Solar Powering Your Community

Addressing Soft Costs and Barriers

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U.S. Department of Energy

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U.S. Department of Energy

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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
Research and Education to Advance Solar Energy

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

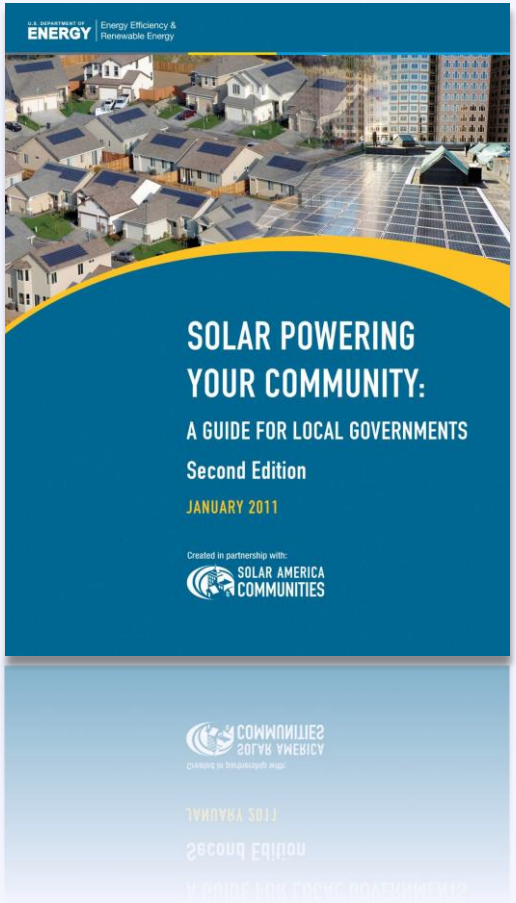
Email solar-usa@iclei.org to request a 20 minute consultation

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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After This Session

Talk to Us!

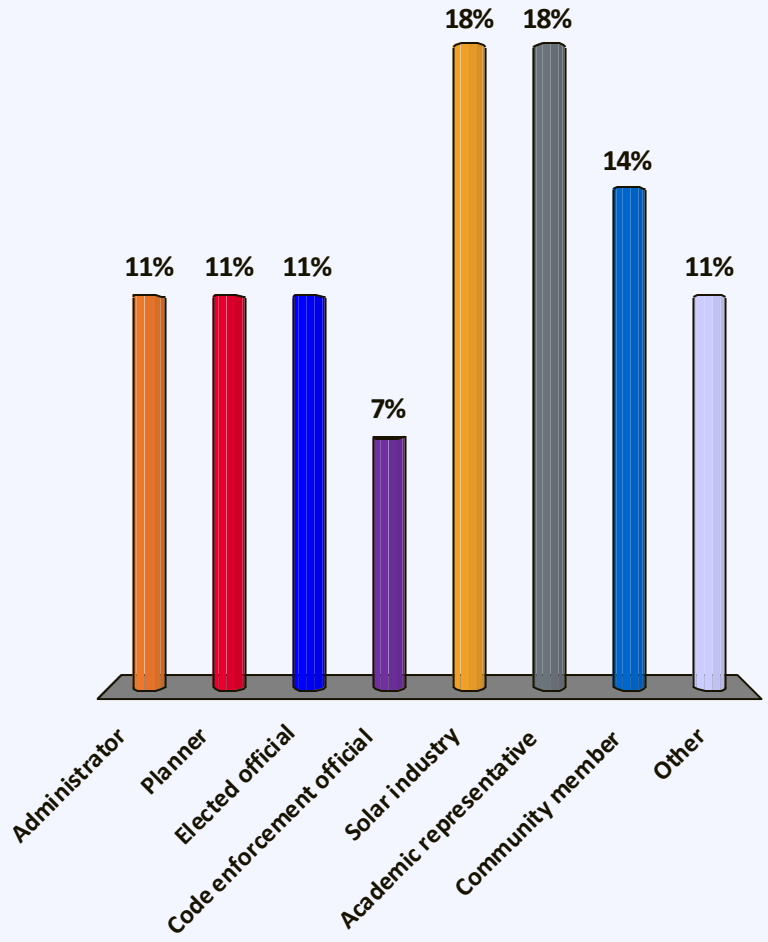
Sign up for a 20 minute consultation to learn more about our free services

See Riana Ackley to sign up.

We want to get to know you better

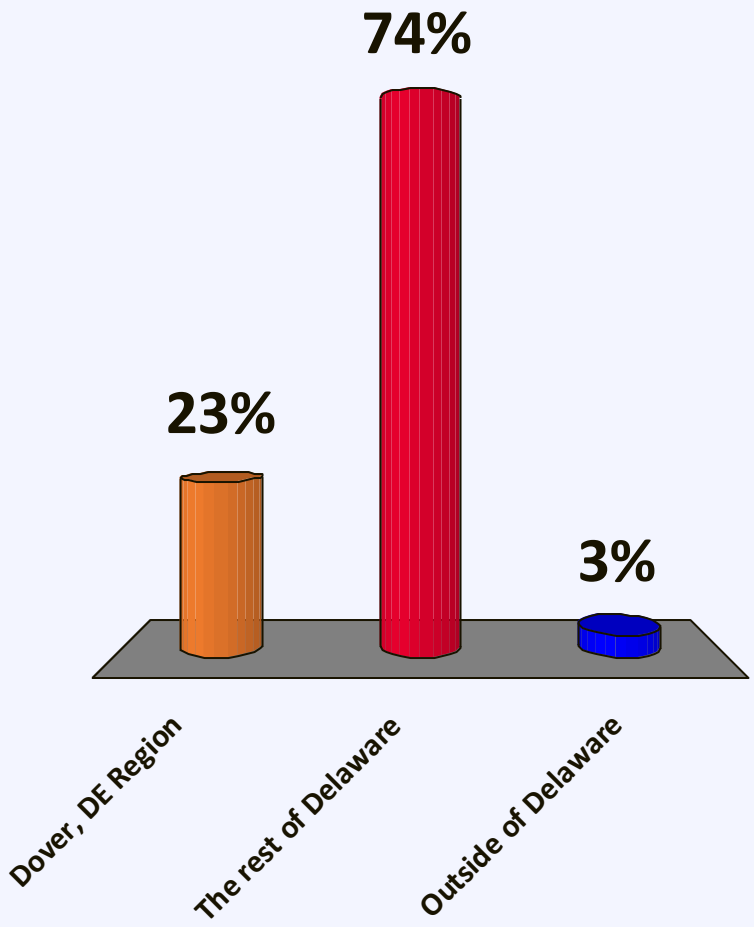
Who are you?

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



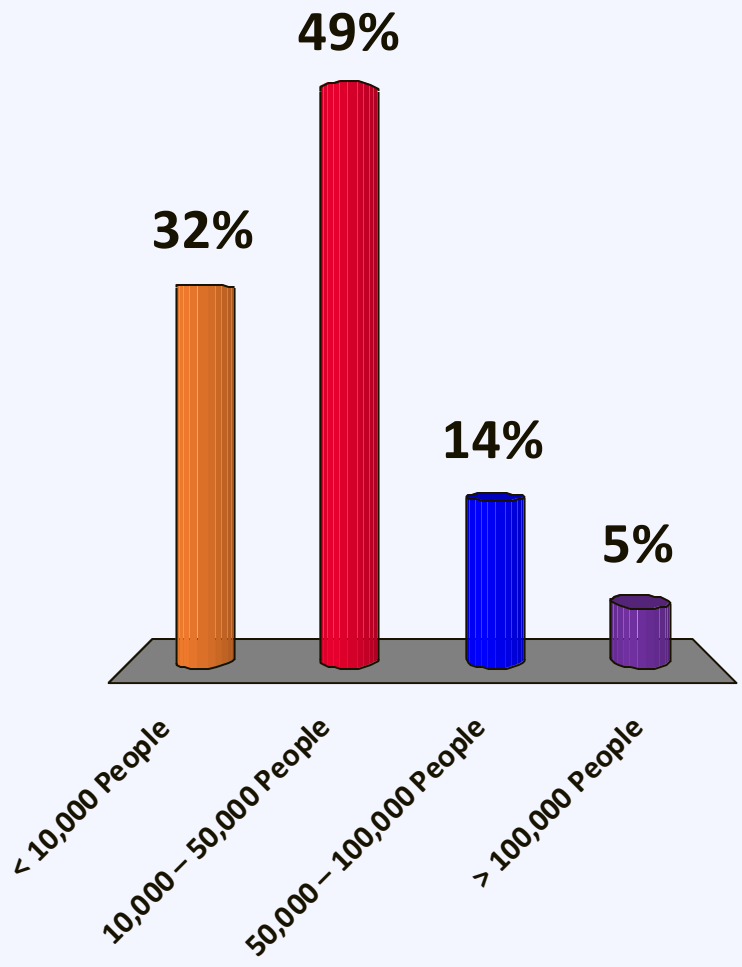
Where are you coming from?

A. Dover, DE Region
B. The rest of Delaware
C. Outside of Delaware



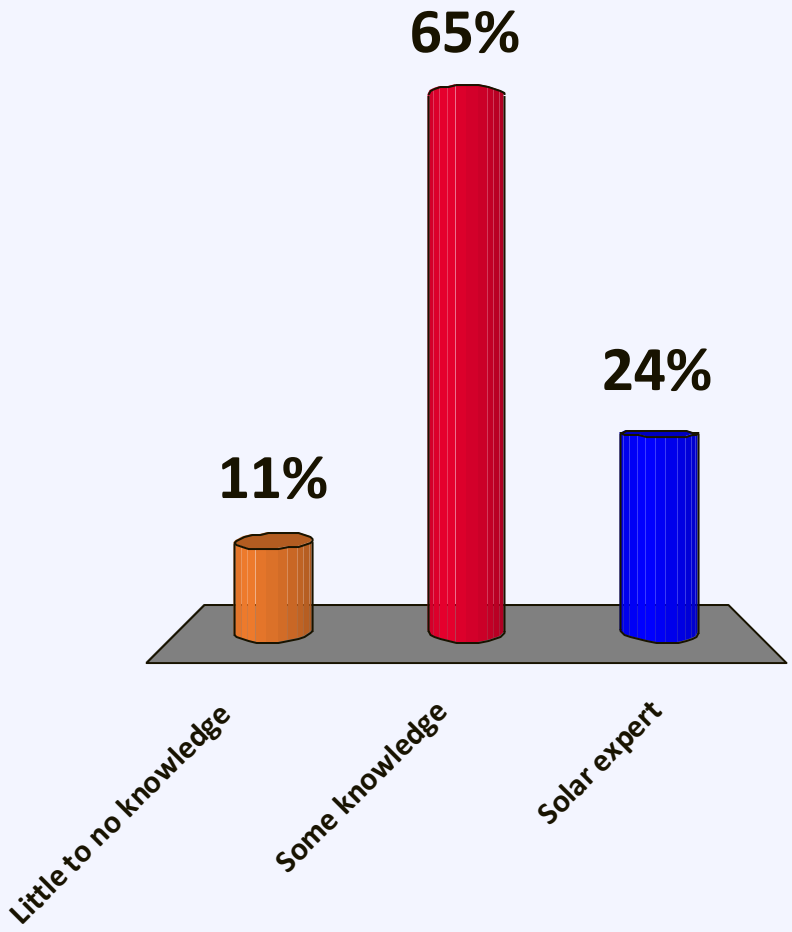
What size is your community?

A. < 10,000 People
B. 10,000 – 50,000 People
C. 50,000 – 100,000 People
D. > 100,000 People



How familiar are you with solar?

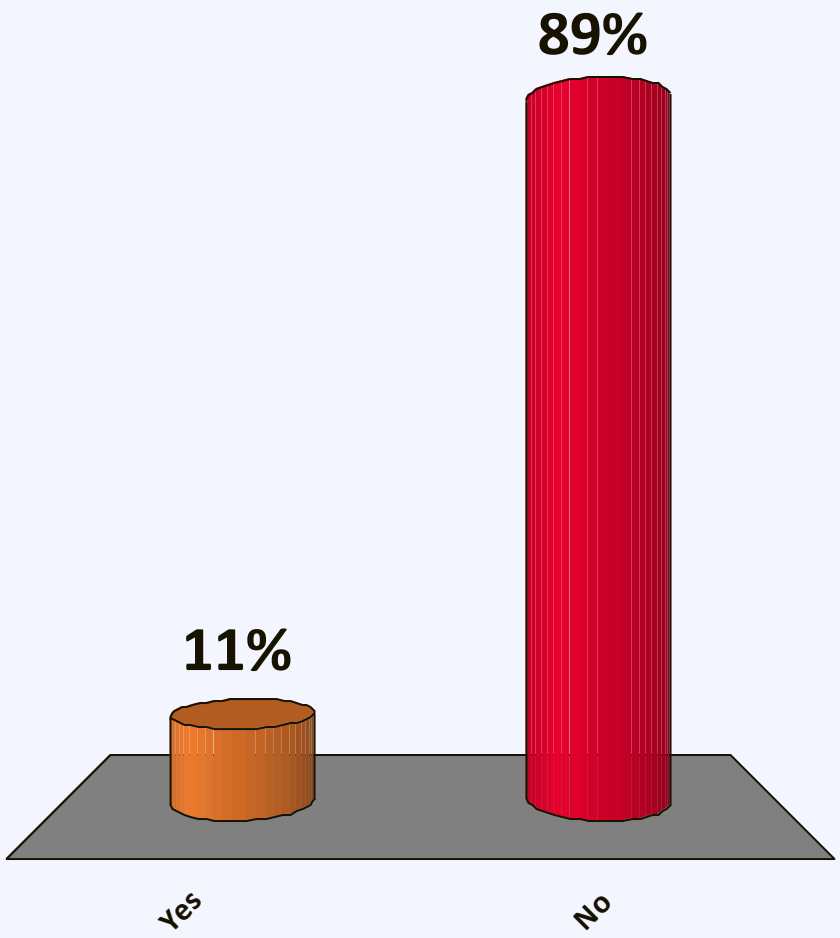
A. Little to no knowledge
B. Some knowledge
C. Solar expert



Do you have solar on your home?

A. Yes

B. No



Solar Development in the US

In 2013, the US solar industry installed

131,000 new solar installations

of which

94% were residential projects

If you do have solar on your home:

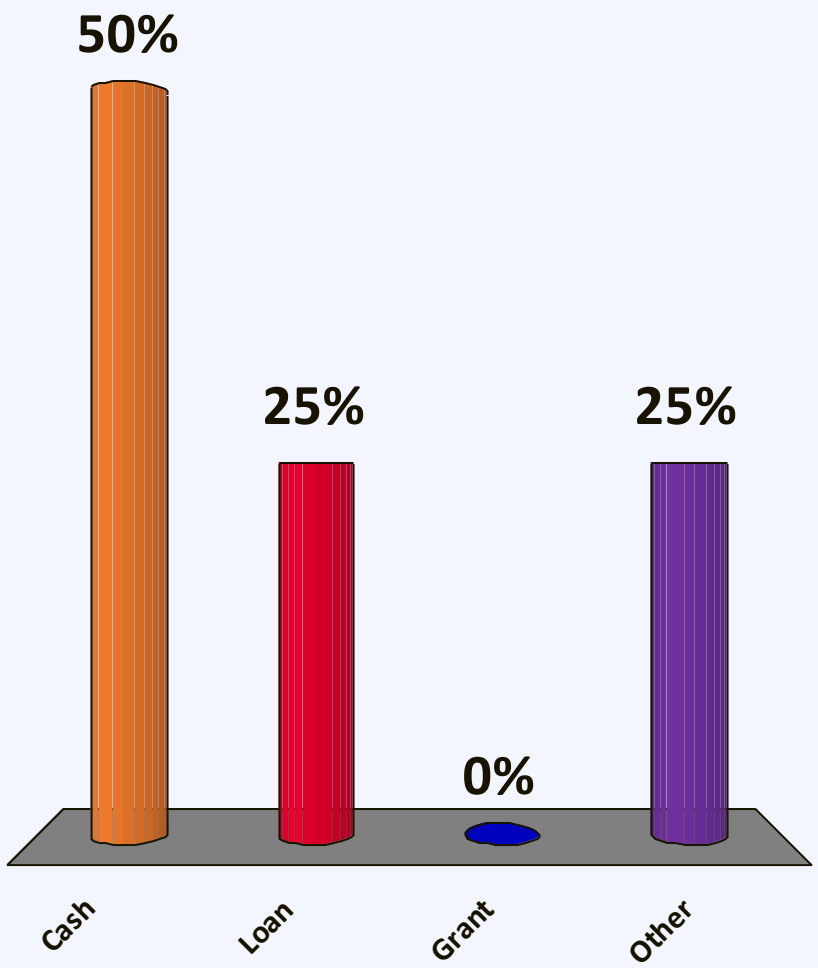
How did you finance it?

A. Cash

B. Loan

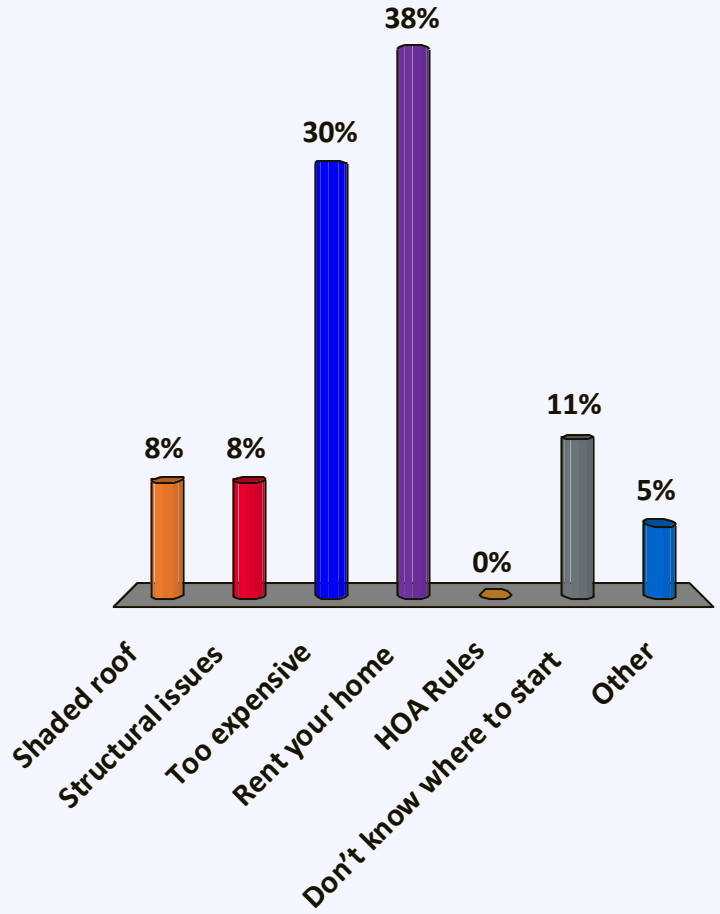
C. Grant

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

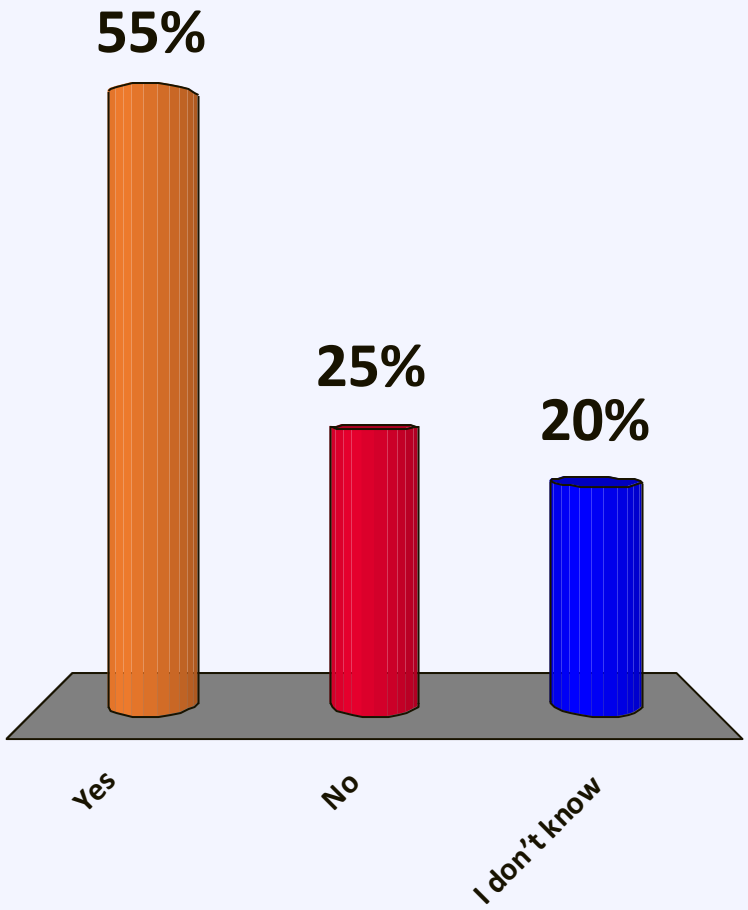


Does your local government have solar on public properties?

A. Yes

B. No

C. I don't know



Agenda

10:10 – 10:30	Putting Solar Energy on the Local Policy Agenda
10:30 – 10:50	State of the Local Solar Market
10:50 – 11:20	Federal, State, and Utility Policy Drivers
11:20 – 11:40	*Break and Grab Lunch*
11:40 – 12:10	Planning for Solar: Getting Solar Ready
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Solar Technologies

Solar Photovoltaic (PV)

Solar Hot Water

Concentrated Solar Power

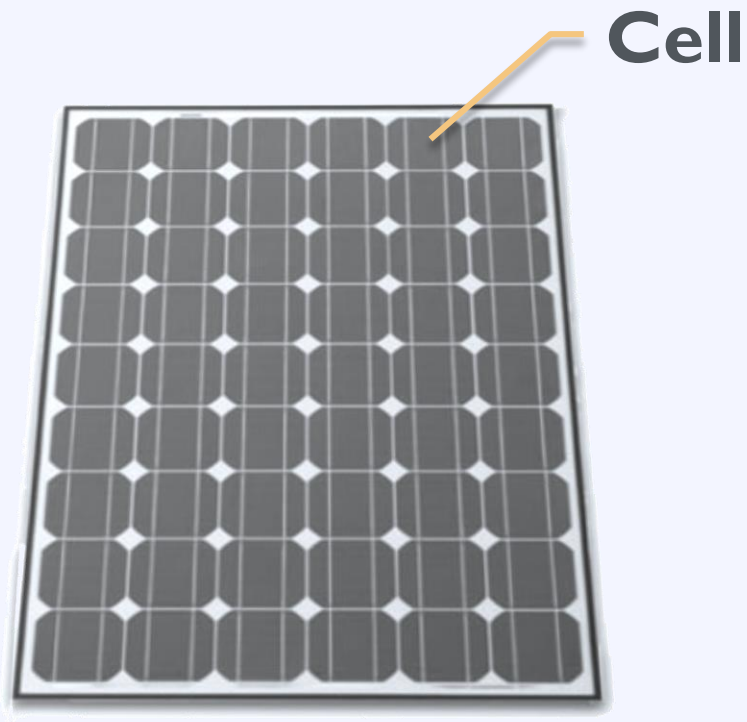
Solar Technologies

Solar Photovoltaic (PV)

Solar Hot Water

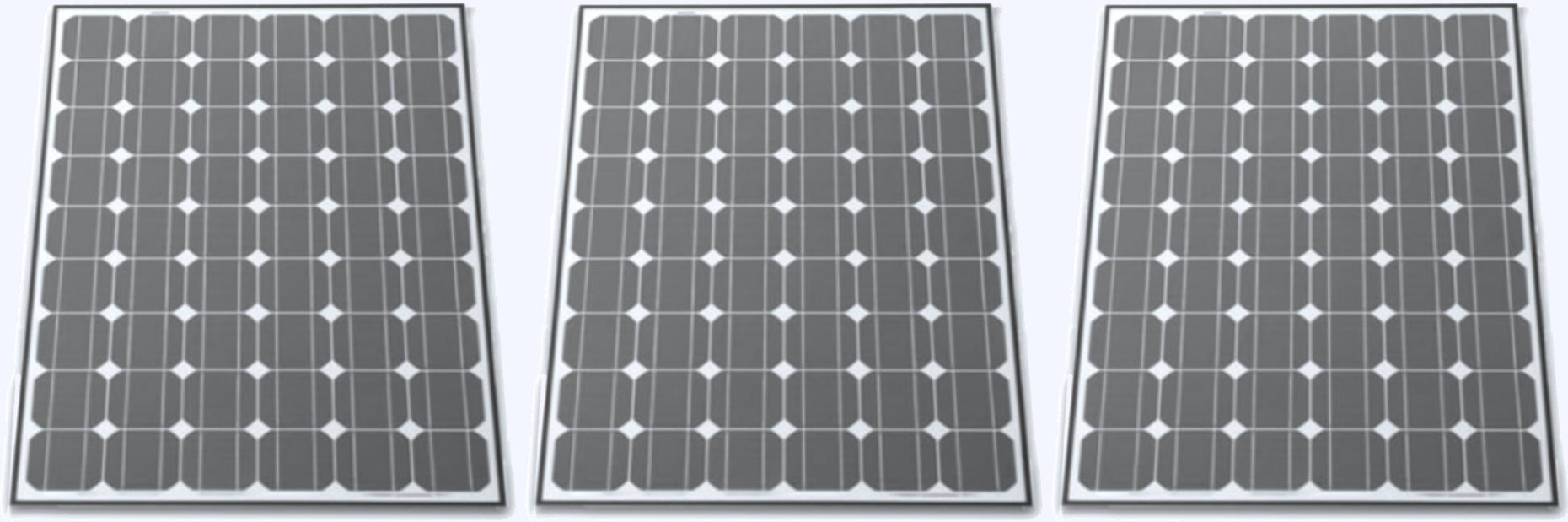
Concentrated Solar Power

Some Basic Terminology



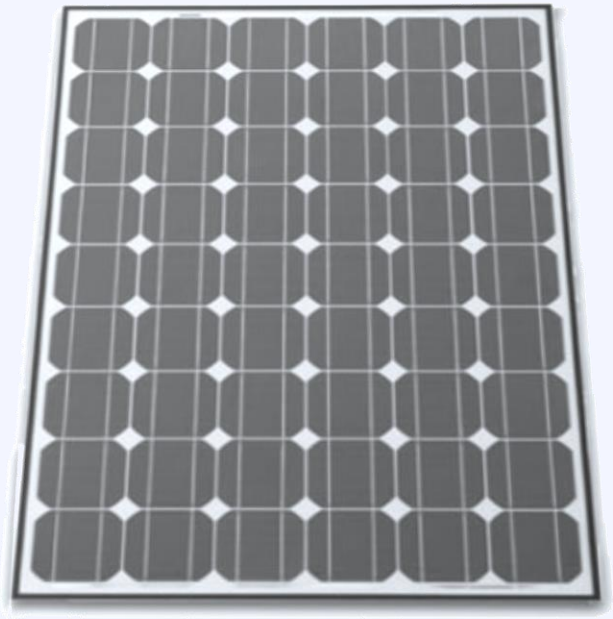
Panel / Module

Some Basic Terminology



Array

Some Basic Terminology



Capacity / Power

kilowatt (kW)

Production

Kilowatt-hour (kWh)

Some Basic Terminology

Residence
5 kW

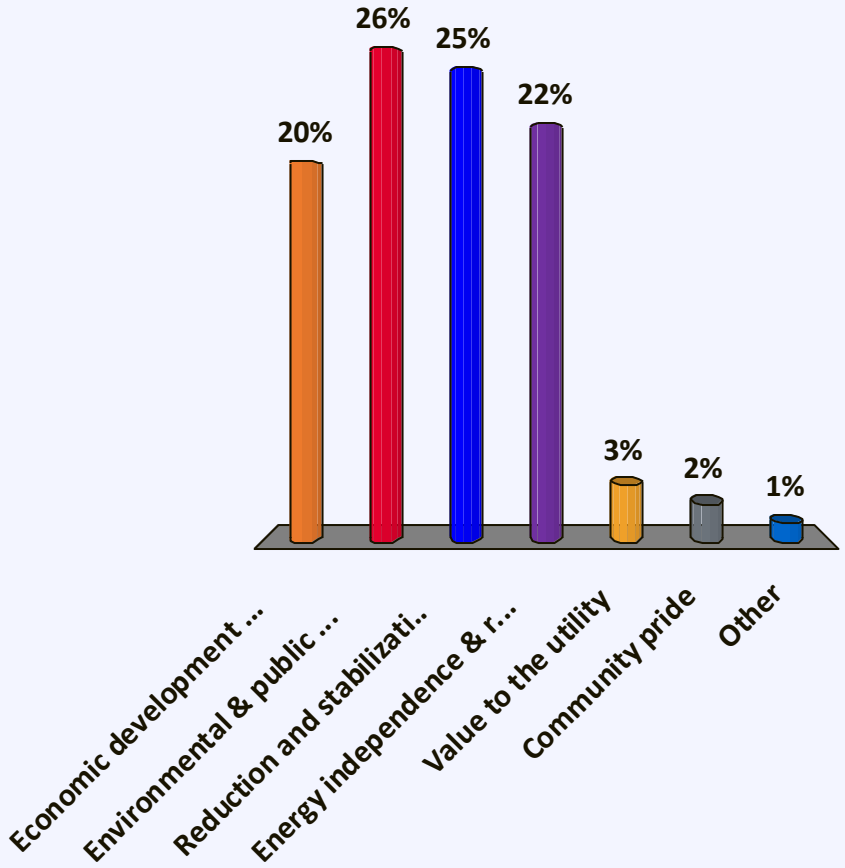
Factory
1 MW+

Office
50 – 500 kW

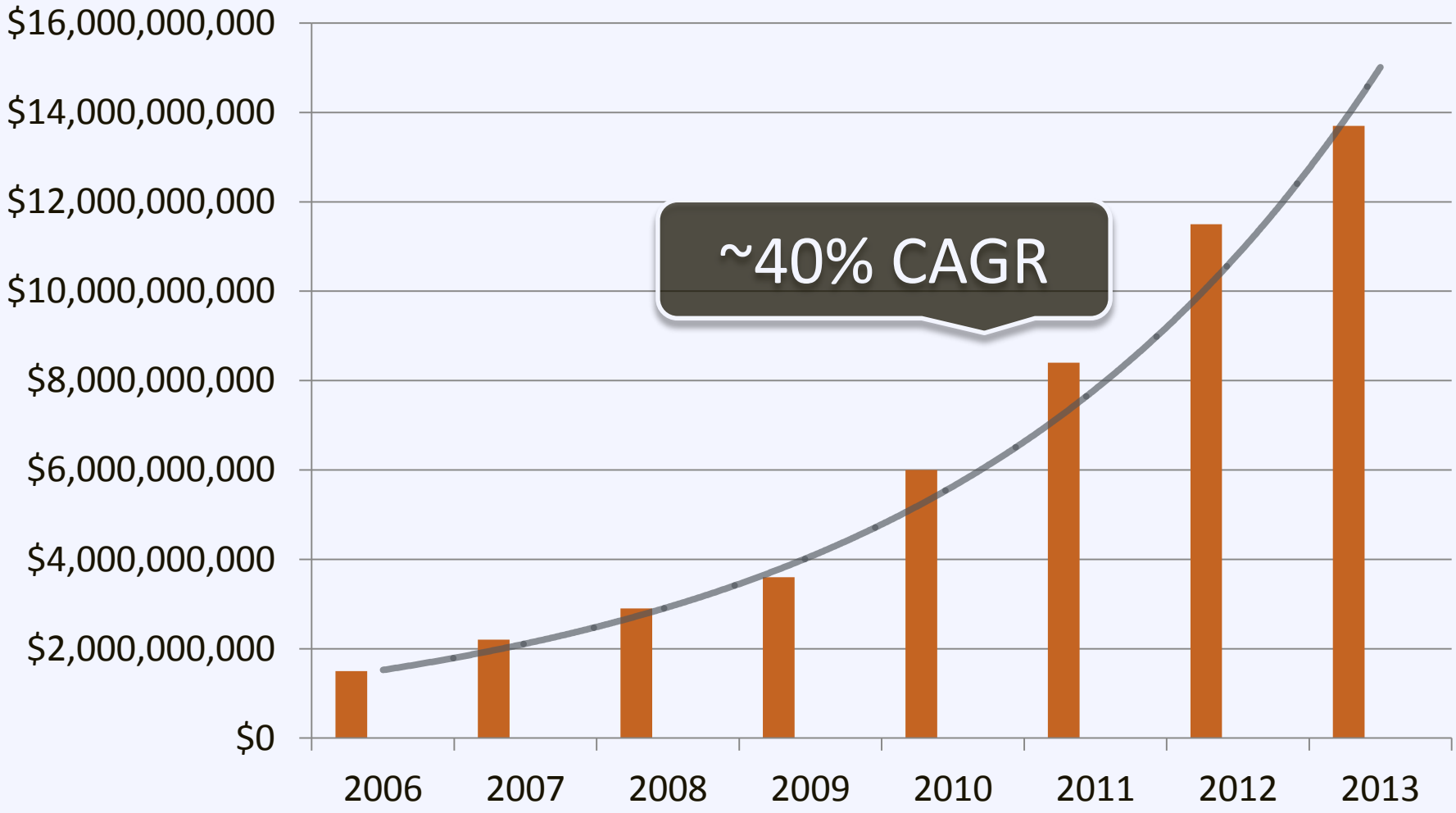
Utility
2 MW+

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

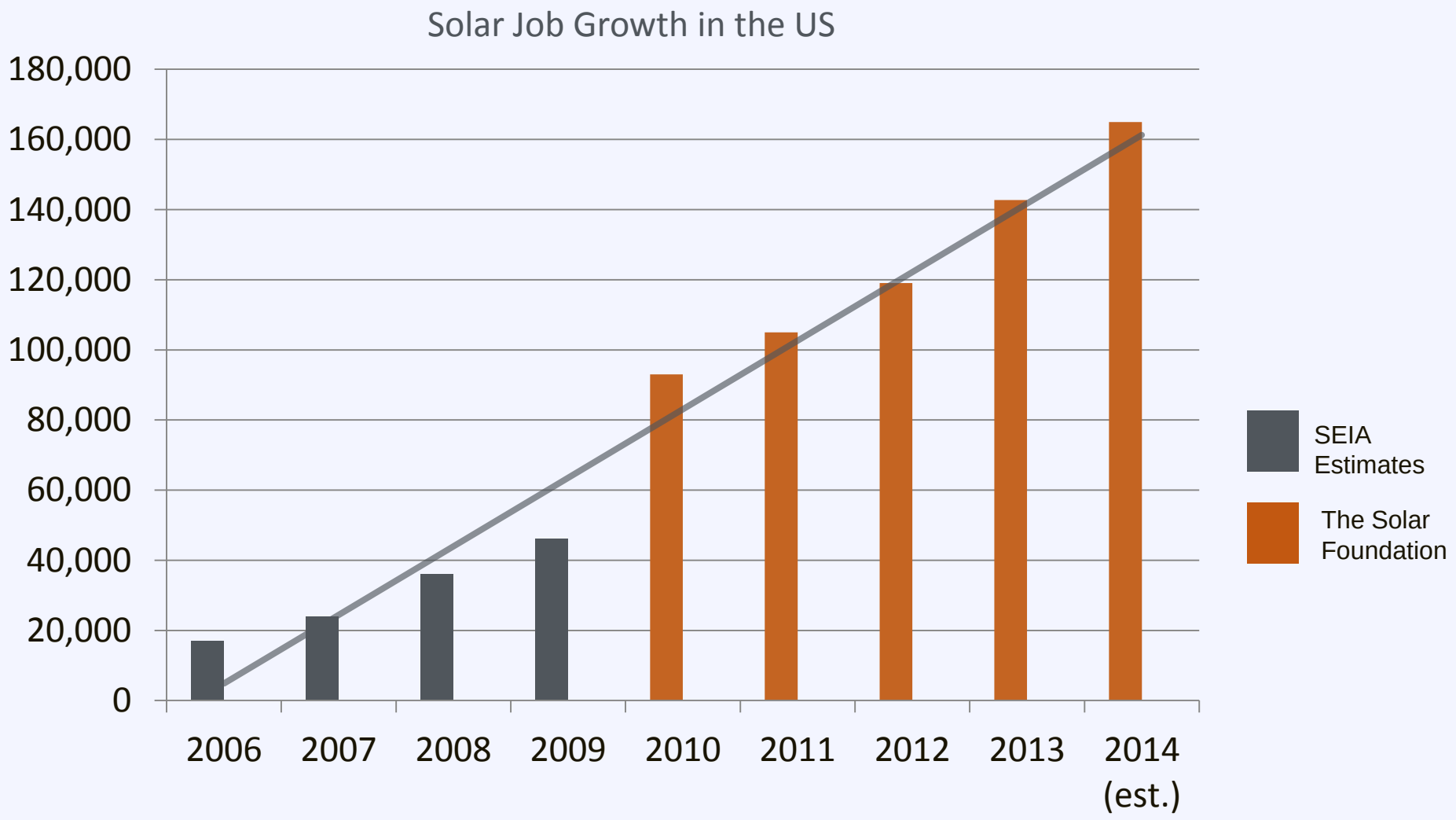


Solar Economic Growth



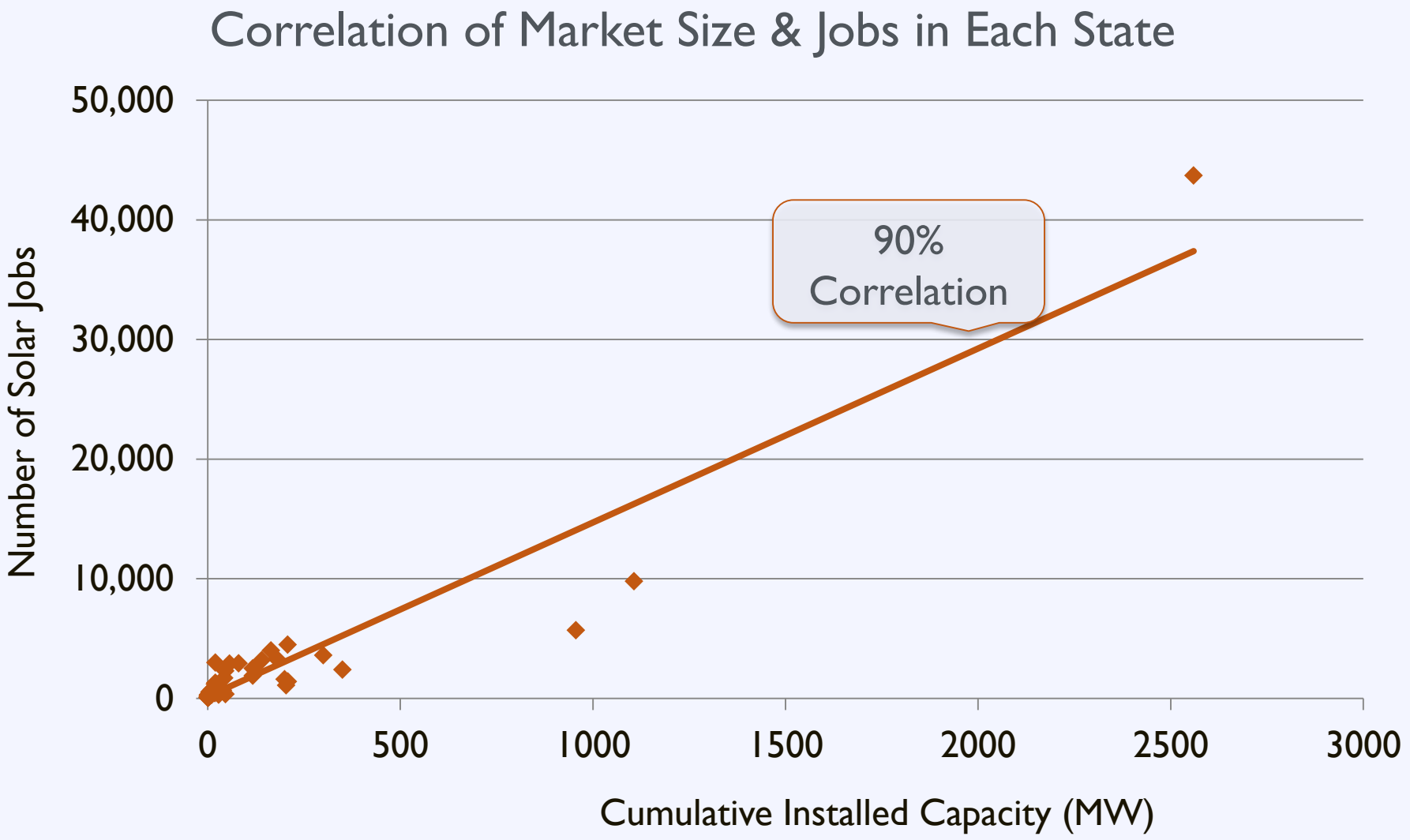
Source: SEIA/GTM Research – 2009/2010/2011/2012 Year in Review Report
http://www.seia.org/research-resources/us-solar-market-insight

