Clean Energy States Alliance Webinar

Solarize Connecticut: Program Results and Secrets of Success

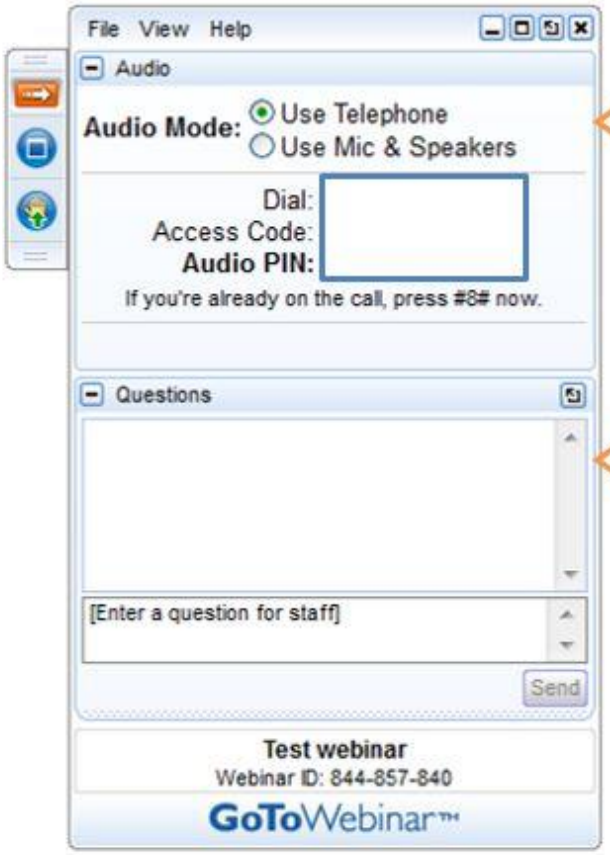
Hosted by
Nate Hausman, Project Associate, CESA

March 28, 2014

SunShot U.S. Department of Energy

CleanEnergy States Alliance

Housekeeping



All participants are in "Listen-Only" mode. Select "Use Mic & Speakers" to avoid toll charges and use your computer's VOIP capabilities. Or select "Use Telephone" and enter your PIN onto your phone key pad.

Submit your questions at any time by typing in the Question Box and hitting Send.

This webinar is being recorded.

You will find a recording of this webinar, as well as all previous CESA webcasts, archived on the CESA website at

http://www.cleanenergystates.org/webinars/

About CESA

Clean Energy States Alliance (CESA) is a national nonprofit organization working to implement smart clean energy policies, programs, technology innovation, and financing tools, primarily at the state level. At its core, CESA is a national network of public agencies that are individually and collectively working to advance clean energy.

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About Rooftop Solar Challenge II

- The U.S. Department of Energy SunShot Initiative Rooftop Solar Challenge II incentivizes regional teams to make it easier and more affordable for Americans to go solar, reducing soft or “plug-in” costs by streamlining permit processes, updating planning and zoning codes, improving standards for connecting solar power to the electric grid, and increasing access to financing.

- A consortium of five New England states and CESA received a Rooftop Solar Challenge II grant to drive down solar soft costs in the region by increasing coordination among the participating states and implementing best practices.

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About Solarize

- The Solarize program lowers acquisition costs for rooftop solar. Elements of Solarize include:
  - Pre-negotiated, tiered group purchasing in a given community (customer acquisition prices lower as more customers sign up)
  - One pre-screened competitively-selected installer
  - Community outreach and promotion campaign
  - Limited timeframe for tiered price reductions

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Today's Guest Speakers

Bob Wall, Associate Director of Outreach at Connecticut's Clean Energy Finance and Investment Authority (CEFIA)

Brian Keane, President of SmartPower

Ken Gillingham, Assistant Professor at Yale University School of Forestry and Environmental Studies

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Thank you for attending our webinar

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Solarize Connecticut[SM]:

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CEFIA - Connecticut Green Bank

Visionary Leadership

…***transitioning programs away from government-funded grants, rebates, and other subsidies, and towards deploying private capital***

…CEFIA was established in 2011 to develop programs that will ***leverage private sector capital to create long-term, sustainable financing for energy efficiency and clean energy to support residential, commercial, and industrial sector implementation of energy efficiency and clean energy measures.***

Statutory Framework

Public Act 11-80, § 106

- CEFIA "shall structure and implement a residential solar investment program, which **shall result in a minimum of thirty megawatts** of new residential solar photovoltaic installations located in this state **on or before December 31, 2022**"

Courtesy Astrum Solar

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Scaling Up Solar

- Lower Customer Acquisition Costs
  - Adopt Solarize Model – Conferred with Massachusetts CEC
  - Build upon *Clean Energy Communities* program – strong infrastructure of municipal government & volunteers
  - Retain SmartPower – Experience with community-based campaigns and solar marketing
- Introduce More Financing – New CEFIA loans & lease combined with independent products through installers
- Reduce Other Soft Costs – DOE's SunShot *Rooftop Solar Challenge*, improving permitting, interconnection and P&Z

