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A comparative perspective in Europe

Jukka Sivonen

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ABSTRACT

The topic of this dissertation is to examine the influential factors on citizens' climate policy attitudes from the comparative perspective. The study is based on four articles published between 2020 and 2023. The research question considers how various macro- and micro-level factors are associated with supporting climate policy instruments. It is essential to obtain more information about the factors influencing climate policy attitudes because understanding them can lead to better decision-making in terms of efficiency and continuity. Earlier studies have also shown an association between citizens' attitudes and realised climate policy.

European Social Survey Round 8 (collected in 2016–2017) and Finland-2019 survey data were used in the analysis. The data were analysed using statistical methods: multilevel modelling, linear regression analysis, ordinal logistic regression analysis, and interaction effects.

One observation is that climate political attitudes are partly, but to a limited extent, dependent on macro-level factors. How much, depends on the climate policy. For example, support for the taxation of fossil fuels depends more on macro-level factors than on banning most energy-inefficient household appliances. Another finding is that the welfare-state model is associated with support for taxation of fossil fuels: people living in the Nordic countries, which are classified as the Nordic welfare regime, generally support it more than the rest of Europe. According to the results, higher support for fossil fuel taxation may be partly due to the strong political trust at the country level, which is a characteristic of the Nordic countries. Additionally, the findings indicate that higher levels of generalised trust at the macro level are associated with greater support for such taxation measures. In the cross-national analysis, neither gross domestic product nor CO2 emissions per capita significantly affected citizens' attitudes.

At the individual-level, left-wing orientation is associated with more support for the taxation of fossil fuels. However, this association is generally weaker in the former Eastern Bloc countries. Political trust is also associated at the individual level with more support for the taxation of fossil fuels. This finding was confirmed in most of the European countries examined. The same applied to a generalised trust, but the association was generally weaker and found to be significant in fewer countries.

In the examined Nordic countries (Finland, Norway, and Sweden), political party preference was more strongly associated with support for fossil fuel taxation than

social class position. The most support was found among supporters of the so-called new-left parties and the least among the populist right. In Sweden, the attitudinal gap between new-left and populist-right supporters was vast among younger citizens. In addition, the social and cultural experts' class supported fossil fuel taxation more than other social classes.

Among Finns, urban–rural domicile did not seem to be a significant dividing line supporting climate policy measures. Only the instruments that are closely related to rural businesses were found to be significantly more supported among those living in urban areas. In the case of reducing logging, a higher subjective closeness to the district widened the difference in attitude between urban and rural residents.

In Finland, specific instruments, such as reducing logging, carbon tax, cutting beef production subsidies, and cap-and-trade program, were more popular as global- than national-level measures. However, no particularly significant differences were found between those living in rural areas and those living in urban areas regarding support for global- and national-level measures. The fact that specific measures were more popular internationally than at the national level provides partial support for the collective action problem theory.

KEYWORDS: climate policy, climate policy instruments, public attitudes, climate change, collective action

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TIIVISTELMÄ

Tämän väitöskirjan aiheena tarkastella kansalaisten ilmastopoliittiset asenteet ja niihin yhteydessä olevia tekijöitä vertailevasta näkökulmasta. Tutkimuskysymys käsittelee sitä, miten erilaiset makro- ja mikrotason tekijät liittyvät ilmastopoliittisten keinojen kannatukseen. Ilmastopoliittisiin asenteisiin vaikuttavista tekijöistä on tärkeää saada lisää tietoa, sillä niiden ymmärtäminen voi johtaa parempaan päätöksentekoon ilmastopolitiikan tehokkuuden ja jatkuvuuden kannalta. Aiemmat tutkimukset ovat myös havainneet yhteyden kansalaisten asenteiden ja toteutetun ilmastopolitiikan välillä.

Analyysissa käytettiin Europen Social Survey Round 8 (kerätty 2016–2017) ja Suomi 2019 -kyselyaineistoja. Tutkimusaineistoa analysoitiin tilastollisilla menetelmillä: monitasomallinnuksella, lineaarisella regressioanalyysillä, ordinaalisella logistisella regressioanalyysillä ja interaktioanalyysillä.

Yksi havainto oli, että ilmastopoliittiset asenteet ovat osittain, mutta varsin rajatusti, riippuvaisia makrotason taustatekijöistä. Makrotason tekijöiden merkitys riippuu myös tarkasteltavasta ilmastopolitiikan keinosta. Esimerkiksi fossiilisten polttoaineiden verotuksen tukeminen riippuu enemmän makrotason tekijöistä kuin energiatehottomimpien kodinkoneiden kieltäminen. Toinen havainto on, että hyvinvointivaltiomalli liittyy fossiilisten polttoaineiden verotuksen tukemiseen: pohjoismaisen hyvinvointivaltiomallin maissa asuvat ihmiset yleensä tukevat fossiilisten polttoaineiden veronkorotuksia enemmän kuin muualla Euroopassa. Tulosten perusteella tämä saattaa osittain johtua maatason poliittisesta luottamuksesta, joka on perinteisesti ollut vahvaa Pohjoismaissa. Havaintojen mukaan korkeampi yleinen luottamus makrotasolla liittyy selvästi fossiilisten polttoaineiden verotuksen kannatukseen. Bruttokansantuote asukasta kohden tai hiilidioksidipäästöt asukasta kohden eivät vaikuttaneet merkittävästi kansalaisten asenteisiin Euroopan maiden välisessä analyysissä.

Yksilötasolla vasemmistosuuntautuneisuus on keskimäärin yhteydessä fossiilisten polttoaineiden verotuksen tukemiseen, mutta entisen itäblokin maissa tämä yhteys on yleensä muuta Eurooppaa heikompi. Poliittinen luottamus on myös yksilötasolla yhteydessä fossiilisten polttoaineiden verotuksen kannatukseen. Tämä havainto löytyi useimmista tutkituista Euroopan maista. Yleistyneen luottamuksen kohdalla sen yhteys fossiilisten polttoaineiden kannatukseen oli yleensä heikompi ja sen havaittiin olevan tilastollisten merkitsevä harvemmissa maissa.

Tutkituissa Pohjoismaissa (Suomi, Norja ja Ruotsi) puoluekannatus liittyi vahvemmin fossiilisten polttoaineiden verotuksen tukemiseen kuin yhteiskunta-luokka-asemaan. Eniten kyseistä verotusta kannattivat niin sanottua uutta vasemmistoa edustavien puolueiden kannattajat, vähiten taas populistisen oikeiston kannattajat. Ruotsissa asennekuilu uuden vasemmiston ja populistisen oikeiston kannattajien välillä oli erityisen suuri nuorempien kansalaisten keskuudessa. Sosiokulttuuristen asiantuntijoiden luokka kannatti fossiilisten polttoaineiden verotusta muita luokkia enemmän.

Suomalaisten keskuudessa kaupunki–maaseutu-jakolinja ei ollut erityisen merkittävä vedenjakaja ilmastopoliittisissa asenteissa. Ainoastaan maaseudun elinkeinoihin suhteellisen läheisesti liittyvät ilmastopolitiikan keinot olivat suositumpia kaupunkiseudulla asuvien keskuudessa. Hakkuiden vähentämisen osalta voimakkaampi subjektiivinen läheisyys kaupunginosaan oli yhteydessä suurempaan kaupunkien ja maaseudun asukkaiden väliseen asenne-eroon.

Suomessa tietyt ilmastopolitiikan välineet, kuten metsähakkuiden vähentäminen, hiilivero, naudanlihatuotannon julkisten tukien vähentäminen sekä päästökauppa, olivat suositumpia globaalisti kuin kansallisesti. Erityisen merkittäviä eroja ei kuitenkaan havaittu maaseudulla ja kaupunkiseudulla asuvien välillä globaalin ja kansallisen tason keinojen osalta. Se, että tietyt toimenpiteet olivat suositumpia globaalilla kuin kansallisella tasolla, antaa osittaista tukea kollektiivisen toiminnan ongelma -teorialle.

ASIASANAT: ilmastopolitiikka, ilmastopolitiikan välineet, kansalaisasenteet, ilmastonmuutos, kollektiivinen toiminta

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List of Original Publications

This dissertation is based on the following original publications, which are referred to in the text by their Roman numerals:

I Sivonen, J. and Kukkonen, I. 2021. Is There a Link between Welfare Regime and Attitudes toward Climate Policy Instruments?. *Sociological Perspectives*, 64(6): 1145–1165.

II Sivonen, J. 2020. Predictors of Fossil Fuel Taxation Attitudes across Post-Communist and Other Europe. *International Journal of Sociology and Social Policy*, 30(11/12): 1337–1355.

III Sivonen, J. and Koivula, A. 2020. How Do Social Class Position and Party Preference Influence Support for Fossil Fuel Taxation in Nordic Countries?. *The Social Science Journal*, (Advance online publication). doi.org/10.1007/s10708-022-10750-0

IV Sivonen, J. 2023. Attitudes toward Global and National Climate Policies in Finland – The Significance of Climate Change Risk Perception and Urban/Rural-Domicile. *GeoJournal*, 88(2): 2247–2262.

