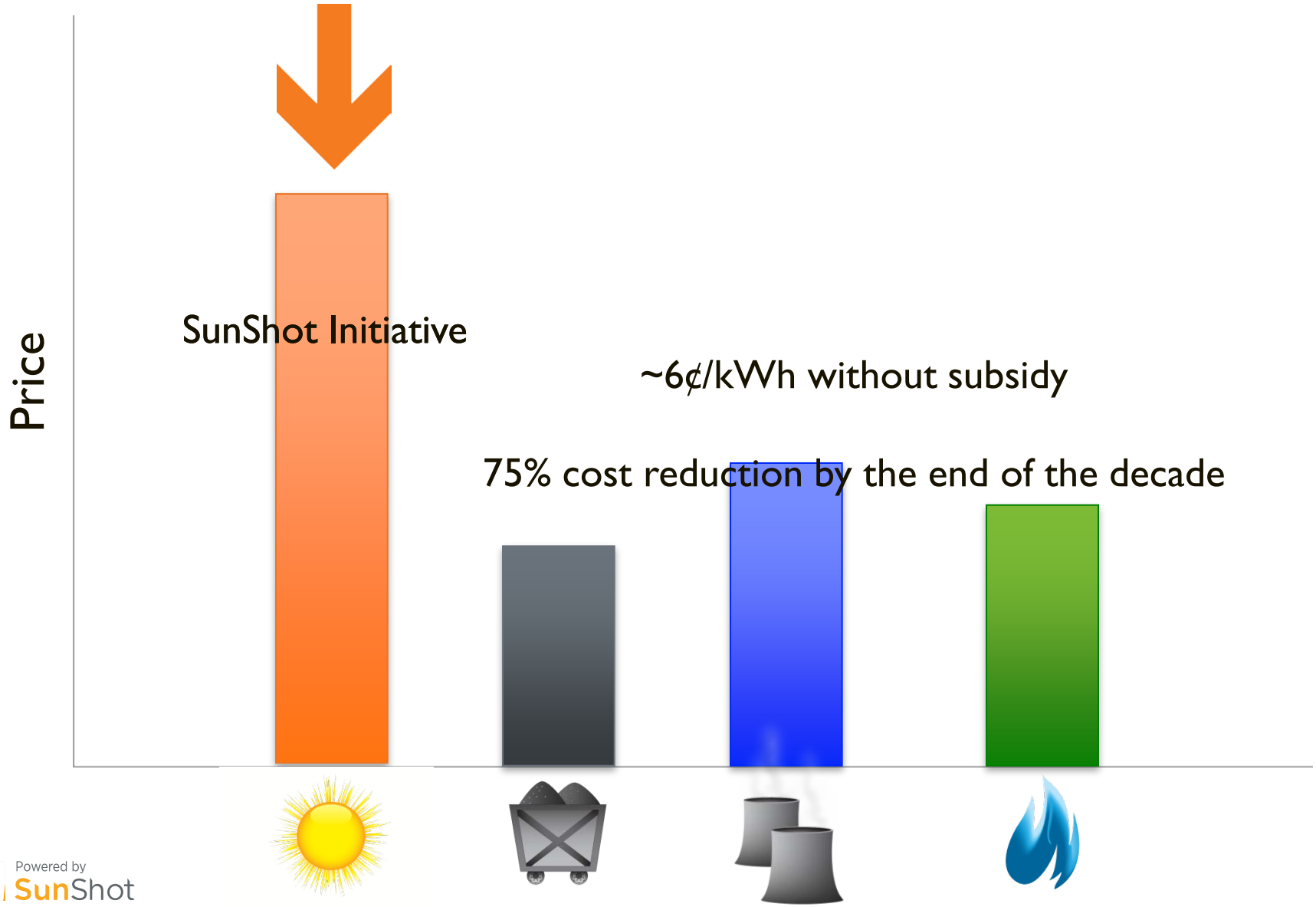
Solar Action Webinar Series:
Innovation and Success in Solar Financing
July 10, 2013

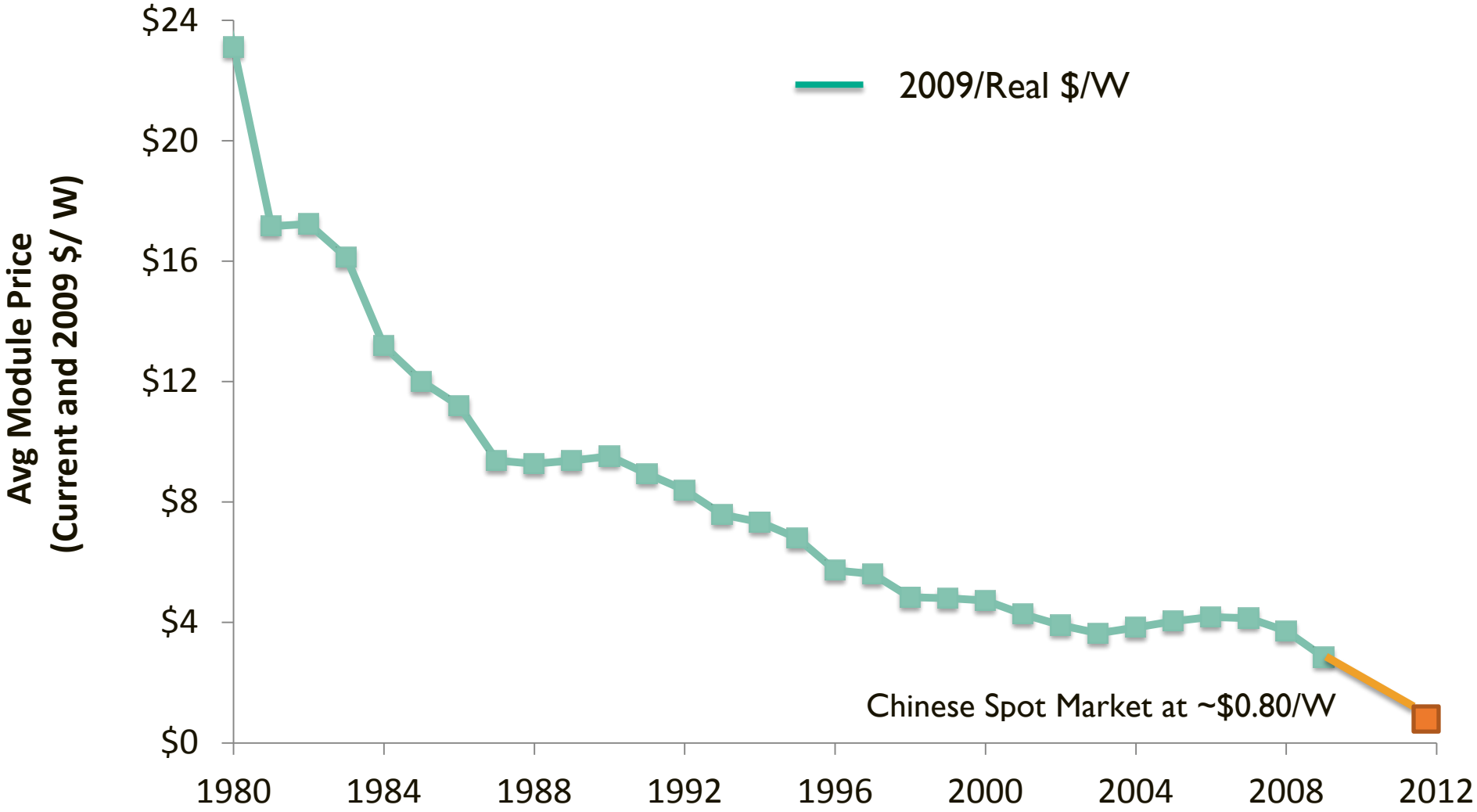
Powered by SunShot
U.S. Department of Energy

Why We're Here: The Big Picture



Powered by SunShot
U.S. Department of Energy

Panel Prices Plummeted



Powered by SunShot
U.S. Department of Energy

Source: Mints, P. (2011). *Photovoltaic Manufacturer Shipments, Capacity, & Competitive Analysis 20010/2011*. Report # NPS-Supply6. Palo Alto, CA: Navigant Consulting Photovoltaic Service Program.

However…

"Even if you paid nothing for the hardware, you'd still pay thousands of dollars to install a residential solar power system."

