MASTERARBEIT | MASTER'S THESIS

Titel | Title

Distributional Effects and Public Support for Carbon Pricing in Europe: A Cross-Country Analysis

verfasst von | submitted by

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angestrebter akademischer Grad | in partial fulfilment of the requirements for the degree of

Master of Science (MSc)

Wien | Vienna, 2026

Studienkennzahl lt. Studienblatt | Degree programme code as it appears on the student record sheet:	UA 066 913
Studienrichtung lt. Studienblatt | Degree programme as it appears on the student record sheet:	Masterstudium Applied Economics
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Abstract

This paper examines the relationship between inequality in energy expenditure burdens and public support for environmental policies in Europe, and how this relationship is influenced by the implementation of national carbon pricing. Public support is proxied using Google Trends search data for environmental and political terms. Using cross-country panel data and regression analysis, the results show that higher inequality is associated with greater public support in periods without carbon pricing, while this positive relationship is almost completely offset after policy implementation. Robustness checks show that this general pattern is broadly consistent, although the magnitude and statistical significance of the estimates vary.

Zusammenfassung

Diese Arbeit geht der Frage nach, ob und wie Ungleichheiten bei der Energiekostenbelastung damit zusammenhängen, wie stark die Bevölkerung klimapolitische Maßnahmen in Europa befürwortet und welche Rolle dabei die Einführung nationaler CO_2-Bepreisung spielt. Um den gesellschaftlichen Zuspruch zu messen, wurden Google-Trends-Daten zu umweltpolitischen Suchbegriffen herangezogen. Mithilfe länderübergreifender Paneldaten und Regressionsanalysen lässt sich zeigen, dass eine höhere Ungleichheit in Ländern ohne CO_2-Bepreisung tendenziell mit einer stärkeren Unterstützung für Klimamaßnahmen einhergeht. Sobald jedoch eine CO_2-Bepreisung eingeführt wird, verschwindet dieser positive Zusammenhang weitgehend. Robustheitstests bestätigen, dass dieses Grundmuster im Wesentlichen stabil bleibt, auch wenn die genaue Größe der Schätzkoeffizienten und ihre statistische Signifikanz je nach Spezifikation variieren.

1. Introduction

Carbon pricing is known as an effective climate policy instrument and it is widely implemented in countries all over the world (Lindvall et al., 2024; Maestre-Andrés et al., 2019). Carbon pricing is a climate policy that reduces greenhouse gas emissions by internalizing the social costs ensuring that prices reflect the environmental damage caused by emissions. Mainly applied to CO_2, carbon pricing can either be implemented through a tax or a cap-and-trade system (Barrez & Bachus, 2023). Despite its effectiveness, the policy instrument tends to be unpopular and has to deal with public resistance. In France, for example, this resistance was demonstrated in protests in 2018 which led to a suspension of the carbon tax for half a year. Australia serves as another example, where the introduction of a carbon pricing mechanism was cancelled due to low public acceptability for the policy in 2014 (Maestre-Andrés et al., 2019). It is not that the public simply lacks concern about climate change. In fact, most people see climate change as a serious problem (Dabla-Norris et al., 2023). The reason is rather that one way of how the public evaluates policy instruments is through the lens of fairness. Perceived fairness is positively related to acceptability of carbon pricing and fairness concerns are shaped by perceived personal consequences, distributional effects and procedural aspects (Maestre-Andrés et al., 2019).

A major fairness concern are the distributional effects of carbon pricing. The burden that low-income groups have to pay for carbon pricing is usually relatively higher than that of high-income groups (Lindvall et al., 2024). This effect can be explained by the fact that low-income households are often more dependent on carbon-intensive technologies and commodities and spend a higher share of their income on energy expenses. An increase in these kind of prices through carbon pricing has therefore a regressive impact on society (Barrez & Bachus, 2023; Lindvall et al., 2024). The regressive impact can be reduced if the revenues of the policy are used for progressive redistributive measures that ease the burden on low-income households (Barrez & Bachus, 2023). Several studies show that the public recognizes these regressive effects of carbon pricing schemes and, therefore, public support for the policy declines (Maestre-Andrés et al., 2019).

As evidence from France shows, these regressive effects are not only theoretical but can also be found in real life examples. A microsimulation study of the carbon tax finds that without redistributing the revenues the tax is regressive and increases fuel poverty. Fuel poverty is interpreted as households having difficulties meeting their domestic energy needs and increases by 6% at a tax rate of 30.5€ per ton CO_2 (Berry, 2017). Berry (2017) further explains that recycling the revenues back to households can not only make the tax progressive but also reduce fuel poverty below pre-tax levels. Depending on the kind of implemented revenue scheme, not only low-income households can be supported financially (Berry, 2017) but it is also possible to shape public support for carbon pricing. Spending revenues on climate projects, redistributive transfers to low-income households, or combinations of both have been shown to increase acceptability relative to designs without compensation (Maestre-Andrés et al., 2021).

Importantly, the literature emphasizes that perceived fairness as well as perceived effectiveness are the main drivers of public acceptability of the policy (Lindvall et al., 2024). Public support for carbon pricing can therefore be enhanced when policies are perceived as fair towards low-income households by reducing regressive distributional effects, as well as when revenues are allocated to green spending, which may independently increase policy acceptance (Hedegaard & Kongshøj, 2026; Maestre-Andrés et al., 2019, 2021; Mohammadzadeh Valencia et al., 2024; Sommer et al., 2022).

1.1 Conceptual Link between distributional effects and public support

The relationship between distributional effects of carbon pricing and public support for the policy can be conceptualized as a multi-step process. First, through energy prices households are affected by carbon pricing policies. As low-income groups spend a higher share of their total consumption on energy expenses they face a relatively higher burden as other income groups. This mechanism results in an unequal energy consumption burden across income groups (Barrez & Bachus, 2023). As a French study shows, this effect leads to an increase in fuel poverty for low-income households (Berry, 2017).

Second, this inequality in energy consumption burdens plays a role in shaping the public's perception of fairness regarding carbon pricing. As Maestre-Andrés et al. (2019) state, perceptions of regressivity are associated with lower fairness evaluations while neutral or progressive distributions are associated with higher perceived fairness. These findings indicate that distributional outcomes play a central role in shaping fairness perceptions (Maestre-Andrés et al., 2019).

Third, fairness perceptions are a key determinant of public support for carbon pricing. Alongside perceptions of policy effectiveness and environmental impact, they rank among the most influential determinants and, depending on the study, often outweigh these factors (Maestre-Andrés et al., 2021). This implies that even economically efficient policies may face resistance if perceived as unfair.

Finally, the strength of this relationship may be moderated by the specific design and implementation of carbon pricing policies. Experimental evidence shows that progressive carbon pricing reforms are associated with increased public support. This effect is especially driven by low-income groups (Hedegaard & Kongshøj, 2026).

In sum, the literature supports a conceptual framework in which carbon pricing affects distributional energy burdens. These burdens shape fairness perceptions, and fairness perceptions influence public support for environmental policies. Policy design can moderate this relationship by changing perceived distributional outcomes. Understanding these relationships is crucial for designing and implementing effective climate change mitigation policies.