1 Introduction

Carbon neutrality would be a necessary goal, and more effective climate policies would be essential to put in place internationally to prevent the worst effects of climate change, such as floods, droughts, and the degradation of ecosystems and food production conditions (IPCC, 2022). However, although the scientific community has been informing the world about climate change for decades, the results in implemented climate policies have been modest, as global emission levels have not dropped (except for 2020 during the COVID-19 pandemic), and the concentration of carbon dioxide in the atmosphere has been growing steadily (UNEP, 2021).

What do social sciences have to say about the accumulating crisis? Over the past few years, climate change has received increasing attention from social scientists (Davidson, 2022), including economic sociologists (Gray and Barral, 2021), and they have focused on numerous climate-related research themes. Public attitudes towards climate policies, this work's primary focus, are one area where social sciences can contribute to climate change research (Islam and Kieu, 2021). It is a relevant topic to study because, without legitimacy derived from citizens, climate policies can be challenging to implement or may be enacted only for a short time (Matti, 2015). Empiric evidence also suggests that citizens' attitudes are associated with implementing climate policies (Anderson et al., 2017; Levi et al., 2020). Hence, one can say that understanding public attitudes can contribute to better decision-making regarding effectiveness and continuity.

However, what is the root cause of climate change? The large-scale introduction of fossil fuels, among other events, made it possible to increase the scale, efficiency, and regularisation of industrial production and expand it into previously impracticable locations (Graham, 2019). Fossil fuels enabled the expansion of the Industrial Revolution and the emergence of modern society, but their use also caused a massive increase in greenhouse gas emissions. The growth-oriented economy introducing fossil fuels enabled can be called the "fossil economy" (Malm, 2016). The effects of fossil energy have permeated society and simultaneously, revolutionised the world of human experience (Salminen and Vadén, 2015).

Social scientists' solutions to the environmental crises range from changing the foundations of the current economic system and its operating logic (e.g., Schnaiberg, 1980; Hickel, 2020) profoundly to ecological modernisation, which refers to transferring the basis of the economy to more eco-friendly technology with essentially policy-driven processes (e.g., Jänicke, 2020). However, most approaches in this thesis are relatively moderate policy reforms, but that does not mean that more drastic action would not also be needed to contain the crisis. Here, it is noteworthy to mention that so far, there is little experience of absolute decoupling of greenhouse gas emissions (or utilisation of natural resources) from the gross domestic product (GDP), at least with sufficient scale, continuity, and speed (Hickel and Kallis, 2020; Haberl et al., 2020; Vadén et al., 2020). Whether one thinks that green growth or abandonment of the growth objective would be a more realistic or desirable way to mitigate climate change, both schools of thought would likely agree that, for example, a higher carbon tax would be a step in a beneficial direction, at least if implemented in a socially sustainable way.

This work falls between economic, environmental, and political sociology. Economic sociology can be defined as "the application of the frames of reference, variables, and explanatory models of sociology to that complex of activities which is concerned with the production, distribution, exchange, and consumption of scarce goods and services" (Smelser and Swedberg, 2005: 3). Climate change is largely a result of consuming scarce goods, such as oil, the societal side of climate change can (or could) be seen as one of the key objects of study within economic sociology. Environmental sociology is "the study of human–environment interactions in modern society" (Lidskog et al., 2014: 345). Conversely, political sociology studies "the development of the state as a mode of political power and social movements and other forms of contentious action as forms of collective action and social protest" (Bevir, 2007: 2).

Climate change is not only a physical process but also a thoroughly societal issue (Valkonen and Saaristo, 2016). Societal processes can accelerate or curb global warming. More emissions will lead to more severe climatic effects on ecosystems, societies, and economies worldwide. Although it would be most costly for the national economy to allow climate change to proceed uncontrollably (Stern, 2007), one of the citizens' concerns in implementing climate policy may be its short-term impact on household livelihoods. This is an example of how social sciences can significantly increase understanding of the difficulties of implementing climate policy.

Public opinion can be one of the current obstacles to enacting effective climate policies. Conversely, politicians may often be too afraid of the consequences of the implementation of climate policy for their popularity (Willis, 2020). Either way, climate policies would be compelling and legitimate in the ideal situation. Some sort

of paradox can be identified here: on the one hand, states' legitimacy depends on their success in mitigating and adapting to climate change (Lieven, 2020), and also, effective climate policies (on a concrete level) are often relatively unpopular among citizens because they might, for example, increase costs for households, or they may have another coercive effect on people's way of life. However, it is good to note that continuing business-as-usual is not a realistic option either, as the progress of climate change would affect the current way of life.

This work focuses primarily on comparative attitude research, which examines how previous research's variables linked to environmental attitudes affect different political or regional contexts.

In sociology, one way to understand macro (such as society-level) and micro-levels (individual level) is that both have independent explanatory power to citizens' actions and attitudes. However, the levels are also in constant interaction. For example, Giddens (1984) argues that social structures are both the medium and outcome of human action: Individuals are not simply products of social structures but also agents who actively produce and reproduce those structures through their actions. It is worth noting, however, that from the perspective of the philosophy of sociology, macro- and micro-level are more nuanced concepts. For instance, they can be approached non-categorially (Ylikoski, 2014).

Empirical research typically requires the operationalisation of theoretical concepts, in a technical sense. In this work, macro-level factors are variables coded at the country level, and micro-level factors are coded at the individual level. For example, trust in political institutions may independently impact citizens' climate policy attitudes at both levels.

The selected background variables were chosen for this work partly from theoretical interests and partly from the questions of the available survey data. For example, the so-called synergy hypothesis suggests that Nordic welfare state models form an especially fruitful context to advance climate policy (e.g., Gough et al., 2008). Hence, it was interesting to test the hypothesis at the level of attitudes in Study I with European cross-country data, namely European Social Survey Round 8.

Previous research has found that left and right-wing ideologies are associated with climate policy attitudes in different manners between countries of the former eastern bloc and other Europe (McCright et al., 2016). Therefore, it was meaningful to study this divide with more recent data in Study II and how generalised and political trust are associated with fossil fuel taxation attitudes in different European countries, not just in Europe.

The association between social class and party preference in Nordic countries was relevant to the study since Nordic countries are relatively supportive of fossil fuel taxes, and it is, therefore, interesting to explore in Study III what type of

differences there are between and inside these countries regarding social classes and party preferences.

Study IV examines the differences between urban and rural citizens regarding different climate policy instruments in Finland. Moreover, it examines if climate change risk perception and subjective closeness with one's district are associated with climate policy attitudes.

The subject is vast, so one study can only cover a small part. However, this work aims to create, from a comparative perspective, an overview of certain relevant factors in how climate policy attitudes are shaped in society. A comparative research perspective can be revealing as it examines how attitudes vary between societies and social groups. It can also provide insights into the diverse range of attitudes across societies and sheds light on how various factors are associated with citizen attitudes in different ways within distinct societal contexts.

2 Theoretical Background

2.1 Commons and the collective action problem

How can we manage commons, and what are the sources of cooperation? The social sciences have examined and answered this question (Simpson and Willer, 2015). According to Simpson and Willer (2015: 44), whereas political scientists have underlined the role of government and formal institutions, economists have focused on market functions and competition, psychologists have examined altruistic motives and emotions, such as empathy and gratitude, and sociologists have "emphasised informal, interpersonal mechanisms such as relationships, norms, hierarchies, shared values, and solidarity."

The term "commons" refers to "resources that are not exclusively owned: resources that are freely available for humans to use" (Stevenson, 2018: 22). Commons can be local or located in a broader area. For example, the atmosphere can be considered a global common (Wiertz and Graaf, 2022).

Although early modern mercantilists or classical political economists, such as Adam Smith, aimed typically towards maximising the utilisation of natural resources, during the twentieth century, commons were more recognised as scarce resources, leading to collective action problems (Wolloch, 2018). The problem can be defined in the following manner: The benefit to the actor of seeking self-interest outweighs the benefit of cooperation; all actors will benefit less if they pursue their own interests (Dawes, 1980; Jagers et al., 2020; Wiertz and Graaf, 2022).

Commons and their handling via collective action have sparked extensive research and dispute. Garret Hardin and Elinor Ostrom expressed two critical ways of thinking about these topics (Pellizzoni, 2018).

Although certain scholars had written about these problems (e.g., Gordon, 1954), Garrett Hardin, in his essay "The Tragedy of Commons" (1968), famously described a collective action problem concerning pasture, shepherds, and cattle. If a single shepherd brings a new animal to the pasture – and according to him, a rational one will – the personal gain is more significant than collective harm. However, if all shepherds act the same way, the pasture dies out.

