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Original Research Article

Policy sequencing can increase public support for ambitious climate policy

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Abstract

Public support for ambitious climate policies and carbon prices that have direct costs for voters may depend on policy sequencing. Policy sequencing theory suggests that the strategic ordering of policies into sequences that initially create benefits can subsequently increase support for higher carbon prices. However, systematic quantitative evidence about the effects of sequencing on public support is lacking. We provide novel theoretical and empirical insights on the mechanisms through which strategic policy sequencing affects public support for climate policies. We generated these insights using geospatial data and a representative conjoint experiment with Swiss voters conducted just before the popular vote on an amendment to the Federal Act on the Reduction of Greenhouse Gas Emissions in June 2021. Our evidence shows that the perceived effectiveness of prior policy-induced benefits is related to more public support for higher carbon prices across sectors. Moreover, we find that more opportunity structures for low-emission alternatives—like higher EV charging station density—are associated with increased public support for carbon prices in the sector where the former material benefits occur. Our results also imply that positive policy perceptions of prior climate policies are related to increased support, particularly among conservative voters and those who do not regard climate change as a salient issue. Thus, strategic policy sequencing could be an effective strategy for broadening public support for ambitious climate policies.

Keywords: policy sequencing; policy feedback; public support; climate policy

Economists typically argue that carbon pricing policies are the most efficient solution for mitigating climate change (Aldy & Stavins, 2012; Bennear & Stavins, 2007; Jenkins, 2014; Nordhaus, 1992, 1994, 2014, 2019; Stavins, 1997, 2008), either in the form of carbon taxes or emission trading systems. If the carbon price is set sufficiently high, carbon pricing policies incentivize producers and consumers to choose low-emission options, allowing market competition to select the least costly clean technologies. In such circumstances, carbon pricing policies are the theoretically first-best solution for tackling climate change because of their economic efficiency. However, ambitious climate policies like higher carbon prices often face political hurdles (Clayton, 2018; Stadelmann-Steffen & Dermont, 2018). Besides political opposition from vested interest groups and decision-makers, higher carbon prices often lack public support—particularly among the more conservative segments of society (Aklin & Mildenberger, 2020; Beiser-McGrath & Bernauer, 2019; Fremstad et al., 2022; Mildenberger et al., 2022; Nowlin et al., 2020).

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Thus, the question of how to increase the political feasibility of ambitious climate policies, like more stringent carbon pricing policies, is currently at the center of political and scientific debate.

One such approach is policy sequencing. Policy sequencing is defined as the strategic, temporal ordering of policies into sequences that may increase the feasibility of introducing more ambitious (carbon pricing) policies over time. More specifically, policymakers may first introduce less controversial green-industrial and innovation-oriented subsidies to create benefits and build new coalitions for the subsequent adoption of more ambitious carbon pricing policies. For instance, while in the past numerous attempts have failed to adopt a stringent nation-wide carbon price in the US, the recent Inflation Reduction Act can be seen as a first step in the strategic sequence towards the adoption of more ambitious climate policies over time. The growing political economy literature on policy sequencing posits that policy-induced benefits from such green industrial policies can nurture interest groups and coalitions that favor decarbonization, facilitating political majorities supportive of more ambitious carbon pricing (Fesenfeld et al., 2022; Leipprand et al., 2020; Meckling et al., 2015, 2017; Pahle et al., 2018). Qualitative case-study research has shown that these benefit-to-cost sequences have indeed allowed climate leaders, such as California, Germany, and the EU, to raise their level of policy ambition over time (Leipprand et al., 2020; Meckling et al., 2015, 2017; Pahle et al., 2018).

However, while the policy sequencing literature has argued and empirically tested such arguments with respect to elite actor coalitions, there is a lack of empirical research on how the strategic sequencing of benefit-inducing policies affects public support for more ambitious, cost-inducing climate policies over time. This is an important research gap as public support is a crucial factor for the political feasibility of ambitious climate policies (Anderson et al., 2017; Fesenfeld, 2020; Schaffer et al., 2021). Particularly for salient policy measures with visible demand-side effects, such as higher carbon prices on fossil fuels or food products, public support can be decisive and often constitutes a barrier (Beiser-McGrath & Bernauer, 2019; Bernauer, 2013; Drews & Van den Bergh, 2016; Edenhofer et al., 2011; Fesenfeld, 2020; Stadelmann-Steffen, 2011; Stadelmann-Steffen & Eder, 2020) in the introduction of such measures.

To close this gap on the effects of strategic policy sequencing on public opinion, we can build on previous research about policy perceptions (Avineri, 2012; Drews & Van den Bergh, 2016; Fesenfeld, 2020, 2022; Hobman et al., 2016; Huber et al., 2019; Jacobs & Matthews, 2012; Mildenberger et al., 2022; Mildenberger & Tingley, 2019; Stadelmann-Steffen, 2011; Stadelmann-Steffen & Dermont, 2018) and policy feedback (Béland, 2010; Béland & Schlager, 2019; Campbell, 2011, 2012; Fesenfeld et al., 2022; Jordan, 2013; Jordan & Matt, 2014; Kumlin & Stadelmann-Steffen, 2014; Mettler, 2002; Mettler & Welch, 2004; Soss, 1999; Stadelmann-Steffen & Eder, 2020).

Existing policy feedback research shows that previous policies can create feedback effects on the adoption of subsequent policies by changing public opinion. Nevertheless, to the best of our knowledge, no previous studies have investigated how the strategic sequence of climate policies that first support low-carbon behaviors is associated with public support for the subsequent introduction of more cost-intensive policies like carbon prices.

Here, we focus on the public opinion mechanisms behind potential sequencing effects by theorizing that policy sequencing affects public support through two main mechanisms: First, we argue that citizens' perceptions of the effectiveness of previous policy-induced benefits that, for instance, include renewable energy policies at the federal level and electric vehicle support programs at the cantonal and the municipal level are an important but insufficiently studied factor that shapes public support for the subsequent adoption of higher carbon prices (Mildenberger et al., 2022). Thus, the nature of feedback from previous policies on support for later policies critically hinges on how citizens subjectively notice and interpret material and immaterial utility gains from pre-existing policies, such as their perceived financial support, policy effectiveness, and fairness (Huber et al., 2019; Mildenberger et al., 2022; Stadelmann-Steffen & Dermont, 2018). Second, we propose that previous policies that create novel opportunity structures for citizens to shift to low-emission alternatives can positively affect public support for the later adoption of higher carbon prices, particularly in sectors where those opportunities are present. In addition, we explore subgroup effects across different segments of the population; in particular, for ideological groups and citizens who ascribe high or low salience to the issue of climate and environment. Finally, we also investigate how carbon price revenue recycling affects support for carbon prices and discuss if the strategic use of such revenues can indirectly increase support for higher prices over time by creating new low-emission opportunity structures.

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To test our argument about the mechanisms through which policy sequencing is associated with public support for carbon prices, we fielded a conjoint survey experiment just before a real public vote on an amendment to the Swiss Federal Act on the Reduction of Greenhouse Gas Emissions (hereafter, CO_2 Act) in June 2021, the cornerstone of Swiss climate change mitigation policy. We thus leverage the unique direct democratic decision-making setting in Switzerland that allows voters to decide about the adoption of policies, such as the CO_2 Act. We analyze if policy support by voters varies depending on (a) the perceived effectiveness of prior policy-induced benefits and (b) exposure to opportunity structures that enable a switch to low-emission alternatives. To do so, we combine the experimental survey data with non-experimental survey items and geographic information systems (GIS) point data. This enables us to test whether the dependent policy support variable (measured via our conjoint experiment for differently designed carbon pricing policies) is related to individual (i.e., policy perceptions) and geographical factors (i.e., low-emission opportunity structures). Moreover, we employ machine-learning-based sparse regression methods as a robustness test. This advanced statistical method allows us to control for potential omitted interaction effects without overfitting the model (Ratkovic & Tingley, 2017).

This paper is structured as follows. The following section presents the theory and our argument. The third section introduces the research design and methods. Fourth, we discuss the results. The fifth section concludes.

Theory

A growing literature on climate policy sequencing describes how the strategic ordering of policies in benefit-to-cost sequences can increase the political feasibility of the adoption of more ambitious policies over time. According to this emerging sequencing literature, previous theoretically second-best climate policies (e.g., renewable energy subsidies) create direct economic benefits for clean technology providers, reduce the cost of such technologies, and thus create new interest coalitions that push for the adoption of increasingly ambitious carbon pricing policies over time (Leipprand et al., 2020; Meckling et al., 2015, 2017; Pahle et al., 2018). However, the sequencing literature has mainly investigated policy-technology feedback concerning changes in interest group coalitions in the energy sector (Pahle et al., 2018; Schmidt & Sewerin, 2017) but has not broadened its scope to other sectors and public opinion. We propose that incorporating insights from political psychology and policy feedback research is key to addressing this gap.

Policy sequencing emerged from historical institutionalist and policy feedback theories, which are primarily concerned with explaining the temporal coevolution of state institutions (Montfort et al., 2023) and ongoing societal, political, and economic processes (Hall & Taylor, 1996; Howlett, 2009; Pierson & Skocpol, 2002; Thelen, 2004). Following the tradition of the more prominent strand of the former, the policy sequencing literature has mainly employed qualitative case studies (Leipprand et al., 2020; Meckling et al., 2015, 2017; Pahle et al., 2018) and lacks quantitative and experimental studies that provide generalizable evidence about the policy sequencing argument.

Moreover, while the historical institutionalism and policy feedback literature has highlighted how previous policies can affect changes in mass public attitudes to the adoption of later policies (Béland, 2010; Béland & Schlager, 2019; Campbell, 2011, 2012; Jordan, 2013; Jordan & Matt, 2014; Kumlin & Stadelmann-Steffen, 2014; Mettler, 2002; Mettler & Welch, 2004; Soss, 1999; Stadelmann-Steffen & Eder, 2020), existing studies provide insufficient insights about how, i.e., through which mechanisms, the strategic sequencing of different types of policy instruments affects public support for increasingly ambitious carbon pricing instruments. We propose that the sequencing literature can be enriched by accounting for both resource and interpretive policy feedback mechanisms. Figure 1 displays these two mechanisms that capture benefit-to-cost sequences by triggering positive resource and interpretive feedback over time. Such feedback can increase support for more ambitious carbon pricing. The policy sequencing literature has predominantly focused on the material, resource-based feedback mechanisms that arise from economic cost reductions associated with low-carbon technologies. These include, for instance, targeted renewable energy subsidies that drive down the economic cost of the low-carbon transition (Meckling et al., 2015, 2017). Besides such resource effects, prior policies may also activate an interpretative policy feedback mechanism by—for example—changing voters' perceptions of public policy and their personal role in society. While research on policy feedback in the social security domain has underscored the importance of this interpretive feedback mechanism (Campbell, 2012), it

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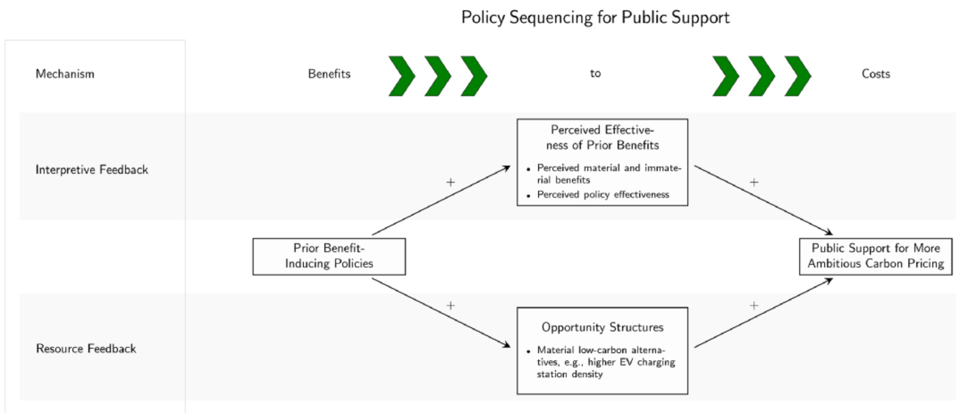

Figure 1. Policy sequencing theory. The figure illustrates two mechanisms through which the sequencing of benefit-inducing policies may increase public support for more ambitious carbon pricing policies. The top bar in grey shows the interpretive feedback mechanism that operates through positive policy perceptions (i.e., perceived effectiveness of prior policy-induced benefits by policies that reward low-carbon behavior), and the bottom grey area displays the resource feedback mechanism that takes effect through policy-induced opportunity structures for switching to low-carbon behavior. The plus signs indicate expected positive effects.

has received insufficient attention in the sequencing literature. Since perceptions are of crucial importance in public support for adopting ambitious climate policy (Avineri, 2012; Drews & Van den Bergh, 2016; Fesenfeld, 2020; Hobman et al., 2016; Huber et al., 2019; Jacobs & Matthews, 2012; Mildenberger & Tingley, 2019; Stadelmann-Steffen, 2011; Stadelmann-Steffen & Dermont, 2018), such as higher carbon prices, this is a key research gap.

