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INTRODUCTION



Climate policy: from complexity to consensus?

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ABSTRACT


Most governments aim for net-zero greenhouse gas (GHG) emissions by 2050, but none know fully how to get there. The papers in this special issue examine the role of climate governance for climate action, addressing three research questions: a) what characterizes enduring climate governance, b) which factors drive climate governance developments, and c) how can these be sustained within the polity? In this introductory article, we present three ideal-typical models of climate governance that provide answers to these questions. The models are, respectively, the market failure, the socio-technological transition, and the public support models. Political science, as a discipline, is ideally suited to contribute to the further development of the public support model, which bears much promise for sustaining the climate and energy transition. The models and the special issue's contributions highlight two concepts as crucial regarding climate governance: complexity and consensus. These concepts can be mutually constitutive: policy packages addressing the complexity of the climate question, including its (heterogenous) societal dimensions, will have a greater chance of being more efficacious and less contested.

KEYWORDS climate governance; climate policy; climate politics; complexity; consensus; political science

Introduction

The Paris Agreement's goal of pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels has repeatedly been confirmed by world leaders and national governments (Glasgow Climate Pact, 2021). This requires global emissions to decline as soon as possible, reaching net-zero by 2050 (IPCC, 2021). In 2022, close to 90 per cent of the countries in the world had adopted net-zero greenhouse gas (GHG) emission targets

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(Climate Change Committee, 2022, p. 62). Achieving net-zero is still out of reach unless multiple political obstacles are overcome (IPCC, 2018, 2022b). Some political scientists have examined climate governance¹ ever since the issue first became a political one. This was reflected by the emergence in the early 1990s of an international relations literature studying the international politics of climate change (e.g., Paterson & Grubb, 1992). However, these frontrunners have, until recently, remained a relative small minority within the field (Javeline, 2014, p. 421).

Back in the 1990s, it seemed the climate challenge could be solved by establishing an international climate treaty and a global price on GHG emissions. This did not happen. Instead, a complex, layered and polycentric patchwork of climate governance has progressively emerged, with climate policy adopted at multiple levels. It has proven difficult to develop consensus on climate policy, both internationally and domestically, and the nature of the political conflicts varies significantly across polities. This special issue presents research that can help us understand how we may spur consensus on climate policy despite, and possibly through, its complexity. The special issue examines some of what political science has to offer when it comes to improving our understanding of climate governance, and the political conflicts it entails. Its three overarching research questions are: *What characterizes enduring climate governance, which factors drive governance developments, and how can they be sustained within the polity?* The special issue's contributions show that complexity and consensus are crucial aspects of climate governance as it develops and matures. We conclude that, (a) recognizing complexity should be the starting point (and not the endpoint) of our analysis and, (b) that addressing this complexity is a necessary condition to achieving consensus (or at least avoiding dissensus). In its absence, the climate and energy transition will likely be slower and generate greater social unrest.

Political science, as an academic discipline, is ideally placed to make a distinct and important contribution to climate science in this respect. Indeed, many climate sciences sidestep questions of acceptance and legitimacy, despite their relevance when deep changes need to be implemented across society. Even though it should play a key role, political science has somewhat lagged behind other disciplines in its contribution to the climate and energy debates. For a long time, climate change was regarded as one international environmental issue among others (Andresen & Boasson, 2012). Today, climate change is considered as the most pressing issue facing humankind. Despite climate change making an imprint on all kinds of major political events, from elections to high-level meetings between heads of state, the discipline specialized in understanding politics (i.e., political science) has been a latecomer to the scientific discussions on climate governance (Bernauer, 2013, p. 422).

Until recently, few political science sub-disciplines, except for international relations, had much impact on real-world climate governance developments.

Even though it eventually became clear that a forceful, binding international agreement was out of reach and that domestic and regional political levels were the crucial locus for climate governance development (Jordan *et al.*, 2015), it took a long time before the political science discipline delved into the issue. By 2022, almost all countries had adopted climate policies, and many countries have developed encompassing and complex climate governance structures (Iacobuta *et al.*, 2018; IPCC, 2022b). Moreover, debates over climate politics increasingly centered on concepts that imply radical societal change, such as the ‘climate transition’, ‘net zero’, ‘deep decarbonization’, and ‘acceleration of climate action’ (IPCC, 2022b; Moore *et al.*, 2021). Hence, after more than three decades of climate policy making, it is clear that:

it is not a lack of scientific understanding or the relative unavailability of technological solutions that is holding society back (...), but the *politics* of who does what, where, when and in what order, a process which will be shaped by the exercise of political power. (Jordan *et al.*, 2022, p. 2)

Not much political science training is required to see that the climate transition will be far from a walk in the park. It will require tectonic shifts in political power structures in most societies. The climate transition challenges entrenched power structures in all countries, in many international organizations, and across all sectors of society (Colgan *et al.*, 2021; Victor *et al.*, 2019). The world’s largest corporate actors need to either profoundly change or cease to exist (Newell, 2021), most governments need to fundamentally change how they make key decisions, such as providing aid in financial crises and take major infrastructure decisions (Dubash, 2021). Moreover, a broad range of practitioners and professionals need to learn new skills (Victor *et al.*, 2019) and governments must fundamentally change their criteria for assessing policy proposals (IPCC, 2022b).

