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How beliefs of the political elite and citizens on climate change influence support for Swiss energy transition policy

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Abstract

This paper analyzes factors that lead to opposition towards policies in Switzerland that promote a clean energy transition. During legislative processes, both the elite and general citizens can develop resistance towards such policies. The article considers those two perspectives and determines, on both levels, factors that explain opposition. We also specifically take into account whether climate change skepticism, i.e., questioning that climate change is real and human-induced, is a key factor that leads to opposition. Furthermore, we employ structural equation models to account for interactions between the elite and general citizens. The results show that political actors who reject the idea of man-made climate change also oppose the promotion of a clean energy transition, and more generally that elite actors influence how citizens think about the issue. At the citizen level, an increase in climate change skepticism has a negative impact on levels of support for clean energy policy. The link is mainly determined by party affiliation. We conclude that potential strategies for achieving a clean energy transition should focus on motivating citizens because they generally seem to be less polarized and partisan, and thus less opposed to new solutions, than the elite, who tend to be more constrained in their actions.

Key words: public policy; clean energy; opposition towards energy transitions; climate change skepticism; political elite

1. Introduction

Most nation states need to adopt ambitious policies and substantially increase low-carbon energy production to achieve their climate goals and to reach a more sustainable long-term energy supply. Many experts of the field view state intervention as necessary for enabling a renewable energy transition because market failures as well as commitment and time inconsistency problems have thus-far limited the transition towards clean energy in areas without government support (Kern & Howlett, 2009; Lodge & Wegrich, 2012). Another factor impeding the transition to renewable energy includes the fact that parts of the political elite (political parties, E-NGOs, administrative offices, interest groups etc.) oppose policies that promote or implement clean energy, especially if they find clean energy neither desirable nor necessary (see also Fraune & Knodt, 2018 in this special issue [Fraune, Cornelia & Michèle Knodt. Sustainable energy transformations in an age of populism, post-truth politics, and local resistance. Energy Research and Social Science 2018: 43]). Moreover, on a systems level, scholars find that well-established socio-technical (Bijker, Hughes, & Pinch, 2005; Geels, 2002; Sovacool, 2016; Sovacool & Geels, 2016) and regulatory systems (Stirling, 2014; Thelen, 1999), like the ones governing energy production and use, tend to be stable and hard to change over time. Finally, political actors and citizens alike are often unsure about what specific policies to implement, because of the diversity of options and the lack of clarity about policy outcomes (Kern & Howlett, 2009). All these factors may lead to substantial delays in the implementation of promotional measures and the deployment of new technologies, which could mean that countries struggling with these issues miss their respective climate and clean energy targets (Karlstrøm & Ryghaug, 2014; Kuzemko, Keating, & Goldthau, 2016).

Transition studies have paid considerable attention to the stability of socio-technical systems. Public policy and environmental economics have mostly explored the uncertainty in policy selection. However, few studies explicitly analyze why certain groups of citizens or elite actors oppose policies supporting the transition towards a more sustainable energy system. The paper therefore asks: W*hat drives elite actors and general citizens to oppose policies that support a clean energy transition?*

To achieve a clean energy transition, it is crucial that states and governments develop and work towards goals that include targets for clean energy production or lower greenhouse gas emissions. Simultaneously, researchers investigating reasons for success or failure of energy transitions need to focus on studying specific policies to better understand where opposition or support from the public comes from, similar to the value-action gap regarding the local siting of technologies (see also Graff et al., 2018 in this special issue [Graff, Michelle et al., 2018. Stakeholder Perceptions of the U.S. Energy Transition: Local-level Dynamics and Community Responses to National Politics and Policy. Energy Research and Social Science 2018: 43]; Bell, Gray, & Haggett, 2005). This paper, therefore, focuses on understanding the opposition to clean energy policies and uses it as a proxy for understanding support for the idea of a clean energy transition more broadly (Kern & Howlett, 2009). This study adopts an actor-centered perspective and considers the beliefs and preferences of both the political elite as well as general citizens because both play important roles in the legislative process as well as in the later implementation of clean energy policies, as (e.g.) Delina and Janetos (2018) or Komendantova, Riegler,

and Neumueller (2018) show. We thus consider the previous findings and expand the literature by explicitly combining research on both the elite and general citizenry. Understanding the root of opposition towards a clean energy policy is important to identify hurdles and solutions for states in achieving or reformulating their targets in accordance with the preferences of the political elite or citizens. Moreover, even when a productive policy does pass, when the public or political elite do not support it, compliance can still be low and undercut the policy's efficacy (see also Trotter & Maconachie, 2018 in this special issue [Trotter, Philipp Andrew & Roy Maconachie, 2018. Populism, post-truth politics and the failure to deceive the public in Uganda's energy debate. Energy Research and Social Science 2018: 43]; Dermont, Ingold, Kammermann, & Stadelmann-Steffen, 2017; Ingold, Stadelmann-Steffen, & Kammermann, 2017).

By exploring the root cause of opposition to clean energy policies from both the public and political elite, we expand current social science research on energy transitions. Stokes and Breetz (2018) as well as Carley, Evans, and Konisky (2018), for example, assessed the attitudes and culture specific to people affected by the expansion of RE and the decline of conventional power sources. They found that both attitudes and culture could drive people's opposition to policies that promote sustainable energy. To develop a unique perspective on the subject, we combine their insights with literature on climate change skepticism (see e.g., McCright, Marquart-Pyatt, Shwom, Brechin, & Allen, 2016; Reiner et al., 2006; Tranter & Booth, 2015), which also seems to be a driving factor in determining whether the public and elite actors oppose a clean energy transition. Climate change skepticism is the belief that climate change either is not as problematic as the scientific community says it is, an altogether denial of anthropogenic climate change, or somewhere in between. Therefore, people can use their skepticism as grounds for rejecting tangible solutions to solving climate change, including supporting a clean energy transition. In addition, political parties and thought-leaders can continue fostering this skepticism by exploiting growing public distrust towards the scientific community and the government for political gain. Therefore, rhetoric that promotes the distrust of scientific facts and sows doubt in anthropogenic climate change can play into a populist mindset. If the frame used by the opposition is that "the government" and "scientists" are trying to force "the people" to live their lives a certain way with no true benefit to them, the result can be deep-seeded antagonism (Mudde, 2004) and further distrust not only of climate change but also of the government and scientific community more broadly. In Switzerland and other countries, the right-wing and populist parties tend to promote climate change skepticism and harbor deeper opposition towards clean energy than their more progressive counterparts. Populist parties, therefore, could be exploiting skepticism to further undermine public and political support for clean energy policies (Tranter & Booth, 2015).

By combining insights from these strands of research, this paper expands on the current debate and increases the understanding of the complex and multi-level participatory processes concerning the clean energy transition. This paper focuses on Switzerland, which is ideal for three reasons: first, Switzerland is often seen as a laboratory for popular votes. This paper thus offers insight for other countries and regions that may rely on similar participatory processes involving both elite actors and citizens,

especially when these processes are generally new or specific to the energy sector (Linder, 2010; Szulecki, 2017). Second, Switzerland's direct democratic system allows citizens to actively participate in the political decision-making process regarding the deployment of low-carbon technologies. There is a balance of power between the political elite (e.g., parties, interest groups, or environmental non-governmental organizations (E-NGOs)) and citizens. That, in turn, allows us to investigate the political relevance and relative influence of both entities (Vatter, 2016). In our case, the elite is mainly in charge of the drafting phase, however, the citizens are later able to express their opposition or support for the new energy strategy in a popular vote. Third, the pressure to transition the electric power supply towards more low-carbon technologies is high in Switzerland because, in 2017, the country set ambitious short-term policy measures to support the transition (Swiss Confederation, 2016). By voting in favor of the 2017 energy act, the Swiss people accepted two primary policies regarding the production of electricity: a ban on constructing new nuclear power plants, and a gradual increase of taxes levied on electricity consumption to be used for subsidizing RE (among the more general goals within the policy were to increase RE production and energy efficiency). In order to achieve these goals, however, Switzerland needs to adopt additional policies. Because this first slate of policies, as well as the idea of bringing on additional policies, is both controversially discussed, Switzerland is an ideal test-case for exploring opposition towards the clean energy transition.