To address these gaps, we combine arguments from policy sequencing literature with those from policy feedback research to build a novel theoretical argument about how policy sequencing can affect public opinion. We argue that previous climate policies affect support for the adoption of more ambitious climate policies through two main mechanisms: the perceived effectiveness of prior policy-induced benefits (i.e., a predominantly interpretive feedback mechanism) and opportunity structures for citizens for shifting to low-emission alternatives (i.e., a predominantly resource feedback mechanism).

Perceived effectiveness of policy-induced benefits from prior policies can increase public support

Political and behavioral scientists have repeatedly emphasized that the perceptions of costs and benefits of policies affect their public support (Avineri, 2012; Drews & Van den Bergh, 2016; Fesenfeld, 2020, 2022; Hobman et al., 2016; Huber et al., 2019; Jacobs & Matthews, 2012; Mildenberger & Tingley, 2019; Stadelmann-Steffen, 2011; Stadelmann-Steffen & Dermont, 2018). Particularly, visible costs related to policies consistently decrease public support for policies, which is one of the primary explanations for why carbon taxes are unpopular and become even more so as the tax level increases. Hence, the crucial question is what elements of a policy generally, and a carbon pricing policy in particular, can generate beneficial policy perceptions. For instance, those related to the perceived effectiveness of a policy in terms of compensating for carbon prices (Fesenfeld, 2020, 2022; Stadelmann-Steffen & Dermont, 2018), thus, making policies "work for citizens" (Klenert et al., 2018).

The sequencing literature theorizes that material, resource-based benefits of prior policies can compensate for the costs of ambitious carbon prices and thus facilitate their adoption (Meckling et al., 2015, 2017; Pahle et al., 2018). We take this theory one step further and argue that the scope of this effect is transmitted through citizens' perceptions of the effectiveness of these initial policies and their benefits. In essence, only if voters clearly perceive prior policy benefits as effective at supporting individual low-carbon behavior will sequencing positively affect public support for more ambitious climate policies (see Figure 1). This argument rests on three premises: First, theories about loss aversion predict that losses affect personal utility more than benefits of the same amount (Jacobs, 2011; Jacobs & Matthews, 2017; Jacobs & Weaver, 2015; Kahneman et al., 1982; Pierson, 1994; Weaver, 2000). Research shows that

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such relative perceptions of losses and benefits also affect public support for climate policies (Fesenfeld, 2022). Second, voters' limited cognitive capacity (i.e., their bounded rationality), the complexity of policy proposals, and the frequent focus on costs in public discourse can limit the visibility and thereby the perceived effectiveness of prior policy-induced benefits. For instance, experimental evidence shows that in complex climate policy decision-making processes, voters tend to focus more on costly rather than beneficial policy design elements (Fesenfeld, 2022). Opponents of higher carbon prices also have a strong incentive to highlight policy costs rather than benefits in public discourse. Third, query theory posits that the sequencing of queries affects the perception of costs and benefits and thus support levels (Hardisty et al., 2010; Johnson et al., 2007; Weber et al., 2007). According to query theory, considering the benefits of an option first rather than its costs increases support because the first query that people process is typically more important in shaping the perceptions than the second one. Previous experimental research has shown that highlighting the benefits of carbon mitigation before its costs can increase public support (Weber et al., 2007). Given the fact that the costs of carbon pricing policies are often more salient and visible to voters than the policy benefits, public support for carbon pricing tends to be weaker than for other policies whose benefits are more salient than costs (e.g., subsidies for low-emission alternatives like EVs that create visible price reductions for consumers while obscuring the often indirect cost implications).

Overall, we thus argue that policy perceptions can create an interpretive feedback mechanism. How citizens subjectively perceive and interpret the effectiveness of such policy-induced benefits from previous climate policies is a crucial factor that affects the potential nature of feedback of earlier policies on public support for later policies. Accordingly, and for the case of often unpopular (higher) carbon prices, we derive the following hypothesis:

> **H1:** Voters who perceive that existing policies rewarding low-carbon behavior have been effective are less in opposition to adopting higher carbon prices, compared to voters who perceive such existing benefit-inducing policies to be ineffective.

Opportunities for switching to low-emission alternatives can increase public support

Literature on feedback has frequently focused on the direct feedback of policies on politics by investigating how such policies generate material resources for some societal groups and stakeholders (Béland et al., 2022; Béland & Schlager, 2019; Pierson, 1993; Schmid, 2020). More recently, studies have also incorporated indirect policy feedback through examining policy outcomes such as technological, infrastructural, and behavioral changes (Breetz et al., 2018; Fesenfeld et al., 2022; Lockwood, 2015; Meckling, 2019; Schmid et al., 2020; Schmidt & Sewerin, 2017; Sewerin et al., 2020). This literature often focuses on how policy-induced technological changes reduce the cost of clean energies and thus create new interest groups that materially benefit from more ambitious climate policies (Schmidt & Sewerin, 2017). We take this resource-based argument a step further and link it to potential feedback on public opinion.

We propose that an increase in the opportunity structures and resources of citizens to switch to low-carbon alternatives, such as a high EV station density in a neighborhood, positively affects public support for higher carbon prices (see Figure 1). More specifically, we argue that opportunities for switching to low-emission alternatives can affect public support through three mechanisms. First, opportunity structures for clean alternatives reduce the perceived cost to voters in modifying their behavior (Fesenfeld et al., 2022; Schmidt & Sewerin, 2017). Further, once they have switched over, the latter's opposition to carbon prices that make the use of high-emission products (such as fossil-fueled cars) more expensive is also reduced. Second, an attractive environment for low-emission alternatives—such as EVs—makes it more likely that individuals living in such areas will already have switched their behavior. Such previously experienced benefits and behavior switches should positively affect policy support. Third, opportunity structures for low-emission alternatives, like a higher density of EV charging stations, can also have a contextual and social norm effect. For example, individuals who have not yet switched to using an EV but live in a neighborhood with a high EV charging station density may notice the benefits of such infrastructure because others have told them about it or because they observe more of their neighbors switching to EVs (i.e., a descriptive norm signal). We thus expect that having

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opportunities to switch to low-emission alternatives, such as a high EV station density, can change individuals' utility and positively affect their support for more ambitious climate policy. We thus derive the following hypothesis:

> **H2:** Voters residing in areas with opportunities for switching to low-emission alternatives, such as a high EV station density, are less likely to oppose the implementation of higher carbon taxes than voters residing in an area with fewer such opportunities.

The positive effects of such opportunity structures are likely to be sector-specific. For instance, in the transport sector, the choice of transport mode largely depends on comfort (Diekmann & Preisendörfer, 2003; Domencich & McFadden, 1975), travel time, and the price of transportation alternatives (Domencich & McFadden, 1975). The density of EV charging stations can affect the comfort and travel time of potential EV users (Falchetta & Noussan, 2021). Thus, a high renewable EV charging station density in proximity to voters makes buying electric vehicles more attractive. (Ajanovic & Haas, 2016; Bonges & Lusk, 2016; Egbue & Long, 2012; Graham-Rowe et al., 2012).

Accordingly, we expect that policies in the transport sector change individuals' utility calculus when they face higher carbon prices in the transport sector. However, there are fewer reasons to assume that such transport-specific opportunity structures also create positive spillovers on support for higher carbon taxes in other sectors.

Research design

We use the popular vote on the proposed amendment to the CO_2 Act as context for our study. The CO_2 Act, initially introduced in 2000, is the cornerstone of Swiss climate change mitigation efforts and should considerably contribute to meeting the commitments first adopted in line with the Kyoto Protocol and later the Paris Agreement. To help with decarbonization efforts, it was constantly revised and now includes a broad portfolio of different policy instruments, mainly in the transport, energy, and housing sectors. Most contested was the proposed introduction of a carbon price on motor fuels. In 2021, a referendum was held against a proposed amendment to the law. In June 2021, it was voted on and rejected at the ballot box (51.6% against).

This vote and the preceding campaign represent a unique opportunity to study public support from a sequencing perspective for several reasons. First, respondents were embedded in a realistic policy process, which implies that they were naturally (dis-)informed via the salient public discourse. More generally, given the strong direct-democratic context in Switzerland, with ballot decisions taking place four times a year, Swiss citizens are used to forming opinions about various policy proposals. This unique experimental setting is thus associated with high external and internal validity.

Second, the policy landscape in Switzerland provides a context in which citizens have had the possibility to perceive some benefit-inducing prior policies—however, with considerable regional variation. In the energy sector, these policies include, e.g., a federal feed-in remuneration at cost (in German "Kostendeckende Einspeisevergütung"), running from 2009 to 2022, which has been replaced by investment grants for renewable energy installations both at a smaller and larger scale. This federal scheme is complemented by varying tax deductions for investment costs and additional subsidies at the cantonal level (Schmidt et al., 2023). Such policies reduce overall renewable technology costs and can create positive cross-sectoral spillovers by supporting the electrification of the transport sector. In the transport sector itself, benefit-inducing policies include EV tax reductions for the vehicle tax that again vary at the subnational level by canton. Additionally, there is relatively large heterogeneity in the supportive policies at the cantonal level including, for instance, supportive policies for the installation of public EV charging stations in the canton of Zurich and Bern or EV test weeks in the canton of Basel.

Third, Swiss climate mitigation policy is and was a realistic setting with respect to the sequencing argument. Over the last decades, the CO_2 Act and the Swiss climate and energy policy landscape have been constantly updated. This has often involved the sequencing of second-best policies (e.g., subsidies, regulations, etc.) before (the proposal of) higher carbon prices. After the failed revision of the CO_2 Act in the summer of 2021, the Swiss government reverted again to benefit-inducing low-carbon subsidies in a counter-proposal to a popular initiative, called Climate and Innovation Act on which the public voted

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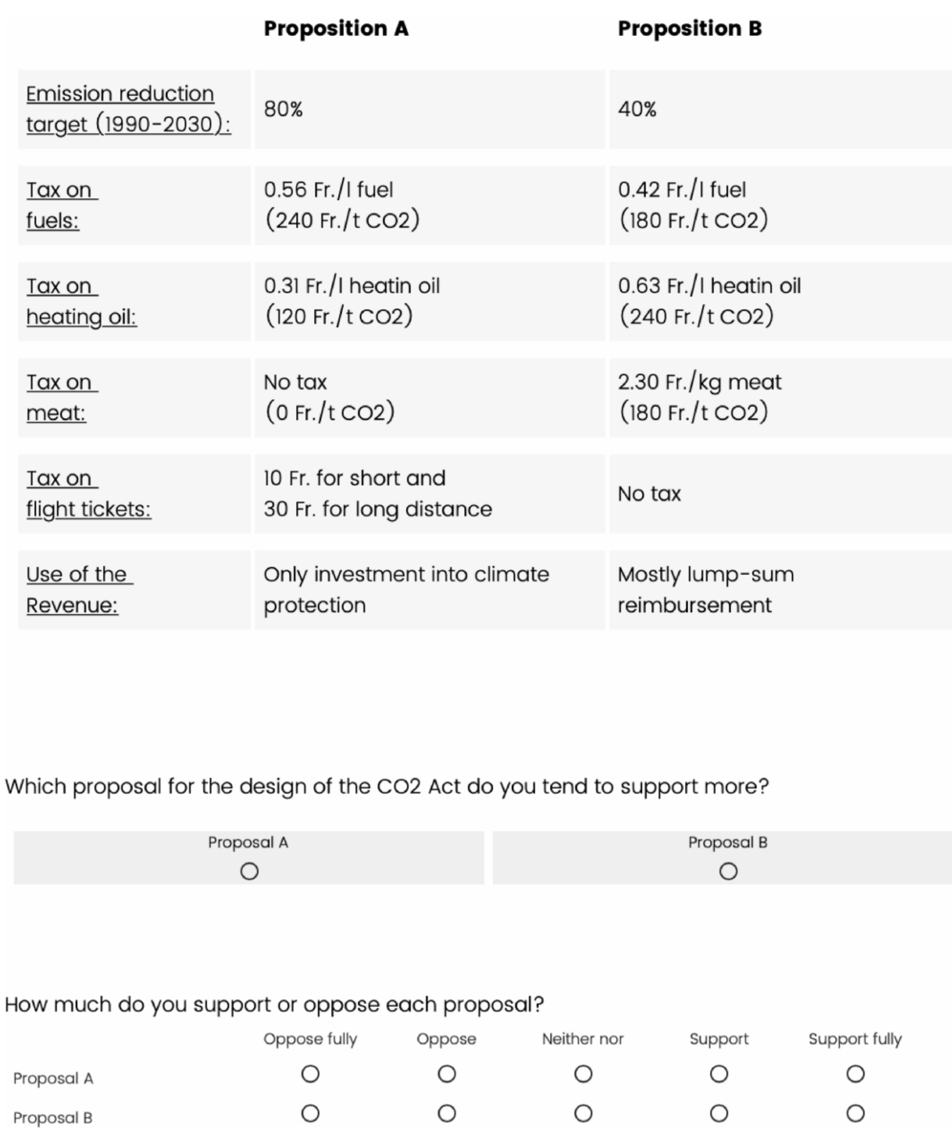

