Solar Powering Your Community
Addressing Soft Costs and Barriers

Powered by SunShot
U.S. Department of Energy
The SunShot Solar Outreach Partnership (SolarOPs) is a U.S. Department of Energy (DOE) program designed to increase the use and integration of solar energy in communities across the US.
SunShot Solar Outreach Partnership: 2013-16

- Increase installed capacity of solar electricity in U.S. communities
- Streamline and standardize permitting and interconnection processes
- Improve planning and zoning codes/regulations for solar electric technologies
- Increase access to solar financing options
Technical Resources

Resource  Solar Powering Your Community Guide

A comprehensive resource to assist local governments and stakeholders in building local solar markets.

www.energy.gov

www.solaroutreach.org
Solar Development in the US

As of 2014, the US solar industry installed 645,000 solar installations of which 93% were residential projects.

Source: SEIA 2014 Year In Review Report
Agenda

10:50 – 11:20  State of the Local Solar Market
11:20 – 11:50  Federal, State, and Utility Policy Drivers
11:50 – 12:15  Break and Grab Lunch
12:15 – 12:45  Planning for Solar: Getting Your Community Solar Ready
12:45 – 1:20   Solar Market Development Tools
1:20 – 1:30    Break
1:30 – 2:45    Local Speakers
2:45 – 3:00    Solar Powering Your Community: Next Steps
Solar Technologies

- Solar Photovoltaic (PV)
- Solar Hot Water
- Concentrated Solar Power
Solar Technologies

- Solar Photovoltaic (PV)
- Solar Hot Water
- Concentrated Solar Power
Some Basic Terminology

Panel / Module

Cell
Some Basic Terminology

Array
Some Basic Terminology

Capacity / Power
kilowatt (kW)

Production
Kilowatt-hour (kWh)
System Components

Residential Grid Connected PV System

- Solar Panels
- Inverter
- Meter
- Utility Service

Home Power/Appliances
System Components – Off-Grid

Off-Grid Residential Solar PV System

- Solar Panels
- Inverter
- Battery Box
- Circuit Breaker Panel
- Home Power/Appliances
Some Basic Terminology

Residence
5 kW

Factory
1 MW+

Office
50 – 500 kW

Utility
2 MW+
What are the top 3 benefits solar can bring to your community?

A. Economic development & job creation
B. Environmental & public health benefits
C. Reduction and stabilization of energy costs
D. Energy independence & resilience
E. Value to the utility
F. Community pride
G. Other
Benefits: Solar Economic Growth

http://www.seia.org/research-resources/us-solar-market-insight

~40% CAGR

2006 2007 2008 2009 2010 2011 2012 2013 2014
Benefits: Solar Job Growth

Benefit: Stabilize Energy Prices

Historical Avg Real-Time LMP (NEMABOS)

Source: NEPOOL
Smart Investment for Homeowners

A typical residential solar system increases a home’s property value by an average of $11,000

Source: LBNL, Selling Into the Sun (2015), non-California homes
Smart Investment for Businesses

Top 20 Companies by Solar Capacity

- Walmart
- Prologis
- Target
- Apple
- Costco
- Kohl's
- IKEA
- Costco
- Apple
- Target
- Prologis
- Walmart

712 megawatts deployed by top 20 companies as of 2015

Source: SEIA Solar Means Business 2015
Smart Investment for Governments

Source: Borrego Solar
Smart Investment for Schools

Current:

\[
\text{Schools} \times 3,752 \quad = \quad $77.8m
\]

Potential:

\[
\text{Schools} \times (40,000 - 72,000) \quad = \quad $800m
\]

Source: The Solar Foundation (http://schools.tsfcensus.org)
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Cumulative Total: ~25,600 Megawatts

US Solar Market

Installed Capacity by State (MW) 2013

12.9% of US Capacity

Source: IREC, Solar Market Trends 2013
Arizona Solar Market

Cumulative Installed Capacity

Megawatts


280 MW CSP Plant
Arizona Solar Market

Arizona: 337 watts per person

US: 80 watts per person
Solar Jobs in Arizona

In 2015, Arizona had

6,922 solar jobs

(~11.5% veterans)

roughly

25% reduction since 2014
Top 5 Countries Solar Operating Capacity (2014)

- Germany: 21.4%
- USA: 10.3%
- China: ~%
- Japan: ~%
- Italy: ~%
- Rest of World: ~%

Source: REN 21, 2015
US Solar Resource

Source: National Renewable Energy Laboratory
What are the top 3 barriers to solar adoption in your community?