Solar Job Growth



Source: SEIA Estimates (2006-2009), The Solar Foundation's National Solar Jobs Census (2010-2013)

Job Creation



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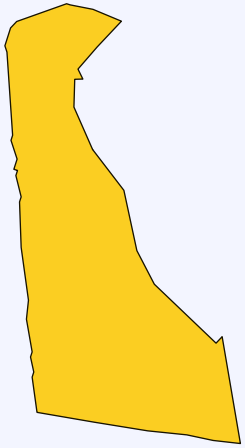
Sources: Interstate Renewable Energy Council, The Solar Foundation, Meister Consultants Group

The Local Economic Opportunity

1 Megawatt of Residential Solar Development in Delaware:



33 Jobs *and* **$4.1 Million**

In economic output

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Source: JEDI Model, NREL

Economic Development in Delaware

There are currently

41 solar companies

that employ

510 people

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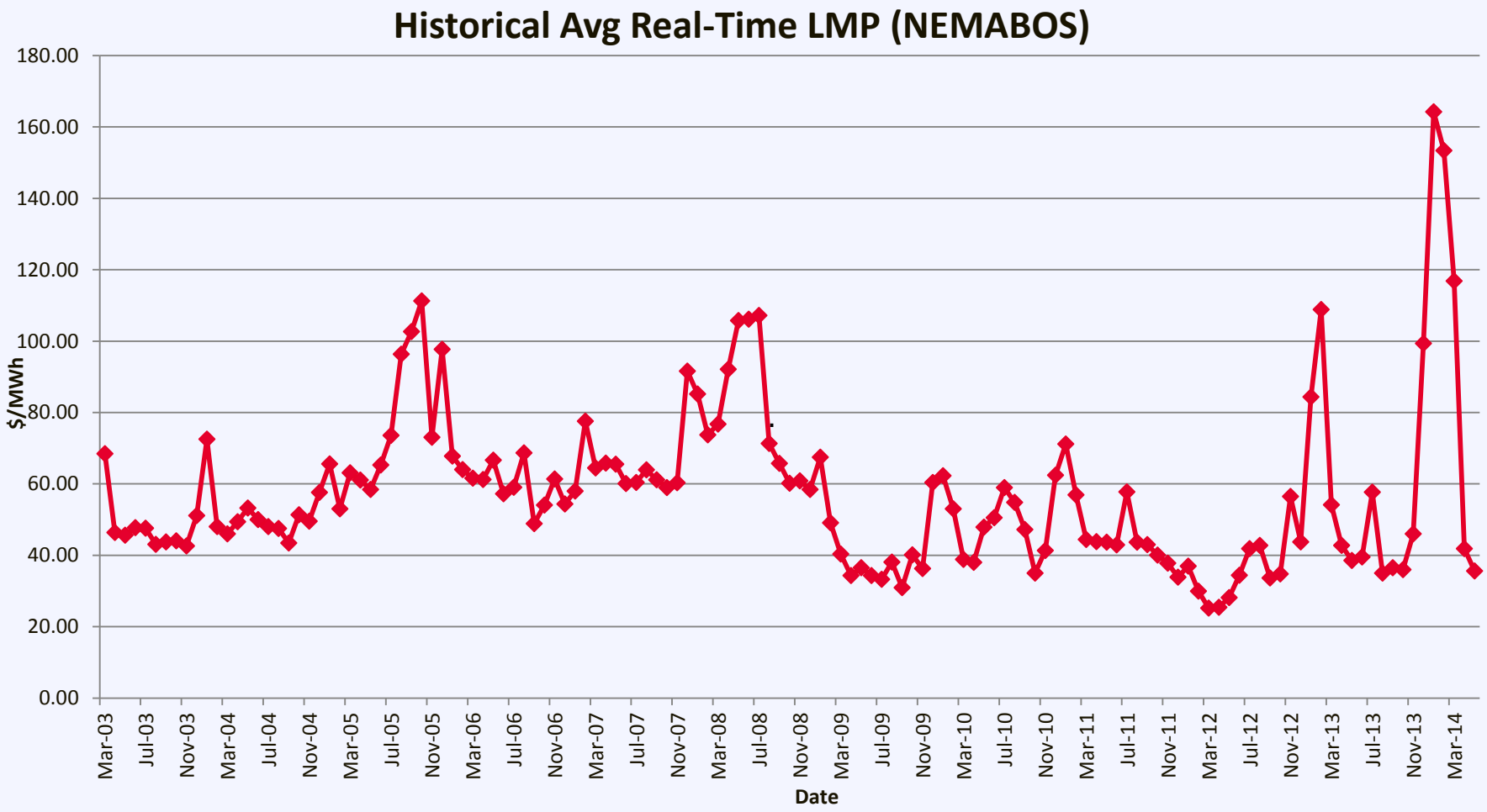
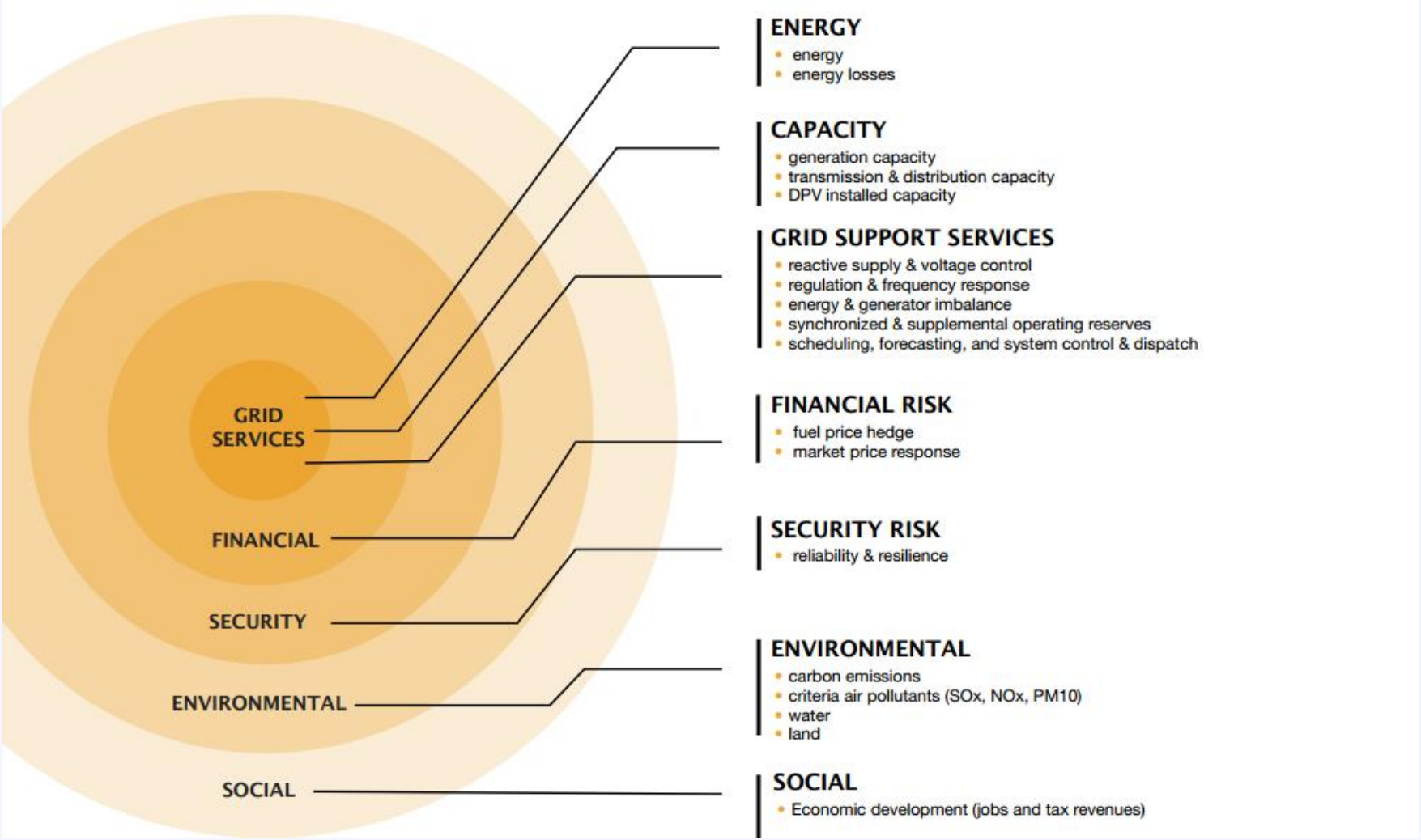
Source: SEIA, The Solar Foundation

Benefit: Stabilize Energy Prices



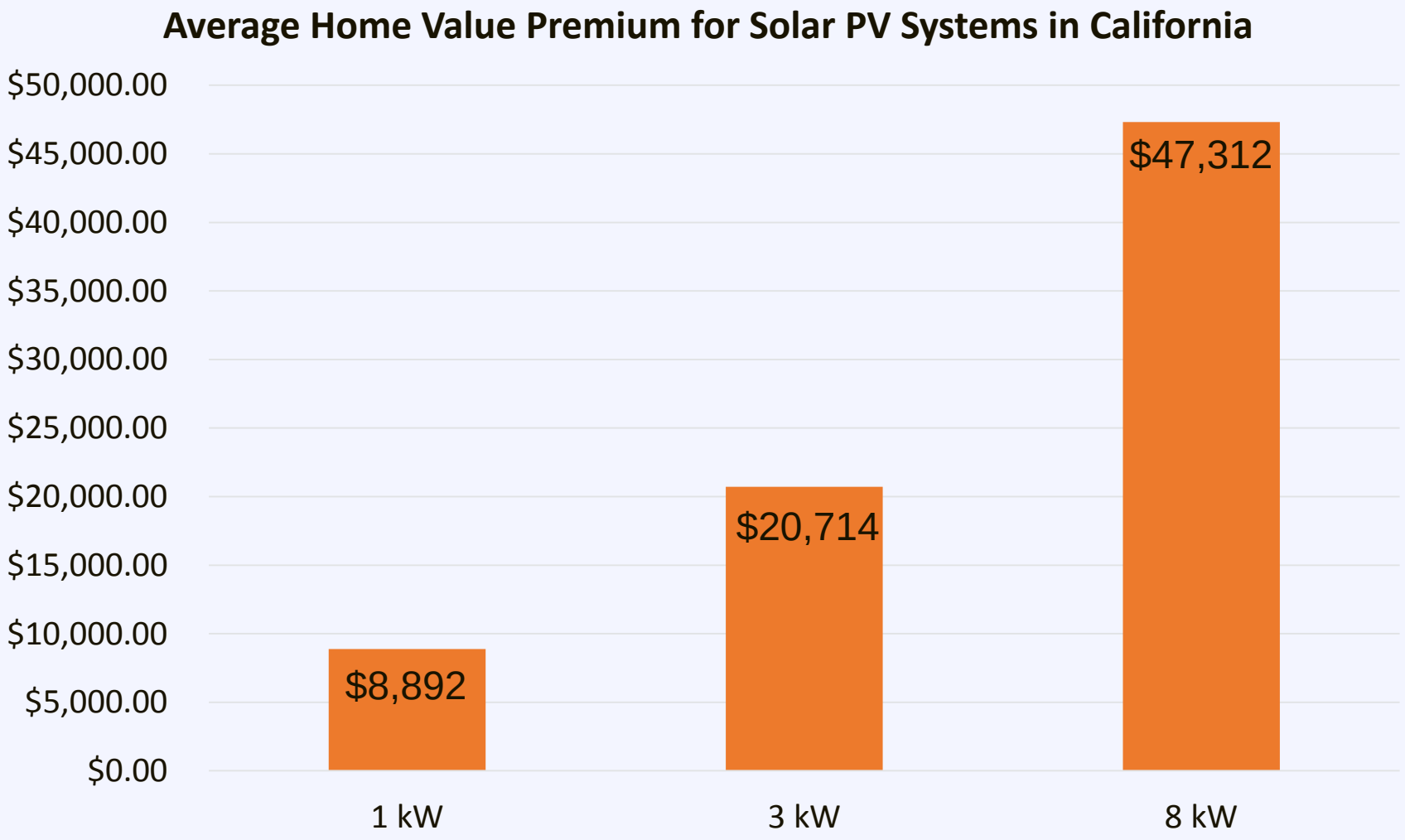
Source: NEPOOL

Valuable to Community & Utilities



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

Smart Investment for Homeowners



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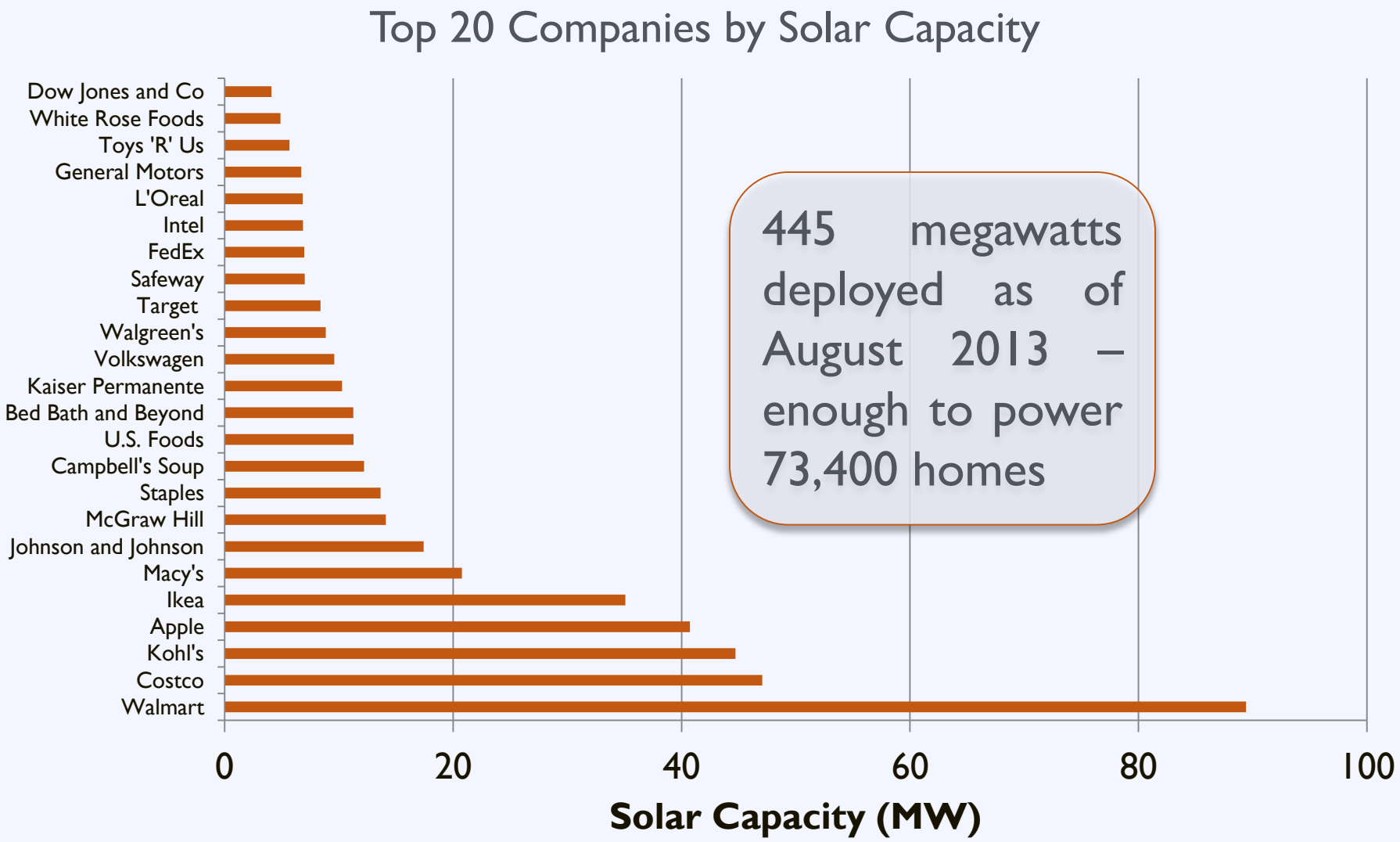
Source: LBNL, *Exploring California PV Home Premiums* (2013)

Smart Investment for Businesses



Source: Solar Energy Industries Association

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Smart Investment for Governments

Source: Borrego Solar

Smart Investment for Schools

Current:

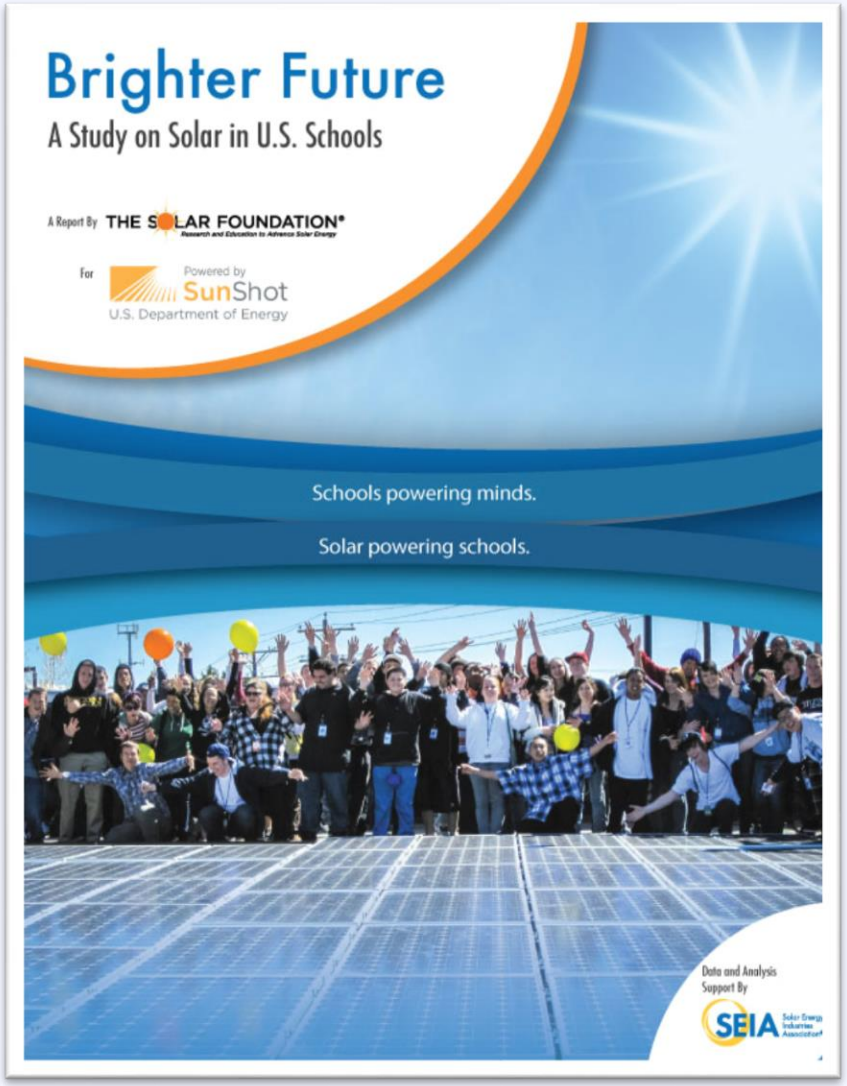
× 3,752

$ = $77.8m

Potential:

× 40,000 – 72,000

$ = $800m



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

Smart Investment for Schools

Currently only nine K-12 Delaware schools with solar

Up to 99% of non-solar schools can "go solar" cost-effectively, with a net present value of over $8 million.

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

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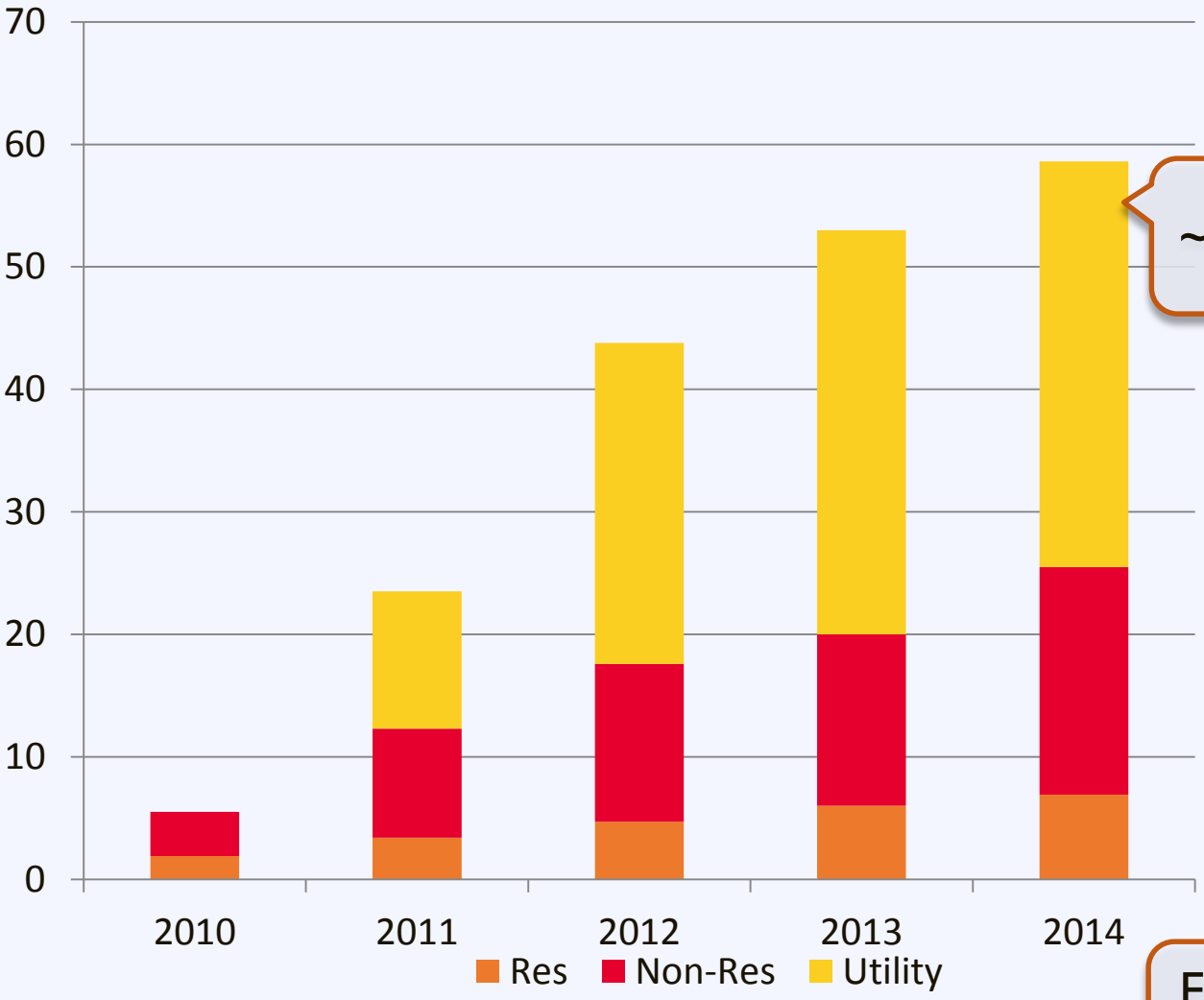
Delaware Solar Market



~59 Megawatts

Enough to power over 6,270 DE homes

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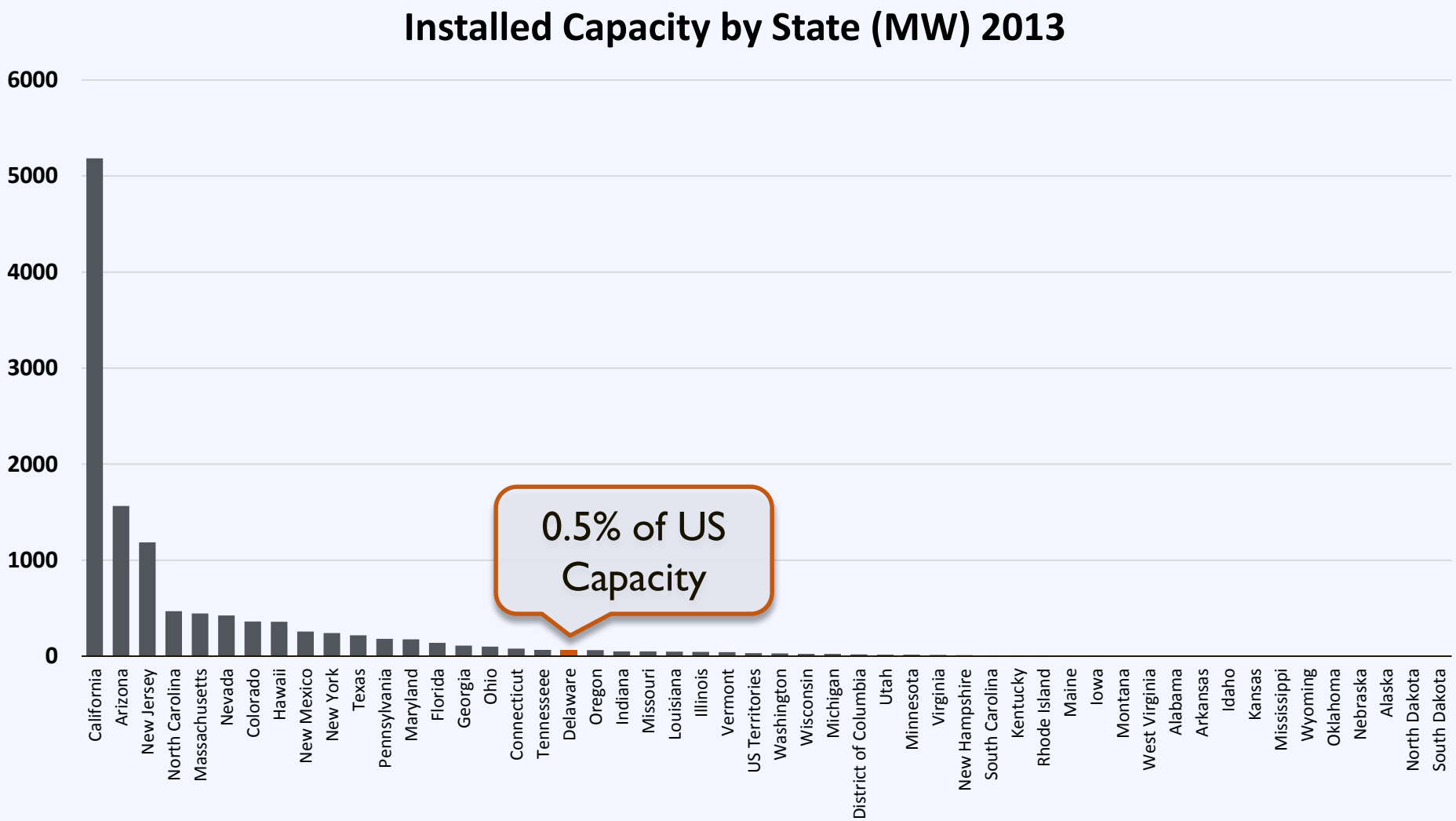
Source: SEIA/GTM Research, *Solar Market Insight*

US Solar Market



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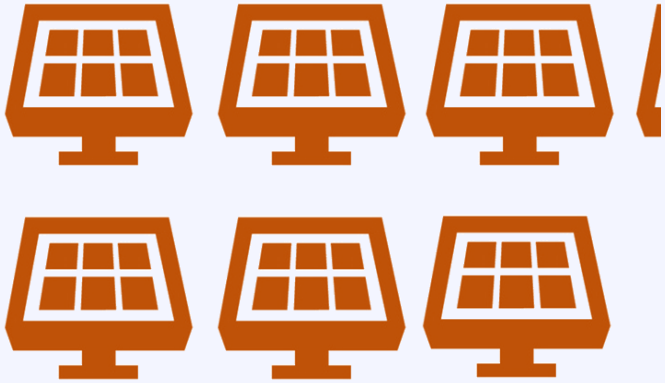
Source: IREC, Solar Market Trends 2013

Delaware Solar Market

Delaware



61

watts per person

US

39

watts per person

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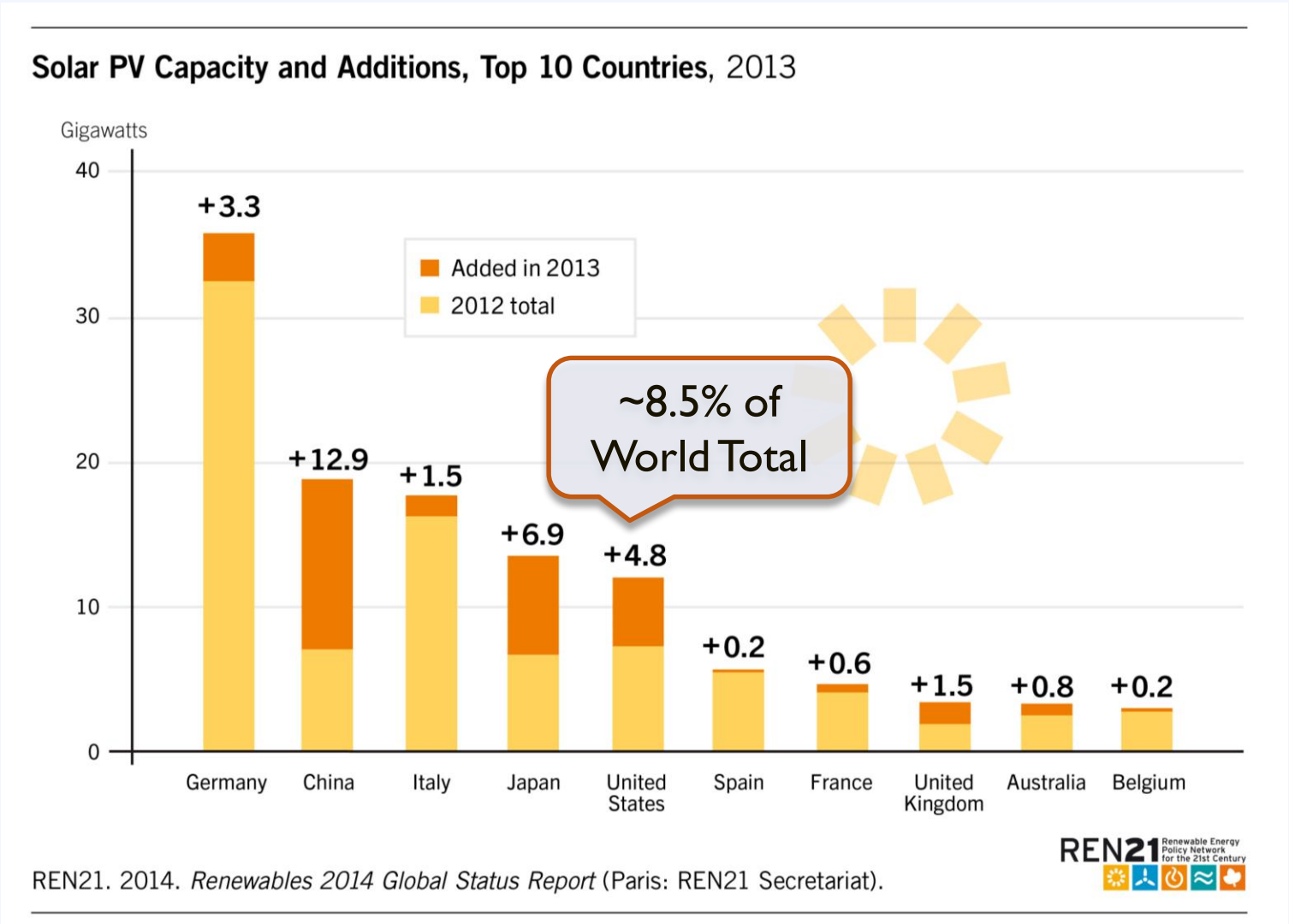
Source: IREC Solar Market Trends 2013

World Solar Market



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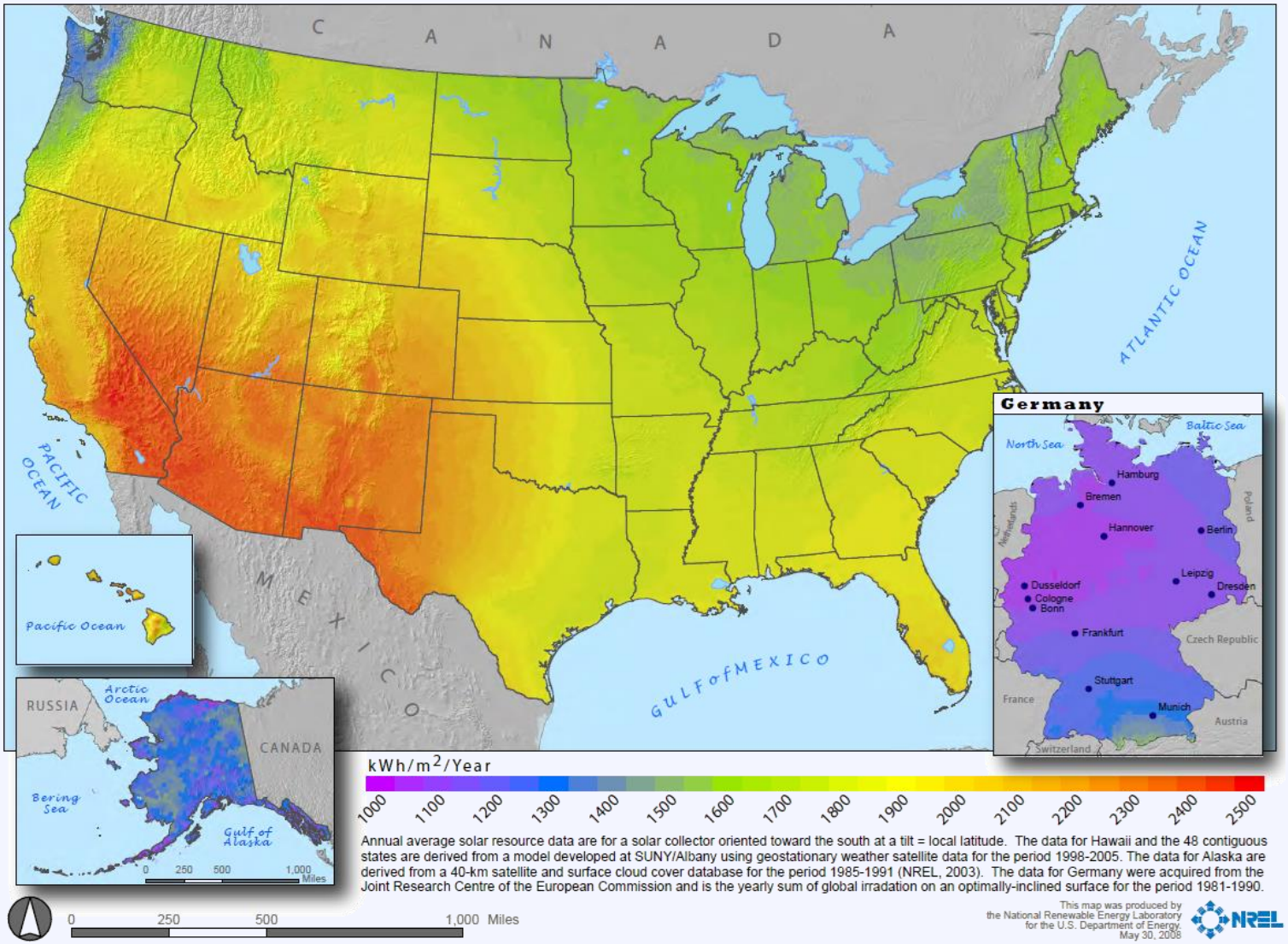
Source: REN 21

US Solar Resource



Annual average solar resource data are for a solar collector oriented toward the south at a tilt = local latitude. The data for Hawaii and the 48 contiguous states are derived from a model developed at SUNY/Albany using geostationary weather satellite data for the period 1998-2005. The data for Alaska are derived from a 40-km satellite and surface cloud cover database for the period 1985-1991 (NREL, 2003). The data for Germany were acquired from the Joint Research Centre of the European Commission and is the yearly sum of global irradiation on an optimally-inclined surface for the period 1981-1990.