	Proposition A	Proposition B
Emission reduction target (1990-2030):	80%	40%
Tax on fuels:	0.56 Fr./l fuel (240 Fr./t CO2)	0.42 Fr./l fuel (180 Fr./t CO2)
Tax on heating oil:	0.31 Fr./l heatin oil (120 Fr./t CO2)	0.63 Fr./l heatin oil (240 Fr./t CO2)
Tax on meat:	No tax (0 Fr./t CO2)	2.30 Fr./kg meat (180 Fr./t CO2)
Tax on flight tickets:	10 Fr. for short and 30 Fr. for long distance	No tax
Use of the Revenue:	Only investment into climate protection	Mostly lump-sum reimbursement

Which proposal for the design of the CO2 Act do you tend to support more?

Proposal A	Proposal B
○	○

How much do you support or oppose each proposal?

	Oppose fully	Oppose	Neither nor	Support	Support fully
Proposal A	○	○	○	○	○
Proposal B	○	○	○	○	○

Figure 2. Paired policy options. This figure shows the policy options that we asked respondents to compare and evaluate. The attribute levels were randomized. For a description of all attribute levels, see Table 1.

in June 2023. The population supported the adoption of the Act with a 59.1% majority on the ballot. The next proposal for a revised CO_2 Act is currently in parliament.

Data

To test the theoretical expectations, we use data from a population-survey-embedded conjoint experiment. We fielded the survey on the 6 June 2021 just before the popular vote on the Swiss CO_2 Act on the 13 June 2021 and closed the survey on the 17 June 2021. A total of 1,511 respondents completed the survey in French or German. The median survey completion time was 19 minutes. Our online survey was fielded by the survey company Qualtrics. To obtain a high-quality representative sample, we stratified along key dimensions of Swiss voters, such as eligibility to vote, age, and gender (for the specific quotas, see Table A4 in Supplementary Materials C). Furthermore, as some imbalances remained in terms of the urban–rural dimension, we weighted the observations according to each age group present in

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Table 1. Conjoint attributes and randomized attribute levels based on data from Fesenfeld et al. (2021); the table was adapted from Montfort, 2023.

Attribute	Randomized attribute levels
Reduction target	• 40% • 50% • 60% • 70% • 80%
Carbon tax road transport	• No tax on petrol (0 Fr./ton CO_2) • 0.14 Fr./l petrol (60 Fr./ton CO_2) • 0.28 Fr./l petrol (120 Fr./ton CO_2) • 0.42 Fr./l petrol (180 Fr./ton CO_2) • 0.56 Fr./l petrol (240 Fr./ton CO_2)
Carbon tax housing	• No tax on heating oil (0 Fr./ton CO_2) • 0.16 Fr./l heating oil (60 Fr./ton CO_2) • 0.31 Fr./l heating oil (120 Fr./ton CO_2) • 0.47 Fr./l heating oil (180 Fr./ton CO_2) • 0.63 Fr./l heating oil (240 Fr./ton CO_2)
Carbon tax food	• No tax on meat (0 Fr./ton CO_2) • 0.77 Fr./kg meat (60 Fr./ton CO_2) • 1.53 Fr./kg meat (120 Fr./ton CO_2) • 2.30 Fr./kg meat (180 Fr./ton CO_2) • 3.07 Fr./kg meat (240 Fr./ton CO_2)
Carbon tax aviation transport	• No tax on flights • 10 Fr. for short- and 30 Fr. for long-distance • 25 Fr. for short- and 75 Fr. for long-distance • 40 Fr. for short- and 120 Fr. for long-distance • 55 Fr. for short- and 165 Fr. for long-distance
Carbon tax revenue use	• Exclusively lump sum reimbursement • Mostly lump sum reimbursement • Lump sum reimbursement and investment into climate protection • Mostly investment into climate protection • Exclusively investment into climate protection

Switzerland's urban, intermediate, and rural areas (for a comparison of the sample and the population, see Figure C.2 in Supplementary Materials A).

Conjoint experiment

In the conjoint survey experiment (Green & Rao, 1971; Hainmueller et al., 2013), respondents were shown four paired policy options and asked to evaluate them. Figure 2 provides an illustrative example of one such pair. The policy options were described using six attributes (emission reduction target, carbon tax road transport, carbon tax housing, carbon tax food, carbon tax aviation transport, and carbon tax revenue use) with five attribute levels each (e.g., 0, 60, 120, 180, and 240 CHF/ton CO_2 for carbon tax attributes; see Table 1), using a fully randomized approach (Hainmueller et al., 2013).

As part of our conjoint experiment, we used a rating outcome to measure public support for each policy package as main dependent variable. Respondents were asked to indicate how much they supported each of two policy proposals shown to them (rating). The rating outcome was measured on a 5-point Likert scale ranging from full opposition to full support, with a neutral middle category. We present robustness checks in Supplementary Materials E using the choice outcome. The choice outcome forces respondents to choose the preferred of the two options. All results, using both outcomes, listed in regression tables can be found in Supplementary Materials E.1 and E.2.

Conjoint survey experiments perform generally well against a natural experimental benchmark and have been shown to closely resemble actual voting decisions in Swiss popular votes (Hainmueller et al., 2015). Although policy attribute levels may sometimes lead to combinations that may be incoherent or unrealistic, this is often also the case in real-life policymaking, particularly in the case of climate policy. For instance, the Swiss Climate and Innovation Act that was accepted in the

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Summer of 2023 has set a carbon neutrality target by 2050 but the measures taken in this law are not in line with reaching this target. Furthermore, using conjoint experiments to measure public support for policies reduces social desirability biases (Hainmueller et al., 2013). Therefore, using a conjoint survey experimental outcome allows for a valid measurement of public support for ambitious climate policy as our dependent variable.

Whereas in conjoint analysis the effects of the randomized policy attribute levels that respondents are asked to compare can be interpreted as causal treatment effects (Hainmueller et al., 2013), these effects are not of central theoretical interest in the study here. Rather, we are interested in how policy support measured in the conjoint experiment is associated with explanatory variables that are observationally measured, namely the perception of previous policies and respondents' geographical proximity to low-emission opportunity structures, like EV charging stations. While we use various robustness checks to reduce endogeneity risks like reversed causality and omitted variable and interaction bias (see below), it is important to note that the main results from our analysis should be interpreted as correlative rather than causal evidence.

Table 1 shows the six attributes used in the conjoint analysis and the respective attribute levels. As each respondent had to evaluate four paired policy options, we have 1,511 (survey respondents) × 2 (question regarding support or opposition) × 4 (repeated conjoint experiments for each respondent) = 12,088 observations in our sample. The conjoint attributes in Table 1 include the greenhouse gas emission reduction target, a tax in the transport, housing, and food sectors, and revenue use. Because we were primarily interested in how public support for ambitious carbon pricing options is affected via resource and interpretive mechanisms, we focused on these salient price-based policy attributes in different sectors. As a qualitative pre-analysis of parliamentary discourse revealed, these policy attributes also represent salient dimensions in the parliamentary discourse that led to the proposed 2021 Swiss CO_2 Act.

The first attribute is the reduction target. It represents the baseline against which the success or failure of a policy is often evaluated and generates the requirement to adopt specific policies. Therefore, it is often a key dimension of political debate. We varied the greenhouse gas emission reduction target levels for the year 2030 compared to 1990 between 40% and 80%. Second, the carbon price in the form of a tax on road transport fuels represented perhaps the politically most-debated dimension of the conflict in the real policy process among the public and members of parliament in Switzerland. The proposed act was intended to increase the fuel price by up to 12 cents per liter in 2025. Third, the act aimed at ratcheting up the carbon price in the form of a tax on combustibles in the housing sector to between 22 and 49 cents a liter. Tax in the housing sector has traditionally faced less resistance than in the transport sector because the carbon price in the transport sector is more visible to citizens on a day-to-day basis (Ingold, 2011). The tax level on combustibles was randomly varied between 0, 16, 31, 47, and 63 cents per liter. Fourth, we also investigated how a potential extension of the Swiss CO_2 Act to the food sector would have affected support. A carbon price in the form of a carbon tax on food was the only attribute that was not part of the official proposal, despite being discussed in the policy process. Fifth, we included varying carbon prices in the form of different carbon tax levels for short- and long-term flights. The values of these extra flight charges in our experiment were identified from the political debate in parliament that led to the proposal. Finally, we included different options for the use of the revenue created through the carbon tax. Here, we measured how using carbon tax revenues for direct material reimbursement or investments in climate protection affects public support. The proposed act foresaw the creation of a climate fund using one-third of the carbon tax revenue from housing and road transport and half of the revenue generated from the tax on aviation transport. The remainder would have been reimbursed to each citizen via old-age pension fund bills. In the experiment, we randomly varied the degree to which the revenues would be used for direct reimbursement or the climate fund.

Attributes were ordered according to their level of ambition, with the highest level being the most ambitious in terms of climate mitigation. Where possible, we chose comparable carbon tax levels across the different sectors to facilitate cross-sectoral comparisons of the results. For the carbon tax in the road transport, housing, and food sectors, we computed and presented emissions per consumption in tons of CO_2-eq to ensure the comparability of the levels and associated effects in the statistical analyses. We used 0, 60, 120, 180, and 240 CHF/ton CO_2 equivalents. In the current Swiss CO_2 Act implemented in 2013, there is only a carbon tax in the housing sector of 120 CHF/t of CO_2 equivalents and an obligation

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for fuel importers to compensate for emissions at a maximum cost of 20 CHF/t of CO_2 equivalents (corresponding to 5 cents/l of transport fuel) implemented. In all other sectors, no CO_2 price exists. Thus, on average, the proposed policy packages in our conjoint experiment increase carbon prices across different economic sectors compared to the status quo.

Perceived effectiveness of prior policy-induced benefits

Our first explanatory variable of interest captures to what extent voters perceive existent policies rewarding low-emission behavior as effective. To operationalize the perceived effectiveness of such policy-induced benefits, we asked respondents the following question: "There are already policy measures in Switzerland that reward climate-friendly behavior. What about you personally—would you say that these policy measures have already influenced you?". We measured the responses on an ordinal Likert scale with four categories. These included "Previous policies that reward climate-friendly behavior have strongly influenced my behavior" = 4, "Previous policies that reward climate-friendly behavior have somewhat influenced my behavior" = 3, "Previous policies that reward climate-friendly behavior have rather not influenced my behavior" = 2, "Previous policies that reward climate-friendly behavior have not influenced my behavior at all" = 1 (translated here from German to English). The first part of this question nudges respondents toward those policies that induce direct benefits rather than a tax. As mentioned above, in Switzerland, these include a variety of policies in the renewable energy, transport, and building sectors, such as feed-in-tariffs, electric vehicle support programs at the subnational level, or support for heat pumps. Using the self-reported influence of prior supportive climate policies that reward climate-friendly behavior, we can closely operationalize the theoretical concept of the subjectively perceived effectiveness of prior policy-induced benefits.