Even though most countries have already agreed in United Nations' Earth Summit 1992 and the Paris 2015 agreement that global warming is happening and

actions are needed to prevent it, far enough policies have been implemented. Hardin's example has been used to describe difficulties in solving the climate crisis. The pasture represents the atmosphere, and emitting pollution to the atmosphere may provide or enable (at least in traditional thinking) certain gains, such as economic growth, to a single polluter.

Figure 1 describes the problematic nature of climate change from the point of view of a problem with global collective action. The figure suggests that actors do too little climate action because the benefits are smaller than the disadvantages for the individual actor. This logic of the problem can be related to actors such as countries (or, more precisely, politicians), companies, and individual citizens. Part of the problem may be related to too pessimistic views regarding other climate change attitudes; data from USA and China suggests that people tend to underestimate other people's support for climate policy (Mildenberger & Stinley, 2017).

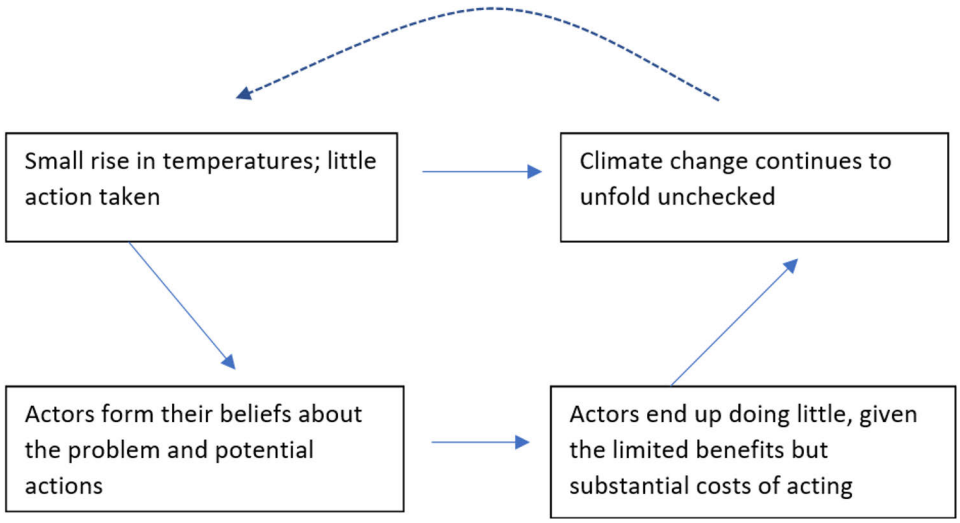

Figure 1. *Collective action problem of climate change* (Wiertz and Graaf, 2022: 477, figure 24.1).

To prevent the ruining of commons due to free access, Hardin called for "mutual coercion, mutually agreed upon by the majority of the people affected" (Hardin, 1968: 1247). The coercion can include, for example, enclosures, restrictions, and regulations. In his later writing, Harding (1994) states that unmanaged commons would lead to overuse of resources, but managing commons could succeed, depending on the details. He suggested two main options. In the first one, resources are divided into several private properties, and each owner is responsible for one's piece. The other option is that resources are considered common property, but

property owners (the people) appoint a manager to control the resource usage (Hardin, 1994).

Hardin's work has been influential but heavily criticised from several angles (Stevenson, 2018). For example, Ostrom (2008) points out numerous examples from around the world in which commons have been somewhat successfully managed by various types of units. It would be oversimplifying to argue that people are inherently selfish or cooperative; instead, how people behave is closely related to their local institutions (Stevenson, 2018).

From the sociological perspective, Hardin's essay has been criticised for failing to account for the political-ecological structures that drive people to overuse a particular collective resource. An incentive for overuse may arise through, for instance, structures of the current capitalistic economies instead of a universal human tendency to maximise individual advantages from commons (Longo and York, 2020).

Aklin and Mildenberger (2020) refer to empiric evidence and argue that the collective action framework is invalid for analysing climate policy because governments implement climate policies regardless of what other countries do. Therefore, they argue, the so-called free-rider question is not a real problem in the politics of climate change. Instead, "distributive conflict" would be a more accurate concept to describe the climate change mitigation problem. Distributive conflict refers to the idea that there are actors inside countries – such as the fossil fuel industry – which actively oppose climate policy. Therefore, the problem in climate action is not that others would benefit if a single actor cooperated; the problem is formed by those opposed to decarbonisation (Aklin and Mildenberger, 2020).

Kennard and Schnakenberg (2021) argue, however, that the reason certain businesses oppose climate policies can also be seen as a collective action problem because they are worried that they would pay more while sharing benefits with others. Either way, collective action and distributive conflict perspectives do not rule each other out but can be seen as complementary (Kennard and Schnakenberg, 2021).

Climate policy attitudes are relevant to both schools of thought – collective action problem and distributive conflict – because advancing climate policy partially depends on the citizens' support.

2.2 Global and local commons

As discussed above, global commons can refer to, for instance, the atmosphere and oceans. Referring to Schlager and Ostrom's (1992) framework (Table 1), we all have access to the atmosphere and produce greenhouse gases daily; no single person owns it. There are many views about the root cause of excessive production of greenhouse

gas emissions. However, at least one can say that producing them has been too cheap or easy to prevent excessive pollution despite some preventive measures, such as carbon taxes or cap and trade systems. Property rights can also play an essential role in climate policy, whether we are discussing producing emissions that end up in the atmosphere by burning fossil fuels, removing emissions from the atmosphere via carbon sinks or trading emission rights (see, Chapter 3.2).

Table 1. Various types of rights to commons (Schlager and Ostrom, 1992: 250–251).

Access	the right to enter a given physical property
Withdrawal	the right to the "products" of a resource – for example, to catch fish
Management	the right to regulate use modalities and to modify a resource to "improve" it
Exclusion	the right to assign access rights
Alienation	the right to sell or lease management and exclusion rights

In some examples, the global community has been able to solve more straightforward global collective problems, such as "The Montreal Protocol on Substances that Deplete the Ozone Layer" (Jagers et al., 2020), and we have plenty of examples of how local communities have managed smaller-scale collective action problems (Dietz et al., 2003) successfully. However, large-scale collective action problems, of which climate change is a prime example, are more complex than smaller or simpler ones for several reasons:

- Number of actors
- Spatial distance
- Temporal distance
- Complexity (Jagers et al., 2020)
- Enforceability (Stevenson, 2018).

For many international relations researchers, it is evident that the level of difficulty increases when more actors are involved (Stevenson, 2018). When the number of actors increases, coordinating and cooperating in collective action becomes increasingly difficult. The same applies to the global climate mitigation negotiations. With more actors, representativeness, anonymity, and the risk of corruption grow (Jagers et al., 2020).

Collective action becomes more difficult when the problem involves a wider geographical area – such as several countries, continents, or the whole world. Greater spatial distance also increases the number of actors involved (Jagers et al., 2020). Harm from local emissions is not faced only locally, and the worst effects may occur far from the worst emission producers. The countries of the Global North are most responsible for climate change. However, countries or communities of the Global

South have the least resources to face the consequences, leading to climate justice problems (Paterson, 2021). There are also differences between Northern and Southern Europe: Southern countries will likely face more severe problems, such as water stress, heat waves, and forest fires (Gough et al., 2008).

As the time between action and consequent disadvantages increases, collective action becomes more difficult. For example, certain greenhouse gas emissions can warm the climate for centuries, and sea level rise can continue for thousands of years. The entry of new generations into the problem also increases the number of actors. It may make cooperation more difficult because certain effects of non-cooperation are likely to have a stronger effect on younger or non-born generations than on the ones causing them (Jagers et al., 2020). However, it is worth noting that young people's activist movements, such as Fridays for Future, have opportunities to alter this situation.

Large-scale collective problems are typically characterized by complexity. Unlike in small-scale problems, the boundaries are unclear. The evidence or facts are fragmented, and scientific support for the problem and solutions is often controversial (at least from a layperson's point of view). For example, understanding the accumulation of carbon dioxide in the atmosphere and its consequences requires the assimilation of abstract knowledge (Jagers et al., 2020).

One reason the management of global commons is challenging is that there is no higher authority above states or state unions such as the EU in the international system. Although the UN provides an architecture for international agreements, its ability to monitor or enforce agreements is often insufficient. Often, international negotiations' outcomes are not legally binding treaties but declarations, guidelines, or codes (Stevenson, 2018). Moreover, as Stevenson (2018: 34) explains, "In poor and weakly governed countries, many people simply cannot rely on state authorities (like police and courts) to enforce agreements." Therefore, citizens' trust in political institutions has been recognized as an essential aspect in the implementation of climate policies (e.g., Fairbrother et al., 2019): people often lack in-depth knowledge about political issues, and when they question a certain reform's worthwhileness, political trust can play a significant role in whether they support or oppose it (Rudolph, 2017).

