**The Residential Solar PV Adoption Model: Version 1.0**

*Patrick Bean, Rolando Fuentes, Steven O. Kimbrough, and Mohammed Muaafa*

Residential solar installations are becoming an economically attractive alternative to local utility service in some areas of the world due to declining photovoltaic (PV) prices, financial incentives and innovative financing mechanisms. Over 250,000 customers in California added solar PV systems to their homes since 2011, and over 1 percent of the state’s residential customers have PV.[[1]](#footnote-1) In Hawaii, market penetration of residential PV is approaching 6 percent.[[2]](#footnote-2)

Electricity sales from incumbent utilities are experiencing downward pressure as more customers decide to produce their own electricity with PV. This is a concern for utilities because it threatens their ability to recover their fixed costs, which are recovered through volumetric rates. Some observers view this feedback as a potential “death spiral” in which utilities must continually raise prices to recover costs, which then further perpetuates adoption of PV and erosion of the utility’s revenue.

To begin investigating this phenomenon and its potential implications, KAPSARC developed the Residential Solar PV Adoption Model. The purpose of the model is to describe the adoption over time of residential PV under realistic assumptions regarding consumer behavior. In particular, the model takes into account electricity prices, levelized costs of PV, contagion effects of PV adoption, and the type of residence and whether it is suitable for PV.

1. Calculated from Energy Information Administration (EIA) utility sales and net metering datasets: EIA. 2015. *Form EIA-826 detailed data*. Available from <http://www.eia.gov/electricity/data/eia826/> [↑](#footnote-ref-1)
2. Ibid. [↑](#footnote-ref-2)