Opportunity structures to switch to low-carbon alternatives

Our second key explanatory variable of interest is the opportunity structures associated with switching to low-carbon behavior. To measure the latter, we estimated the proximity of the respondent to EV charging stations. In Switzerland, EV charging station proximity can vary substantially for different groups of citizens and is a salient dimension to operationalize low-emission opportunity structures for several reasons. First, EV transport in Switzerland is currently going through a strong transformation phase with around a quarter of newly purchased vehicles being EVs. However, for many car owners, charging infrastructure is an important prerequisite for switching their cars towards EVs. Second, other opportunity structures in this sector such as public transport require a switch in transport mode. Even though the Swiss public transport infrastructure is—compared to other European countries—well developed (Falchetta and Noussan, 2021), the choice of transport mode can be expected to be more rigid than the choice of technology as it is additionally associated with a behavior change. Thus, low-emission opportunity structures in private transport like a dense EV charging network can offer an important lever for shifting behaviors and potentially policy support, especially among segments of society that are more skeptical about ambitious climate policies. Third, only around 40% of the people own the house they live in. This means that EV charging station installation decisions are often not made by potential users themselves but are conditioned by the network run by public entities and private companies. The expansion of the existing charging network is also supported by subnational government policies at varying degrees. This implies that there is some geographical variance in low-emission opportunity structures and the density of EV charging stations in the municipality of the respondent. To compute EV charging station density in the respondents' municipality, we use GIS information systems point data (Swiss Federal Office of Energy, 2022) to calculate the density. A higher density should increase the convenience and the visibility of alternatives, encouraging the switch to low-carbon transport modes. We intersected the polygons containing the municipalities' spatial information with point data on the EV charging stations. We then divided the number of stations by the area of the municipality. Finally, we took the square root of that value to decrease the sensitivity of the variable to extreme values[1]. As we have data on the municipality of residence of respondents, we merged the information on the number of charging stations in the latter with the experimental survey data of each respondent.

[1] This is typically done with logarithmic transformations, which is not possible when data contain zeros as the logarithm of 0 is minus infinity. Hence, we use the square root transformation.

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Analytical methods

We used Generalised Linear Models (GLM) to weight our data and employed Ordinary Least Squares (OLS) regressions and Sparsereg LASSO Plus, a machine learning method, to estimate effects. Our sample included only citizens who were eligible to vote. We stratified the sample by age, gender, and language regions in Switzerland. In the GLM, we additionally weighted our sample according to urban, rural, and intermediary areas of residence. The urban–rural dimension is typically a key political divide in Swiss voting behavior. The distribution in our sample indicates some imbalance compared to the official population statistics (see Figure C.2 in the Supplementary Materials A). Consequently, we weighted observations to ensure that our sample was representative along this dimension. Sample weighting involved assigning respondents a weight so that the distribution in the sample was proportional to the population (DuMouchel & Duncan, 1983; Lumley, 2004, 2011; Nordberg, 1989). Because our two main explanatory variables (perceived effectiveness of prior benefits and density of EV charging stations) can be expected to vary across the urban–rural divide (e.g., urban areas are likely to have a higher EV charging density), we used the DuMouchel-Duncan test (DuMouchel & Duncan, 1983) with 10,000 bootstrap simulations to test if our sample significantly differs along the urban–rural divide. We rejected the null hypothesis that the two distributions were the same due to the F-statistic of $F(5,310,214) = 3.622$ and a p-value of 0 (for further details, see Supplementary Materials C). We, therefore, used weighted generalized regression alongside the standard linear regression models and interpreted results that are robust across the different model specifications. Results for the weighted and unweighted samples did not systematically differ (see Tables A5 and A6 in Supplementary Materials E).

In addition to the GLM, we used OLS, which can be used to compute average marginal component effects and average marginal interaction effects (Hainmueller et al., 2013) for both regressions with the choice outcome and the rating outcome (see Tables A5 and A6).[2] We used marginal means to interpret the interaction effects between the conjoint attributes and our explanatory variables of interest (i.e., perceived effectiveness of prior policy-induced benefits and EV charging station density). Marginal means show the rate of change in the dependent variable against the rate of change in the explanatory variable. The sign and significance of the estimates do not depend on the choice of the baseline category (Leeper et al., 2018). Finally, because some respondents indicated invalid postcodes, merging these with the secondary data on EV charging stations and urban, intermediary, or rural residences was impossible.

To address potential endogeneity risks caused by omitted variable and interaction bias, we included key control variables in all our models. For example, our key explanatory variables of interest, perceived effectiveness of prior policy-induced benefits and EV charging station density, are likely to correlate with other variables (such as education, income, and ideology). While we experimentally varied the policy design attributes in our conjoint experiment, the perceived effectiveness of prior policy-induced benefits and EV charging station density were not experimentally varied. Therefore, we control for potential confounding factors in the relationship between our main explanatory variables and the dependent public support variable. We selected these control variables from the literature on public support for climate policies (Drews & Van den Bergh, 2016; Fesenfeld, 2020, 2022; Fesenfeld & Rinscheid, 2021; Huber et al., 2019; Mildenberger et al., 2022; Stadelmann-Steffen & Dermont, 2018). They include basic demographic respondent attributes such as age, education, linguistic area, employment sector, or place of residence in urban or rural areas, current driving behaviors and home ownership, and selected attitudinal variables such as political ideology or the salience of environmental and climate issues. Without controlling for these, our estimates could be confounded since the control variables might influence both our explanatory variables and our outcome variable on the public support for carbon prices (for a more thorough discussion of the selection process of our control variables and properties that such control variables should have, see Montfort (2023)).

In addition to the inclusion of control variables, we run interactions between our explanatory variables (perceived effectiveness of prior benefit-inducing policies and EV charging stations) with the left–right placement of voters in the political spectrum and issue salience of climate and environment. These interactions allow for substantively and statistically important insights. First, the interaction effects show if the findings are generalizable across different ideological groups of society. Second, prior policies and opportunity structures are not politically exogenous. A positive correlation between

[2] According to Hainmueller et al. (2013), OLS and logit or probit generate similar Average Marginal Component Effects estimates for the choice outcome.

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effectiveness perceptions, opportunity structures, and policy support could also be the result of omitted variable bias or reversed causality. For instance, suppose underlying attitudinal preferences such as respondents' left–right ideology would drive both the policy support outcome and respondents' effectiveness perceptions of existing policies. In this case, cognitive dissonance theory (Druckman & McGrath, 2019; Festinger, 1957, 1964; Hart et al., 2009; Hart & Nisbet, 2012) would suggest that we should observe a positive effect of policy-induced benefits on policy support for the left-leaning segments of society and weaker or even non-existent for right-leaning individuals because the theory predicts that EV use would induce lower cognitive dissonance for the left-leaning. However, we find the opposite, i.e., that right-leaning segments of society increase their support for carbon taxes more if they perceive prior policies to be effective. Thus, although we cannot rule out reversed causality, it is unlikely to be the driver (for a more detailed discussion, see the subsection below entitled "Sequencing for voters with traditionally weak climate policy support").

In contrast to our dependent variable in the conjoint experiment, we could not use forced-choice questions for all control variables, which is why we have a few NAs in the dataset (see Figure A.1). To avoid that the omission of these observations systematically biases the distribution of our sample, we imputed the median values of the respective variable for questions with missing values (Berkelmans et al., 2022) in the data used for OLS regressions.

Moreover, as an additional robustness check, we employed a machine-learning method called LASSO Plus sparse regression (Ratkovic & Tingley, 2017) that helps avoid so-called omitted interaction bias. Such bias could occur if we estimated interactions between the various policy design attributes and the two explanatory variables of interest but did not simultaneously include higher-order interactions with potentially relevant other confounding factors (e.g., ideology, issue salience, etc.). However, including various potentially relevant higher-order interactions in traditional regression models can easily lead to the overfitting of models. Machine-learning methods are a promising approach for exploring treatment-effect heterogeneity within survey experiments and preventing potential omitted interaction bias (Duch et al., 2020; Hill, 2011; Imai & Ratkovic, 2013; Künzel et al., 2019; Green & Kern, 2012; Ratkovic & Tingley, 2017; Wager & Athey, 2018). Thus, LASSO Plus sparse regressions serve as a suitable robustness check because the approach does not lead to overfitting while it controls for potential omitted interaction effects (Ratkovic & Tingley, 2017).

Results and discussion

First, we present results related to our two main hypotheses. Second, we investigate if the effects vary depending on voters' ideology and personal salience of climate change. Third, we present robustness check analyses for effect heterogeneity using the LASSO plus Sparsereg machine-learning methodology.

Perceived effectiveness of prior policy-induced benefits increases support for carbon pricing across sectors while the density of EV charging stations does not

Taking the average support rating for experimental policy packages, including higher carbon prices across different sectors such as transport, housing, and food, our results confirm Hypothesis 1. The findings corroborate that the perceived effectiveness of prior policy-induced benefits rewarding climate-friendly behavior is associated with a significant increase in support for higher carbon pricing policies across sectors. Figure 3 shows the standardized regression coefficients for both the perceived effectiveness of prior policy-induced benefits and the density of EV charging stations. We rescaled continuous variables by two times the standard deviation to make regression coefficients more comparable across continuous and binary variables (Gelman, 2008), meaning that regression coefficients reflect the effect of a two-standard-deviation change in the respective explanatory variable (see Supplementary Materials D for a description). Thus, increasing the subjectively perceived effectiveness of benefits from prior climate policies by two standard deviations is associated with a significant increase in average voter support for more ambitious cross-sectoral carbon pricing policy proposals of 0.239 points (for details, see Table A8).

However, we do not find support for H2, identifying no positive effect of a higher density of EV charging stations on the rating outcome that measures support for the policy proposal of higher carbon prices across different economic sectors. As Figure 3 shows, on average, a higher density of EV charging

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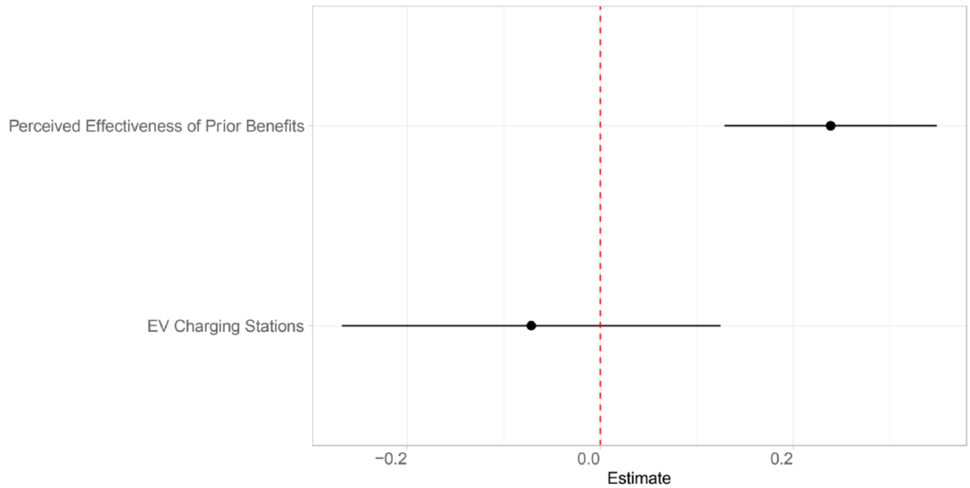

Figure 3. Direct effects. This figure shows the direct effect of our main explanatory variables on average support as identified in the conjoint survey experiment. The results are based on survey-weighted GLM regression in Supplementary Materials Table A8, Models 4 and 5, using the rate outcome.

stations in respondents' neighborhoods is not associated with a significant increase in public support for carbon pricing instruments across different sectors. However, as outlined in the theory section, the resource feedback effect is likely to be linked to the respective sector-specific opportunity structure. As the following section confirms, while insignificant in relation to cross-sectoral support for more ambitious carbon pricing, the density of EV charging stations in respondents' neighborhoods is associated with a significant increase in public support for carbon pricing in the transport sector—a sector where distributional questions loom large, and the Swiss policy debate on carbon pricing was particularly heated.

