Energy Policy Preferences in Times of Crisis: Evidence from survey experiments in the UK*

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This Version: 15th September 2024

Abstract

Understanding public support for energy policy is crucial for designing feasible interventions to mitigate climate change and reach net-zero goals. This is particularly the case given the increased salience surrounding energy policy in light of the major disruptions to global energy markets generated by the 2022 Russian invasion of Ukraine. Combining framing and conjoint experiments, I examine how framing and policy design shape public support for energy policy responses to this crisis in the UK. Results show that the public has strong preferences over specific policy features, supporting investment in renewables, reductions of energy imports from Russia and non-democracies, and policies that shield vulnerable groups. While security framing increases support for energy policy, its effect is smaller than that of policy design, and it has little impact on policy design preferences overall. The findings suggest that substantive policy designs remain crucial for generating public acceptance of energy policy, even in times of crisis.

*This paper has previously been presented at The Political Economy of Energy Conference, USC Price School of Public Policy and Workshop on The Politics of Climate Change: Current Issues and Challenges at Universität Luzern, and greatly benefited from the participants feedback and suggestions. Particular thanks are reserved for Paasha Mahdavi's detailed comments on the paper. The data collection for this project was funded by Royal Holloway, University of London. Replication data will be available upon publication at https://doi.org/10.7910/DVN/RUNQHV

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1 *Introduction*

The global transition towards cleaner, more sustainable energy systems is the bedrock of efforts to mitigate climate change and reach net-zero goals in many countries. The salience of energy supply, and public awareness of its importance, has increased significantly in many countries due to shocks to the global energy market triggered by 2022 Russian invasion of Ukraine. In the absence of government intervention, energy bills were expected to rise by £2000 for the average household in the UK,[1] compounding a broader ongoing cost of living crisis. In this context, understanding public preferences and support for potential energy policy options is crucial for designing politically feasible policies that can overcome potential short-term obstacles generated by the energy crisis to enable long-term renewable energy supplies as part of the green transition.

A large body of literature examines two key determinants of support for green policy interventions: policy framing and policy design. In the context of climate change, a significant body of literature has examined the role of framing to increase engagement with and support for climate policy (Nisbet, 2009; Lakoff, 2010; Lockwood, 2011; Bain et al., 2012; Myers et al., 2012; Bain et al., 2016; Drews and van den Bergh, 2016). While this has led to a large number of frames being explored in the literature, other research suggests caution in treating framing as a "silver bullet", and that framing effects are either limited or highly contextual (e.g. Bernauer and McGrath, 2016; Bergquist and Mahdavi, 2023). In contrast, research examining the role of policy design, emphasises

[1] https://www.resolutionfoundation.org/publications/a-chilling-crisis/

the role that key policy features can play in shaping public support for significant green policy interventions (e.g. Stokes and Warshaw, 2017; Bergquist et al., 2020; Wicki et al., 2020; Mildenberger et al., 2022), particularly with regard to the use of compensation to build broader bases of policy support for stringent policy and avoid backlash (e..g. Beiser-McGrath and Bernauer, 2019a; Gaikwad et al., 2022; Colantone et al., 2023; Beiser-McGrath and Bernauer, 2024). In spite of their prominence, extant work has not typically examined the *relative* importance of framing and policy design. This has important consequences for understanding climate and energy policy, as they offer distinct mechanisms for understanding public acceptance of policy interventions. While framing broadly takes policy as given, and considers communication the key means of increasing public acceptance, design-centric perspectives emphasizes that the choice of policy features is integral to political feasibility. This debate has significant implications for our ability to accurately gauge and potentially increase mass support for climate policies.

This paper aims to contribute to this ongoing debate by examining citizens' preferences over energy policy design in response to the 2022 energy crisis in the UK. Specifically, I investigate three key questions. First, which policy features and frames that affect public support for energy policy interventions? Second, what is the relative impact of framing compared to policy design when examining public acceptance of energy policy? Finally, how does support for energy policies and preferences for policy design vary depending on individuals' characteristics, such as their political affiliations, economic circumstances, and attitudes towards international issues?

To do so, this paper utilises survey experiments from an original survey fielded in the UK from 15th to 17th August 2022, at the height of concerns about the cost and supply of energy entering the colder parts of the year where higher energy consumption is required. The survey combines a conjoint experiment with a framing experiment in order to: i) examine citizens preferences over energy policy design in response to the energy crisis, ii) identify the effect of framing on support for policy responses writ large and iii) explore how framing affects the relative importance of policy features in assessing individuals' design preferences for responses to the energy crisis. This design, by randomizing both framing and policy design simultaneously, allows for the identification of the relative causal effects of these different means for fostering public acceptance.

The UK in this time period is an ideal opportunity to examine how "windows of opportunity" can trigger demands for policy interventions (e.g. Kingdon, 1984). In the field of climate change, previous research has examined how societal crises, such as economic crises and COVID-19, have led to changes in individuals' policy preferences and attitudes (e.g. Scruggs and Benegal, 2012; Shum, 2012; Mildenberger and Leiserowitz, 2017; Beiser-McGrath, 2022; Bergquist et al., 2023; Rudolph and Gomm, 2024). Given the UK's energy crisis economic impacts, and intimate connection to issues of energy supply and the green transition, it provides an ideal case to examine which aspects of political communication, framing and policy design, are particularly salient in times of crisis.

The results find that policy framing and design have differential impacts in shaping public support for energy policy in response to the energy crisis. First,

analysis of the conjoint experiment reveals that individuals have distinct preferences regarding the design of energy policies, with strong support for renewable energy sources, targeted support schemes for vulnerable groups, and measures to reduce reliance on energy imports from Russia and non-democracies. Second, I find that Security framing significantly increases public support for energy policy interventions, while Economic framing fails to do so. Nevertheless, policy design continues to have a stronger impact on public support than framing. Third, framing has relatively little impact on individuals' policy design preferences, other than the case of investments in Gas, suggesting that economic and security concerns surrounding energy induce some increased support for transition fuels. Fourth and finally, I find that security framing is particularly effective at increasing support amongst those who support UK intervention in the Russia-Ukraine conflict and Labour Party voters.