While political scientists were dragging their feet, other disciplines stepped up to the challenge of suggesting what governments and other authorities could do to combat climate change. Two of the three ideal-typical models of climate governance that we present in this introduction, the *market failure* and the *socio-technological transition* models, hardly pay attention to the political aspects of the climate transition. The first model is primarily rooted in economics, the second in sociological and economic studies of innovation and transition. The first generation of climate governance was primarily informed by the market failure model, and this emerged already in the early 1990s. The second wave, the socio-technological transition model, gained prominence after 2010 and rather swiftly garnered significant influence. The third model, the *public support* model, puts politics at the forefront and is rooted in political science. This most recent climate governance model is less developed, and gained much traction after the yellow vest protests against carbon taxation in France in 2018.

These models now co-exist in parallel, both in the scientific literature and by underpinning real-world climate governance. The special issue contributes to enhance our understanding of each of these models, with a particular emphasis on developing the public support model. The market failure and the socio-technological transition models grew out of traditions where policy instruments have been center stage, while the actual factors that produce specific policy outputs have previously attracted less attention. Climate change is complex, in the literal sense of the term, that is: 'involving a lot of different but related parts' (Cambridge Dictionary). In this special issue, we show that all three models can help us grasp the complexity of the climate governance challenge. Our findings are in line with the call from Elinor Ostrom, for a correspondence between the nature of a problem, on the one hand, and the nature of the governance structures addressing that problem, on the other. She argued that we need 'complex, multi-level systems to cope with a complex, multi-level problem' (Ostrom, 2014, p. 123). The special issue shows that complex, polycentric governance systems facilitate the climate transition. However, we push this argument further: complexity should not only be mirrored in governance structures, but also in the policy mixes they produce. These should increasingly take the form of integrated and multi-faceted packages, which not only seek to address the climate and energy challenges themselves, but also their societal consequences. Deep, fundamental changes have knock-on effects. They too need to be addressed. In this sense, complexity underpins consensus-building, and hence the necessary public support for a long-term and enduring transition.

In the following, we first show how the three models suggest different answers to our three core questions (i.e., the ideal characteristics of enduring climate governance, the factors which drive such developments, and how they can be achieved and sustained). The public support model both allows and requires more complexity than the two former models, whilst also highlighting the importance of developing broad societal consensus on climate governance. Then, we move on to discuss the role of political science in climate governance research and how this has affected the late development of the public support model. Lastly, we show how the individual contributions provide some answers to the three overarching research questions of the special issue. We conclude by highlighting how complexity should be viewed as a necessary building block to achieve greater consensus, or at least avoid too constraining dissensus.²

Conceptualizing climate governance: three ideal-typical models

Models are abstract representations of (political) processes. They help us focus our attention on key logics and mechanisms at work. Just like maps

of the real world, they are simplifying devices which highlight features of interest. Hence, models are inherently partial and of limited accuracy (Clarke & Primo, 2012). In this sense, they are ‘neither true nor false’ (Clarke & Primo, 2007, p. 742). As British statisticians Box and Draper (1987, p. 424) reminded us, ‘essentially, all models are wrong, but some are useful’. This echoes earlier calls by their colleague Achen (1982, p. 15) who had warned that theoretical models ‘are to be used and not believed’. Hence, models should be considered ‘for their usefulness for a particular purpose’ (Clarke & Primo, 2007, p. 749). In line with this understanding of ‘models’, we present three ideal-typical models which help us better capture three core questions of climate governance: what its main characteristics are, which factors drive its developments, and which sustain it. These models, and the special issue itself, are structured around the same three issues (governance characteristics, factors driving and factors sustaining governance) (see Table 1).

The *market failure* model emerged in the early 1990s. It draws on environmental economics and highlights cost-effective emission reductions (Stavins *et al.*, 2014). Here, climate change is perceived as a market failure, so measures that correct this failure are needed. Moreover, climate change is conceptualized as a tragedy of the commons dilemma (Bernstein &

Table 1. Three ideal-typical models of climate governance.

		Models		
		Market failure	Socio-technological transition	Public support
Climate governance elements	Governance characteristic	Carbon pricing, supplemented by a few other economic instruments.	Technology specific measures, regulatory measures.	Complex and thick packages of policy mixes. Climate policy integration.
	Factors driving governance developments	Narrow participation. Scientific recommendations implemented through political decisions.	Negotiations between governments and businesses. Several parallel industry specific processes.	A broad array of civic groups participates. Events (e.g., extreme weather, energy shocks) may shape climate governance via citizen feedback loops. Policy-opinion link, responsiveness to citizens.
	Factors sustaining climate governance	Autonomous and strong environmental-economic expert bodies. Politicians follow scientific recommendations. Business is obedient in implementing policy.	Industry change: low carbon industries gaining prominence. Transformation of fossil-dependent industry.	Broad and enduring political consensus around climate governance. Increasing public support.

Hoffmann, 2019). Economic incentives are perceived as the prime driver of mitigation, and the model relies on the development of a global carbon price and binding international emission reduction commitments (Nordhaus, 1991, 1994).

Originating in the 1990s, this market failure model strongly influenced policy design in ensuing decades (Stavins *et al.*, 2014). This model prescribes a one-size-fits-all solution for all countries and sectors: a high CO₂ price, in the shape of taxation or emissions trading, maybe combined with a certain level of research and development support (Nordhaus, 1991, 1994; Stavins *et al.*, 2014). Carbon pricing will be cost-efficient, and minimize the global cost of the transition. If it is not possible to introduce carbon pricing through a global treaty, the alternative is to link domestic and regional emissions trading schemes, eventually creating a global carbon price (Mehling *et al.*, 2018).