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Basic Program Outline

- Recruit Towns – Webinar, *Let's Solarize* Report
- Town Selection – CEFIA issues RFP & selects towns
- Installer Selection – CEFIA issues RFP &, with towns, select installer
- Community Outreach Planning Meeting – SmartPower/ CEFIA/town/installer plan kickoff event & campaign
- Kickoff Event – begins 20-week campaign featuring workshops, open-houses, local events and other marketing strategies
- Bi-weekly Calls – regular program management check-ins with stakeholders

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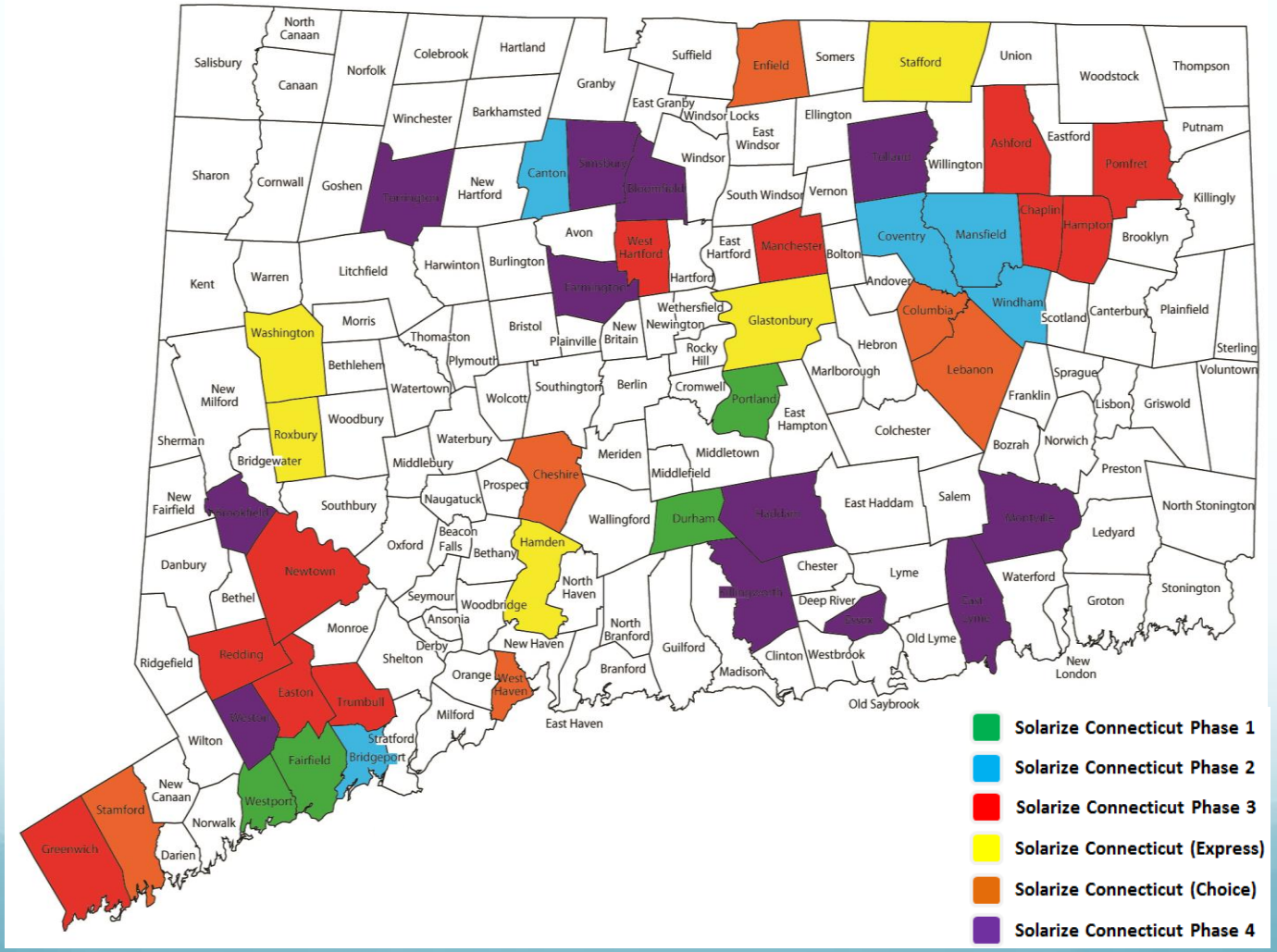
Solarize CT Communities