The paper contributes to a large body of literature that broadly seeks to understand the political economy of climate and energy policy, with particular emphasis on the political feasibility and public acceptance of various policies. First, it provides new evidence on the role of policy design in shaping public opinion towards energy policy and policies to facilitate the green transition (e.g. Stokes and Warshaw, 2017; Rabe, 2018; Beiser-McGrath and Bernauer, 2019a; Bergquist et al., 2020; Wicki et al., 2020; Beiser-McGrath and Bernauer, 2024), in the case of responding to global energy supply shocks. Second, it adds to debates on the efficacy and importance of framing in shaping public support for climate policies (e.g. Bernauer and McGrath, 2016). While there remain concerns that the efficacy of framing may be overemphasized in generating meaningful support for

policy (e.g. Bernauer and McGrath, 2016; Bergquist and Mahdavi, 2023), a recent body of research finds national security framing to be effective within the USA (e.g. Feldman and Hart, 2018; Bayer and Ovodenko, 2019; Gainous and Merry, 2022; Uji et al., 2023a,b). This paper extends this analysis to the UK and finds that security framing does cause an increase support for energy policy, unlike economic framing. Nevertheless, comparison of effect sizes suggests that policy design remains of primary importance over framing for significantly increasing public acceptance of policy interventions. Finally, the paper adds to a recent body of research that examines the importance of international ideational concerns for environmental policy in the UK (e.g. Bayer and Genovese, 2020) and the support for domestic climate policy in an interdependent world (e.g. Beiser-McGrath and Bernauer, 2019a, 2022). This paper finds further evidence that this is the case, with significant variation in support for domestic energy policy responses and security framing effectiveness by individuals' foreign policy preferences regarding intervention the Ukraine-Russia conflict.

The paper proceeds as follows. First, I outline the theoretical background that underlies the examination of how policy framing and design shape individuals' support for and preferences over energy policy. Second, I discuss the combination of survey experiments fielded in the UK in 2022 that are utilised to identify the causal effects of design and framing considerations. Third, I present the results of the empirical analysis of the survey experiments. The final section offers concluding thoughts.

2 Theoretical Background

In this section I outline the theoretical background that informs the role of framing and policy design in shaping pubic support for and preferences over energy policy in response to the energy crisis. To do so, I first discuss the role of framing in persuading the public to invest in energy policy. Following this I then discuss the role that policy design plays in shaping public support for investment in energy policy.

2.1 Framing

Framing has a long history as a means of increasing public support for policy interventions (Chong and Druckman, 2007). The study of framing in the areas of climate, energy, and environmental policy has generated a large academic literature in the past decade, spurred by perceived inaction and lack of interest on the issue of climate change and necessary policy responses. In the context of climate change, particular emphasis has been put upon the idea of the use of framing to emphasise "co-benefits", that is, benefits from policy intervention beyond those benefitting the climate, in areas such as the economy, health, and national security (Lakoff, 2010; Lockwood, 2011; Bain et al., 2012; Myers et al., 2012; Bain et al., 2016; Drews and van den Bergh, 2016). While this has led to a large number of frames being explored in the literature, other research suggests caution in treating framing as a "silver bullet", and that framing effects are either limited or highly contextual (e.g. Bernauer and McGrath, 2016; Bergquist and Mahdavi, 2023).

While there are numerous frames that could be applied to the topic of the energy crisis, in this paper I focus on two particular frames: the Economy frame and the Security frame. Economic framing focuses on the broader benefits of clean energy policies for the economy, such as reduced volatility in energy prices and associated costs. Security framing portrays energy policy as a means of maintaining a nation's safety and interests, for example through weakening dependence on fossil fuel imports from hostile nations which may put energy security at risk.

Economic framing can increase support for climate policies by emphasising the economic co-benefits from taking action. Typically studies focus on the extent to which policy can increase economic growth and reduce energy costs and volatility. In a notable recent study Gustafson et al. (2022), find that economic framing primarily works through its emphasis on cost reductions, with framing that emphasises economic growth (e.g. Bain et al., 2012) not generating durable changes in policy support, echoing previous research (Bernauer and McGrath, 2016). Therefore, in examining the role of economic framing in the context of the UK energy crisis, I examine economic framing that emphasises how the UK's reliance on fossil fuels makes it susceptible to disruptions to gas and oil supplies, which lead to rising prices for consumers and businesses, that increase the cost of living.

National security has become an increasingly prominent frame for climate change and clean energy (e.g. Feldman and Hart, 2018; Bayer and Ovodenko, 2019; Gainous and Merry, 2022; Uji et al., 2023a,b). This recent body of research, typically examines the effectiveness of national security framing in the context

of energy independence within the USA, finding it shapes support for various forms of energy policy. Therefore, in examining the role of security framing in the context of the UK energy crisis, I examine security framing that emphasises how disruptions to gas and oil supplies leave the UK economy vulnerable to other countries, and the importance of energy policy for energy independence and the UK's national security.

In the context of the energy crisis, and given the findings of the existing literature, these frames can be considered "most likely" cases in terms of finding effects. In a context of war leading to large energy supply constraints and material economic impacts, economic and security framing are likely to be incredibly salient, and therefore effective, in shaping individuals' support of and preferences for energy policy.

2.2 Policy Design and Support for Energy Policy

Responding to the increased recognition of the limited efficacy of framing, an emerging literature has placed renewed focus on the importance of policy design for shaping public support for significant green policy interventions (e.g. Stokes and Warshaw, 2017; Rabe, 2018; Beiser-McGrath and Bernauer, 2019a; Bergquist et al., 2020; Wicki et al., 2020; Mildenberger et al., 2022; Beiser-McGrath and Bernauer, 2024). The key insights of this literature is that support can be increased, even for costly policies such as carbon taxes (e..g. Beiser-McGrath and Bernauer, 2019a, 2024), through the design of policy. Typically, this involves the combination of different policy instruments in order to balance costs and benefits, thereby broadening the base of support for the policy intervention.

