

# The impact of education on attitude towards green energy policies

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**Abstract:** this paper aims to investigate the attitudes towards green policies among individuals, using data from European Social Survey (ESS8), with a particular focus on how they are affected by their educational level. The study begins by reviewing the existing literature on attitude towards green policies, highlighting the importance of socio-demographic factors and implications for policymakers, organizations, and researchers. With growing concerns about environmental degradation, understanding public opinion and factors influencing support for green policies is crucial for effective policy implementation. Building upon this knowledge, an ordinal logistic regression analysis is conducted to assess the relationship between these factors and the levels of support towards green policies.

**Key words:** green energy policies, ordinal logistic regression, social and political attitudes, eco-practices

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## Introduction

Attitudes towards green policies play a crucial role in shaping environmental governance and sustainability initiatives worldwide. With the pressing need to address environmental challenges - such as climate change, pollution, deforestation and resource depletion - understanding public perceptions and support for green policies is crucial for effective policy development and implementation. This paper aims to examine the relevance and significance of studying these attitudes, with a specific focus on the relationship between education and support towards green energy policies, emphasizing its implications not only for policymakers, but also for organizations and researchers.

First of all, with the expression “green energy policies” we refer to “any policy measure aimed at aligning the structure of a country's energy sector with the needs of sustainable development within established planetary boundaries”<sup>1</sup>.

With reference to “Climate Change Views, Energy Policy Preferences, and Intended Actions Across Welfare State Regimes: Evidence from the European Social Survey” - written by Sandra T. Marquart-Pyatt, Hui Qian, Matthew K. Houser & Aaron M. Mc Cright - emerged that for comparative social science studies, it is crucial to increase our knowledge of how perspectives on climate change connect to other social, political, and environmental viewpoints. Social science research over the past two decades has revealed that while there are fewer uniform trends across countries, climate change is a highly political subject in many European countries.

With the aim of giving a general overview of why it is relevant to study such attitudes, we selected a few macro-areas:

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<sup>1</sup> Politics of Green Energy Policy, Anna Pegels, Georgeta Vidican-Auktor, Wilfried Lütkenhorst and Tilman Altenburg, The Journal of Environment & Development, Vol. 27, No. 1, pp. 26-45 (20 pages), Sage Publications, Inc. (March 2018)

a) Environmental impact

By understanding the level of public support for green energy policies, we can better identify barriers to implementation, development of effective strategies and measures to address critical environmental challenges. This has a direct effect on policies' implementation and, consequently, on climate change mitigation and pollution reduction.

b) Socio-economic and political sphere

Considering these factors – such as policymaking, identification of obstacles and alignment with societal values – we can design effective green initiatives. Furthermore, social and economic implications can influence industries, job markets and communities. Studying these attitudes, it could be possible to anticipate potential problems and develop policies that balance environmental concerns and socio-economic factors.

c) Communication and public engagement

Understanding public attitudes towards green legislation is crucial for businesses and marketing communications, in order to adapt their tactics. Fostering support for green programs requires effective communication and public involvement. Addressing public concerns, dispelling myths and spreading awareness can increase public support, involvement in green efforts and preventing attempts of green washing by big industries.

Several studies have discussed the relationship between education and environmental concerns. We analysed a few academic papers with the purpose of investigating the extent in which educational levels affect the attention towards environmental issues. This study aims to enhance our understanding of public viewpoint and support towards green policies by examining the different facets of attitudes towards them, in the hope to help and transform to a more sustainable future. In particular, the research conducted by E. Clery and R. Rhead (2013) - dataset taken from ISSP 2010, performed in 29 countries - has proven that the relationship between levels of education and the environmental concerns is statistically significant, with higher levels of education being associated with higher levels of environmental concern.

## Research question and related hypothesis

- **RQ:** how does education affect support for green policies?

The aim of this short analysis is to investigate the extent in which education levels affect support towards green energy policies. With reference to E. Clery and R. Rhead's paper (2013), they highlighted how with increased education, individuals may become more aware of the importance of sustainability and, therefore, the need for proactive measures to address environmental challenges. Afterwards, we addressed our hypothesis:

- **H1:** as education years increase, also the support for green energy policies increases.

This hypothesis assumes a positive relationship between education level and support for green policies: assuming that as individuals attain higher levels of education, they gain a deeper understanding of environmental issues and potential benefits of green policies.

## Data and model specifications

For our research we decided to use data from European Social Survey Round 8 (ESS8). The data were collected in 2016 and include 23 countries. In particular, the country covered by the survey were the following: Austria, Belgium, Czech Republic, Estonia, Finland, France, Germany, Hungary, Iceland, Ireland, Israel, Italy, Lithuania, Netherlands, Norway, Poland, Portugal, Russian Federation, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

The ESS8 had a specific set of questions regarding attitudes towards climate change and renewable energy policies, so it was particularly interesting and useful for our purposes. Namely, we used three variables to measure our latent dependent variable *Attitude towards green energy policies*. The respondents were asked to what extent were they in favour or against the following policies in [country] to reduce climate change, respectively:

- *inctxff* - “Increasing taxes on fossil fuels, such as oil, gas and coal”;
- *sbsrnen* - “Using public money to subsidise renewable energy such as wind and solar power”;
- *banhhap* - “A law banning the sale of the least energy efficient household appliances”.

