

*Brina MALNAR****INFORMING CLIMATE MITIGATION POLICIES:
A SCOPING STUDY BASED ON 64 ARTICLES USING THE
2016 EUROPEAN SOCIAL SURVEY ROTATING MODULE**

Abstract. *The article presents a meta-analysis of academic articles using the European Social Survey Climate Change module. It summarises the key individual and country-level factors that shape climate beliefs, behaviours, and policy support, aiming to mitigate the problem of the fragmentation of findings when informing policymakers. The results, depicted in a heuristic model, underscore the significance of awareness, trust, and socio-political contexts, illustrating the intricate interplay of climate change beliefs, emotional engagement and policy preferences. By consolidating the scattered research through a meta-analytical approach, the study efficiently identifies key obstacles encountered by European decision-makers while implementing climate mitigation measures and policies.*

Keywords: *climate change, climate action, climate policy, European social survey*

664**Introduction: The distinct role of comparative surveys
in informing policies**

Comparative social research is widely recognised as a core branch of empirical research in the social sciences, with some authors describing it as the “lifeblood” of these disciplines (Smith, 2011). One of the key data sources in comparative research are multi-purpose comparative surveys, specialized programmes that provide quantitative data for secondary analysts in various social science fields. Notable examples include the World Values Survey, the European Values Study, the International Social Survey Programme and the European Social Survey. According to Andreß et al. (2019), comparing tendencies between countries and following up within them would not be possible without the existence of these survey programmes.

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The epistemic advantage of comparative surveys is the added dimension of cross-national comparisons, which is important not only for academic research, but for public policy-making as well. Studies based on comparative surveys often employ macro-societal factors as explanatory variables, utilising multi-level modelling to explore cross-level interaction (Esser, 2017). They allow comparisons of the effects of alternative (policy) interventions in various institutional and societal contexts (Norris, 2009; Bryan and Jenkins, 2015), i.e., by studying the ways in which country contexts shape and condition the relationships between individual-level variables (Kroneberg, 2019). They offer the possibility to compare the outcomes of different policy solutions, examining macro-level structural elements otherwise difficult or impossible to manipulate. Cross-national surveys provide an ideal research format to assess policy effects. Some scholars have even postulated that country-level comparisons are the closest substitute for experimental research in the social sciences (Smelser, 1976).

Large quantitative surveys are usually publicly funded and costly exercises. As such, they face external and internal expectations to demonstrate both academic and societal relevance to funders, researchers and the public (Molas-Gallart, 2015; Benneworth, 2015; Martin, 2011). This may be interpreted as forming part of the ongoing 'accountability trend' where science is expected to contribute something in return to society and its public funds for research, i.e., to generate knowledge that benefits society as a whole, stimulate new approaches to social issues or inform public debate and policy-making (Penfield et al., 2014; Bornmann, 2012, Donovan, 2011). While publicly funded multi-purpose comparative surveys remain under academic control, governments expect general 'policy returns' from them (Hakim, 1982) and most researchers seem to respond to this expectation. A global study of research activity in modern universities conducted among 12,379 academics in 15 countries (Bentley et al., 2015) found that analysts overwhelmingly combine basic and applied research. According to the authors, this is not only linked to funding and university strategies but also, more significantly, to individual norms concerning academics' obligations where researchers have internalised the duty to generate returns to policy.

The aim of this article is to reassert these hybrid practices and capitalise on them by extracting policy-directed content from academic articles generated using the European Social Survey (ESS) 2016 Climate Change module, conducted in 23 countries (for details, see ESS ERIC 2018). The ESS, now a European Research Infrastructure Consortium, is an academically driven multi-purpose, cross-national survey that measures the attitudes, beliefs and behaviour patterns of diverse populations across Europe. In addition to producing scientific findings and promoting higher standards of rigour in cross-national research, its third main goal is to inform policies. As noted

by Kropp (2017), the biannual setup of ESS enables it to address pressing political issues more effectively and positions it closer to the policy area than other similar surveys. This orientation is reflected in ESS module selection procedures where policy relevance is one of the key criteria, as well as in thousands of academic ESS publications where policy-oriented content is present in 79% of the texts, especially those addressing welfare, climate change, immigration, and work-life balance. (Malnar, 2022: 27).

Research goals: Addressing the issue of the fragmentation of findings

Our study is motivated by the combination of the ESS' policy-friendly format and content, along with the significant efforts made by analysts to consistently generate 'policy returns'. The bibliographic database of European Social Survey academic publications is extensive, currently totalling nearly 10,000 units¹. In principle, this should provide a valuable policy resource, a trend also observed with other comparative survey programmes experiencing similar publication growth.

Paradoxically, the growing volume of academic publications has become a challenge for social science research. Many scholars are concerned that findings from the exponentially rising number of scientific articles are not adequately integrated into theory-building. Comparative research, although praised for establishing causality, is not exempt from this issue. Despite the vast number of articles being published, they often go unread as the focus is primarily on publish for the sake of publishing (Fernandez-Cano, 2020). Some point to overspecialisation due to which sociology has retreated into safe niches of fellow thinkers, with dense networks and their own journals (Turner, 2016). According to Blaikie, research practice has tended to become ritualised in the testing of isolated or trivial hypotheses (Blaikie, 2010) and, while variable-based quantitative comparative research is an inexhaustible source of causal propositions, this does not mean that these propositions form a theory in the sense of a logically connected system (Kroneberg, 2019). Similarly, Lagos believes the perverse effect of having so much individual data available is the production of the partial interpretation and atomisation of analysis, which may be delaying rather than accelerating the development of theory (Lagos, 2008).