A. High upfront cost
B. Lack of education
C. Lack of policy support
D. Lack of utility support
E. Private interests
F. Lack of HOA support
G. Historic preservation
H. Reliability concerns
I. Environmental impact
J. Other
Q: What is the greatest barrier to solar adoption in your community?
Activity: Addressing Barriers

Environmental Impact
Reliability concerns
Lack of HOA support
Historic Preservation
Other
Lack of utility support
Lack of policy support
Lack of education
High upfront cost

Historic Preservation
Lack of HOA support
Reliability concerns
Other
Environmental Impact
Lack of utility support
Lack of policy support
Lack of education
High upfront cost
The Cost of Solar PV

US Average Installed Cost for Residential PV

Avg. for 2015: $3.50/W (SEIA)

33% drop in price 2010 - 2013
The Cost of Solar PV

Source: Solar Electric Power Association

<table>
<thead>
<tr>
<th>Stage 1</th>
<th>Today</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of Electricity</td>
<td></td>
</tr>
</tbody>
</table>
The Cost of Solar PV

<table>
<thead>
<tr>
<th>Stage 1</th>
<th>Stage 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Today</td>
<td></td>
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</tbody>
</table>

Source: Solar Electric Power Association
The Cost of Solar PV

Source: Solar Electric Power Association
The Cost of Solar in the US

Comparison of US and German Solar Costs

The Cost of Solar in the US

Comparison of US and German Solar Costs

<table>
<thead>
<tr>
<th>$ per Watt</th>
<th>US Solar Cost</th>
<th>German Solar Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>$0.50</td>
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<td>$1.00</td>
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<th>$ per Watt</th>
<th>US Solar Cost</th>
<th>German Solar Cost</th>
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<tbody>
<tr>
<td>$4.00</td>
<td>$2.50</td>
<td>$1.50</td>
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<td>$3.50</td>
<td>$2.00</td>
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The Cost of Solar in the US

Comparison of US and German Solar Costs

- The Cost of Solar in the US

Source: NREL (http://www.nrel.gov/docs/fy14osti/60412.pdf)
The Cost of Solar in the US

Comparison of US and German Solar Costs

**Challenge: Installation Time**

**New York City’s Goal**
8 days from inception to completion

**Germany Today**
100 days from inception to completion
Time to Installation

Average Time to Permit a Solar Installation

Source: NREL, LBNL
Permitting Costs

Average Cost of Permitting in the US and Germany

Source: NREL, LBNL

21x the cost for permitting in the US
Germany’s Success

Consistency and Transparency through Standardized Processes
The Cost of Solar in the US

Change in Soft Costs and Hardware Costs Over Time

No change in soft costs between 2010 and 2012

Soft costs remain nearly 2/3s of installed cost
Local Government Impact

What would be the impact of a 25% reduction in local government-addressable soft costs on the value of a 5 kW solar investment?

<table>
<thead>
<tr>
<th>Q4 2015 US Avg. Residential Installed Cost:</th>
<th>$3.48/W</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Present Value:</td>
<td>$2,924</td>
</tr>
<tr>
<td>Payback Period:</td>
<td>14.8 years</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>After 25% Reduction in addressable soft costs:</th>
<th>$3.26/W</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Present Value:</td>
<td>$3,696</td>
</tr>
<tr>
<td>Payback Period:</td>
<td>13.9 years</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Difference:</th>
<th>$0.22/W</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Present Value:</td>
<td>+ 26%</td>
</tr>
<tr>
<td>Payback Period:</td>
<td>- 6%</td>
</tr>
</tbody>
</table>
Workshop Goal

