Solar Powering Your Community

Addressing Soft Costs and Barriers

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About the SunShot Solar Outreach Partnership

ICMA
Leaders at the Core of Better Communities

APA
American Planning Association
Making Great Communities Happen

NARC
Building Regional Communities
National Association of Regional Councils

ICLEI
Local Governments for Sustainability USA

IREC
Interstate Renewable Energy Council

MEISTER
CONSULTANTS GROUP

NC CLEAN ENERGY
TECHNOLOGY CENTER
Formerly the NC Solar Center

The SOLAR FOUNDATION

SEPA
solar electric power association

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.

About the SunShot Solar Outreach Partnership

- 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

Complimentary Services

Technical Resources

Regional Workshops

One to One Assistance

Strategy Session

Complimentary Services

Technical Resources

Helping Policymakers Understand Best Practices:

- Case Studies
- Fact Sheets
- How-to Guides
- Toolkits

www.solaroutreach.org

One to One Assistance

Regional Workshops

Strategy Session

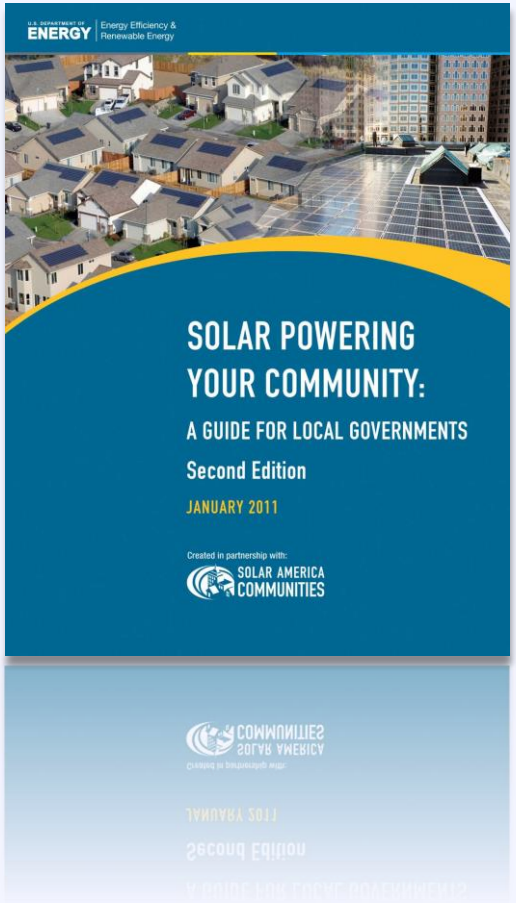
Email solar-usa@iclei.org to request a 20 minute consultation

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



Complimentary Services

Quickly get up to speed on key solar policy issues:

- Solar 101
- Planning for Solar
- Implementing an Ordinance
- Streamlining Solar Permits
- Growing your Market

Regional Workshops

Strategy Session

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Email solar-usa@iclei.org to request a 20 minute consultation

Complimentary Services

Technical Resources

Regional Workshops

Develop an implementation strategy for smart solar policy

Strategy Session

Email solar-usa@iclei.org to request a 20 minute consultation

Complimentary Services

Technical Resources

Regional Workshops

One to One Assistance

Receive customized technical support on implementation of smart solar policy

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Email solar-usa@iclei.org to request a 20 minute consultation

After This Session

Talk to Us!

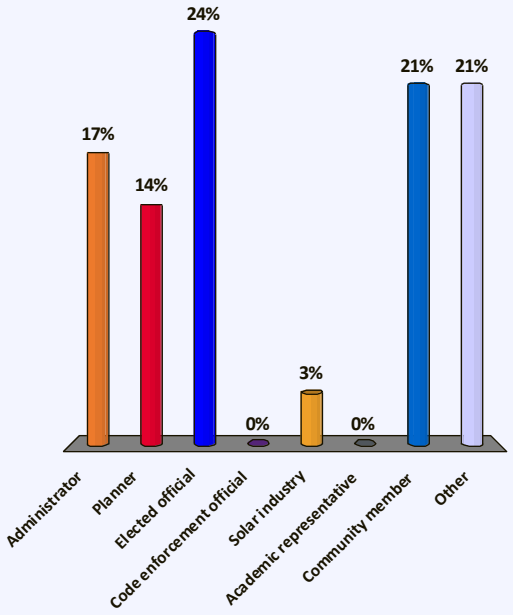
We can connect you with free solar consultation services.

See http://gosparc.org for more information.

We want to get to know you better

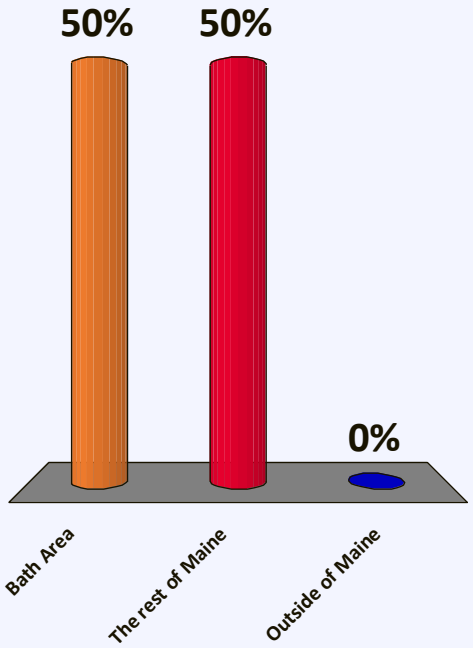
Who are you?

A. Administrator
B. Planner
C. Elected official
D. Code enforcement official
E. Solar industry
F. Academic representative
G. Community member
H. Other



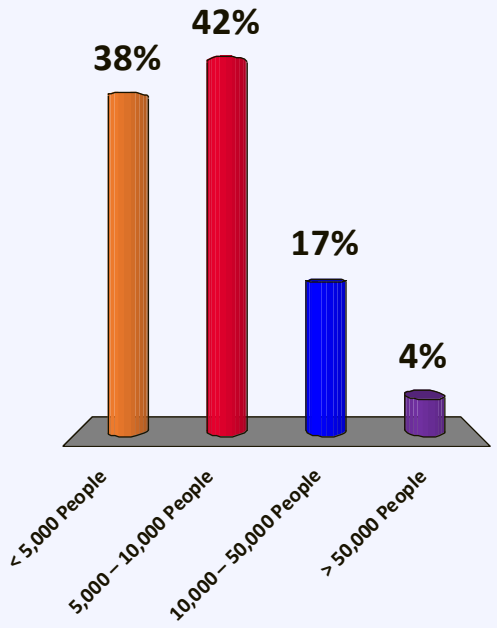
Where are you coming from?

A. Bath Area
B. The rest of Maine
C. Outside of Maine



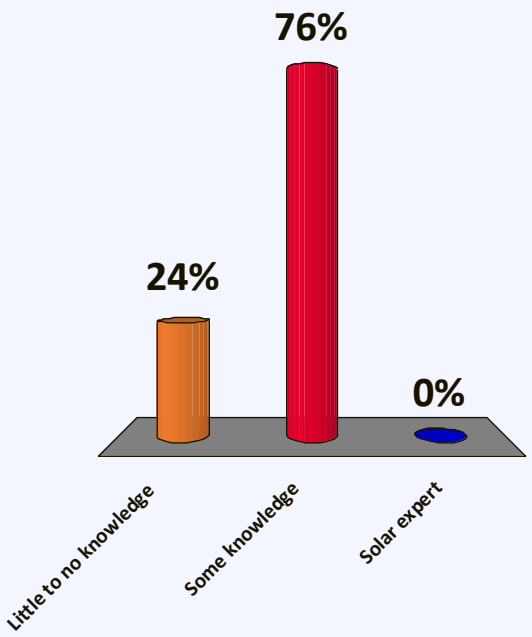
What size is your community?

A. < 5,000 People
B. 5,000 – 10,000 People
C. 10,000 – 50,000 People
D. > 50,000 People



How familiar are you with solar?

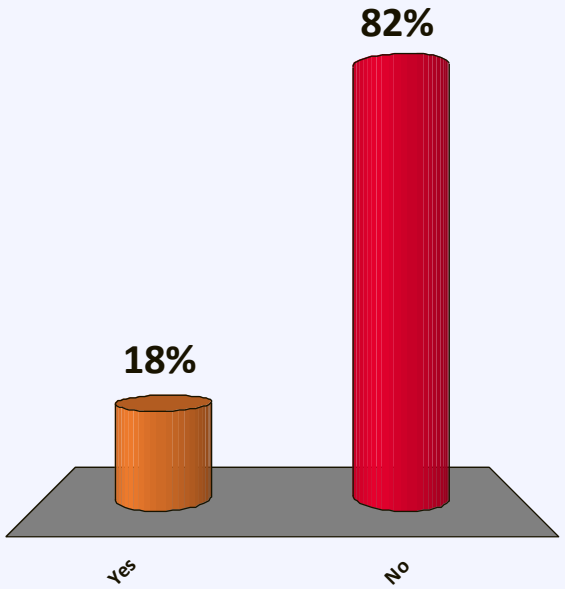
A. Little to no knowledge
B. Some knowledge
C. Solar expert



Do you have solar on your home?

A. Yes

B. No



Solar Development in the US

The US solar industry has installed

869,000 solar installations

of which

94% are residential projects

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SEIA/GTM Solar Market Insight Q3 2015

If you do have solar on your home:

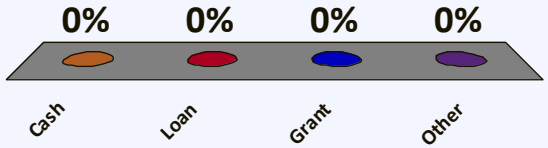
How did you finance it?

A. Cash

B. Loan

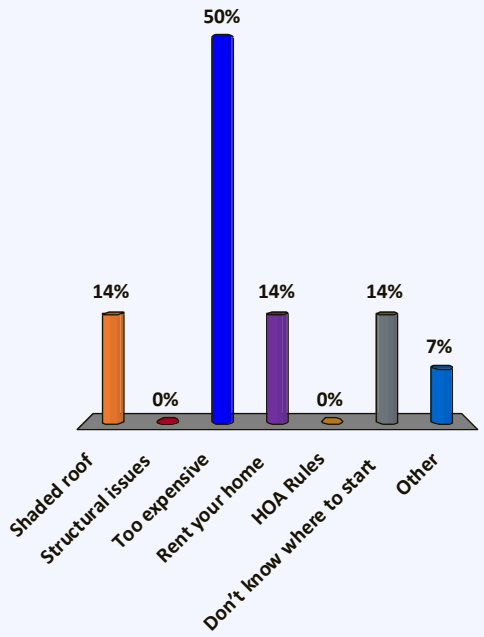
C. Grant

D. Other



If you don't have solar on your home: **Why not?**

A. Shaded roof
B. Structural issues
C. Too expensive
D. Rent your home
E. HOA Rules
F. Don't know where to start
G. Other

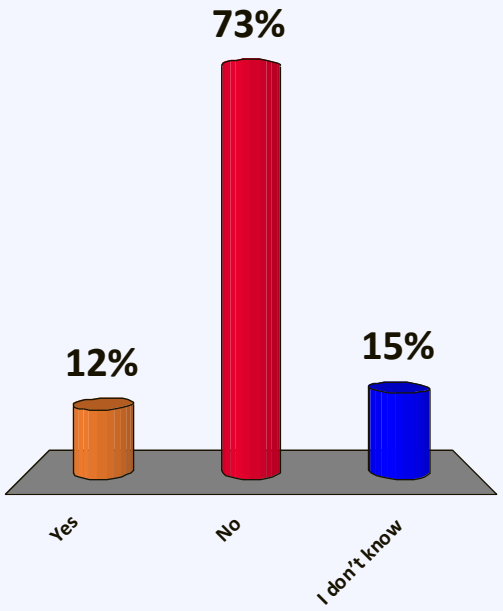


Does your local government have solar on public properties?

A. Yes

B. No

C. I don't know



Agenda

10:20 – 10:50	Putting Solar Energy on the Local Policy Agenda
10:50 – 11:20	State of the Local Solar Market
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2:20– 2:50	Developing and Solar Policy Implementation Plan for Your Community and Next Steps

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Solar Technologies

Solar Photovoltaic (PV)

Solar Hot Water

Concentrated Solar Power

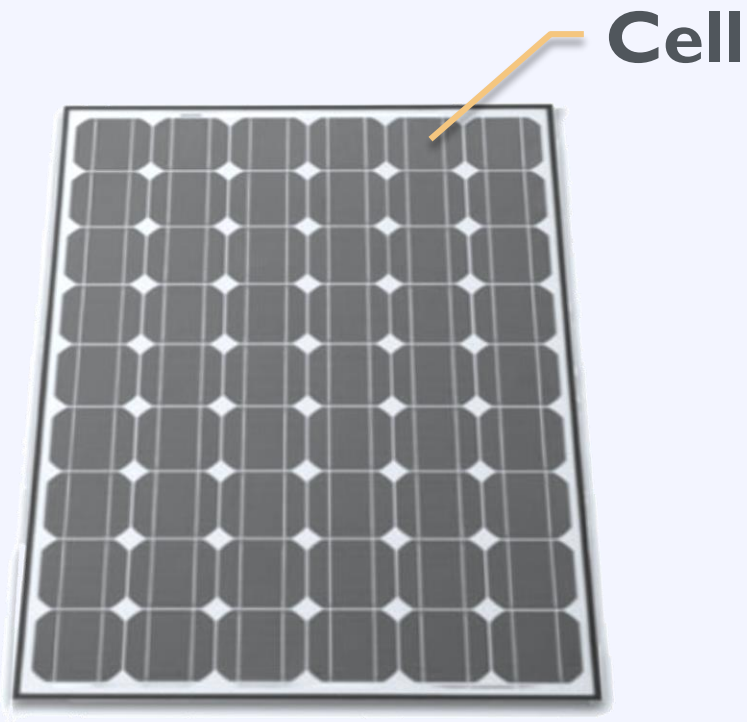
Solar Technologies

Solar Photovoltaic (PV)

Solar Hot Water

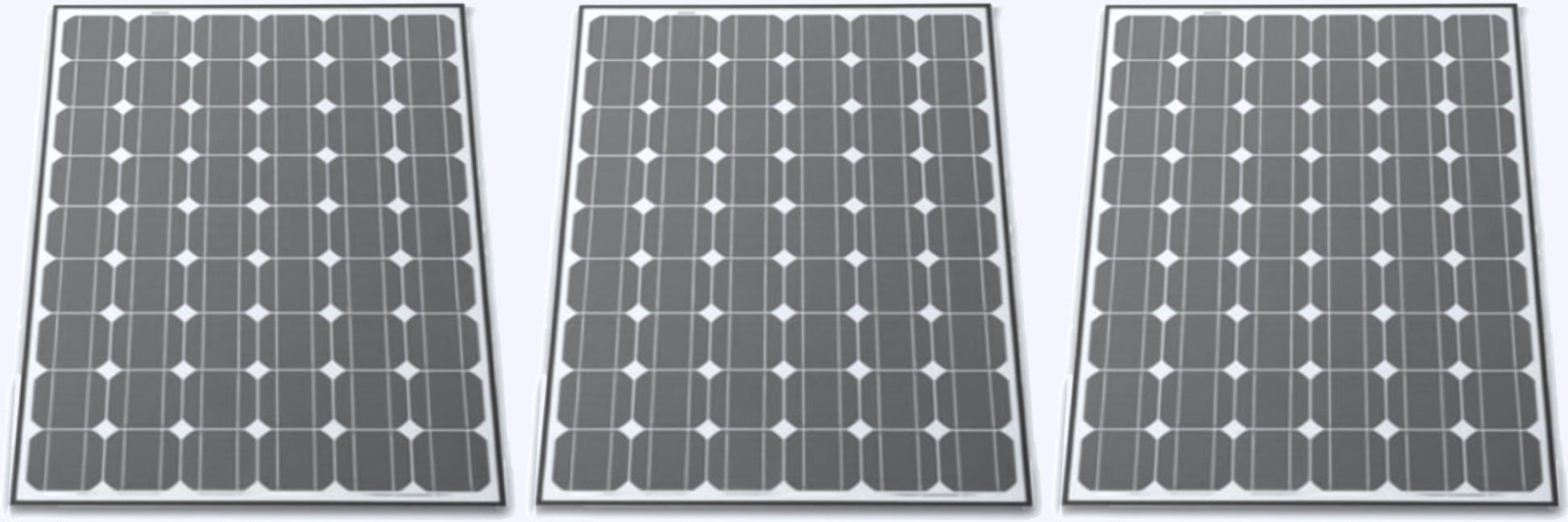
Concentrated Solar Power

Some Basic Terminology



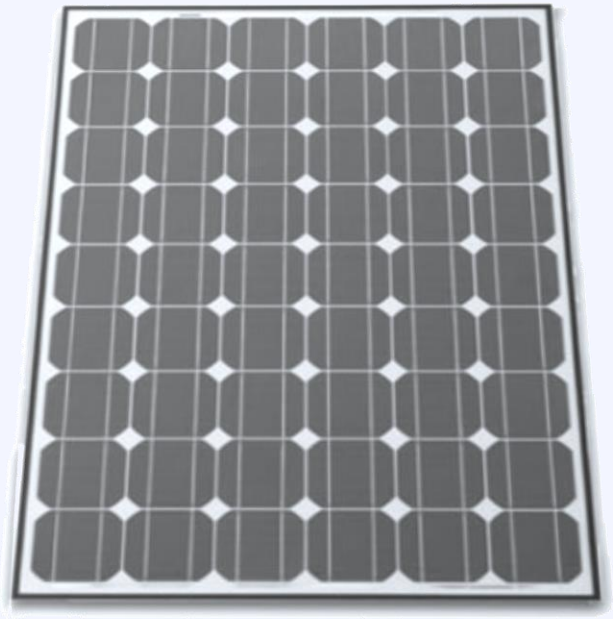
Panel / Module

Some Basic Terminology



Array

Some Basic Terminology



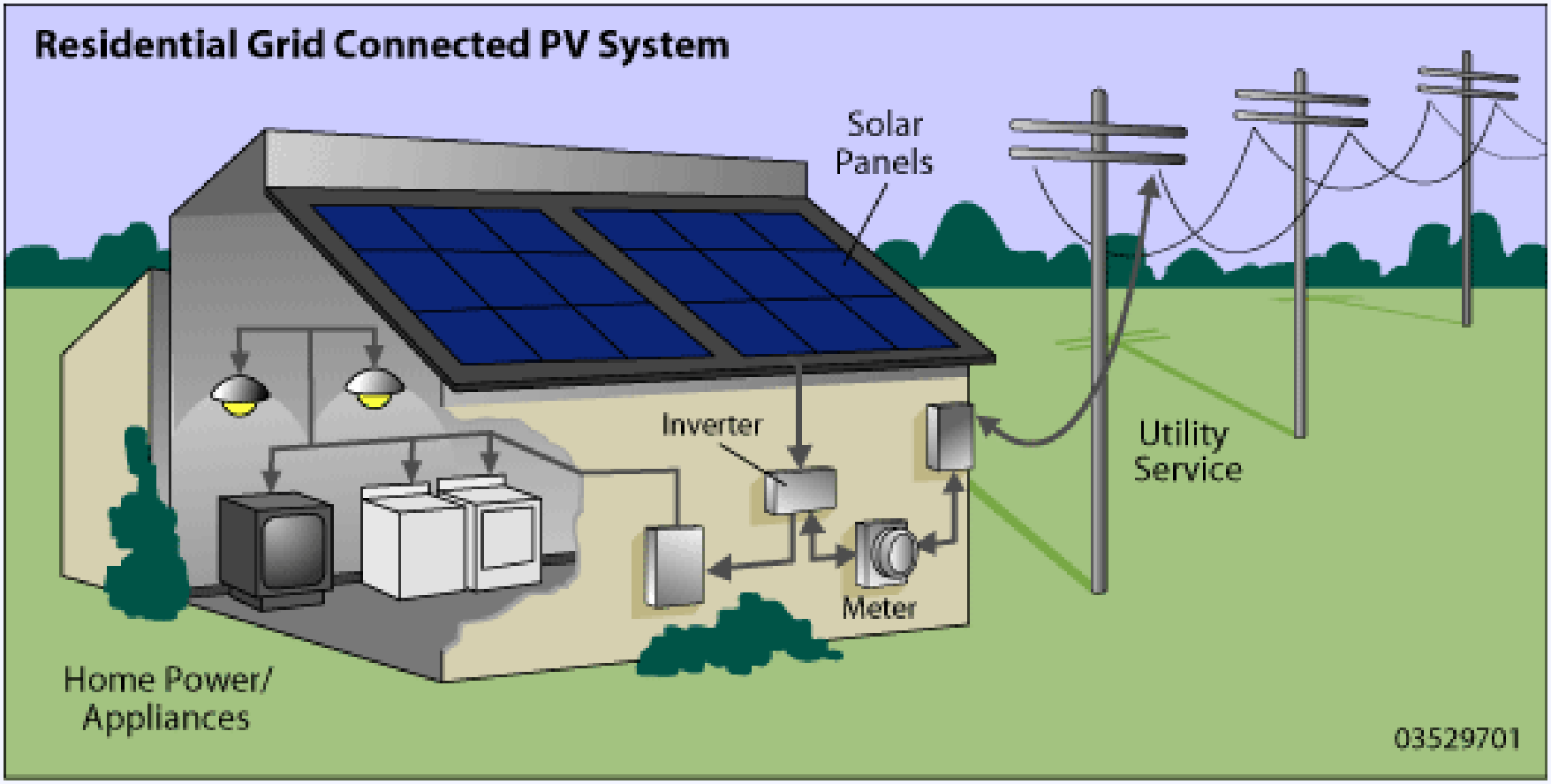
Capacity / Power

kilowatt (kW)

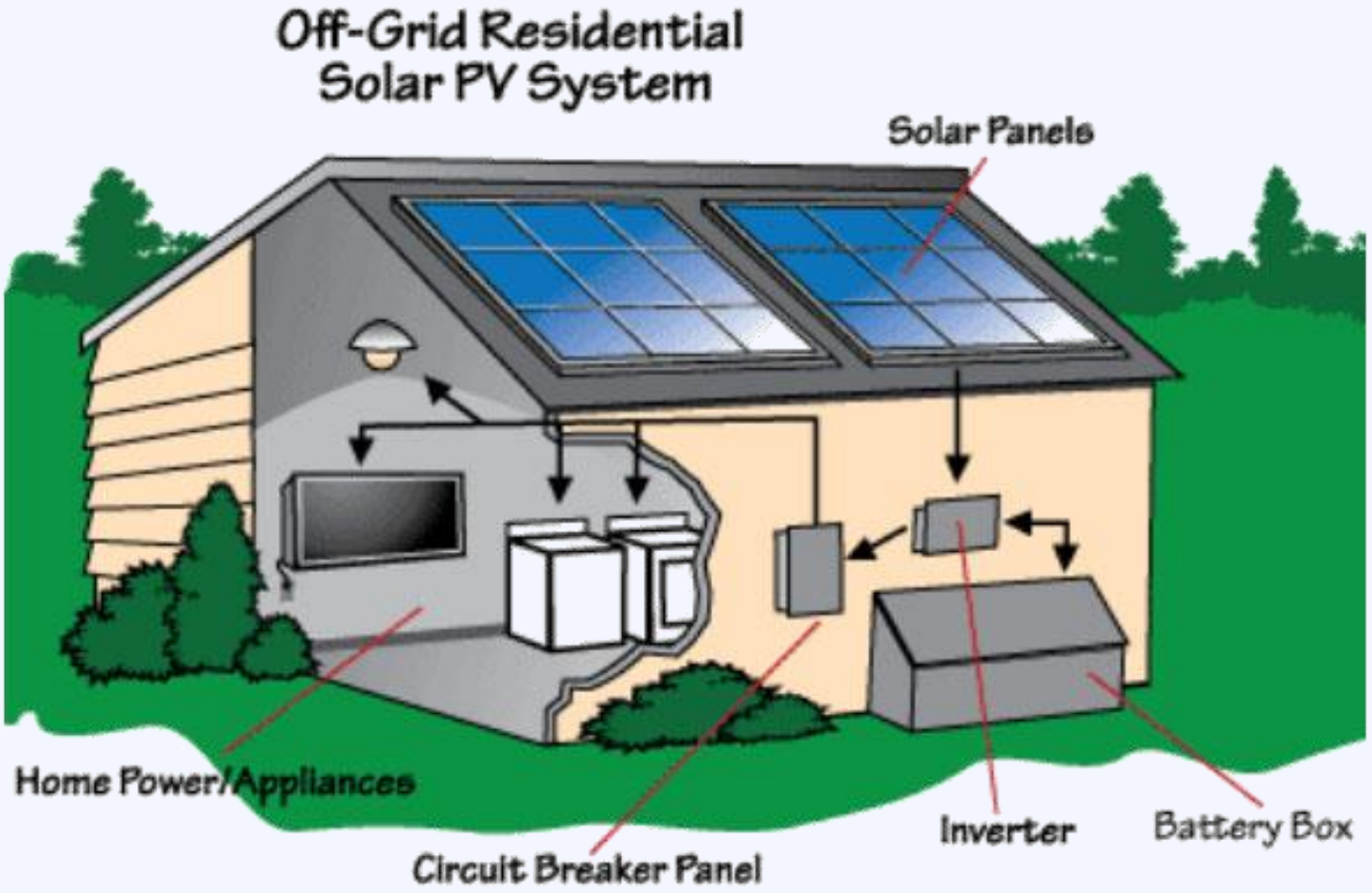
Production

Kilowatt-hour (kWh)

System Components



System Components – Off-Grid



Some Basic Terminology

Residence
5 kW

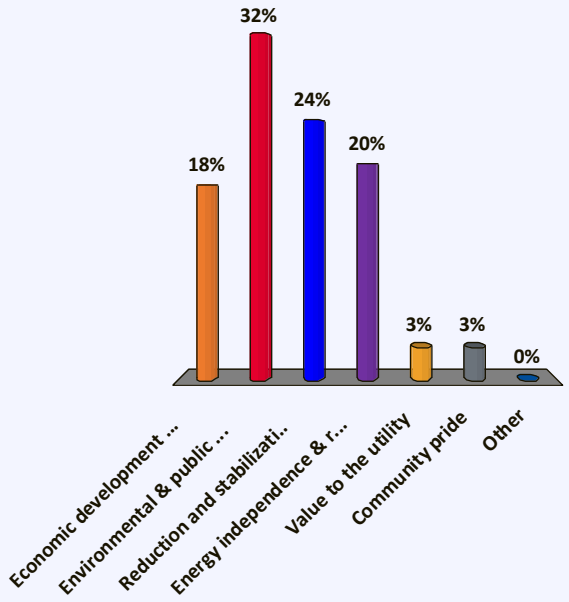
Factory
1 MW+

Office
50 – 500 kW

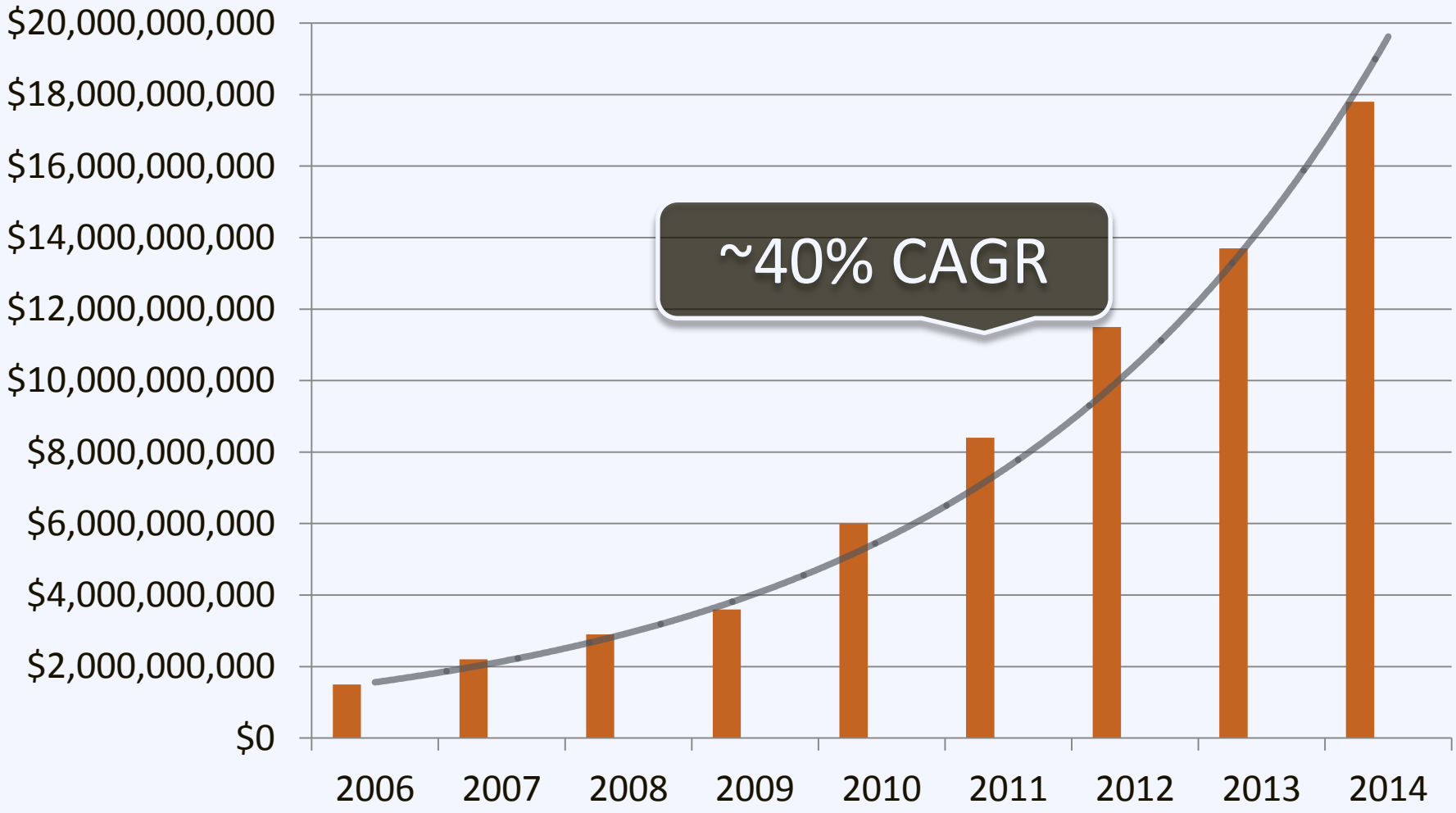
Utility
2 MW+

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



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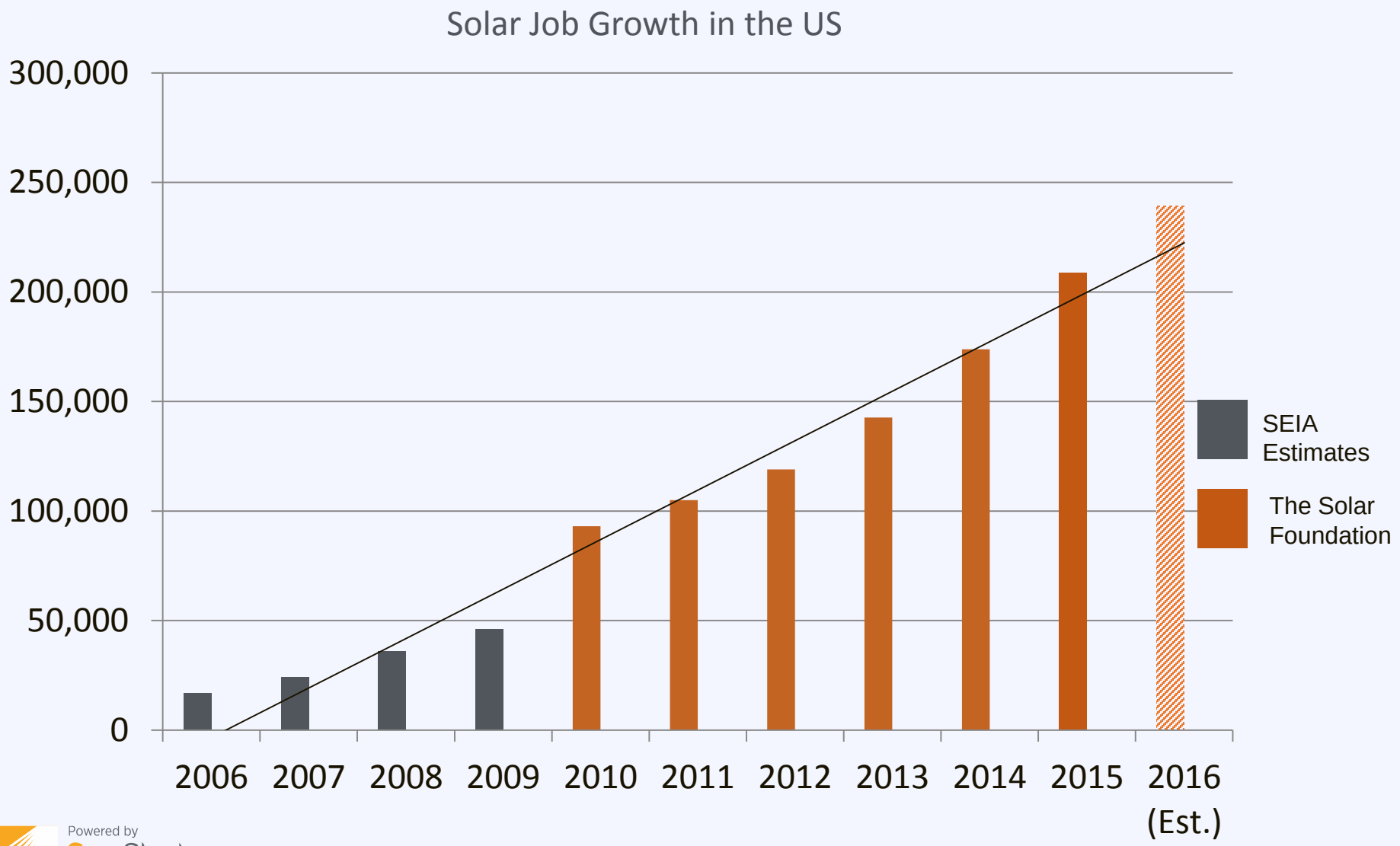
Source: SEIA/GTM Research – 2009/2010/2011/2012 Year in Review Report
http://www.seia.org/research-resources/us-solar-market-insight

Benefits: Solar Job Growth



Source: SEIA Estimates (2006-2009), The Solar Foundation's *National Solar Jobs Census* report series

Economic Development in Maine

There are currently

48 solar companies

that employ

330 people

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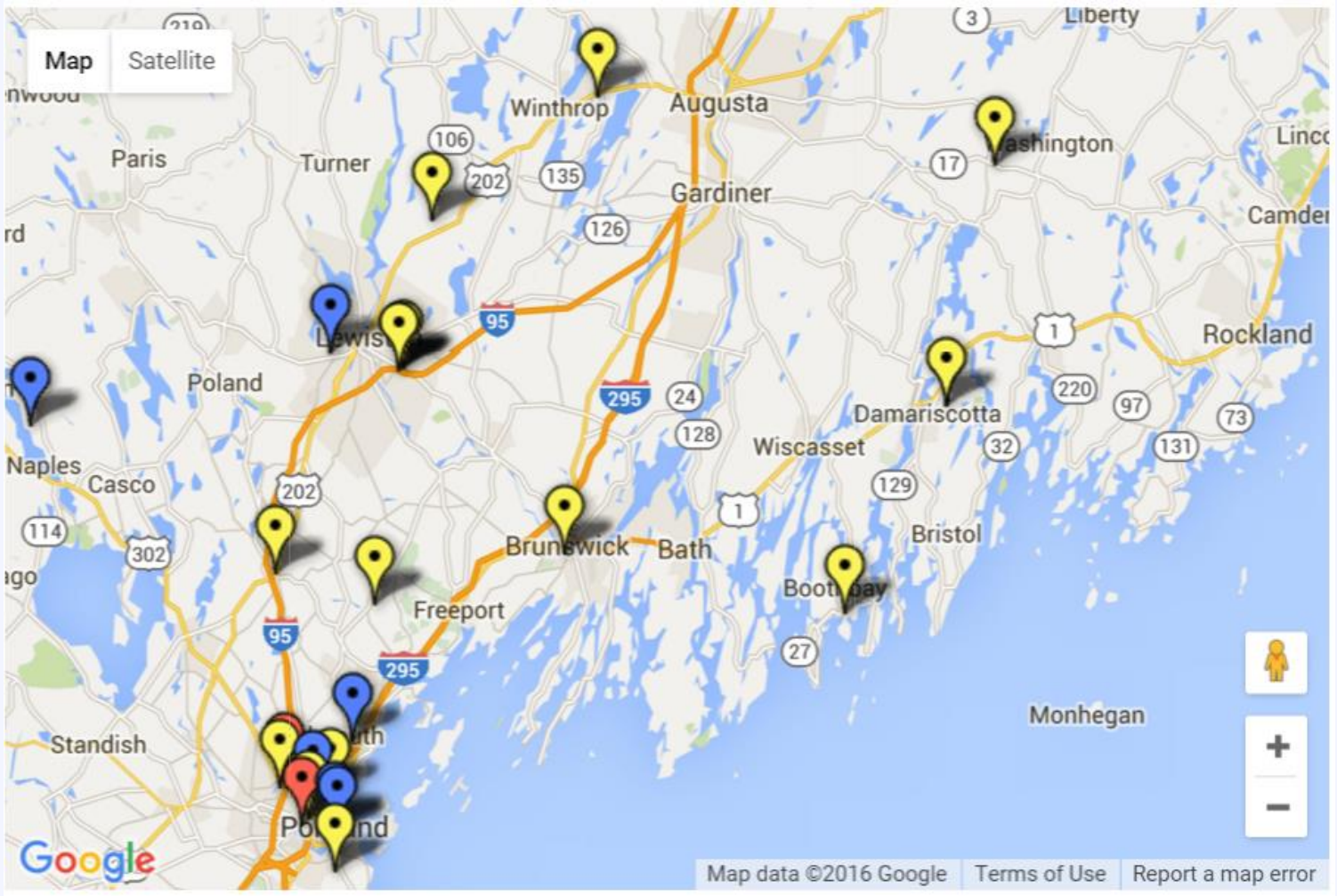
Source: The Solar Foundation

Economic Development in Maine



Key: Manufacturer Installer Other

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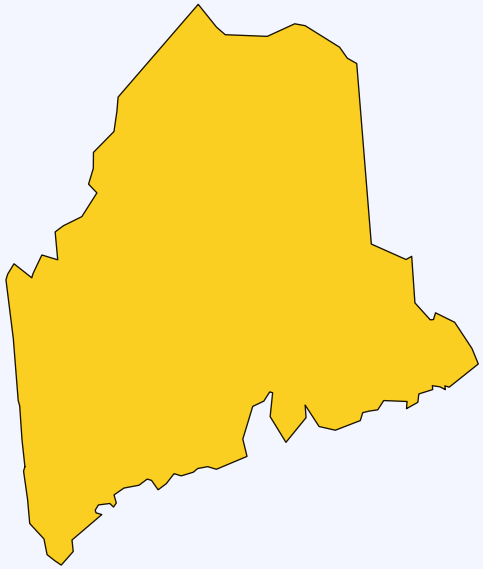
Source: SEIA

