

Assessing the efficiency and drivers of household energy demand

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Extended Abstract

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Abstract Summary

Reductions of household energy demand and electrification of energy end-uses are considered key elements of the decarbonised energy transition. Thus, identifying the comparative efficiency of the consumption of gas and electricity in the residential sector and the determinants of such consumption are very relevant research tasks to propose public policy instruments which reduce demand for different energy carriers while encouraging more efficient ones. Although the literature has analysed the drivers of energy demand, it has often done so at an aggregate level or has only focused on one energy carrier. In contrast, this paper pays attention to both electricity and gas comparatively, adopting a micro-level perspective. Its aim is to compare the efficiency of gas and electricity consumption in the residential sector with a stochastic frontier analysis and the drivers of such consumption, focusing on the responsiveness of households to changes in gas and electricity prices. It also analyses differences in efficiency levels and price elasticities for different household types. Using a panel database of Spanish households between 2006 and 2019, an econometric model which corrects for endogeneity is estimated. Our results show that efficiency in the use of energy is higher for electricity (82%) than for gas (69%) and that electricity demand is more responsive to price changes than gas, although the demand for both is price-inelastic (-0.746 and -0.705, respectively). Furthermore, some household and dwelling features (e.g., income and location in colder or warmer regions) have substantial influence on, both, electricity and gas demand.

Presenting Author Biography

Pablo del Río is senior researcher and head of the Environmental Economics Group at the Institute for Public Policies and Goods and at the Spanish National Research Council (CSIC). His main areas of research are at the cross-road of Energy, Environmental and

Innovation Economics. He holds a PhD in Environmental Economics and a B.Sc. in Economics and Business. He is the author of four books in leading international publishers (Springer and Palgrave) and editor of the book *The Economics of Renewable Energy* (Edward Elgar). He has 127 peer-reviewed articles in 42 journals indexed in JCR (98 of them Q1 journals).