Zooming in on the transport sector: perceived effectiveness of prior policy-induced benefits and EV-charging station density increase support for carbon pricing in road transport

In line with the cross-sectoral results, Figure 4 shows that sector-specific policy support for different carbon tax levels on fuel in the road transport sector depends on the degree to which voters perceive the effectiveness of prior benefits. Voters who do not perceive benefits from prior climate policies oppose higher carbon prices in the road transport sector (see red line in Figure 4); i.e., the mean support rating decreases as the tax increases (from no carbon tax on petrol [mean support rating = 3.04 on the 5-point Likert support scale] to a carbon tax of 0.56Fr./l petrol [mean rating = 2.66]; for details about the specification of the model, see Table A12, Model 1). In contrast, voters who report some influence from prior benefit-inducing policies do not oppose higher carbon prices in the road transport sector (see blue line in Figure 4; the mean support rating is 3.16 for no carbon tax on petrol and a 3.09 for a carbon tax of 0.56Fr./l petrol). In other words, the perceived effectiveness of prior policy-induced benefits is associated with increasing support for more ambitious carbon pricing in the transport sector.

In line with H2 (concerning opportunity structures for switching to low-carbon behavior), and in contrast to the cross-sectoral results (see Figure A8), Figure 4 shows that support for carbon prices in the transport sector depends on sector-specific opportunity structures for switching to low-emission behavior—here, the density of EV charging stations. Respondents who live in a municipality with zero EV charging stations per square kilometer are more strongly opposed to increasing carbon prices (see red line in Figure 4; i.e., the mean support rating for no carbon tax on petrol [mean support rating = 3.16] decreases as the tax increases to 0.56 Fr./l petrol [mean support rating = 2.86]). In contrast, for respondents who live in municipalities with 2.56 EV charging stations per square kilometer, higher carbon taxes do not significantly decrease support (see blue line in Figure 4; i.e., the mean support rating is 2.94 for no carbon tax on petrol and 2.89 for a carbon tax of 0.56 Fr./l petrol). This difference from 0

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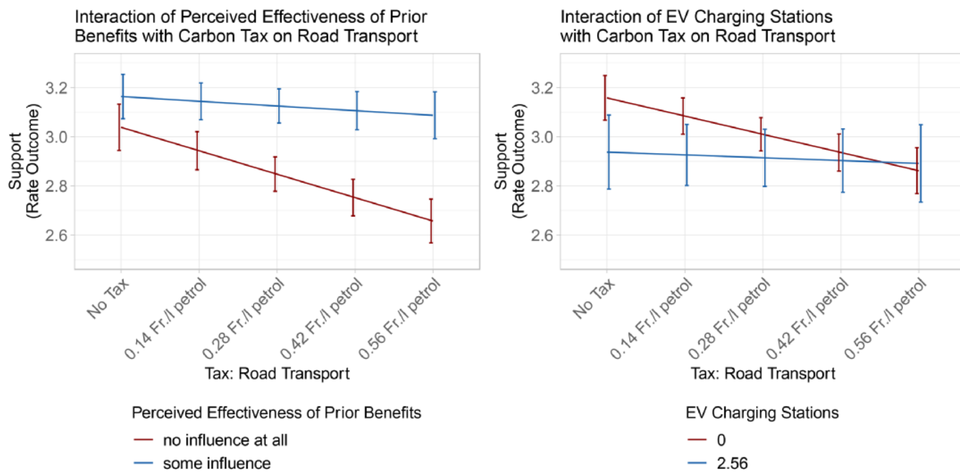

Figure 4. Marginal means of interaction effects with a tax on road transport. The first pane shows the interaction between the perceived effectiveness of prior policy-induced benefits and a tax in the road transport sector on policy support. The second pane shows the interaction between EV charging station density and a tax on road transport. The results are based on survey-weighted linear regression in Supplementary Materials Table A12.

to 2.56 EV charging stations per square kilometer corresponds to a two-standard-deviation increase in EV charging stations in respondents' neighborhoods—i.e., we investigate the marginal effect, controlling for a range of potential confounding factors (for details, see Supplementary Materials Table A12, Model 2). In sum, the results support H2 and indicate living in areas with a higher density of EV charging stations is associated with higher support for carbon taxes in the transport sector. This evidence is consistent with the expectation that opportunity structures that facilitate switching to low-emission alternatives can increase policy support for higher carbon prices in the sector in which the opportunities are created.

Sequencing for voters with traditionally weak climate policy support

So far, we have presented results showing that the perceived effectiveness of prior policy-induced benefits and opportunity structures for switching to low-emission alternatives are associated with increasing support for more ambitious carbon pricing among all respondents. This section reports on the subgroup effects among ideologically different segments of society that traditionally support more ambitious climate policies to variable degrees.

We present these subgroup effects for two different reasons. First, to increase the political feasibility of ambitious climate policy, it is crucial to make sequencing work for voters with traditionally weak climate policy support. These include conservative segments of society, such as right-leaning voters or those who ascribe low salience to climate and environmental issues.

Second, we use this interaction effect to explore whether reversed causality and omitted variable bias (see also the section on analytical methods) could drive our results. As highlighted above, we are using an observational measurement of our explanatory variables. This implies that despite various robustness checks our results should be interpreted as correlative rather than causal evidence. On the one hand, the perception that previous policies have been effective is likely associated with individuals' existing attitudes. On the other hand, dense EV infrastructure is presumably more likely to be present in areas with residents that have a higher share of pro-environmental attitudes.

If underlying attitudinal preferences would indeed be the underlying driver of both the perceived effectiveness of prior policy-induced benefits and public support for ambitious carbon pricing, we would expect the positive "effect" of policy-induced benefits on policy support to be strongly driven by the left-leaning segments of society and be weaker or even non-existent for right-leaning individuals. We root the reasoning in cognitive dissonance theory (Festinger, 1957, 1964). Research on cognitive dissonance theory has argued that people who anticipate or experience cognitive conflict are motivated to defend their initial position and behavior, especially when these conflicts are related to enduring positions,

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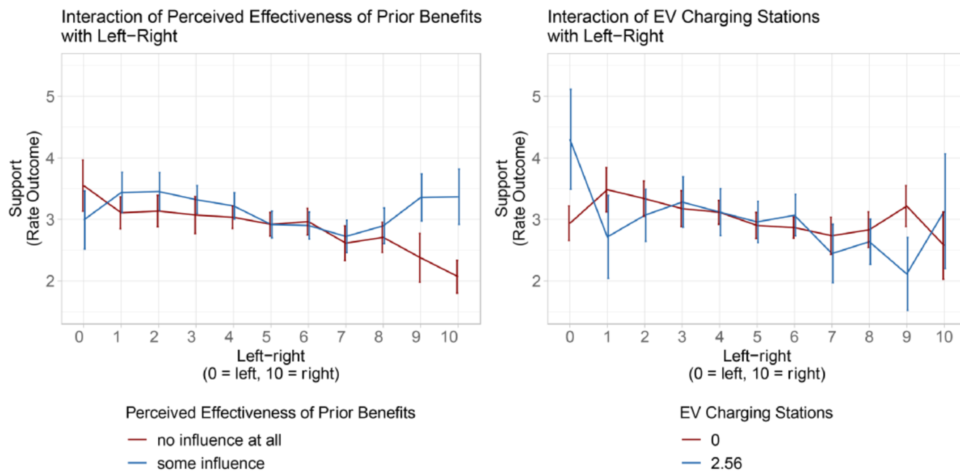

Figure 5. Marginal means for interaction effects with covariates. The first pane shows the interaction between the perceived effectiveness of prior policy-induced benefits and tax in the road transport sector on policy support. The second pane shows the interaction between EV charging station density and a tax on road transport and meat in the food sector, respectively. The results are based on survey-weighted linear regression displayed in Supplementary Materials Table A12.

such as political ideology. A meta-analysis in the field of psychology confirms that such mechanisms are at work (Hart et al., 2009). This has also been shown to be the case for climate change (Druckman & McGrath, 2019; Hart & Nisbet, 2012). Accordingly, we would expect that left-leaning individuals and those with pro-environmental values perceive existing climate policies rewarding low-emission behavior as more effective than right-leaning individuals. In turn, if ideology is truly the underlying driving factor for both support and effectiveness perceptions (i.e., an omitted variable bias), we should observe that left-leaning individuals have a higher perceived effectiveness and higher support for new carbon taxes than right-leaning participants.

However, Figure 5 shows the opposite. Right-leaning segments of society increase their support for carbon taxes more if they perceive prior policies to be effective than left-leaning respondents. Thus, while we acknowledge that this evidence does not fully rule out endogeneity, both our research design and the empirical results imply it is unlikely that our findings and conclusions are primarily the result of reversed causality and omitted variable bias. The figure displays the marginal means for the respondents' left-right position with the perceived effectiveness of prior benefits and EV charging stations, respectively (see Supplementary Materials E.4 in Figure E.6, for such interaction effects with the salience of climate change and the environment). Then, using the rating outcome from the conjoint survey experiment, where respondents state their level of support for each policy package on a 5-point Likert scale, we can make inferences about general levels of support for policy proposals, including higher carbon prices across sectors.

For the interaction effect between the perceived effectiveness of prior policy-induced benefits and the left–right position of the voter, we observe that the impact of the perceived effectiveness of prior policy-induced benefits on support for higher carbon prices across sectors is considerably larger for right-leaning voters than for moderate and left segments (see blue line in left panel in Figure 5). For voters who report prior benefit-inducing policies not to be effective, we observe the expected pattern: Consistent with the generally established relationship in the literature, voters' support for carbon pricing is stronger for left-leaning voters than for right-leaning voters (Drews & Van den Bergh, 2016). In contrast, this relationship is the opposite for respondents who report a strong influence of prior benefit-inducing policies. Importantly, the effect of the perceived effectiveness of prior policy-induced benefits tends to increase from centrist positions towards the far right (e.g., right-wing voters who score 9 or 10 in the left-right spectrum and perceive prior policies to have effectively influenced their behavior [blue line in left panel in Figure 5] support ambitious climate policies on average at a mean value of 3.6–3.7, while those right-wing voters who do not perceive benefits to have effectively influenced their behavior

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[red line in the left panel in Figure 5] only have a mean support level of 2–2.3). As shown in Supplementary Materials E.4 in Figure E.6, we also find consistent results for the interaction with individuals' general salience of the issues of climate change and environmental protection. For people who ascribe less salience to climate protection, the perceived effectiveness of prior policy-induced benefits increases support for higher carbon prices more strongly than for respondents who assign high salience to climate protection. As discussed above (see section "Analytical methods"), these results also provide evidence that endogeneity is unlikely to be a major driver of the observed effects. As outlined above, if reversed causality would be the main explanation for the observed effects, we would expect the opposite to our results, i.e., that the perceived effectiveness of prior policy-induced benefits would increase support for carbon prices more among left-leaning voters and those that generally assign higher salience to climate protection.

In contrast, the interaction effects between EV charging station density and the left–right ideological spectrum show no consistent pattern. The overall effect between the two variables is insignificant and suggests that opportunity structures in the transport sector have broadly similar effects on support for higher carbon prices across sectors for right- and left-leaning voters. A notable exception is with very far-left voters, on whom EV charging stations seem to have a somewhat greater effect (the blue line in the right panel in Figure 5). However, we deem that the overall relationship and the overlapping effects are not strong enough evidence to conclude that EV charging station density clearly has a stronger effect on left-leaning voters. These findings also suggest that reversed causality is unlikely to be the main driver of our observed effects.

As outlined above for the main effect, this null effect for the interaction with left–right ideology might also depend on the sector-specificity of the opportunity structures. These results concerning interaction with left–right ideology are also confirmed when we run interactions with the salience that citizens generally attribute to the issue of climate protection. That is, opportunity structures for switching to low-emission behavior have similar effects on support for carbon pricing policies for voters who deem climate issues more important than those who do not.

Overall, these results have important policy implications as we can show that strategic policy sequencing—via the interpretive and resource feedback mechanisms—has the potential to create particularly positive support effects among segments of society that traditionally oppose ambitious climate policy.

