Change 116:523–545. https://doi.org/10.1007/s10584-012-0512-7

Francesch-Huidobro M, Mai QQ (2012) Climate advocacy coalitions in Guangdong, China. Adm Soc 44:43S–64S. https://doi.org/10.1177/0095399712460068

Glaser BG (1969) The constant comparative method of qualitative analysis. In: McCall GJ, Simmons JL (eds) Issues in participant observation: a text and reader. Addison-Wesley Publishing Company, MA, pp 99–119

Gottschamer L, Zhang Q (2020) The dynamics of political power: the socio-technical transition of California's electricity system to renewable

Gabehart *et al. Climate Action*   *(2022) 1:13*

Page 13 of 14

energy. Energy Res Soc Sci 70:101618. https://doi.org/10.1016/j.erss.2020.101618

Gralepois M, Larrue C, Wiering M, Crabbé A, Tapsell S, Mees H, Ek K, Szwed M (2016) Is flood defense changing in nature? Shifts in the flood defense strategy in six European countries. Ecol Soc 21:37. https://doi.org/10.5751/ES-08907-210437

Griffith E (1939) The impasse of democracy: a study of the modern government in action. Hilton Books

Gronow A, Brockhaus M, Di Gregorio M, Karimo A, Ylä-Anttila T (2021) Policy learning as complex contagion: how social networks shape organizational beliefs in forest-based climate change mitigation. Pol Sci:1–28. https://doi.org/10.1007/s11077-021-09418-2

Gronow A, Ylä-Anttila T (2016) Cooptation of ENGOs or treadmill of production? Advocacy coalitions and climate change policy in Finland. Policy Stud J 47. https://doi.org/10.1111/psj.12185

Gronow A, Ylä-Anttila T, Carson M, Edling C (2019) Divergent neighbors: corporatism and climate policy networks in Finland and Sweden. Environ Politics 28:1061–1083. https://doi.org/10.1080/09644016.2019.1625149

Gronow A, Ylä-Anttila T, Satoh K, Weible CM (2022) Of devils, angels and brokers: how social network positions affect misperceptions of political influence. J Eur Public Policy 12:1-24

Hansen J (2013) The Danish biofuel debate: coupling scientific and politico-economic claims. Sci Cult 23:73–97. https://doi.org/10.1080/09505431.2013.808619

Haukkala T (2018) A struggle for change—the formation of a green-transition advocacy coalition in Finland. Environ Innov Soc Trans 27:146–156. https://doi.org/10.1016/j.eist.2017.12.001

Heikkila T, Jones MD (2022) How diverse and inclusive are policy process theories? Pol Polit J Blog. January 26.

Higa C, Cunha M, Silveira S (2020) Coalitions towards the carbon tax in the Swedish heating sector. Sustainability 12:8530. https://doi.org/10.3390/su12208530

Howe AC, Tindall DB, Stoddart MCJ (2021) Drivers of tie formation in the Canadian climate change policy network: belief homophily and social structural processes. Soc Netw. https://doi.org/10.1016/j.socnet.2021.06.004

Hudson M (2019) What does Canute want? The 'Monash Forum' and the Australian climate deadlock. Energy Res Soc Sci 49:126–133. https://doi.org/10.1016/j.ers.2018.10.029

Hughes L, Meckling J (2017) The politics of renewable energy trade: the US-China solar dispute. Energy Policy 105:256–262. https://doi.org/10.1016/j.enpol.2017.02.044

Ingold K (2011) Network structures within policy processes: coalitions, power, and brokerage in Swiss climate policy. Policy Stud J 39:435–459. https://doi.org/10.1111/j.1541-0072.2011.00416.x

Ingold K, Fischer M (2014) Drivers of collaboration to mitigate climate change: an illustration of Swiss climate policy over 15 years. Glob Environ Change-Hum Policy Dimensions 24:88–98. https://doi.org/10.1016/j.gloenvcha.2013.11.021

Ingold K, Gschwend M (2014) Science in policy-making: neutral experts or strategic policy-makers? West Eur Polit 37:993–1018. https://doi.org/10.1080/01402382.2014.920983

Ingold K, Varone F (2012) Treating policy brokers seriously: evidence from the climate policy. J Public Adm Res Theory 22:319–346. https://doi.org/10.1093/jopart/mur035

Jang S, Weible CM, Park K (2016) Policy processes in South Korea through the lens of the advocacy coalition framework. J Asian Public Policy 9:274–290. https://doi.org/10.1080/17516234.2016.1201877

