

**Clean Energy States Alliance Webinar**

# New England Solar Cost- Reduction Partnership: Results and Lessons Learned

Hosted by

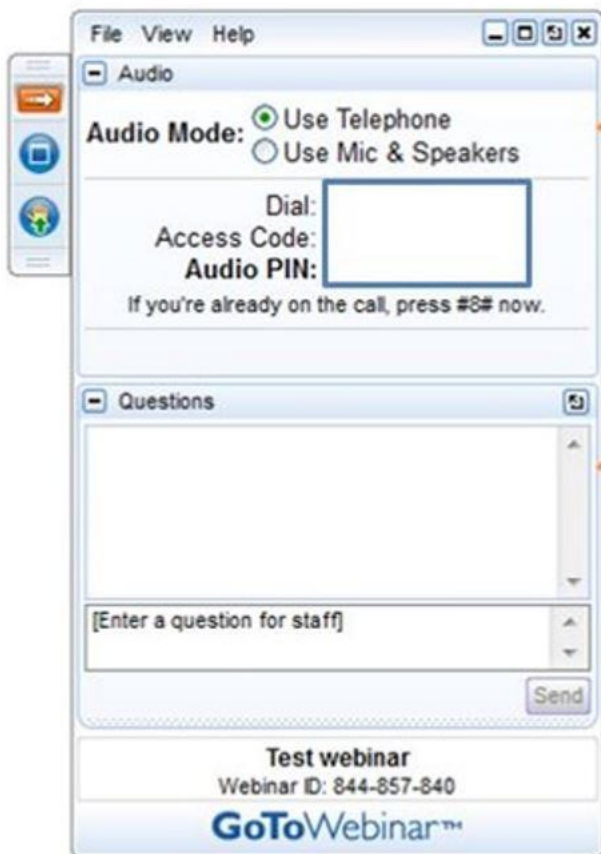
Warren Leon, Executive Director, CESA

Nate Hausman, Project Director, CESA

November 3, 2016



# 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.**

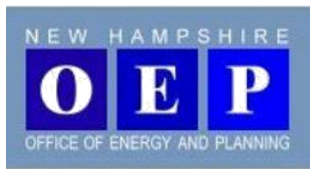
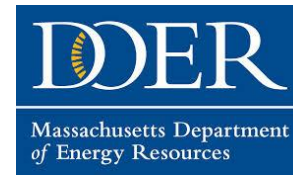
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[www.cesa.org/webinars](http://www.cesa.org/webinars)

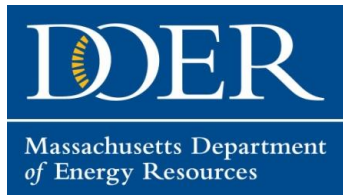
# About CESA

The 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.

# CESA Members



# New England Solar Cost-Reduction Partnership



- In 2013, five New England states — Connecticut, Massachusetts, New Hampshire, Rhode Island, and Vermont — with support and coordination from CESA, forged the New England Solar Cost-Reduction Partnership to help drive down regional solar soft costs and enable scaled deployment of rooftop solar.
- Over the past three years, the Partnership tackled a wide range of soft cost barriers to PV, including:
  - Difficult, costly, and slow permitting and interconnection processes in some locations
  - The need for new financing tools and cost-efficient group purchasing arrangements
  - Unfavorable zoning rules for solar in some jurisdictions.