In the context of the UK energy crisis, I focus on five features of policy design that are relevant for public support for energy policy.

First, individuals' have preferences over the types of **energy sources** to be invested in as part of the UK's energy policy. This ranges from renewable energy (e.g. solar and wind) to fossil fuels (e.g. coal and gas), as well as energy sources that generate low CO2 emissions but are controversial from an environmental perspective (e.g. nuclear power). In the context of the 2022 energy crisis, governments faced a trade-off between investing in renewable energy to reduce long-term dependence on imported fossil fuels, or instead continue and expand fossil fuel usage to substitute the reduced energy access generated by the conflict.[2]

The public's support for an energy policy is likely to be influenced by the specific energy sources prioritized. Previous research has shown that people tend to divided opinions about different energy technologies. For instance, individuals broadly tend to prefer renewables to fossil fuels, and in envisioning future energy policy scenarios renewable energy sources often enjoy high levels of support (e.g. Hobman and Ashworth, 2013; Demski et al., 2017). However, support may be lower for onshore wind compared to offshore due to concerns about visual and noise impacts.[3] Nuclear power and fracking are however more divisive due to their localised environmental impacts (e.g. Pidgeon et al., 2008; Corner et al., 2011; Boudet et al., 2014; Kim et al., 2014).

[2]For example, Germany re-activated Coal plants due to be decommissioned in response to the energy crisis https://www.bloomberg.com/news/articles/2023-10-04/germany-orders-three-old-lignite-plants-to-operate-in-winter

[3]As of 2015 the UK effectively has a de-facto ban on onshore wind due to planning permission requirements https://commonslibrary.parliament.uk/research-briefings/sn04370/

Second, individuals will have preferences over the **funding** of energy policy responses. Specifically, funding mechanisms vary in the extent to which they impose burdens on different segments of the population. For example, funding mechanisms such as windfall taxes on oil and gas companies and carbon taxation, follow the polluter pays principle in placing the financial burden of energy transitions on those who have profited from the current energy system. This contrasts, with more conventional fiscal policy instruments used by governments, such as raising income taxes, issuing government debt, or reducing public spending in other areas, which broadly affect the population.

Public support for energy policy in this context, is therefore likely to be influenced by how it is funded. Previous research documents individuals' sensitivity to difficult fiscal choices, with policies tending to be more popular when their costs are less visible or perceived as falling on those with a greater responsibility (Neimanns et al., 2018; Beiser-McGrath et al., 2023; Bremer and Bürgisser, 2023; Busemeyer and Beiser-McGrath, 2024). In this context, funding the policy through windfall taxes on oil and gas companies is likely to be the most popular instrument, given the significant profits made by firms in response to the Russian invasion of Ukraine. In contrast, conventional instruments which personally affect the disposable incomes and services available to individuals, such as income tax rises and reduction of public spending, are likely to be the least popular.

Third, energy policy can impose **import restrictions** fossil fuels into the UK. The policy could ban imports of fossil fuels from Russia specifically, imports from all non-democratic countries, or have no import restrictions. In the context of

the current energy crisis, which has been exacerbated by Russia's invasion of Ukraine, there have been active debates around the security and geopolitical implications of fossil fuel imports. Restricting imports could be seen to incentivise a decoupling of the UK's energy supply from Russia and other autocratic countries, thereby reducing the UK's dependence on such countries and exposure geopolitical risks. However, import restrictions may increase prices in the short term by limiting supply, which in the context of a cost of living crisis may be considered a step too far.

While less extensively studied compared to other policy attributes, from a theoretical perspective discussions of energy import restrictions tap in to similar logics as those regarding national security framing and energy independence (Bolsen and Shapiro, 2018; Feldman and Hart, 2018; Bayer and Ovodenko, 2019; Gainous and Merry, 2022; Uji et al., 2023a,b). In doing so it activates more belligerent aspects of national security in the realm of energy, with restrictions potentially being seen as a means to withhold support and revenues from hostile regimes. In the context of the Russian invasion of Ukraine and its subsequent impacts on global energy markerts, such restrictions may be seen as a necessary step to increase long-run energy independence and sufficiency.

Fourth, individuals can have preferences over the use of **subsidies** which provide financial incentives for households and individuals to invest in technologies or behaviors that reduce energy use or emissions. This includes subsidies for greening households, for example through improving energy efficiency or installing solar panels or heat pumps, or electrifying transport through subsidies for purchasing electric vehicles and funding electric public transport. In

this context subsidies can help insulate individuals in the long-run from the energy price rises generated by shifts in the global market, by either reducing the amount of energy required to be purchased (through energy efficiency and solar generation) or by lessening reliance on fossil fuel generated energy through electrification.

Public support for an energy policy is likely to be shaped by the inclusion of subsidies and the specific technologies targeted. Subsidies that are seen as providing direct benefits for households are likely to increase policy support. Nevertheless, one would expect that inclusion of "pull" measures, such as subsidies, within energy policy broadly increase policy support (e.g. Steg et al., 2006). A recent example is Beiser-McGrath et al. (2023), who find that the negative effect of a fuel tax on support for vehicle usage policies in Beijing Delhi is offset by pledging the generated revenue to subsidise public transport and electric vehicles.

Fifth and finally, **support schemes** within the energy policy includes, such as financial support to help certain groups cope with potentially higher energy costs, can also affect individuals' support. This support could be directed towards pensioners, low-income households, those in lower council tax bands, or there could be no additional support. Support schemes are a way to address the distributional impacts of the energy crisis, as well as of the energy policy itself given differences in individuals ability to take advantage of subsidies and reliance on fossil fuels for home heating and transportation.