Robustness checks

Finally, we analyze the robustness of our results along three dimensions. Tables A6 and A5 in Supplementary Materials E summarize the robustness of these different models. First, we used both weighted GLM and OLS regression and interpreted effects that are robust across these two model types. Second, we ran regressions with interaction effects with conjoint attributes operationalized as factor levels. That is, we estimated an individual effect for each attribute level (e.g., an individual estimate for each tax level corresponding to 0, 60, 120, 180, and 240 CHF/ton of CO_2) in the conjoint survey experiment. Additionally, and for ease of interpretation, we operationalized conjoint attributes as continuous variables (e.g., one estimate for all tax levels in one sector across 0, 60, 120, 180, and 240 CHF/ton of CO_2). Third, we analyzed to what extent support for policies is driven by heterogeneity in the covariates to control for potentially omitted interaction effects. Figure E.5 in Supplementary Materials E.3 presents the results of a machine-learning-based LASSO Plus sparse regression model (Ratkovic & Tingley, 2017). The key result is that our explanatory variable EV charging stations shown in Figure E.4 are robust to the inclusion of higher-order interaction effects with other covariates. For instance, voters who live in municipalities with a high EV charging station density support the highest carbon tax of 0.56 Fr./l fuel (240 CHF per ton of CO_2 equivalents). However, despite being robust across all four direct specifications and all eight interaction effect specifications across the GLM and OLS model, including various controls (see Table A6 in Supplementary Materials E), the results of the sparse regression do not completely rule out potential omitted interaction effects for the perceived effectiveness of prior policy-induced benefits variable. However, such omitted interaction bias is very unlikely, given the results of the subgroup analysis. If one assumes that the perceived effectiveness of prior policy-induced benefits only masks other variables, such as general climate policy preferences or individuals' ideology, we should not observe larger effects among the more conservative segments of society. Our results, in fact, show this does not only occur among left-wing voters and those that already favor ambitious climate policy.

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Discussion and conclusion

The policy sequencing literature emphasizes that theoretically second-best policies (e.g., subsidies), which create visible material benefits for target groups, can nurture interests and coalitions in favor of decarbonization. This increases coalition support for more ambitious first-best carbon pricing policies (e.g., carbon taxes) (Leipprand et al., 2020; Meckling et al., 2015, 2017; Pahle et al., 2018). We add to this literature by providing the first quantitative evidence on the effects of policy sequencing on public opinion and, more specifically, on how sequencing may alter citizen support. We argue that policy sequencing may broaden citizen support for more ambitious policies via two mechanisms, i.e., (a) by altering the perceived effectiveness of prior policy-induced benefits and (b) by offering opportunity structures for switching to low-carbon behavior. We show that there is a significant relationship between the perceived effectiveness of prior policies and opportunity structures for switching to low-carbon behavior with citizens' support for increasingly ambitious carbon pricing. Our conjoint survey experiment and the subgroup analysis based on observational survey and geospatial data lead to three main conclusions.

First, the results confirm our theoretical argument that the cognitive processes of voters concerning the perception of the effectiveness of prior, benefit-inducing policies shape support for ambitious carbon pricing. Besides the material benefits that sequencing theory (Leipprand et al., 2020; Meckling et al., 2015, 2017; Pahle et al., 2018) emphasizes, we show that such interpretive effects on the perceived effectiveness of prior benefit-inducing policies have a robust positive impact on support among voters. These results underscore the relevance of the sequential processing of information, which suggests that when voters first have positive connotations about a set of policy instruments, status-quo biases may be eliminated. This increases support for policies associated with potentially negative connotations (Hardisty et al., 2010; Johnson et al., 2007; Weber et al., 2007). This result underpins the claim that addressing perceptions through policy sequencing strategies can facilitate the creation of majorities at the ballot box.

Second, previous research has investigated how benefit-to-cost sequences enabled coalition building among elite actors using qualitative case studies (Leipprand et al., 2020; Meckling et al., 2015, 2017; Pahle et al., 2018). We provide the first quantitative generalizable evidence about how resource-based effects from previous climate policies affect public opinion. The combination of our conjoint experiment with fine-grained geocoded data for EV charging stations relevant to respondents' municipalities allowed us to test how low-emission opportunity structures affect public support for higher carbon prices. In lockstep with pre-existing sequencing theory, we show that opportunity structures for switching to low-emission behavior can increase support for more ambitious carbon pricing policies, but only in the sector in which these opportunities are created. This result indicates that the phase-out of fossil-based technologies can be achieved more easily when policymakers first create viable and visible alternatives to the status quo. Introducing these alternatives before rather than after carbon pricing policies can remove barriers to successful climate mitigation. Such positive public opinion feedback emanating from the strategic ordering of policies into benefit-to-cost sequences has thus far been insufficiently studied and incorporated into policy feedback research. This offers an opportunity for future studies.

Third, our findings indicate that sequencing not only increases support among those segments of society that traditionally support ambitious climate policies (e.g., left-wing voters; those highly concerned about climate change). Instead, they show that benefit-inducing climate policies are likely to lessen the partisan divide between left- and right-leaning voters. This finding is significant, considering the extensive literature that emphasizes the existence of partisan-based opposition to climate policy (Drews & Van den Bergh, 2016; McCright et al., 2016; Unsworth & Fielding, 2014). It suggests that the three mechanisms we outline in the theory section (loss aversion, focusing on benefits rather than costs, and the sequential processing of information) have larger positive effects among right-leaning voters who perceive the effectiveness of prior benefits. Moreover, the positive effects of policy sequencing are particularly pronounced among right-leaning voters and those who ascribe low salience to the issues of climate and environment compared to those who think these issues are important. This result also implies that our findings and conclusions are unlikely to be primarily driven by reversed causality. Substantively, our result shows that rather than amplifying political polarization, which increases the potential for political backlash and policy reversal (Lockwood, 2013; Merkley & Stecula, 2021; Rabe, 2018; Stokes, 2016), strategic policy sequencing may be an effective strategy for reducing political polarization and reconciling climate policy positions.

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Moreover, our results also add to the growing literature on the design of carbon pricing schemes. There is debate in this literature about whether carbon pricing revenues may be designed to increase direct support. For example, a prominent expectation in the public opinion literature on carbon pricing is that the lump-sum reimbursement of revenues from carbon prices (meaning that each citizen regularly receives an equal amount of money) can make higher carbon prices more feasible because citizens receive a material benefit (Kallbekken et al., 2011; Klenert et al., 2018) that increases their support (Baranzini et al., 2014; Baranzini & Carattini, 2017; Bristow et al., 2010; Hsu et al., 2008). However, lump-sum reimbursement is often not visible to voters (Beuermann & Santarius, 2006; Mildenberger et al., 2022; Thalmann, 2004). Other authors have contributed to the debate by showing that earmarking revenues for low-emission investments can increase direct public support for carbon taxes prices (Amdur et al., 2014; Bachus et al., 2019; Baranzini et al., 2014; Baranzini & Carattini, 2017; Bristow et al., 2010; Carattini et al., 2019; Dolšak et al., 2020; Fairbrother, 2019; Gevrek & Uyduranoglu, 2015; Hsu et al., 2008; Kallbekken & Aasen, 2010; Kallbekken & Sælen, 2011; Kotchen et al., 2017; Rotaris & Danielis, 2019; Steg et al., 2006; Thalmann, 2004). Our experimental evidence confirms the latter position (see Supplementary Materials D.1).

Research on policy sequencing should investigate in more detail how the design of policies can enable a strategic link between policy sequencing and revenue recycling. There may potentially be a twofold pathway for revenue recycling and sequencing: Policymakers might be able to directly increase support for carbon taxes if the revenue is used for investment into climate protection. Subsequently, policymakers might strategically use this carbon tax revenue to invest in the opportunity structures for low-emission alternatives (e.g., increasing the density of EV charging stations).

Accordingly, research should also delve deeper into the causal mechanisms and different types of benefits that policies can generate. Our study takes a first step in this direction by providing correlative evidence that perceptions about the effectiveness of prior benefit-inducing policies and low-emission opportunity structures are positively associated with increased public support for more ambitious carbon pricing—especially among segments of society with traditionally weak climate policy support. Despite various robustness checks (see method section), a limitation of our research design is that the results should not be interpreted as causal. For a causal interpretation of results, it would be necessary to experimentally vary the perceived effectiveness of prior policy-induced benefits, allowing for a clear distinction between the induced benefits from different types of prior policies (e.g., feed-in-tariffs, EV subsidies, etc.). Ideally, voters' exposure to different low-emission opportunity structures could also be randomly varied to draw causal conclusions. However, a randomized field-experimental variation of different policy-induced benefits and low-emission opportunity structures is unlikely to be implemented at the country-level. Instead, future research could seek to experimentally vary information about different existing real opportunity structures and different existing policy-induced benefits to study how such information and potential belief updating affects policy support. Thus, our study offers several avenues for further research integrating work on policy feedback and strategic policy sequencing.

Playable Video

The playable video is available online at https://players.brightcove.net/1611106596001/default_default/index.html?videoId=6342329322112

Supplementary material

Supplementary material is available online at *Music Therapy Perspectives. All replication files are available under* https://github.com/SimonMontfort/SEQ-CO2.

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Conflict of interest

The authors declare that none exist.

Author contributions

S.M. and L.F. developed the theory and research design. S.M. and L.F. developed and implemented the survey experiment with input from I.S. and K.I. S.M. conducted the analysis with input from L.F. All authors analysed the results. L.F. and S.M. wrote introduction and theory with contributions from I.S. and K.I. S.M. and L.F. wrote the research design, results and conclusion with contributions from I.S. and K.I.

References

Ajanovic, A., & Haas, R. (2016). Dissemination of electric vehicles in urban areas: Major factors for success. *Energy*, *115*(2), 1451–1458. https://doi.org/10.1016/j.energy.2016.05.040

Aklin, M., & Mildenberger, M. (2020). Prisoners of the wrong dilemma: Why distributive conflict, not collective action, characterizes the politics of climate change. *Global Environmental Politics*, *20*(4), 4–27. https://doi.org/10.1162/glep_a_00578

Aldy, J. E., & Stavins, R. N. (2012). Using the market to address climate change: Insights from theory & experience. *Daedalus*, *141*(2), 45–60. https://doi.org/10.1162/DAED_a_00145

Amdur, D., Rabe, B. G., & Borick, C. P. (2014). Public views on a carbon tax depend on the proposed use of revenue. *Issues in Energy and Environmental Policy*, (13).

Anderson, B., Böhmelt, T., & Ward, H. (2017). Public opinion and environmental policy output: A cross-national analysis of energy policies in Europe. *Environmental Research Letters*, *12*(11), 1–10. https://doi.org/10.1088/1748-9326/aa8f80

Avineri, E. (2012). On the use and potential of behavioural economics from the perspective of transport and climate change. *Journal of Transport Geography*, *24*(1), 512–521. https://doi.org/10.1016/j.jtrangeo.2012.03.003

Bachus, K., Van Ootegem, L., & Verhofstadt, E. (2019). 'No taxation without hypothecation': Towards an improved understanding of the acceptability of an environmental tax reform. *Journal of Environmental Policy & Planning*, *21*(4), 321–332. https://doi.org/10.1080/1523908X.2019.1623654

Baranzini, A., Caliskan, M., & Carattini, S. (2014). Economic prescriptions and public responses to climate policy. Genève: Haute école de gestion de Genève.

Baranzini, A., & Carattini, S. (2017). Effectiveness, earmarking and labeling: Testing the acceptability of carbon taxes with survey data. *Environmental Economics and Policy Studies*, *19*(1), 197–227. https://doi.org/10.1007/s10018-016-0144-7

Beiser-McGrath, L. F., & Bernauer, T. (2019). Could revenue recycling make effective carbon taxation politically feasible? *Science Advances*, *5*(9), 1–8. https://doi.org/10.1126/sciadv.aax3323

Béland, D. (2010). Reconsidering policy feedback: How policies affect politics. *Administration & Society*, *42*(5), 568–590. https://doi.org/10.1177/0095399710377444

Béland, D., Campbell, A. L., & Weaver, R. K. (2022). *Policy feedback: How policies shape politics*. Cambridge University Press.