Although the environmental economists spearheading this model are not very explicit about the elements driving climate governance, based on their writings we assume a rather limited number of actors playing a key role. In this world view, legislators are crucial decision makers that obediently act in line with scientific recommendations. Subsequently, business groups readily implement new policies. We assume that strong and autonomous environmental-economic expert bodies are needed to sustain this model, for instance strong ministries of finance with high environmental economics competence and/or independent climate-change committees (as in the United Kingdom). However, the models also rely on business readily implementing public policy rather than taking a more active role in shaping governance processes themselves.

Another model, with room for more complexity, started to emerge by the turn of the millennium. The second generation of climate governance studies aligns to a *socio-technological transition* model. This model highlights the role of industrial change and innovations to climate mitigation, and the inter-relationship between business and the state. It is rooted in innovation studies and institutional economics, but has been refined and specified by human geography, sociology, and political science scholars. Portraying increasing GHG emissions as primarily resulting from fossil fuel 'lock-in' effects in a range of socio-technological systems (Patt, 2015; Unruh, 2000), it sees mitigation as requiring major changes in infrastructure, industrial practices, and technology (Geels, 2014). A wide spectrum of socio-technological systems needs to be fundamentally altered, such as electricity, transport, heating, the industry, forestry, and agriculture (Geels *et al.*, 2017; Victor *et al.*, 2019). To achieve this, governments need to adopt a broad set of sector-specific measures, and technology-specific support schemes are particularly important (Boasson *et al.*, 2021; Mazzucato, 2013). First-mover advantages are regarded as important, and Germany's *Energiewende* is often

highlighted as a good example of this type of climate governance (Geels *et al.*, 2017).

For this model, it is often assumed that governments will start by targeting one or a few sectors with complex policy mixes – involving, for instance, support schemes (Boasson *et al.*, 2021), regulations, siting policies (Hochstetler, 2020), and state ownership of corporations (Boasson, 2015). More and more sectors will be targeted, and thus the policy mix will become increasingly complex over time. Carbon pricing may be applied, but the actual economic incentive level will vary significantly across sectors. In this way, climate governance will be driven forward through repeated negotiations between governmental and corporate actors. A broader range of economic actors may take part in decisions, with legislators playing a less pro-active role, and business and labor organizations being more important. To sustain this model, governments will need strong environmental ministries and agencies with high in-house energy and climate transition competence, but also sectoral ministries with clear and specific climate responsibilities. Moreover, climate governance will over time spur the emergence of low-carbon businesses and industries that shift the power balance and underpin the upscaling of climate ambitions (Meckling *et al.*, 2015).

While the socio-technological model enhances our understanding of the complexities of climate governance, it gives limited assistance in highlighting how one may create consensus and spur broad support for climate policies. However, a string of recent publications place politics and democratic processes at the core of the decarbonization challenge (Boasson *et al.*, 2021; Dubash, 2021; Lægread & Povitkina, 2018). Drawing on these, we construct a *public support* model. This third model draws more explicitly on political science, and centers on the creation and acceleration of civic support for climate actions. Here, the role of the government is seen as constrained and enabled by popular sentiment, support from civil society, and election results. This model centers on procedures and policies that can secure democratic legitimacy and increase support for climate action. It expects that it is easier to develop broader consensus over climate governance when adopting complex and thick climate-policy blends, mixing regulations, as well as economic carrots and sticks (Meckling *et al.*, 2015; Oberthür & von Homeyer, 2022).

In this model politicians and political parties are crucial drivers of climate governance, and not mere instruments for business interests or neutral receptors of scientific recommendations. While they constantly aim to increase their electoral success, secure control over the governmental executive, and maximize their impact on public policy, they still have leeway to make independent imprints on climate governance (Boasson *et al.*, 2021; Strøm & Müller, 2000). Hence, the dynamics of climate policy development are closely linked to other issues, such as social welfare, health, economic

development, and other environmental considerations (Dubash, 2021). If climate issues are politically salient, elected officials will play a major role in determining climate policies, and how climate issues are organized into the state apparatus (Boasson, 2015; Dubash, 2021). Governments will have legislative assemblies with wide formal responsibilities over climate policy, but regional and local governments will also have significant importance. Politicians, in the executive and in the legislature, have a major say in adopting climate policies, but also on how climate policies are perceived and implemented (see Boasson *et al.*, 2022).

Whether and how politicians relate to climate governance is also influenced by a broad array of civic actors, as well as changes in public sentiments, but research on such causal relationships is in its infancy (Huber *et al.*, 2020; Schaffer *et al.*, 2022). For instance, political protests for or against climate action may directly influence climate policy and how climate is integrated into public-administrative structures (Dubash, 2021). In this model, civic actors can have some access to decision-making, and elections may cause abrupt shifts in state actions (Boasson, 2015). Climate governance will be sustained over time if one succeeds in developing broad and enduring political consensuses around climate governance. Moreover, this model highlights that it is crucial to ensure increasing public support as we approach the need for more drastic reductions in emissions. Thus far, however, we lack research that can inform us about what policy makers may do to ensure such increases in public support.

Table 1 summarizes how the three models answer the questions of (a) what characterizes enduring climate governance, (b) which factors drive such developments, and (c) how they can be sustained within the polity. Although the table aims to distinguish these three ‘ideal-typical’ models as clearly as possible from each other, they are far from mutually exclusive and the boundaries between them can be quite porous. Similarly, not all models are as coherently perceived. For example, whilst there is a degree of consensus on the main elements of the market failure and socio-technological transition models, the public support model is more recent, less consolidated, and hence more heterogeneous in the literature. The three models are here presented in a stylized and simplified way.