1.2 Existing literature and contribution

The existing literature in this field of study can be broadly divided into two strands. On the one hand, there is research on distributional effects of carbon pricing and on the other hand, there is research on public acceptability of carbon pricing.

The first strand examines distributional impacts, often using computational general equilibrium models or microsimulation approaches. In addition, several review-based contributions synthesize findings from existing studies and show that the distributional effects of carbon pricing vary across countries and policy designs. Wang et al. (2016), for example, synthesize evidence from previous studies and find that a pure carbon tax without any revenue redistribution is usually regressive. This effect is true for developed countries while the paper can not support a progressive carbon tax effect in developing countries (Wang et al., 2016). Consistent with this, Gonzalez (2012) examines the distributional effects of a carbon tax across income groups in Mexico using a GE model. The paper demonstrates that, in general, without any compensation, carbon taxes are regressive. The results show that, depending on the revenue spending method, the tax can still, but does not have to stay regressive and can also become progressive (Gonzalez, 2012). A meta-analysis by Ohlendorf et al. (2021) additionally suggests that the distributional effects are different for developed and developing countries. The paper shows that the likelihood of a progressive outcome of carbon pricing increases significantly for lower income countries (Ohlendorf et al., 2021). Another study uses a CGE model to analyse what distributional effects a carbon tax in Australia had (Sajeewani et al., 2015). The results indicate that, in this case, a tax had a proportional to slightly progressive incidence (Sajeewani et al., 2015). The paper stresses again that revenue recycling can be applied to overcome undesirable distributional outcomes. To summarize, the literature shows that there are ambiguous distributional effects for different countries (Ohlendorf et al., 2021). But, generally and especially in developed countries, carbon pricing tends to be regressive. Although, with the right revenue spending methods, the distributional effects can become progressive.

The second strand focuses on examining public acceptability and support for carbon pricing policies. This literature relies mostly on surveys and experiments to study preferences and fairness perceptions. Papers written by Hedegaard & Kongshøj (2024), Barrez & Bachus (2023), Maestre-Andrés et al. (2019 & 2021) and Sommer et al. (2022) all conclude that public support for the policy is strongly shaped by the perception of fairness and effectiveness. Moreover, revenue recycling can substantially alter fairness perception and therefore increase support.

However, this research often relies on stated preferences and hypothetical policy scenarios, which may not fully capture behavioural responses to actual policy implementation. In addition, the first strand of the literature pays limited attention to how estimated distributional effects translate into the policy preferences of the population. This paper aims to fill this gap by examining the direct link between observable distributional outcomes and behavioural indicators of public support in a real-world, cross-country context. It will contribute to the existing literature by examining the following research question: How do distributional effects of national carbon pricing influence public support for environmental policies in EU countries?

To answer this question, the paper links inequality in energy consumption burdens across income groups to a behavioural proxy for public support for environmental policies. By focusing on revealed political interest rather than survey-based attitudes, this analysis complements existing evidence that relies mainly on stated preferences. The use of an inequality measure based on energy consumption burdens aligns closely with the fairness mechanisms emphasized in the literature.

1.3 Hypotheses

The literature reviewed above highlights that carbon pricing is usually regressive in developed countries (Wang et al., 2016) and affects low-income groups stronger (Berry, 2017). Furthermore, it is broadly analysed that unequal distributional outcomes negatively influence support for the policy (Barrez & Bachus, 2023; Maestre-Andrés et al., 2019, 2021; Sommer et al., 2022).

Based on these insights, three hypotheses are formulated. The first one is that the implementation of carbon pricing is associated with an increase in inequality in energy consumption burdens across income groups. Second, in the absence of carbon pricing, higher inequality in energy consumption burdens is associated with lower public support for environmental policies. The third and main hypothesis of this paper is that the negative association between inequality in energy consumption burdens and public support for environmental policies is stronger when carbon pricing is implemented.

The main hypothesis argues that carbon pricing increases the political relevance of distributional inequality by more directly connecting energy cost differences to environmental policy, thereby strengthening the negative impact of rising inequality on public support.

The remainder of this paper is structured as follows: Section 2 describes the methodology, including the empirical strategy, data sources, variable construction and model specification. Then, section 3 presents the results, beginning with the baseline regression results and followed by robustness checks. Finally, section 4 summarizes the main findings and discusses their implications.

2. Methodology

This section outlines the methodological approach used to examine the relationship between inequality in energy expenditure burdens and public support for environmental policies. It first presents the empirical strategy, followed by a description of the data and variable construction. Finally, the model specification is introduced.

2.1. Empirical Strategy

This paper employs a quantitative observational research design to examine the relationship between inequality in energy expenditure burdens and public support for environmental policies. The analysis is based on cross-country panel data and estimates a linear regression model.

The empirical strategy uses variation over time and across countries to assess whether higher inequality is associated with lower public support for environmental policies. Furthermore, this analysis investigates whether this relationship changes depending on whether carbon pricing is implemented or not.

The identification of the relationship between carbon pricing and public support relies on variation in the timing of carbon pricing implementation across countries and over time. The presence of both treated and untreated observations in the dataset allows the analysis to exploit within-country changes as well as cross-country differences.

The baseline model is estimated using pooled Ordinary Least Squares (OLS). This approach integrates both cross-country differences as well as temporal variation within countries. To evaluate the robustness of the main findings additional specifications including country and time fixed effects are estimated. These models control for unobserved time-invariant country characteristics and common shocks affecting all countries in a given period.

2.2. Data

This section provides information on the data sources and the variable construction used in the empirical analysis. It contains the operationalisation of the dependent variable measuring public support for environmental policies, the key explanatory variables capturing carbon pricing and inequality in energy expenditure, and the set of control variables. Finally, the sample composition and data coverage are presented.

2.2.1. Dependent variable

The dependent variable of this research is *public support* for environmental policies. Support is measured by analysing how frequently different terms are searched for on Google platforms. This data is provided by Google Trends. Google Trends is a website that captures relative search volume over time in a specific geographic region (Google News Initiative, n.d.). Search interest is based on a sample and is normalised and scaled from zero to 100. A value of 100 denotes the peak search interest for a given term in the specified time and region, while other values reflect search volume relative to that peak (Google News Initiative, n.d.). Therefore, this measure captures the relative share of searches for a term compared to all Google searches at that time. A declining trend indicates decreasing relative popularity and not necessarily a reduction in absolute search volume (Google News Initiative, n.d.).

The use of Google Trends as a data source in political research is based on the assumption that aggregated search behaviour provides meaningful insights into public interest. A paper by Erokhin (2025) highlights that in election research, increased online search interest has been shown to correlate with electoral outcomes, including vote share, winning status, and candidate ranking. Digital trace data such as Google Trends are immediately available, cost-effective, and reflect actual user behaviour rather than self-reported attitudes, making them particularly valuable in political contexts (Erokhin, 2025). Moreover, search data can serve as a proxy for public opinion and help illustrate patterns of voter engagement across different contexts (Erokhin, 2025). Although search volumes do not guarantee causation and cannot distinguish between positive and negative search intent, they provide a descriptive indicator of public attention that can be used when results of traditional instruments such as surveys and polls are not available (Erokhin, 2025).