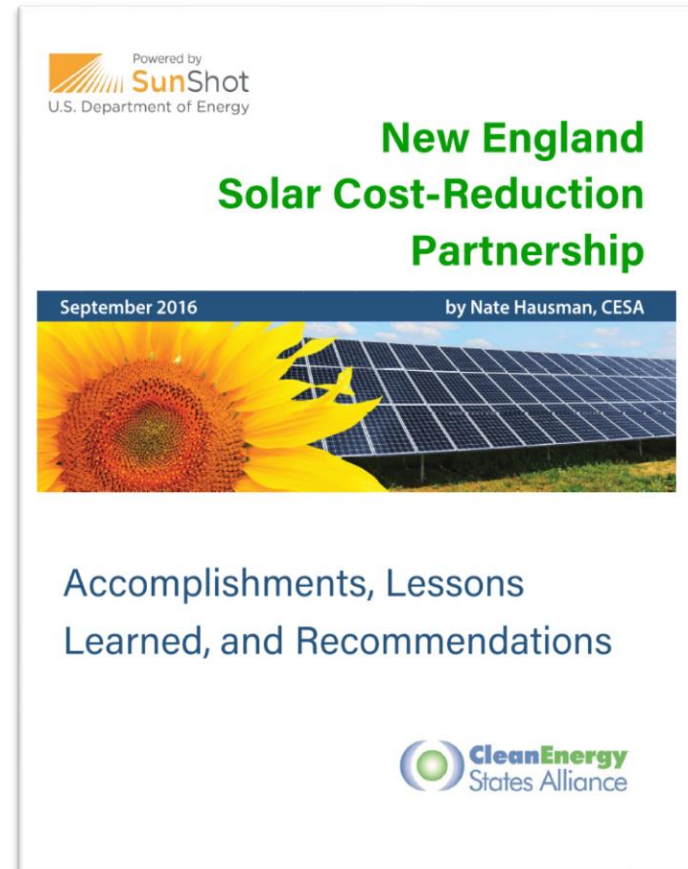
# Rooftop Solar Challenge II



- The New England Solar Cost-Reduction Partnership was funded through the U.S. Department of Energy SunShot Initiative Rooftop Solar Challenge II program.
- U.S. Department of Energy SunShot Initiative is a collaborative national effort that aggressively drives innovation to make solar energy fully cost-competitive with traditional energy sources before the end of the decade.
- Rooftop Solar Challenge II incentivized 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 or zoning codes, improving standards for connecting solar power to the electric grid, and increasing access to financing.

# Report on Accomplishments & Lessons Learned

- The Partnership concluded in September 2016.
- We produced a report on project accomplishments, lessons learned, and recommendations for future actions.
- The report is available at <http://bit.ly/NE-Solar>



# Broad Partnership Objectives

1. Increase coordination among participating states and with key stakeholders in those states.
2. Refine, combine, and deploy innovative tools and practices from Rooftop Solar Challenge I projects and other earlier efforts.
3. Implement other best practices more widely across the region, with a particular focus on achieving more consistent policies and practices across state lines.
4. Communicate lessons learned and best practices beyond New England.



# Project Activity Areas

- Community-Shared Solar
- Consumer Education
- E-Permitting
- Financing
- Fire Safety
- Installer Licensing
- Interconnection
- Permitting
- Solar Contractor Training
- Solar Scorecards
- Solarize
- Structural Review
- Zoning

# Community-Shared Solar

- **Massachusetts** published a [Solar Guide for Condominium Owners and Associations in Massachusetts](#)
- **Vermont** offered a [Community Solar Loan Program](#), which provided financing to help low-income Vermonters buy an ownership interest in community solar projects.
- CESA, with stakeholders in **Massachusetts** and **Vermont**, arranged for the submission of a private letter ruling request to the IRS to obtain guidance on the circumstances in which community solar panel owners are eligible for the Section 25D residential income tax credit. The IRS issued a favorable private letter ruling in 2015.

# Consumer Education

- The Connecticut Green Bank launched a revamped [www.gosolarct.com](http://www.gosolarct.com) website. Connecticut Green Bank also produced a consumer-focused [“From Paperwork to Panels” video](#) that walks homeowners through the residential PV installation process
- New Hampshire, in conjunction with Lakes Region Community College, conducted a series of introductory [solar PV trainings for New Hampshire residents](#).
- Vermont published [A Vermonter’s Guide to Residential Solar](#) to inform Vermont consumers about residential solar PV
- CESA published a guide, titled [A Homeowner’s Guide to Solar Financing: Leases, Loans and PPAs](#), to help homeowners navigate the complex landscape of residential solar PV system financing. [Massachusetts](#), [New Mexico](#), and [New York](#) all built on CESA’s guide to publish state-specific versions of the guide

# E-Permitting

- **Connecticut** and **Massachusetts** worked with municipalities in their states on the adoption of online permitting
- **Rhode Island** worked with a vendor to pilot online permitting in several Rhode Island municipalities. Rhode Island implemented e-permitting for the state's Fire Marshall's Office and Building Code Commission Office

# Financing

- Connecticut Green Bank trained nearly 100 solar installers on Connecticut's Residential Solar Investment Program
- Massachusetts launched the [Mass Solar Loan Program](#), which connects potential Massachusetts solar customers with low-interest financing

# Fire Safety

- The Connecticut Green Bank partnered with the Connecticut Fire Academy to develop a solar PV and fire safety training for firefighters
- In addition to Connecticut's trainings, the Partnership conducted a seven PV fire safety trainings across the other four states
- The Partnership produced a [Solar PV Fire Safety Training Module](#) designed as a three-hour instructional slideshow for firefighters

# Installer Licensing

- Rhode Island implemented a [statewide Renewable Energy Professional Licensing program](#) designed to remove electrical licensing barriers for solar installers and the state created licensing resources for new installers in the state

# Interconnection

- **Connecticut's** major utilities proposed revisions to Connecticut's distributed generation interconnection guidelines
- Two of **Massachusetts'** major electric utilities participated in the Massachusetts Distributed Generation Working Group.
- **New Hampshire** developed an online [Simplified Guide to Utility Interconnection Requirements](#)
- **Rhode Island's** electric utility held trainings on its interconnection tariff at Rhode Island Commerce Corporation during Rooftop Solar Challenge II
- **Vermont** successfully worked with the state's largest electric utility to eliminate the homeowner insurance requirement from its net metering rules



