

UNDERSTANDING HOUSEHOLD ENERGY EXPENDITURE IN SPAIN: A QUANTILE REGRESSION APPROACH

Marco Barassi¹, Rakel Murillo-Rivas², Cristina Pizarro-Irizar^{2,3}

¹University of Birmingham, Birmingham, United Kingdom. ²University of the Basque Country, Bilbao, Spain. ³Basque Centre for Climate Change, Bilbao, Spain

Extended Abstract

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Abstract Summary

In recent years, energy vulnerability has become a critical issue due to rising energy prices and the effects of climate change. This paper aims to identify the key factors driving household energy expenditure in Spain, analyse how these change by decile, and examine their influence on energy vulnerability, with a particular focus on electricity, heating, and private transport. Using data from the Household Budget Survey of the Spanish National Institute of Statistics for the period 2016–2022, we employ quantile regression analysis to examine variation in energy expenditure across households. We also use a logit regression based on the Low Income High Cost (LIHC) indicator to identify the main drivers of energy vulnerability. The paper contributes to the literature in three main ways: (i) it separately models the three main energy vectors—electricity, gas, and transport fuels—rather than aggregating them; (ii) it incorporates climate variation using Heating Degree Days (HDD) and Cooling Degree Days (CDD); and (iii) it examines how household gender composition, including the degree of feminisation, affects energy expenditure. By combining quantile regressions with the LIHC-based logit model, the paper provides a comprehensive framework that links expenditure patterns with vulnerability risks, offering deeper insight into how various factors shape both energy spending and energy vulnerability. Our findings shed light on the vulnerabilities associated with energy consumption, particularly among low-income households, and inform the design of public policies that address energy vulnerability in the context of Spain's ongoing energy transition. By providing a quantitative basis for policy decisions, this paper contributes to the development of targeted interventions that can mitigate energy vulnerability and promote equitable energy access across income groups.

Presenting Author Biography

Cristina Pizarro-Irizar is Associate Professor at the University of the Basque Country and Associate Researcher at the Basque Centre for Climate Change. She holds a Bachelor's degree in Engineering and a PhD in Economics from the University of the Basque Country. Her research focuses on energy economics. She has published and presented internationally. She was a visiting researcher at the Fraunhofer Institute in 2014 and the University of Birmingham in 2024. She has supervised one PhD thesis, is Principal Investigator of two ongoing projects, and has been Basque Country delegate of the Spanish Association of Energy Women since 2021.