2.3 The state as an actor in climate policy

The sociology of the state is often closely aligned with economic sociology: both argue that societal institutions, such as states, markets, and organizations, are social constructs; they are manifestations of ideas, symbols, and narratives rather than part of the natural order (Bevir, 2007).

Governance is "the maintenance of collective order, the achievement of collective goals, and the collective processes of rule through which order and goals are sought" (Rosenau, 2000: 175). Climate change governance requires two key forms of action: mitigation and adaptation (Meadowcroft, 2009). This work focuses on mitigation. As Meadowcroft (2009: 8) formulates, "Governance of mitigation requires an understanding of emissions sources, cost-effective abatement potentials, and policy approaches. An array of policy instruments is available to encourage mitigation. The difficulty lies less in the design of approaches than in the political will to implement them" (Meadowcroft, 2009: 8). Political will, on the other hand, is closely linked with public attitudes.

Researchers have argued about the optimal level at which to implement climate policy; for example, should we have a global solution, or should individual countries or country unions decide the optimal policies? Certain researchers have called for, for example, a global carbon tax (e.g., Morgan and Patomäki, 2021). It is worth mentioning, however, that these levels do not rule each other out: international and national solutions can be combined, as can more local solutions. There would be numerous ways to organize global governance and policies (Zürn, 2012), but such methods do not fall within this work's scope.

The traditional approach to environmental policy is to look at it in the context of national parliaments and their disposal (Sterner and Robinson, 2018), which reflects a state's central position. However, over the last few decades, researchers have conducted more studies underlining the significance of non-state actors, such as cities, companies, and third-sector organizations (Mol, 2018). According to Mol (2018), due to the increased role of non-governmental actors, the concept of governance has replaced the concept of government (in terms of protecting the environment) (Mol, 2018).

Climate change governance is an example of multilevel governance, which means that governance takes place simultaneously at many levels: across and within states, including sub-national level and non-state actors (Di Gregorio, 2019). Multilevel global governance was introduced at UN Rio Summit in 1992, first as a governance model to advance sustainable development and later as climate change mitigation. The concept of multilevel global governance gained further prominence with the advent of the Paris Agreement in 2015, which recognized the role of diverse actors in collectively addressing climate change and implementing mitigation strategies at various levels of governance (Jänicke, 2018).

Still, arguments have also been made regarding how states are still key players in international climate policy:

- States remain the most powerful mechanism for collective action and (re)distribution of resources.

- States still structure the economic, political, and social interactions and deploy significant administrative recourses via, for example, taxation, expenditures, and legislation (Duit et al., 2016).

As Jänicke (2018) points out, national governments introduce most climate policies. The nation-state still monopolises coercive power in most of the world and has remained the most powerful actor, individually and collectively. Although the institutional capacity of global regions (such as the African Union or Community of Latin American and Caribbean States) is typically weak regarding climate policy, the EU is an exception; EU has implemented a relatively effective climate policy and actively cooperates with other regional organizations (Jänicke, 2018).

In order to function, a capitalist market economy needs rules created by the state (Fligstein and Mara-Drita, 1996). Thus, states play an essential role in the functioning of the market and its (external) effects. One discussion active in environmental politics research concerns the environmental state: a state in which environmental issues are an inseparable part of legislation and societal discourse (Duit et al., 2016). As noted previously, few countries have reached target sustainable emission levels (and other material outputs) and could be seen as examples of environmental states.

There are often crucial differences in governance between different states. For example, each country has its structural path dependencies, such as how it organizes social policy, which affects its capability to implement climate policies (Gough et al., 2008). Another factor affecting climate policy action is the varying effect of such policies on various groups; not only between but also within countries can discrete areas or groups experience the effects of a certain policy in very different manners. For example, reducing logging can affect the livelihoods of people who live in the countryside differently than that of city dwellers. This type of case explains why compensatory policies targeting the possible undesirable effects of climate policies can be crucial to gain public support.

2.4 Climate policy instruments

One way to classify environmental or climate policy instruments is to sort them into three categories: price-type, rights, and quantity-type regulation (see Table 2). Price-type instruments create incentives to change behaviour by affecting prices. Rights-based instruments are typically related to property rights but may also include, for example, tradeable permission systems (such as cap and trade). Quantity-type regulation controls amounts of production or pollution: functions may be banned or regulated so that they must take place in a certain area, at a certain time, and in a certain way (Sterner and Robinson, 2018).

Table 2. Climate policy instrument categories, adopted from Sterner and Robinson (2018) and Drews and van den Bergh (2016).

Policy instrument example	Price-type	Rights	Quantity-type regulation	Push	Pull
Carbon tax	x			x	
Subsidizing renewable energy production	x				x
Cutting subsidies for coal energy usage	x			x	
Cutting subsidies for beef production	x			x	
Cap and trade system		x		x	
Reducing logging		x		x	
Permitting new nuclear plants			x		x
Banning coal			x	x	
Banning energy-inefficient household appliances			x	x	

Perhaps the most well-known example of a price-type instrument is the carbon tax, which attempts to increase the cost of producing carbon emissions. From the perspective of the national economy, a carbon tax offers tax income and, thus, is often considered a cost-effective instrument (e.g., Stern, 2007).

Subsidizing can be thought of as negative taxation. The public sector typically pays for subsidies; a common example of this policy tool in the context of climate protection is subsidizing renewable energy production. Cutting certain subsidies can serve as a policy instrument: even when the original purposes of (emission-causing) subsidies have been forgotten, lobbies may emerge to defend these existing customs (Sterner and Robinson, 2018).

Property rights are the most fundamental mechanism of rights instruments (Sterner and Robinson, 2018). Rights-based environmental or climate policies are often clarifications of property rights, which can be bundled to include, for instance, the rights to enter, utilize or sell a particular property or resource (Table 1). Therefore, the rights instrument may answer such questions as whether or to what extent a landowner has the right to log a particular area (or what type of logging the proper permits).

Quantity-type regulation aims to control amounts of production or pollution, for example, by banning or regulating actions to be carried out in a specific timeframe, area, or manner. Quantity-type regulation includes many options, from technology standards (which provide specific procedures for organizations, such as companies, to follow) to performance standards (which identify ideal environmental outcomes; Sterner and Robinson, 2018).

A “push–pull” dichotomy is another framework for categorising climate policy measures. “Push” policies are more coercive and aim to prevent certain activities. “Pull” policies are less- or non-coercive and aim to promote a specific type of action (Drews and van den Bergh, 2016). To prevent specific actions, push policies can, for instance, make them more expensive to conduct or ban them altogether, while pull policies can try to enhance the practical appeal of specific actions by, for example, making them easier or cheaper.

Push and pull dichotomy are a close concept for the stick, carrot, and sermon typology, which became well-known in the late 1990s. In this typology, sticks refer to regulatory instruments, carrots to economic instruments, and sermons to information-based measures (Vedung, 1998). It is worth noting that policy instruments are not mutually exclusive, but successful environmental or climate policy often requires a combination of different measures (Pacheco-Vega, 2020).

Economists tend to emphasize the push type of economic instruments – such as taxation – over pull measures: carbon taxation is a relatively cost-effective way to curb emissions from the perspective of a national economy (e.g., Stern, 2007). In contrast, the effect of push instruments on citizens and other actors is relatively direct or visible; hence, pull policies with a relatively indirect impact on citizens – such as subvention of renewable energy – tend to be more popular than push policies (Drews and van den Bergh, 2016).

Nevertheless, another way to characterize instruments is to classify them as high-cost and low-cost measures. The low-cost hypothesis suggests that the effects of environmental concern on environmental behaviours decrease as costs rise; it suggests that the most effective policies are a combination of making low-carbon alternatives more affordable and accessible and disincentivising carbon-intensive actions (Diekmann and Preisendörfer, 2003). For example, taxation is considered a high-cost measure, while subvention and regulation are considered low-cost measures (Von Borgstede and Lundqvist, 2006).

One aspect is also how the content of policies affects their support. For example, a climate policy that is perceived as fair gains significantly more support than a policy that is perceived as unfair would. In contrast, a particular climate policy measure’s perceived efficacy (in reducing emissions) also significantly impacts its support (Bergquist et al., 2022). Evidence shows that in economically more equal and less corrupt countries, people are inclined to perceive environmental policy measures as more effective (Harring, 2014).

3 Empirical Background

3.1 Climate change and democratic forms of government

Public opinion plays a significant role in implementing climate policies in democratic countries. Without approval from the citizens, climate policies can lose some of their impacts. Moreover, if a certain climate policy is particularly unpopular once implemented, citizens may vote to overturn it in future elections (Matti, 2015).

Scholars have recognized certain issues in the interactions between current democratic systems and climate change policy. One such issue concerns the length of election cycles. Because election cycles are relatively short-term and climate change is a long-term problem, the political system has difficulty addressing the problem (Di Paola and Jamieson, 2017). Furthermore, politicians may fear losing elections and may choose to advance economic growth at the expense of climate protection.