To operationalise public support for environmental policies search interest in the term *green party* is used as a proxy (exact search terms for every country are in the Appendix Table A1) (Google Trends, n.d.). This term is selected because it is expected to reflect more active engagement with environmental policy positions rather than purely informational queries. Green parties across Europe explicitly define climate protection and environmental policy as central political priorities (European Greens, n.d.) and are widely associated with environmental policy positions (Halikiopoulou et al., 2026). This association is a key reason why interest in a Green party can be used as a proxy for interest in environmental policies. Consequently, attention directed towards green parties is closely linked to engagement with environmental policy platforms and normative positions regarding climate policy.

That this association is not merely symbolic but also reflected in practice is illustrated by the countries included in the sample. In the majority of treated countries, i.e. countries that implemented a carbon pricing system, Green parties played an important role in the implementation or shaping of carbon pricing policies: in Austria, Luxembourg, and Ireland, Green parties participated directly in government during the introduction of carbon pricing legislation (Convery et al., 2013; Delano staff, 2019; Gam, 2020). In France, Green politicians supported the introduction of carbon pricing through parliamentary cooperation with the Socialist Party (Rocamora, 2017). Even in countries where Green parties were not formally part of government, they contributed to the political development of carbon pricing frameworks. In Germany, Green politicians advocated for stricter emissions trading rules and higher carbon prices during the development of the national ETS (Eddy, 2019). Similarly, in the Netherlands, the Green party played an important role in promoting the Dutch Climate Law, which later served as a foundation for national carbon pricing initiatives (GroenLinks, 2018; NL Times, 2019). These examples suggest that Green parties are not only associated with environmental policy, but also actively involved in shaping climate-related legislation within the analysed countries.

Unlike broader terms such as *carbon tax*, which may capture general information-seeking behaviour instead of political preferences, the term *green party* is more directly linked to normative positions and political action. Searches for a Green party captures attention directed towards political actors whose core agenda centers on environmental and climate policy. Interest in Green parties is therefore closely related to political alignment with environmental policy platforms. This reasoning is consistent with findings saying that search interest in political parties is associated with electoral outcomes and voter engagement (Erokhin, 2025), suggesting that party-related search behaviour reflects politically meaningful attention. Therefore, using search interest in Green parties as a proxy captures public attention directed towards actors that promote environmental policy and provides an observable behavioural measure of engagement with environmental policy positions.

Green party is the only opinion-based search term that provides sufficient coverage across the full sample of countries and time periods. Additional search terms and composite measures were considered during the development of the empirical strategy. However, many conceptually relevant terms, including policy-oriented search phrases, exhibit very low search intensity across a substantial share of countries and time periods. In several cases, search values are predominantly zero, resulting in substantial sample loss and reduced comparability across countries. Since changes in the results would then partly reflect differences in sample composition rather than only differences in measurement, the analysis relies on *green party* as the most consistent and broadly available proxy across the sample countries and observation period. While the use of a single proxy variable has limitations, it ensures sufficient coverage and comparability for the panel analysis.

To reduce the influence of extreme spikes in search activity and mitigate the effect of short-term search jumps, the Google Trends search index is transformed using the natural logarithm. Since the index may take the value zero in some observations, one is added to the index before applying the logarithmic transformation.

2.2.2. Independent variables

The empirical model includes the two key explanatory variables *inequality* in energy expenditure burden and *carbon pricing* and two control variables that are the *inflation rate* and the *Gini coefficient*. This section describes the construction and conceptual role of each variable.

Inequality

The primary explanatory variable captures inequality in energy expenditure burdens across income groups. Energy expenditure burden is defined as the share of household income spent on energy consumption. To construct the inequality measure, data on consumption expenditure by income quintiles from Eurostat is used (Eurostat, 2025). This dataset provides information on the expenditure share spent on electricity, gas and other fuels by each income quintile at five-year intervals from 2005 to 2020. Based on the assumption that expenditure distributions are relatively stable over time (Barigozzi et al., 2009), a monthly energy expenditure burden is calculated. Since detailed expenditure shares are only available at five-year intervals, monthly variation is captured using the Eurostat monthly price index for electricity, gas, and other fuels (Eurostat, 2026c). The energy expenditure burden is calculated as follows:

$$\mathrm{EB}_{j,t}^{Q} = \mathrm{ES}_{j,t}^{Q} \times \mathrm{PI}_{j,t} \tag{1}$$

where Q indexes income quintile, j indexes countries and t indexes months. $EB_{j,t}$ denotes the energy expenditure burden, $ES_{j,t}$ represents the energy expenditure share, which stays constant between survey waves, and $PI_{j,t}$ the monthly price index.

Based on the calculated energy expenditure burdens of all income groups an inequality measure is constructed. This paper defines inequality as the difference in the burden of the lowest income group and the highest income group:

$$Ineq_{j,t} = EB_{j,t}^{Q1} - EB_{j,t}^{Q5} \tag{2}$$

where Q1 denotes the lowest income quintile and Q5 the highest income quintile.

This measure is chosen because alternative measures of inequality, such as the Gini coefficient or ratio-based indicators, would eliminate the influence of the price index; as a result, inequality would remain constant over time. However, capturing changes in inequality driven by variation in energy prices is a crucial part of this research.

Carbon pricing

Carbon pricing is operationalised as a binary variable that equals one in periods during which a country has a national carbon pricing mechanism in place, such as a carbon tax or a national emissions trading system (nETS), and zero otherwise. The implementation month is determined based on official policy introduction dates. Countries that introduce a national carbon pricing mechanism during the observation period switch from zero to one in the month of implementation. Countries without a national carbon pricing mechanism during the observation period remain coded as zero throughout the sample period. This coding allows the analysis to use both within-country variation among treated countries and cross-country variation between treated and untreated countries. The exact implementation dates of carbon pricing mechanisms are mostly obtained from official government sources and scientific articles. Appendix Table A2 provides a detailed list of countries, implementation dates and corresponding sources (Enerdata, 2014; European Commission, 2021; Federal Government of Germany, 2020; ICAP, 2022; Jensen & Pfitzner, 2025; Pereira et al., 2016; Revenue, 2026; World Bank, n.d.).

Control variables

To account for macroeconomic conditions that may independently influence public support for environmental policies, the model includes two control variables: the *inflation rate* and the *Gini coefficient.* These variables are selected because they capture general price dynamics and overall income inequality, both which may affect political attitudes independently of inequality in energy expenditure burden. Including these variables reduces the risk of omitted variable bias.

The monthly inflation rate is measured as the annual percentage change in Harmonized Index of Consumer Prices (HICP) (Eurostat, 2026b). The data is obtained from Eurostat (Eurostat, 2026b). Inflation reflects changes in the general costs of living which may shape public perceptions of policies associated with higher consumer prices. Controlling for inflation helps distinguish general price pressures from distributional effects specific to energy expenditure inequality.