The Local Economic Opportunity

1 Megawatt of Residential Solar Development in Maine:



34 Jobs *and* **$3.7 Million**

In economic output

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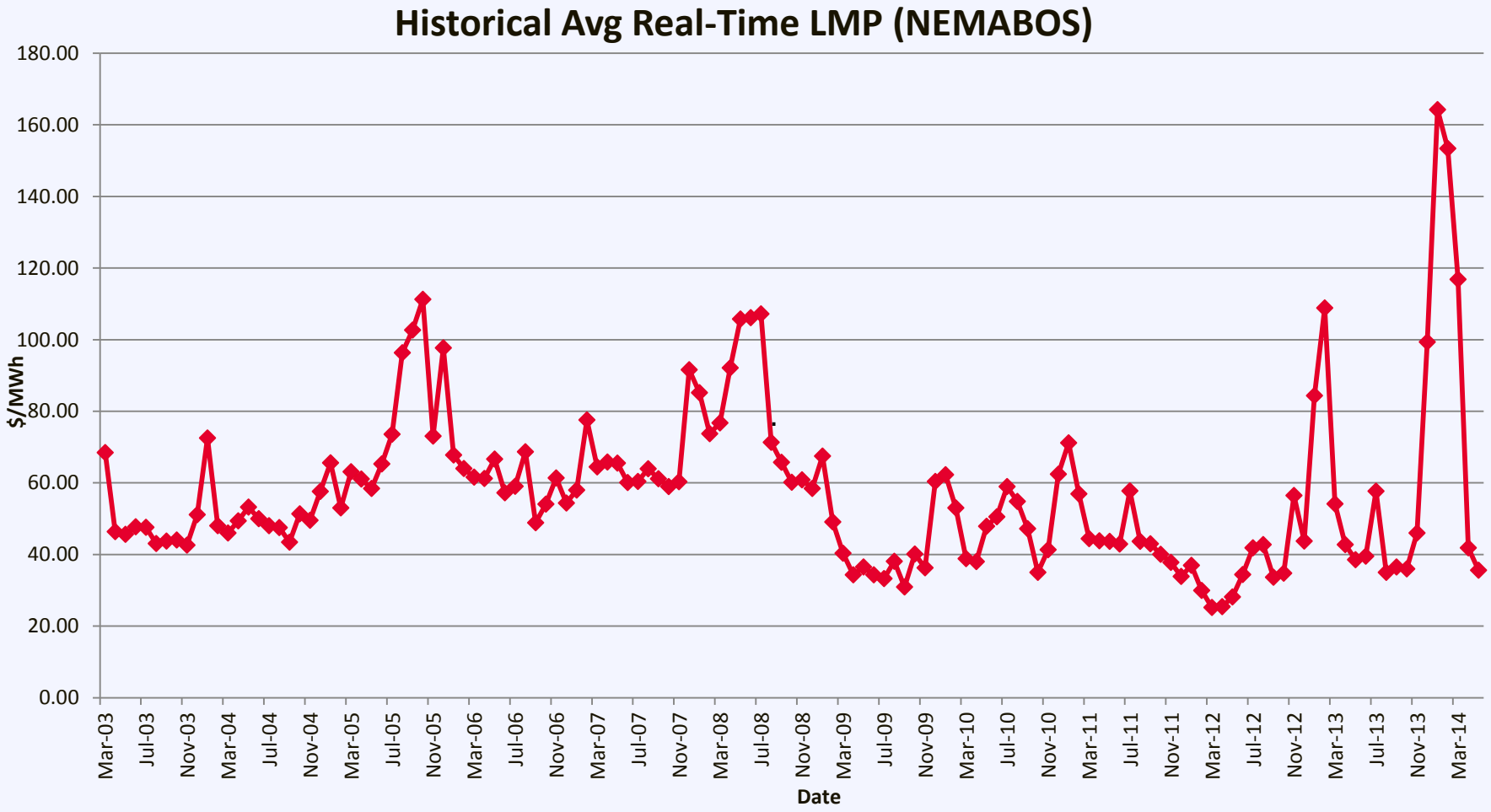
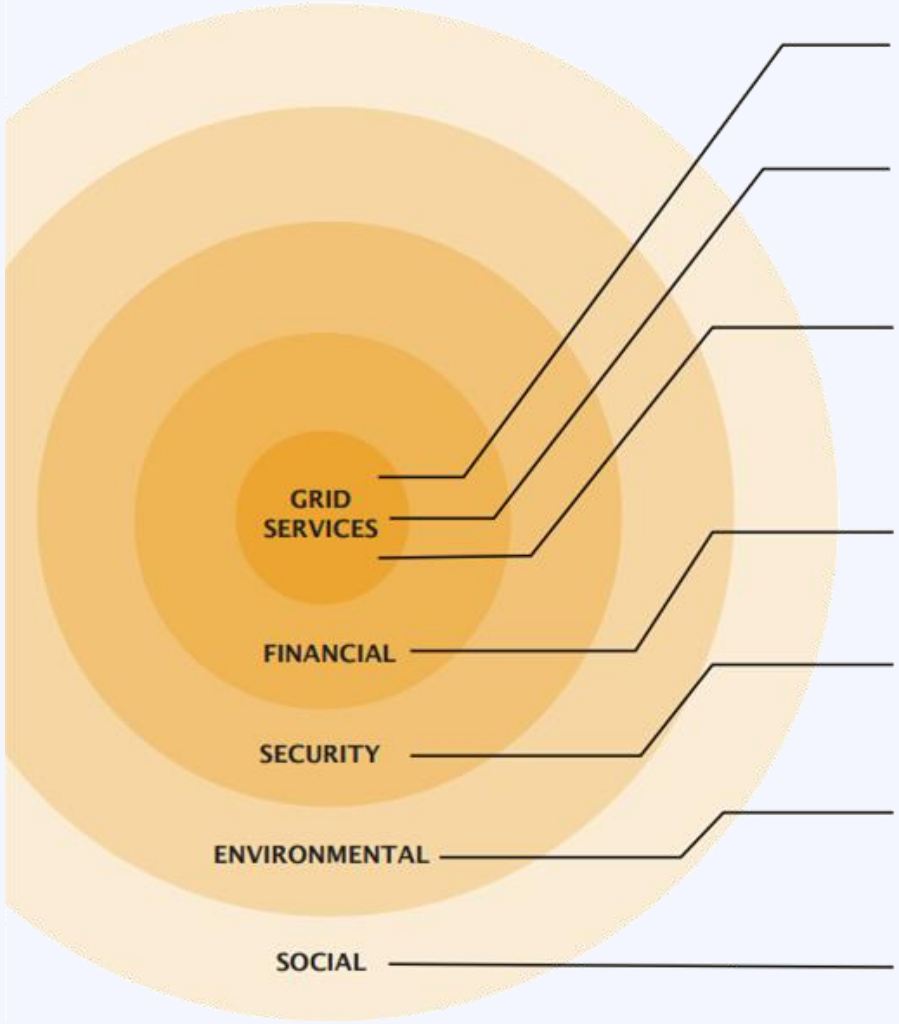
Source: JEDI Model, NREL

Benefit: Stabilize Energy Prices



Source: NEPOOL

Valuable to Community & Utilities



ENERGY
- energy
- energy losses

CAPACITY
- generation capacity
- transmission & distribution capacity
- DPV installed capacity

GRID SUPPORT SERVICES
- reactive supply & voltage control
- regulation & frequency response
- energy & generator imbalance
- synchronized & supplemental operating reserves
- scheduling, forecasting, and system control & dispatch

FINANCIAL RISK
- fuel price hedge
- market price response

SECURITY RISK
- reliability & resilience

ENVIRONMENTAL
- carbon emissions
- criteria air pollutants (SOx, NOx, PM10)
- water
- land

SOCIAL
- Economic development (jobs and tax revenues)

Source: Rocky Mountain Institute
(http://www.rmi.org/Content/Files/eLab-DER_cost_value_Deck_130722.pdf)

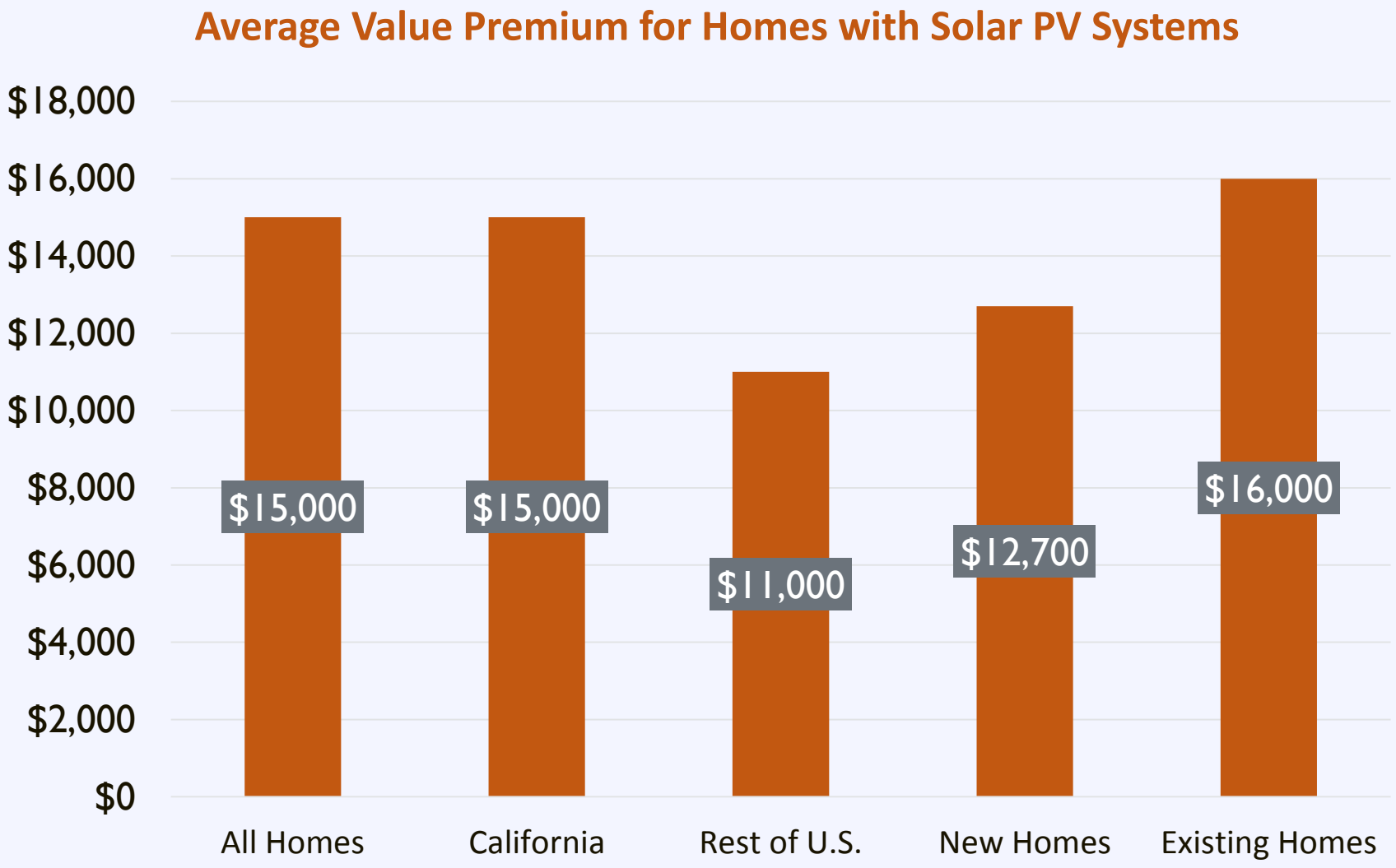
Valuable to Community & Utilities

Figure ES- 2. CMP Distributed Value – 25 Year Levelized ($ per kWh)

25 Year Levelized		Gross Value A ($/kWh)	× Load Match Factor B (%)	× Loss Savings Factor (1+C) (%)	= Distr. PV Value D ($/kWh)	
Energy Supply	Avoided Energy Cost	$0.076		6.2%	$0.081	Avoided Market Costs $0.138
	Avoided Gen. Capacity Cost	$0.068	54.4%	9.3%	$0.040	
	Avoided Res. Gen. Capacity Cost	$0.009	54.4%	9.3%	$0.005	
	Avoided NG Pipeline Cost					
	Solar Integration Cost	($0.005)		6.2%	($0.005)	
Transmission Delivery Service	Avoided Trans. Capacity Cost	$0.063	23.9%	9.3%	$0.016	
Distribution Delivery Service	Avoided Dist. Capacity Cost					
	Voltage Regulation					
Environmental	Net Social Cost of Carbon	$0.020		6.2%	$0.021	Societal Benefits $0.199
	Net Social Cost of SO_2	$0.058		6.2%	$0.062	
	Net Social Cost of NO_x	$0.012		6.2%	$0.013	
Other	Market Price Response	$0.062		6.2%	$0.066	
	Avoided Fuel Price Uncertainty	$0.035		6.2%	$0.037	
					$0.337	

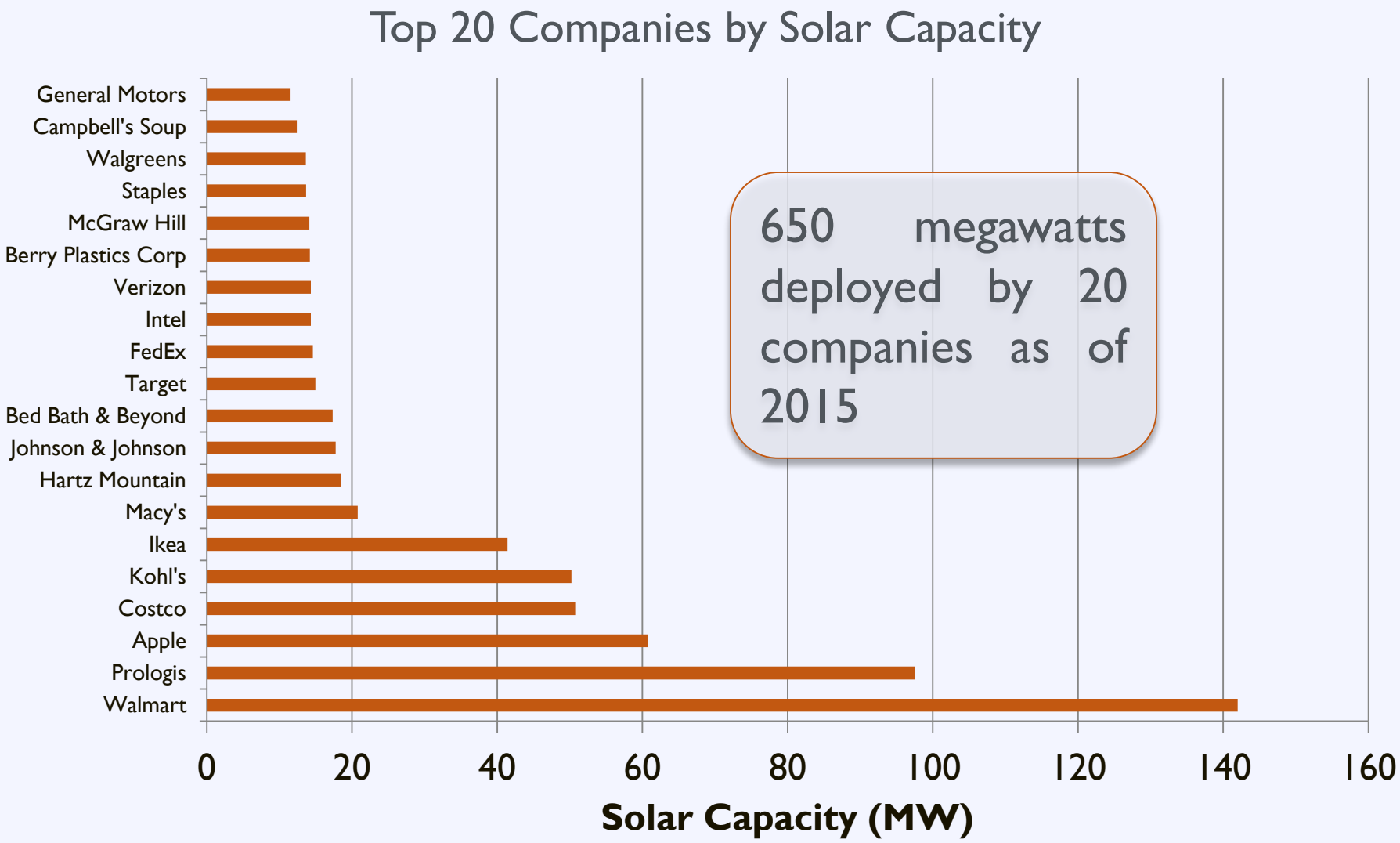
Source: Maine Public Utilities Commission
(http://www.nrcm.org/wp-content/uploads/2015/03/MPUCValueofSolarReport.pdf)

Smart Investment for Homeowners



Source: LBNL, *Selling Into the Sun* (2015)

Smart Investment for Businesses



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Source: Solar Energy Industries Association

Smart Investment for Governments

Source: Borrego Solar

Smart Investment for Schools

Current:

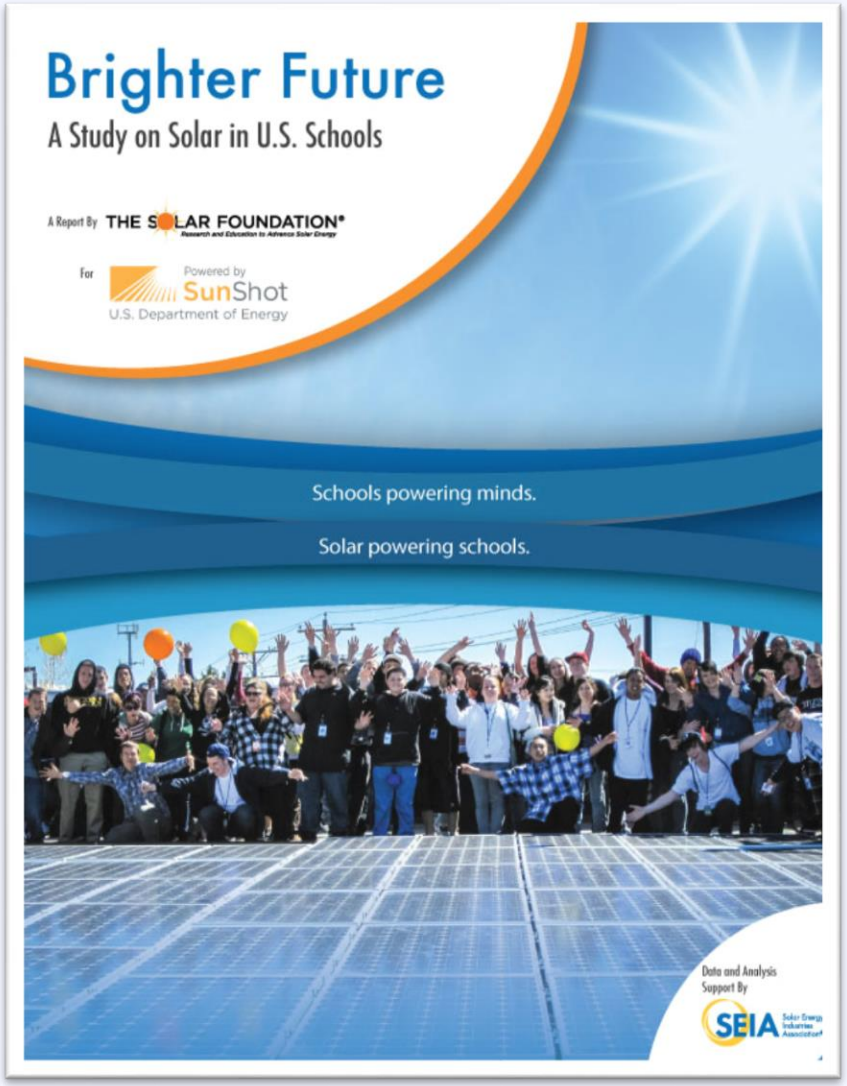
× 3,752

$ = $77.8m

Potential:

× 40,000 – 72,000

$ = $800m



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Source: The Solar Foundation (http://schools.tsfcensus.org)

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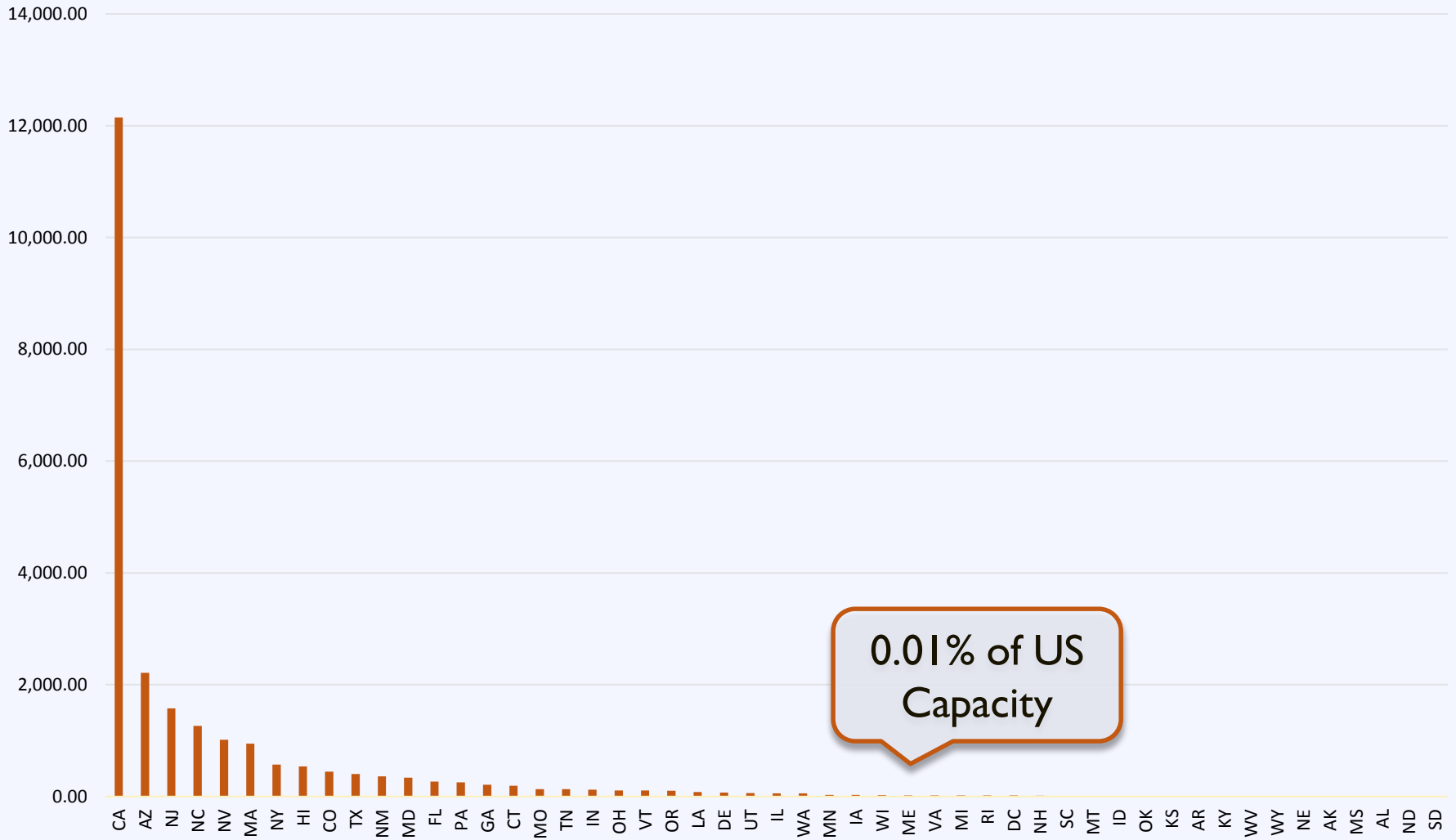
US Solar Market



Source: IREC, Solar Market Trends 2013

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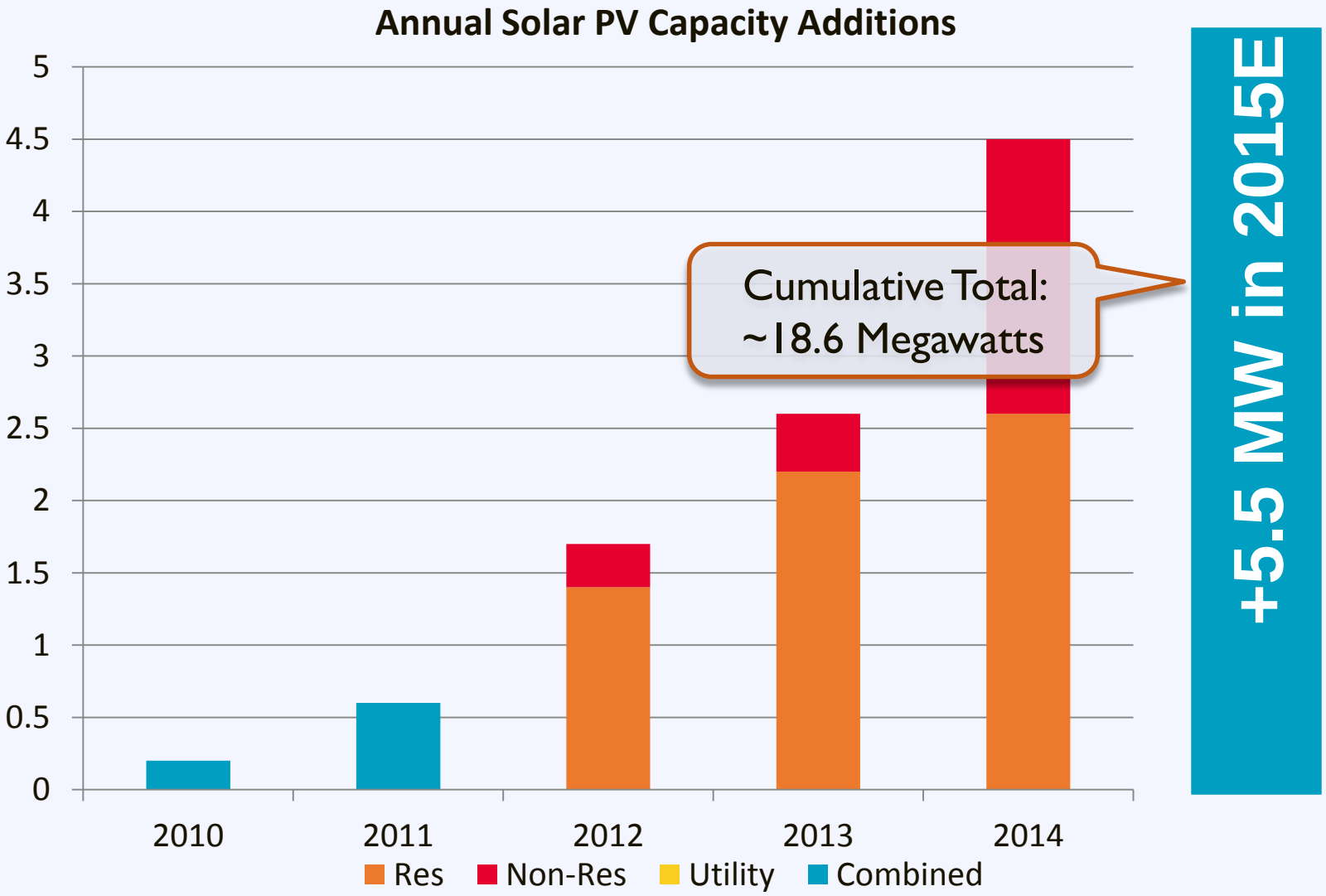
Maine Solar Market



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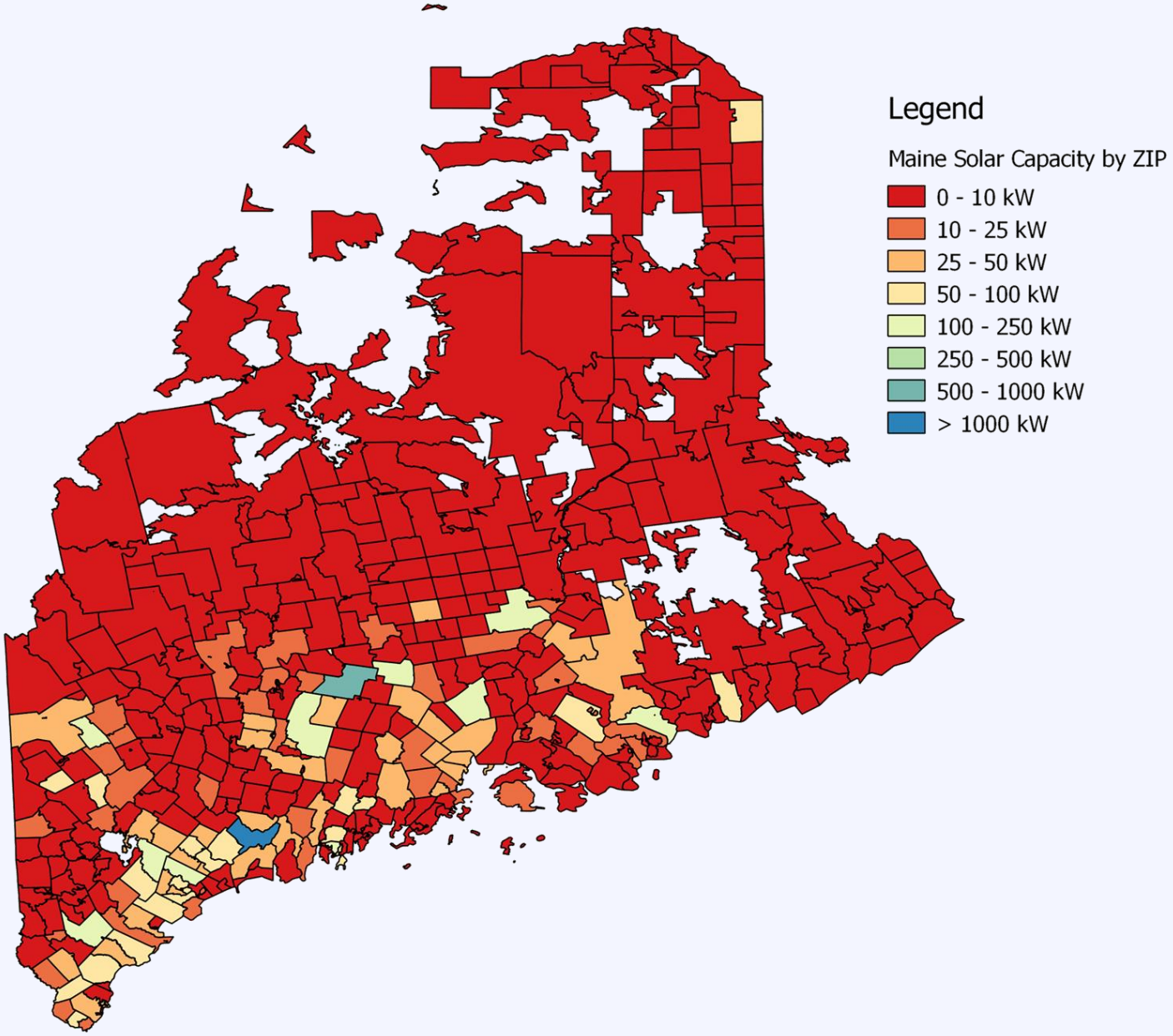
Source: SEIA/GTM Research, *Solar Market Insight; EIA*



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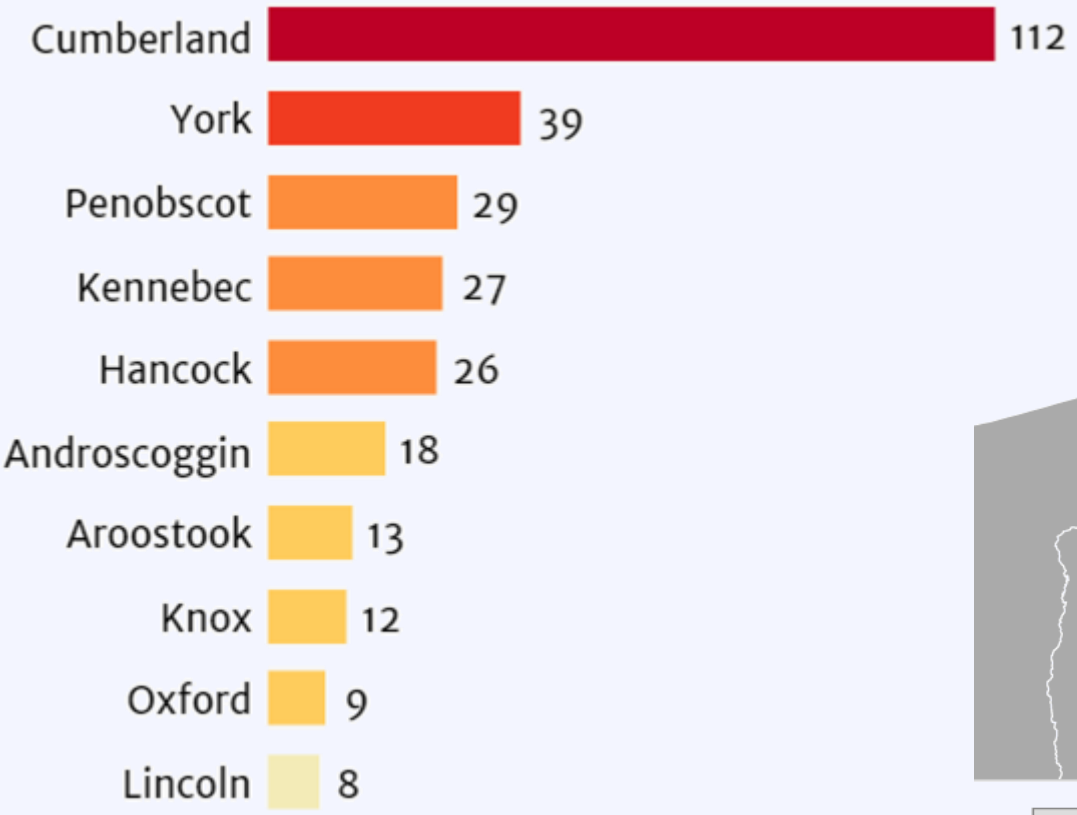
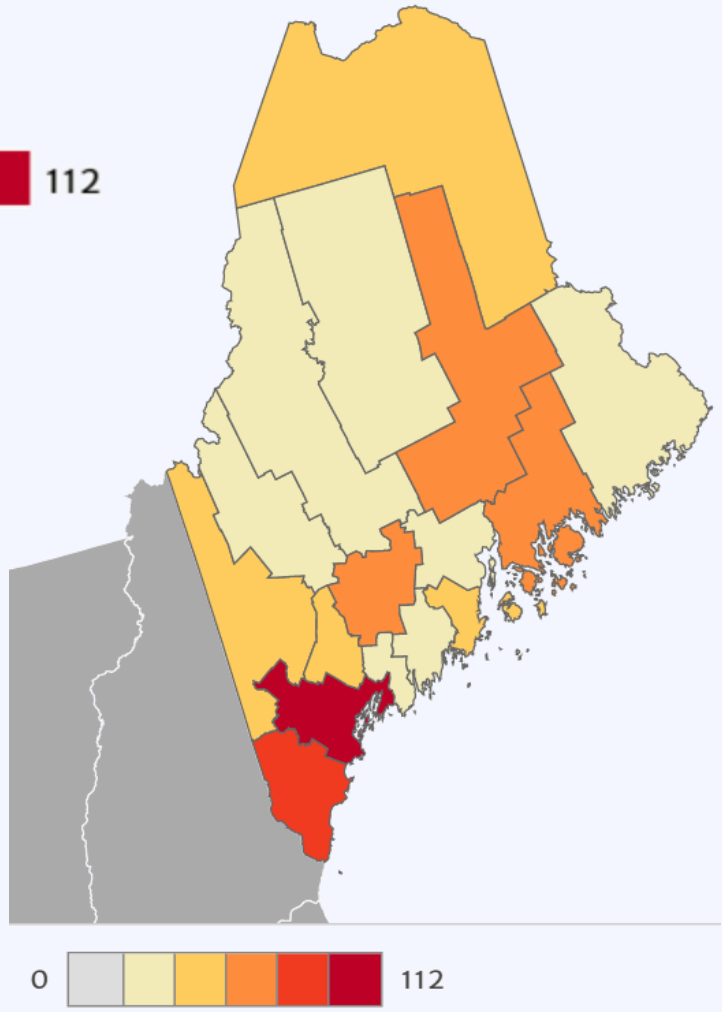
Maine Solar Market

Solar Jobs by County





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Source: The Solar Foundation