According to these authors, multi-purpose comparative surveys are contributing to the problem of fragmented findings rather than serving as a solution for theory-building. This issue could pose legitimacy problems for research infrastructures in relation to funders and the public. In the case

¹ Accessible at <https://bibliography.europeansocialsurvey.org>.

of the ESS, the majority of its resources are allocated to data provision and methodological issues, with only a fraction dedicated to findings-related concerns (see ESS ERIC, 2022). Although the ESS requires questionnaire design teams to publish 'topline results,' offering comprehensive cross-data analysis from rotating modules for various audiences, these efforts do not address the problem of fragmented findings. The compiling and digesting of results continue to rely entirely on user communities. In our perspective, the lack of systematic efforts by research programmes to summarise findings based on their data might be the missing link in better connecting and accumulating knowledge from scattered publications within academic and policy communities. Our study aims to explore and demonstrate the benefits of a meta-analytical approach for offering 'general policy returns' in the context of widespread academic publishing, while focusing on climate change mitigation research.

Methodological approaches to summarising the outcomes of numerous studies can be broadly categorised into quantitative and qualitative ones. Among quantitative methods, the systematic review stands out, having gained prominence in medical research as a solution to information overload. A systematic review's specific objectives may include assessing the effectiveness of a policy, offering the policy-making context, identifying risk factors, guiding primary research in understudied areas etc. Another aim can be to review the theories, typologies, data or methods in a certain field (Petticrew and Roberts, 2006; Schlosser, 2006; Thomson, 2013; Harden, 2010). It is based on the entire relevant scientific literature, allowing for a comprehensive and unbiased review. This approach empowers research users, including researchers and decision-makers, to organise and prioritise information effectively.

Unlike medicine, research approaches in the social sciences lack standardisation, making a narrow systematic review nearly impossible. Instead, various non-systematic review methods are often employed. These methods do not yield a common final quantitative effect size estimate, such as a correlation coefficient between variables, but serve other purposes, such as summarising findings across different topic areas and acting as sources of ideas or information. One of the most commonly used non-systematic review formats is the scoping study, which investigates the scope, range and nature of findings in a given field, provides a summary, identifies gaps in primary research (Arksey and O'Malley, 2005: 21–22) and offers a synthetic narrative evaluation of the findings. The aim is to enable a new or higher level of interpretation and a deeper understanding of the phenomenon under investigation (Harden, 2010; Smit and Van Der Graaf, 2012).

This article is a scoping study that utilises all available ESS English-language articles based on the Climate Change module as its framework.

The focus on this topic is twofold. First, with the increasing frequency of extreme weather events, climate change mitigation has become a top priority on policy agendas. Still, it poses significant challenges for policymakers due to the substantial costs and necessary lifestyle changes involved. Interestingly, while the environment has been widely recognised as a policy 'grand challenge' for at least a decade or two, the ESS did not comprehensively include this topic until 2016. This was largely due to its bottom-up policy of module selection and strict evaluation procedures. However, after publication of the first dataset from the new module in 2017, academic publications quickly emerged, showing the steepest increase for any module to date (Malnar, 2021: 21). This suggests that the topic was highly anticipated and filled a significant gap in the ESS thematic landscape. The article aims to explore how a scoping study, focused on recent and 'compact' academic publications in terms of thematic focus and data source, can help overcome various policy implementation obstacles and obstacles to policy change (Šinko, 2014). The second reason is practical and pertains to the ESS' rich and systematic bibliographic resources. The ESS collects continuous and detailed information about its academic use to evaluate its impact, inform questionnaire design, and guide outreach and communications efforts. These resources enable scholars to robustly identify and access relevant publications based on the Climate Change module.

The specific research focus of our scoping study is to harvest knowledge and findings that would help address the key policy challenge faced by climate change mitigation policies: how to achieve the transition from climate change awareness and concern, which now seem widespread among the general public, to climate change mitigation behaviour and policy support, which are much less so. In other words, how to explain and address the fact that the considerable of public concern is not adequately reflected in actual behaviour and policy support.

After outlining our empirical sources (articles) and their analytically relevant attributes, the article proceeds to the results section, cataloguing individual- and country-level parameters associated with climate change attitudes, mitigation behaviour, and support for climate change policies, along with their essential interactions. The results section culminates in a descriptive meta-model outlining the conditions needed for climate change awareness to translate into action and policy support. The discussion section provides a narrative summary of relevant policy findings, drawing lessons and implications for policymaking, while noting some limitations of this research format. The conclusion briefly reflects on the future role of research infrastructures in light of the findings concerning fragmentation issues, suggesting they should consider taking a more active role in summarising academic knowledge.

Data and methods

The study is based on all available English-language articles utilising the ESS Climate Change module. The selection framework is the ESS official bibliographic database acquired through the Google Scholar search platform, covering the period 2004–2022. An ESS-based publication is defined as any academic publication in the English language with at least one ESS item used in primary analysis (Malnar, 2022). The publications were coded for various bibliographic variables, including the use of items from ESS modules, as established by reviewing publication texts obtained through open-access and university subscription-access schemes. While there was a total of 112 academic publications using items from the Climate Change module, including reports, book chapters, theses etc., we narrowed our study to journal articles (64) to ensure sufficient analytical quality, subject to the peer review process.