- Former Secretary Chu

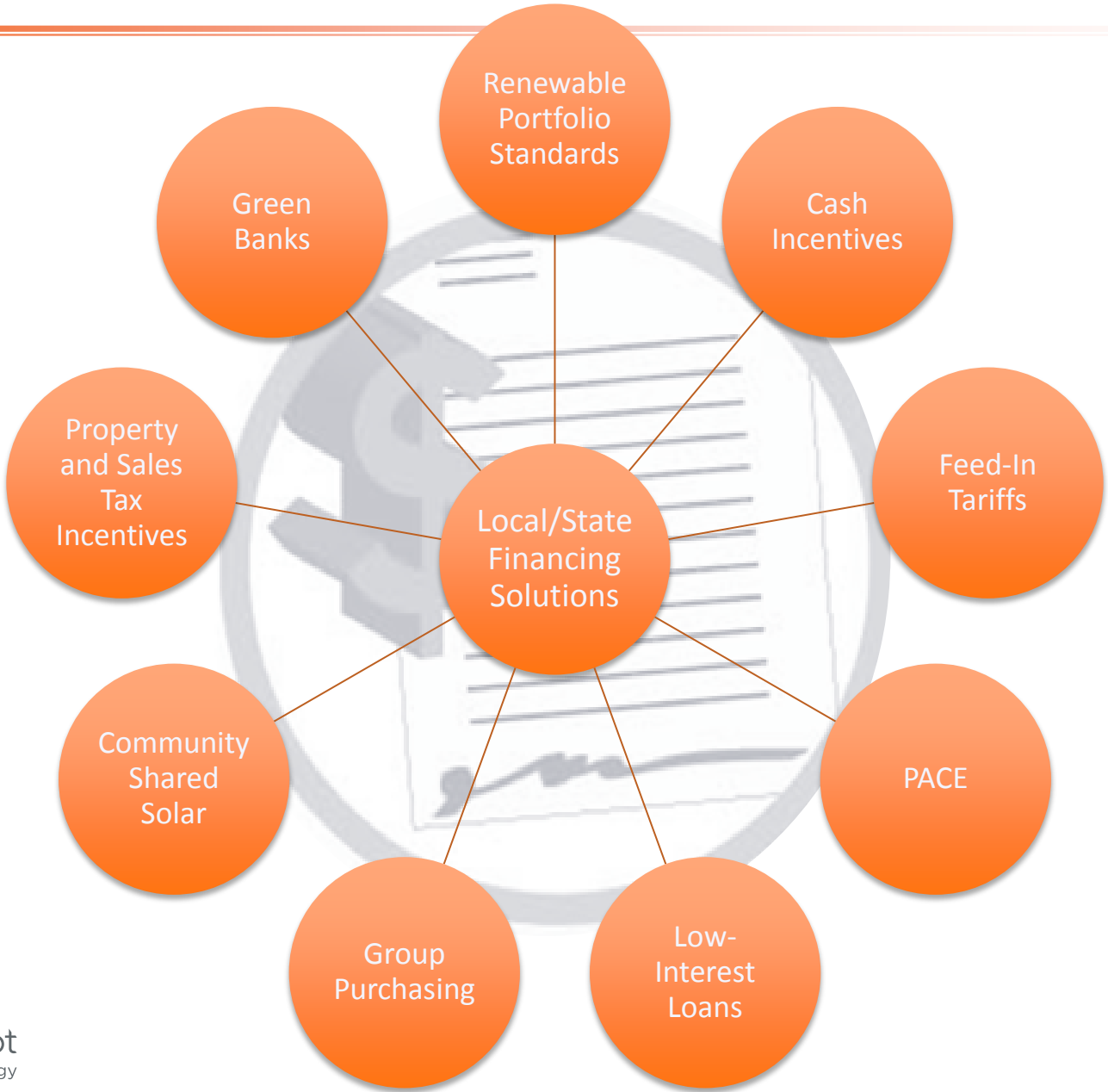
What is SunShot targeting?

Soft Costs

=

Up to **50%** of the cost of a solar installation

Solving the Solar Finance Bottleneck



Powered by SunShot
U.S. Department of Energy

Southeast
12,500,000 People

Midwest
5,000,000 People

47M TOTAL

Northeast
10,200,000 People

Southwest
20,500,000 People

Northwest
790,000 People

Powered by SunShot
U.S. Department of Energy

Rooftop Solar Challenge Successes

Permitting

- 40% Faster
- 12% Cheaper

Overall Time Saved: One Week Per Install

What Does One Week of Time Mean?

PV Installed in RSC locales:

Residential: 225 MW

Commercial: 357 MW

37,960 Residential Systems

3,148 Commercial Systems

Average Business Days Saved Per Install = 5.1

Average Business Days Saved Per Install = 4.1

Which means the RSC saved Americans from an estimated…

792 YEARS OF RED TAPE

Today's Presenters

- **Natalie Andrews,** Renewable Energy Coordinator
  - Massachusetts Department of Energy Resources
  - Solar Outreach to Local Financial Institutions
- **Sara Baldwin,** Senior Policy & Regulatory Associate
  - Utah Clean Energy
  - Community, Local, and State Financing Initiatives
- **Bert Hunter,** Chief Investment Officer
  - Connecticut's Clean Energy Finance and Investment Authority
  - Green Banks & Innovative Solar Lease Models

Solar Outreach to Local Financial Institutions

Powered by SunShot
U.S. Department of Energy

Solar in Massachusetts

- 281 MW of solar installed
- 40% of projects are 3rd party owned
- SRECs, Solarize, Rebates, Net metering, State and Federal Tax Incentives
- Currently MA is ranked 6th in residential and 4th in non-residential installations in the U.S.

SunShot Initiative: Rooftop Solar Challenge

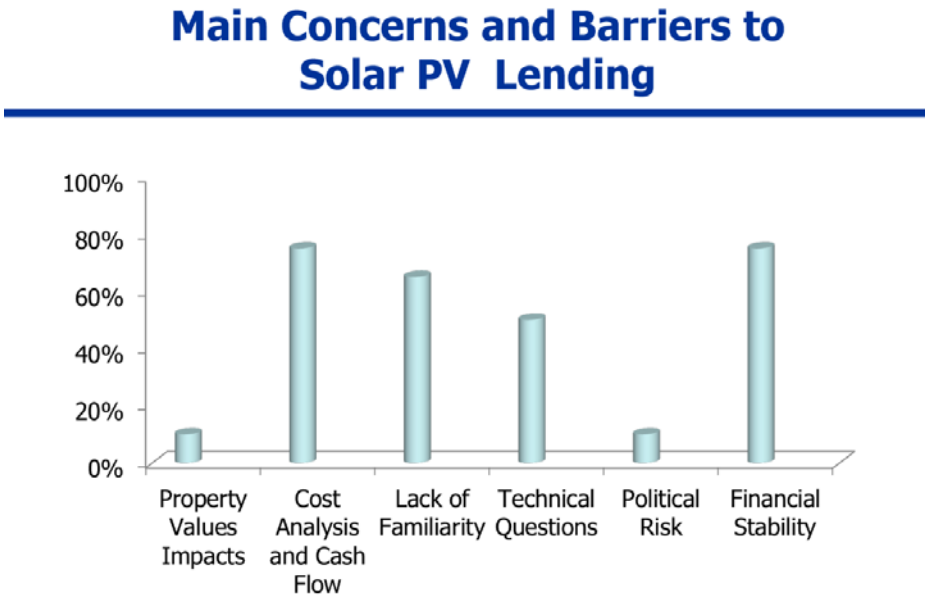
- Department of Energy resources
- Received $566,354 focused on reducing the soft costs of solar
- One of our goals was to understand challenges and improve local lending
- ICF International hired
- Survey, held two workshops and a webinar

Financing Challenges Hypothesis

- Local financial institutions were resistant to solar PV lending due to:
  - Misconceptions with PV technology
  - Lack familiarity with projects
  - Lack experience with project cash flow risks

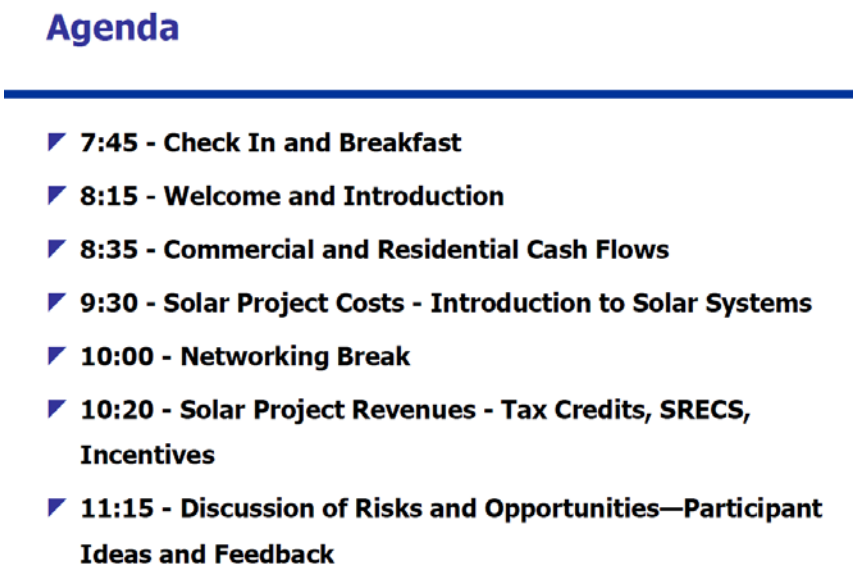
Results of Survey

- Consultant administered a phone survey
- Goals of the Survey
- 22 interviewees
- Large and small banks
- 1/3 had experience
- Cost analysis and cash flow
- Political risks



Workshop Format and Content

- Audience was residential and commercial banks
- Centered on cash flow
- Installation and equipment costs
- Revenue streams
- Presenters consisted of bankers, solar installers, state agencies and ICF



Lessons Learned

- Centralized list of solar lenders
- Clearinghouse to facilitate communication between all relevant parties
- Undertake and "appraisal study" impact of solar on resale value
- Additional education
- Financial assistance to reduce risk

Additional Resources

- PowerPoint presentations, handouts and a final report from ICF are available:

http://www.mass.gov/eea/energy-utilities-clean-tech/renewable-energy/solar/outreach-to-community-financial-institutions-.html

Natalie Andrews

Renewable Energy Project Coordinator

Natalie.Andrews@state.ma.us

July 10, 2013

Wasatch Solar Challenge Financing Success Stories: Community, Local, and State Initiatives