Maine Solar Market

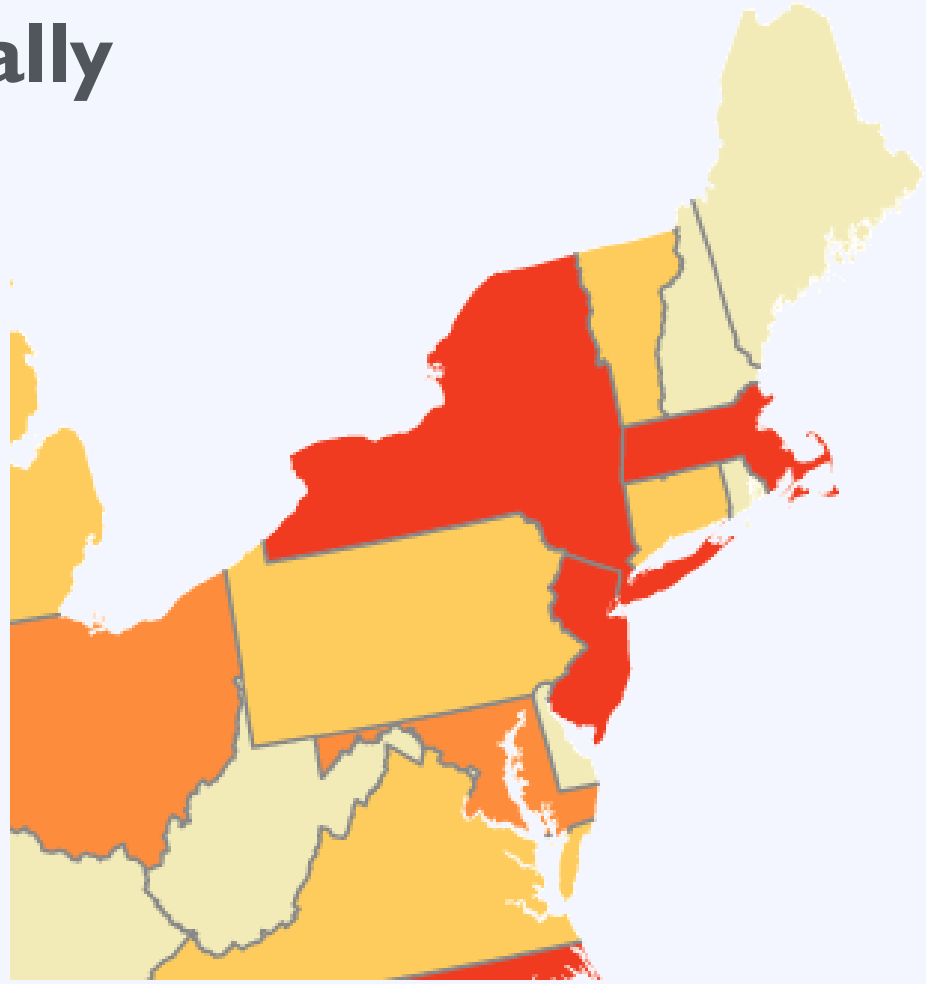
Solar Jobs Regionally

ME: 35th

solar jobs per capita

NH: 17th

solar jobs per capita



Powered by SunShot
U.S. Department of Energy

Source: The Solar Foundation

Maine Solar Market

Maine

14

watts per person

US

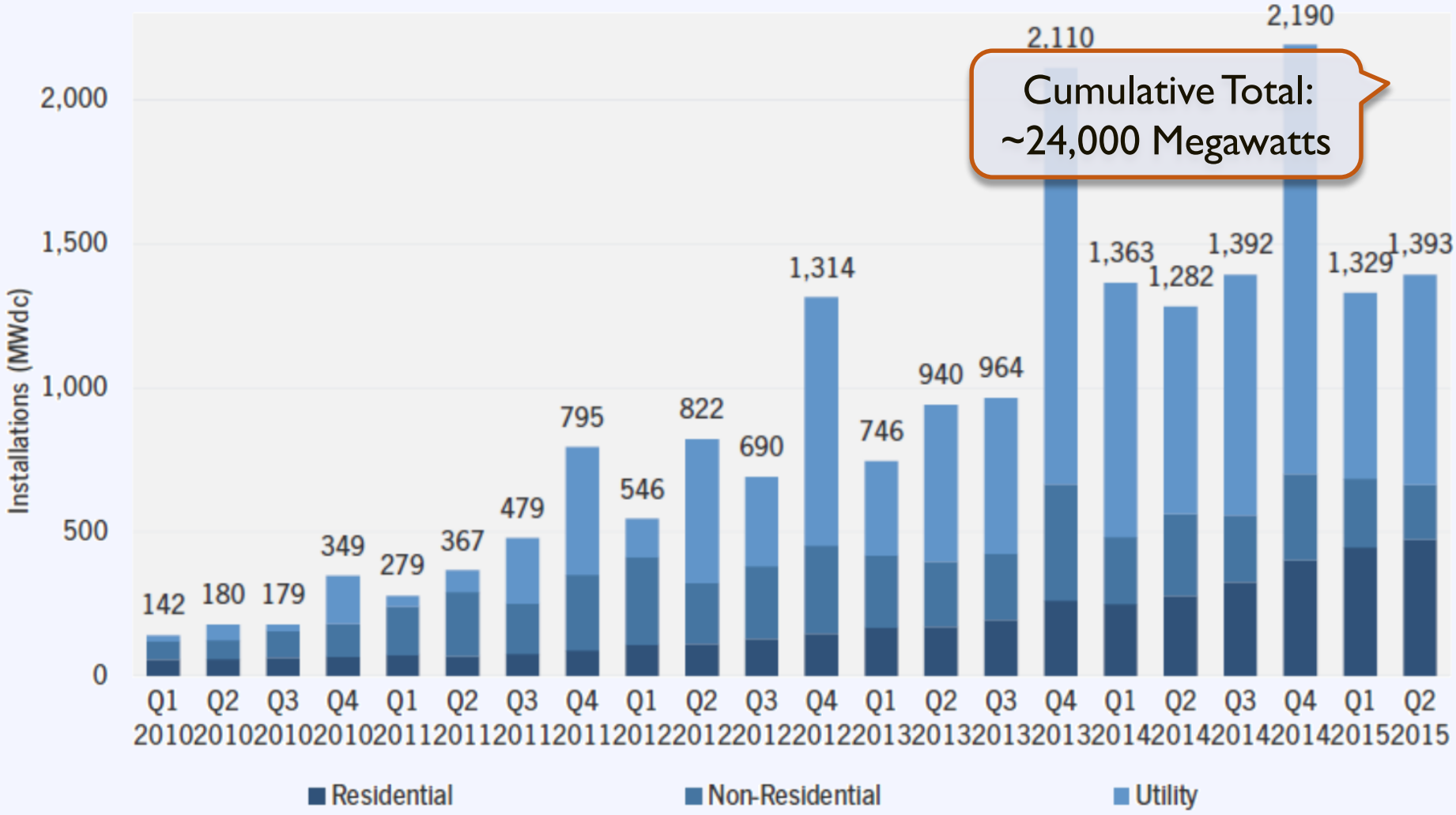
75

watts per person

Powered by SunShot U.S. Department of Energy

Source: SEIA/GTM; EIA 2015

US Solar Market



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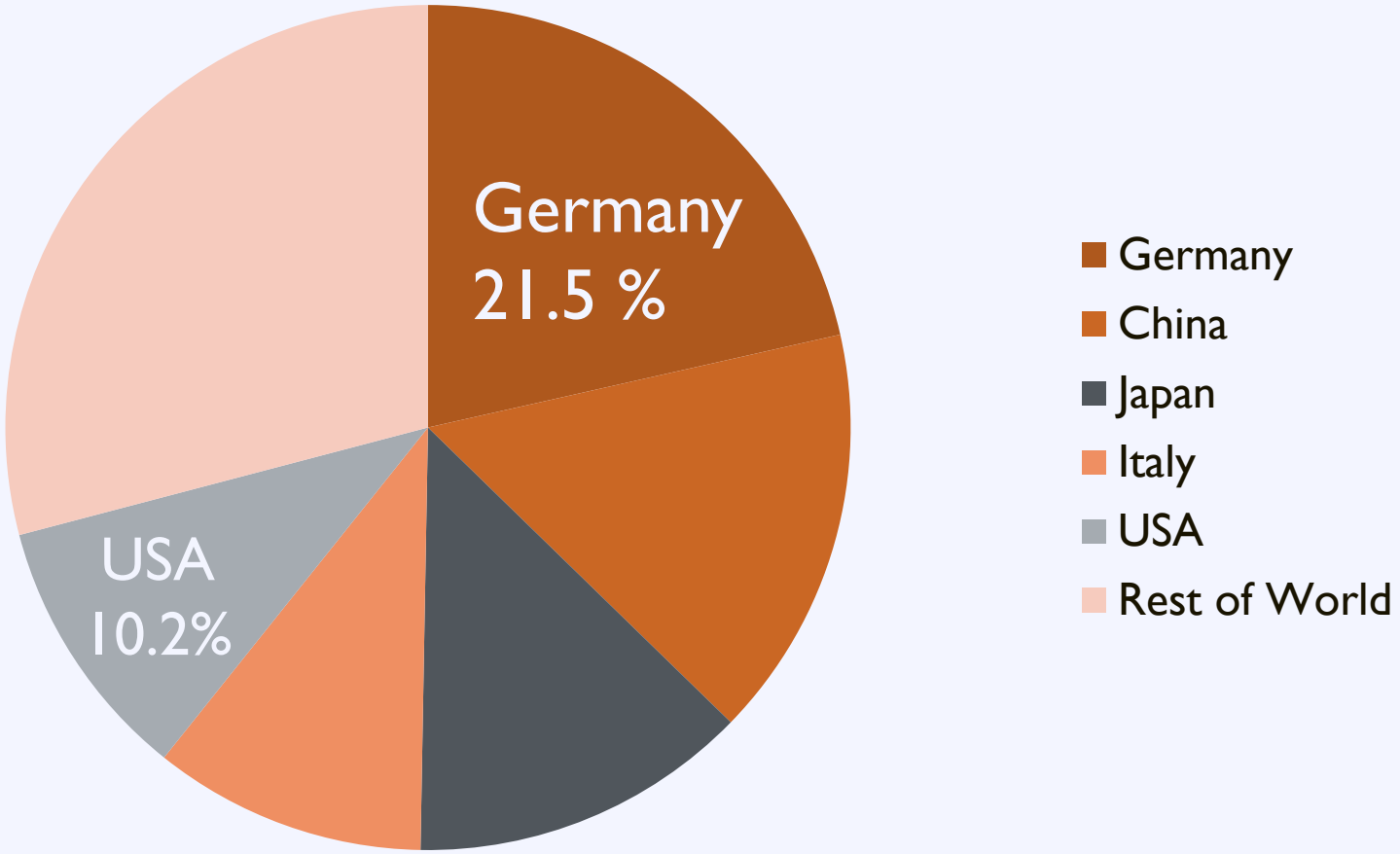
Source: Solar Energy Industries Association/ GTM Research, *Solar Market Insight: 2014 Year-in-Review*

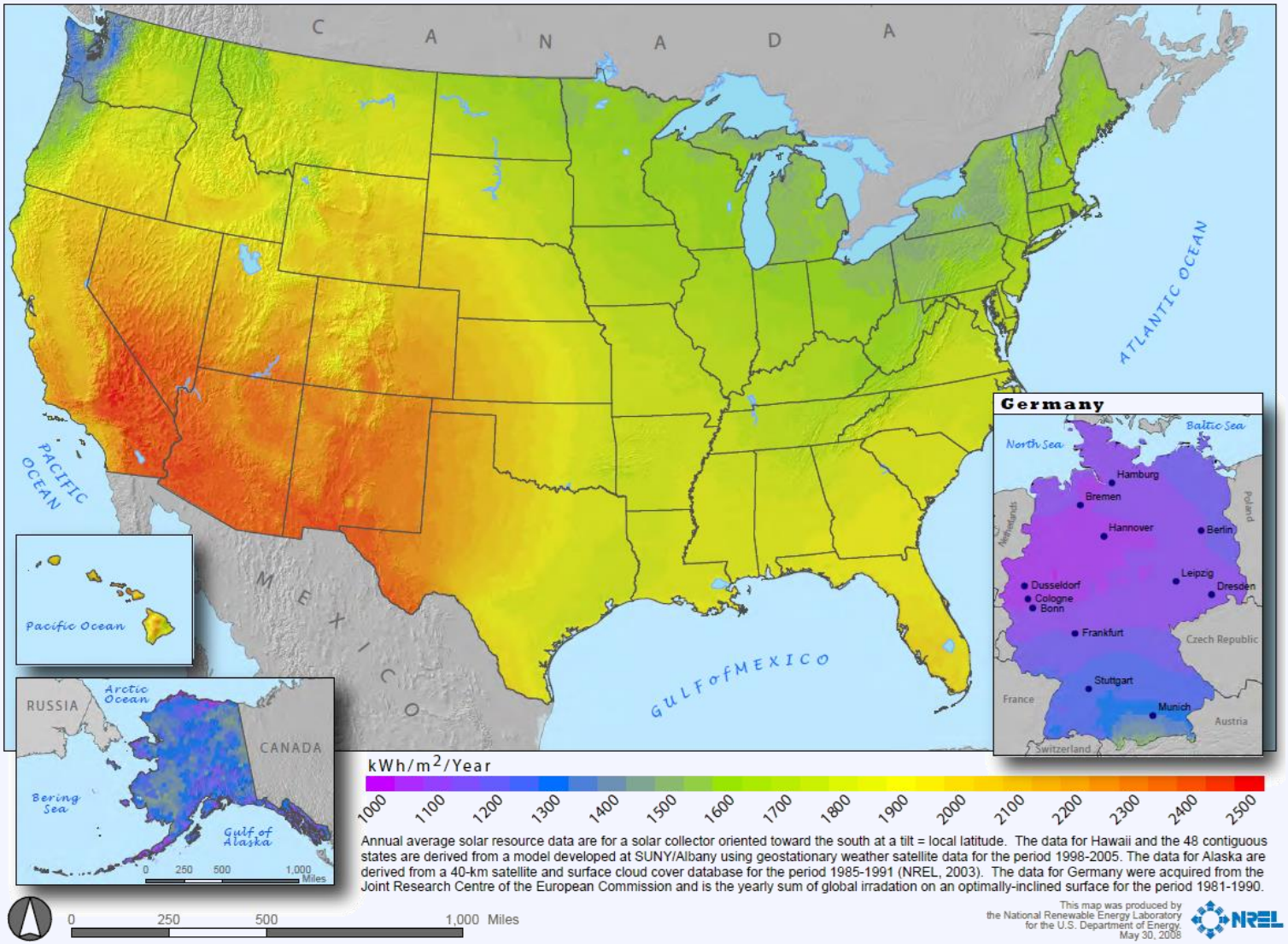
World Solar Market

Top 5 Countries Solar Operating Capacity (2014)



Source: REN 21, *Renewables 2015 Global Status Report*

US Solar Resource



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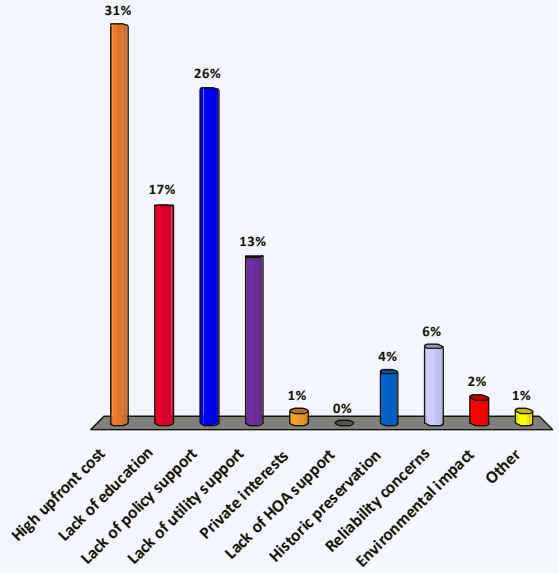
U.S. Department of Energy

Source: National Renewable Energy Laboratory

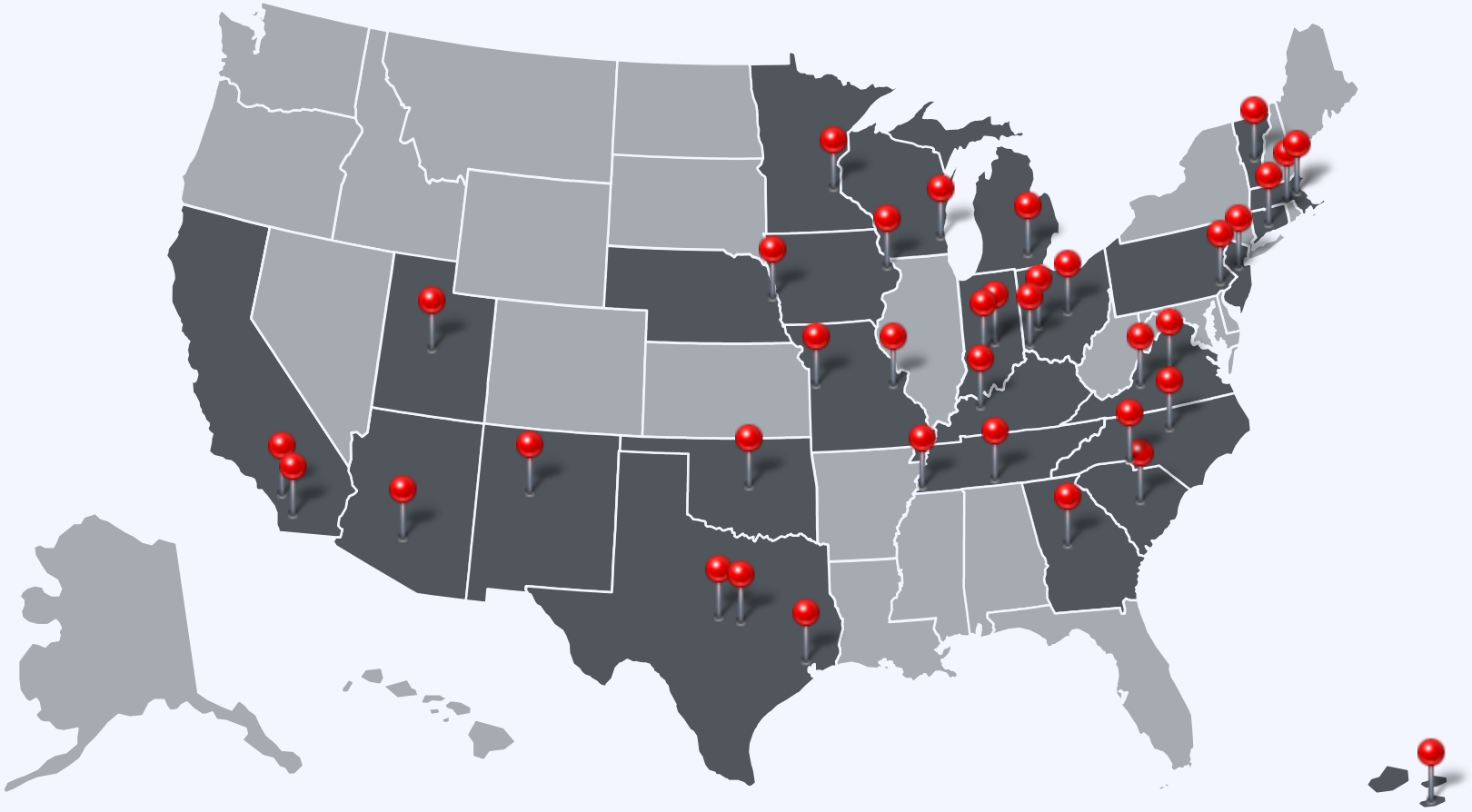
What are the top 3 barriers to solar adoption in your community?

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



Regional Workshop Surveys

Q: What is the greatest barrier to solar adoption in your community?



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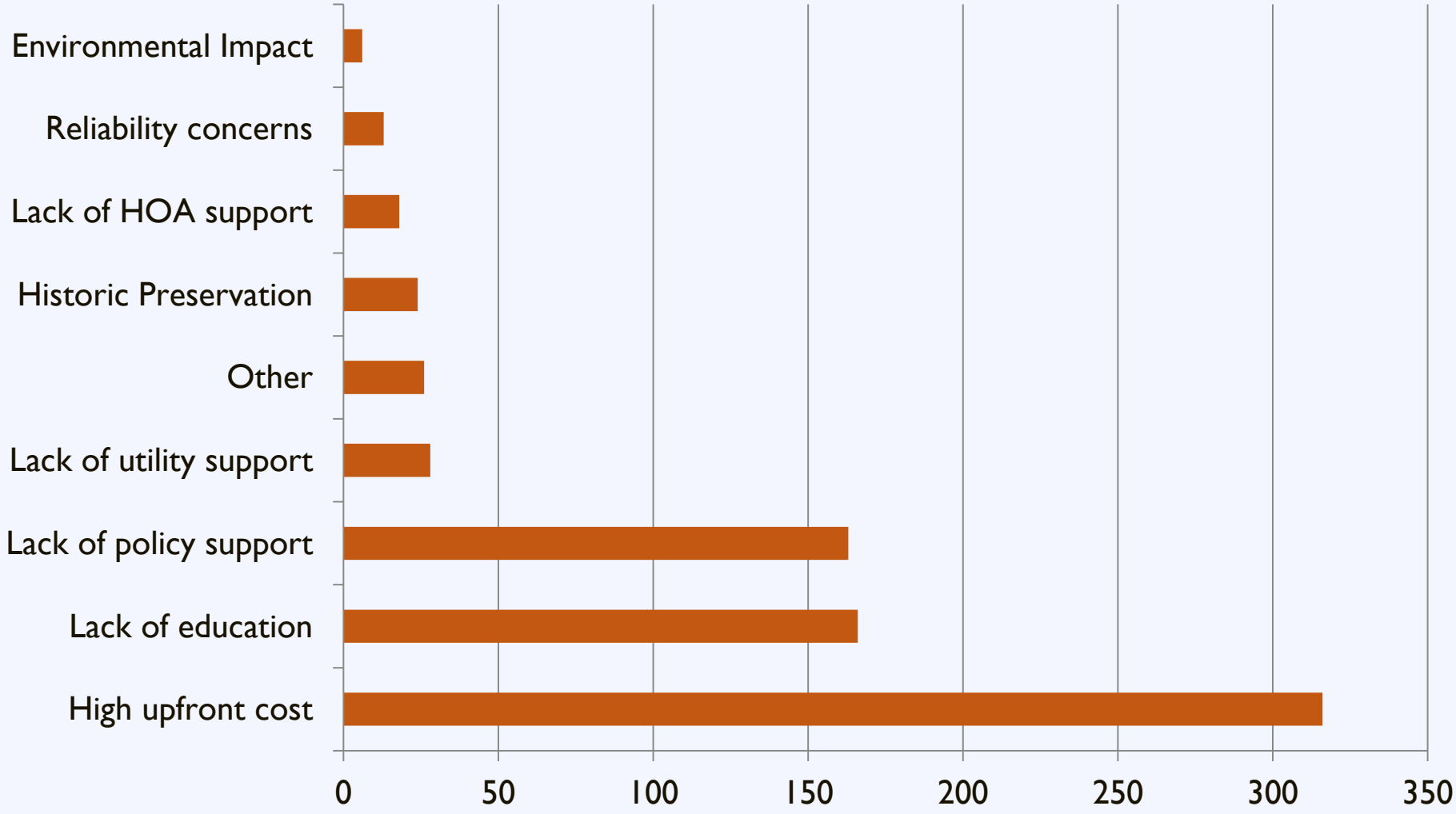
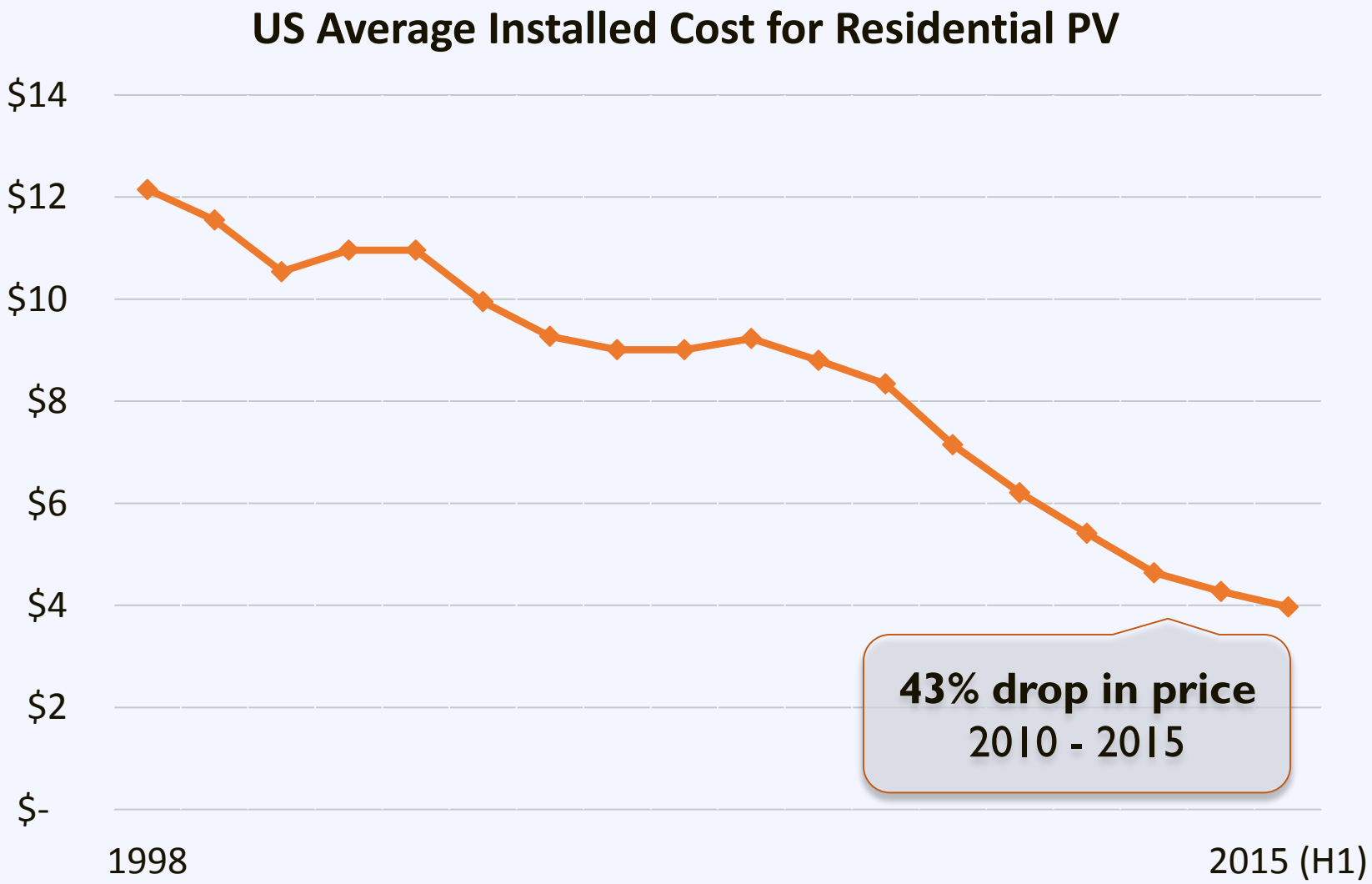
Activity: Addressing Barriers



The Cost of Solar PV



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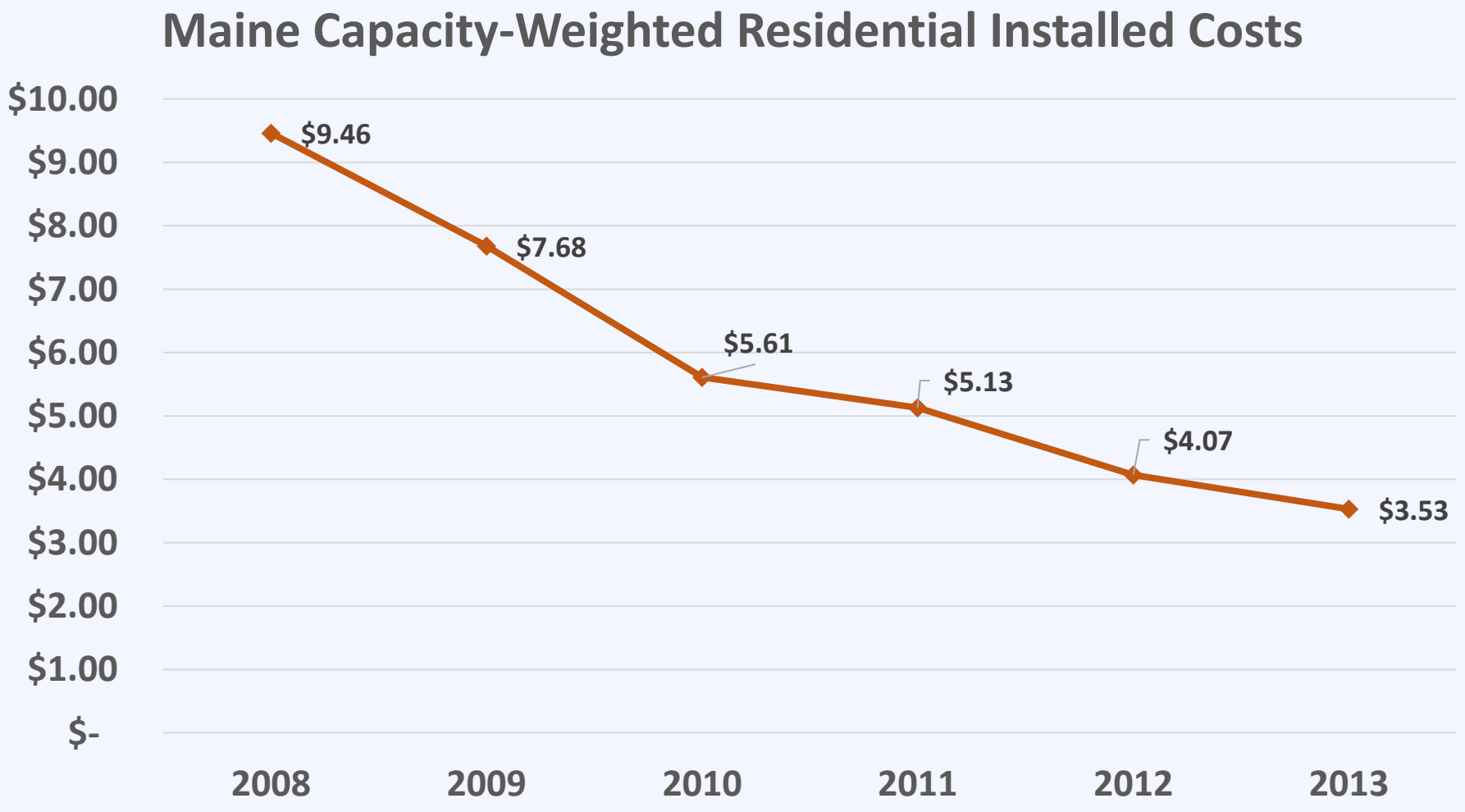
Tracking the Sun VII: The Installed Cost of Photovoltaics in the US from 1998-2013 (LBNL)

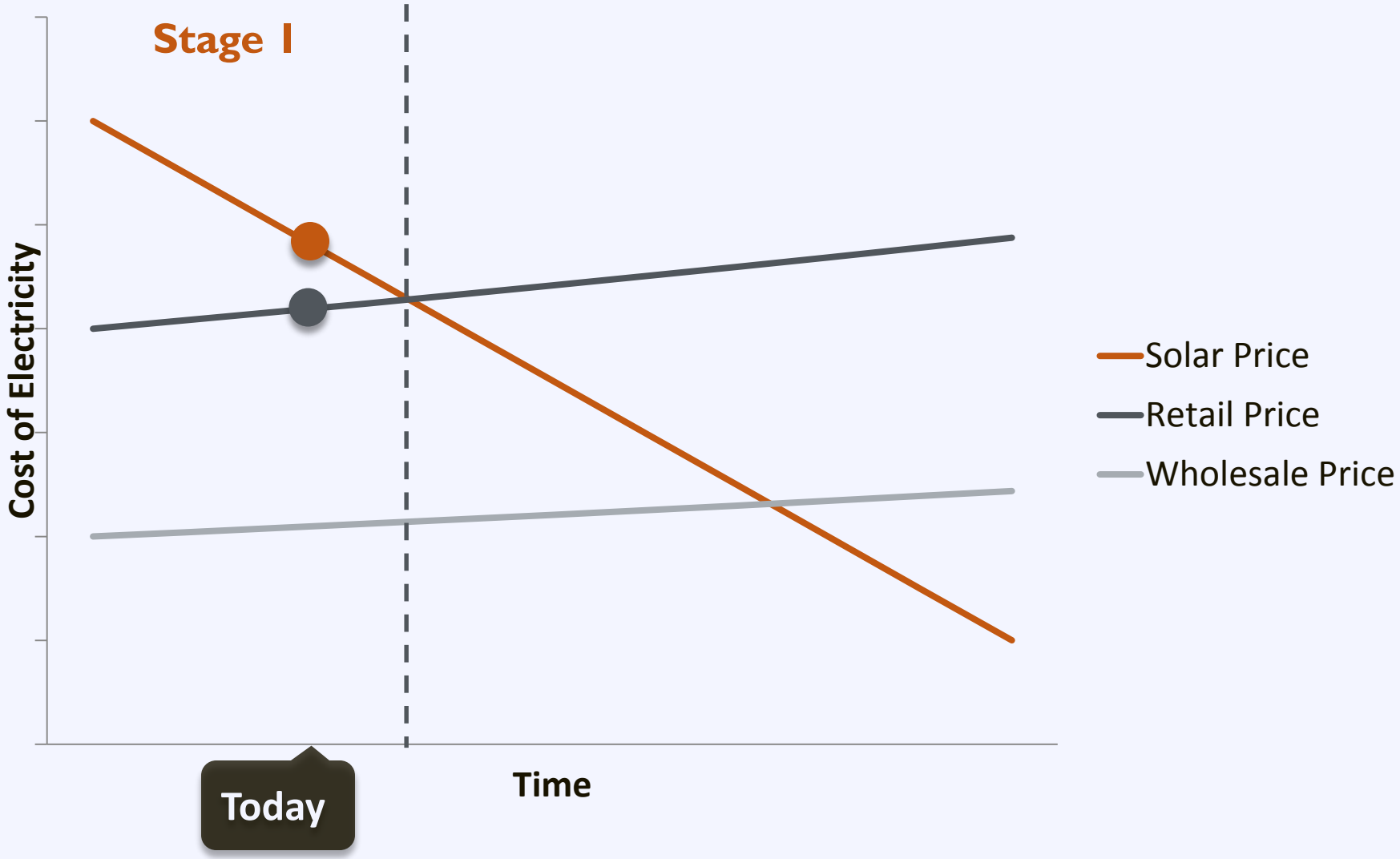
The Cost of Solar PV



Powered by SunShot U.S. Department of Energy

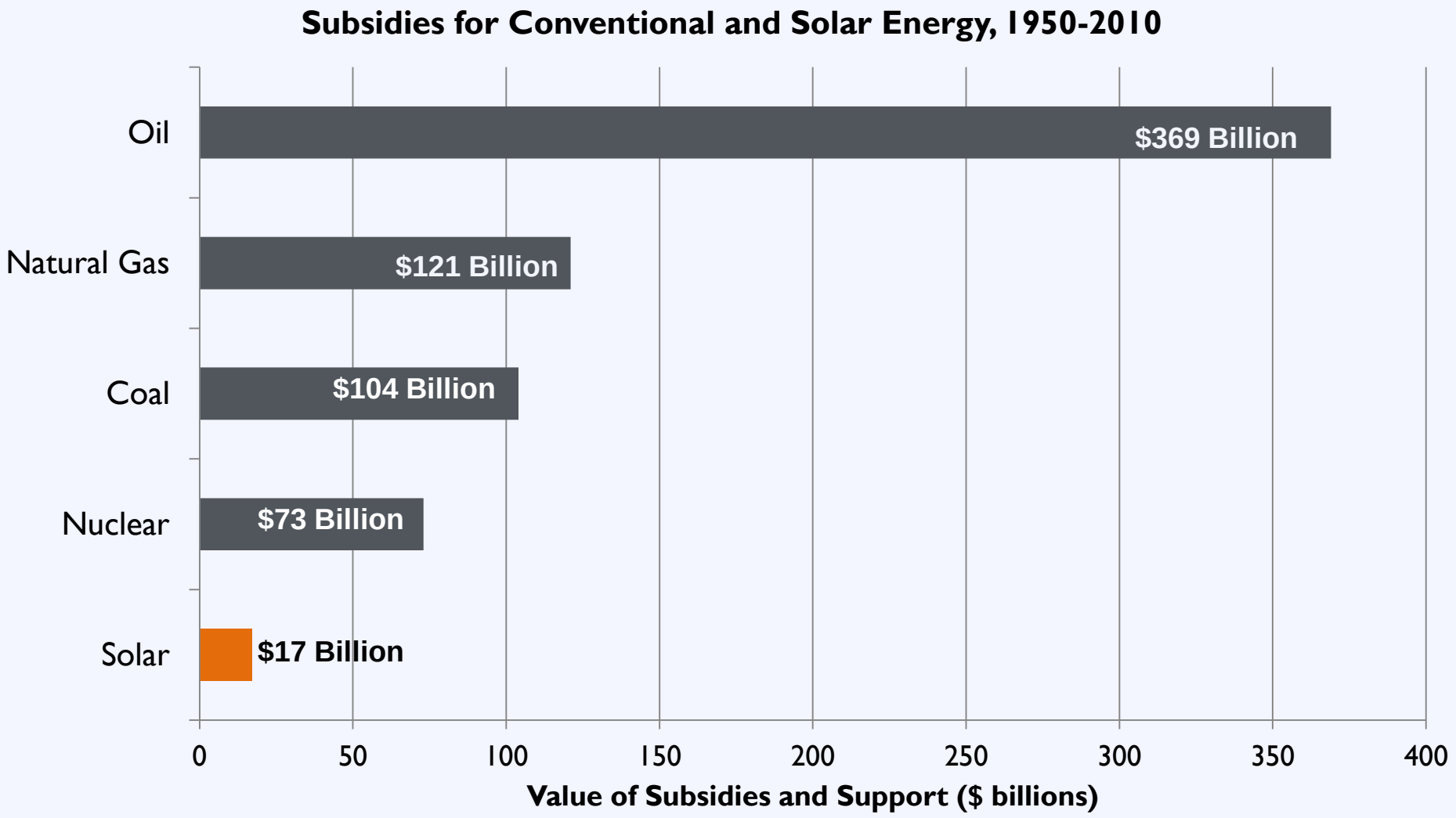
Source: OpenPV (https://openpv.nrel.gov/search?state=ME&zipcode=)

The Cost of Solar PV



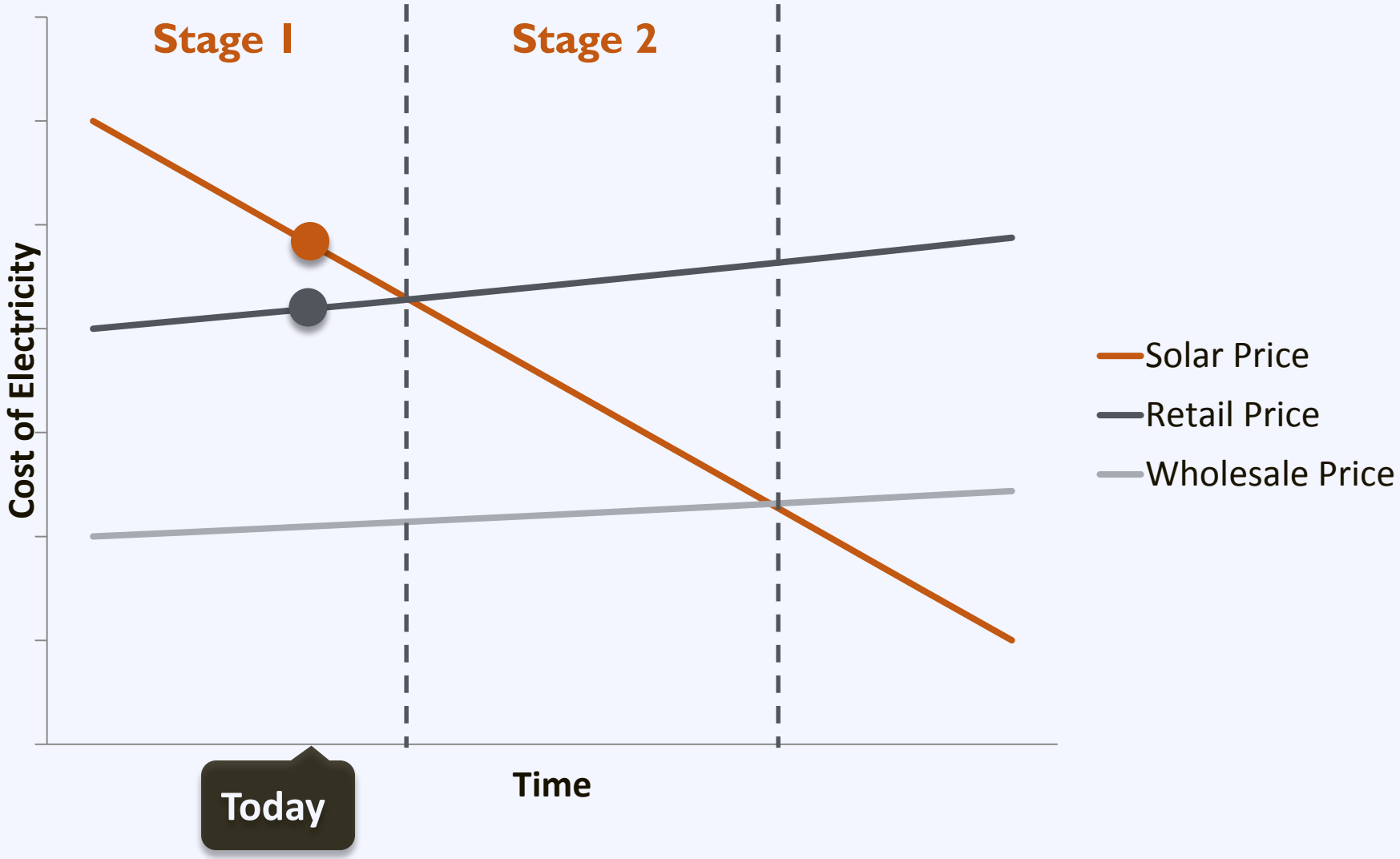
Source: Solar Electric Power Association

