South Carolina PV Soft Cost and Workforce Development Survey: Part 1

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April 22, 2016
Background

• In order to support the DOE SunShot Initiative funded project titled “Soft Cost Reductions in the Southeastern US,” PV cost metrics and workforce needs must be better understood
• A survey was developed by the SuNLaMP participating partners in October 2015.
• The finalized survey was handed out to over 100 participants at the October 28, 2015 meeting of the South Carolina Solar Council (SCSC)
• 35 responses were received
• 7 surveys contained only contact information and were removed from the data set
• 1 pair of surveys was from the same company with identical answers and were combined to create one dataset from that participating company
• 1 pair of surveys was from the same company with similar, but not the same responses. These surveys were kept as individual data points and are marked for follow up with the Round 2 survey. These surveys were filled out by an employee in sales and the company owner
• 3 responding companies only provided responses for NC and are interested in expanding to SC. These responses are not included in this dataset and are kept for future analysis.
• 3 electronic responses were added
• Resulting in 27 response datasets that were used for this analysis
What segment of the PV industry does your company serve?

- 2/3 of respondents (18 of 27) serve the residential sector
- Of these only 5 (28%) only serve the residential sector
What is the typical size of that type of installation in SC now?

- Residential installations are typically no larger than 10 kW-DC, 20 kW-DC is atypical
- Commercial installations average between 136 – 236 kW-DC
- Utility installations average between 5.348 – 15.166 MW-DC
What is the typical total cost (in $/W-DC) for each segment?

- Residential total costs average between $3.42 - $3.54/W-DC, with a range of $2.50-$4/W
- Commercial total costs average between $2.65 - $2.70/W-DC, with a range of $1.85-$3.5/W
- Utility total costs average between $1.70 - $1.76/W-DC, with a range of $1.10-$3/W
What percent of the typical installed cost is attributable to hardware only?

- Hardware cost is an average of 61-63% for residential systems
- Hardware cost is an average of 62-63% for commercial scale systems
- Hardware cost is an average of 69-70% for utility scale systems
- Soft costs are ~40% of the cost for residential and commercial systems and ~30% for utility scale
Of the remaining, non-hardware costs, what percentage is...?

<table>
<thead>
<tr>
<th>Type of Soft Cost</th>
<th>*Mean Cost ($/W-DC)</th>
<th>*% of soft costs</th>
<th>*% of total cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installation, etc.</td>
<td>$0.59</td>
<td>41%</td>
<td>16.9%</td>
</tr>
<tr>
<td>Marketing, etc.</td>
<td>$0.21</td>
<td>15%</td>
<td>6%</td>
</tr>
<tr>
<td>Overhead, etc.</td>
<td>$0.43</td>
<td>30%</td>
<td>12.3%</td>
</tr>
<tr>
<td>Permitting, etc.</td>
<td>$0.20</td>
<td>14%</td>
<td>5.7%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$1.43</strong></td>
<td><strong>100%</strong></td>
<td><strong>40.9%</strong></td>
</tr>
</tbody>
</table>

*calculated based only on respondents who included soft cost percentages, using a total cost of $3.50/W-DC

- Installation > overhead > marketing > permitting
- Permitting is most often referenced as the biggest potential for reductions
What are your workforce needs over the next six months and three years?

<table>
<thead>
<tr>
<th>Need Category</th>
<th>6 mon needs low</th>
<th>6 mon needs high</th>
<th>3 yr needs low</th>
<th>3 yr needs high</th>
</tr>
</thead>
<tbody>
<tr>
<td>design, engineering</td>
<td>31 (16%)</td>
<td>32</td>
<td>56 (12%)</td>
<td>61</td>
</tr>
<tr>
<td>electrician &amp; installer</td>
<td>69 (35%)</td>
<td>77</td>
<td>151 (32%)</td>
<td>155</td>
</tr>
<tr>
<td>gen. business</td>
<td>29 (15%)</td>
<td>32</td>
<td>52 (11%)</td>
<td>54</td>
</tr>
<tr>
<td>sales &amp; marketing</td>
<td>70 (35%)</td>
<td>76</td>
<td>212 (45%)</td>
<td>217</td>
</tr>
<tr>
<td>Total</td>
<td>199</td>
<td>217</td>
<td>471</td>
<td>487</td>
</tr>
</tbody>
</table>

- Between 199 – 217 new positions were expected to be filled in from 11/15 – 4/16
- Between 471 – 487 new positions will need to be filled over the next three years
- Short term growth in general business and design are about equal
- Short term growth in installers and sales are about equal
- The largest long-term needs are in sales and installation
- A majority of the growth is in the residential sector (graph not shown)
- Minimal growth in employment is expected in the utility sector (graph not shown)
If funding were available to support training, what type of training would you recommend?

