Solar Powering Your Community

Addressing Soft Costs and Barriers

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Chad Laurent

Meister Consultants Group

chad.laurent@mc-group.com

Autumn Proudlove

NC Clean Energy Technology Center

afproudl@ncsu.edu

Ryan Cook

Meister Consultants Group

ryan.cook@mc-group.com

About the SunShot Solar Outreach Partnership

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

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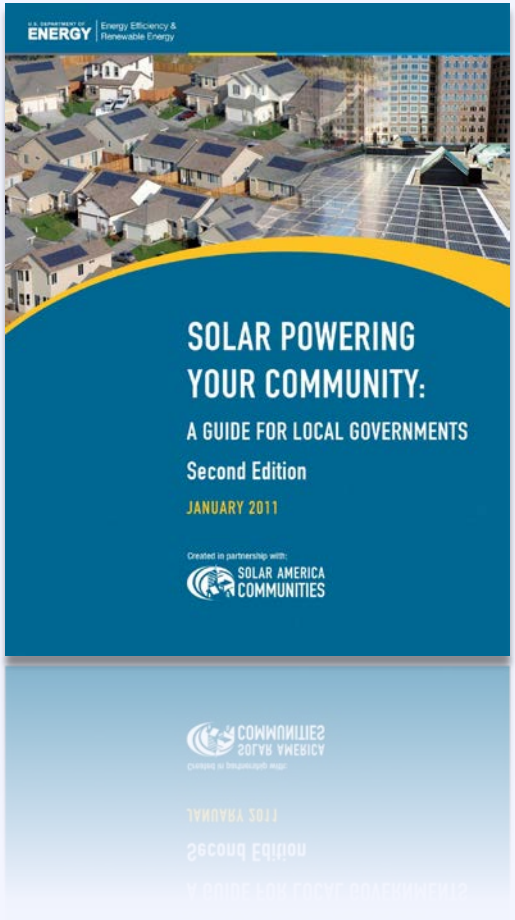
Email solar-usa@iclei.org to request a 20 minute consultation

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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Complimentary Services

Technical Resources

Regional Workshops

Develop an implementation strategy for smart solar policy

Strategy Session

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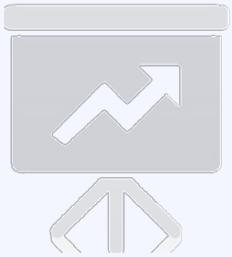
Complimentary Services

Technical Resources



Regional Workshops

One to One Assistance

Receive customized technical support on implementation of smart solar policy

After This Session

Talk to Us!

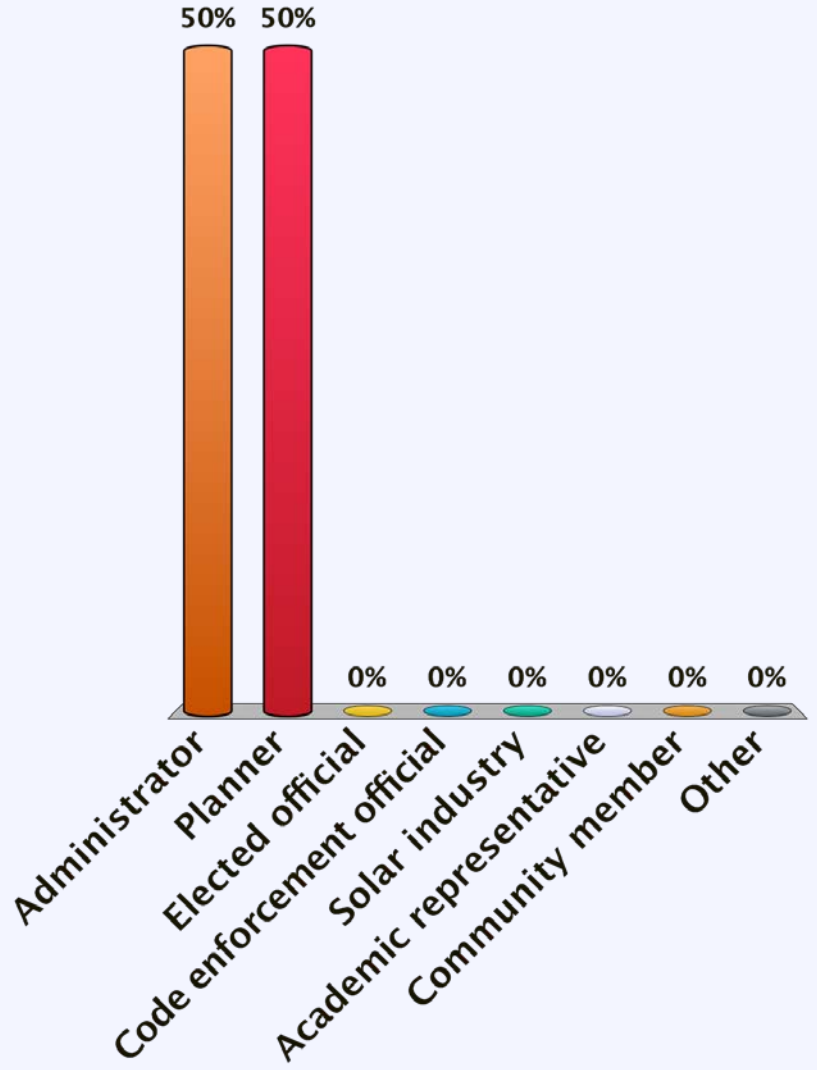
Sign up for a 20 minute consultation to learn more about our free services

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. Des Moines Area MPO member community
B. The rest of Iowa
C. Outside of Iowa

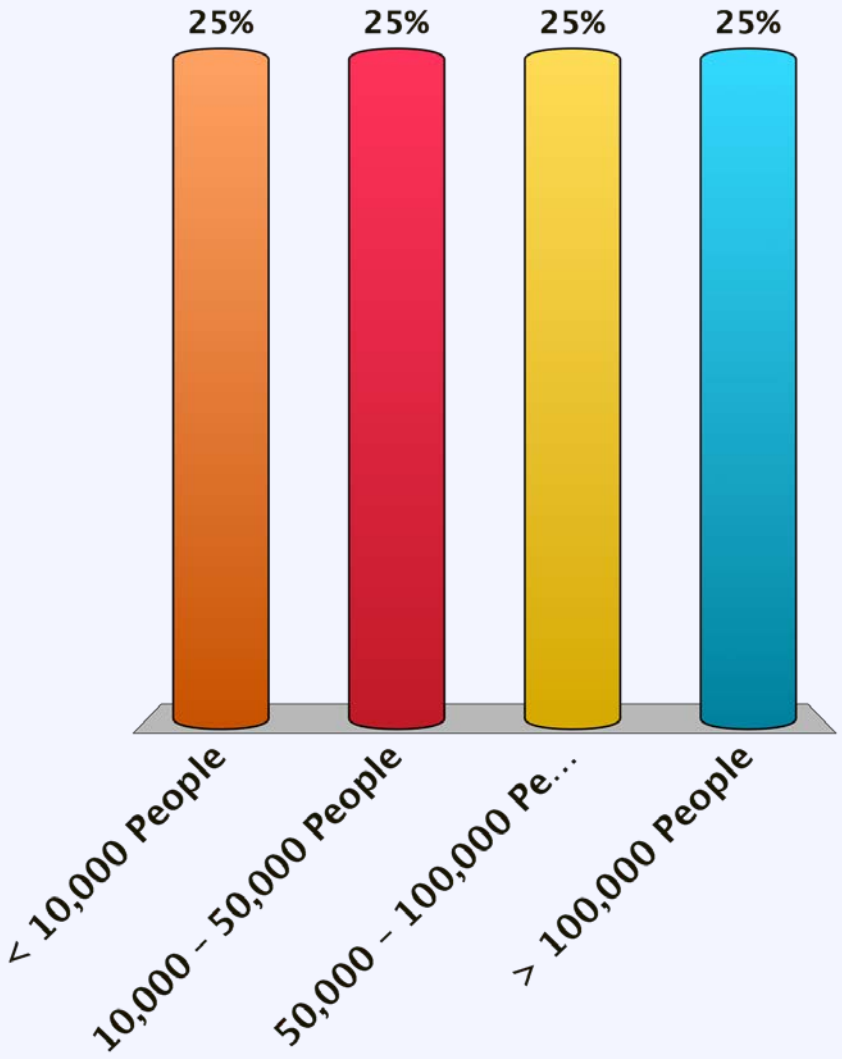
What size is your community?

A. < 10,000 People

B. 10,000 – 50,000 People

C. 50,000 – 100,000 People

D. > 100,000 People

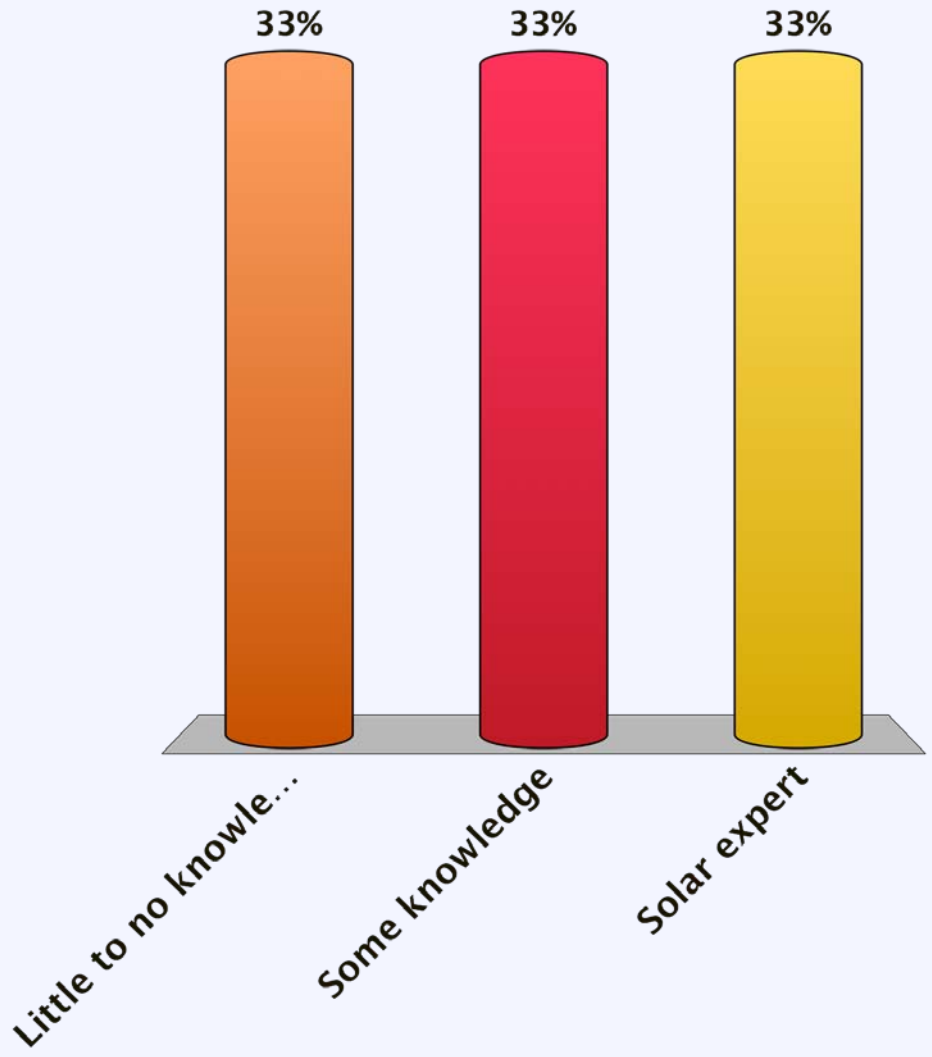


How familiar are you with solar?

A. Little to no knowledge

B. Some knowledge

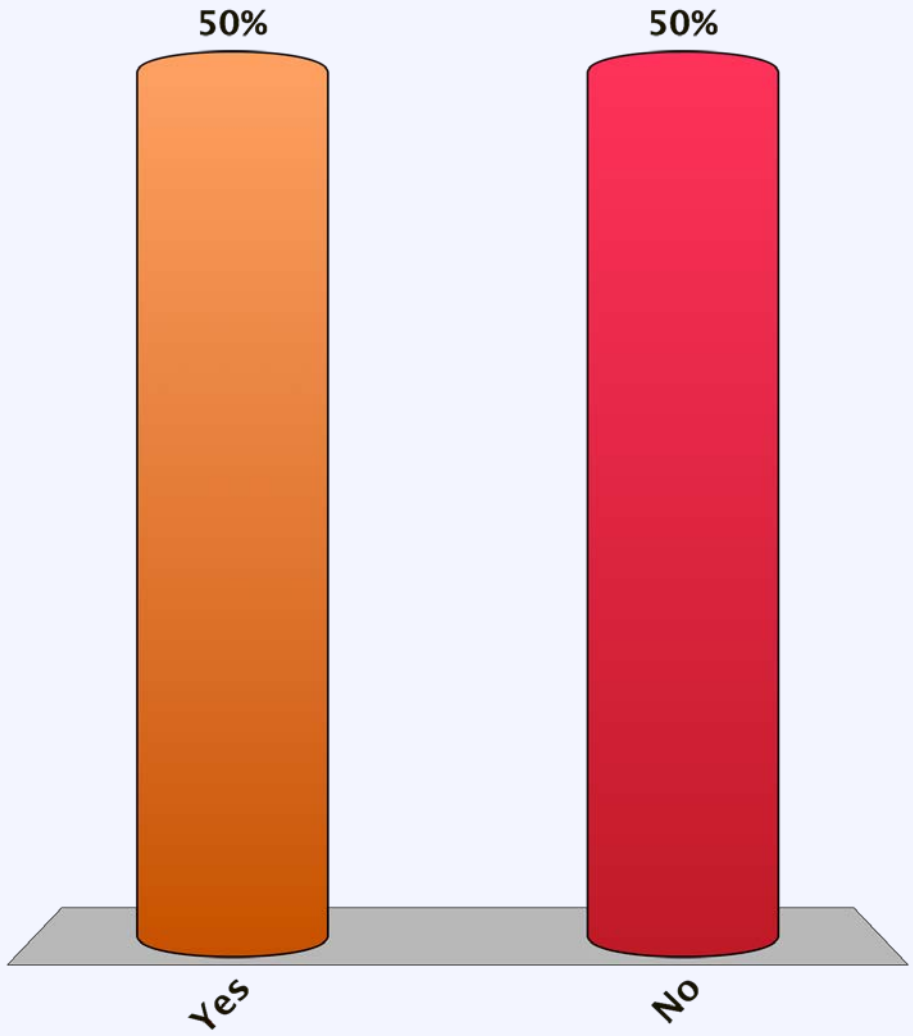
C. Solar expert



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

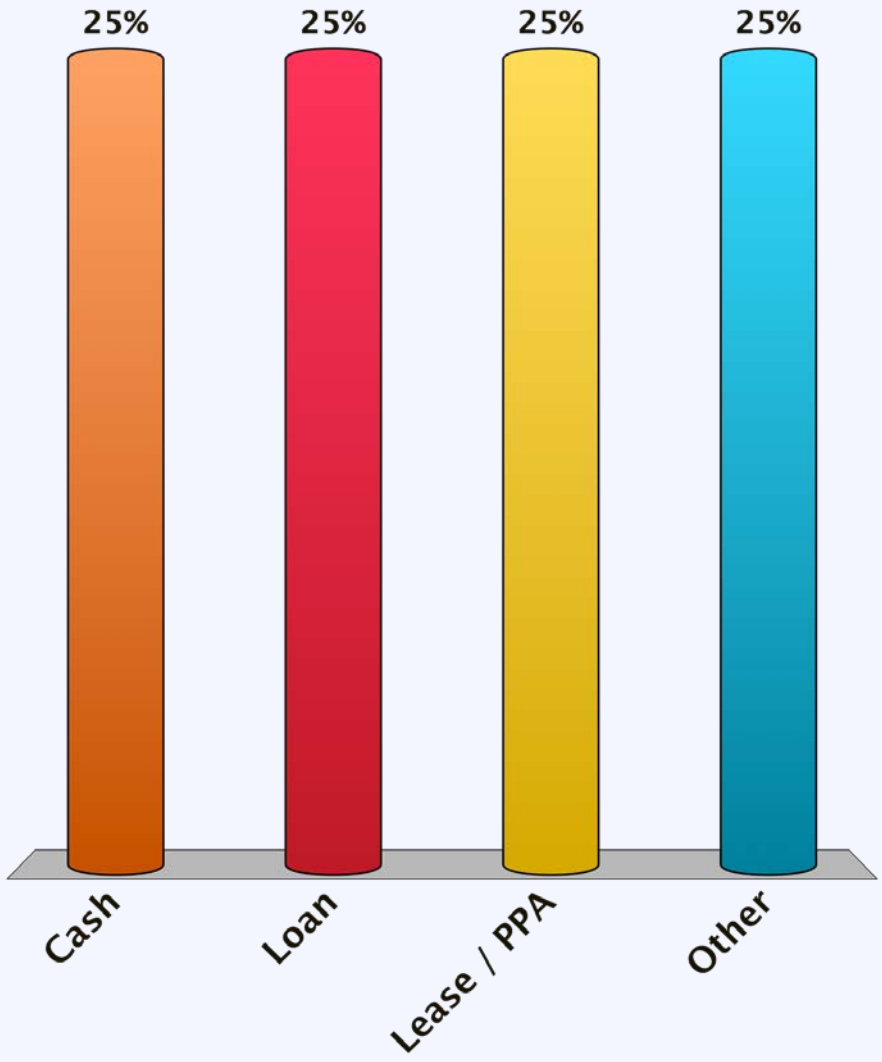
If you do have solar on your home:
How did you finance it?

A. Cash

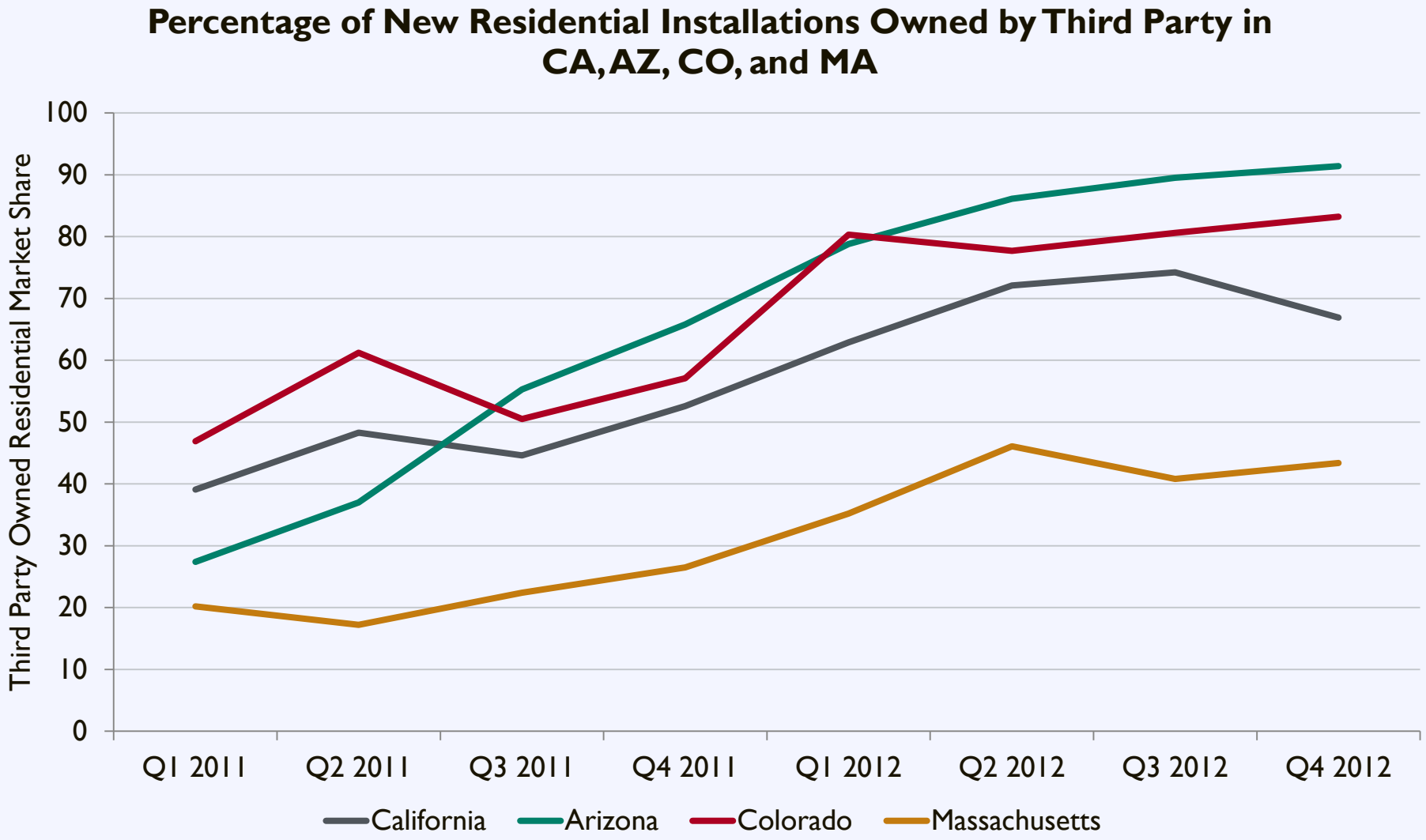
B. Loan

C. Lease / PPA

D. Other



Third Party Ownership



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U.S. Department of Energy

Source: GTM Research/ Solar Energy Industries Association, *U.S. Solar Market Insight 2012 Year-in-Review*