Subsidies and Support



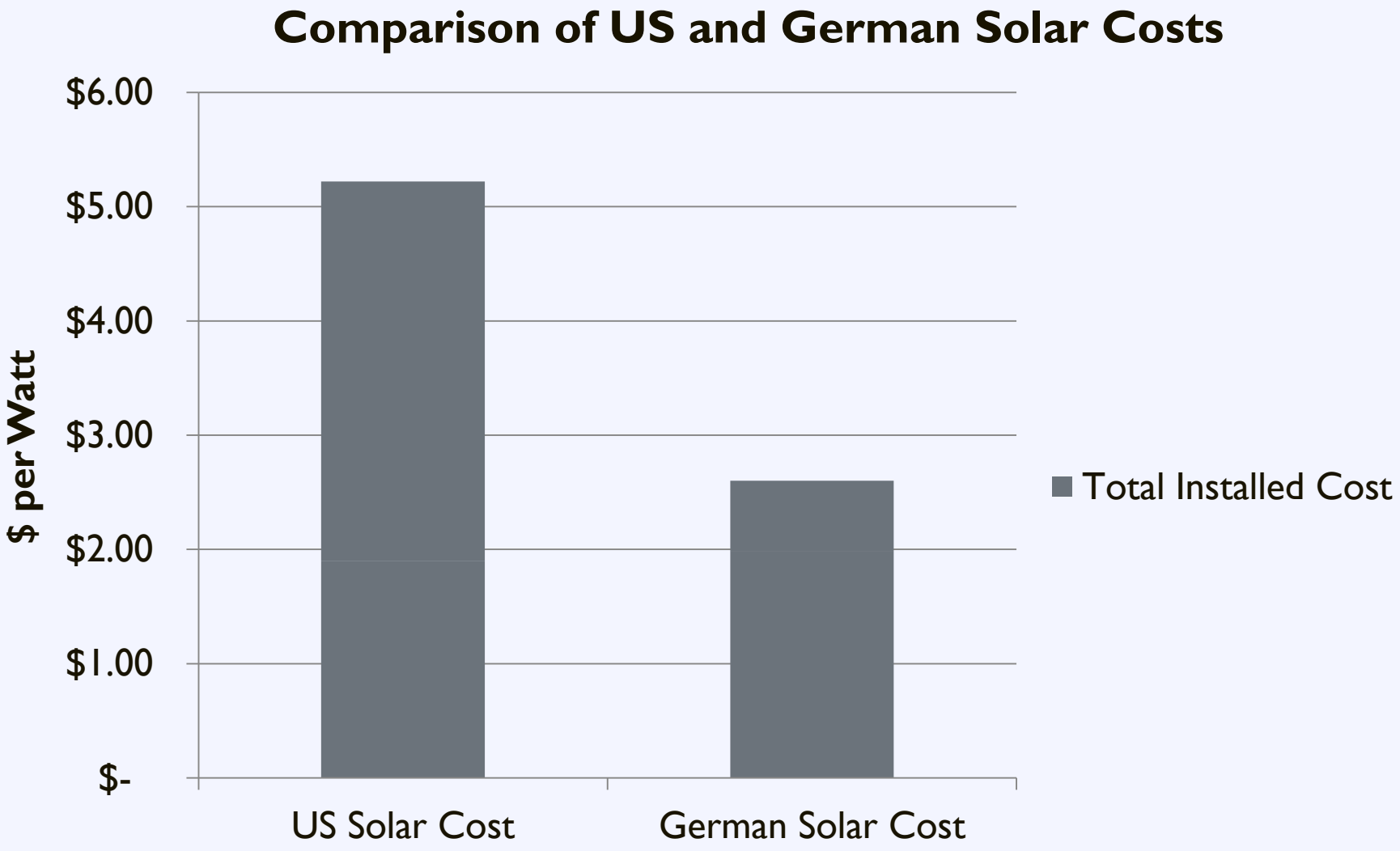
Source: Management Information Services, Inc. October 2011. *60 Years of Energy Incentives: Analysis of Federal Expenditures for Energy Development*; SEIA, May 1, 2012. *Federal Energy Incentives Report.*

The Cost of Solar PV



Source: Solar Electric Power Association

The Cost of Solar in the US



Source: NREL (http://www.nrel.gov/docs/fy14osti/60412.pdf)
LBNL (http://emp.lbl.gov/sites/all/files/lbnl-6350e.pdf)(http://www1.eere.energy.gov/solar/pdfs/sunshot_webinar_20130226.pdf)

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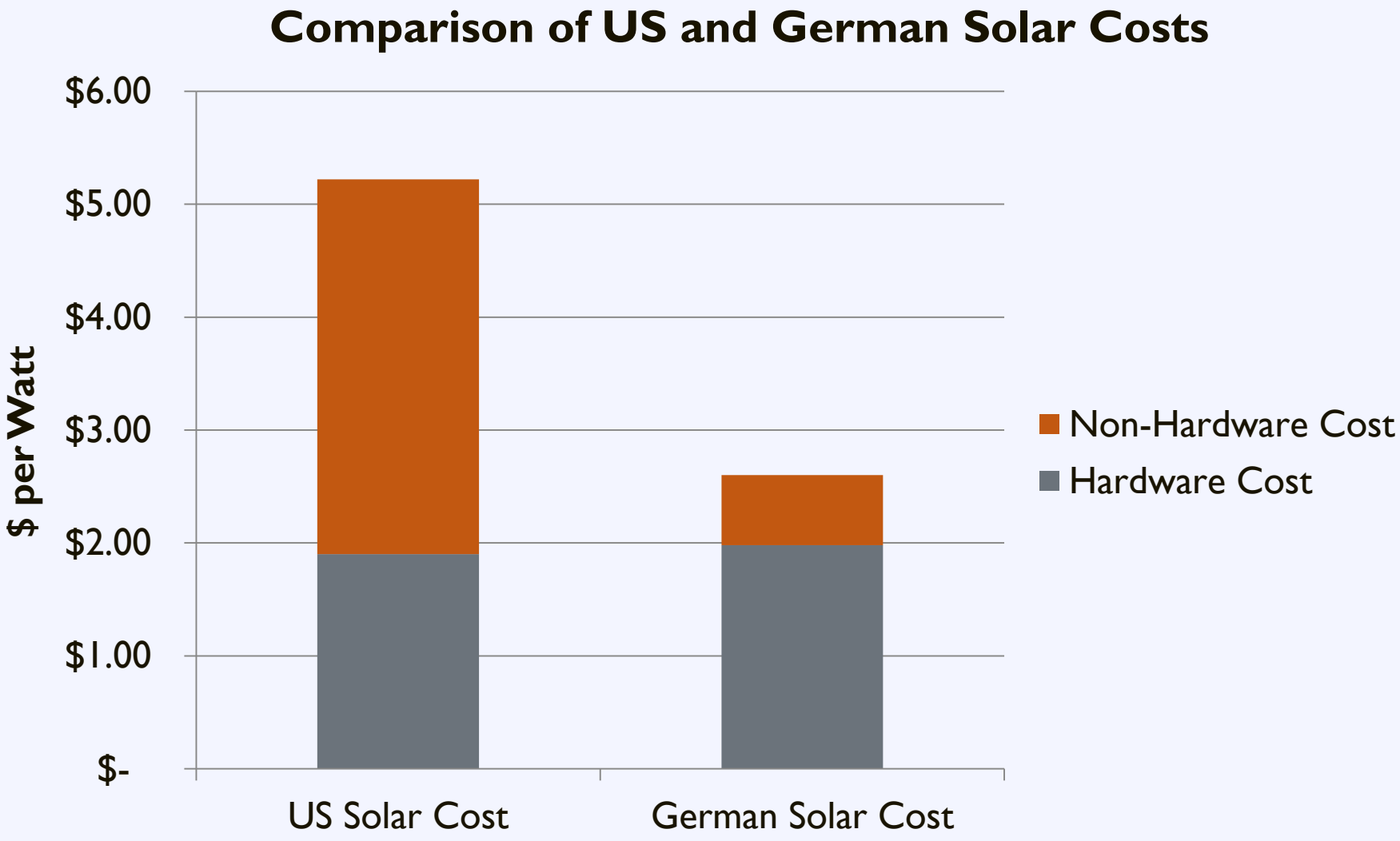
The Cost of Solar in the US



Powered by SunShot U.S. Department of Energy

Source: NREL (http://www.nrel.gov/docs/fy14osti/60412.pdf)
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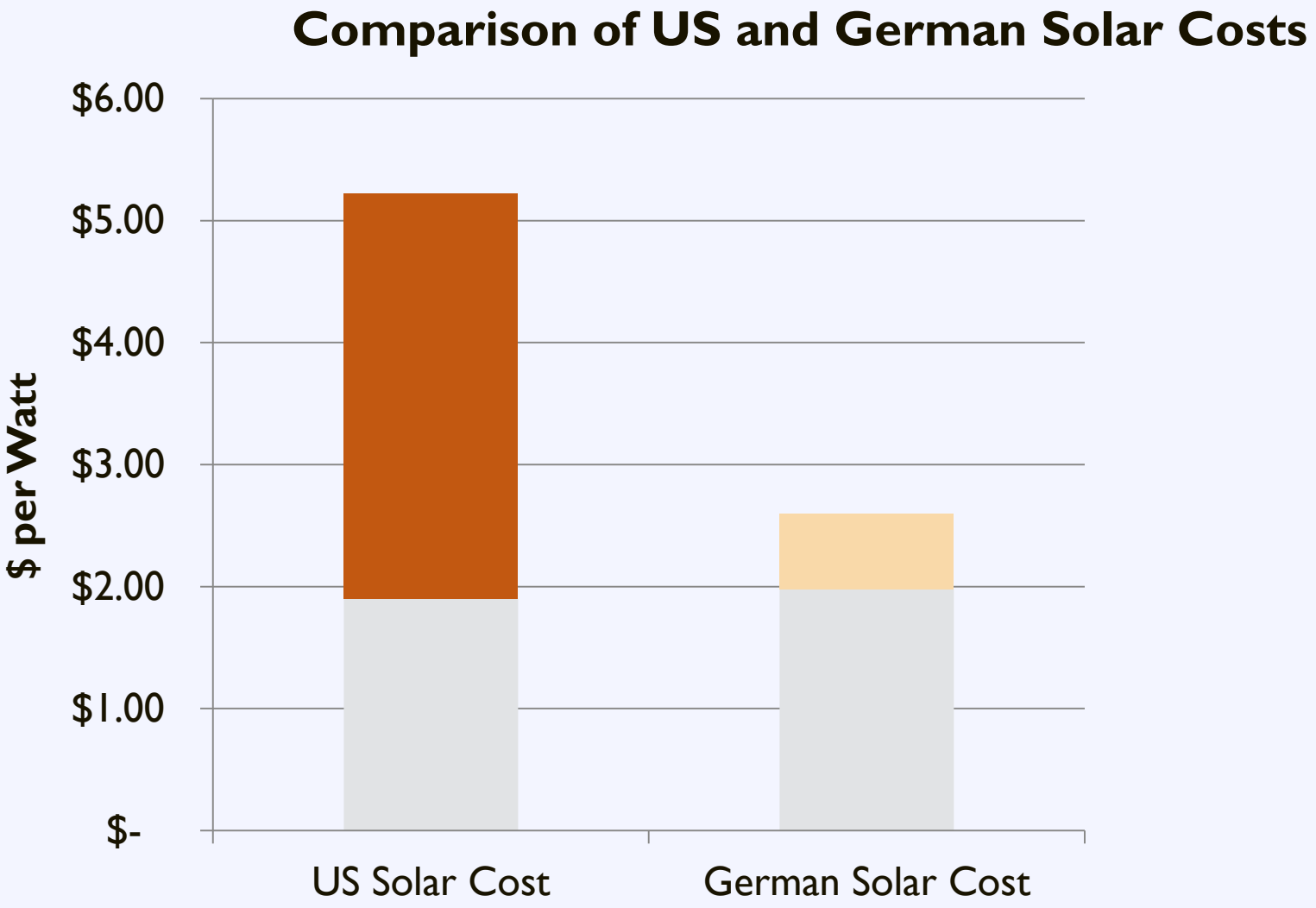

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Source: NREL (http://www.nrel.gov/docs/fy14osti/60412.pdf)
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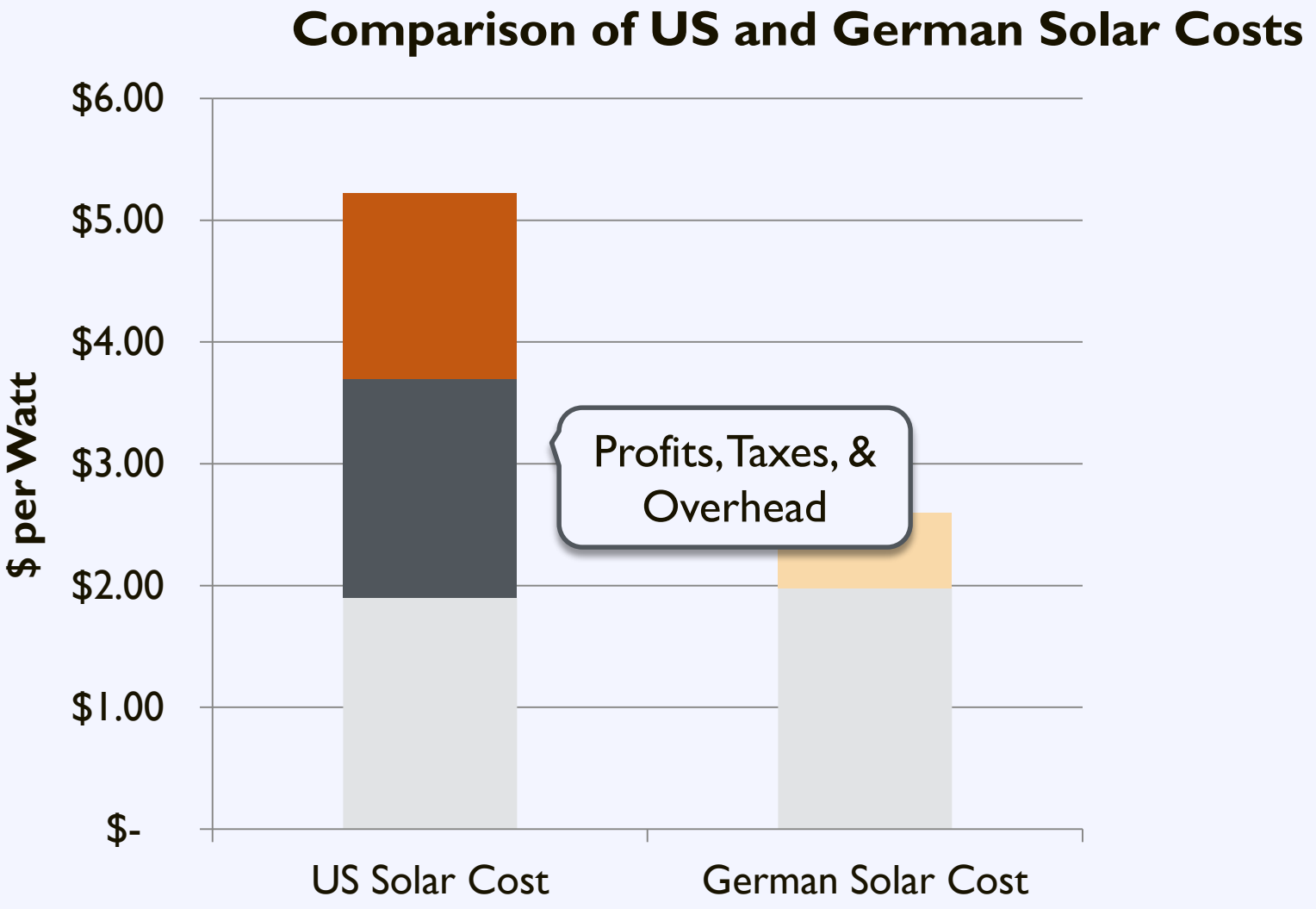

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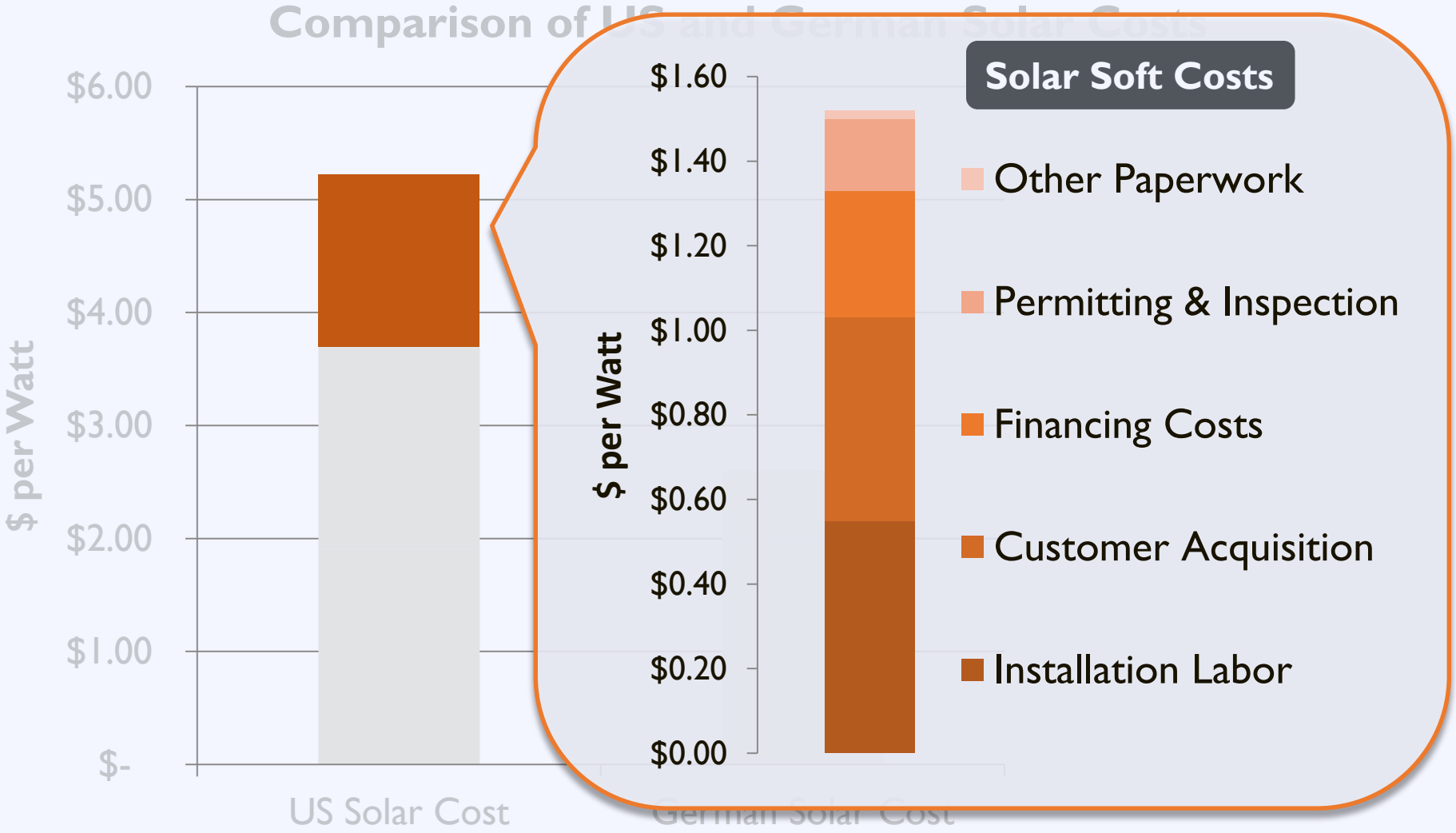

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LBNL (http://emp.lbl.gov/sites/all/files/lbnl-6350e.pdf)(http://www1.eere.energy.gov/solar/pdfs/sunshot_webinar_20130226.pdf)

Challenge: Installation Time

New York City's Goal

100 days

from inception to completion

Germany Today

8 days

from inception to completion

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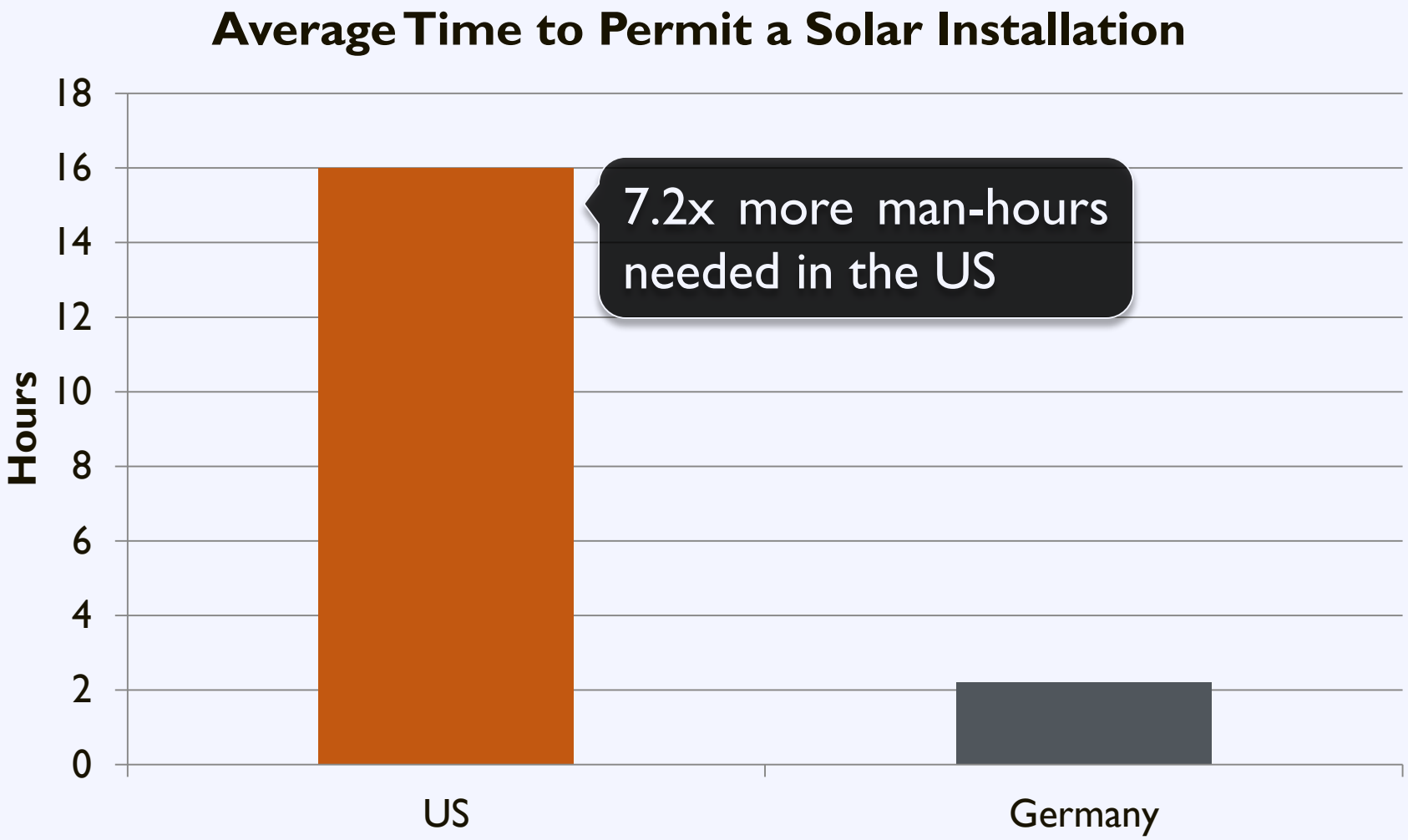
U.S. Department of Energy

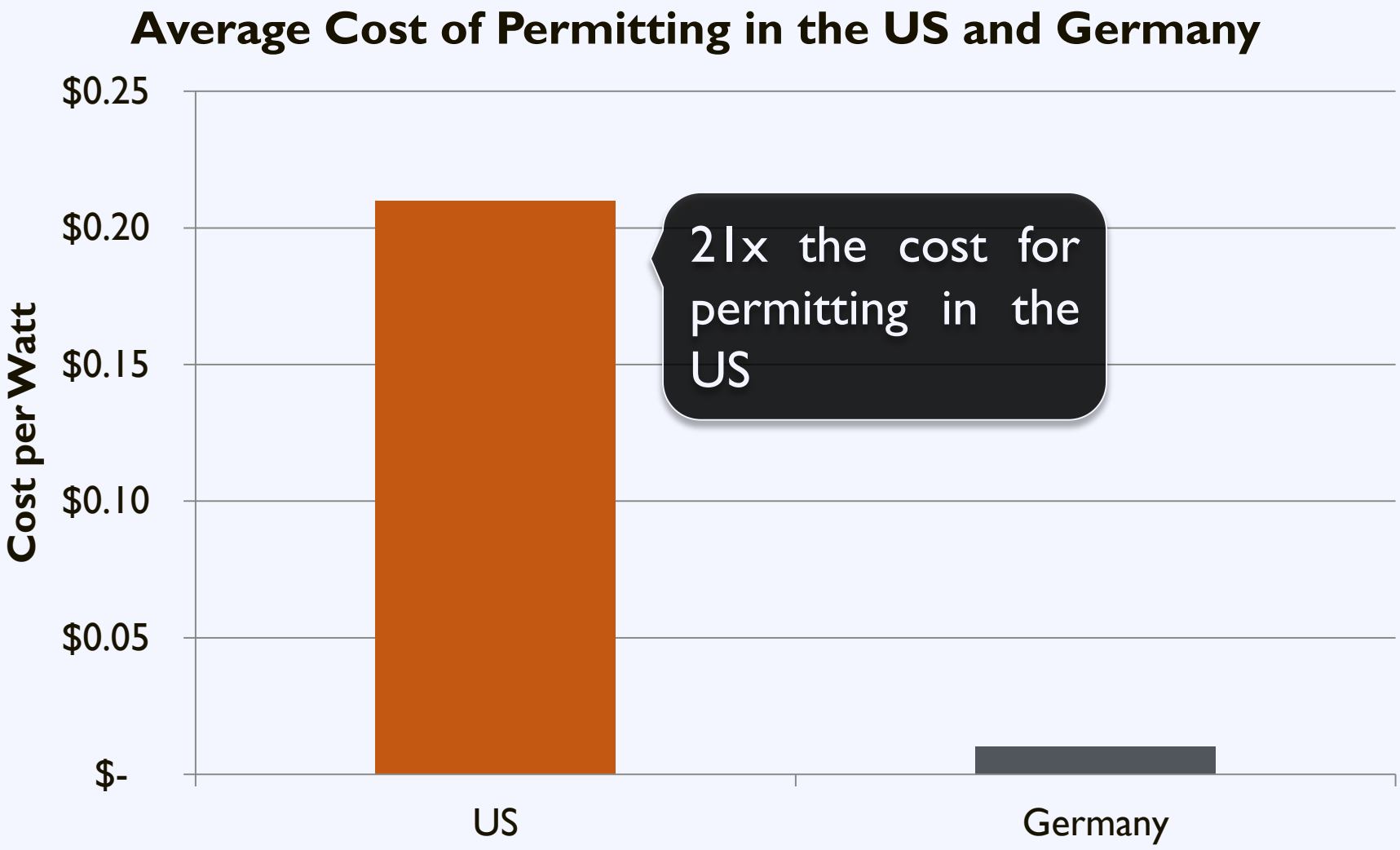
Photon Magazine

Time to Installation



Source: NREL, LBNL

Permitting Costs



Source: NREL, LBNL

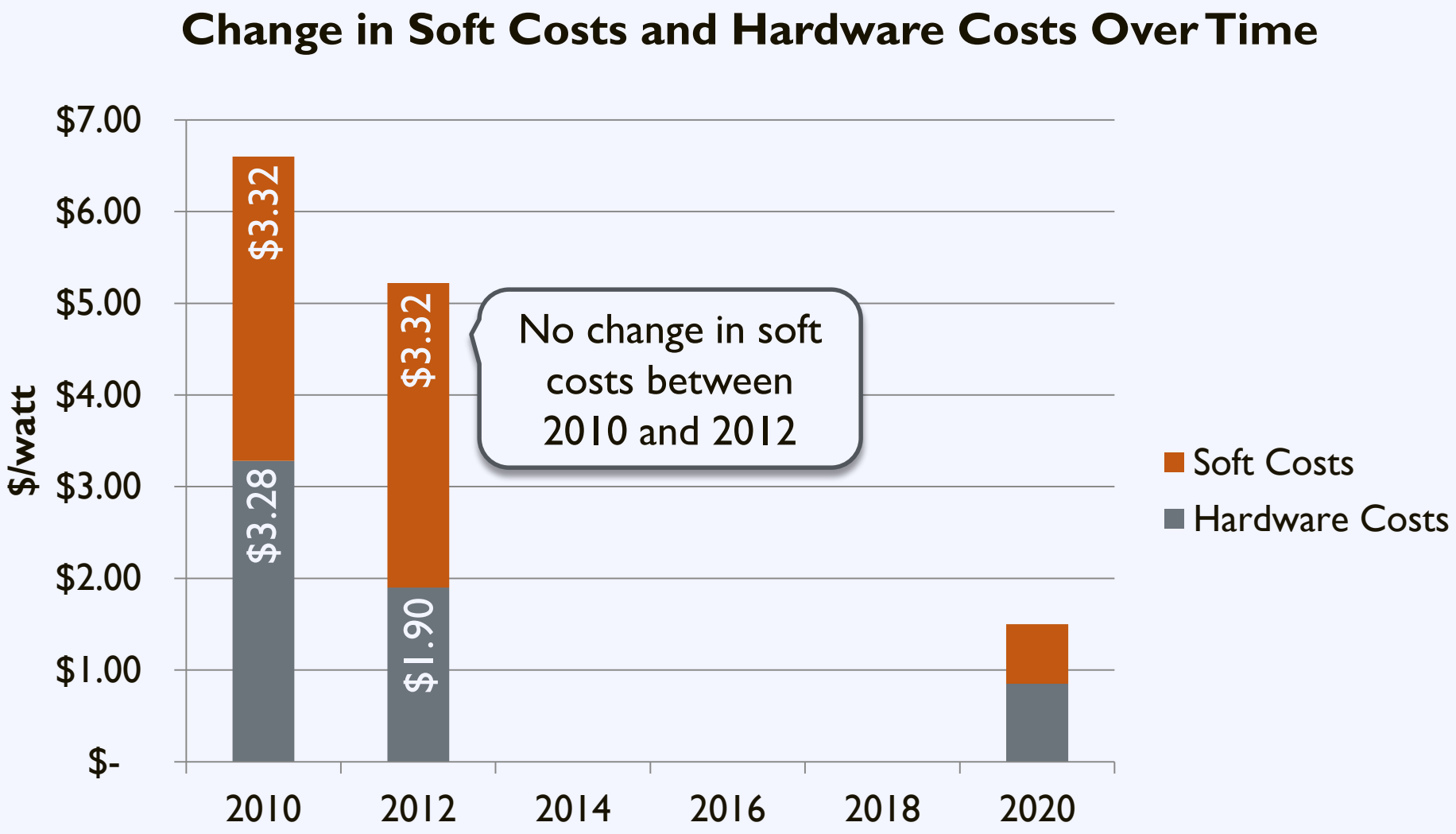
Germany's Success

Consistency and Transparency

through

Standardized Processes

The Cost of Solar in the US



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Workshop Goal

Enable local governments to replicate successful solar practices to reduce soft costs and expand local adoption of solar energy

Agenda

10:20 – 10:50	Putting Solar Energy on the Local Policy 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*
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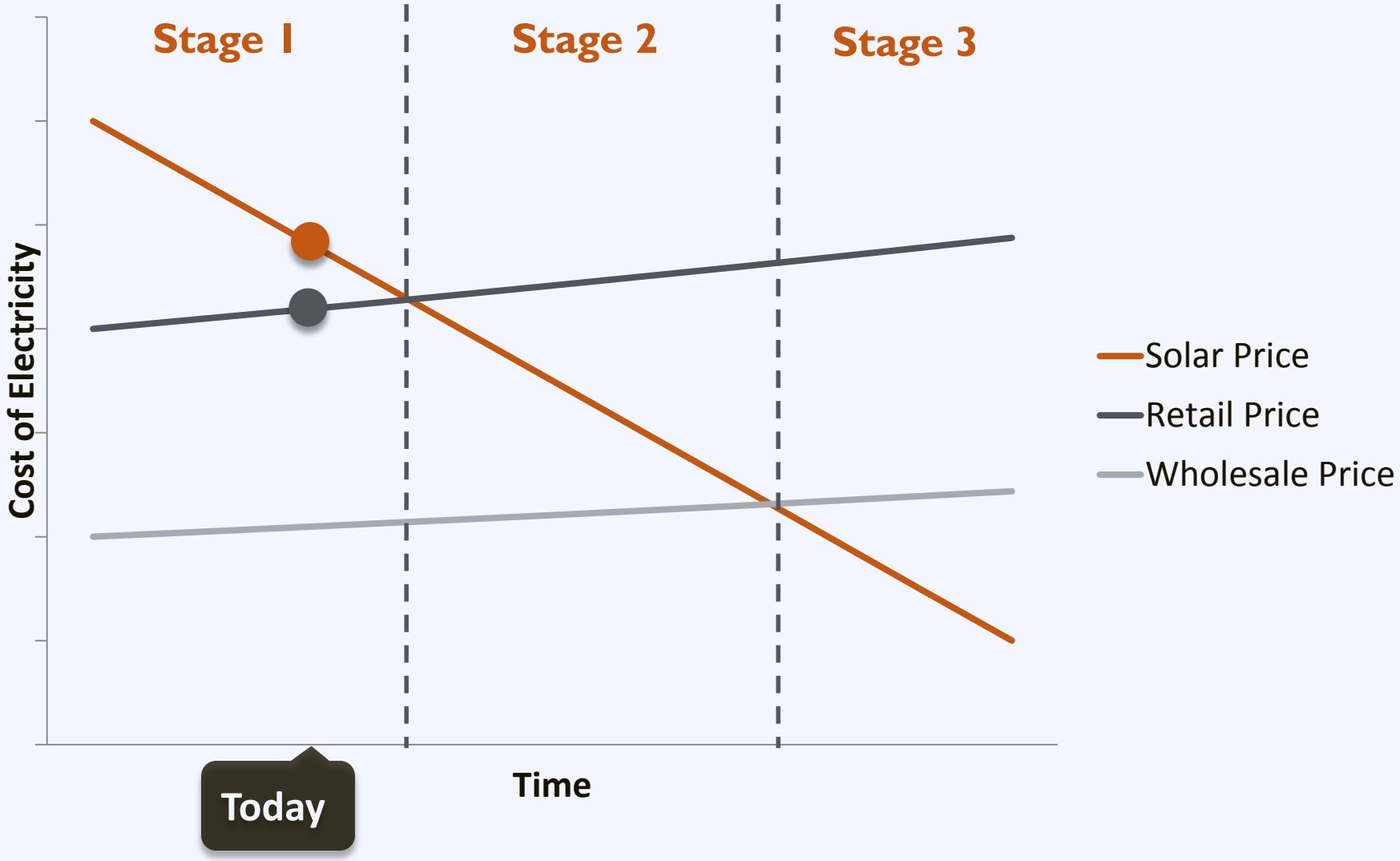
1:15 – 1:25	*Break*
1:25 – 2:20	Local Speakers
2:20– 2:50	Developing and Solar Policy Implementation Plan for Your Community and Next Steps

Solar Market: Trends



Source: Solar Electric Power Association

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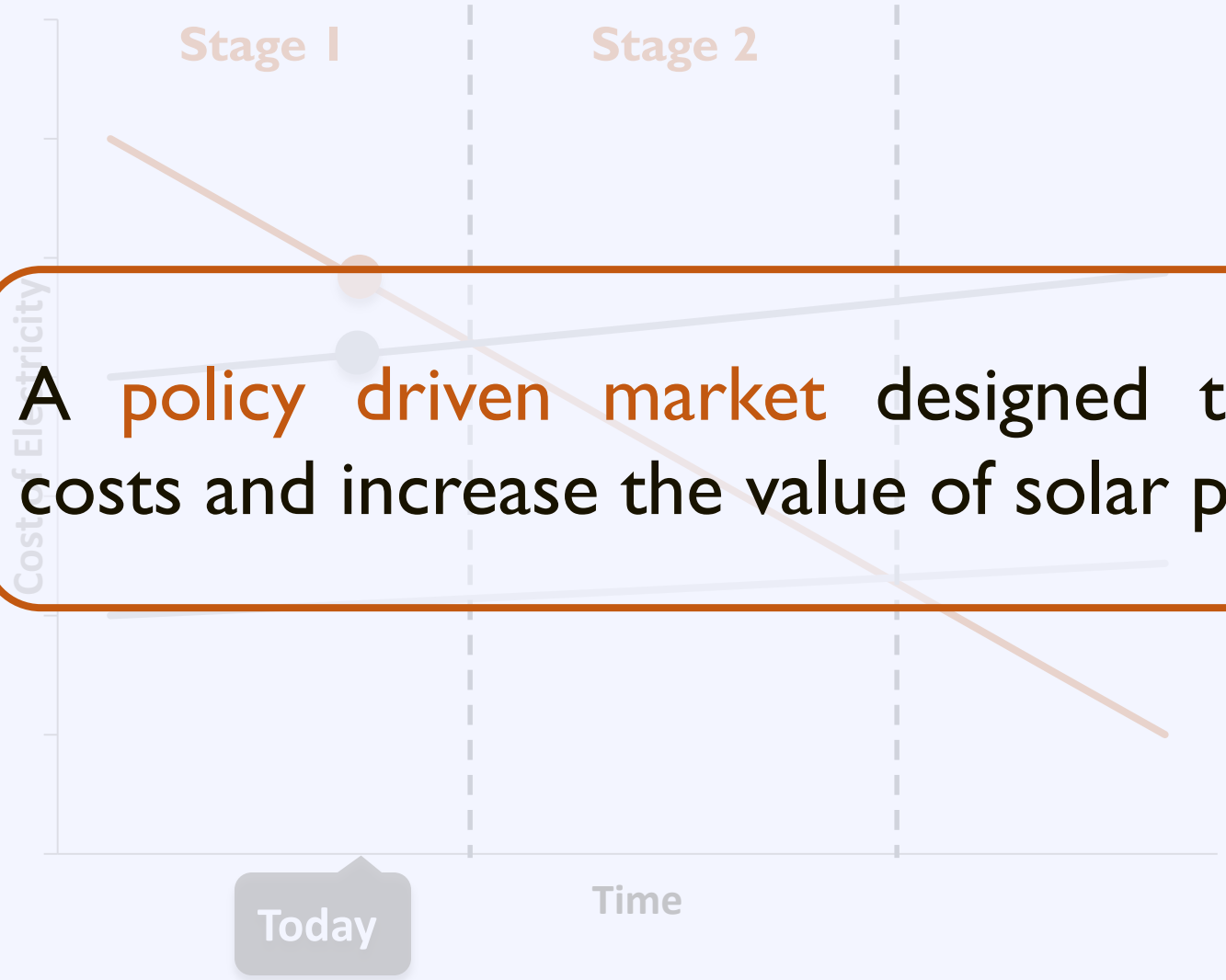

A policy driven market designed to mitigate costs and increase the value of solar production

Source: Solar Electric Power Association

A Policy Driven Market

Federal	Investment Tax Credit	Accelerated Depreciation	Qualified Energy Conservation Bond
State & Utility	Renewable Portfolio Standard	Net Metering	Interconnection
	Solar Access	Property Tax Exemption	Value of Solar

A Policy Driven Market

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Investment Tax Credit

Type: Tax Credit

Eligibility: For-Profit Organizations & Individual Taxpayers

Value: 30% of the installation cost through 2019 (26% for 2020, 22% for 2021)