On the theoretical level, we consider the attitudes and policy preferences of both elite actors and the citizenry as they pertain to clean energy policies (Converse, 1964). We also consider literature on social acceptance (Dermont et al., 2017; Jegen & Philion, 2017). For the elite actors, we apply cluster analyses (Everitt, Landau, Leese, & Stahl, 2011; Murtagh & Legendre, 2014). Cluster analyses allow us to identify not only single actors and their opposition to the promotion of energy transitions, but also the attitudes of whole groups of actors based on their central beliefs. On the individual level, we apply structural equation modeling to assess and identify the factors that influence opposition to clean energy policies (Beaujean, 2014; Rosseel, 2012). The data used for the analysis is based on a survey conducted among elite actors in the energy policy domain as well as on data from a nationally-representative survey questioning citizens about their preferences regarding RE policy. By combining both sources, we present a comprehensive account of why elite actors and citizens alike often oppose clean energy policies.

2. Theory

2.1. Policy supporting energy transitions

This paper focuses on the drivers behind opposition to renewable energy policy by both the political elite and general public. Most experts agree that a clean energy transition can only be successful when supported by state intervention (Kern & Howlett, 2009; Lodge & Wegrich, 2012). The range of policy options to accomplish such a goal is broad: they range from highly regulated, like banning nuclear power or implementing a feed-in tariff scheme, to those that are less prescriptive and more targeted such as subsidizing research and development of clean energy options (for an extensive list of measures

see Sovacool, 2009). Public support, as well as the support of the political elite, is a central prerequisite for success. Political parties, interest groups, and E-NGOs play an important role in the drafting phase of most energy policies, as do administrative entities and local governments. Political parties make the final determination about policy selection, unless a policy makes it to a public vote (at least in the Swiss case under investigation in this study). Although policy selection and a potential public vote are sequentially independent from each other and follow different rules, they are interrelated (Vatter, 2016). For instance, policymakers are susceptible to public opinion, and political parties play a role in shaping public opinion by providing heuristics (Kriesi, 2008).

Most studies that have attempted to analyze the development of clean energy policy have been conducted under the frame of "social acceptance." Dermont et al. (2017) further emphasize the political nature of social acceptance, since most processes used to promote clean energy policies are inherently political in nature. Policy decisions follow the rules of political institutions such as parliaments, citizens' assemblies, or popular votes (Jegen & Philion, 2017; Scherhaufer, Höltinger, Salak, Schauppenlehner, & Schmidt, 2017). Elite stakeholders are crucial during the process of designing policies, but citizens become important actors later in the process when, in a direct-democratic setting, a public vote is triggered on the issue.

2.2. Opposition by elite actors

The policy preferences of elite actors are determined by two major factors (among others): their beliefs (e.g., Converse, 1964), and the preferences of the people or entities they represent (especially their political parties) (e.g., Schneider & Ingram, 1993). The beliefs of elite actors build the basis for their actions, influence with whom they collaborate, and determine what policies (if any) they choose for solving a problem (in this case the promotion of clean energy) (Converse, 1964; Weible & Sabatier, 2005). Their policy preferences – more detailed expressions about what specific policies should be used and which shouldn't, as compared to whether or not any renewable energy policies should be pursued in the first place – tend complement these beliefs (Weible & Jenkins-Smith, 2016). Weible (2006) showed, in an empirical study, that even when political players are making choices about protecting marine areas, their decisions are impacted by their more general beliefs outside of the conservation realm. Kriesi and Jegen (2001) further show that beliefs also play a crucial role in the selection of energy related policies in the consensus oriented system of Switzerland. The paper thus adopts this hierarchical beliefs structure and considers actors to be boundedly rational in line with other frameworks such as the Advocacy Coalition Framework (Weible, 2006).

Other factors besides beliefs and preferences also influence the decisions of political elite. For instance, political elite may express opposition to a policy as a quid-pro-quo exchange with other actors (e.g., Ingold, Fischer, & Cairney, 2016), or because of other political priorities in tight budgetary situations (Howlett & Lejano, 2012). While we acknowledge the importance of these other aspects, however, this paper focuses primarily on the two previously described factors.

2.3. Opposition by citizens

Many studies have analyzed citizen support for environmental issues at the polls, both in Switzerland (Bornstein & Thalmann, 2008; Stadelmann-Steffen, 2011), and in the U.S. (Deacon & Shapiro, 1975; Kahn & Matsusaka, 1995). Those studies offer insights into the factors that affect public support for clean energy policies. For instance, the public is generally sensitive to whether or not they will be personally impacted by a certain policy. In direct democratic processes, citizens can directly influence policy outcomes by voting against such policies, therefore asking to consider the specific context of popular votes if interested in the reaction of citizens towards the policies implementing (Dermont et al., 2017). Similar to elite actors, the individual attitudes of citizens influence their voting behavior. For example, if a citizen values environmental protection and public goods, they are more likely to vote for conservation-minded policies. In California, Deacon and Shapiro (1975) and Kahn and Matsusaka (1995) found such findings and reported that alignment with the Republican Party depressed voter support for conservation policies. By contrast, in Switzerland, a left-green ideology has been shown to significantly increase the probability that a citizen will vote in favor of an environmentally-friendly proposal (Bornstein & Thalmann, 2008; Sciarini, Bornstein, & Lanz, 2007). Similar results were found for more general environmental attitudes as well (Stadelmann-Steffen, 2011).[1] These insights from literature referring to popular votes inform us about possible determinants of reactions by citizens towards proposals by the government where they have a say in voting decisions, and therefore quite explicit political process of acceptance, which does not necessarily reflect the multitude of determinants to other forms of acceptance in the literature (Dermont et al., 2017; see also Bell et al., 2005; Huijts, Molin & Steg 2012; Fast, 2013). Besides the focus on such political decisions for individuals, the next subchapter introduces a new perspective towards votes not discussed in the literature on voting on the environment so far, that is gaining in urgency and trending in political debate, as new aspect.

2.4. Climate change perception

In recent years the research community has honed in on the fact that climate change skepticism – and especially doubt in anthropogenic climate change in particular – is very likely to correspond with an individual's view that a clean energy transition is unnecessary (Capstick & Pidgeon, 2014; Engels, Hüther, Schäfer, & Held, 2013; Lee, Markowitz, Howe, Ko, & Leiserowitz, 2015; McCright et al., 2016; Shi, Visschers, & Siegrist, 2015). As aforementioned, both the political elite and citizens are likely to evaluate an issue like a specific energy policy based on their pre-existing beliefs, political ideologies, and environmental attitudes. Notably, a person's perception and knowledge of climate change significantly impacts their judgment about the importance of phasing out conventional energy sources and investing in renewable energy, as well as their willingness to support environmental policies (Lee et al., 2015; Shi et al., 2015). Most importantly, as Shi et al. (2015, 2194 & 2197) found in Switzerland, the more citizens recognize the causes and impacts of climate change, the more likely they are to support

[1] In the following, we use 'beliefs' for the elite level and 'attitudes' for the citizens' level.

and accept climate-friendly policies. Moreover, public opinion on climate change is heavily influenced by the political elite, as Brulle, Carmichael, and Jenkins (2012) have shown in the U.S. In fact, compared to several other factors like the prominence of extreme weather events and more scientific information, cues from the political elite, like policymakers, advocacy groups, and the media, are the most prominent drivers of public opinion on climate change issues (Brulle et al., 2012, p. 182). The political elite, therefore, are a relevant factor in determining public opinion and thus public support (or lack thereof) for clean energy policies (see Kriesi, 2008 for direct democratic voting heuristics). This is even truer given that recent research demonstrates that simply stating that climate change is man-made is likely to increase opposition from individuals who doubt the scientific consensus (Bolsen & Druckman, Forthcoming). A similar reaction is conceivable for skeptic political actors when presented with additional scientific information (Cairney, 2016).