This map was produced by the National Renewable Energy Laboratory for the U.S. Department of Energy. May 30, 2008

NREL

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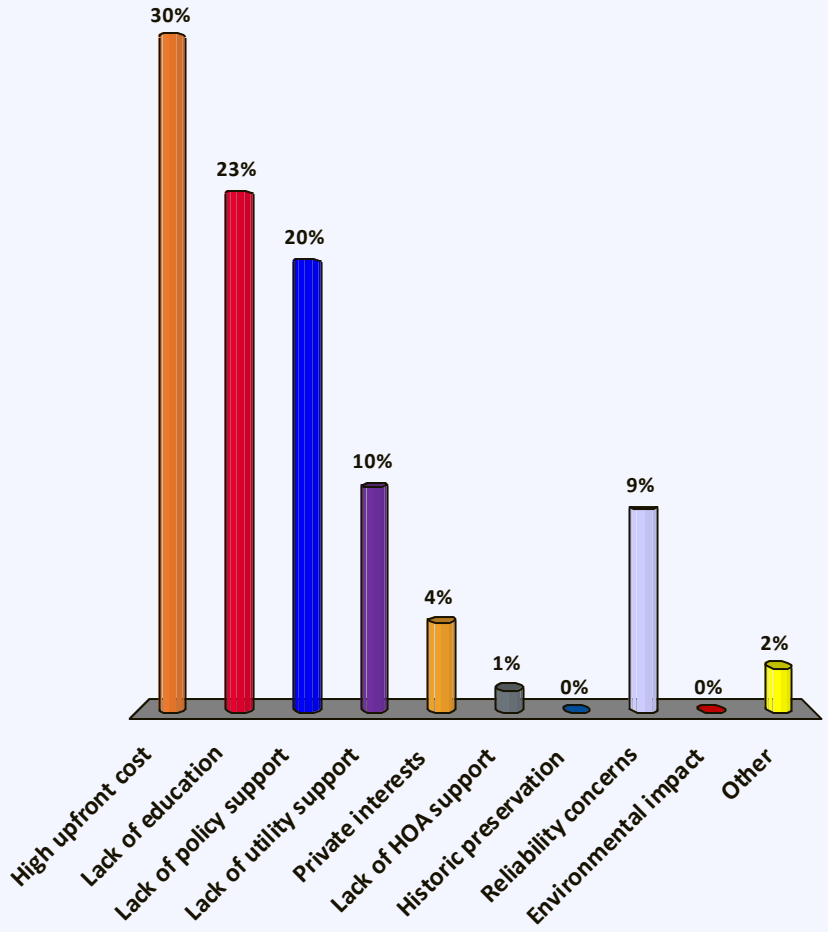
Source: National Renewable Energy Laboratory

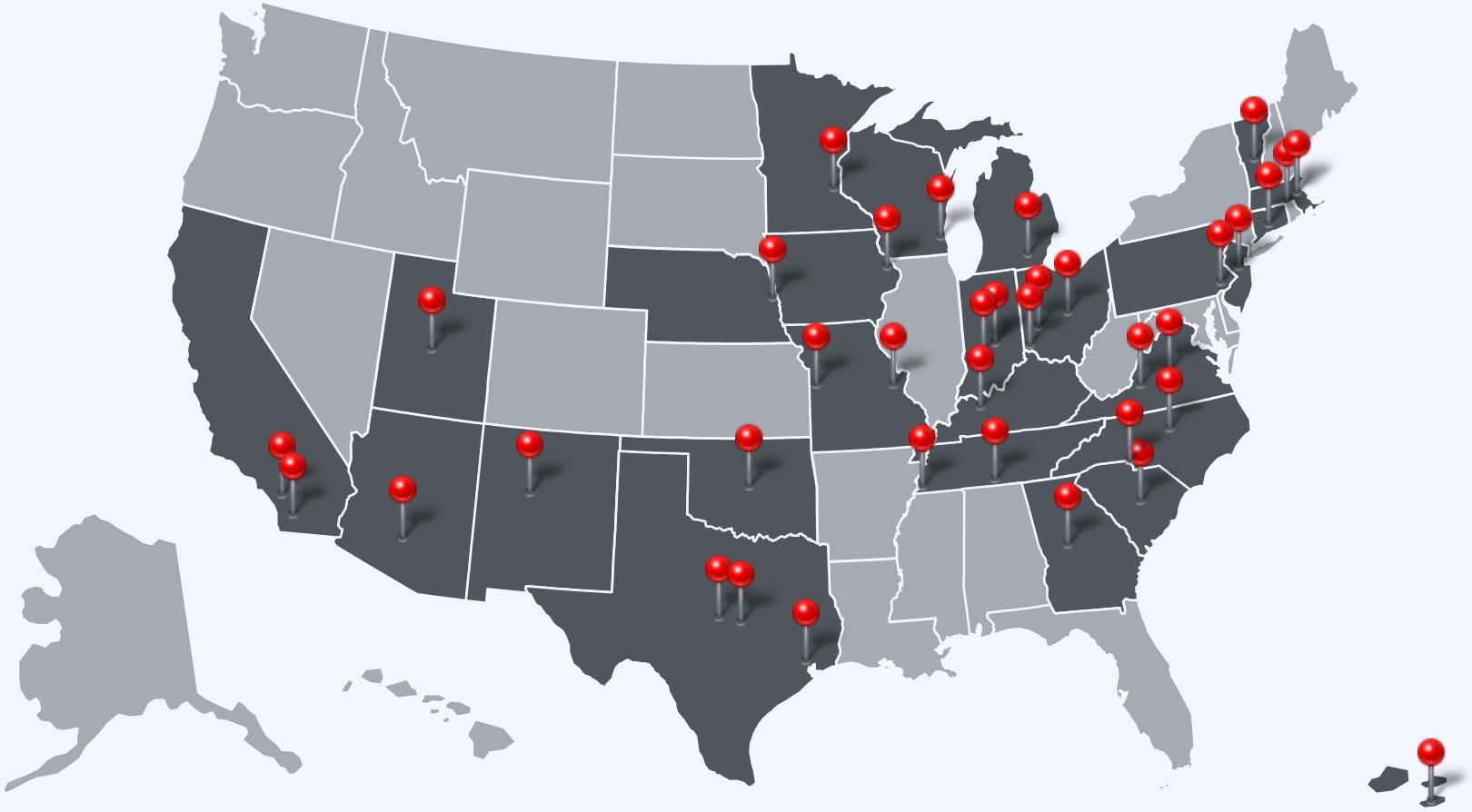
What are the top 3 barriers to solar adoption in your community?

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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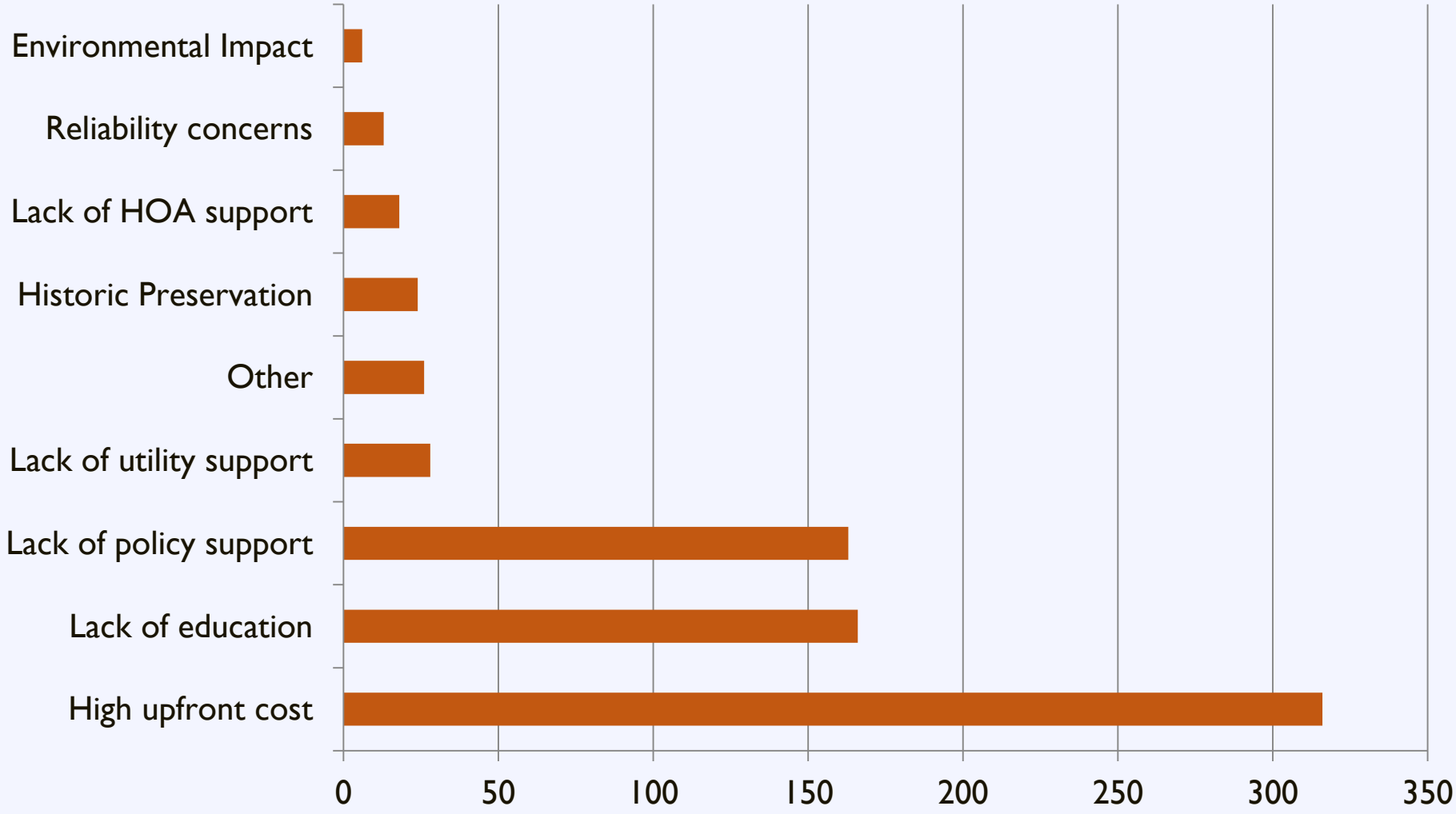
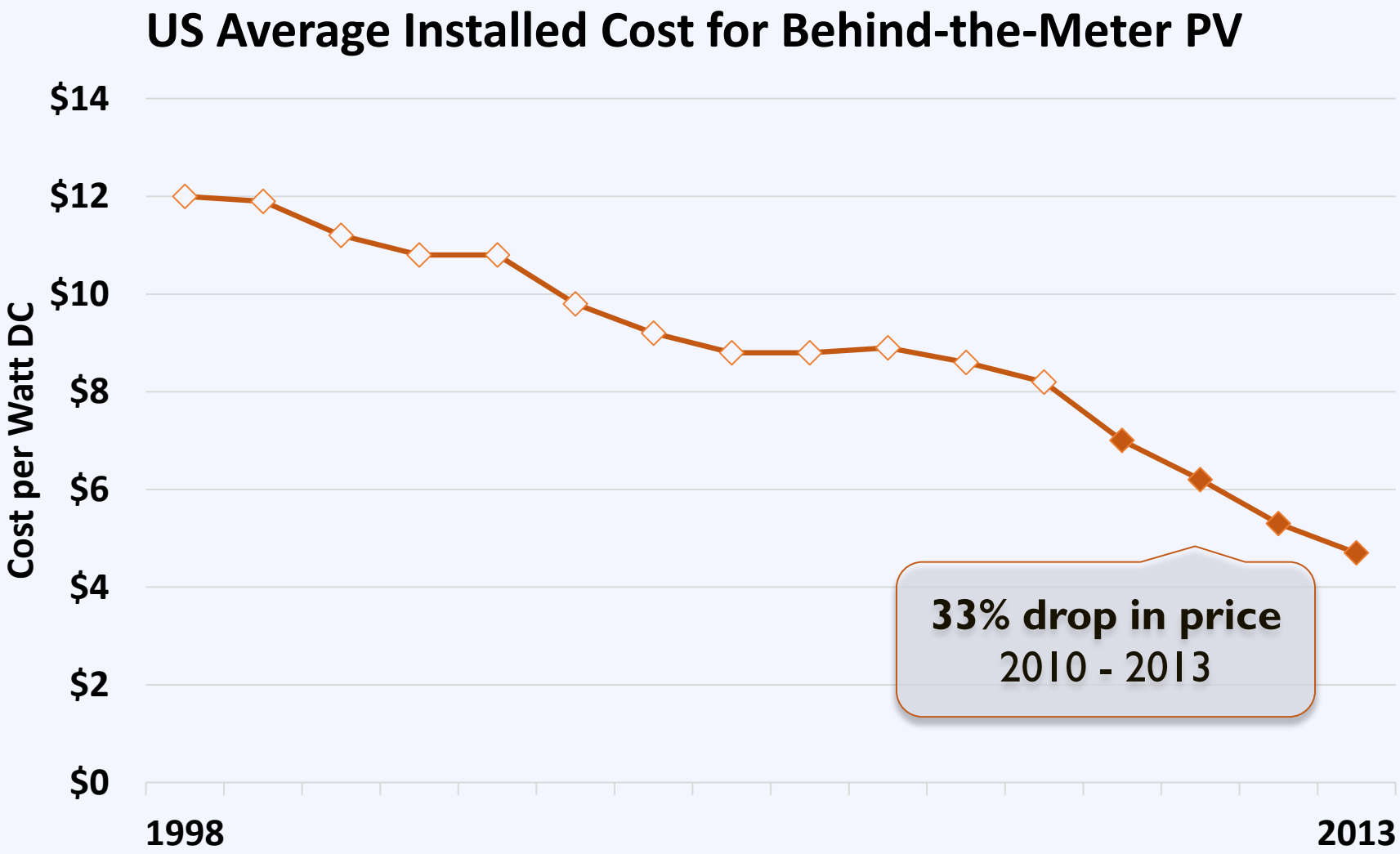
Activity: Addressing Barriers



The Cost of Solar PV



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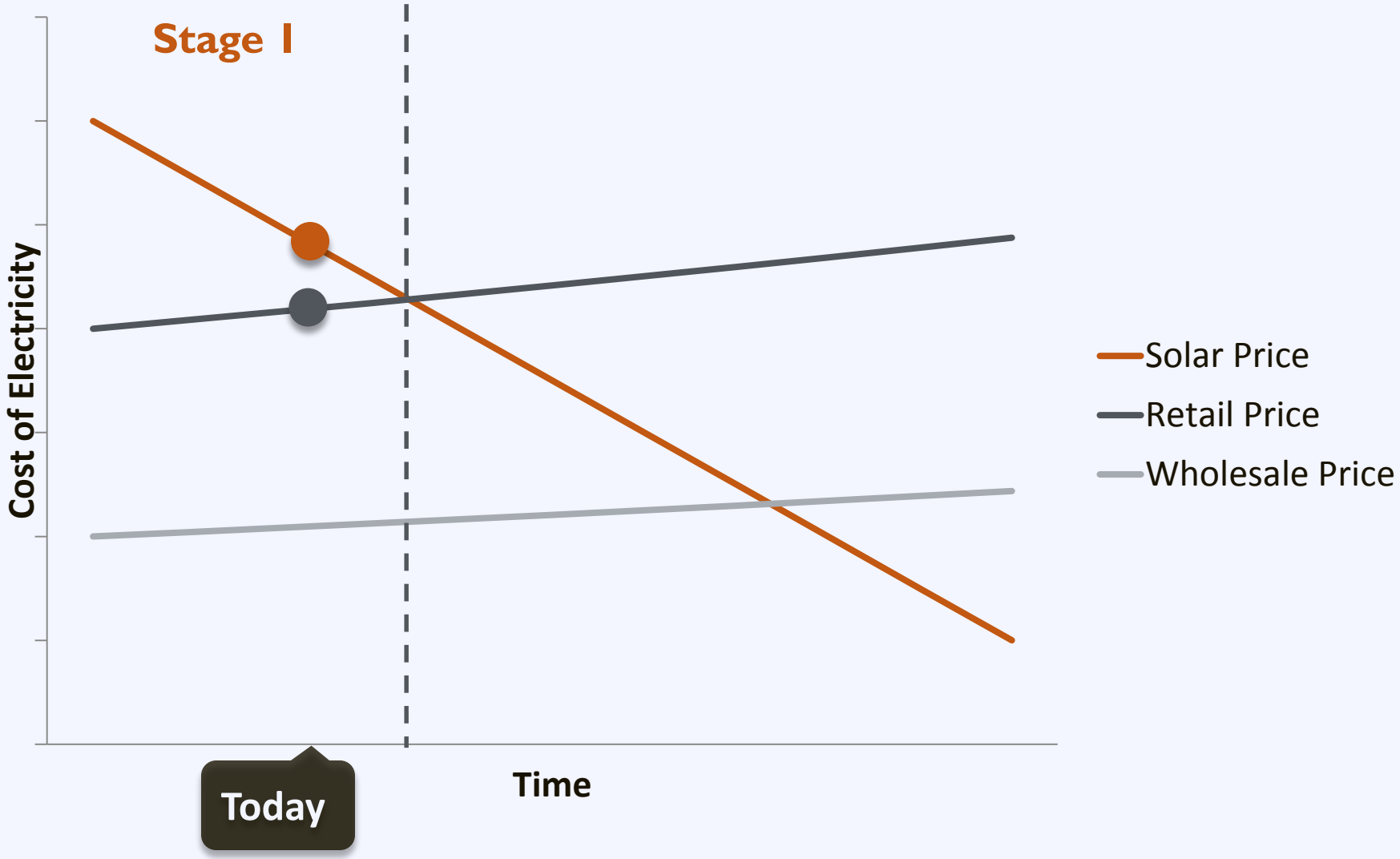
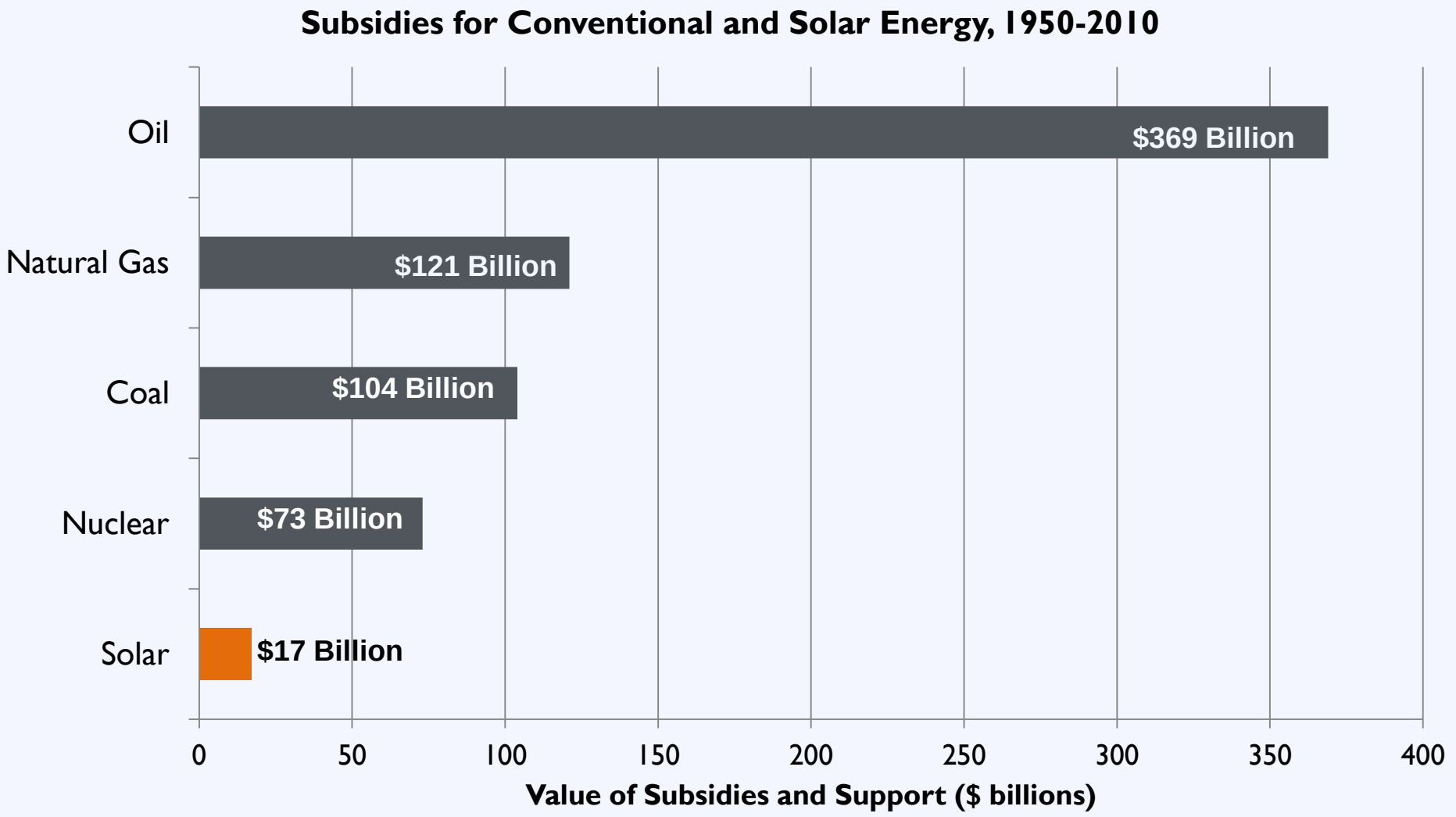
Tracking the Sun VII: The Installed Cost of Photovoltaics in the US from 1998-2013 (LBNL)

The Cost of Solar PV



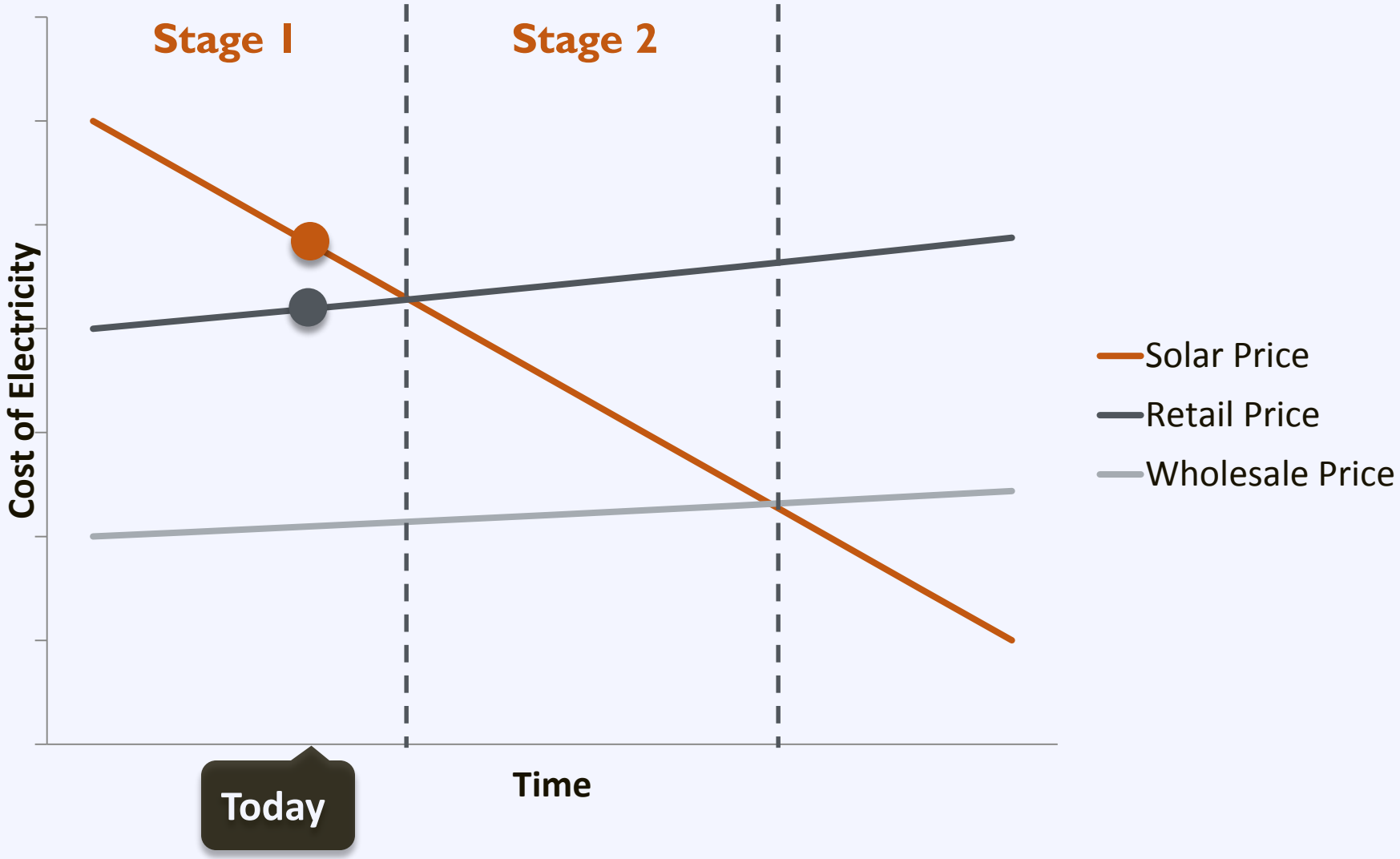
Source: Solar Electric Power Association

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



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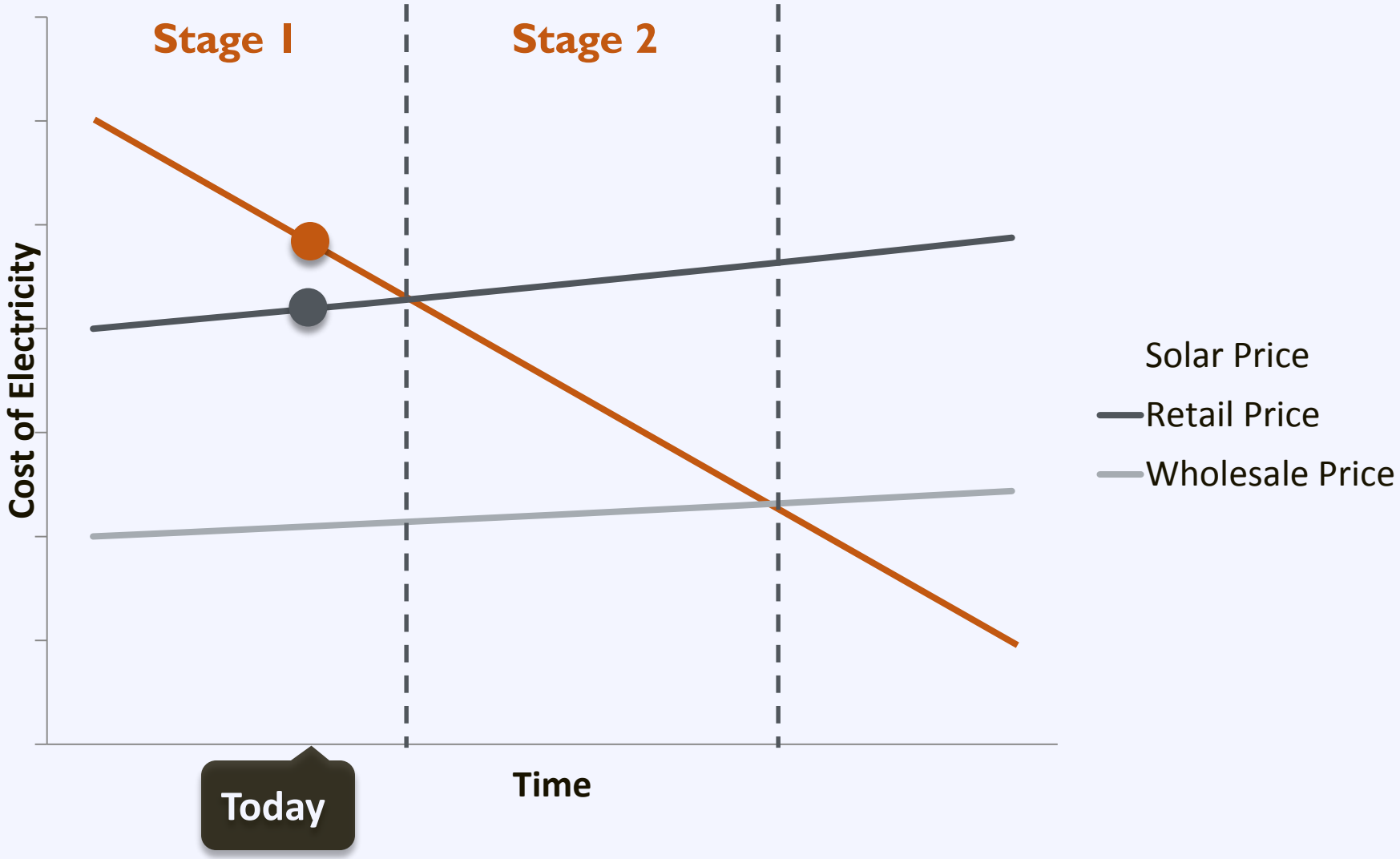
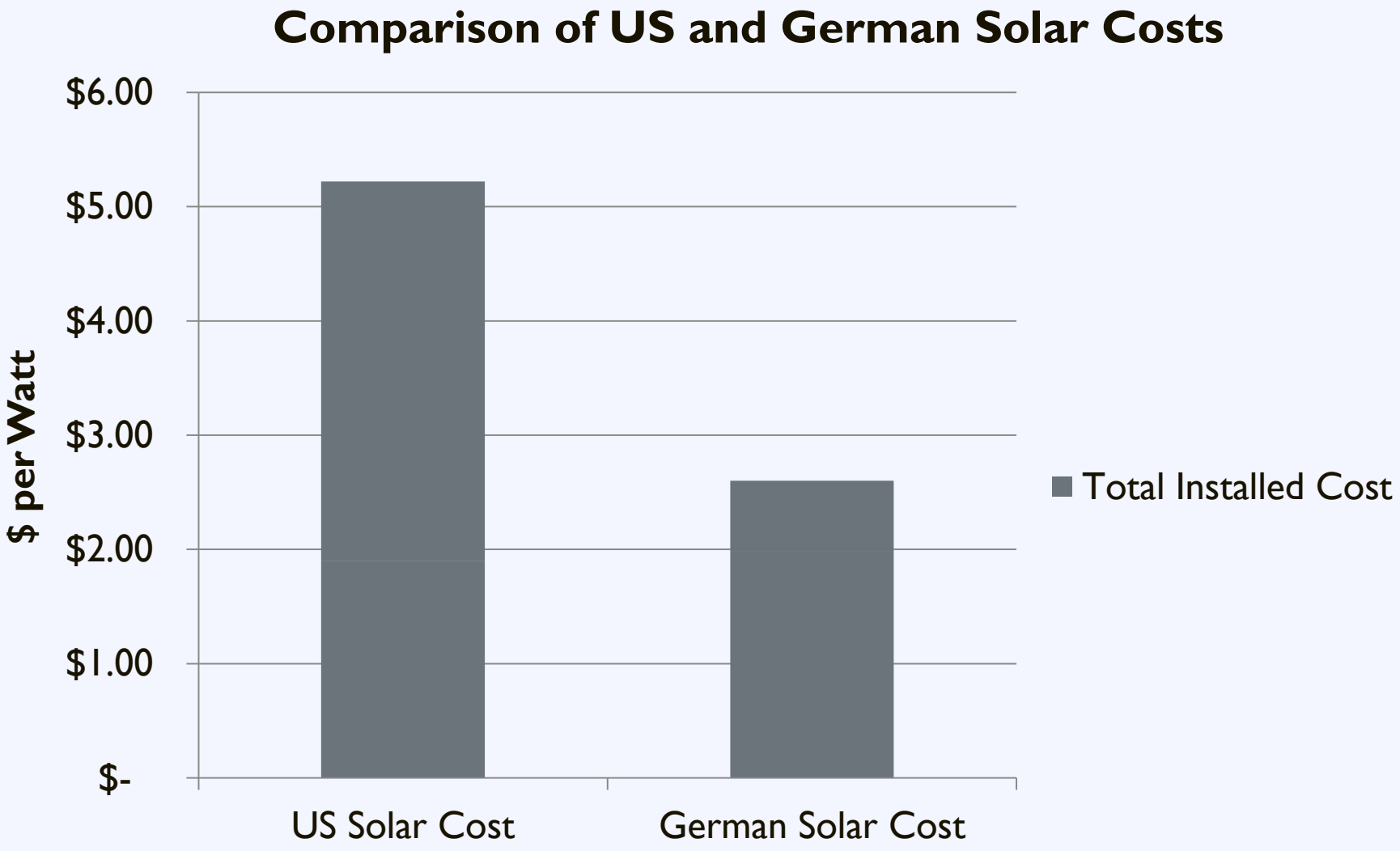