The contributions to this special issue give us more insights into how and to what extent the three models appear in real-life climate governance, and how the analytical constructs of the three models can help us to better understand climate governance. However, since it seems clear that governments’ ability to reach net-zero will to some extent rely on their ability to spur public support for climate action, it is important to examine why this ideal-typical model is so under-developed. This relates to the late advent of political science climate research. In the following, we discuss why it took our

discipline so long, and which consequences this has for climate science as well as for political science.

Political science's untapped climate research potential

Already in the mid-1990s, it was clear that political leaders were having a harder time developing effective international cooperation agreements on climate change compared to other environmental questions, such as the ozone layer or acid rain (Andresen *et al.*, 2012). Hence, it is puzzling in and of itself that the discipline specialized in assessing politics and governing (i.e., political science) did not early on insert itself as a key climate science discipline. As political science plays a particularly vital role for the development of the public support model, it is important to gain a deeper understanding of the role of this discipline in climate science.

The assessment reports of the Intergovernmental Panel on Climate Change (IPCC), published for the first time in 1990, illustrate this well. Political science was largely absent from the first five assessment reports (Victor, 2015). Although political science contributions were more referenced in the reports launched in 2022, conclusions rooted within this discipline were largely omitted from the IPCC's Summaries for Policy Makers, even in the report from the Working Group (WG) that examines and assess the literature on how to mitigate climate change (IPCC, 2022a). In fact, the WG III Mitigation summary only mentions the political nature of climate change in the passing. In the following, we discuss three possible explanations: a lack of supply of climate science from political scientists, basic differences in epistemological foundations between climate science and political science, and a lack of empirical cases of successful climate governance.

Concerning the supply of research, there are clear limitations. International relations (IR) is one of the sub-disciplines with the longest history of climate research, but leading IR journals have hardly published climate research (Bernauer, 2013, p. 422; Green & Hale, 2017, pp. 474–475). Below, we analyze the publications of 6 important political science journals. These are, in alphabetical order, the *American Journal of Political Science* (AJPS), the *American Political Science Review* (APSR), *Comparative Political Studies* (CPS), the *Journal of European Public Policy* (JEPP), *The Journal of Politics* (JOP), and *World Politics* (WP).³ Focusing on a 12-year time-period, from 2010 to 2021, we find that these leading political science journals publish a relatively low number of climate articles, both in absolute and relative terms.

As illustrated in [Figure 1](#), these journals have generally published a low number of articles on the climate change question. The exception being one of Europe's flagship journals for political science, JEPP. Among these 6 journals, only JEPP regularly publishes climate-related articles. Indeed, apart from 2011 and 2019, it has published every year between 2 and 8 articles

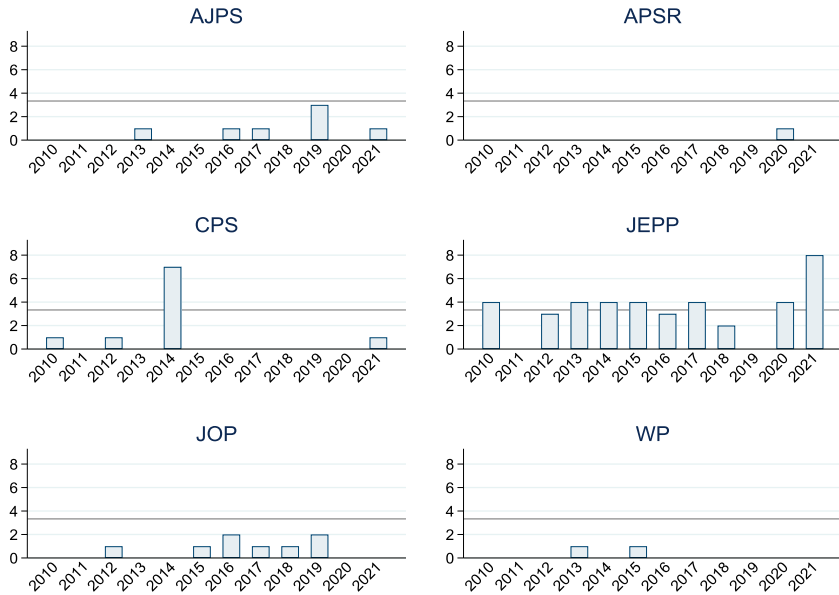


Figure 1. Raw count of yearly climate publications in six important political science journals. Notes: AJPS = American Journal of Political Science; APSR = American Political Science Review; CPS = Comparative Political Studies; JEPP = Journal of European Public Policy; JOP = Journal of Politics; WP = World Politics. Gray horizontal line represents the JEPP average. Sources, methodology, and coding decisions are detailed in the online appendix.

on the topic. Most of the other journals often go years without publishing on the issue. For instance, the APSR and WP have published only 1 and 2 articles, respectively, on climate issues in this 12-year interval (compared to JEPP's 40). As displayed in [Figure 2](#), the relative share of these journals' publications on climate issues is similarly low. In this group, JEPP is again a frontrunner. Climate articles represent about 3.8 per cent of its published contents (this is three times more than CPS, the runner-up with 1.2 per cent). In comparison, the APSR, the AJPS, and JOP dedicated, respectively, 0.1, 0.5, and 0.6 per cent of their contents to climate questions.