Therefore, an individual's pre-existing attitudes towards the environment and climate change are strong factors as to whether or not they will support specific clean energy policies, for both the political elite and the general citizenry (Shi et al., 2015). Brulle et al. (2012) show that the political elite influence public support for climate change issues, and beg the question of whether or not political parties deliberately use climate skepticism to reinforce opposition to clean energy policies. As climate change skepticism refers to questioning scientists and their work, it also reflects a skepticism or distrust towards "the elite" and "the educated". This distrust of the elite or a group different from the own, in this case highly educated scientists, reflects the essence of populism establishing an antagonism between the people and an elitist group (Mudde, 2004). In this analysis, we will therefore take a closer look at how beliefs in climate change, both for the elite and for the general public, influences thinking around energy policy, and how this new explanation fares in comparison to older explanations.

2.5. Hypotheses

Based on the theoretical understandings, we formulate three assumptions that guide our analysis (see *Figure 1)*. Multiple studies show that general beliefs about an issue influence the policy preferences of both the elite and the citizenry (Kriesi & Jegen, 2001; Weible, 2006). Recently, research also highlights that beliefs, attitudes, and concerns about climate change have an effect on the public's support and acceptance of policies supporting a clean energy transition (Capstick & Pidgeon, 2014; Engels et al., 2013; Shi et al., 2015; Tranter & Booth, 2015). Therefore, our first hypothesis is that for both the elite and for citizens, climate change skepticism drives opposition to renewable energy policies:

H1a: For political elite, skepticism about anthropogenic climate change coincides with opposition to clean energy policies.

H1b: For general citizens, skepticism about anthropogenic climate change coincides with opposition to clean energy policies.

We also take into account that political actors and citizens have different tasks to accomplish during a political process (Dermont et al., 2017). Political actors, and especially political parties, are in charge of drafting policy and formally adopting them in parliament. If a referendum is later triggered, citizens have to vote on that policy. However, we recognize that those two processes do not develop independently. Rather, political parties and citizens *interact* during both the policy development and a public vote (Brulle et al., 2012; Kriesi, 2008). With this in mind, and acknowledging that political ideology and heuristics about climate change impact support for new policy, we will test two additional assumptions: First, we assume that the political elite, namely political parties, influence how citizens perceive climate change; hence, H2 supposes that political parties skeptic about climate change transfer those beliefs to their voters. Second, we assume in H3 that political parties influence their voters' opposition to clean energy policies by offering decision heuristics.

H2: The political elite, namely political parties influence how citizens perceive climate change.

H3: Political ideology influences the public's support or opposition to clean energy policies.

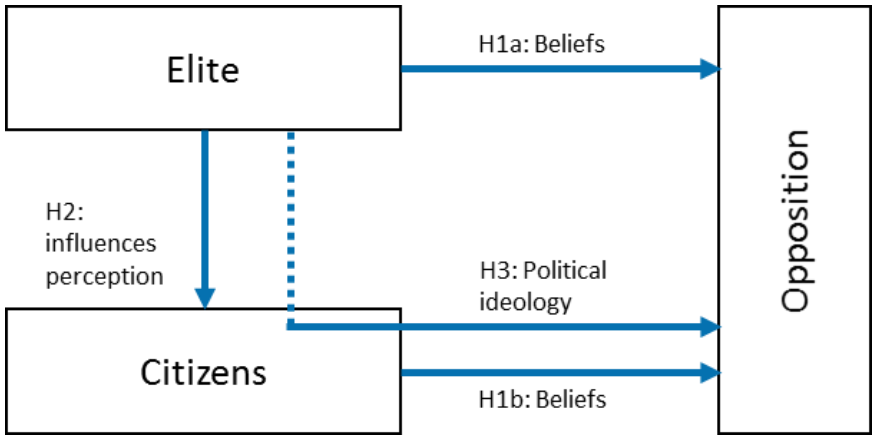

Figure 1: Graphic presentation of the hypotheses. H1 symbolizes the connection between the elite's and citizens' beliefs and opposition towards policies supporting an energy transition; H2 indicates the connection between the elite (especially political parties) and citizens' perception; H3 indicates how the elite (especially political parties) influence citizens' opposition through party ideology.

3. Research Design

3.1. Case

Since the early 2000s, Switzerland has had a strong climate mitigation strategy that was reinforced when they signed the COP21 treaty (Ingold et al., 2016). In 2017, Switzerland adopted an ambitious new energy strategy that contained additional goals regarding renewable energy production and energy efficiency standards. From a policy perspective, the most impactful piece of the new energy act is a ban on new construction of nuclear power plants, which was first proposed shortly after the Fukushima incident (Sager, 2014; Swiss Confederation, 2016). This ban effectively prevents energy companies from replacing their current nuclear power plants and is equivalent to a nuclear phase-out by 2035. The other major piece of the new energy act is an increase in the tax levied on electricity consumption, which then

goes towards funding renewable energy promotion (feed-in tariff). Further implementation is partly delegated to the sub-national level (cantons) due to the federal setup (Sager, 2014; Vatter, 2016). The investigation both on elite and individual level is embedded in this context of the new energy act and its further implementation. Thus both the elite (drafting) and the citizens (popular vote) are confronted with the issue of the Swiss energy transition.

3.2. Data

We collected data for this paper by two means. First, we conducted a survey among the political elite after the completion of the consultation for the new energy act. The consultation procedure is a process where all political actors (parties, cantons, E-NGOs, economic associations etc.) can formally issue their support or opposition for a specific legal act and suggest modifications to the proposed legal text. To structure this process, the federal department in charge of the respective consultation procedure distributes a preliminary version of the new act among all actors relevant to the process and requests the actors to respond. Based on the participants in the consultation process, 42 actors were selected for the survey based on the approaches (reputational, decisional & positional) suggested by Pappi and Henning (1998): First, we assessed all actors participating in the consultation procedures whether they were in a formal position during the decision process and were able to actively vote on the output (positional approach) and whether they tried to enter their ideas and interests into the decision process (i.e. participation in the consultation procedure; decisional approach). Furthermore, with the questionnaire we asked all actors who they consider important in the process (reputational approach). We then cross-referenced all three approaches and received a final list of relevant actors.

In the survey, elite actors were asked to express their general beliefs and preferences about how to achieve a more sustainable energy system.[2] The survey participants included all political parties that were able to form a faction in the national parliament on their own in 2014 (at least five representatives are needed), relevant economic interest groups and interest groups specific to the energy sector, E-NGOs and utilities, and actors from science and administrative entities. The response rate to the survey was 79 percent. Actors that did not answer the survey responded that they did not have an official position towards the new energy act or had their interests represented by another actor.[3]

Second, we gathered data from the public using a representative survey conducted in spring 2016 in Switzerland in three languages (German, French and Italian). Individuals were invited by postal mail to participate in an online survey, whereby 8,287 individuals accepted the invitation (42.7% response rate). From this group, a random subsample of 1,985 respondents were prompted to answer questions about policy measures they would support to help the cantons implement the newly adopted energy targets. These measures ranged from financial support for renewable energy production, to restrictions on non-renewable energy sources, to supporting information and consultation opportunities, to no measures at all. The measures are detailed in *Table 3* in the Annex. The survey sample populations did

[2] A list of all survey items is included in *Table 3* in the Annex.
[3] A list of all participating actors including their actor type is depicted in Table 2 in the Annex.

not deviate from the general population in demographic, structural, or political composition, which is likely due to the high-quality representative sample provided by the Federal Office of Statistics.