# Permitting

- **Connecticut** released a comprehensive [Connecticut Rooftop Solar PV Permitting Guide](#)
- **Massachusetts** held [six solar PV permitting trainings](#) across the state and published [a series of case studies](#) highlighting Massachusetts municipalities that have made strides in streamlining their solar permitting processes. Massachusetts produced three permitting webinars:
  1. [Considerations for Aging Solar PV System Components](#)
  2. [Solar PV Inspection Techniques for Municipal Inspectors](#)
  3. [Labeling Requirements for Solar PV Systems](#)
- **New Hampshire** published a [New Hampshire Residential Rooftop Solar PV Permitting, Zoning and Interconnection Guide](#)
- **Rhode Island** conducted training for Rhode Island building and electrical officials on common PV system inspection issues
- **Vermont** worked with the City of Burlington to identify ways to streamline the city's PV permitting process

# Solar Contractor Training

- The Rhode Island Office of Energy Resource and Commerce RI convened regular solar stakeholder meetings with solar contractor to discuss the state's solar programs and to generate ideas for achieving greater solar cost reductions
- Vermont worked with a consultant to deliver training to solar and efficiency contractors on a program that combines PV installations with efficiency upgrades

# Solar Scorecards

- Connecticut Green Bank contracted with the Yale Environmental Performance Index to create [Connecticut Solar Scorecards](#) for municipalities to encourage them to take actions to become more solar friendly

# Solarize

- Both [Connecticut](#) and [Massachusetts](#) had established Solarize programs under Rooftop Solar Challenge I and continued them under Rooftop Solar Challenge II
- Rhode Island launched a successful Solarize program during Rooftop Solar Challenge II.
- CESA published a Solarize Guide entitled [Planning and Implementing a Solarize Initiative: A Guide for State Program Managers](#)

# Structural Review

- Connecticut released a [structural review worksheet](#) to evaluate the integrity of a roof's framing for a proposed PV system
- As a component of [New Hampshire's solar permitting and zoning guide](#), New Hampshire produced a [Residential Solar PV Structural Review Worksheet](#)

# Zoning

- **Connecticut** included a model zoning ordinance and general zoning guidance in its [Connecticut Rooftop Solar PV Permitting Guide](#)
- **Massachusetts** developed a [model solar zoning bylaw](#) and [policy guidance](#)
- **New Hampshire** included model zoning considerations for municipalities in the [Residential Rooftop Solar PV Permitting, Zoning and Interconnection Guide](#)

# Results

- Decline in Regional Installation Costs
  - **Connecticut's** median installed cost fell from \$4.35/W to \$3.45/W from 2013 to 2016.
  - **Massachusetts'** median cost fell from \$4.66/W to \$3.83/W over the same period.
  - Data from **New Hampshire** showed the state's median installed cost rising slightly from \$3.65/W to \$3.72/W.
  - **Rhode Island's** median cost fell from \$4.46/W to \$3.90/W.<sup>1</sup>
  - **Vermont's** median installed cost in 2013 was \$4.72. A 2016 Vermont solar cost study modeled a \$3.55/W system cost for a typical 10kW rooftop system in Vermont.

# Lessons Learned

- The Value of Sharing Information among States
- The Value of Leveraging Efforts among States
- The Importance of Relationship Building with Stakeholders
- State-Driven Work Can Stimulate Independent Efforts

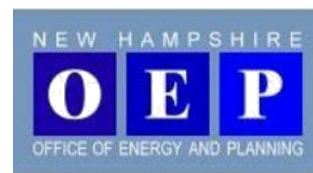


# Lessons Learned Continued

- Solarize Continues to Be a Successful Cost-Reduction Strategy
- Not All Successful Strategies Can Cross State Lines
- Municipalities' Authority Can Make Statewide Change Complicated
- Online Permitting Is Desirable but Was Difficult to Achieve

# Today's Guest Speakers

- **Isabelle Hazlewood**, Connecticut Green Bank
- **Elizabeth Youngblood**, Massachusetts Clean Energy Center
- **Rick Minard**, New Hampshire Office of Energy and Planning
- **Shawn Selleck**, Rhode Island Office of Digital Excellence
- **Andy Perchlik**, Vermont Department of Public Service





# **Access to Affordable Financing – A Key Ingredient in CT’s Residential Solar Market Growth**

# Affordable Solar Financing Options



## Lease and Loan Programs for Independent Installers

	<b>CT Solar Lease 2013-2015</b>	<b>CT Solar Loan 2013-2014</b>	<b>Smart-E Loan 2013-Ongoing</b>
<b>What Makes It Special?</b>	Hassel and worry-free, no money down	Low monthly payment makes purchasing solar affordable	Quick and easy financing from 10 community banks and credit unions
<b>Own Your Solar?</b>	No (option to purchase after 5 years)	Yes	Yes
<b>Down Payment?</b>	Not required if installed cost $\leq$ \$4.50/W	Minimum of 5% of installed cost	Not required
<b>Rates &amp; Terms</b>	20 years Fixed or escalating	15 years 6.49%	5, 7, 10, 12 years 4.49% - 6.99% 2.99% "Bundle" rate