Availability: Residential - Expires 12/31/2021

Commercial - Permanent 10% Credit

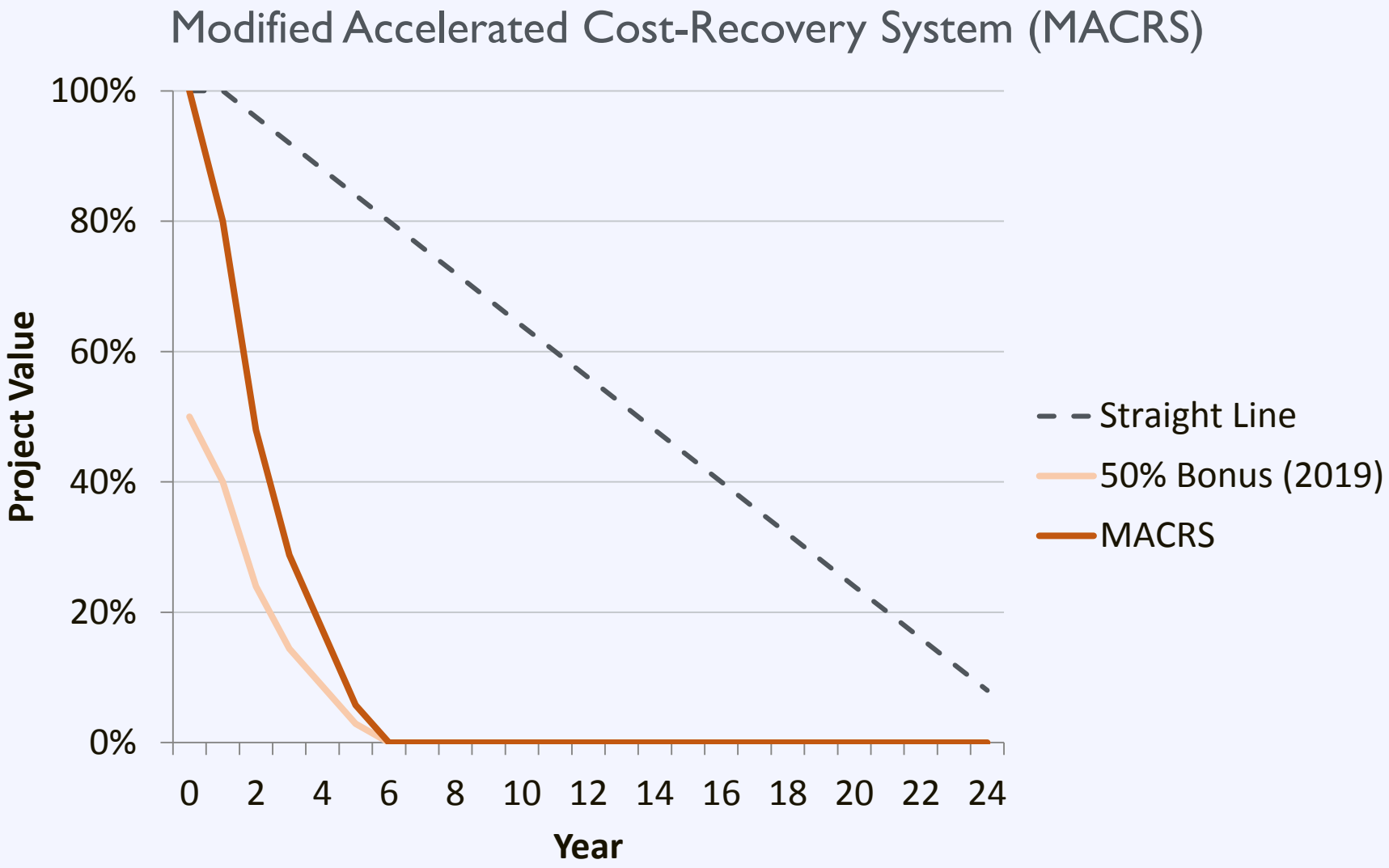
Source: DSIRE

Accelerated Depreciation

Modified Accelerated Cost-Recovery System (MACRS)

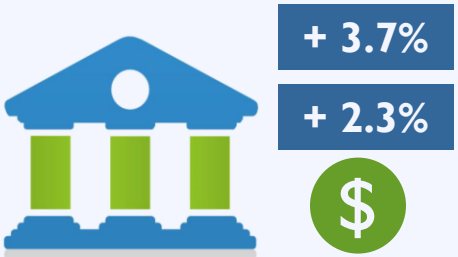
- Accelerated depreciation schedule – value can be as high as 20-25% of the project cost
- Bonus Depreciation offered through 2019
  - 50% bonus through 2017
  - 40% bonus in 2018
  - 30% bonus in 2019

Accelerated Depreciation

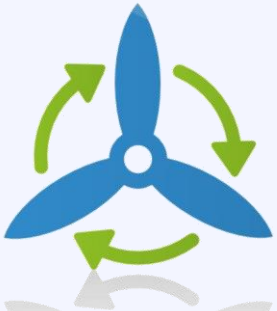


Qualified Energy Conservation Bond

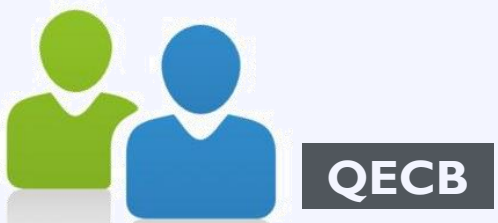
US Treasury



Local Gov



Project



Bond Holders

Qualified Energy Conservation Bond

Local Government	Amount	Use
Portland Housing Authority	$4,097,100	Energy efficiency improvements
Total Used	$4,097,100	
Total Remaining	$9,559,900	

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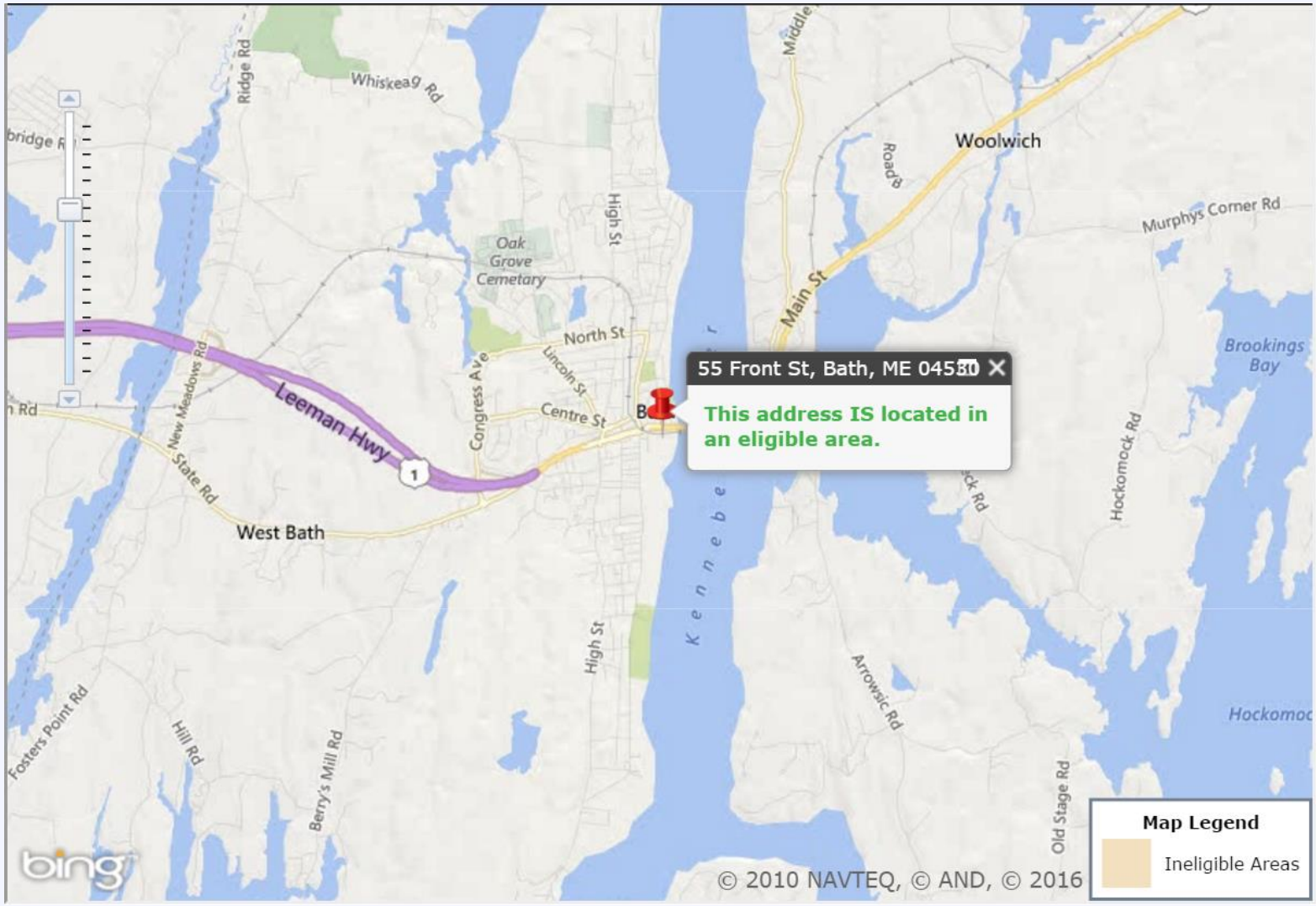
Source: Energy Programs Consortium (Jan 2016)

USDA REAP

- USDA Rural Energy for America Program (REAP)
  - Guaranteed loan financing and grant funding for agricultural producers & rural small businesses to install renewable energy systems
  - Grants: $2,500-$500,000
  - Loan Guarantees: $5,000-$25 million
    - Up to 85% loan guarantee

Source: http://www.rd.usda.gov/programs-services/rural-energy-america-program-renewable-energy-systems-energy-efficiency

USDA REAP



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A Policy Driven Market

Federal	Investment Tax Credit	Accelerated Depreciation	Qualified Energy Conservation Bond
State & Utility	Renewable Portfolio Standard	Net Metering	Interconnection
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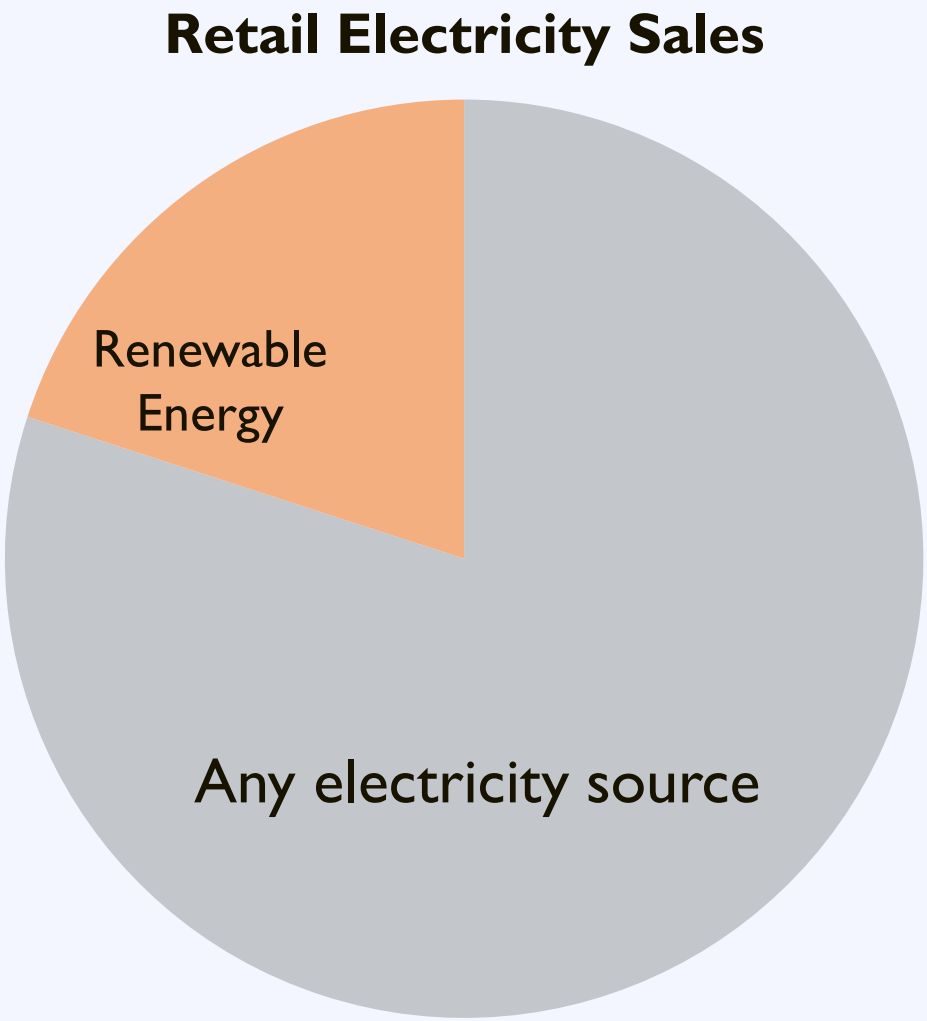
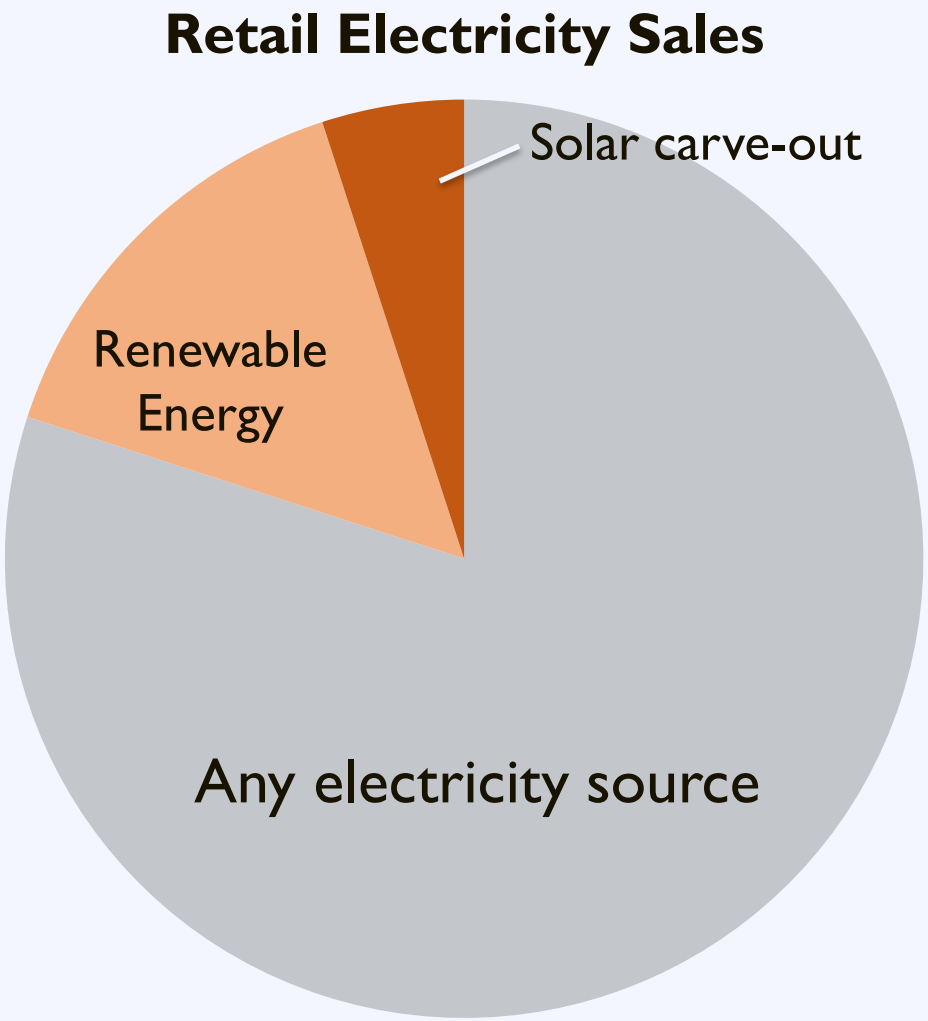
Renewable Portfolio Standard

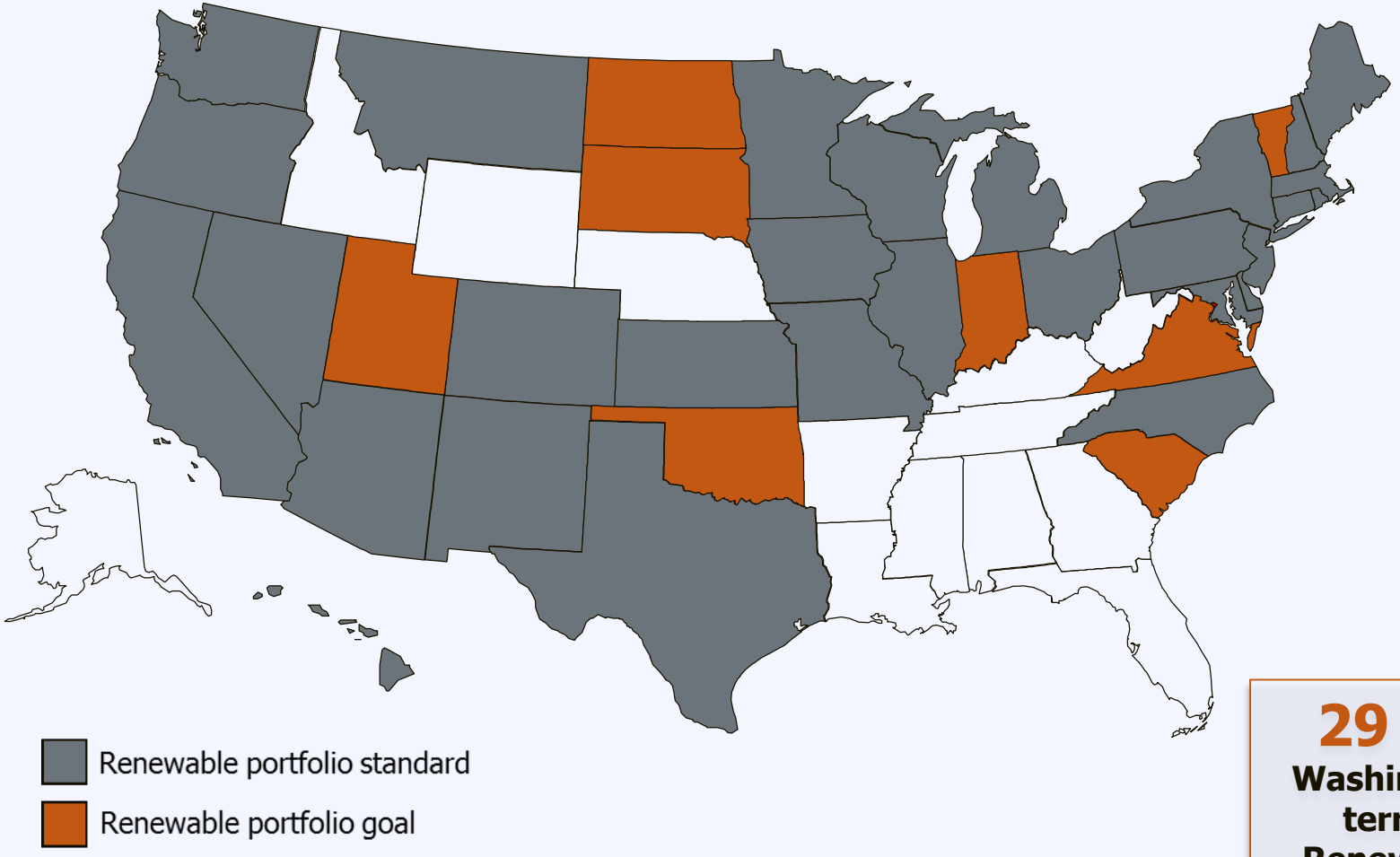


Renewable Portfolio Standard



Renewable Portfolio Standard

www.dsireusa.org / April 2015



29 states, +
Washington DC and 2 territories have Renewable Portfolio Standards
(8 states and 2 territories have renewable portfolio goals)

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U.S. Department of Energy

RPS Impacts: Solar Deployment

RPS and Solar/DG Status of Top Ten Solar States by Cumulative Installed Grid-Connected PV Capacity (as of Q4 2013)

Ranks	State	RPS?	Solar/DG Provision?
1	California	Y	N
2	Arizona	Y	Y
3	New Jersey	Y	Y
4	North Carolina	Y	Y
5	Massachusetts	Y	Y
6	Nevada	Y	Y
7	Colorado	Y	Y
8	Hawaii	Y	N
9	New Mexico	Y	Y
10	New York	Y	Y

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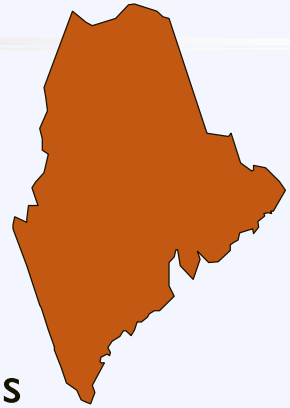
Source: DSIRE Solar (http://dsireusa.org/documents/summarymaps/Solar_DG_RPS_map.pdf); IREC, U.S. Solar Market Trends 2013 (http://www.irecusa.org/annual-u-s-solar-market-trends-report/)

RPS: Maine Overview



- 40% of retail electricity sales by 2017
  - 10% Class I Resources
    - Fuel cells, tidal, solar, wind, geothermal, hydro, biomass
    - New renewables (must have come online after Sept. 1, 2005)
  - 30% Class II Resources
    - Also includes existing renewables, municipal solid waste, and combined heat & power (>100MW)
    - Less stringent hydro requirements
- 1.5 credit multiplier for community-based renewable energy projects

Source: DSIRE

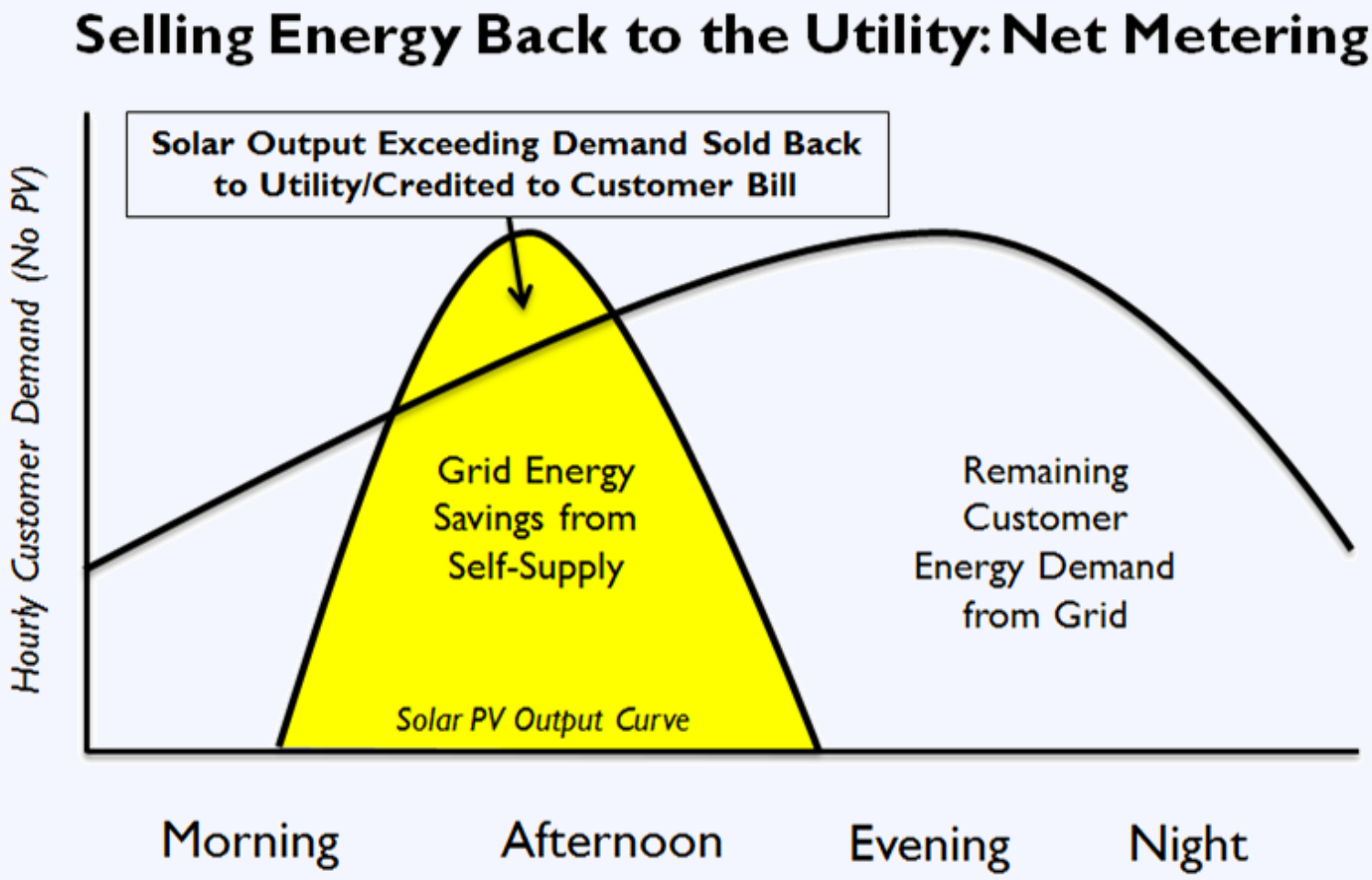
A Policy Driven Market

Federal	Investment Tax Credit	Accelerated Depreciation	Qualified Energy Conservation Bond
State & Utility	Renewable Portfolio Standard	Net Metering	Interconnection
	Solar Access	Property Tax Exemption	Value of Solar

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



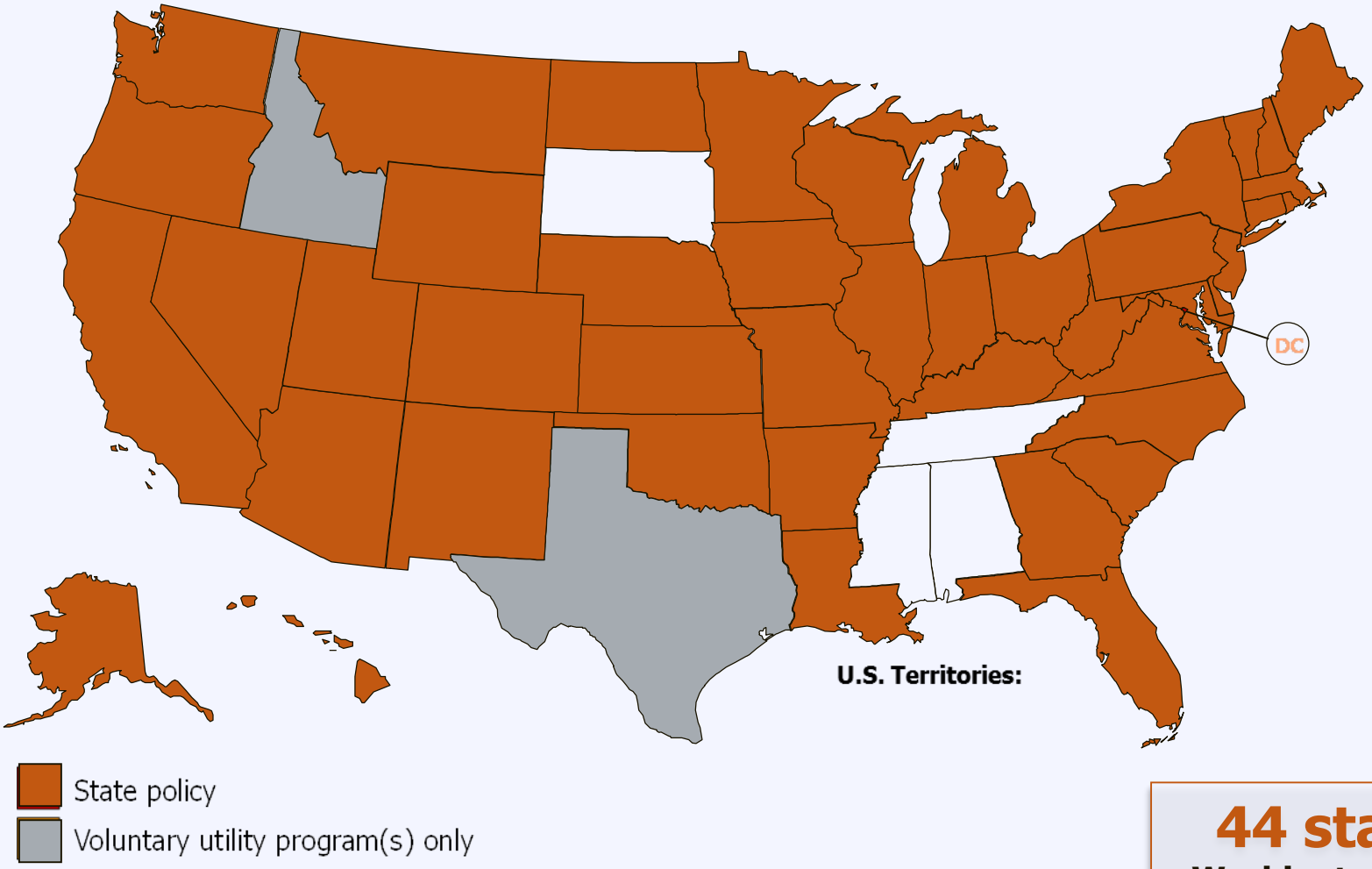
Net Metering: Market Share

More than **95%** of distributed PV Installations are net-metered

Powered by SunShot U.S. Department of Energy

Source: IREC, *U.S. Solar Market Trends 2013* (http://www.irecusa.org/annual-u-s-solar-market-trends-report/)

Net Metering



44 states, + Washington DC and 4 territories have Net Metering Policies

Source: DSIRE (April 2015)

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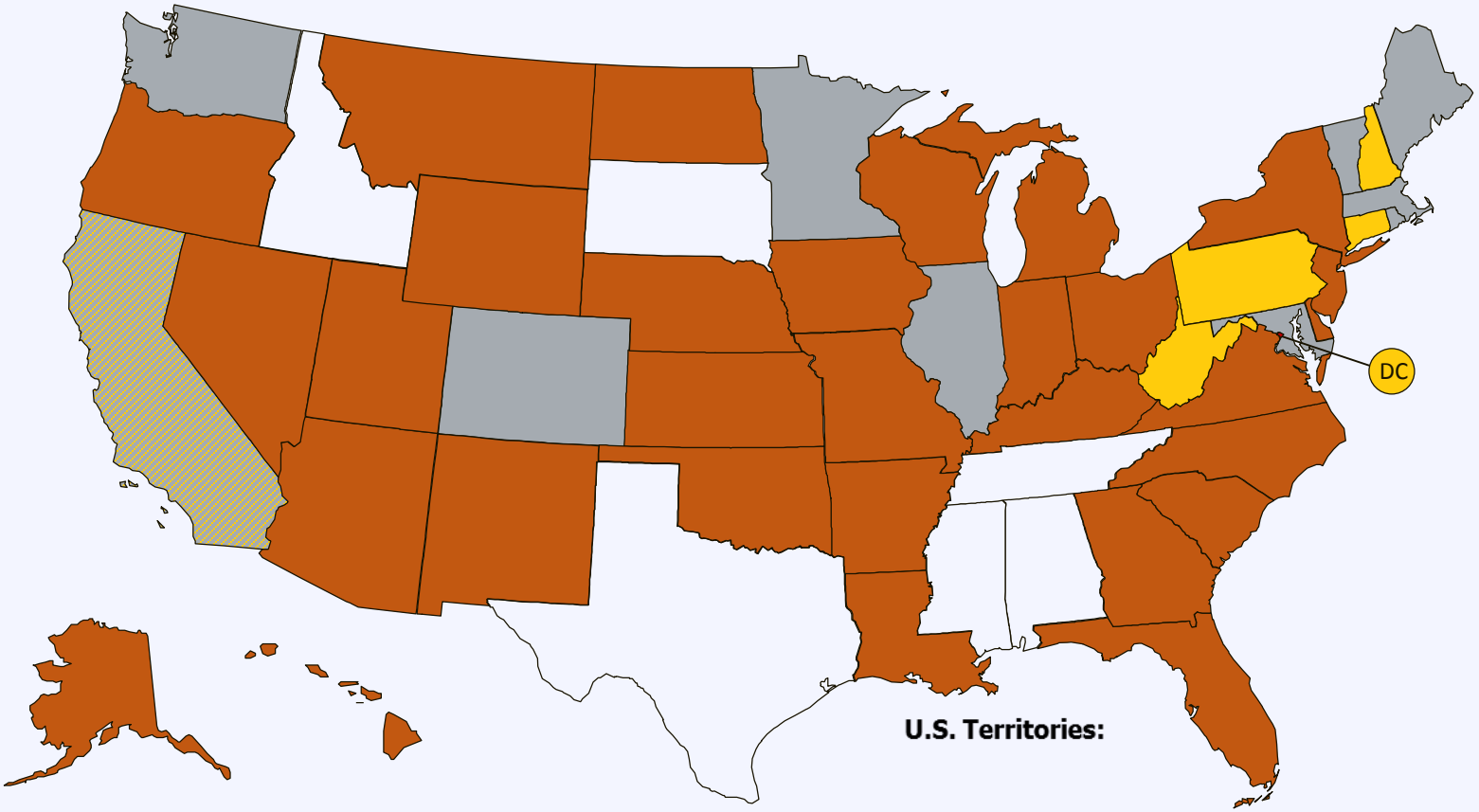
Net Metering: Virtual

Enhanced Net Metering



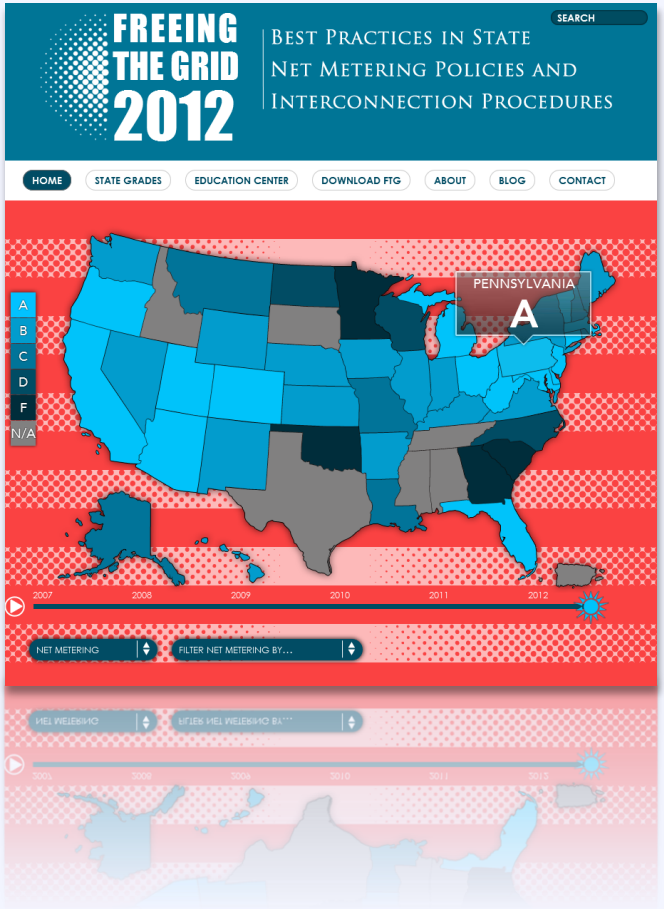
Source: DSIRE (April 2015)

Net Metering: Resources

Resource **Freeing the Grid**

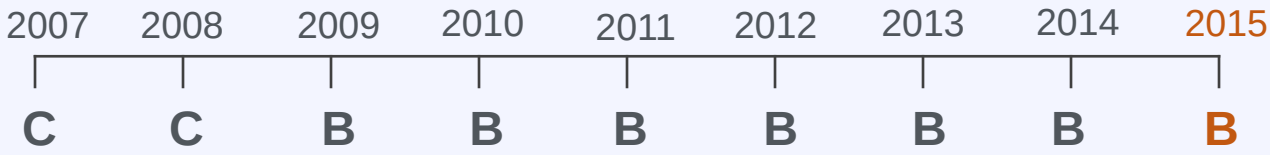
Provides a "report card" for state policy on net metering and interconnection

http://freeingthegrid.org/



Net Metering: Maine

B



Net Excess Credit Value
Retail Rate
Credits granted to utility every 12 months

Applicable Utilities
All utilities

System Capacity Limit
660 KW- IOU customers
100 kW- Muni/Co-op customers

Meter Aggregation
Allowed

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Source: Freeing the Grid

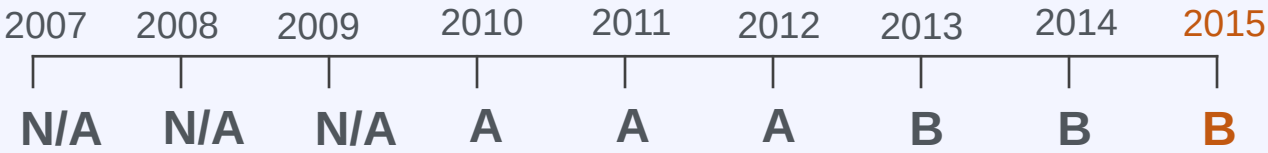
A Policy Driven Market

Federal	Investment Tax Credit	Accelerated Depreciation	Qualified Energy Conservation Bond
State & Utility	Renewable Portfolio Standard	Net Metering	Interconnection
	Solar Access	Property Tax Exemption	Value of Solar

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.

