

Findings from a discrete choice experiment on Household Adoption of Plug & Play PV in Multi Family Buildings: Battery Valuation, Preference Heterogeneity, and Policy Effectiveness

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Extended Abstract

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Abstract Summary

Rooftop PV deployment has expanded rapidly in single family homes, while uptake in multi family buildings (MFBs) remains limited due to fragmented ownership and complex collective decision making. Plug and play solar systems (PPSS) provide a small scale alternative with low upfront costs, easy installation, and portability, making them particularly attractive for residents of MFBs. PPSS are therefore considered a promising option to enable renters and low income households to participate in the energy transition. However, adoption barriers may remain higher for renters, as landlord approval is often required and shorter expected ownership duration reduces the net present value of investment.

Household benefits from PPSS depend on the ability to shift electricity consumption to sunny hours. Battery storage reduces the need for load shifting and provides protection against short term outages. At the system level, batteries generate additional benefits by absorbing excess renewable generation during periods of low demand and mitigating negative wholesale prices. This motivates interest in policies supporting PPSS only in combination with batteries.

The study uses a discrete choice experiment with over 800 residents of MFBs in France to estimate willingness to pay (WTP) for PPSS attributes, analyze preference heterogeneity, and simulate policy impacts. Results show that respondents are willing to pay around €4 upfront to save €1 annually on electricity costs and about €600 for a battery, as well as €22 per additional year of warranty. No convincing differences are found between owner occupiers and renters or between income groups. Preference heterogeneity is primarily driven by innovativeness and desire for independence from electricity suppliers rather than socio-demographics. Policy simulations indicate that a battery mandate substantially increases adoption, whereas a €100 rebate has small effects and high

free riding. Overall, PPSS appear well suited to broaden participation in the energy transition, with battery mandates proving particularly effective.

Presenting Author Biography

Joachim Schleich. Degrees in Economics from the University of Mannheim (Diploma), the University of Florida (Master), and Virginia Tech (PhD); Professor of Energy Economics at Grenoble Ecole de Management, co-coordinator of the the Chaire Européenne de la Transition du Territoire. He is also employed at the Fraunhofer Institute for Systems and Innovation Research ISI in Karlsruhe, Germany and Adjunct Professor at Virginia Tech. Member of the Editorial Board of "Energy Efficiency". Publication outlets include Environmental Economics and Management, The Energy Journal, Energy Economics, Resource and Energy Economics, Energy Policy, Climate Policy, Ecological Economics, and Energy Efficiency.