

Appliance Efficiency and Long-Run Energy Demand

Matthew Harding (Department of Economics, Stanford University)

David Rapson (Department of Economics, University of California, Davis)

This project will examine how people make decisions about appliance purchases and the effect that these choices have on energy demand. Currently, approximately half of U.S. greenhouse gas emissions are attributable to residential appliance use. However, consumers can reduce their long-run energy needs by replacing old appliances with ones that are more energy efficient. It is not surprising, then, that efficiency standards have been the cornerstone of U.S. energy conservation efforts to date. Unfortunately, the effect of these standards on appliance purchase behavior is not well understood. There are two primary reasons why. Current datasets lack crucial information, and even with appropriate data it is difficult to accurately model the dynamic aspect of appliance purchase behavior. This project addresses both of these issues.

We will use the latest econometric techniques on existing data to model the complex dynamic decision faced by consumers when choosing appliances. This will allow us to evaluate the costs and benefits of various market interventions such as efficiency standards, subsidies and carbon taxes, and will provide policymakers with insights into how best to achieve abatement goals such as California's AB 32. Additionally, the principal investigators will explore the feasibility of a detailed multi-year data collection initiative that will address the shortcomings of current sources. We expect that this will vastly improve our ability to analyze durable goods purchase behavior and, as a result, improve our understanding of optimal long-run energy policy.