Our three variables are all measured on a scale from 1 to 5, where 1 is “Strongly in favour” and 5 is “Strongly against”. We reversed the scale of these three variables, so that higher values correspond to higher levels of agreement. Then, to synthesize this information into one single outcome variable we summed the values for each respondent for the three variables selected and then we divided the results by three; in this way we could maintain the original scale also for our final composite index. By doing so, it allowed us to get an average value of support for green energy policies for each respondent and provide an easier and more intuitive interpretation of the results.

Our main independent variable is education (*eduyrs*): in the questionnaire, respondents were asked to assess how many years of education they completed, whether full-time or part-time. We kept the variable as it was in the original dataset. We can observe that its distribution is approximatively normal, with some outliers on the right tail of the distribution.

As control variables we chose some socio-demographic predictors and the political self- placement scale to test how they affect the relationship between our main independent variable and the dependent one. More precisely, we used the following variables:

- *agea* – “age of the respondent, calculated”;
- *gndr* – “Gender”;
- *lrscale* – “Placement on left-right scale” (from 0 to 10).

We kept *agea* as it was, while we recoded gender into a standard dichotomous variable with values 0 and 1 (where 0 is “Woman” and 1 is “Man”). Furthermore, we also recoded *lrscale*, so that -1 corresponds to “Extreme Left”, 0 to “Centre” and 1 to “Extreme Right”.

Since our dependent variable is an ordinal one, for our analysis we decided to perform an ordinal logistic regression to evaluate the relationship between education and support towards green energy policies and its significance.

## Results

Our very first step into the analysis was running the ordinal logistic regression: as the results show, our main dependent variable *eduyrs* has a positive and significant impact on the attitude towards green energy policies. It seems that more educated you are the more in favour of green policy you are going to be. Meanwhile, we noticed that the control variables have a negative effect on the dependent variable. For what concerns *lrscale*, we can point out that going from left to right, people tend to be less in favour of green energy policies; the same trend can be observed as age increases. Considering the last control variable *gndr*, men tend to support green policies less than women.

By looking at our results, we can point out that our average subject less in favour of green policies would be a right-wing, grown-up man with a low level of education; whereas the subject that would be more in favour of green policies is a well-educated, left-wing, young woman.

**Table 1: ordinal logistic regression output**

Dependent variable:			
green_pol5cat			
eduyrs	0.061 *** (0.003)		
lrscaler	-0.468 *** (0.022)		
gndr	-0.130 *** (0.020)		
agea	-0.003 *** (0.001)		
Observations	36,474		
Note: * p<0.1; ** p<0.05; *** p<0.01			
Intercepts:			
	Value	Std. Error	t value
1 2	-2.85	0.06	-49.65
2 3	-0.82	0.05	-16.04
3 4	1.31	0.05	25.45
4 5	4.04	0.06	68.51

By looking at the intercepts we can reconstruct the equations for the model.

$$\text{Logit } (P(Y \leq 1)) = (-2.84) - 0.06 * \text{eduyrs} - (-0.46) * \text{lrscaler} - (-1.13) * \text{gndr} - (-0.003) * \text{agea}$$

$$\text{Logit } (P(Y \leq 2)) = (-0.82) - 0.06 * \text{eduyrs} - (-0.46) * \text{lrscaler} - (-1.13) * \text{gndr} - (-0.003) * \text{agea}$$

$$\text{Logit } (P(Y \leq 3)) = (1.31) - 0.06 * \text{eduyrs} - (-0.46) * \text{lrscaler} - (-1.13) * \text{gndr} - (-0.003) * \text{agea}$$

$$\text{Logit } (P(Y \leq 4)) = (4.04) - 0.06 * \text{eduyrs} - (-0.46) * \text{lrscaler} - (-1.13) * \text{gndr} - (-0.003) * \text{agea}$$

These equations can be used to calculate the likelihood of each level of support towards green energy policies for a specific subject, given the values of the independent variables included in the model.