Interconnection: Maine



Applicable Technologies
Most renewable/DG technologies

Applicable Utilities
All transmission & distribution utilities

System Capacity Limit
Not specified

Bonus
Insurance waived for generators up to 25 kW

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U.S. Department of Energy

Source: Freeing the Grid

A Policy Driven Market

Federal	Investment Tax Credit	Accelerated Depreciation	Qualified Energy Conservation Bond
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Solar Access

A landowner does not have any legal right to the free flow of light and air across the adjoining land of his neighbor

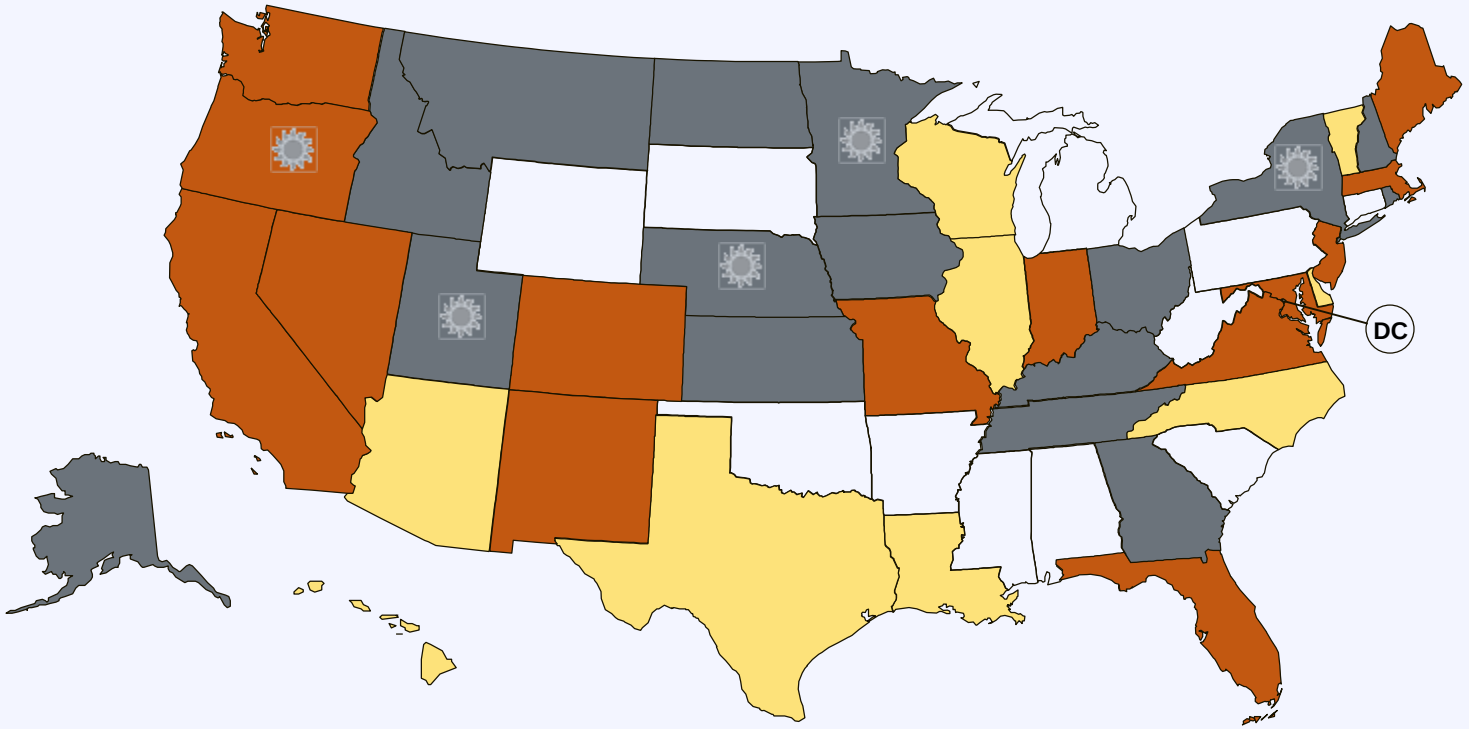
Source: Google Earth

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



Solar Easements Provision

Solar Rights Provision

Solar Easements and Solar Rights Provisions

U.S. Virgin Islands

Local option to create solar rights provision

Powered by SunShot
U.S. Department of Energy

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

Maine Solar Access Law

Solar Rights Provision:

- Municipal & HOA regulations cannot prohibit a person from installing/using a solar energy device (including clotheslines and drying racks) on their own property
- However, municipalities & HOAs may reasonably restrict the installation & use of solar energy devices to protect:
  - Public health & safety
  - Buildings from damage
  - Historic/aesthetic values (when a comparable alternative is available)
  - Shorelands
- May also restrict on:
  - Residential property that is commonly owned
  - Common areas of condominiums

Maine Solar Access Law

Solar Easements:

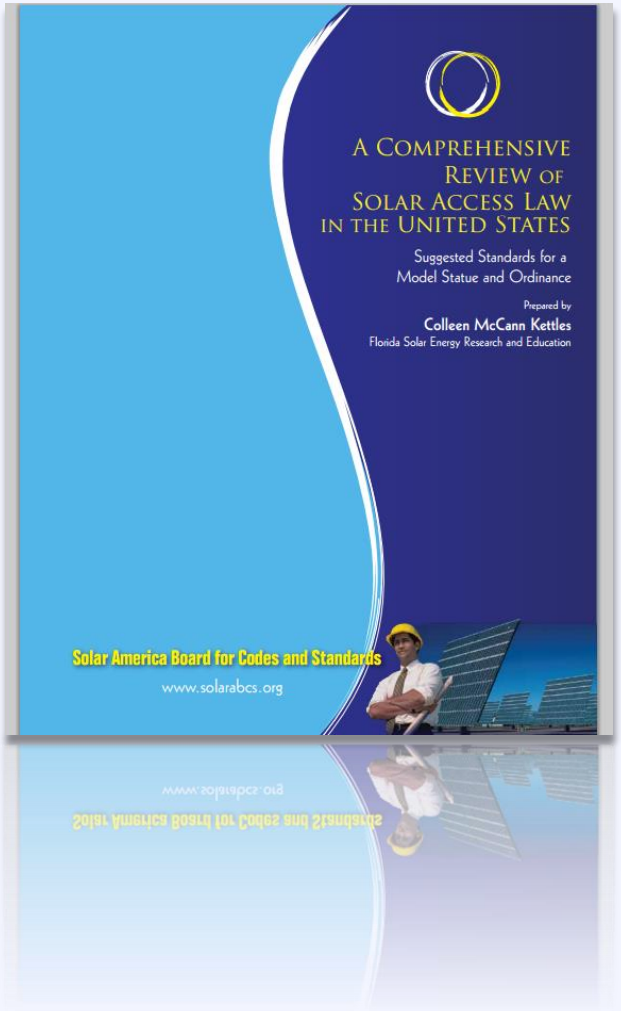
- Maine allows for the creation of solar easements between property owners
- Easements may commonly include:
  - Description of the space affected
  - Terms & conditions of the easement
  - Map showing affected properties

Solar Access

Resource **Solar America Board for Codes & Standards**

A comprehensive review of solar access law in the US – Suggested standards for a model ordinance

www.solarabcs.org



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A Policy Driven Market

Federal	Investment Tax Credit	Accelerated Depreciation	Qualified Energy Conservation Bond
State & Utility	Renewable Portfolio Standard	Net Metering	Interconnection
	Solar Access	State Tax Incentives	Value of Solar

State Tax Incentives

- State Tax Credits: None
- Property Tax Exemption: None
  - Must pay property tax on value added by a solar PV system
- Sales Tax Exemption: None
  - Must pay 5.5% sales tax on solar PV systems

A Policy Driven Market

Federal	Investment Tax Credit	Accelerated Depreciation	Qualified Energy Conservation Bond
State & Utility	Renewable Portfolio Standard	Net Metering	Interconnection
	Solar Access	State Tax Incentives	Value of Solar

Value of Solar: Maine

- S.P. 644 (2014) directed the Maine Public Utilities Commission to prepare a report on the value of distributed solar energy generation to the state.
  - Final study was released on March 3, 2015
    - First-year value of distributed solar = $0.182 per kWh
    - Long term (25-year levelized) value = $0.337 per kWh
- L.D. 1263 (2015) directed the Maine Public Utilities Commission to convene a stakeholder engagement process to derive common solar values
  - Agreed on need for distributed and large-scale solar (~300 MW)
  - Agreed on need to address sustainable net metering replacement
  - No clarity on what value solar generators should receive for excess generation/sell all value

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Effective Local Solar Policy

Local Solar Policy

Planning for Solar

Solar in Development Regulation

Effective Solar Permitting Process

Solar Market Development Tools

Effective Local Solar Policy

Local Solar Policy

Planning for Solar

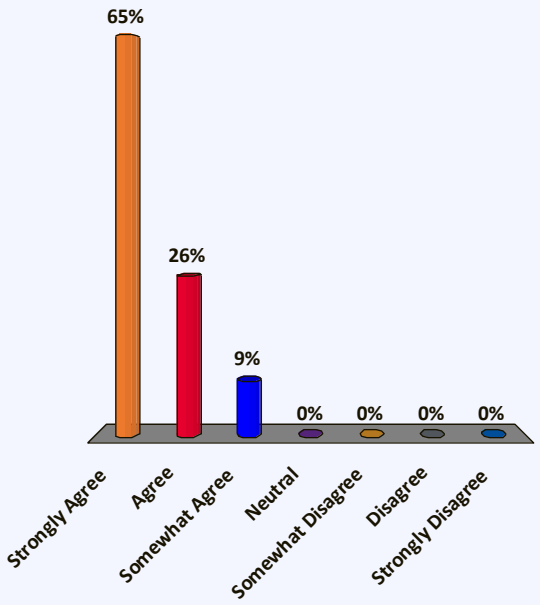
Visioning & goal setting

Effective Solar Permitting Process

Solar Market Development Tools

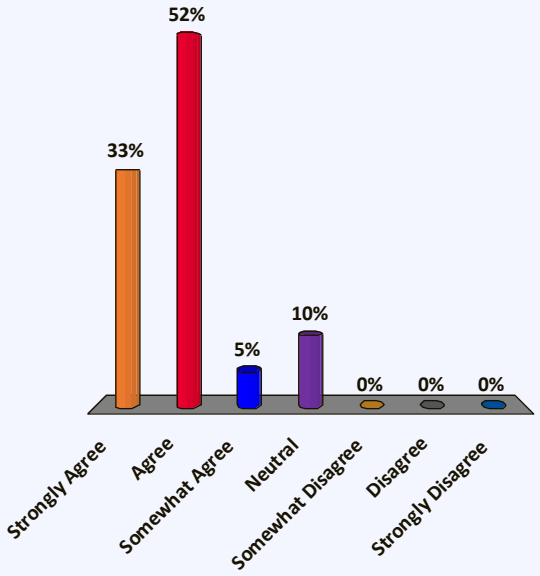
Solar advances your energy goals

A. Strongly Agree
B. Agree
C. Somewhat Agree
D. Neutral
E. Somewhat Disagree
F. Disagree
G. Strongly Disagree



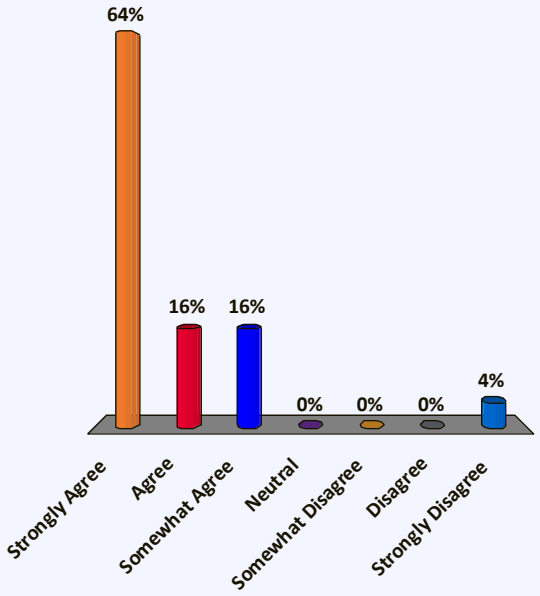
Solar advances your economic development goals

A. Strongly Agree
B. Agree
C. Somewhat Agree
D. Neutral
E. Somewhat Disagree
F. Disagree
G. Strongly Disagree



Solar advances your environmental & health goals

A. Strongly Agree
B. Agree
C. Somewhat Agree
D. Neutral
E. Somewhat Disagree
F. Disagree
G. Strongly Disagree



Visioning: Scales & Contexts

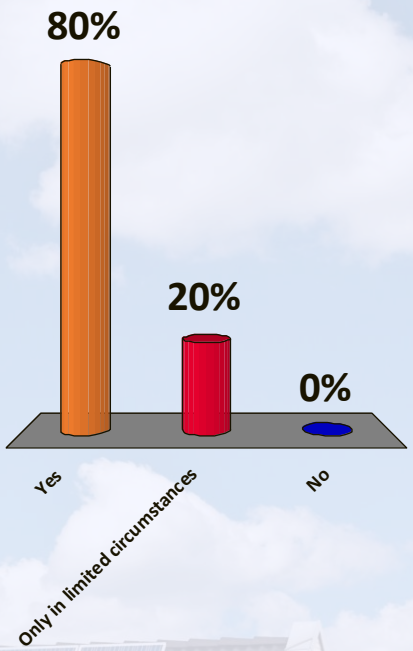
Poll

Is solar on residential rooftops appropriate for your community?

Visioning: Scales & Contexts

Poll

Is solar on residential rooftops appropriate for your community?



A. Yes
B. Only in limited circumstances
C. No

Visioning: Scales & Contexts

Poll

Is solar on commercial rooftops appropriate for your community?

Visioning: Scales & Contexts

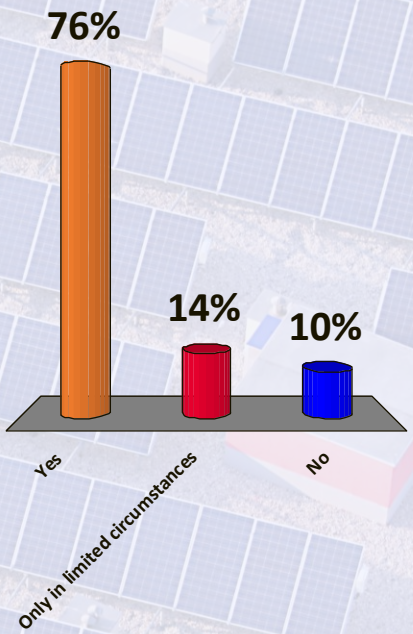
Poll

Is solar on commercial rooftops appropriate for your community?

A. Yes

B. Only in limited circumstances

C. No



Visioning: Scales & Contexts

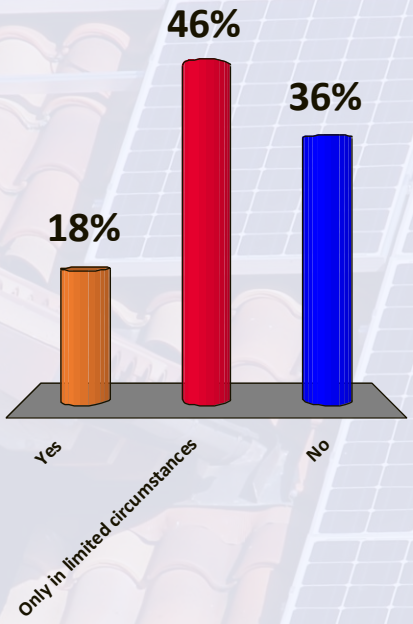
Poll

Is solar on historic structures appropriate for your community?

Visioning: Scales & Contexts

Poll

Is solar on historic structures appropriate for your community?



A. Yes
B. Only in limited circumstances
C. No

Visioning: Scales & Contexts

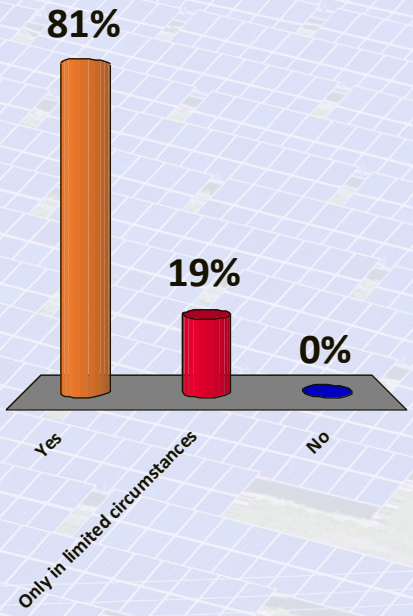
Poll

Is solar on brownfields appropriate for your community?

Visioning: Scales & Contexts

Poll

Is solar on brownfields appropriate for your community?



A. Yes

B. Only in limited circumstances

C. No

Visioning: Scales & Contexts

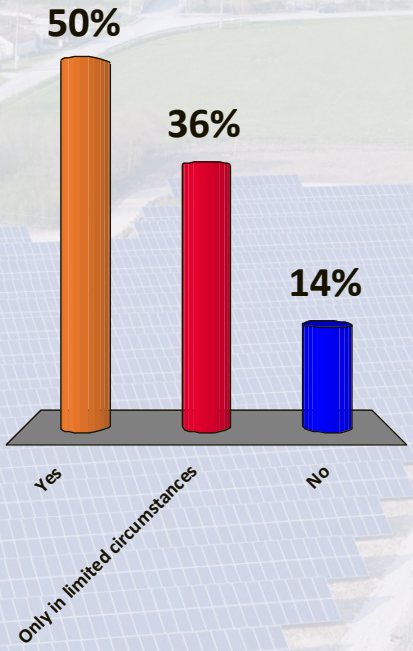
Poll

Is solar on greenfields appropriate for your community?

Visioning: Scales & Contexts

Poll

Is solar on greenfields appropriate for your community?



A. Yes
B. Only in limited circumstances
C. No

Visioning: Scales & Contexts

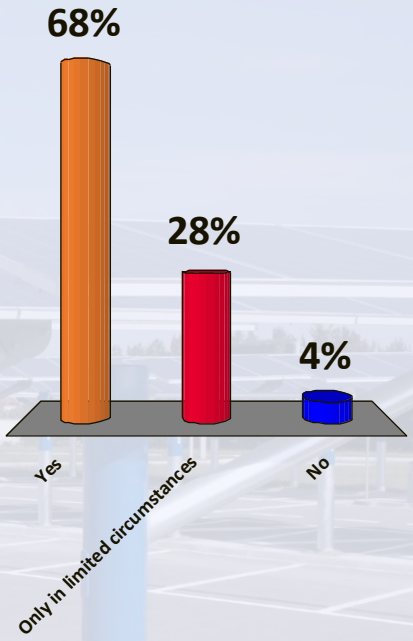
Poll

Is solar on parking lots appropriate for your community?

Visioning: Scales & Contexts

Poll

Is solar on parking lots appropriate for your community?



A. Yes
B. Only in limited circumstances
C. No

Visioning: Scales & Contexts

Poll

Is building-integrated solar appropriate for your community?

Visioning: Scales & Contexts

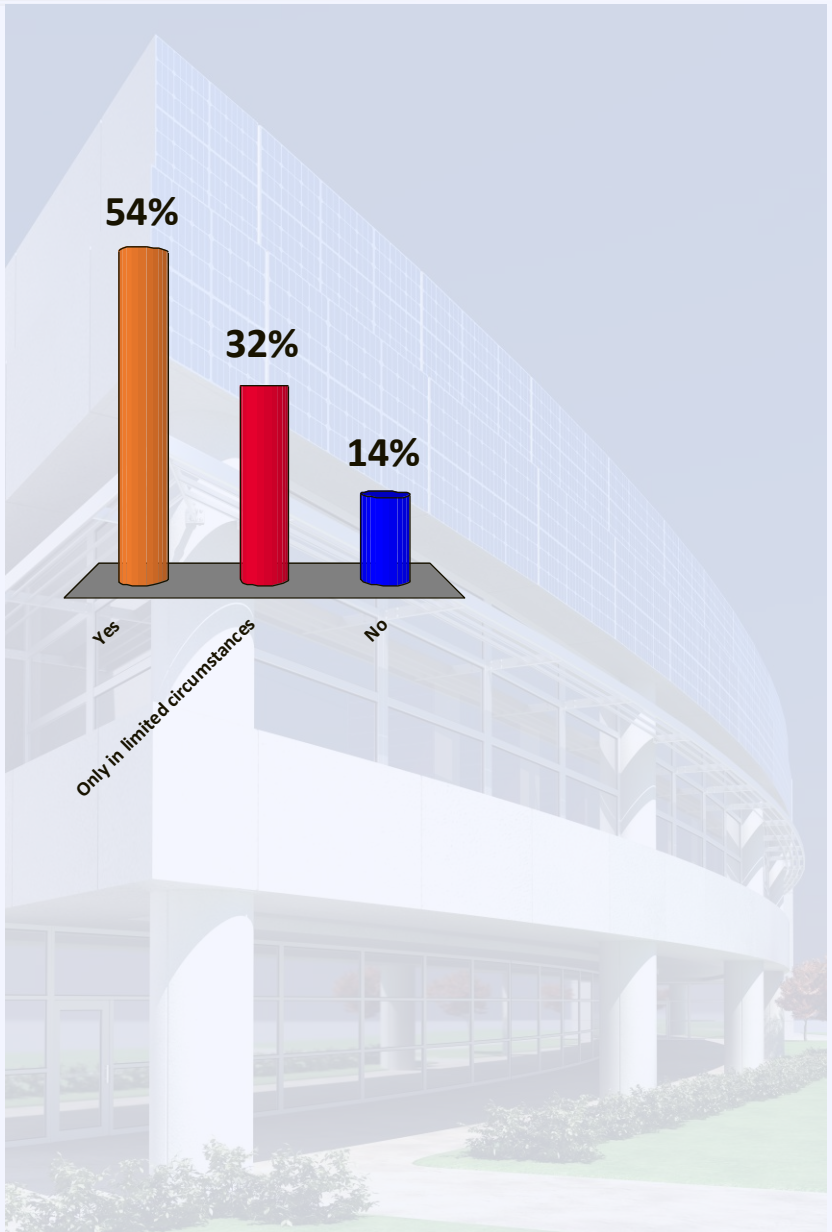
Poll

Is building-integrated solar appropriate for your community?

A. Yes

B. Only in limited circumstances

C. No



Planning for Solar Development

Communitywide Comprehensive Plan

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

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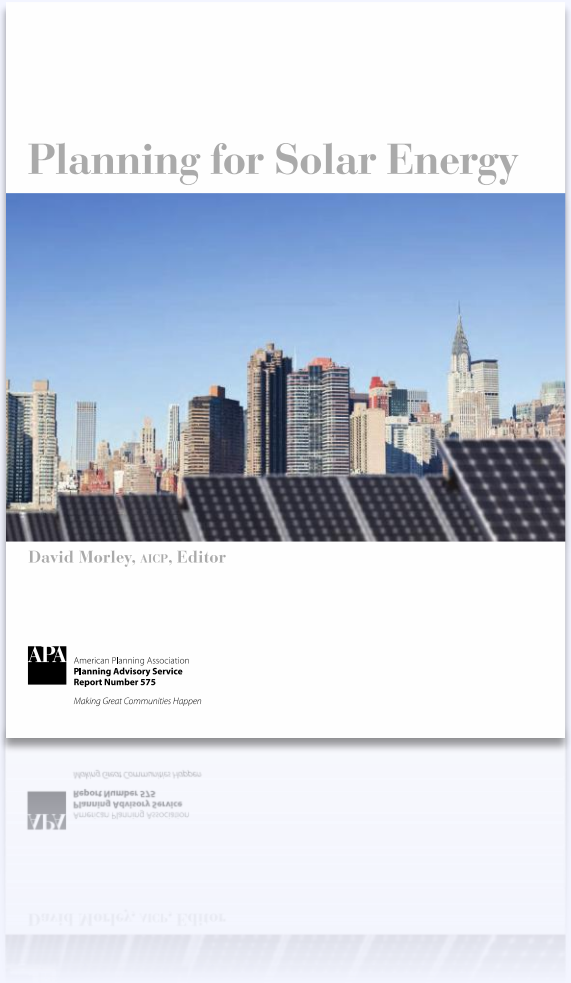
Source: American Planning Association

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



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Effective Local Solar Policy

Local Solar Policy

Planning for Solar

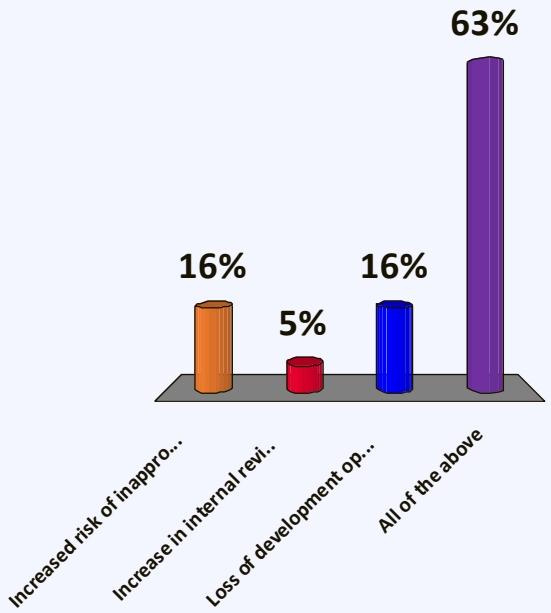
Solar in Development Regulation

Effective Solar Permitting Process

Solar Market Development Tools

What is the cost of convoluted regulations or "regulatory silence"?

A. Increased risk of inappropriate development
B. Increase in internal review costs
C. Loss of development opportunities
D. All of the above



Zoning Standards

Section	Topics to Address
Definitions	Define technologies & terms
Applicability	Primary vs. accessory use
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

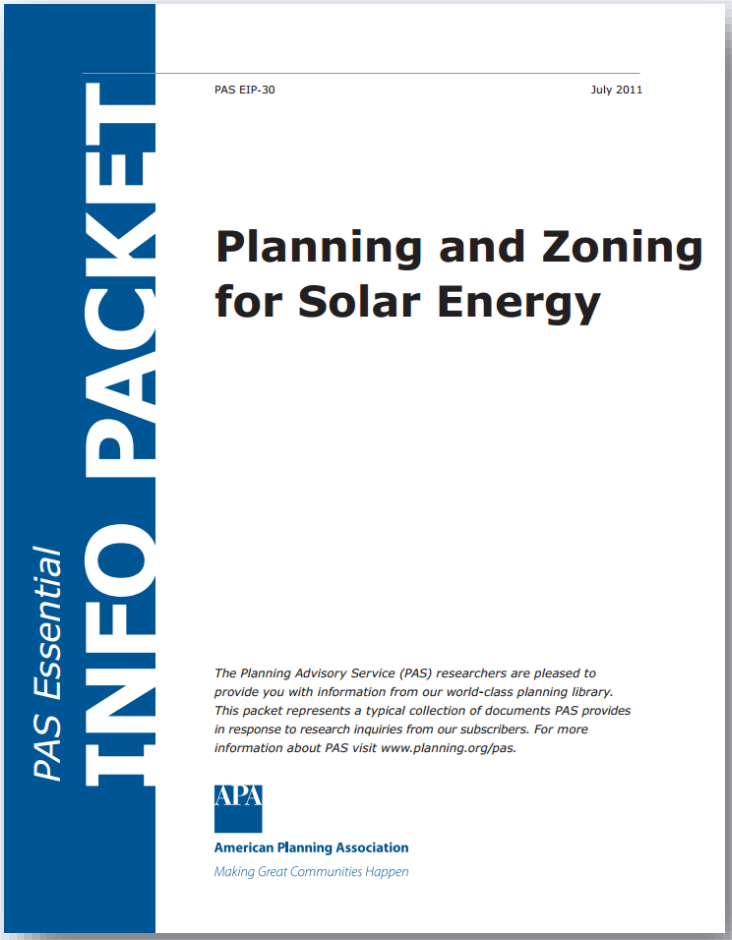
Typical Requirements:

- 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

Zoning Standards: Historic

Typical Requirements:

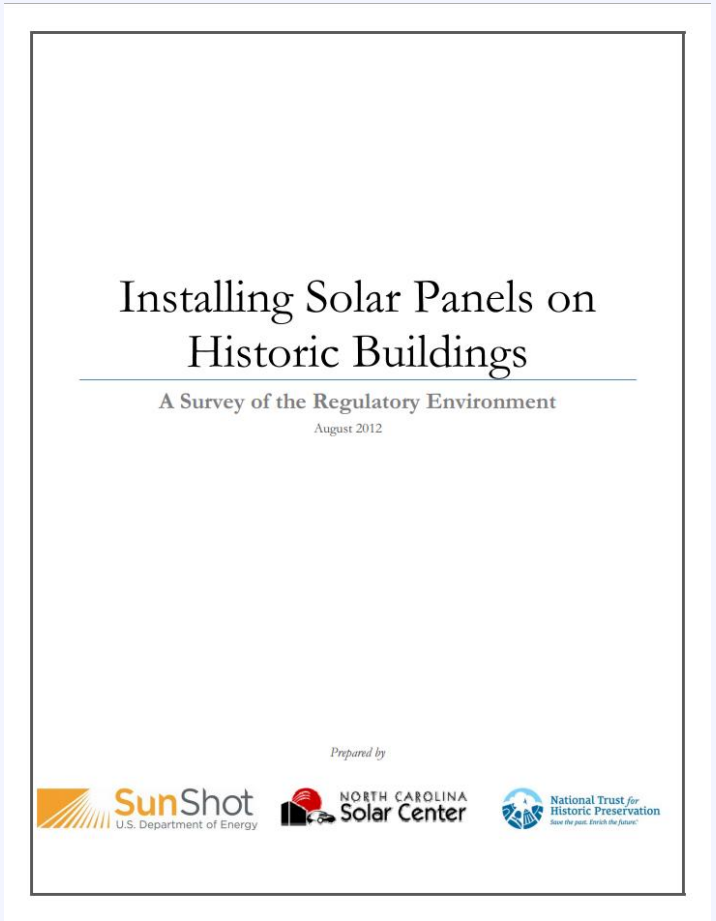
- Prevent permanent loss of "character defining" features
- Possible design requirements
  - Ground mounted
  - Flat roof with setback
  - Panels flush with roof
  - Blend color

Source: SolarCentury

Zoning Standards: Historic

Resource **North Carolina Clean Energy Technology Center**

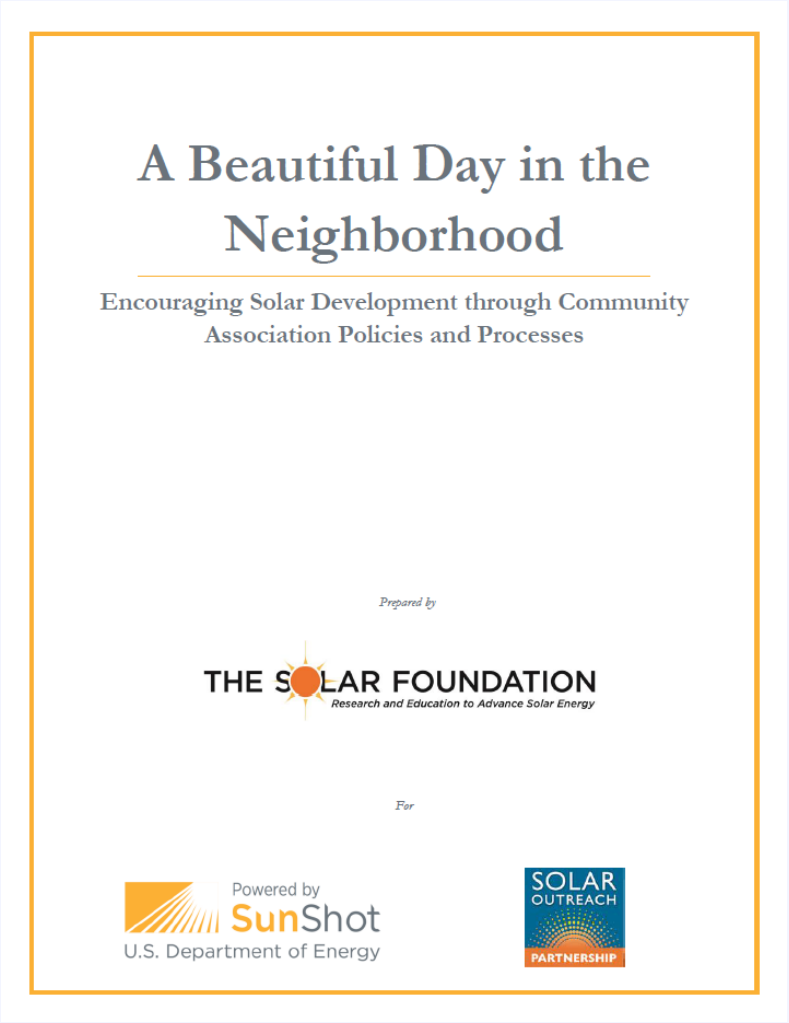
Provides sample design principles and example regulations incorporating historic preservation into sustainability and energy projects.



Private Rules on Residential Solar

Resource **The Solar Foundation**

Guide for HOAs on solar access law and simple recommendations for reducing barriers to solar in association-governed communities.



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www.solaroutreach.org

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

Update Building Code

Solar Ready Construction:

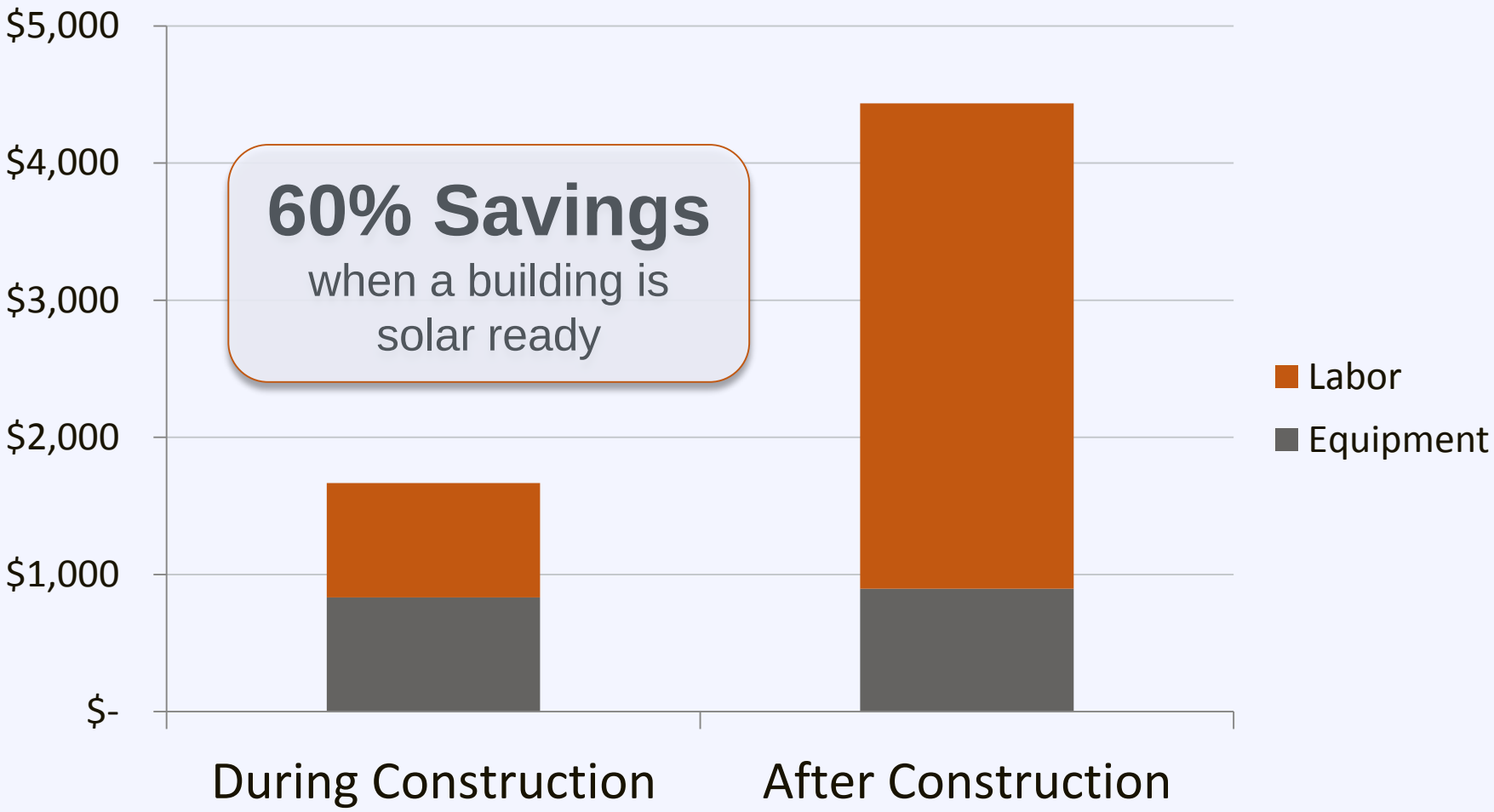
Preparing a building for solar at the outset can help make future solar installations easier and more cost effective.

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



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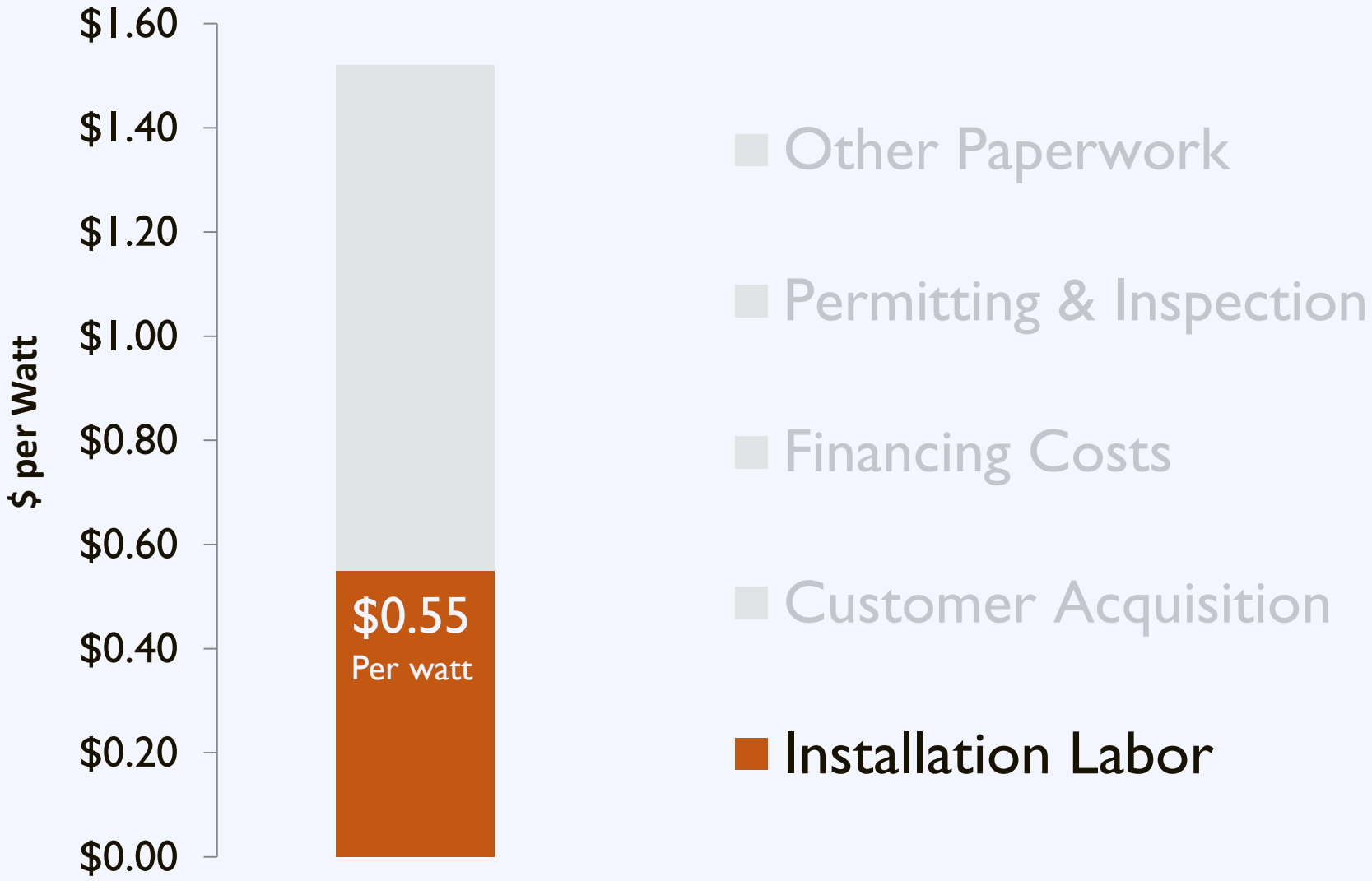
Source: Solar Ready: An Overview of Implementation Practices [Draft]. NREL, Feb. 18, 2011.