Prior research finds that the addition of support schemes, can significantly increase public acceptance of costly climate and energy policy. For example,

Beiser-McGrath and Bernauer (2019b) find that using the revenue generated by carbon taxes to provide transfers or reduce income taxes to the population broadly increases the acceptance of more stringent carbon taxes. Additionally, tax rebates associated with carbon taxes can increase support amongst lower-income groups through the compensation provided by this form of redistribution (Beiser-McGrath and Bernauer, 2024). More broadly, the linking of social policies with green policy can foster additional support for policy interventions (Bergquist et al., 2020), with compensation being critical for the green transition (Gaikwad et al., 2022). Therefore, I expect that the addition of such transfer schemes increase support for an energy policy proposal.

3 Research Design

In order to examine the effect of framing and policy design upon energy policy preferences, I fielded an original survey in the UK from 15th to 17th August 2022. Respondents were recruited through the Lucid platform (Coppock and McClellan, 2019) and completed the survey in Qualtrics. In order to ensure representativeness, I use quotas for age, country (England, Northern Ireland, Scotland, Wales), education, and sex based upon the UK census. I initially started with a sample of 1180 respondents recruited from Lucid. To ensure respondent quality 149 respondents are removed who fail an attention check where they are asked to click the "Neither agree nor disagree" response for a statement.

The survey consists of two survey experiments, in order to examine these research questions.

1. Pre-treatment items
2. Framing Experiment
3. Conjoint Experiment & Outcomes

First, the survey includes pre-treatment survey items relating to individuals characteristics used to ensure representative sampling and characteristics relevant for exploring conditional effects of framing and policy design upon policy support. Specifically, the following characteristics are explored in terms of moderating effects:

- **Intervention in UKR:** To what extent do you support or oppose UK intervention in the Russia-Ukraine conflict?[4]
- **EU Referendum:** In the referendum on membership of the EU in 2016, what did you vote for?[5]
- **Party Support:** Which political party do you feel closest to politically?[6]
- **Costs of Living (Experiences):** In the last 12 months has it been more difficult or easier to pay your everyday costs of living?[7]
- **Costs of Living (Expectations):** In the next 12 months do you think it will be more difficult or easier to pay your everyday costs of living?[8]

[4]For analysis this is recoded to a binary variable with 1 = {Strongly Support, Somewhat Support} and 0 otherwise.

[5]For analysis I focus on differences between Brexit and Remain voters.

[6]For analysis I focus on supporters of the two major political parties: the Conservative Party and Labour Party.

[7]For analysis this is recoded to a binary variable with 1 = {Very Difficult, Somewhat Difficult} and 0 otherwise.

[8]For analysis this is recoded to a binary variable with 1 = {Very Difficult, Somewhat Difficult} and 0 otherwise. Cost of living categories are then created based upon the possible combinations of experiences and expectations: Always = (1,1), Entering = (0,1), Leaving = (1,0), Never =

Second, the survey includes a framing experiment immediately before the conjoint experiment, that is used to examine how framing affects individuals' support for energy policy and their preferences over its design. The framing experiment has the following three experimental conditions:

- **Control:** We are interested on your views about how the government can manage the UK's energy supply.
- **Economy:** <Control Text> + The UK's reliance on fossil fuels has significant consequences for the economy. Disruptions to gas and oil supplies lead to rising prices for consumers and businesses, that increase the cost of living. Therefore, as a matter of *economic stability*, a new energy policy is important to ensure energy supply in the UK.
- **Security:** <Control Text> + The UK's reliance on fossil fuels has significant consequences for its energy security. Disruptions to gas and oil supplies leave the UK vulnerable to other countries. Therefore, as a matter of *national security*, a new energy policy is important to ensure energy independence for the UK.

Finally, the survey respondents participate in a conjoint experiment, that allows identification of how variation in policy design shapes citizens' preferences over energy policy.

The conjoint experiment consists of the following attributes:

- **Energy Sources:** Type of energy source invested in.
- **Funding:** Source of funding for program.

(0,0).

Table 1: Energy Policy Attributes for Conjoint Experiment

Attribute	**Attribute Features**
Energy Source	Onshore Wind
	Offshore Wind
	Solar
	Nuclear
	Shale Gas (Fracking)
	Gas
	Coal (Baseline)
Funding	Windfall Tax on Fossil Fuel Producers
	Reduce Spending in Other Areas
	Increase Taxes on Fossil Fuels
	Increase Income Tax and National Insurance
	Increase Government Debt (Baseline)
Import Restrictions	Ban Fossil Fuels from Non-Democracies
	Ban Russian Fossil Fuels
	No Initiative (Baseline)
Subsidies	Household Solar Installation
	Household Heat Pumps
	Household Energy Efficiency
	Electric Public Transport
	Electric Cars and Chargers
	No Subsidies (Baseline)
Support Schemes	Pensioner
	Low Income Groups
	Council Tax Bands A to D
	No Scheme (Baseline)

- **Import Restrictions:** Existence of energy import bans on targeted countries.
- **Subsidies:** Type of energy and green subsidies provided.
- **Support Scheme:** Existence of targeted support schemes.

which specific attribute values displayed in table 1.

Respondents evaluate five pairs of hypothetical policies[9], answering the following outcome questions:

- **Forced Choice:** Which policy do you prefer?
- **Support for Policy A:** How much do you support or oppose <Policy A>?
- **Support for Policy B:** How much do you support or oppose <Policy B>?

The forced choice outcome allows identification of the causal effect of a policy attribute feature on choosing one policy over another (relative to baseline), as is typically analysed in a conjoint experiment (Hainmueller et al., 2013). Importantly, however, this only allows estimation of the relative support of an individual or set of policy attributes, and not absolute levels of support that are often the relevant quantity of interest in understanding public opinion. Therefore, I use support items for each policy when identifying the effect of framing on energy policy support and assessing the relative importance of framing compared to policy design.[10]

4 Results

I now turn to presenting the results. To do so, I first examine the role of policy design in isolation by analysing the conjoint experiment in the control group.

The conjoint experiment reveals several important findings about public preferences for energy and economic policies in the UK. First, when it comes to

[9]This results in $5 \times 2 \times n$ observations for the statistical analysis.