3.3. Methods

Elite level

First, we used a cluster analysis to identify actor groups with shared beliefs. Actors are divided into clusters that within themselves are as homogeneous as possible, whereas the different clusters should be as heterogeneous as possible (Murtagh & Legendre, 2014). Cluster analysis is well suited to capture different groups of actors within the sector based on their beliefs and preferences. With clustering, we are furthermore able to distinguish between subgroups of actors that may oppose or support policies for a clean energy transition based on different reasons. We thus applied agglomerative hierarchical clustering using the complete linkage method. Even though the data is not strictly hierarchical, we believe that hierarchical clustering is an adequate approach because it is a good system for handling small data sets. Moreover, hierarchical clustering generates a 'tree' (displayed in a dendrogram) that allows for a comprehensive assessment of the structures within the clusters.

We preferred the complete link method over single links because the former is less prone to outliers that occur due to actors' distinct beliefs regarding a single subject (Fonseca, 2012). The stems/heights of the hierarchical model are unweighted because the selected beliefs are considered equally relevant for the differentiation of the clusters. We determined the final number of clusters based on case knowledge (Everitt et al., 2011). We then tested cluster validity by partitioning the data in subsets to check whether the clusters stay the same with less actors, and by checking whether single variables disproportionately affected the assignment of specific actors to any given cluster (Halkidi, Batistakis, & Vazirgiannis, 2001). We later aggregated specific beliefs and policy preferences by cluster in order to assess what beliefs about renewable energy the actor groups were trying to assert. We also briefly discuss the validity of the clusters using different approaches. The supplementary material includes more detailed information regarding the internal and external validity and robustness of the analyses.

Citizen level

On the individual level, we estimated opposition towards policies that support a clean energy transition, including tax reductions, subsidies, bans on non-RE, public interventions, or information dissemination. We used structural equation modeling to analyze both how political ideology impacts beliefs and attitudes towards nature and climate, as well as how those impact an individual's support (or lack thereof) for corresponding policies (Beaujean, 2014; Rosseel, 2012). A structural equation model allowed us to estimate two things. First, the estimation of latent variables based on several observed items. For example, climate change skepticism, which is a score compiled from four items reflecting several aspects of climate change skepticism, is such a latent variable representing a theoretical construct measured through four items. The same approach applies for opposition towards the promotion of energy transitions (six items) and environmental attitudes (two items). Second, a

structural equation model runs multiple regressions at the same time, thereby allowing us to simultaneously analyze the influence of ideology on climate change skepticism, and the influence of those two concepts on opposition towards policy.

We fully documented the empirical analysis in the supplementary material, in which we also listed additional measures of the validity of items, comprehensive model results, and test scores in detail.

3.4. Operationalization

The dependent variable for the elite as well as the citizenry is opposition towards clean energy policies. The measures included in this paper were selected based on a qualitative analysis of the policy process that led to the adoption of the new energy law. During the process of the new energy law being adopted, multiple policies were discussed, including a nuclear phase-out, increasing support for energy research, increasing a pre-existing electricity tax, or putting in place a CO2-tax compensation. The most relevant measures were then included in the elite survey, in which actors were able to specify whether they agreed, rather agreed, rather disagreed, or disagreed with the adoption of a policy. On the individual level, respondents were asked which policy should be introduced in order to promote a clean energy transition, and they had the option to check all policies of which they approved.

The beliefs used for clustering the elite actors were compiled by asking them whether they agreed, rather agreed, rather disagreed, or disagreed with certain statements regarding the transformation of the electricity sector. The statements included those that corresponded with the following values: economic efficiency, free market, social justice, environmental concerns and prioritization of RE over landscape protection, security of supply, and energy independence. The beliefs/values were then coded on a scale from 1 to 4 where 1 corresponded to 'disagree' and 4 to 'agree.' The preferences of each actor were then aggregated for each previously-identified cluster. A full list of beliefs used for clustering can be found in *Table 3* in the Annex.

For the individual data, the models considered party preference, i.e., the party the individual voted for in the 2015 election, climate change skepticism and general environmental attitudes as main independent variables. The model included several control variables such as age (both linear and quadratic), gender, language, region, education, and income. The variables are described in more detail in *Table 4* in the Annex. For more details on the operationalization conducted in this paper, see the extended documentation.

4. Analysis

4.1. Opposition on the elite level

Our first analysis sought to understand whether opposition to policies supporting a clean energy transitions from members of the elite coincides with climate change skepticism. We used the complete linkage method and agglomerative hierarchical clustering to identify four clusters among the elite actors working in renewable energy policy in Switzerland. The first cluster includes a rather large group of actors centered on the center-right Christian Democrats (CVP), the Social Democrats (SPD), and the

Green-liberal Party (GLP). Also included in the cluster are the responsible ministry of Environment and Energy (UVEK) as well as most actors representing science and parts of the RE industry. This group of actors has been supportive of a clean energy transition but also showed restraint in that they did not promote particularly strict policy instruments during the drafting or advocacy process ('pro' cluster). The most supportive group of actors came from the Green Party (GPS) and all questioned E-NGOs, as well as the business association representing the solar industry (SSOLAR). These actors mostly favored an extensive promotion of clean energy and a rather short-term nuclear phase-out ('very-pro' cluster). The dendrogram identifies another rather large group of actors led by the Liberal Party (FDP) that contains the major electricity producers (BKW, VSE) and the largest economic interest association, economiesuisse (ECON). Most of these actors were split on the matter of promoting a clean energy transition, as well as on whether to support the final version of the new energy act. The FDP came very close to opposing the act during the referendum, whereas economiesuisse stayed neutral, as it was not able to identify a position that satisfied a majority of its members. Both organizations remained skeptical of the policy and opposed major parts of the act during the parliamentary phase, primarily due to their economic concerns ('semi-anti' cluster). The fourth cluster contains the populist right-wing Swiss People's Party (SVP) and actors from the nuclear energy sector. These actors were the most likely to oppose the nuclear phase-out, the promotion of renewable energy, and more generally the transition towards a more sustainable energy sector ('anti' cluster). This last cluster is also the only group of actors that did not believe that climate change is man-made, although they did not question the idea that the climate is changing, per se. All other groups of actors consider anthropogenic climate change to be real. The different clusters identified are depicted in *Figure 2*.

Choosing four clusters for analysis allowed us to be the most accurate both theoretically and contextually. Raising the number of clusters to five or six would have artificially complicated the interpretation because the additional clusters would not have been clearly distinguishable from the four we presented. Similarly, if we had lowered the number of clusters to three or two, important contextual differences between actors would have been omitted. We also tested the clusters for their validity by randomly splitting the actors into two different subsets and conducting the same analysis (see supplementary material for documentation). Furthermore, beliefs were removed one-by-one from the model in order to check whether a single belief was able to alter the assembled clusters. Neither checks for validity returned significantly different results.[4]

The analysis showed that only one cluster of the four prescribed to the idea that climate change is not caused by human activity. This 'anti'-cluster also opposed most measures promoting a clean energy transition. As depicted in *Figure 3*, the anti-cluster is the only group of actors that clearly opposes a nuclear phase-out, whereas all other groups of actors fully or partially support a phase-out. The second major measure adopted within the new energy act was the increase of a tax levied on electricity used for a feed-in tariff for renewable energy. Here the preferences of the semi-anti cluster differed in

[4] More detailed information regarding the internal and external validity as well as further checks for robustness such as (e.g.) item sampling, and the use of different clustering algorithms can be found in the supplementary material.

comparison to their preferences for the nuclear phase-out; the semi-anti cluster opposed a raise of the current tax, in sharp contrast to the two pro-clusters. No other distinct preferences could be identified that separate the clusters as starkly as did these policies.

Based on our analyses, we were able to validate Hypothesis 1a, which assumes that, on the elite level, climate change skepticism coincides with opposition towards a clean energy transition and related policies. We also determined that other beliefs, such as economic concerns (especially in the case of the semi-anti cluster) might also have an impact on opposition to clean energy policies.

