

**Exploring the role of emissions-economy trade-offs in climate policy support:  
Comparative survey evidence from the United Kingdom and Australia**

By

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## **Supervisory Committee**

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## **Abstract**

Countries vary in their success in decoupling greenhouse gas emissions from economic growth to meet emissions reduction targets. Using a web-based survey of citizens in the United Kingdom (n = 1,009) and Australia (n = 1,029), with different decoupling rates, this study assesses levels of citizen support for different types of climate policies, beliefs in trade-offs between emissions reduction and economic growth, and associations between these emissions-economy trade-off beliefs and support for climate policies. The results show compulsory policies, including carbon taxes and bans, receive the highest opposition. There is little variation between the studied countries for climate policy support and emissions-economy trade-off beliefs. The results also show that citizens who are agnostic about economic growth support policies the most. Therefore, decision-makers should focus on communicating climate policies' economic and social benefits for the economic growth-concerned citizens to increase overall policy support.

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## Chapter 1: Introduction

Political leaders are more likely to implement climate policies that receive citizen support or low opposition (Burstein, 2003). Compulsory policies such as carbon pricing and regulations tend to invoke lower support than non-binding voluntary policies, including education, subsidies, and government investments (Rhodes et al., 2017). Citizen opposition to carbon pricing is especially high due to its cost visibility, known as ‘tax salience’ (Fairbrother, 2022; Carattini et al., 2019; Drews & Van Den Bergh, 2016a; Rhodes et al., 2017). Carbon pricing and regulations are also often criticized for their perceived distributional inequities and potential ‘damage’ to the economy, often framed via job-killing and industrial competitiveness reduction arguments (Carattini et al., 2018; Vona, 2019; Casey, 2022). Such arguments typically ignore economic gains in the renewable energy sector that offset jobs lost in the fossil fuel sector in the low-carbon economy transition (Pai et al., 2021). For these and other reasons, very few jurisdictions have been able to implement carbon pricing at stringent enough levels to effectively mitigate greenhouse gas emissions.

Literature suggests that citizens who believe climate policy adversely affects the economy and employment show lower support for it, demonstrating the importance of an economic trade-off perception in climate policy implementation (Drews & Van Den Bergh, 2016a). However, the association between economic trade-off perception and climate policy support is not studied for different policy types and is often reduced to an aggregated trade-off between protecting the environment as a whole (rather than addressing climate change specifically) and growing the economy.

Empirical evidence suggests that countries differ in addressing the climate-economy trade-off in real-life policy-making. In this regard, the United Kingdom (UK) and Australia represent contrasting case studies, with the former being known for successful policy implementation and the latter for climate policy failures. Both the UK and Australia have grown their economies since the 2015 climate agreement in Paris by 10.2% and 16.3% respectively (World Bank 2024a, 2024b). However, the UK has been able to decouple emissions from economic growth better than Australia, with annual greenhouse gas (GHG) emissions decreasing by 18.4% in the UK and 3.3% in Australia (Climate Action Tracker, 2023a, 2023b). Notable UK climate policies include an emissions trading scheme, a carbon levy on petrol and diesel, a carbon price floor to phase out coal, and a zero-emission vehicle sales mandate (UK Government, 2023a, 2023b, 2018, 2023c; Gransauil et al., 2023). Public opinion studies suggest that UK citizens broadly support most climate policies (Ipsos, 2022), though carbon pricing sees the lowest support (Committee on Climate Change, 2019). Additionally, the UK ranked eighth worldwide for the largest government budget for low-carbon and renewable energy technologies in the last decade (Cambridge Industrial Innovation Policy, 2022). In contrast to the UK, Australia has tried to implement a carbon tax but failed in 2014 due to strong citizen opposition (Taylor, 2014). Australia currently relies on a carbon credit trading scheme as the primary climate policy tool, but it has been ineffective in reducing emissions because of a lack of mandatory emissions targets (Crowley, 2021; Morton, 2022). Overall, the UK’s case may indicate that the emission reduction and economic growth trade-offs can be minimal.

Citizen preferences for economic growth and emissions trends can be represented through beliefs in various pathways for economic development. Studies by Drews and Van Den Bergh (2016b), Drews et al. (2019), Tomaselli et al. (2019), and Van Den Bergh (2018) have

identified citizen beliefs in four different economic growth paradigms, including green growth, degrowth, agrowth, and growth-at-all-costs. Green growth suggests that emissions could be reduced while growing the economy (also known as decoupling), whereas degrowth claims economies must shrink to substantively reduce emissions (Drews and Van Den Bergh, 2016b). Agrowth compromises between green growth and degrowth by placing economic growth as secondary to achieving other societal goals (Van Den Bergh, 2018). Finally, growth-at-all-costs advocates for unconditional economic growth without environmental considerations. While existing studies have categorized citizens according to the four paradigms, no research has assessed whether beliefs in these growth paradigms are associated with climate policy support. This study addresses the gap by assessing associations between citizen emissions-economy trade-off beliefs expressed through growth paradigms with support for various compulsory and voluntary climate policies, in the UK and Australia, two countries with contrasting decoupling rates.

Using a web-based citizen survey in the UK and Australia ( $n = 2,038$ ), this research objectives are to assess: (1) levels of citizen support for different types of climate policies in the UK and Australia, (2) perceptions of emissions-economy trade-offs in the UK and Australia, and (3) associations between beliefs in emissions-economy trade-off and beliefs in past and future emissions and economic changes with climate policy support.

The study is organized as follows. Section 2 reviews the literature on citizen opinion about emissions-economy trade-offs and the cases of climate policy-making in the UK and Australia. Section 3 explains theoretical frameworks guiding the study design and introduces the key independent variables. Section 4 explains the methodology. Section 5 discusses results. Section 6 concludes with the study's limitations and policy implications.

## Chapter 2: Literature review

### 2.1. Climate policy types

The majority of the global population believes that climate change is an emergency, with 81% of UK citizens and 72% of Australian citizens sharing this view (Oxford University, 2021). Yet the UK has been much more successful at reducing emissions than Australia. Research explains that the choice of a policy instrument plays a substantial role in addressing a policy problem (Bardach & Patashnik, 2019). Climate policy instruments, in particular, are generally categorized into voluntary and compulsory types. Jaccard (2020) describes voluntary policies as optional with no consequence for inaction, whereas compulsory policies offer much less flexibility and include consequences for non-compliance. Voluntary policies include information, such as energy efficiency labels, and financial incentives, also called subsidies and rebates, that aim to influence behaviour with little to no accountability. Compulsory policies, on the other hand, include command-and-control regulations that require specific action (e.g., banning gas boilers in new buildings and energy efficiency regulations) and financial disincentives such as carbon taxes (Jaccard, 2020). Economists often prefer carbon taxes because they work by reducing fossil fuel demand and are efficient because they allow citizens and industries to choose the cheapest way to reduce emissions (Chetty et al., 2009). Climate policies can also combine features of prescriptive regulations with flexibility of financial incentives, known as ‘flexible regulations’ (Rhodes et al., 2021). Examples of flexible regulations include the zero-emission vehicle (ZEV) mandate, cleaner electricity regulations, and low carbon fuel standards, where each policy has mandatory performance standards but offers flexibility through tradable permits and freedom in choosing a compliance pathway (e.g., technology or fuel).

Higher climate policy compulsoriness typically translates into higher policy effectiveness at reducing GHG emissions. In fact, international climate policy experts call for introducing more compulsory rules in all sectors of the economy (Hale et al., 2024). But the relationship between policy effectiveness and political acceptability tends to be inverse for some policies (Rhodes et al., 2017). As such, voluntary policies are less effective at reducing emissions due to their non-prescriptive nature (Valkengoed & Werff, 2022; Jaccard, 2006) but see higher support, while compulsory policies are more effective at rapid emissions reductions (Baranzini, et al., 2017) but face greater opposition (Fairbrother, 2022; Rhodes, 2017; Kallbekken, 2023; Dechezlepretre et al., 2022). While many individual interest groups can affect climate policy implementation, this study focuses on one key component of political acceptability, citizen support (Schaffer et al., 2021).

Rhodes et al. (2014, 2017), Odland et al. (2023), Kitt et al. (2021), and Long et al. (2020) are among a few studies that measure citizen support for different types of climate policies. Their results consistently show that carbon taxation has the lowest support, followed by command-and-control regulations such as limits on fossil fuel technology and emissions caps. Voluntary policies, such as subsidies, education, and government investment, receive the highest support from citizens, followed by flexible regulations. The observed differences may be explained by psychological reactance and loss aversion. According to behavioural scientists (Steindl et al., 2015), psychological reactance is where people generally dislike being told what to do or having their freedoms limited, while loss aversion describes how people value losses, such as immediate carbon tax payments or limited conventional technology choices, much greater than otherwise equivalent gains (Kahneman & Tversky, 1979) such as carbon tax rebates or reduced gas bills,

making compulsory policies seem costly and voluntary policies cheap (Carantini et al., 2018; Vona, 2019; Casey, 2022).

The carbon tax has additional drivers of opposition, including high salience and citizens' low trust in government spending. Chetty et al. (2009) suggest that high taxation salience leads to lower public support. As a result, carbon taxes tend to attract negative media attention and generate public outcry. Fairbrother (2022) explains that support for the carbon tax can decrease if citizens believe the revenue generated is being misappropriated or if they believe politicians are being dishonest about the benefits of the carbon tax for emission reductions.

One of the most understudied reasons for lower support for compulsory policies is deliberate stigmatization expressed via climate delay techniques in the public discourse (Lamb et al., 2020). A common delay technique by stakeholder groups vested in fossil fuels perpetuate the 'job-killing' argument, suggesting that compulsory policies will hurt workers in the fossil fuel sector and make trade-exposed sectors less competitive (Vona, 2019). Although jobs are projected to decrease in the fossil fuel sector under stringent climate policy, the argument dismisses job gains and economic growth opportunities in the renewable energy sector as countries shift their energy production methods to meet climate targets (Pai et al., 2021). Further, many climate policies have provisions to protect the competitiveness of trade-exposed sectors such as cement and steel by applying output-based pricing systems that cover only a portion of carbon emissions above certain levels of emissions intensity of their production (Good, 2018; Arjmand et al., 2024). Such trade-off thinking highlights that citizen beliefs in policy effectiveness versus policy impacts on jobs and the associated economic growth might explain opposition to compulsory climate policy needed to rapidly decrease emissions. Yet, existing research does not explicitly investigate the emissions-economy trade-offs via empirical survey evidence—a gap this study aims to address.

## **2.2. Citizen beliefs in emissions-economy trade-offs**

### **2.2.1. Emissions-economy growth paradigms**

The perceived trade-offs between emissions reductions and economic growth are explored in literature via citizen support for different economic paradigms associated with emissions reductions. Previous research by Drews and Van Den Bergh (2016b), Drews et al. (2019), Tomaselli et al. (2019), and Van Den Bergh (2018) investigated public opinions on the compatibility of economic growth and the environment in general. These studies classified citizens into previously identified beliefs for economic growth paradigms. Based on their findings, this study tests beliefs in four paradigms concerning the co-existence of emissions reductions and economic growth, including beliefs in *decoupling* (a component of *green growth*, as named in past literature), *degrowth*, *agrowth*, and *growth-at-all-costs*.

The *green growth* paradigm emphasizes the compatibility between economic growth and environmental sustainability (Drews & Van Den Bergh, 2016b). According to green growth, *decoupling* emissions while continuing to grow the economy is a feasible way to meet societal objectives. Indeed, the Organisation for Economic Co-operation and Development (OECD) has routed its sustainable development strategies within the *green growth* paradigm (OECD, 2011). However, *green growth* has been criticized for its ineffectiveness and for potentially causing delays in climate and environmental policy by creating the illusion that technology and human

ingenuity alone can solve the climate crisis and other sustainability issues (Hoffmann, 2011). Although there is disagreement within academic and political spheres over the possibility of *green growth* for all aspects of environmental sustainability, *decoupling* greenhouse gas emissions specifically from economic growth is likely possible as 32 countries have already achieved decoupling between production-based emissions and gross domestic product (GDP), the most widely used metric of economic growth (Hubacek et al., 2021). Notably, there is a debate about the definition of absolute and relative *decoupling*. The concept of *decoupling* was used in this study only as a tool to guide the design of survey questions, rather than a concept to prove or disprove with empirical data.

The *degrowth* paradigm is the antithesis of *decoupling* and *green growth* due to skepticism over prosperity with economic growth (Drews & Van Den Bergh, 2016b). According to Schneider et al. (2010, p. 512), degrowth consists of “an equitable down-scaling of production and consumption that increases human well-being and enhances ecological conditions at the local and global level, in the short and long term.” In other words, economies should shrink to meet emission reduction goals, according to the degrowth paradigm. The concept of *degrowth* dates back to Meadows et al.’s (1972) “The Limits to Growth,” in which the authors suggest that physical and resource constraints limit economic growth and that environmental issues can be solved by aligning the global economy with the Earth’s carrying capacity. Some consider *degrowth* radical because this paradigm does not have a clear framework, which may lead to unnecessary welfare losses without achieving climate targets (Van Den Bergh, 2018).

*Agrowth* is a more recent growth paradigm that aims to bridge decoupling and degrowth views by placing economic growth as secondary to achieving other societal goals (Van Den Bergh, 2018). This paradigm suggests that GDP may not be a reliable indicator of social welfare because it fails to capture environmental and other negative externalities and that improving social welfare, such as happiness and a healthy environment, may result in GDP growing, shrinking, or remaining neutral depending on the circumstance (Van Den Bergh, 2011, 2017, 2018). The *agrowth* paradigm requires a societal shift so that everybody becomes agnostic about GDP growth, which may be a more reasonable proposition for politicians and economists than strictly shrinking the economy (Van Den Bergh, 2018). If this societal shift is achieved, effective pricing and regulatory climate policies can be implemented with minimal opposition, according to the *agrowth* paradigm.

The final growth paradigm is *growth-at-all-costs*, which calls for unconditional economic growth due to both citizen skepticism about climate change and the environmental degradation associated with economic growth (Drews & van Den Bergh, 2016b). This paradigm differs from the previous three by strongly emphasizing prosperity with growth while also ignoring environmental limits (Drews & van Den Bergh, 2016b).