Jenkins-Smith HC (1990) Democratic politics and policy analysis. Brooks Cole, CA

Jenkins-Smith HC, Nohrstedt D, Weible CM, Ingold K (2018) The advocacy coalition framework: an overview of the research program. In: Weible CM, Sabatier PA (eds) Theories of the policy process, 4th edn. Routledge

Kammermann L, Angst M (2021) The effect of beliefs on policy instrument preferences: the case of Swiss renewable energy policy. Policy Stud J 49:757–784. https://doi.org/10.5167/uzh-207367

Karapin R (2012) Explaining success and failure in climate policies developing theory through German case studies. Comp Polit 45:46–68 41714171

Knox-Hayes J (2012) Negotiating climate legislation: policy path dependence and coalition stabilization. Regul Gov 6:545–567. https://doi.org/10.1111/j.1748-5991.2012.01138.x

Koivisto JE (2014) A stakeholder analysis of the disaster risk reduction policy subsystem in Mozambique. Risk, Hazards Crisis Public Policy 5:38–58 https://doi-org.aurarialibrary.idm.oclc.org/10.1002/rhc3.12048

Kukkonen A, Ylä-Anttila T, Broadbent J (2017) Advocacy coalitions, beliefs and climate change policy in the United States. Public Adm 95:713–729 https://doi.org.aurarialibrary.idm.oclc.org/10.1111/padm.12321

Kukkonen A, Ylä-Anttila T, Swarnakar P, Broadbent J, Lahsen M, Stoddart MCJ (2018) International organizations, advocacy coalitions, and domestication of global norms: debates on climate change in Canada, the US, Brazil, and India. Environ Sci Policy 81:54–62. https://doi.org/10.1016/j.envsci.2017.12.008

Kwon KL, Hanlon RJ (2016) A comparative review for understanding elite interest and climate change policy in China. Environ Dev Sustain 18:1177–01193. https://doi.org/10.1007/s10668-015-9696-0

Lakatos L (1978) The methodology of scientific research programmes. In: Philosophical papers, vol 1. Cambridge University Press

Lauden L (1978) Progress and its problems: towards a theory of scientific growth. University of California Press

Li W, Weible CM (2019) China's policy processes and the advocacy coalition framework. Policy Stud J 49:703–730. https://doi.org/10.1111/psj.12369

Li WX (2012) Advocating environmental interests in China. Adm Soc 44:26S–42S. https://doi.org/10.1177/0095399712460079

Lindberg MB, Kammermann L (2021) Advocacy coalitions in the acceleration phase of the European energy transition. Environ Innov Soc Trans 40:262–282. https://doi.org/10.1016/j.eist.2021.07.006

Lintz G, Leibenath M (2020) The politics of energy landscapes: the influence of local anti-wing initiatives on state policies in Saxony Germany. Energy, Sustain Soc 10 http://dx.doi.org.aurarialibrary.idm.oclc.org/10.1186/s13705-019-0230-3

Litfin KT (2000) Advocacy coalitions along the domestic-foreign frontier: globalization and Canadian climate change policy. Policy Stud J 28:236. https://doi.org/10.1111/j.1541-0072.2000.tb02026.x

Lovell H (2007) Framing sustainable housing as a solution to climate change. J Environ Policy Plann 6:35–55. https://doi.org/10.1080/1523908042000259677

Malloy JT, Ashcraft CM (2020) A framework for implementing socially just climate adaptation. Clim Change 160:1–14. https://doi.org/10.1007/s10584-020-02705-6

Mann S, Gennaio MP (2010) The central role of centralisation in environmental policy initialisation. J Environ Plann Manag 53:283–295. https://doi.org/10.1080/09640561003612858

Markard J, Suter M, Ingold K (2015) Socio-technical transitions and policy change--advocacy coalitions in Swiss energy policy. Environ Innov Soc Trans 18:215–237. https://doi.org/10.1016/j.eist.2015.05.003

McFarland AS (2004) Neopluralism: the evolution of political process theory. University Press of Kansas

Milhorance C, Le Coq JF, Sabourin E (2021) Dealing with cross-sectoral policy problems: an advocacy coalition approach to climate and water policy integration in northeast Brazil. Pol Sci 54:557–578. https://doi.org/10.1007/s11077-021-09422-6

Newell D (2018) Implementing wind power policy–institutional frameworks and the beliefs of sovereigns. Land Use Policy 72:16–26. https://doi.org/10.1016/j.landusepol.2017.12.031