[10]For analysis this is recoded to a binary variable with 1 = {Strongly Support, Somewhat Support} and 0 = {Strongly Oppose, Somewhat Oppose}. Setting

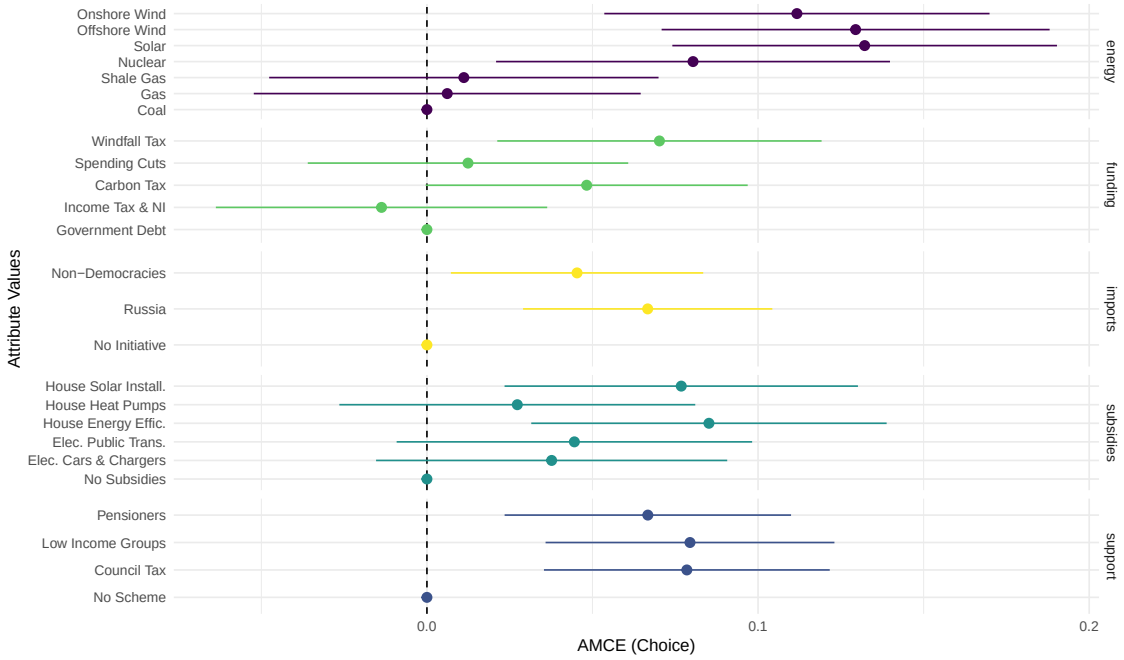

Figure 1: Energy policy choice depends upon policy features. Points indicate Average Marginal Component Effects (AMCEs). Lines indicate 95% confidence intervals. Data restricted to respondents in the control group.

energy sources, respondents show a significant preference for renewable energy (e.g. onshore wind, offshore wind, and solar energy). Nuclear energy also receives some support, although to a lesser extent. In contrast, coal, gas, and shale gas are the least preferred. This suggests that in response to the energy crisis faced in this time period, the public prioritised investment in clean and renewable energy sources, rather than doubling down on fossil fuels.

Second, regarding funding options for energy initiatives, the only options with statistically significant effects are the windfall tax and carbon tax. This indicates that respondents follow the polluter pays principle when considering financing new energy policy, particularly in light of the significant increases in energy company's profits in the context of the crisis. In contrast, efforts that increase

income, involve spending cuts, or increase government debt see lower levels of support.

Third, the results find that individuals' have a preference for reducing reliance on energy imports. Respondents favour initiatives that both limit imports from Russia and non-democracies, suggesting a desire for greater energy independence and a concern about relying on these particular sources for energy supplies.

Fourth, with regard to subsidies, individuals prefer options that provide benefits directly to households in the form of subsidies financing energy efficiency measures and solar installation. Interestingly, subsidising heat pumps does not lead to a statistically significant increase in support, perhaps reflecting uncertainty regarding the newness of the technology in domestic usage. Additionally, support for electrified transport options also do not generate statistically significant increases in policy popularity.

Finally, the experiment reveals that respondents favour all forms of targeting schemes to different vulnerable groups at broadly the same effect size. This suggests redistributive and social policy component aspects of energy policy design can bolster support.

I now turn to examining how the framing of energy policy intervention affects overall support levels of energy policy. Table 2 displays the effect of framing on individuals' support for each energy policy. First, the constant in Model 1 reveals the baseline proportion of support relative to opposition in the control group, finding that there is a clear majority of support relative to opposition,

Table 2: Effect of Treatments on Support for Energy Policy

	(1)	(2)
Economy Framing	−0.004	−0.006
	(0.014)	(0.014)
Security Framing	0.031**	0.033**
	(0.013)	(0.013)
Constant	0.618***	0.579***
	(0.010)	(0.020)
Covariate Adjustment	No	Yes
Num.Obs.	7603	7603

* p < 0.1, ** p < 0.05, *** p < 0.005

absent framing. Turning to the treatment effects, we find that while Security framing has a clear and statistically significant effect this is not the case for the Economy frame. This echoes previous discussions that context is likely important for the possibility of a frame to have an effect, with the invasion of Ukraine and subsequent energy crisis creating the perfect storm for Security framing to significantly increase support.

I now turn to examining whether framing has an effect upon individuals' preference for specific policy design features. Figure 2 displays the difference between AMCEs for policy features in the treatment group (Economic or Security) and the control group. We see that, apart from the source of energy, there is relatively little impact of the treatments on preferences for particular policy features. The source of energy, however, does see significant differences in AMCEs for both treatments.

