Recent Solar Home Valuation Research & News

Ben Hoen, Lawrence Berkeley National Laboratory

ACEEE
National Symposium on
Market Transformation
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Agenda

- Background on PV Market
- New Research on PV Premiums
- Progress on Valuing PV Homes
PV Is More Affordable Than Ever

Average PV System Gross Installed Costs

63% Drop Since 2009!

Installed Price ($/watt)

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<tbody>
<tr>
<td>Price</td>
<td>$9.00</td>
<td>$8.00</td>
<td>$8.00</td>
<td>$7.00</td>
<td>$6.00</td>
<td>$6.00</td>
<td>$5.00</td>
<td>$4.00</td>
<td>$3.00</td>
<td>$2.00</td>
<td>$1.00</td>
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LBNL "Tracking the Sun IV"  SEIA/GTM Research
Almost 600,000 US Residential Installations Through 2014

Approximately 50% in California, but HI, AZ, NJ and CO are growing.

Source: GTM & SEIA, 2015
Home Buyers Want Green Features In General And Solar In Particular

12% Say Solar Is “Important”
But What About The Value Of The Home?
New Study Examines Largest Dataset Of PV Home Transactions Assembled To-Date

Total 22,822 Homes
- 3,951 PV
- 18,871 Non-PV

Spanning 12 years and 8 states

<table>
<thead>
<tr>
<th>Sale Year</th>
<th>Non-PV Homes</th>
<th>PV Homes</th>
<th>Total</th>
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<tbody>
<tr>
<td>2002</td>
<td>107</td>
<td>18</td>
<td>125</td>
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<tr>
<td>2003</td>
<td>196</td>
<td>31</td>
<td>227</td>
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<tr>
<td>2004</td>
<td>238</td>
<td>53</td>
<td>291</td>
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<tr>
<td>2005</td>
<td>197</td>
<td>56</td>
<td>253</td>
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<tr>
<td>2006</td>
<td>348</td>
<td>64</td>
<td>412</td>
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<tr>
<td>2007</td>
<td>818</td>
<td>242</td>
<td>1,060</td>
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<tr>
<td>2008</td>
<td>1,251</td>
<td>453</td>
<td>1,704</td>
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<tr>
<td>2009</td>
<td>1,762</td>
<td>429</td>
<td>2,191</td>
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<tr>
<td>2010</td>
<td>2,751</td>
<td>504</td>
<td>3,255</td>
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<tr>
<td>2011</td>
<td>3,341</td>
<td>642</td>
<td>3,983</td>
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<tr>
<td>2012</td>
<td>3,928</td>
<td>694</td>
<td>4,622</td>
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<tr>
<td>2013</td>
<td>3,934</td>
<td>765</td>
<td>4,699</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>18,871</strong></td>
<td><strong>3,951</strong></td>
<td><strong>22,822</strong></td>
</tr>
</tbody>
</table>
Across All Homes & Subsets Of Homes
PV Home Premiums Were Clear

Premiums Averaged ~ $4/watt or $15,000 for an average-sized 3.6 kW system

Error bars represent 95% confidence interval
Premiums are based on an average 3.6 kW sized system
The Study Compared PV Premiums To Income & Cost Estimates To Better Understand “Market Value”

Sales Comparison Approach: Hedonic Model Premiums

Income Approach using PV Value®: Present value of stream of energy cost savings

Cost Approach: Installed costs of PV systems at time of sale: “Gross” or “Net” (less federal, state and utility incentives)
Premium Is Not Statistically Different From Net Cost Estimate

And is lower than the Gross Cost and higher than the Income estimates

If the Income estimate uses a weighted electricity rate, to account for California tiered rates, it falls in-line with the Premium
Other Photovoltaic Studies Have Also Found Premiums

  - 22 out of 30 studies reveal a sales price premium of $1.40 to $2.60 per Watt of installed PV

  - Found premiums of $9,800 to $12,800
  - Results are slightly higher than net cost estimates
  - None of the homes sold for less than comparable homes
Agenda

- Background on PV Market
- New Research on PV Premiums
- Progress on Valuing PV Homes
AI Residential Green & E.E. Addendum

- Appraisers
- Builders
- Real Estate Agents
- Energy Raters
- Sellers

The direct link for the fillable PDF “AI Residential Green and Energy Efficient Addendum” is http://www.appraisalinstitute.org/assets/1/7/Interactive820.04-ResidentialGreenandEnergyEfficientAddendum.pdf
Appraisal Institute Has A Variety Of Courses To Help Appraisers Analyze Green Features

www.appraisalinstitute.org
A National PV Valuation Tool Is Available And Has Been Endorsed By The Appraisal Institute

pvvalue.com
NAR Helped Develop And Promote MLS Fields To Capture Green Features

New NAR Guide Helps MLSs Highlight Green Homes and Features

Media Contact: Jane Dollinger / 202-383-1042 / Email

WASHINGTON (May 7, 2014) – Finding and selling green homes is about to get easier for buyers and sellers with the National Association of Realtors® new Green MLS Implementation Guide, a comprehensive guide for helping multiple listing services promote the special features of a green home.

www.realtor.org
Fannie Mae Recognizes Solar’s Value IF Property Owner Owns The System

“Fannie Mae will purchase or securitize a mortgage loan on a property with solar panels.”

“If the property owner is the owner of the solar panels, standard eligibility requirements apply (for example, appraisal, insurance, and title).”

“If the solar panels are leased...The solar panels may not be included in the appraised value of the property.”
HUD’s FHA Also Recognized Solar’s Value In Insurable Mortgage Limit

Solar Energy Systems

“A mortgagee may add the cost of a solar energy system to the mortgage up to 20 percent above than the maximum insurable mortgage limit.”

“Costs for new solar systems may be added to an FHA-insured base mortgage, for the following Sections of the Act and transaction types:

- Purchase Transaction
- Rate and Term Refinances and Simple Refinance”

Handbook Released In March 2015
Research shows that homes with solar energy systems can sell for more money than homes without solar, and institutional support is increasing for that valuation.

Learn More About Solar and Find Resources for Homebuilders at energy.gov/eere/sunshot/homebuilders
Thank You

Ben Hoen
Lawrence Berkeley National Laboratory
845-758-1896
bhoen@lbl.gov
Additional Slides
PV (and EE) Features Can Increase Sales Velocity

• “Some CA home builders…have found accelerated home sales, and improved customer satisfaction.”
  Dakin, Springer & Kelly, 2008

• “New homes with solar sell twice as fast as comparable non-PV homes”
  SunPower, 2008
New PV Home Growth Steady But Much Slower Than Existing Homes

- Roughly 5% of all CA installations over the last 12 years have been on new homes.
- In California, there are ~16,400 new homes with PV installed.

*Source: NSHP, 2015*