Béland, D., & Schlager, E. (2019). Varieties of policy feedback research: Looking backward, moving forward. *Policy Studies Journal*, *47*(2), 184–205. https://doi.org/10.1111/psj.12340

Bennear, L. S., & Stavins, R. N. (2007). Second-best theory and the use of multiple policy instruments. *Environmental and Resource Economics*, *37*(1), 111–129. https://doi.org/10.1007/s10640-007-9110-y

Downloaded from https://academic.oup.com/policyandsociety/article/42/4/454/7462136 by UPD E-Library user on 08 April 2024

Berkelmans, G. F., Read, S. H., Gudbjörnsdottir, S., Wild, S. H., Franzen, S., van der Graaf, Y., Eliasson, B., Visseren, F. L., Paynter, N. P., & Dorresteijn, J. A. (2022). Population median imputation was noninferior to complex approaches for imputing missing values in cardiovascular prediction models in clinical practice. *Journal of Clinical Epidemiology*, *145*(1), 70–80. https://doi.org/10.1016/j.jclinepi.2022.01.011

Bernauer, T. (2013). Climate change politics. *Annual Review of Political Science*, *16*(1), 421–448. https://doi.org/10.1146/annurev-polisci-062011-154926

Beuermann, C., & Santarius, T. (2006). Ecological tax reform in Germany: Handling two hot potatoes at the same time. *Energy Policy*, *34*(8), 917–929. https://doi.org/10.1016/j.enpol.2004.08.045

Bonges, H. A., III, & Lusk, A. C. (2016). Addressing electric vehicle (EV) sales and range anxiety through parking layout, policy and regulation. *Transportation Research Part A: Policy and Practice*, *83*(1), 63–73. http://dx.doi.org/10.1016/j.tra.2015.09.011

Breetz, H., Mildenberger, M., & Stokes, L. (2018). The political logics of clean energy transitions. *Business and Politics*, *20*(4), 492–522. 10.1017/bap.2018.14

Bristow, A. L., Wardman, M., Zanni, A. M., & Chintakayala, P. K. (2010). Public acceptability of personal carbon trading and carbon tax. *Ecological Economics*, *69*(9), 1824–1837. https://doi.org/10.1016/j.ecolecon.2010.04.021

Campbell, A. L. (2011). *How policies make citizens*. Princeton University Press.

Campbell, A. L. (2012). Policy makes mass politics. *Annual Review of Political Science*, *15*(1), 333–351. https://doi.org/10.1146/annurev-polisci-012610-135202

Carattini, S., Kallbekken, S., & Orlov, A. (2019). How to win public support for a global carbon tax. *Nature*, *565*(7739), 289–291. https://doi.org/10.1038/d41586-019-00124-x

Clayton, S. (2018). The role of perceived justice, political ideology, and individual or collective framing in support for environmental policies. *Social Justice Research*, *31*(3), 219–237. https://doi.org/10.1007/s11211-018-0303-z

Diekmann, A., & Preisendörfer, P. (2003). Green and greenback: The behavioral effects of environmental attitudes in low-cost and high-cost situations. *Rationality and Society*, *15*(4), 441–472. https://doi.org/10.1177/1043463103154002

Dolšak, N., Adolph, C., & Prakash, A. (2020). Policy design and public support for carbon tax: Evidence from a 2018 us national online survey experiment. *Public Administration*, *98*(4), 05–921. https://doi.org/10.1111/padm.12657

Domencich, T. A., & McFadden, D. (1975). *Urban travel demand - A behavioral analysis*. Norh-Holland Publishing.

Drews, S., & Van den Bergh, J. C. (2016). What explains public support for climate policies? A review of empirical and experimental studies. *Climate Policy*, *16*(7), 855–876. https://doi.org/10.1080/14693062.2015.1058240

Druckman, J. N., & McGrath, M. C. (2019). The evidence for motivated reasoning in climate change preference formation. *Nature Climate Change*, *9*(2), 111–119. https://doi.org/10.1038/s41558-018-0360-1

Duch, R., Laroze, D., Robinson, T., & Beramendi, P. (2020). Multi-modes for detecting experimental measurement error. *Political Analysis*, *28*(2), 263–283. https://doi.org/10.1017/pan.2019.34

DuMouchel, W. H., & Duncan, G. J. (1983). Using sample survey weights in multiple regression analyses of stratified samples. *Journal of the American Statistical Association*, *78*(383), 535–543. https://doi.org/10.1080/01621459.1983.10478006

Edenhofer, O., Pichs-Madruga, R., Sokona, Y., Seyboth, K., Kadner, S., Zwickel, T., Eickemeier, P., Hansen, G., Schlömer, S., von Stechow, C., & Matschoss, P. (2011). *Renewable energy sources and climate change mitigation: Special report of the intergovernmental panel on climate change*. Cambridge University Press.

Egbue, O., & Long, S. (2012). Barriers to widespread adoption of electric vehicles: An analysis of consumer attitudes and perceptions. *Energy Policy*, *48*(1), 717–729. https://doi.org/10.1016/j.enpol.2012.06.009

Fairbrother, M. (2019). When will people pay to pollute? Environmental taxes, political trust and experimental evidence from Britain. *British Journal of Political Science*, *49*(2), 661–682. https://doi.org/10.1017/S0007123416000727

Falchetta, G., & Noussan, M. (2021). Electric vehicle charging network in Europe: An accessibility and deployment trends analysis. *Transportation Research Part D: Transport and Environment*, *94*(1), 1–18. https://doi.org/10.1016/j.trd.2021.102813

Fesenfeld, L. (2020). *The political feasibility of transformative climate policy – Public opinion about transforming food and transport systems* [dissertation]. ETH Zurich. https://www.research-collection.ethz.ch/handle/20.500.11850/425564

Downloaded from https://academic.oup.com/policyandsociety/article/42/4/454/7462136 by UPD E-Library user on 08 April 2024

Fesenfeld, L. (2022). The effects of policy design complexity on public support for climate policy. pp. 1–26.
Fesenfeld, L., Ingold, K., Montfort, S., & Stadelmann-Steffen, I. (2021). *CO_2-vote 2021, dataset*. Bern: University of Bern.
Fesenfeld, L., & Rinscheid, A. (2021). Emphasizing urgency of climate change is insufficient to increase policy support. *One Earth*, 4(3), 411–424. https://doi.org/10.1016/j.oneear.2021.02.010
Fesenfeld, L., Schmid, N., Finger, R., Mathys, A., & Schmidt, T. S. (2022). The politics of enabling tipping points for sustainable development. *One Earth*, 5(10), 1100–1108. https://doi.org/10.1016/j.oneear.2022.09.004
Festinger, L. (1957). *A theory of cognitive dissonance*. *Stanford University Press*.
Festinger, L. (1964). *Conflict, decision, and dissonance*. *Stanford University Press*.
Fremstad, A., Mildenberger, M., Paul, M., & Stadelmann-Steffen, I. (2022). The role of rebates in public support for carbon taxes. *Environmental Research Letters*, *17*(8), 1–9. https://doi.org/10.1088/1748-9326/ac8607.
Gelman, A. (2008). Scaling regression inputs by dividing by two standard deviations. *Statistics in Medicine*, *27*(15), 2865–2873. https://doi.org/10.1002/sim.3107
Gevrek, Z. E., & Uyduranoglu, A. (2015). Public preferences for carbon tax attributes. *Ecological Economics*, *118*(1), 186–197. https://doi.org/10.1016/j.ecolecon.2015.07.020
Graham-Rowe, E., Gardner, B., Abraham, C., Skippon, S., Dittmar, H., Hutchins, R., & Stannard, J. (2012). Mainstream consumers driving plug-in battery-electric and plug-in hybrid electric cars: A qualitative analysis of responses and evaluations. *Transportation Research Part A: Policy and Practice*, 46(1), 140–153. https://doi.org/10.1016/j.tra.2011.09.008
Green, D. P., & Kern, H. L. (2012). Modeling heterogeneous treatment effects in survey experiments with bayesian additive regression trees. *Public Opinion Quarterly*, *76*(3), 491–511. https://doi.org/10.1093/poq/nfs036
Green, P. E., & Rao, V. R. (1971). Conjoint measurement-for quantifying judgmental data. *Journal of Marketing Research*, *8*(3), 355–363. https://doi.org/10.1177/002224377100800312
Hainmueller, J., Hangartner, D., & Yamamoto, T. (2015). Validating vignette and conjoint survey experiments against real-world behavior. *Proceedings of the National Academy of Sciences*, *112*(8), 2395–2400. https://doi.org/10.1073/pnas.1416587112
Hainmueller, J., Hopkins, D. J., & Yamamoto, T. (2013). Causal inference in conjoint analysis: Understanding multidimensional choices via stated preference experiments. *Political Analysis*, *22*(1), 1–30. https://doi.org/10.1093/pan/mpt024
Hall, P. A., & Taylor, R. C. (1996). Political science and the three new institutionalisms. *Political Studies*, *44*(5), 936–957. https://doi.org/10.1111/j.1467-9248.1996.tb00343.x
Hardisty, D. J., Johnson, E. J., & Weber, E. U. (2010). A dirty word or a dirty world? Attribute framing, political affiliation, and query theory. *Psychological Science*, *21*(1), 86–92. https://doi.org/10.1177/0956797609355572
Hart, W., Albarracın, D., Eagly, A. H., Brechan, I., Lindberg, M. J., & Merrill, L. (2009). Feeling validated versus being correct: A meta-analysis of selective exposure to information. *Psychological Bulletin*, *135*(4), 555–588. https://doi.org/10.1037/a0015701
Hart, P. S., & Nisbet, E. C. (2012). Boomerang effects in science communication: How motivated reasoning and identity cues amplify opinion polarization about climate mitigation policies. *Communication Research*, 39(6), 701–723. https://doi.org/10.1177/0093650211416646
Hill, J. L. (2011). Bayesian nonparametric modeling for causal inference. *Journal of Computational and Graphical Statistics*, 20(1), 217–240. https://doi.org/10.1198/jcgs.2010.08162
Hobman, E. V., Frederiks, E. R., Stenner, K., & Meikle, S. (2016). Uptake and usage of cost-reflective electricity pricing: Insights from psychology and behavioural economics. *Renewable and Sustainable Energy Reviews*, 57(1), 455–467. https://doi.org/10.1016/j.rser.2015.12.144
Howlett, M. (2009). Process sequencing policy dynamics: Beyond homeostasis and path dependency. *Journal of Public Policy*, 29(3), 241–262. https://doi.org/10.1017/S0143814X09990158
Hsu, S.-L., Walters, J., & Purgas, A. (2008). Pollution tax heuristics: An empirical study of willingness to pay higher gasoline taxes. *Energy Policy*, 36(9), 3612–3619. https://doi.org/10.1016/j.enpol.2008.06.010
Huber, R. A., Wicki, M. L., & Bernauer, T. (2019). Public support for environmental policy depends on beliefs concerning effectiveness, intrusiveness, and fairness. *Environmental Politics*, 29(4), 649–673. https://doi.org/10.1080/09644016.2019.1629171
Imai, K., & Ratkovic, M. (2013). Estimating treatment effect heterogeneity in randomized program evaluation. *The Annals of Applied Statistics*, 7(1), 443–470. https://doi.org/10.1214/12-AOAS593

Downloaded from https://academic.oup.com/policyandsociety/article/42/4/454/7462136 by UPD E-Library user on 08 April 2024

Ingold, K. (2011). Network structures within policy processes: Coalitions, power, and brokerage in Swiss climate policy. *Policy Studies Journal*, *39*(3), 435–459. https://doi.org/10.1111/j.1541-0072.2011.00416.x

Jacobs, A. M. (2011). *Governing for the long term: Democracy and the politics of investment*. *Cambridge University Press*.

Jacobs, A. M., & Matthews, J. S. (2012). Why do citizens discount the future? Public opinion and the timing of policy consequences. *British Journal of Political Science*, *42*(4), 903–935. https://doi.org/10.1017/S0007123412000117

Jacobs, A. M., & Matthews, J. S. (2017). Policy attitudes in institutional context: Rules, uncertainty, and the mass politics of public investment. *American Journal of Political Science*, *61*(1), 194–207. https://doi.org/10.1111/ajps.12209

Jacobs, A. M., & Weaver, R. K. (2015). When policies undo themselves: Self-undermining feedback as a source of policy change. *Governance*, 28(4), 441–457. https://doi.org/10.1111/gove.12101

Jenkins, J. D. (2014). Political economy constraints on carbon pricing policies: What are the implications for economic efficiency, environmental efficacy, and climate policy design? *Energy Policy*, *69*, 467–477. https://doi.org/10.1016/j.enpol.2014.02.003

Johnson, E. J., H öaubl, G., & Keinan, A. (2007). Aspects of endowment: A query theory of value construction. *Journal of Experimental Psychology. Learning, Memory, and Cognition*, *33*(3), 461. https://doi.org/10.1037/0278-7393.33.3.461

Jordan, J. (2013). Policy feedback and support for the welfare state. *Journal of European Social Policy*, *23*(2), 134–148. https://doi.org/10.1177/0958928712471224

Jordan, A., & Matt, E. (2014). Designing policies that intentionally stick: Policy feedback in a changing climate. *Policy Sciences*, *47*(3), 227–247. https://doi.org/10.1007/s11077-014-9201-x

Kahneman, D., Slovic, S. P., Slovic, P., & Tversky, A. (1982). *Judgment under uncertainty: Heuristics and biases*. *Cambridge university press*.