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

A. Shaded roof

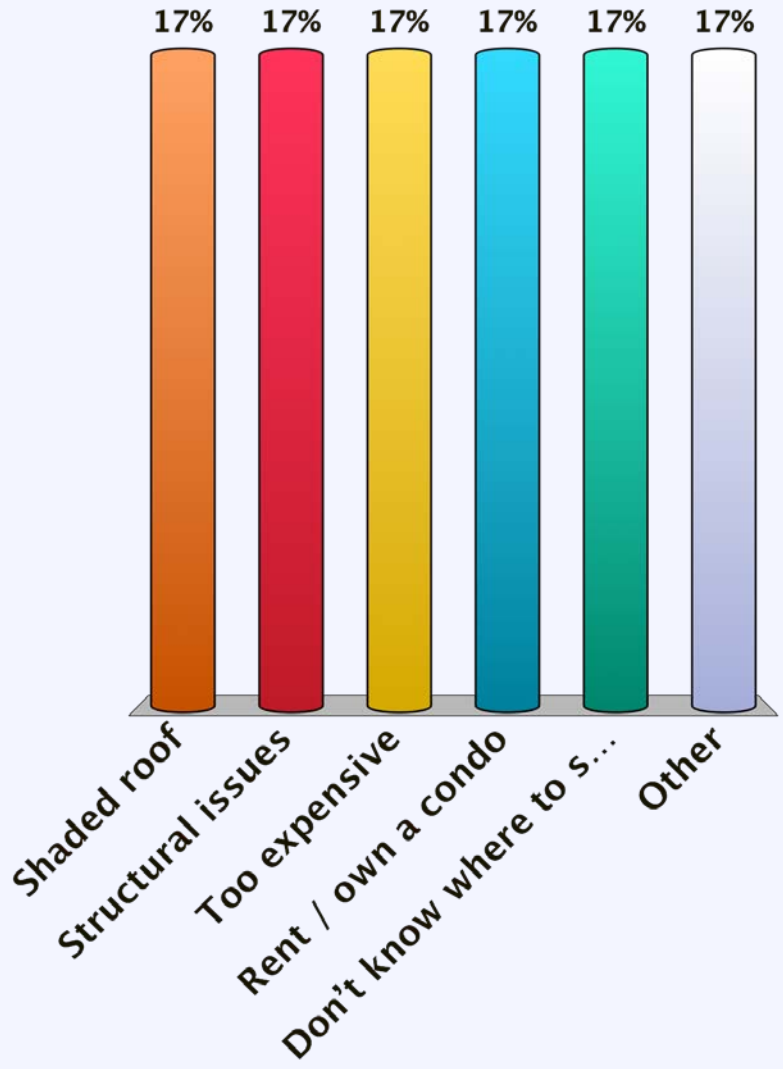
B. Structural issues

C. Too expensive

D. Rent / own a condo

E. Don't know where to start

F. Other

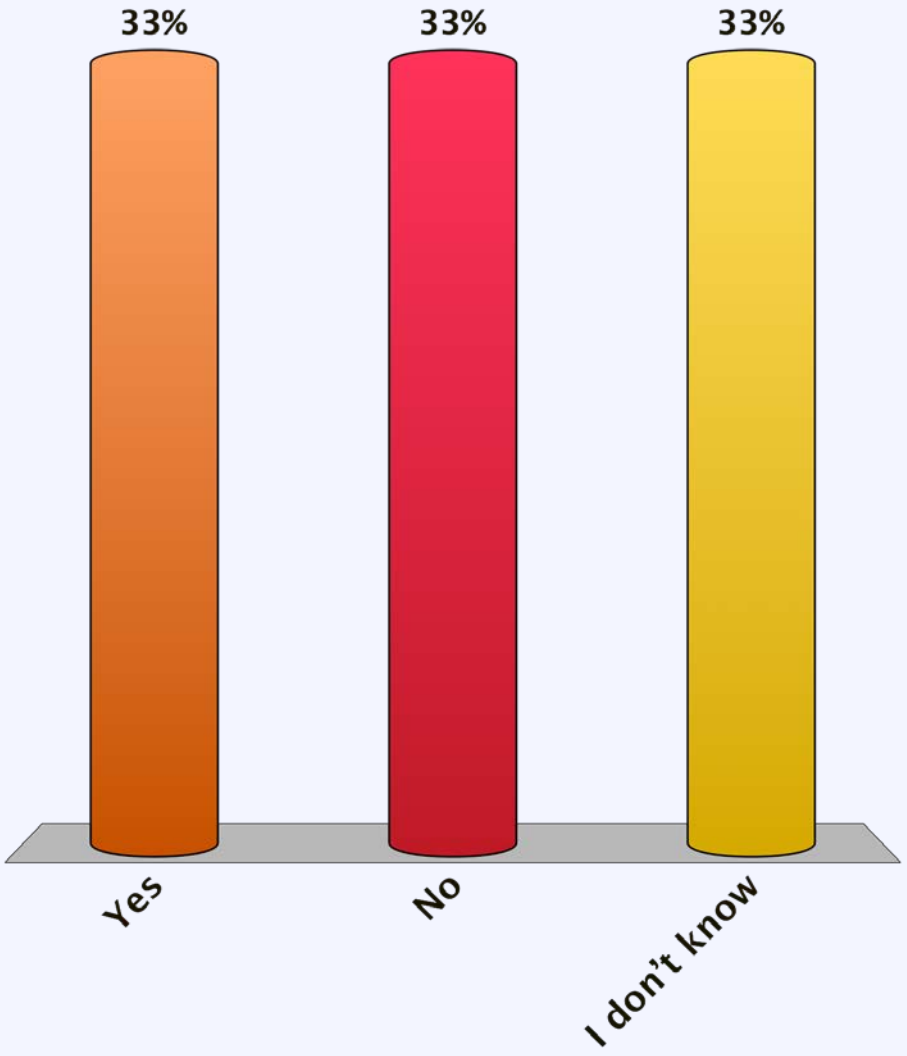


Does your local government have solar on public properties?

A. Yes

B. No

C. I don't know



Agenda

1:40 – 2:00	Putting Solar Energy on the Local Policy Agenda
2:00 – 2:20	State of the Local Solar Market
2:20 – 2:50	Federal, State, and Utility Policy Drivers
2:50 – 3:00	*Break*
3:00 – 3:30	Planning for Solar: Getting Solar Ready
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Solar Technologies

Solar Photovoltaic (PV)

Solar Hot Water

Concentrated Solar Power

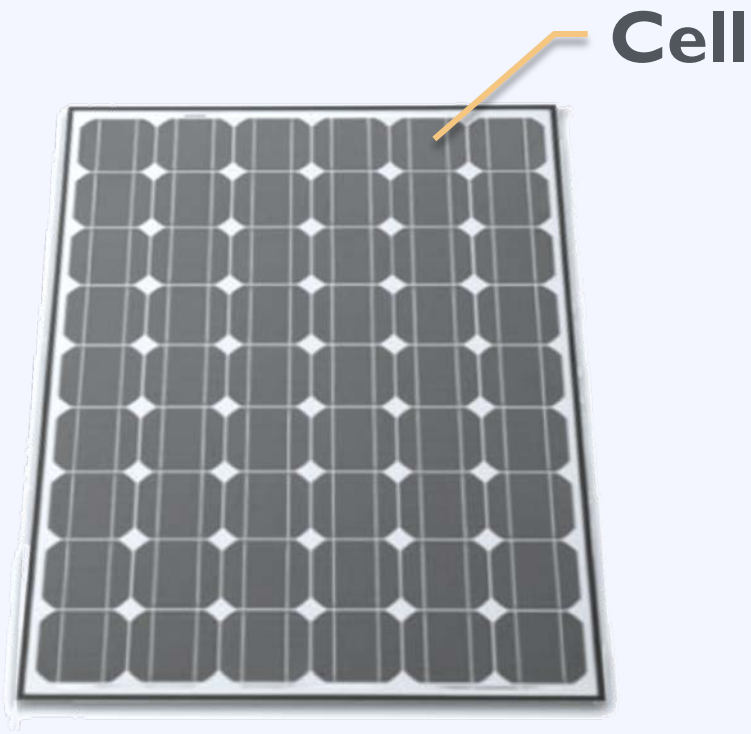
Solar Technologies

Solar Photovoltaic (PV)

Solar Hot Water

Concentrated Solar Power

Some Basic Terminology



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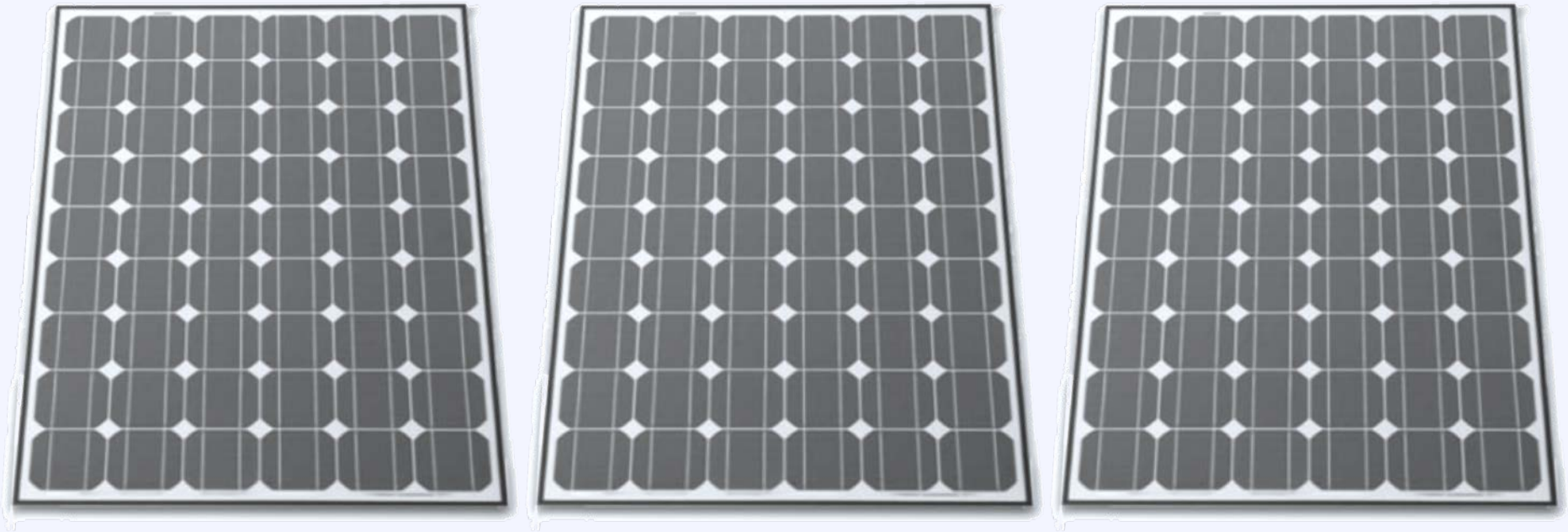
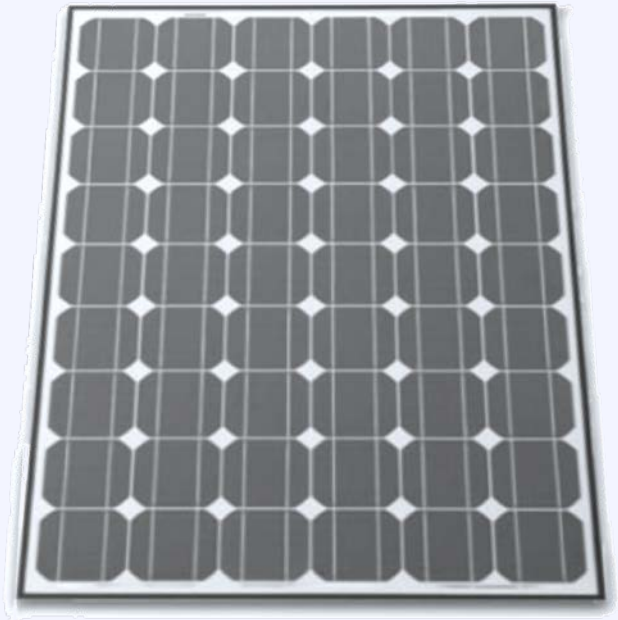


Array

Some Basic Terminology



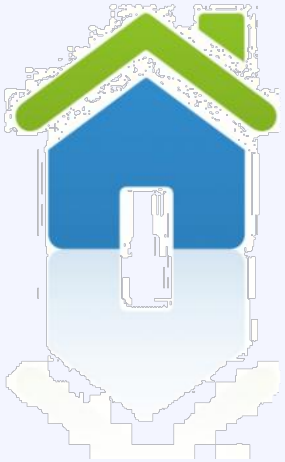
Capacity / Power

kilowatt (kW)

Production

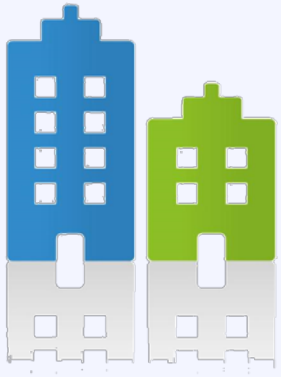
Kilowatt-hour (kWh)

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

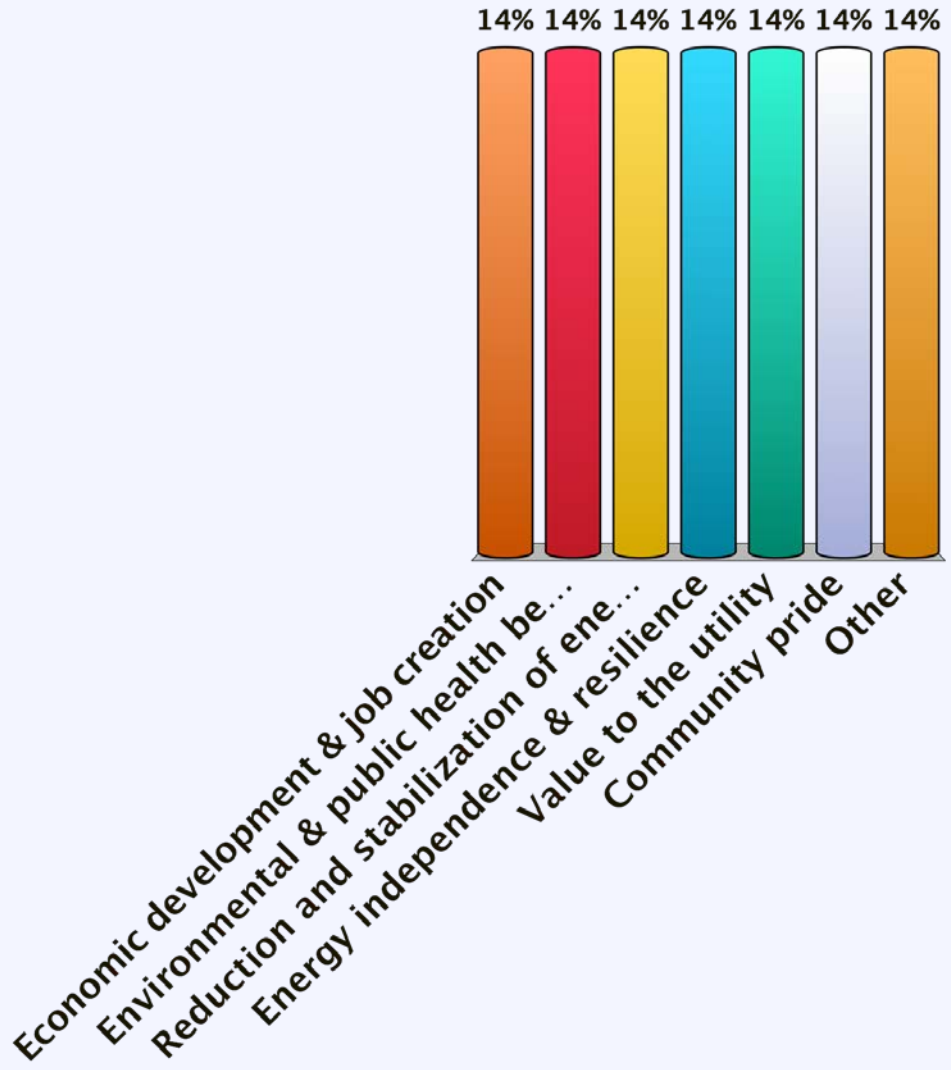
C. Reduction and stabilization of energy costs

