
Editorial: Recent advances in energy and environmental economics

The world is facing unprecedented challenges with respect to environmental protection and climate change, putting the long-term survival of humankind at risk. Attaining environmental protection and decarbonisation, in the energy or other sectors, should be effective, efficient and fair, i.e. should be achieved at least cost and considering social justice.

Thus, the urgency to address those issues faced by humankind emphasises the need for a just decarbonised energy transition based on low carbon energy sources which addresses the goals of the so-called energy trilemma (access to affordable energy, decarbonisation and environmental sustainability). This is certainly a difficult task because those goals are often conflicting, and trade-offs between them need to be balanced.

Energy and Environmental Economics provide useful theoretical and methodological frameworks to analyse the degree to which economies are advancing towards those goals cost-effectively and, in particular, how to achieve a net-zero economy at least cost. This is precisely the aim of this special issue, whose relevance lies in the current political and economic importance of the topic.

On the basis of the guidelines in the call for papers, we received 21 submissions. Finally, four articles, based on solid economic fundamentals on Energy and Environmental Economics addressing those issues have been published. Three papers focus on the affordable energy access goal of the aforementioned trilemma, whether regarding efficiency (reduction of fuel prices, decarbonisation at least cost and welfare effects of degrowth as decarbonisation) or equity (energy poverty) and another one addresses the welfare effects of broader decarbonisation strategies, i.e. not circumscribed to energy production or use. The goal of decarbonisation is explicitly addressed in two papers. Three of them provide interesting empirical analyses and one makes relevant methodological contributions; and all of them include relevant policy implications. An explicit spatial dimension is included in the papers.

The paper “Competition and Consumer Prices in the Fuel Market: Insights from a Small EU Country” by Dolšak *et al.* (2024) assesses the effect of competition on retail fuel prices in a small EU country (Slovenia) with high market concentration. The authors start from the assumption that understanding the competitive dynamics in a market with a largely homogenous product requires accounting for differences between stations and brands, as well as variations in costs and locations. It is found out that a significant portion of the daily price variation observed at gas stations can be attributed to observable station characteristics, as well as the ex-refinery price that affects all stations. Within the observable variables, an important distinction is between highway and road stations. Brand recognition also has a significant impact on price levels. Furthermore, the structure of local competition is an essential factor in addition to the number of brands. The more diverse the



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group of independent brands in a particular area, the lower the anticipated price levels. Border proximity encourages cross-border competition, resulting in increased prices due to positive cross-border price differences. As major policy implications, the study suggests that regulation restricting the entry of oligopoly suppliers may not decrease prices and can even be associated with price increases in the absence of strong market players in the retail fuel market. It also indicates that policy should encourage fiercer competition in the local market by increasing the density of gas stations, especially from independent brands.

Using an environmental dynamic general equilibrium model, the paper “The Welfare Effects of Degrowth as a Decarbonization Strategy” by Boscá *et al.* (2024) assesses the welfare and macroeconomic implications of three distinct decarbonisation strategies (penalising fossil fuel demand, substituting aggregate consumption with leisure, and curbing consumption by limiting total factor productivity [TFP] growth), which the authors suggest could be categorised within the diverse landscape of ideas encompassed by the degrowth literature. The model is calibrated using data from Spain. Their results reveal that the strategies analysed, which most closely align with the strictest interpretations of degrowth (a reduction in the consumption of goods and services compensated by an increase in leisure, or strong impediments against conventional economic growth), would lead to a notable decline in welfare. A degrowth scenario aimed at curbing consumption through a decline in TFP would result in the most pronounced reduction in welfare, whereas inducing a reduction in fossil fuel demand by increasing the price of fossil fuels through taxes would have a noticeably less detrimental effects on welfare. Their results suggest that a globally coordinated strategy could result in long-term welfare gains.

The paper “Decarbonisation at least cost: an analysis of the optimal portfolio of instruments” by Rodríguez *et al.* (2024) proposes a methodology for assessing an optimal portfolio of investment instruments that minimise the social costs of decarbonising economic activity while improving the environmental objectives proposed in EU legislation. The authors consider four technologies or practices (which the authors call “instruments”): the installation of solar PV and wind generation, thermal insulation of households and deployment of heat pumps. The article provides an empirical application in the Spanish context. The methodology defines the net social cost of decarbonisation related to a portfolio of those instruments. The social cost is minimised by restricting it to the minimum level of the targets proposed in the Spanish National Energy and Climate Plan (NECP) to reduce greenhouse gas emissions, increase generation from renewable sources and reduce energy consumption. The application of this methodology concludes that the social cost of decarbonisation can be reduced while improving environmental performance through a reorientation of investment instruments. In particular, efforts in the thermal insulation of households should be minimised and measures aimed at the installation of heat pumps should be maximised. The authors suggest that national governments should concentrate their efforts on instruments with comparative advantages when setting the objectives of the NECP.

Finally, the paper “The effect of regional factors on energy poverty” by Jove *et al.* (2024) examines the spatial variation in energy poverty using a sample of more than 300,000 Spanish households. The authors identify the regions that are at greatest risk of energy poverty and their evolution in this regard. Their results point to the importance of regional factors in the probability of being energy poor. They confirm that the phenomenon is asymmetrically distributed across the country and is mostly concentrated in those Spanish regions where the population is more sparsely distributed. In addition, their findings point to the importance of regional factors in the probability of being energy poor. On the basis of these outcomes, several policy recommendations are provided, which stress the need for

countries to design household energy poverty policies that jointly pursue the correct identification of vulnerable groups while ensuring that the measures adopted complement the characteristics of each region. More specifically, they argue that local initiatives are required to combat energy poverty more effectively, especially for those households that find themselves in regions that are “trapped in energy poverty”. A mix of policy interventions is proposed, including energy support offices that can provide information on energy rights, awareness and education to all the households in an area, simplify administrative procedures, ensure adequate levels of digitalisation and gather insightful information about households vulnerable to energy poverty via a range of different agencies. Third-sector services can also play a crucial role in identifying individuals at risk of energy poverty, given their close relationship with these vulnerable communities and their management of aid programmes with close ties to the problems of the energy poor.

By using a rigorous methodology, the papers included in this special issue provide novel results and relevant policy recommendations. The analyses contribute to a broader debate that addresses not only the trilemma analysed in this special issue but also energy security and green transition in a war and climate crisis context.

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