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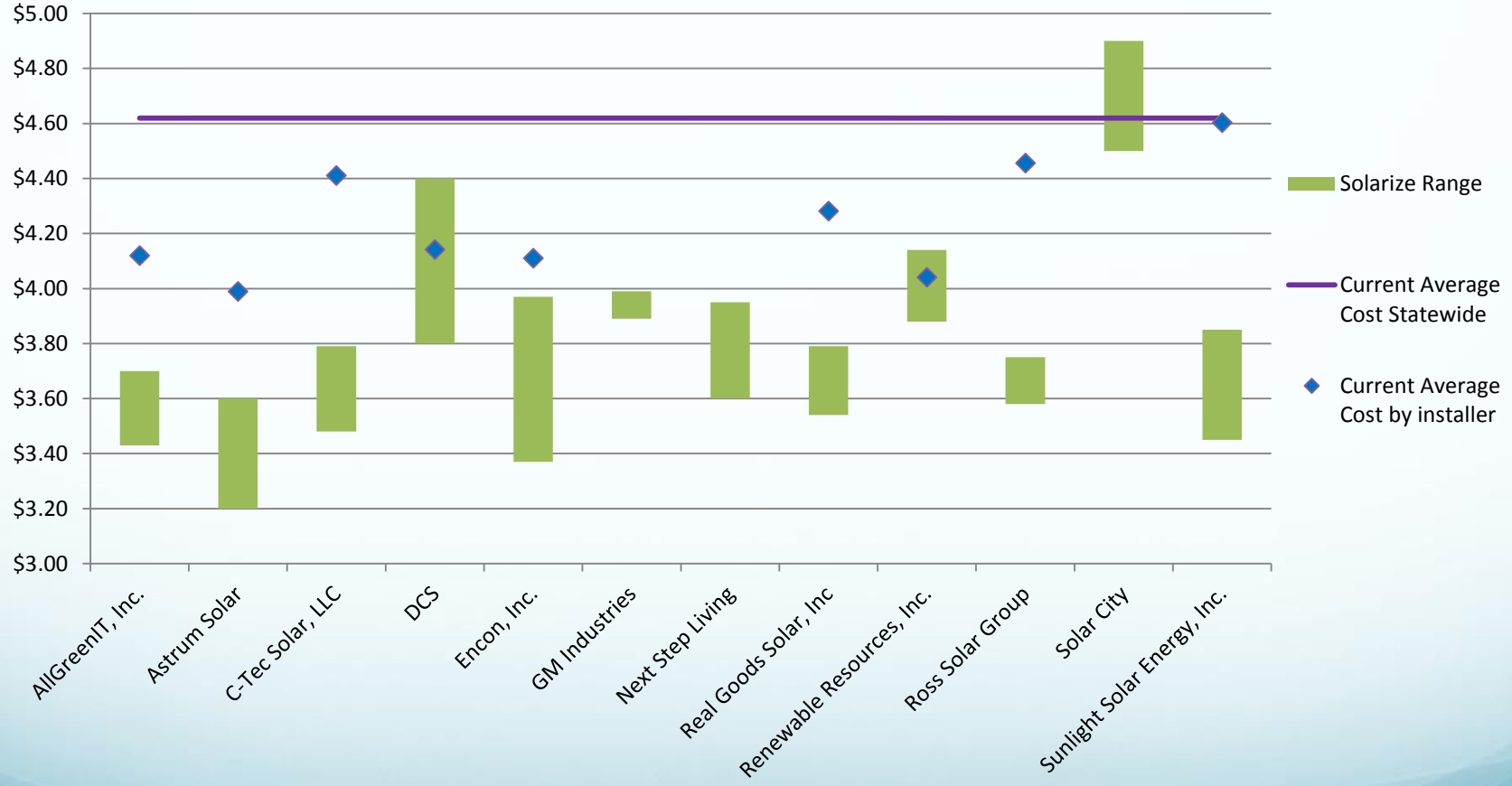
Tiered Pricing Ranges – Phase 3



Tier 5 bid prices were more than 20% lower ($3.64/W) than then current average installed costs ($4.62/W)