The Climate Change module was fielded in 2016 in 23 countries, and its first data file was issued by the ESS in 2017. This means that all publications are relatively recent, covering the period between 2018 and 2022: 2018 (2 articles), 2019 (8 articles), 2020 (20 articles), 2021 (16 articles) and 2022 (18 articles). The authorship structure follows typical publication patterns, with the majority of first authors coming from Western Europe (39) and Nordic Europe (22), while 8 articles were authored by researchers in Southern-Mediterranean and 8 in post-socialist Europe. This article does not address issues of regional bias in academic publishing, a well-researched phenomenon (e.g., Lundgren, 2015; Krause, 2016), albeit it should be considered since it may influence the content of publications in terms of focus and interpretation. The picture is more balanced in terms of country data use where all European regions are well represented. The average number of countries included was 18.9, there were 5 single country studies. With respect to academic domain, the majority of articles (37) was published in journals in the area of environment, energy and space, 8 in sociological journals, 7 in economic journals, 6 in political journals, 3 in psychological journals and 3 in other journals, which provides a variety of theoretical perspectives.

The 64 articles underwent content analysis using the scoping study review format (Arksey and O'Malley, 2005; Harden, 2010; Smit and Van Der Graaf, 2012), a qualitative analysis method that provides a synthetic narrative evaluation of the findings. Relevant content was identified, organised and summarised through a reviewing process guided by three research aspects: 1) major determinants of climate change attitudes, behaviour, and policy support; 2) key implications and recommendations for climate change policy; and 3) analytical limitations. The research results are presented through

a narrative synthesis and visually with a scheme depicting the key concepts and their associations. The aim is to enable a new or higher level of interpretation and a deeper understanding of the phenomenon under study.

Empirical results

Individual-level determinants

The first goal of the scoping study was to map key determinants of climate change attitudes, behaviour, and policy support. Overall, 15 analytical concepts or constructs were found to be influential for climate change behaviour and policy support, 12 of them on the individual-level and 3 on the country-level.

Beliefs about climate change. Beliefs are essential for predicting climate actions and policy support, serving as a necessary precondition. Accepting the fact that climate change is happening, is partly caused by humans, and brings negative impacts is crucial for individuals to engage in mitigation behaviour and support policies. The findings from the 64 articles generally indicate that this precondition is largely fulfilled as an overwhelming majority of the European population believes that climate change is happening. Scepticism about it ranged from 2.3% in Iceland to 16.5% in the Russian Federation (Poortinga et al., 2019). The public is more divided on the issue of the causes where a significant share of people attributes climate change equally to human influences (anthropogenic) and natural processes (Lübke, 2021a). People doubtful about anthropogenic climate change are more unlikely to feel responsibility and support costly policies (Levi et al., 2020), which creates a challenge. On the other hand, the perceived impacts of climate change were seen to be negative in all participating countries (Poortinga et al., 2019).

Worry and concern about climate change. Worry signals that an individual is actively and emotionally engaged with the topic of climate change and more likely to engage in climate action and support climate policies. Worry was found to be positively related to feelings of personal responsibility to reduce climate change which, in turn, is linked to climate policy support, as well as to personal climate mitigation behaviours (Bouman et al., 2020). The scope of worry was found to be associated with attribution beliefs, i.e., the more people believe that climate change is caused by human actions, and the more they believe that it has negative impacts, the more they worry about it (Verschoor et al., 2020). On the other hand, trend and attribution denial has the opposite effect and reduces 'eco-anxiety', particularly in regions and countries with higher levels of climate change exposure (Hadarics, 2020). Worry about climate change also appears to be rooted in

biospheric values, i.e., caring about nature and the environment (Bouman et al., 2020).

Human values. ESS-based studies repeatedly find that individuals who prioritise self-transcendence over self-enhancing values are less likely to have trend or attribution sceptical views, to have a stronger concern with climate change and engage more in energy-reducing behaviours (Poortinga et al., 2019), being oriented to endorsing or supporting collective benefits and the provision of public goods (Nezlek, 2022; Welsch, 2021). There is also a country-level effect with larger shares of post-materialists in affluent countries making these countries more climate conscious. One study found that in France, Germany and the United Kingdom self-transcendent values play a key role in driving preferences for solar energy (Pagliuca et al., 2022), albeit values are comparatively less effective in shaping support for increased fossil fuel taxes.

Socioeconomic attributes. Analysts consistently find that ecological concerns are driven by more privileged segments of society, specifically those with a tertiary education and higher economic status. Educated individuals tend to be more aware of climate change, recognise its human-induced origins, perceive it as a serious issue, exhibit more reported saving behaviour, and express greater support for relevant policies (Poortinga et al., 2019). The impact of income is less straightforward. ESS-based studies indicate that individuals with a higher income are more likely to invest in energy-efficient appliances but less likely to limit their energy use. In contrast, lower-income groups tend to limit energy use more, possibly due to the relatively higher economic benefits they derive from reduced energy consumption (Umit and Schaffer, 2020). Self-interest is one of the determining factors.

Demographic attributes. Analysts find that older respondents are more likely to hold trend or attribution sceptical views and lower levels of concern. For example, in Spain and Lithuania the youngest respondents are found to be the most aware, blame climate change on human activity most intensely, are the most concerned and the most willing to act (Foncubierta-Rodríguez et al., 2021; Vaznonienė, 2022). Nevertheless, the situation is complex. ESS-based studies indicate that millennials, raised in an individualistic culture and facing frustration due to precarious employment opportunities and the 2008 economic crisis, are less likely than other generations to feel responsible for reducing climate change (Gómez-Román et al., 2021; Georghiou et al., 2019). Surprisingly, the older Generation X was found to feel the most responsible. Another challenging group comprises vulnerable NEETs (not in education, employment or training) who experience social exclusion. Their unhappiness associated with the NEET condition mediates their willingness to adopt pro-environmental attitudes (Bonanomi and Luppi, 2020).