D. Energy independence & resilience

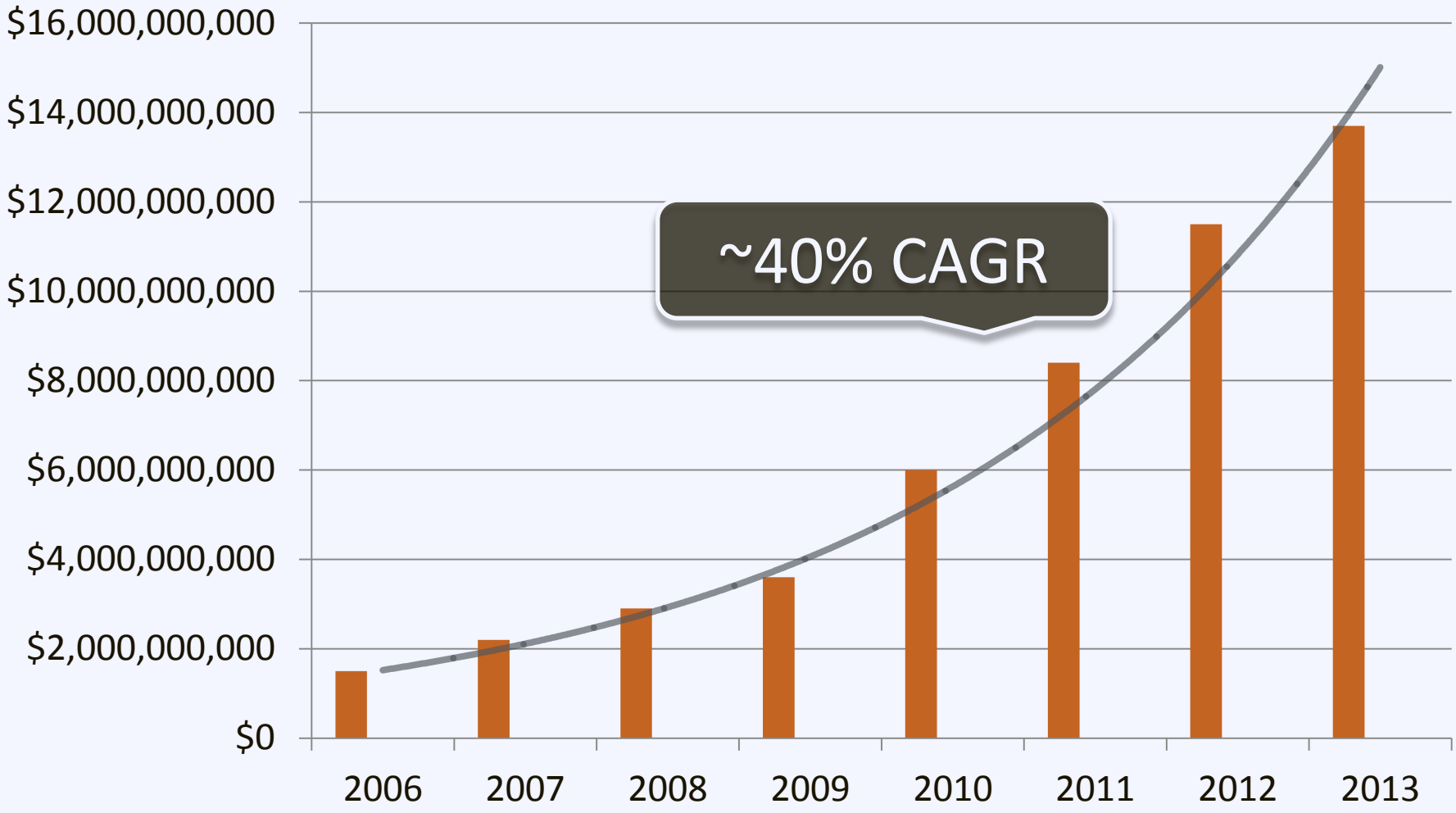
E. Value to the utility

F. Community pride

G. Other

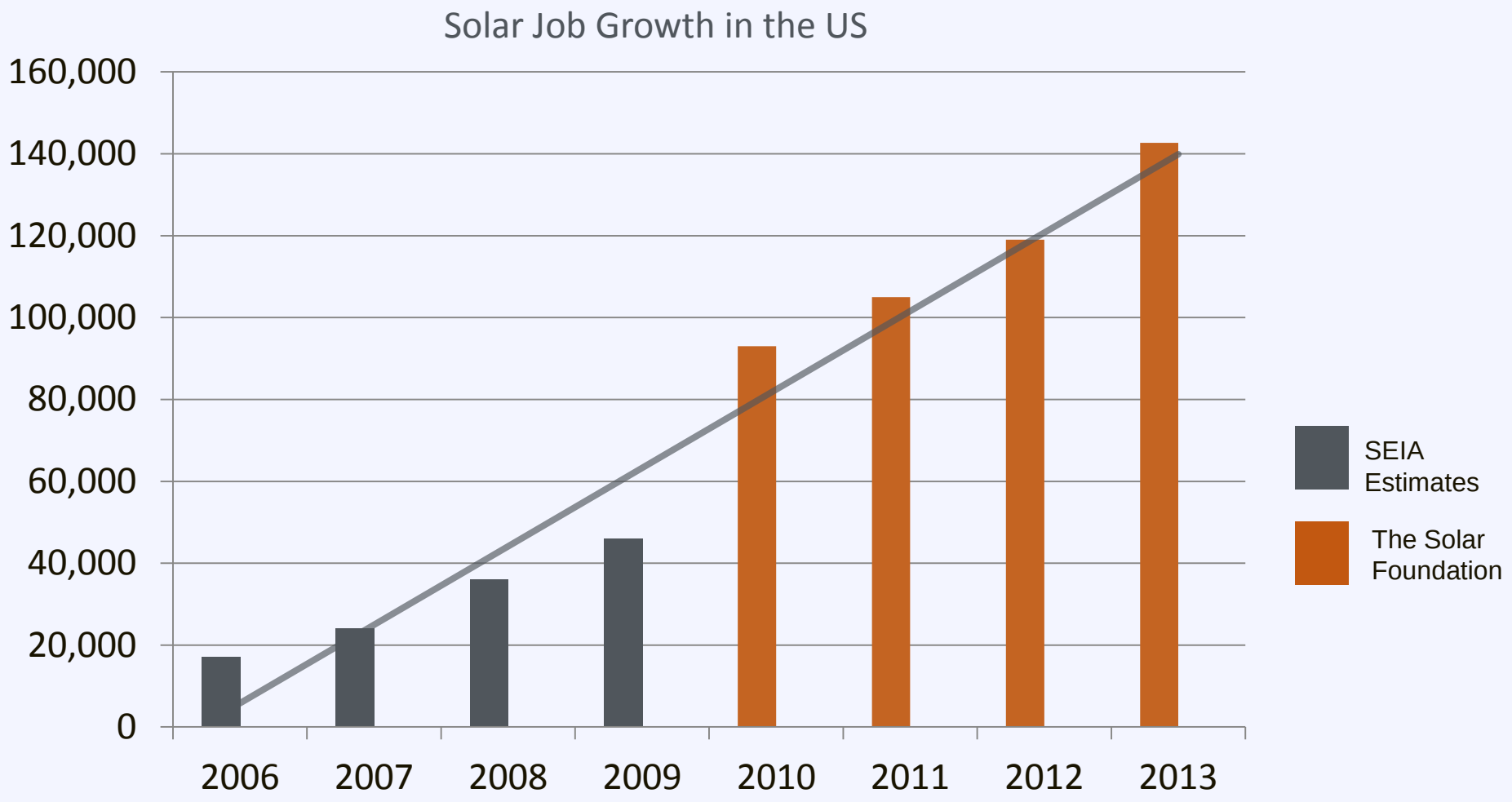


Solar Economic Growth



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 (2010), The Solar Foundation's National Solar Jobs Census 2012 (2011-2012).

Economic Development in Iowa

In 2013 the industry invested

$18 million

in solar development in Iowa

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Source: Solar Foundation

Economic Development in Iowa

There are currently

34 solar companies

that employ

680 people

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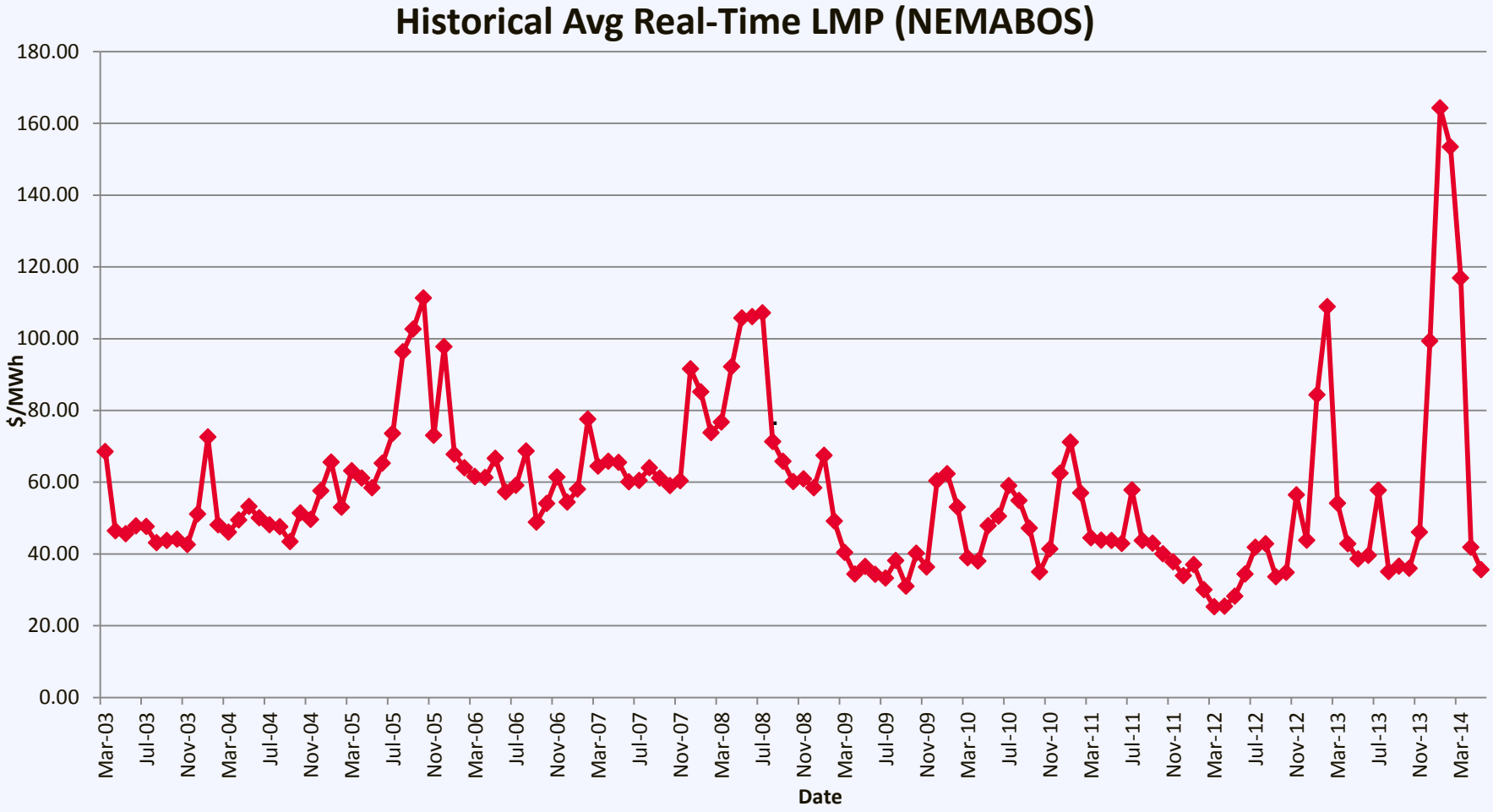
Source: Solar Foundation

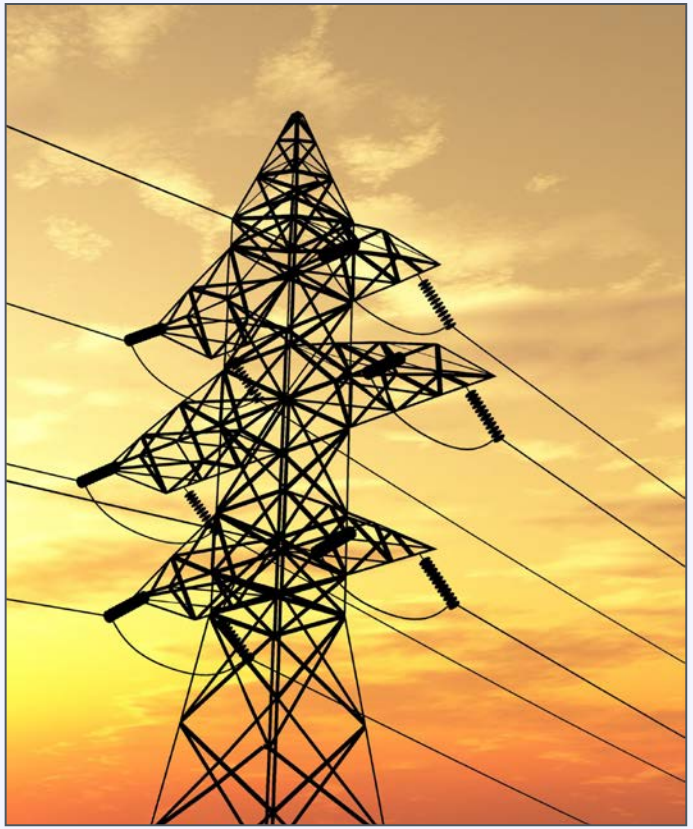
Benefit: Stabilize Energy Prices



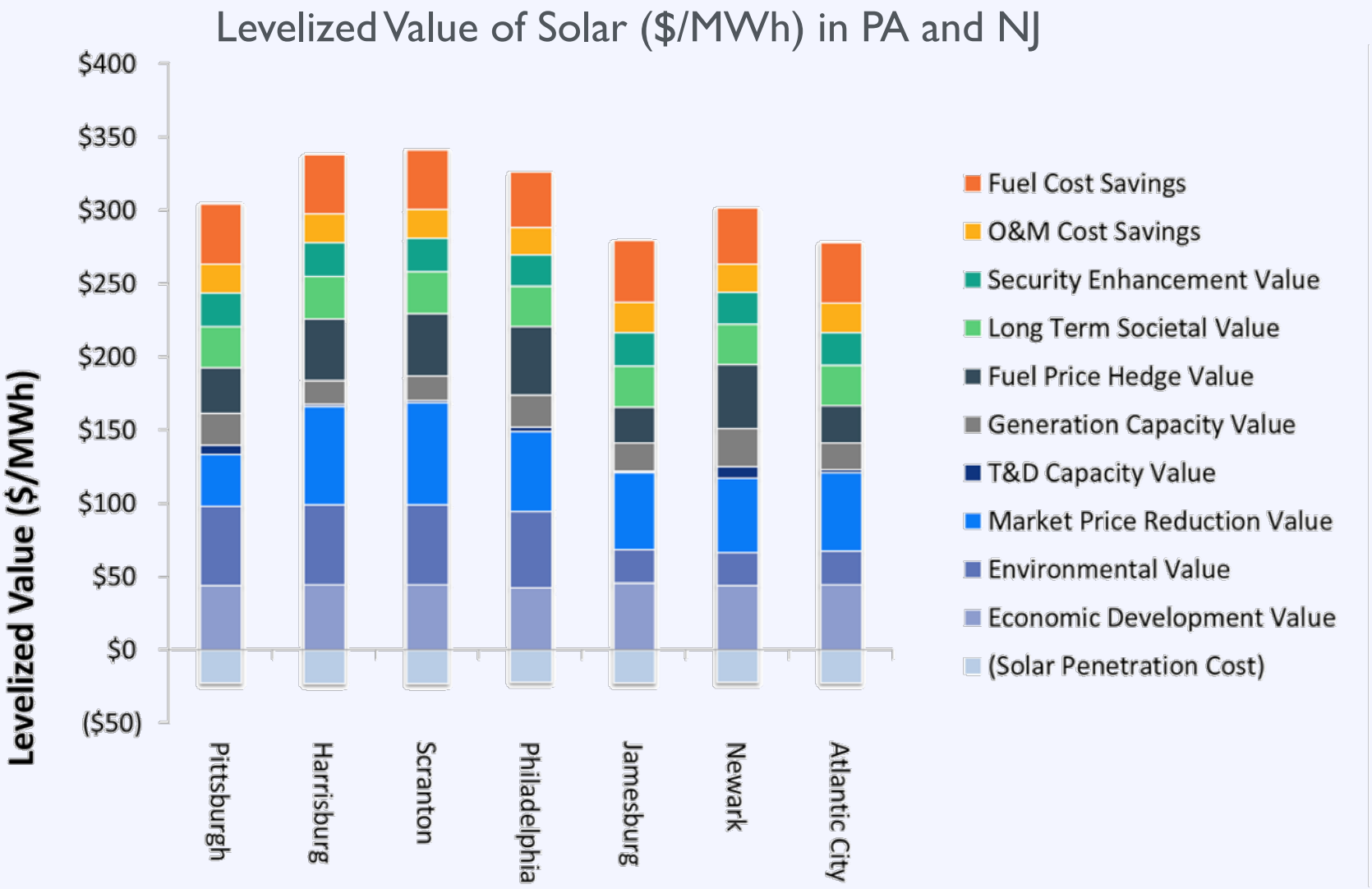
Source: NEPOOL

Benefits: Valuable to Electric Grid

- Avoided Energy Purchases
- Avoided T&D Line Losses
- Avoided Capacity Purchases
- Avoided T&D Investments
- Fossil Fuel Price Impacts
- Backup Power



Value to Community & Utility



Source: Clean Power Research http://mseia.net/site/wp-content/uploads/2012/05/MSEIA-Final-Benefits-of-Solar-Report-2012-11-01.pdf

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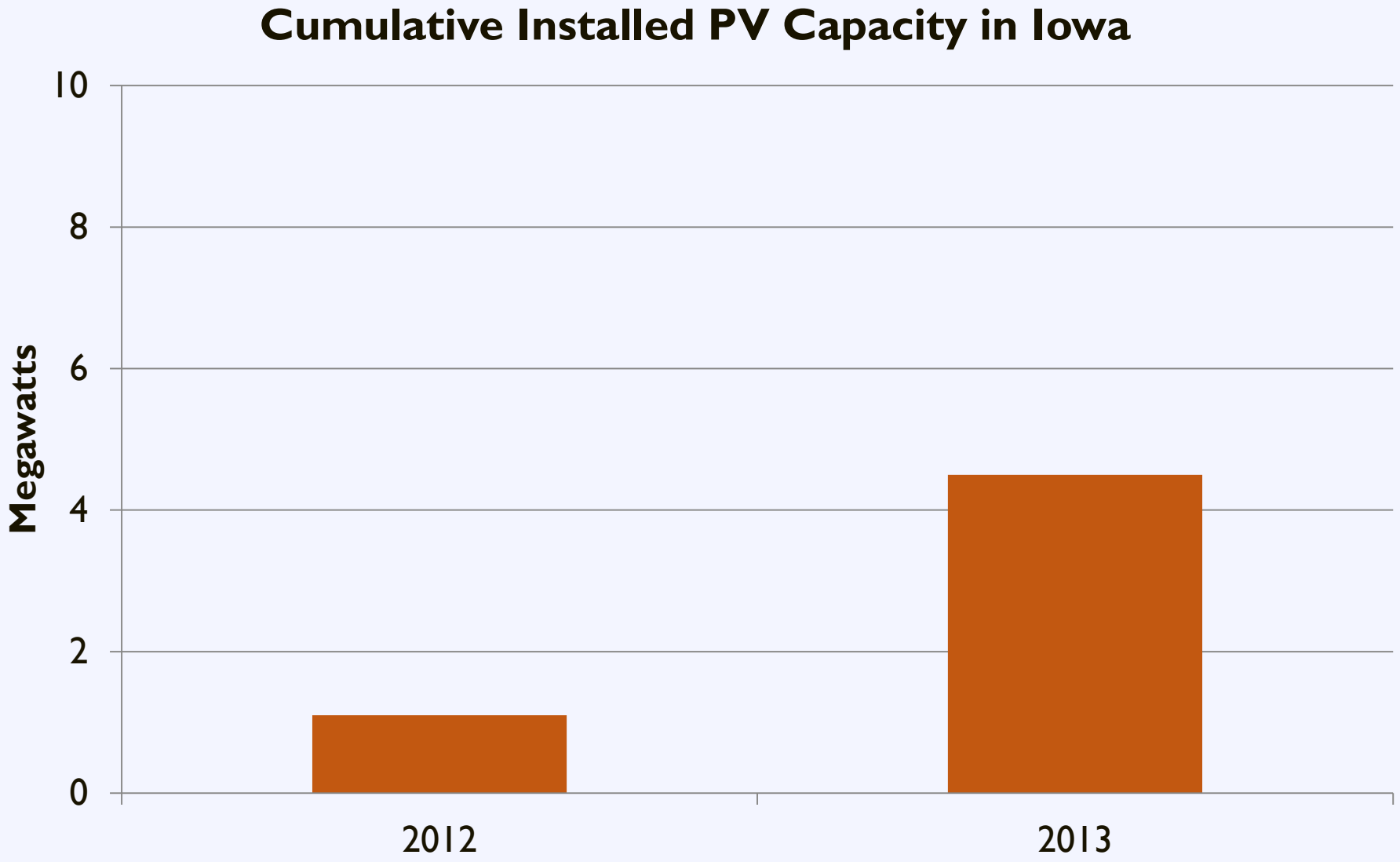
Iowa Solar Market



Source: IREC: US Solar Market Trends

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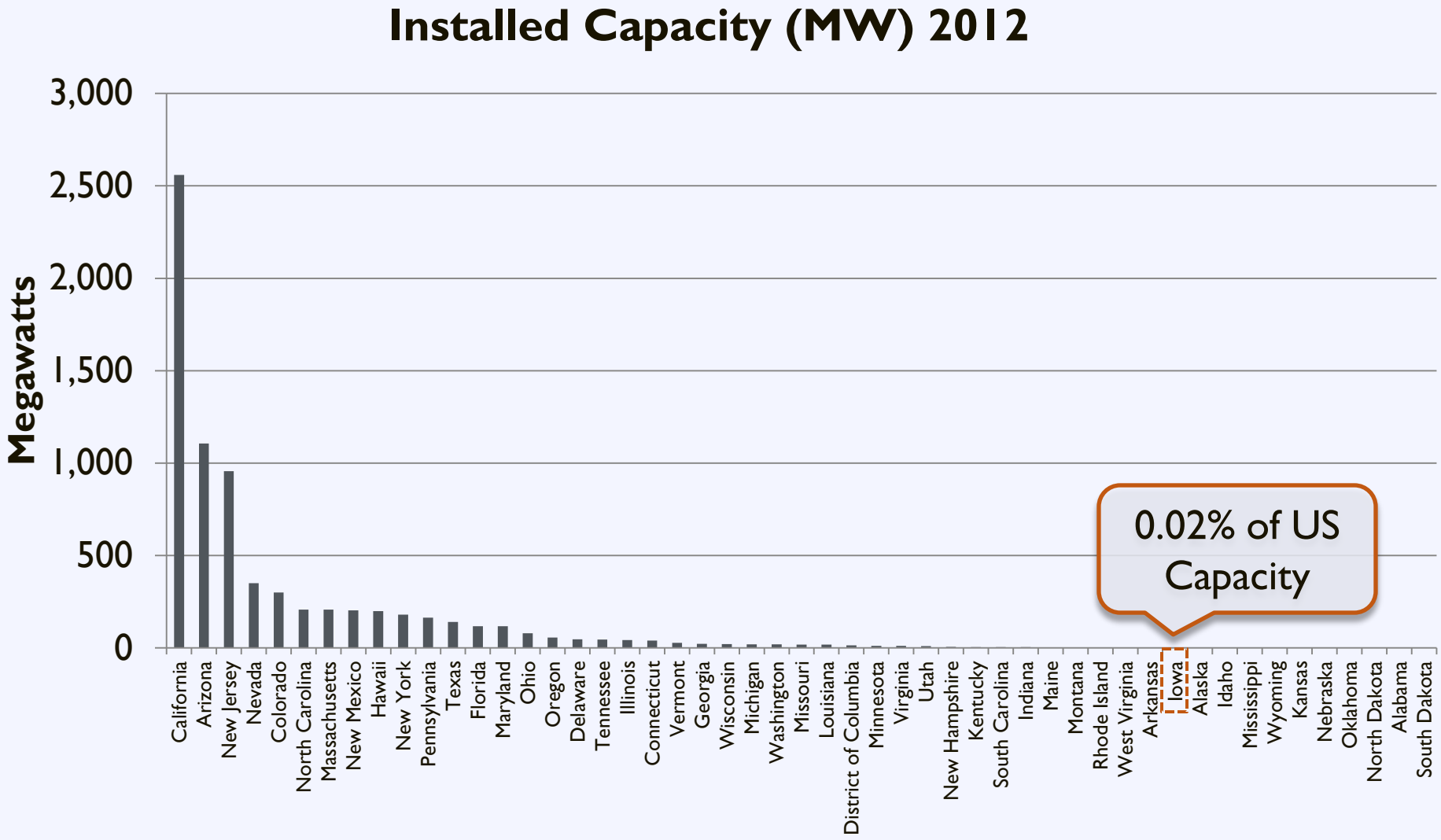
US Solar Market