Enable local governments to replicate successful solar practices to reduce soft costs and expand local adoption of solar energy.
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A policy driven market designed to mitigate costs and increase the value of solar production.
A Policy Driven Market

Federal
- Investment Tax Credit
- Rural Grants and Loans

State & Utility
- Renewable Portfolio Standard
- Net Metering
- Interconnection
- Solar Access
- Other Incentives
A Policy Driven Market

- Federal
- Investment Tax Credit
- Rural Grants and Loans
- Renewable Portfolio Standard
- Net Metering
- Interconnection
- Solar Access
- Other Incentives
- State & Utility
**Investment Tax Credit**

**Type:** Tax Credit

**Eligibility:** For-Profit Organization

**Value:** 30% of the installation cost through 2019

**Availability:** Steps down 26% in 2020, 22% in 2021, expires in 2022

Credit available if construction commences before end of year (rather than system operational)
Modified Accelerated Cost Recovery System (MACRS)

**Type:** Accelerated depreciation

**Eligibility:** For-Profit Organization

**Value:** Depreciate solar asset over 5 years (vs. lifetime of system)
USDA Rural Energy for America Program

**Type:** Federal Grant and Loan Program

**Eligibility:** Rural small businesses and agricultural producers

**Renewable energy grant:** 25% of project cost

**Energy efficiency grant:** 25% of project cost

**Loan Guarantees:** 75% of project cost up to $25 million

http://www.rurdev.usda.gov/bcp_reap.html
Rural Utilities Service EECLP

**Type:** Federal loans

**Eligibility:** Rural Cooperative and Municipal Utilities

Low-cost lending based on treasury rate

Can be passed on to customers with on-bill repayment

Complex application process for non-RUS borrowers

A Policy Driven Market

- Federal
- Investment Tax Credit
- Rural Grants and Loans

- State & Utility
  - Renewable Portfolio Standard
  - Solar Access
  - Interconnection

- Net Metering
- Other Incentives
A Policy Driven Market

Federal
Investment Tax Credit
Rural Grants and Loans

State & Utility
Renewable Portfolio Standard
Net Metering
Interconnection

Solar Access
Other Incentives

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U.S. Department of Energy
Renewable Portfolio Standard

Retail Electricity Sales

- Renewable Energy
- Any electricity source
Renewable Portfolio Standard

Retail Electricity Sales

- Solar carve-out
- Renewable Energy
- Any electricity source
# RPS Impacts: Solar Deployment

## RPS and Solar/DG Status of Top Ten Solar States by Cumulative Installed Capacity (as of Q4 2013)

<table>
<thead>
<tr>
<th>Rank</th>
<th>State</th>
<th>RPS?</th>
<th>Solar/DG Provision?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>California</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>2</td>
<td>Arizona</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>3</td>
<td>New Jersey</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>4</td>
<td>North Carolina</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>5</td>
<td>Nevada</td>
<td>Y</td>
<td>Y</td>
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<tr>
<td>6</td>
<td>Massachusetts</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>7</td>
<td>Hawaii</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>8</td>
<td>Colorado</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>9</td>
<td>New York</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>10</td>
<td>New Mexico</td>
<td>Y</td>
<td>Y</td>
</tr>
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29 states, Washington DC and 2 territories have renewable portfolio standards. (8 states and 2 territories have renewable portfolio goals.)
A Policy Driven Market

- Federal
- Investment Tax Credit
- Rural Grants and Loans
- State & Utility
  - Renewable Portfolio Standard
  - Solar Access
- Net Metering
- Other Incentives
- Interconnection
Net Metering

Average Hourly kWh

Load Met by Grid

Exports to Grid

Load Met by Solar

Household Consumption

Solar Generation

12 AM 4 AM 8 AM 12 PM 4 PM 8 PM
Net Metering

Net metering allows customers to export power to the grid during times of excess generation, and receive credits that can be applied to later electricity usage.
Net Metering: Market Share

More than 93% of distributed PV Installations are net-metered

Net Metering

44 states, Washington DC, and 4 territories have net metering policies.