Since the coefficients are not directly interpretable, we convert them into odds ratios. Then, from the odds ratio we extract the odd probability by applying the following formula:  $(OR - 1) \cdot 100$

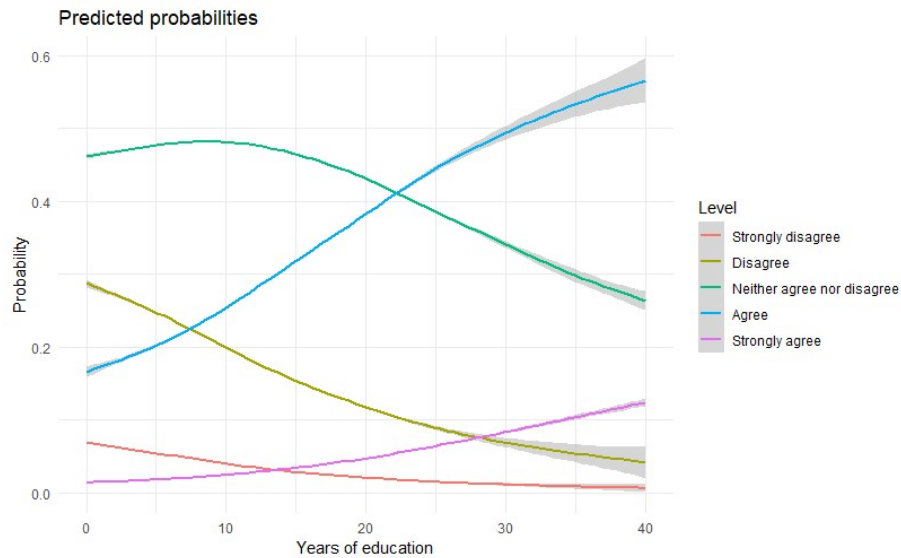
**Table 2: odds ratio and odds probability**

	OR	2.5 %	97.5 %
eduyrs	1.063	1.057	1.068
lrscaler	0.626	0.599	0.654
gndr	0.878	0.845	0.913
agea	0.997	0.996	0.998
eduyrs	6.28	-37.37	-12.17
lrscaler			-0.32
gndr			
agea			

The odds of supporting green policies increase of 6.28% as education years increase; meanwhile, the odds of being in favour of green policies decrease of 37.37% moving from left to right, they decrease of 12.17% for men compared to women and of 0.32% as age increases. This is coherent with the coefficients we described previously; it is important to point out that the odds probabilities are not directly comparable in terms of magnitude of the effect because the variables considered are measured on different scales.

To show the results in a more intuitive way we decided to plot the predicted probabilities for each category of our dependent variable, level of support for green policies. Predicted probabilities are usually easier to understand than either the coefficients or the odds ratio.

**Figure 1: predicted probabilities**



We can observe that in relation to the first three categories of the dependent variable (i.e., “strongly disagree”, “disagree” and “neither agree nor disagree”) the probability of supporting green policies decreases as years of education increase. Differently, considering the pro green policies categories (“agree” and “strongly agree”), the probability of support increases when education years increase.

Looking at the plot above, years of education seem to have the strongest impact on the category “agree”, as shown by the slope of the blue line. However, we should keep in mind that the confidence interval is quite wide above 30 years of education; this is probably due to the shortage of observations with this level of education. Moreover, considering the graph, we can comment on the intersection points: it is interesting to highlight that with more than 8 years of education, the probability of being in favour of green policies is always higher than the one of not supporting them. However, the probability of neither agreeing nor disagreeing remains the highest until about 22 years of education. This represents the turning point where the highest probability becomes agreeing with green policies.

## Conclusions

According to the findings of the ordinal logistic regression analysis, we can state that education, in general, has a positive and significant effect on the agreement on active green policies. Individuals seem to be more inclined to favour green initiatives the better educated they are. Therefore, we can

confirm our initial hypothesis H1: *as education years increase, also the support for green energy policies increases.*

From our analysis emerged that, when considering the effect of education on each category of the dependent variable, the direction of the relationship varies. The likelihood of falling into the categories “strongly disagree”, “disagree” and “neither agree nor disagree” declines with more school years; while the likelihood of responding “agree” and “strongly agree” rises with more years of higher education. This furtherly confirms the general positive relationship between educational level and eco-friendly attitudes and support towards green energy policies.

It is also important to point out how that, considering the relevance of the topic in the public and media debate, there is the general belief that people are well aware and informed about the urgency of all the issues connected to climate change and are ready to take action about it. However, we must mention, that looking at the composite index we created to summarize attitudes towards green energy policies, the majority of individuals falls into the category of response (“*Neither agree nor disagree*”). These results are quite surprising considering the importance of the issue nowadays. We would have expected to see more agreement towards green policies and, in general, more awareness with clear and well-defined positions on the topic.

As observed from the analysis, a positive correlation between education levels and eco-friendly attitudes can be found. To spread more consciousness, schools, universities and other social contexts should educate beyond simply providing a person with information about environmental challenges, but also informing about the actual policies that can be implemented in our society for a direct action on the environment.

Future research can further investigate the determinants of attitudes towards green energy policies and, more in general, towards climate change; moreover, future studies can examine interactions between education and other social and political factors. This could be useful for public institutions and policymakers to promote adequate measures to better address this global challenge.

## References

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