Source: Solar Electric Power Association

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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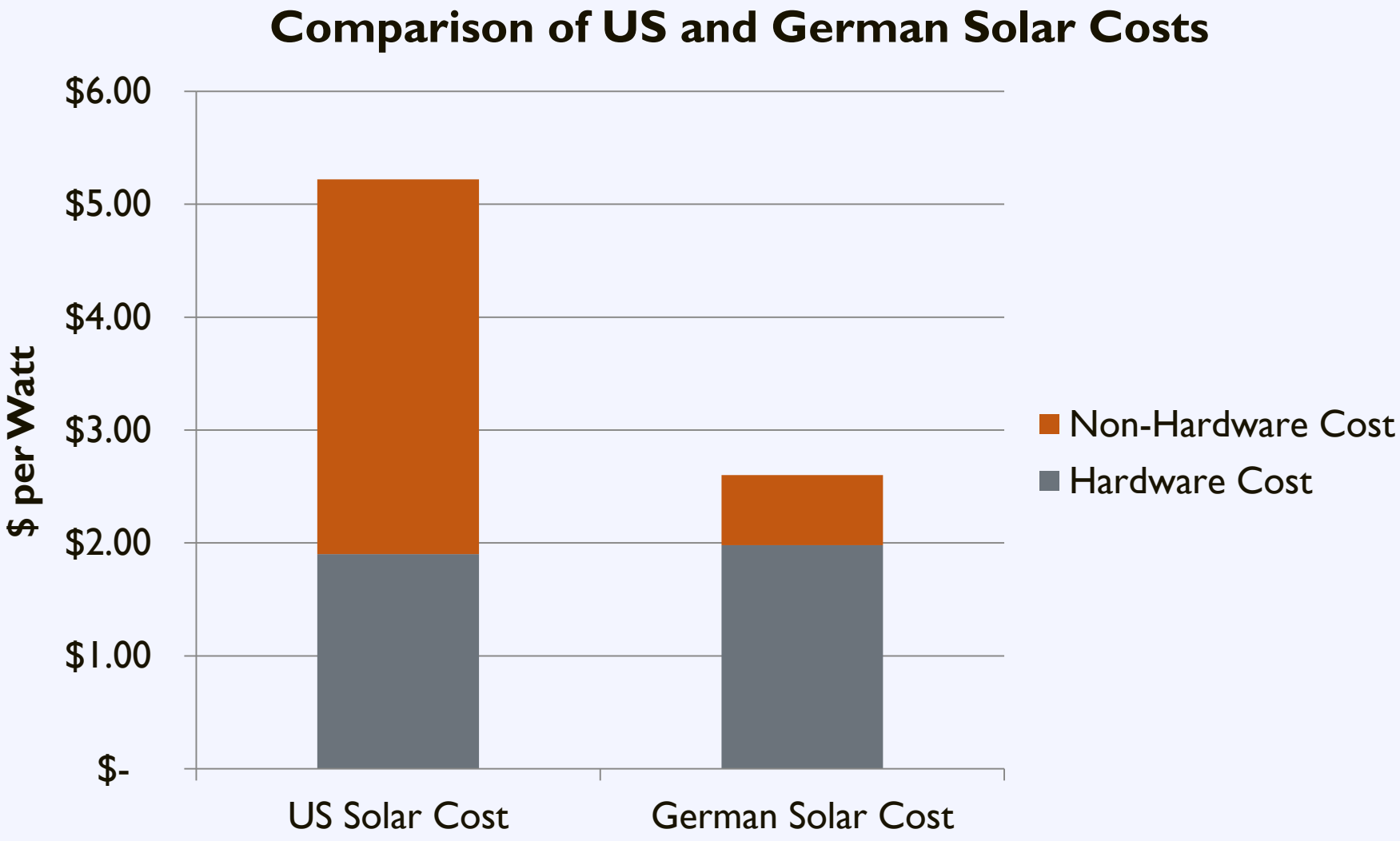
The Cost of Solar in the US



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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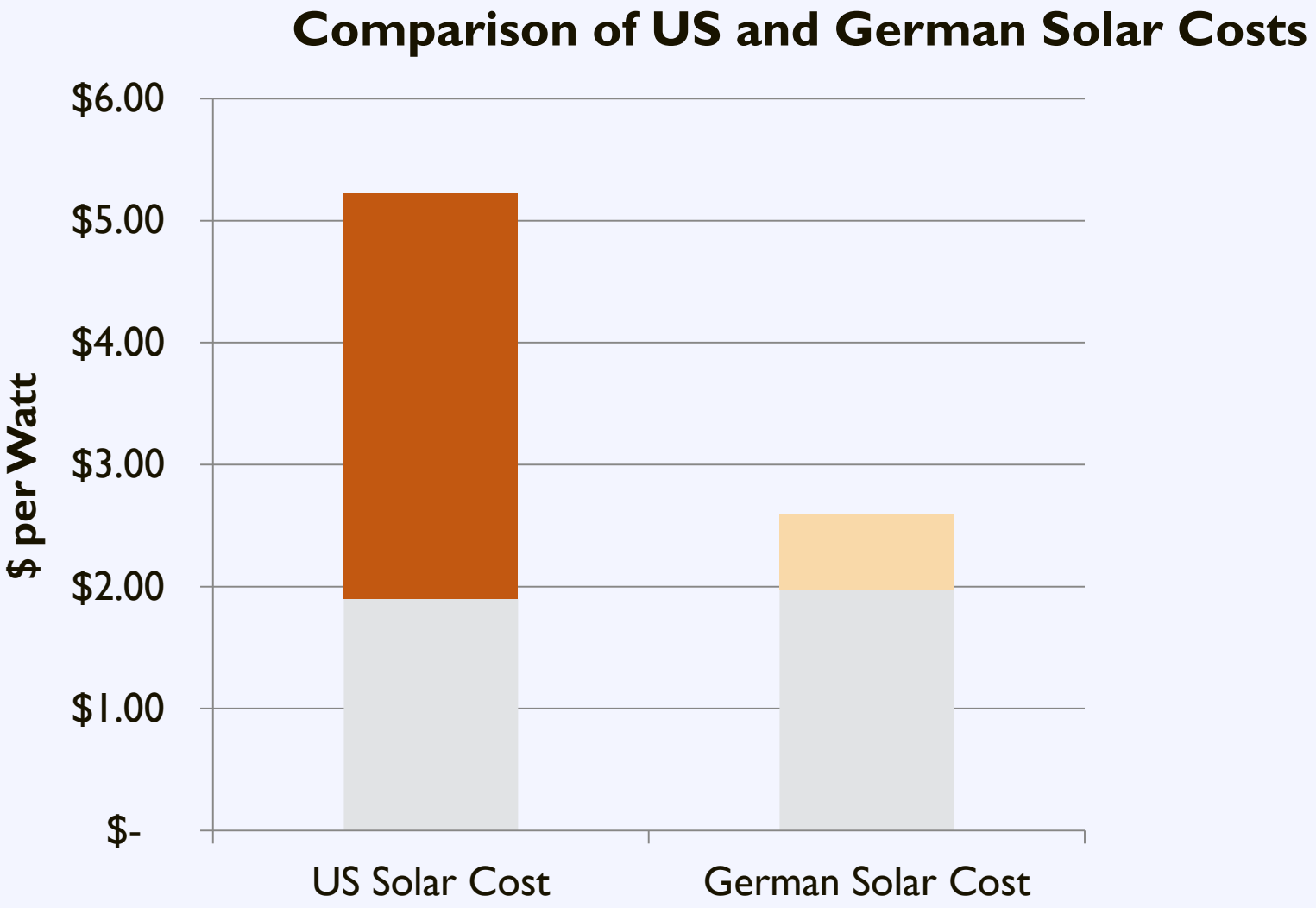
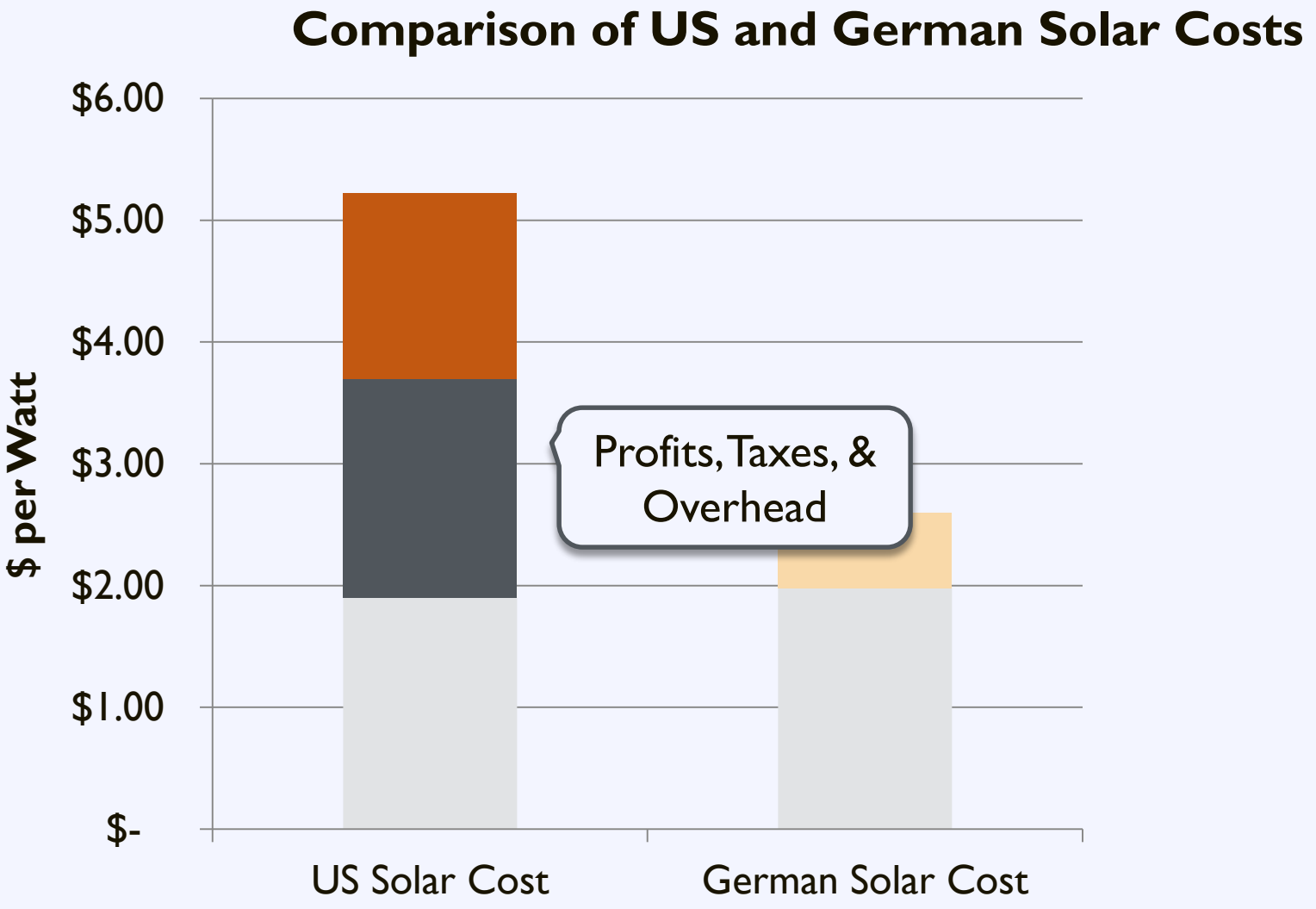
The Cost of Solar in the US



Powered by SunShot U.S. Department of Energy

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

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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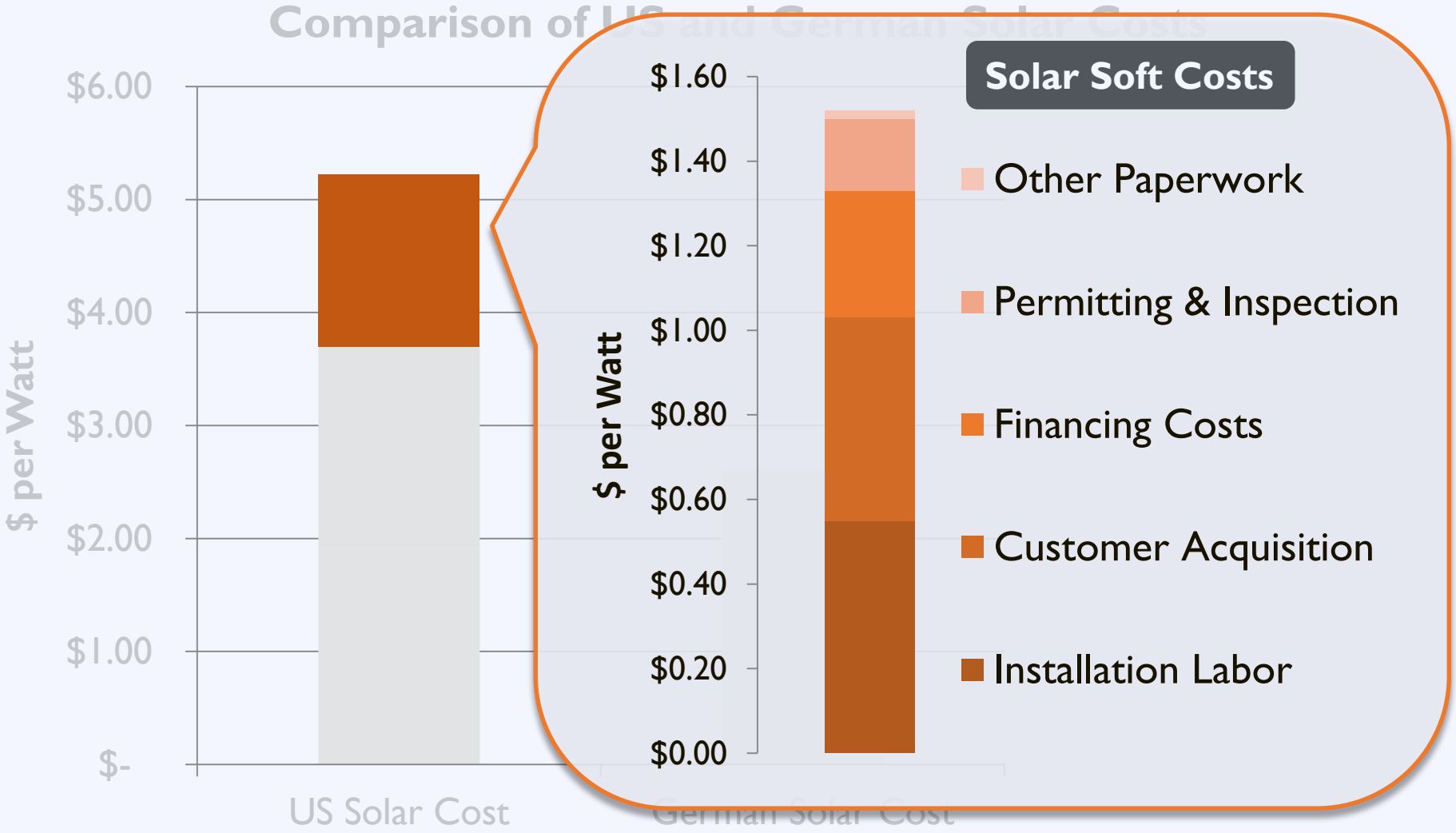
The Cost of Solar in the US



Powered by SunShot U.S. Department of Energy

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

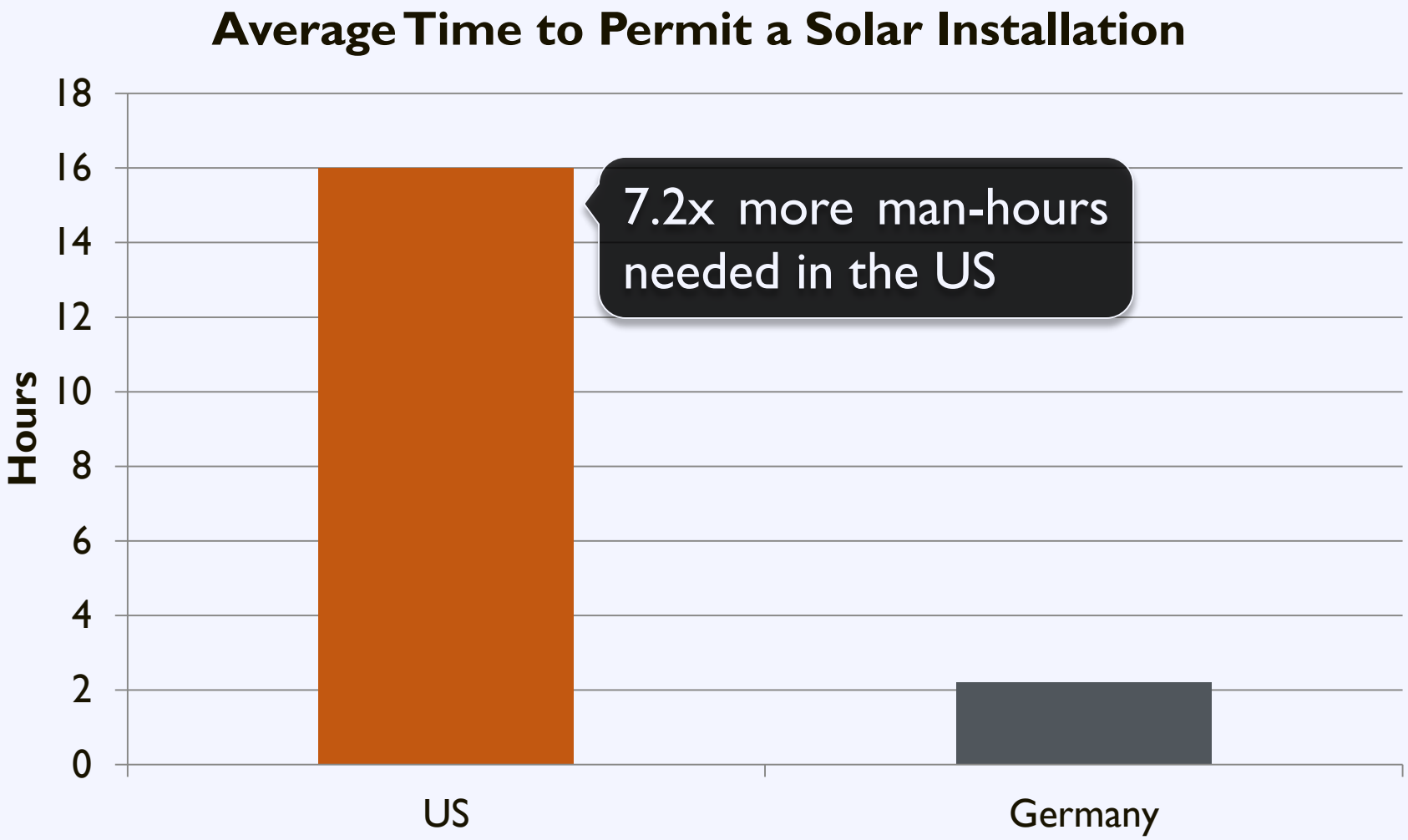
from inception to completion

Germany Today

8 days

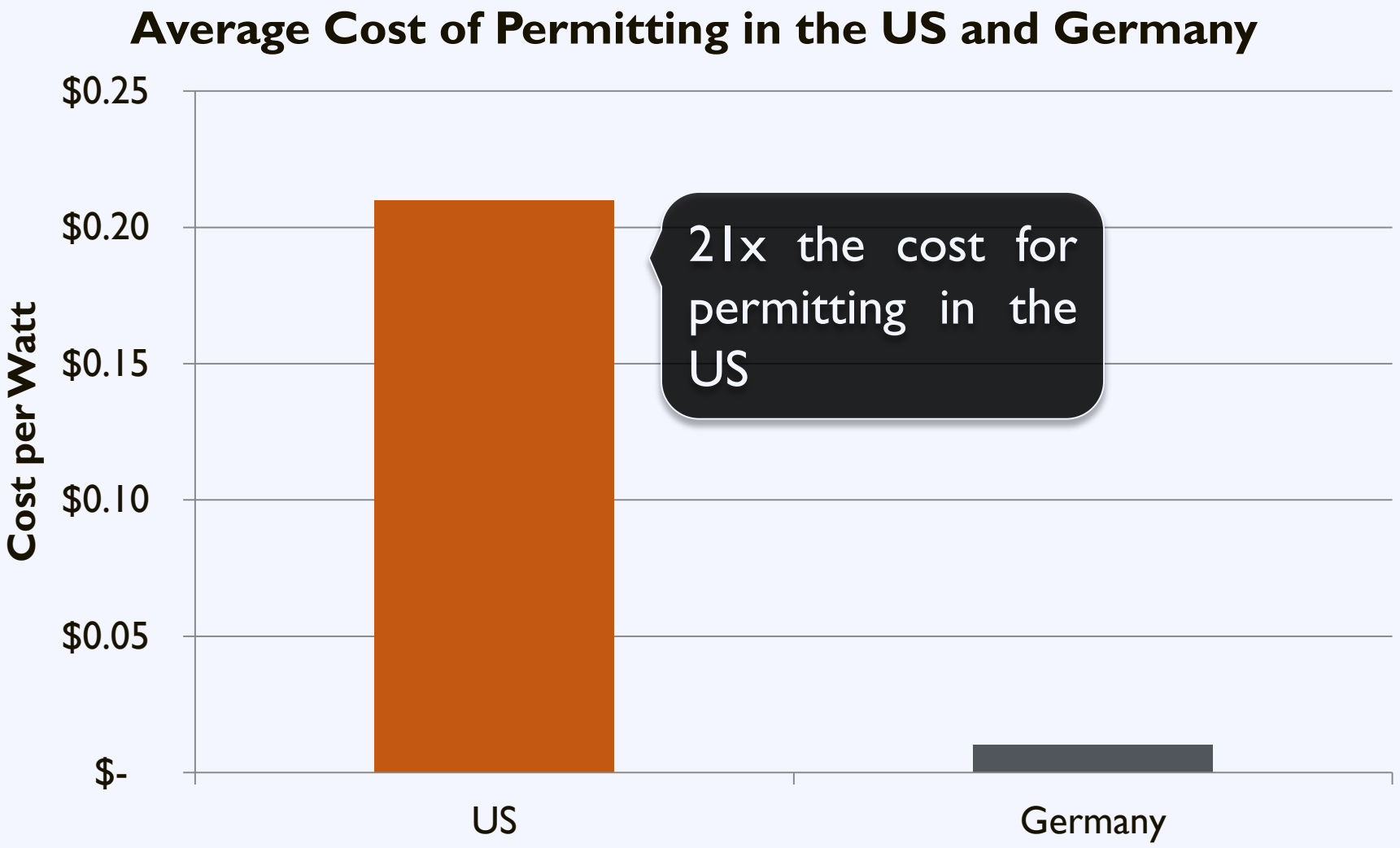
from inception to completion

Time to Installation



Source: NREL, LBNL

Permitting Costs



Source: NREL, LBNL

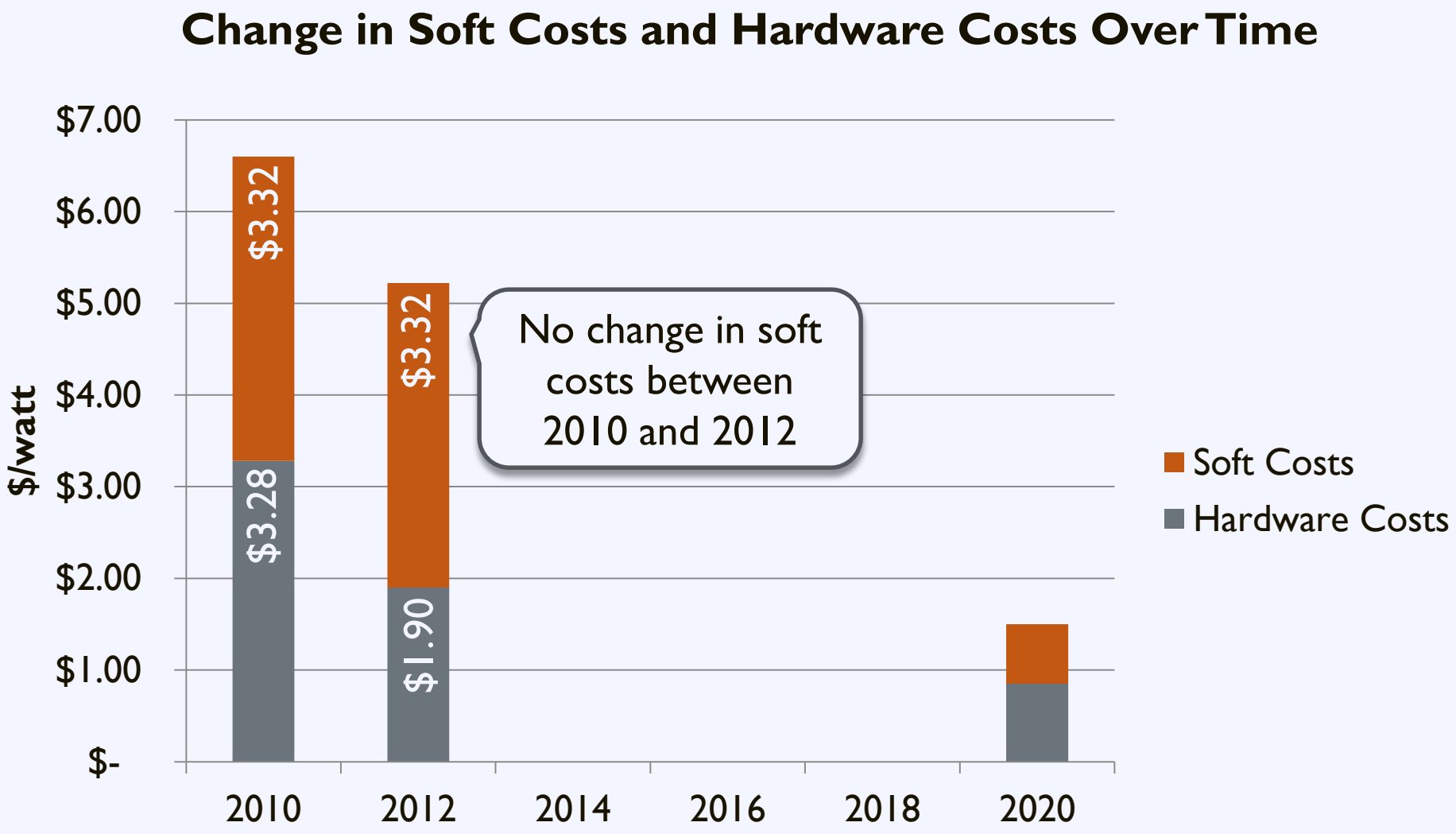
Germany's Success

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

10:10 – 10:30	Putting Solar Energy on the Local Policy Agenda
10:30 – 10:50	State of the Local Solar Market
10:50 – 11:20	Federal, State, and Utility Policy Drivers
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12:10 – 12:45	Solar Market Development Tools
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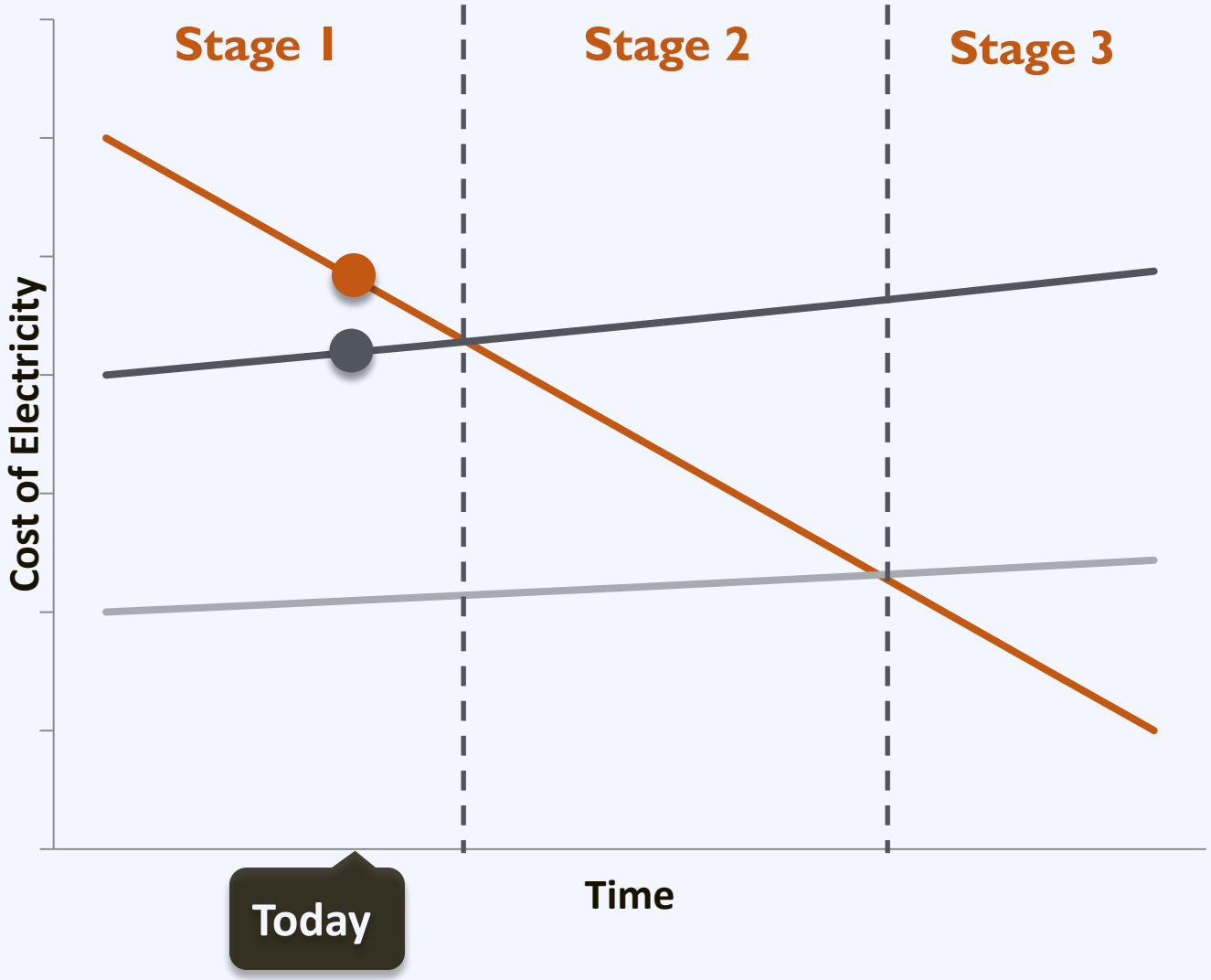
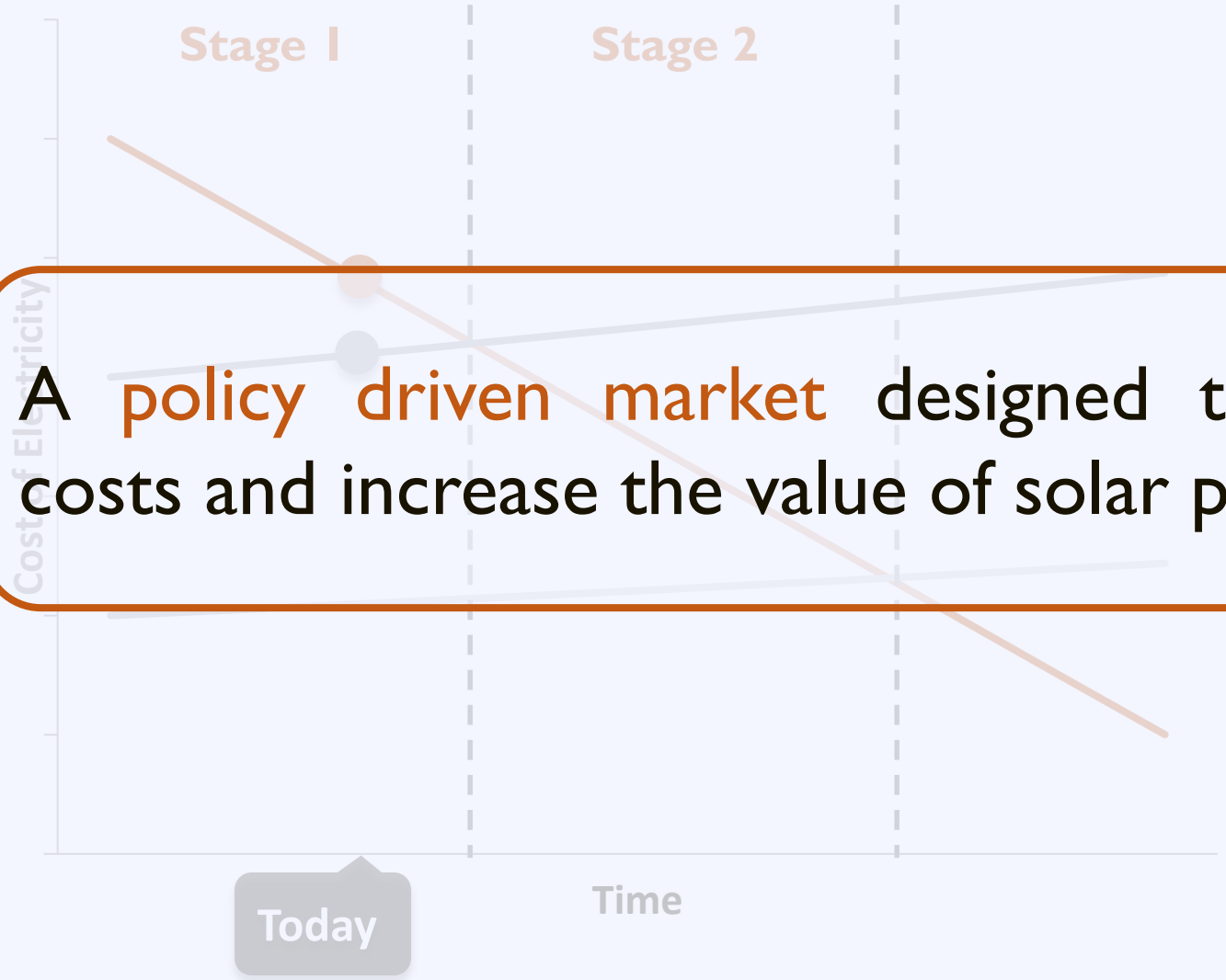
1:00 – 2:00	Local Speakers
2:00 – 3:00	Developing and Solar Policy Implementation Plan for Your Community and Next Steps