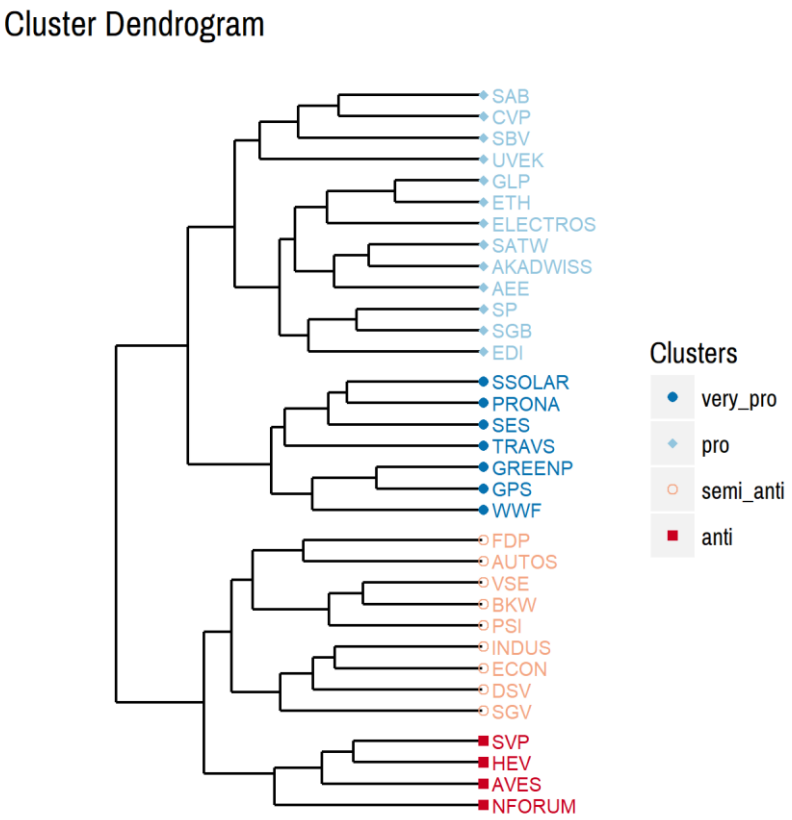

Figure 2: Elite actor clusters based on hierarchical agglomerative clustering. A list of actors is presented in *Table 2* in the Annex.

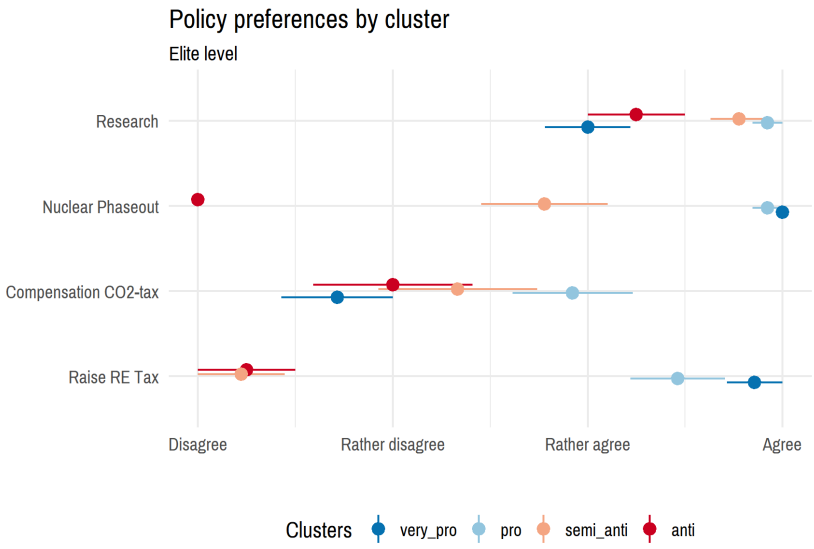

Figure 3: Elite preferences for policies considered in the new energy act including standard deviations. Reading example: The "anti" cluster of the elite completely disagrees with nuclear phase-out, but supports research on renewables, with some actors more in favor than others are. The point denotes the group mean, the interval the mean +/- the standard error per group.

4.2. Opposition on the citizen's level

In this section, we first analyze whether the elite do, in fact, have an influence on the public's perception of climate change (H2). Second and third, we assess whether climate change skepticism and political ideology influence the public's support or opposition for renewable energy policies (H1b & H3).

Before addressing these hypotheses, we must answer the question of whether or not the elite and individuals share the same preferences regarding energy policies yet to be developed. Based on the clusters presented in section 4.1, individuals are grouped in the same clusters based on the party they voted for in the last national election. *Figure 4* shows their support for four main policies, which were a part of the new energy act. Notably, *Figure 4* shows that agreement with the policy goals is relatively consistent with more environmentally-friendly beliefs by elite clusters. Therefore, individuals and the elite are exhibiting similar and parallel preferences. However, in direct comparison with Figure 3 in section 4.1, individuals show less opposition towards policies across the board than the elite, and are generally less polarized than their elite counterpoints. Therefore, individuals seem to exhibit more willingness to compromise and recognize both the benefits and drawbacks of energy policy as compared to the political elite.

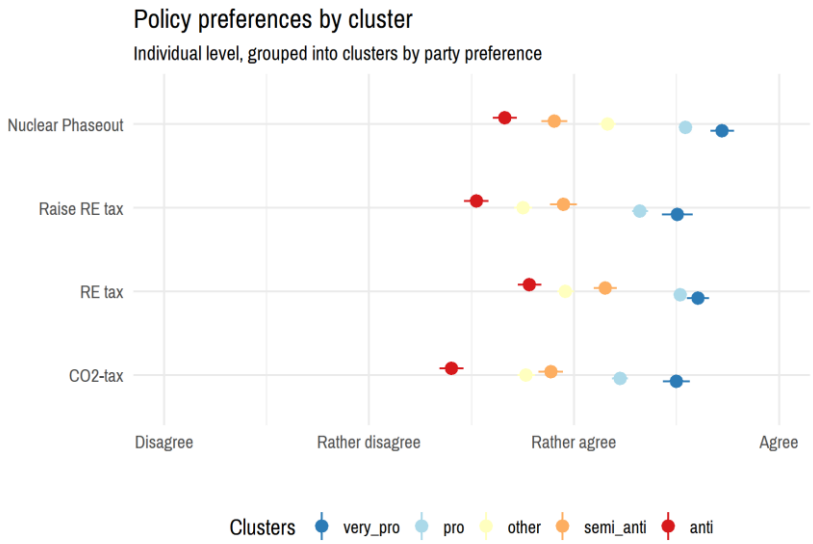

Figure 4: Policies in the new energy act and support by individuals, grouped by clusters based on elite belief. Reading example: see Figure 3. The point denotes the group mean, the interval the mean +/- the standard error per group.

However, does elite positioning on subjects such as the environment and climate change also influence how individuals perceive these issues, such as Brulle et al. (2012) find for the U.S. and as stated in H3? To answer this question, we estimated a structural equation model, which also addressed how political ideology influences beliefs and attitudes about the environment generally and climate change more specifically. *Figure 5* demonstrates how the model was constructed (without control variables). Structural equation modeling allows for multiple simultaneous regressions, considering that some variables are both dependent and independent variables in those regressions. For example, in the present analysis, climate change skepticism is regressed on party preference and environmental attitudes, while also serving as an independent variable in a regression estimating opposition.