Gender was not identified as one of the strongest predictors of climate change concepts. Nevertheless, men across the 23 countries are more likely to hold trend and attribution sceptical beliefs and generally exhibit lower levels of concern about climate change compared to women (Poortinga et al., 2019). In the USA, this trend is particularly noticeable among politically conservative men, a phenomenon often referred to as the 'white male effect'. Analysts theorise that differences in socialisation, such as the motherhood mentality or a stronger ethic of care, might explain this disparity (Verachtert, 2022).

Social trust. A large number of ESS-based studies identified social trust as the key factor explaining the well-known concern-behaviour gap, i.e., the fact that respondents' environmental awareness is not adequately reflected in their actual behaviour. What they find is that pro-environmental behaviour is influenced not only by intrinsic motivation and external economic incentives, but also by how people perceive the likelihood of others' actions (Lübke, 2021). The concern-action relationship is stronger in high-trust countries, while in low-trust countries strong concern is paired with a low level of feeling personal responsibility and climate policy support (Bodor et al., 2020). Pro-environmental behaviour seems to depend on one's perception that a large number of people are willing to make an effort to help mitigate climate change and not take a 'free ride' while the costs are being paid by the global collective (Davidovic and Harring, 2020). People need to trust their fellow citizens and other actors to comply with policies and will only take on the costs for climate action if others do so as well. One study established that a tipping point must be reached for the social-norm effect to dominate the rational-choice, free-rider effect (Welsch, 2022). Once individuals believe that a large enough percentage of the population is engaging in mitigation behaviour, they are subject to conformity bias and switch from free-rider to mitigation behaviour, which is perceived as a social norm. In this way, a group with a pro-environmental orientation will continuously incentivise each other to act in ways that reduce energy consumption, such as the well-known trend of imitation in purchasing solar panels (Caferra et al., 2021). However, ESS-based studies show that most people structurally underestimate the willingness of others to contribute, i.e., doubt that many other people will limit their energy use to help mitigate climate change (Bouman and Steg, 2019; Lübke, 2021). This high level of distrust in others' pro-environmental behaviour contrasts with the generally high level of self-reported energy conservation behaviour.

Perceptions of responsibility, efficacy and outcome expectancy. ESS-based studies find that a sense of personal responsibility to reduce climate change is essential for translating worry into energy-saving behaviour. Climate concern is a necessary, yet insufficient condition for climate responsibility,

which can be a combination of factors such as personal beliefs and social pressures (Pohjolainen et al., 2021). The feeling of personal responsibility, or lack thereof, is also the most important condition for predicting both opposition to carbon taxes and attitudes to other climate policies (Levi, 2021).

Nonetheless, worry and personal responsibility may not be sufficient for people to engage in energy-saving behaviours. Another factor are perceptions of self-efficacy (the belief that one is able to use less energy) and personal outcome expectancy (the belief that limiting one's own energy use will help reduce climate change; Dirksmeier and Tuitjer, 2022). Efficacy beliefs have been identified as a core psychological component that influences climate change engagement (Choi and Hart, 2021). Yet studies find that while people's belief in their ability to limit their own energy use is high, their positive outcome expectancy is low, i.e., most were pessimistic about how much difference their individual actions make. The situation is the opposite for the societal level. While perceptions of collective efficacy are low, perceptions of collective outcome expectancy are high. That is, although respondents believe that collective action by large numbers of people would successfully reduce climate change (Žigienė et al., 2021), they do not believe this is likely to happen. People's motivation to limit energy use is therefore diminished by the low expected effect of their personal actions and lack of belief in the collective action, an issue closely related to social trust. Efficacy beliefs thus modify the effect of worry about climate change in shaping behavioural responses. Worrying translates into energy saving behaviour more for those with high levels of personal and collective outcome expectancy (ibid.).

Political position, ideology. In line with previous research, ESS-based studies find that political orientation alters the relationship between climate change beliefs and worry. Believing that climate change is caused by humans and will have a negative impact across the world is a more potent source of worry for left-leaning than right-leaning individuals (Gregersen et al., 2020). Not only Populist-Right but also mainstream Conservative party-family voters are less worried about climate change and less in favour of higher fossil fuel taxation. Political ideology also modifies the effects of education. For those on the political left, education is related to pro-climate change beliefs and support for climate change policy, whereas for those on the political right, these effects are weak or negative (Czarnek et al., 2020). The exception is post-communist Europe where the left-right ideological divide is understood differently. For example, a study finds that attitudes to fossil fuel taxation are relatively independent from the left-right political orientation in many of these countries (Sivonen, 2020). In these countries, climate change attitudes did not become as entrenched within the party

system as in the West (Fisher et al., 2022), with the exception of the Czech Republic (Čermák and Potančoková, 2020).

The effect of left-right ideological positioning in (Western) Europe (and even more so in the USA) is due to the fact that climate change attitudes are part of a wider cluster of political orientations and affiliations. During the second half of the twentieth century, parties on the left reoriented to include environmentalism as well as other “new politics” issues (ibid.). In contrast, studies find the congruence of anti-immigrant and anti-ecological attitudes in extreme populist right voters. ESS-based studies confirm these congruencies. There is an association between attitudes to refugees and attitudes to the environment across 20 European countries, with pro-environmental party voters being more positive regarding immigrants and refugees (Puskarova and Dancakova, 2018; Ilmarinen et al., 2020; Parsons, 2021). Next, people who hold attitudes consistent with a nationalist ideology are generally more likely to be sceptical about climate change and oppose policies that increase taxes on fossil fuels (Kulin et al., 2022). Nationalism prioritises national interests over supra-national agendas and the transfer of some national competences to the supranational level may make climate action less appealing to communitarian Europeans (Weko, 2021). Analysts also find synergy between attitudes to redistribution and environmental attitudes. Support for reducing income differences was positively connected to supporting all three climate policy instruments (Sivonen and Koivula, 2020a).