Solar Market: Trends



Source: Solar Electric Power Association

Solar Market: Trends



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	Utility Rebate Programs

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	Utility Rebate Programs

Investment Tax Credit

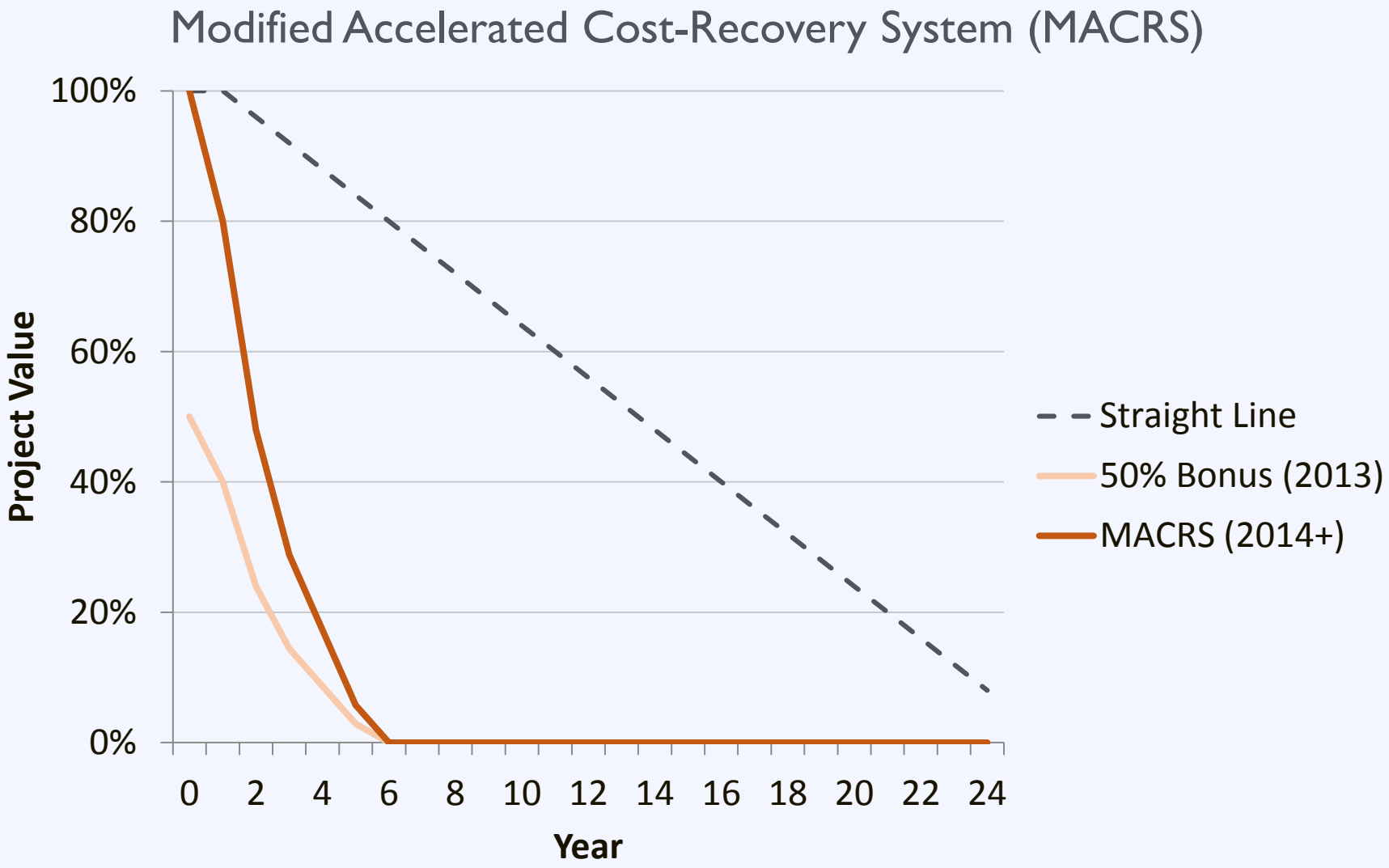
Type: Tax Credit

Eligibility: For-Profit Organization

Value: 30% of the installation cost

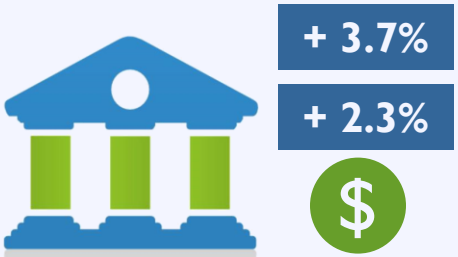
Availability: Through 2016

Accelerated Depreciation

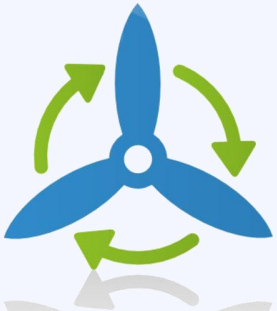


Qualified Energy Conservation Bond

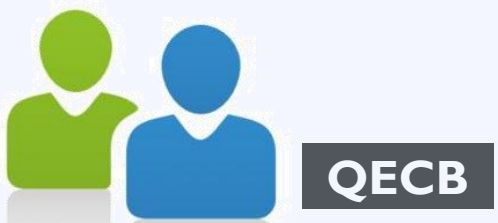
US Treasury



Local Gov



Project



Bond Holders

A Policy Driven Market

Federal	Investment Tax Credit	Accelerated Depreciation	Qualified Energy Conservation Bond
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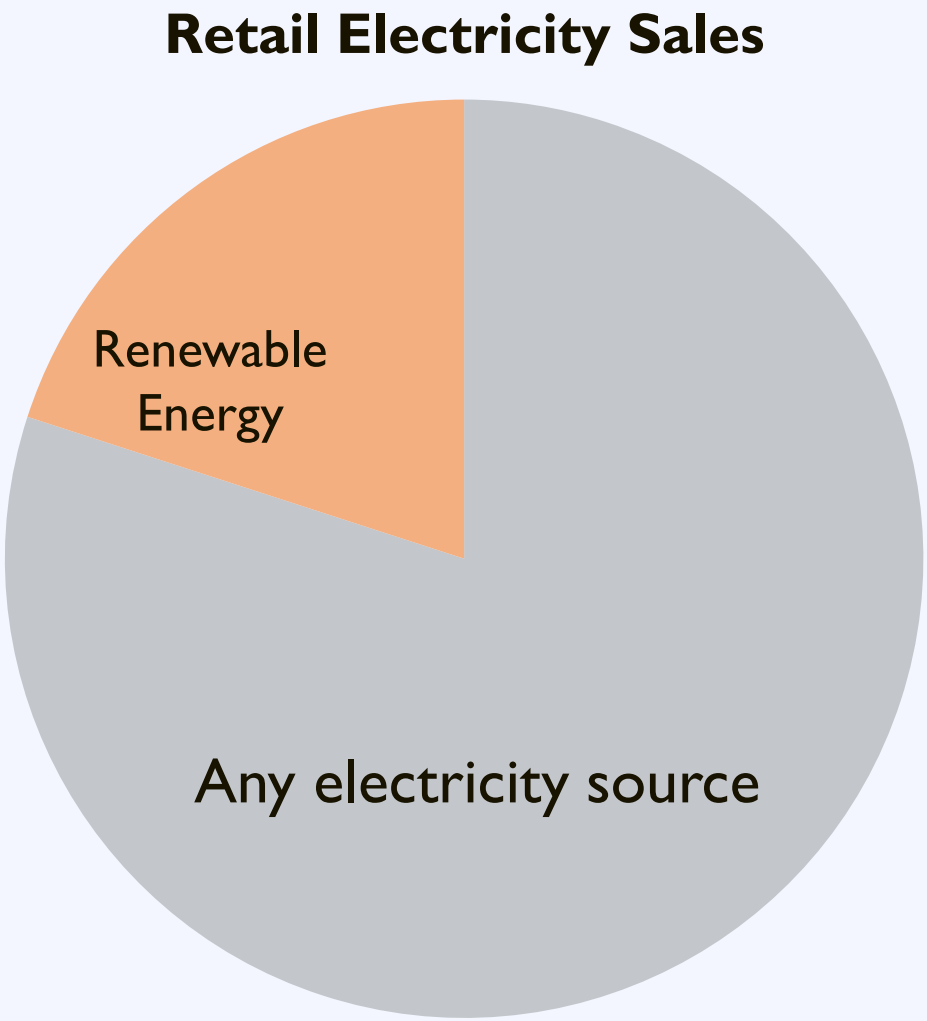
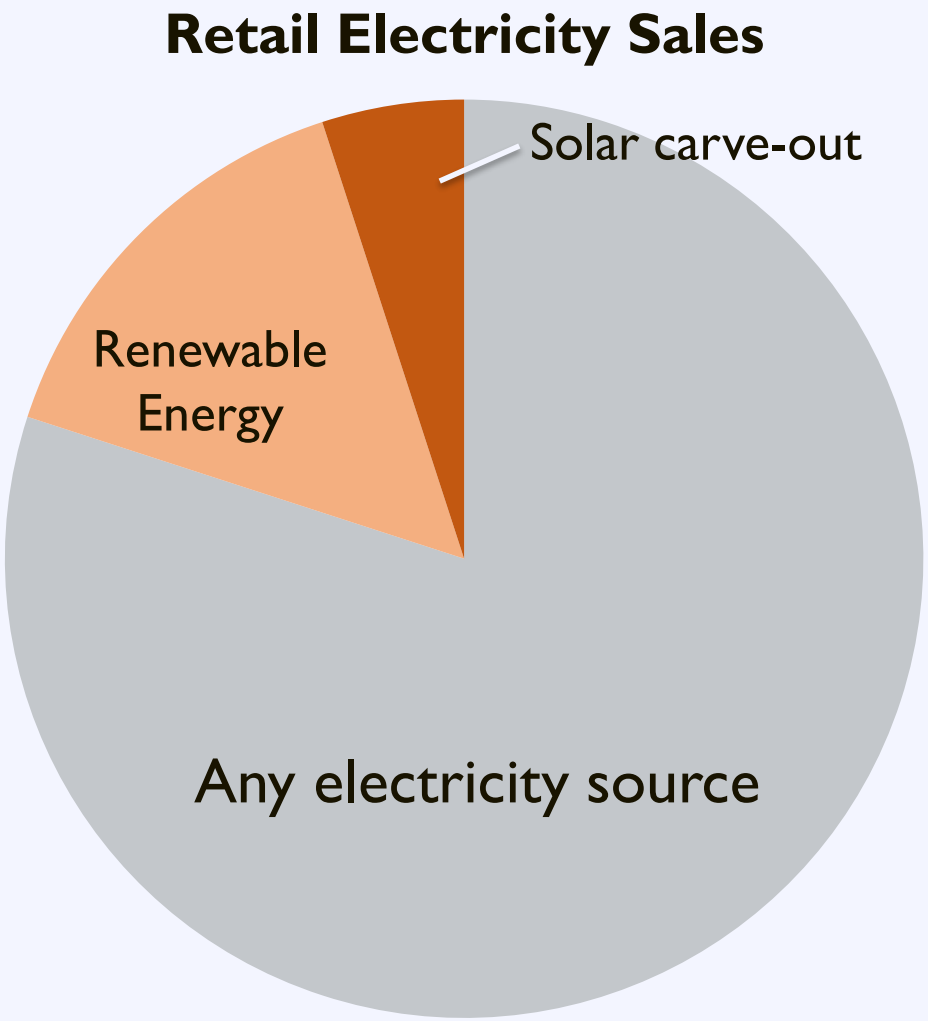
	Solar Access	Property Tax Exemption	Utility Rebate Programs

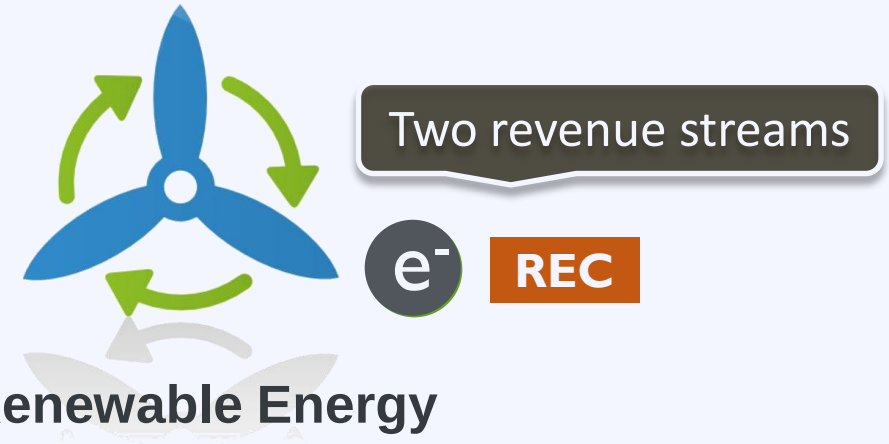
Renewable Portfolio Standard



Renewable Portfolio Standard

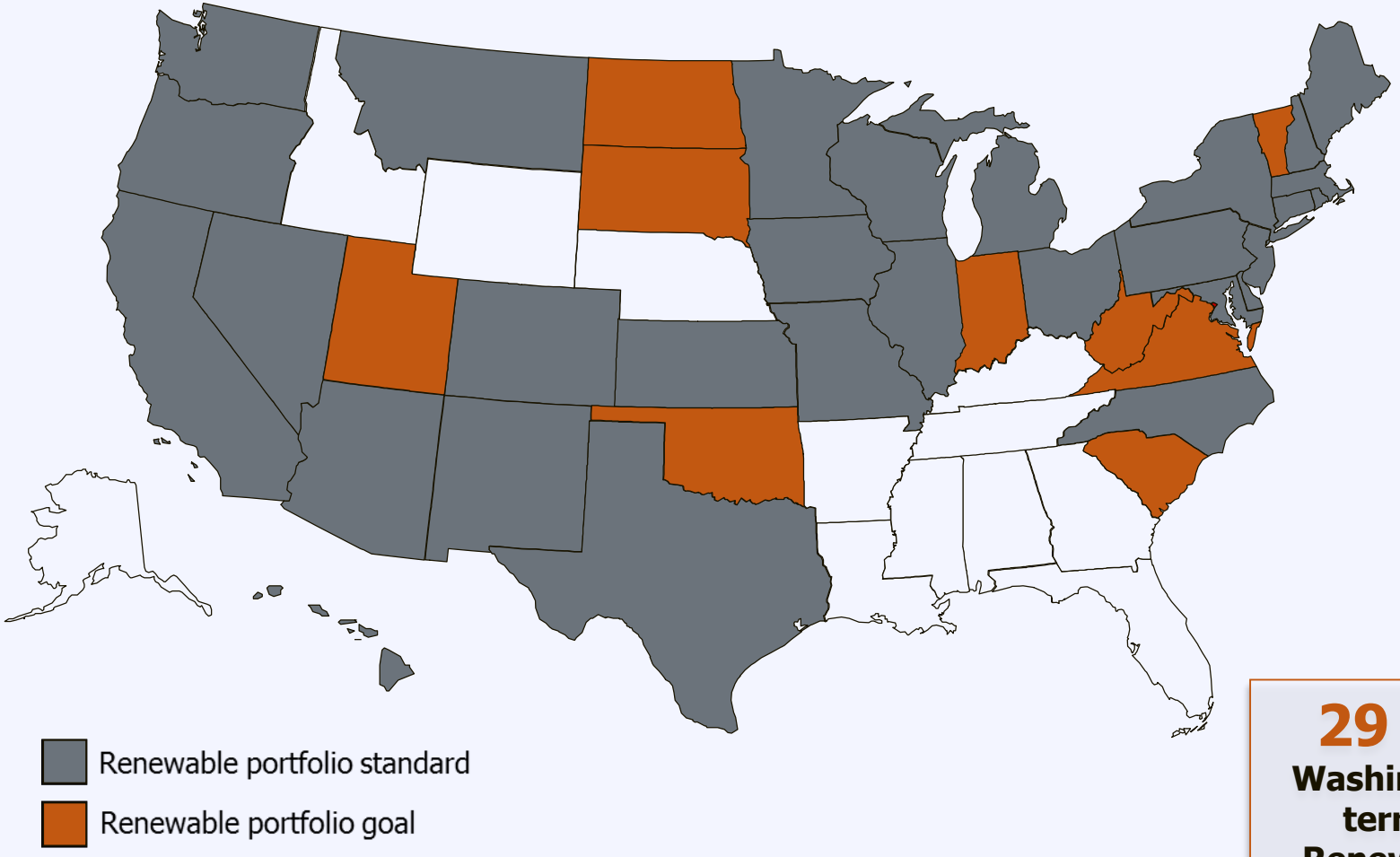


Renewable Portfolio Standard



Renewable Portfolio Standard

www.dsireusa.org / September 2014



29 states, +
Washington DC and 2 territories have Renewable Portfolio Standards
(9 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 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	Nevada	Y	Y
6	Massachusetts	Y	Y
7	Hawaii	Y	N
8	Colorado	Y	Y
9	New York	Y	Y
10	New Mexico	Y	Y

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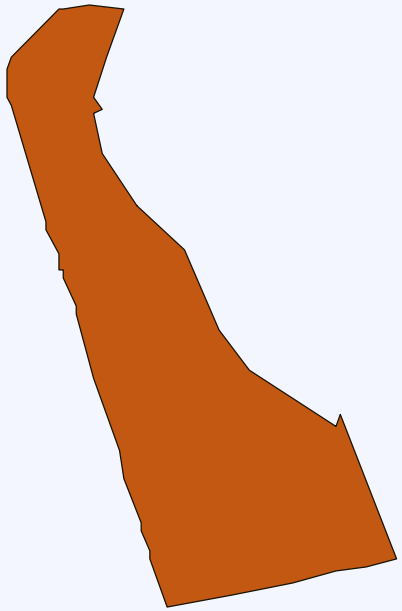
Source: DSIRE Solar (http://dsireusa.org/documents/summarymaps/Solar_DG_RPS_map.pdf); Solar Energy Industries Association/ GTM Research *Solar Market Insight 2013 Year-in-Review*

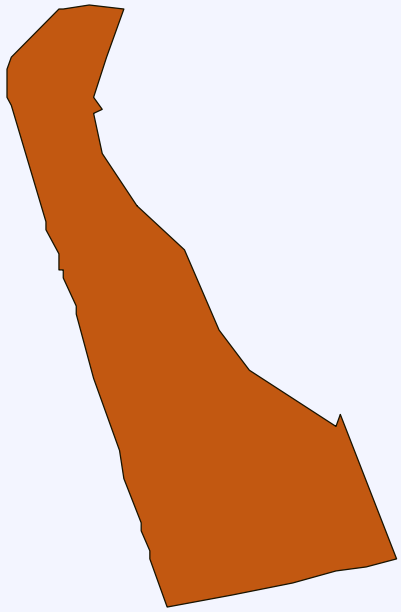
RPS: Delaware Overview

- Applies to IOUs, munis, co-ops, and retail electricity suppliers
- Standard increases annually until 2025
- 25% renewable energy by compliance year 2025-2026
  - 11.5% for compliance year 2014-2015



RPS: Delaware Solar Carve-Out

- Increases annually until 2025
- 3.5% solar by compliance year 2025-2026
- Solar Renewable Energy Certificates (SRECs) are used to demonstrate compliance
- Sept. 2014 online auction saw SRECs sell for $55



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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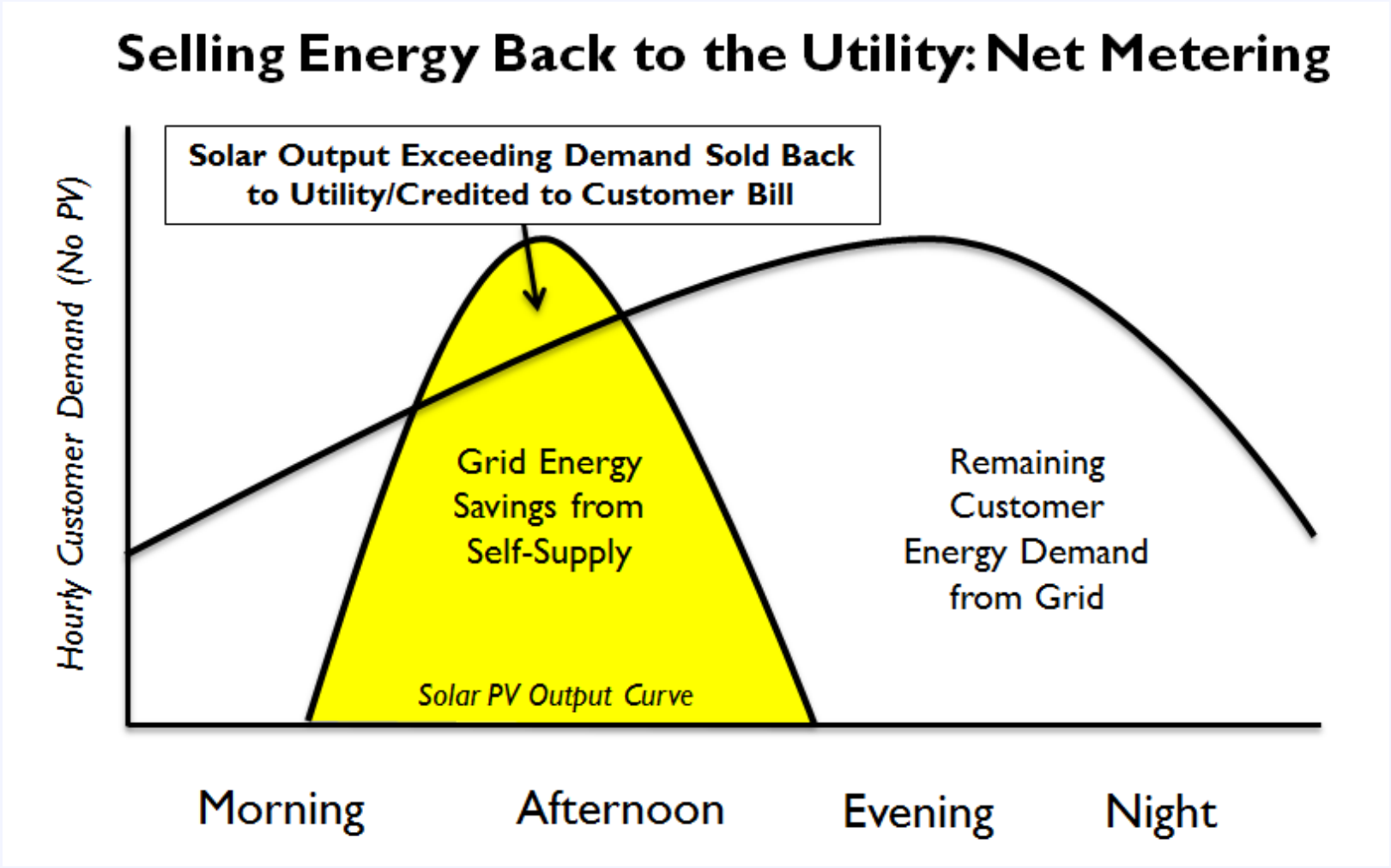
Net Metering

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 **93%** of distributed PV Installations are net-metered

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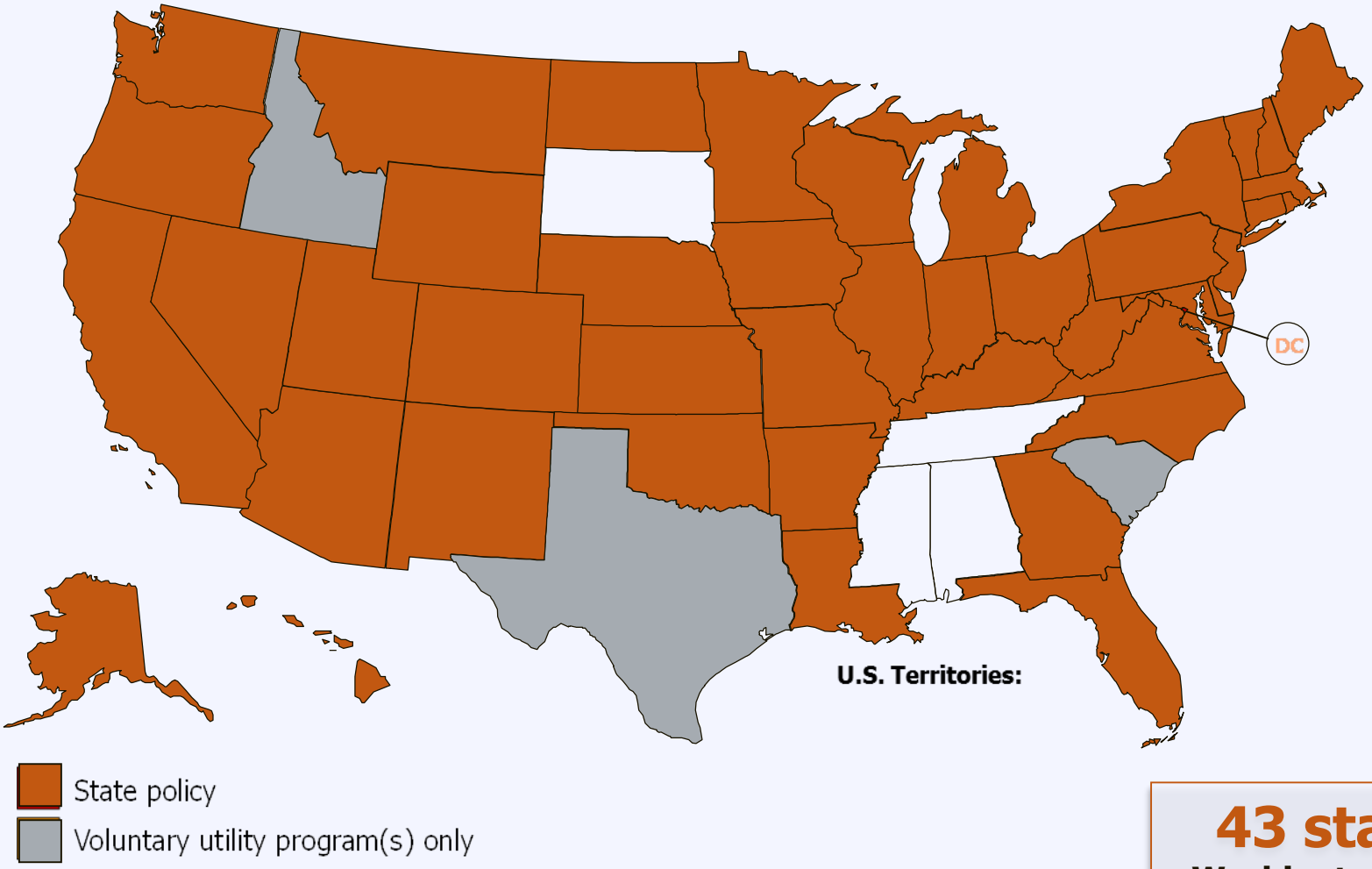
Source: IREC (http://www.irecusa.org/wp-content/uploads/IRECSolarMarketTrends-2012-web.pdf)

Net Metering



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

Source: DSIRE (July 2013)

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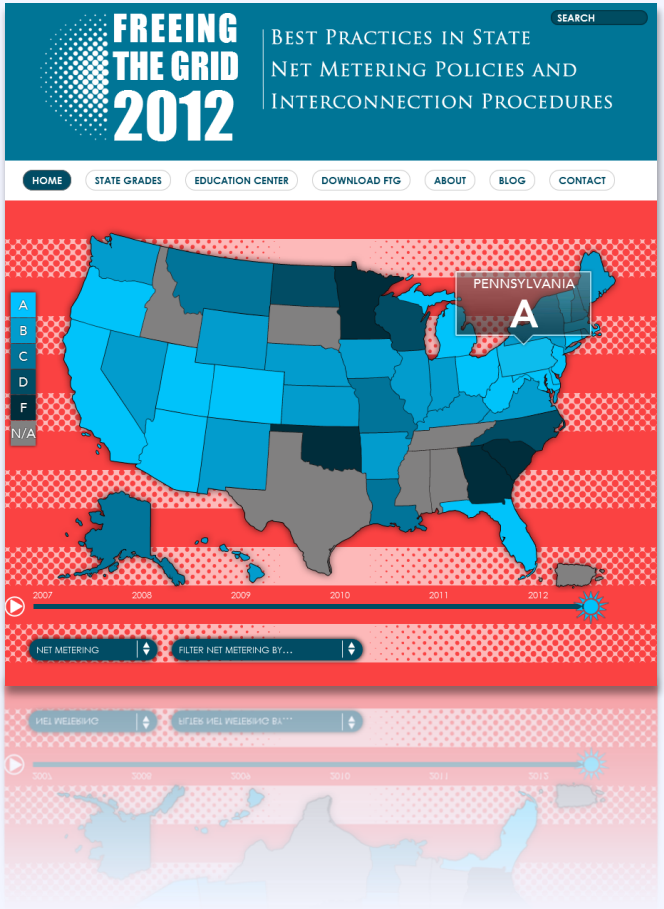
U.S. Department of Energy

Net Metering: Resources

Resource **Freeing the Grid**

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

http://freeingthegrid.org/



Net Metering: Delaware

Net Excess Credit Value

Retail Rate

Credit Rollover

Yes- indefinite rollover with option of annual payment

System Capacity Limit

25 kW- Residential
2 MW- Non-residential (DP&L)
500 kW- Non-residential (DEC & munis)
100 kW- Farm customers on res. rates

REC Ownership

Customer

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Source: Freeing the Grid

A Policy Driven Market

Federal	Investment Tax Credit	Accelerated Depreciation	Qualified Energy Conservation Bond
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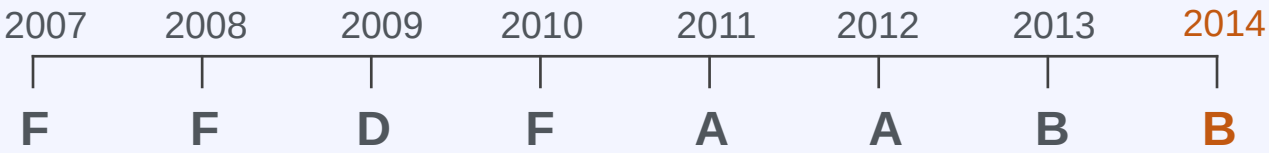
Interconnection

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: Delaware



Applicable Technologies
Includes solar thermal electric & solar PV, among others

Applicable Utilities
All utilities

System Capacity Limit
10 MW

Bonus
Electronic applications & agreements; insurance waived 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

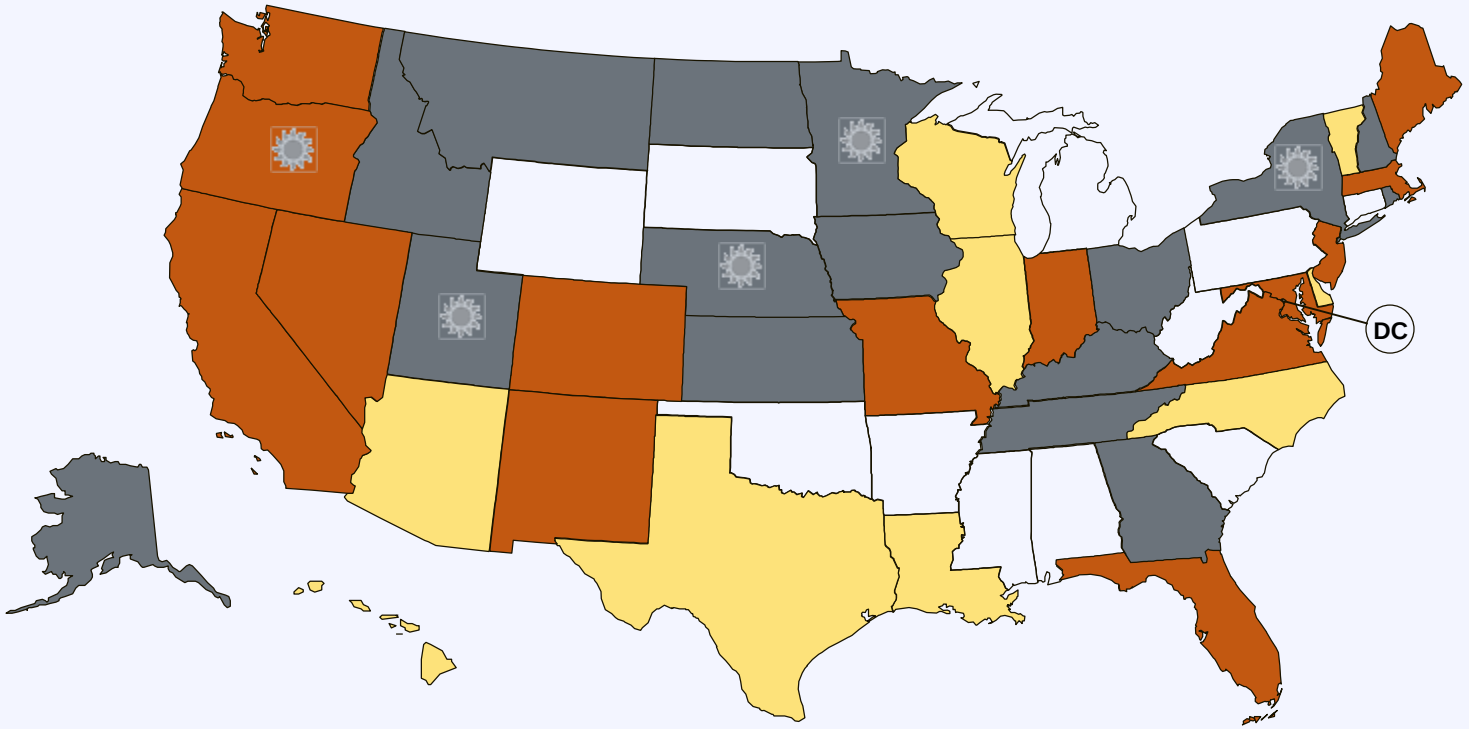
Source: Google Earth

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

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U.S. Department of Energy

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

Delaware Solar Access Law

Solar Rights:

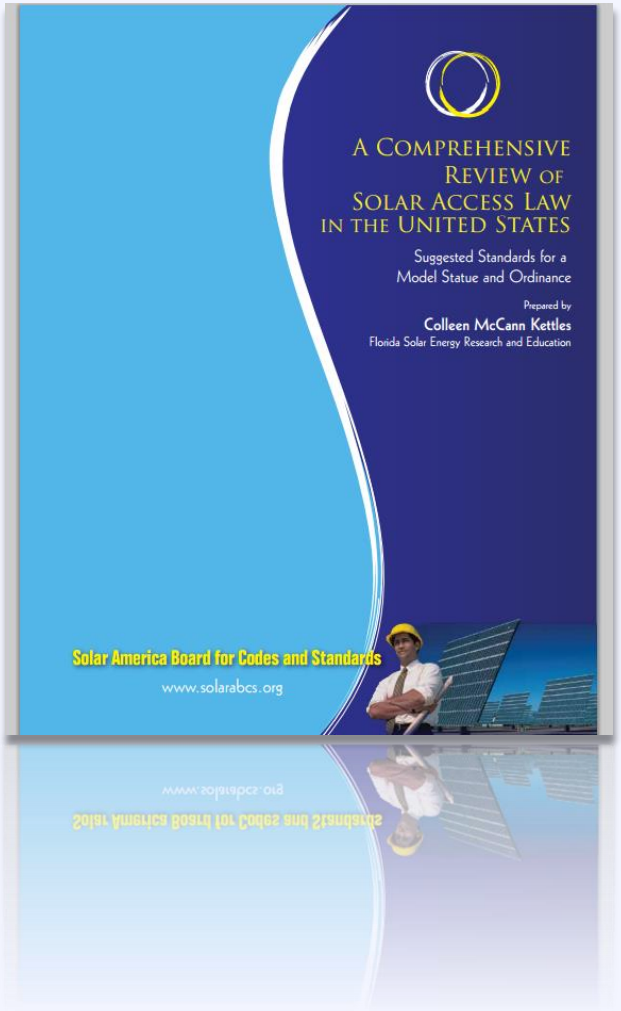
- Delaware solar rights law became effective in 2010
  - Prohibits private covenants that prohibit or unreasonably restrict the use of solar PV systems on residential rooftops
  - Only applies to single-family residences
  - Does not apply to covenants in existence prior to January 1, 2010

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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Property Tax Exemption

- Delaware does not have property tax laws specific to solar PV
- However, under state law, counties & other political subdivisions are prohibited from taxing tangible or intangible personal property
- Sussex & Kent counties classify all PV equipment as personal property, exempting it from property taxes

A Policy Driven Market

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Green Power Program: DP&L

- Incentives available for solar PV and solar water heating systems
- 40% funding is available for residential customers
- Solar PV Rebates
  - $0.25-$0.85/W for residential & non-residential
  - $1.00-$1.75/W for non-profits
- Solar Thermal Rebates
  - $1.00/ annual kWh ($2.00/ annual kWh for non-profits)

Green Power Program: DEMEC

- Incentives available for solar PV and solar thermal systems
- Values vary by municipality
  - General incentives are 33.3% of PV installation costs and 50% solar thermal installation costs
- City of Dover and City of Milford have suspended their programs

Green Power Program: DEC

- Rebates for solar PV and solar thermal systems
- Solar PV incentives: $0.45-$0.90/W ($0.52-$1.05/W for non-profits)
  - Value depends upon system size
- Solar Thermal: 20% of installed costs

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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