### **2.2.2. Citizen beliefs in growth paradigms**

Citizen beliefs differ for each growth paradigm. A survey of Spanish citizens on economic growth, the environment, and prosperity by Drews and Van Den Bergh (2016b) reveals that 59% of citizens support *decoupling*, 21% support *agrowth*, 15% support *degrowth*, and that only 4% support *growth-at-all-costs* (perhaps due to some realization of negative environmental impacts on the economy). Similar results were observed in Tomaselli et al.’s (2019) study that surveyed Canadian citizens regarding economic growth, sustainability, and citizen involvement

in sustainability issues. Three belief clusters on the relationship between economic growth and sustainability were identified: assured at 41%, ambivalent at 36%, and concerned at 23% of the sample. The larger “assured” cluster resembles *green growth* and *decoupling* beliefs in that citizens hold expansionist views and are optimistic about economic growth while also recognizing sustainability issues that need to be addressed. The “ambivalent” cluster consists of citizens who are uncertain about the relationship between economic growth and the environment as well as the benefits of economic growth, which is likened to *agrowth* characteristics. Finally, the “concerned” cluster is consistent with the *degrowth* group since these citizens disagree with indefinite economic growth and largely believe that humans are a part of nature.

Another study of the Spanish population by Drews et al. (2019) produced slightly different results for the growth paradigm belief. The study finds that *agrowth* beliefs are the most popular by respondents at 43%, followed by *green growth* beliefs at 29%, *degrowth* beliefs at 18%, and indifference at 10%. These results suggest citizens are more skeptical about the benefits of economic growth. To explain these results, Savin et al. (2021) use a free association method with qualitative data collected from the same survey, which shows that Spanish citizens are more critical of economic growth and associate it with corruption, inequality, and poverty. However, the data was collected in 2014 after Spain’s economic crisis, which likely influenced citizen responses. A common finding between Drews et al. (2019) and Savin et al. (2021) is that citizen beliefs are not very polarized and could be influenced by communication.

Although Drews et al. (2019) demonstrate that *agrowth* beliefs may be the strongest in Spain, collective results from multiple international surveys in Drews et al. (2018) offer different results. Findings from Europe and the United States show that the majority of citizens prioritize environmental protection over economic growth; however, citizens do not see economic growth and environmental protection as mutually exclusive (Drews et al., 2018). Belief in the compatibility of economic growth and the environment is consistent with *green growth* and *decoupling* beliefs. Generally, the current literature shows that the majority of citizen beliefs align with *green growth* and *decoupling*, followed by *agrowth*, *degrowth*, and *growth-at-all-costs*.

These four growth paradigms can offer different citizen expressions of emissions-economy trade-offs, which were directly measured in this study. Past studies have categorized citizen preferences into different growth paradigms by asking questions about the relationship between economic growth and the environment. However, there is scant research about associations between these growth paradigms and climate policy support. Additionally, most studies lack jurisdictional contrasts due to a focus on a single country. Given that some countries are starting to show climate successes while others fail, it is important study jurisdictions with different decoupling rates to propose policy recommendations and communication techniques to accelerate emissions reductions. As such, this study aims to fill the aforementioned gaps by measuring associations between the different growth paradigms and support for various compulsory and voluntary climate policies using Australia and the UK as a jurisdictional contrast.

### **2.3. Climate policy in Australia and the United Kingdom**

Australia and the United Kingdom are two advanced countries with varying degrees of success in decoupling greenhouse gas emissions from economic growth. According to the World

Bank (2024a, 2024b), the UK’s GDP grew by 10.2% and Australia’s by 16.3% between 2015 and 2022. In the same period, the UK reduced its greenhouse gas emissions by 18.4% while Australia by 3.3% (Climate Action Tracker, 2023a, 2023b). To analyze the discrepancy, this section compares the UK’s and Australia’s climate governance and policy cases at national levels. Of note, the UK and Australia have different urban and rural characteristics, and the UK’s economy is service-based (UK Parliament, 2024), which is structurally different from Australia’s resource-extractive economy (MacDonald & Sloman, 2020), leading to different GHG intensities by sector. These structural discrepancies could imply different interpretations of climate policies when asking citizens about their policy support. Additionally, the UK is an asymmetrically decentralized unitary state, comprised of England and three countries with devolved governments: Scotland, Wales, and Northern Ireland, while Australia uses a federal system. This study does not look at regional differences in climate policies in the UK and does not intend to compare the two countries fully; instead, it uses them as contrasting case studies.

Table 1 summarizes different types of climate policies in both countries. The UK enacted the *Climate Change Act* in 2008, which legislated carbon budgets to reach net-zero by 2050, meaning a reduction of greenhouse gas emissions by at least 100% from 1990 levels, and created the non-partisan Climate Change Committee (CCC) to advise on budgets (CCC, n.d.). The carbon budgets and CCC’s expert advice signal to the government and sectors by how much emissions need to decrease to comply with the law, setting the stage for strong emissions reduction policies. The latest report by the CCC (2024) shows that the third carbon budget (2018 – 2022) saw 15% larger emissions reductions than required, demonstrating the effectiveness of the UK’s climate policy mix.

Table 1: Climate policy summary for Australia and the United Kingdom

Policy type	Policy	Australia	UK	References
Carbon pricing policies	Cap and trade	✓	✓	Australian Government (2023b); UK Government (2023a)
	Carbon price floor	✗	✓	UK Government (2018)
	Climate change levy	✗	✓	UK Government (2023b)
	Fuel duties	✗	✓	UK Government (2024a)
	Vehicle emission taxes	✗	✓	UK Government (2017a)
Regulatory policies	Ultra-low emission zone charge <sup>1</sup>	✗	✓	Transport for London (2024)
	ZEV sales mandate	✗	✓	UK Government (2023c)
	Banning gas boilers in new homes	✓	✓	Victoria State Government (2024); British Gas (2023)
	Low-carbon fuel regulations	✗	✓	UK Government (2024b)
	Building energy efficiency	✓	✓	Australian Government (2024c); UK Government (2020a, 2023d)
Vehicle energy efficiency	✗	✓	UK Government (2023c)	

Policy type	Policy	Australia	UK	References
Voluntary policies	Subsidies/investment for green industry	✓	✓	Australian Government (2024d); the UK Government (2017b, 2020b)
	Subsidies for citizens for low-emission vehicles	✓	✓	Government of Western Australia (2024); UK Government (2024e)
	Subsidies for citizens for solar	✓	✓	Australian Government (2024e); UK Government (2023e)
	Subsidies for citizens for heat pump	✓	✓	Australian Government (2024e); UK Government (2024c)
	Coal phase-out	✓	✓	UNSW (2023); UK Government (2018)

<sup>1</sup>While the ultra-low emission zone (ULEZ) charge started at London’s city level, it has been expanded to most metropolitan areas in the UK becoming a common sub-national approach to emissions charging. The policy was also frequently identified as a carbon pricing policy as part of the analysis for the ‘policy awareness’ variable described in Section 4.3.

On the other hand, Australia has only recently committed to net-zero emissions by 2050 and 43% reduction below 2005 levels by 2030 by legislating emissions reduction targets through the *Climate Change Act* in 2023 (Australian Government, 2023a). Similar to the UK, Australia created its own expert body, the Climate Change Authority (CCA), in 2011 to advise the Australian government on climate policies (CCA, 2023). However, national Australian governments spent the last decade trying to disband the CCA or ignore its advice (Crowley, 2021). Instead of implementing effective climate policies, Australia developed a habit of negotiating decreases in land clearing to offset emissions increases in the transportation, industry, and electricity sectors (Crowley, 2021). However, Australia has recently released an energy roadmap that plans to phase out coal power stations by 2038, demonstrating a step in the right direction (UNSW, 2023). Australia’s lack of clear emissions reduction ambition and resistance to expert advice has led to an ineffective climate policy mix discussed below, and failure to decouple emissions from economic growth.

### 2.3.1. Carbon pricing policies

The UK has a relatively large carbon pricing policy mix directed at industry and citizens. Examples of the UK Government’s industry emissions pricing policies include the cap and trade schemes used since 2005 under the European Union law; the Carbon Price Floor introduced in 2013 that taxes fossil fuels used to generate electricity, catalyzing the phase-out of coal; and the Climate Change Levy introduced in 2001 that taxes businesses according to their natural gas and electricity consumption to encourage efficiency (UK Government, 2023a, 2018, 2023b). Other policies that apply to citizens and industry include fuel duties for fossil fuels and vehicle tax rates proportional to carbon dioxide emissions (UK Government, 2024a, 2017a). The UK’s longstanding carbon pricing policies that target industry and citizens have contributed greatly to the country’s emission reduction (Beugin, et al., 2018).

Comparatively, Australia has struggled to implement any effective emissions pricing policies. The Australian Government (2015) enacted the *Clean Energy Act* (CEA) in 2011, introducing the Carbon Pricing Mechanism for industry. However, the CEA was repealed shortly after in 2014 for the Emissions Reduction Fund - a voluntary emissions reduction credit scheme composed of a static emissions cap, known as the Safeguard Mechanism, and tradeable carbon credits (CMI & IETA, 2016). This was an ineffective approach because the sectoral caps did not decrease over time. In 2016, the CCA recommended using emission intensity targets for industries that align with 2030 emissions reduction goals, while Australia's Chief Scientist advocated for clean energy targets to tax fossil fuels--both recommendations were rejected by the Prime Minister (Crowley, 2021). The Australian Government (2023b) finally implemented a cap and trade scheme in 2023 by reforming the Safeguard Mechanism to have legislated targets (43% below 2005 levels by 2030) for industries that align with the Paris Agreement. However, given the recency and complexity of this policy, the feasibility of achieving the 2030 target is yet to be determined.

### **2.3.2. Regulatory policies**

Regulatory policies to reduce emissions aim to phase out fossil fuel use and improve efficiency. The UK Government (2023c, 2024b) is phasing out fossil fuel use through a 100% zero-emission vehicle (ZEV) sales mandate by 2035, low-carbon fuel regulations under the 2008 Renewable Transport Fuel Obligations, and by banning gas boilers in new homes in 2025 (British Gas, 2023). For building energy efficiency, the UK Government (2020a, 2023d) uses the 2012 Energy Performance of Buildings Regulations that require the disclosure of buildings' energy efficiency to encourage suppliers to improve efficiency, and the 2018 Minimum Level of Energy Efficiency Standards that require rental buildings to meet a minimum energy efficiency rating. For vehicles, energy efficiency standards for non-ZEVs are being implemented as part of the ZEV sales mandate to help reduce emissions while manufacturers transition to ZEVs (2023c).

Unlike the UK, Australia is missing some key regulatory policies. Australia does not have a ZEV mandate and lacks energy efficiency regulations for vehicles, although the Australian Government (2024a) has plans to implement vehicle efficiency standards in 2025. The Australian Government (2024b) has fuel quality standards that they intend to improve in 2025; however, it is unclear if these improvements will sufficiently contribute to greenhouse gas emissions reductions. Finally, the Australian Government (2024c) has energy efficiency regulations for buildings and is phasing out gas for buildings sub-nationally (Victoria State Government, 2024).

### **2.3.3. Voluntary policies**

Voluntary policies mainly consist of government investment in green industries and subsidies. The UK Government (2017b, 2020b) has subsidies for industry, such as the Contracts for Differences (CfD) scheme to subsidize low-carbon electricity generators from wind and solar and the Regulated Asset Base model to subsidize nuclear energy construction. For citizens, the UK Government (2024c, 2024d, 2024e, 2023e) provides subsidies for heat pumps, improving

building energy efficiency, low-emission vehicles, and solar panels. Citizens may also receive payments for electricity exported to the national grid that is generated using low-carbon systems such as wind or solar (Ofgem, 2024). Australia has comparable voluntary policies. The Australian Government (2024d) is investing in integrating renewable sources into the electricity grid, installing community batteries and solar power, and investing in electric vehicle infrastructure. Solar panels and heat pump subsidies are also available to citizens (Australian Government, 2024e), while a ZEV rebate is available sub-nationally in Western Australia (Government of Western Australia, 2024).

### **2.3.4 Summary and critique of the UK and Australia's policy mixes**

The UK and Australia's climate policy mixes differ dramatically for compulsory policies. The UK's heavy emphasis on carbon pricing policies is a central reason for its emission reduction success. This is not surprising, as carbon pricing is well supported by expert bodies such as OECD, the World Bank, and the International Monetary Fund (UNFCCC, 2020) and researchers (Beugin, et al., 2018) due to its effectiveness and cost efficiency. On the contrary, Australia's lack of long-term carbon pricing policies and history of governments ignoring climate experts' advice has likely contributed to its low emissions reduction. For the countries' regulatory policy mixes, the UK focuses on both fuel switching (to lower carbon fuels) and energy efficiency, while Australia mainly focuses on improving energy efficiency. Although energy efficiency lowers emissions per unit consumption, gains in efficiency are often offset by increased energy use, which is known as the rebound effect (Greening et al., 2000). In fact, the energy efficiency approach has failed at reducing emissions in the last three decades (Murphy and Jaccard, 2011). Therefore, serious emission reductions are not feasible without regulatory fuel switching policies that phase out fossil fuel use, further explaining Australia's emission reduction failure.

Finally, voluntary policies are similar in the UK and Australia. However, voluntary policies alone cannot effectively reduce emissions. Instead, they should be used to complement compulsory policies (Baranzini, et al., 2017).

These contrasts in climate policies between the UK and Australia, along with their respective better and poorer decoupling rates, provide a unique opportunity to investigate differences in citizen support for climate policies and to test the role of emissions-economy trade-offs in climate policy support.