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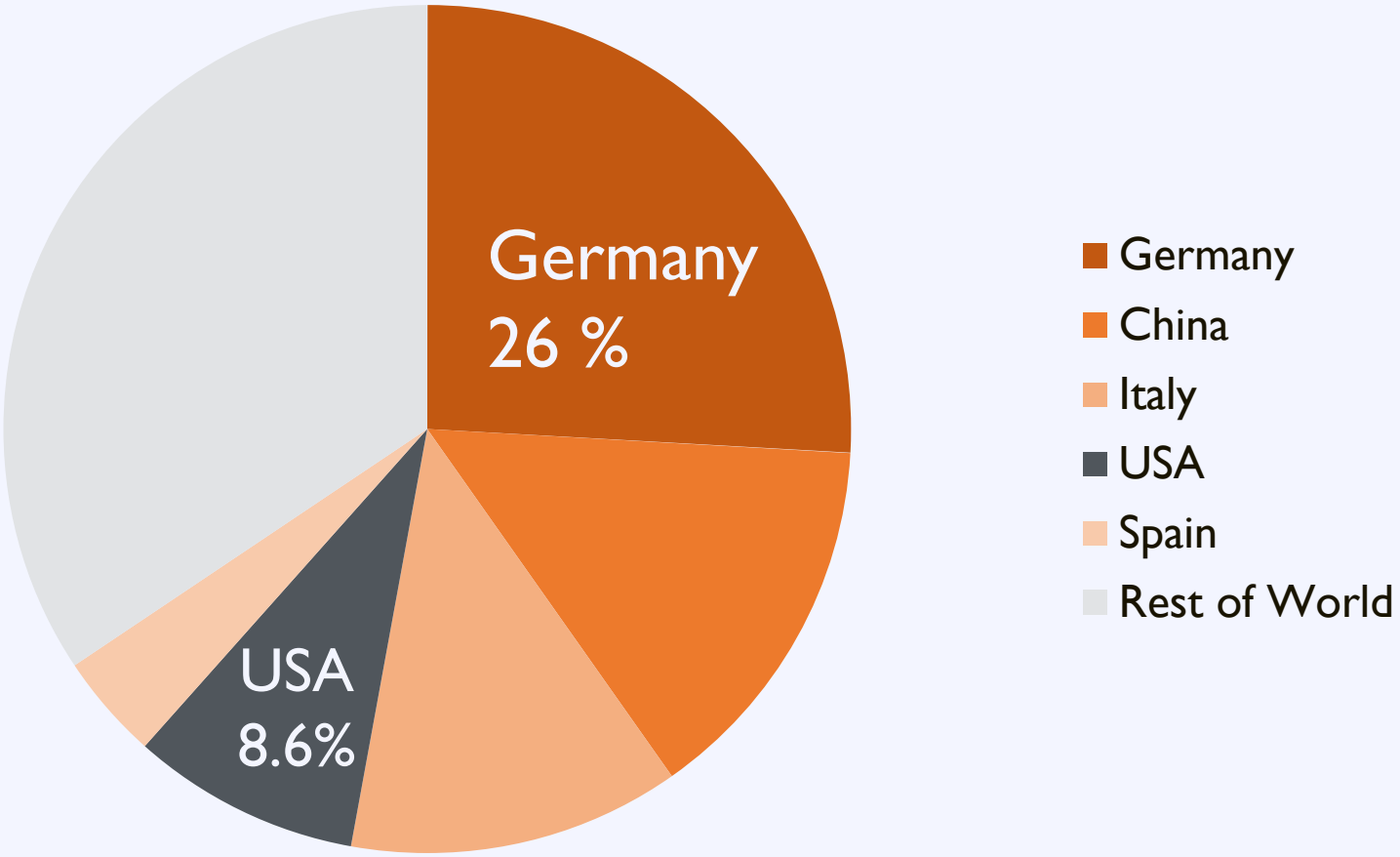
Iowa Solar Market

Iowa	US
0.4	**39**
watts per person	*watts per person*

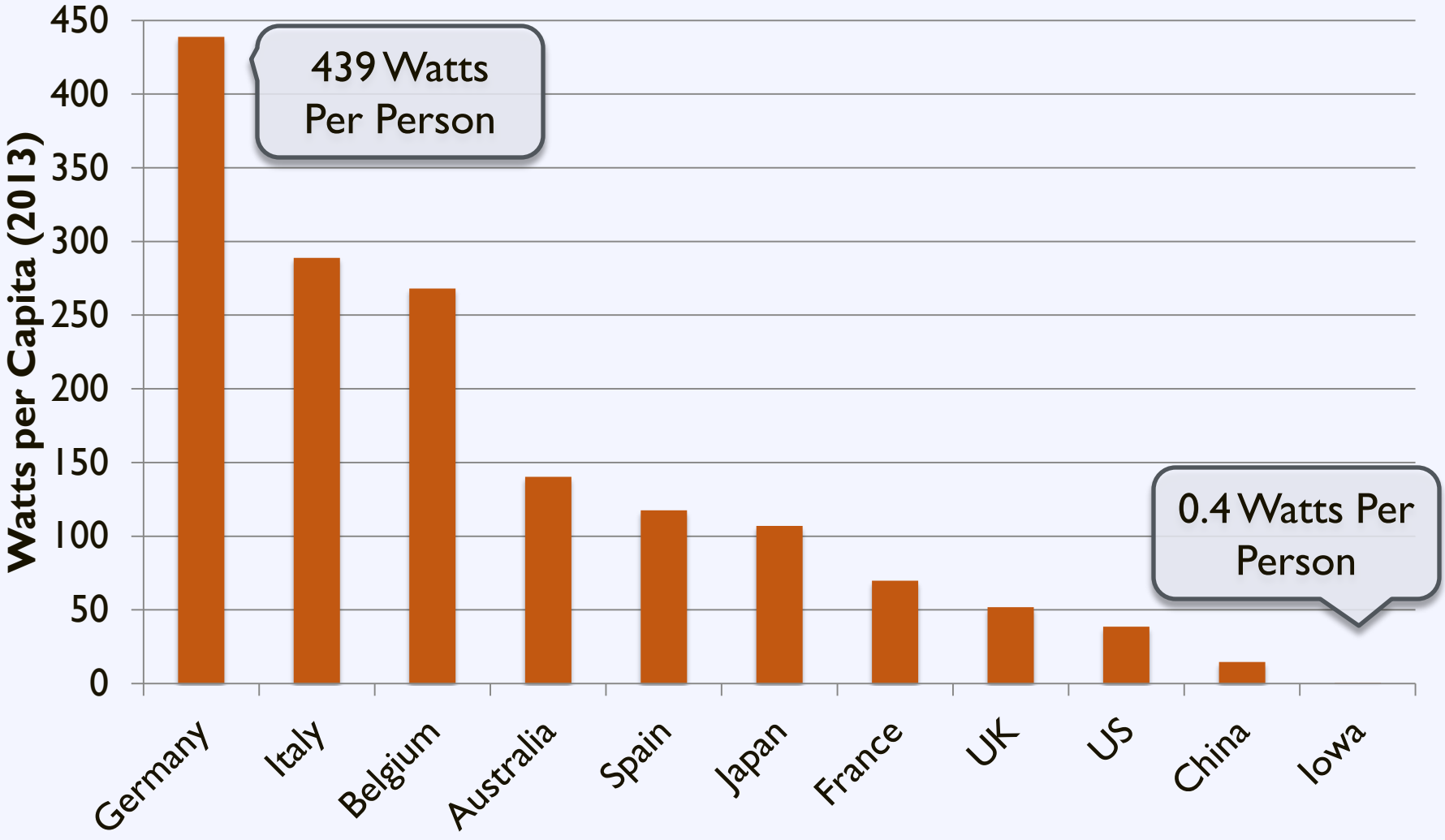
World Solar Market

Top 5 Countries Solar Operating Capacity (2013)



Source: REN 21

Installed Capacity per Capita



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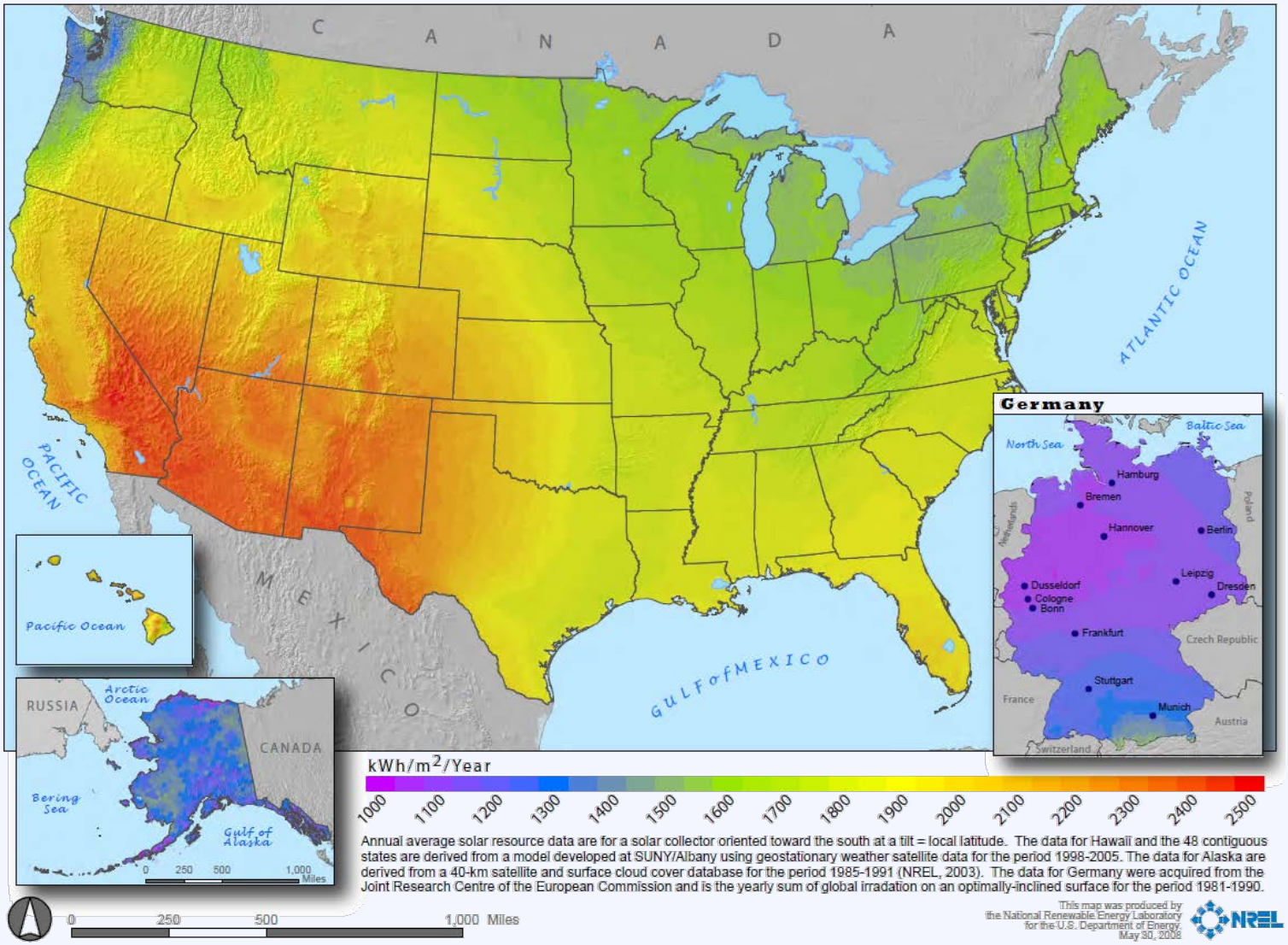
Source: REN 21, World Bank

US Solar Resource



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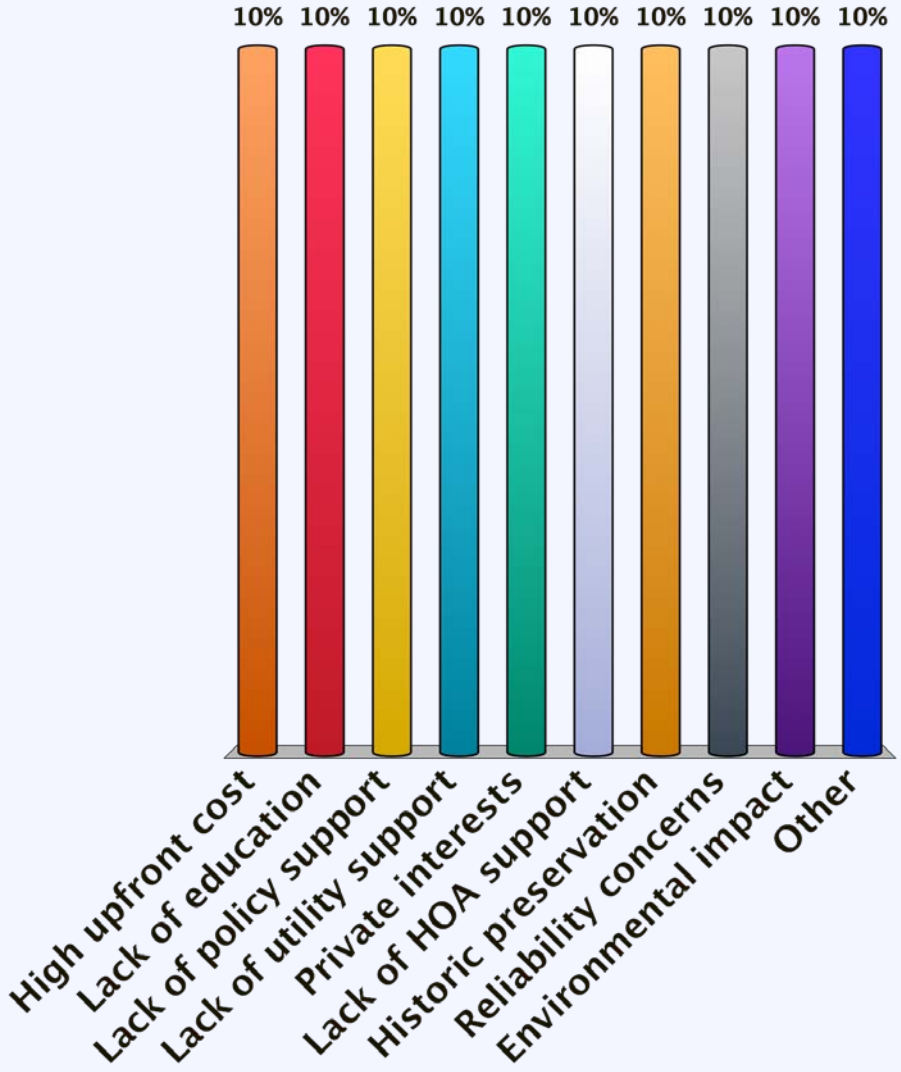
Source: National Renewable Energy Laboratory

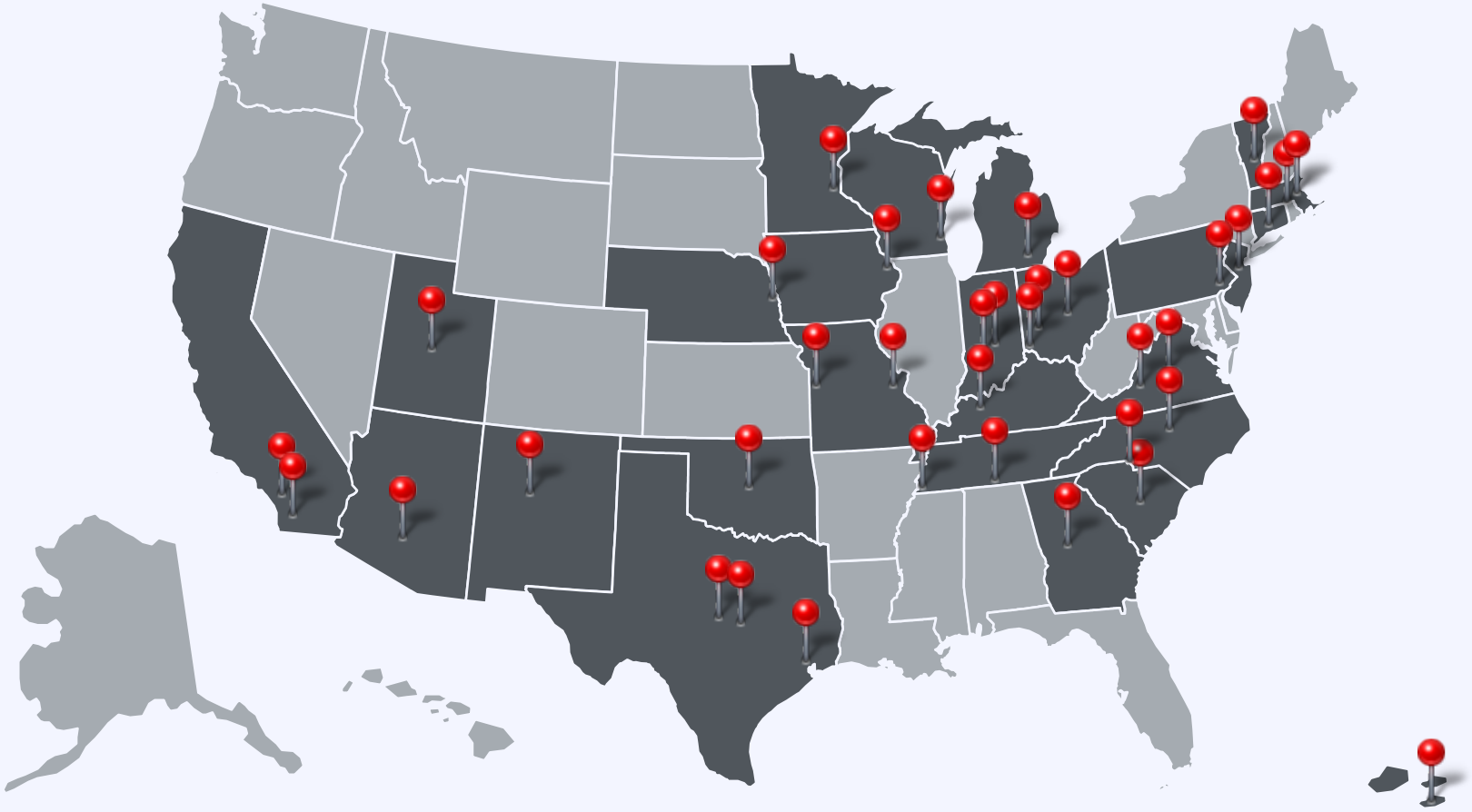
What are the top 3 barriers to solar adoption in your community?