The Gini coefficient is included as a measure of overall income inequality within a country. The variable ranges from zero to 100, where zero implies perfect equality and 100 represents perfect inequality meaning that all income is received by one single individual (World Bank, 2025). Data for this variable is obtained from two sources: the World Bank and Eurostat (Eurostat, 2026a; World Bank, 2025). Since Eurostat provides data only from 2014 onwards and the World Bank dataset lacks observation for some more recent years, the two datasets are combined to construct a consistent time series. To ensure comparability between the datasets, the World Bank data is normalised and scaled to match the Eurostat data using the following scaling factor:

$$\text{scaling factor} = \frac{Gini_{2014}^{Euro}}{Gini_{2014}^{WB}} \tag{3}$$

where $\text{Gini}_{2014}^{Euro}$ denotes the Gini coefficient for 2014 obtained from Eurostat and Gini_{2014}^{WB} denotes the corresponding value obtained from the World Bank.

The scaling factor is applied to the World Bank data for the years prior to 2014, while the original Eurostat data is used for the years from 2014 onwards. This procedure results in a continuous series of yearly Gini coefficient values. As the Gini coefficient is available only at an annual frequency, the value remains constant for all months within the same year.

2.2.3. Sample construction

The final panel dataset consists of ten European Union member states observed over the period from 2007 to 2024. The sample includes seven treated countries (Austria, France, Germany, Ireland, Luxembourg, the Netherlands, and Portugal) that introduced a national carbon pricing mechanism during the observation period. In addition, three untreated countries (Belgium, Italy, and Spain) are included as control countries, as they did not implement a national carbon pricing mechanism during the sample period and are considered the most comparable to the treated countries in terms of their broader political and economic context.

The dataset is structured at the country-month level. The variables described above are merged using country and time identifiers. After combining all data sources, the final panel dataset contains 2,160 country-month observations.

2.2.4 Descriptive statistics

Table 1 presents descriptive statistics for the variables used in the empirical analysis. The table reports the mean, standard deviation, minimum, and maximum values across the full sample of country–month observations. Since inequality in energy expenditure burdens is constructed as the difference between expenditure shares across income groups, the measure does not have fixed theoretical bounds. In the sample used in this study, the variable ranges from approximately 0.6 to 11.7.

Table 1: Descriptive statistics

Variable	Mean	SD	Min	Max
Support	17.153	17.371	0.000	100.000
Inequality	3.116	1.465	0.628	11.700
Carbon pricing	0.276	0.447	0.000	1.000
Inflation	2.129	2.355	-2.900	17.100
Gini coefficient	29.824	2.822	24.100	35.663

Observations = 2,160.

The *carbon pricing* variable shows variation across the sample, with 27.6% of observations corresponding to periods in which carbon pricing is implemented (Table 2).

Table 2: Distribution of the carbon pricing variable

Carbon pricing	Observations	Share
0	1564	72.4%
1	596	27.6%

2.3. Model Specification

To study the relationship between inequality in energy expenditure burdens and public support for environmental policies, the following linear regression model is estimated:

$$\log(\text{Support}_{j,t} + 1) = \beta_0 + \beta_1 \text{Ineq}_{j,t} + \beta_2 \text{CP}_{j,t} + \beta_3 (\text{Ineq}_{j,t} \times \text{CP}_{j,t}) + \beta_4 \text{Inflation}_{j,t} + \beta_5 \text{Gini}_{j,t} + \varepsilon_{j,t} \tag{4}$$

j indexes countries and t indexes months. The dependent variable $log(Support_{j,t} + 1)$ measures public support for environmental policies and is proxied by the natural logarithm of the Google Trends search intensity for the term *green party*, with one added to the index to account for zero search values. $Ineq_{j,t}$ represents energy expenditure burdens between the lowest and highest income quintiles. $CP_{j,t}$ is a dummy variable indicating whether a national carbon pricing mechanism is in place or not. $Inflation_{j,t}$ and $Gini_{j,t}$ are the control variables capturing inflation rates and the Gini coefficient. Finally, $\varepsilon_{j,t}$ represents the error term.

The coefficient β_1 captures the relationship between inequality in energy expenditure burdens and public support in periods without carbon pricing. The coefficient β_2 measures the average difference in public support between periods with and without carbon pricing when inequality is zero. The interaction term $Ineq_{j,t} \times CP_{j,t}$ allows the effect of inequality on public support to differ depending on whether carbon pricing is implemented. The coefficient β_3 therefore represents the additional effect of inequality on support in periods with carbon pricing.

In this specification, the marginal effect of inequality on public support is given by

$$\frac{\partial Support_{j,t}}{\partial Ineq_{j,t}} = \beta_1 + \beta_3 CP_{j,t}. \tag{5}$$

Thus, when carbon pricing is not implemented ($CP_{j,t} = 0$), the effect of inequality on support equals β_1. When carbon pricing is implemented ($CP_{j,t} = 1$), the effect becomes $\beta_1 + \beta_3$. This specification directly corresponds to the hypotheses formulated above, allowing the analysis to test whether inequality reduces public support and whether this relationship becomes stronger when carbon pricing is in place.

3. Results

This section presents the empirical results of the analysis. First, descriptive evidence on the relationship between carbon pricing and inequality in energy expenditure burdens is presented. Then, the baseline regression results examining how inequality and carbon pricing relate to public support for environmental policies are reported. Finally, several robustness checks are presented to assess the stability of the main findings.

3.1 Descriptive Evidence

Before presenting the regression results, it is useful to examine the relationship between carbon pricing and inequality in energy expenditure burdens descriptively. Figure 1 displays the average level of inequality over time. The x-axis presents the months relative to the implementation of carbon pricing, where $t = 0$ denotes the implementation month. The figure shows that mean inequality tends to be higher in periods following the introduction of carbon pricing policies.