www.dsireusa.org / March 2015
Net Metering

Figure 2. 2015 Policy Action on Net Metering, Rate Design, or Solar Ownership

Provides a “report card” for state policy on net metering and interconnection

http://freeingthegrid.org/
A Policy Driven Market

Federal
Investment Tax Credit
Rural Grants and Loans

State & Utility
Renewable Portfolio Standard
Net Metering
Solar Access
Other Incentives
Interconnection
Standardized interconnection rules require utilities to provide a fair and transparent pathway for customer-generators and other developers of distributed energy resources to interconnect with the utility’s grid.
A 2015 NREL study analyzed 5 of the major solar markets in the U.S. and found that the median time for utility interconnection was 53 days.

- Median times in CA and AZ: 50 days and 54 days
- AZ has no standard timeframe requirements for interconnection (though AZ utilities do much better than some states that have such requirements!)
- Only 7 states received an “A” grade from Freeing the Grid on their interconnection standards
A Policy Driven Market

Federal

Investment Tax Credit

Rural Grants and Loans

State & Utility

Renewable Portfolio Standard

Net Metering

Interconnection

Solar Access

Other Incentives

Powered by SunShot
U.S. Department of Energy
A landowner does not have any legal right to the free flow of light and air across the adjoining land of his neighbor.
Solar Access

Solar Access Laws:

1. Increase the likelihood that properties will receive sunlight

2. Protect the rights of property owners to install solar

3. Reduce the risk that systems will be shaded after installation
Solar Access

Source: Database of State Incentives for Renewables & Efficiency (www.dsireusa.org)

Solar Easements Provision
Solar Rights Provision

Local option to create solar rights provision

U.S. Virgin Islands
A comprehensive review of solar access law in the US – Suggested standards for a model ordinance

www.solarabcs.org
# A Policy Driven Market

<table>
<thead>
<tr>
<th>Federal</th>
<th>Investment Tax Credit</th>
<th>Rural Grants and Loans</th>
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<tbody>
<tr>
<td>Renewable Portfolio Standard</td>
<td>Net Metering</td>
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<td>Solar Access</td>
<td><strong>Other Incentives</strong></td>
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**State & Utility**

*Powered by SunShot*

U.S. Department of Energy
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Effective Local Solar Policy

Local Solar Policy

Planning for Solar

Effective Solar Permitting Process

Solar in Development

Regulation

Solar Market Development Tools
Effective Local Solar Policy

Local Solar Policy

Planning for Solar

Effective Solar Permitting Process

Visioning & goal setting

Solar Market Development Tools
Every community is different!

Is solar on residential rooftops appropriate for your community?
Visioning: Scales & Contexts

Every community is different!

Is solar on commercial rooftops appropriate for your community?
Visioning: Scales & Contexts

Every community is different!

Is solar on historic structures appropriate for your community?
Visioning: Scales & Contexts

Every community is different!
Is solar on brownfields appropriate for your community?
Visioning: Scales & Contexts

Every community is different!

Is solar on greenfields appropriate for your community?
Visioning: Scales & Contexts

Every community is different!

Is solar on parking lots appropriate for your community?
Visioning: Scales & Contexts

Every community is different!
Is building-integrated solar appropriate for your community?
Planning for Solar Development

Communitywide Comprehensive Plan

- Neighborhood Plans
- Corridor Plans
- Special District Plans
- Green Infrastructure Plans
- Energy Plan
- Climate Action Plan

Source: American Planning Association
Technical Resources

Resource      Planning for Solar Energy

A guide for planners on determining and implementing local solar goals, objectives, policies, and actions

www.planning.org
Effective Local Solar Policy

Local Solar Policy

Planning for Solar

Effective Solar Permitting Process

Solar in Development

Solar Market Development Tools

Powered by SunShot
U.S. Department of Energy
# Zoning Standards

<table>
<thead>
<tr>
<th>Section</th>
<th>Topics to Address</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Definitions</strong></td>
<td>Define technologies &amp; terms</td>
</tr>
<tr>
<td><strong>Applicability</strong></td>
<td>Primary vs. accessory use</td>
</tr>
</tbody>
</table>
| **Dimensional Standards**| • Height  
                              • Size                                                  |
|                          | • Setbacks  
                              • Lot coverage                                          |
| **Design Standards**     | • Signage  
                              • Disconnect                                            |
|                          | • Screening  
                              • Fencing                                               |

