

Evaluating the Energy Savings Effect of a Utility Demand-Side Management Program using a Difference-in Difference Coarsened Exact Matching Approach

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Abstract

This paper seeks to estimate the energy savings effect of a Demand-Side Management program, specifically Gainesville Regional Utility's (GRU) high-efficiency central Air Conditioner (AC) rebate program in which GRU offers incentives to its customers to replace their old, low-efficiency AC unit with a high-efficiency model. We used a difference-in-difference coarsened exact matching approach to reduce the imbalance of pre-treatment characteristics between treated and control households and also to control for the effects of weather on electricity consumption. We found substantial annual energy savings of the high-efficiency AC program. We disaggregated the energy savings effects into summer peak effects, winter peak effects, and nonpeak effects. The results indicate that the summer peak effects were substantial and statistically significant while there were little or no statistically significant effects of the program on winter peak demand. Also, by following program participants over a three-year period, we find that there is no statistically significant rebound effect of the high-efficiency AC rebate program.

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