Similarly, politicians may also think that voters are more opposed to climate policies than they are (Willis, 2020). This issue also relates to heavy lobbying from fossil fuel companies, which have often supported parties and politicians (especially in the United States, but also more broadly), making it difficult for many politicians to act against their donors' interests (Ruser, 2018).

Some scholars argue that democracy is a suitable form of governance for addressing climate change, but it would be advantageous to develop it further (e.g., Deese, 2019; Willis, 2020). However, certain authors have alleged that democracies are inherently unable to solve climate change. For example, Sherman and Smith (2007) argue that one of the main causes of this inability is the tacit licence democracy gives its parties to pursue self-interest and greed, which is incompatible with protecting the commons (Shearman and Smith, 2007). It seems clear, however, that the authoritarian model is not doing any better. A study finds that, in democratic countries with low levels of corruption, greenhouse gas emissions are lower than in authoritarian regimes (Povitkina, 2018).

3.2 Attitudes and risk perception

Social sciences do not typically study mechanisms which would be deterministically causal. The same applies to this work. The studied variables, such as social class position, share the ability to make a certain outcome more likely than some other outcome. This can be called probabilistic causation (Goldthorpe, 2001). Following the probabilistic causality school of thought, this work discusses predictors of attitudes that may make certain attitudes more likely or unlikely instead of determining them.

What about the relationship between macro or micro-level factors and citizens' attitudes? The position of purely methodological individualism is that all social phenomena revert to individuals; thus, social explanations cannot have independent power. Another approach holds individuals and their characteristics to be central to explanations of social phenomena, but also that such explanations can still refer to macro-level factors that do not revert to the characteristics of those individuals (Ylikoski, 2007).

This study examines macro and micro-level factors' influence on individuals' attitudes. For example, macro-level political trust can independently affect an individual's attitudes. The macro and micro levels are interrelated; therefore, changes at either level can affect the other.

Sociologists typically emphasize contextual factors that shape how people think and act; our attitudes rarely result from our thinking processes. This also applies to research on attitudes towards climate policy.

On the individual level and from the psychological perspective, an attitude is a "tendency expressed by evaluating a particular entity with some degree of favour or disfavour" (Eagly and Chaiken, 2007: 598). Sociologists, however, argue that evaluations might be personal but are formed concerning social context (Voas, 2014). As Voas formulates this dynamic, "Attitudes emerge from the interaction of beliefs, preferences, behaviour and values at the individual level, but these influences are formed through the interaction of culture, human nature and the world around us" (2014: 12).

Attitudes differ from values because values are more abstract and manifest in more specific judgements called attitudes. To sociologists, attitudes are not individual mental states but evaluative judgments. However, evaluations that are not value judgements are not considered attitudes (Voas, 2014).

The context influencing an individual's attitudes can include numerous factors, from broad-scale macro foundations to micro-level factors. However, critics of the structural point of view argue that, though social structures influence individuals' attitudes, humans remain active processors of information; we have the potential to be both automatons of our socialization or free agents, depending on the conditions (e.g., Bergman, 1998).

The relationship between attitudes and actual behaviour has been a long-standing discussion and controversy in the social sciences. Some studies find attitudes to correlate poorly with behaviour. For example, environmental concern may not translate into environmentally friendly actions (e.g., Valkila and Saari, 2013). Other studies show a significant association between attitudes and behaviour, depending on the topic or situation. For example, the attitude–behaviour gap seems to widen, especially when the costs of environmentally conscious behaviour are high (Diekmann and Preisendörfer, 2003; Farjam et al., 2019). A weak association between attitudes and actions related to a certain topic can also be interesting and indicate, for instance, the topic's sensitivity. Additionally, behaviour is not the only reason to study attitudes: human life is more than actions, and the study of attitudes, thinking, and ideals can be significant regardless of how they relate to behaviour (Schuman and Johnson, 1976).

Conversely, social norms can often lead to environmentally friendly behaviour, even with low environmental concern (Vermeir and Verbeke, 2006). While the effect of environmental concern on behaviour may have been overemphasized at times, it is worth noting that people without remarkable environmental concern engage in a certain amount of green behaviour and vice versa: much of our behaviour is strongly influenced by socio-political structures and physical infrastructure (Scavenius and Lindberg, 2018).

While, in a technical sense, risk refers to the "probability and consequences of a potentially harmful event" (Battistelli and Galantino, 2019: 66), risk perception refers to the subjective evaluation of the severity and characteristics of a risk (Molina et al., 2013) and can also be understood as attitude (Koivula et al., 2018). Societal risks concern society's members and their environment (Rothstein et al., 2006).

Douglas (1983) argues that risk calculation is not an individual process but that the social circles and media around individuals will affect their calculations of certain phenomena's risks. Citizens' risk perceptions are formed through combinations of the influence of various social cues and individual evaluation (Paek and Hove, 2017).

According to Beck's risk society theory, the complexity of modern society renders risk management impossible and the emergence of new risks inevitable, despite efforts to counter them (Beck, 1992). However, since this work's definition of risk perception considers a more specific risk, climate change, the perspective somewhat differs from Beck's theory.

The perception of climate change as a societal risk varies across groups and areas. Climate risk perception has been recognized to predict significantly more public support for climate policies (e.g., Park and Vedlitz, 2013; Mayer, 2020).

There are numerous societal risks carried by climate change, from economic crises to conflicts (Kemp et al., 2022). Though this work does not detail these risks,

the fourth study's survey respondents rate their perception of the societal risk posed by climate change.

3.3 Climate policy attitudes

Examples of macro-level factors associated with micro-level climate policy attitudes include political trust at the country level or in the welfare-state model. According to Svallfors (2012), attitudes vary between different welfare-state models (i.e., welfare regimes) since each has a distinctive institutional framework that provides specific resources and poses certain risks. These preconditions generate certain predispositions, such as institutional and generalized trust, values, and beliefs (Svallfors, 2012).

The so-called synergy hypothesis suggests that social democratic or Nordic welfare states are especially fruitful contexts for advancing environmental policies and steps towards an environmental state (e.g., Meadowcroft, 2005). In the environmental-state model, environmental questions are an irreducible part of governance and an unavoidable issue in political discourse (Duit et al., 2016).

The welfare state and the environmental state have several similarities. For example, both present political solutions to societal problems or developments, address shortcomings that the markets alone have not solved and change the patterns through which economic operations work. Both believe in reformist ways of changing society instead of overthrowing the current political institutions (Meadowcroft, 2005). The welfare state also offers solutions to collective social problems, such as healthcare or income security for the unemployed.

However, significant differences are also between the welfare and environmental states. Working-class movements largely generated welfare states, but the environmental state does not have a similar connection with the social class structure. Another important difference is related to economic growth: welfare states were built during times of strong economic growth. The relationship between economic growth and the environmental state is more controversial; the environmental state would need to take ecological limits and decouple growth from environmental harms (Meadowcroft, 2005). As previously noted, proper decoupling is a challenging task.

One argument for the hypothesis that the social democratic or Nordic welfare regime model is most suitable for moving to an environmental-state model is that the discourse of ecological modernization – which suggests that economic growth and environmental protection can progress at the same time – is most adopted there (Gough et al., 2008).

According to the collective action theory, individual actors may have difficulty considering whether one should cooperate with others or act in the interest of individual gain. Trust, "a belief about the attitudes of others" (Voas, 2014: 8), is a

crucial part of this consideration (Sønderskov, 2009). One is more likely to cooperate if one believes that other actors will cooperate instead of free riding. For example, trust in other people increases the likeliness to cooperate in resolving large-N collective problems such as recycling (Sønderskov, 2011).

Trust in political institutions is also crucial in predicting attitudes that present material risks for citizens, who often do not have in-depth knowledge about political affairs. Thus, when citizens estimate the worthwhileness of a risky reform, they often rely on their ideological orientation and political (mis)trust (Trüdinger and Bollow, 2011; Rudolph, 2017). For example, increases in carbon and fuel taxes are among the policy measures perceived as risky: they could, at least in the short term, be detrimental to the economic situation of households. Trust in political institutions has been recognized to predict support for environmental policies (e.g., Fairbrother et al., 2019). Political trust at the country level appears to have an independent contextual effect on individuals: trust seems to be both a macro and micro-level phenomenon (Smith and Mayer, 2018).

What about the relationship between climate policy attitudes and political ideology? Left-wing ideology is commonly associated with advancing the positions of the working class, relatively high taxation and income redistribution, and a large welfare state. In contrast, right-wing ideology is typically associated with support for business interests and lower taxation and income redistribution.