Spatial placement, urban-rural residence. Studies reveal that climate change scepticism and concern exhibit urban-rural differences. Living in a country village is associated with greater climate scepticism and lower concern compared to living in a big city (Weckroth and Ala-Mantila, 2022) and individuals in small towns and rural areas are also more likely to oppose climate change measures (Arndt et al., 2022). Analysts maintain that for people who live in rural areas the economic cost of energy-based taxes is likely to be higher, and thus the self-interest is one of the determining factors. Poorer regions are generally more sceptical of climate change measures and more likely to be rural. Another aspect is that carbon-intensive industries, especially coal mining and coal-based power generation, are often concentrated in a few regions and decarbonisation actions will affect those regions especially strongly (Yazar et al., 2022). The second explanation is ideological and refers to anti-establishment attitudes in more peripheral and declining regions. In the light of intergroup conflict or the core-periphery thesis, the opposition is between progressive, egalitarian, metropolitan wealthy middle classes concerned about climate change, and the ‘left behind’ low-income individuals residing in poorer regions, the ‘losers’ of globalisation (Arndt et al., 2022). The latter have no incentive to support policies that hurt

them financially. This is the basis for new political alliances where populist right-wing parties increasingly align with the periphery and the countryside and green parties with the metropolitan centres.

(Social) media and Internet use. Previous studies indicate that climate change perceptions interact with how climate change is portrayed in the news, which is today increasingly accessed via social media platforms. Media representations can affect both climate change perceptions and perceived efficacy. On the individual level, an ESS-based study found that daily Internet use as well as the amount of time spent online correlate negatively with perceived climate change efficacy particularly in Germany, Finland, the UK, the Netherlands and France (Tuitjer and Dirksmeier, 2021). On the national level, Facebook usage negatively correlates with perceived climate change efficacy.

Extreme weather exposure. Analysts maintain that individuals use first-hand weather experience to form climate opinions, although this could depend or be modified by news exposure as media enable those experiences to be viewed in light of the climate change issue (Damsbo-Svendsen, 2020). One ESS-based study found that when objective temperatures increase, climate opinions are strengthened, comparable to the effect of a full step to the left on a 0-10 political ideology scale. Another found that a significantly bigger share of support for the tax-and-subsidy policy is present when interviews are conducted during the hottest months (seasonal effect), suggesting that consensus on decisions about climate change policies is stronger in the hottest months (Becchetti and Conzo, 2022). Findings suggest that extreme weather experiences 'automatically' foster some level of support for pro-mitigation attitudes, but it is only an extremely warm climate that increases the awareness and focus on climate change and not the increase or decrease in temperature in colder months.

Political trust. The last individual-level determinant is political trust, a 'heavy weight' predictor for explaining attitudes to carbon taxes. For economists, carbon taxes are the most effective means for discouraging carbon consumption, yet they encounter strong public opposition. For example, researchers highlight instances like Australians voting out a government that had introduced a carbon tax, and in France, large protests by the 'gilets jaunes' led the government to cancel a proposed increase in fuel taxes (Otto and Gugushvili, 2020). ESS-based studies consistently demonstrate that attitudes to carbon and other environmental taxes are shaped not only by people's beliefs and concerns about the issues these taxes address, but also by their trust in their country's politicians and political system. Positive expectations lead individuals who trust their government and institutions to be more cooperative and willing to accept risks or sacrifices (Fairbrother et al., 2019). Analysts find that on aggregate nations most supportive of higher

taxes on fossil fuels are not those that are more aware and concerned about climate change, but those with the highest levels of political trust. Support for carbon taxation is highest in Sweden, which is unremarkable in terms of beliefs about the dangers of anthropogenic climate change. On the other hand, climate concern is exceptionally high in Spain where support for new carbon taxes is very low. People who worry about climate change are substantially more likely to support climate policies if they live in a society with high political trust, while in countries with low levels of political trust, being aware and concerned about the climate is at most weakly associated with support for taxes on fossil fuels (Kulin and Sevä, 2020). In countries with more corruption, any money people pay in as public revenues could be stolen, be spent in wasteful ways, or disappear through corruption. Studies also find that while political trust strongly predicts carbon tax opposition, it does not (so much) affect attitudes to subsidies and bans (Davidovic and Harring, 2020).

Country-level determinants

As noted in the introduction, manipulating country-level determinants of climate change variables is a specific advantage of comparative research. ESS-based studies identified three key country-level factors:

Democratic legacy and quality of governance significantly influence climate change concerns, with lower levels observed in Eastern Europe than in the West. One explanation is the persistence of “sticky” values from the communist era (Sivonen, 2020), shaping citizens’ political perspectives differently from other regions. Post-materialist values, common in advanced industrial societies, are less prevalent in post-communist societies (Marquart-Pyatt et al., 2019). In addition, the political and economic uncertainties following the collapse of communist regimes have left citizens in former socialist states (FSS) with mixed reactions, struggling to prioritise environmental protection over personal economic security, reflecting a cultural lag in their attitudes (Poortinga et al., 2019).