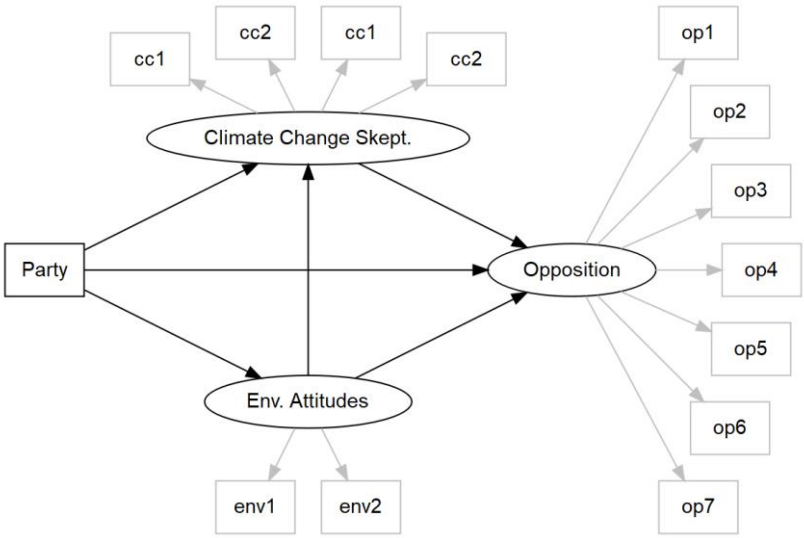

Figure 5: Setup of the structural equation model, including the latent variables (ellipses) and the observed values (rectangles). Reading example: climate change skepticism, a latent variable as per the elliptic representation, is estimated by four items, represented by the four rectangles cc1-cc4. Climate change skepticism is considered a dependent variable in a regression, with

party preference and environmental attitudes as independent variables (the incoming arrows), and is considered an independent variable in a regression estimating opposition.

The results are documented in *Table 1, Table 5* in the Annex, and depicted in Figure 6. The indicators (RMSEA = .032, SRMR = .032, CFI = .908) suggest a satisfactory fit of the model. Regarding the results of the model, first, political ideology reflected through party preference correlated with all three latent variables - environmental attitudes, climate change skepticism, and opposition. Compared to the reference category without party preference, Left-Green political ideology (preference for SP, GPS or GLP) is positively correlated with higher concern for the environment, while liberal and conservative respondents (FDP, SVP) have lower levels of conservation-mindedness. Preference for the CVP, currently the leading party in energy policy as they hold the office of the energy minister, does not coincide with environmental attitudes significantly different from the general population. Both party preference and environmental attitude are linked with climate change skepticism: again, Left-Green political ideology goes hand in hand with lower climate change skepticism. On the other hand, respondents with a preference for the SVP have significantly higher climate change skepticism. Conservation-minded and pro-environmental attitudes are negatively correlated with climate change skepticism.

The results suggest that climate change skepticism is influenced by political ideology, as argued by Brulle et al. (2012). In addition to the influence of political ideology, individuals with lower educational background and income are more skeptical about climate change. Lastly, respondents from the French-speaking part of the country are more skeptical about anthropogenic climate change than those from German-speaking areas (see Table 1).

Regressions	Estimate	Std. Err	z-value	P > |z|
Environmental Attitudes ~				
Party preference *(ref. other/none)*				
SVP	-.447	.105	-4.261	.000
SP	.376	.100	3.752	.000
CVP	-.209	.111	-1.882	.060
FDP	-.532	.106	-5.024	.000
GLP	.479	.127	3.781	.000
GPS	.858	.142	6.057	.000
Gender *(female)*	.299	.065	4.585	.000
Income *(ref. middle)*				
low income	.151	.087	1.731	.084
high income	-.236	.075	-3.147	.002
Climate Change Skepticism ~				
Party preference *(ref. other/none)*				
SVP	.248	.058	4.292	.000
SP	-.272	.051	-5.331	.000
CVP	-.041	.059	-.700	.484
FDP	-.017	.058	-.295	.768
GLP	-.266	.070	-3.781	.000
GPS	-.209	.071	-2.949	.003
Environmental Attitudes	-.199	.024	-8.299	.000
Education *(ref. middle)*				
low education	.140	.042	3.322	.001
high education	-.021	.047	-.456	.648
Income *(ref. middle)*				
low income	.108	.046	2.329	.020
high income	-.121	.040	-3.041	.002
Opposition ~				
Party preference *(ref. other/none)*				
SVP	-.016	.016	-1.020	.308
SP	-.070	.018	-3.814	.000
CVP	-.010	.019	-.511	.609
FDP	-.054	.017	-3.247	.001
GLP	-.091	.027	-3.371	.001
GPS	-.110	.027	-4.097	.000
Environmental Attitudes	-.011	.007	-1.569	.117
Climate Change Skepticism	.069	.013	5.199	.000
N				1'627
Degrees of freedom				180
P-value (Chi-square)				.000
Robust Comparative Fit Index (CFI)				.908
Robust Root Mean Square Error of Approximation (RMSEA)				.032
Standardized Root Mean Square Residual (SRMR)				.032

Table 1: Structural equation model, regressions. Note: estimated in R with lavaan (Rosseel, 2012). Latent factors are presented in Table 5 in the Annex. Full results in the supplementary material.

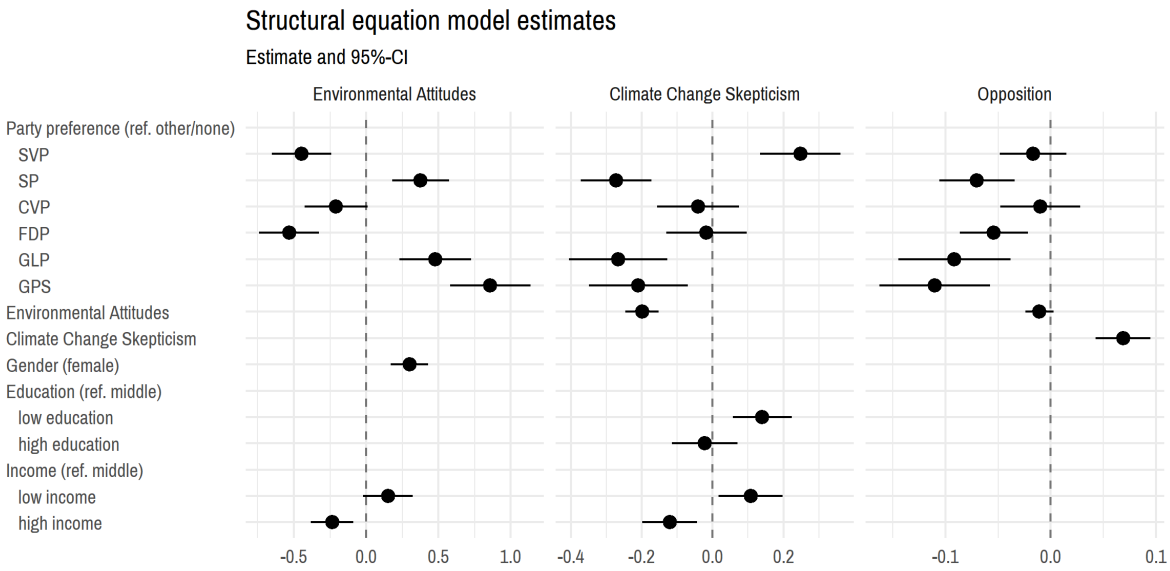

Figure 6: Regression results of the structural equation model estimated with lavaan (Rosseel, 2012), with each column of results representing one regression within the structural equation model with the dependent variable denoted at the head. Full results in *Table 1,* and *Table 5* in the Annex. Reading example: the last column depicts the estimation of opposition towards clean energy policies. The mean effect, depicted as a point, in the regression for climate change skepticism on opposition is at .069 and therefore demonstrates a positive correlation between higher skepticism and more opposition towards clean energy policy. The line represents the 95% confidence interval.

Having established a relationship between political ideology, represented by party preference, and climate change skepticism, the next step is to look at how both could be heuristics that inform attitudes towards clean energy policies. As the results in *Figure 6* also show, climate change skepticism does indeed increase opposition towards new clean energy policies. In fact, the final regression suggests that climate change skepticism is significantly correlated with higher opposition to these policy instruments, corroborating Shi et al. (2015). How individuals think about climate change and whether they believe in it is related to their opposition for pro-renewable policies; the more skeptical the respondent, the more strongly opposed they were to clean energy policies. Although anthropogenic climate change is scientific fact, respondents' beliefs still coincide with their readiness to oppose renewable energy, which suggests that climate change skepticism influences voting behavior on these issues.