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

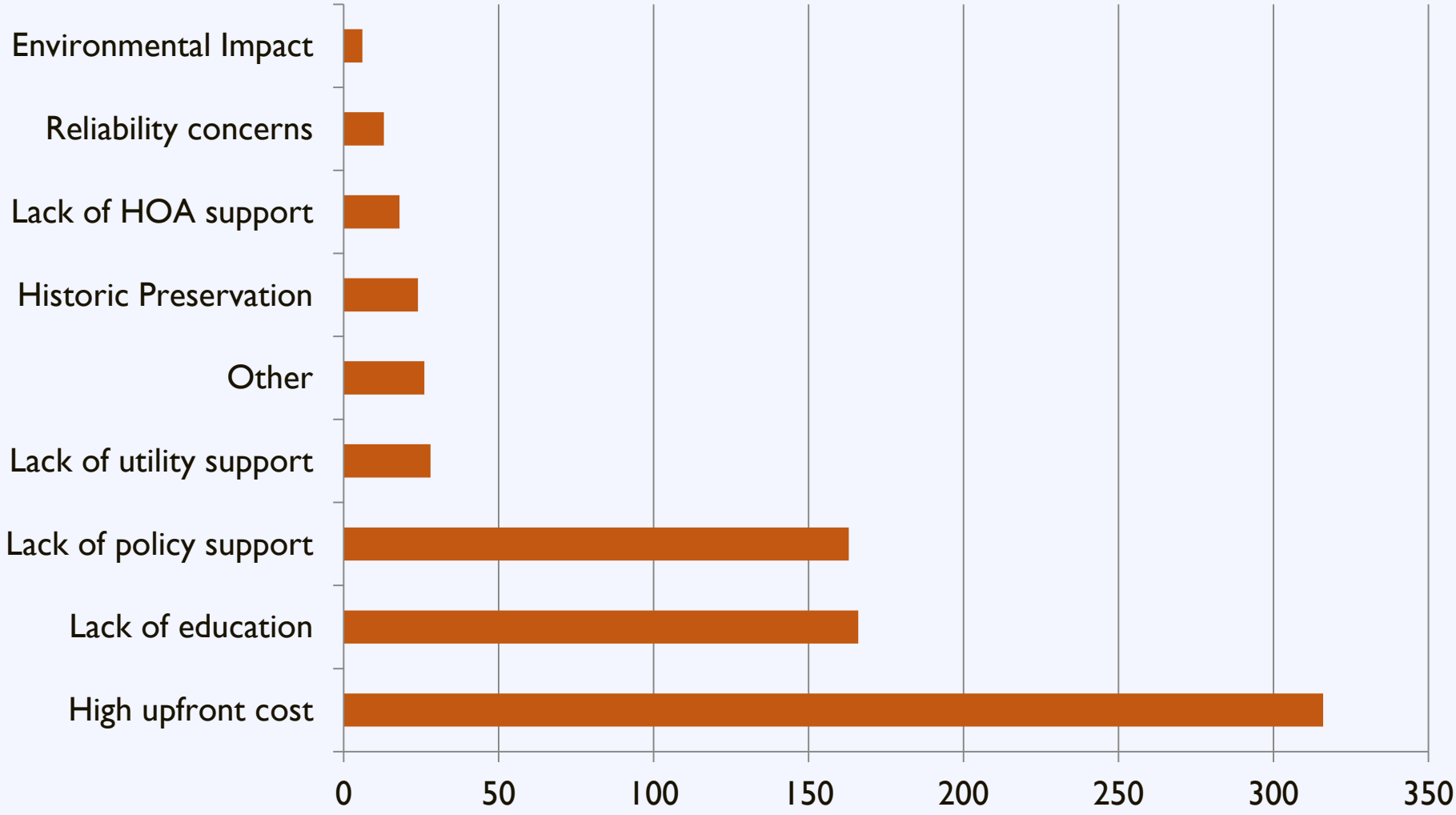


Regional Workshop Surveys

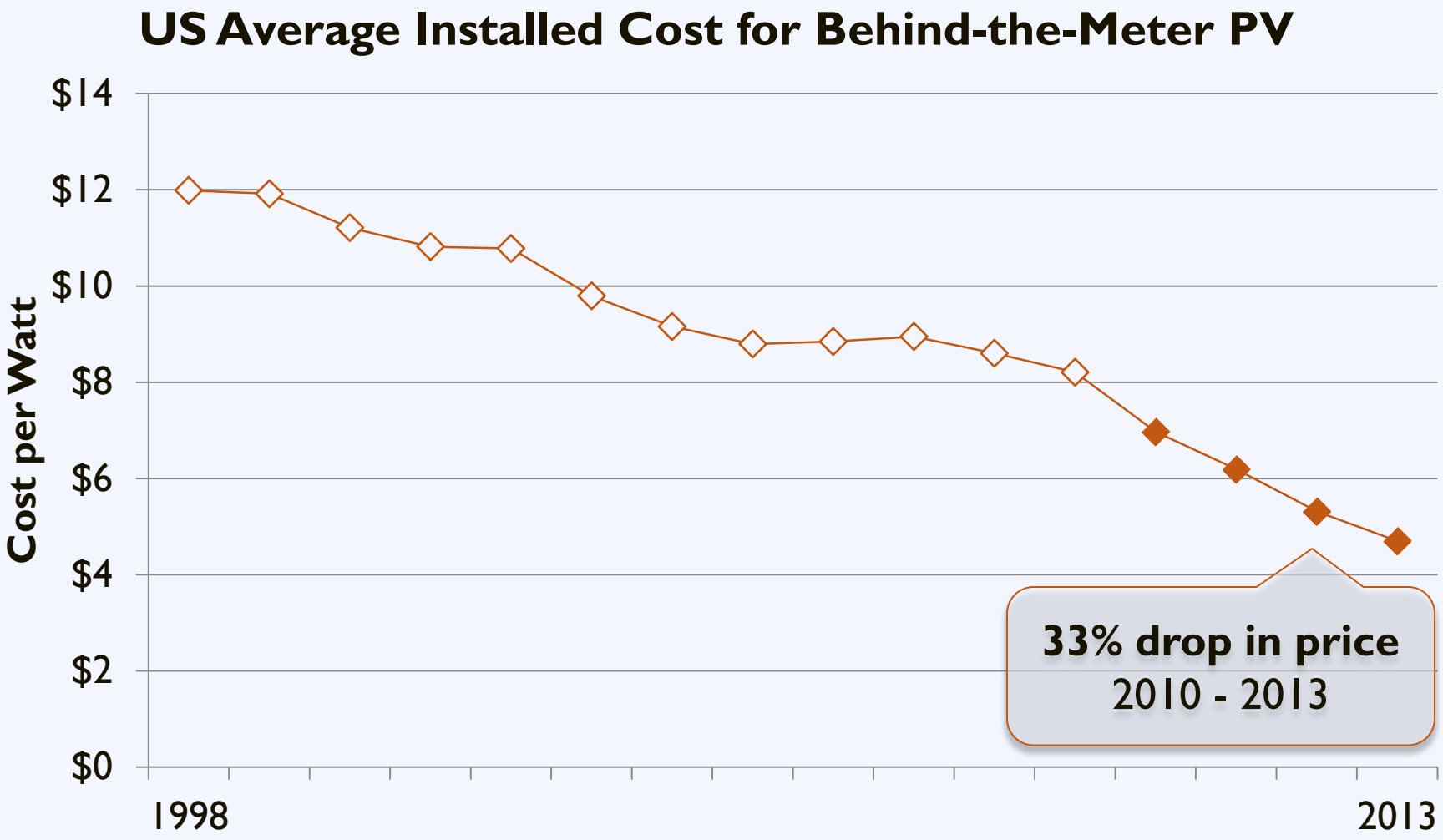
Q: What is the greatest barrier to solar adoption in your community?



Activity: Addressing Barriers



The Cost of Solar PV



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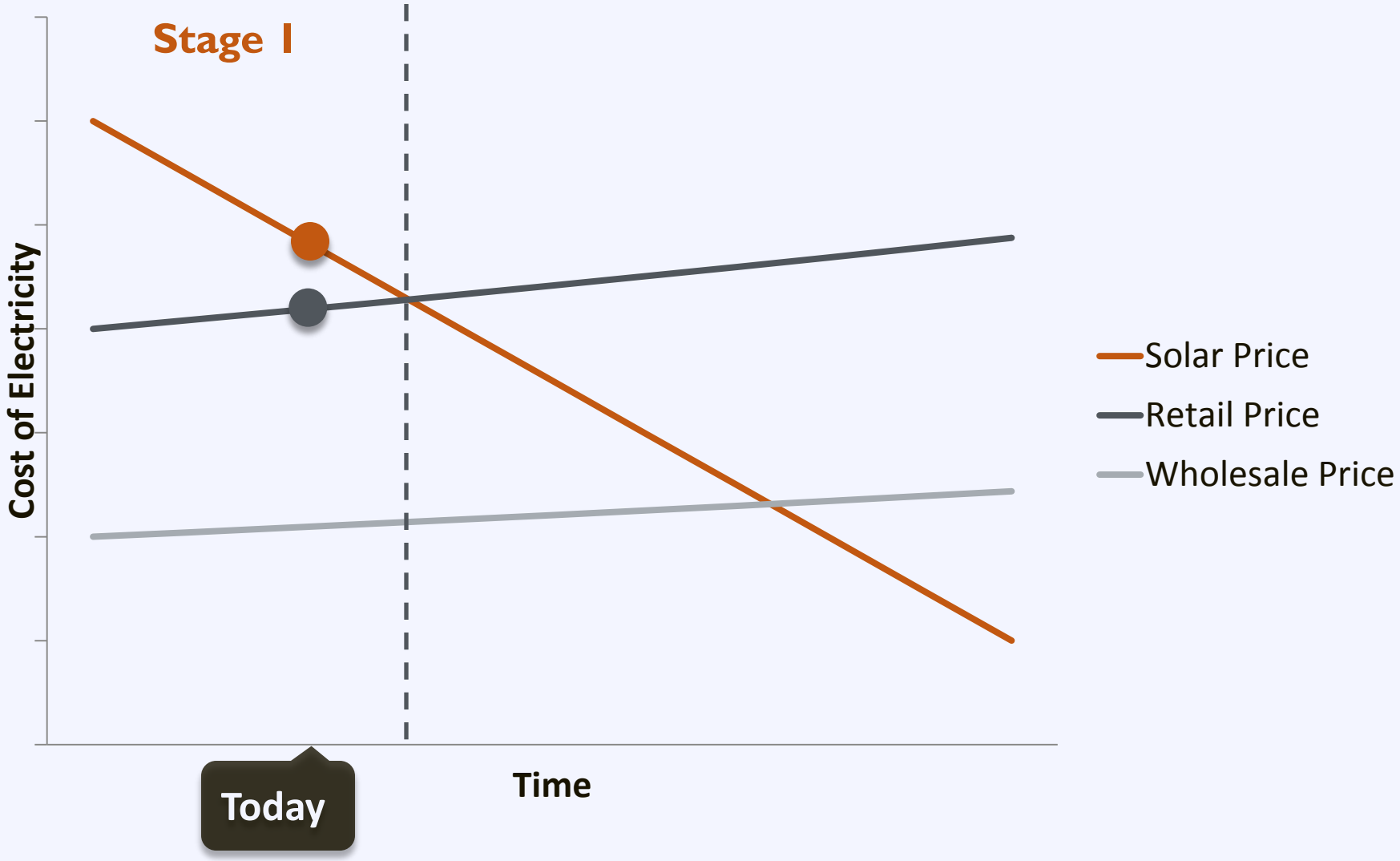
Tracking the Sun VI: The Installed Cost of Photovoltaics in the US from 1998-2012 (LBNL)

The Cost of Solar PV



Source: Solar Electric Power Association

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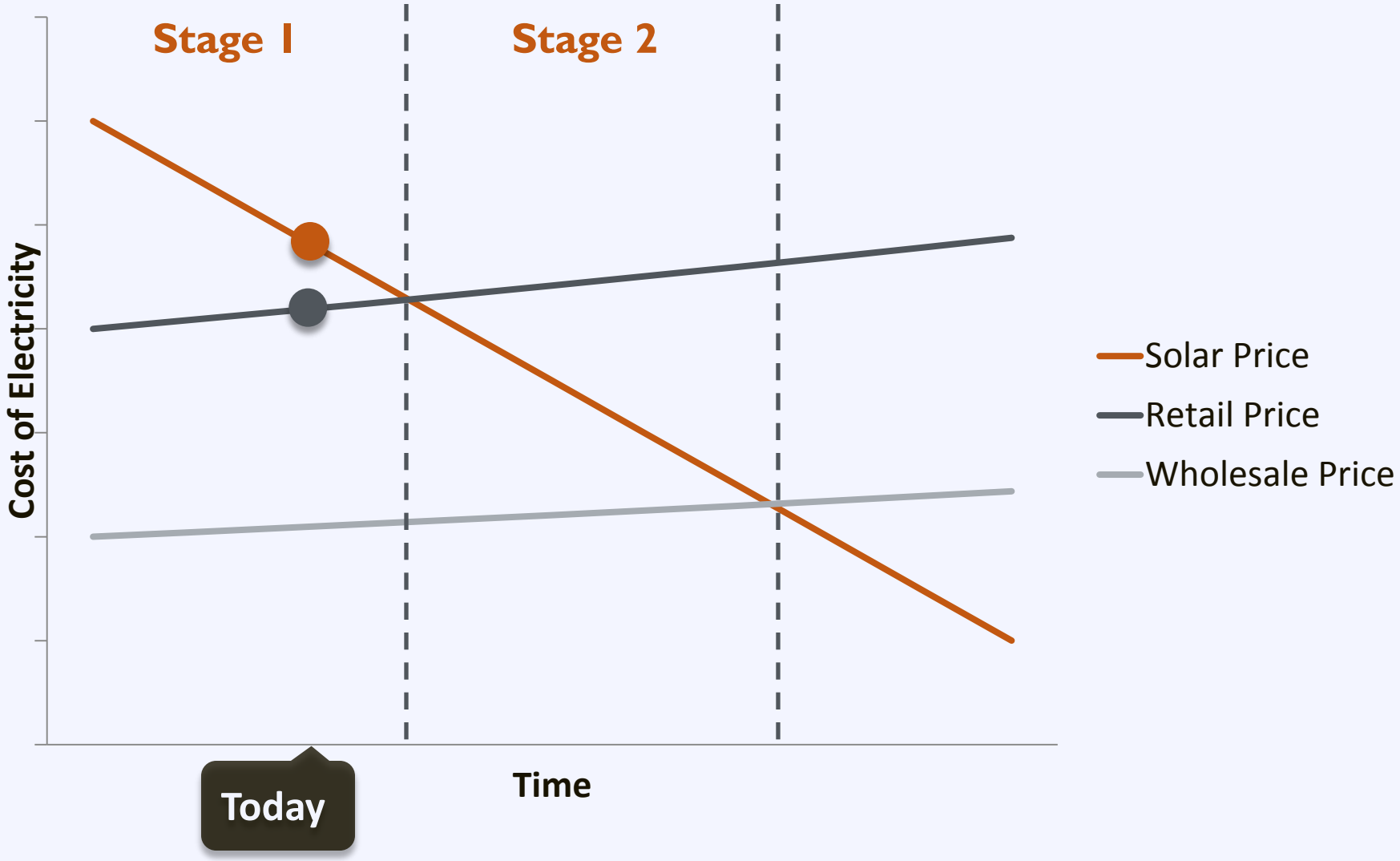

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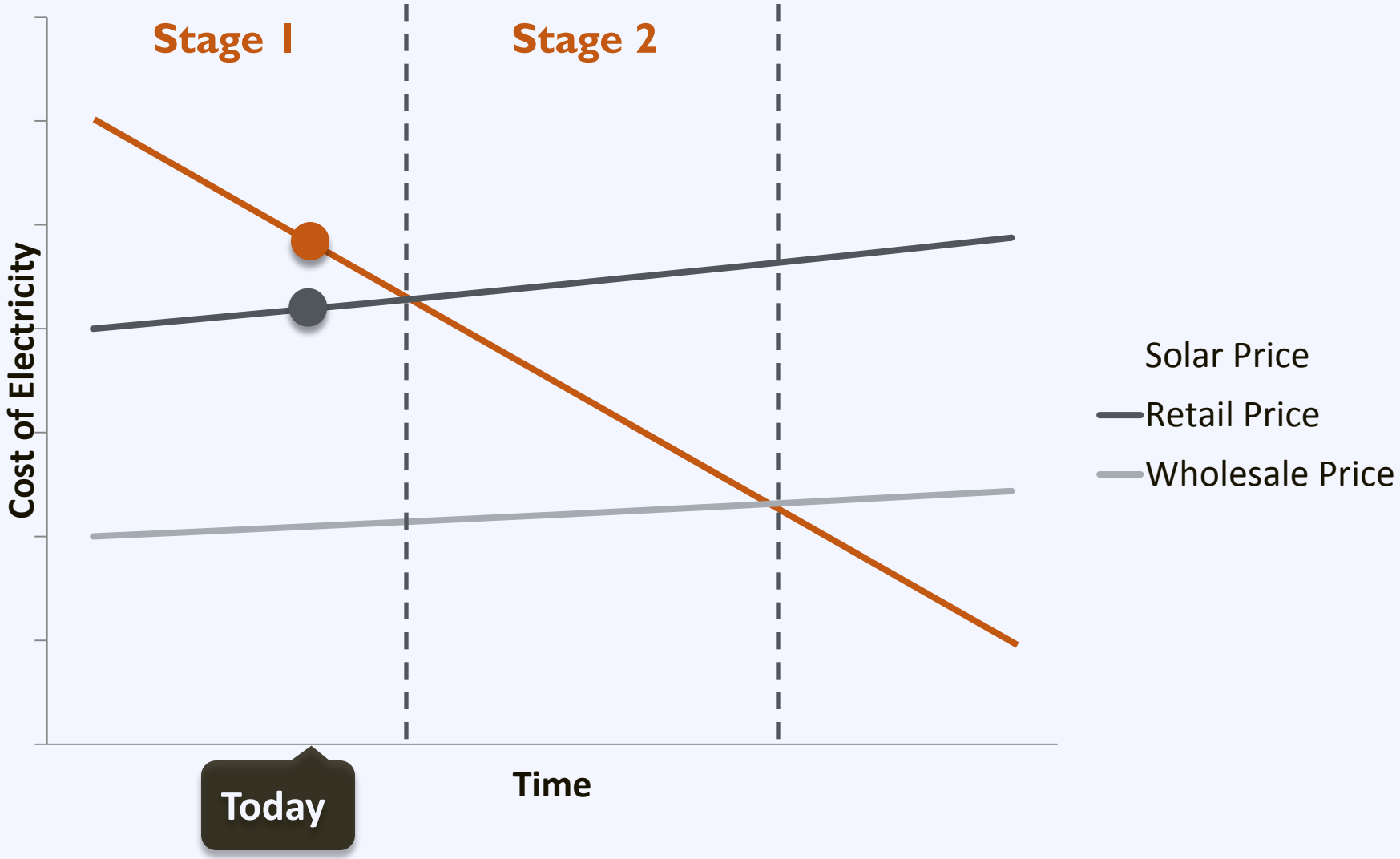
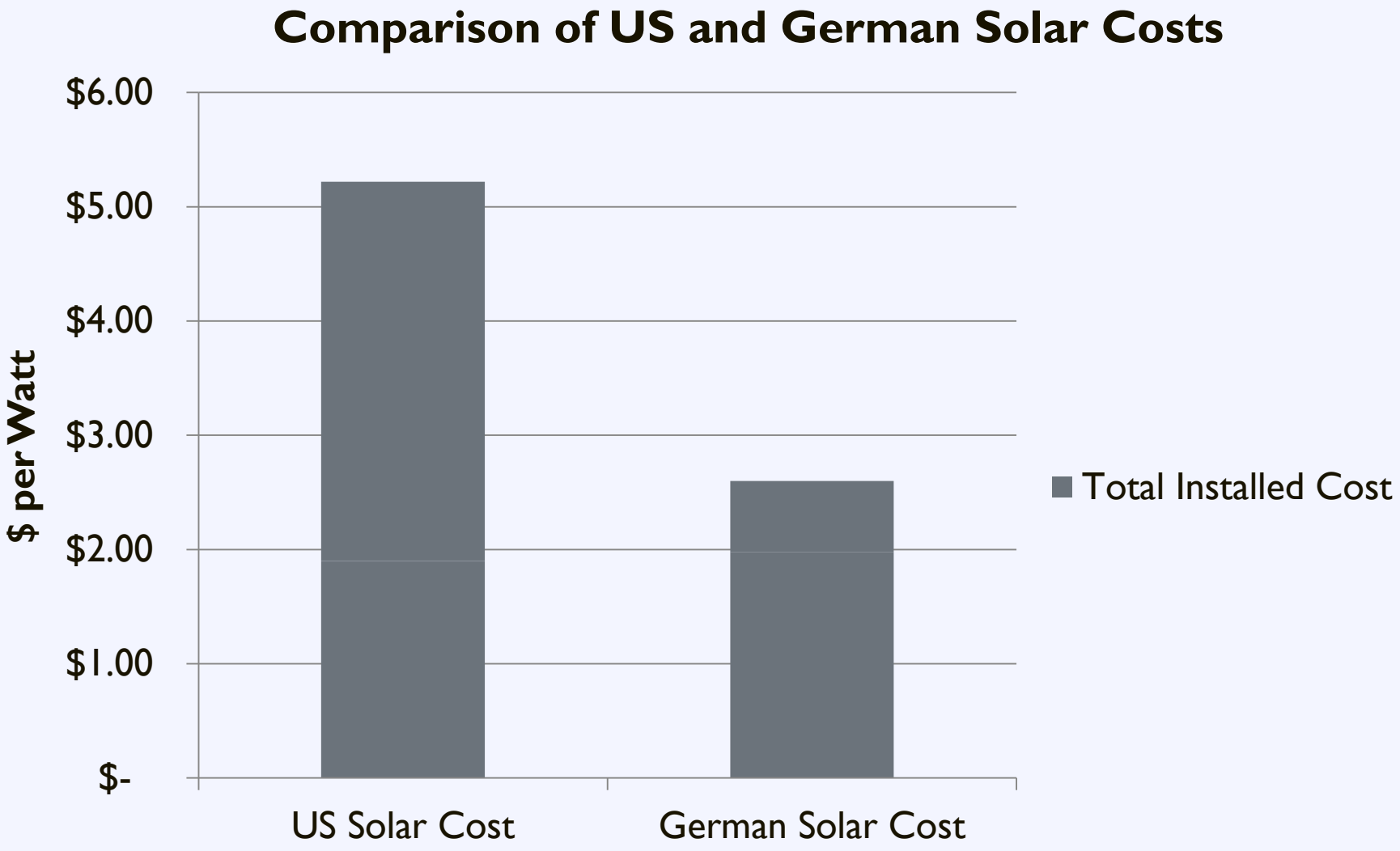