Environmental problems have added a new dimension to political division. A broader environmental awakening took place in the 1960s and 1970s, and in its wake, climate change became better known in the 1980s. Compared to right-wing supporters, supporters of the left are typically more concerned about climate change (Kvaløy et al., 2012) and more supportive of climate policies (Drews and van den Bergh, 2016). As climate protection requires interventionist policies from the state, it is sometimes thought to be incompatible with the ideology of political right (Priest, 2016). However, the left–right division may not work in the same way in the countries of the former Eastern Bloc, where McCright et al. (2016) find that identification with right-wing ideology increases one's likelihood of advocating for climate policy.

An individual's level of trust in other people and political institutions heavily depends on societal context. Citizens in more equal countries typically have higher generalized and political trust (Edelman, 2016; Newton et al., 2018). Evidence shows that social spending on working-age adults and families increases political trust (Shore, 2019). Hence, the welfare state model appears to influence the levels of trust significantly.

Climate change is expected to have drastic consequences on younger generations (Page, 2007), so age is another factor that is expected to influence climate attitudes. For instance, younger people in Switzerland are more concerned about climate

change (Shi et al., 2016) and, in Australia, in greater favour of climate action (Colvin and Jotzo, 2021). In contrast, some studies find that in certain other countries, age is not significantly related to attitudes in terms of climate (Shi et al., 2016). Hence, the significance of age appears to be context related.

The evidence is mixed regarding the association between place of residence and climate attitudes. In Europe, people living in rural areas are more likely to deny anthropogenic climate change (Lübke, 2021). A study of European countries finds that rural citizens support a lower carbon tax than citizens living in urban areas or big cities. However, this finding did not apply to subsidizing renewable energy or banning the least energy-efficient household appliances (Arndt et al., 2022). Another study found that rural citizens in China were less concerned about environmental problems than urban citizens were. However, the concern depends on the environmental problem: farmers are more concerned about issues related to agriculture (Yu, 2014). A study conducted in the United States finds that rural residents favour climate-related regulation less than urban residents and that rural citizens with stronger local identity favour US climate action less than rural citizens with weaker local place identity (Bonnie et al., 2020). Generally speaking, people are more likely to take cues that affect their attitudes and actions from people with close ties than those with weaker ties (Wiertz and Graaf, 2022).

4 Research Design

4.1 Research questions

RQ1: How are different macro-level factors associated with citizens' attitudes towards climate policy instruments? In a technical sense, macro-level factors are variables at the country level, such as a welfare state model and (country-level) political trust.

RQ2: How are different micro-level factors associated with citizens' attitudes towards climate policy instruments? Micro-level factors include variables coded to the individual level, such as party preference and social class position.

To implement more efficient and consistent climate policies, leaders must understand better how attitudes towards climate policy instruments are socially formed (Wiertz and Graaf, 2022). This work attempts to contribute to such an understanding by shedding light on the research questions above.

Due to the fact the initial purpose of this study was to map citizens' climate-policy-related political attitudes, the recent European Social Survey (ESS) Round 8 data collected between 2016 and 2017 offered an appropriate opportunity for comparative research. Therefore, it was natural, to begin with a Europe-wide comparison and, from there, move closer to an analysis of Finland and other Nordic countries.

The first study's purpose was to test, at the attitudinal level, the so-called synergy hypothesis, which suggests that social democratic or Nordic welfare states are an especially fruitful context in which to advance environmental policies and take steps towards an environmental state (e.g., Meadowcroft, 2005). Using ESS Round 8 data, the study compared different welfare regimes' attitudes towards higher taxes on fossil fuels, subsidizing renewable energy and banning the least energy-efficient household appliances. Moreover, the paper examined whether political trust at the country level predicted support for the instruments.

Because the first study examined political trust at the country level, finding it to be especially associated with support for fossil fuel taxation, it was interesting to examine the extent to which trust at the micro level was associated with support for a carbon tax in the second study of the ESS Round 8 data. At the same time, the study examined the association between political ideology and the attitudes in

question. This was well-founded; previous research found that left-wing and right-wing ideologies affected climate policy support differently in post-communist countries and elsewhere in Europe (McCright et al., 2016). It is hypothesized that left-wing ideology predicts less support for fossil fuel taxation in the countries of the former Eastern Bloc and more support for it elsewhere in Europe and that political and generalized trust predict support for fossil fuel taxation across Europe. Similarly, the study analysed how generalized trust, political trust, and left-wing orientation were correlated with attitudes towards fossil fuel taxation at the level of country averages.

As the first two studies considered Europe, in the third study, it was interesting to examine more closely Nordic countries, namely Finland, Norway, and Sweden, using the ESS Round 8 data. The study concerned the association of fossil fuel taxation attitudes with social class position, political party preference, and age. According to previous research, party preference is considered to be a significant predictor of attitudes regarding, for example, ethical consumption (Koivula et al., 2020) and climate policies (Linde, 2018). Previous research has also shown that values and political orientation differ among professions, such as the technical or social and cultural fields (Güveli, 2006) and between generations (Inglehart, 2018). According to Güveli (2006), the job of experts in the technical field ("technocrats") and values are more strongly characterized by rationality, profit maximization and materialism, while autonomous and non-financial postmaterial aims more characterize socio-cultural experts. Based on the described discussion, it was hypothesized that socio-cultural specialists would be in greater favour of higher fossil fuel taxation than other classes would and that supporters of Left-Green parties would be in greater favour of higher fossil fuel taxation than supporters of other parties.

The fourth study studied Finnish attitudes towards various climate policy instruments in more detail. At the same time, the study presented an urban–rural comparison and explored how the perception of climate risk was associated with support for different climate policy measures. It is sometimes argued in the public debate that climate policies (for example, a global carbon tax) should be implemented internationally instead of confined to national stages. Moreover, the collective action problem framework argues that a major barrier to advancing climate policy is limiting individual countries' contributions to solving a problem; effective problem-solving requires all (or enough) actors to cooperate. If implementing a particular climate policy could be global, the mitigation would be more effective than if enacted by a smaller group of countries.

The data and variables used are summarized in Table 3.

Table 3. Research design[1]

Study	Independent variable(s)	Dependent variable(s)	Countries of study	Data
1	Welfare regime (ma.), political trust (ma.)	Attitudes towards: taxing fossil fuels, subsidizing renewable energy, banning least energy-efficient household appliances	22 European countries + Israel	European Social Survey Round 8 (survey collected 2016–2017)
2	Post-communist/non-post-communist country (ma.), Left–right ideology (ma. and mi.), generalized trust (ma. and mi.), political trust (ma. and mi.)	Attitudes towards: taxing fossil fuels	23 European countries (East and West Germany were separated)	European Social Survey Round 8 (survey collected 2016–2017)
3	Social class position (mi.), party preference (mi.)	Attitudes towards: taxing fossil fuels	Finland, Norway, Sweden	European Social Survey Round 8 (survey collected 2016–2017)
4	Climate risk perception (mi.), urban–rural domicile (mi.)	Attitudes towards (at global and national levels): taxing carbon, subsidizing renewable energy, cutting subsidies for coal energy use, cutting subsidies for beef production, implementing a cap and trade program, reducing logging, licensing of new nuclear power plants, banning the use of coal for energy	Finland	Finland-2019: Consumption and way of life survey

4.2 Data and methods

This study utilized two data sets: ESS Round 8 (from the years 2016–2017) (ESS, 2018) and Finland-2019: Consumption habits and way of life (Saari et al., 2019). The ESS Round 8 data included 23 countries (from Europe and Israel) and 44,387

[1] *ma. = macro level, mi. = micro level*

respondents aged 15+. The response activity of the ESS data from each country can be found on the website europeansocialsurvey.org.

The Finland-2019 questionnaire was sent to 4001 Finnish-speaking people aged 18–74 living in Finland. The sampling was carried out as an age-disaggregated random sample from the population register data. The final number of responses to the survey was 1742, and the response rate was 44%. The unit of economic sociology at the University of Turku was responsible for the implementation of the survey, and the units of sociology at the University of Jyväskylä and the University of Turku were also involved in planning the survey.

Both data sets attempt to be statistically representative at the population level. The ESS data set is freely available from europeansocialsurvey.org, and the Finland-2019 data will be available from the Finnish Social Science Data Archive (fsd.tuni.fi). More detailed information about the ESS data collection is described in the documentation of the ESS (2017), and the Finland-2019 data collection is described in more detail by Saari et al. (2019).

Since both macro- and micro-level factors were targets of interest, study 1 utilized multilevel modelling. This method enables the examination of the effects of contextual- and individual-level variables at the same time. Multilevel models are extensions of ordinary linear regressions. In a single-level regression analysis, the response variable is explained by the same-level explanators. The aim is to explain as much of the variance of the response variable as possible. A multilevel regression model has the same goal but incorporates at least two levels of explanatory variables. Level 1 factors explain the response variable at the lowest level, and level 2 factors explain the groups' differences between the explanatory variable and the response variable. Hence, the multilevel model explains the variability of the phenomenon between both individuals (level 1) and groups (level 2). In study 1, individuals formed level 1 and level 2 consisted of countries. Thus, it is possible to estimate how much of the variance of the explanatory variable can be explained by the differences between countries and how much by the differences between individuals.

