

Do Energy Conservation Workshops Help Households Save Energy?

Experimental Evidence from Urban Apartment Communities

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Abstract We evaluate household responses to a series of community-based, classroom-style energy conservation workshops aimed at reducing residential electricity consumption. These workshops, held in the common areas of apartment complexes in urban Taiwan, were designed as a low-cost behavioral intervention and demand-side management (DSM) strategy. Participants were provided with tools to better understand household electricity usage, interpret electricity bills, and adopt practical energy-saving behaviors—for example, recognizing the energy use of various appliances, using affordable timers to manage consumption, and understanding Taiwan's progressive electricity tariff scheme. The workshops also introduced the concept of smart meters and examined how the lack of real-time usage feedback may affect users' cost perception and responsiveness to price signals.

Using a difference-in-differences model with household and time fixed effects, supplemented by two synthetic control methods for robustness, we find that the overall reduction in electricity use is modest—ranging from 3% to 10% in the baseline model, though not statistically significant in the synthetic control specifications. Heterogeneous effects, however, are consistent: households with higher initial energy knowledge, more conservative goal-setting, no automatic bill payment, sole decision-making authority, and longer air conditioner usage are more likely to reduce electricity consumption after the intervention. Our findings demonstrate the multifaceted value of such workshops, including educational and behavioral benefits, enhanced cost awareness, and energy-saving potential. By improving public understanding of energy consumption, tariff structures, and conservation tools, these workshops empower households to shift their usage patterns—particularly by avoiding peak pricing brackets and reducing peak load pressure on the grid. Compared to large-scale infrastructure upgrades, community workshops are a cost-effective way to promote energy democracy, support DSM strategies, and accelerate behavior-based energy transitions. The results further offer empirical insights to guide government policies on scaling up smart meter adoption and advancing smart grid integration in urban and aging residential contexts.