### Chapter 3: Theoretical framework: Stern’s ABC theory

This study relies on the Attitude-Behavior-Context (ABC) theory developed by Guagnano et al. (1995) and Stern (2000) to test the associations between beliefs in emissions-economy trade-offs and trends with climate policy support. According to the ABC theory, pro-environmental behaviour, such as climate policy support, is a product of internal attitudinal and external contextual characteristics, as demonstrated successfully in recent studies (Long et al., 2020; Odland et al., 2023; Rhodes et al., 2017). The ABC theory suggests four types of characteristics influencing climate policy support: attitudinal, contextual, personal capability, and habitual (Stern, 2020). *Attitudinal* characteristics include an individual’s beliefs, values, and norms; *contextual* characteristics include interpersonal influences, community expectations, and broader dimensions of the social, economic, and political contexts; *personal capabilities* refer to sociodemographic variables; and *habitual* characteristics are defined as a citizen’s pro- or anti-environmental habits. Given that support for or opposition to climate policy has not been seen as a habit in literature, habitual characteristics are not used in this study. As a result, this study has organized independent variables into the categories of attitudinal, contextual, and personal capability characteristics summarized in Table 2.

Table 2: Variables hypothesized to have associations with climate policy support.

Variables	Hypothesized direction for compulsory policies (pricing and regulations)	Hypothesized direction for voluntary policies	References
<b>Attitudinal variables</b>			
Emissions-economy trade-off belief			
Decoupling	[+]	[+]	Drews & Van Den Bergh, (2016b)
Degrowth	[+]	[-]	Drews & Van Den Bergh, (2016b) and Van Den Bergh, (2018)
Agrowth	[+]	[-]	Van Den Bergh, (2011) (2017) (2018)
Growth-at-all-costs	[-]	[+]	Drews & Van Den Bergh, (2016b)
Emissions and economy <i>trend</i> belief			
Past emissions decreased	[+]	[+]	Not available
Past economy increased	[+]	[+]	Not available
Future emissions decrease	[+]	[+]	Not available
Future economy increase	[+]	[+]	Not available
Values			
Traditional	[-]	[+]	Kitt et al. (2021), Long et al. (2020), and Odland et al. (2023)

Variables	Hypothesized direction for compulsory policies (pricing and regulations)	Hypothesized direction for voluntary policies	References
Altruistic	[+]	[+]	Long et al. (2020) and Kitt et al. (2021)
Egoistic	[-]	[conflicting evidence]	Odland et al. (2023), Rhodes et al. (2017), Long et al. (2020), Kitt et al. (2021), Bouman et al. (2018), and Weber et al. (2020)
Openness to change	[+]	[+]	Long et al., (2020), Rhodes et al. (2017), and Odland et al. (2023)
General environment concern (NEP)	[+]	[+]	Long et al. (2020) and Kitt et al. (2021)
<b>Contextual variables</b>			
Policy awareness	[-]	[+]	Rhodes et al. (2014), Dechezlepretre et al., 2022; Long et al., 2020
Political affiliation (left to right)	[-]	[-]	Moyaon-Diaz et al. (2018) and Bumann (2021)
Lifestyle			
Technology-oriented	[-]	[+]	Axsen et al. (2012) and Odland et al. (2023)
Environment-oriented	[+]	[+]	Axsen et al. (2012) and Odland et al. (2023)
<b>Personal capability variables</b>			
Age	[-]	[-]	Kitt et al. (2021), Bumann (2021), and Gugushvili (2021)
Female (ref: male)	[+]	[+]	Bumann (2021), and Gugushvili (2021)
Other gender (ref: male)	[+]	[+]	Not available
Education	[+]	[+]	Odland et al. (2023), Bumann (2021), and Gugushvili (2021)
Household income	[+]	[+]	Kitt et al. (2021), Bumann (2021), and Gugushvili (2021)

Attitudinal characteristics are measured via questions about emissions-economy trade-off beliefs (first independent variable), emissions and economy trend beliefs (second independent variable), and other control variables, including values and ecological worldviews. Emissions-economy trade-off beliefs consist of belief questions about the four growth paradigms: *decoupling*, *degrowth*, *agrowth*, and *growth-at-all-costs*. The hypothesized relationships are relative to the *decoupling* belief, with (a) *degrowth* beliefs hypothesized to have positive associations with support for compulsory policies to reduce emissions and negative support associations with voluntary policies such as subsidies that may be seen as supportive of economic growth; (b) *agrowth* beliefs having positive associations with support for compulsory policies to achieve emission reductions regardless of economic impacts, and negative associations with support for voluntary policies such as information and subsidies that are less effective at reducing emissions; and (c) *growth-at-all-costs* beliefs having negative associations with support for all compulsory policies due to a likely perception that these policies are harmful to economic growth, and positive associations with support for subsidies that may incentivize growth.

Emissions and economy trend beliefs measure citizen beliefs in the direction of the past and future economy and emissions trends. Because this variable is novel, the direction of associations with policy support will be hypothesized for climate policies in general rather than for compulsory and voluntary policies separately. It is therefore expected that citizens who are optimistic about past and future economic growth and emissions reduction will have higher support for climate policies. Citizens who are optimistic about past and future economic growth are likely to believe their country's climate policies do not negatively affect the economy; therefore, they are hypothesized to support such policies. Citizens who are optimistic about past and future emissions decreases are likely to support climate policies because their optimism may indicate the belief that their government's policies are working.

This study tests four types of values orientation: altruistic (equality and working for the welfare of others), openness to change (desire for an exciting life, new experiences, and exploration), egoistic (influence on others and prioritizing material possessions), and traditional values (honouring elders, self-discipline, and conserving the norm) (Dietz et al., 2005). Ecological worldviews are measured via the New Ecological Paradigm (NEP) scale concerning relationships between humans and the environment (Stern et al., 1995). The foundational works of Dietz et al. (2005) and Stern (2000) show that altruistic values and NEP are positively associated with pro-environmental behaviour; that openness to change values may have little or no positive association with pro-environmental behaviour; and that traditional and egoistic values tend to have negative associations with pro-environmental behaviour since traditionalism is rooted in conserving societal norms while egoism prioritizes self-interest. More recent research has refined the relationship between values and NEP to climate policy support. Long et al. (2020) and Kitt et al. (2021) demonstrate that altruistic values and NEP are positively associated with compulsory policies, such as the carbon tax and ZEV mandate, and voluntary policies, such as subsidies. Openness to change values also have positive associations with compulsory and voluntary policies. Long et al. (2020) show a positive association between openness to change values and support for the carbon tax. Rhodes et al. (2017) and Long et al. (2020) also show positive associations with support for clean electricity standards and low-carbon fuel standards, respectively, while Odland et al. (2023) only show positive associations with support for climate subsidies. Unlike Dietz et al. (2005), recent literature demonstrates that openness to change values are indeed positively associated with support for climate policies.

Kitt et al. (2021) and Long et al. (2020) demonstrate that traditional values are negatively associated with support for the carbon tax and ZEV mandate. Odland et al. (2023) also finds a negative association between traditional values and support for the carbon tax, while showing positive associations with support for voluntary policies such as subsidies and education. Finally, Odland et al. (2023) shows that egoistic values have negative associations with voluntary policies. Rhodes et al. (2017) also show a negative association between egoistic values and voluntary policies and supply-focused regulations. Long et al. (2020) and Kitt et al. (2021) show a negative association with vehicle emission standards, but interestingly, a positive association with a ZEV mandate. Positive associations between egoistic values and climate policy support may be occasionally expected, as Bouman et al. (2018) and Weber et al. (2020) suggest pro-environmental behaviours and egoistic values may be positively associated if the pro-environmental behaviour such as climate policy support, directly benefits citizens.

Contextual characteristic measures include climate policy awareness, political ideology, and lifestyles. Past studies found that public awareness of existing climate policy is low and primarily limited to highly salient (i.e., with high cost visibility) compulsory policies such as carbon taxes and strict mandates or bans (Rhodes et al., 2014; Dechezlepretre et al., 2022; Long et al., 2020.). In fact, Chetty et al. (2009) demonstrate that higher cost-visibility tends to increase opposition to taxes. Therefore, more compulsory policies with higher cost-visibility, such as the carbon tax, are hypothesized to have higher opposition, while voluntary policies that do not directly impose a cost but rather benefit a citizen will have higher support. More right-wing political orientation is expected to have a negative association with climate policy support as right-wing citizens tend to believe that climate policies interfere too much with the economy (Moyaon-Diaz et al., 2018) and/or do not believe in human-caused climate change all together (Bumann, 2021). Finally, the lifestyle characteristics of engagement with new technologies and environmentalism are also expected to influence climate policy support. According to Axsen et al. (2012), citizens engaged with technologies tend to show higher support for technology-gearred policies, such as household climate subsidies for installing solar panels, while environment-oriented citizens are expected to be interested in investments in green electricity infrastructure and have higher satisfaction rates with electric vehicles. Odland et al. (2023) show partial agreement with Axsen et al. (2012) in that environment-oriented citizens have higher support for compulsory and voluntary policies but technology-oriented citizens only show higher opposition to the carbon tax and regulations.

The final characteristics of personal capabilities are represented through socio-demographic variables, including age, gender, education, and household income. Younger, female, more educated, and wealthier citizens are predicted to show higher support for climate policies as per past literature (Bumann, 2021; Gugushvili, 2021). One of the novelties of this study is that it includes non-binary genders, which have not been researched in relation to climate policy support. It is hypothesized that non-binary genders will have higher support for climate policies due to their greater support of leftwing political ideology (Albaugh et al., 2023).

## Chapter 4: Methods

### 4.1. Data collection

Primary data were collected using a 20-minute web-based representative survey of citizens (18+) in Australia (n=1,029) and the UK (n=1,009). The survey was administered by the market research company, Qualtrics, in September-October 2023. The samples are fairly representative of the population by education, age, and gender in both countries. When compared to Census data (Table 3), Australia’s sample is slightly over-represented by middle-aged citizens and under-represented by seniors and males. In the UK, the sample is slightly over-represented by more educated people and under-represented by seniors and females.

To ensure representativeness, weights were generated and applied to education, age, and gender in R with the “Survey” package using Random Iterative Method (RIM) weighting. Non-responses for the education and age variables were replaced with averages to include these citizens in the RIM weighting. For gender, non-responses or ‘other genders’ could not be replaced with an average, so they were weighed to 0.01% of the population. This was appropriate because gender non-response was under 1% for both countries. The raw RIM weights were then applied to all continuous variables except for education and age variables, given that these variables were used to create weights.

Table 3: Sample versus census data for Australia and the United Kingdom

Socio-demographic variables	Australian sample	Australia Census <sup>1,2</sup> (YouGov – Education)	UK sample	UK Census <sup>3, 4,5</sup>
<b>Education</b>				
Highschool or less	26.2%	25.8%	26%	27.8%
Diploma or certificate	26.5%	25.0%	36.7%	38.4%
Bachelor degree	29.7%	31.9%	37.3%	33.8% BA
Graduate degree	17.5%	17.3%	BA+	+
<b>Age</b>				
18 – 34	28.3%	29.1%	29.9%	27.6%
35 – 54	38.8%	33.8%	34.7%	33.2%
55+	32.9%	37.1%	35.4%	39.2%
<b>Gender</b>				
Male	48.6%	49.35%	49.36%	49.0%
Female	50.7%	50.64%	49.75%	51.0%
Prefer not to answer (including non-binary genders)	0.7%	0.01%	0.89%	n/a

<sup>1</sup>Australian Bureau of Statistics (2022), <sup>2</sup>YouGov (2023), <sup>3</sup>United Kingdom Government (2023f), <sup>4</sup>United Kingdom Government (2023g), <sup>5</sup>United Kingdom Government (2023h).

The survey consisted of four sections (see Appendix A for full questionnaire). Section 1 assessed citizen views on their country’s economy and impact on the environment. Section 2 measured citizen support for climate policies. Section 3 assessed values and beliefs. Section 4 collected general demographic information. This study only uses a subset of questions from the

survey, as determined by our present research objectives. The entire survey was pretested by a range of academic and non-academic individuals to minimize the survey error.

## 4.2. Descriptive analyses

All analyses of this study were performed in R 4.2.2. To assess levels of climate policy support (objective 1), citizens were asked to indicate how much they would oppose or support their government using different kinds of policies in trying to reduce climate change on a five-point Likert scale from “strongly oppose” to “strongly support” with “prefer not to answer” category. The tested policies included the carbon tax, cleaner fuel regulations, energy efficiency regulations, zero-emission vehicle (ZEV) sales mandate, fossil fuel bans, subsidies for households, subsidies for business, information, and government investment. These policies were accompanied with brief non-technical definitions. To assess differences in climate policy support between countries, a pooled two-sample *t*-test was used, which tests for differences in means of policy support between the countries. The more conservative two-tailed *t*-test was used first to determine if there was a statistically significant difference between mean support, followed by a one-tailed *t*-test to determine which countries’ mean support for the climate policy was greater.

To identify perceptions of emissions-economy trade-offs (objective 2), citizens were asked a question about the direction the UK and Australian governments should pursue concerning economic growth and emission reduction. Citizens who answered “reduce greenhouse gas emissions regardless of any impacts on the economy” were categorized as *agrowthers*; those who answered “grow the economy regardless of any impacts on greenhouse gas emissions” were named as supporters of *growth-at-all-costs*; those who answered “reduce greenhouse gas emissions and shrink the economy at the same time” were named as *degrowthers*; and those who answered “try to grow the economy and reduce greenhouse gas emissions at the same time” were labelled as *decouplers*. Emissions-economy trade-offs were also measured indirectly via questions on beliefs of past and future emissions and economy changes on a continuous slide from -100% to +100% with 0 meaning no change. The timeframes were 2015-2023 for past trends (i.e., since the Paris commitment) and 2023-2030 (until the most immediate climate target) for future trends. Responses to questions about support for growth paradigms and perceived changes in past and future emissions and economy, were then compared between countries using a Pearson’s Chi-Squared test for homogeneity and a Bonferroni-adjusted critical value at  $\alpha=0.05$  post hoc test.