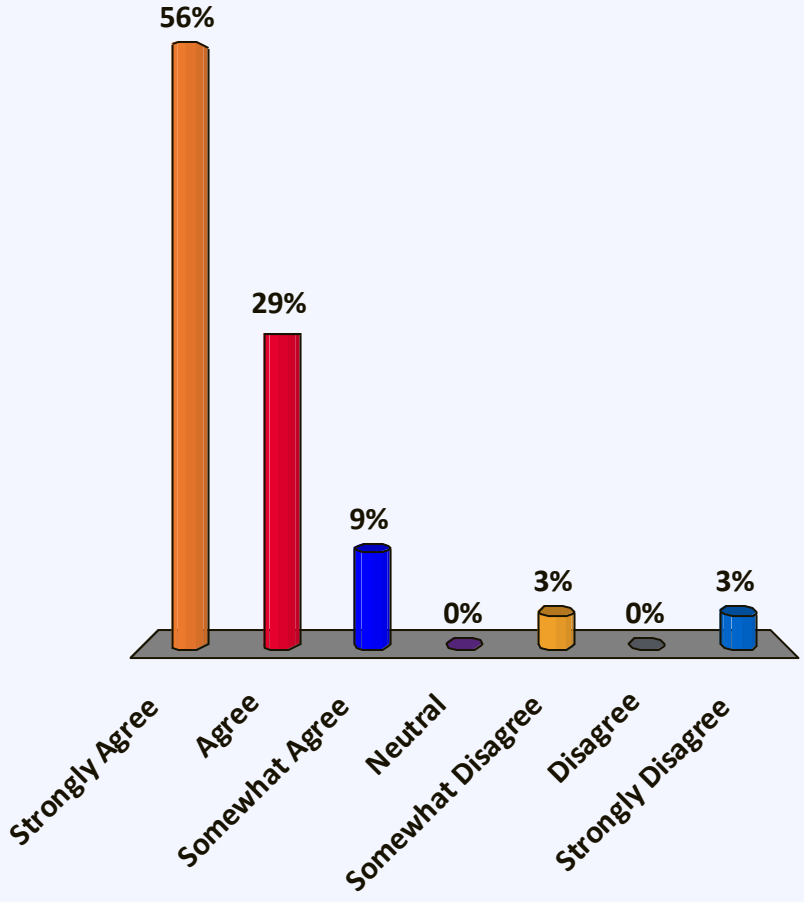
Visioning & goal setting

Effective Solar Permitting Process

Solar Market Development Tools

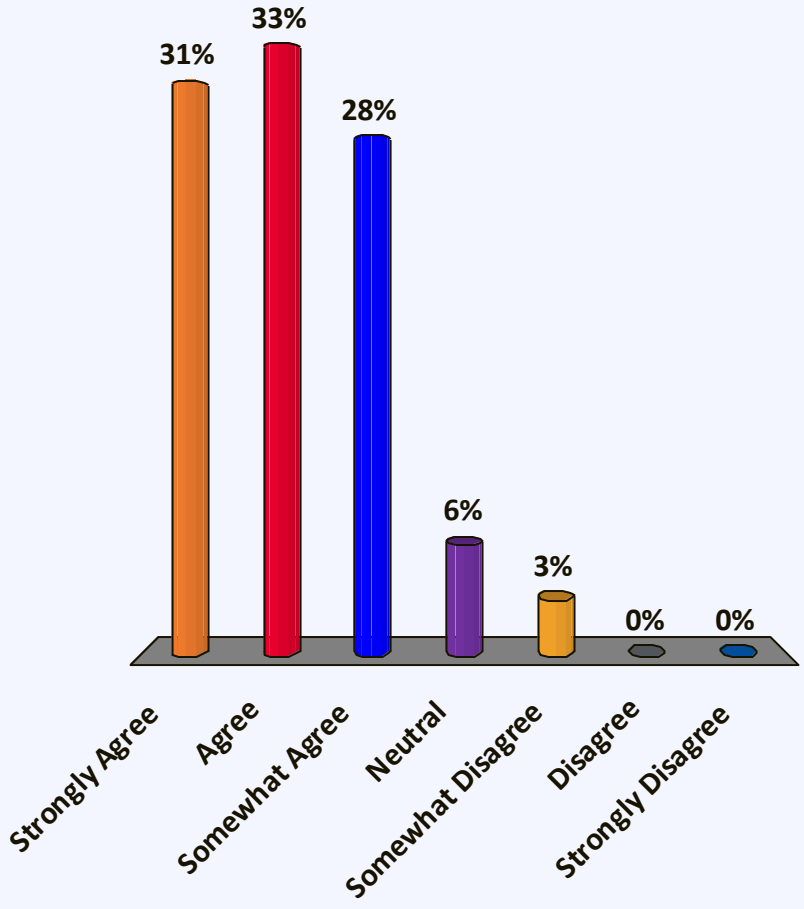
Solar advances your energy goals

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



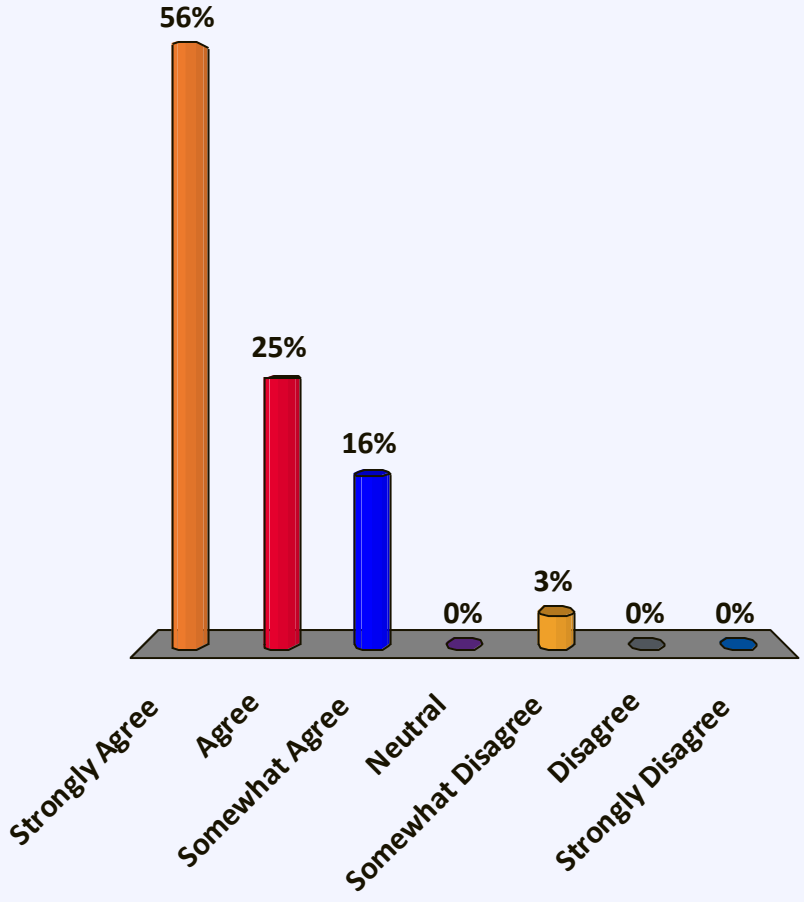
Solar advances your economic development goals

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

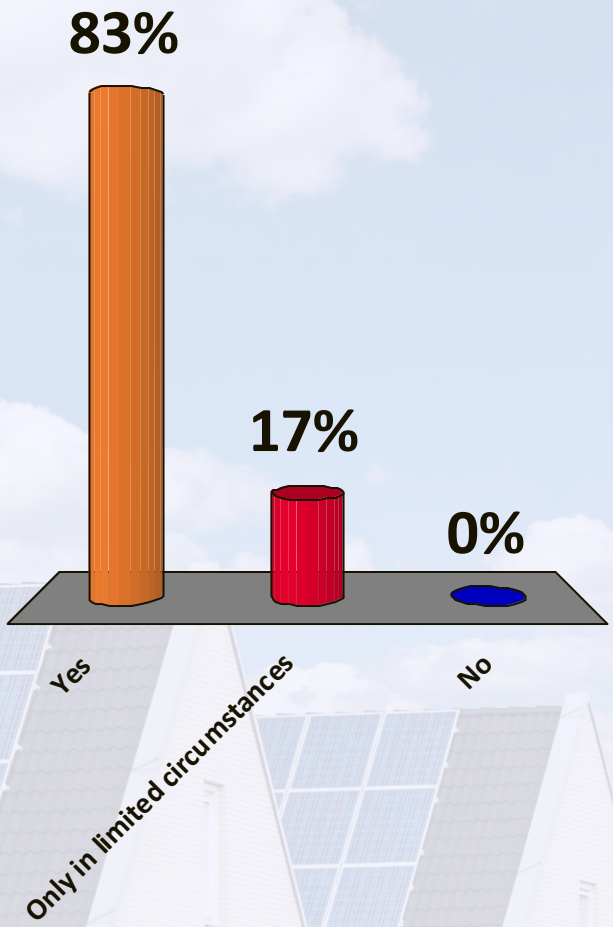
Is solar on residential rooftops appropriate for your community?

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

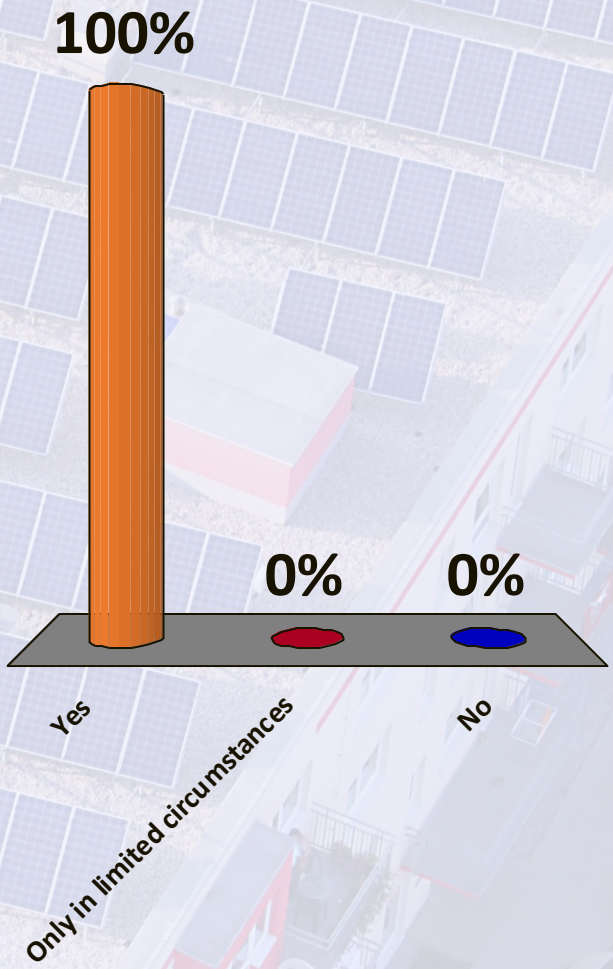
Poll

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

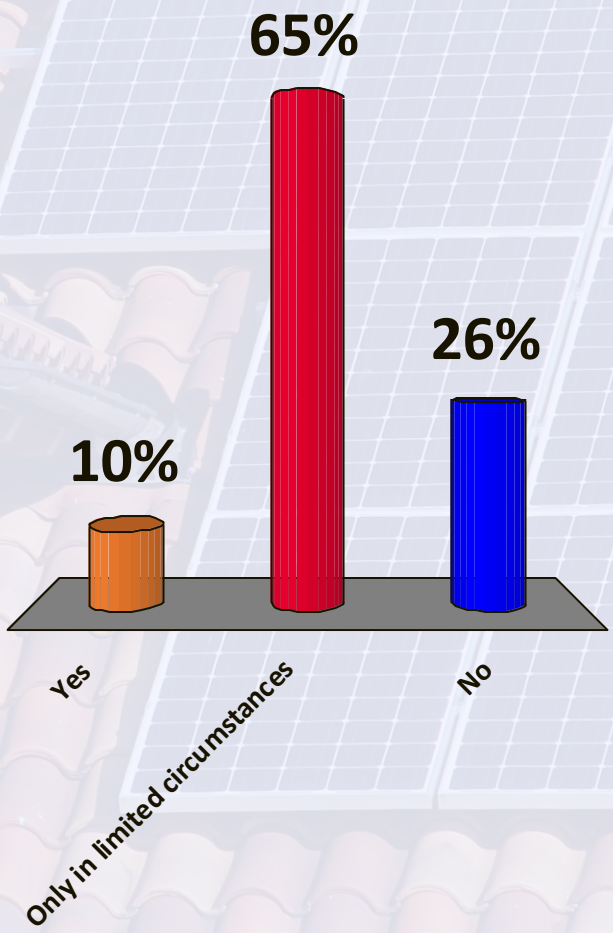
Poll

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

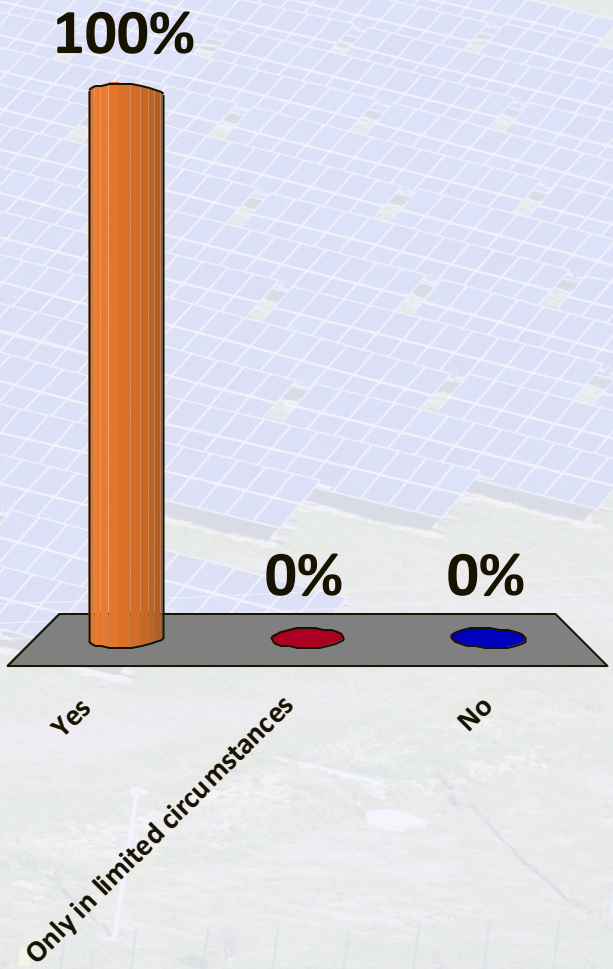
Poll

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

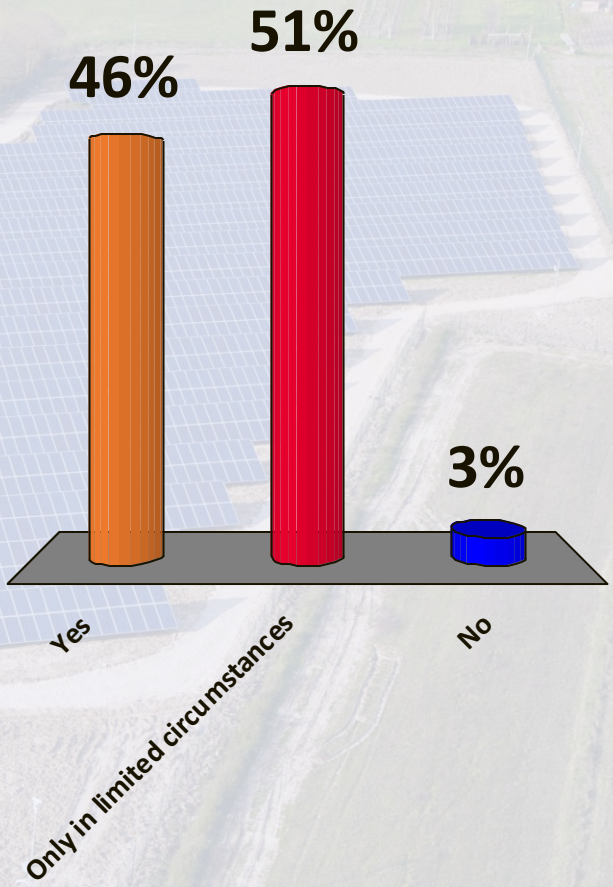
Poll

Is solar on greenfields appropriate for your community?

A. Yes

B. Only in limited circumstances

C. No



Visioning: Scales & Contexts

Poll

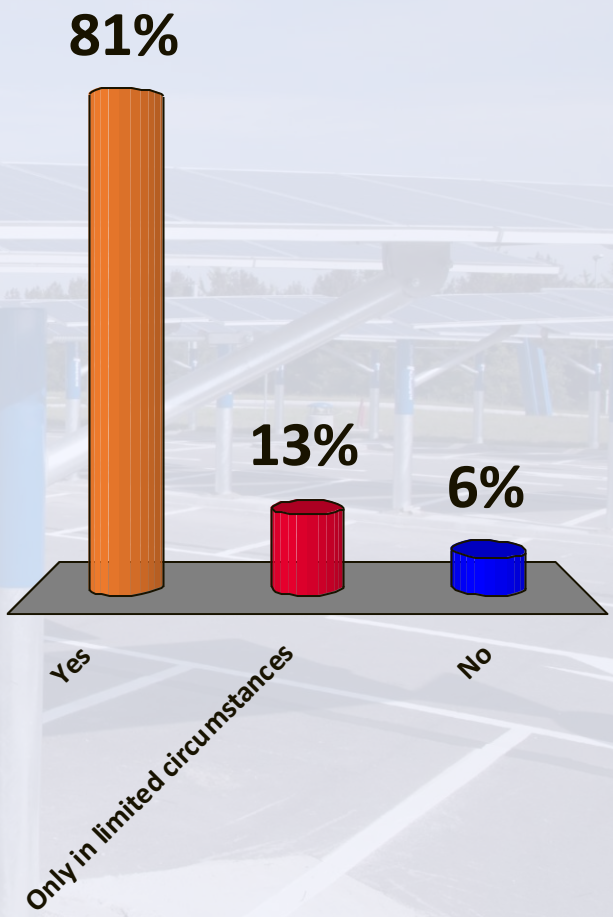
Is solar on parking lots appropriate for your community?

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

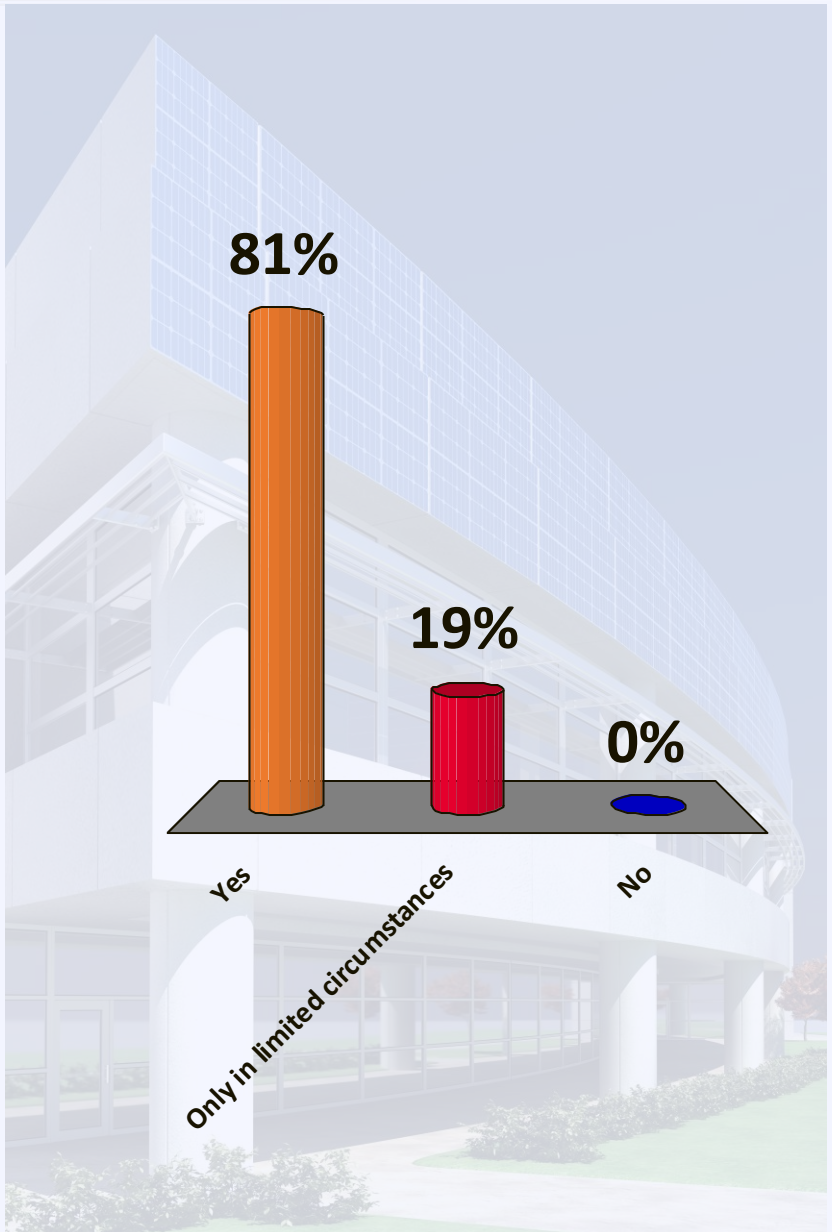
Poll

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

Powered by SunShot U.S. Department of Energy

Source: American Planning Association

Solar in Dover Plans

Comprehensive Plan

Part II – Plan Goals: Natural Resources and Environmental Protection

Goal 3: *Encourage Green Development and Sustainable Energy Practices*

Begin the process of creating both Code amendments and/or policy amendments and revisions which encourage environmentally sensitive development and allow for emerging "green" trends to flourish in the City.

Recommendation 6: Research and Implement a Green Energy Program

- Revise the City Code to eliminate/minimize barriers to "green" and environmentally friendly development.
- The City should support the use of "green" development practices wherever possible.

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

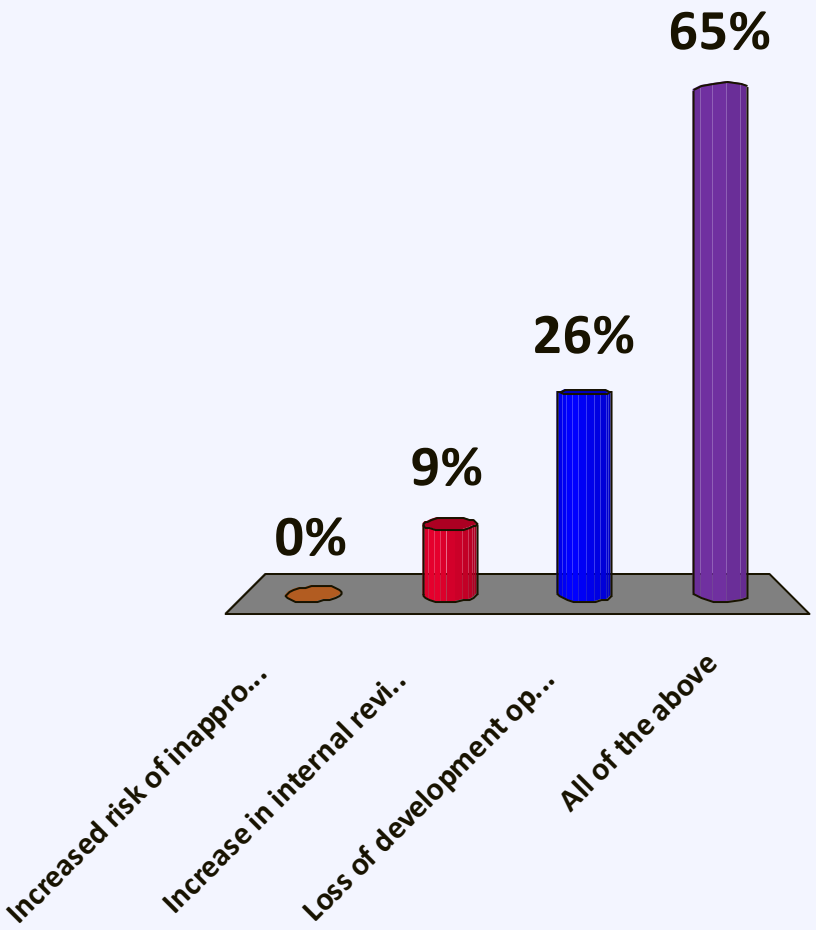
Solar in Development Regulation

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:

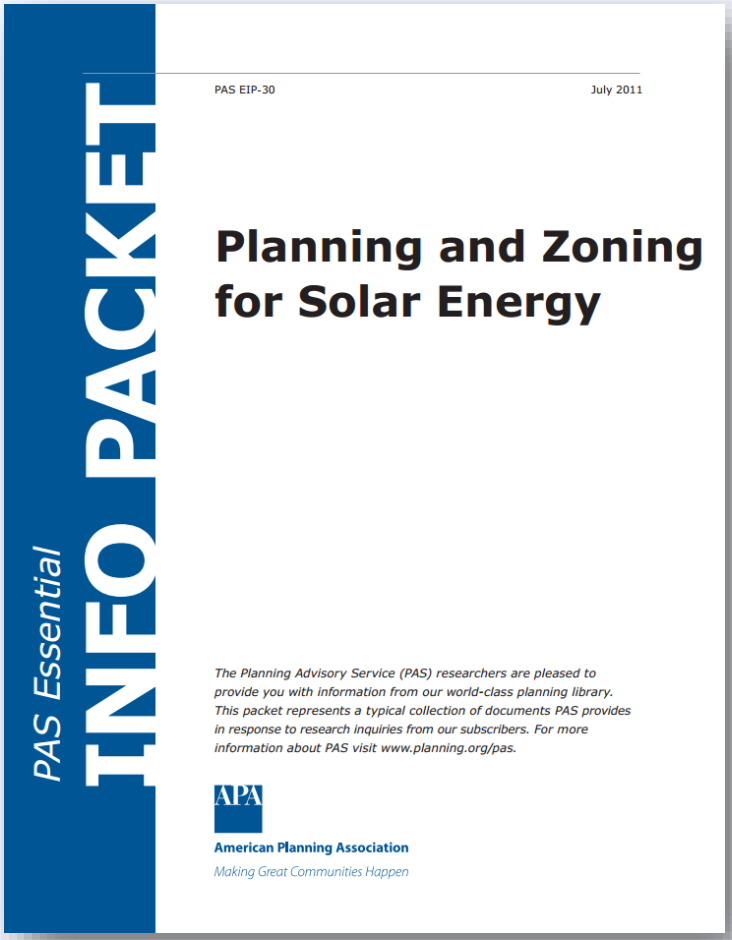
- Allowed for primary use in limited locations
- Requirements:
  - Height limits
  - Lot coverage
  - Setback
  - Fencing and Enclosure

Zoning Standards: Model Ordinances

Resource **American Planning Association**

Bethany Beach, Town of. 2010.
Ordinance no. 455: An Ordinance to Add A New Chapter 484 "Solar Energy Systems" To the Town Code of Bethany Beach.

Allows solar energy systems for on-site energy use as permitted accessory uses in all zoning districts. Encourages rooftop panels on side and back roof slopes rather than ground-mounted systems.



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

Zoning Standards: Historic

Typical Requirements:

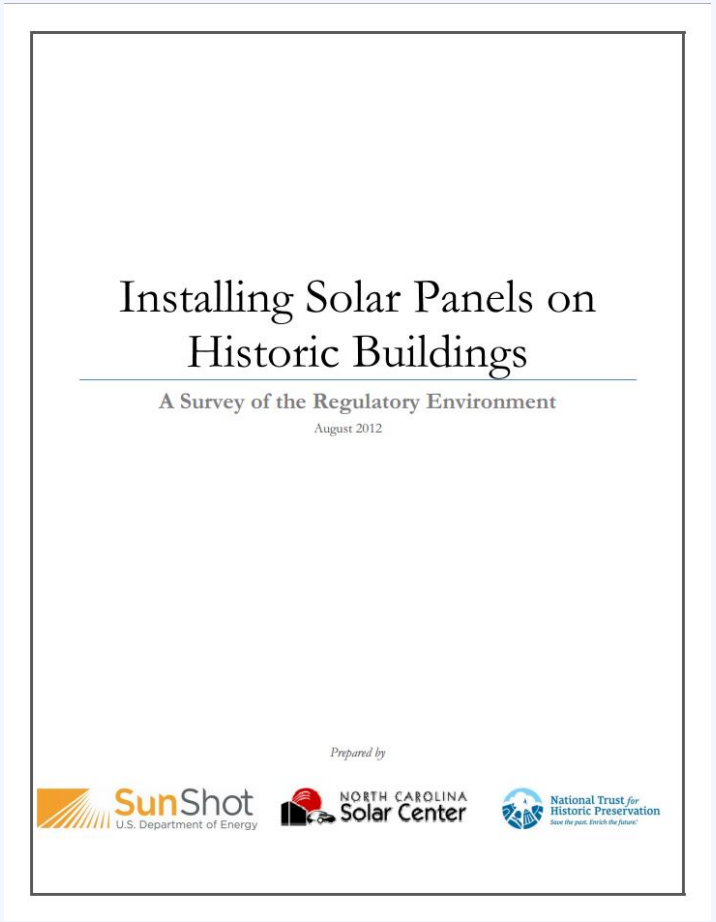
- Prevent permanent loss of "character defining" features
- Possible design requirements
  - Ground mounted
  - Flat roof with setback
  - Panels flush with roof
  - Blend color

Source: SolarCentury

Zoning Standards: Historic

Resource **North Carolina Clean Energy Technology Center**

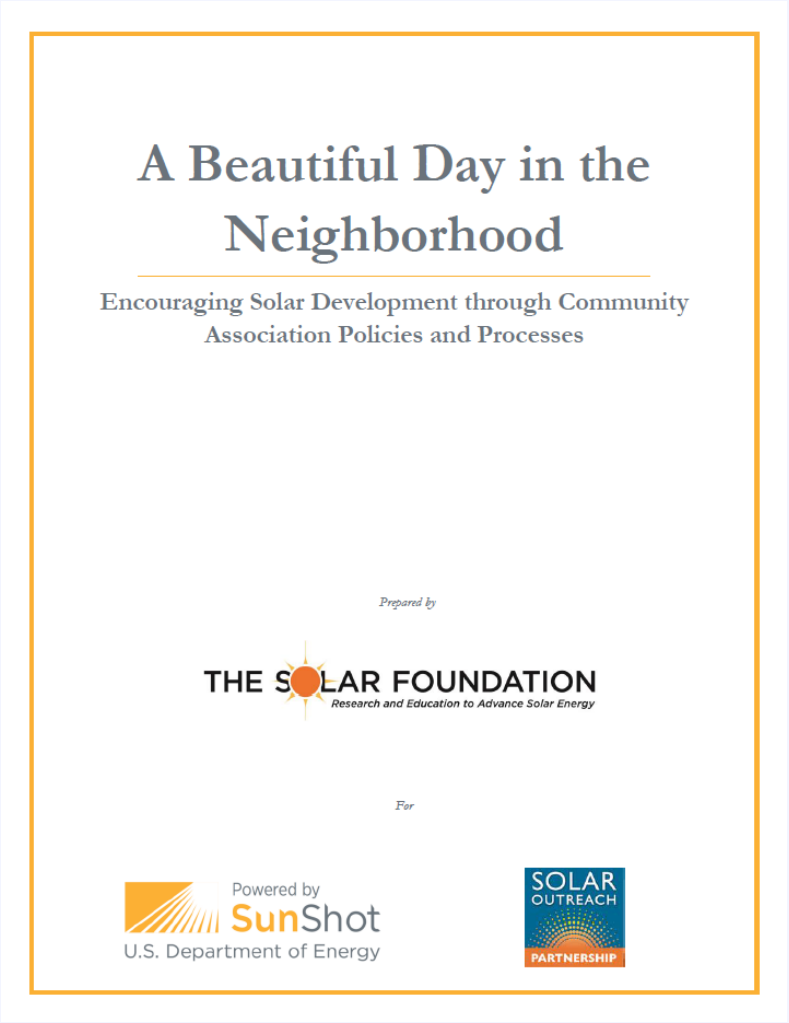
Provides sample design principles and example regulations incorporating historic preservation into sustainability and energy projects.



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:

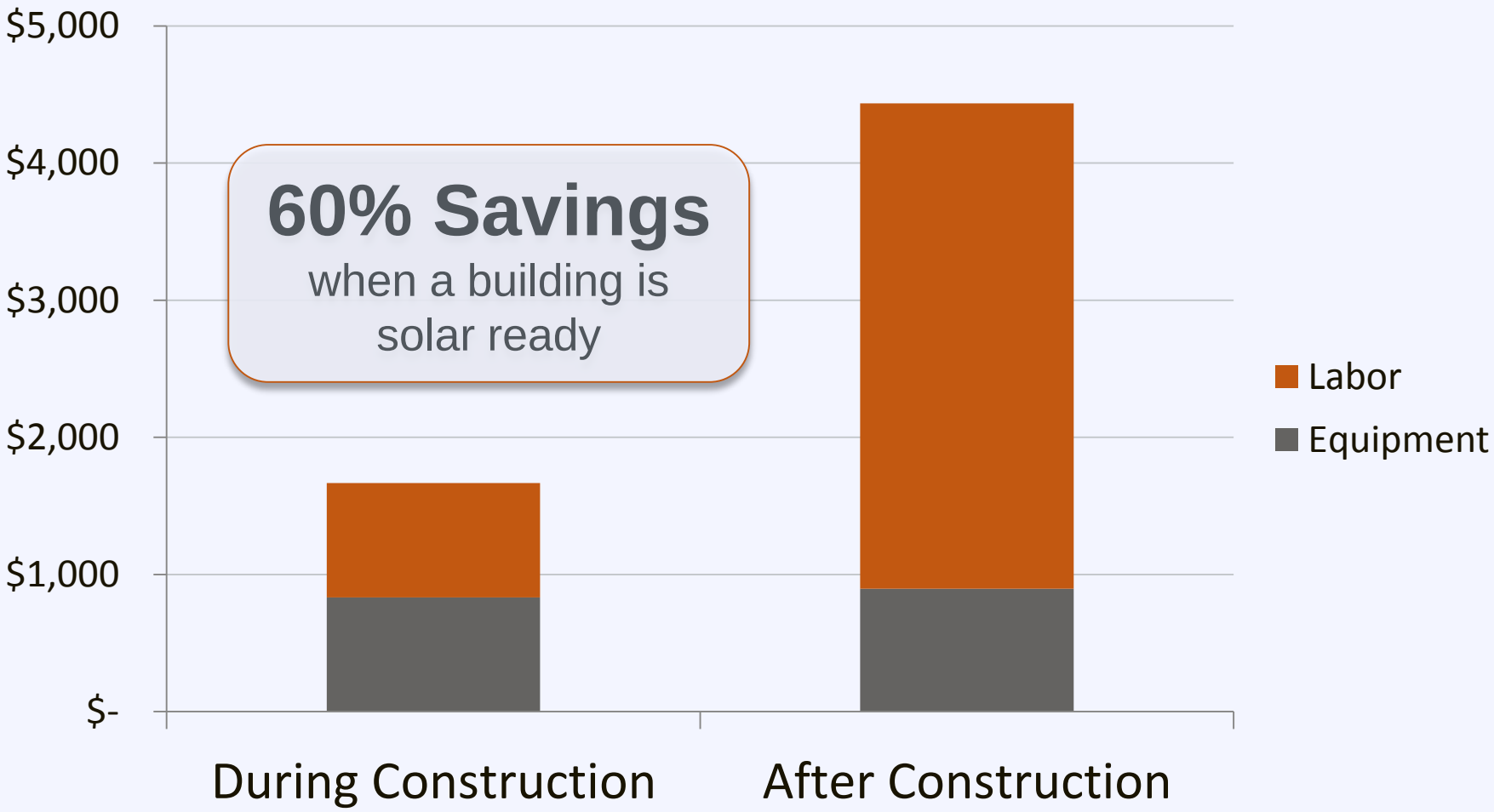
Preparing a building for solar at the outset can help make future solar installations easier and more cost effective.

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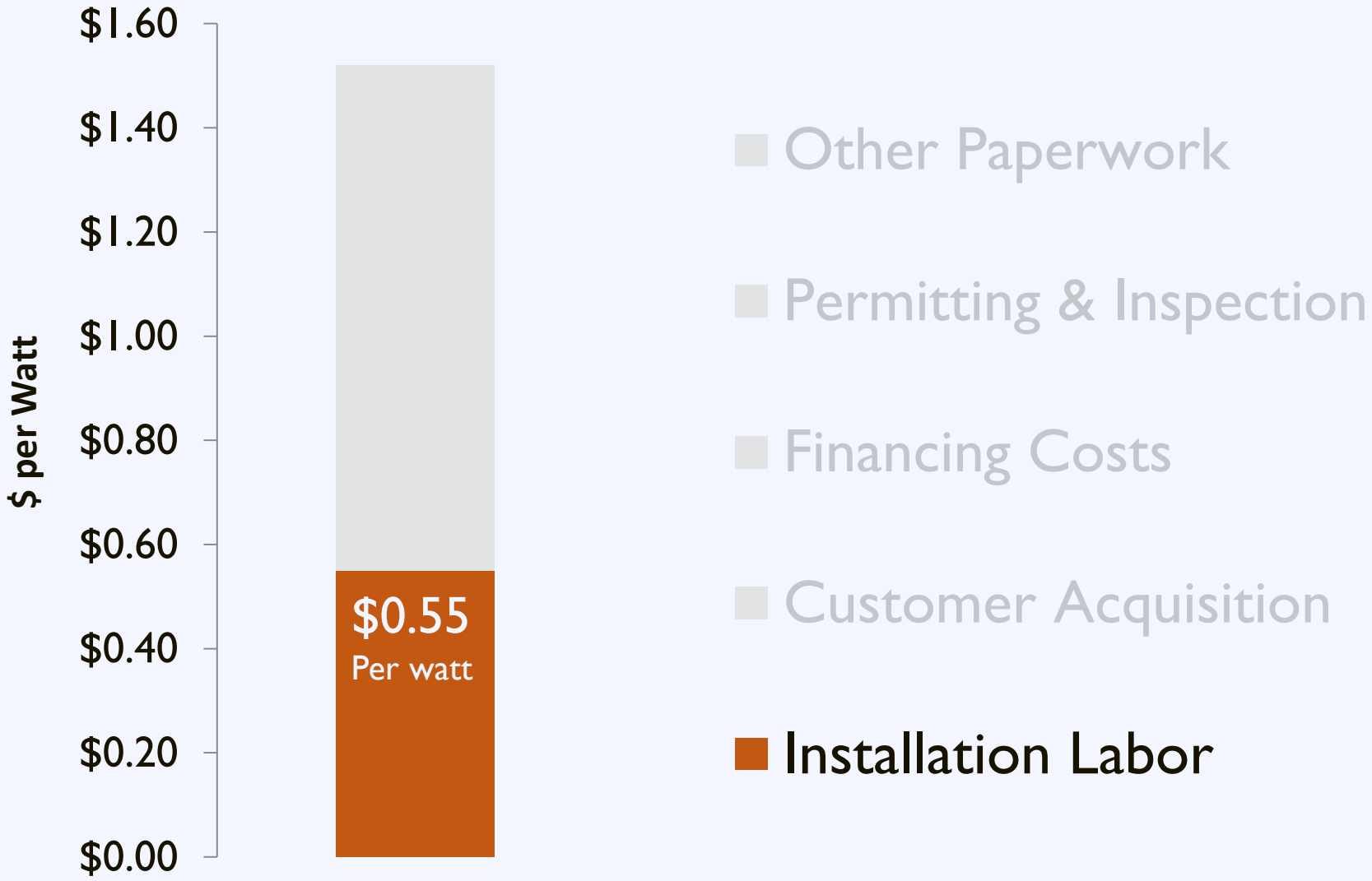
Source: Solar Ready: An Overview of Implementation Practices [Draft]. NREL, Feb. 18, 2011.