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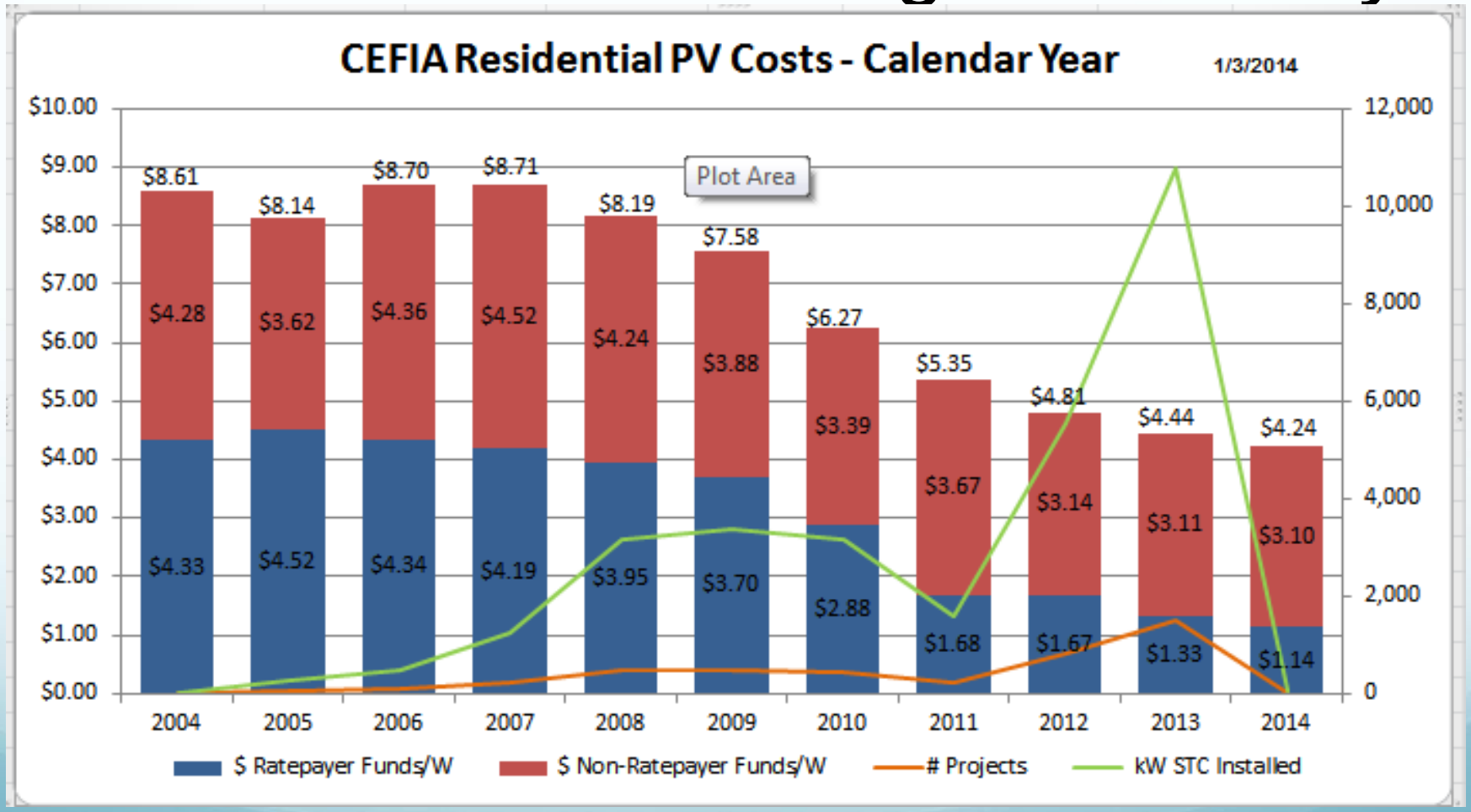
Residential Solar Program History



Doing more with less and faster!!

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Scaling Up Solarize

- How to scale up & transition program to "Open Market"
  - Surveys to assess value of roles played by CEFIA & SmartPower and potential transferability of tasks
  - Yale/NYU-led research under DOE's *Solar Energy Evolution Diffusion Studies* ("*SEEDS*") grant
  - Develop & provide tools for towns or installers to conduct campaigns more independently
- Future Phases
  - Test Solarize variations
  - Affinity partners (employer, university, membership organization)
  - Other technologies (Solar Hot Water, Natural Gas Conversion)

About SmartPower

- Nation's leading non-profit marketing firm dedicated to promoting energy efficiency and renewable energy
- Other CT community-based campaigns include Clean Energy Communities, Neighbor to Neighbor Energy Challenge and Energize Norwich
- 12 years of Extensive solar marketing experience from coast-to-coast

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Solarize
CONNECTICUT

What is Solarize Connecticut?

Solar.
Simple.
Together.

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Solar.

- Proven technology
- Lowers energy costs
- Protects against utility rate increases
- Avoids harmful emissions
- State & federal incentives
- Flexible financing options

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Simple.

- Pre-selected installer
- Transparent, discounted pricing structure
- Pre-determined equipment (with optional upgrades)
- Free, no obligation site evaluations
- Clear deadline

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Together.

- Community initiative
- Motivated clean energy task forces & solar ambassadors
- Backing of municipal leaders & community organizations
- Group pricing discounts that increase with the number of contracts