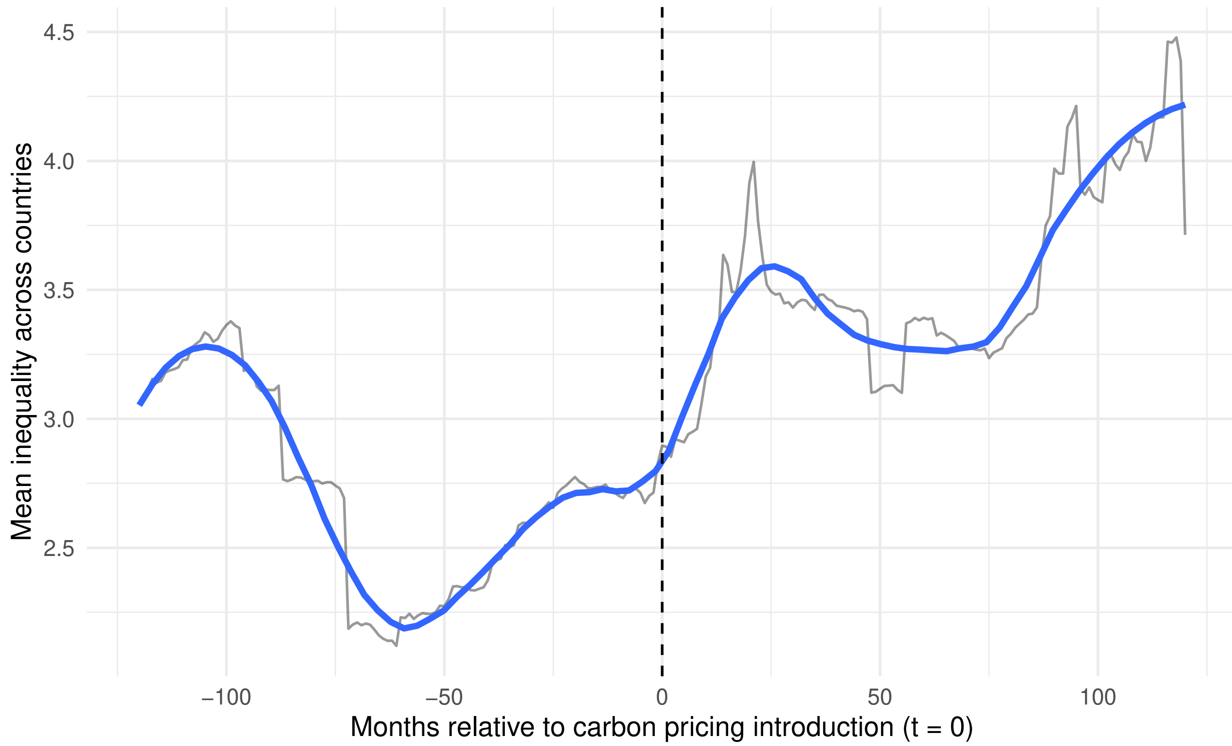

Figure 1: Mean inequality around carbon pricing introduction

To further illustrate this pattern, Table 3 compares the mean level of inequality in periods with and without carbon pricing. The results show that the average inequality in energy expenditure burdens is higher when carbon pricing is in place. While these descriptive statistics do not establish causal relationships, they provide initial evidence consistent with the first hypothesis that carbon pricing is associated with higher inequality in energy expenditure burdens.

Table 3: Average inequality by carbon pricing status

Carbon Pricing	Mean Inequality	Observations
0	2.862	1564
1	3.784	596

The next section formally tests this relationship using the regression model specified above.

3.2 Regression Results

Table 4 reports the results of the baseline regression model studying the relationship between inequality in energy expenditure burdens, carbon pricing and public support for environmental policies.

Table 4: Regression results

	log (1+Support)
Intercept	−0.249
	(0.289)
Inequality	0.236***
	(0.024)
Carbon pricing	0.815***
	(0.148)
Inequality × Carbon pricing	−0.230***
	(0.039)
Inflation	−0.015
	(0.012)
Gini	0.062***
	(0.009)
Observations	2160
R^2	0.068
Adjusted R^2	0.066

Standard errors in parentheses.
* p<0.1; ** p<0.05; *** p<0.01

The coefficient on inequality is positive and statistically significant at the 1% level. This indicates that higher inequality in energy expenditure burdens is associated with an increase in public support for environmental policies in periods without carbon pricing. Since the dependent variable is expressed in logarithmic form, the coefficient can be interpreted as a semi-elasticity. The estimated coefficient of 0.24 implies that a one-unit increase in inequality, equivalent to a one percentage point increase in the difference in energy expenditure burdens between the lowest and highest income quintiles, is associated with an approximate 27% increase in public support. This result is contrary to the expectation that unequal distributional outcomes reduce public support for environmental policies.

The coefficient on carbon pricing is positive and statistically significant. However, because the model includes an interaction term, this coefficient represents the association between carbon pricing and support when inequality equals zero. Since this value is outside of the observed inequality range, the coefficient should not be interpreted in isolation.

The interaction term Inequality × Carbon pricing has a coefficient that is negative and statistically significant at the 1% level. This coefficient captures how the relationship between inequality and public support changes when carbon pricing is implemented. To interpret this interaction, it is necessary to examine the marginal effect of inequality under different policy regimes. As shown in Equation 5, in periods without carbon pricing, the marginal effect of inequality on public support is equal to the coefficient on inequality, which is 0.24. In periods with carbon pricing, the marginal effect is given by the sum of the inequality coefficient and the interaction coefficient. Based on the estimated coefficients, the marginal effect becomes

$$\frac{\partial Support_{j,t}}{\partial Ineq_{j,t}} = \beta_1 + \beta_3 = 0.236 - 0.23 = 0.006. \tag{6}$$

This indicates that while inequality has a clear positive association with support in periods without carbon pricing, this relationship is almost completely offset when carbon pricing is implemented. In this case, a one-unit increase in inequality is associated with only an approximately 0.6% increase in support. The negative coefficient of the interaction term is consistent with the expected moderating role of carbon pricing in the sense that carbon pricing reduces the marginal effect of inequality on support. However, since the baseline coefficient of inequality is positive rather than negative, the substantive interpretation differs from the hypothesis. The results therefore do not support the expectation that carbon pricing strengthens a negative relationship between inequality and public support. Instead, they suggest that carbon pricing offsets an unexpected positive association between inequality and support.

One possible explanation for this unexpected pattern is that higher inequality in energy expenditure burdens may increase the salience of environmental and energy-related issues. In periods without carbon pricing, this may translate into greater attention towards political actors associated with environmental policy, such as Green parties. The positive coefficient on inequality may therefore reflect increased political attention rather than direct approval of unequal distributional outcomes. However, after carbon pricing is introduced, further increases in inequality may make the distributional costs of climate policy more visible. At higher levels of inequality, this may reduce support for additional environmental policies, as households become more concerned about the financial burden of climate measures. This could explain why the positive association between inequality and support is almost completely offset in periods with carbon pricing.

Among the control variables, the Gini coefficient is positive and statistically significant, suggesting that higher overall income inequality is associated with greater public support for environmental policies. In contrast, the coefficient on inflation is not statistically significant in the baseline specification.

The model explains a modest share of the variation in the dependent variable, with an adjusted R^2 of 0.066, indicating that approximately 6.6% of the variation in public support for environmental policies across countries and over time is captured by the explanatory variables included in the regression.

Overall, the baseline results show that inequality in energy expenditure burdens is positively associated with public support for environmental policies in periods without carbon pricing. This finding contradicts the hypothesis that higher inequality reduces public support. The negative interaction term indicates that the introduction of carbon pricing substantially weakens this positive relationship and almost completely offsets it. However, because the initial relationship is positive rather than negative, the results do not support the hypothesis that carbon pricing strengthens a negative association between inequality and support.

3.3 Robustness Checks

To assess the robustness of the baseline results, alternative model specifications are estimated. Table 5 reports the baseline model, a two-way fixed effects specification, a model using *climate action* as an alternative proxy for public support, and the corresponding two-way fixed effects specification for this alternative proxy.

