

The Impact of Behavioral Science Experiments on Energy Policy

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Executive Summary

One of the most exciting areas of research today is the use of behavioral science experiments to better understand how various behavioral interventions change the energy consumption decisions of consumers and businesses. Many policy makers face severe constraints, and are unable to alter markets, regulation, or taxes, so that the price of energy reflects its full social cost. Understanding and changing the pattern of energy consumption is critical for a variety of reasons, including meeting the challenge of climate change by reducing greenhouse gas emissions.

This article provides a survey and synthesis of behavioral experiments that may affect energy consumption. We focus primarily on experiments examining how alternative behavior interventions affect residential electricity consumption because that is where most experiments have been done.

When economists started conducting experiments in the energy sector in the 1970s, the focus was on the importance of economic variables, such as price, in affecting consumption decisions. The “law of demand” tells us as the price of something increases, people generally consume less of it, and this is generally borne out in traditional econometric studies of energy demand. However, the story is much richer than that. We now know there are a host of ways in which behavior can be affected in addition to traditional price and income variables. These include supplying people with additional information relevant for making decisions, and changing the way information is presented and framed. Thus, it will be useful to explore experiments that focus on price and non-price interventions, as well as experiments that focus on both simultaneously.

In this review, we summarize *general principles* that can be gleaned from the behavioral science experiments aimed at examining energy consumption. We focus on “field experiments” that try to understand the likely impact of different treatments in a real-world setting. Many of the experiments in our review attempt to reduce energy demand. This demand reduction can be separated into two parts: energy conservation and energy efficiency. “Energy conservation” is used to mean reductions in energy use, holding the energy use per unit of output constant. “Energy efficiency” measures energy use per unit of output. A decrease in the use of energy per unit of output means energy efficiency has increased.

Here are some of general insights from the literature. First, the “law of demand” is typically satisfied, but responsiveness to price changes can vary dramatically in different contexts. Second, information provision can help reduce energy use, but it does not

always work in a cost effective way or at all. Third, the use of social norms can reduce energy consumption in many contexts. Finally, the economic welfare impacts of behavioral interventions aimed at promoting energy conservation are not well understood, but initial research suggests that some people want nudges and some do not. More generally, it is important to distinguish between policies that reduce demand and policies that increase overall economic welfare or efficiency. We measure the latter by net changes in producer and consumer surplus. Thus, policies that promote conservation may or may not increase economic welfare as defined here.