Notably, both treatments significantly increase the importance of gas in the energy mix for respondents. Given that both treatments explicitly talk about gas

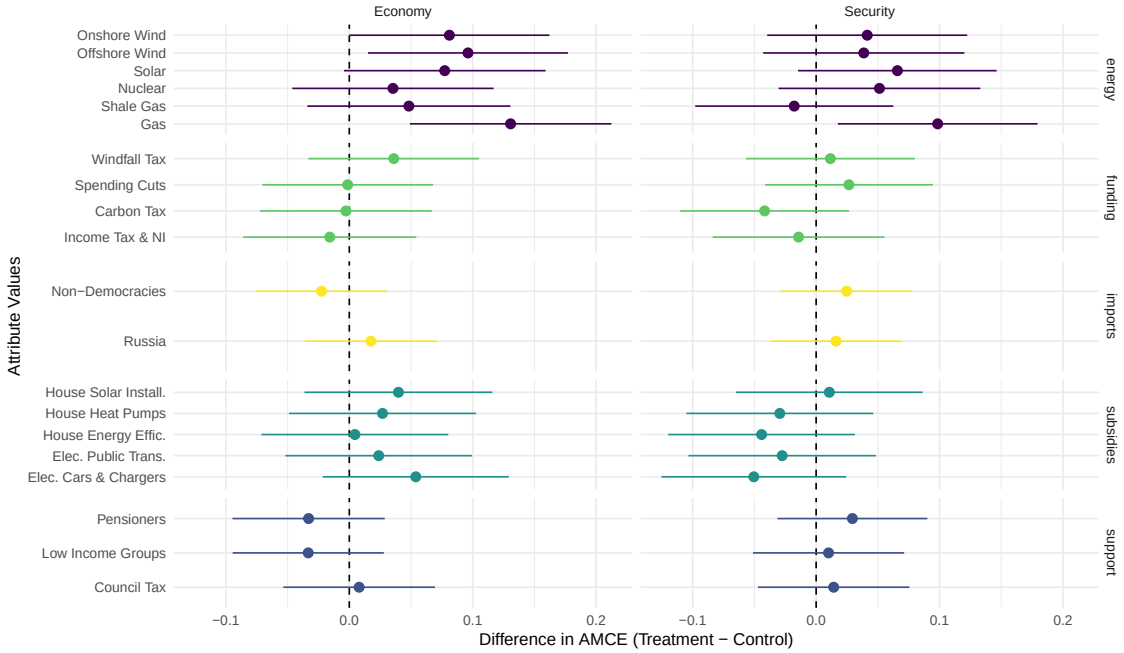

Figure 2: Framing has a limited impact on preferences over energy policy design. Points indicate the difference in Average Marginal Component Effects (AMCEs) between the treatment group (Economic or Security) and the control group. Lines indicate 95% confidence intervals.

disruption, this suggests that this framing leads respondents to increase support for addressing this supply problem directly rather than substitute through alternative sources of energy. We do see some additional evidence that the economic frame leads to a further increase in support for renewables, while there is not a statistically significant increase in support for these when receiving the security frame.

Finally, I examine the relative importance of framing versus policy design when understanding changes in support for energy policy. Figure 3 displays the causal effect of the policy design attribute features upon absolute support for a policy, ordered by substantive magnitude, with the Security frame treatment

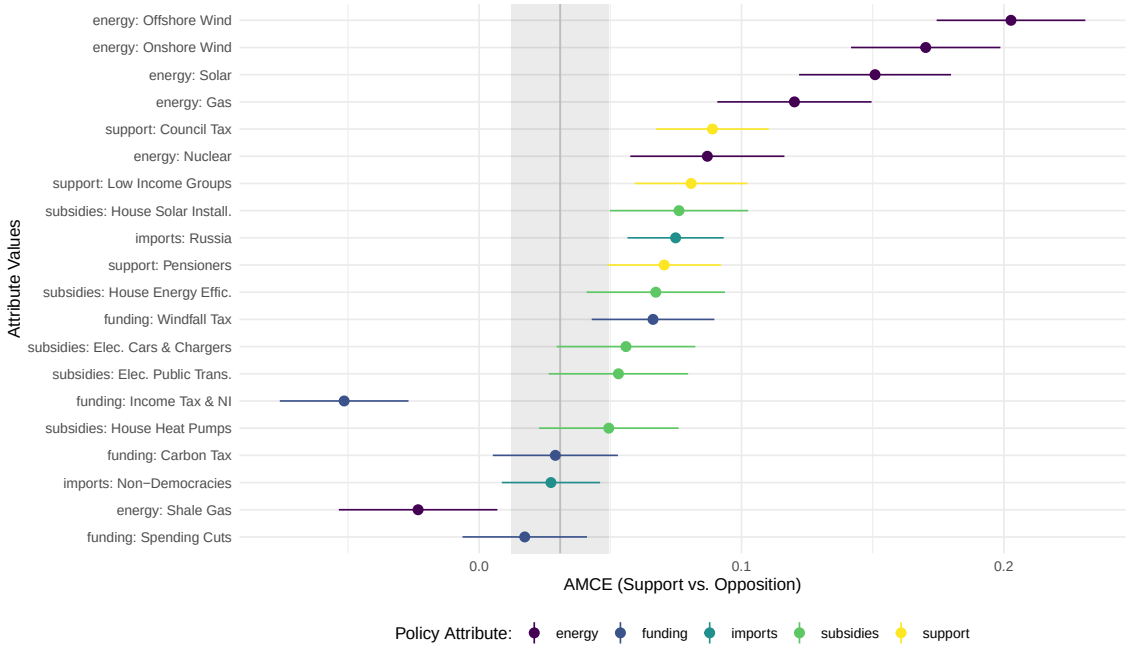

Figure 3: Framing has a limited impact on support for energy policy, compared to policy features. Points indicate the Average Marginal Component Effects (AMCEs) of policy features. Lines indicate 83.4% confidence intervals to allow visual comparison of statistically significant differences between effects (Knol et al., 2011). Gray horizontal line indicates the estimated treatment effect of the security frame, with 83.4% confidence intervals indicated by the grey polygon.

effect plotted for comparison. As can be seen, a majority of policy features have significantly larger effects on policy support compared to the framing. This suggests that in the grand scheme of things, policy design remains the primary lever by which public acceptance of energy policy can be fostered.