The second explanation is the increased level of policy performance risk in FSS countries, i.e., the heightened probability that a given policy initiative will underperform or fail. This relates to the concept of government quality, encompassing bureaucratic effectiveness, the rule of law, and absence of corruption (Davidovic and Harring, 2020), influencing political trust. Perceptions that the state can deliver on its promises increase tolerance of taxation, while scepticism about the state’s ability to carry out policies effectively erodes the willingness for sacrifices. As policy performance risk rises, the positive relationship between concern and policy support weakens, potentially the case in former socialist nations. Moreover, FSS countries

heavily rely on fossil fuels and the jobs the fossil fuel industry produces, potentially increasing the size and complexity of policy programmes, opening up further opportunities for mistakes and, potentially, corruption. In high-policy-risk contexts, concern about climate change becomes a poor predictor of policy preferences (Campbell, 2022). The quality of government nevertheless does not affect support for subsidies and bans, most likely because these two policies involve much less risk in terms of cost and regulations. ESS-based studies show that higher levels of national affluence, typically measured as gross domestic product per capita, strengthen the link between perceived climate responsibility and climate policy support (Pohjolainen et al., 2021), which makes national affluence another explanation for FSS specifics. Namely, economic development may itself be a condition for lowering policy risk.

Welfare and tax regime. Welfare regime is another institutional factor closely linked to political and social trust, especially relevant for the legitimacy of high-cost policy instruments such as taxation (Sivonen and Kukkonen, 2021; Otto and Gugushvili (2020).

The principle of universality and relatively impartial and objective policy instruments, such as taxation, may partly explain why people trust comprehensive welfare states more. Attitudes in countries with social-democratic and conservative welfare regimes are the most supportive of sustainable welfare and eco-social policies, contrasting with attitudes in liberal countries like the UK and Ireland, as well as Eastern European countries. ESS-based studies show that welfare regime type strongly influences taxation attitudes rather than attitudes to subsidising or banning. Support for higher fossil fuel taxes was notably high in Nordic regimes (ibid.). This supports the idea that taxation is not simply about tax payments but also about the distribution of tax revenues. People in more universal and generous welfare states may perceive they get better value for their tax revenues.

Existing energy policies and energy sources. According to the policy feedback perspective, the current domestic energy context and policies shape the possibilities and preferences for future policies among citizens (Stadelmann-Steffen and Eder, 2020). Research indicates that in countries with a substantial share of renewable energy individuals accepting anthropogenic climate change are more inclined to support policies promoting renewable energy. On the contrary, in countries heavily reliant on fossil fuels (such as Hungary, Lithuania, Israel, Russia), there is a stronger preference for fossil energy, leading to a rejection of climate policies (Fritz and Koch, 2019). Transitioning away from fossil fuels would entail substantial costs, making it challenging to implement such policies. Policies consequently hold the potential to transform both structural factors and the attitudes and behaviours of specific groups or entire populations. Notably,

individuals with strong climate change attitudes and high levels of political trust experience positive feedback effects, where the existing energy policy context reinforces their preferences for policies aligned with this context. Still, this feedback mechanism also has its downsides. In countries where the fossil energy sector remains a significant economic factor, even individuals sensitised to climate issues are more reluctant to accept taxes on fossil fuels compared to their counterparts in other countries (Stadelmann-Steffen and Eder, 2020). Further, a country's dependency on fossil fuels may alter the relationship between political ideology and attitudes to fossil fuel taxation (Sivonen, 2020).

The awareness to action model

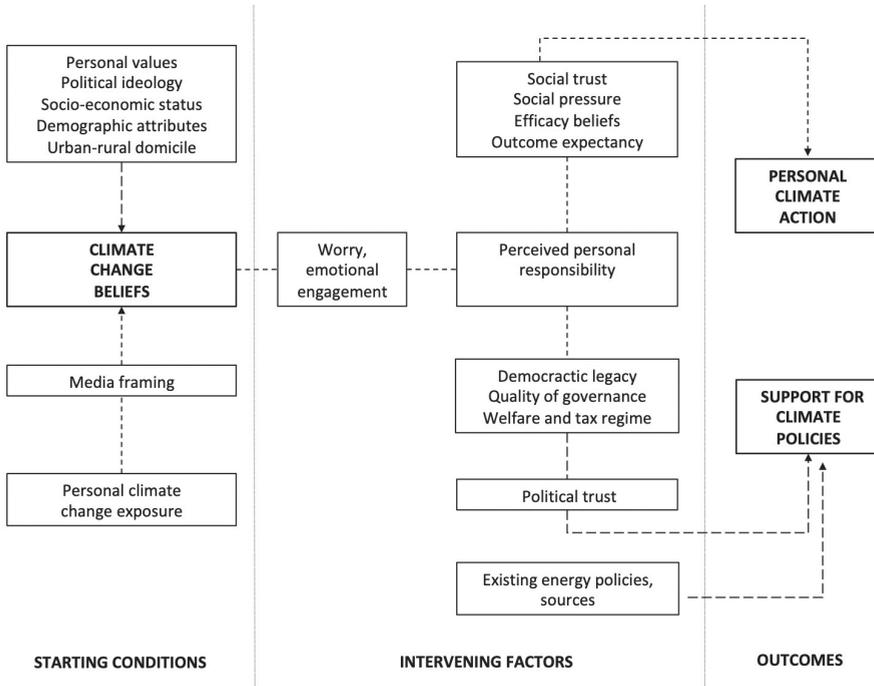
Based on the mapping of key determinants of climate change attitudes, behaviour and policy support in the 64 academic articles, we developed a heuristic conceptual model illustrating the complex relationship between climate change awareness and climate action or policy support (Figure 1). The model comprises three main components: starting conditions, intervening factors, and outcomes.

