Supporting Information for

Adoption model choice affects the optimal subsidy for residential solar

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1. **Forecasting Residential Solar PV Adoption**

The nine adoption models are integrated into the previously-created techno-economic framework to determine the residential solar PV adoption level resulting from a given subsidy. To start, we performed a retrospective forecast starting from 2012 by considering the pre-IRA residential solar PV federal tax credit subsidy policy as planned by the government. This subsidy offers 30% of the investment as a federal tax credit (FTC) for systems installed before 2020. The credit is lowered to 26% for installations between 2020–2022, to 22% for systems connected in 2023, and would expire after 2024. Figure 3 shows the annual residential PV diffusion in the US predicted by the techno-economic framework using the nine different adoption models. The error function model that includes the prior adoption variable forecasts the highest diffusion rate, with peak annual adoption reaching about 16 GW in 2024. The mixed log-linear and logit models that use prior adoption are also observed to predict a higher adoption rate than the rest of the models.
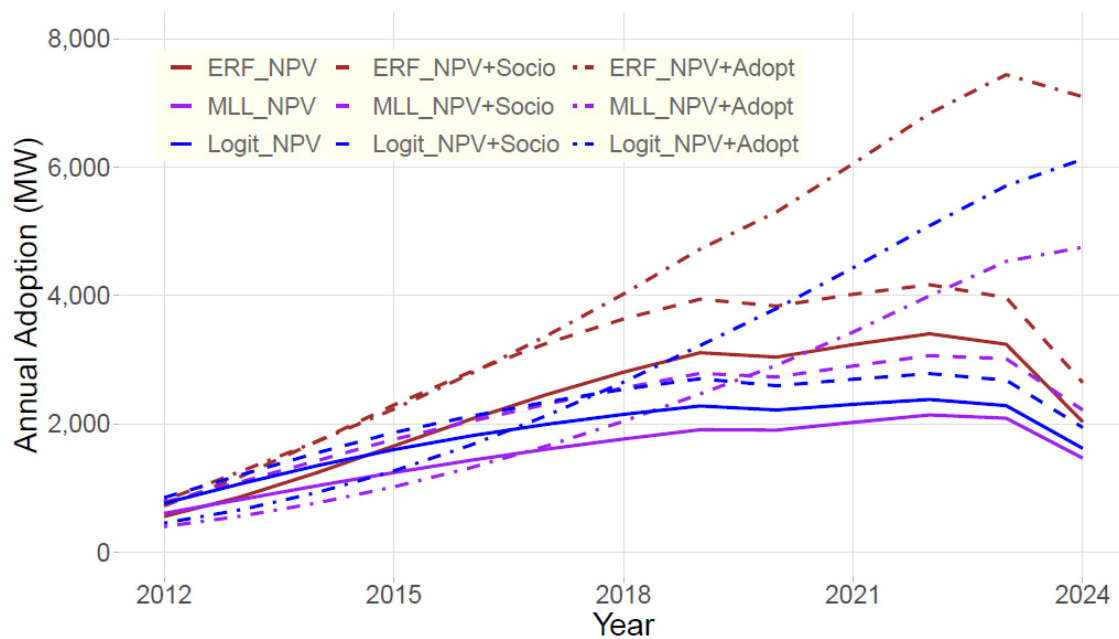

Figure S1. US annual adoption starting from 2012 under the Federal Tax Credit (30% until 2020, 26% for 2020-2022, 22% for 2023, and zero afterwards) and learning rate of 15% predicted by the nine different adoption models.

