EPP and Center for Climate and Energy Decision Making

Sponsored Seminar

Mike Blackhurst
Assistant Professor
Civil, Architectural, and Environmental Engineering
The University of Texas at Austin

Presenting on:

"The Implications of Consistent Efficiency Improvements for The Rebound Effect for U.S. Households - Theoretical and Empirical Insights"

December 16, 2013
12 noon
(Lunch served at 11:50am)
129 Baker Conference Room
Department of Engineering and Public Policy

Seminar Abstract: In response to concerns regarding overconsumption of scare resources, policymakers have emphasized technological solutions to reducing resource consumption from U.S. households. However, the behavioral and economic implications of residential end-use efficiency ("the rebound effect") remain unclear. Existing models of rebound assume technical change for only one end use. However, technical efficiency improves consistently across many end uses through factors that are both exogenous (e.g., Federal standards) and endogenous (e.g., voluntary adoptions) to households. We use theoretical and empirical models to show that such consistent, marginal technical change within and across end uses significantly affects net energy savings and respective energy externalities. As an example, residential efficiency improvements have recently outpaced transportation sector improvements. If homeowners leverage residential efficiency gains for added travel demands, such disproportionate efficiency changes can significantly erode technically feasible savings. We also apply regression to an exemplary database of residential energy consumption. Within end use categories, results show a declining rebound effect with marginal efficiency improvements; however, some consumers may be leveraging efficiency gains for new energy services (devices). These results have significant policy implications. They challenge the long-run efficacy of efficiency to meet expected environmental goals, as householders continually expand energy services. Similarly, consumer reactions to disproportionate efficiency changes may simply shift consumption to different primary fuels and respective externalities. Results indicate that the net effect of efficiency must consider behavioral responses across multiple energy services, as opposed to single-service models influencing decision-making.

Speaker Bio: Dr. Michael Blackhurst is an Assistant Professor in Civil, Architectural, and Environmental Engineering at The University of Texas at Austin. Dr. Blackhurst's research considers the sustainability of technical systems given system uncertainty, user behavior, system interdependency, and environmental life cycle implications. His research emphasizes the economic and behavioral responses to and drivers of technical change, with applications to buildings, urban systems, and municipal and energy infrastructure. Dr. Blackhurst also has seven years of experience providing engineering consulting services to a diverse array of public sector clients. His is research has been profiled in the New York Times and National Geographic.

Carnegie Mellon University