Source: American Planning Association
Zoning Standards: Small Solar

Typical Requirements:

- Permitted as accessory use
- Minimize visibility if feasible

Requirements:
- District height
- Lot coverage
- Setback
Zoning Standards: Large Solar

Typical Requirements:

- Allowed for primary use in limited locations

Requirements:

- Height limits
- Lot coverage
- Setback
- Fencing and Enclosure
Zoning Standards: Model Ordinances

Resource American Planning Association

This Essential Info Packet provides example development regulations for solar.

https://www.planning.org/pas/infopackets/open/pdf/30intro.pdf
Typical Requirements:

- Prevent permanent loss of “character defining” features
- Possible design requirements
  - Ground mounted
  - Flat roof with setback
  - Panels flush with roof
  - Blend color

Zoning Standards: Historic

Source: Kimberly Kooles, NC Solar Center
Zoning Standards: Historic

Resource North Carolina Clean Energy Technology Center

Provides sample design principles and example regulations incorporating historic preservation into sustainability and energy projects.

www.solaroutreach.org
Guide for HOAs on solar access law and simple recommendations for reducing barriers to solar in association-governed communities.
Solar in HOAs: Best Practices

- Provide clear, unambiguous design guidelines
- Post rules and requirements online
- Provide a list of all required documents
- Waive design rules that significantly increase cost or decrease performance
- Allow exceptions from tree removal rules for solar
Solar Ready Construction:

Preparing a building for solar at the outset can help make future solar installations easier and more cost effective.
Update Building Code

Require builders to:

✓ Minimize rooftop equipment
✓ Plan for structure orientation to avoid shading
✓ Install a roof that will support the load of a solar array
✓ Record roof specifications on drawings
✓ Plan for wiring and inverter placement
Update Building Code

60% Savings when a building is solar ready

Installation Soft Costs

- Other Paperwork
- Permitting & Inspection
- Financing Costs
- Customer Acquisition
- Installation Labor

$0.39 Per watt
Installation Labor Roadmap

Source: NREL (http://www.nrel.gov/docs/fy13osti/59155.pdf)
Effective Local Solar Policy

- Local Solar Policy
- Planning for Solar
- Effective Solar Permitting Process
- Solar in Development Regulation
- Solar Market Development Tools
Challenge: Inconsistency

18,000+ local jurisdictions
with unique zoning and permitting requirements

Source: http://www.nrel.gov/docs/fy12osti/54689.pdf
Consumer Challenges
Regulatory Barriers

- Other Paperwork: $0.14 Per Watt
- Permitting & Inspection
- Financing Costs
- Customer Acquisition
- Installation Labor

Per Watt
Planning & Permitting Roadmap

![Graph showing the added cost per watt from 2010 to 2020. The graph compares the current trajectory (dashed line) and the roadmap target (solid line). The cost decreases over the years, with a significant drop from 2014 to 2015.](image_url)
Sample of Arizona Jurisdictions

Estimated permitting time reported by 40 AZ jurisdictions to the Arizona Rooftop Solar Challenge team in 2013

Identifying Challenges

Solar Developer Perspective:

- Unclear or inconsistent requirements
- Lengthy application review process, even for small projects
- High or inconsistent fees
- Multiple inspections and long inspection appointment windows
- Lack of familiarity with solar

Added together, these cost a lot of time and money!
Identifying Challenges

Local Government Perspective:

- Solar permitting is a small portion of everything else local governments do
- Many local governments are resource-constrained
- Inexperienced installers submit incomplete applications
- Installations do not match design drawings

Importance of balancing government needs and demands with encouraging solar energy and economic development
Implementing Improvements

- **Responsibility** for change should be shared between permitting authorities and the solar industry.

