“Real-Time Energy & Fuel Consumption Technology Effects on User Behavior and Conservation”

by Jordan Hibbs

Abstract

In an average home, there are few technologies for energy saving. Individuals typically have access to monthly data such as the amount of an energy bill and the daily kilowatt usage. However, there are new technologies that allow users to monitor their energy usage day-to-day, rather than monthly: smart-home energy management systems. The objective of smart-home energy management systems (“smart-home technology”) is to monitor and control energy consumption and to minimize the energy leakage in a home. Smart-home technology saves and notifies residents of data related to their energy consumption to monitor and control home appliances using their mobile devices. Such technology is also in vehicles, but instead of tracking energy consumption, the vehicle displays real-time fuel consumption and battery levels.

Energy and fuel supply are sociotechnical in nature: technology and behavior interact and change with each other over time. It is well established that technical and physical improvements in housing and vehicles are not enough to guarantee reduced energy and fuel consumption. Energy consumption in identical homes, even homes designed to be energy efficient, can easily differ depending on the behavior of the occupants. Similarly, individuals in identical vehicles, even those designed to be fuel-efficient, can easily differ depending on the behavior of the driver. Over the past few decades, many studies have noted the importance of including social and behavioral consideration in the analysis of energy use in buildings, and fuel consumption in vehicles. With the emergence of real-time technology displaying real-time fuel consumption in vehicles, and current energy-consumption in homes, the question is raised as to if these technologies will reduce consumption.

This paper will set out general issues that are relevant to the debate on the future of energy and fuel consumption with the increasing use of real-time technology, and will analyze the current research related to user-behavioral changes due to the real-time consumption data. Additionally, this paper will examine the implications of such behavioral changes on public policy, privacy, and energy and fuel markets.

\