Although an increasing number of political scientists have published on climate, they have primarily done so in specialized or interdisciplinary journals as well as in books (see also Bernauer, 2013, p. 422; Green & Hale, 2017, pp. 474–475). Apart from JEPP in 2021, there are few signs of any dramatic increases in the share of climate articles making their way into the discipline's top journals. Patterns from this past decade are clear: although climate has been at the top of the political agenda in many established democracies, generalist political science journals have so far not reflected this trend. Nonetheless, with more and more political scientists working on climate, and increasing amounts of both public and private funding going

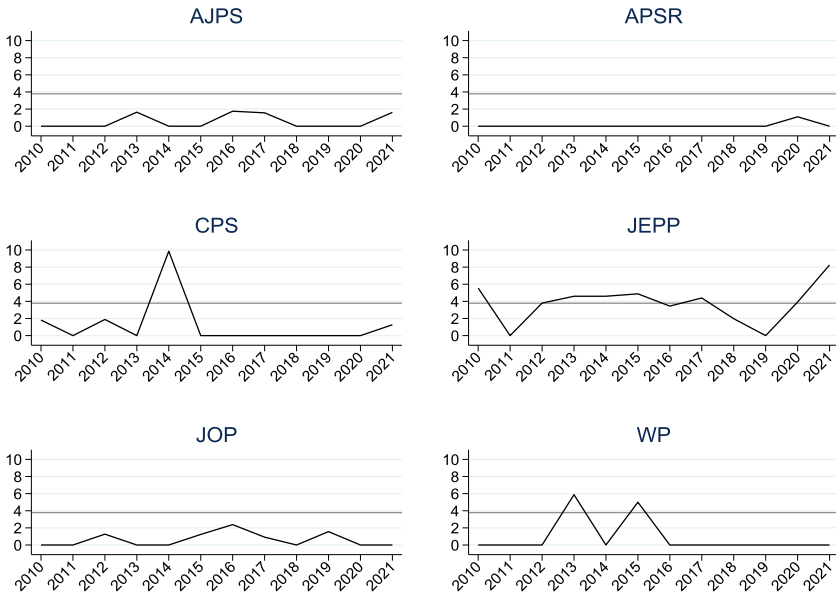


Figure 2. Percentage share of yearly climate publications in six important political science journals. Notes: Gray horizontal line represents the JEPP average. Sources, methodology, and coding decisions are detailed in the online appendix.

into climate research, we expect that climate research will more frequently find its way into the pages of the discipline's leading journals.

Another factor that may explain why political science has remained remote from the climate policy field is basic differences in epistemological foundations. While making predictions about developments in the coming decades and centuries are at the core of climate science (Beck & Oomen, 2021), political science has no similar tradition. In contrast, the dominant methods and theories of political science are set up to explain the past or the present, not predicting the future (Gleditsch, 2022). Climate models are at the core of physical climate science and provide forecasts 50–100 years, or even more, into the future. These are implemented with the help of large super-computers that run complex equations, representing all the processes and integrations that drive the world's climate (see IPCC, 2021). Furthermore, Integrated Assessment Models (IAMs) have a dominant role in producing scenarios for future emission developments (Beck & Oomen, 2021; Geels *et al.*, 2016). IAMs rely on simplified rational choice assumptions about human behavior, and produce scenarios of different mitigation pathways, describing both the drivers of climate change in human systems and the consequences of these changes (Sognaes *et al.*, 2021). Because some strands of economics rest on simplified assumptions and positivist approaches that resemble the modeling techniques of climate science, this

discipline more easily took on a key role in climate science than other social sciences did (see discussion in Geels *et al.*, 2016).

Political scientists have neither been willing nor able to make credible and useful scientific predictions about future climate politics or policies. No model exists that can help us do this in a meaningful way. Forecasting is traditionally not a central political science practice, beyond short-term electoral dynamics (Dowding, 2021; Jordan *et al.*, 2022), some international relations issues (e.g., sanction effectiveness, the onset of conflict), or game theoretical situations (such as bargaining situations) (Schneider *et al.*, 2011). When political scientists do venture into forecasting or predictions, their time horizon is short. Whilst climate predictions regularly span several decades up until 2100 (and sometimes up to 2300), political scientists tend to consider 'long-term' forecasting as 3–5 years in the future (Horowitz, 2021).

A third explanation may be related to the repeated failure of past climate policies. For a long time, the lack of successful climate policy efforts hindered political scientists from examining how political obstacles to the climate transition could be overcome. We simply lacked relevant empirical data. Given that our study subject was primarily unsuccessful attempts at climate governance, the resulting political science conceptualizations mostly underlined climate governance as challenging and sometimes even impossible. For instance, scholars have labeled climate change as 'a malign issue' (Underdal, 1987) and 'a super wicked problem' (Levin *et al.*, 2012), and highlighted mechanisms that may impede climate governance such as 'veto-point density' (Harrison & Sundstrom, 2010) and 'the logic of double [fossil fuel] representation' (Mildenberger, 2020). While these explanations of failure and non-action can be useful, they do not give much actionable knowledge to policy makers eager to successfully engage with climate change.

By 2021, however, successful climate governance has emerged in several nation states and within the EU, as well as in many sectors (IPCC, 2022b, ch. 13). Even though global GHG emissions are still increasing, at least 18 countries have cut emissions for more than 10 years (Le Quéré *et al.*, 2019). This is good news for the climate, but it also partly solves political science's climate conundrum: increasing numbers of successful – though still limited in scope or level – climate actions pave the way for more systematic and cumulative research on the role of climate governance. As the empirical and theoretical richness of climate governance research increases, the attractiveness (and prestige) of climate research among political scientists may also rise.