# Residential Sector Financing Program Snapshot



- \$62 million across more than 2,175 loans and leases approved/closed
  - Independent installers “got” financing and used it to grow their businesses
  - Very strong portfolio credit quality and performance to date:
    - Smart-E (as of 9/30/2016): 1 delinquency (1-30 days), 2 defaults
    - CT Solar Loan (as of 10/31/2016): 3 delinquencies (1-30 days), 1 default
    - CT Solar Lease (as of 10/31/2016): 2 delinquencies (30-59 days)

Program	Number of Loans / Leases	Amount Financed	Average Loan / Lease	Number of Eligible Solar Contractors
Smart-E	707	\$12,840,158	\$18,161	62
CT Solar Loan	279	\$5,953,772	\$21,340	19
CT Solar Lease	1,189	\$43,762,387	\$36,806	22
<b>Total</b>	<b>2,175</b>	<b>\$62,556,316</b>	<b>\$28,762</b>	

# Market Entry & Transformation

Low-to-Moderate Income Homeowners



PosiGen Co-investment: \$15 - \$20 million fund

## Home

(New Haven – Oil Heat)



\$59,250 HHI  
High Energy Costs

High  
Energy Burden



## Solar PV (Lease)



\$55 to \$100/month Lease  
Solar \$ Savings

Moderate  
Energy Burden



## Energy Efficiency (ESA)



\$10/month ESA  
Energy Savings  
<<Additional Savings>>  
Solar + EE \$ savings



Reasonable  
Energy Burden

# Smart-E Bundle

## “Solar +” Multi-measure Pairings



- **Smart-E Bundle 2.99%** interest rate for qualifying projects with **multiple measures**
  - ✓ **Solar + High Efficiency HVAC**
  - ✓ **Solar + Insulation**
  - ✓ **Solar + Heat pump**
  - ✓ **Solar + EV Charger**
- “Credit” given for an eligible measure installed in last 5 years, with proof
- [www.energizect.com/SmartEBundle](http://www.energizect.com/SmartEBundle)

**smart-e loan**



# Solarize Massachusetts Update

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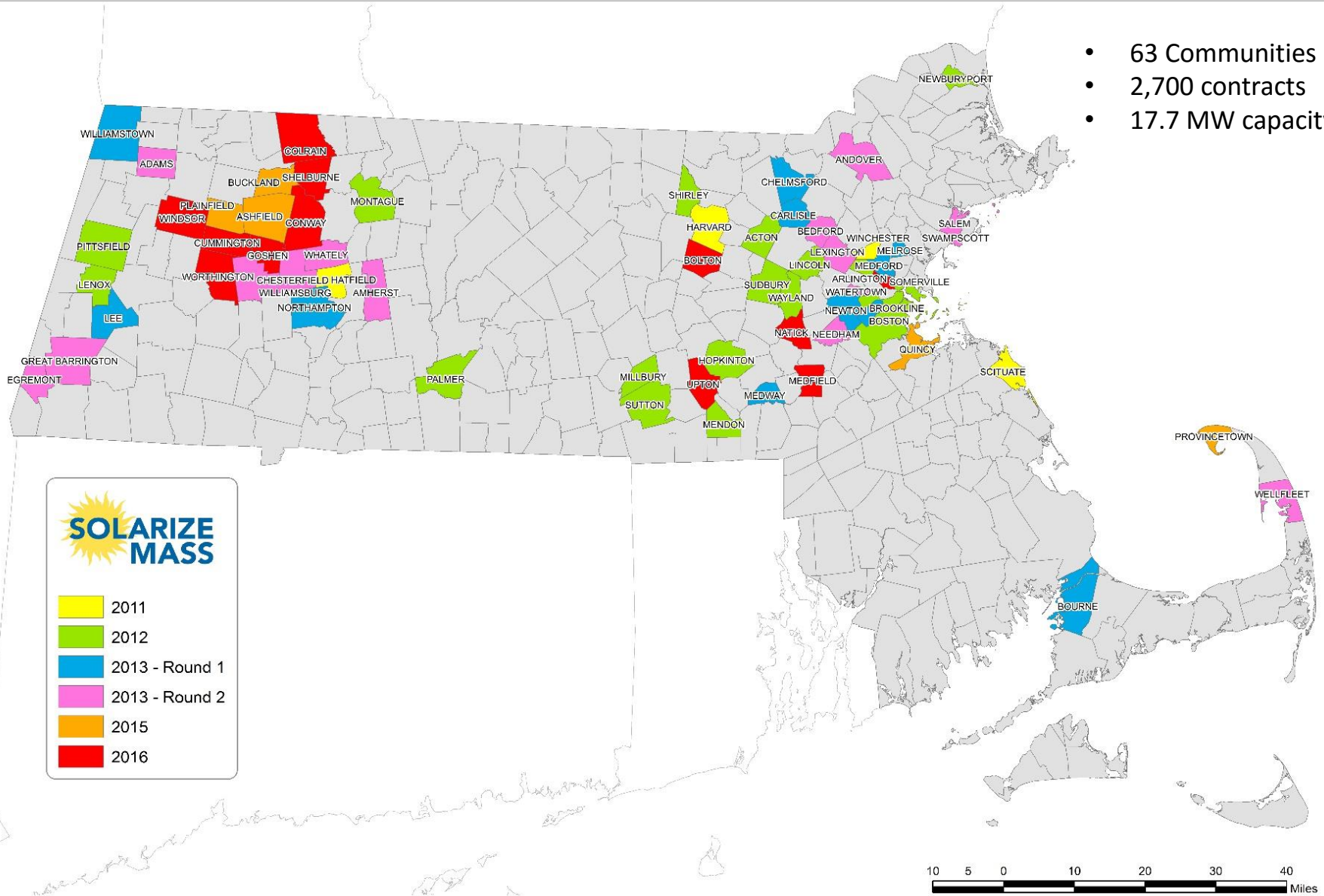