Source: Solar Electric Power Association

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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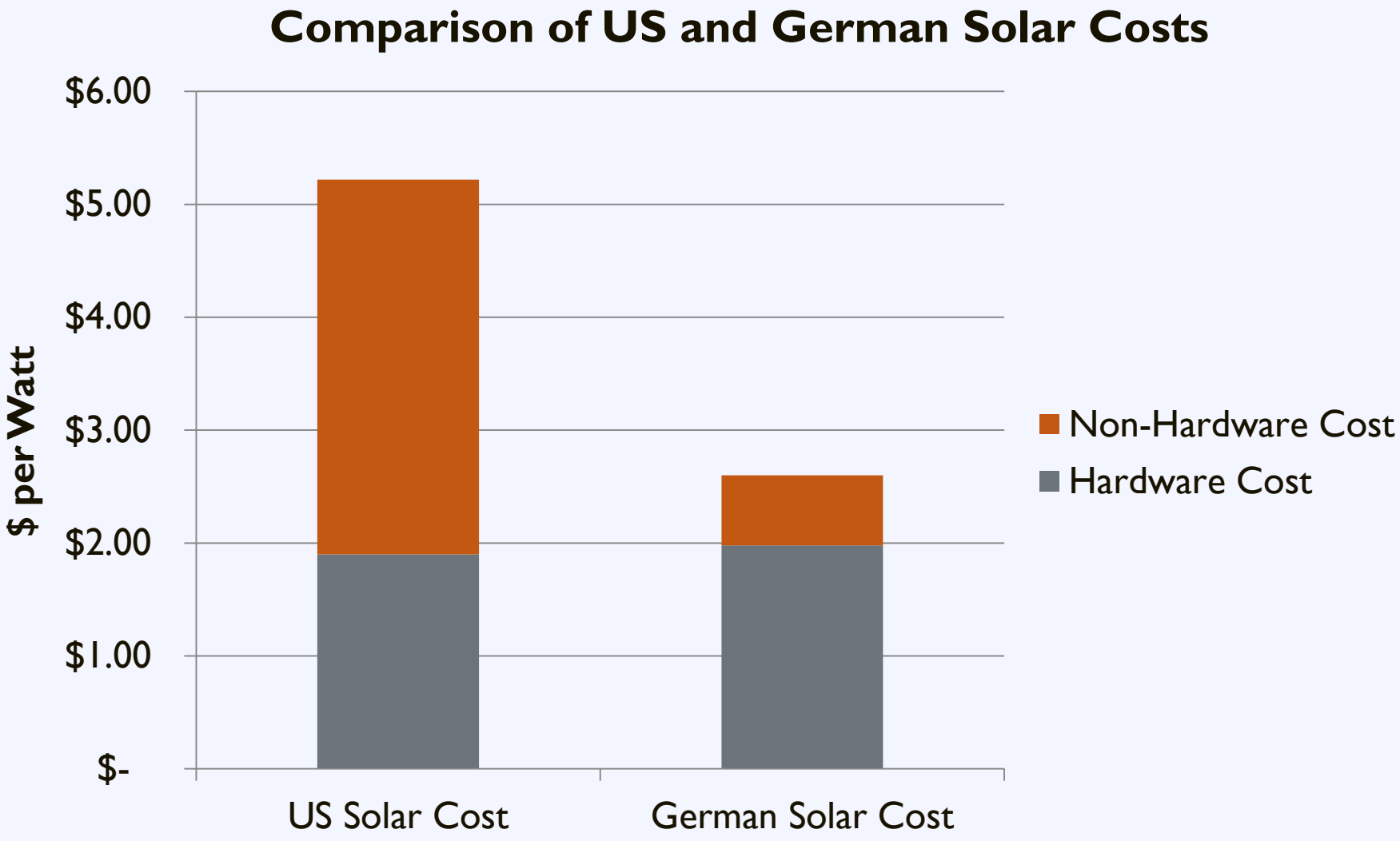
The Cost of Solar in the US



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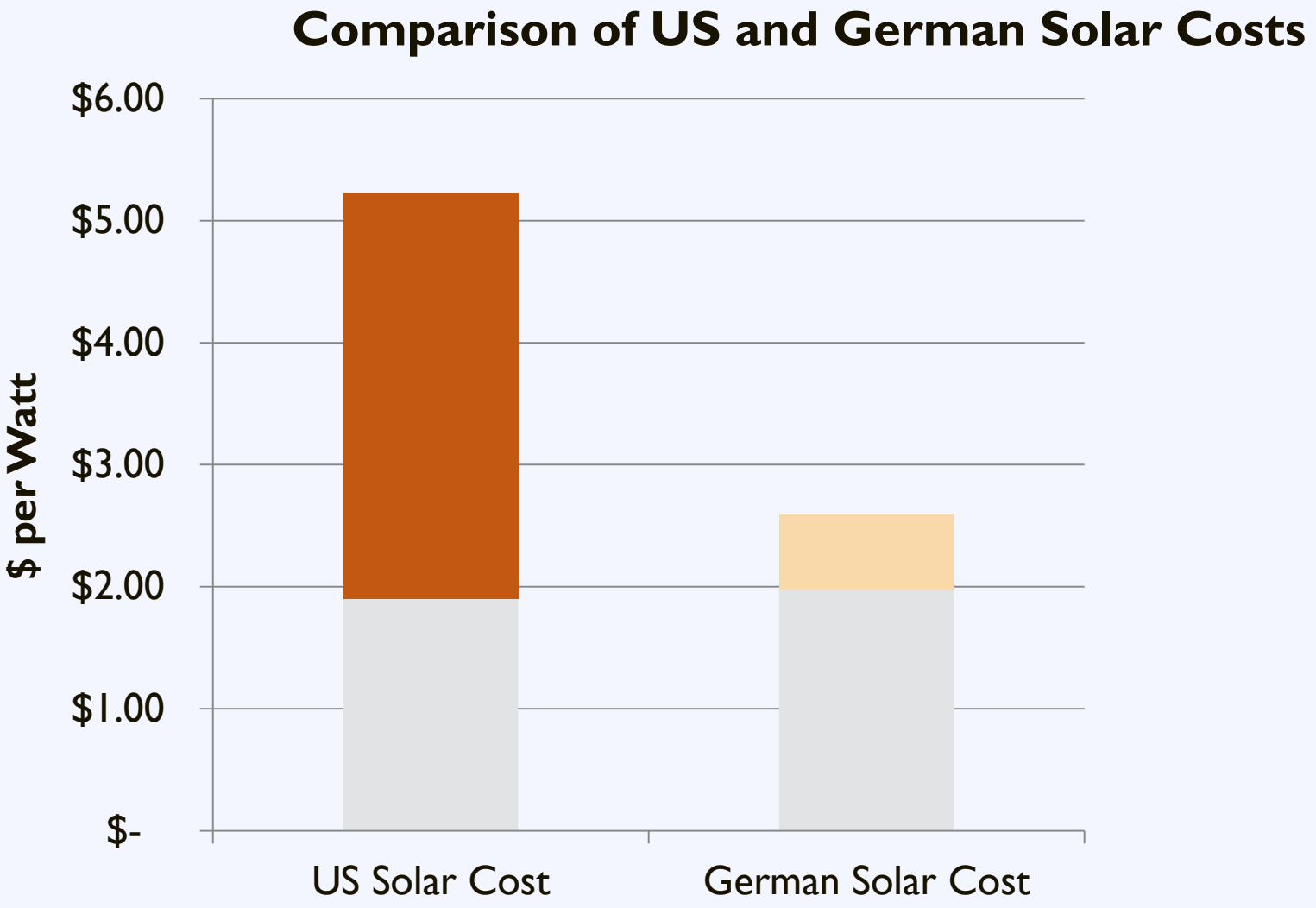
The Cost of Solar in the US



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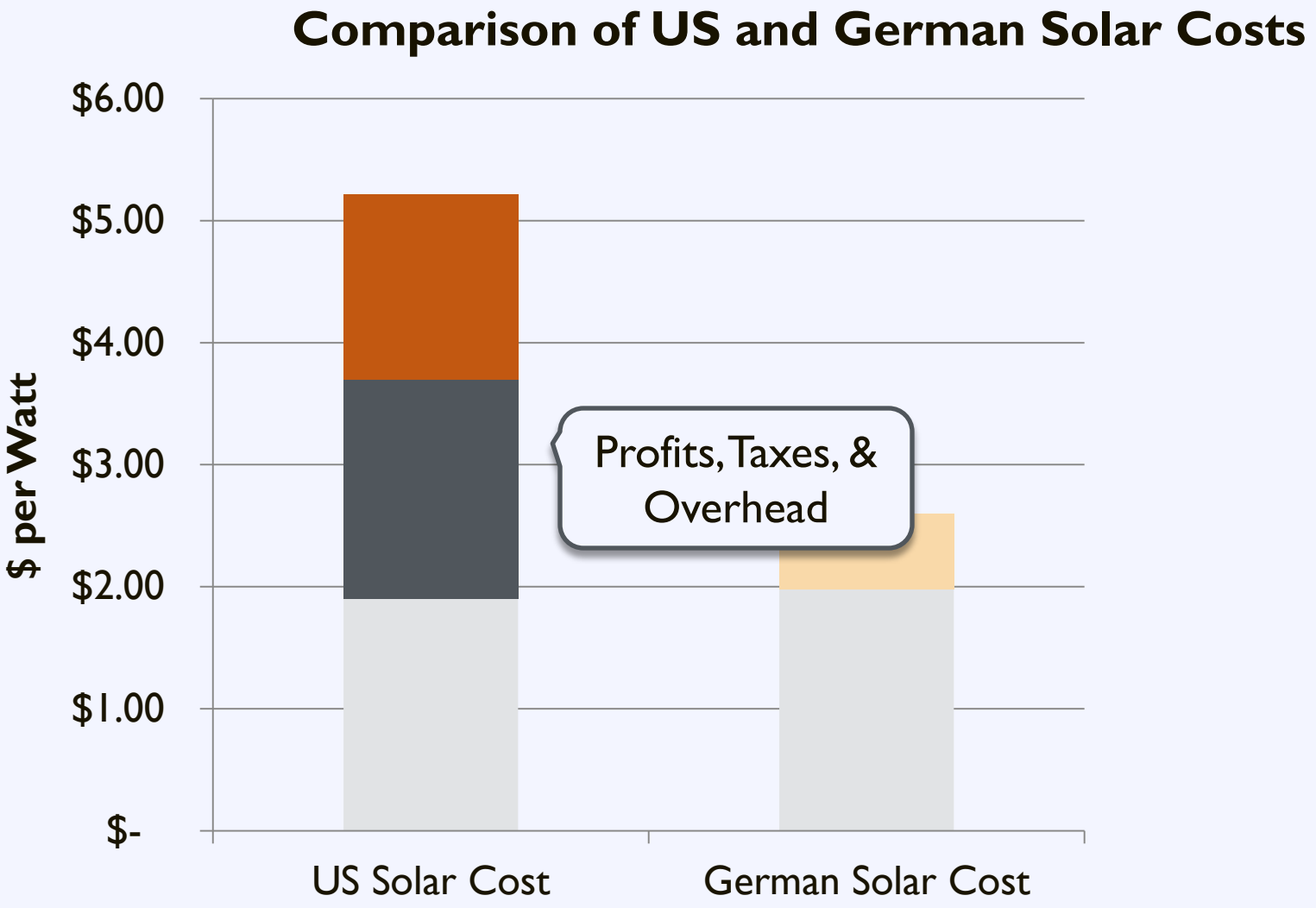

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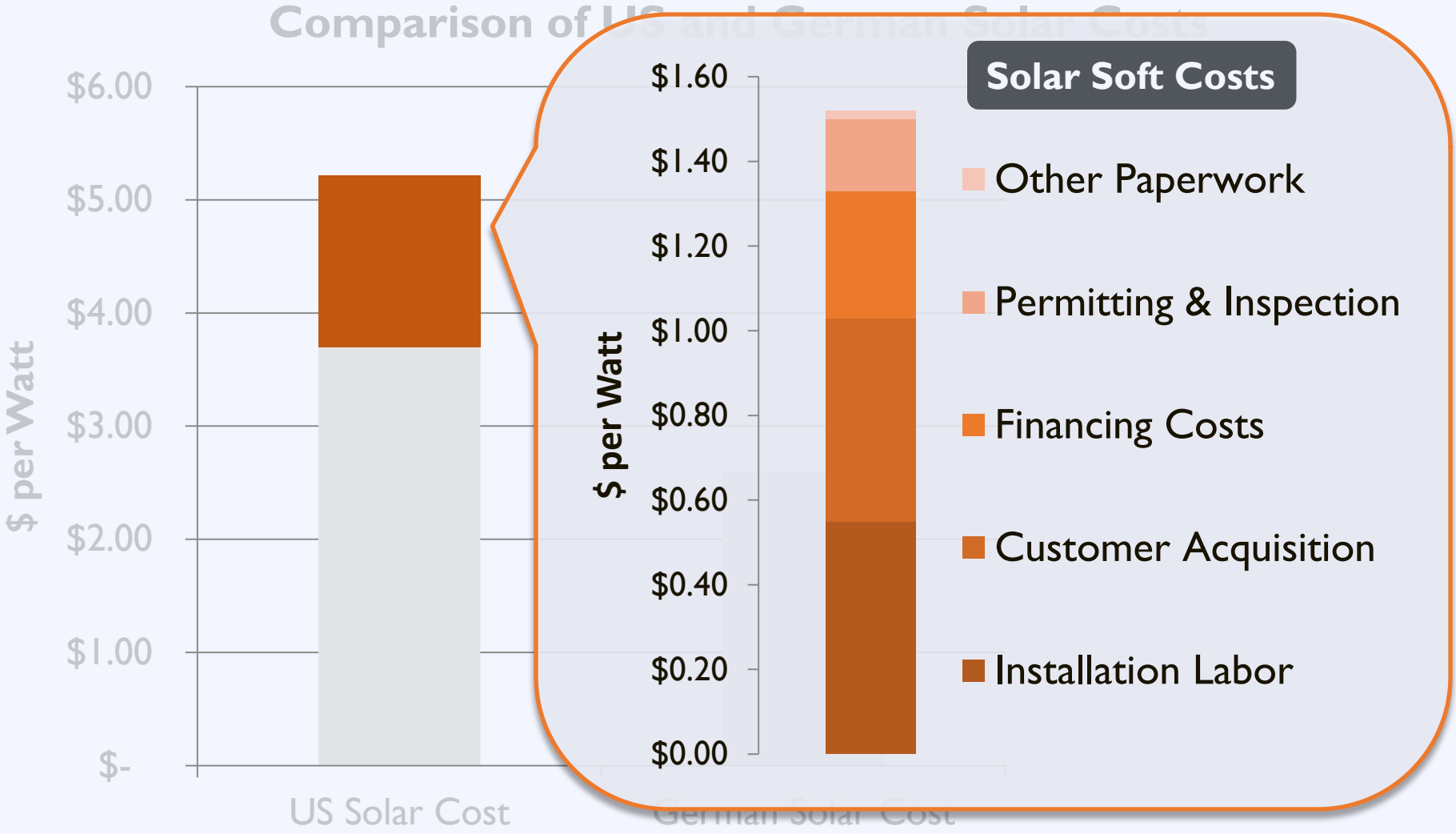

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LBNL (http://emp.lbl.gov/sites/all/files/lbnl-6350e.pdf)(http://www1.eere.energy.gov/solar/pdfs/sunshot_webinar_20130226.pdf)

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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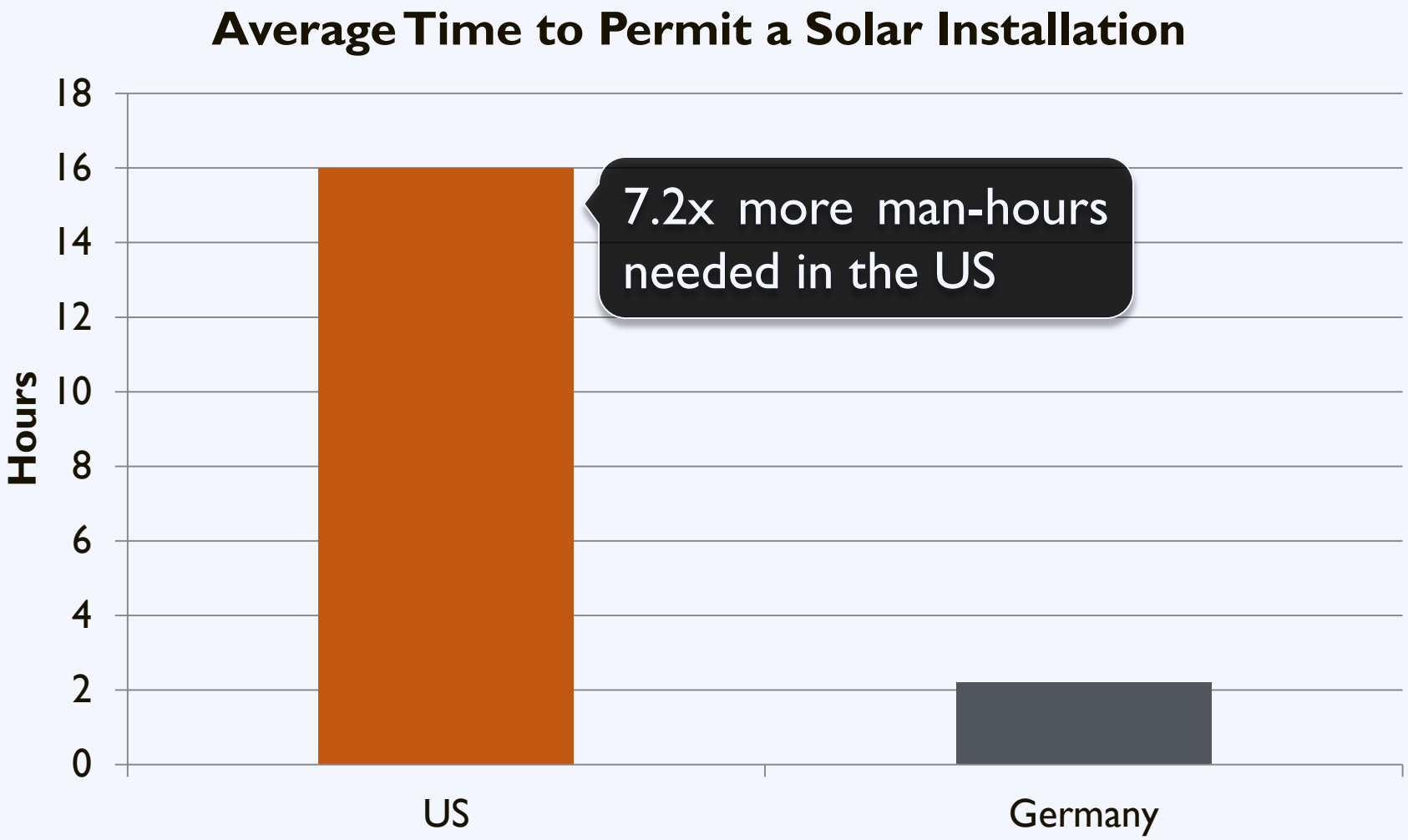
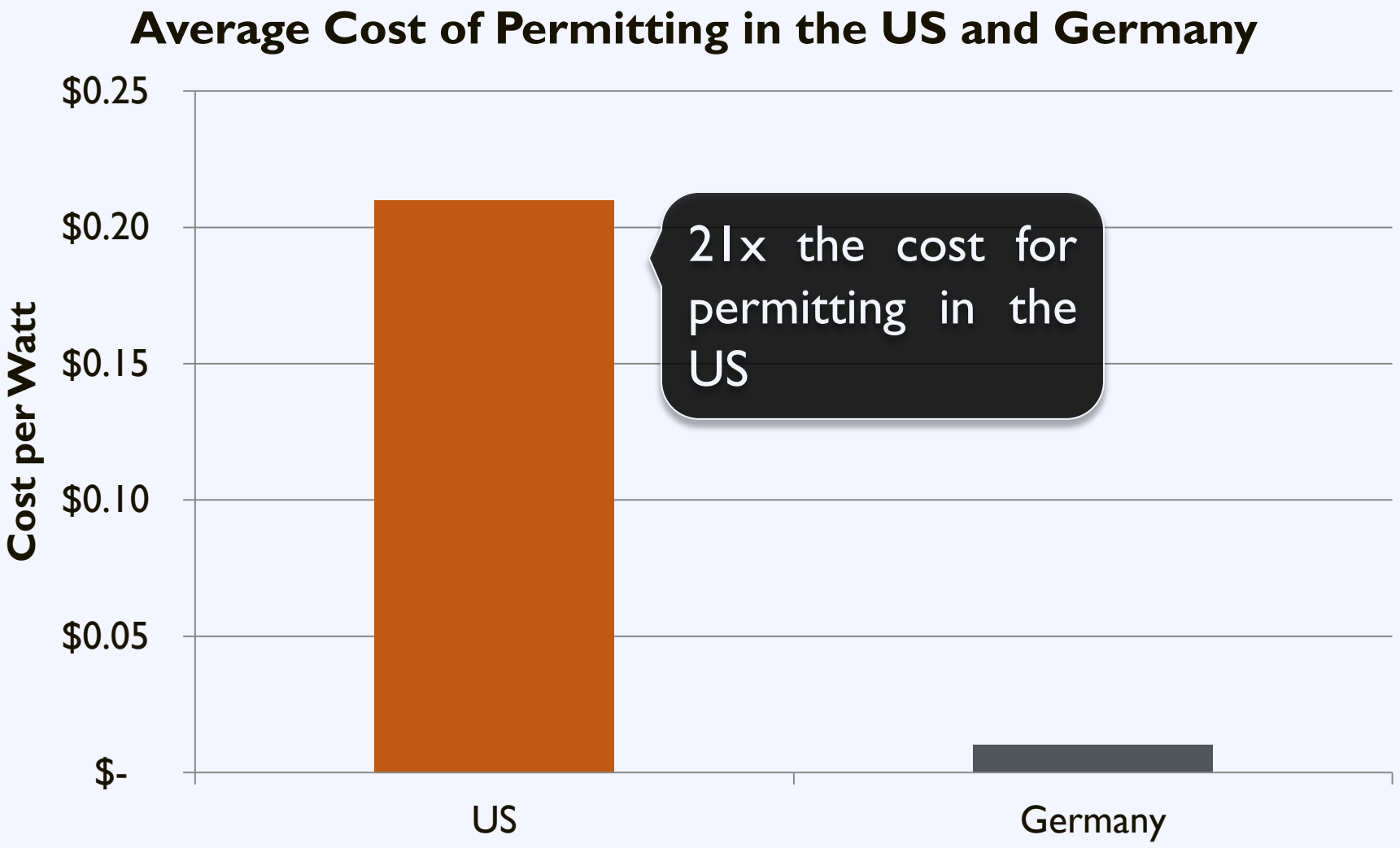
Photon Magazine