Powered by SunShot
U.S. Department of Energy

UTAH CLEAN ENERGY

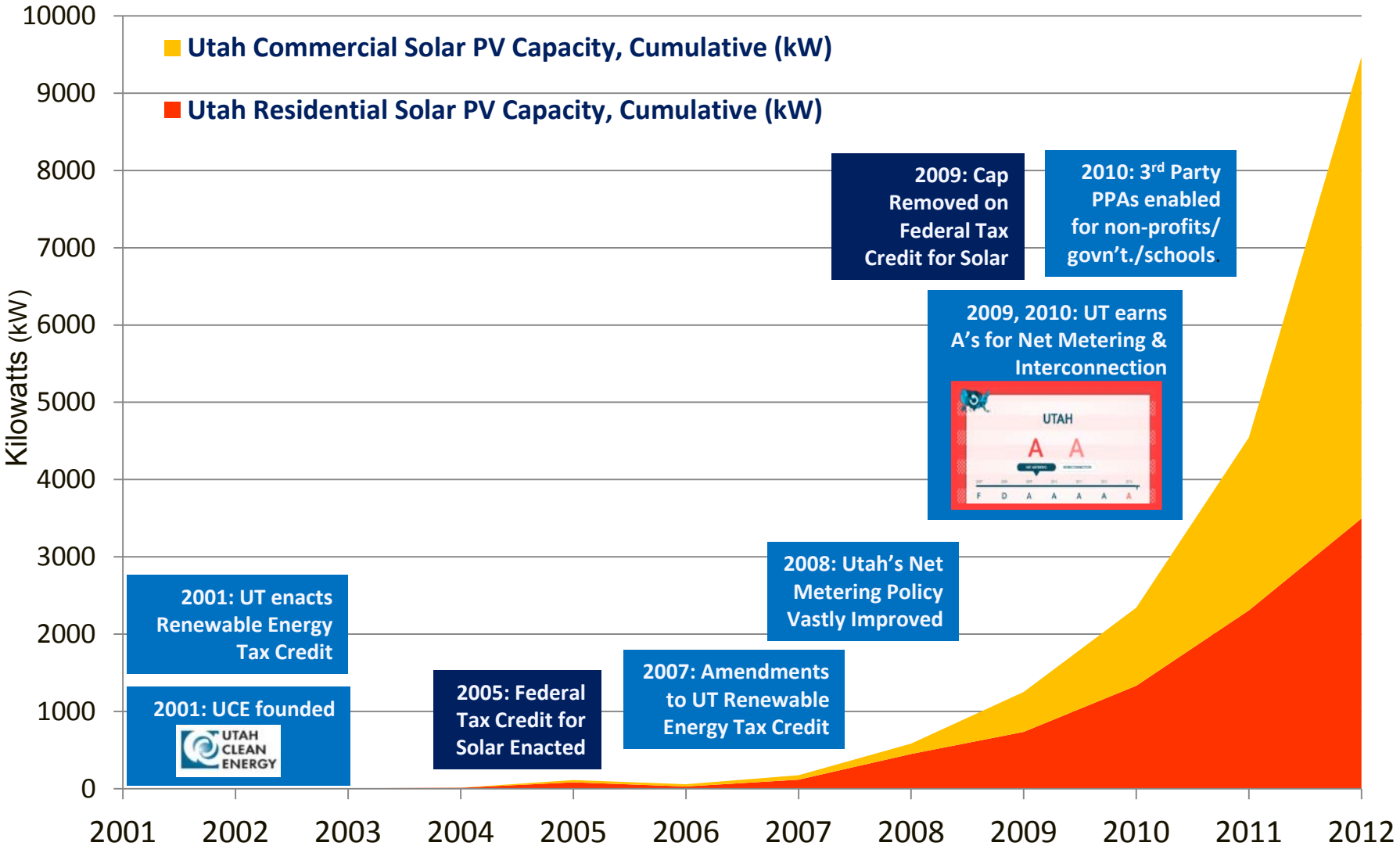
STOP
ENERGY WASTE

CREATE
CLEAN ENERGY

BUILD
A SMART ENERGY FUTURE

www.utahcleanenergy.org | @UtahCleanEnergy

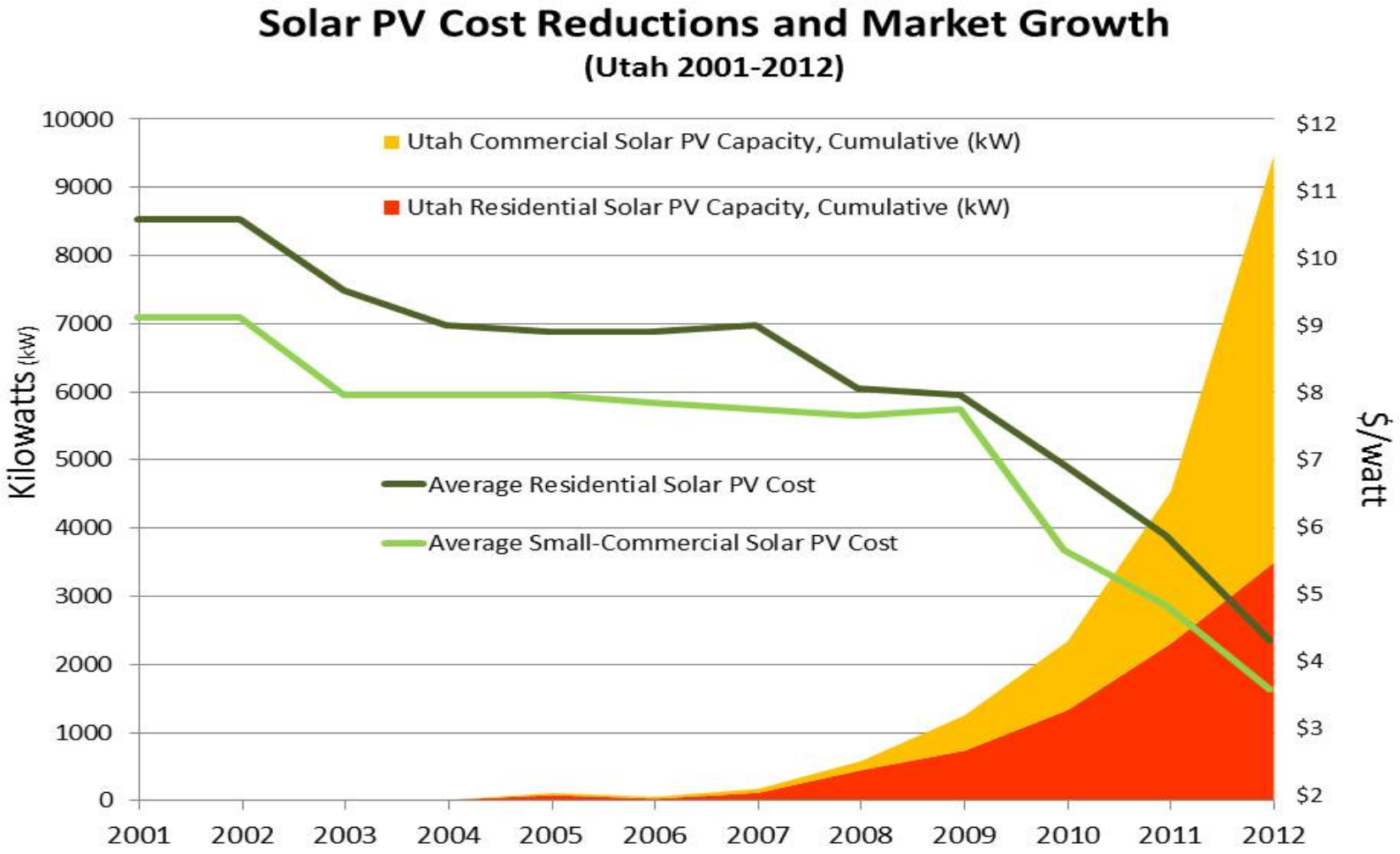
Utah's Solar Market is Starting to Shine…



Source: Utah Clean Energy, 2013. References: *Rocky Mountain Power Net Metering Data*, December 2012. and *Photovoltaic (PV) Pricing Trends: Historical, Recent, and Near-Term Projections (November 2012)*. David Feldman, Galen Barbose, Robert Margolis, Ryan Wiser, Naïm Darghouth, and Alan Goodrich. URL: www.nrel.gov/docs/fy13osti/56776.pdf

*Data set only reflects Rocky Mountain Power net metering customers through Dec 2012; Rocky Mountain Power represents 80% of Utah's electric utility service territory and is the only Investor-owned utility in Utah. Data from municipal utilities, rural electric cooperatives, and off-grid solar not represented.