Kallbekken, S., & Aasen, M. (2010). The demand for earmarking: Results from a focus group study. *Ecological Economics*, *69*(11), 2183–2190. https://doi.org/10.1016/j.ecolecon.2010.06.003

Kallbekken, S., Kroll, S., & Cherry, T. L. (2011). Do you not like pigou, or do you not understand him? Tax aversion and revenue recycling in the lab. *Journal of Environmental Economics and Management*, *62*(1), 53–64. https://doi.org/10.1016/j.jeem.2010.10.006

Kallbekken, S., & Sælen, H. (2011). Public acceptance for environmental taxes: Self-interest, environmental and distributional concerns. *Energy Policy*, *39*(5), 2966–2973. https://doi.org/10.1016/j.enpol.2011.03.006

Klenert, D., Mattauch, L., Combet, E., Edenhofer, O., Hepburn, C., Rafaty, R., & Stern, N. (2018). Making carbon pricing work for citizens. *Nature Climate Change*, *8*(8), 669–677. https://doi.org/10.1038/s41558-018-0201-2

Kotchen, M. J., Turk, Z. M., & Leiserowitz, A. A. (2017). Public willingness to pay for a US carbon tax and preferences for spending the revenue. *Environmental Research Letters*, *12*(9), 1–5. https://doi.org/10.1088/1748-9326/aa822a

Kumlin, S., & Stadelmann-Steffen, I. (2014). *How welfare states shape the democratic public: Policy feedback, participation, voting, and attitudes*. *Edward Elgar Publishing*.

Künzel, S. R., Sekhon, J. S., Bickel, P. J., & Yu, B. (2019). Metalearners for estimating heterogeneous treatment effects using machine learning. *Proceedings of the National Academy of Sciences*, *116*(10), 4156–4165. https://doi.org/10.1073/pnas.1804597116

Leeper, T. J., Hobolt, S. B., & Tilley, J. (2018). Measuring subgroup preferences in conjoint experiments. *Political Analysis*, 28(2), 207–221. https://doi.org/10.1017/pan.2019.30

Leipprand, A., Flachsland, C., & Pahle, M. (2020). Starting low, reaching high? Sequencing in EU climate and energy policies. *Environmental Innovation and Societal Transitions*, *37*(1), 140–155. https://doi.org/10.1016/j.eist.2020.08.006

Lockwood, M. (2013). The political sustainability of climate policy: The case of the UK Climate Change Act. *Global Environmental Change*, 23(5), 1339–1348. https://doi.org/10.1016/j.gloenvcha.2013.07.001

Lockwood, M. (2015). The political dynamics of green transformations: Feedback effects and institutional context. In I. Scoones, M. Leach & P. Newell (Eds.), *The politics of green transformations*. (pp. 104–119). Routledge.

Lumley, T. (2004). Analysis of complex survey samples. *Journal of Statistical Software*, *9*(8), 1–19. https://doi.org/10.18637/jss.v009.i08

Lumley, T. (2011). *Complex surveys: A guide to analysis using R*. John Wiley & Sons.

Downloaded from https://academic.oup.com/policyandsociety/article/42/4/454/7462136 by UPD E-Library user on 08 April 2024

McCright, A. M., Dunlap, R. E., & Marquart-Pyatt, S. T. (2016). Political ideology and views about climate change in the European Union. *Environmental Politics*, *25*(2), 338–358. https://doi.org/10.1080/09644016.2015.1090371

Meckling, J. (2019). Governing renewables: Policy feedback in a global energy transition. *Environment and Planning C: Politics and Space*, *37*(2), 317–338. https://doi.org/10.1177/2399654418777765

Meckling, J., Kelsey, N., Biber, E., & Zysman, J. (2015). Winning coalitions for climate policy. *Science*, *349*(6253), 1170–1171. https://doi.org/10.1126/science.aab1336

Meckling, J., Sterner, T., & Wagner, G. (2017). Policy sequencing toward decarbonization. *Nature Energy*, *2*(12), 918–922. https://doi.org/10.1038/s41560-017-0025-8

Merkley, E., & Stecula, D. A. (2021). Party cues in the news: Democratic elites, republican backlash, and the dynamics of climate skepticism. *British Journal of Political Science*, *51*(4), 1439–1456. https://doi.org/10.1017/S0007123420000113

Mettler, S. (2002). Bringing the state back in to civic engagement: Policy feedback effects of the GI bill for World War II veterans. *American Political Science Review*, *96*(2), 351–365. https://doi.org/10.1017/S0003055402000217

Mettler, S., & Welch, E. (2004). Civic generation: Policy feedback effects of the GI Bill on political involvement over the life course. *British Journal of Political Science*, *34*(3), 497–518. https://doi.org/10.1017/S0007123404000158

Mildenberger, M., Lachapelle, E., Harrison, K., & Stadelmann-Steffen, I. (2022). Limited impacts of carbon tax rebate programmes on public support for carbon pricing. *Nature Climate Change*, *12*(2), 141–147. https://doi.org/10.1038/s41558-021-01268-3

Mildenberger, M., & Tingley, D. (2019). Beliefs about climate beliefs: The importance of second-order opinions for climate politics. *British Journal of Political Science*, *49*(4), 1279–1307. https://doi.org/10.1017/S0007123417000321

Montfort, S. (2023). Key predictors for climate policy support and political mobilization: The role of beliefs and preferences. *PLOS Climate*, *2*, 1–21.

Montfort, S., Fischer, M., Hollway, J., & Jager, N. W. (2023). Design paths of federal intergovernmental cooperation. *Policy Studies Journal*, 1–20. https://doi.org/10.1111/psj.12498

Nordberg, L. (1989). Generalized linear modeling of sample survey data. *Journal of Official Statistics*, *5*(3), 223–239.

Nordhaus, W. (1992). An optimal transition path for controlling greenhouse gases. *Science*, *258*(5086), 1315–1319. https://doi.org/10.1126/science.258.5086.1315

Nordhaus, W. (1994). *Managing the global commons: The economics of climate change (Vol. 31)*. MIT press.

Nordhaus, W. (2014). *A question of balance: Weighing the options on global warming policies*. Yale University Press.

Nordhaus, W. (2019). Climate change: The ultimate challenge for economics. *American Economic Review*, *109*(6), 1991–2014. https://doi.org/10.1257/aer.109.6.1991

Nowlin, M. C., Gupta, K., & Ripberger, J. T. (2020). Revenue use and public support for a carbon tax. *Environmental Research Letters*, *15*(8), 1–11. https://doi.org/10.1088/1748-9326/ab92c3

Pahle, M., Burtraw, D., Flachsland, C., Kelsey, N., Biber, E., Meckling, J., Edenhofer, O., & Zysman, J. (2018). Sequencing to ratchet up climate policy stringency. *Nature Climate Change*, *8*(10), 861–867. https://doi.org/10.1038/s41558-018-0287-6

Pierson, P. (1993). When effect becomes cause: Policy feedback and political change. *World Politics*, *45*(4), 595–628. https://doi.org/10.2307/2950710

Pierson, P. (1994). *Dismantling the welfare state?: Reagan, thatcher and the politics of retrenchment*. Cambridge University Press.

Pierson, P., & Skocpol, T. (2002). Historical institutionalism in contemporary political science. *Political Science: The State of the Discipline*, 3(1), 1–32. https://doi.org/10.1017/CBO9780511805288

Rabe, B. G. (2018). *Can we price carbon?* MIT Press.

Ratkovic, M., & Tingley, D. (2017). Sparse estimation and uncertainty with application to subgroup analysis. *Political Analysis*, 25(1), 1–40. https://doi.org/10.1017/pan.2016.14

Rotaris, L., & Danielis, R. (2019). The willingness to pay for a carbon tax in Italy. *Transportation Research Part D: Transport and Environment*, *67*(1), 659–673. https://doi.org/10.1016/j.trd.2019.01.001

Schaffer, L. M., Oehl, B., & Bernauer, T. (2021). Are policymakers responsive to public demand in climate politics? *Journal of Public Policy*, *42*(1), 136–164.

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Schmid, N. (2020). *The politics of technological change – Case studies from the energy sector* [dissertation]. ETH Zurich. https://www.research-collection.ethz.ch/handle/20.500.11850/447993

Schmid, N., Sewerin, S., & Schmidt, T. S. (2020). Explaining advocacy coalition change with policy feedback. *Policy Studies Journal*, *48*(4), 1109–1134. https://doi.org/10.1111/psj.12365

Schmidt, T., & Sewerin, S. (2017). Technology as a driver of climate and energy politics. *Nature Energy*, 2(6), 1–3. https://doi.org/10.1038/nenergy.2017.84

Schmidt, T., Stadelmann-Steffen, I., Dukan, M., Giger, D., Schmid, N., & Schneuwly, V. (2023). *Quantifying the degree of fragmentation of policies targeting household solar PV in Switzerland*. ETH Zürich.

Sewerin, S., Béland, D., & Cashore, B. (2020). Designing policy for the long term: Agency, policy feedback and policy change. *Policy Sciences*, 53(2), 243–252. https://doi.org/10.1007/s11077-020-09391-2

Soss, J. (1999). Lessons of welfare: Policy design, political learning, and political action. *American Political Science Review*, 93(2), 363–380. https://doi.org/10.2307/2585401

Stadelmann-Steffen, I. (2011). Citizens as veto players: Climate change policy and the constraints of direct democracy. *Environmental Politics*, 20(4), 485–507. https://doi.org/10.1080/09644016.2011.589577

Stadelmann-Steffen, I., & Dermont, C. (2018). The unpopularity of incentive-based instruments: What improves the cost–benefit ratio? *Public Choice*, *175*(1), 37–62. https://doi.org/10.1007/s11127-018-0513-9

Stadelmann-Steffen, I., & Eder, C. (2020). Public opinion in policy contexts. A comparative analysis of domestic energy policies and individual policy preferences in Europe. *International Political Science Review*, *42*(1), 78–94. https://doi.org/10.1177/0192512120913047

Stavins, R. N. (1997). Policy instruments for climate change: How can national governments address a global problem. *University of Chicago Legal Forum*, *27*(1), 293–330.

Stavins, R. N. (2008). Addressing climate change with a comprehensive US cap-and-trade system. *Oxford Review of Economic Policy*, 24(2), 298–321. https://doi.org/10.1093/oxrep/grn017

Steg, L., Dreijerink, L., & Abrahamse, W. (2006). Why are energy policies acceptable and effective? *Environment and Behavior*, *38*(1), 92–111. https://doi.org/10.1177/0013916505278519

Stokes, L. C. (2016). Electoral backlash against climate policy: A natural experiment on retrospective voting and local resistance to public policy. *American Journal of Political Science*, 60(4), 958–974. https://doi.org/10.1111/ajps.12220

Swiss Federal Office of Energy. (2022). Charging points for electric cars. Last accessed 02.09.22.

Thalmann, P. (2004). The public acceptance of green taxes: 2 million voters express their opinion. *Public Choice*, *119*(1), 179–217. https://doi.org/10.1023/B:PUCH.0000024165.18082.db

Thelen, K. (2004). *How institutions evolve*. *Cambridge University Press*.

Unsworth, K. L., & Fielding, K. S. (2014). It's political: How the salience of one's political identity changes climate change beliefs and policy support. *Global Environmental Change*, *27*(1), 131–137. https://doi.org/10.1016/j.gloenvcha.2014.05.002

Wager, S., & Athey, S. (2018). Estimation and inference of heterogeneous treatment effects using random forests. *Journal of the American Statistical Association*, *113*(523), 1228–1242. https://doi.org/10.1080/01621459.2017.1319839

Weaver, R. K. (2000). *Ending welfare as we know it*. Brookings Institution Press.

Weber, E. U., Johnson, E. J., Milch, K. F., Chang, H., Brodscholl, J. C., & Goldstein, D. G. (2007). Asymmetric discounting in intertemporal choice: A query-theory account. *Psychological Science*, *18*(6), 516–523. https://doi.org/10.1111/j.1467-9280.2007.01932.x

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