4.1 Exploring Heterogeneity

I now turn to examining the extent to which individuals' prior characteristics conditions the effects of framing and policy design on support for energy policy.

To do so, I draw upon respondents' characteristics relating to foreign policy preferences, political party affiliation, and economic positions to examine their relevance for the role of framing and policy design in shaping energy policy preferences.

Table 3 displays how the effect of framing varies by these relevant sub-groups. In doing so, I find that there is a strong divergence in the effectiveness of the Security frame when examining individuals' foreign policy preferences relating to UK intervention in the Russia-Ukraine conflict. Amongst those who are supportive of intervening, the Security frame significantly increases the proportion of support vs. opposition to the energy policy by approximately 7 percentage points. In contrast, those not supporting intervention do not meaningfully respond to this frame.

The other notable source of treatment effect heterogeneity is again with regard to the comparison between Conservative and Labour Party voters, where it is Labour Party voters who are most responsive to the Security frame. In the control group Labour Party voters have lower levels of support for the proposed energy policies (62.3% compared to 68.4% for Conservative voters), potentially due to the perception it will be implemented by the incumbent Conservative government. As a result it appears that the Security frame is able to diminish partisan differences, by increasing support amongst Labour voters to a similar level to that of Conservative voters.

The remaining respondent characteristics do not show meaningful signs of treatment effect heterogeneity, with Leave and Remain voters responding almost identically, and individuals with different experiences during the cost of living

Table 3: Effect of Treatments on Support for Energy Policy by Sub-Group

	Intervene in UKR		EU Referendum		Party		Costs of Living Difficulty			
	Support	Oppose	Brexit	Remain	Conservative	Labour	Always	Entering	Leaving	Never
Economy Framing	0.023	−0.029	−0.016	−0.007	−0.036	−0.013	0.007	0.003	0.016	−0.034
	(0.019)	(0.020)	(0.022)	(0.021)	(0.026)	(0.022)	(0.020)	(0.032)	(0.097)	(0.027)
Security Framing	0.068***	0.009	0.048**	0.045**	−0.032	0.056**	0.026	0.044	0.003	0.032
	(0.019)	(0.019)	(0.021)	(0.021)	(0.026)	(0.021)	(0.019)	(0.032)	(0.076)	(0.026)
Constant	0.621***	0.572***	0.460***	0.612***	0.607***	0.578***	0.528***	0.538***	0.809***	0.661***
	(0.029)	(0.027)	(0.052)	(0.028)	(0.045)	(0.029)	(0.028)	(0.047)	(0.118)	(0.040)
Covariate Adjustment	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Num.Obs.	3658	3945	3104	3274	2061	2959	3869	1364	266	2104

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.005$

crisis not having any significant differences in framing effectiveness. This lends further credence to the weakness of the Economy frame, as even those most economically harmed by the energy crisis are unresponsive to it as a means of increasing policy support.

Next, I examine whether these characteristics shape the importance of particular policy features in assessing energy policy options. As displayed in Figure 4, we see that there is very little variation in the effect of different policy features when examining differences between subgroups. While there are occasionally substantively relevant differences, such as Brexit and Conservative voters' prioritisation of pensioners relative to Remain and Labour voters, there is not strong systematic differences across all facets of policy to facilitate meaningful overall differences in policy design preferences amongst the sub-groups.

In summary, the results suggest that there is some heterogeneity in the effectiveness by respondents' prior characteristics, further emphasising the context conditional nature of framing effectiveness. In contrast, there are few significant differences in the effect of policy features by these same groups, suggesting that policy design is a more robust and universal approach to increasing support for energy policy.

5 Conclusion

The global need to transition towards more sustainable energy systems is a challenge that requires a deep understanding of public preferences and support for different policy interventions. As countries around the world seek to design