We noticed one distinct discrepancy, however, while more closely examining the relationship between party predisposition, climate change skepticism, and support for clean energy policies: for the populist right, party preference and opposition towards renewable energy policy did not correlate, i.e., no direct correlation. Respondents who preferred the SVP did not differ from the general citizen in their support for energy policy. However, we did find that those respondents are more skeptical about climate change, which is linked with a significantly higher opposition, i.e., an indirect correlation. Climate change skepticism, which is strongly influenced by the political elite, according to Brulle et al. (2012), could thus serve as a tool for this party to incite opposition to renewable energy policy. On the other side, though, a pre-existing belief in climate change can benefit the Left-Green party and reinforce an individual's support for both the party and clean energy policy.

To summarize, the political parties and their voters share similar attitudes towards environmental policies intended to mitigate climate change. Moreover, the results of our analysis suggest that political ideology shapes how citizens perceive climate change and its causes, corroborating the findings of Brulle et al. (2012) for the Swiss direct democratic context. Generally, we can assume that climate change skepticism does not influence which political party individuals associate with, but rather that party affiliation influences the strength of climate change skepticism or the belief in anthropogenic climate change. There are two reasons for this argument – because parties and affiliations with them are older than specific concerns about climate change, and because of the multi-issue reality of politics and voter concerns. For example, voters who associate with the Swiss Peoples' Party, who show the strongest climate change skepticism, prescribe to a party that built its strength on immigration issues, not environmental concerns. In short, hypothesis 2, which suggests that the political elite influence how citizens think about climate change, can be supported in accordance with Brulle et al. (2012), and is most evident in the case of the populist right which is sowing skepticism about both climate change and science more broadly.

Our research also validates hypotheses 1b and 3, which line up with the conclusions of prior research as well. Skepticism about the man-made nature of climate change, as postulated by Shi et al. (2015), does indeed correlate with opposition to clean energy policy, the result being that the most skeptical people are also the most oppositional to climate action, which supports hypothesis 1b. Political ideology itself, as suggested in hypothesis 3 and represented through party preference, is also directly linked with opposition, most evidently in the reduced opposition to clean energy policy for those that associate with liberal or Left-Green ideologies.

5. Discussion

The models reveal that beliefs and attitudes, and climate change skepticism in particular, are important factors in explaining opposition to clean energy policies for both the political elite and citizenry. For the elite, this can be attributed to the belief that an RE transition is not desirable or necessary because climate change is not the top priority, or a priority at all, among actors voicing opposition. In Switzerland, the populist Swiss People's Party SVP is the only major party skeptic of climate change, and is the sole outspoken party opponent of the new energy act. The nuclear industry and the Swiss Homeowner Association (at the time of the survey presided by an MP of the SVP) are the other strong opponents of the policy. All other major political actors, including the current electricity producers and free-market FDP, accept human-made climate change as a fact and support a general transition towards RE. However, the results have to be taken with caution, as the analysis applied to better understand the political elite does not allow for direct causal conclusions.

For individuals within the citizenry, the results suggest that the political elite do influence notions regarding climate-change skepticism, which in turn influences the public's support for environmental policy. Moreover, climate change skepticism does seem to be a tool that the political elite can use to depress support for clean energy policy. The political elite, and especially those with close ties to

industry, are very cautious to support policies that may affect the economy. This conclusion is well illustrated by the 'semi-anti' cluster's general approval of a nuclear phase-out but its rejection of a tax increase on electricity consumption. Because economic arguments against renewable energy may not be as impactful in discouraging support for climate policies, political actors within the elite are able to spread doubt about the necessity of clean energy by spreading doubt about climate change as a concept. The findings suggest that elite actors not only influence how citizens think about climate change, but also that political ideology is an important heuristic as to whether or not citizens reject clean energy policy more broadly. This suggests that climate change skepticism serves as a proxy influenced by political ideology, most substantially for the populist right. Speaking to the necessity of an energy transition and questioning the reality of climate change emotionalizes the debate and allows the party to not only undermine scientific consensus but also to push for less or no state-intervention at all. In this sense, nurturing climate skepticism pushes the public's attention away from policy options to treat climate change, and instead focuses it on questions about whether climate change is even real in the first place.

Given our results, more thorough investigations into the link between a party position with regards to climate change and its influence on the respective voters need to be conducted. The approach with an SEM establishes this link and also suggests, together with the theoretical discussion and insights from earlier literature, the influence of parties on climate change skepticism. However, the data structure at hand and the model can not go into the depths or the mechanisms of the relation between a parties' position and a voters' attitudes. As such, more research with regards to this relation could built on interviews with voters to highlight how this process of perception and attitudinal alignment works.

6. Conclusion

This paper investigates factors that explain opposition in both the political elite and the public towards policies clean energy policies that support a renewable energy transition. The paper furthermore questions whether the attitudes of the political elite, notably political parties, influence the way citizens support climate and energy issues. In the analysis, climate change skepticism is identified as a sufficient but not necessary condition for the rejection of policies supporting clean energy. We also show that elite stakeholders project their beliefs and specifically their aversion to RE onto their voters and are an important source for decision heuristics.

The paper's findings are important to understanding the steps necessary to transition to a primarily renewable energy system. The public relies on cues received from elite actors (most notably parties). This gives the elite a major opportunity to influence public opinion and, therefore, votes. Moreover, climate change skepticism has been a trending issue within populist parties on the right (but not only, according to Brown, 2014). With the denial of climate change, populist parties are thus able to rally opposition against clean energy policies, similarly to the way in which they established political strength on immigration issues. Climate change skepticism can thus become an important and strong tool for political parties and elite to transfer their opposition to clean energy to voters.

Because elite actors play a central role in policy selection and influencing public opinion, they can be a massive hindrance towards pursuing a renewable energy transition. Elite actors and especially political parties that oppose the promotion of clean energy and promote climate skepticism are probably one of the most important hurdles to overcome if we are to transition to renewable energy. More generally, and independently from the Swiss direct-democratic system, some political actors seem to be exploiting climate change skepticism to incite public opposition to clean energy policy. It is, however, highly questionable whether these actors nourishing skepticism can be convinced to stop. In order to facilitate the process, political actors clearly in favor of a RE transition need to rethink how they approach citizens and what arguments they use to convince citizens that do not have strict preferences (see e.g., Stoknes, 2014). Motivated reasoning could potentially provoke a backlash and further promote distrust in the government and in climate change (Bolsen & Druckman, Forthcoming). At the same time, scientists also need to rethink how they present evidence for anthropogenic climate change to political actors. Time and resources to process information are almost as limited for the political elite as they are for the public, and its possible scientific evidence may not make its way into political debate (Cairney, 2016).

The differing results of our analysis for the elite and citizens illustrate how opinion is more ideologically polarized for the elite than for individuals. This might be because political actors and especially political parties need to have very distinct positions in order to capture citizens' attention and support. Individuals, however, do not need to develop clearly distinguishable beliefs and are often more ambivalent regarding a specific issue unless they are immediately impacted by it. This conclusion suggests that solutions addressing climate change could be supported by individuals even if some elite actors categorically reject the idea.

Lastly, it is important to acknowledge the interests and preferences of actors included in the 'semi-anti' cluster. As the somewhat platitudinous label for this group already indicates, these actors will probably oppose policies they consider too drastic. However, this paper also demonstrates that while the actors may oppose specific policies, they are not principally opposed to clean energy across the board. They are more likely to define their support or opposition depending on the selected policy and its specific implications. For states advocating for a clean energy transition, it is therefore essential to gain the support of this cluster of actors, in contexts both with and without direct-democratic options.