- Strongest training recommendation is for PV Technical Sales in the sales/marketing category

![Bar chart showing the percentage of respondents recommending different types of training for different levels within positions. The chart indicates that technical sales in the sales/marketing category is the most recommended.]
In what Southeastern states have you focused your business so far?
In what regions of SC have you focused your business on so far?

- There is a slightly higher business concentration in the Midlands and Coastal regions.
### Installation distribution around SC based on company focus area

<table>
<thead>
<tr>
<th></th>
<th># of Counties</th>
<th>Population</th>
<th>1Average Median Income</th>
<th>1Average Percent living in poverty</th>
<th>2Number of customer owned installations</th>
<th>2Total capacity/kW-AC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Piedmont</td>
<td>13</td>
<td>1,466,007</td>
<td>$43,845</td>
<td>17.4%</td>
<td>249</td>
<td>1520.25</td>
</tr>
<tr>
<td>Midlands</td>
<td>17</td>
<td>1,641,149</td>
<td>$46,448</td>
<td>18.1%</td>
<td>235</td>
<td>1288.66</td>
</tr>
<tr>
<td>Coastal</td>
<td>7</td>
<td>954,887</td>
<td>$52,501</td>
<td>15.2%</td>
<td>269</td>
<td>1934.56</td>
</tr>
<tr>
<td>PeeDee</td>
<td>9</td>
<td>736,539</td>
<td>$38,685</td>
<td>21.4%</td>
<td>81</td>
<td>363.06</td>
</tr>
<tr>
<td>State Total</td>
<td>46</td>
<td>4,798,582</td>
<td>$45,033</td>
<td>18.0%</td>
<td>834</td>
<td>5,107</td>
</tr>
</tbody>
</table>

1. Calculated from U.S Census Bureau Data, 2014; median income and % in poverty were determined using a weighted (by population) average
2. Calculated from S.C. Energy Office Data, August 2015

- Companies that only serve the state of SC are more likely to serve areas of lower total population. Suggesting that larger companies with larger service territories are limiting business to areas with high population densities
- SC focused businesses will be key to development in rural and low income area
- Positive correlations between the number of installations and the total capacity of the installations
- Negative correlations between the median income and the percent of the county’s population in poverty
How much PV capacity have you installed in your career and in SC?

- Of the respondents, no one has installed more than 5MW in SC, while over 35% have installed over 5MW in their career.
- Slightly less than 45% of the respondents have not installed in SC or installed less than 100 kW.
Conclusions from survey

• Reported costs are not as high as expected.
• The average cost of a residential system is between $3.42 - $3.54
• Hardware is ~60% of the cost of a residential or commercial system
• Labor and permitting are the two most frequently cited opportunities for improvement
• Clear interest in participating in the growth of SC solar market
• Companies that only serve SC are more likely to install in rural and low income communities
• About 50% of the expected job growth was predicted to occur from October 2015 – April 2016
What’s Next?

• The report will be issued to the public late April/early May
• Beginning Part 2
  – One on one interviews that:
    • Are a confirmation of Oct 2015 data
    • Track short term employment changes
    • Broaden time table for cost estimates
• Re-give this survey at the final SCSC meeting for 2016 and 2017 to help track changes in business climate
• Currently developing expanded training options
• Assessing permitting options
Acknowledgements

• Dale Bradshaw, National Rural Electric Cooperative Association
• Tommy Cleveland, North Carolina Clean Energy Technology Center
• Andrew Cotter, National Rural Electric Cooperative Association
• Hamilton Davis, South Carolina Coastal Conservation League
• Emily Felt, Duke Energy
• Mark Furtick, South Carolina Electric & Gas
• Phillip Greenway, SanteeCooper
• Scott Hammond, Central Electric Power Cooperative
• Trish Jerman, The South Carolina Energy Office at the Office of Regulatory Staff
• Elizabeth Kress, SanteeCooper
• Jose Merino, Duke Energy
• John Raftery, South Carolina Electric & Gas
• Lyra Rakusin, North Carolina Clean Energy Technology Center
• Mike Smith, Central Electric Power Cooperative
• Steve Spivey, SanteeCooper
• Don Zimmerman, Alder Energy
• SC Solar Council
• Solar Business Alliance
QUESTIONS?