

Solar Power on the Rise

An Infographic from the Union of Concerned Scientists

Data Sources and Methodology

August 2014

Panel 1: Installing rooftop solar has never been more affordable

Content: Shows average cost to customers of installed rooftop photovoltaic (PV) systems, assuming 5 kilowatt (kW) systems

Sources, data, and notes:

- Average installed price of residential PV, 2005-2013 – data sources
 - GTM Research and Solar Energy Industries Association (SEIA). 2014a. *U.S. solar market insight report 2013 year in review*. Boston, MA, and Washington, DC.
 - GTM Research and Solar Energy Industries Association (SEIA). 2013. *U.S. solar market insight report 2012 year in review*. Boston, MA, and Washington, DC.
 - GTM Research and Solar Energy Industries Association (SEIA). 2012. *U.S. solar market insight report 2011 year in review*. Boston, MA, and Washington, DC.
 - Barbose, G., N. Darghouth, R. Wiser, and J. Seel. 2011. *Tracking the Sun IV: An historical summary of the installed cost of photovoltaics in the United States from 1998-2010*. Berkeley, CA: Lawrence Berkeley National Laboratory (LBNL).
 - GTM Research and Solar Energy Industries Association (SEIA). 2010. *U.S. solar market insight report 2010 year in review*. Boston, MA, and Washington, DC.
- Actual cost may be less than \$10,000 after federal, state, and local incentives
 - Based on federal investment tax credit (ITC) and sample state (Massachusetts) tax credit, rebates, and discounted sale of expect solar renewable energy credit (SREC) revenue stream

Panel 2: By 2017, more than half the states could have rooftop solar as cheap as local electricity prices

Content: Shows states for which some residents can buy, or are projected to be able to buy, residential systems at costs such that the costs of energy will be equal to or less than their local electric utility rates—including the federal investment tax credit (ITC, 30 percent) but excluding state and local incentives

Sources, data, and notes:

- Forecast data of break-even cost for residential PV
 - Ong, S., P. Denholm, and N. Clark. 2012. *Grid parity for residential photovoltaics in the United States: Key drivers and sensitivities*. Golden, CO: National Renewable Energy Laboratory.
 - UCS analysis is based on the 2015 “policy” sensitivity case, which includes:

- Typical rate structure (Note: A time-of-use rate structure would generally improve the economics of residential solar across states)
 - No state or local incentives (Note: At least 45 states provide tax incentives, and many include specific solar or distributed generation incentives, along with other support relevant to rooftop solar installations)
 - No carbon price
 - No ITC; the UCS analysis adds the ITC back in
- Installed price of residential systems, current and projected
 - GTM Research and SEIA 2014a gives a Q4 2013 national average installed price for residential of \$4.59 per watt (W), with a range extending below \$3.00.
 - UCS analysis uses an extrapolation based on the average annual price decline, 2010 to 2013 (GTM Research and SEIA 2014a, 2013, and 2012).
- Assumptions
 - “Now” refers to states with PV breakeven cost forecast for 2015 to be above \$4/W.
 - “Near term” includes states with PV breakeven cost forecast to be at or above \$3/watt for 2015.
 - For states with variance in breakeven cost as presented, the UCS analysis used each state’s majority breakeven cost.
 - The federal ITC incentive is scheduled to decrease from 30% to 10% as of January 1, 2017; the UCS analysis does not estimate solar break-even points for systems installed after that date.

Panel 3: The number of households with rooftop solar is skyrocketing

Content: Shows actual and projected cumulative number of homes with PV

Sources, data, and notes:

- Number of residential systems through 2006
 - Sherwood, L. 2009. *U.S. solar market trends 2008*. Latham, NY: Interstate Renewable Energy Council.
- Number of residential systems through 2013
 - Total system count
 - From GTM Research and Solar Energy Industries Association (SEIA). 2014a. *U.S. solar market insight report 2013 year in review*. Boston, MA, and Washington, DC.
 - Calculation of residential portion
 - Based on portion of systems equal to or less than 10 kW, from Seel, J. 2012. *Making photovoltaics competitive in the US: A comparison of residential PV prices in Germany and the United States*. Berkeley, CA: University of California, Berkeley.
- 2020 forecast data
 - Higher figure (3.8 million)

- Based on “SunShot scenario” (75% cost reductions from 2010 to 2020) from Department of Energy (DOE). 2012. *SunShot Visions Study*. Washington, DC.
- Calculation of number of homes – Based on 5 kW per home.
- Lower figure (900,000)
 - Overall “distributed” solar – “End-Use Sector” figure for 2020 (megawatts) from Energy Information Administration (EIA). 2014. *Annual Energy Outlook 2014*. Washington, DC.
 - Calculation of residential portion – Based on fraction of new capacity (megawatts) historically in residential sector (vs. “non-residential”), 2010-2013, from GTM Research and SEIA 2014a.
 - Calculation of number of homes – Based on 5 kW per home.