## 4.3. Regression analyses

Finally, multiple multivariate linear regression models were estimated to assess the association between beliefs in emissions-economy trade-offs using growth paradigms and beliefs about past and future economy and emissions changes with different climate policies (objective 3), while controlling for the independent variables. Multivariate regression models determine statistically significant relationships between a single response variable (i.e., support for the various climate policies) and multiple explanatory variables (Alexopoulos, 2010). The following model was used to determine climate policy support:

$$y_i = \alpha_0 + \alpha_1 Agrowth_i + \alpha_2 Degrowth_i + \alpha_3 GAAC_i + \alpha_4 PEI_i + \alpha_5 PED_i + \alpha_6 FEI_i + \alpha_7 FED_i + \mathbf{X}'\boldsymbol{\beta} + u_i$$

where  $y_i$  represents climate policy support for the carbon tax, fossil fuel bans, regulation index, subsidy index, and government investment (policy aggregations are explained below). Support for a given policy was regressed on beliefs aligning with *agrowth* ( $Agrowth_i$ ), *degrowth* ( $Degrowth_i$ ), *growth-at-all-costs* ( $GAAC_i$ ), and the beliefs that the past economy increased ( $PEI_i$ ), past emissions decreased ( $PED_i$ ), the future economy will increase ( $FEI_i$ ), and future emissions will decrease ( $FED_i$ ).  $\mathbf{X}'\boldsymbol{\beta}$  represents variables controlled for, as outlined in Table 2. The *decouplers* were used as the reference category in the regressions for the “emissions-economy trade-off belief” variable, so the standardized  $\beta$ -coefficients show an association between three other emissions-economy trade-off beliefs (*growth-at-all-costs*, *agrowth*, and *degrowth*) and policy support, as compared to *decouplers*.

For regression purposes, all climate policies were kept on a five-point Likert scale for greater response nuance. Other policy support variables were combined to create a regulation support variable (i.e., cleaner fuel regulations, energy efficiency regulations, and ZEV mandate) and a subsidy support variable (i.e. household subsidies and business subsidies), reducing the number of policy support models from nine to five for both countries. To address research objectives, the main independent variables used were belief in an emissions-economy trade-off (growth paradigm) and beliefs in country’s past and future economic and emission trends described above, with the latter belief variables being recoded as dummy variables and framed optimistically. Citizens were coded as ‘1’ for the belief of negative past and future emission trends and ‘1’ for the belief of positive past and future economic growth.

The control variables included climate policy awareness, new ecological paradigm (NEP), values, lifestyle (technology-oriented, passive environmentalism, and active environmentalism), and demographic information. To measure climate policy awareness, the survey used an open-ended question, allowing citizens to list up to five existing climate policies they were aware of in their country (Rhodes et al., 2014). A semi-verbatim analysis was used to match responses to their country’s climate policies (Table 1). Non-specific responses such as “solar panels,” “renewable energy,” and “electric cars” as well as generic targets (e.g., “net zero by 2050”) or climate action plans were excluded. However, if responses had the general idea of a policy in place even if the citizen could not directly name the policy, they were included. For example, “all cars electric by 2035” is a non-technical description of a ZEV sales mandate that was included in this analysis.

NEP and values were measured using multi-item scales that were averaged to obtain a final score for each variable (Dunlap et al., 2002; Dietz et al., 2005; Stern et al., 1998). However, the commonly used ecological value was omitted from the regressions models due to multicollinearity with NEP. Similarly, the three lifestyle variables were produced using a factor analysis of the lifestyle variable (Axsen et al., 2012) with the “nFactors” and “psych” packages (Murphy P. , 2021). A scree plot (Figure B.1 and B.2 in Appendix B) was used to determine the number of factors to extract. The factor variables were non-independent (smallest correlation between factors  $r \geq |0.46|$  for Australia and  $r \geq |0.42|$ ), so a Promax (oblique) rotation at a cut-off of  $r < |0.30|$  was used to extract the factors, which is advantageous for larger datasets (Murphy P. , 2021). Visualizations of the factor loadings and analysis were made to confirm the factor variables.

For the household income variable within demographic information, responses were recoded into integers for each increase of \$25,000 USD, starting from \$0.00 to \$24,999 as (1) and going up to \$250,000+ as (11). Those whose income was \$250,000 and greater were recoded the same.

The regression models started with many variables that were refitted for refinement. As part of the process, a forward stepwise regression was used to determine a pattern of significant variables compared to the full model. Doing so allowed for the removal of non-significant variables; however, some non-significant variables were left as controls to reduce endogeneity or if their non-significance was important to answer the research questions. To address multicollinearity, variables with a variance inflation factor (VIF) above the generally accepted threshold of 5.0 were excluded from the regression (Marcoulides & Raykov, 2019). Due to this, urban, rural, and suburban areas were removed due to potential multicollinearity with other variables, such as political ideology. The regressions did not have multicollinearity, as all VIFs were below 5.0 ( $< 2.9$  for Australia and  $< 2.5$  for the UK).

Most variables had a “prefer not to answer” or “I don’t know” response option. For continuous variables, these responses were treated as non-responses and replaced with the variable’s mean prior to running the regression. On average, non-responses for the continuous variables used in the regressions were 2.8% for Australia and 3.9% for the UK, which are below the generally accepted threshold of 5%. Due to the relatively small percentage of missing values, using the mean did not significantly influence the data, but instead allowed to retain all data points.

## Chapter 5: Results and discussion

The results and discussion section begins with the descriptive statistics for climate policy support and the two main independent variables: (1) citizen beliefs in emissions-economy trade-offs and (2) citizen beliefs for past and future emissions and economic trends. The section continues with the regression results and discussion of associations between the main independent variables and control variables with support for different types of compulsory and voluntary climate policies.

### 5.1. Support for different climate policies

Figure 1 provides descriptive results on citizen support for climate policies in Australia and the UK. In both countries, citizens show the highest support (i.e., an aggregate of “support” and “strongly support”) for information (79% in Australia and 78% in the UK) and government investment policies (73% in Australia and 76% in the UK). Subsidies, energy efficiency regulations, and cleaner fuel regulations receive moderate support, at 63–75% for subsidies and 68–75% for regulations in both countries. In both Australia and the UK, business subsidies are 5% less popular than household subsidies. As expected, the carbon tax has the lowest support at 47% in Australia and 44% in the UK, closely followed by fossil fuel bans at 48% in Australia and 45% in the UK and a ZEV sales mandate at 53% in Australia and 49% in the UK. This is in line with past research suggesting that people are more likely to oppose highly salient policies with perceived high costs to individuals, including taxes and bans, and support voluntary policies instead (Rhodes et al., 2017; Chetty et al., 2009; Fairbrother, 2022; Dechezlepretre, et al., 2022). The low support for a ZEV sales mandate is somewhat surprising because past studies considered this policy politically viable (Kitt et al., 2021) due to its market flexibility features. One potential explanation is that ZEVs’ initial costs are still high compared to conventional vehicles, and citizens may be concerned about their substitutability with internal combustion vehicles (EPIC, 2023).

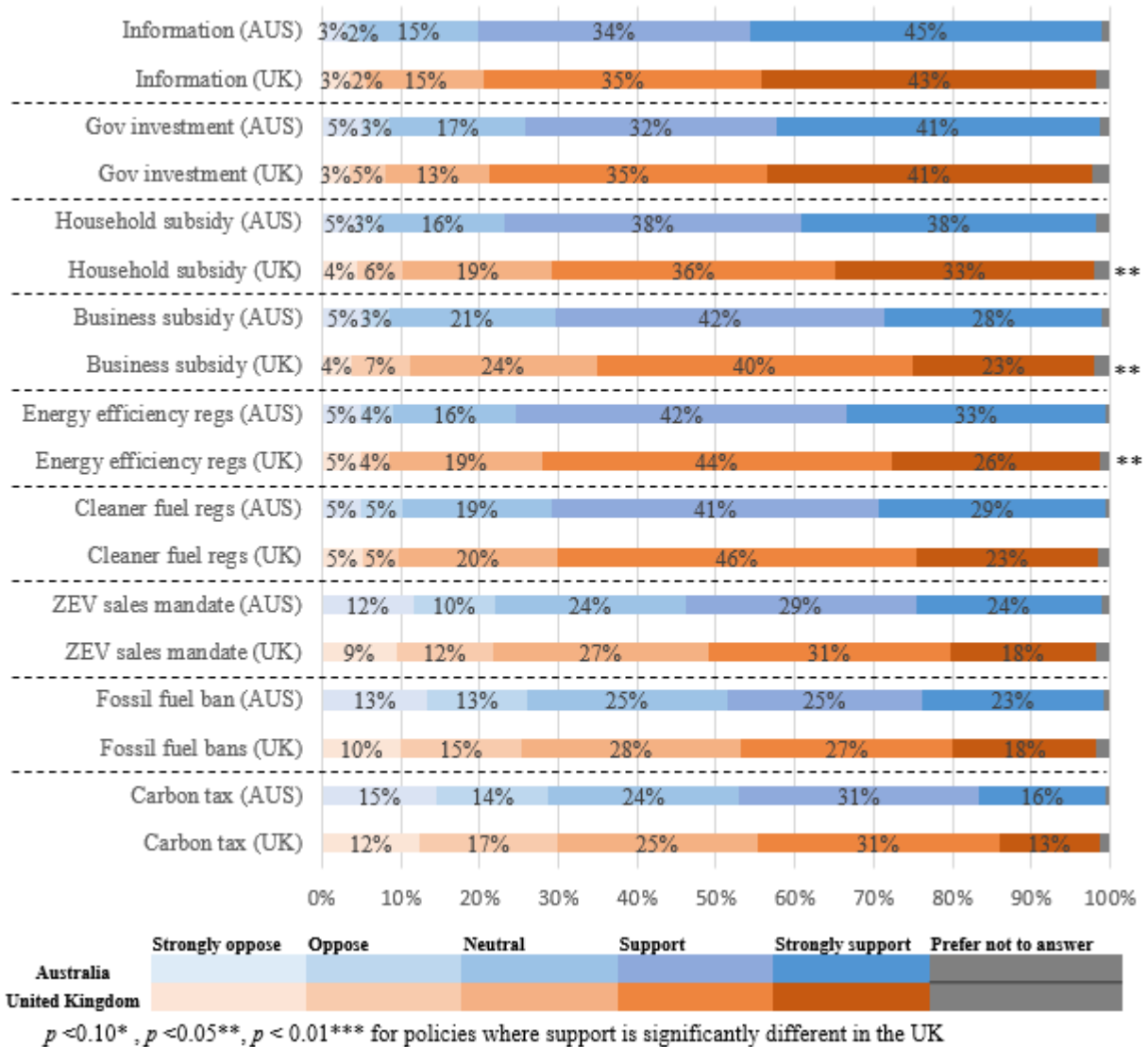


Figure 1: Climate policy support in Australia and the United Kingdom

The two-sample *t*-tests revealed that significantly more Australian citizens support energy efficiency regulations (2038 = -1.7665,  $p = 0.03873$ ), household subsidies (2038 = -2.3926,  $p = 0.008411$ ), and business subsidies (2038 = -2.1696,  $p = 0.01508$ ) than UK citizens. It is possible that Australians support these three policies more than UK citizens because they do not require phasing out fossil fuels. However, the overall absence of differences in support for other policies suggests that policy preferences for general policy types (i.e., lower support for carbon taxes versus higher support for regulations and voluntary policies) are consistent in both Australia and the UK, suggesting the irrelevance of the level of decoupling of emissions from the economic growth for most policies.

## 5.2. Perceptions of emissions-economy trade-offs

Figure 2 shows levels of citizen beliefs in their government's direction on economic growth and emission reductions. Nearly half of the citizens in both countries believe in

*decoupling* emissions from the economic growth (48% in Australia and 47% in the UK), followed by *agrowth* (21% in Australia and 19% in the UK), *growth-at-all-cost* (16% in Australia and 15% in the UK), and *degrowth* (10% in both countries). The chi-square test finds a statistically significant difference for growth paradigm categories between countries ( $X^2(4, 2038) = p < 0.05$ ). The Bonferroni post-hoc test reveals that only proportions in the “prefer not to answer / don’t know” category are significantly different, suggesting no significant difference in the distribution of citizen beliefs in the four growth paradigms between Australia and the UK. However, significantly fewer UK citizens responded to this question. This may be because the UK is more successful at addressing climate change through policies, making citizens less concerned with trade-offs between the economy and emissions. Belief in the *growth-at-all-costs* paradigm in Australia and the UK is three times higher compared to the results found in Drews and Van Den Bergh (2016b). This suggests that a lack of environmental concern may be higher than expected in both countries. For both countries, the more extreme growth paradigms of *growth-at-all-costs* and *degrowth* are believed in the least, demonstrating that citizens prefer a balance of economic growth and emission reductions and suggesting a potential compatibility between the two issues, consistent with past findings by Drews et al. (2018) and Tomaselli et al. (2019).