Studies 2 and 3 utilized OLS regression, and study 3 also used interaction effects. OLS estimates how the dependent variable's average varies according to the independent variables' values. This method is founded on the principle of least squares: minimizing the sum of the squares of the explanatory variable values and the values calculated from the equation of the regression line (e.g., Eye and Schuster, 1998). The regression coefficient indicates the slope of the regression line. If the value is negative, the line points linearly downwards, and if positive, the line points upwards. If the regression coefficient has a value of zero, no observable association exists between the variables. The interaction effect, instead, means that the effect of the independent variable on the dependent variable varies according to the third, moderating or modifying, variable (Jaccard and Turrisi, 2003). Study 2 also utilized

the Pearson correlation coefficient to examine correlations between the independent and dependent variables at the level of country averages.

Study 4 used ordinal logistic regression and interaction effects. Ordinal logistic regression is a form of logistic regression where the value scale of the dependent variable is ordinal and has multiple classes. A basic assumption of ordinal logistic regression is the assumption of proportional odds, which is the effect of an independent variable, is constant for each increase in the level of the response. Thus, the output of an ordinal logistic regression contains an intercept for responses on all levels except one and one slope for every explanatory variable (Parry, 2020).

4.3 Variables

Study 1 examined attitudes towards three climate policy instruments: taxation, subvention, and banning. The respondents were asked the following question, "To what extent are you in favour of or against the following policies in [your country] to reduce climate change?" The policies were as follows: (1) increasing taxes on fossil fuels such as oil, gas, and coal; (2) using public money to subsidize renewable energy such as wind and solar power; and (3) implementing a law banning the sale of the least energy-efficient household appliances. The original response options were reversed to enable more intuitive interpretations. Thus, the scale was as follows: 1 = strongly against, 2 = somewhat against, 3 = neither in favour of nor against, 4 = somewhat in favour, and 5 = strongly in favour. The welfare regime was operationalized following the classifications of Esping-Andersen (1990) and Campos-Matos (2015).

A political trust variable was utilized in studies 1 and 2. It was measured by a summed variable that contained three dimensions: (1) trust in [one's country]'s parliament, (2) trust in politicians, and (3) trust in political parties (e.g., Kestilä-Kekkonen and Söderlund, 2016).

A generalized trust variable was used in study 2. It was studied with a summed variable that consisted of three questions: (1) "most people can be trusted or you cannot be too careful", scored from 0 ("you cannot be too careful") to 10 ("most people can be trusted"); (2) "most people try to take advantage of you or try to be fair", scored from 0 ("most people try to take advantage of me") to 10 ("most people try to be fair"); and (3) "most of the time, people are helpful or mostly looking out for themselves", scored from 0 ("people mostly look out for themselves") to 10 "(people are helpful") (e.g., Hooghe et al., 2009).

The left–right political ideology (used in study 3) was investigated as follows: "In politics, people sometimes talk of 'left' and 'right'. Using these terms, where would you place yourself on this scale, where 0 means the left and 10 means the right?"

In study 3, the participants' party preferences were explored as follows: "Is there a particular political party you feel closer to than all the other parties? If so, which one?" Regarding the participants' occupations, we asked, "What is/was the name or title of your main job?" Based on ISCO-codes, their answers were categorized by social classes according to Güveli's class scheme (Güveli, 2006).

In the fourth study, the dependent variables surveyed the participants' attitudes towards eight climate policy measures. The question was formulated in the following way: "To what extent do you support or oppose the following policy actions?" After reversion, the scale ranged from 1 (*oppose strongly*) to 5 (*support strongly*). The climate policies in question were the following (each question was asked at both the global and national levels):

- Taxing carbon dioxide emissions
- Subsidizing renewable energy (e.g., solar and wind power)
- Cutting subsidies for coal energy use
- Cutting subsidies for beef production
- Implementing a cap and trade program
- Reducing logging
- Licensing new nuclear power plants
- Banning the use of coal for energy

The fourth study also included the following question on the participants' urban/rural place of residence: "Is your residential area an urban/city area (scored as 1) or a rural area (scored as 2)?" To determine their closeness to a local district, we asked, "How closely do you feel you belong to the following: district or village?" To enable easier interpretation, the scale was reversed and thus ranged from 1 (not at all) to 5 (very closely). The participants' perceptions of climate change risk were measured with the following question: "To what extent do you consider the following issues risks or sources of uncertainty in society: climate change?" The respondents answered on a scale from 1 (*very significant*) to 5 (*not at all significant*). To allow better intuitive interpretation, the scale was reversed.

5 Results

The first research question asked which macro-level factors are associated with attitudes towards climate policy instruments. Study I concentrated especially on the welfare regime and political trust at the country level. The results revealed that attitudes towards fossil fuel taxation were related more to the welfare regime than to subsidizing renewable energy or banning energy-inefficient household appliances. People living in the Nordic welfare regime supported higher fossil fuel taxation more than those living in other regimes. Yet, the difference was not statistically significant with Post-Communist or Former USSR when GDP per capita was controlled for.

Political trust at the country level was associated with more supportive attitudes towards all three climate policy instruments, but the association was strongest with taxation. The higher support for fossil fuel taxation in Nordic countries is partially related to trust in political institutions. The results indicated that the more universal and generous welfare-state model might be advantageous in advancing attitudes towards fossil fuel taxes. However, when it comes to supporting subvention and banning, people living in the Nordic countries did not stand out compared to those living under other regimes. Instead, banning was more supported in Southern Europe and post-communist regimes.

The other macro-level factor under examination is whether it affects if one's country belongs to the post-communist/socialist bloc (referring here to countries of the former Eastern bloc) and how left–right-ideology is associated with attitudes on fossil fuel taxation. The results of study II suggest that a left-wing ideology is commonly associated with more support for fossil fuel taxation. At the same time, the effect is more inconsistent among the former Eastern Bloc countries. However, more research would be needed to make strong conclusions about this matter. At the level of country averages, generalized trust and political trust were positively strongly correlated with support for fossil fuel taxes, whereas left-wing orientation was scarcely correlated with the dependent variable.

Study I indicates that attitudes towards supporting fossil fuel taxation and the subvention of renewable energy were more related to country-level factors than support for banning was. However, the variance in attitudes towards the subvention

of renewable energy was significantly less related to the welfare regime classification.

The second research question considered factors related to micro-level climate policy attitudes. According to Study II, the political trust had a consistent and strong correlation with increased support for fossil fuel taxation at the micro level across different European countries. However, the effect of generalized trust was less consistent or strong.

Study III explored how social class and party preference are related to fossil fuel taxation attitudes in Finland, Norway, and Sweden. In all the countries, social and cultural specialists favoured higher fossil fuel taxation, while workers were the least in favour. Party preference was more significantly associated with fossil fuel taxation attitudes than social class. Supporters of the so-called new-left parties supported fossil fuel taxation, while populist-right supporters were least supportive of it. In Sweden, the attitudinal gap in question was especially wide among younger cohorts. The attitudinal gap between party supporters was the smallest of the three observed countries in Finland.

Both higher concerns about climate change (study I) and higher perceptions of climate risk (study IV) were linked with different climate policy instruments. In Study I (with data from Europe), higher climate change concerns predicted support for all three instruments: taxation, banning, and subvention. Study IV indicated that risk perception was positively associated with all the studied instruments except for new nuclear plant permissions in Finland.

Moreover, study IV showed how an urban or rural domicile was not typically associated with climate policy attitudes, except for the policy instruments more related to countryside livelihoods, namely, reducing logging and cutting beef production subsidies, which were less popular among rural than urban citizens. Moreover, rural citizens were less supportive of subsidizing renewable energy at the national level. In the case of reducing logging, higher subjective closeness with a district widened the attitudinal gap between the urban and rural respondents in question. These results applied to attitudes towards both global- and national-level policies.

Study I also showed that the redistribution ideology (operationalized regarding whether "the government should take measures to reduce differences in income levels") predicted more support for taxation, banning, and subvention. The same effect was found with higher education, although the difference between primary and secondary education was insignificant.

What about differences in citizens' attitudes concerning global and national climate policies? This depended a lot on the instrument. Reducing logging, introducing a carbon tax, cutting subsidies for beef production, and implementing a cap-and-trade system were more likely to be supported globally. For the other instruments, the differences were not statistically significant.

6 Discussion and Conclusions

The results of this work attempt to contribute to understanding how citizens' climate policy attitudes are formed socially. These influential social factors are found on both the macro and micro levels. Looking at Europe from a comparative perspective, one can notice that, to a certain extent, attitudes towards climate policies vary from region to region, and certain structural factors can be identified behind this variation. For example, in the case of fossil fuel taxation, the people of the Nordic countries stood out because of their relatively supportive attitudes. The high level of trust in political institutions at the country level may partly explain this difference from the rest of Europe.