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Figure S2 shows the impacts of the FTC subsidy (30% until 2020, 26% for 2020-2022, 22% for 2023, and zero afterwards) on residential PV adoption for the nine different models, including predicted adoption both with and without this subsidy. The gap between the two curves represents the stimulated adoption due to the subsidy. The subsidy induces the greatest adoption with the error function models with NPV and socio-demographic variables. The models that include prior adoption suggest both that a) unsubsidized adoption will grow rapidly and b) subsidy of rooftop solar has almost no effect on adoption.
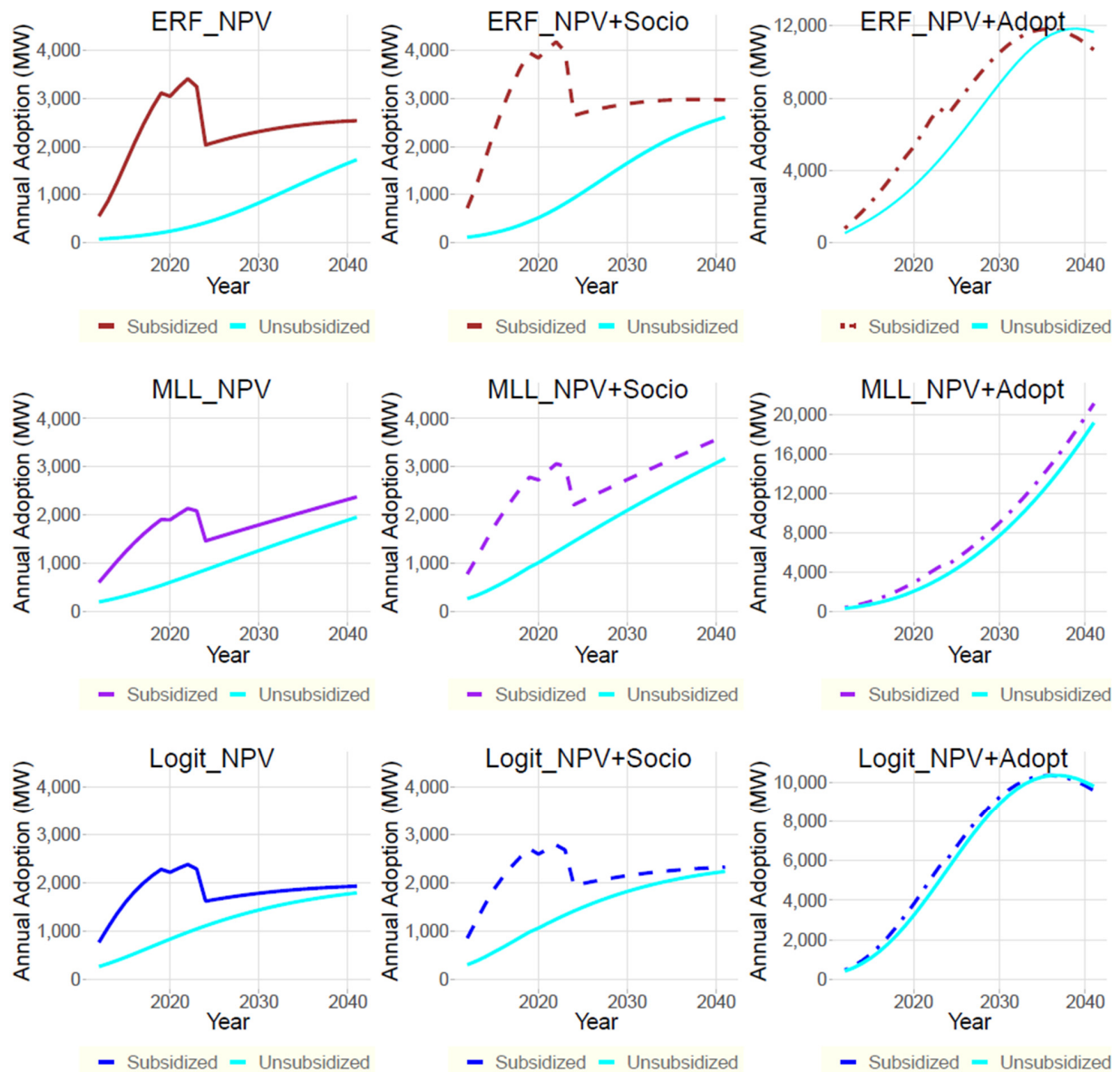

Figure S2. Forecasted annual adoption for all of the US with and without planned FTC (30% until 2020, 26% for 2020-2022, 22% for 2023, and zero afterwards). Learning rate for rooftop solar is 15%. The gap between the two lines represents the subsidy-induced adoption, which can continue after subsidies are removed due to the technological progress effect that the subsidy had on future solar costs.