In line with these developments, the special issue aims to contribute to this shift in focus: away from explaining obstacles to climate governance and towards conceptualizing and identifying factors and mechanisms that enable successful climate governance, here understood as enabling the creation and implementation of climate policies, be it for climate change

mitigation or adaptation. Below, we specify how the contributions to this special issue illustrate the relevance of political science scholarship to increase our understanding of how to develop enduring climate governance that promotes sustainable climate actions.

Complexity: undermining and underpinning consensus

The articles in this special issue show that all three models help us get a better grasp of the relationship between complexity and consensus in climate governance. None of the three models are obsolete, but the public support model has become increasingly relevant over time and will probably become more important as countries aim for net-zero emissions by 2050. All articles highlight the complexity of both the climate transition and the climate governance needed to achieve such a transition. They show that complex policy packages and mixes have advantages, especially in terms of generating consensus, or at least avoiding too constraining dissensus.

The first two articles enhance our understanding of *what characterizes enduring climate governance*, namely Oberthür and von Homeyer (2022) and Jordan and Moore (2022). Both examine the European Union's (EU) climate governance. To our knowledge, no other polity has developed more encompassing and complex climate governance, and hence in-depth studies of this polity can provide insights of relevance to other polities at earlier stages of their climate governance development. The EU has an encompassing and complex climate policy, and, according to Jordan and Moore, by 2019 it consisted of 48 distinct instruments. Back in 1992, the EU had only three mitigation-related policies. Drawing on empirical studies of EU climate governance, both articles develop conceptualizations that have the potential to help us characterize climate governance also in other political units.

Jordan and Moore (2022) specify the relationship between EU climate policies with respect to durability and flexibility. The EU's climate instruments are remarkably stable, with 48 of the 58 instruments that had been adopted in the 1992–2019 period still in operation by 2019. Some EU rules are broad in scope, such as the European Climate Law, while others are narrow, such as the regulation on emissions from cars. Their article shows that the EU has introduced a range of durability devices, such as increasingly stringent emission reduction goals, and tying consecutive climate policy packages to particular endpoints, but also flexibility devices such as revert clauses committing the EU to review its policies at a later stage. Jordan and Moore (2022: emphasis added) conclude that 'when durability and flexibility are accomplished through *myriad interconnecting devices rather than one single "big bang" goal or instrument* (a role, incidentally, often ascribed to the ETS), the broader policy paradigm has appeared more robust overall'.

Hence, to some extent, policy durability seems to go hand-in-hand with policy diversity, plurality, and flexibility. These arrangements may be more complex, but they seem associated with greater robustness too. Policymakers should aim to strike an acceptable balance between policy durability and flexibility. And the authors conceive of the relationship between the two as dialectical.

Oberthür and von Homeyer (2022) show that by 2021, EU climate governance has ‘thickened’ through a stepwise layering of economic, regulatory, procedural, and informational instruments. The diversity of policy instruments has increased over time, and it is particularly noteworthy that the procedural instruments have become increasingly important, catering to a broad variety of audiences and policy makers. Again, this thickening seems to correspond to a maturing process as well as the recognition that a plurality of actors and objectives need to be addressed at the same time if climate governance is to be both effective and acceptable. And indeed, this thickening has developed together with an expansion and strengthening of climate policy integration, with an increasing number of sectors affected and climate gaining increased priority over time.

The two articles show that the EU policy portfolio draws on both the market failure as well as the socio-technological transition models, though none of them has ever existed in pure form. Already in the early 2000s, the EU ventured on a more encompassing governance path than prescribed by the market failure model. Moreover, the climate governance of the EU has over time become much more complex than what the two established models prescribe. Hence, it is hard to understand these EU governance developments unless we also draw on the public support model.

The complexity of the EU climate governance portfolio has made it possible for many different interest groups to endorse these developments. Oberthür and von Homeyer (2022) highlight several recent developments towards including features explicitly aimed at spurring popular support, with the Social Climate Fund as a prime example. The EU’s policy instruments and their mixes can be related to all three ideal-typical climate governance models: carbon pricing features prominently in the market failure model, regulatory instruments and targeted subsidies are typical of the socio-technological transition model, and many procedural instruments are linked to the public support model. Interestingly, Oberthür and von Homeyer (2022) note how procedural elements have increased in prominence recently. It strikes us that this trend is parallel to the emergence of the public support model. And both the public support model and the procedural dimension of EU climate policy seem to be growing concomitantly.

These studies show increasing complexity in policy mixes and governance processes over time, indicating that we have reason to expect similar developments as witnessed in the EU in other political systems in the future. Such

growth in complexity seems to reflect both the complex nature of the problem, but also a desire to satisfy – or at least somewhat include – a diversity of actors, be they from the scientific, political, administrative, business, or civil society realms.

A second set of articles examines the *drivers of domestic and transnational climate governance*, giving specific attention to how complex domestic factors result in complex climate policy patterns, that vary across issue areas and countries. The article by Tosun and Rinscheid (2022) highlights that the political dynamics shaping transnational cooperation vary significantly across climate issue areas, Groen *et al.* (2022) show that a broad variety of mechanisms contribute to shape climate adaptation policies, whilst Boasson *et al.* (2022) show that a broad array of actors contribute to shape domestic climate governance. All three articles unequivocally highlight the complexity of climate governance. Equally, they give pointers as to how these policy processes can move forward, satisfying a greater plurality of actors.