Solar Costs are Dropping…



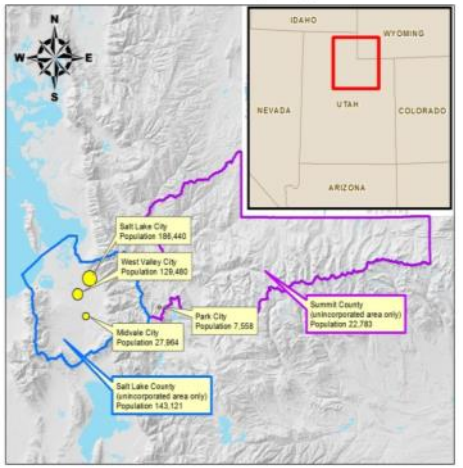
Source: Utah Clean Energy, 2013. References: *Rocky Mountain Power Net Metering Data*, December 2012. and *Photovoltaic (PV) Pricing Trends: Historical, Recent, and Near-Term Projections (November 2012).* David Feldman, Galen Barbose, Robert Margolis, Ryan Wiser, Naïm Darghouth, and Alan Goodrich. URL: www.nrel.gov/docs/fy13osti/56776.pdf

Powered by SunShot U.S. Department of Energy

…yet, solar financing tools are largely unavailable or unutilized

TARGETED ACTION AREAS:

- Local Action Plans for Streamlined Solar **Permitting**
- One-Stop-Shop on-line Solar **Information Portal**
- Solar-Friendly **Zoning** Guidelines
- Preserve Strong **Net metering/ Interconnection** Grades
- Expand **Toolbox of Solar Financing Options**



SUMMIT COUNTY UTAH

SALT LAKE COUNTY

SALT LAKE CITY

PARK CITY 1884

MIDVALE In the Middle of Everything

UNITY • PRIDE • PROGRESS • WEST VALLEY CITY, UTAH

UTAH CLEAN ENERGY
We Partner to Build the New Clean Energy Economy

SunShot U.S. Department of Energy

UTSolar.org Utah Solar Energy Association

Powered by SunShot U.S. Department of Energy

Team Objective:

Create and/or expand 2-3 solar financing options to increase Utah's solar PV market activity

First Things First: Do Your Homework

- *Solar Technical Assistance White Paper: Expanding Options for Financing Distributed Solar in Utah* (NREL, Sept. 2012)
- *Four Corners of Clean Energy Financing Memorandum* (Harcourt Brown & Carey Energy & Finance, November 2012)
- *Solarize Guidebook* (DOE, SunShot Initiative 2012)
- Individualized local government consultation with Harcourt Brown & Carey, Ballard Spahr, LLC, and Zions Bank Public Finance
- Wasatch Solar Challenge Workshop Series:
  - Financing Workshop
  - Community Solar
  - Community Solar Financing
  - PACE Webinar
- Research options, identify barriers and strategies

Solar Financing: Neither Simple Nor Straightforward…

- Source of funding?
- Who bears the risk?
- Sectors served?
- Useful?
- Legality?
- Providers in Utah?
- Implementation process?
- Program management & administration?
- Who needs to be involved?

	Residential	Commercial, Non-Residential	Public, Government, Schools	Non-Profits, Churches
Traditional Financing	· Energy Efficient Mortgages · Personal Line of Credit · Home Equity Loan · Title I Home Improvement loans	Varies	Varies	Varies
Private Loan Programs	· Power Saver Loan Program · Admirals Bank · LRB Financial · Enerbank (through select contractors only)	N/A	N/A	N/A
Property Assessed Clean Energy (PACE) Financing	Not currently legal in Utah	C-PACE enabled in Utah, no programs available yet (stay tuned!)	C-PACE enabled in Utah, no programs available yet (stay tuned!)	C-PACE enabled in Utah, no programs available yet (stay tuned!)
Power Purchase Agreements (PPAs)	Not currently legal in Utah	Not currently legal in Utah	Available	Available
Leasing	Legal in Utah, but limited to select solar companies	Legal in Utah, but limited to select solar companies	Legal in Utah, but limited to select solar companies	Legal in Utah, but limited to select solar companies
Qualified Energy Conservation Bonds (QECBs)	Stay tuned! New programs under development…	N/A	Available, locally determined	N/A
USDA REAP Loan Guarantee	N/A	Available for Rural Small Business, Agricultural Operations	N/A	N/A

Source: www.solarsimplified.org

Our Approach: A Financing Trifecta

- Strategic combination of 'financing' initiatives
  1. community-level
  2. local government
  3. state-level
- Focus on generating demand for solar across all sectors in an emerging market with limited incentives and no RPS
- Tackle real-world barriers with workable and replicable strategies
- Keep it simple

Community-Level:
Utah's first bulk-purchase programs

Bringing Community Bulk Purchase Models to Utah

Silicon Valley Leadership Group
SunShares

solarize portland

Join forces with your neighbors to bring the power of solar into your home and be a part of Oregon's energy solution!

- *Can a model pioneered in Oregon and California work in Utah?*
- *How? What will work here? What won't?*
- *How will this effort impact the solar market?*
- *Will it work without utility incentives?*

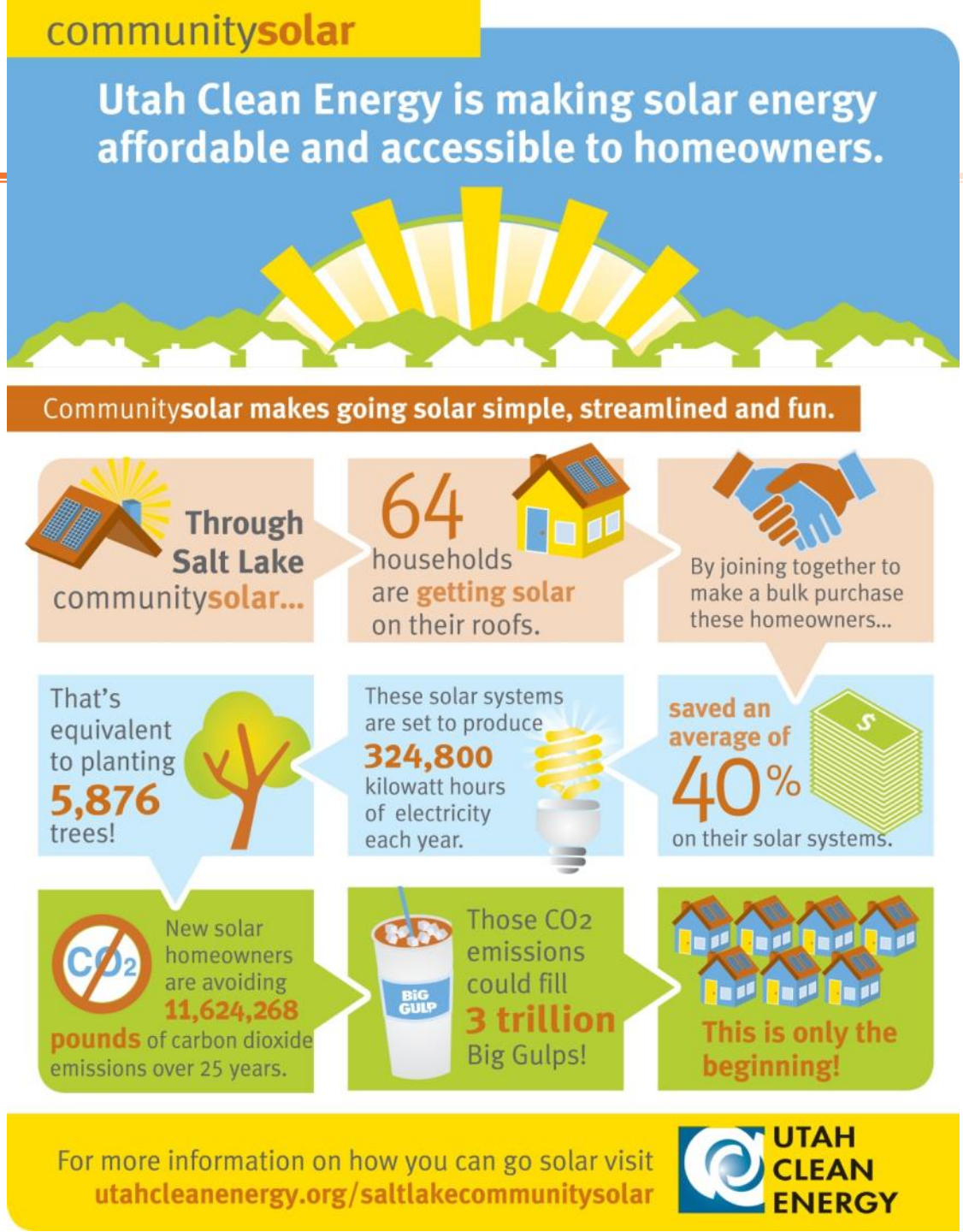
Salt Lake Community Solar – A Pilot Program

- Residential Solar PV in Salt Lake County and Salt Lake City

- When:
  - Jan – May 2012 (Prep, recruitment)
  - May – June 2012 (RFP, Contractor Selection)
  - June – Nov 2012 (Enrollment, commitment period)
  - Aug – Dec 2012 (installations, final celebration)

- Project Manager: Utah Clean Energy

- Funding/Support:
  - Wasatch Solar Challenge,
    DOE SunShot Rooftop Solar Challenge
  - AmeriCorps/Utah Conservation Corps
  - Patagonia



AWARDS & RECOGNITION

- **2012 Utah Business Magazine Sustainable Business Award for *Social Impact***
- **(FINALIST) 2013 Governor's Excellence in Energy Award – *Responsible Energy Developer of the Year***
- ***Salt Lake City Mayor Becker wins 2013 Mayors' Climate Protection Award - Salt Lake Community Solar recognized***

* Subject to individual eligibility for federal and state tax incentives (price range after incentives: $1838-$1995/kW)