Niederberger AA (2005) Science for climate change policy-making: applying theory to practice to enhance effectiveness. Sci Public Policy 32:2–16 https://doi-org.aurarialibrary.idm.oclc.org/10.3152/147154305781779678

Nohrstedt D, Olofsson K (2016) A review of the applications of the advocacy coalition framework in Swedish policy processes. Eur Policy Anal 2:18–42. https://doi.org/10.18278/epa.2.2.3

Nohrstedt D, Weible CM (2010) The logic of policy change after crisis: proximity and subsystem interaction. Risk, Hazards Crisis Public Policy 1:1–32. https://doi.org/10.2202/1944-4079.1035

Osei-Kojo A, Ingold K, Weible C M (2022) The advocacy coalition framework: Lessons from application in African countries. Politische Vierteljahresschrift 63:181–201

Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, Shamseer L, Tetzlaff JM, Akl EA, Brennan SE, Chou R, Glanville J, Grimshaw JM, Hróbjartsson A, Lalu MM, Li T, Loder EW, Mayo-Wilson M, McDonald S, McGuinness LA, Stewart LA, Thomas J, Tricco AC, Welch VA, Whiting P,

Moher D (2021) The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. Int J Surg 88:105906

Patt A, van Vliet O, Lilliestam J, Pfenninger S (2019) Will policies to promote energy efficiency help or hinder achieving a 1.5 °C climate target? Energ Effic 12:551–565. https://doi.org/10.1007/s12053-018-9715-8

Pattison A (2018) Factors shaping policy learning: a study of policy actors in subnational climate and energy issues. Rev Policy Res 35:535–563 https://doi-org.aurarialibrary.idm.oclc.org/10.1111/ropr.12303

Pierce JJ (2021) Emotions and the policy process: enthusiasm, anger and fear. Policy Polit 49:595–614

Pierce JJ, Peterson HL, Jones MD, Garrard SP, Vu T (2017) There and back again: a tale of the advocacy coalition framework. Policy Stud J 45(S1):S13–S46. https://doi.org/10.1111/psj.12197

Pollak M, Phillips SJ, Vajjhala S (2011) Carbon capture and storage policy in the United States: a new coalition endeavors to change existing policy. Glob Environ Chang 21:313–323. https://doi.org/10.1016/j.gloenvcha.2011.01.009

Rietig K (2016) The links among contested knowledge, beliefs, and learning in European climate governance: from consensus to conflict in reforming biofuels policy. Policy Stud J 46:137–159 https://doi-org.aurarialibrary.idm.oclc.org/10.1111/psj.12169

Roßegger U, Ramin R (2012) Explaining the ending of Sweden's nuclear phase-out policy: a new approach by referring to the advocacy coalition framework theory. Innov: Eur J Soc Sci Res 26:323–343. https://doi.org/10.1080/13511610.2012.699648

Ruysschaert D, Hufty M (2020) Building an effective coalition to improve forest policy: lessons from the coastal Tripa peat swamp rainforest, Sumatra, Indonesia. Land Use Policy 99:103359. https://doi.org/10.1016/j.landusepol.2018.04.034

Sabatier PA (1988) An advocacy coalition framework of policy change and the role of policy-oriented learning therein. Pol Sci 21:129–168. https://doi.org/10.1007/BF00136406

Sabatier PA, Hunter S, McLaughlin S (1987) The devil shift: perceptions and misperceptions of opponents. Western Political Q 40:449–476. https://doi.org/10.1177/106591298704000306

Sabatier PA, Zafonte MA (2001) Policy knowledge: advocacy organizations. In: Smelser NJ, Baltes B (eds) International Encyclopedia of the Social and Behavioral Sciences, pp 17–11563

Satoh K, Gronow A (2021) The advocacy coalition index: a new approach for identifying advocacy coalitions. Policy Stud J. https://doi.org/10.1111/psj.12450

Schmitter PC (1974) Still the century of corporatism? Rev Politics 36:85–131 https://www.jstor.org/stable/1406080

Setiadi R, Lo AY (2016) Does policy research really matter for local climate change policies. Urban Policy Res 37:111–124. https://doi.org/10.1080/08111146.2017.1377607

Sotirov M, Winkel G, Eckerberg K (2021) The coalitional politics of the European Union's environmental forest policy: biodiversity conservation, timber legality, and climate protection. Ambio 50:2153–2167. https://doi.org/10.1007/s13280-021-01644-5