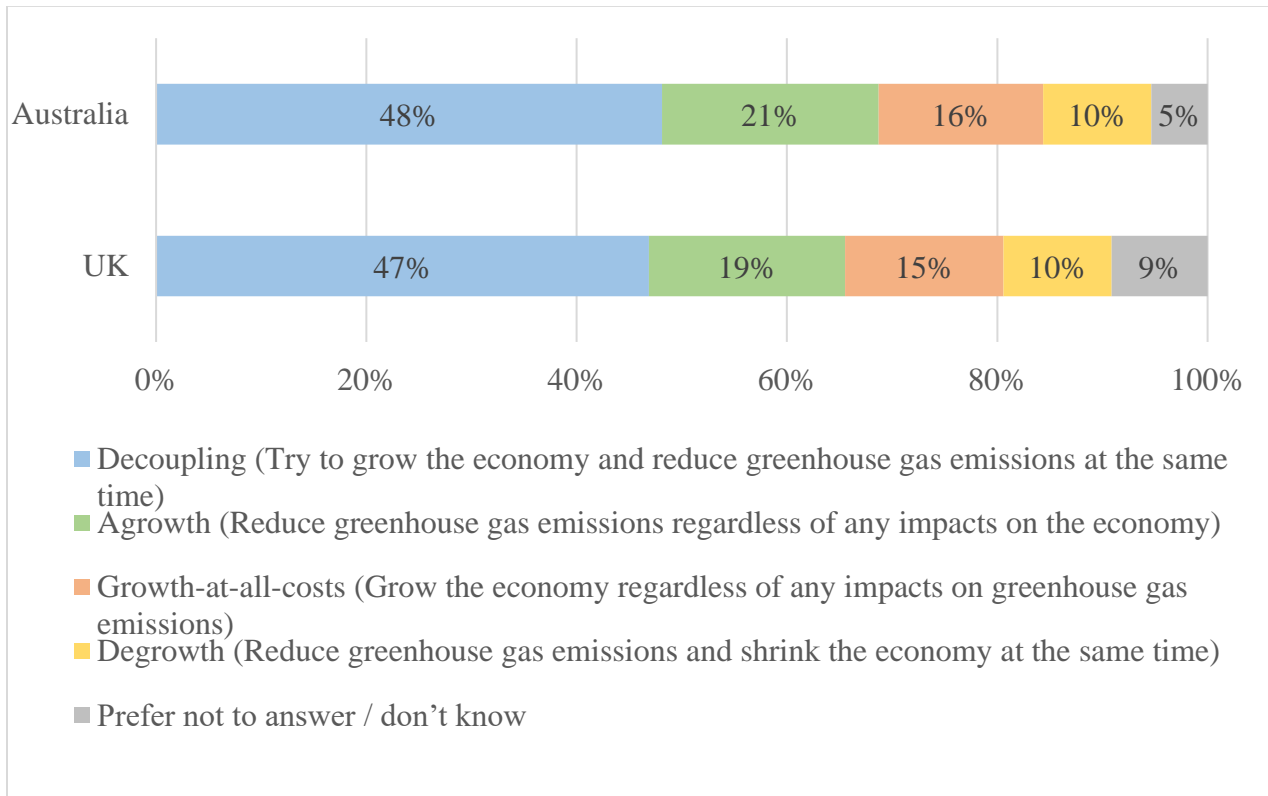


Figure 2: Citizen beliefs in the emissions-economy trade-offs in Australia and the United Kingdom

Figure 3 shows levels of citizen beliefs about past and future emissions and economic growth trends in both countries. Fifteen percent more citizens in both countries believe that past emissions increased than decreased, indicating pessimism about past climate progress. Only 29% of UK citizens believe that their country’s emissions have decreased since 2015, showing a lack of awareness of their emission reduction success (i.e., the actual reduction is 18.4% since 2015

(Climate Action Tracker, 2023a)). In terms of beliefs in future emission growth trends, more citizens in both countries (7% in the UK and 10% in Australia) believe that emissions will decrease compared to past beliefs; however, there is still a greater belief that future emissions would increase, showing an overall lack of optimism in meeting 2030 emission targets. For the economic growth trends, in both countries, more citizens believe that the past economy grew rather than shrank, with the majority of citizens (52% in the UK and 62% in Australia) stating the economy would grow in the future. These descriptive results suggest that, overall, there is much more positive thinking about economic growth than climate change mitigation in both jurisdictions.

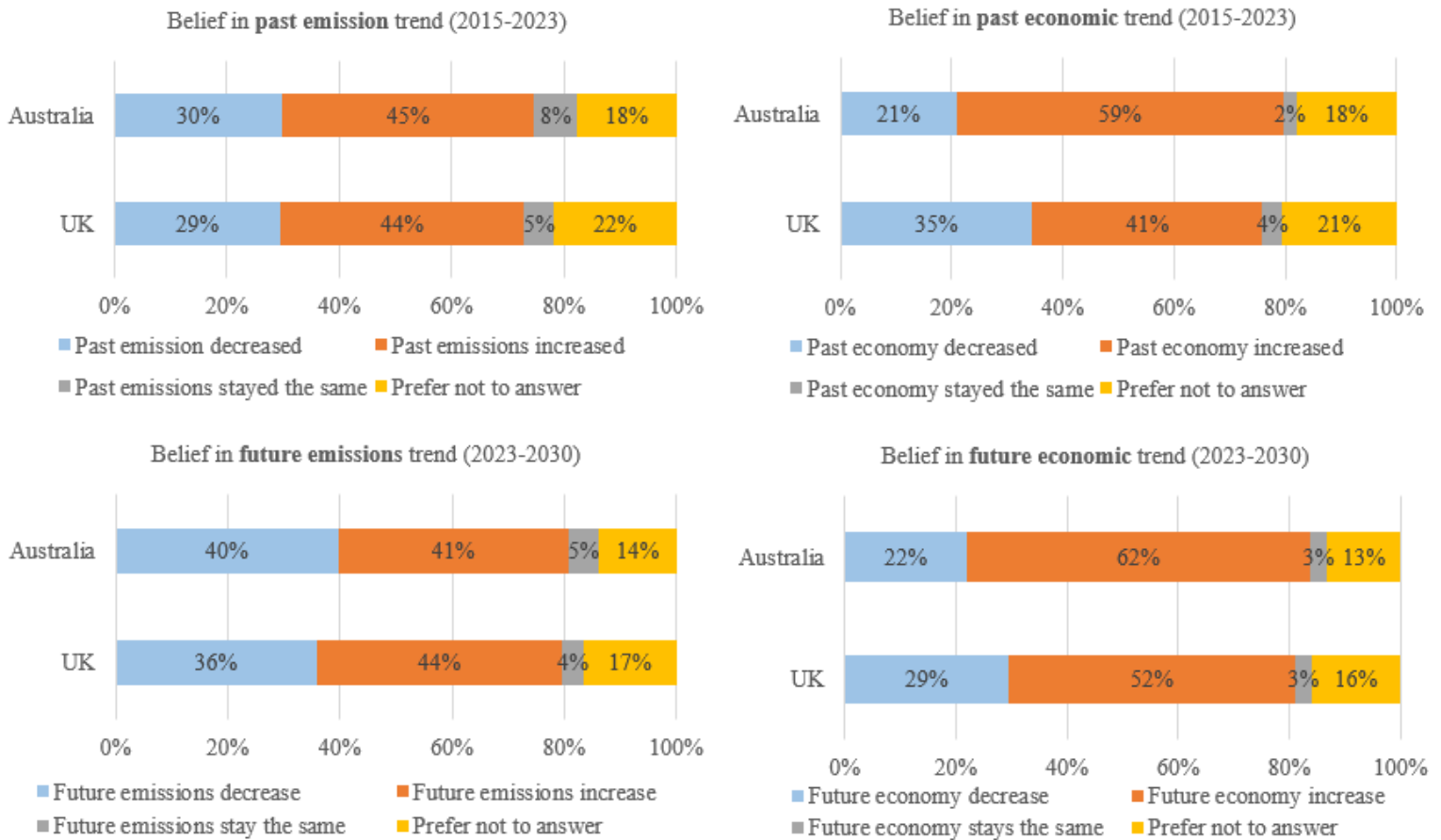


Figure 3: Past and future beliefs about emissions and economic trends in Australia and the United Kingdom.

When comparing the four belief trends between countries, the chi-square test shows a significantly different distribution for Australia and UK's citizen belief in past emission trends ( $X^2(3, 2038) = 8.9405, p < 0.05$ ), future emission trends ( $X^2(3, 2038) = 8.6085, p < 0.05$ ), past economic trends ( $X^2(3, 2038) = 69.865, p < 0.0001$ ), and future economic trends ( $X^2(3, 2038) = 23.103, p < 0.0001$ ). For beliefs in past and future emissions trends, the Bonferroni post-hoc test suggests that 3% more Australians than UK citizens believe past emissions stayed the same; that the proportion of citizens who believe past emissions increased or decreased is the same in both countries; and that 4% more Australians than UK citizens believe future emissions will decrease. For beliefs in past and future economic trends, the Bonferroni post-hoc confirmed that 18% more

Australians than UK citizens believe their economy grew since 2015, and that 10% more Australians believe their future economy will grow. Both Australia's and the UK's GDPs have grown by 16.3% and 10.2%, respectively, albeit the UK's grew significantly less with more years of economic downturn, which could explain why UK citizens are more pessimistic about past and future economic growth (The World Bank, 2024a, 2024b).

### 5.3. Regression results

Tables 4 and 5 show the results of multiple linear regressions that identify characteristics of support for climate policies in Australia and the UK, respectively. Standardized  $\beta$  coefficients were used for continuous variables (referred to using  $^{\circ}$  next to the variable name) to reflect the relative change in policy support per one-unit change of the independent variables. The three lifestyle control variables (technology-oriented, passive environmentalism, and active environmentalism) were determined through factor analysis (see Appendix B). The Cronbach's alphas for the lifestyle variables were all above 0.86 and 0.83 (Table B.1) for Australia and the UK respectively, indicating high internal consistency (Tavakol & Dennick, 2011).

#### 5.3.1. Role of perceived emissions-economy trade-offs in climate policy support

In both Australia and the UK, compared to the *decoupling* belief, the *growth-at-all-costs* belief has a negative association with support for all climate policy types, while the *agrowth* belief (i.e., reducing greenhouse gas emissions regardless of any impact on the economy) has a positive association with support for all compulsory policies and similar associations with support for voluntary policies. Therefore, *agrowth* is the emissions-economy trade-off belief that has the strongest association with climate policy support, while the *growth-at-all-costs* belief has negative associations with support for all policy types. The results for *agrowth* and *growth-at-all-costs* only align with their hypotheses for compulsory policies, as *agrowth* was expected to have negative associations with voluntary policies, while *growth-at-all-costs* was expected to have positive associations.

In both countries, compared to the *decoupling* belief, the *degrowth* belief has similar associations with support for the carbon tax, regulations, and government investment, and has a negative association with support for subsidies. However, in Australia only, the *degrowth* belief is also positively associated with support for fossil fuel bans. These results align with the *degrowth* belief (i.e., need to decrease the economy in order to reduce emissions), as subsidies may imply continuous economic growth, while banning fossil fuels may align better with the notion of shrinking the economy. These results suggest that *degrowth* is the belief with the second strongest association with climate policy support, and *decoupling* the third. The results fully align with the hypothesis for *degrowth* in Australia and only partly in the UK, as there are no negative associations with any voluntary policies. Overall, there is minimal variation in policy support associated with emissions-economy trade-off belief between Australia and the UK.

Table 4: Multivariate regression results on support for climate policy in Australia (with standardized  $\beta$  coefficients)

	Carbon tax	Fossil fuel bans	Regulation index	Subsidy index	Government investment
<b>Attitudinal variables</b>					
Emissions-economy <i>trade-off</i> belief <sup>a</sup> (reference: Decoupling)					
Growth-at-all-costs	-0.452***	-0.419***	-0.535***	-0.616***	-0.821***
Agrowth	0.329***	0.450***	0.130*	-0.073	-0.080
Degrowth	0.125	0.236**	-0.035	-0.191**	-0.078
Emissions & economy <i>trend</i> belief <sup>b</sup>					
Past emissions decreased	0.04	-0.129	0.011	-0.025	0.05
Past economy increased	0.222**	0.178*	0.111*	0.088	0.131*
Future emissions decrease	0.04	0.06	0.096*	0.152**	0.134**
Future economy increase	0.234***	0.133	0.213***	0.063	0.165**
Values					
Traditional <sup>c</sup>	-0.130**	-0.213***	-0.155***	-0.132***	-0.115***
Altruistic <sup>c</sup>	-0.011	0.007	0.031	0.139***	0.089**
Egoistic <sup>c</sup>	0.117**	0.110**	0.124***	0.041	0.066*
Openness to change <sup>c</sup>	-0.089*	-0.151***	-0.095***	-0.069*	-0.091**
General environment concern (NEP) <sup>c</sup>	0.370***	0.442***	0.376***	0.187***	0.312***
<b>Contextual variables</b>					
Policy awareness <sup>c</sup>	-0.001	-0.030	0.025	0.038	0
Political affiliation (left to right) <sup>c</sup>	-0.054	-0.033	-0.051*	-0.020	-0.061*
Lifestyle					
Technology-oriented <sup>c</sup>	0.06	0.075	0.049	0.026	0.049
Passive environmentalism <sup>c</sup>	0.079	0.178***	0.146***	0.117***	0.147***
Active environmentalism <sup>c</sup>	0.122**	0.052	-0.011	-0.012	-0.032
<b>Personal capability variables</b>					
Age <sup>c</sup>	-0.202***	-0.228***	-0.167***	-0.119***	-0.118***
Female	-0.066	0.131*	-0.102*	0.068	-0.174***
Other gender	0.722	2.756**	2.319***	1.41	1.977**
Education <sup>c</sup>	0.029	0.03	0.04	-0.004	0.054*
Household income <sup>c</sup>	-0.023	-0.027	-0.009	-0.054*	0.005
Adjusted R <sup>2</sup>	0.262	0.329	0.385	0.225	0.312
F-Statistic	16.204	21.992	27.817	13.395	20.427

$p < 0.1$  \*,  $p < 0.05$  \*\*,  $p < 0.01$  \*\*\*

<sup>a</sup> first main independent variable

<sup>b</sup> second main independent variable

<sup>c</sup> continuous variables

Table 5: Multivariate regression results on support for climate policy in the United Kingdom  
(with standardized  $\beta$  coefficients)

	Carbon tax	Fossil fuel bans	Regulation index	Subsidy index	Government investment
<b>Attitudinal variables</b>					
Emissions-economy <i>trade-off</i> belief <sup>a</sup> (reference: Decoupling)					
Growth-at-all-costs	-0.460***	-0.461***	-0.407***	-0.384***	-0.504***
Agrowth	0.244**	0.417***	0.169**	0.025	-0.044
Degrowth	0.193	0.092	0.068	-0.155*	-0.060
Emissions & economy <i>trend</i> belief <sup>b</sup>					
Past emissions decreased	-0.095	-0.013	-0.122*	-0.063	-0.092
Past economy increased	-0.111	-0.013	-0.089	-0.209***	-0.122*
Future emissions decrease	0.027	0.081	0.114*	0.153**	0.198***
Future economy increase	0.300***	0.105	0.170***	0.083	0.152**
Values					
Traditional <sup>c</sup>	-0.048	-0.079	-0.057	-0.051	-0.006
Altruistic <sup>c</sup>	0.021	0.083*	0.105***	0.127***	0.132***
Egoistic <sup>c</sup>	-0.026	0.02	-0.010	-0.001	-0.057
Openness to change <sup>c</sup>	0.093**	0.069	0.047	0.022	0.046
General environment concern (NEP) <sup>c</sup>	0.241***	0.359***	0.295***	0.169***	0.252***
<b>Contextual variables</b>					
Policy awareness <sup>c</sup>	-0.075**	-0.086**	-0.010	0.047*	0.035
Political affiliation (left to right) <sup>c</sup>	-0.135***	-0.079**	-0.088***	-0.079**	-0.064*
Lifestyle					
Technology-oriented <sup>c</sup>	0.015	0.057	0.046	0.070**	0.082**
Passive environmentalism <sup>c</sup>	0.110**	0.04	0.137***	0.123***	0.118***
Active environmentalism <sup>c</sup>	0.101**	0.210***	0.039	-0.024	0.014
<b>Personal capability variables</b>					
Age <sup>c</sup>	-0.079	-0.098**	-0.129***	-0.014	-0.156***
Female	-0.176**	-0.073	-0.205***	-0.123*	-0.223***
Other gender	1.834***	2.514***	2.013***	1.710***	2.115***
Education <sup>c</sup>	0.120***	0.158***	0.131***	0.130***	0.180***
Household income <sup>c</sup>	0.042	0.024	0.037	0.071***	0.077***
Adjusted R <sup>2</sup>	0.157	0.244	0.286	0.204	0.24
F-Statistic	8.815	14.513	17.832	11.78	14.241