- Changes to permitting policies should **benefit both** local governments and solar installers (as well as their customers).

Expediting Permitting

Solar Permitting Best Practices:

✓ Post Requirements Online
✓ Implement an Expedited Permit Process
✓ Enable Online Permit Processing
✓ Ensure a Fast Turn Around Time

Source: IREC/Vote Solar
Expedited Permitting

Solar Permitting Best Practices:

- Collect Reasonable Permitting Fees
- No Community-Specific Licenses
- Narrow Inspection Appointment Windows
- Eliminate Excessive Inspections
- Train Permitting Staff in Solar

Source: IREC/Vote Solar
Expedited Permitting: Case Study

Breckenridge, Colorado
Population: 4,540

Expedited Permitting: Case Study

Breckenridge charges no fees to file for a solar permit
Breckenridge offers a short turn around time for solar permits

Expedited Permitting: Case Study

Permitting: Best Practices

Resource Interstate Renewable Energy Council

Outlines leading best practices in residential solar permitting and provides examples of implementation.

Expedited Permitting:

- Simplifies requirements for PV applications
- Facilitates efficient review of content
- Minimize need for detailed studies and unnecessary delays

I-1. Example Design Criteria:

- Size < 10-15 kW
- Code compliant
- Weight < 5 lb / sqft
- 4 strings or less
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Local Solar Policy

Planning for Solar

Effective Solar Permitting Process

Solar Market Development Tools

- Understanding solar financing
- Expanding financing options
- Addressing customer acquisition
Third Party Ownership

$0.21 Per watt

- Other Paperwork
- Permitting & Inspection
- Financing Costs
- Customer Acquisition
- Installation Labor
The Solar Equation

Cost

+ Installed Cost
+ Maintenance
- Direct Incentive

Benefit

+ Avoided Energy Cost
+ Excess Generation
+ Performance Incentive
Solar Financing Options

Third Party Ownership

Traditional Lending

Utility-Owned Solar
Solar Financing Options

- Third Party Ownership
- Traditional Lending
- Utility-Owned Solar
Third Party Ownership

- Customer
- Developer

Power Purchase Agreement

Incentives
Third Party Ownership

Third Party Ownership: State Policy

- **Third Party Ownership is not always available**

- **Authorized by state or otherwise currently in use, at least in certain jurisdictions within the state**

- **Apparently disallowed by state or otherwise restricted by legal barriers**

- **Status unclear or unknown**
Solar Financing Options

- Third Party Ownership
- Traditional Lending
- Utility-Owned Solar
Engage Local Lenders

Fewer than 5% of the 6,500 banks in the US are actively financing solar PV projects.
Third Party Ownership: Cost

Weighted Average Cost of Capital

Third Party Ownership: 14.0%  
Direct Ownership with Debt: 6.0%
Financing Options

- Secured loan
  - Admirals Bank: 4.95% - 9.95%
- Unsecured loan
  - Admirals Bank: 9.99% - 11.99%
- Federal loan
  - HUD PowerSavers: 7.98%
- RUS loans
Municipal – Lender Partnership

Milwaukee SHINES
– Partnership with Summit Credit Union
– 4.5% (5-year) and 5.25% (15-year) options

Austin Energy Power Saver Loans
– Partnership with Velocity Credit Union
– Market-variable rate

Municipal partnerships can beat existing options

Opportunities to improve lending options by offering
loan loss reserves or credit enhancements
Engage Local Lenders: Resources

Resource Local Lending for Solar PV

A guide for local governments seeking to engage financial institutions

www.solaroutreach.org
Solar Financing Options

- Third Party Ownership
- Traditional Lending
- Utility-Owned Solar
Utility- Owned Solar

Utility Options for Distributed Solar

- Centrally owned solar
- Utility-owned rooftop solar
- Customer-owned with On-Bill Financing
- Community Solar
Utility-Owned Rooftop Solar

Utility pays for and owns rooftop system

Customer either:

1. Purchases energy from the system at a special rate
2. Purchases energy from the grid but receives a monthly payment for hosting