Tosun and Rinscheid (2022) examine the domestic determinants of participation in the policy initiatives of an international ‘climate club’, the Clean Energy Ministerial (CEM) (Weischer *et al.*, 2012). They show that domestic political dynamics vary significantly across climate issue areas, creating differences in countries’ international political engagement across these issues. The article illustrates that climate policy is much more than the policy instruments favored by the market failure model, carbon pricing. Most climate policy issues examined in this article are strongly connected to technological and industrial development, and thus the socio-technological transition model. Tosun and Rinscheid (2022) identify factors explaining engagement in these different CEM initiatives. For instance, domestic emissions contribute to explain participation in renewable energy initiatives but not in energy efficiency. Higher shares of renewable energy production mostly decrease participation in both renewable energy initiatives (except for hydropower) and energy efficiency initiatives. Similarly, the greenness of the ministry partaking in the CEM does not necessarily increase the likelihood of participation: likelihood of participation increases with greenness regarding solar and wind initiatives but decreases when it comes to smart grid actions or carbon capture initiatives. Clearly, climate mitigation is a cross-cutting issue and different actors have different sets of constraints and motivations depending on the nature of the initiative. Thus, a whole range of factors must be considered to understand how a country positions itself internationally on this range of climate and energy initiatives. Crucially, different policies will be attractive to different actors, meaning that none will be completely left out. Whereas high emitting countries or those with right-wing governments are often perceived as being less enthusiastic about climate policy, this research shows they will nonetheless find solace in certain initiatives, such

as those related to hydrogen, smart grids, or carbon capture. All roads lead to Rome, and different paths may lead different actors to the climate transition.

While most contributions to this special issue examine climate mitigation, Groen *et al.* (2022) examine climate adaptation and show that a broad variety of mechanisms contribute to shape climate adaptation policies across cases and countries. They identify a range of lock-in mechanisms that have influenced adaptation policy developments, drawing on field research of coastal management in England (UK) and Schleswig-Holstein (Germany). While lock-ins have gained significant attention in climate mitigation studies, this article opens a new research frontier in relation to adaptation studies. Lock-in mechanisms known from other literatures are in operation here, including: economies of scale, adaptive expectations, learning effects, collective action, habituation, and power differentiation. In addition, Groen *et al.* also identify and conceptualize four new mechanisms: social contracting, co-dependency, business network effects, and framing (re)production. Most of these mechanisms fit within the socio-technological model, as they specify dynamics in the industry-government relationship within coastal management governance processes. They highlight the complex yet dynamic nature of lock-in processes in adaptation policy and how these can trigger resistance when threatened by change.

Boasson *et al.* (2022) review the literature on the role of various groups in domestic climate governance, showing that the participation patterns are complex, with many actors playing multiple roles, and similar groups playing different roles across contexts. Boasson *et al.* seek to detect similarities in groups' participation patterns across issue areas and countries and examine whether any of the three ideal models are better at capturing actual participation in climate governance. While the two first models primarily assume politicians and business actors play key roles, the third model opens for much broader participation. They find that although political actors and business are important, as highlighted by the two dominant governance models, they play more multi-faceted roles than indicated by these models. Political actors and business are influencers, decision-makers, and implementers. Climate advocacy organizations and anti-climate action groups can also be crucial, but these are primarily influencers. The literature is still scattered on the role of emerging constituencies, such as indigenous peoples' organizations, labor unions, consumer groups, youth, and religious organizations, and we know little about systematic differences across issue areas and countries. A broader outlook than provided by the market failure model is needed to capture the complexity of domestic actors that contribute to shape climate governance, but we also need more comparative research. Although the literature shows that governance participation patterns are complex, it is still unclear how

this varies across issue areas and across countries, and whether this complexity underpins or undermines ambitious climate governance.

The third and last set of articles contributes to our understanding of *how climate governance can be sustained within the polity*. Schaffer and Umit (2022) and Tatham and Peters (2022) show that, to succeed, climate governance needs broad societal support. To some extent, in this process of support building, complexity underpins the consensus needed to push forward ambitious climate transitions. Policies may generate various levels of support in different cross-sections of society depending on their specific attributes. It is difficult to simultaneously satisfy different groups. However, addressing this complexity is important to generate consensus, or at least some form of acceptance. Societal heterogeneities often get lost behind aggregate values which obfuscate important cleavages. Policies hence need to be packaged in ways which optimize support, not just in general but also among the more skeptical, such as citizens who are less educated, more rural, or simply less worried by climate change.

Schaffer and Umit (2022) explore the extent to which support for climate change obligations is affected by these obligations' national or international framing. Focusing on emission targets, results from their survey experiment in Switzerland indicate a positive effect of international framing. However, the effect is rather small and hence of limited importance. More interesting is that the effect is stronger regarding two sub-sets of respondents. First, younger respondents (i.e., the 20–40-year-old) are much more demanding of international targets. An identical target framed in an international light (as opposed to a national one) will make these younger citizens more expectant and harsher in their judgement of the appropriateness of the target. In other words, younger citizens set their expectations higher when a target is framed internationally. This is relevant as it might affect their political mobilization, either through traditional channels of representation (e.g., party membership or voting) or through 'extra-representative' channels, such as demonstrations, boycotts, or the signing of petitions (Peters, 2018, p. 26), as illustrated by different youth social movements. Second, respondents with lower levels of climate concern become more supportive of emission reduction targets when these are framed internationally. This is critical: increasing support from groups who usually oppose such policies, or have climate-sceptic beliefs, is key to building greater acceptance of ambitious policy objectives, such as large emission reductions.