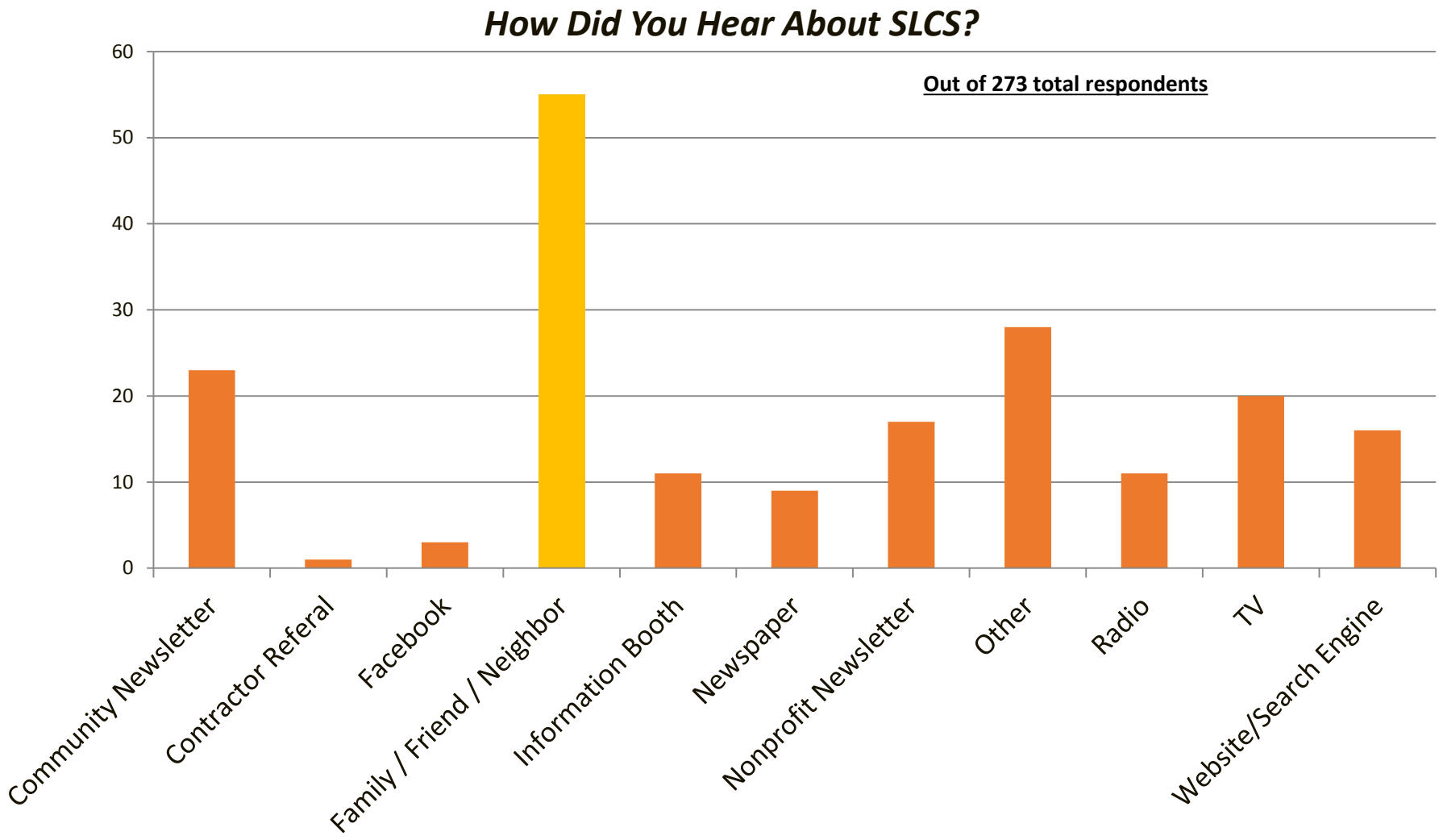
community solar makes $ense

total installed community solar kilowatts	price per kW before incentives	discount from average price
0 - 50 kW	$3,800	36.1%
51 - 75 kW	$3,630	38.9%
76 - 100 kW	$3,550	40.3%
100 + kW	$3,500	41.2%

Discount prices listed are for a standard grid-tied rooftop solar PV system using REC245 solar modules and Enphase M215 micro-inverter. Individual bids may vary.
1 kilowatt = 1000 watts. A typical Utah residential solar PV system may be 2-4 kilowatts; system size depends on personal energy goals and energy usage.

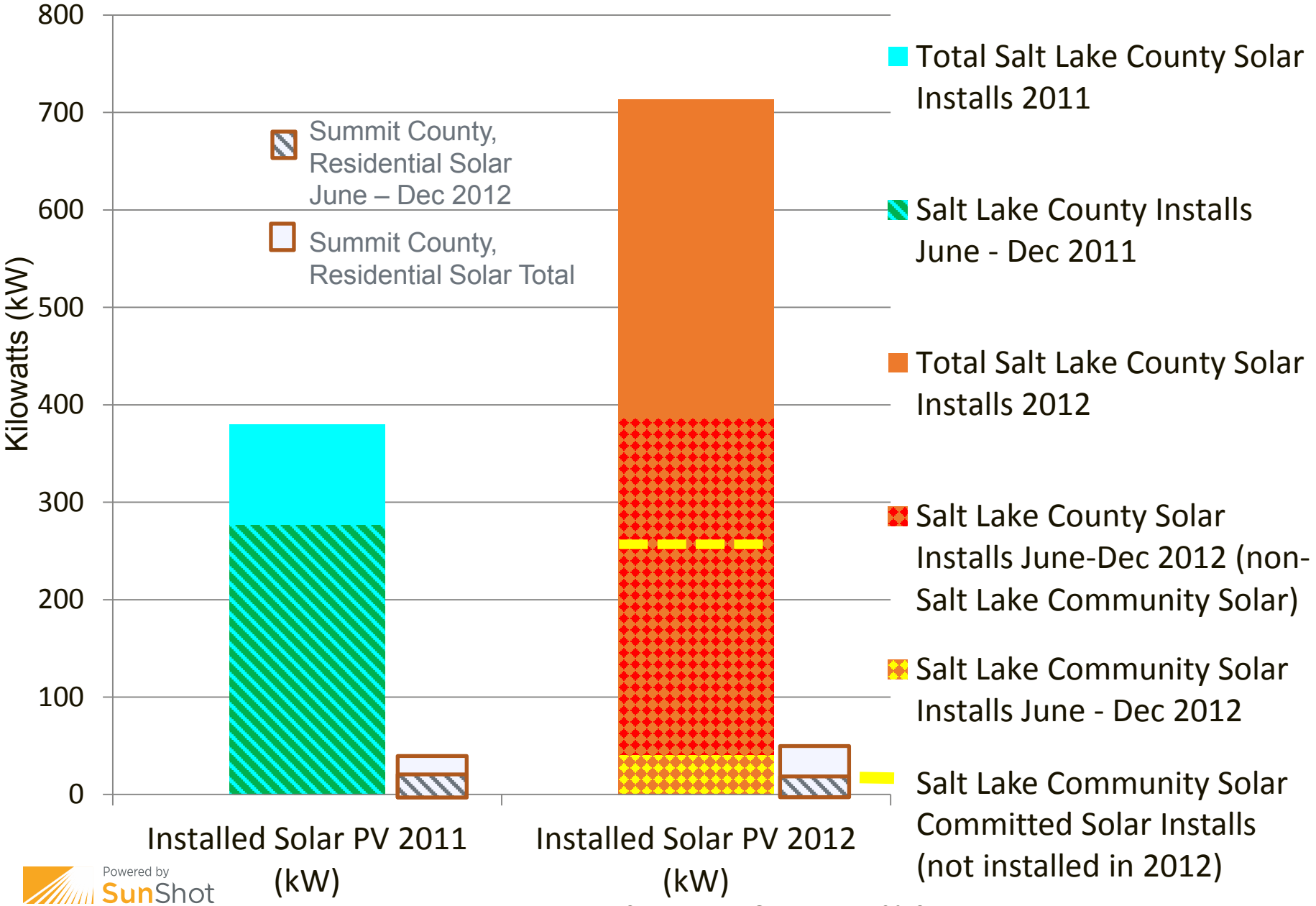
Source: Utah Clean Energy, 2012

Community Models Work!



