

Evaluating the Cost Effectiveness of Subsidies: A Case Study of Solar Panels in New York State

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Abstract

Electrification is key to achieving net-zero emissions, leading to an inevitable increase in the demand for electricity in the near future. The residential sector accounts for a substantial 35% of electricity consumption in the United States. This study focuses on how governmental programs can promote the adoption of residential solar energy, helping to reduce electricity demand and assist in the transition to net-zero emissions.

This paper examines the effectiveness of generous governmental policies aimed at promoting residential solar panel adoption in New York. Specifically, we analyze the impact of the NY-capacity-based subsidy program, net metering policy, and tax rebates on residential solar adoption. Using a dynamic discrete choice model, we evaluate how forward-looking households respond to these governmental incentives. With these estimates, we run counterfactual scenarios to assess the impact of various policies on solar panel adoption.

Motivated by a recent policy change in California that reduced the net metering benefit, our counterfactual analysis will explore how a similar reduction in net metering would affect residential solar panel adoption in New York. Additionally, we compare the efficiency of the current incentive structure with a more aggressive policy offering higher incentives for a shorter period. In each scenario, we calculate the social benefit from reduced CO2 emissions due to solar panel adoption.

Our research holds significant policy relevance, offering insights for policymakers on optimizing incentive structures to enhance residential solar panel adoption. Furthermore, our findings provide a valuable reference for assessing the potential impact of similar policies implemented in other regions in the United States.