



The Energy Efficiency Gap, Bounded Rationality, and the Role of Energy-related Financial Literacy

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Increases in energy efficiency play a major role in projections of how the world might cut carbon emissions. However, in what is commonly referred to as the “energy efficiency gap,” individuals often don’t adopt energy efficient technologies, even when they could save money by doing so, Massimo Filippini, a Professor at ETH Zurich and the Università della Svizzera Italiana, explained in Monday’s energy policy seminar. ([Link to his presentation](#)).



One theory about the reason for limited investment in energy efficiency has to do with ideas about “bounded rationality” of consumers who “make decisions using limited information and with cognitive constraints in processing information.” With this in mind, Filippini wondered whether twin limitations—in financial literacy and in energy-related knowledge—might play a role in diverting consumers from spending money cost effectively on energy efficiency. Many energy efficiency choices, Filippini noted, involved a significant upfront investment, recouped over an extended period. It may be hard to make the right decision about when to buy a more energy-efficient appliance, Filippini observed, if you don’t know how much your electricity costs, or you are not clear about how to work with interest rates and compound interest.

To capture the combination of these two kinds of knowledge, Filippini explained, he and his colleagues developed the concept of “Energy-related financial literacy,” defined as, “The combination of energy-related knowledge and cognitive abilities that are needed in order to take decisions with respect to the investment for the production of energy services and their consumption.” ([Blasch, Boogen, Daminato and Filippini, 2018](#)) A review of previous research revealed that there might be some deficits in energy-related financial literacy in Europe, Filippini reported. A survey of 4600 European households found that most did not know the price of their electricity, or the amount of energy used by particular appliances, and many were unclear about how to calculate the lifetime cost of an appliance.

What if policymakers found a way to help the customer with their energy efficiency investment decisions? Would such help result in consumers being more likely to choose more efficient products that would save them money in the long run? Filippini and his colleagues devised an online survey to help answer this question. They administered the survey twice: to 5,015 households in German and French speaking regions of Switzerland, and also to 916 households in and around Bern (Switzerland’s capital). Survey participants were asked to identify which of two otherwise identical refrigerators would have the lowest lifetime cost, given all the pieces of information necessary to answer the question (price, energy savings, energy cost, and lifetime). One group was asked to answer the question based on this information alone, another group was given a set of educational slides to help them with the analysis, and a third group was given a simple online calculator. In the particular case given, the lowest lifetime cost choice was actually the less energy efficient refrigerator, which had a substantially lower sales price than the more efficient model.

In all three groups, and in both surveys, participants identified the more cost-effective option less than half the time (performing worse than they would have done if they had simply chosen randomly). However, those who were

given the education slides performed better than the no-treatment group, and those given the online calculator performed better still (topping out at a 44% success rate in the Bern survey).

Filippini and his colleagues concluded that both educational training and decision support tools might result in more customers choosing cost-effective energy efficiency purchases, and, more broadly, that “The effectiveness of the introduction of environmental taxes/subsidies can increase if people are informed and have a high level of energy related financial literacy.”

Filippini spoke as part of the Kennedy School’s Energy Policy Seminar Series, which is sponsored by the Consortium for Energy Policy Research of the Mossavar-Rahmani Center on Business and Government.