7. Funding & Acknowledgments

[…]

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8. Annex

Acronym	Organization	Actor Type
AEE	Organization for Renewable Energy and Energy Efficiency	Interest group (energy)
AKADWISS	Swiss Academies of Arts and Sciences	Science
AUTOS	Swiss Automobile Association	Interest group (economy)
AVES	Organization for Responsible Energy Policy Switzerland	Interest group (energy)
BKW	BKW AG	Utility company
CVP	Christian Democratic People's Party of Switzerland	Political party
DSV	Swiss Association for Distribution System Operators	Interest group (energy)
ECON	economiesuisse	Interest group (economy)
EDI	Federal Department of Home Affairs	Administration
ELECTROS	Association for Electrical Engineering, Power and Information Technologies	Interest group (economy)
ETH	ETH Board	Science
FDP	FDP.The Liberals	Political party
GLP	Green Liberal Party of Switzerland	Political party
GPS	Green Party of Switzerland	Political party
GREENP	Greenpeace Switzerland	Environmental NGO
HEV	Swiss Homeowner Association	Interest group (economy)
INDUS	ScienceIndustries - Swiss Business Association Chemistry Pharma Biotech	Interest group (economy)
NFORUM	Nuclear Forum Switzerland	Interest group (energy)
PRONA	ProNatura	Environmental NGO
PSI	Paul Scherrer Institute	Science
SAB	Swiss Working Group for Mountain Regions	Regional association
SATW	Swiss Academy of Engineering Sciences	Science
SBV	Swiss Farmers Union	Interest group (economy)
SES	Swiss Energy Foundation	Interest group (energy)
SGB	Federation of Trade Unions	Trade union
SGV	Swiss Association for Small and Medium-sized Enterprises	Interest group (economy)
SP	Social Democratic Party of Switzerland	Political party
SSOLAR	Swiss Trade Association for Solar Energy Swissolar	Interest group (energy)
SVP	Swiss People's Party	Political party
TRAVS	Travail Suisse	Trade union
UVEK	Federal Department of the Environment, Transport, Energy and Communication	Administration
VSE	Association of Swiss Electricity Companies	Interest group (energy)
WWF	WWF Switzerland	Environmental NGO

Table 2: List of elite actors

Belief	Variable	Min.	Max.	Mean	Stdev	Var
Energy strategy 2050 in general	stratsupport	1	4	2.848	0.870	0.758
General nuclear phase-out	besupport	1	4	3.030	1.185	1.405
Lower energy and electricity consumption	useredu	2	4	3.455	0.711	0.506
Increase share of renewables	renewincr	2	4	3.606	0.609	0.371
Sustaining Swiss access to international markets	maccess	2	4	3.515	0.566	0.320
Reconstructing energy grid	netwreconstr	2	4	3.455	0.617	0.381
Support for sequential nuclear phase-out	phaseout	1	4	3.273	1.126	1.267
Increase international competitions	intenscollab	1	4	3.515	0.755	0.570
Banning construction of new nuclear power plants	constrban	1	4	2.667	1.407	1.979
Introduction of white certificates for utilities	efftargets	1	4	2.182	1.044	1.091
Explicit right for own use of electricity for individuals	legalanchor	2	4	3.515	0.712	0.508
Limit duration of feed-in tariff per installation	kev	1	4	3.424	0.792	0.627
Increase electricity tax for individuals	cap	1	4	2.667	1.362	1.854
Partial exemption of CO2 tax for utilities	chargerelief	1	4	2.394	1.116	1.246
Increase energy research	research	2	4	3.606	0.556	0.309
Ensure security of supply	guarantsuppl	3	4	3.758	0.435	0.189
Ensure international independence of Swiss energy sector	sectautono	1	4	2.909	0.765	0.585
Prioritize economic efficiency of the energy mix	economix	2	4	3.182	0.808	0.653
Ensure competitiveness of energy sector	intcompet	2	4	3.727	0.517	0.267
Ensure equal access possibilities for all individuals, independent from their social status	equalaccess	1	4	3.121	0.857	0.735
Ecological risk of prolonging permits for nuclear power plants	lifespanext	1	4	2.424	1.324	1.752
Prioritization of RE production over increasing energy efficiency	renewpref	1	4	2.545	0.938	0.881
Necessity to adapt to & mitigate climate change	climtargets	1	4	3.394	0.864	0.746
Free choice of electricity products for consumers	consumchoice	1	4	3.273	0.911	0.830
Energy mix should be determined by free market	meconomix	1	4	3.030	1.015	1.030
Explicit right for own use of electricity for individuals	govparlmix	1	4	2.152	0.939	0.883
Nuclear phase-out is implementable in 30 years	phaseoutimpl	1	4	3.242	1.062	1.127
Urgency of energy transition is high	reconstr	1	4	3.152	1.034	1.070
Safety of current nuclear power plants is given	ppcond	1	4	2.727	1.153	1.330
Energy transition should be implemented subsidiarily	implcomp	1	4	2.303	0.883	0.780

Table 3: List of survey items included in cluster analysis. Support for different beliefs regarding the new energy act were measured with a four-point scale from 1 = 'fully disagree' to 4 = 'fully agree'.

Variable	Values
Party Preference	
Greens	6.6%
SP	15.3%
GLP	5.3%
CVP	9.2%
FDP	14.0%
SVP	18.9%
other	30.8%
Environmental attitudes, scale 0-5 in the form of a semantic differential	
Economic welfare <-> Environmental protection	66.7% prefer protection
Use of natural resources <-> Protection of nature and landscape	65.6% prefer protection
Climate change skepticism, scale 0-3 from "disagree" to "agree"	
I'm unsure if climate change really happens	27.2% skeptics
Climate change is primarily caused by humans (rec)	11.7% skeptics
The consequences of climate change are exaggerated	37.2% skeptics
Climate change is an excuse to patronize or tax people	23.5% skeptics
Opposition, multiple choice, tick if supported	
Tax reductions for operators of renewable energy plants	37.6%
Subsidies for building renewable energy plants	45.6%
Bans on building electricity plants for non-renewable energy sources	27.2%
Public tendering to find investors for building renewable energy plants	34.9%
Public investments in the production of renewable energy	37.2%
Energy companies shall be instructed to build renewable energy plants	25.5%
More information, consultation and education for people considering building renewable energy plants	38.5%
None of the above, renewable energies should not be promoted	2.6%
Age	continuous
Gender	49.1% women
Education	
Low	47.6%
Middle	22.3%
High	30.1%
Income	
Low	24.5%
Middle	41.4%
High	34.1%

Table 4: List of survey items included in the structural equation model. Original questions in German, French and Italian. Values and proportions reported for the full considered sample of n = 1'985 respondents.

		Factor loadings			
LHS	Op	RHS	Estimate	Std. Err	P > |z|
Opposition	=~	Ban on non-renewables	1.000	.000	.000
Opposition	=~	Tax reductions	.940	.151	.000
Opposition	=~	Subsidies	1.187	.162	.000
Opposition	=~	Public tendering	1.069	.152	.000
Opposition	=~	Public investments	1.038	.142	.000
Opposition	=~	Instruction energy companies	1.063	.139	.000
Opposition	=~	Information, consultation, education	1.323	.167	.000
Climate Change Skepticism	=~	Unsure if climate change happens	1.000	.000	.000
Climate Change Skepticism	=~	Primarily caused by humans (rec)	.615	.046	.000
Climate Change Skepticism	=~	Consequences exaggerated	1.118	.056	.000
Climate Change Skepticism	=~	Excuse to patronize/tax	1.055	.053	.000
Environmental attitudes	=~	Environmental protection	1.000	.000	.000
Environmental attitudes	=~	Protection of nature and landscape	.843	.049	.000

Table 5: Structural equation model, regressions. Note: estimated in R with lavaan (Rosseel, 2012). Full results in the supplementary material.