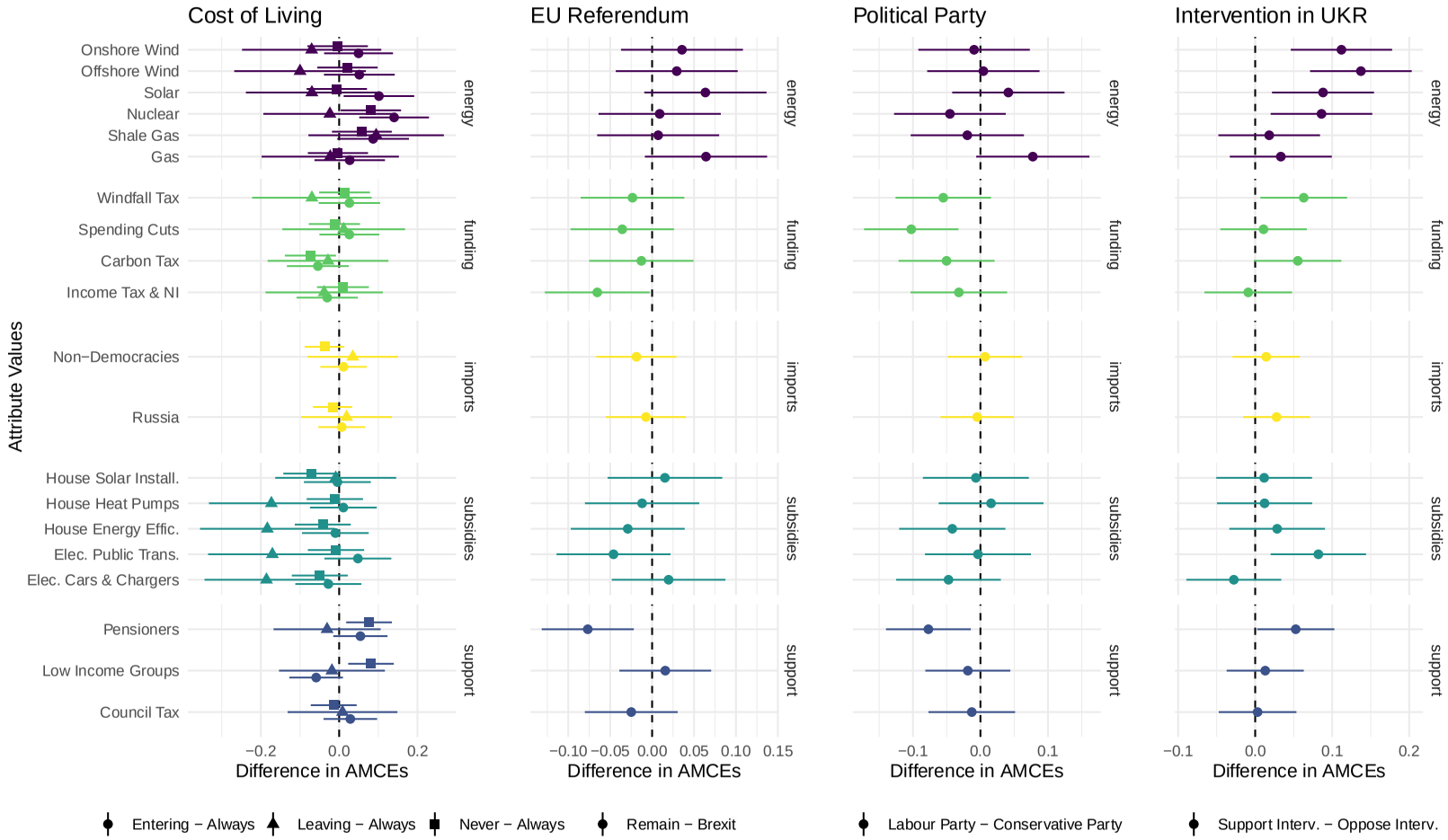

Figure 4: The effect of respondent characteristics on importance of specific features in energy policy design. Points indicate the difference in Average Marginal Component Effects (AMCEs) between the sub-groups based on respondent characteristics. Lines indicate 95% confidence intervals.

and implement effective energy policies to reduce greenhouse gas emissions and combat climate change, the framing of these issues and the specific design features of proposed interventions have emerged as crucial factors shaping the success of these efforts. The 2022 energy crisis in the UK, triggered by the Russian invasion of Ukraine, serves as a particularly relevant case study for examining the role framing and policy design play in shaping public opinion, in a situation where energy policy was particularly salient.

This paper fielded original survey experiments in August 2022 within the UK, to understand the role of policy design and framing in shaping individuals' support for energy policy responses. The results find that both policy framing and design play a role in shaping public support for energy policy in response to the energy crisis. First, analysis of the conjoint experiment reveals that individuals have distinct preferences regarding the design of energy policies, with strong support for renewable energy sources, targeted support schemes for vulnerable groups, and measures to reduce reliance on energy imports from Russia and non-democracies. Second, I find that Security framing significantly increases public support for energy policy interventions, while Economic framing fails to do so. Nevertheless, policy design continues to have a stronger impact on public support than framing. Third, framing has relatively little impact on individuals' policy design preferences, other than the case of investments in Gas, suggesting that economic and security concerns surrounding energy induce some increased support for transition fuels. Fourth and finally, I find that security framing is particularly effective at increasing support amongst those who support UK intervention in the Russia-Ukraine conflict and Labour Party

voters.

These findings contribute to the existing literature on energy policy preferences and public opinion in several ways. First, it provides new evidence on the role of policy design in shaping public opinion towards energy policy and policies to facilitate the green transition (e.g. Stokes and Warshaw, 2017; Beiser-McGrath and Bernauer, 2019a; Bergquist et al., 2020; Wicki et al., 2020; Beiser-McGrath and Bernauer, 2024), in the case of responding to global energy supply shocks. Second, it adds to debates on the efficacy and importance of framing in shaping public support for climate policies (e.g. Bernauer and McGrath, 2016; Bergquist and Mahdavi, 2023), identifying the conditions under which national security framing can play some (small) role in increasing policy support(e.g. Feldman and Hart, 2018; Bayer and Ovodenko, 2019; Gainous and Merry, 2022; Uji et al., 2023a,b). Third, the paper further highlights the international embeddedness of energy policy and the role this plays in shaping individuals' policy preferences (e.g. Beiser-McGrath and Bernauer, 2019a; Bayer and Genovese, 2020; Beiser-McGrath and Bernauer, 2022).

Future research could further investigate the role of fiscal costs of energy policy in shaping public acceptance and political feasibility. A body of research has more closely examined the cost implications of policy in terms of willingness to pay (e.g. Kaplowitz and McCright, 2015; Kotchen et al., 2017), with pocketbook considerations found to be particularly important for understand the political feasibility of carbon taxation (Beiser-McGrath and Bernauer, 2024). Extending this logic to estimate willingness to pay for energy investment, at a time when individuals are faced with pocketbook considerations, offers the potential for

further understanding potential economy-environment trade-offs inherent in the green transition (e.g. Scruggs and Benegal, 2012; Shum, 2012; Mildenberger and Leiserowitz, 2017; Beiser-McGrath, 2022). This would also prove a stricter test on the potential role of national security framing in increasing policy support.

More broadly, the paper has broader policy implications in the realm of energy policy responses, particularly given recent disruption to global energy markets. First, policy designs that involve investing in renewable energy sources, providing targeted support for vulnerable groups, and reducing dependence on energy imports from hostile nations, are significantly more supported by the public. There is little evidence of a public interested in delaying the green transition in response to the recent disruption in global energy markets. Second, emphasising the security dimensions of energy policy can play a limited role in building public support, although its effects are confined to distinct constituencies. Thus, finally, policy that generates public acceptance can not rely solely on messaging and framing strategies but rather focus on developing substantive policy solutions that recognise and address the multidimensional nature of individuals' relations to energy policy and the energy transition writ large.

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