Stensdal I (2014) Chinese climate-change policy, 1988-2013: moving on up. Asian Perspect 38:111–135. https://doi.org/10.1353/apr.2014.0004

Swarnakar P, Rajshri S, Broabdent J (2021) Beliefs and networks: mapping the Indian climate policy discourse surrounding the Paris climate change conference in 2015. Environ Commun:1–18. https://doi.org/10.1080/17524032.2021.1973528

Szarka J (2010) Bringing interests back in: using coalition theories to explain European wind power policies. J Eur Publ Policy 17:836–853. https://doi.org/10.1080/13501763.2010.486988

Torfing J, Ferlie E, Jukić T, Ongaro E (2021) A theoretical framework for studying the co-creation of innovative solutions and public value. Policy Polit:189–209. https://doi.org/10.1332/030557321X16108172803520

Ulmanen J, Swartling ÅG, Wallgren O (2015) Climate adaptation in Swedish forestry: exploring the debate and policy process, 1990–2012. Forests 6:708–733. https://doi.org/10.3390/f6030708

von Malmborg F (2021) Exploring advocacy coalitions for energy efficiency: policy change through internal shock and learning in the European Union. Energy Res Soc Sci 80:102248. https://doi.org/10.1016/j.erss.2021.102248

Wagner T, Ylä-Anttila T (2018) Who got their way? Advocacy coalitions and the Irish climate change law. Environ Politics 27:872–891. https://doi.org/10.1080/09644016.2018.1458406

Weible CM (2008) Expert-based information and policy subsystems: a review and synthesis. Policy Stud J 36:615–635. https://doi.org/10.1111/j.1541-0072.2008.00287.x

Weible CM, Ingold K (2018) Why advocacy coalitions matters and practical insights about them. Policy Polit 46:325–343. https://doi.org/10.1332/030557318X15230061739399

Weible CM, Ingold K, Nohrstedt D, Henry AD, Jenkins-Smith HC (2020) Sharpening advocacy coalitions. Policy Stud J 48:1054–1081. https://doi.org/10.1111/psj.12360

Weible CM, Moore RH (2010) Analytics and beliefs: competing explanations for defining problems and choosing allies and opponents in collaborative environmental management. Public Adm Rev 70:756–766. https://doi.org/10.1111/j.1540-6210.2010.02203.x

Weible CM, Olofsson KL, Heikkila T (2022) Advocacy coalitions, beliefs, and learning: an analysis of stability, change, and reinforcement. Policy Stud J. https://doi.org/10.1111/psj.12458

Weible CM, Pattison A, Sabatier PA (2010) Harnessing expert-based information for learning and the sustainable management of complex socio-ecological systems. Environ Sci Policy 13:522–534. https://doi.org/10.1016/J.ENVSCI.2010.05.005

Weible CM, Sabatier PA, McQueen K (2009) Themes and variations: taking stock of the advocacy coalition framework. Policy Stud J 37:121–140. https://doi.org/10.1111/j.1541-0072.2008.00299.x

Weiss JS, Daijan Z, Enriquez MA, May PH, Pinheiro do Nascimento E, Pengue WA, Shmelev S (2017) UN environmental policy: non-state actors, trends, and the regulatory role of the state. J Political Ecol 24:1013–1037. https://doi.org/10.2458/v24i1.20980

Wellstead AM, Davidson D, Stedman RC (2006) Assessing approaches to climate-change-related policy formation in British Columbia's forest sector: the case of the mountain pine beetle epidemic. J Ecosyst Manag 7:1-10 http://www.forrex.org/publications/jem/ISS38/vol7_no3_art1.pdf

Winkel G, Gleißner J, Pistorius T, Sotirov M, Storch S (2011) The sustainably managed forest heats up: discursive struggles over forest management and climate change in Germany. Crit Policy Stud 5:361-390 https://doi-org.aurarialibrary.idm.oclc.org/10.1080/19460171.2011.628002

Ydersbond IM (2018) Power through collaboration: stakeholder influence in EU climate and energy negotiations. Int Negotiation 23:478–514. https://doi.org/10.1163/15718069-23031161

Ylä-Anttila T, Gronow A, Karimo A, Goodman J, da Rimini F (2020) Breaking the treadmill? Climate change policy networks and the prospects for low carbon futures in Australia and Finland. Soc Nat Resourc 33:1380–1398. https://doi.org/10.1080/08941920.2020.1802540

Publisher's Note