Time to Installation



Source: NREL, LBNL

Permitting Costs



Source: NREL, LBNL

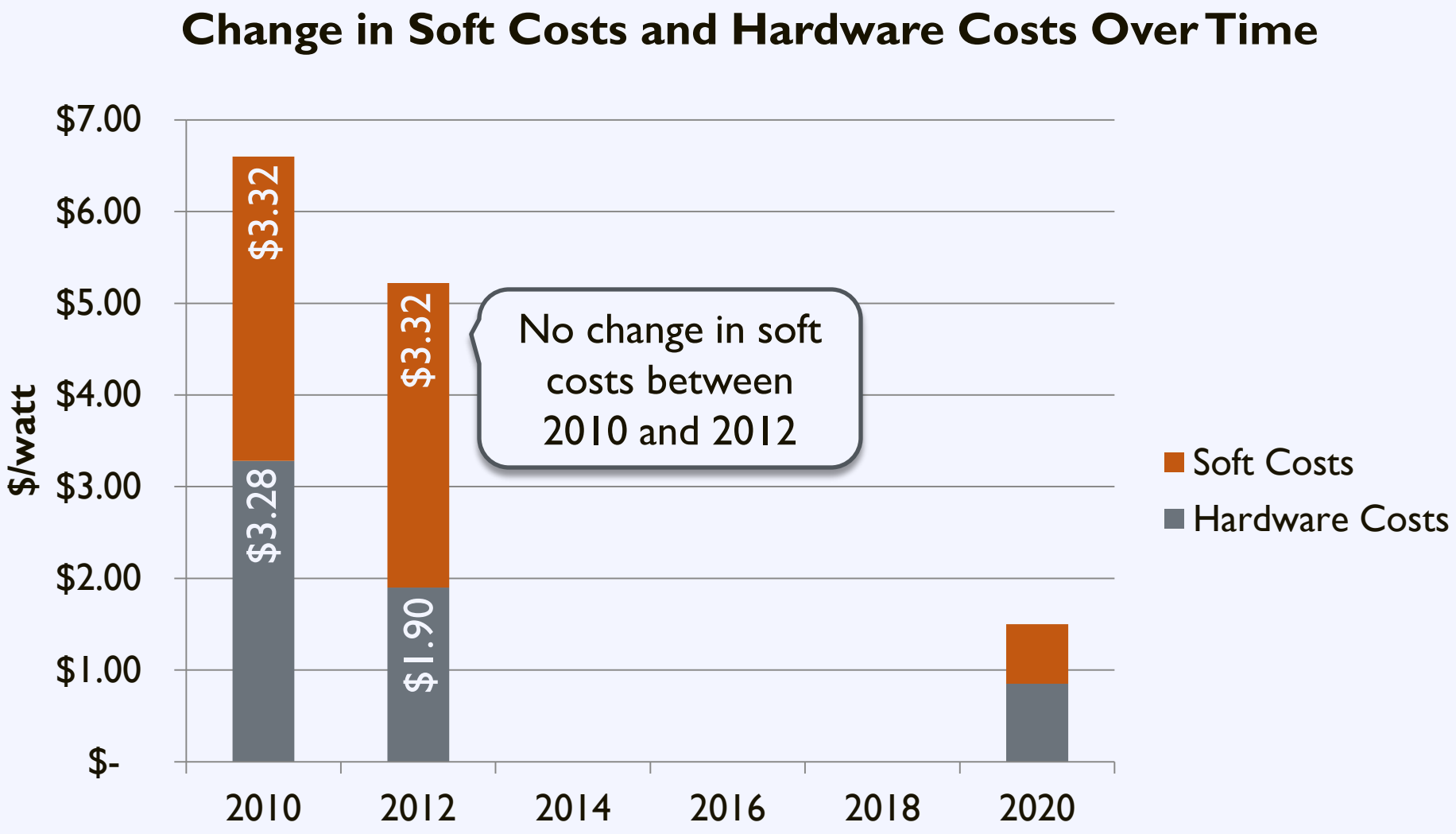
Germany's Success

Consistency and Transparency

through

Standardized Processes

The Cost of Solar in the US



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U.S. Department of Energy

Workshop Goal

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

Agenda

1:40 – 2:00	Putting Solar Energy on the Local Policy Agenda
2:00 – 2:20	State of the Local Solar Market
2:20 – 2:50	Federal, State, and Utility Policy Drivers
2:50 – 3:00	*Break*
3:00 – 3:30	Planning for Solar: Getting Solar Ready
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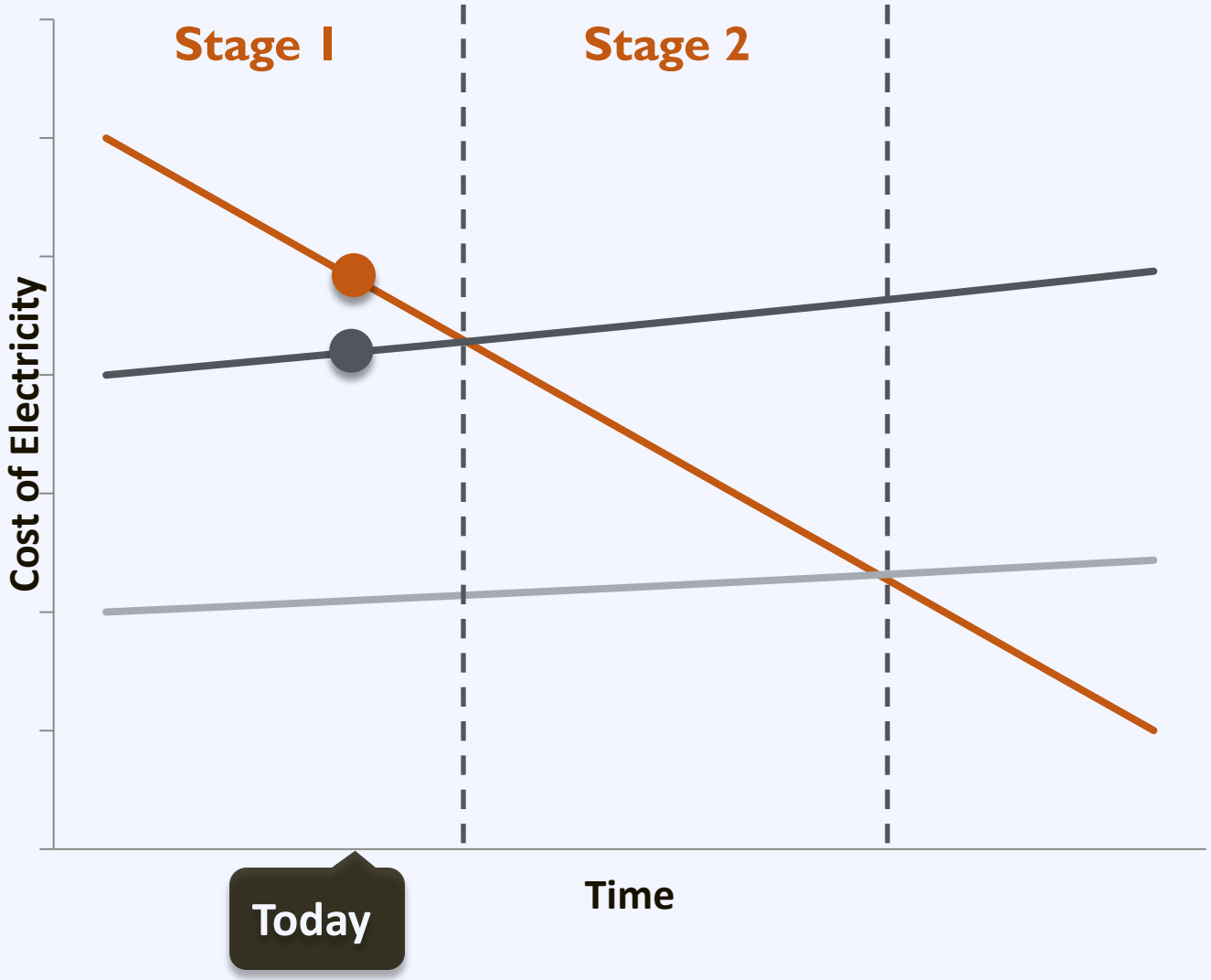
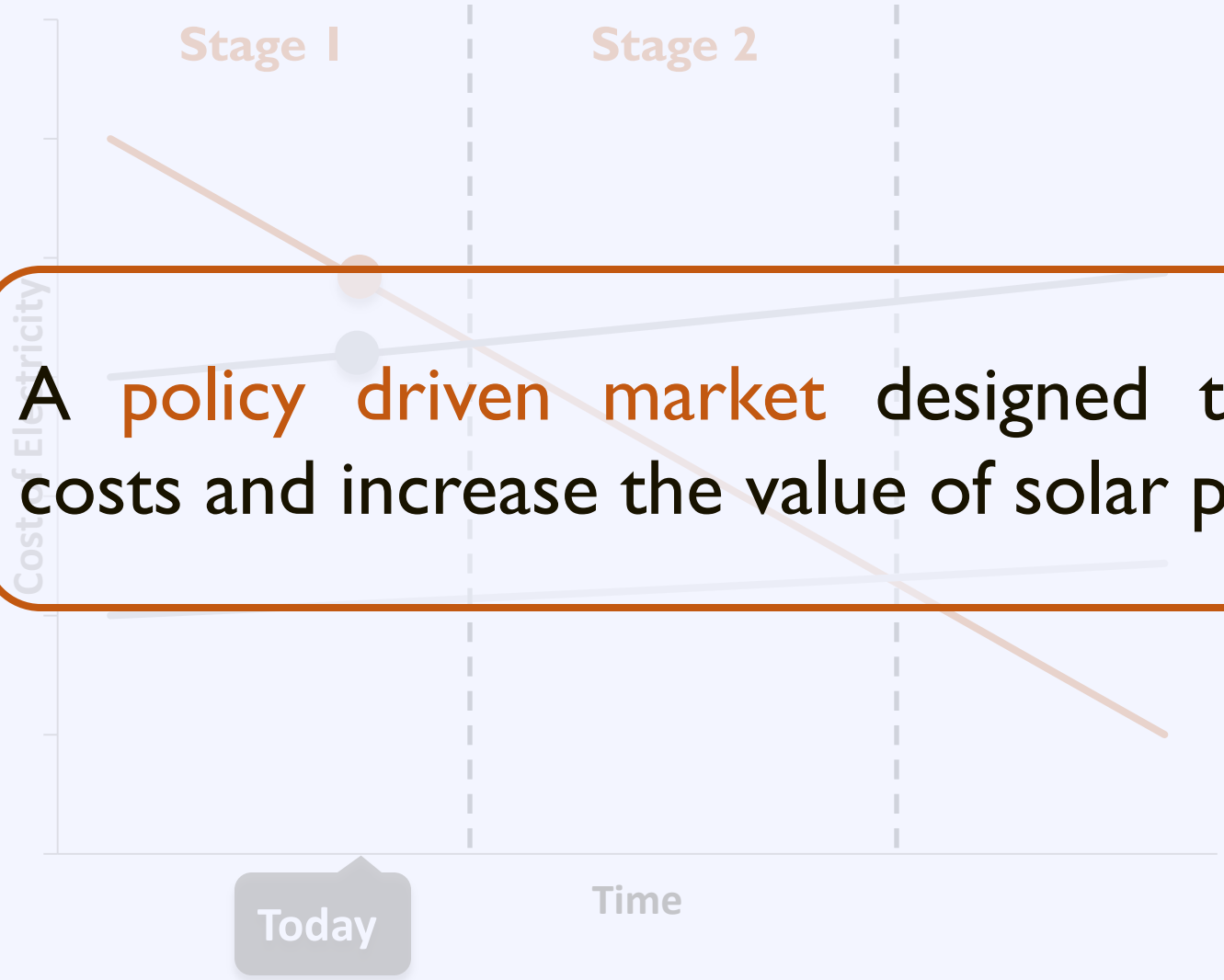
Solar Market: Trends



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	State Tax Credits	Property & Sales Tax Exemptions
	Net Metering	Interconnection	Solar Access