$p < 0.1$  \*,  $p < 0.05$  \*\*,  $p < 0.01$  \*\*\*

<sup>a</sup> first main independent variable

<sup>b</sup> second main independent variable

<sup>c</sup> continuous variables

The regression results for beliefs in future economy and emissions changes show that the support characteristics are the same for all policy types between the two countries. In both countries, beliefs that future emissions will decrease (i.e., future decarbonization) are positively associated with support for regulations and voluntary policies, while future beliefs in economic growth are positively associated with support for the carbon tax, regulations, and government investment. However, there are discrepancies in the characteristics of climate policy support for past beliefs. The belief in past emissions decreases (i.e., past decarbonization) is not a statistically significant characteristic of support for any climate policy in Australia but is a characteristic of opposition to regulations in the UK. Beliefs in past economic growth are positively associated with support for all policies except for subsidies in Australia, while in the UK, this belief is negatively associated with subsidies and government investment. The results for beliefs in future economy and emissions changes align with the hypotheses for both countries. However, the results for beliefs in past economy and emissions changes only align with the hypothesis for the past economic trend beliefs in Australia.

The results for past belief trends can be explained by the fact that in both countries, far fewer citizens who believe in past decarbonization also believe that the government should put in more effort to address climate change (see Table B.2 in the Appendix B for cross-tabulation analysis). This may explain the negative association with support for regulations in the UK and the lack of associations between beliefs in past decarbonization and support for climate policies in both countries. For past economic growth beliefs, more Australians than UK citizens who believe the economy grew also believe the government should put more effort into climate change, helping explain why the future belief in the economic growth is a stronger characteristic of climate policy support in Australia than in the UK.

### **5.3.2. Attitudinal characteristics of climate policy support**

Besides beliefs in emissions-economy trade-offs and trends, other attitudinal characteristics matter in explaining support for all climate policy types, including ecological worldviews (measured via NEP) and altruistic, openness to change, traditional, and egoistic values. Ecological worldviews are positively associated with support for all policy types in both countries, consistent with past research suggesting that citizens with higher environmental concerns are expected to show higher pro-environmental policy support (Dietz et al., 2005; Ntanos et al., 2019; Derdowski et al., 2020). Altruistic values are positively associated with support for voluntary and compulsory policies in the UK but only positively associated with support for voluntary policies in Australia. The positive association is in line with theoretical justifications by Stern (2000) and Dietz et al. (2005) and past empirical findings (Xu et al., 2021; Odland et al., 2023). Openness to change values are only positively associated with support for the carbon tax in the UK but negatively associated with support for all policies in Australia. The results for the UK are in line with recent empirical studies by Odland et al. (2023), Rhodes et al. (2017), and Long et al. (2020) that show a positive association between openness to change values and climate policy support, but not all studies. Dietz et al. (2005) claimed there is little or no association between openness to change and pro-environmental behaviour. In Australia, it is possible that citizens may feel that climate policies inhibit their ability to travel and explore as openness to change is measured via items on wanting to have an exciting life, curiosity, and a desire to explore.

Traditional and egoistic values are not associated with support for any policy type in the UK in contrast to Dietz et al. (2005) and Stern (2000) who claim the importance of these values in explaining opposition to pro-environmental policy. However, in Australia, traditional values are negatively associated with support for all climate policies, while egoistic values are positively associated with support for all policies except subsidies. The negative association with traditional values is consistent with Dietz et al. (2005) and Stern (2000) and empirical research by Long et al. (2020, 2021). The positive association with egoistic values contradicts findings from Odland et al. (2023) and Rhodes et al. (2017) but may be explained by Bouman et al. (2018) and Weber et al. (2020) in that the citizens can be acting through self-interest or preservation to protect themselves from negative and, nowadays, more salient impacts of climate change.

### **5.3.3. Contextual characteristics of climate policy support**

Contextual variables include climate policy awareness, political orientation, and lifestyle variables (technology-oriented, passive environmentalism, and active environmentalism). Climate policy awareness is not associated with support for any climate policy in Australia. In the UK, it is negatively associated with support for the carbon tax and fossil fuel bans and positively associated with support for subsidies. A potential reason for policy awareness only being associated with policy support in the UK may be attributed to broader climate discourse in the UK than in Australia, as only 8% of Australians could identify one or more existing climate policies correctly compared to 13% of UK citizens. Perceived high costs of compulsory policies could explain why UK citizens who are aware of more policies are more likely to oppose compulsory climate policies (Carattini et al., 2018; Vona, 2019; Casey, 2022), while subsidies that directly benefit citizens see positive associations with policy support.

For political orientation, a more conservative affiliation is negatively associated with support for all policies in the UK but only for regulations and government investment in Australia. These findings are consistent with past research by Gugushvili (2021) and Bumann (2021). Interestingly, Australia's lack of association between the conservative ideology and support for the carbon tax, subsidies, and fossil fuel bans may suggest that these policies are not as politicized or present in the public discourse as they are in the UK.

Finally, technology-orientated lifestyles, where citizens are deeply engaged with new technologies, are positively associated with support for subsidies and government investment in the UK but have no association with policy support in Australia, suggesting a stronger role of technological engagement in the UK in climate policy support. The results for the UK contradict those of Odland et al. (2023), who demonstrate that technology-oriented lifestyles are negatively associated with compulsory policies but have no association with voluntary policies like subsidies or government investment. The technology-oriented nature of subsidies (e.g., for solar panels and electric vehicles) and government spending (e.g., on carbon capture and storage, low carbon hydrogen, and offshore wind) can help explain the association between technology-leaning lifestyles and support for these policies. Passive environmentalism, defined as a non-active pro-environmental engagement such as thinking about protecting the environment, is positively associated with support for voluntary and compulsory policies in both countries, and only with support for the carbon tax in the UK. Active environmentalism, defined as active pro-environmental engagement such as attending environmental meetings or engaging in

conservation activities, is positively associated with support for the carbon tax and fossil fuel bans in the UK, but only with support for the carbon tax in Australia. These results show that actively environmentally engaged citizens only show positive associations for more compulsory pricing and regulatory policies, while passively engaged citizens also have positive associations with support for voluntary policies. The results for both environmental lifestyles are consistent with those of Odland et al. (2023), Axsen et al. (2012), and Long et al. (2021). The findings show that UK citizens with both passive or active environmental lifestyles support pricing and bans more than Australians, suggesting a potentially greater role of environmentalism in climate policy implementation in the UK.

#### **5.3.4. Personal capability characteristics of climate policy support**

Finally, personal capabilities include socio-demographics such as age, gender, education, and income. Older citizens are more likely to oppose all climate policies in Australia and regulations, fossil fuel bans, and government investment in the UK. This result is expected and consistent with Gugushvili (2021), Bumann, (2021) and Odland et al. (2023). The female gender is negatively associated with support for all policies except fossil fuel bans in Australia, and it is negatively associated with support for regulations and government investment in the UK. The only positive association for the female gender is found for fossil fuel bans in the UK. The negative associations are surprising as females are typically more likely to engage in pro-environmental behaviours and support climate policies compared to males (Gugushvili, 2021; Rhodes et al., 2017). There could be suppression from other variables affecting the coefficients sign, as the VIF detected no multicollinearity (Portland State University, 2024). Interestingly, the 'other' gender category, where citizens self-identified as another gender other than male or female, including 'non-binary,' 'genderfluid,' and 'genderqueer,' has positive statistically significant associations with support for compulsory and voluntary policies in both countries. However, these results are based on very small sample sizes (less than ten citizens per country), so they should be considered cautiously. Additionally, associations between 'other' genders and pro-environmentalism or climate policy support are understudied, making it difficult to interpret if these are the expected results. But these are novel results that deserve further investigation as 'other genders' may have salient equity-deserving voices in climate policy implementation.

Higher education is positively associated with support for all climate policies in the UK but only with support for government investment in Australia. These results are observed in Odland et al. (2023), as higher education is associated with higher support for climate policies. Australia implemented a 'sustainability cross-curriculum priority' (S-CCP) in 2012 for schools, but according to Hill et al. (2020), implementation issues and a lack of understanding of sustainability by teachers has hampered the S-CCP's effectiveness. Contrary to Australia, the UK has a long history of environmental education (Scott, 2020), with the most recent advancement being the Sustainability and Climate Change Strategy launched by the UK's Department of Education in 2022 (United Kingdom Government, 2022). Therefore, no associations between Australians' educational level and support for most climate policies may be related to less effective sustainability and climate education in the curriculum as compared to the UK. Finally, household income is positively associated with support for subsidies and government investment in the UK but negatively associated with support for subsidies in Australia. A positive association between income and climate policy support is the expected result, as wealthier individuals can pay for environmental initiatives (e.g., carbon taxes and related low-carbon technologies such as

electric vehicles) while also meeting their other basic needs (Kuznets, 1955; Kaika & Zervas, 2013; Gugushvili, 2021). In the UK, a positive association between income and voluntary policy support agrees with Rhodes et al. (2017). Australia's negative association between income and subsidy support contradicts expectations but is consistent with Odland et al. (2023). A potential reason for Australians having this negative association is that wealthier individuals benefit less from subsidies compared to other income groups.

## Chapter 6: Conclusions

### 6.1. Summary of results

Climate policy support varies by policy type in Australia and the United Kingdom. In both countries, voluntary policies receive the highest citizen support, followed by regulatory policies. Carbon taxes are the least supported or most opposed in both jurisdictions, regardless of UK's climate policy progress. These results are consistent with past research, including by Odland et al. (2023), Kitt et al. (2021), Long et al. (2020), and Rhodes et al. (2014, 2017). When comparing citizen support for climate policies between the two countries, levels of support for voluntary and compulsory policies are similar. However, mean support for household subsidies, business subsidies, and energy efficiency regulations is higher in Australia than in the UK at a statistically significant level. This could be because subsidies and energy efficiency regulations do not require stopping fossil fuel consumption, helping maintain citizen support for these policy tools in Australia, where emissions have not been effectively decoupled from economic growth.

The distribution of citizen beliefs in economic growth paradigms they would like their government to pursue, is similar in both countries. Almost half of the citizens believe in *decoupling* (48% in Australia and 47% in the UK), followed by *agrowth* (21% in Australia and 19% in the UK), *growth-at-all-cost* (16% in Australia and 15% in the UK), and *degrowth* (10% in both countries). This suggests that the rate of actual decoupling of emissions from economic growth is not linked to the distribution of citizen beliefs in different growth paradigms. For beliefs in emissions and economic trends, more citizens in both countries believe that their country's emissions have increased than decreased, while many thought their country's economy shrunk. Similar results are found for beliefs in future emissions trajectories. These results show that citizens generally have lower confidence in their country's ability to reduce emissions or, in the UK's case, are unaware of past emission reduction successes. Also, relatively large portions of citizens in both countries are pessimistic about past and future economic growth, which is surprising given that both countries' GDPs grew between 2015 and 2023, setting a precedent for continued growth. Generally, large segments of the populations in both countries were unaware of the actual state of their country's economy and emission reduction, yet their beliefs in the past and future emissions and economy trends mattered for climate policy support as found in regression results.

The study also adds to the academic literature by testing associations between beliefs in emissions-economy trade-offs and support for a number of voluntary and compulsory climate policies. Regression results suggest that citizens who are less concerned with economic growth or the impact of climate policies on the economy are more likely to show a positive association with support for compulsory climate policies. Further, optimism over future economic growth and emissions reduction has a stronger explanatory role than past beliefs for climate policy support. However, the belief that the past economy grew is a more important characteristic of policy support in Australia than the UK, potentially suggesting that citizen support for climate policies in countries with a lower decoupling rate is influenced more by past economic trends. Still, the general conclusion is that *beliefs* (rather than actual knowledge of) in emissions-economy trade-offs and in past and future emissions and economic trends influence climate policy support in both Australia and the UK in a similar manner, regardless of their different decoupling rates.

The regression results also add to the existing literature by showing that other characteristics are important for climate policy support. For both countries, ecological worldviews are positively associated with all climate policies. Passive environmentalism is positively associated with support for compulsory and voluntary policies, and active environmentalism is only positively associated with support for compulsory policies. Associations between policy awareness and climate policy support are only found in the UK, likely due to a greater citizen awareness of climate policies compared to Australians. The results show that climate policy awareness is negatively associated with the carbon tax and fossil fuel bans and positively associated with subsidies, lending further evidence that the cost-visibility of the most compulsory policies leads to decreased support. As a reminder, policy awareness only tests citizen awareness of policies, not their actual knowledge of policy benefits or drawbacks. Finally, the ‘other’ gender category had very strong positive associations with both voluntary and compulsory policies in both countries, but the results should be taken cautiously due to the small sample size. Including an ‘other’ gender category is rarely seen in research and should be incorporated into future studies to broaden understanding of climate policy opinion.