Source: Utah Clean Energy, 2012

Community Solar Drives the Local Market



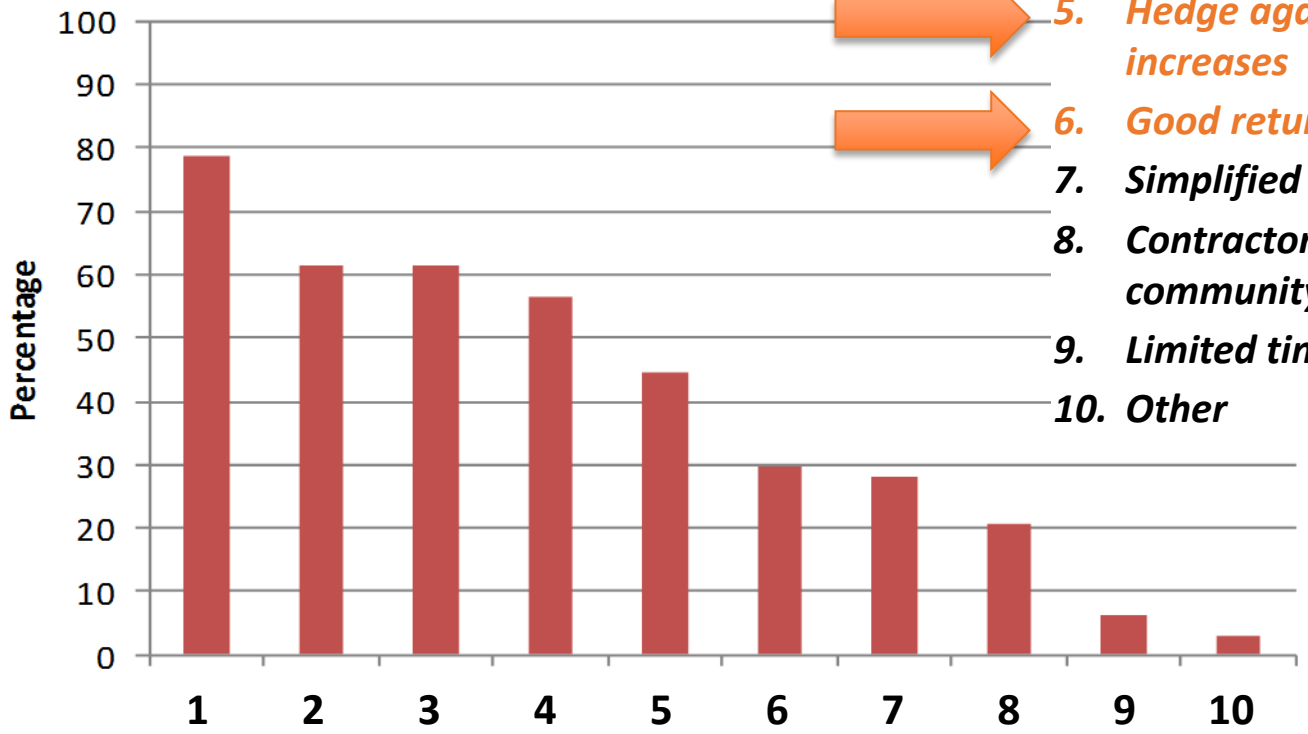
Source: Utah Clean Energy, 2013

Powered by SunShot U.S. Department of Energy

Environmental and Economic Factors Were Both Strong Motivators…

SLCS Survey:
"What motivates you to go solar?"

1. *Reduce environmental impact*
2. *Improve air quality*
3. *Discounted prices*
4. *Desire to be energy independent*
5. *Hedge against energy price increases*
6. *Good return on investment*
7. *Simplified Process*
8. *Contractor was vetted by community Steering committee*
9. *Limited time offer*
10. *Other*



Interestingly…only 3 people out of 64 utilized available financing options from local/regional 'unsecured loan' providers

Source: Utah Clean Energy, 2013

Round Two: Summit Community Solar, 2013

- Residential Solar PV in Park City/Summit County
- Start Date: January 2013
- Official Launch: May 2013
- Deadline to Commit: Sept. 2013
- Starting Strong:
  - 51.75 kilowatts of solar contracted with installer
  - 2nd tier pricing: *$2.47-$3.39/watt* (before incentives)

This community-led initiative motivated both Summit County and Park City to streamline their permitting and reduce solar permit fees!

Local Government:
Salt Lake County
Energy Smart Loan Program



Public-Private Partnership: Leveraging Resources

- In November 2012, Salt Lake County issued an RFP for a county-wide program, modeled after successful 2010 pilot effort
- Goal:
  - Allocate $4.4 million in Qualified Energy Conservation Bonds (QECB) bonds for the purpose of making low interest loans available to residents for distributed renewable energy and energy efficiency upgrades.
  - QECB funds to be used as loan loss reserve or direct loan capital (up to Provider)
  - Combine QECB funds with the *FHA/HUD's PowerSaver Loan Program* mortgage insurance product to provide a below-market-rate financing program for residential energy upgrades backed by a mortgage insurance guarantee of up to 90%
- County allocates QECB bonds, works with Provider to develop the program guidelines, structure, and marketing strategy
- Provider originates and services PowerSaver home energy improvement loans and manages a contractor network to install projects funded by these loans.
- County does not issue loans, nor bears any risk in the event of default
- Program details being finalized now, slated for official launch Summer 2013

State-Level:
Enabling Commercial Financing Options

Utah Businesses and local governments recognize the opportunity to cut energy costs by improving building energy efficiency and installing on-site renewable energy...

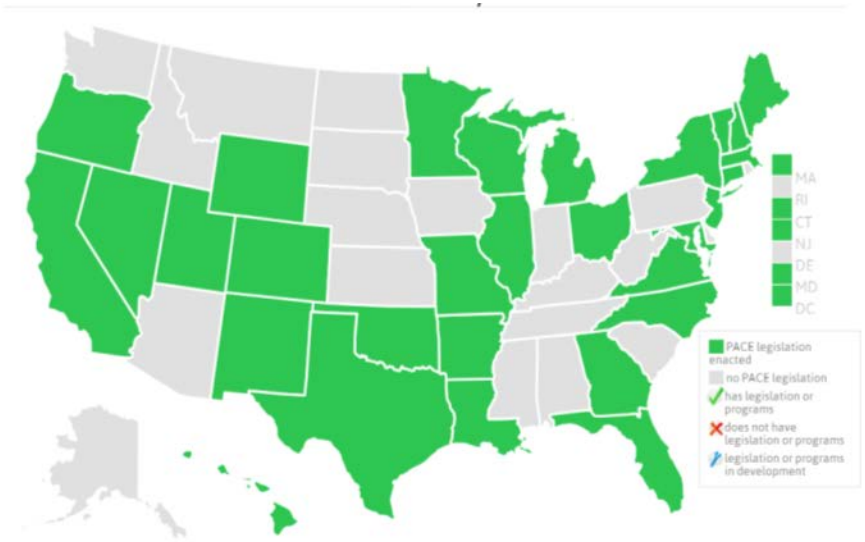
…but, the **high up front cost, long-term payback time,** and the **split-incentives** are significant barriers.

Plus, energy-related financing is uncommon and unfamiliar for most financial institutions.

Utah Businesses and Local Governments Are Calling for More Energy Financing Options!

In 2013, Utah enabled Commercial Property Assessed Clean Energy (C-PACE) by expanding Utah's Area Assessment Act

- Energy efficiency upgrades and renewable energy on commercial or industrial real property
- Requires lender consent
- Property can't have delinquent taxes, special assessments, or involuntary liens
- Local government can designate a voluntary assessment area
- No impact or obligation to non-participant property owners or local governments



PACE States

Source: PACENow, www.pacenow.org

What's on the Horizon in Utah?

- Community Solar Toolbox & Replication
- Finalize Energy Smart Loan Program Rules and Launch Program
- C-PACE workgroup to identify best practices, program guidelines, and initiate first local government program(s)
- Continue exploring available financing options and develop strategies to address legal barriers
- Pursue funding opportunities to ensure the sun doesn't set on solar financing in Utah…

Sara Baldwin

Senior Policy & Regulatory Associate
Utah Clean Energy
sbaldwin@utahcleanenergy.org
(801) 363-4046 ext. 103

July 10, 2013

Innovation and Success in Solar Financing

CLEAN ENERGY
FINANCE AND INVESTMENT AUTHORITY

Powered by SunShot
U.S. Department of Energy

Innovation and Success in Solar Financing (CEFIA)

- **Who is CEFIA?**
  - **CEFIA's Role & Goals**
  - **Organizational Structure**
  - **Principles**
- **CEFIA Innovation and Success in Solar Financing**
  - **Smart – E Loans for Residential Energy Efficiency & Renewable Energy**
  - **Solar Loan – Residential Solar**
  - **Solar Lease – Residential Solar**
- **Take-Aways & Lessons Learned**