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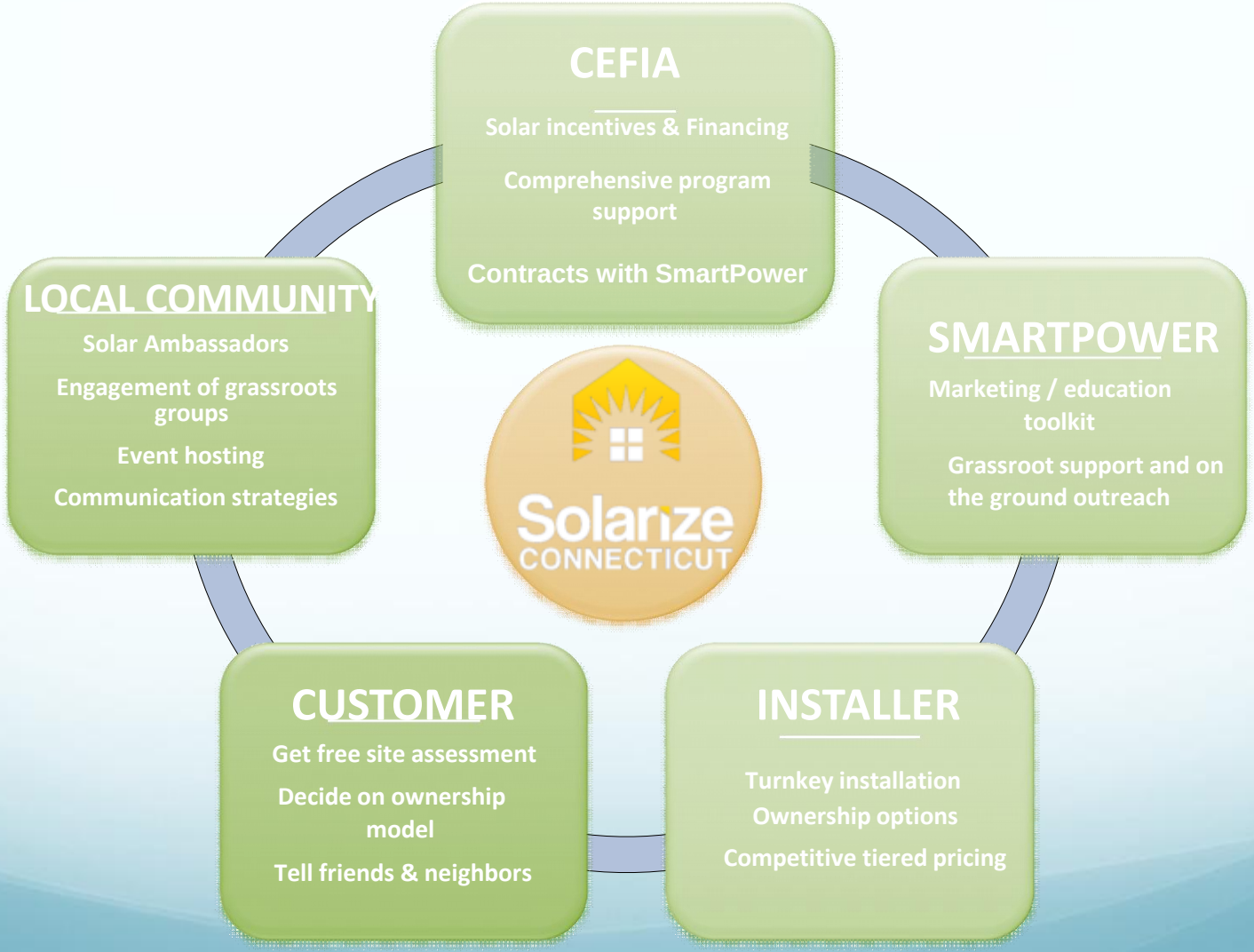

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SEEDS Project

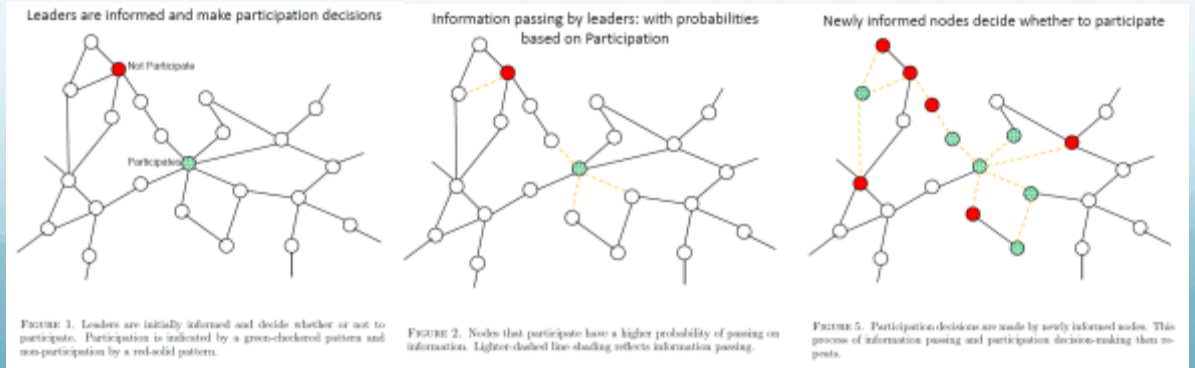
- 3-year, $1.9 million, DOE SunShot-funded project
- Team: Yale University, New York University, SmartPower, CEFIA

Project research questions:

- How well do a variety of novel behavioral strategies work in accelerating solar diffusion and why?
  - Which strategies are most cost-effective?
  - To what extent are they scalable?
  - How persistent are the strategies
- What do these strategies imply for the future diffusion of solar through social networks?