Examples:
- Arizona Public Service
- Tuscon Electric Power
- CPS Energy (San Antonio)
Utility On-Bill Financing

Utility pays for customer-owned rooftop system

1. Customer repays cost of system through added charge on electric bill

2. Proven Concept for Electric Coops for energy efficiency program

Examples:
- Roanoke Electric Coop (North Carolina)
- How$martKY (coalition of five Kentucky Cooperatives)
Utility-Run Community Solar

Utility lends money to solar developer

1. Developer constructs large system and claims tax credit
2. Utility allows customers to purchase portion of system
3. Utility credits customer bills for the solar they own
4. Upfront cost repaid by customer purchases
Community Solar in the U.S.

57 Community Solar programs to date, all but 5 are utility-led

Customer Acquisition

$0.32 Per watt

- Other Paperwork
- Permitting & Inspection
- Financing Costs
- Customer Acquisition
- Installation Labor

Source: National Renewable Energy Laboratory
Customer Acquisition

5% of homeowners that request a quote choose to install solar.
Customer Acquisition

Barriers

High upfront cost

Complexity

Customer inertia
The Solarize Program

Group purchasing for residential solar PV
The Solarize Program

Barriers
- High upfront cost
- Complexity
- Customer inertia

Solutions
- Group purchase
- Vetted offer
- Limited-time offer
Solarize: Partnership

- **Program Sponsor**: Community ties, Technical knowledge
- **Solar Contractor**: Solar installations, Volume discounts
- **Citizen Volunteers**: Campaign support, Neighborhood outreach
- **Community Residents**: Program participation, Word of mouth
Solarize: Process

Select Installer → Marketing & Workshops → Enrollment → Site Assessment → Decision & Installation
Solarize Plano: Case Study

Plano, Texas
Population: 272,000
Solarize Plano: Case Study

Select Installer

July – August 2013

Marketing & Workshops

Enrollment

Site Assessment

Decision & Installation

July 2013

February 2014
Solarize Plano: Case Study

Pricing Tiers

<table>
<thead>
<tr>
<th>Tier</th>
<th>Power Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tier 1</td>
<td>(1 kW - 15 kW)</td>
</tr>
<tr>
<td>Tier 2</td>
<td>(15 kW - 35 kW)</td>
</tr>
<tr>
<td>Tier 3</td>
<td>(35 kW - 55 kW)</td>
</tr>
<tr>
<td>Tier 4</td>
<td>(55 kW - 80 kW)</td>
</tr>
<tr>
<td>Tier 5</td>
<td>(80 kW +)</td>
</tr>
</tbody>
</table>

Prevailing solar market price

20% discount
Solarize Plano: Case Study

- **Select Installer**
- **Marketing & Workshops** *(July – August 2013)*
- **Enrollment**
- **Site Assessment**
- **Decision & Installation**

**Timeline:**
- **July 2013**
- **February 2014**
Marketing Strategy:

- Used Google for online communications
- Online Solar 101 presentations and videos
- Local newspaper and media
- Utility bill insert

How did you learn about Solarize Plano?

- Utility Bill Insert
- Social Media
- PSA Blog
- Other
- NTREG
- nextdoor.com
- Newspaper Article
- LGP Newsletter
- Info Session
- HOA
- Friend

Source: Solarize Plano & NCTCOG
Solarize Plano: Case Study

- Select Installer
- Marketing & Workshops
- Enrollment: Aug – Sep 2013
- Site Assessment
- Decision & Installation

220 households signed up

July 2013 to February 2014
Solarize Plano: Case Study

Select Installer
Marketing & Workshops
Enrollment
Site Assessment
Decision & Installation

July 2013

September 2013

February 2014

49 sites assessed

49 sites assessed
Solarize Plano: Case Study

- Select Installer
- Marketing & Workshops
- Enrollment
- Site Assessment
- Decision & Installation

July 2013 to February 2014

23 final contracts

 Powered by SunShot
U.S. Department of Energy
Solarize Plano: Case Study

Results:

23 new installations totaling 112 kW

45% of assessed sites signed contracts

20% reduction in solar price

Round 2 of Solarize Plano in 2014

5 new Solarize communities in Texas
A household is **0.78%** more likely to adopt solar for each additional installation in their zip code.