Installation Soft Costs



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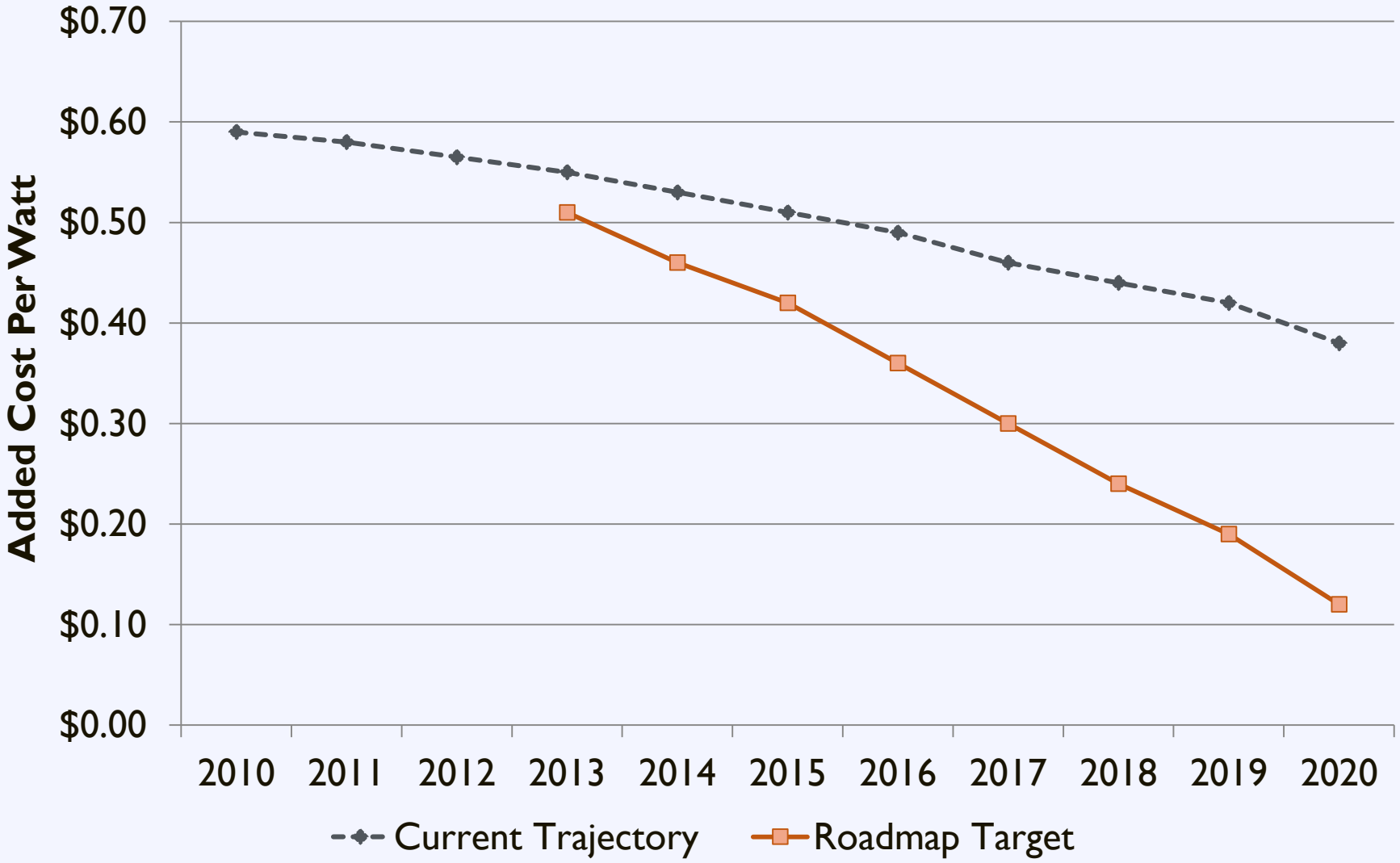
Installation Labor Roadmap

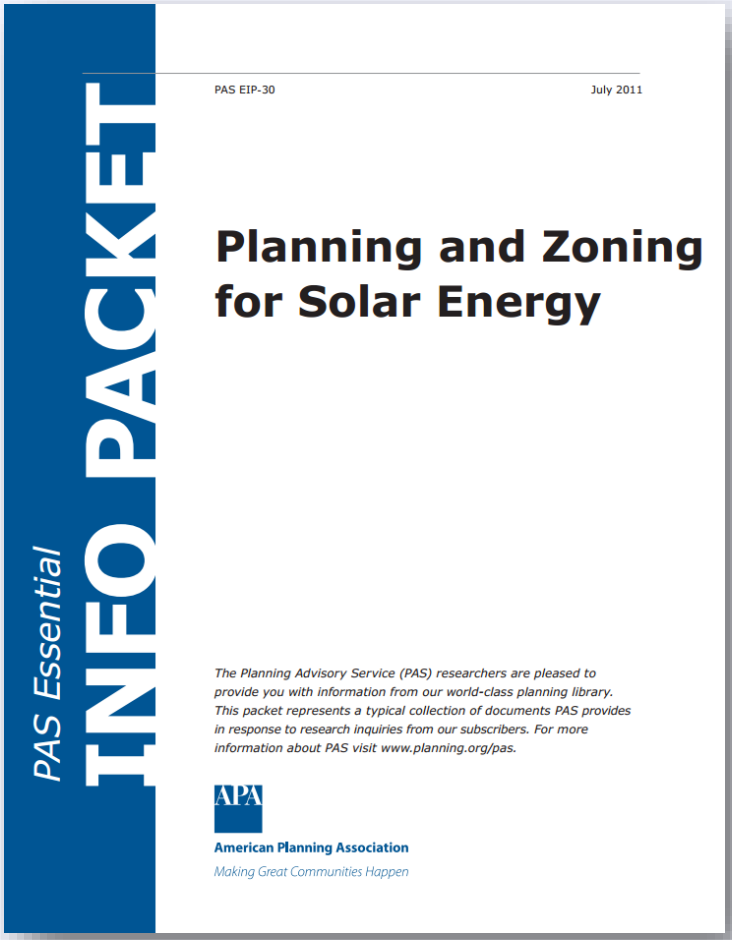


Source: NREL (http://www.nrel.gov/docs/fy13osti/59155.pdf)

Zoning Standards: Model Ordinances

Resource **American Planning Association**

This Essential Info Packet provides example development regulations for solar.



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

Effective Local Solar Policy

Local Solar Policy

Planning for Solar

Solar in Development Regulation

Effective Solar Permitting Process

Solar Market Development Tools

Challenge: Inconsistency

18,000+ local jurisdictions

with unique zoning and permitting requirements

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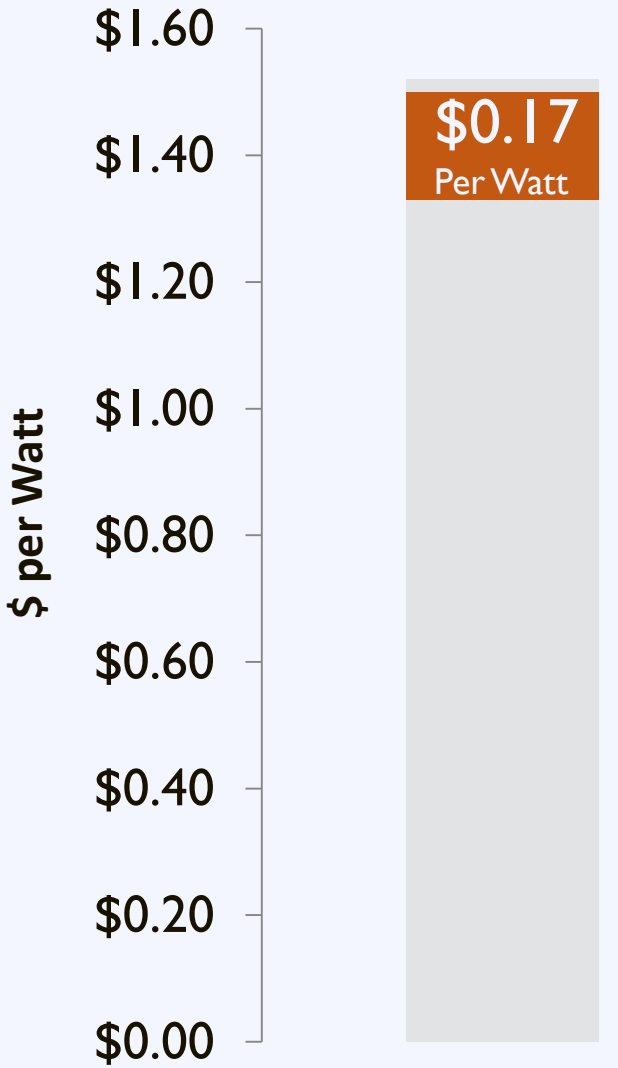
Source: http://www.nrel.gov/docs/fy12osti/54689.pdf

Consumer Challenges

Source: Forbes

Regulatory Barriers



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

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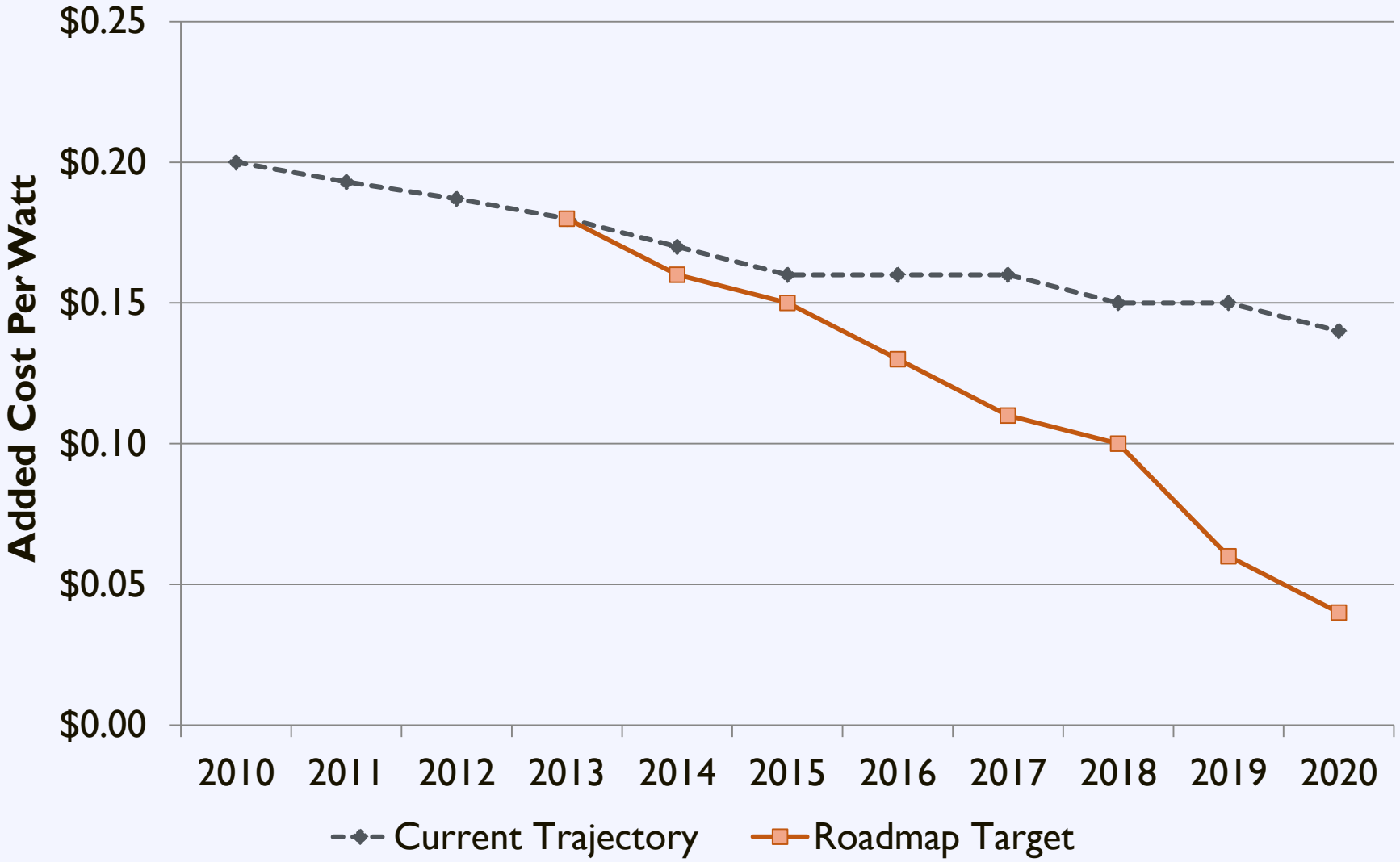
Planning & Permitting Roadmap



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Expedited Permitting

Solar Permitting Best Practices:

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

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Source: IREC/ Vote Solar

Expedited Permitting

Solar Permitting Best Practices:

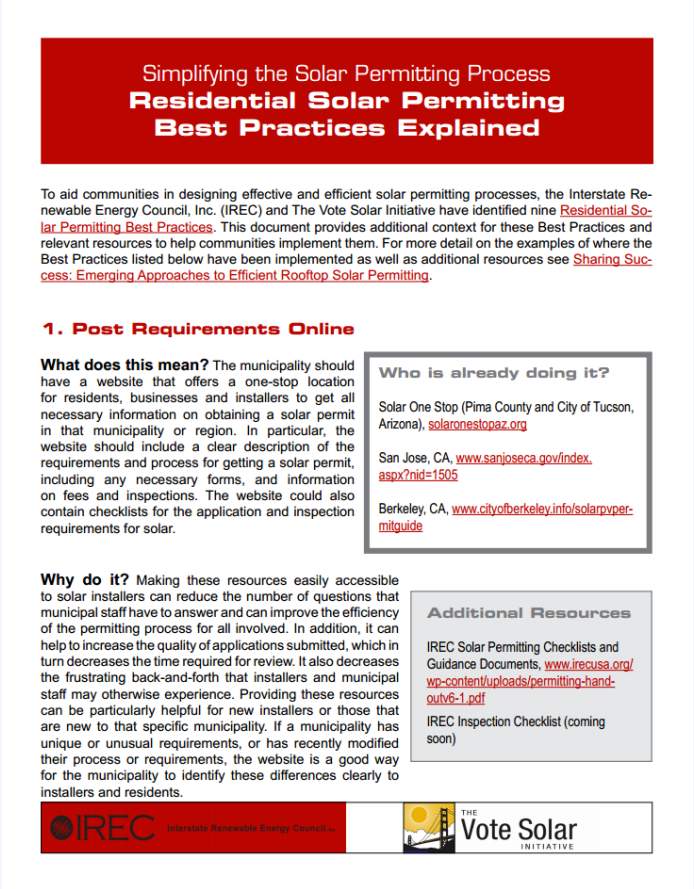
- ✓ Collect Reasonable Permitting Fees
- ✓ No Community-Specific Licenses
- ✓ Narrow Inspection Appointment Windows
- ✓ Eliminate Excessive Inspections
- ✓ Train Permitting Staff in Solar

Source: IREC/Vote Solar

Permitting: Best Practices

Resource **Interstate Renewable Energy Council**

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



Simplifying the Solar Permitting Process
Residential Solar Permitting Best Practices Explained

To aid communities in designing effective and efficient solar permitting processes, the Interstate Renewable Energy Council, Inc. (IREC) and The Vote Solar Initiative have identified nine Residential Solar Permitting Best Practices. This document provides additional context for these Best Practices and relevant resources to help communities implement them. For more detail on the examples of where the Best Practices listed below have been implemented as well as additional resources see Sharing Success: Emerging Approaches to Efficient Rooftop Solar Permitting.

1. Post Requirements Online

What does this mean? The municipality should have a website that offers a one-stop location for residents, businesses and installers to get all necessary information on obtaining a solar permit in that municipality or region. In particular, the website should include a clear description of the requirements and process for getting a solar permit, including any necessary forms, and information on fees and inspections. The website could also contain checklists for the application and inspection requirements for solar.

Who is already doing it?

Solar One Stop (Pima County and City of Tucson, Arizona), solaronestopaz.org

San Jose, CA, www.sanjoseca.gov/index.aspx?nid=1505

Berkeley, CA, www.cityofberkeley.info/solarpvpermitguide

Why do it? Making these resources easily accessible to solar installers can reduce the number of questions that municipal staff have to answer and can improve the efficiency of the permitting process for all involved. In addition, it can help to increase the quality of applications submitted, which in turn decreases the time required for review. It also decreases the frustrating back-and-forth that installers and municipal staff may otherwise experience. Providing these resources can be particularly helpful for new installers or those that are new to that specific municipality. If a municipality has unique or unusual requirements, or has recently modified their process or requirements, the website is a good way for the municipality to identify these differences clearly to installers and residents.

Additional Resources

IREC Solar Permitting Checklists and Guidance Documents, www.irecusa.org/wp-content/uploads/permitting-hand-outv6-1.pdf

IREC Inspection Checklist (coming soon)

IREC Interstate Renewable Energy Council

THE Vote Solar INITIATIVE

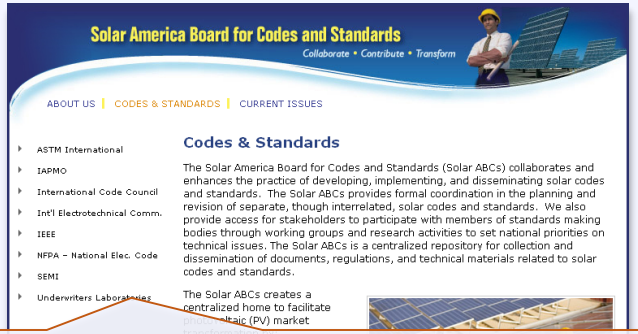
http://projectpermit.org/wp-content/uploads/2013/04/Expanded-Best-Practices-7.23.13_VSI.pdf

Model Permitting Process

Resource **Solar America Board for Codes & Standards**

Expedited Permitting:

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



1-1. Example Design Criteria:

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

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Agenda

10:20 – 10:50	Putting Solar Energy on the Local Policy 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 – 12:50	Planning for Solar: Getting Solar Ready
12:50 – 1:15	Solar Market Development Tools
1:15 – 1:25	*Break*
1:25 – 2:20	Local Speakers
2:20– 2:50	Developing and Solar Policy Implementation Plan for Your Community and Next Steps

Effective Local Solar Policy

Local Solar Policy

Understanding solar financing

Expanding financing options

Addressing customer acquisition

Effective Solar Permitting Process

Solar Market Development Tools

Financing

- 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

Ownership Options for Solar

Direct Ownership

Third-Party Ownership

Direct Ownership

Direct Ownership

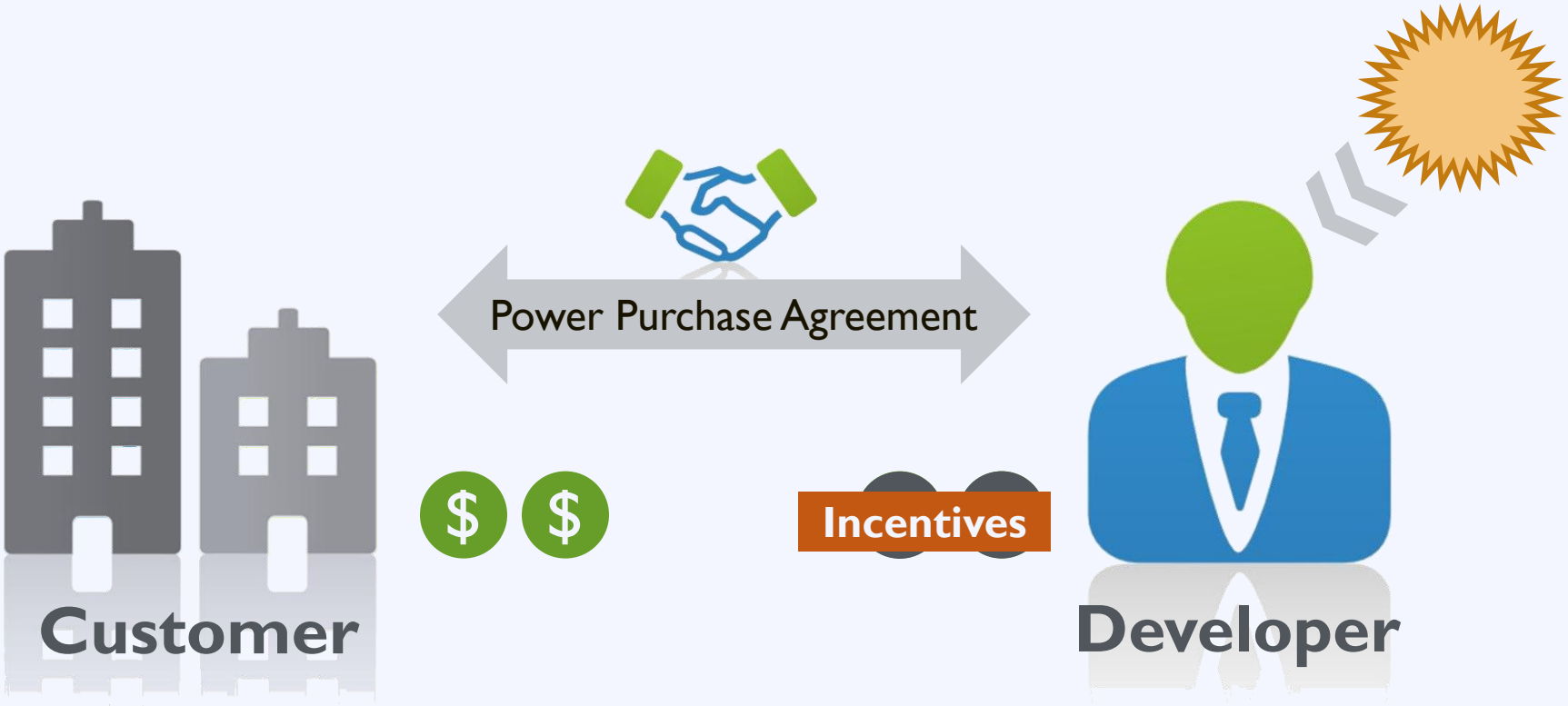
Pros

- Low-cost electricity
- REC revenue

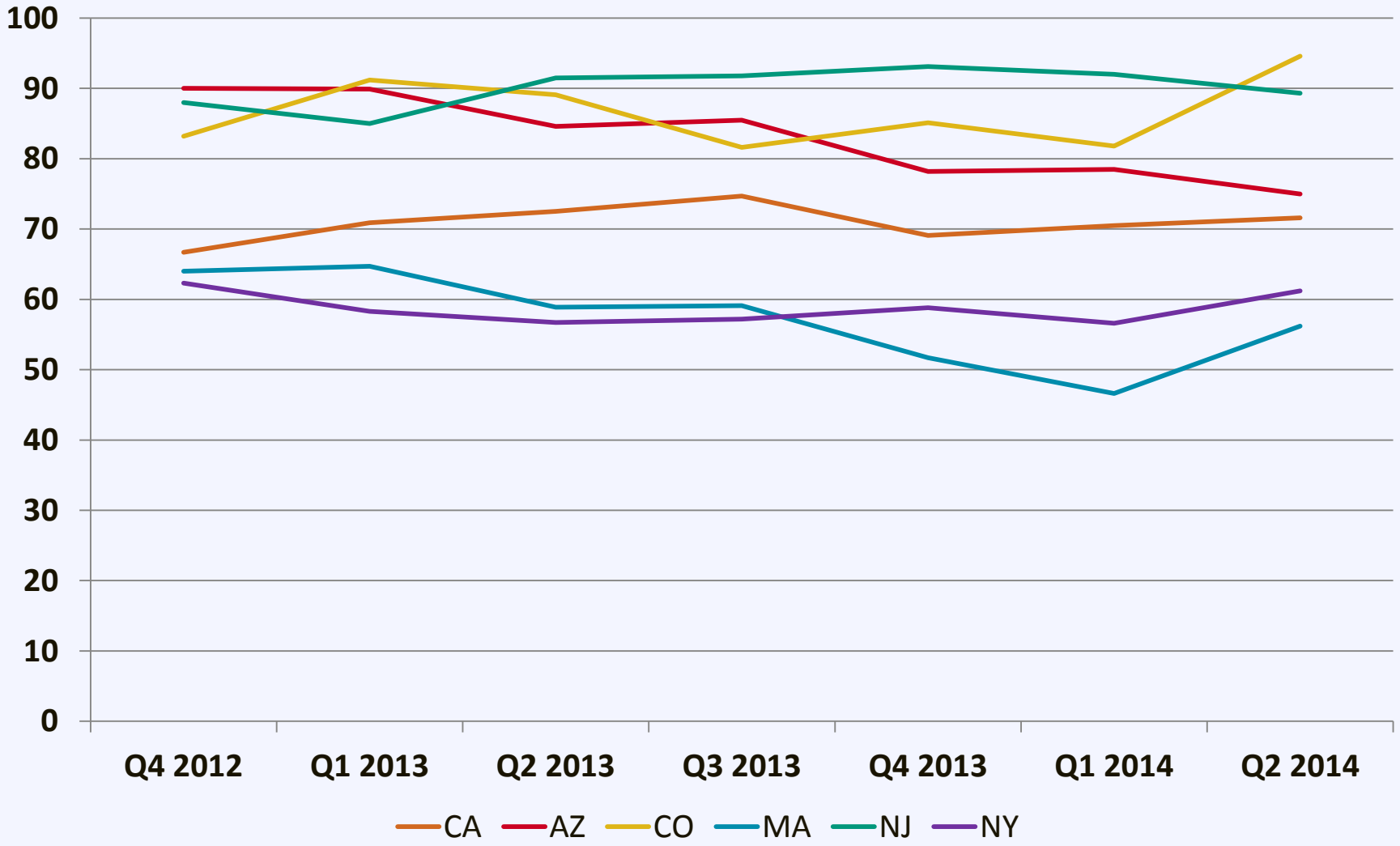
Cons

- Large upfront cost
- Long term management
- Development risk
- Performance risk

Third Party Ownership



Third Party Ownership



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Source: GTM Research/ Solar Energy Industries Association, *U.S. Solar Market Insight Q2 2014*

Third Party Ownership

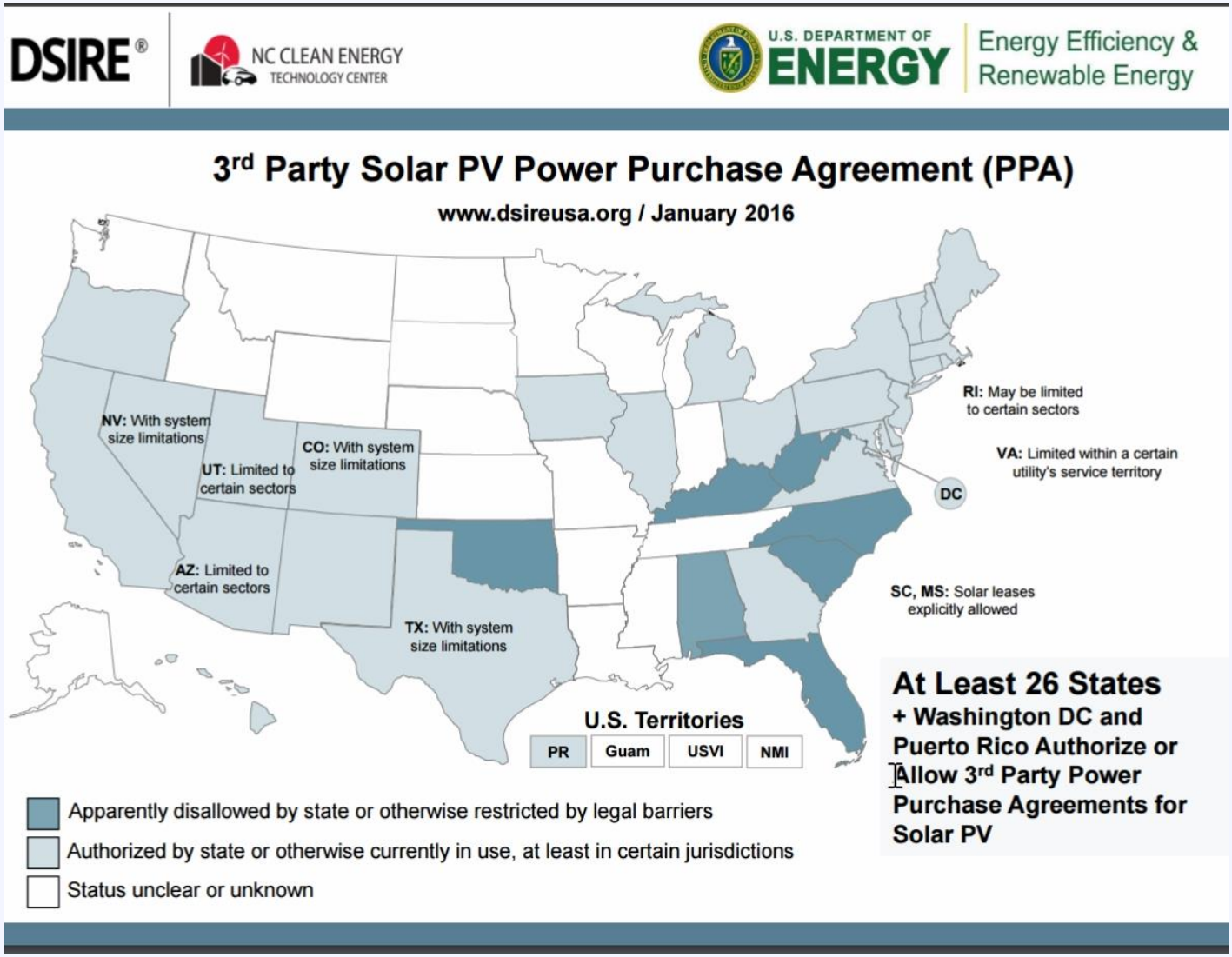
Benefits

- No upfront cost
- No O&M costs
- Low risk
- Predictable payments

Drawbacks

- Not available in all states
- Investor needs higher ROI

Financing: Third Party PPAs



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Source: Database of State Incentives for Renewables and Efficiency (DSIRE)

Ownership Options for Solar

Direct Ownership

Third-Party Ownership

Expand direct ownership options by engaging local lenders

Engage Local Lenders

Fewer than **5%**

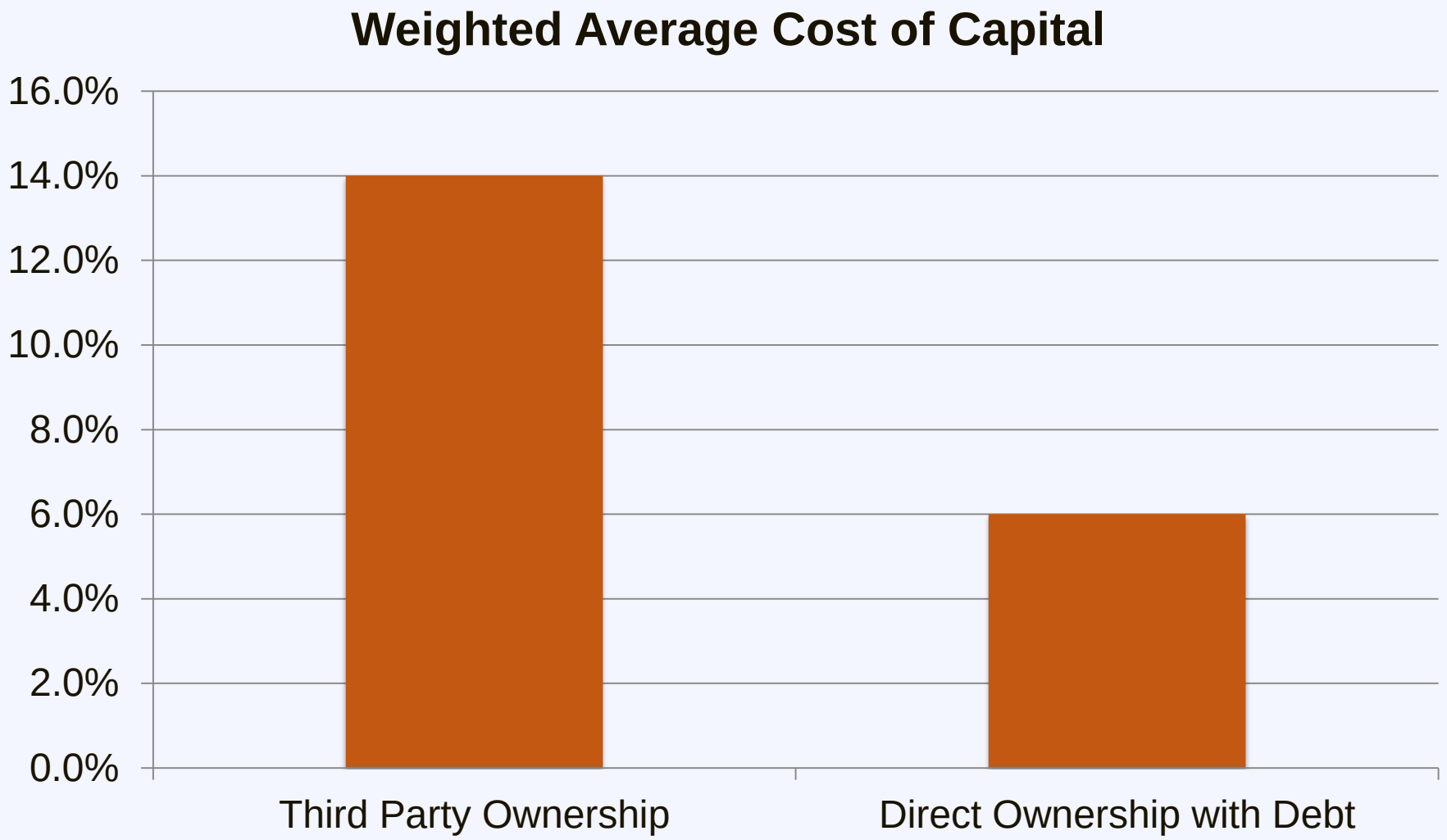
of the

6,500 banks in the US

are

actively financing solar PV projects

Third Party Ownership: Cost



Engage Local Lenders: Resources

Resource **Local Lending for Solar PV**

A guide for local governments seeking to engage financial institutions

www.solaroutreach.org

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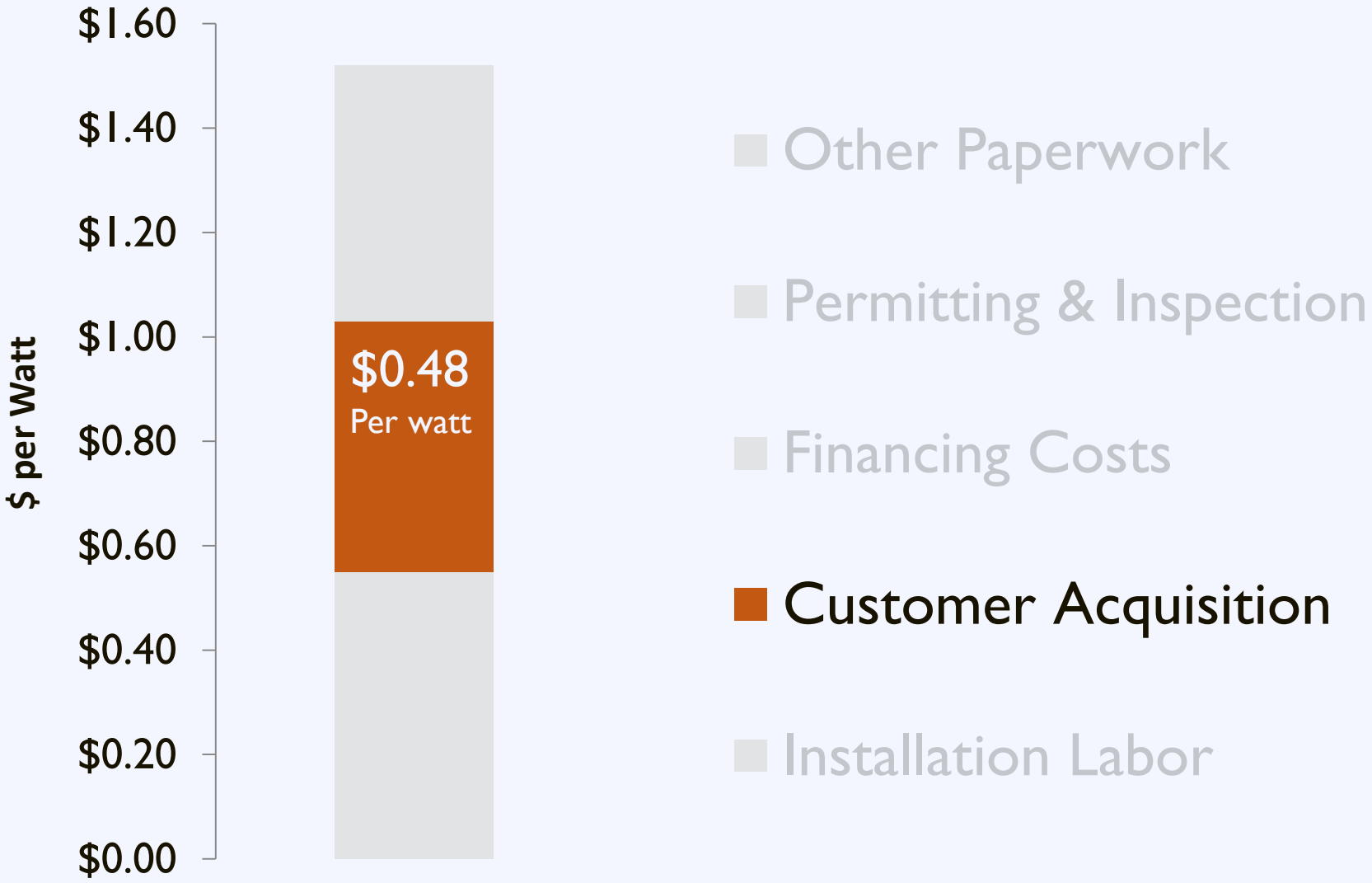
Customer Acquisition



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

SOLARIZE MASS

Solarize CONNECTICUT

solarize ASHEVILLE

solarize portland

Solarize Blacksburg

SOLARIZE ROANOKE

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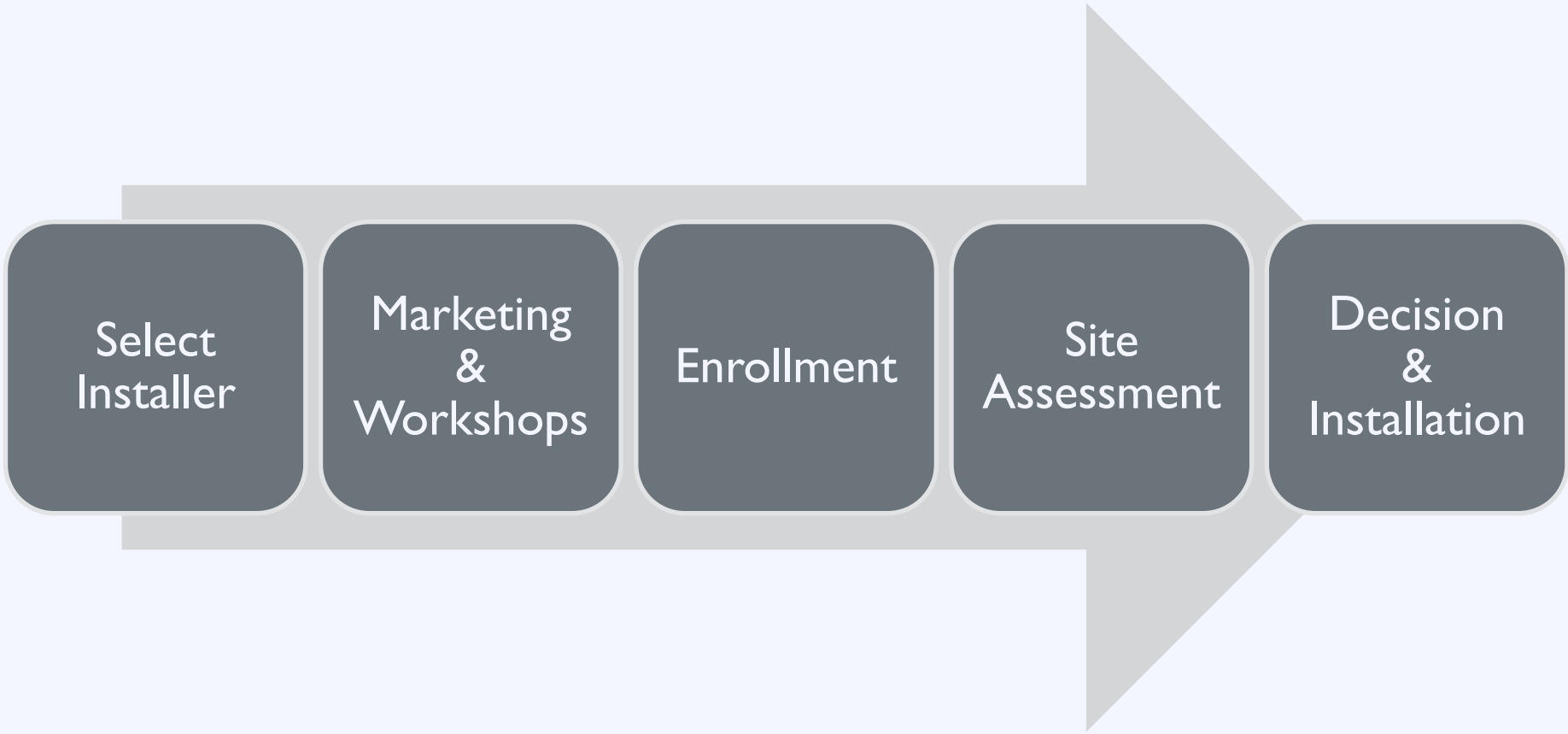
Solarize: Partnership