Project Plan

1. Quantify the effectiveness and cost-effectiveness of the Solarize CT (and MA) programs
2. Perform randomized field experiments (pilots) in CT to explore promising changes to the model
   - Solarize Choice and Express – testing related models
   - Solarize Select – testing scalability
3. Examine *persistence* of the strategies
4. Survey participants and develop a predictive social network model of solar adoption with and without Solarize programs



Source: Banerjee et al. (Science 2013)

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First Study

Quantify the effectiveness and cost-effectiveness of the Solarize CT (and MA) programs

Study Methodology:

- Compare the Round 1 and Round 2 Solarize towns to a set of "control" towns using a technique called "nearest-neighbor propensity score matching"
  - Idea is simple: Use the demographics of the Solarize towns to find very similar towns that did not have Solarize
  - Also compare the Solarize towns to towns that applied but did not receive Solarize in those rounds
  - And compare Solarize towns to all CT Clean Energy Communities

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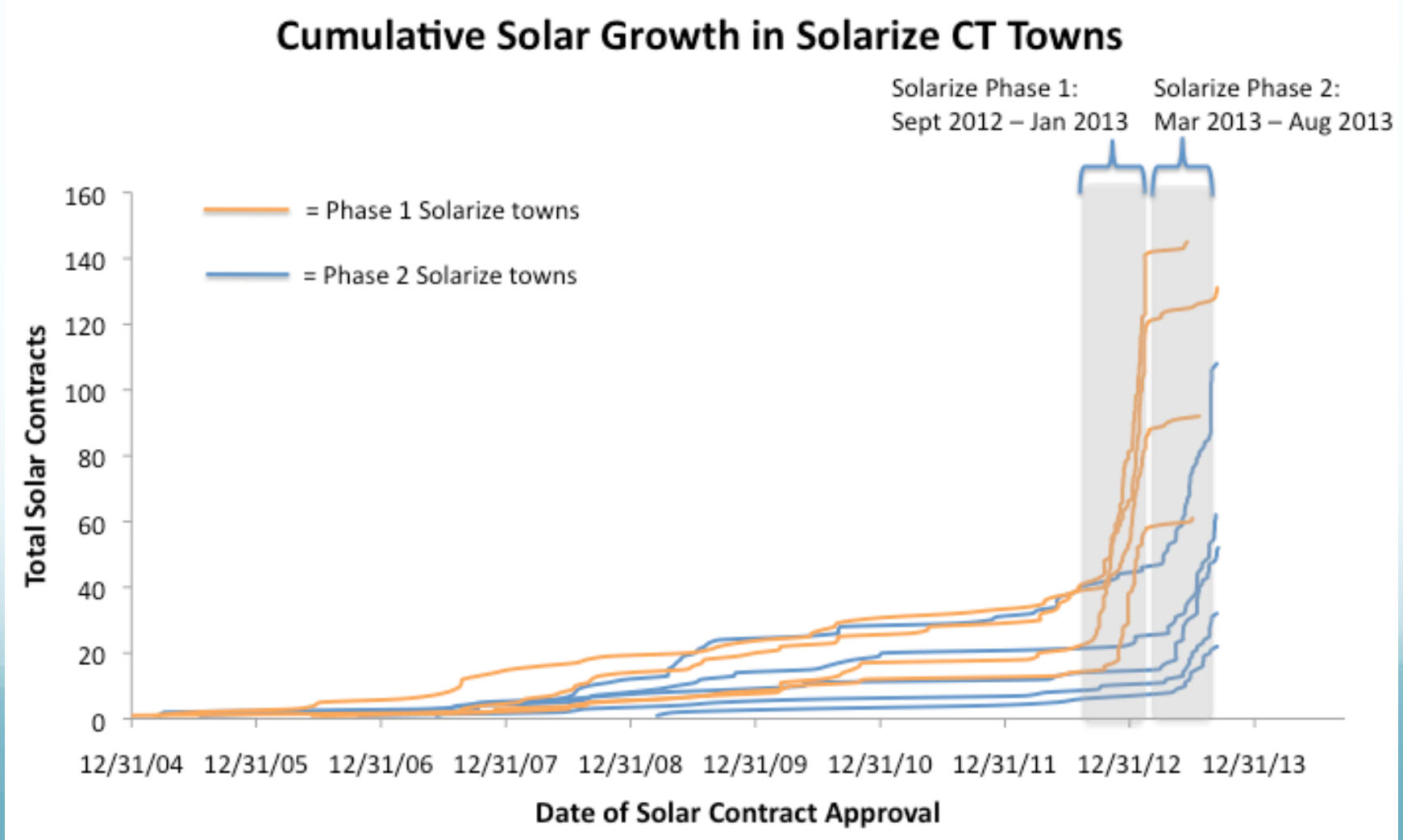
The Key Graph