The final article by Tatham and Peters (2022) follows the same line of reasoning, though on a different empirical case. Focusing on fuel taxation in Norway, the article seeks to assess the effects of varying tax levels (from a 5 per cent to a 35 per cent price increase), revenue recycling schemes (general public expenses, green projects, and redistribution to low-income households), and origin framing (personal responsibility, national

commitments, and international commitments). Taking inspiration from the French yellow vest movement, it then tests for these effects in general and across the yellow vest/urban elite divide, as captured by low-educated ruralites on the one hand, and high-educated urbanites on the other. The findings suggest important variation at the group level, especially regarding revenue recycling and origin framing. Indeed, many policy attributes open a 'support gap' between the yellow vests and the rest of society (whilst urban elites are invariably supportive of any policy package). However, some attributes close this gap. For instance, using the fresh tax money to redistribute to low-income households and framing the tax as an international commitment deactivates the yellow vest cleavage. Deactivating such a cleavage is relevant in terms of abating the polarization effects of climate policies. This research again highlights the complexity policymakers face when addressing the climate question. In this case, different sections of society react differently to an identical policy. But this study also underscores that, from this complexity, consensus can be generated (or at least dissensus avoided): an international framing and redistribution to the less wealthy deactivates the yellow vest cleavage. This is important if one is to learn anything from the French experience (Driscoll, 2021; Martin & Islar, 2021).

Conclusions

This introductory article focused on three research questions: what characterizes enduring climate governance, which factors drive climate governance developments, and how can these be sustained within the polity? All three models presented in this introduction – the market failure, the socio-technological transition, and the public support model – contribute some answers to our key questions, although the public support model possibly has most untapped potential. Political science has a leading role to play in expanding, refining, and popularizing such a model of climate governance, but also in examining how the three models may be combined over time and across issue-areas. Political science has only recently embarked on such a journey, and we hope the discipline will be able to increase its contribution in the near future.

Two intertwined red threads run throughout the special issue: complexity and consensus. In this conclusion, we make two recommendations. First, scholarship should move on, from recognizing the complexity of the challenge towards achieving consensus on what needs to be done and how. Recognizing the complexity of the task should be the starting point, not the endpoint, of our analyses. Generating consensus (or at least mitigating dissensus) for the hard and substantial emission cuts which lie ahead should become a priority. Consensus building on the current situation, on objectives and ambitions, as well as on how to attain them in practice, should be the focus of efforts, for

policymakers but also for scholars. Deep changes require legitimacy and acceptance. In their absence, making headway will either be difficult and slow, or come at the cost of much social unrest.

Second, we argue in favor of reconceptualizing complexity, not as a barrier for change but as a necessary condition for consensus-building and the acceleration of the climate transition. Building on Elinor Ostrom (2014) as well as the contributions to this special issue, we argue that complexity should not only be mirrored in governance structures, but also in the policy mixes they produce. Simple policies are unlikely to either work or be accepted because the climate question, by definition, involves many different but related parts: groups and sub-groups within the citizenry and a variety of actors across issue areas, sectors, organizations, the public-private divide, and levels of governance (from the local to the global). Policy mixes must cater to this diversity, and it is especially important to consider the preferences and interests of those that are recalcitrant, less convinced, or more adversely affected. Many contributions to this special issue highlight this, from gaining the support of less-educated ruralites (Tatham & Peters, 2022) and those less worried by climate change itself (Schaffer & Umit, 2022), all the way to getting high-emitting countries governed by right-wing governments involved in clean energy initiatives (Tosun & Rinscheid, 2022).

Including a larger variety of actors and sub-groups will generate more complex participation patterns, from policy shaping, to decision-taking, implementation, and policy revision (Boasson *et al.*, 2022). However, this is both inevitable and desirable if climate policies are to be successful. Because climate governance needs to reconcile different objectives and different properties (such as durability and flexibility) (Jordan & Moore, 2022), it is logical and necessary that climate policies are packaged in increasingly 'thick' ways and that they are gradually integrated across a growing number of policy domains (Oberthür & von Homeyer, 2022). Flanking policies such as social subsidies (Oberthür & von Homeyer, 2022) or redistribution to adversely affect groups (Tatham & Peters, 2022), come across as crucial to mitigate the negative externalities of these ambitious policies. Focusing only on emission reductions or technological change alone cannot enable us to reach net zero. The knock-on effects of emission cuts and of the wider energy transition also need to be directly addressed. Without complex and overarching policy mixes, the necessary climate transition runs the risk of becoming all the more protracted, arduous, and conflict-ridden.

Notes

1. Whilst the term of 'government' has been mostly used to depict 'state authority', that of 'governance' has become more general and denotes 'the act of

governing *in* states, *among* states, *above* states, and *by* non-state actors' (Hooghe & Marks, 2020, p. 821, emphasis added).

2. For a discussion of the concepts of 'constraining dissensus', see Hooghe and Marks (2009). Focusing on European integration, they highlight the shift from a situation of permissive consensus to one of constraining dissensus. To some extent, similar logics apply to climate policies, which benefited from indifference and tacit support in their early days, to suffer from greater scrutiny and contestation as their scope and consequences grew. For elaborations on the two-by-two matrix along the enabling/constraining and consensus/dissensus dimensions and especially the notion of 'enabling dissensus', see Ferrara and Kriesi (2022) and Bressanelli et al. (2020). We have much sympathy for the concept of 'enabling dissensus' as our argument that complexity can underpin consensus resonates particularly well with this idea.
3. We acknowledge that many other journals could have been included but due to resource constraints we had to select some.

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