Installation Soft Costs



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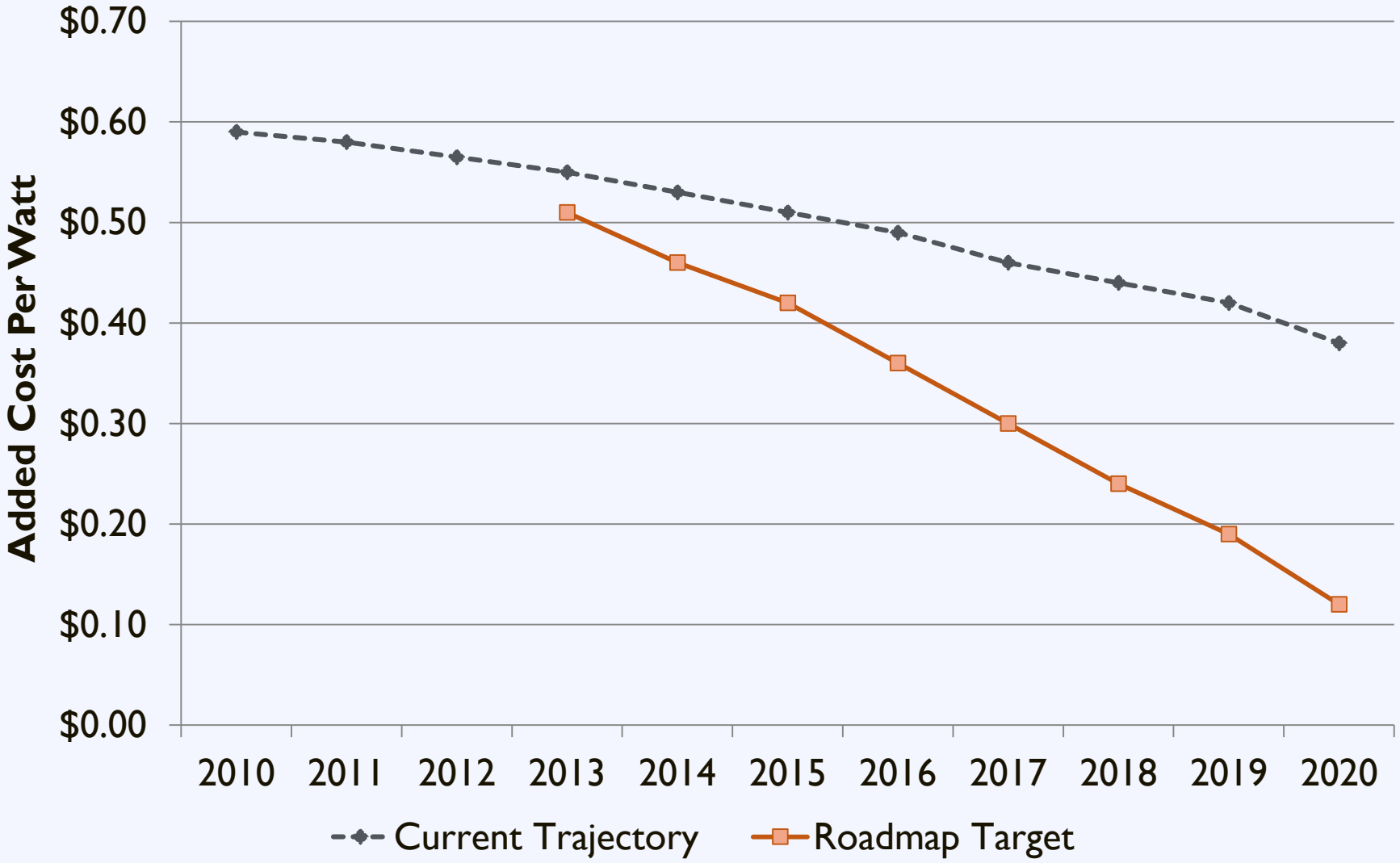
Installation Labor Roadmap

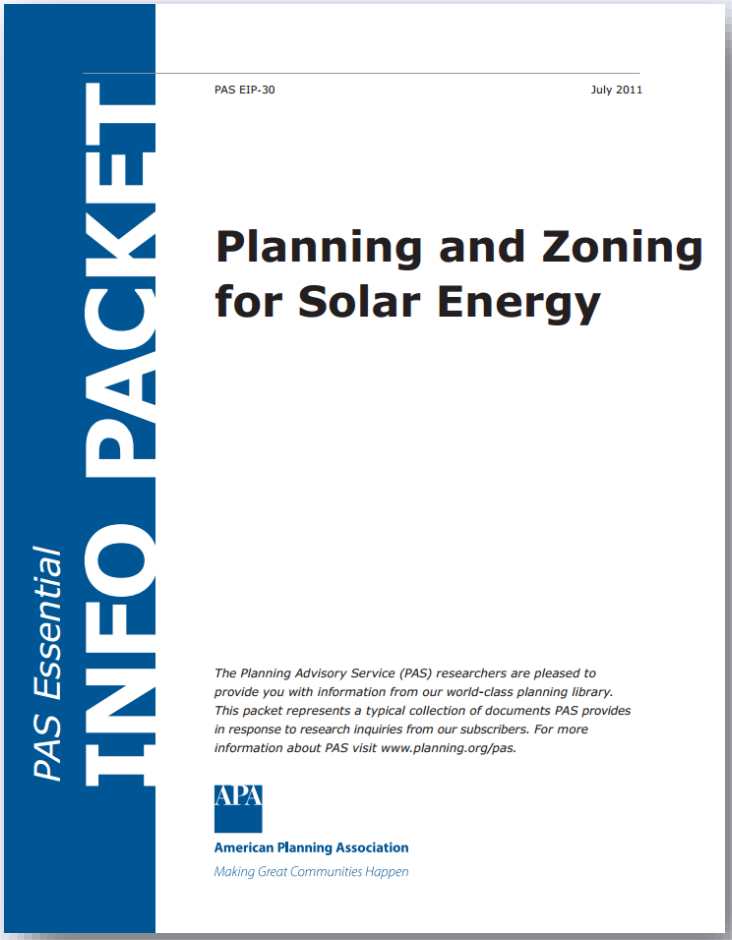


Source: NREL (http://www.nrel.gov/docs/fy13osti/59155.pdf)

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

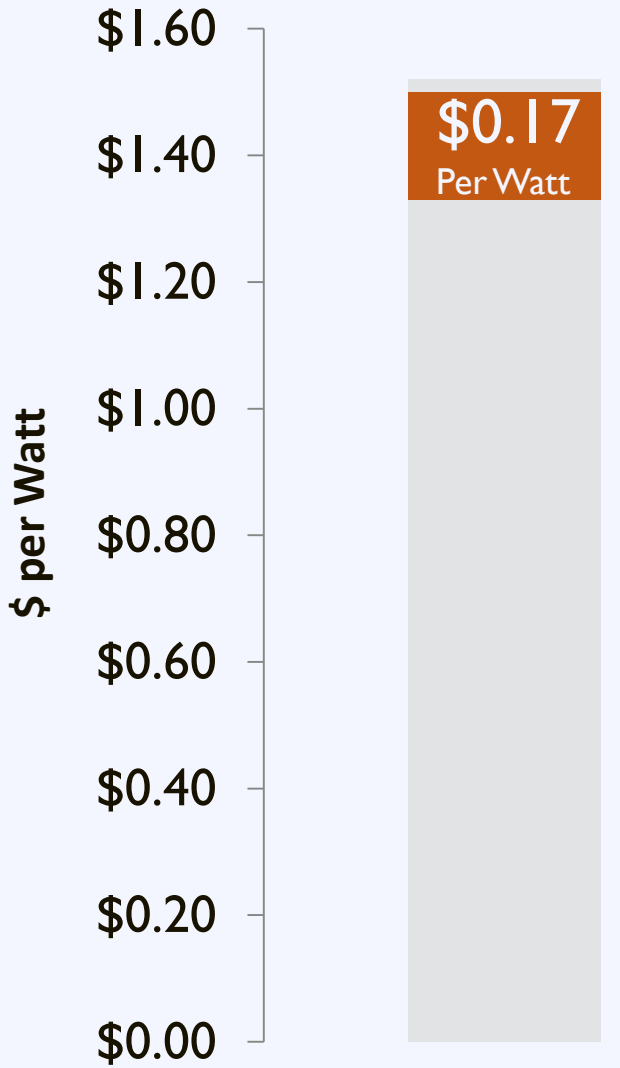
with unique zoning and permitting requirements

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

Consumer Challenges

Source: Forbes

Regulatory Barriers



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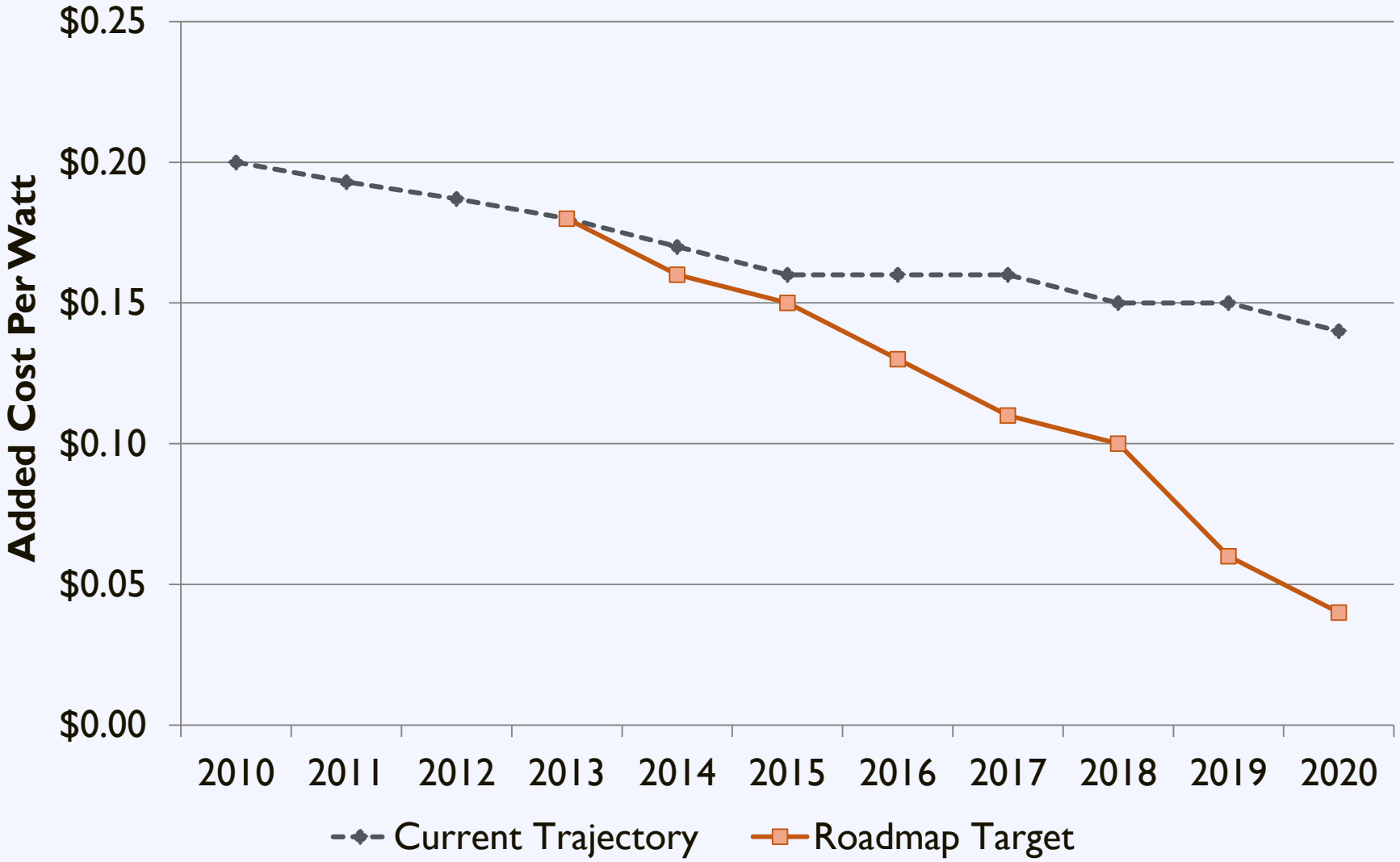
Planning & Permitting Roadmap



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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:

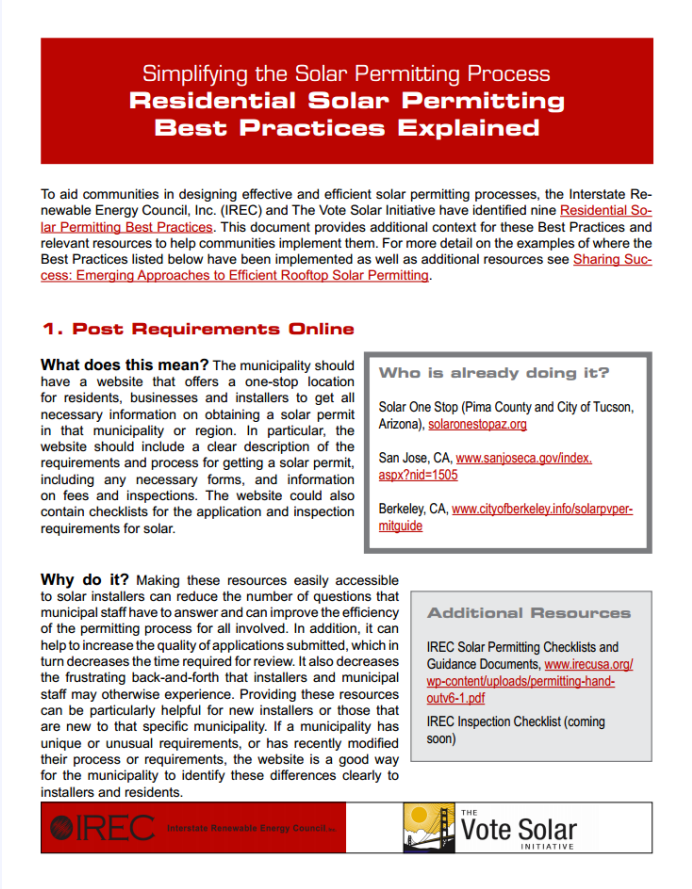
- ✓ Collect Reasonable Permitting Fees
- ✓ No Community-Specific Licenses
- ✓ Narrow Inspection Appointment Windows
- ✓ Eliminate Excessive Inspections
- ✓ Train Permitting Staff in Solar

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

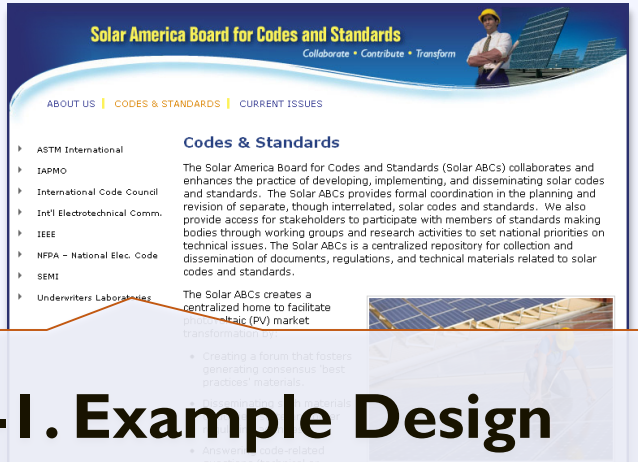
http://projectpermit.org/wp-content/uploads/2013/04/Expanded-Best-Practices-7.23.13_VSI.pdf

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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Effective Local Solar Policy

Local Solar Policy

Understanding solar financing

Expanding financing options

Addressing customer acquisition

Solar Market Development Tools

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The Solar Equation

Cost

+ Installed Cost

+ Maintenance

- Direct Incentive

Benefit

+ Avoided Energy Cost

+ Excess Generation

+ Performance Incentive

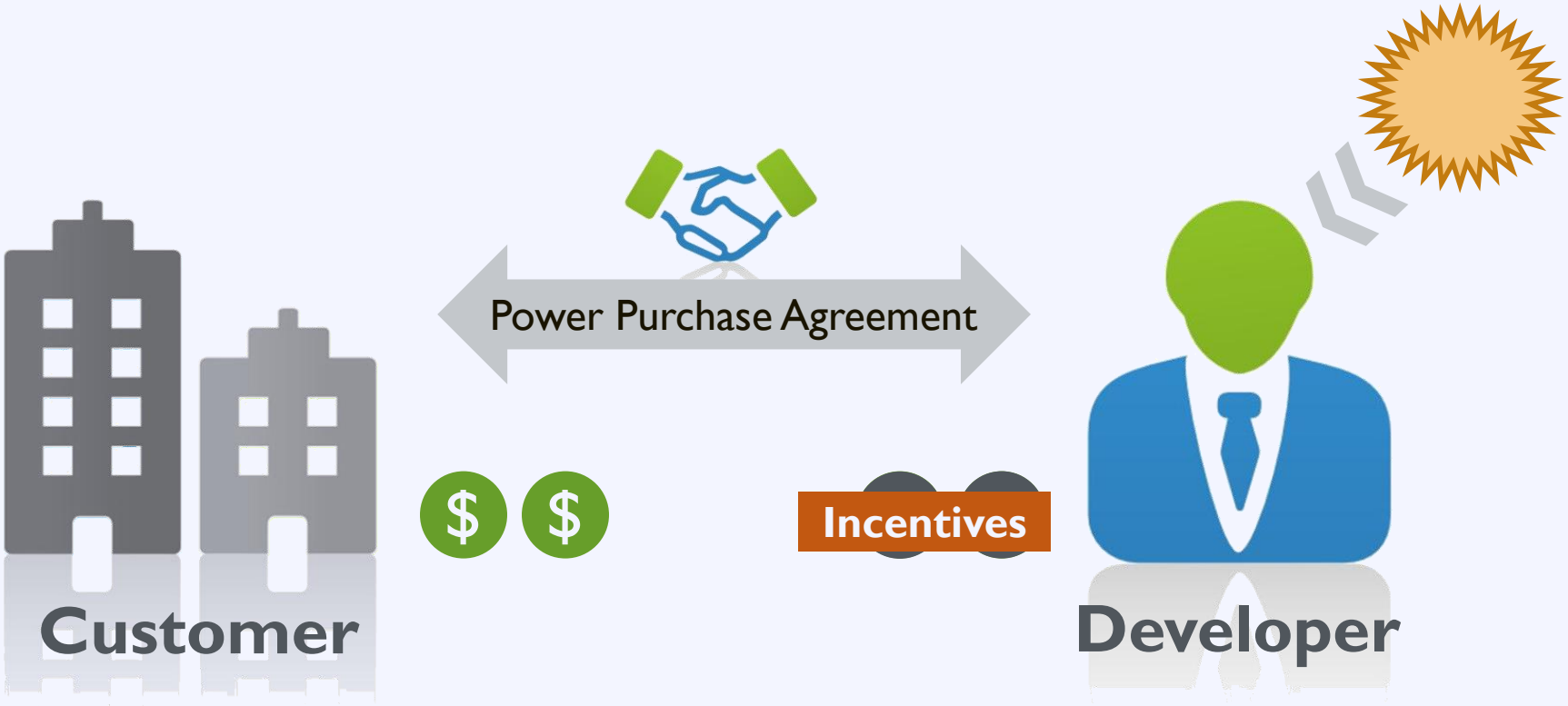
Ownership Options for Solar

Direct Ownership

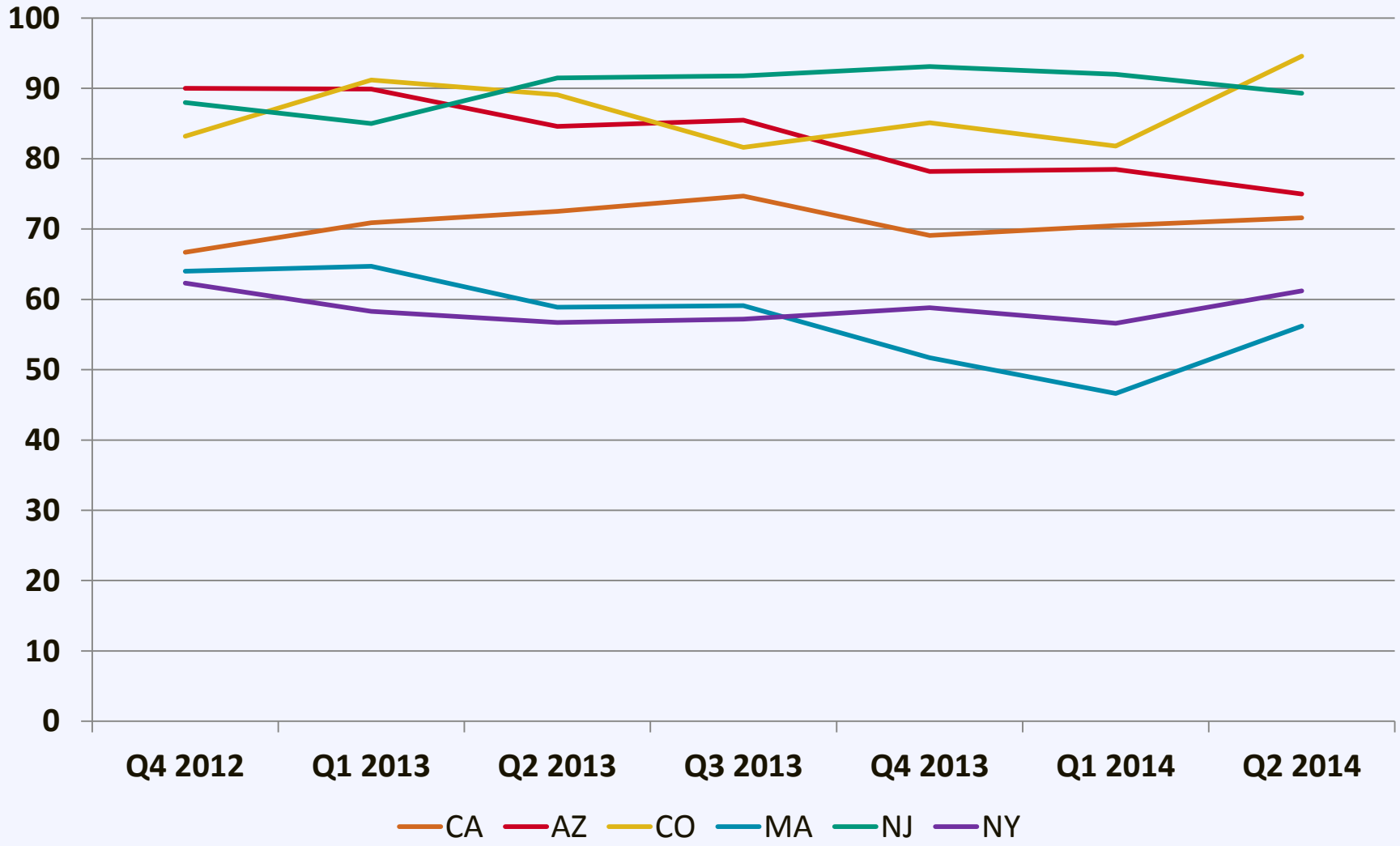
Third-Party Ownership

Direct Ownership

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

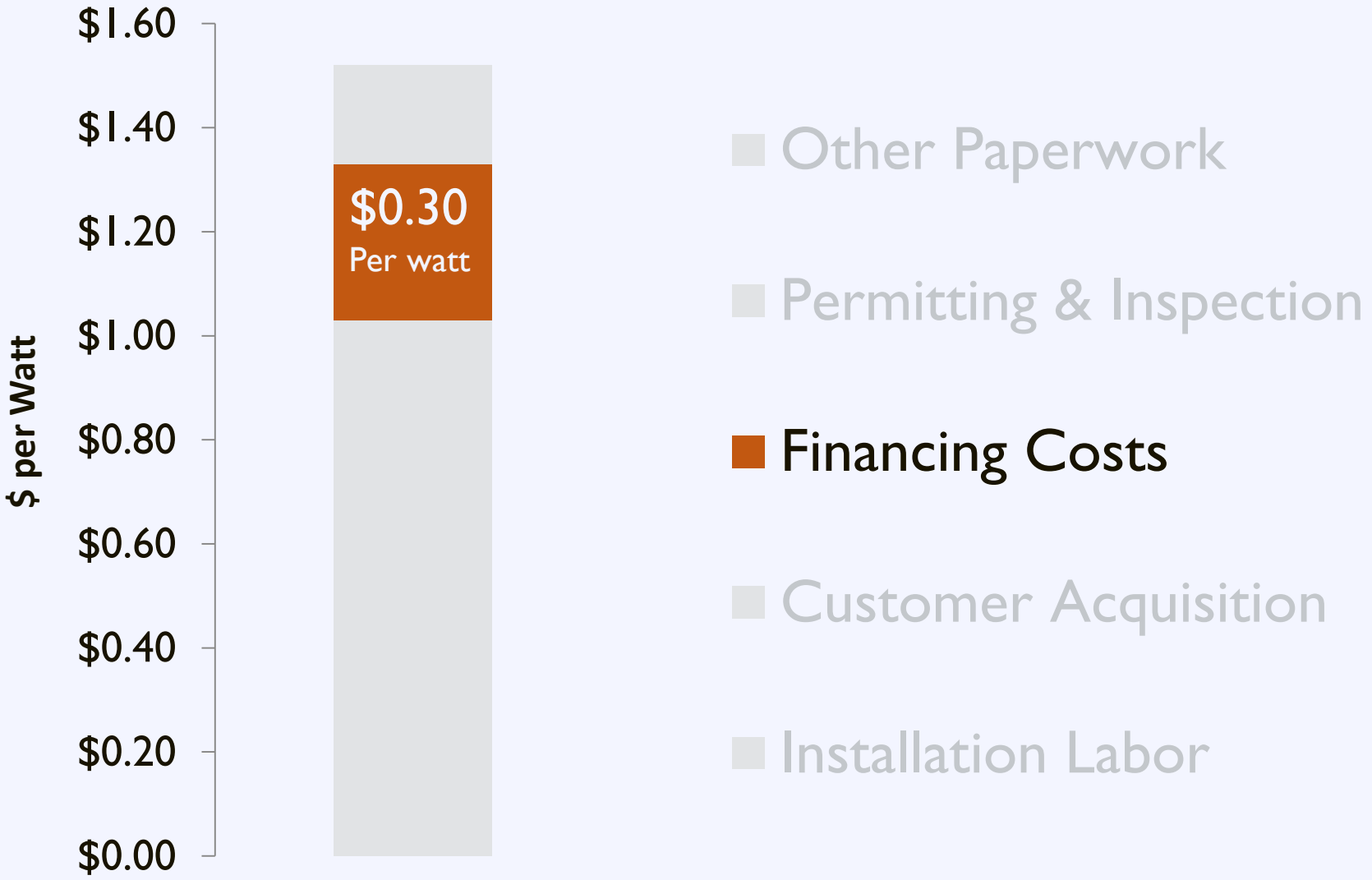
Benefits

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

Drawbacks

- Investor needs higher ROI
- Not available in all states

Third Party Ownership



Ownership Options for Solar

Direct Ownership

Third-Party Ownership

Expand direct ownership options by engaging local lenders

Engage Local Lenders

Fewer than **5%**

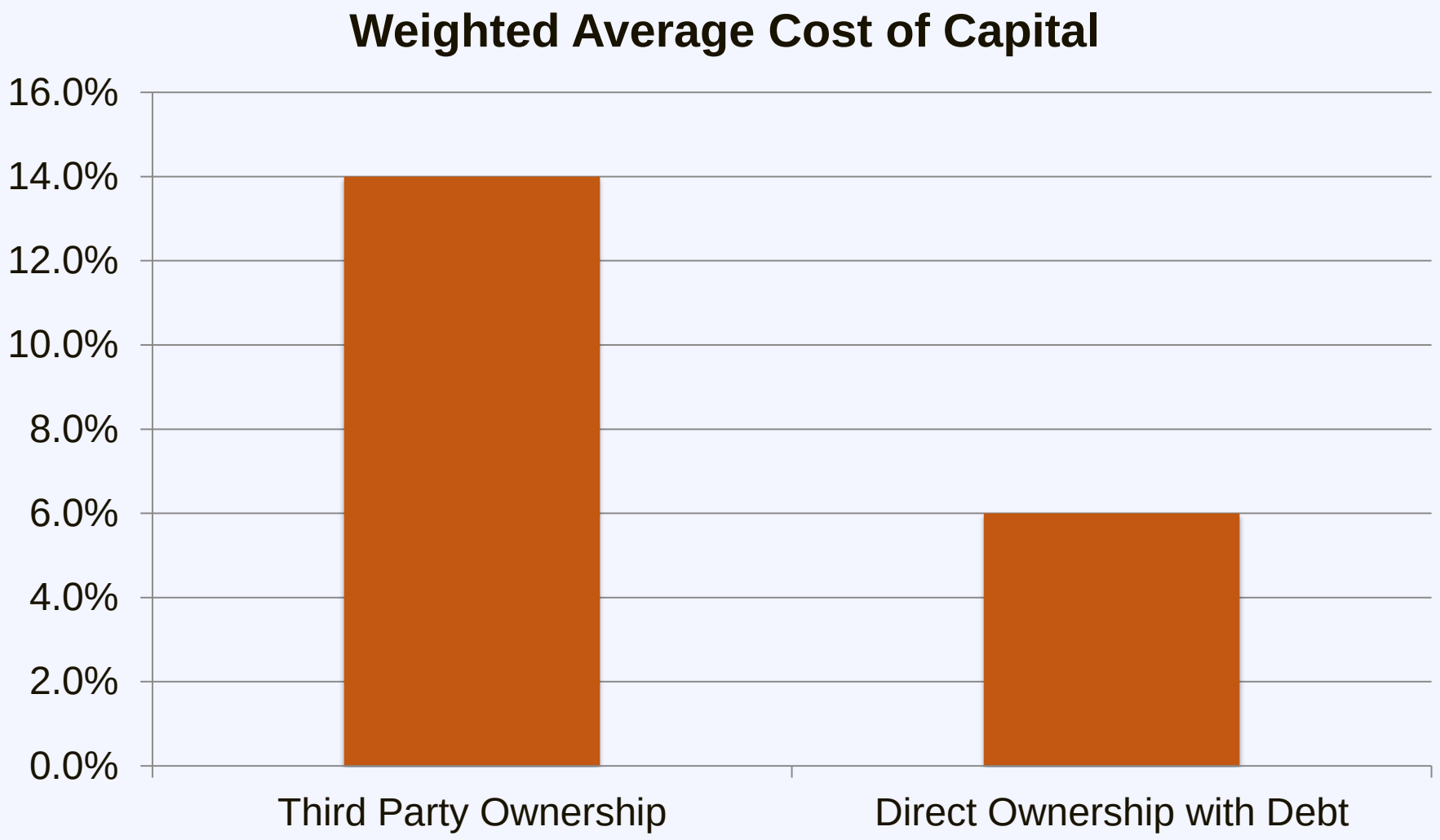
of the

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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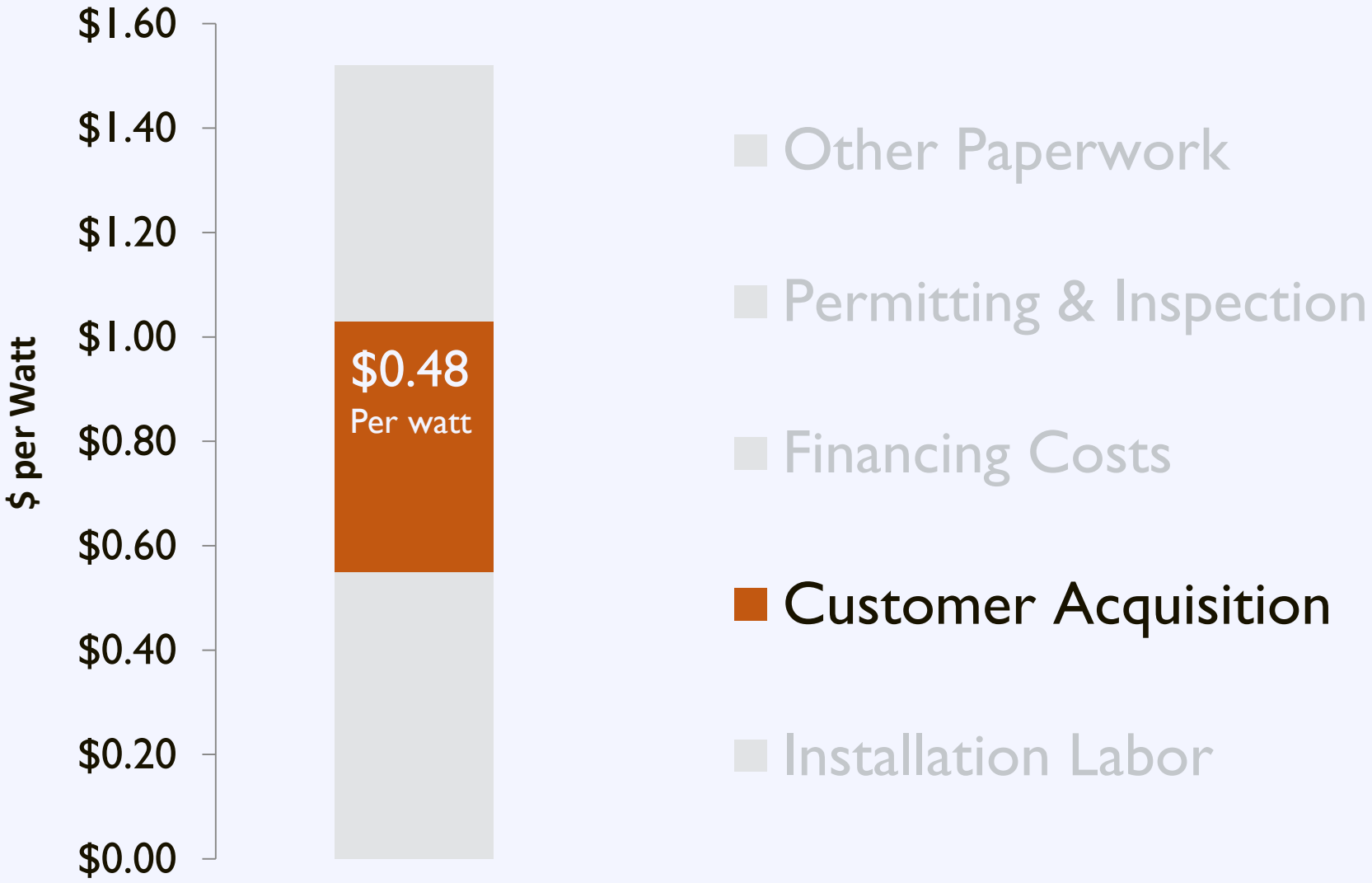
Customer Acquisition