Results of First Study

- Results from studying Solarize CT Rounds 1 & 2:
  - Participating in Solarize CT increases installations by about 0.5 installations per block group per month during the five-month Solarize campaign
  - 0.6 in Solarize Round 1 and 0.5 in Round 2
  - Maps to roughly 44 *additional* installations per town
- These results appear to be quite robust
- Solarize CT appears to continue to boost solar growth after the campaign ends
- The installer-driven “CT Solar Challenge” also increased installations, but to a lesser degree

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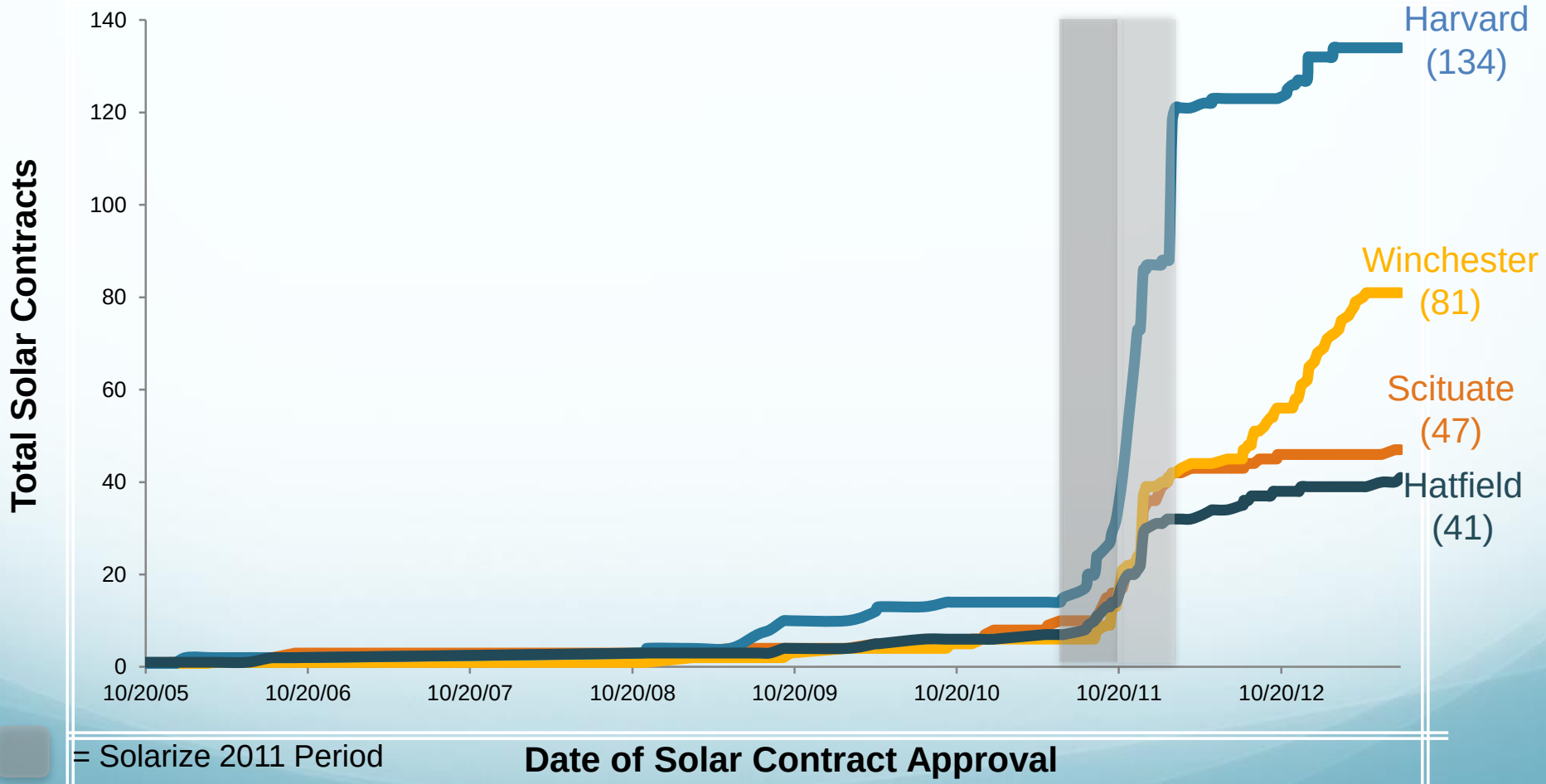
Similar Results in MA R1



