

# Income-targeted subsidies for low-emission cars

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## Abstract

We study the impact of subsidy targeting on additionality in car replacement programs, using administrative micro-level data on vehicle ownership, household income, and program participation covering nearly the entire population of French households. France implemented a large-scale retire-and-replace program between 2015 and 2024, which featured sharp income-based eligibility thresholds and substantial variation in subsidy generosity. Using a regression discontinuity design at these thresholds, we identify the causal effect of higher subsidies on household participation and vehicle replacement behavior. We find that low-income households eligible for the higher subsidy amount increased their participation in the program by around 30%, with similar responses among middle-income households, for electric vehicles (EVs) and non-EVs. While these participation effects are large, our results also imply that 74% to 76% of participants are inframarginal, indicating substantial windfall gains under uniform subsidies. We recover policy-relevant parameters such as the share of inframarginal participants and the slope of demand for replacement subsidies. Thereby we provide empirical evidence consistent with theoretical predictions that targeting can improve the economic efficiency of environmental subsidy programs.

**Keywords:** subsidies, additionality, electric vehicles, regression discontinuity, policy evaluation