## **6.2. Limitations and future research**

The study has several limitations that present opportunities for future research. First, it only compares two developed countries with different decoupling rates without controlling for their structural economic differences. Although the results give some insight into differences (or lack thereof) in climate policy support and characteristics of support for the two countries, generalizing the results to other countries should be done cautiously. Future research may consider conducting a truly comparative analysis when studying the UK and other countries by controlling for each country’s economic structure and over-sampling separate region countries in the UK for regional representativeness.

Additionally, the study omits less advanced countries, meaning the results cannot be generalized to all countries. Future research should include multi-country comparisons including high-, medium-, and low-income countries, to understand discrepancies between the global north and south for climate policy support and support characteristics. Further, given the survey’s static nature, it is important to note that citizen beliefs may change over time. Future research could include longitudinal survey studies to assess the dynamics of public opinion about climate policies and drivers of policy support.

Next, the study only focuses on one aspect of political acceptability – citizen support. However, policy decisions are also influenced by different industries and advocacy groups when implementing climate policies (London School of Economics, 2023; Crowley 2021a). Future studies could consider conducting semi-structured interviews with these groups to better understand their beliefs in emissions-economy trade-offs with an associated impact on climate policy decisions, if any.

In regression analyses, the study combined support for the ZEV sales mandate, cleaner fuel regulations, and energy efficiency regulations into a regulation index and household and business subsidies into a subsidy index. While the aggregated policies are similar in their mechanisms, our approach to simplify the regressions might have reduced granularity for how characteristics of support differ for these policies. Future studies could focus on analyzing support for these individual policies.

When studying beliefs in emissions-economy trade-offs, a single categorial question was employed to align with different economic growth paradigms. Future research could employ multi-item questions assessed via factor analysis to gain more nuanced understanding of perceived trade-offs between climate and economic goals. Additionally, the regressions tested for associations between various characteristics and climate policy support rather than testing causation. Future research may want to divide respondents into a control and a test group that is given information about the benefits/drawbacks of climate policies on the economy to see if there is an effect on support.

For the “other gender” category, the low sample size in each country means the results should be taken cautiously. Future research may consider oversampling the “other gender” category to gain more precise associations. For the policy awareness variable, future research may take this notion a step further by exploring the impact of knowledge of a policy’s benefits and drawbacks on climate policy support.

Finally, there are the limitations associated with the survey questionnaire (Stantcheva, 2022). Responses might have been subject to an anchoring bias in that the order and nature of questions could have influenced subsequent answers. Respondents might have also answered some questions to make themselves appear better, known as a social desirability bias, or to influence potential research results and ultimate climate policy recommendations, known as strategic bias. The acquiescence bias, which is when responses tend to be mostly positive (e.g., “strongly agree” responses), could have also been present, especially if respondents found the questions complicated, lacked knowledge or interest, or had survey fatigue. These biases are difficult to detect when cleaning data, making them especially noteworthy.

### **6.3. Policy implications**

Despite the limitations, the study offers several important considerations for climate policymakers. First, governments should redirect their efforts from promoting climate policy as an important lever to address climate change to communicating observed and future economic and social benefits of low-carbon economy, to improve climate policy support. This is because (i) citizens are less likely to support climate policies if they *believe* the policies will negatively affect the economy (regardless of their actual impact on the economy), and (ii) optimistic *beliefs* over future economic growth and emissions reduction is associated with higher climate policy support. Therefore, targeted communication about social and economic gains from climate action versus climate inaction can reduce citizen opposition towards climate policies. In addition, governments and policy advocacy groups may choose to communicate success cases of decoupled economies like the UK's to increase optimism about the future economy and emissions reductions. Finally, citizen engagement in environmental activities is important, as initiatives that actively involve the public in such activities may increase climate policy support. Having more environmental stewardship programs and educating youth and university students about the importance of individual contribution, altruism, low-carbon technology choices, and social movements to improve climate policy, can increase citizens’ environmental engagement, which may also augment climate policy support.

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## Appendix A. Survey questionnaire



### International Well-Being Survey

This survey asks what you think about your country's economic well-being and its emissions of greenhouse gases. Emissions of greenhouse gases, from activities like burning oil, gas, and coal, contribute to climate change, also sometimes referred to as global warming.

We encourage you to complete this survey on your own to ensure we accurately understand your individual views. *We would like to hear your thoughts regardless of whether you know a lot or a little about environmental issues.* Please feel free to choose "Prefer not to answer / don't know" at any point.

4.1. Could you please indicate your age?

- \_\_\_\_\_
- Prefer not to answer

4.3. What is the highest level of education you have completed?

- High school or less
- Some college or other non-university certificate or diploma
- Bachelor's degree
- Master's degree
- Doctorate or PhD degree
- Prefer not to answer

4.5. What is your approximate *annual household income?* (Adjusted to USD)

- \_\_\_\_\_
- Prefer not to answer

### Section 1: Your country

In this first section, we will ask you some questions about how you see [COUNTRY's] economy and impact on the environment. When we talk about the economy, we include ways that societies manage their natural resources and deal with wastes. Economies can grow or decline to produce more or less things.

1.1. To start, which of the following three statements do you think is most accurate?

- Climate change is happening now, caused mainly by human activities
- Climate change is happening now, but caused mainly by natural forces
- Climate change is not happening now
- Prefer not to answer / don't know

1.2. How worried are you about climate change?

- Not at all worried
- Not very worried
- Somewhat worried
- Very worried
- Extremely worried
- Prefer not to answer / don't know

1.5. In 2015, [COUNTRY] joined other countries around the world in signing the Paris Agreement to limit climate change. How much do you think [COUNTRY's] greenhouse gas emissions have gone up or down since then? 0 indicates no change. -100% means emissions have reduced to zero. +100% means emissions have doubled.

- [SLIDER BETWEEN -100% to +100%]
- Prefer not to answer / don't know

1.6. And, in this same period, since 2015 till now, how much do you think the size of [COUNTRY's] economy (measured with so-called "gross domestic product" or GDP) increased or decreased? 0 indicates no change. -100% implies the economy has reduced greatly. +100% implies the economy's size has doubled.

- [SLIDER BETWEEN -100% to +100%]
- Prefer not to answer / don't know

1.7. Since joining the Paris Agreement in 2015, how much of an economic price do you think [COUNTRY] has paid for the efforts it has made to reduce its greenhouse gas emissions?

- No price at all
- A low price
- A moderate price
- A high price
- A very high price
- Prefer not to answer / don't know

1.8. Looking to the future, how much do you think [COUNTRY's] greenhouse gas emissions will likely go up or down by the year 2030, compared to now? 0 indicates no change in emissions by 2030. -100% implies emissions will reduce to zero. +100% implies emissions will double by 2030.

- [SLIDER BETWEEN -100% to +100%]
- Prefer not to answer / don't know

1.9. Looking to the future, how much do you think [COUNTRY's] economy will likely grow or shrink by 2030? 0 indicates no change in the economy size by 2030. -100% implies the economy will reduce greatly. +100% implies the economy's size will double by 2030.

- [SLIDER BETWEEN -100% to +100%]
- Prefer not to answer / don't know

1.10. Looking to the future, how much of an economic price do you think [COUNTRY] will pay for its efforts to reduce its greenhouse gas emissions?

- No price at all
- A low price
- A moderate price
- A high price
- A very high price
- Prefer not to answer / don't know

1.11. In your **lifetime**, in each of the following ways, would you say the state of the environment in [COUNTRY] has gotten better or worse?

	<b>Getting worse</b>	<b>Same</b>	<b>Getting better</b>	<b>Prefer not to answer</b>
1) Air quality in the area where you live	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2) Protection of wildlife and wilderness in [COUNTRY]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3) Children's exposure to dangerous substances like lead and dioxins	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4) Greenhouse gas emissions contributing to climate change	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

1.12. Which of the following do you believe?

- Reducing greenhouse gas emissions will require growing the economy
- Reducing greenhouse gas emissions will require shrinking the economy
- Reducing greenhouse gas emissions will not require either growing or shrinking the economy
- Prefer not to answer / don't know

1.13. Which of the following do you think the [COUNTRY's] government should do?

- Reduce greenhouse gas emissions regardless of any impacts on the economy
- Grow the economy regardless of any impacts on greenhouse gas emissions
- Reduce greenhouse gas emissions and shrink the economy at the same time
- Try to grow the economy and reduce greenhouse gas emissions at the same time
- Prefer not to answer / don't know

## Section 2: Government and policies

In this section, we'd like to hear your thoughts and opinions on [COUNTRY's] policies aimed at limiting climate change. A **climate policy** is any action taken by the government to try to limit climate change, such as programs and regulations encouraging the use of greener technologies and discouraging people from doing things that cause emissions. By "greener" we mean technologies that emit little or no greenhouse gases.

2.1. In general, how much MORE effort, if any, do you think [COUNTRY's] government should be making to introduce laws and policies to reduce climate change?

- No more effort
- A little more effort
- Somewhat more effort
- Quite a bit more effort
- A great deal more effort
- Prefer to not answer / don't know

2.2. Could you please list any climate policies that you believe [COUNTRY] is already using to reduce its greenhouse gas emissions? There is space below for you to list up to five policies.

*If you can't think of any, that's okay. Please select "I can't think of any policies currently used by the government in my province/territory."*

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- I can't think of any policies currently used by the government of [COUNTRY]

2.5. In general, how much would you oppose or support the [COUNTRY] government using each of the following kinds of policies in trying to reduce climate change?

*By "strongly oppose" we mean you would not want your government to put in place and/or continue that policy, while "strongly support" means you would want that policy to be put in place or continue.*

	Strongly oppose	Oppose	Neutral	Support	Strongly support	Prefer not to answer
1) Taxes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2) Regulations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3) Bans	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Strongly oppose	Oppose	Neutral	Support	Strongly support	Prefer not to answer
4) Subsidies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5) Information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6) Government investments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2.6. Now, please read these short descriptions of common policies for reducing greenhouse gas emissions:

1. **Carbon tax** – a tax applied to all fossil fuels such as natural gas and oil based on how much carbon they release when burned (for example, a carbon tax would be added to a gasoline bill when fueling your car at the pump).
2. **Regulations:**
  - **Cleaner fuel regulation** – a requirement to have more biofuels like ethanol in the gasoline or diesel mix (also sometimes called a low carbon fuel standard).
  - **Energy efficiency regulation** – a requirement that new buildings, appliances, and/or equipment are more energy efficient.
  - **Zero-emission vehicle sales mandate** – a requirement for car manufacturers to sell a higher percentage of zero-emission (e.g., electric and hydrogen vehicles) vehicles every year. The policy eventually eliminates all fossil fuel combustion vehicles.
3. **Ban on fossil fuels** – government requirements to ban combustion of certain fuels like coal or oil.
4. **Subsidies:**
  - **Subsidy for households** – a grant, rebate, low-interest loan or other financial benefit given for actions that reduce emissions by individuals, such as buying a heat pump, an electric vehicle, or an energy efficient device.
  - **Subsidy for businesses** – a grant, rebate, low-interest loan or other financial benefit given for actions that reduce emissions by businesses, such as buying equipment to reduce emissions in buildings and fleet, and training workers to use low-carbon technology.
5. **Information** – information that might induce individuals and businesses to voluntarily acquire technologies or change behaviour to reduce emissions (for example, information on the advantages of home retrofits and public transit).
6. **Government investment** – government directly invests in projects that reduce emissions, for example, investments in public transportation and building bike lanes.

I have read the definitions of the common policies for reducing greenhouse gas emissions



In general, how much would you oppose or support the [COUNTRY] government using each of the following kinds of policies in trying to reduce climate change?

*By “strongly oppose” we mean you would not want your government to put in place and/or continue that policy, while “strongly support” means you would want that policy to be put in place or continue.*

	<b>Strongly oppose</b>	<b>Oppose</b>	<b>Neutral</b>	<b>Support</b>	<b>Strongly support</b>	<b>Prefer not to answer</b>
1) Carbon tax	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2) Cleaner fuel regulation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3) Energy efficiency regulation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4) Zero-emission vehicle sales mandate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5) Ban on fossil fuels	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6) Subsidy for households	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7) Subsidy for businesses	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8) Information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9) Government investment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2.7. To what extent do you perceive these policies to reduce climate change to be fair or unfair?

	<b>Very unfair</b>	<b>Unfair</b>	<b>Neutral</b>	<b>Fair</b>	<b>Very fair</b>	<b>Prefer not to answer</b>
1) For <i>industries and businesses</i> in [COUNTRY]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2) For <i>people</i> in [COUNTRY]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2.8. How strongly do you agree or disagree with the following statements? If our country introduces new policies to reduce climate change, it will...

	<b>Strongly disagree</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Agree</b>	<b>Strongly agree</b>	<b>Prefer not to answer</b>
1) Achieve the promised goal of reducing climate change	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2) Put my own job at risk	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3) Lead to higher costs of living	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Prefer not to answer
4) Reduce our country's employment and harm our economy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5) Reduce my life satisfaction	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2.9. Now we would like to get your feelings toward different groups of people in your country.

- **Ratings between 50 and 100 degrees** mean that you **feel favorable and warm** toward the group people.
- **Ratings between 0 and 50 degrees** mean that you **don't feel favorable** toward the group of people and that you don't care too much for them.

Please rate each of the following group:

	0 Very cold or unfavorable	50 No feeling at all	100 Very warm or favorable	Prefer not to answer
1) People in [COUNTRY] who <b>support policies</b> to reduce climate change	Slider from 0 to 100, an increment of 1.			<input type="radio"/>
2) People in [COUNTRY] who <b>oppose policies</b> to reduce climate change	Slider from 0 to 100, an increment of 1.			<input type="radio"/>

2.10. To what extent do you agree or disagree with each of the following statements?

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Prefer not to answer
1) In a group, we should sacrifice our individual interests for the sake of the group's collective interest	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2) For the sake of national interest, the individual interest could be sacrificed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### Section 3: Values and beliefs

Thank you for answering our questions on the economy, emissions, and policies in [COUNTRY]. This next section is going to focus on your values, beliefs, and worldviews in general.

3.1. How much do you personally trust each of the following institutions on a score of 0-10? 0 means you do not trust an institution at all, and 10 means you have complete trust.