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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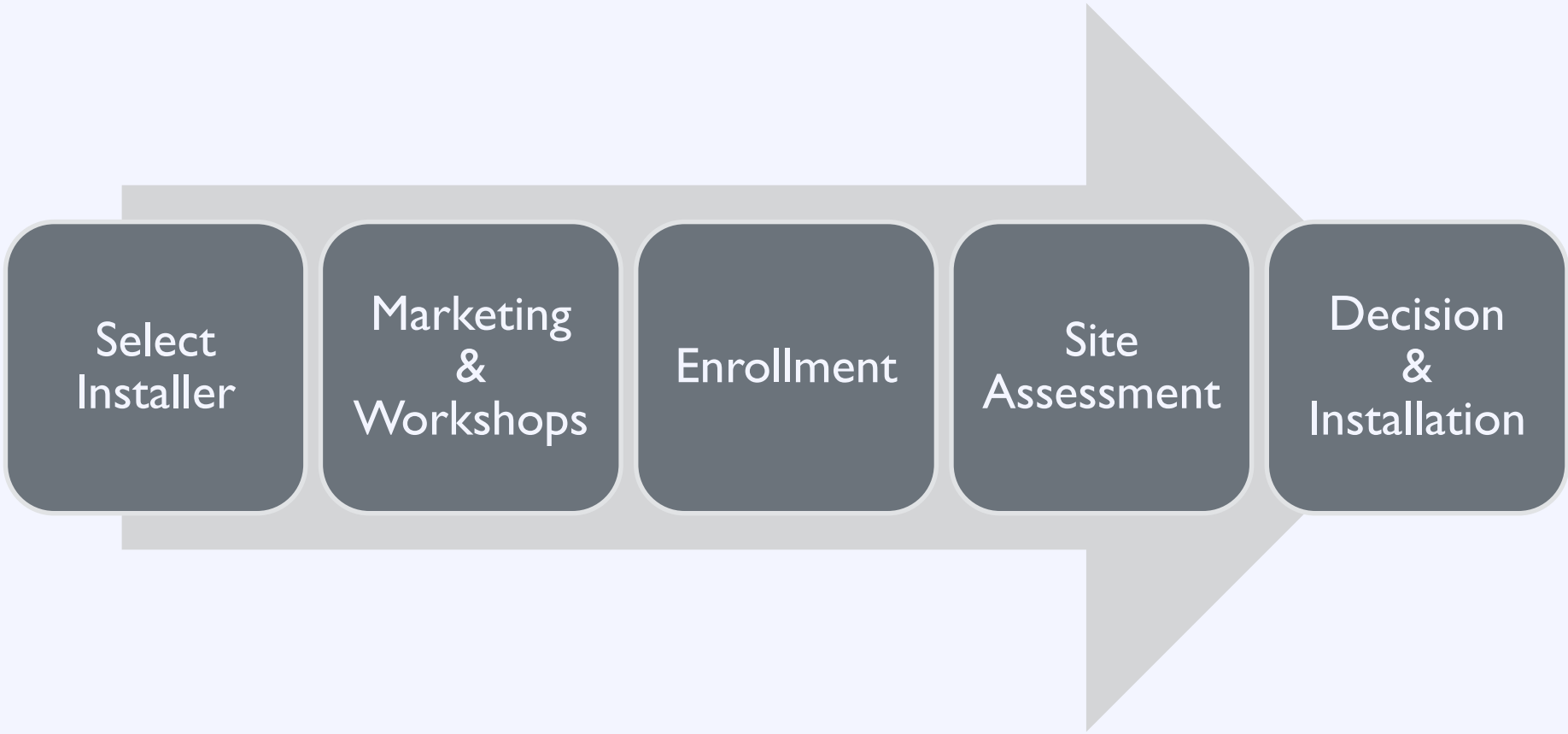
Solarize: Partnership

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

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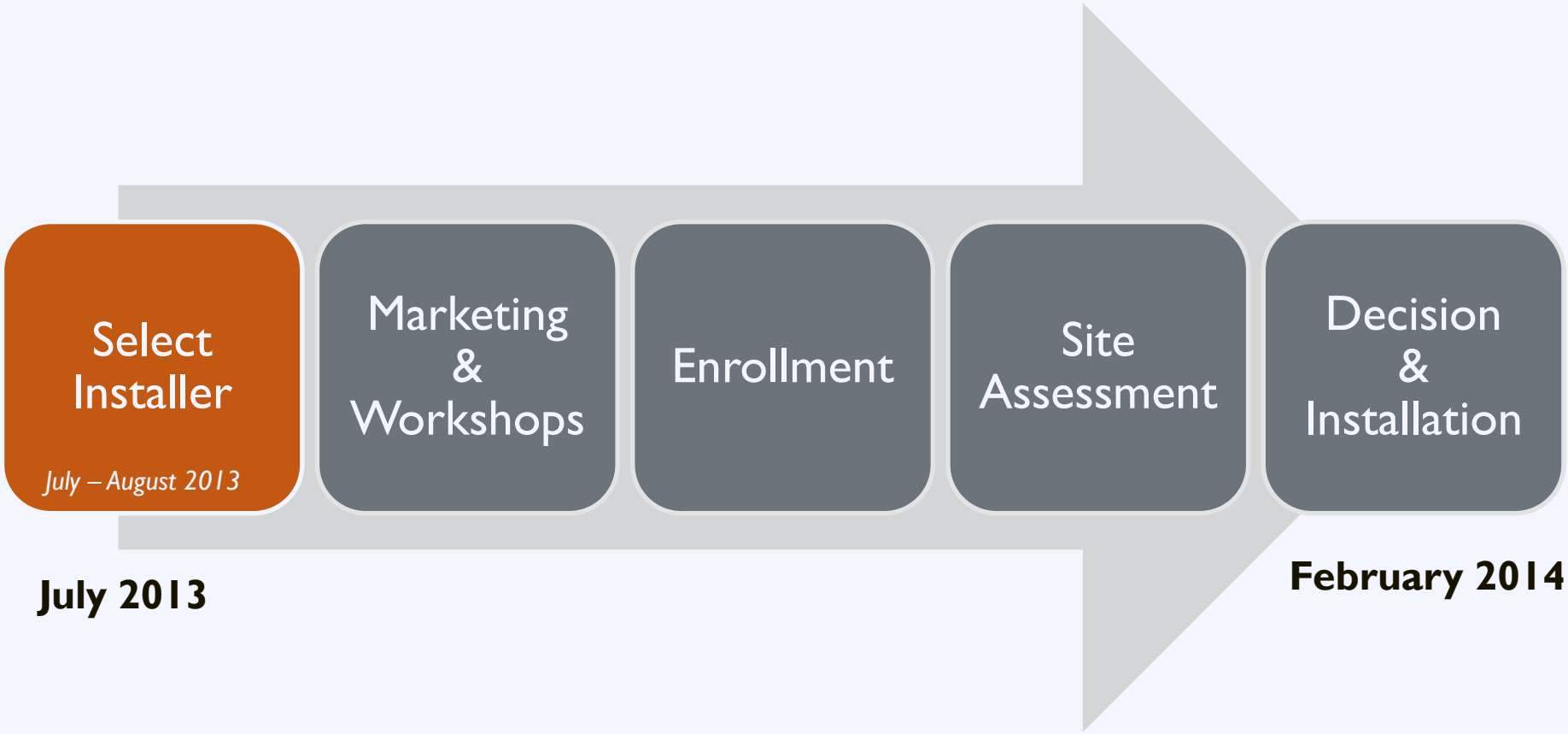
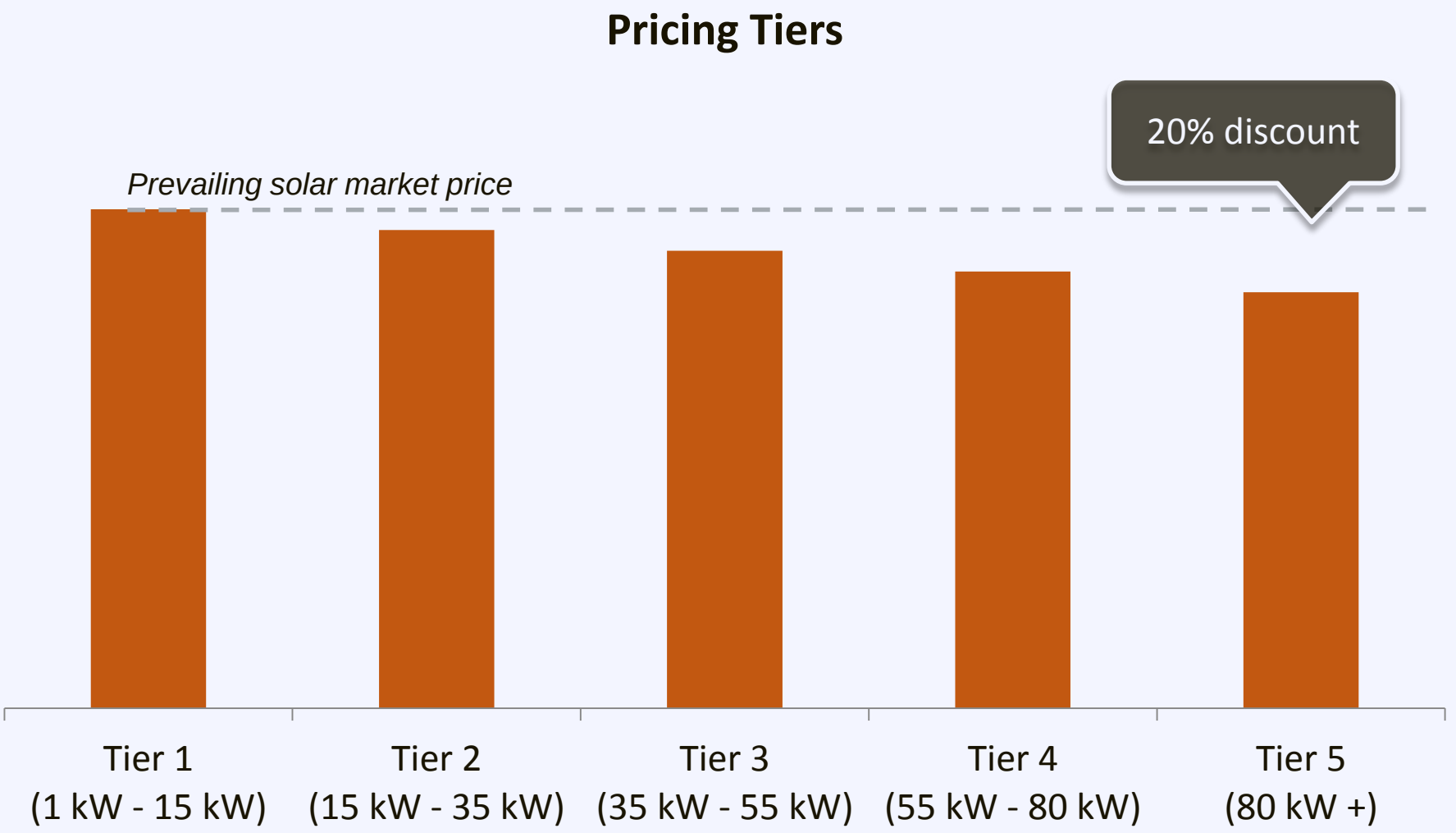
Solarize Plano: Case Study



Solarize Plano: Case Study



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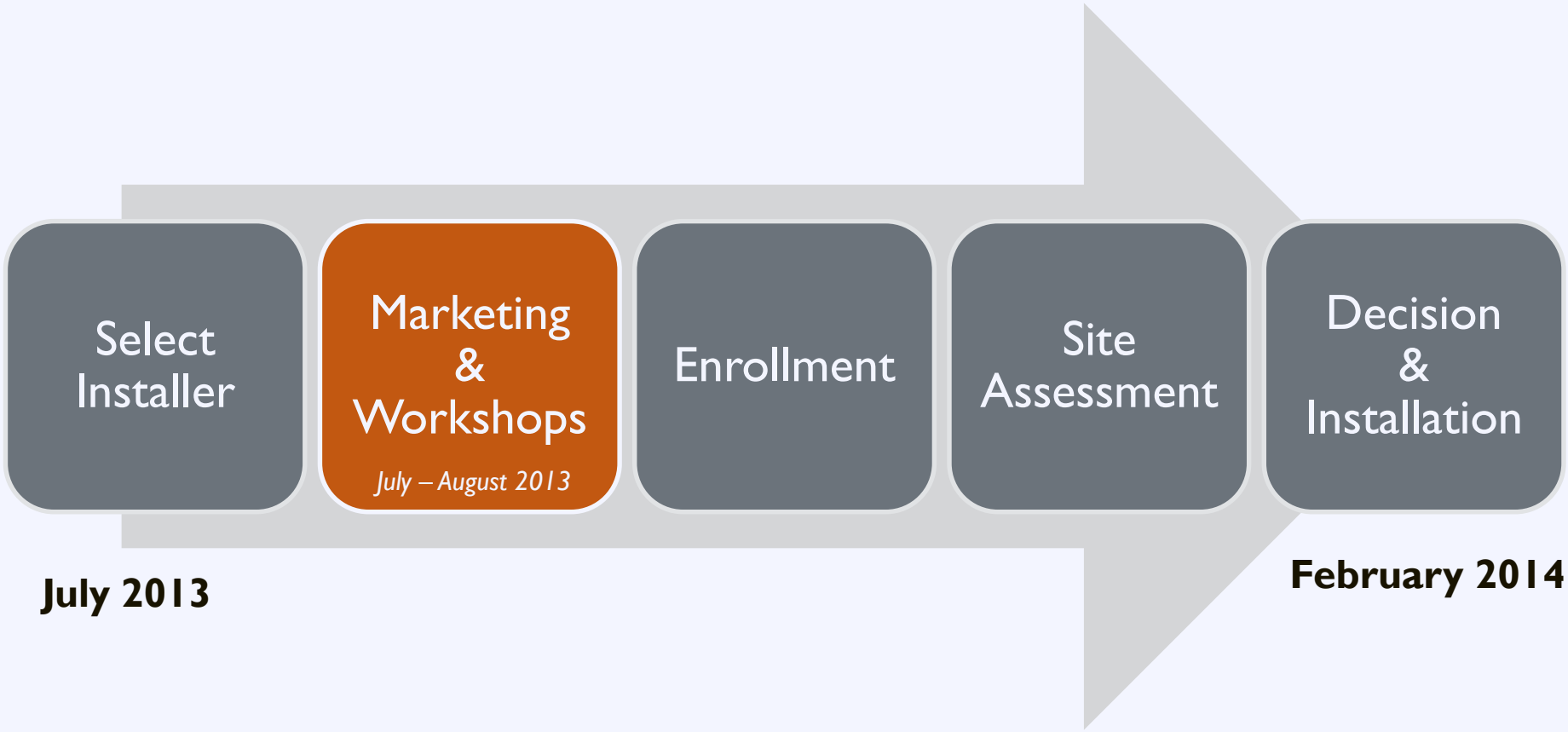
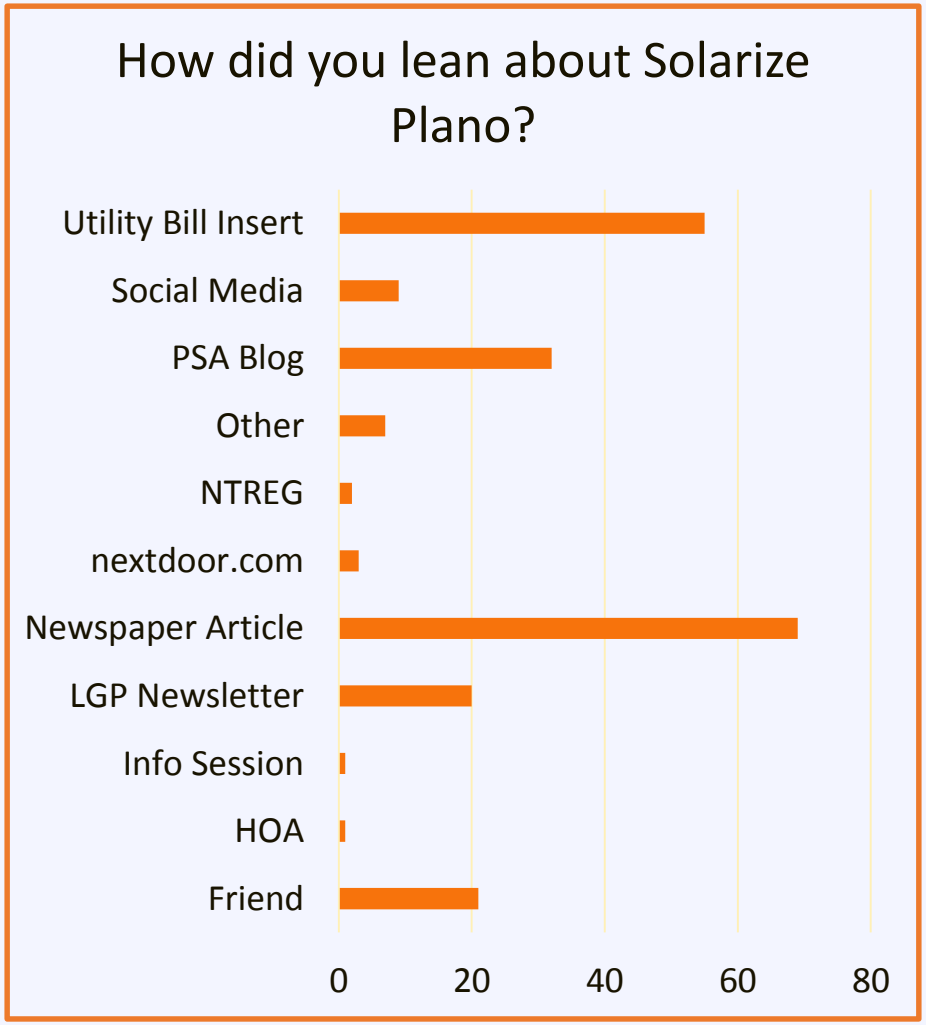


Solarize Plano: Case Study

Marketing Strategy:

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



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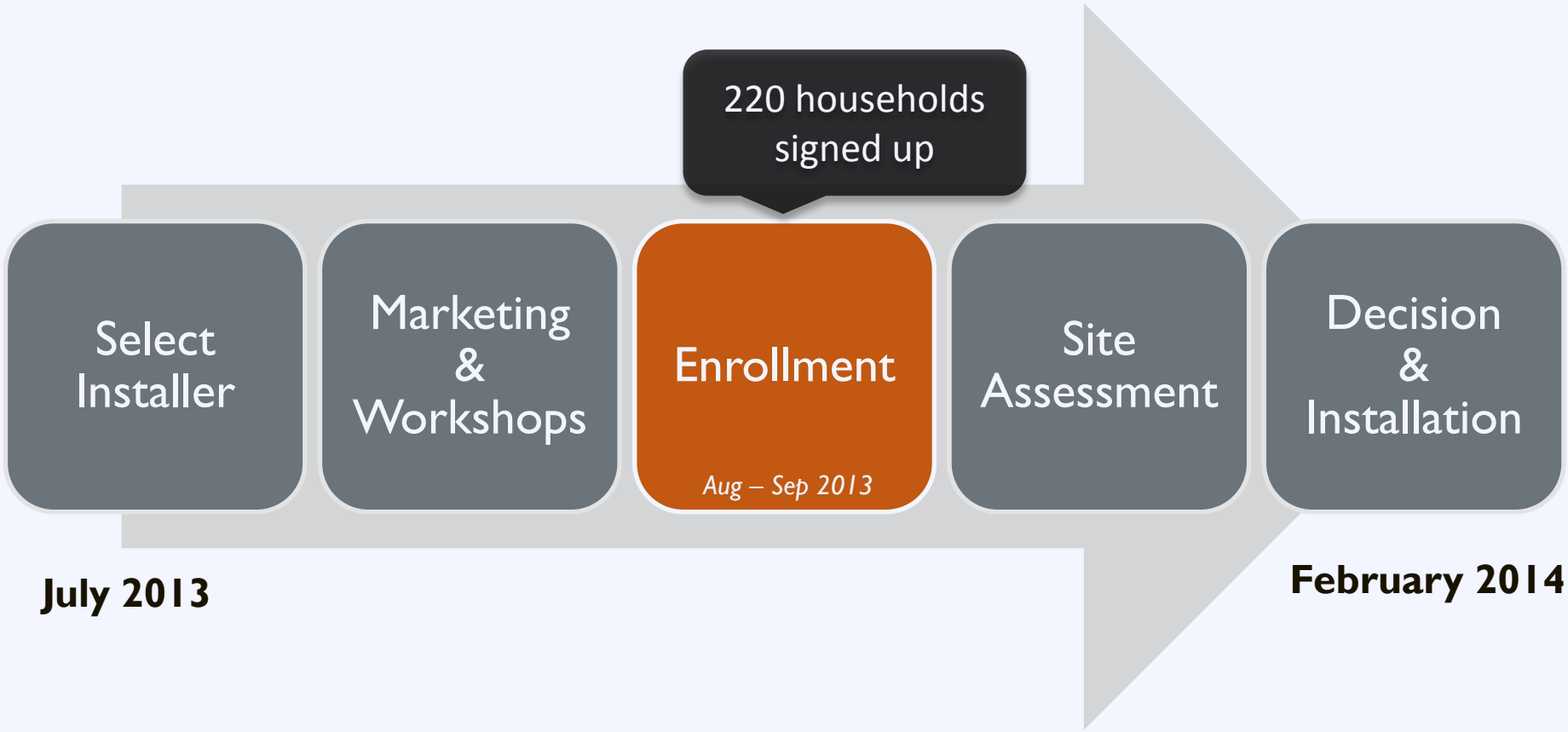
Source: Solarize Plano & NCTCOG

Solarize Plano: Case Study



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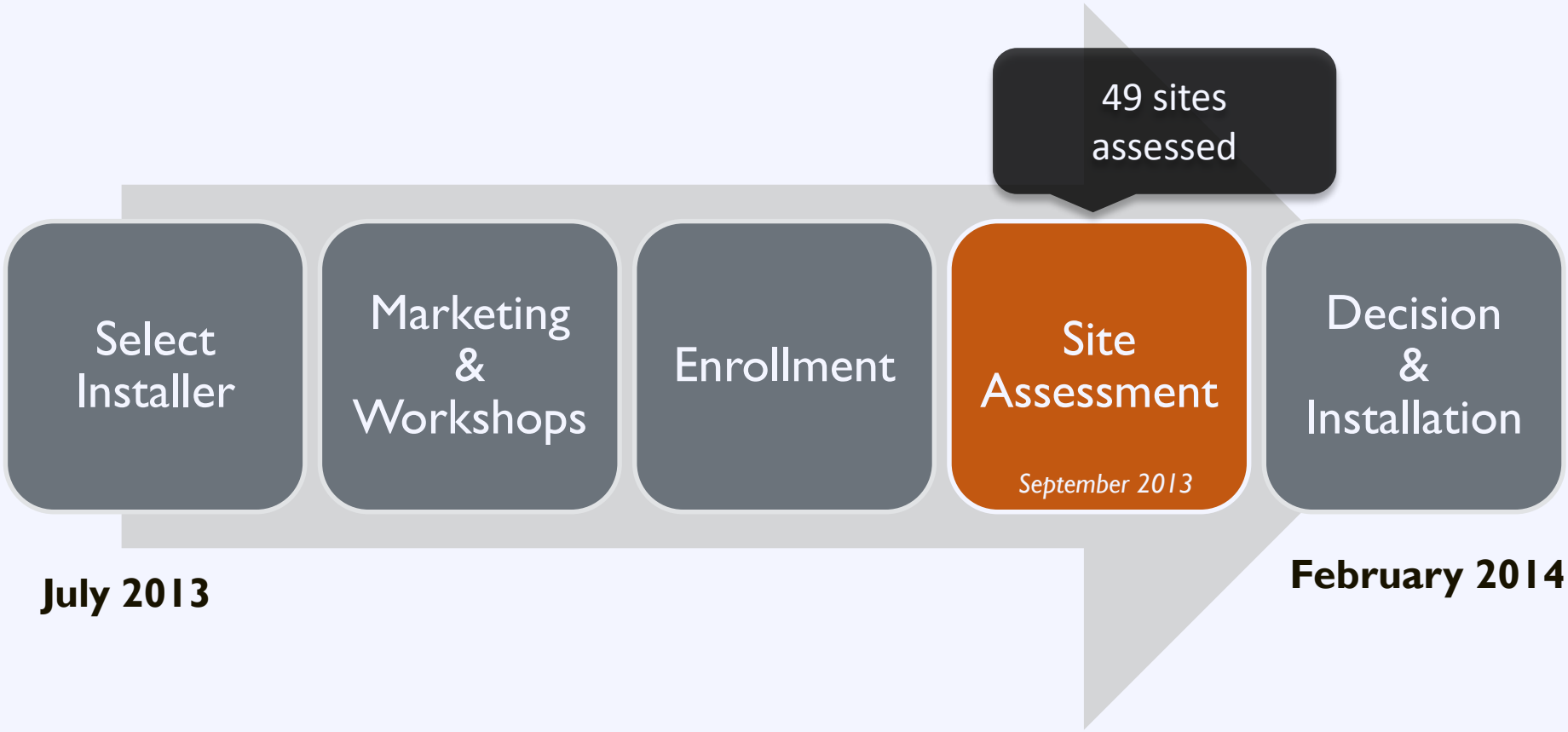
Solarize Plano: Case Study



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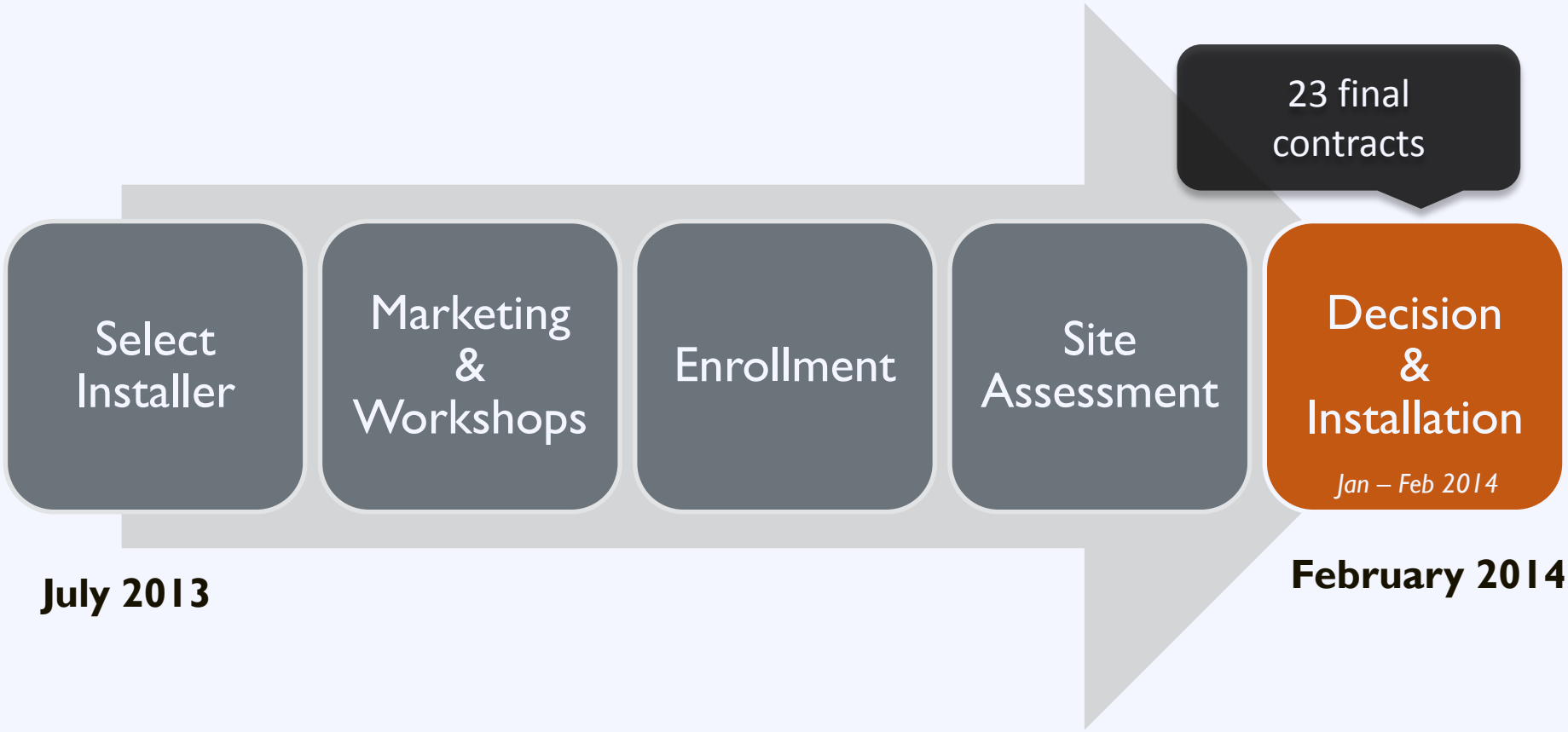

Solarize Plano: Case Study

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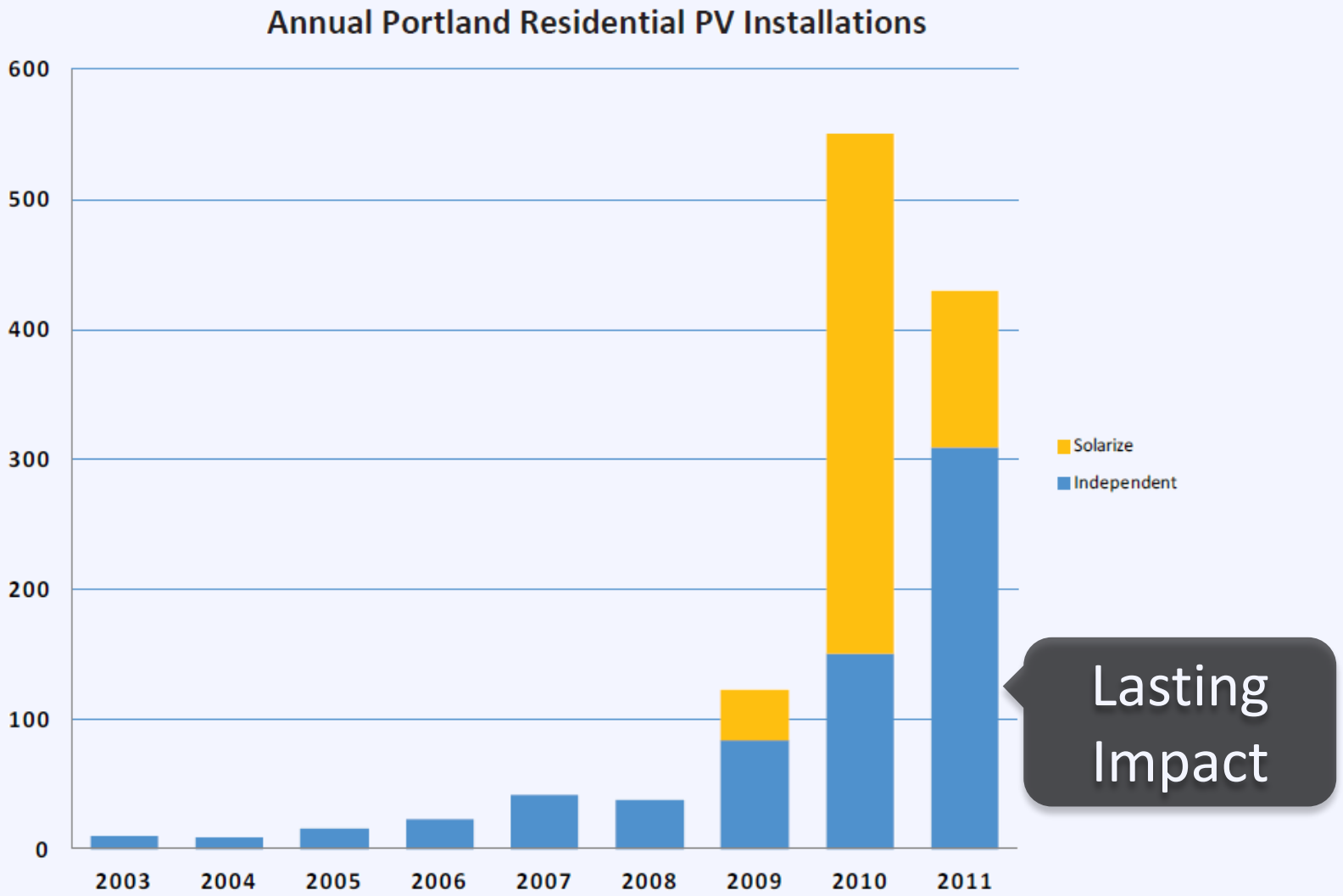
Source: NYU Stern and Yale School of Forestry – Peer Effects in the Diffusion of Solar Panels

Solarize: Lasting Impact



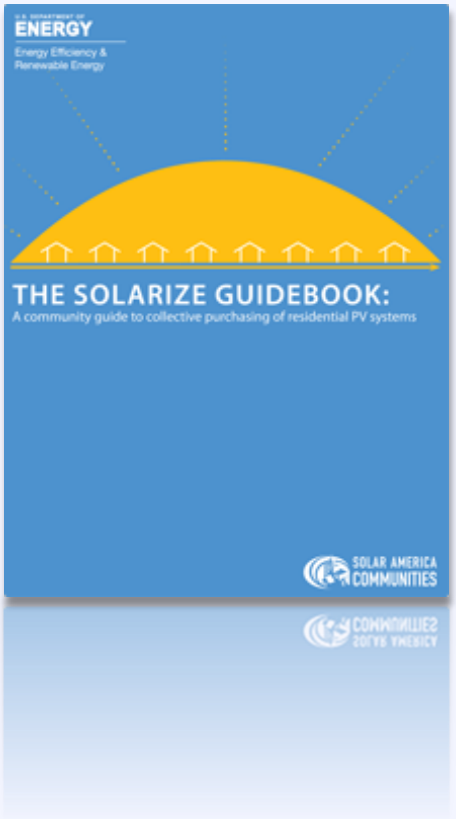
Source: NREL

Solarize: Resources

Resource **The Solarize Guidebook**

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

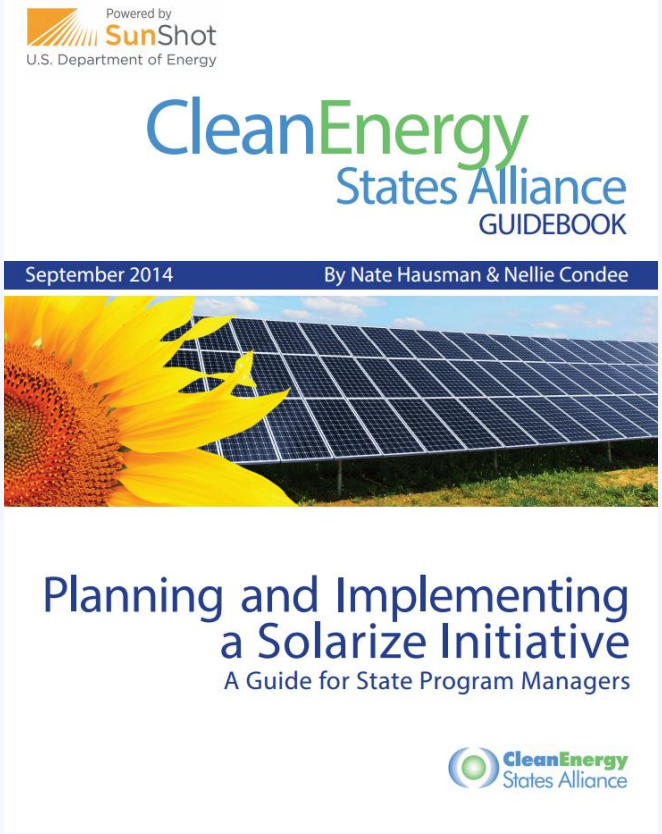
www.nrel.gov



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

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Activity: Solar in Your Community

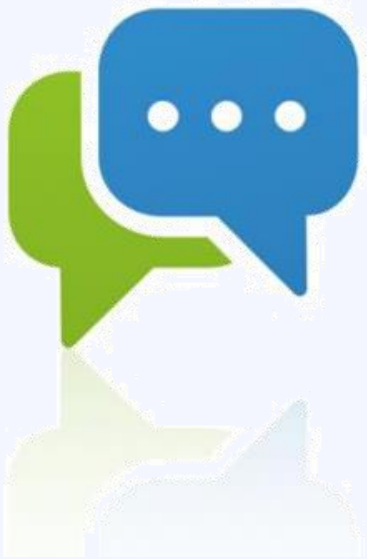
1. Recognize successes
2. Identify opportunities
3. Select strategies & best practices
4. Outline implementation plan
5. Discuss barriers to implementation

Activity: Solar in Your Community

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

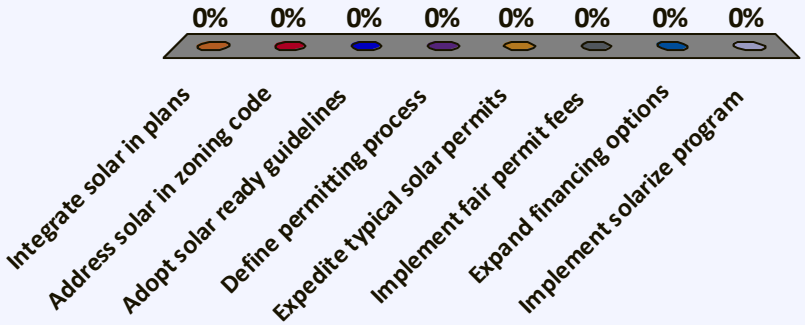
Activity: Solar in Your Community

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?

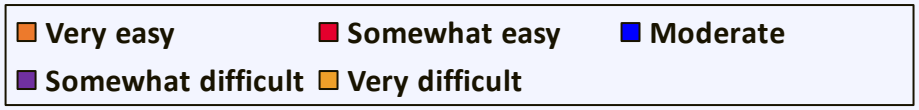
A. Integrate solar in plans
B. Address solar in zoning code
C. Adopt solar ready guidelines
D. Define permitting process
E. Expedite typical solar permits
F. Implement fair permit fees
G. Expand financing options
H. Implement solarize program



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

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

0%



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]

Next Steps

1. Meet with us for 20 minutes
2. Apply for free Technical Assistance
3. Complete a DOE solar policy audit
4. Host a in-person strategy session
5. Implement policy changes & programs

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