

The Private Net Benefits of Residential Solar PV: And Who Gets Them

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Abstract: California has promoted renewable energy aggressively since the 1970s, but began a more targeted campaign to stimulate the solar photovoltaics market in 2007. Funded by taxpayers and utility ratepayers, the California Solar Initiative program has subsidized installation of nearly 1,500 MW of PV capacity. We study the net benefits that have flowed to residential customers who have adopted solar PV under the program, and how those gains have been distributed across households of different income strata. We estimate the total direct and indirect subsidies provided to residential households within the service territory of Southern California Edison, one of the two largest California utilities, for the period 2007 - 2011. Using confidential billing data, we are able to estimate the bill savings to these customers under the increasing block pricing tariffs (IBP, marginal price rises with monthly consumption) they face. Matching the billing information to census data, we also develop a more precise estimate of the income of each household than has been available previously. We confirm previous studies that found households adopting solar PV are much wealthier than average. Unlike some reports and media stories, however, we do not find a evidence of that changing over time, apart from a small program specifically targeted at low-income customers. We also calculate the net present private value of having installed a solar PV system by households of different income brackets. Under the current tariff structure, the average NPV for the lowest income bracket is consistently negative, while the average NPV for households in higher brackets turned from negative to positive over our sample period, with the wealthiest brackets gaining the most from solar. We show that the differential in benefits from solar PV would be eliminated if IBP tariffs were flattened.

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