



ENVIRONMENTAL AND ECOLOGICAL ENGINEERING

Research Seminar

Accounting for long-term benefits from energy technologies subsidies: case study of Plug-in Hybrid subsidies in the United States

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Abstract

The social benefit of energy technology subsidies is typically underestimated when considering only the costs and benefits per item directly subsidized. This approach misses the motivation underlying many subsidies: Increased production drives technological progress and reduces costs. When the cost of a subsidy is calculated include the "free" diffusion that occurs after the technology becomes economically competitive, the social benefits of the subsidy are markedly greater. We examine subsidies for Plug-in Hybrid Electric Vehicles (PHEV) in the U.S, showing that accounting for technological progress and eventual market activation reduces the subsidy cost per vehicle by over 90%, suggesting that the current \$7,500 per vehicle PHEV subsidy is in the public interest. As a caveat, at this stage we only analyze the evolution of economic parity of PHEV versus conventional vehicles, we do not account for consumer preferences for non-MPG aspects of vehicles. Our modeling framework shows, more generally, that assessing technological progress is critical to understand the benefits of a subsidy policy.

Biographical Sketch

Originally trained in theoretical physics, Eric Williams began work on sustainability related systems assessment of technology at the United Nations University in Tokyo. Returning to the U.S. first to Carnegie Mellon and then to Arizona State University, he is now Associate Professor at the Golisano Institute of Sustainability at the Rochester Institute of Technology. Eric's research focuses on modeling energy and materials flows to gain insights into sustainability impacts and management of new technologies. Much of his work has focused on information technology, such as characterization of materials flows in semiconductor and computer manufacturing and international management of electronic waste. He testified before Congress on electronic waste and his IT work has been widely covered in the media in outlets such as USA Today, Science, and the BBC. Eric's recent research focuses on understanding progress and diffusion of emerging energy technologies using perspectives such as experience curves, consumer market heterogeneity, and thermodynamic limits.