**Elizabeth Youngblood**  
**Senior Project Manager**  
**November 3rd, 2016**



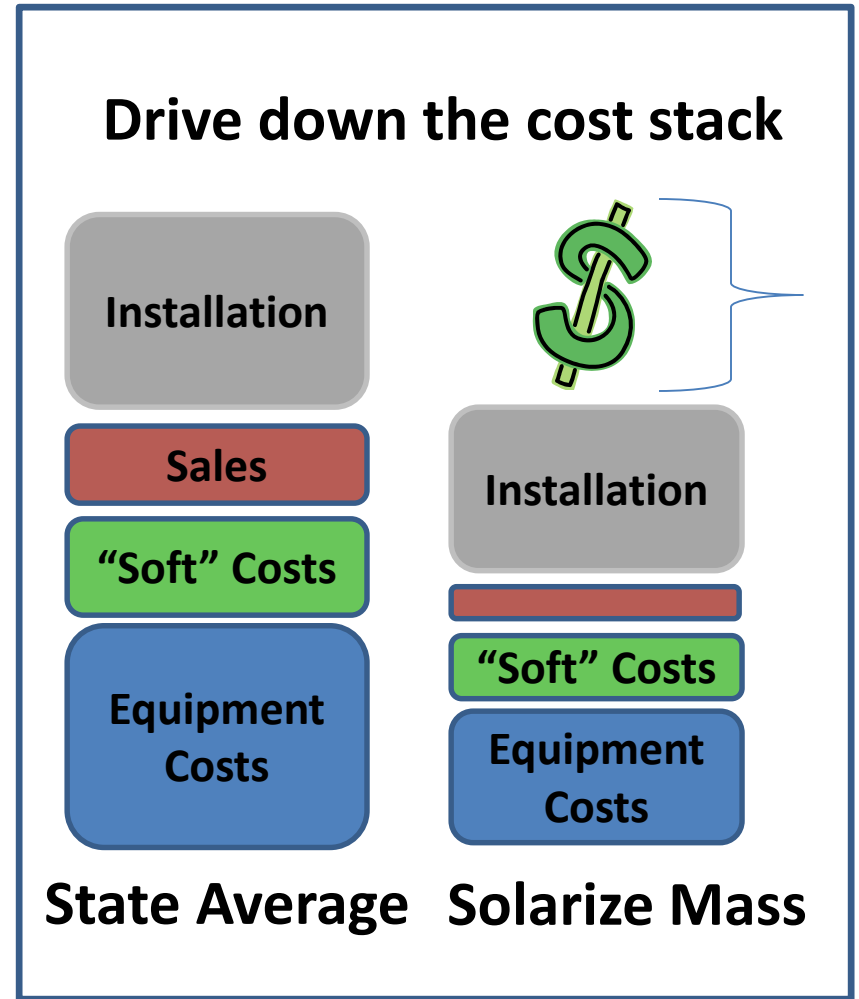
# Solarize Mass Communities

- 63 Communities
- 2,700 contracts
- 17.7 MW capacity



# Goals of Solarize Mass

- Increase education and community outreach
- Implement a model to simplify process
- Reduce installation costs
- Reduce time to contract
- Increase adoption



## MassCEC/DOER

Community RFPs  
Engage tech. consultants  
Marketing/Education  
State Incentive Program

## Installer

Free Site Assessments  
Tiered Pricing and Ownership Options  
Contracting  
Installation