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The focus of the left panel is on the generation of climate change attitudes and the factors that determine the essential starting condition: climate change beliefs. Believing that climate change is occurring, is human-caused, and has negative consequences is a necessary precondition for action. According to our scoping study, awareness is influenced by a range of moral, political, socio-economic, socio-demographic and climate-related factors.

The middle panel presents intervening factors that need to align for climate change awareness to translate into mitigation behaviour and policy support, which are our key outcomes concerning the research question. Guided by our scoping study, the model illustrates that awareness first needs to be coupled with emotional engagement (worry) and then with the sense of personal responsibility. Once these factors are established, additional conditions come into play, depending on the type of outcome. For worry to successfully translate into personal climate action, high social trust and strong efficacy and outcome expectancy beliefs are necessary. When it comes to translating worry into climate policy support, high political trust is crucial. Political trust, in turn, is influenced by various country-level conditions, including democratic legacy, characteristics of the welfare system, and the quality of governance. In addition, a policy feedback loop and low dependency on fossil fuels play separate roles in this process.

Figure 1: HEURISTIC CONCEPTUAL MODEL OF THE LINK BETWEEN CLIMATE CHANGE AWARENESS, CLIMATE ACTION AND POLICY SUPPORT



Source: author's compilation.

The presented model is a condensed version, simplifying the relationships as awareness determinants often also directly influence worry and responsibility. Further, the policy side of the model is more strongly aligned with fossil fuel taxation measures and less so for subsidies and bans. Despite these simplifications, the aim was to depict the relationships in the clearest way possible, even if some details were lost in the process.

Discussion: Lessons and implications for policymaking

In our discussion, we aim to focus on the second goal of our scoping study: to chart and summarise key implications and recommendations for climate change policy. Climate change, as noted, is one of the ESS topics with the strongest policy-oriented content in its publications. We follow our heuristic model to summarise the policy advice provided by analysts based on their results. The main challenge addressed in this discussion is how to achieve the desired outcomes of climate change mitigation behaviour and policy support.

First, the findings emphasise the crucial role of awareness and concern as prerequisites for action. Renewable energy policies frequently struggle to engage social groups less sensitised to climate change (Stadelmann-Steffen and Eder, 2020). Analysts recommend that governments persist in informing the public about the risks linked to the ongoing global warming and its potential consequences. They should develop climate change awareness policies and programmes that are accessible to all segments of the population (Roberts, 2022). Effective communication efforts are best initiated by individuals or groups with whom many people can identify (Bouman and Steg, 2019). Increased awareness can be facilitated by promoting online media literacy, enabling individuals to better assess the credibility of media sources (Tuitjer and Dirksmeier, 2021). Analysts also highlight the seasonal effect and recommend focusing on environmental policy decisions during the hotter months. High summer temperatures are more likely to lead to extreme weather events and greater media coverage about climate change, making public opinion more sensitive to these issues (Becchetti and Conzo, 2022). In addition to informing people on climate change, it seems critical to encourage them to take personal responsibility in order to increase climate policy support and action (Pohjolainen et al., 2021).

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A significant portion of policy analysis examines climate change measures in relation to social inequalities and well-being, identifying this link as one of the key policy challenges. Many policies that are environmentally sound, such as imposing heavy taxes on fossil fuels, disproportionately impact the poor and may introduce a new ecological dimension to existing social conflicts (Otto and Gugushvili, 2020; Mayer and Smith, 2019). The fear of rising costs is likely to reduce support for increasing energy taxation, especially among people who do not consider climate change a major risk, and among lower income groups (Sivonen and Koivula, 2020). The suggested solution is to develop welfare policies along with climate policies to facilitate a “just transition” to a sustainable energy model (Weko, 2021). Environmental policies need to be aligned with social as well as regional policies, for example, establishing progressive tax and subsidy schemes. On the European level, mechanisms like the Just Transitions Fund could help level out differences between countries given that the lower average support in Eastern Europe is also linked to economic development.

Analysts also suggest policy diversification because policies based on efficient measures hold greater potential to be successful among higher-income groups, while lower-income individuals are more likely to save energy (Umit et al., 2019). They also recommend framing diversification to overcome public scepticism across countries. For instance, in affluent countries, key environmental messages should emphasise the lower cost of climate change consequences if necessary measures are taken sooner,

whereas in countries with a higher incidence of poverty the key message should focus on the fact that impoverished people are more likely to bear the brunt of environmental degradation (Otto and Gugushvili, 2020). Studies also suggest that resistance to climate policies is likely to be concentrated in specific local communities, the potential 'losers' of these processes (Arndt et al., 2022).