CEFIA is Connecticut's Green Bank

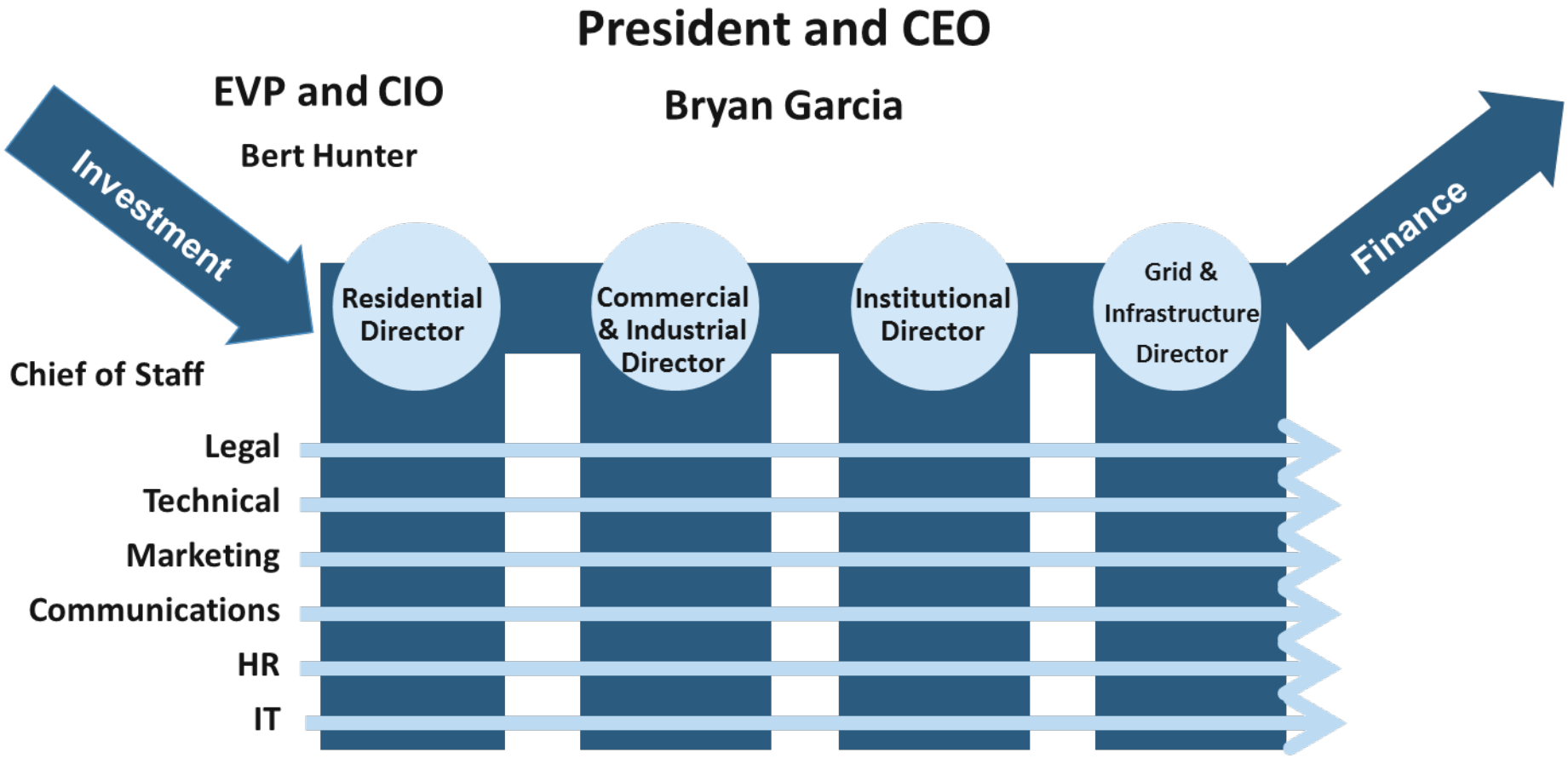
--- *the Nation's First State Green Bank*

Attract and deploy capital to finance the clean energy goals for Connecticut

Develop and implement strategies that bring down the cost of clean energy in order to make it more accessible and affordable to consumers

Reduce reliance on grants, rebates and other subsidies and move towards innovative low-cost financing of clean energy deployment

Organizational Structure
Reorganization for Financing



Green Banks – Some Key Principles

- Be an enabler of those in the market - i.e. leverage Green Bank Capital
- Focus where the Private Sector is operating but constrained by:
  - A lack of capital
  - Capital available only at a High Cost
- Where possible - operate through existing wholesale channels
  - (i.e., avoid creating / duplicating complete lending infrastructures)
- Be mindful of the potential for Securitization
  - Will be needed as markets get "to scale" → need for standardization and collection protection mechanisms
- DON'T LOSE MONEY (practical implication - keep focus / minimize losses)
  - Lower Risk - project development / energy efficiency → NO Solyndras!

Smart-E Loans
Overview

Comprehensive list of eligible measures and eligible contractors + **Robust QA/QC Process** + **Private Capital** = **More Energy Savings**

Quick

Any measure (or combination) that qualifies for CEFIA or utility incentives or rebates qualifies

Any contractor already qualified by CEFIA, utilities or BPI is eligible

20% of total amount financed can be used for related, non-energy measures like asbestos remediation or roof repair

Simple

First 10 proposals by "lead" contractor inspected by CEFIA or utility

After 10 inspections passed in a row, random inspections

Affordable

Not to exceed rates:

5-yr	4.49%
7-yr	4.99%
10-yr	5.99%
12-yr	6.99%

No prepayment penalty

Loans of $3,000-$25,000+

Smart-E Loans
Goals

Attract private capital

- **$30M** will come from credit unions or community banks, leveraged by a CEFIA loan loss reserve of **$2.5M (DOE - ARRA -SEP)**
- LLR is **SECOND LOSS** capital
- First 1-½% loss is absorbed by **LENDER**
- **Third Party $ :: CEFIA $ = 12 :: 1**

Provide "deep retrofits" for homeowners

- Use community-based marketing to drive uptake of comprehensive energy efficiency and equipment replacement measures
- **Provide meaningful savings:** ensure that benefits outweigh costs and that homeowners are paying less from day one

"Prove the market" for cost-effectiveness of energy upgrades

- **Collect loan repayment and default data** to help drive more capital investment into the energy efficiency market
- **Collect utility bill information** to prove energy and cost savings

Create a pilot program that can serve as a foundation for growth and encourages private investment into energy upgrades for Connecticut homes, a key focus of the Connecticut Comprehensive Energy Strategy

Innovation and Success in Solar Financing (CEFIA)

Program Description

- Dedicated Solar Loan Product
- Allows Connecticut homeowners with FICO scores greater than 680 to own solar photovoltaic (PV) and take advantage of the Investment Tax Credit (ITC)
- Previously out of reach for those who could not afford the entire upfront cost of PV installations.
- The standard loan rate of 6.49% rises to 9.99% if the homeowner does not use the ITC to pay down the loan ("Tax Credit Recapture and Reamortization" or “TCRR”).
- Individual loan tenor is 15 years
- Utilizes $300,000 of repurposed DOE-ARRA-SEP funding and a maximum of $2,200,000 ratepayer capital (Total Fund $5M … might expand to $10M)
- Currently close to securing foundation capital and "crowd funding" sources

Solar Loan
Terms and Risk

Financing Terms			
Program Contractor	any CEFIA authorized solar PV installer		
Borrower Criteria	- borrowers with FICO 680-720: 45% DTI - borrowers with FICO > 720: no DTI requirement		
Initial Term	15-year, mortgage-style amortization (requires TCRR)		
Interest Rate		ITC Prepayment	No ITC Prepayment
	15-year term	6.49%	9.99%
Minimum Down Payment	5% of total construction cost		
Prepayment Right	Anytime -- No penalty		
Servicing Company	Sungage, Inc., with LeaseDimensions as sub-servicer		
Risk to ratepayers	Sub-debt participation (first 20% risk) Credit enhanced through LLR (ARRA funds … results in senior LTV ~75%)		
Attraction to Investor	Excellent Yield (T+350bp) Good LTV Comparable to "A" slice of securitizations that yield ~T+100 to 150bp		
Investment Issues	Not Rated Paper … difficult for some institutional investors to hold Not "liquid" (no secondary market) … but assignable		

Solar Lease II
Goals (1/2)

Attract private capital

- CEFIA will lend $2.3M in Sub Debt
- CEFIA will invest $7.2M in Sponsor Equity
- US Bank will provide Tax Equity of $23.6M
- Banks led by First Niagara will provide $26.7M Senior Debt
- **>$50 Million in Private Capital**
- $3.5M ARRA-SEP LLR will ensure Senior Debt Coverage is attractive, enabling new private capital providers to enter the space
- **Private : Ratepayer Investment = 5 : 1**

Scale up deployment of solar in CT

- Structure allows pooling of many leases to take advantage of ITC and MACRS depreciation for more affordable installations
- Builds on success of SL1 and Solarize to offer independent contractors a financing product competitive with larger companies
- Will result in significant, new renewable capacity:
  - **11MW** Residential Solar PV
  - **3.1MW** Commercial Solar PV
  - **4,600MMBTU** Solar Thermal

Earn return for ratepayers

- CEFIA's IRR for funds invested (equity + debt) is ~9%
- PBI only released as clean energy is produced, and spread over the first six years of a system's life (first eight years of fund life)
- Investment returns all or most of PBI advanced -- making SL2 "100% financially efficient"
- Capital outlays of subordinated debt and equity spread over three fiscal years (6/2013 - 9/2015)

Create an accessible financial product for local, independent installers in order to support both the widespread adoption of residential and commercial solar photovoltaic (PV) and solar hot water (SHW) and the sustained growth of a clean energy industry in Connecticut

Solar Lease II
Goals (2/2)

Strengthen and Enhance Supplier Diversity

- Federal Tax code and high transaction costs allows limited access to solar incentives “at scale”
- CEFIA’s SL programs level the playing field
  - Contributes to a sustainable PV industry and supplier base in CT
  - More competition will drive PV costs lower – faster!