= Solarize 2011 Period

= Period between close of program and last Solarize contract approval

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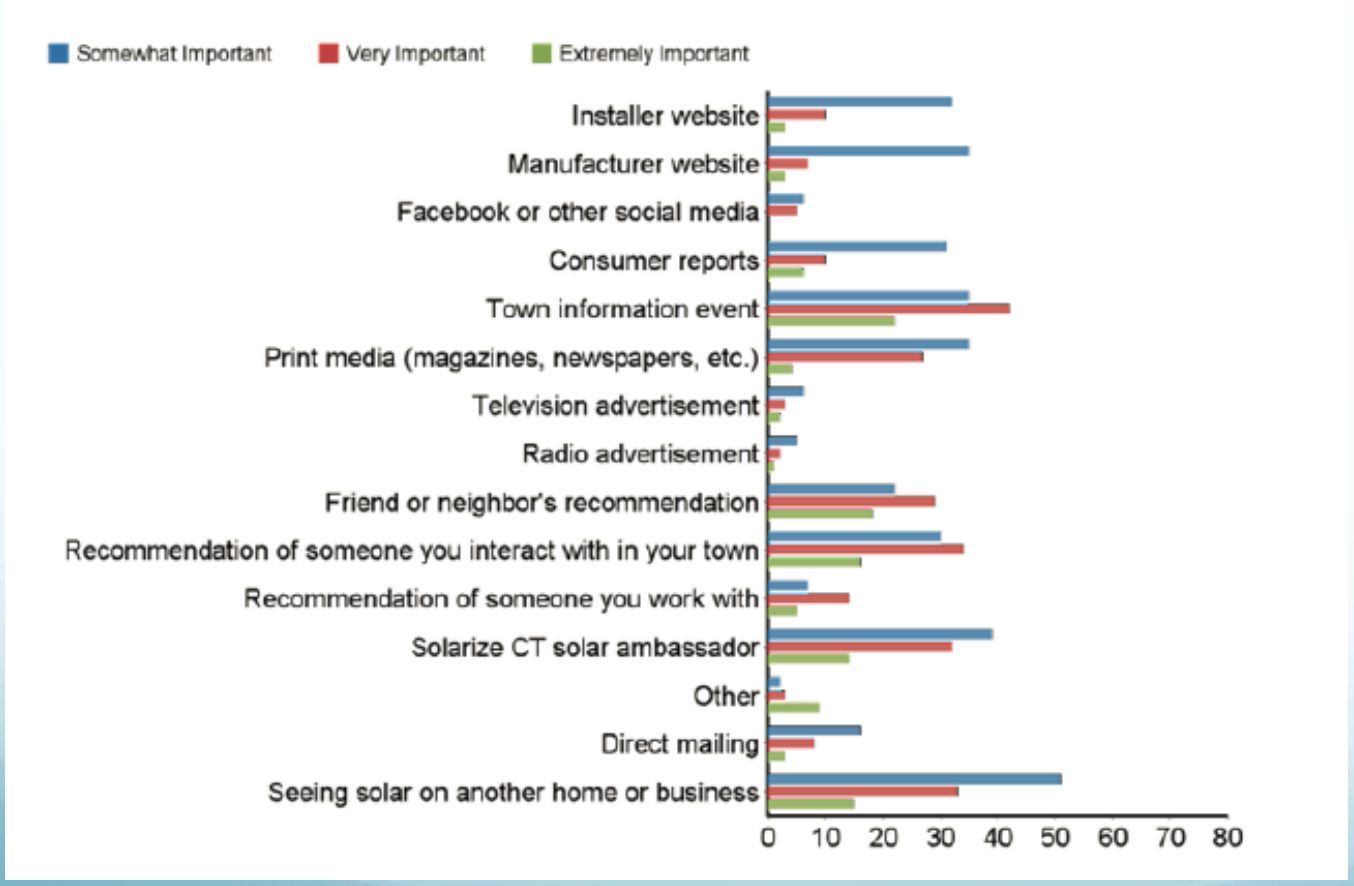
Importance of Social Network Effects



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Cost-effectiveness Analysis

Many possible metrics to examine Solarize Round 1

- Non-Solarize average cost per W: $4.68
- Solarize average cost per W: $3.78
  - Average savings per customer of $9,323
  - Implies $1.89 million in cost savings to solar adopters in Solarize towns (not even including some spillovers)
- Cost of running Round 1: $100K CEFIA + $100K foundations
- Total funding dollars per installation: $724
- Tons of CO_2 avoided over lifetime of installs[1]: 26,649
- Total funding dollars per ton of CO_2 saved[1]: $7.50

Besides building community and employing contractors, this is an impressively inexpensive way to reduce CO2 emissions

[1] Assumes constant carbon intensity at today's CT values

Next Steps in SEEDS Project

- Our current round with Solarize Choice and Express (and Classic) is wrapping up
  - Finish surveys
  - Analyze this round
- We are examining some of the pathways that lead to the social interaction-driven adoption
  - Is there more adoption when panels are more visible?
- We are developing the next round of pilots
  - “Open Market” or “DIY-Solarize”?
- Using the survey results to develop a social network model of solar adoption
- Once a few more months go by, we will begin examining persistence in a more complete way

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Thank you!

Feel free to be in touch with any questions:

- Brian Keane (bkeane@smartpower.org)
- Bob Wall (Bob.Wall@ctcleanenergy.com)
- Ken Gillingham (kenneth.gillingham@yale.edu)