## Community

Installer RFP and Selection  
Solar Coach  
Volunteers  
Outreach

## Homeowner

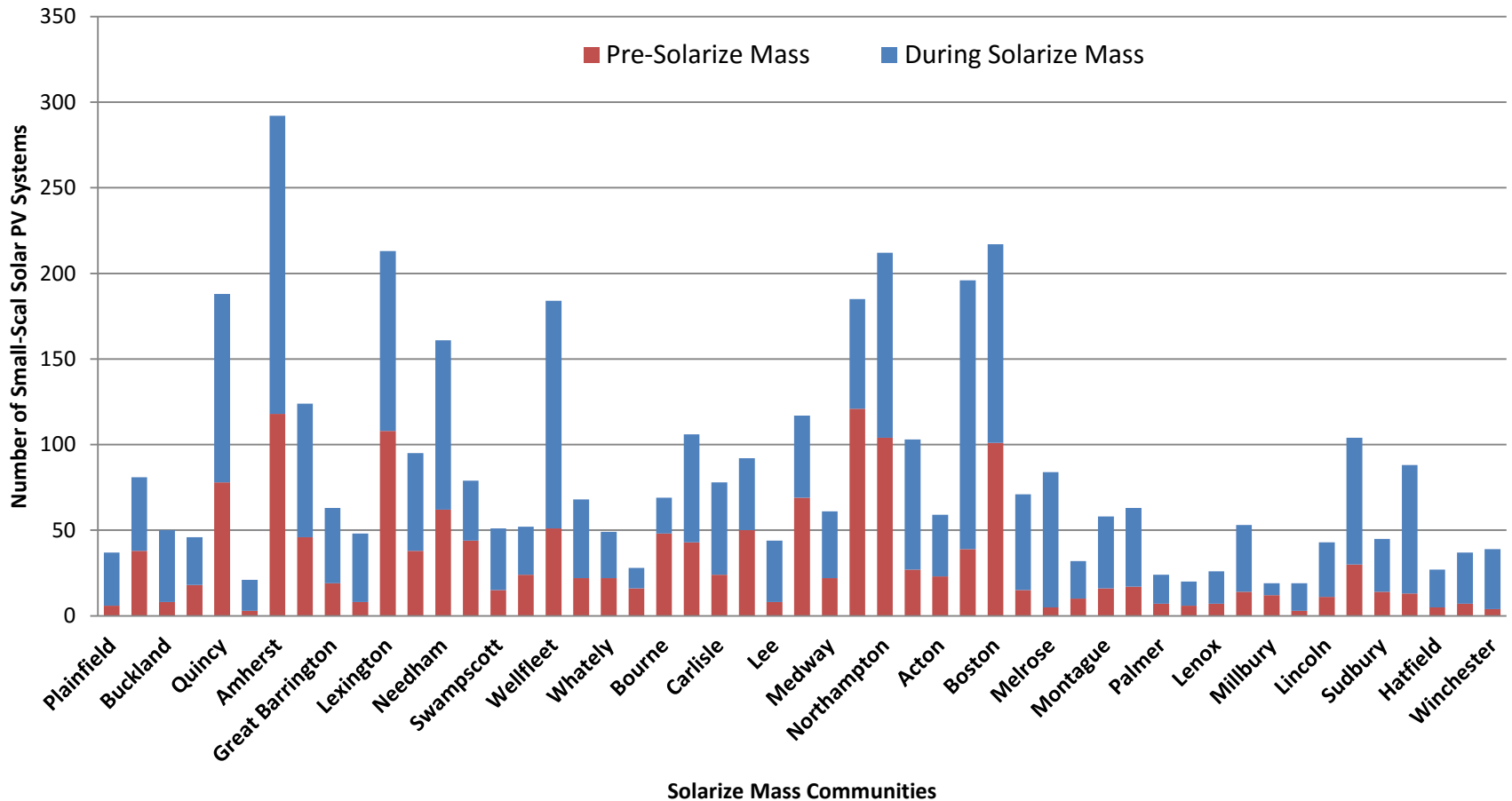
Sign up for a site assessment  
Talk to neighbors!

# Program Results to Date

Year	Communities	Contracts Signed	Avg. Contracts per Community	Capacity (kW)	Avg. Capacity per Community (kW)
2011	4 communities	162	40.5	829.36	207.34
2012	17 communities (13 proposals)	803	47.2	5,146.18	302.7
2013	10 communities (9 proposals)	551	55.1	3,838.2	383.8
2014	15 communities (10 proposals)	932	62.1	6,140.59	409.37
2015	5 communities (3 proposals)	254	50.8	1,748.5	349.7
<b>Total</b>	<b>51 communities</b>	<b>2,702</b>	<b>52.9</b>	<b>17,703.23</b>	<b>1,652.99</b>

- 10% forfeiture rate, consistent with Commonwealth Solar II Rebate

# Solarize Mass Adoption 2011 - 2015



- 43 of 51 communities doubled amount of solar in community
- 18% – 21% average cost reduction compared to industry