Deepen Solar Access to more CT residents

- Open to FICO scores ≥640 and up (same as SL1)
  - SL1 average FICO score was over 750
  - ARRA-SEP LLR enables expansion to lower FICO scores with private capital
- SL2 includes access for MUSH & Commercial market including C-PACE secured transactions
- No upfront cost and results in cheaper, cleaner energy

Manage the transition to less ratepayer support

- Gather data on MUSH, Commercial, and residential financial performance
- Participate in capital stack as an investor – paves the way for private capital and lower incentives

Create an **accessible financial product** for local, independent installers in order to support both the **widespread adoption** of residential and commercial solar photovoltaic (PV) and solar hot water (SHW) and the **sustained growth of a clean energy industry** in Connecticut

Solar Lease II
Sectors & Technology

Solar Lease II
Stakeholders

Solar Lease II
Summary of Roles

Homeowner*

- ***Chooses installer***
- Makes monthly lease payments to AFC First
- Receives all power generated by system
- Receives net metering revenues
- "Worry-Free" arrangement under the Assurant Warranty Management and Insurance Plan for entire 20-year lease period

Installer

- Sizes, locates & installs system
- Gets paid by CT Solar Lease 2 LLC at completion
- Under **Assurant Plan**, maintains system
  - 6-year warranty period - Installer
  - Thereafter - warranty management

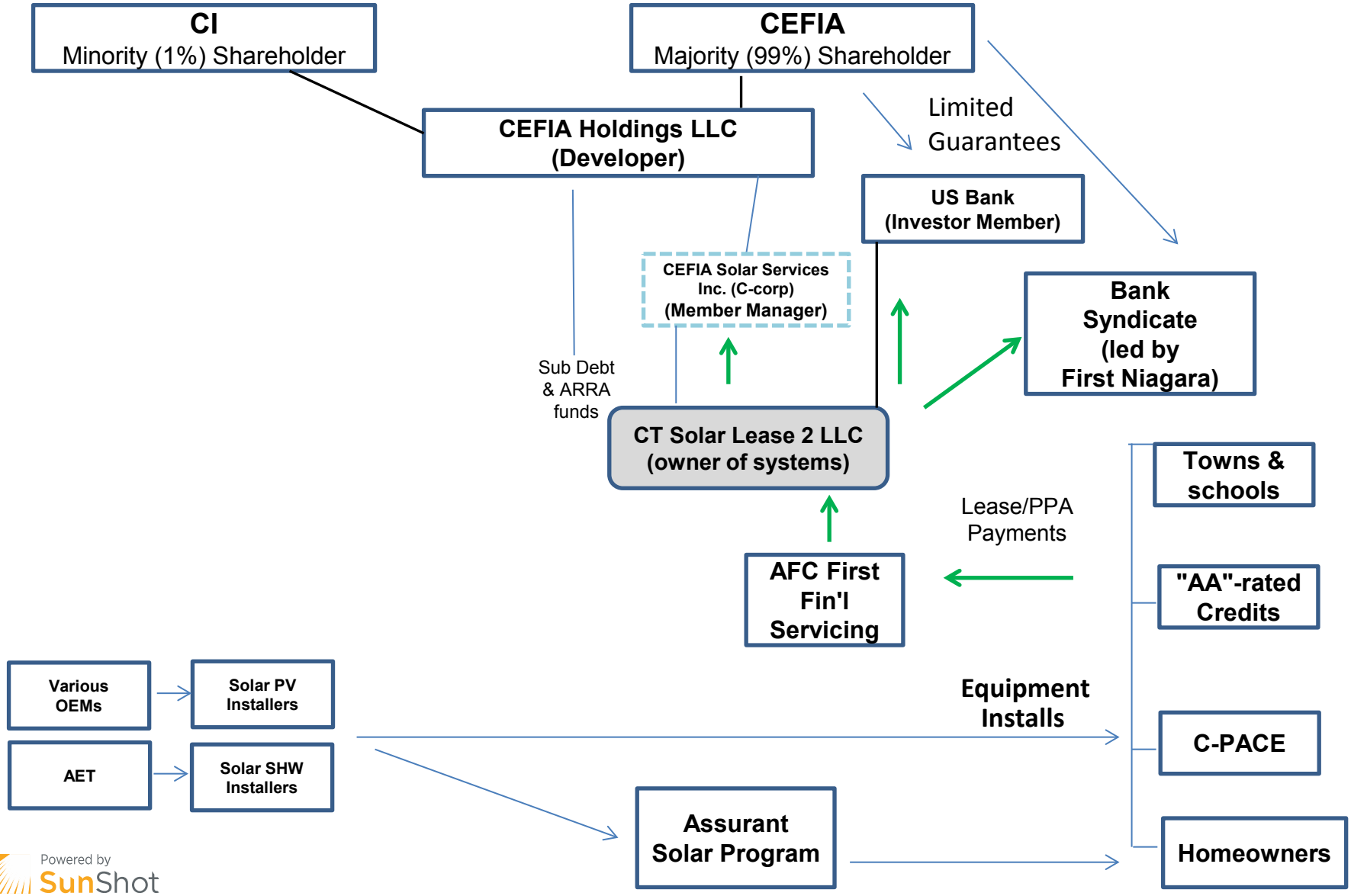
CT Solar Lease 2 LLC

- Owns systems
- Provides funding for residential installations and services bank debt
- Receives monthly lease payments from homeowner (through AFC First)
- Funds the Warranty Management & Insurance Program (through Assurant)
- Markets product through Energize CT platform

* **Similar for Commercial Scale but w/o Assurant Plan**

Solar Lease 2 Structure

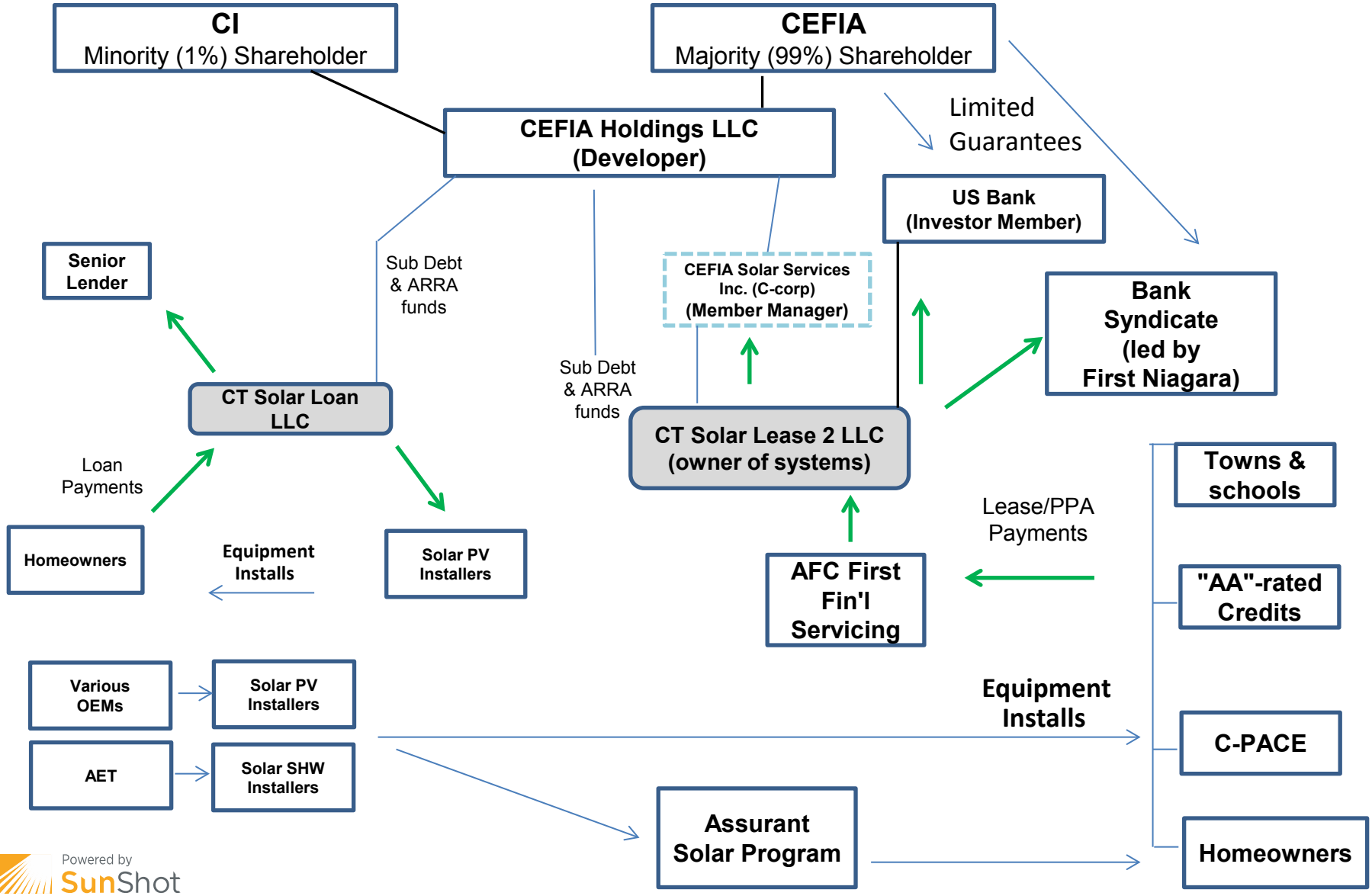
CLEAN ENERGY
FINANCE AND INVESTMENT AUTHORITY



Powered by SunShot
U.S. Department of Energy

Solar Lease 2 & Solar Loan Structure

CLEAN ENERGY
FINANCE AND INVESTMENT AUTHORITY



Powered by SunShot
U.S. Department of Energy

Innovation and Success in Solar Financing (CEFIA)

Take-Aways & Lessons Learned

- What's the situation? What barriers are you trying to overcome? What are your desired outcomes? Who are your potential partners?
- Banks Want to Lend – capital is available, and is not a limiting factor
- Good Program Design Attracts Capital – the Smart-E and Solar lease programs in particular demonstrate this… regional banks vs community banks vs CUs
- Real Innovation Takes Time – to develop optimal program design, then attract right capital partners, then to develop and negotiate docs to support all the counterparty agreements needed for new programs
- Training is Essential – contractors and lenders are critical partners and require focused investment in ongoing training/support on program details, process, marketing. Critical to channel marketing strategy
- Last but not least - Finance is just **one** element of a successful program

Bert Hunter

Chief Investment Officer
Clean Energy Finance and Investment Authority
845 Brook Street, Rocky Hill, CT 06067-3444
bert.hunter@ctcleanenergy.com
860.257.2174