Table 5: Baseline results and robustness checks

	(1) Main	(2) 2WFE	(3) Climate action	(4) Climate action 2WFE
Inequality	0.236***	0.054**	0.036	−0.035
	(0.024)	(0.028)	(0.026)	(0.041)
Carbon pricing	0.815***	−0.346***	0.601***	0.562***
	(0.148)	(0.120)	(0.201)	(0.146)
Ineq × CP	−0.230***	−0.035	−0.009	−0.304***
	(0.039)	(0.033)	(0.061)	(0.040)
Inflation	−0.015	−0.087***	0.111***	−0.045*
	(0.012)	(0.020)	(0.015)	(0.024)
Gini	0.062***	−0.065***	−0.148***	−0.041
	(0.009)	(0.020)	(0.011)	(0.026)
Observations	2160	2160	1512	1728
R^2	0.068	0.644	0.217	0.637
Adjusted R^2	0.066	0.602	0.214	0.582

Standard errors in parentheses.
* p<0.1; ** p<0.05; *** p<0.01

In column (2) a two-way fixed effects model is estimated, controlling for unobserved country-specific characteristics and time effects. Compared to the main specification, the coefficient on inequality decreases substantially in magnitude, from 0.236 to 0.054, although it remains statistically significant at the 5% level. While the baseline model shows a strong positive association between inequality and support, this relationship becomes much weaker once country and time fixed effects are included. The interaction term between inequality and carbon pricing becomes statistically insignificant in the two-way fixed effects model. This indicates that the moderating effect observed in the baseline specification is not robust when unobserved country-specific factors and common time shocks are controlled for. The coefficient on carbon pricing changes sign and becomes negative and stays statistically significant, suggesting that the estimated association between carbon pricing and support is sensitive to model specification. Both control variables are negative and statistically significant at the 1% level, indicating that higher inflation rates and greater overall income inequality are associated with lower public support for environmental policies in this specification. However, the estimated magnitudes are relatively modest.

As an additional robustness check, an alternative proxy for public support is employed. Instead of using search interest in *green party*, column (3) reports the results using the term *climate action* (exact search terms in Appendix Table A1). This term is selected because it is expected to reflect active and issue-oriented engagement with environmental topics rather than purely informational search behaviour. It captures normative support for environmental preservation and also has large coverage over the majority of the sample countries (Appendix Table A3). Using this alternative proxy allows for assessing whether the baseline results depend on the specific operationalisation of public support.

The results obtained using *climate action* as the proxy variable differ from the baseline specification. In this specification, the coefficient on inequality is small and statistically insignificant, indicating that there is no clear association between inequality in energy expenditure burdens and search interest in climate action. The interaction term is also statistically insignificant, suggesting that carbon pricing does not significantly moderate the relationship between inequality and this alternative support measure in the pooled specification. However, the coefficient on carbon pricing remains positive and statistically significant. Both control variables change signs and are statistically significant at the 1% level. While higher inflation is associated with more public support for environmental policies, a higher Gini coefficient has the opposite effect. Taken together, these results can not support the baseline results regarding the crucial variables since they both are insignificant. This suggests that the statistical support for the baseline relationship depends on the choice of proxy variable.

Column (4) presents the two-way fixed effects specification using *climate action* as the dependent variable. In this model, the coefficient on inequality is again statistically insignificant. However, the interaction term between inequality and carbon pricing is negative and becomes statistically significant at the 1% level. This suggests that, once country and time fixed effects are included, carbon pricing is associated with a moderation of the relationship between inequality and search interest in climate action. In other words, the effect of inequality becomes more negative in periods with carbon pricing. The coefficient on carbon pricing remains positive and statistically significant, indicating higher search interest in climate action in periods with carbon pricing. The control variables are negative and become less significant in the two-way fixed effects model. While inflation is significant at the 1% level Gini is statistically insignificant.

Overall, the robustness checks provide mixed and limited support for the baseline results. The positive association between inequality and public support becomes considerably smaller in the two-way fixed effects model and is not statistically significant when climate action is used as an alternative proxy. Similarly, the interaction effect between inequality and carbon pricing is not robust across all specifications: it is insignificant in the baseline two-way fixed effects model and in the pooled *climate action* model, but becomes negative and statistically significant in the two-way fixed effects specification using climate action. These findings suggest that the baseline results should be interpreted with caution as their statistical significance depends on both the model specification and the operationalisation of public support.

One possible explanation for the differences across specifications is that they rely on different sources of variation and capture different dimensions of public attention. The two-way fixed effects model removes time-invariant country differences and common time shocks, suggesting that part of the baseline association may be driven by cross-country differences rather than within-country changes over time. In addition, climate action may capture broader issue-related attention, general concern, or information-seeking behaviour, whereas search interest in Green parties is more closely linked to political engagement with environmental policy actors. Finally, the alternative proxy is available for fewer observations (Appendix Table A3), meaning that differences in the results may also partly reflect changes in sample composition rather than only differences in the operationalisation of public support.

Taken together, the robustness checks indicate that the relationship between inequality in energy expenditure burdens, carbon pricing, and public support is sensitive to both model specification and proxy choice. Additional robustness checks presented in the Appendix (Table A5, Table A6) provide further evidence on the stability of the results and offer partial support for the baseline pattern.

4. Conclusion

This thesis examines the relationship between inequality in energy expenditure burdens and public support for environmental policies in Europe. Moreover, it analyses how this relationship is influenced by the implementation of carbon pricing policies, such as national emissions trading systems and carbon taxes. Using cross-country panel data and regression analysis, this research provides several key insights.

First, the descriptive analysis provides initial support for the first hypothesis, expecting that inequality in energy expenditure burdens tends to be higher in periods with carbon pricing than in periods without. In this analysis, periods with carbon pricing are indeed associated with higher observed mean inequality. One possible explanation for this correlation is that carbon pricing increases energy costs, which leads to a relatively larger burden for low-income households than for high-income households. This relationship is consistent with findings in the existing literature (Barrez & Bachus, 2023; Berry, 2017).

Second, the baseline regression results do not support the second hypothesis. Contrary to the expectation that higher inequality in energy expenditure burdens reduces public support for environmental policies in periods without carbon pricing, the baseline model finds a positive and statistically significant association. This suggests that higher inequality is associated with more public support for environmental policies. One possible explanation is that higher energy burden inequality may increase attention to environmental policies if these policies are perceived as a way to reduce dependence on fossil fuels and volatile energy prices. In this view, support for Green parties may rise because climate policies are associated not only with additional costs, but also with long-term solutions such as renewable energy expansion and energy efficiency improvements.

Third, the baseline results also do not support the third hypothesis in the expected form. The interaction term between inequality and carbon pricing is negative and statistically significant, indicating that carbon pricing weakens the positive relationship between inequality and public support. However, because the baseline relationship between inequality and support is positive rather than negative, the interaction does not indicate that carbon pricing strengthens a negative relationship. Instead, the results suggest that the introduction of carbon pricing almost completely offsets the unexpected positive association between inequality and support. A possible explanation is that, once carbon pricing is implemented, further increases in energy burden inequality may make the distributional costs of climate policy more visible. At higher levels of inequality, households may become more concerned about the financial burden of additional environmental policies, which could weaken the positive relationship between inequality and Green-party search interest.