# Efficacy of Marketing & Outreach

Marketing & Outreach Method	2013 Important	2014 Important
Neighbor/Friend	45%	50%
Local community or civic group	48%	60%
Solar coach or town official	42%	58%
Solar installer	57%	65%
Community meetings or events	51%	66%
Lawn signs/Banner	38%	40%
Mailing/Door hanger/Flyer	21%	31%
Traditional/Online media (TV, radio, newspaper, etc.)	34%	45%
Social media (Facebook, google groups, twitter, etc.)	13%	20%
Other	11%	12%

# Thank You!

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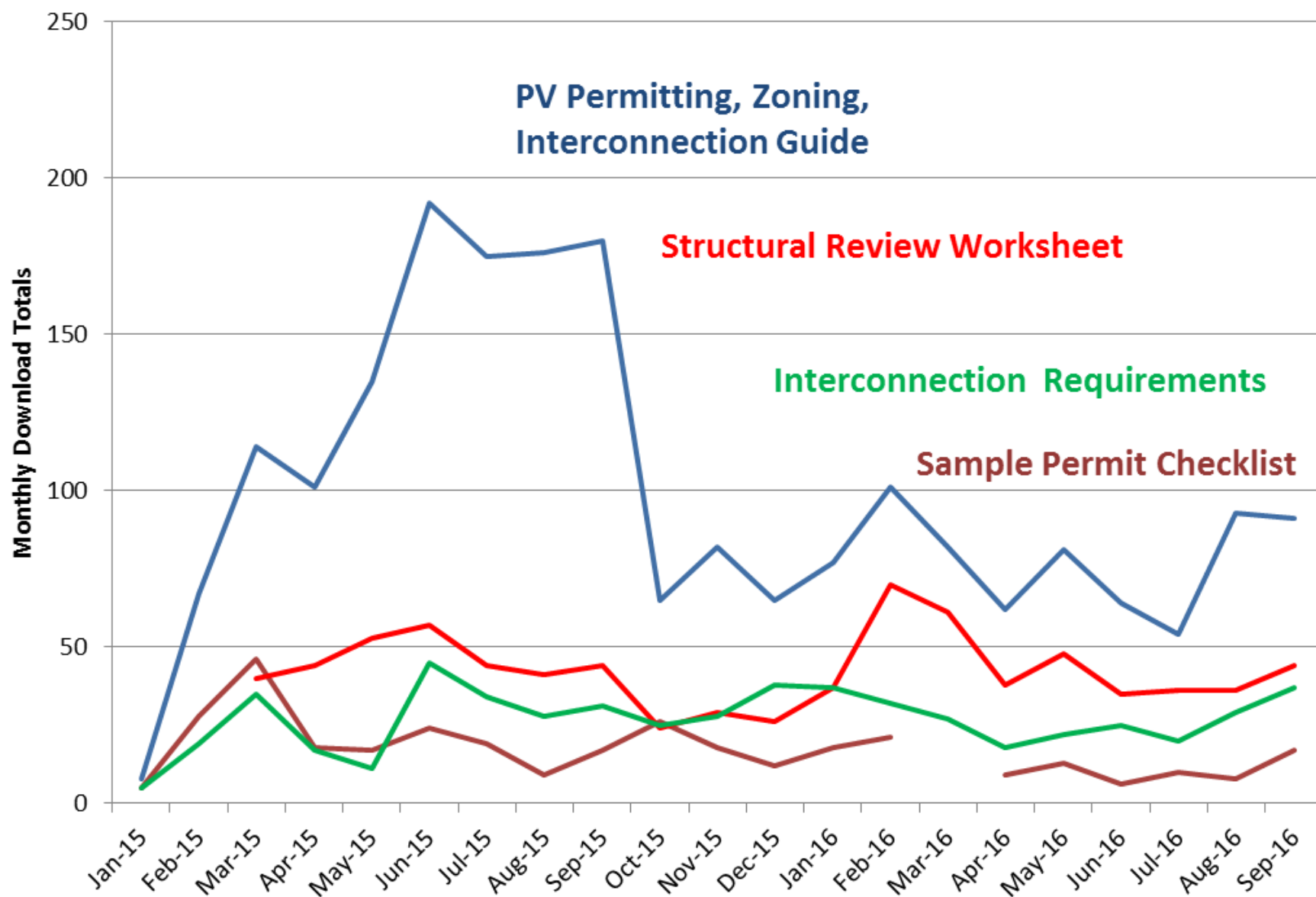
# New Hampshire Residential Rooftop Solar PV Permitting, Zoning and Interconnection Guide

- <http://www.nh.gov/oep/energy/saving-energy/documents/solar-permitting-guide-no-appendices.pdf>