Source: NYU Stern and Yale School of Forestry – Peer Effects in the Diffusion of Solar Panels
Solarize: Lasting Impact

Annual Portland Residential PV Installations

- Solarize
- Independent

Lasting Impact
Solarize: National Growth

Over 200 Campaigns in 22 States

Thousands of homes Solarized!
A roadmap for project planners and solar advocates who want to create their own successful Solarize campaigns.

www.nrel.gov
Agenda

10:50 – 11:20  State of the Local Solar Market
11:20 – 11:50  Federal, State, and Utility Policy Drivers
11:50 – 12:15  Break and Grab Lunch
12:15 – 12:45  Planning for Solar: Getting Your Community Solar Ready
12:45 – 1:20   Solar Market Development Tools
1:20 – 1:30    Break
1:30 – 2:45    Local Speakers
2:45 – 3:00    Solar Powering Your Community: Next Steps
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2:45 – 3:00    Solar Powering Your Community: Next Steps
Activity: Solar in Your Community

1. Understand the federal, state, & utility policy landscape
2. Think about your community’s solar goals
3. Recognize local successes and review current local policies/procedures
4. Identify opportunities and barriers to implementation
5. Outline implementation plan
Where to begin?

- Integrate solar in plans
- Address solar in zoning code
- Adopt solar ready guidelines
- Define permitting process
- Expedite typical solar permits
- Implement fair permit fees
- Expand financing options
- Implement solarize program
Technical Assistance

- Available to local governments
  - Can request through a non-profit or regional organization (RPC)
  - Previously available through SolarOPs
  - Provided by RSC Teams
  - If not provided by RSC Team, then SolarOPs could help
  - Now will be available through SPARC
The Next Solution

Solar Powering America by Recognizing Communities (SPARC)

Community recognition program for 300 communities taking steps to reduce soft costs and promote solar locally
Designation Program Development

• Tiered designation program with different levels of achievement
• Ongoing competitions to reward success in real-time
• Annual awards recognizing outstanding achievement in soft cost, market growth, community engagement, other categories

FINAL CRITERIA AND STRUCTURE AVAILABLE: SPRING 2016
No-Cost Technical Assistance

• Communities pursuing SPARC designation will be eligible for up to 100 hours (on average) of no-cost technical assistance from national solar experts.

• Technical assistance will be designed to help a community achieve the basic requirements for designation. Depending on demand, some TA may also be available to help more advanced communities achieve higher levels of designation.

• Possible topic areas for TA include: streamlining permitting and inspection processes for solar, planning and zoning for solar, solar financing options, codes and standards, community and utility engagement, market development programs, and others.
SPARC Advisors

- **Funded temporary staff** to help communities achieve designation. Communities must apply to participate in SPARC to host an Advisor.

- Advisors will **evaluate existing local government policies/processes** and apply **industry leading best practices** that will move a community toward designation.

- SPARC Advisors will assist communities through **engagements lasting up to six months**.

- There will be **two opportunities** for a community to be chosen as a SPARC Advisor host, and these will occur through a highly competitive process.

**FIRST ROUND OF COMMUNITY SELECTION BEGINS: April 2016**
SPARC Timeline

- Program Planning and Kick-Off: Q4 2015
- Designation Criteria Finalized; Advisors Application Open: Q2 2016
- Full Technical Assistance and Designation: Q2 2016 – Q3 2018
- SPARC Advisors in Communities: Q1 2017 + Q1 2018
- 300 Communities Designated: Q3 2018
What do municipalities ask for?

- Review solar zoning ordinance, or HOA language – is it solar friendly?
- Review permitting processes
- Help with solarize program
- Review RFP
- Review responses to RFP
- Feasibility analysis for solar PV
- Myth busting
Application Process

- Apply for SPARC assistance & sign up for updates through gosparc.org
- Contact Philip Haddix at phaddix@solarfound.org