	No trust at all										Complete trust	Prefer not to answer
	0	1	2	3	4	5	6	7	8	9	10	
1) [COUNTRY's] parliament	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2) The legal system	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3) Politicians	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4) Scientists in academia	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5) Fossil fuel companies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6) Clean or renewable energy companies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7) Non-profit environmental groups	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8) United Nations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3.2.1. With respect to economic issues, where would you place yourself on a scale of 0 to 10, where 0 means the left and 10 means right?

- 0 – Left
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9

- 10 – Right
- Prefer not to answer

3.2.2. With respect to social/cultural issues, where would you place yourself on a scale of 0 to 10, where 0 means liberal and 10 means conservative?

- 0 – Liberal
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10 – Conservative
- Prefer not to answer

3.3. Please read the following sentences and indicate your agreement or disagreement.

	<b>Strongly disagree</b>	<b>Disagree</b>	<b>Somewhat disagree</b>	<b>Somewhat agree</b>	<b>Agree</b>	<b>Strongly agree</b>	<b>Prefer not to answer</b>
1) I think everyone should be free to do as they choose, so long as they don't infringe upon the equal freedom of others	○	○	○	○	○	○	○
2) People should be free to decide what group norms or traditions they themselves want to follow	○	○	○	○	○	○	○
3) People who are successful in business have a right to enjoy their wealth as they see fit	○	○	○	○	○	○	○
4) Society works best when it lets individuals take responsibility for their own lives without telling them what to do	○	○	○	○	○	○	○

	<b>Strongly disagree</b>	<b>Disagree</b>	<b>Somewhat disagree</b>	<b>Somewhat agree</b>	<b>Agree</b>	<b>Strongly agree</b>	<b>Prefer not to answer</b>
5) The government interferes far too much in our everyday lives	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6) The government should do more to advance the common good, even if that means limiting the freedom and choices of individuals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7) Property owners should be allowed to develop their land or build their homes in any way they choose, as long as they don't endanger their neighbors	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3.4. How interested would you say you are in politics?

- Not at all interested
- Hardly interested
- Quite interested
- Very interested
- Prefer not to answer / don't know

3.5. How strongly do you agree or disagree with the following statements?

	<b>Strongly disagree</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Agree</b>	<b>Strongly agree</b>	<b>Prefer not to answer</b>
1) Politicians need to follow the will of the people	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2) I would rather be represented by a citizen than by a specialized politician	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3) Politics is ultimately a struggle between good and evil	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3.6. How strongly do you agree or disagree with the following statements?

	<b>Strongly disagree</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Agree</b>	<b>Strongly agree</b>	<b>Prefer not to answer</b>
1) [COUNTRY] should limit the import of foreign products in order to protect its national economy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2) [COUNTRY] should limit immigration in order to protect our national way of life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3) International organizations are taking away too much power from the [COUNTRY NATIONALITY] government	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3.7. If you had to choose among the following things, which are the two that seem most desirable to you? *Please choose two answers.*

- Maintaining order in the nation
- Giving the people more say in important political decisions
- Fighting rising prices
- Protecting freedom of speech
- Prefer not to answer / don't know

3.8. How important are each of these values in your life?

	<b>Not important at all</b>	<b>Not important</b>	<b>Moderately important</b>	<b>Important</b>	<b>Extremely important</b>	<b>Prefer not to answer</b>
1) Honoring parents and elders, showing respect	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2) Self-discipline, self-restraint, resistance to temptation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3) Respecting the earth (living in harmony with other species)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	<b>Not important at all</b>	<b>Not important</b>	<b>Moderately important</b>	<b>Important</b>	<b>Extremely important</b>	<b>Prefer not to answer</b>
4) Unity with nature (fitting into nature)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5) Equality (equal opportunities for all)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6) Helping others (working for the welfare of others)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7) Influence (having an impact on people and events)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8) Wealth (material possessions, money)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9) An exciting life, stimulating experiences	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10) Curiosity, many interests, desire to explore	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3.9. To what extent do you agree or disagree with the following statements about natural environments?

	<b>Strongly disagree</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Agree</b>	<b>Strongly agree</b>	<b>Prefer not to answer</b>
1) The so-called “ecological crisis” facing humankind has been greatly exaggerated	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2) If things continue on their present course, we will soon experience a major ecological catastrophe	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3) Humans have the right to modify the natural environment to suit their needs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4) Humans are severely abusing the environment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5) When humans interfere with nature, it often	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	<b>Strongly disagree</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Agree</b>	<b>Strongly agree</b>	<b>Prefer not to answer</b>
produces disastrous consequences						
6) The balance of nature is very delicate and easily upset	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7) The earth is like a spaceship with limited room and resources	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8) We are approaching the limit of the number of people the earth can support	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3.10. How much do you agree or disagree with the following statements about consequences of climate change? *We would like to hear your thoughts regardless of whether you know a lot or a little about climate change.*

	<b>Strongly disagree</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Agree</b>	<b>Strongly agree</b>	<b>Prefer not to answer</b>
1) More species will be lost in [COUNTRY] due to climate change	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2) More species will be lost in the world due to climate change	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3) Health problems in [COUNTRY] will increase due to climate change	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4) Health problems in the world will increase due to climate change	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5) The economy in [COUNTRY] will suffer due to climate change	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6) The world economy will suffer due to climate change	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

7) The standard of living of many people in [COUNTRY] will decrease due to climate change	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8) The standard of living of many people in the world will decrease due to climate change	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3.11. To what extent do you feel a personal responsibility to try to reduce climate change on a scale from 0 “Not at all” to 10 “A great deal”?

- 0 – Not at all
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10 – A great deal
- Prefer not to answer / don’t know

3.12. Some people try to protect the environment in their personal lives. How much effort do you make to live an environmentally friendly lifestyle?

- No effort at all
- A little effort
- A moderate effort
- Quite a bit of effort
- A great deal of effort
- Prefer not to answer / don’t know

3.13. How frequently do you engage in the following activities?

*Think about how often you engage in these activities, or how much time you devote to these activities.*

	<b>Never</b>	<b>Rarely</b>	<b>Occasionally</b>	<b>Frequently</b>	<b>Very frequently</b>	<b>Prefer not to answer</b>
1) Researching new technologies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2) Shopping for new technologies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Never	Rarely	Occasionally	Frequently	Very frequently	Prefer not to answer
3) Talking about new technologies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4) Working on or tinkering with technology	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5) Thinking about protecting the environment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6) Trying to help the environment through daily actions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7) Attending environmental meetings	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8) Engaging in environmental conservation activities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9) Promoting environmental conservation (talking to people about the environment)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3.14. Do you do any of the following to reduce your carbon emissions?

	Never	Rarely	Occasionally	Frequently	Very frequently	Prefer not to answer
1) Try to reduce carbon emissions as much as possible in my daily life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2) Buy green products and services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3) Try to reduce emissions to heat and/or cool my home	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4) Drive an electric car and/or motorcycle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5) Eat less meat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6) Fly less frequently	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7) Use public transportation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8) Biking and/or walking when possible	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3.15. How strongly do you agree or disagree with each of the following statements?

When I hear people saying our country needs to do more to fight climate change, it feels like what they want to do...

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Prefer not to answer
1) Contradicts the way I think of <i>myself as a person</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2) Fits <i>other people's agenda</i> more than mine	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3) Fits <i>other countries' agenda</i> more than our country's	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Section 4. More details about you

In this last section, we'd like to learn a little more about you. This survey is anonymous, and the information in this section will be used only for statistical purposes.

4.2. Could you please indicate the gender identity you identify with?

- Male/Man
- Female/Woman
- None of the above. I identify as: \_\_\_\_\_
- Prefer not to answer

4.4. How many people live in your household (including yourself)?

- Only myself
- 2 people
- 3 people
- 4 people
- 5 or more people
- Prefer not to answer

4.6. How do you feel about your household's income nowadays?

- Living comfortably on present income
- Coping on present income
- Finding it difficult on present income
- Finding it very difficult on present income
- Prefer not to answer

4.7. How much would you say you earn compared to most people around you?

- More than most people
- About the same as other people
- Less than most people
- Prefer not to answer

4.8. How do you feel about your current standard of living?

- I could get by with less than I have
- I am quite satisfied with the way things are now
- I would like to raise my standard of living
- Prefer not to answer

4.9. Could you please indicate your work status?

- Employed or self-employed
- Unemployed
- Not in the labour force (students, homemakers, retired workers, seasons workers in an 'off' season who were not looking for work, and persons who could not work because of a long-term illness or disability)

4.10. Which of the following industries *best describes your employment* sector now or when you were last employed/self-employed.

- Agriculture, forestry, fishing and hunting
- Mining
- Oil and gas extraction
- Renewable energy/clean energy
- Utilities
- Construction
- Manufacturing
- Wholesale trade
- Retail trade
- Transportation and warehousing
- Information and cultural industries
- Finance and insurance
- Real estate and rental and leasing
- Professional, scientific and technical services
- Management of companies and enterprises
- Administrative and support, waste management and remediation services
- Educational services
- Health care and social assistance
- Arts, entertainment and recreation
- Accommodation and food services
- Public administration / public service
- Other occupations
- Prefer not to answer

4.11. Which of the following categories best describes the area where you live?

- Urban (city centre with dense housing)
- Suburban (just outside a city, with more spread out housing)
- Rural (far away from a city, with very spread out housing)

4.12. What is your postal code?

**You have finished the survey!**

Thank you for taking the time to complete the International Well-Being. We truly value the information you have provided. Your responses will contribute to our analysis and understanding of public preferences for the economic well-being and emissions.

## Appendix B. Supplementary tables and figures

Table B.1: Lifestyle variable factors

	Factors Australia <sup>a</sup>			Factors UK <sup>b</sup>		
	Technologically Oriented	Passive environmentalism	Active environmentalism	Technologically Oriented	Passive environmentalism	Active environmentalism
How often do you engage in these activities:						
Researching new technologies	<b>0.814</b>			<b>0.792</b>		
Shopping for new technologies	<b>0.863</b>			<b>0.854</b>		
Talking about new technologies	<b>0.852</b>			<b>0.858</b>		
Working or tinkering with technology	<b>0.761</b>			<b>0.705</b>		
Thinking about protection the environment		<b>0.898</b>			<b>0.876</b>	
Trying to help the environment through daily actions		<b>0.861</b>			<b>0.799</b>	
Attending environmental meetings			<b>0.889</b>			<b>0.806</b>
Engaging in environmental conservation activities			<b>0.840</b>			<b>0.937</b>
Promoting environmental conservation (talking to people about the environment)		0.307	<b>0.583</b>			<b>0.666</b>
Cronbach's alpha	0.90	0.86	0.87	0.88	0.83	0.87

<sup>a,b</sup> Factors loadings <0.3 are not shown. Bolded values indicate the variable with the strongest correlation for the given factor.

Table B.2 – Cross-tabulations of beliefs of past emissions and economy changes and belief of how much more effort the government should take to address climate change.

<i>Australia - Past emissions belief &amp; Gov effort</i>			<i>Australia - Past economy belief &amp; gov effort</i>		
Government effort	BPED* - yes	BPED* - no	Government effort	BPGdpI** - yes	BPGdpI** - no
No effort	44	99	No effort	89	54
Minimal/somewhat more effort	115	233	Minimal/somewhat more effort	270	78
Quite a bit/a great deal more effort	143	366	Quite a bit/a great deal more effort	404	105
Don't know	4	25	Don't know	27	2

<i>United Kingdom - Past emissions belief &amp; gov effort</i>			<i>United Kingdom - Past economy belief &amp; gov effort</i>		
Government effort	BPED* - yes	BPED* - no	Government effort	BPGdpI** - yes	BPGdpI** - no
No effort	45	65	No effort	62	48
Minimal/somewhat more effort	111	265	Minimal/somewhat more effort	244	132
Quite a bit/a great deal more effort	137	357	Quite a bit/a great deal more effort	294	200
Don't know	4	25	Don't know	24	5

\* BPED – Belief that past emissions decreased  
 \*\* BPGdpI – Belief that the past economy increased

Figure B.1: Australia – Scree plot to determine the number of lifestyle factors

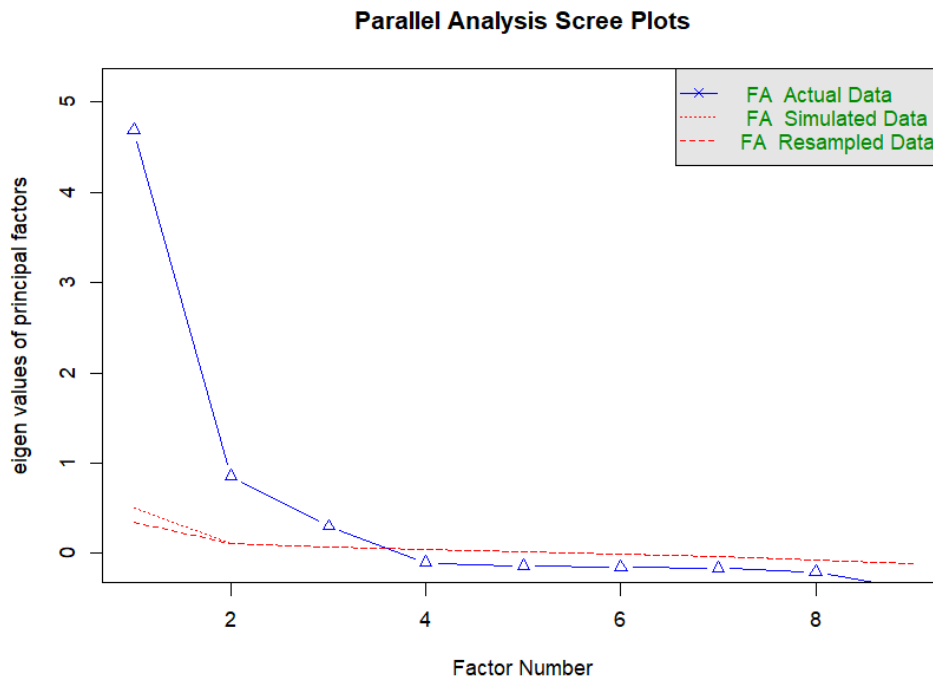


Figure B.2: United Kingdom – Scree plot to determine the number of lifestyle factors