Highlighting the role of social and political trust is another prominent topic in informing policymakers since trust in both institutions and peers improves pro-social behaviour, in this case leading to more responsible energy consumption (Caferra et al., 2021a). Analysts suggest that in order to improve their effectiveness, environmental policies must be shaped by thinking on the group rather than the individual level, i.e., be perceived as a social dilemma situation (Lübke, 2021). Policy should promote the 'desirable norm', sanction free-rider behaviour, and reward cooperation in individuals and organisations. For instance, legislators should push companies toward the adoption of environmental practices, even if they are seen as economically detrimental, to bring about system-wide changes (Rintala et al., 2021). Decision makers should strive to increase trust in others' cooperative efforts, highlight the prevalence of virtuous behaviour among peers, and enhance individuals' beliefs in their own capabilities and the effectiveness of their actions (Choi & Hart, 2021). In addition, policies should work on enhancing belief in the effectiveness of collective actions. Analysts point out that in low-trust contexts policies which heavily depend on trust, such as fossil fuel taxes, can pose an inextricable challenge (Kulin and Sevä, 2020). They also warn that increased efforts to raise people's awareness about the reality and dangers of climate change are likely to have little impact on people's support for carbon taxes, which strongly depends on political trust (Fairbrother et al., 2019). They suggest increasing political trust by reducing policy performance risk through the increased transparency of public administrations, enabling people to have a clear understanding of how their money is being managed (Caferra et al., 2021). More specific suggestions include sharing critical information regarding the effectiveness of carbon taxes or earmarking revenues for green spending (Pohjolainen et al., 2021) and implementing a highly visible revenue recycling mechanism, such as direct transfer schemes (Levi, 2021). Others suggest shifting the policy focus from carbon taxation to subsidies on renewable energy given that these policies are associated less with trust in political institutions and more with trust in impartial institutions, such as the legal system and the police, which is considerably higher (Kulin and Sevä, 2020). They also do not directly affect the affordability of energy, making them less costly for individuals.

Another set of recommendations concerns political and ideological divisions. Some suggest that climate policy could benefit from framing carbon

taxes in ways that do not resonate with ideological orientations, by avoiding the term “tax” and instead using “carbon fee and dividend”, “pollution reduction scheme” or “climate contribution”, which could meet with less public opposition (Levi, 2021). Others suggest the opposite, proposing that policies should target various political groups in a way that appeals to them. For example, targeting individuals with a right-leaning political orientation in a manner that appeals to communitarian priorities rather than global framings, emphasising in-group benefits and focusing on the possible economic or local consequences of climate change (Gregersen et al., 2020).

The final set of recommendations relates to the role existing policies play in shaping public preferences for energy sources. The good news for policymakers is that renewable energy policies have the potential to reinforce themselves (Stadelmann-Steffen and Eder, 2020) through the policy feedback loop. However, this is also true for carbon-based policies and carbon prices, which are less frequently implemented in countries that rely on a high proportion of fossil fuels to generate electricity. Analysts therefore caution that the feedback mechanism involves a risk of greater polarisation as both types of energy policies reinforce themselves. Studies focusing on energy security perceptions also caution that individuals who are more worried about energy supply interruptions may hold stronger preferences for energy sources that are programmable, such as fossil fuels and hydroelectric power, as opposed to wind and solar power, which are intermittent (Casamassima et al., 2022; Demski et al., 2018).

Analysts also place their findings within an epistemic and methodological context by discussing the study’s limitations, which was the final goal of the review. While consistently acknowledging the quality of ESS data, analysts warn that the module was fielded in a relatively small number of countries ($n = 23$), and those countries tend to be relatively affluent (Poortinga et al., 2019). It would be advantageous to include a more geographically, economically and culturally diverse set of countries, ideally encompassing lower-income countries outside of Europe, since attitudes and their determinants there could differ from those in the ESS dataset. Several analysts also point out the module’s limited thematic scope, such as the absence of more detailed survey data about individual Internet use and online practices (Tuitjer and Dirksmeier, 2021). To address the geographical and conceptual limitations, they recommend conducting more in-depth case studies to identify unique patterns within countries and exploring the role of other contextual factors, such as media influence, climate vulnerability and socio-political histories in greater detail (Smith and Hempel, 2022). In addition to this key epistemic criticism, which to some extent relativises the findings of the 64 articles, analysts mention specific methodological issues. These include the cross-sectional nature of the data, limiting the establishment of

causal associations (Lübke, 2021; Welsch, 2020; Levi et al., 2020; Kácha et al., 2022), the use of single-item measures (Gregersen et al., 2021; Ilmarinen et al., 2020), potential social desirability bias due to self-reported items (Gómez-Román et al., 2021; Syropoulos and Markowitz, 2022) along with concerns about low construct reliability and the low percentage of explained variance (Ilmarinen et al., 2020).

To summarise, analysts emphasise the significant challenges and ‘obstacles’ faced by policymakers while implementing climate change mitigation policies and promoting desired behaviours in European countries. When providing recommendations, analysts mostly offer general strategies rather than specific solutions. A more focused policy evaluation effort is called for in the next steps to effectively implement these recommendations.

Conclusion

Our objective was to conduct a comprehensive summary of findings from the ESS Climate Change module to identify general policy implications that social science research can contribute and address the challenge of fragmented findings. We aimed to illustrate how a meta-analysis of results can offer a more efficient method for communicating insights from multiple studies to diverse audiences by identifying the common determinants of climate beliefs, behaviours, and policy support, along with their main associations. The heuristic meta-model derived from our scoping study highlights essential risk factors that policymakers encounter while implementing climate goals. The scoping study also offers an overview of different scenarios suggested by analysts to help decision-makers address public opposition to climate policies.

Similar exercises could be conducted for ESS topics such as immigration, welfare or family work, all of which are highly policy-oriented. Considering the benefits of summarising findings, a critical point for future discussion is whether survey research infrastructures like ESS ERIC and similar programmes should continue to leave the task of summarisation solely to academic endeavours or gradually expand their operations to provide resources that encourage the summarising of findings. This dilemma, which might pose legitimacy issues for research infrastructures concerning funders and the public, is relevant for survey management teams, funders, and science policymakers alike.

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