The robustness checks provide a more cautious picture of these findings. The two-way fixed effects specification shows that the positive coefficient on inequality becomes considerably smaller, while the interaction term loses statistical significance. This suggests that part of the baseline relationship is driven by cross-country differences rather than within-country variation over time. When *climate action* is used as an alternative proxy for public support, the pooled model does not reproduce the significant inequality and interaction effects found in the baseline model. However, the two-way fixed effects specification using *climate action* again finds a negative and statistically significant interaction term. Additional robustness checks provide qualified support for the baseline pattern: excluding election periods and using *climate policy* as an alternative proxy produce results broadly consistent with the baseline model, while clustered standard errors weaken statistical significance. The leave-one-out robustness check further suggests that the main pattern is not driven by one single country alone, although the results remain sensitive to the inclusion of some control countries and France.

These findings have important implications for the interpretation of the results. The baseline model points to a relationship between inequality in energy expenditure burdens, carbon pricing, and public attention towards environmental policy actors. However, the robustness checks show that the statistical strength and magnitude of this relationship depend on model specification, proxy choice, and sample composition. Therefore, the findings should be interpreted as evidence of suggestive associations rather than robust causal effects.

A central limitation of this paper is the use of a single Google Trends search term as the baseline proxy for public support. Search interest in Green parties is meaningful because Green parties are closely associated with environmental and climate policy. Previous research also suggests that Google Trends search data can be informative in political contexts, particularly because party-related search interest is associated with electoral outcomes (Erokhin, 2025). The term also provides sufficient data coverage across all sample countries, which is essential for maintaining a comparable panel dataset. Nevertheless, relying on a single proxy is not ideal from a measurement perspective. Search behaviour may be influenced by election campaigns, media coverage, party leadership, candidate-specific popularity, or other short-term political events. In addition, Google Trends data cannot distinguish between positive and negative sentiment towards a search term. A measure based on several well-covered, opinion-oriented search terms would improve the construct validity of the dependent variable and reduce reliance on one specific proxy. However, in practice, no additional opinion-based search terms provided comparable coverage across all countries and over the full observation period. For this reason, the analysis relies on Green-party search interest as the most consistent available proxy, while acknowledging these limitations.

Overall, this paper highlights both the potential relevance of distributional concerns for climate policy acceptance and the methodological challenges involved in measuring public support using search data. Future research could build on this analysis by employing alternative measures of public opinion or using more detailed data to better capture within-country variation.

Appendix

A. Data and variable construction

A.1 Search terms

Table A1 reports the exact search terms used for each country in the Google Trends data.

Table A1: Google Trends search terms

Country	Green Party	Climate action	Climate policy
Austria	Die Grünen	Klimaschutz (topic)	Klimapolitik
Belgium	Ecolo	Klimaschutz (topic	politique climatique
Germany	Bündnis 90/Die Grünen	Klimaschutz (topic)	Klimapolitik
France	Les Verts	Klimaschutz (topic)	politique climatique
Ireland	Green Party	Klimaschutz (topic)	climate policy
Italy	I Verdi	Klimaschutz (topic)	politica climatica
Luxembourg	Déi Gréng	Klimaschutz (topic)	politique climatique
Netherlands	GroenLinks	Klimaschutz (topic)	klimaatbeleid
Portugal	Os Verdes	Klimaschutz (topic)	política climática
Spain	Verdes Equo	Klimaschutz (topic)	política climática

Search data for the term *climate action* is retrieved by using the *topic* option in Google Trends. *Topics* are a group of terms that represent the same concept across different languages. When the same term is searched for in a different language, it is captured by using the topic in another language (Google Support, n.d.). In this case the topic *Klimaschutz* (German for *climate action*) is used to retrieve search data for *climate action* in every country.

A.2 Carbon pricing implementation

Table A2 provides an overview of carbon pricing implementation dates and corresponding sources for each country.

Table A2: Carbon pricing implementation by country

Country	Policy type	Implementation month	Source
Austria	ETS	2022-10-01	[ICAP, 2022]
Belgium	—	—	[World Bank, n.d.]
France	Tax	2014-04-01	[Enerdata, 2014]
Germany	ETS	2021-01-01	[The Federal Government, 2020]
Ireland	Tax	2010-05-01	[Revenue, 2026]
Italy	—	—	[World Bank, n.d.]
Luxembourg	Tax	2021-01-01	[EPRS, 2025]
Netherlands	Tax	2021-01-01	[European Commission, 2021]
Portugal	Tax	2015-01-01	[Pereira et al.,2016]
Spain	—	—	[World Bank, n.d.]

A.3 Sample composition

Table A3 reports the number of observations and country composition for the different model specifications.

Table A3: Sample composition for different specifications

Model	Countries included	Observations
Green party (baseline)	AT, FR, DE, IE, LU, NL, PT, ES, IT, BE	2160
Climate policy	FR, DE, NL	648
Climate action	AT, FR, DE, NL, ES, IT, BE	1512
Excluding elections	AT, FR, DE, IE, LU, NL, PT, ES, IT, BE	2010

Countries in which fewer than 30% of observations exhibited positive search activity were excluded from the sample.

A.4 Election dates

Table A4 presents the national election dates for each country included in the sample, along with the corresponding sources.

Table A4: National election dates by country

Country	Election dates	Source
Austria	2008-09-28; 2013-09-29; 2017-10-15; 2019-09-29; 2024-09-29	[BMI, n.d.]
Belgium	2007-06-10; 2010-06-13; 2014-05-25; 2019-05-26; 2024-06-09	[OSCE ODIHR, n.d.]
France	2007-06-10; 2012-06-10; 2017-06-11; 2022-06-12; 2024-06-30	[OSCE ODIHR, n.d.]
Germany	2009-09-27; 2013-09-22; 2017-09-24; 2021-09-26	[OSCE ODIHR, n.d.]
Ireland	2007-05-24; 2011-02-25; 2016-02-26; 2020-02-08; 2024-11-29	[OSCE ODIHR, n.d.]
Italy	2008-04-14; 2013-02-25; 2018-03-04; 2022-09-25	[OSCE ODIHR, n.d.]
Luxembourg	2009-06-07; 2013-10-20; 2018-10-14; 2023-10-08	[OSCE ODIHR, n.d.]
Netherlands	2010-06-09; 2012-09-12; 2017-03-15; 2021-03-17; 2023-11-22	[OSCE ODIHR, n.d.]
Portugal	2009-09-27; 2011-06-05; 2015-10-04; 2019-10-06; 2022-01-30; 2024-03-10	[OSCE ODIHR, n.d.]
Spain	2008-03-09; 2011-11-20; 2015-12-20; 2016-06-26; 2019-04-28; 2019-11-10; 2023-07-23	[OSCE ODIHR, n.d.]

B. Additional Robustness Checks

This section presents additional robustness checks that complement the results reported in the main text. These specifications are not discussed in detail in the main analysis but provide further insight into the stability of the estimated relationships.

