

Energy-efficiency policies for decarbonising residential heating in Spain: a fuzzy cognitive mapping approach

E. López Bernabé; P. Linares Llamas; I. Galarraga

Abstract-

Decarbonising residential heating poses a major challenge for the energy transition, but the policy attention devoted to and the support provided for it seem limited. There is a rather limited consideration of the perceptions of households, which play a large role in this sector. This in turn may affect the effectiveness of policy instruments. This study contributes to a better understanding of the various perceptions held by key stakeholders, in particular about what can be done to reduce residential heating bills and how. We use a participatory method based on Fuzzy Cognitive Mapping (FCM), which accounts for the behavioural complexity of the transition in residential heating and provides a better understanding of policy instruments in terms of stakeholder perception. We then test combinations of policy instruments based on expert opinion and identify the most effective ones based on their perceptions. Our analysis indicates that environmental education and information are perceived to reduce heating bills by a very significant amount. Taxes are perceived to be more effective than subsidies. We also show that policy packages are considered essential: when policy instruments are combined the effects perceived are cumulative, resulting in a much greater expected impact on heating bills and energy consumption.

Index Terms- Energy-efficiency policy instruments; Policy simulation; Residential heating decarbonisation; Fuzzy cognitive mapping.

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