How the facets of energy security impact the support for energy sources: Evidence from UK household data

Andreas Markoulakis, University of Warwick, Department of Economics, +44 (0)24 765 28090,
Andreas.Markoulakis@warwick.ac.uk
Eleanya Nduka, University of Warwick, Department of Economics, +44 (0)24 761 50143,
Eleanya.Nduka@warwick.ac.uk

Overview

The path to decarbonization and the net zero targets set around the world requires changes in the energy policy and public attitudes towards energy in many countries. An important topic in this discussion, which is often overlooked but more recently has become more prominentn is the role of energy security.

Energy security is a multi-faceted concept, its definition can change and be dynamic in nature and can depend on the context. Multiple indexes to assess its impact have been proposed by researchers (Sovacool and Mukherjee, 2011).

We know very little about the attitudes of households with respect to energy security and its varius dimensions (facets) and how concerns could impact their attitudes and their support for different energy sources.

Using UK household data, we examine empirically how different facets of energy security impact energy preferences for electricity provision for three energy sources: renewable energy, nuclear energy and shale gas. The facets (dimensions) of energy security we employ are the following: energy vulnerability concerns consisting of items on energy supply disruption (domestic energy supply, import dependency, technology development on energy sources and fossil fuel investment), energy affordability concerns (higher prices), energy reliability concerns (power cuts frequency) and energy imports dependency from other countries.

Since the empirical literature in this area is rather limited, our study attempts to fill in this gap. We put forward the hypothesis that higher energy security concerns are positively with support for all three energy sources we examine, although we remain agnostic the magnitude of this relationship which could vary across energy sources and facets.

Methods

Our empirical approach utilises an ordered logistic econometric model and controls for various socio-demographic variables at household level and the energy security facets mentioned earlier. This approach allows us to estimate the impact of each energy security facet actross different levels of concerns and the findings are easier to interpret than OLS. This allows to disentangle the impact of each energy security facet on energy preferences and to help provide robust empirical evidence to inform policy decisions.

The above findings are robust to endogeneity concerns since we make use of instrumental variables and the relevant statistical tests (Hausman-Wu, Kleibergen-Paap and Hansen tests) support our findings.

Results

Our findings reveal that the public support for renewables is comparatively less sensitive to energy security concerns than support for nuclear energy and shale gas extraction. More specifically, declining concerns for energy vulnerability imply that households are becoming less likely to support each energy source, however, the average

probability of support is falling substantially and at a much larger rate (almost double) for nuclear and shale gas than for renewables.

Energy affordability concerns only have a small impact on shale gas and no discernible impact on renewables and shale gas whereas energy reliability shows a different pattern where the support for renewables increases as reliability concerns ease—an exception to the inverse relationship of our hypothesis typically observed—support for nuclear energy and shale gas decreases significantly. Energy imports dependency concerns can impact negatively the support for renewables and at a much larger rate the support for nuclear and shale gas.
Moreover, when households are at least fairly concerned about imports dependency, we examine the impact of three energy types -oil, gas, and electricity- and we find that it is primarily nuclear and then shale gas which benefit the most and not renewables.

Conclusions

We discuss policy implications derived from our findings. One of them is about the limited concerns for higher energy prices in the future, we suspect that the main reason is due to framing effects and that households devalue concerns which can appear in the distant future.

Energy import dependency does have an impact, but its impact varies across energy sources. Moreover, it is unclear how risky are energy imports from neighbouring countries of the UK (France, Belgium). We are unsure why energy imports concerns have a larger impact than affordability or reliability, it might be that people tend to associate energy security mainly with being energy importer or not. Apparently, the limited impact of reliability is related with the unfamiliarity of UK households with power cuts.

Finally, other facets of energy security like environmental sustainability, energy efficiency and economic efficiency which are not examined in our paper, could have an impact and should be addressed in the path towards green transition.

References

Arndt, C. (2023) Climate change vs energy security? the conditional support for energy sources among western europeans *Energy Policy* **174**, p. 113471.

Demski, C., Poortinga, W., Whitmarsh, L., Böhm, G., Fisher, S., Steg, L., Umit, R., Jokinen, P. and Pohjolainen, P. (2018) National context is a key determinant of energy security concerns across europe *Nature Energy* **3**(10), pp. 882–888.

Roddis, P., Carver, S., Dallimer, M. and Ziv, G. (2019) Accounting for taste? analysing divergingpublic support for energy sources in great britain *Energy Research & Social Science* **56**, p. 101226.

Sovacool, B.K. and Mukherjee, I. (2011) Conceptualizing and measuring energy security: A synthesized approach *Energy* **36**(8), pp. 5343–5355.