B.1 Clustered standard errors, election period exclusion and alternative search proxy

Table A5 reports three additional robustness checks. First, standard errors are clustered at the country level to account for potential within-country correlation of the error term. This adjustment relaxes the assumption of independently distributed errors and provides more conservative inference. Second, a specification is estimated excluding election periods to account for potential spikes in search activity driven by electoral campaigns. Election periods are defined as the month in which a national election takes place as well as the month before and after the election (Election dates in Appendix Table A4) (Bundesministerium Inneres, n.d.; OSCE ODIHR, n.d.). Third, an additional specification uses *climate policy* as an alternative search-based proxy for public support.

Table A5: Clustered SE and election period exclusion

	(1) Main	(2) Clustered SE	(3) Excl. elections	(4) Climate policy
Inequality	0.236***	0.236	0.229***	0.908***
	(0.024)	(0.208)	(0.025)	(0.074)
Carbon pricing	0.815***	0.815	0.742***	3.400***
	(0.148)	(0.952)	(0.152)	(0.262)
Ineq × CP	−0.230***	−0.230	−0.217***	−0.869***
	(0.039)	(0.229)	(0.040)	(0.096)
Inflation	−0.015	−0.015	−0.014	−0.006
	(0.012)	(0.040)	(0.012)	(0.026)
Gini	0.062***	0.062	0.067***	0.239***
	(0.009)	(0.067)	(0.010)	(0.026)
Observations	2160	2160	2010	648
R^2	0.068	0.068	0.069	0.450
Adjusted R^2	0.066	0.066	0.067	0.446

Standard errors in parentheses.
Column (2) reports country-clustered standard errors.
* p<0.1; ** p<0.05; *** p<0.01

Column (2) provides the results of the clustered standard error specification. While this check does not affect the estimated coefficients it substantially increases standard errors. As a result the coefficients on inequality, carbon pricing and the interaction term lose statistical significance. This indicates that the statistical significance of the baseline results is sensitive to within-country correlation in the error terms.

In contrast, the results obtained when excluding election periods (column (3)) are largely consistent with the baseline specification. The coefficients on inequality, carbon pricing, and the interaction term remain statistically significant and keep similar magnitudes. The positive association between inequality and public support in periods without carbon pricing persists. Moreover, the interaction term stays negative, indicating that this positive relationship decreases in periods with carbon pricing. These results suggest that the baseline findings are not driven by election-related changes in search activity.

Column (4) presents an additional robustness check using the term *climate policy* as a third search-based proxy for public support. Since the main robustness checks already considered *climate action* as an alternative operationalisation, this specification further examines whether the results depend on the chosen search term. However, the *climate policy* proxy has substantially more limited data coverage than the baseline and *climate action* measures, resulting in a considerably smaller number of observations (Table A3). The results should therefore be interpreted cautiously, as differences relative to the baseline may reflect both the alternative operationalisation of public support and changes in sample composition. The coefficient on inequality is positive and statistically significant, suggesting that higher inequality in energy expenditure burdens is associated with greater search interest in *climate policy* in periods without carbon pricing. The interaction term is negative and statistically significant, indicating that this positive association becomes weaker when carbon pricing is implemented. However, the coefficients are considerably larger than in the baseline specification, further suggesting that the magnitude of the estimated relationship is sensitive to the chosen proxy variable.

Overall, these additional robustness checks partly support the baseline pattern. The exclusion of election periods and the *climate policy* specification support the general pattern observed in the baseline model, namely a positive association between inequality and public support in periods without carbon pricing and a negative moderating effect of carbon pricing. However, the clustered standard error specification weakens the statistical significance of the baseline estimates. Taken together, these results suggest that the baseline findings are not driven by election periods and are broadly consistent when using an alternative proxy, although statistical inference remains sensitive to within-country error correlation.

B.2 Leave-one-out robustness check

Table A6 presents the results of a leave-one-country-out robustness check. In this specification, the baseline regression is re-estimated ten times, each time excluding one country from the sample. This approach tests whether the main results are driven by a single country and therefore evaluates the sensitivity of the estimates to the composition of the sample.

Table A6: Leave-one-country-out robustness check

	Germany	Ireland	France	Luxembourg	Netherlands	Austria	Portugal	Italy	Spain	Belgium
Inequality	0.233***	0.253***	0.331***	0.353***	0.228***	0.258***	0.219***	0.032	0.029	0.282***
	(0.025)	(0.023)	(0.023)	(0.023)	(0.025)	(0.025)	(0.025)	(0.030)	(0.025)	(0.027)
Carbon pricing	0.910***	1.283***	−0.311*	1.262***	0.868***	0.927***	0.912***	0.467***	0.049	0.900***
	(0.158)	(0.176)	(0.170)	(0.139)	(0.162)	(0.154)	(0.153)	(0.154)	(0.146)	(0.154)
Ineq × CP	−0.258***	−0.229***	−0.045	−0.396***	−0.238***	−0.247***	−0.296***	−0.033	−0.046	−0.273***
	(0.042)	(0.048)	(0.041)	(0.036)	(0.042)	(0.040)	(0.042)	(0.044)	(0.038)	(0.042)
Inflation	−0.016	−0.061***	−0.030**	−0.015	−0.008	−0.019	−0.001	−0.008	0.024**	−0.019
	(0.013)	(0.012)	(0.012)	(0.011)	(0.013)	(0.013)	(0.013)	(0.013)	(0.012)	(0.013)
Gini	0.060***	0.068***	0.069***	0.055***	0.054***	0.075***	0.026**	0.015	0.151***	0.046***
	(0.010)	(0.009)	(0.009)	(0.008)	(0.011)	(0.010)	(0.011)	(0.010)	(0.010)	(0.012)
Observations	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944
R^2	0.067	0.130	0.148	0.137	0.055	0.079	0.046	0.022	0.114	0.075
Adjusted R^2	0.064	0.128	0.145	0.134	0.052	0.077	0.043	0.019	0.111	0.072

Standard errors in parentheses.
* p<0.1; ** p<0.05; *** p<0.01

The results indicate that the positive coefficient on inequality remains statistically significant in most specifications. When one of the treated countries is excluded, the coefficient on inequality remains positive and statistically significant at the 1% level. This suggests that the positive association between inequality in energy expenditure burdens and public support in periods without carbon pricing is not driven by a single treated country. However, when Italy or Spain is excluded, the coefficient on inequality becomes statistically insignificant. This indicates that the estimated baseline relationship is more sensitive to the inclusion of these control countries.

The interaction term between inequality and carbon pricing remains negative and statistically significant in most specifications, indicating that the moderating effect of carbon pricing is generally stable across several sample variations. However, when France, Italy, or Spain is excluded, the interaction term becomes statistically insignificant. This suggests that the estimated interaction effect is partly sensitive to the sample composition, particularly to the inclusion of France and two of the control countries.

Overall, the leave-one-out robustness check provides qualified support for the baseline results. The main pattern, a positive association between inequality and public support in periods without carbon pricing and a negative interaction between inequality and carbon pricing, remains visible in most specifications. However, the results are not fully robust to all country exclusions, especially when Italy, Spain, or France is removed from the sample. This indicates that the baseline findings are not driven by one single country alone, but that they remain sensitive to the composition of the treated countries and control groups.

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