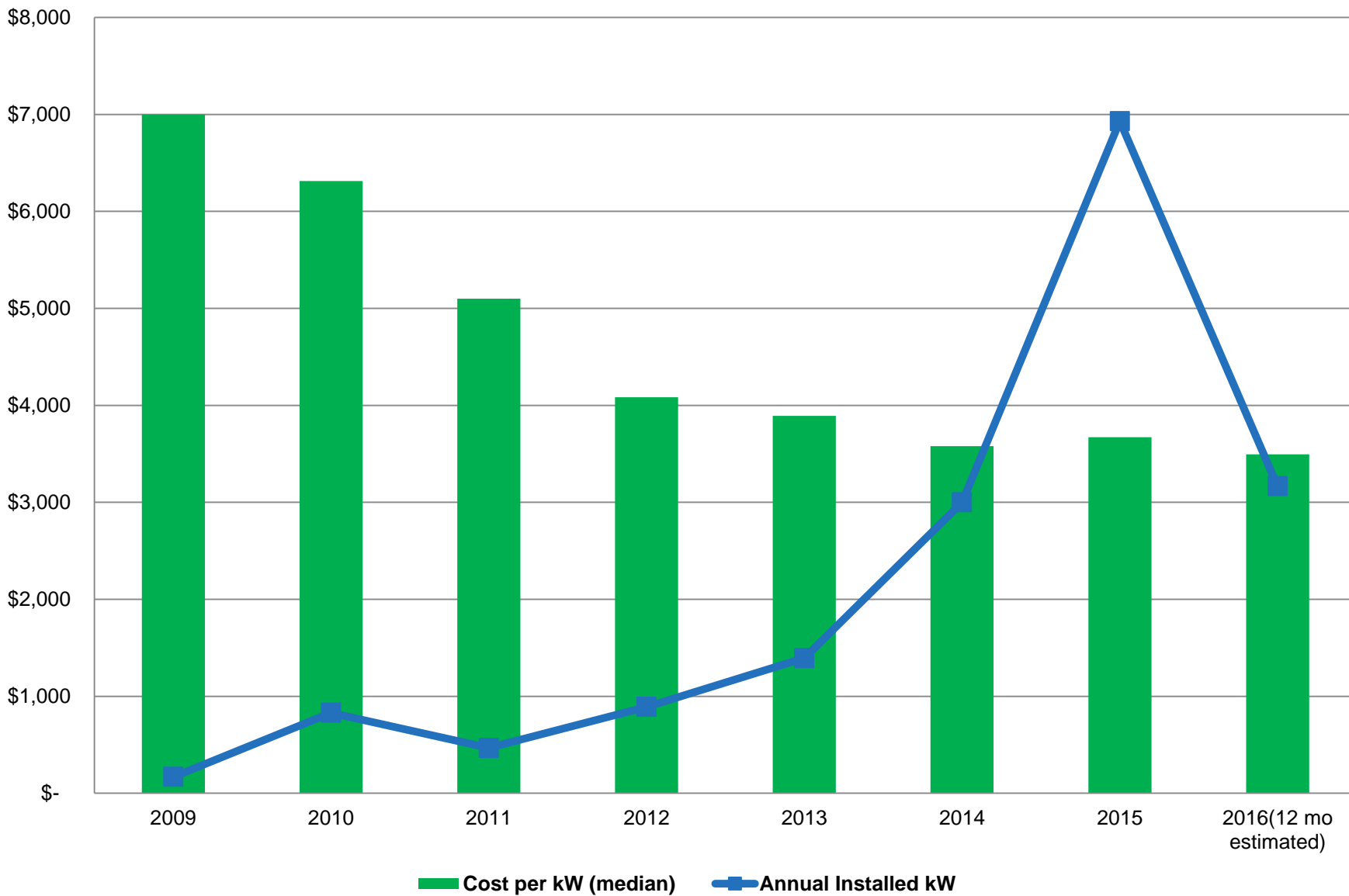




## NH OEP Web Downloads of RSCII Publications



## Residential Solar PV in NH: 2009-2016 (?)



# Rhode Island E-Permitting

November 3, 2016



STATE OF RHODE ISLAND  
**OFFICE OF  
ENERGY RESOURCES**

# History of e-Permitting in Rhode Island

- 2012-Initiative launched
- 2013-Initial funding
- 2014-Sufficient funding for RFP release
- 2015-Vendor Selection/Project Launch/Project Manager hired
- 2016-Go Lives begin and staff augmentation

# Implementation Approach

- **State First**
- **Pilot municipalities follow, with additional phases scheduled**
- **Lead by example (does not need to be top-down)**
- **Unified Platform**
- **No paper applications upon launch**
- **Four entities launched so far (two municipalities)**
- **Three additional planned by end of year (including Providence which the DOE Sunshot funding significantly supported)**
- **Ten municipalities by Spring 2017**
- **20-25 (over half of Rhode Island) by end of 2017**

# Online Application Highlights

- **Elimination of repetitive data entry**
- **Instantaneous validation of credentials**
- **Reduced burden on officials**
- **Reduces risk for home/business owners**

# Thank you for attending our webinar

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