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

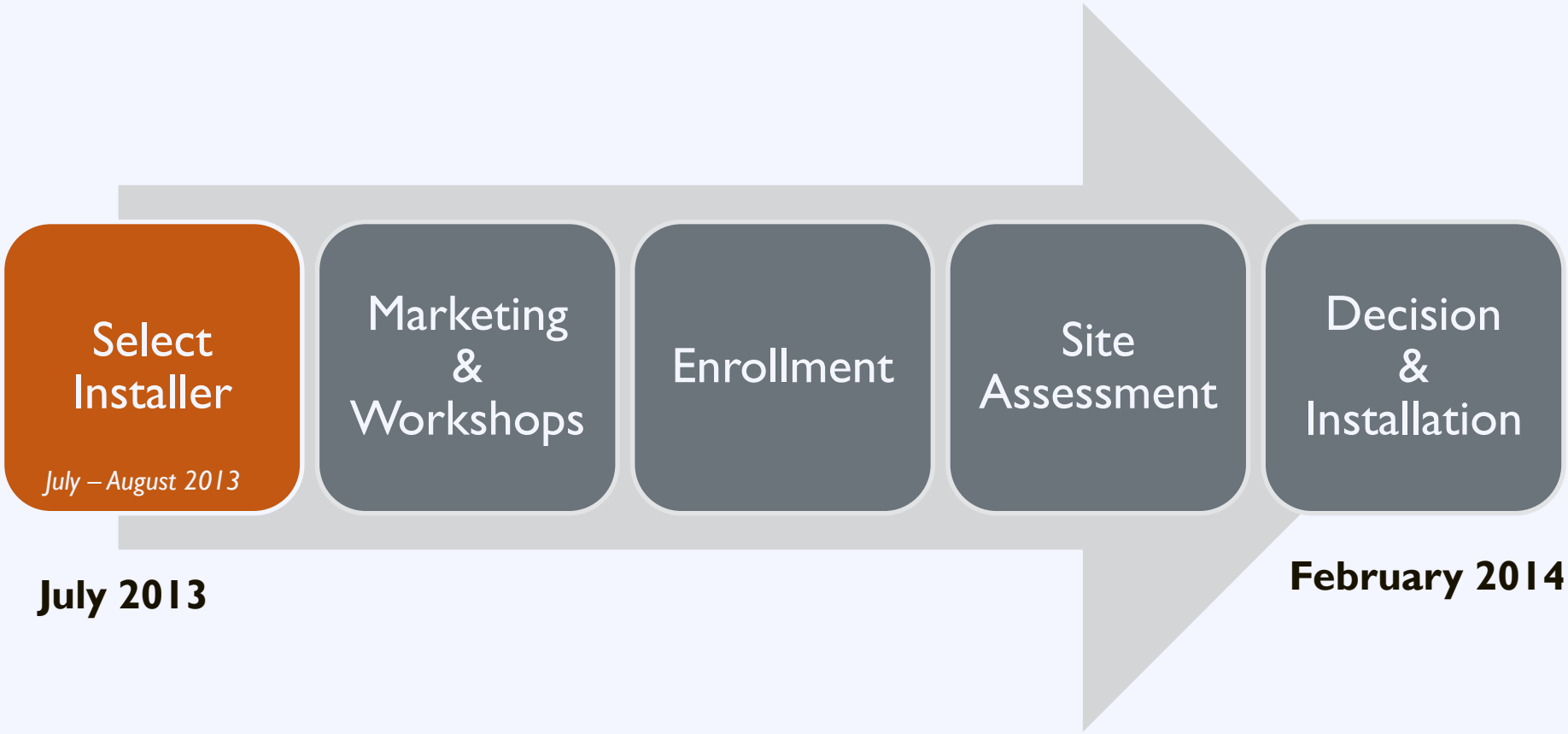


Solarize Plano: Case Study

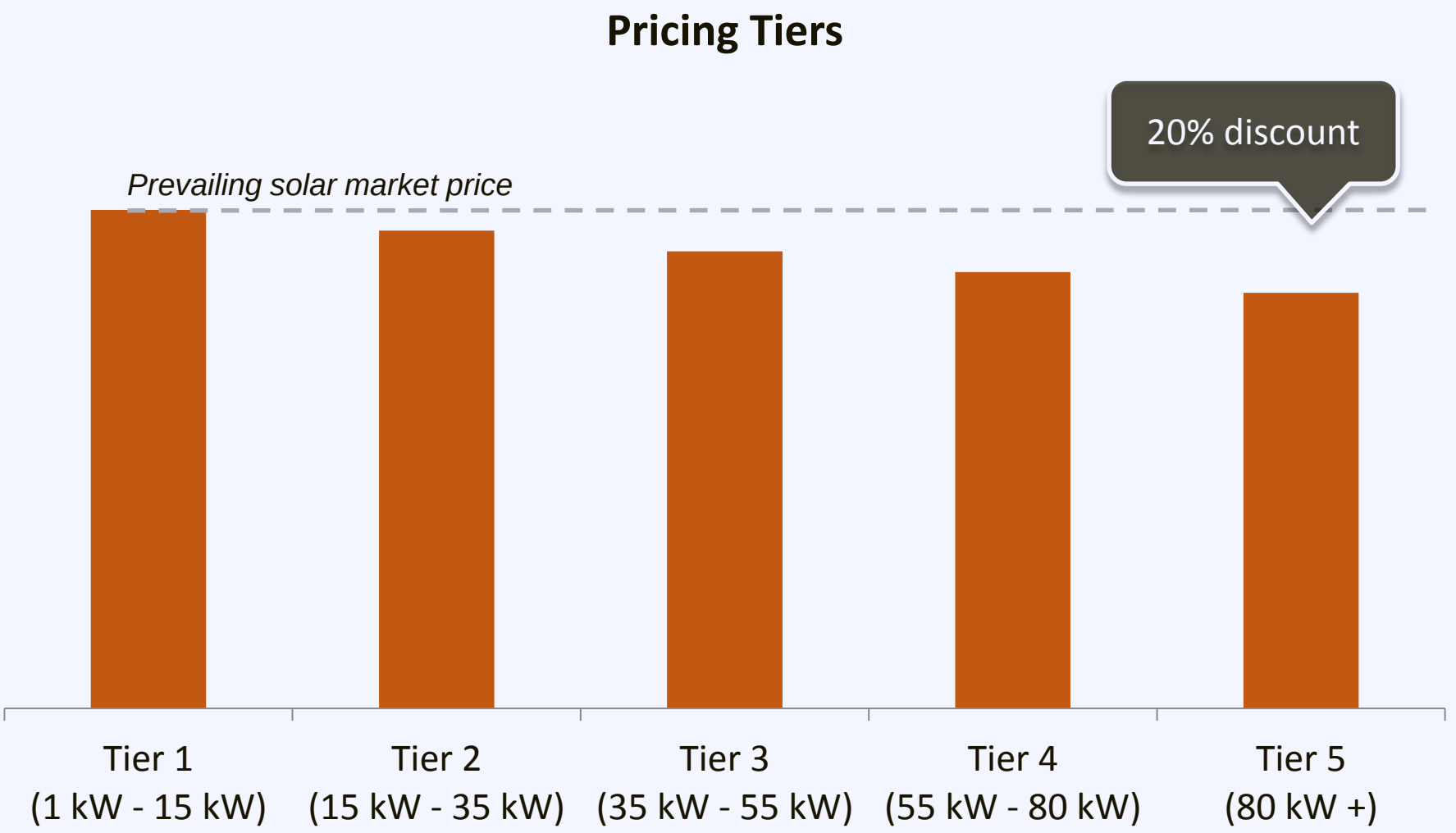
Plano, Texas

Population: 272,000

Solarize Plano: Case Study



Solarize Plano: Case Study



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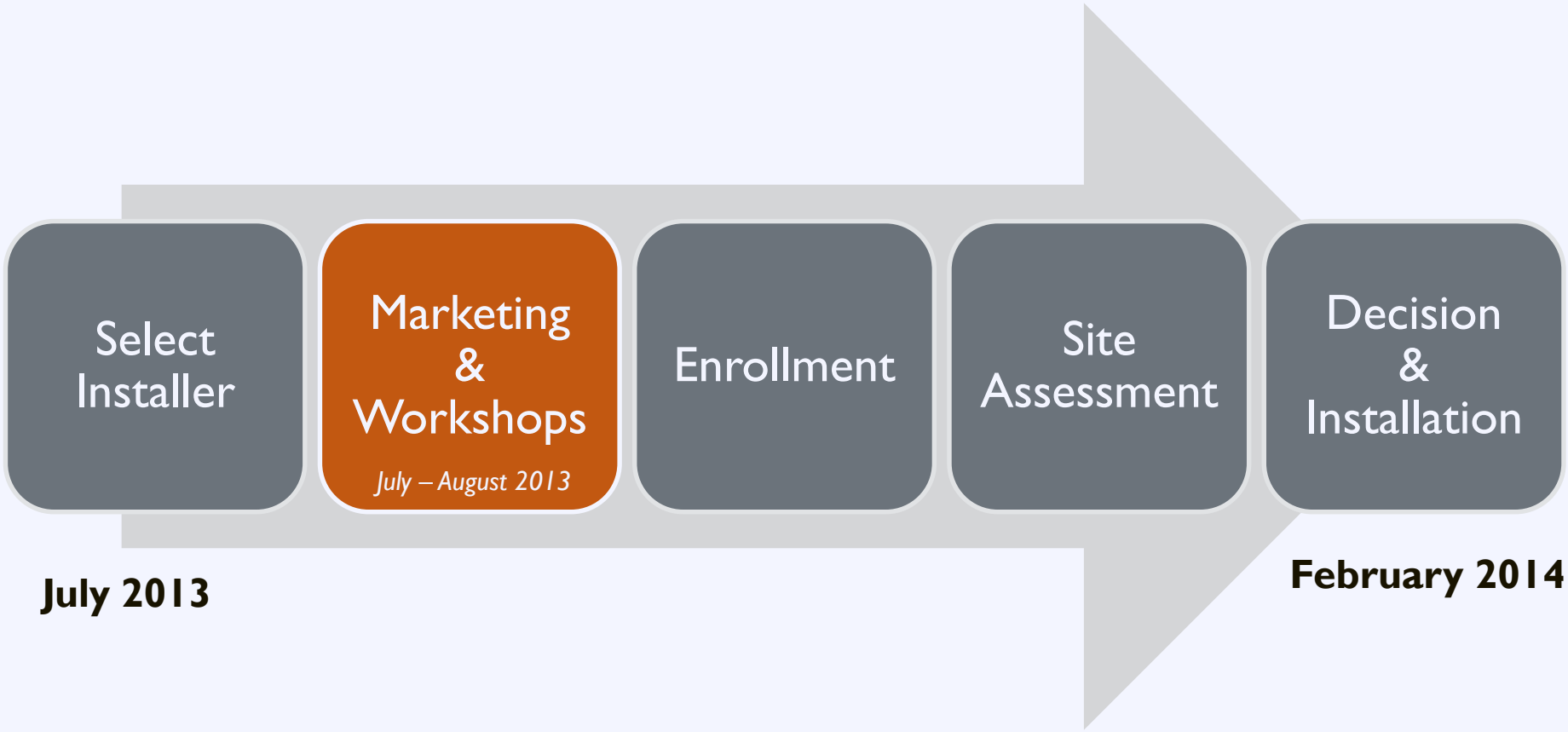
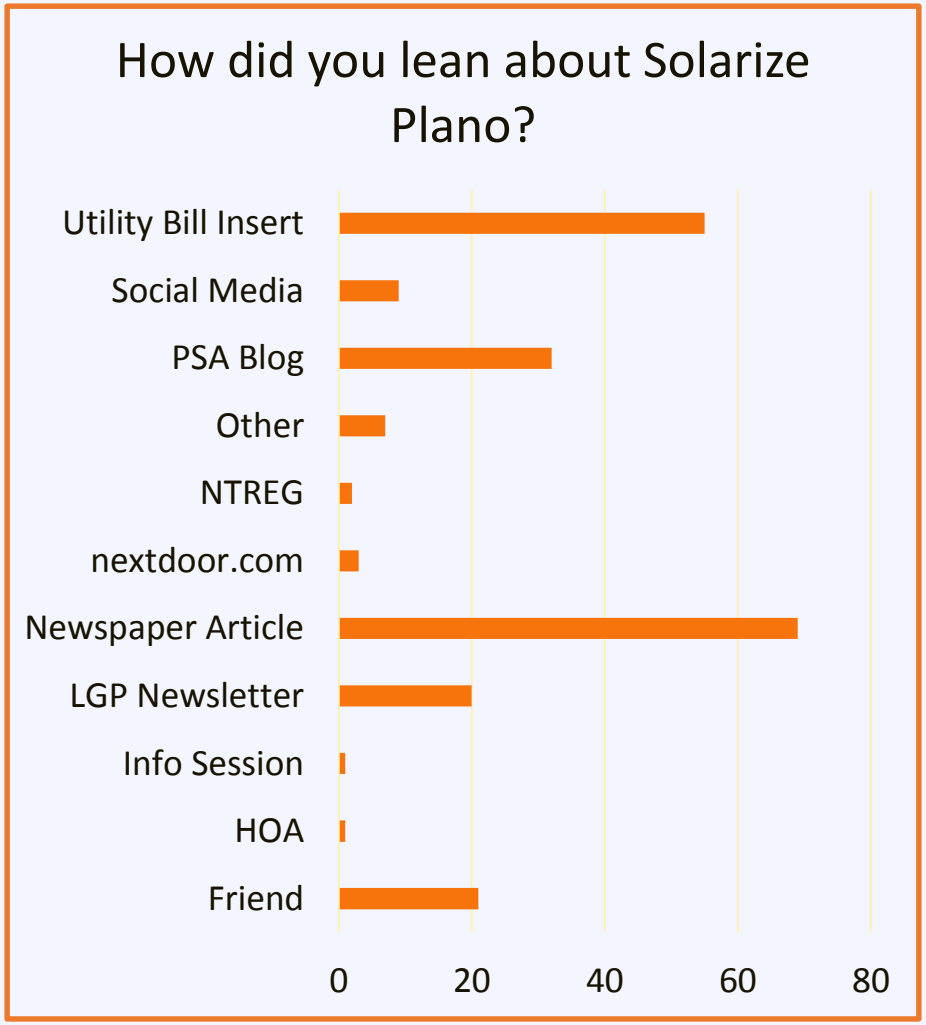
Solarize Plano: Case Study



Solarize Plano: Case Study

Marketing Strategy:

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



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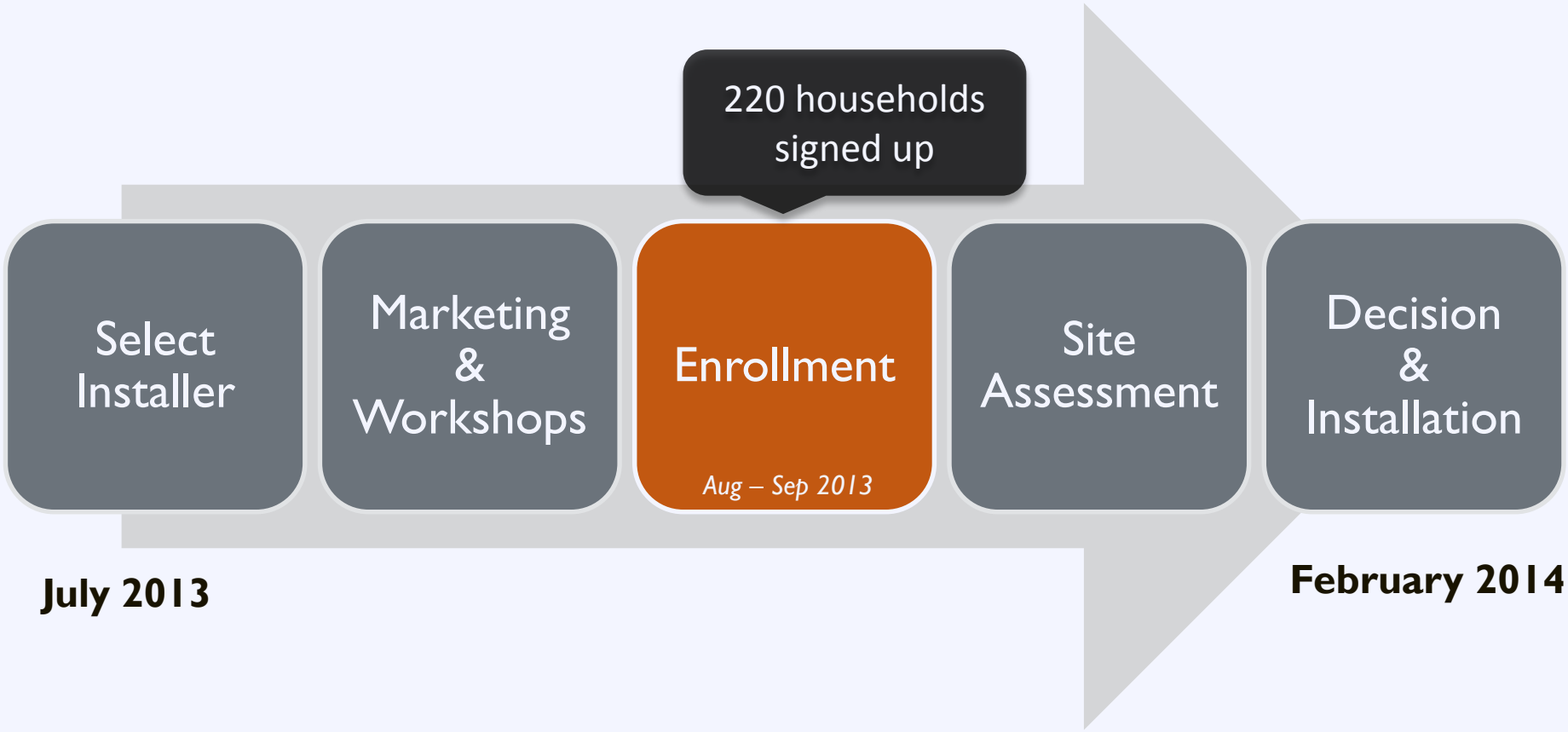
Source: Solarize Plano & NCTCOG

Solarize Plano: Case Study



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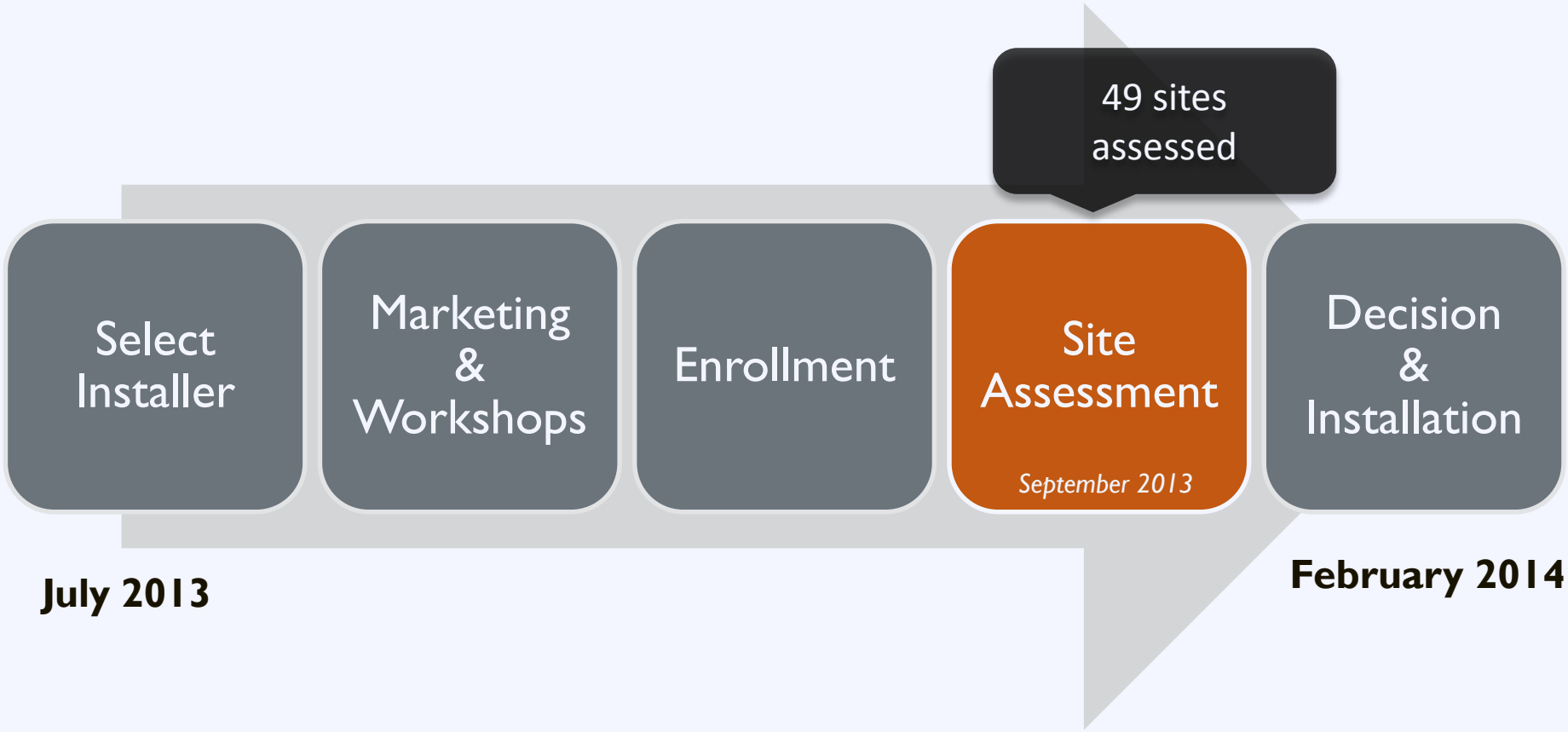
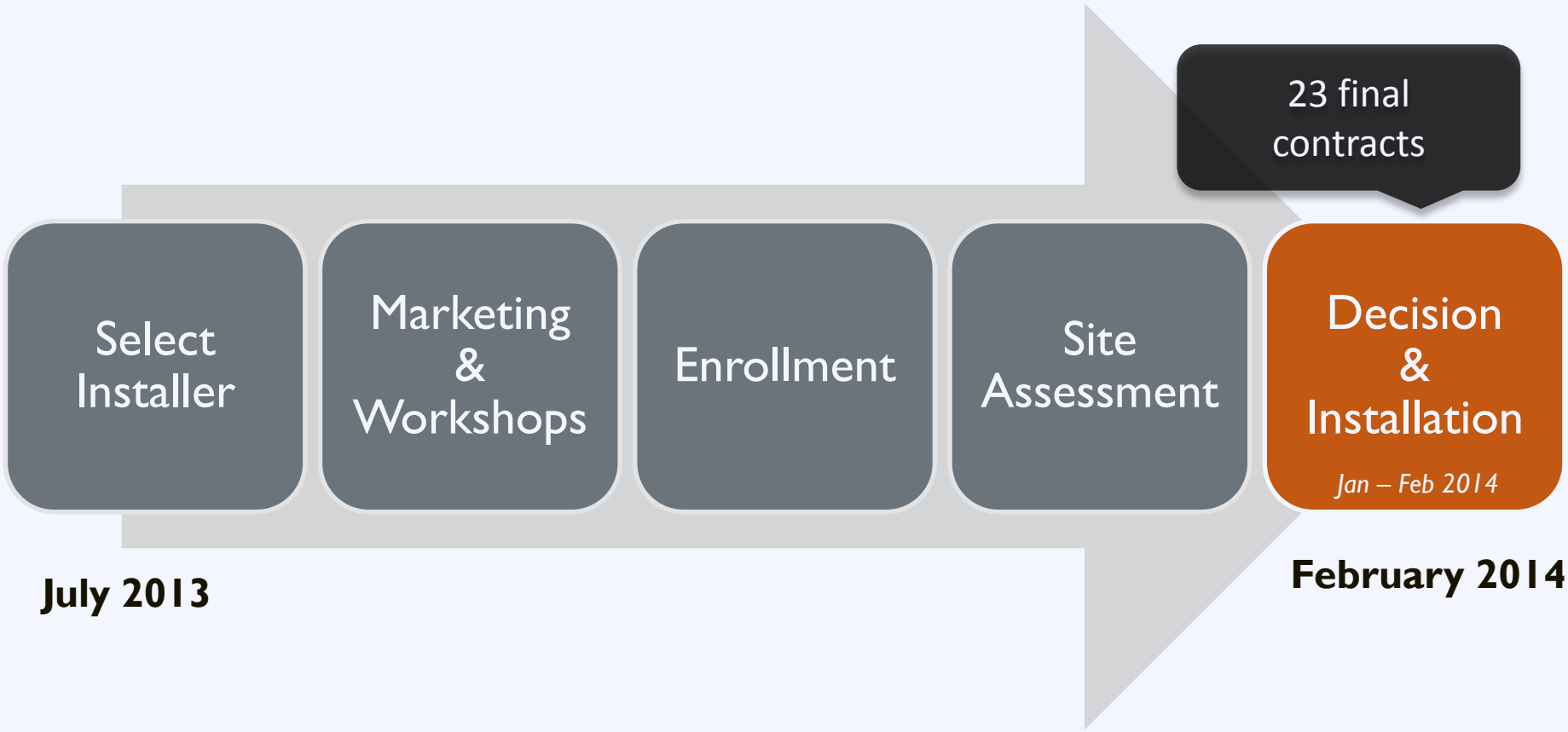
Solarize Plano: Case Study



Solarize Plano: Case Study



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

The Solarize Program

Barriers		Solutions
High upfront cost	→	Group purchase
Complexity	→	Community outreach
Customer inertia	→	Limited-time offer

Solarize: Lasting Impact

A household is

0.78% more likely to adopt solar

for

each additional installation in their zip code

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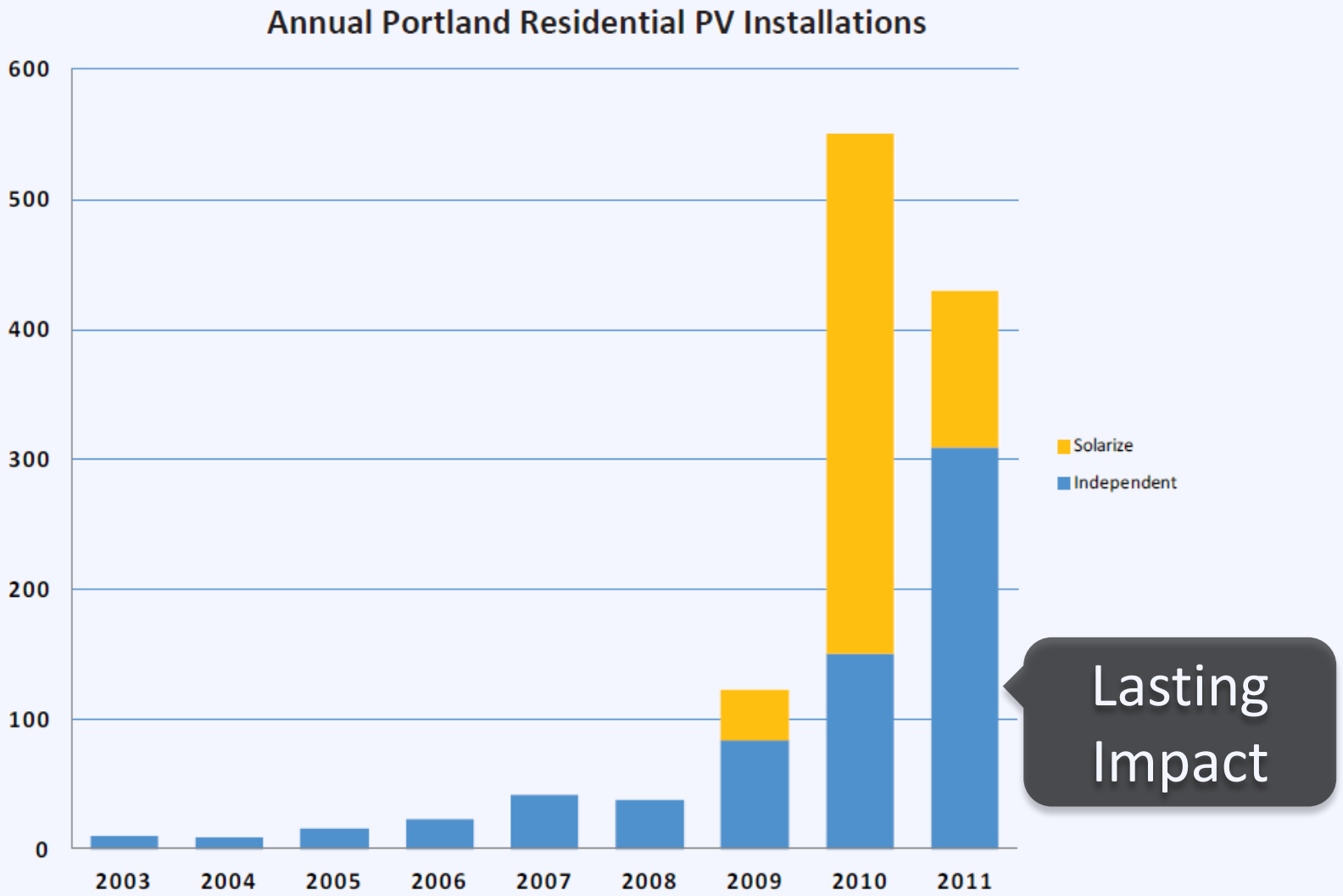
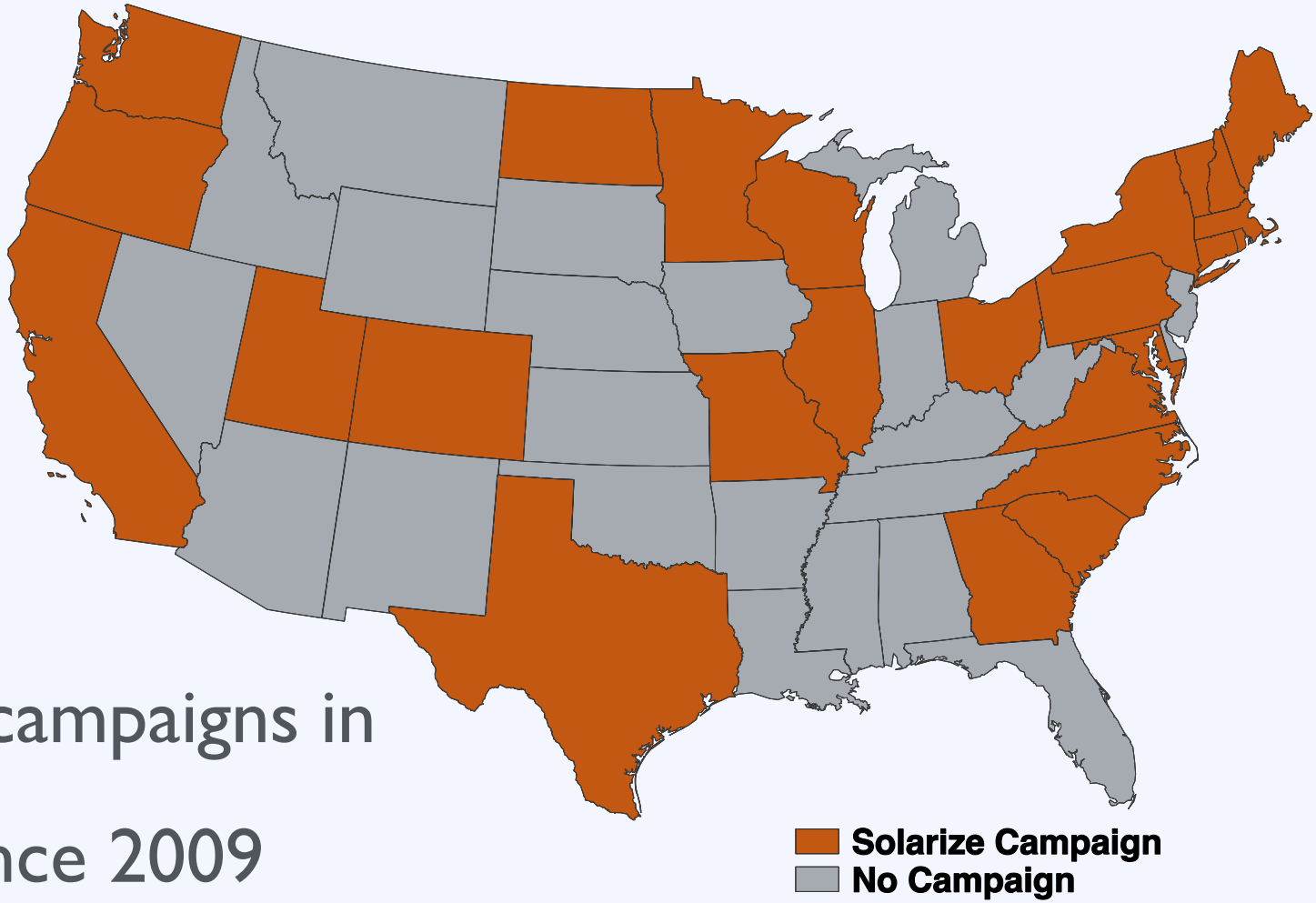
Source: NYU Stern and Yale School of Forestry – Peer Effects in the Diffusion of Solar Panels

Solarize: Lasting Impact



Source: NREL

Solarize: National Growth



Over 150 campaigns in

25 states since 2009

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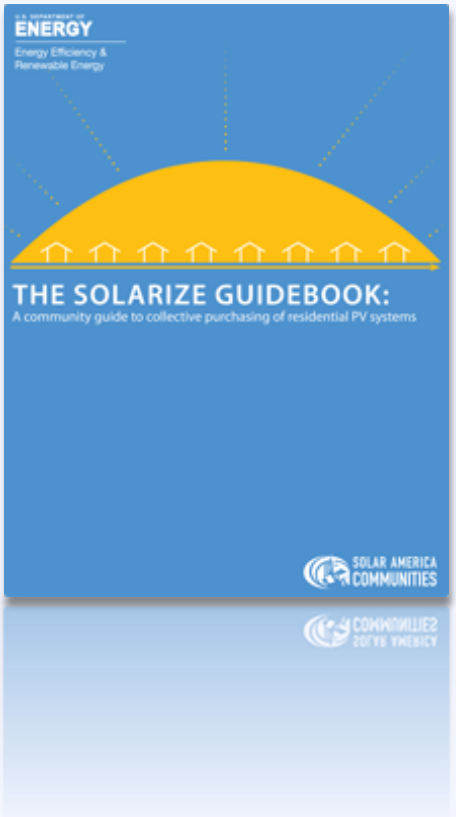
Solarize: Resources

Resource **The Solarize Guidebook**

A roadmap for project planners and solar advocates who want to create their own successful Solarize campaigns.

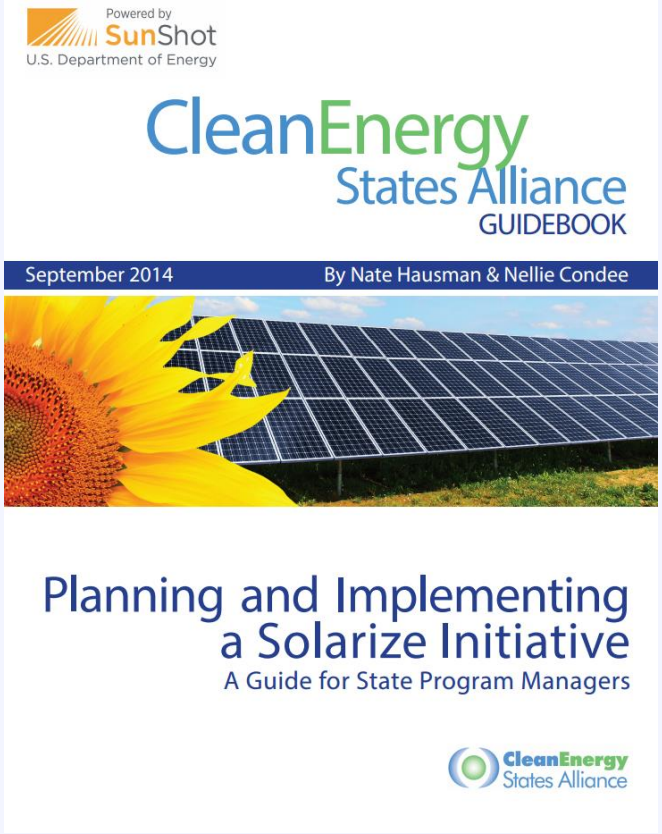
www.nrel.gov



Solarize: Resources

Resource **Planning and Implementing a Solarize Initiative**

Presents two successful state-driven Solarize programs (Solarize Mass and Solarize Connecticut) to provide best practices to stakeholders interested in replicating these successes.



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http://solaroutreach.org/wp-content/uploads/2014/04/CESA-Solarize-Guide-September-2014-Final.pdf

Agenda

10:20 – 10:50	Putting Solar Energy on the Local Policy 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 – 12:50	Planning for Solar: Getting Solar Ready
12:50 – 1:15	Solar Market Development Tools
1:15 – 1:25	*Break*
1:25 – 2:20	Local Speakers
2:20– 2:50	Developing and Solar Policy Implementation Plan for Your Community and Next Steps

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Local Speakers

- Scott LaFlamme – City of Bath
- Jeff Kobrock – MCEDD Executive Director,
  - Solarize Midcoast Maine Initiative
- Chuck Piper – Owner, Sundog Solar,
  - Solarize Midcoast Maine Partner Installer

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Activity: Solar in Your Community

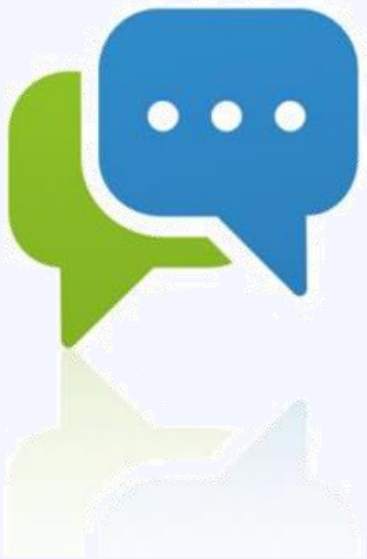
1. Recognize successes
2. Identify opportunities
3. Select strategies & best practices
4. Outline implementation plan
5. Discuss barriers to implementation

Activity: Solar in Your Community

Part 1: Take 5 minutes to complete the questions in the *Developing Effective Solar Policies in Your Community* handout.

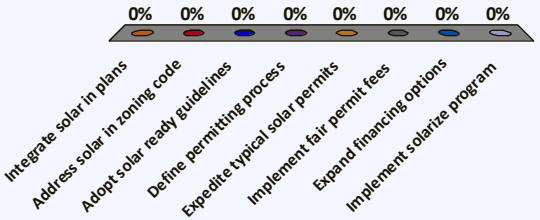
Activity: Solar in Your Community

Part 2: Spend the next 10 minutes discussing your responses to Questions 8 – 12 with the others at your table. Discuss strategies for overcoming potential obstacles to implementation.



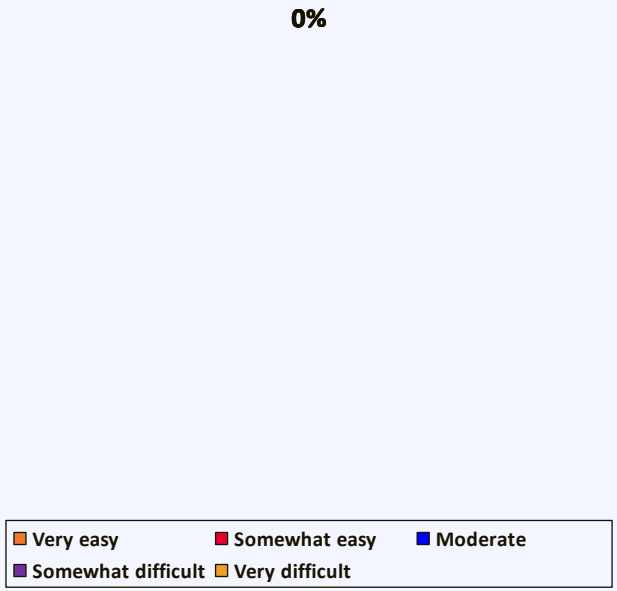
Which “best practice” did you select to pursue first?

A. Integrate solar in plans
B. Address solar in zoning code
C. Adopt solar ready guidelines
D. Define permitting process
E. Expedite typical solar permits
F. Implement fair permit fees
G. Expand financing options
H. Implement solarize program



How difficult will it be to implement this policy/program?

1. Very easy
2. Somewhat easy
3. Moderate
4. Somewhat difficult
5. Very difficult



Discussion

What obstacles stand in the way of implementation?

Discussion

What are possible strategies to overcome those obstacles?

Activity: Next Steps

What do you pledge to do when you leave today's workshop? [Orange Card]

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