Micro-level Rebound Effect of Improvements in Heating Efficiency

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Summary
The burgeoning literature on micro-level rebound effect of energy efficiency still misses a structural model that could guide empirical analysis. While abundant empirical estimates show a quite wide range, there is little knowledge as to how to narrow down the estimates or to delineate different patterns of responses among individuals. This gap is particularly important in residential heating, where the extremely wide range of rebound estimates hampers the development of evidence-based policy instruments. We use two distinct but closely related approaches to provide insight to the consumer’s micro-level rebound responses. First, integrating a household production function for energy services in the utility maximization problem, we propose a household’s decision model and draw conclusions for identifying the patterns of rebound responses and their main determinants. Second, using a hypothetical choice experiment conducted on a nationwide sample of more than 3,500 households, we estimate the patterns of rebound effects in residential heating and quantify the effect of various household characteristics. The results point to a strong heterogeneity among households, providing a possible explanation for the wide range of aggregate estimates in previous studies. While part of this heterogeneity is explained by observed characteristics such as income and risk attitudes, some contrasting differences remain unexplained. We provide a possible explanation using hierarchical preferences with an unobservable household-specific threshold.

About the speaker
Mehdi Farsi is a professor at the University of Neuchâtel where he holds the Chair of the Microeconomics of the Public Sector. He also serves as a board member of SCCER-CREST. His current research focuses on the determinants of energy consumption and investment decisions in particular, the end user’s behavioral response to energy transition and the related technological and business innovations. Prior to his current engagement in Neuchâtel, Dr. Farsi has been a Senior Scientist at the ETH Zürich where he obtained his habilitation in Applied Microeconomics and Econometrics. Mehdi holds a PhD in Economics from University of Southern California and a DEA in Civil Engineering from Ecole Centrale de Lyon.