As the synergy hypothesis suggests, is the Nordic welfare state an especially fruitful context to proceed towards an environmental state? It is noteworthy that public attitudes are only one aspect related to the potential transfer towards the environmental state. The results of this work offer a controversial answer. Although people in Nordic countries were relatively supportive towards fossil fuel taxation, they did not stand out similarly in support of subsidising renewable energy or banning energy-inefficient household appliances. Thus, one can say that the synergy hypothesis gets only limited support from the results.

Generally speaking, fossil fuel taxation is a relatively opposed climate policy instrument. Hence, supportive attitudes toward it could offer to a certain extent, a beneficial position for the advancement of the environmental state. But to this date, considering the greenhouse gas emission (or material consumption) levels (Larsen & Alslund-Lanthén, 2017), there is insufficient evidence to properly back up the hypothesis. Then again, as Meadowcroft (2005) points out, the development of welfare states was unsmooth, uneven, and periodic and took 50–80 years. Hence, an environmental state could hypothetically have still time to develop similarly. The problem is the tight time frame, where ecological limits would need to be considered to avoid worst scenarios.

In a Europe-wide analysis, the GDP per capita was not significantly associated with support for taxing fossil fuels, subsidizing renewable energy, or banning the least energy-efficient household appliances. This indicates that countries do not first have to become particularly prosperous economies to promote support for climate

policy, but other factors are more relevant in this regard. Total CO2 emission levels per capita also were not a significant factor in climate policy support in a cross-national European examination.

Variation also exists in how a value or ideology is channelled into attitudes in different contexts. For example, a stronger left-wing ideology is associated with higher support for fossil fuel taxation in several European countries, but not all of them, especially the countries of Eastern Europe. However, regarding country averages, left-wing orientation was barely correlated with support for fossil fuel taxation, while generalized trust and political trust were strongly correlated.

What about other micro-level factors and support for climate policies? Political trust is also a significant element at the micro level: in most European countries included in Study II, higher trust in political institutions predicted support for higher fossil fuel taxation. The association between generalized trust and support for the taxation of fossil fuels was also positive but typically weaker (than the association with political trust) and significant in fewer countries.

Party preference explains fossil fuel taxation attitudes more strongly in Nordic countries than social class position. However, it was found that the class of socio-cultural specialists favoured fuel tax increases in Finland, Sweden, and Norway more than in other classes. At the same time, these increases were least supported by populist-right supporters compared to other party supporters. The highest support for fossil fuel taxation was found among the so-called new-left parties' supporters.

In Finland, the attributional gap between the party supporters was least remarkable. This may be related to the fact that in their official communication, the Finns party (often considered part of the populist right) leaders have not typically denied climate change as a natural phenomenon (Hatakka and Välimäki, 2019).

If a respondent assessed one's economic situation as worse than "living comfortably", it predicted less support for fossil fuel taxation (cross-nationally) in Study I. At the same time, a better objective monthly income did not particularly affect climate policy attitudes in Finland (Study IV). Thus, is it the case that the subjective income level is more relevant than the objective one in terms of climate policy attitudes? This question requires more research since these results consider different datasets and analysis models.

It is worth noting that the way background factors influence climate policy attitudes is highly dependent on which climate policy measure is at issue. For example, support for increasing taxes on fossil fuels is relatively strongly linked to macro-level political trust, while support for renewable energy is much less linked to it. Likewise, Finland's urban–rural divide can only be observed in attitudes towards certain policies, nowhere near all of them.

Although the urban–rural cleavage was not particularly noticeable in Finland, certain instruments linked to rural livelihoods – to be more precise, reducing logging

and cutting subsidies for beef production – were more supported in rural areas. This is in line with previous research to the extent that the differences in climate policy attitudes between cities and rural areas are highly dependent on the policy instrument (Arndt et al., 2022).

Climate policy instruments can be categorized as pull and push measures, which are typically more popular among citizens (Drews and van den Bergh, 2016). However, the support for policy instruments is highly dependent on the details. In Study IV concerning Finns, both pull measures were the most and least supported instruments. Thus, the popularity of the policy instruments is a much more complex question than the push–pull divide may suggest.

Regarding attitudes towards climate policy instruments in Finland, does it matter whether these instruments would be implemented globally or nationally? The answer seems to be highly dependent on which instrument is in question. For example, attitudes towards logging or carbon taxes were significantly more positive globally than at the national level. In contrast, attitudes towards banning coal or subsidizing renewable energy were not significantly related to the level of (hypothetical) implementation. This finding reveals an interesting dynamic in the formation of climate policy attitudes. Regarding citizens' attitudes, the claim that climate policy would be worthwhile only if implemented at the global level seems to apply to some extent to certain policy instruments. This finding partially supports the argument that the collective action problem is a valid framework for analysing the (dis)advancement of climate policy. Conversely, several instruments were not significantly more popular globally, and the most popular instrument at both levels was subsidizing renewable energy.

One conclusion may be that advancing climate policy is far more complex than a single theory – in this case, the collective action problem – perhaps can encompass. The fact that the global level carbon tax was a relatively popular in Finland offers an interesting subject for further research: is this also the case cross-nationally? If so, that would be one more factor that would support an international carbon tax.

What would be legitimate ways would be to advance climate policy, then? Of course, surveys alone do not give a comprehensive overall picture of some policy measures' legitimacy. However, they can still contribute to providing valuable information about the support of policy measures among citizens. On an abstract level, the fight against climate change is typically well supported in surveys in Finland (e.g., Climate Barometer, 2023). The results of study IV suggest that in Finland, there are (or at least were at the time of the study's execution) different types of climate policies that are typically more supported than opposed by citizens in Finland. How socio-demographic background variables relate to this depends greatly on the climate policy instrument. For example, higher education is related to

support for a global carbon tax, but generally speaking not to support for other measures that were included in study IV.

In an international comparison, Finland and other Nordic countries stood out with relatively high support for increasing fossil fuel taxation. The most popular methods in Finland include subsidising renewable energy and cutting subsidies for coal energy use. However, cutting industrial subsidies that harm the environment has proven challenging in Finland, at least because of strong lobbying. This can be seen as an example of how citizen attitudes may not necessarily translate into concrete political actions, especially when their implementation involves significant conflicting interests.

As it appears to be the case that trusts in political institutions increase support for carbon taxation, should we attempt to increase political trust, and if so, how? One aspect is that a certain amount of distrust may be a healthy situation since a political system can never work perfectly. In a corrupted context, not trusting the political system is especially logical. Hence, a quality government and a well-functioning welfare state can be advantageous in increasing trust and, among other benefits, can also increase support for climate-friendly taxation. However, one problem here is that effective climate policies should be implemented rapidly to prevent the worst effects of global warming. Consequently, the implementation of climate policies should be conducted in various political contexts. The idea that we should first, for example, root out corruption may be too long a way to follow in this case, although it can be a good aim for numerous reasons.

This study has certain limitations. The structural or social background factors included in this work explain only a limited part of the attitudinal variation. Further cross-disciplinary research is needed to understand how citizens' attitudes toward climate policy emerge and shape. Another limitation is related to the fact that in this study, climate policies are handled separately. At the same time, in many academic and other discussions, the individual measures are often part of larger packages, such as in discourses about the Green New Deal in the USA (Friedman, 2019) or Ecological Reconstruction in Finland (BIOS, 2019). Attitudinal research on such larger policy entities would require another type of approach.

Another limitation is related to the cross-sectional data. The data sets used in this study were gathered in certain periods, and one needs to be critical in generalizing these results to other periods. Time series and panel data would offer more trustworthy pictures of the attitudes and factors associated with them. The results of survey studies can become outdated quickly. In the case of this study, it should be noted that after the data were collected, a global pandemic broke out, and Russia started a large-scale invasion of Ukraine. Consequently, special caution should be exercised when generalizing the results to the present.

Collecting and utilizing survey data requires ethical considerations. Studies I–III use ESS data collected following the Declaration on Ethics of the International Statistical Institute and possible national obligations (ESS, 2017). Study IV utilizes Finland 2019 data. The survey respondents voluntarily accepted their participation in collecting the data and were informed about the data handling processes and information security. From the research ethics perspective, the data utilized have been handled following the General Data Protection Regulation of the European Union. Individual respondents cannot be identified from the results.

In future studies, time series data could be used to obtain a more comprehensive understanding of the formation of climate policy attitudes in different societal and social contexts. Moreover, combinations of policy instruments could be studied (perhaps climate policies combined with social policies), which could be used to increase support for less popular climate policy measures; presumably, significant variation has been found between countries, so the importance of local research would be important.

There is also a need for a deeper analysis of why certain climate policy instruments are more popular than others. For example, what are the reasons that certain policies may be considered unfair by the citizens, and how can those perceptions be acknowledged? Additionally, while this work has focused on mitigation policies, there is also a need for information on public attitudes towards climate change adoption policies.

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