A Policy Driven Market

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

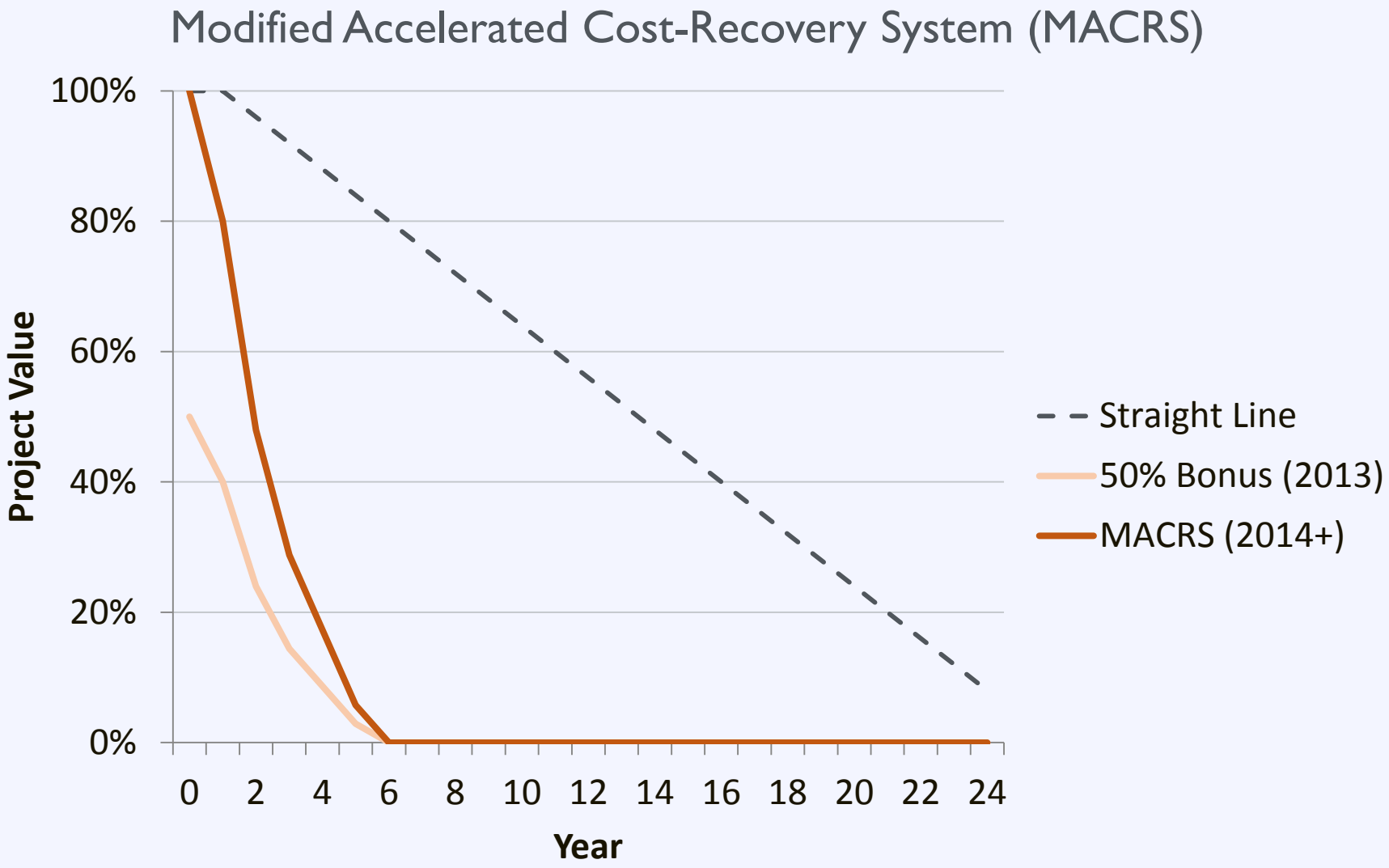
Type: Tax Credit

Eligibility: For-Profit Organization

Value: 30% of the installation cost

Availability: Through 2016

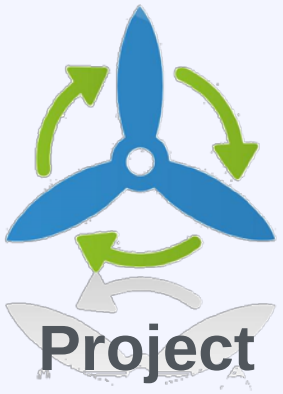
Accelerated Depreciation



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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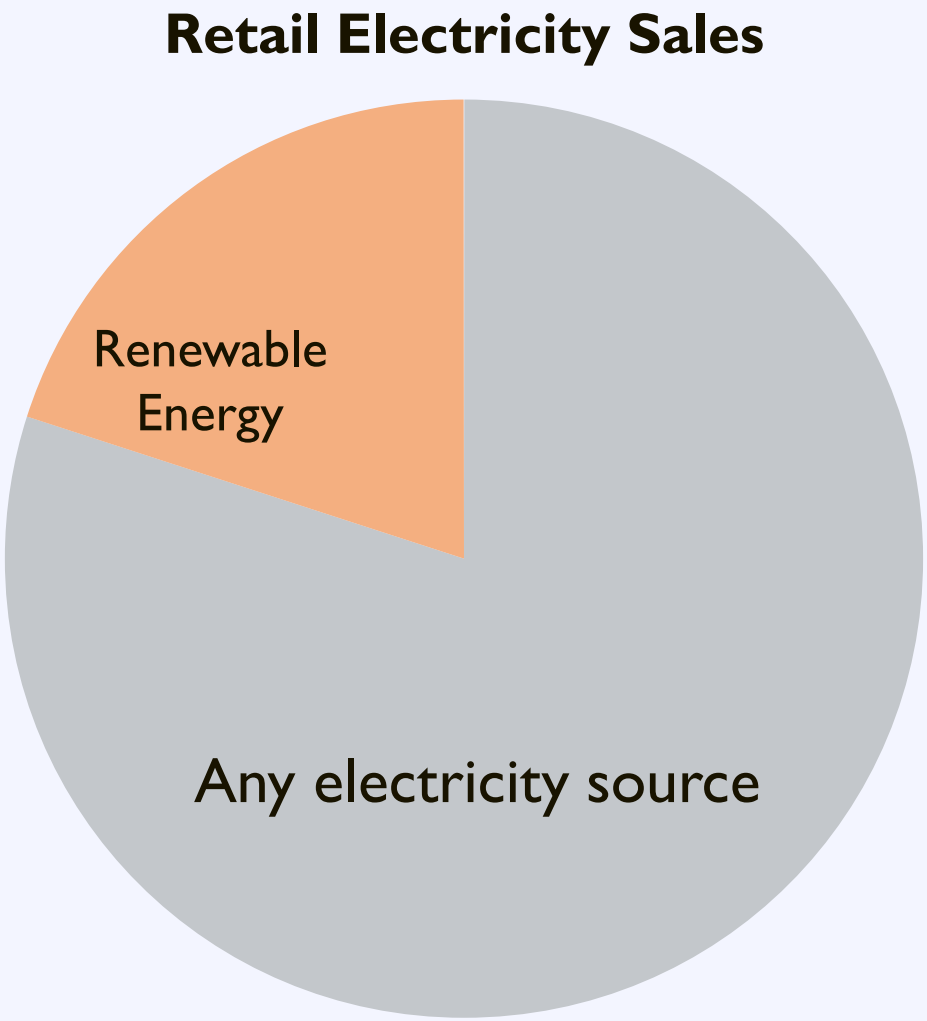
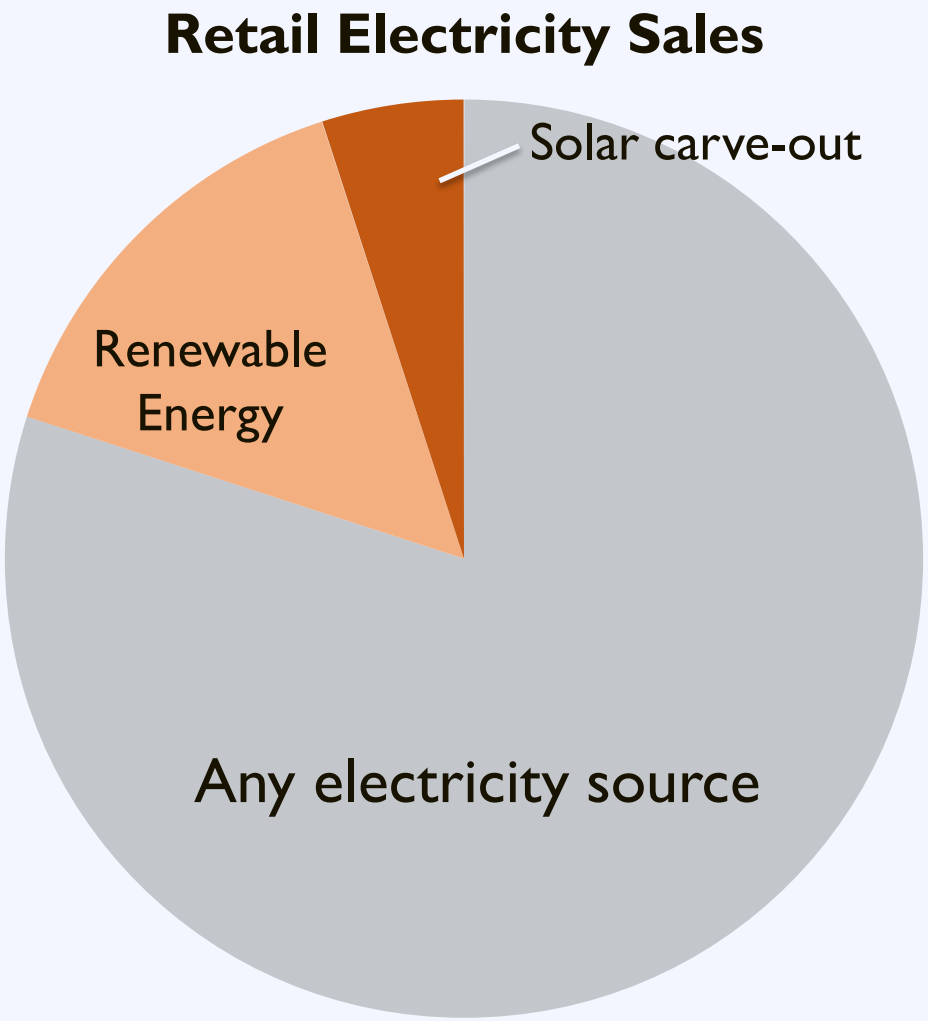
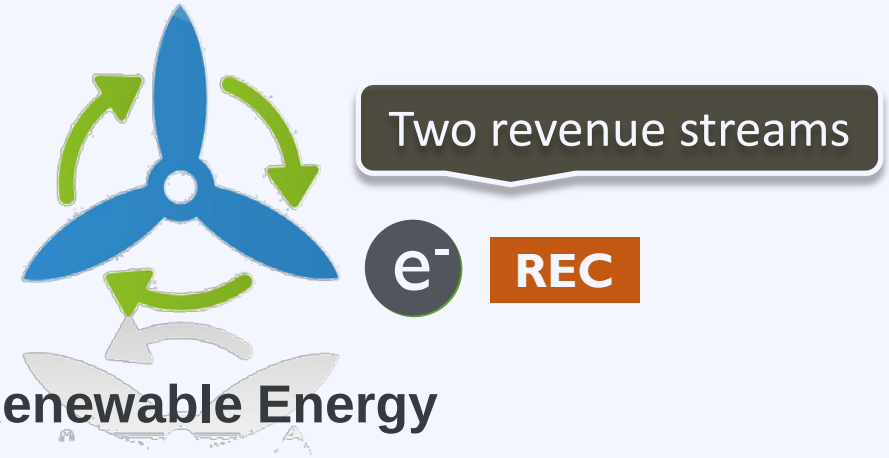
Renewable Portfolio Standard



Renewable Portfolio Standard

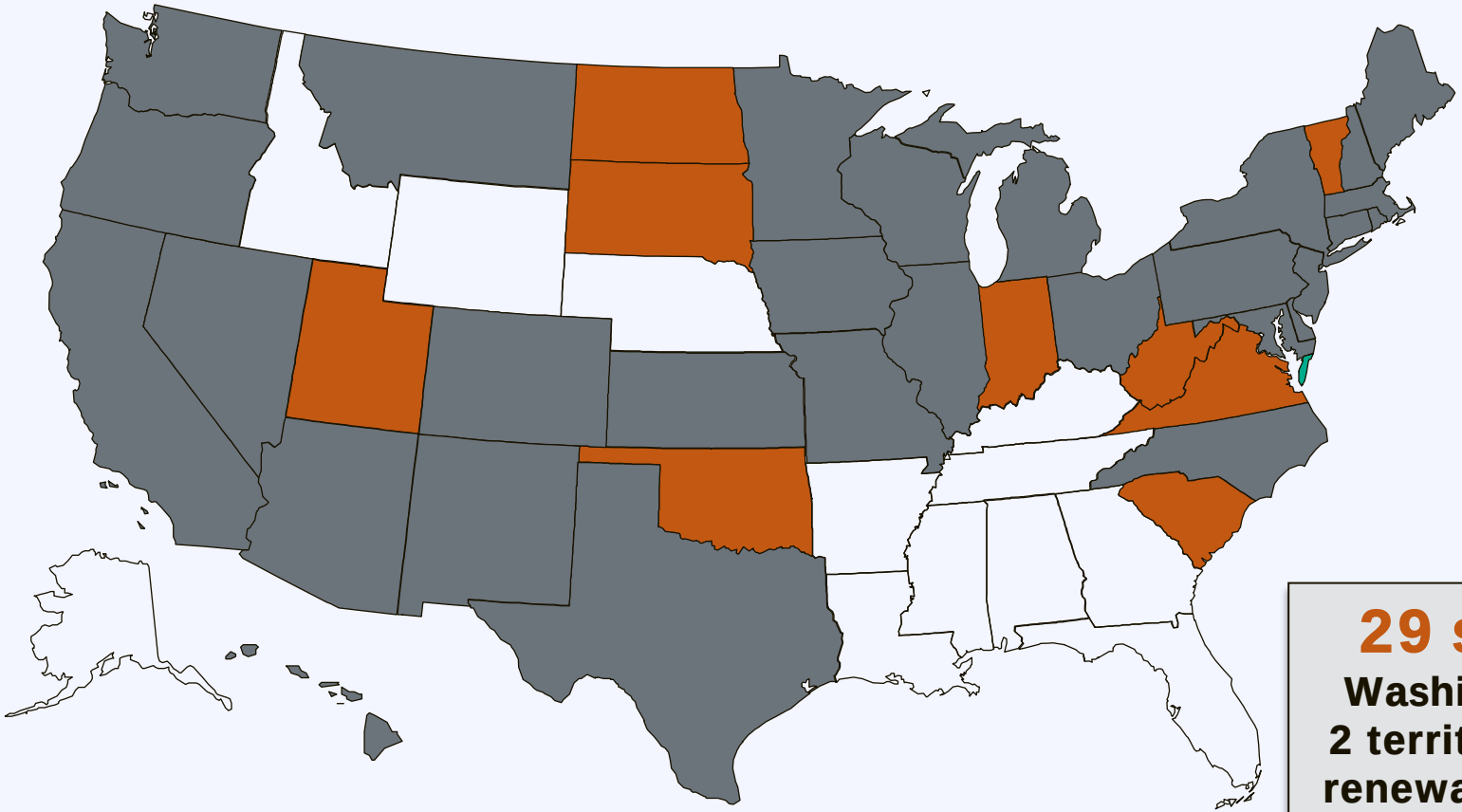


Renewable Portfolio Standard



Renewable Portfolio Standard

www.dsireusa.org / September 2014



Renewable portfolio standard

Renewable portfolio goal

29 states + Washington DC + 2 territories have a renewable portfolio standard

(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 2012)

Ranks	State	RPS?	Solar/DG Provision?
1	California	Y	N
2	Arizona	Y	Y
3	New Jersey	Y	Y
4	Nevada	Y	Y
5	Colorado	Y	Y
6	North Carolina	Y	Y
7	Massachusetts	Y	Y
8	Pennsylvania	Y	Y
9	Hawaii	Y	N
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 2012 Year-in-Review*

Iowa: RPS Status

Investor-Owned Utilities

105 MW target
(already met)

75.7% of state market

Muni & Coop Utilities

no target

24.7% of state market

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U.S. Department of Energy

Source: DSIRE

A Policy Driven Market

Federal	Investment Tax Credit	Accelerated Depreciation	Qualified Energy Conservation Bond
State & Utility	Renewable Portfolio Standard	State Tax Credits	Property & Sales Tax Exemptions
	Net Metering	Interconnection	Solar Access

Renewable Energy Production Tax Credit

- 1.5 cents/kWh for electricity produced
- Available to residential, commercial, industrial, & agricultural entities
- Expires 01/01/2017
- May not be taken with the state solar energy systems tax credit

Solar Energy Systems Tax Credit

- 18% of installation cost of a solar system
  - Max credit is $5,000 for residential and $20,000 for commercial
- Available to residential, commercial, & agricultural entities
- Annual limit of $4.5 million
- Expires 12/31/2016
- May not be taken with the state renewable energy production tax credit

A Policy Driven Market

Federal	Investment Tax Credit	Accelerated Depreciation	Qualified Energy Conservation Bond
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Tax Exemptions

- Property Tax Exemption
  - Property value added by solar energy systems is fully exempt from Iowa state property tax for 5 years
- Sales Tax Exemption
  - Solar energy equipment is fully exempt from Iowa state sales tax (Iowa state sales tax is currently 6%)

A Policy Driven Market

Federal	Investment Tax Credit	Accelerated Depreciation	Qualified Energy Conservation Bond
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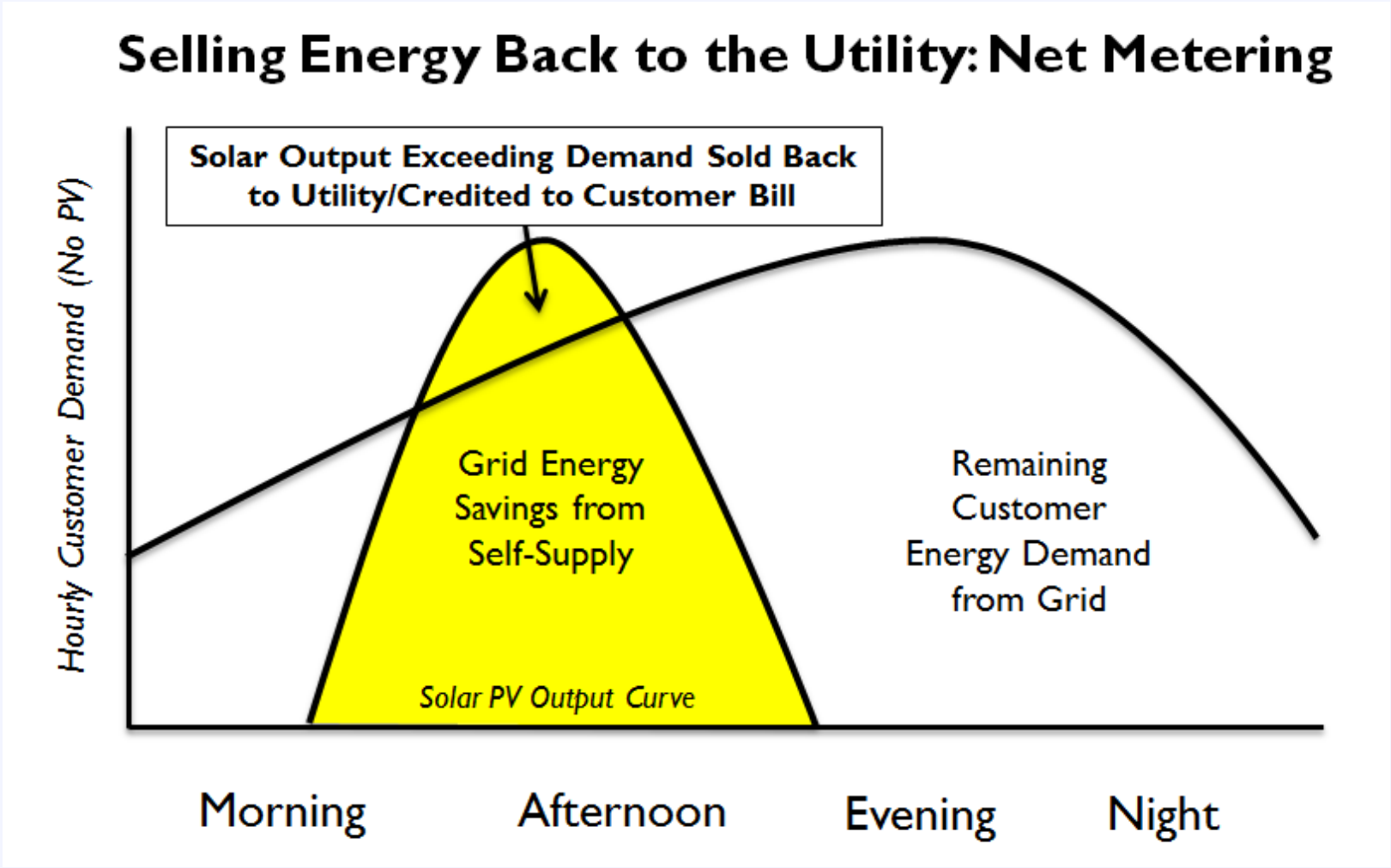
Net Metering

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



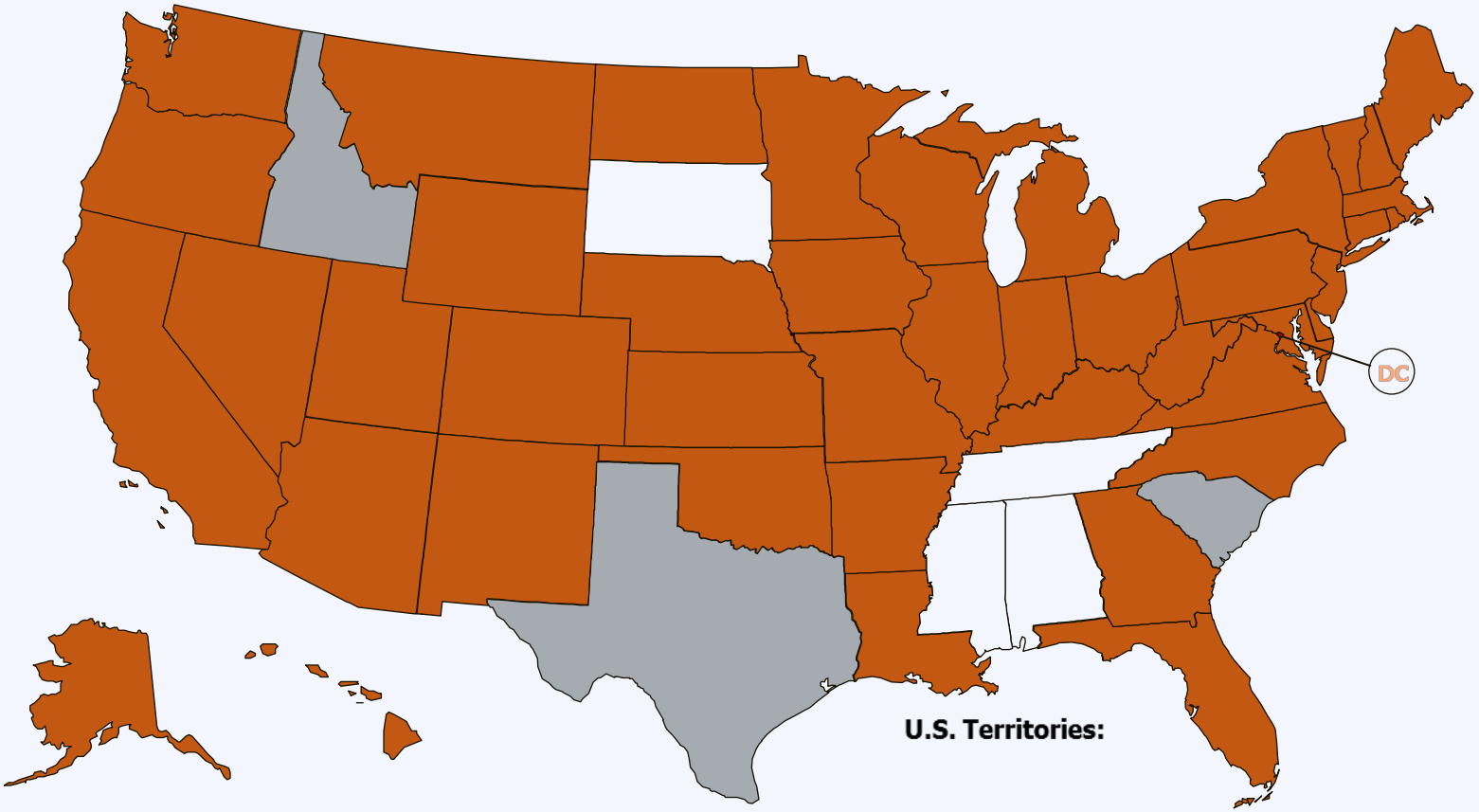
Net Metering: Market Share

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

Powered by SunShot U.S. Department of Energy

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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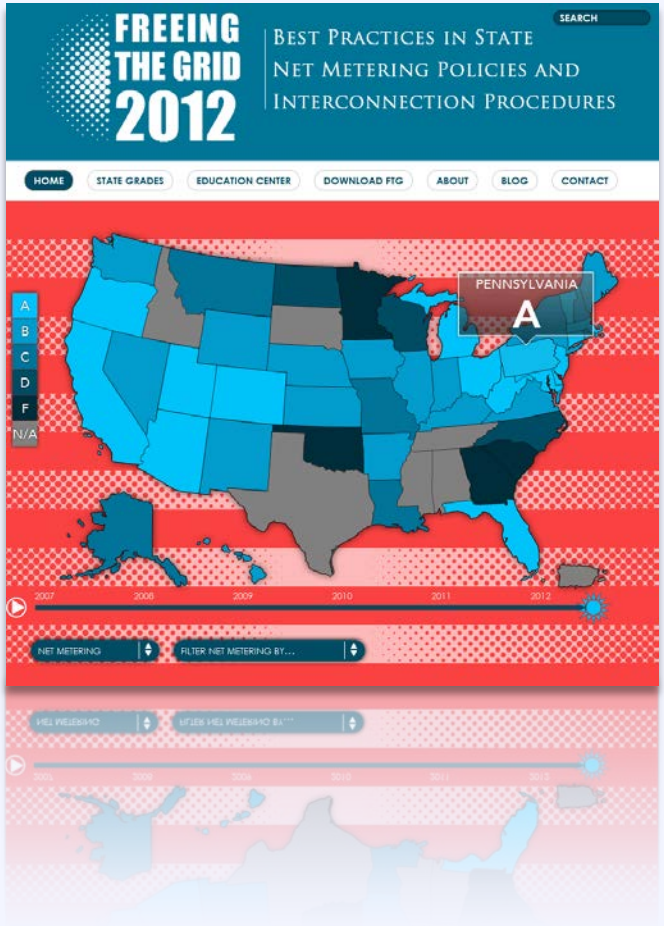
U.S. Department of Energy

Net Metering: Resources

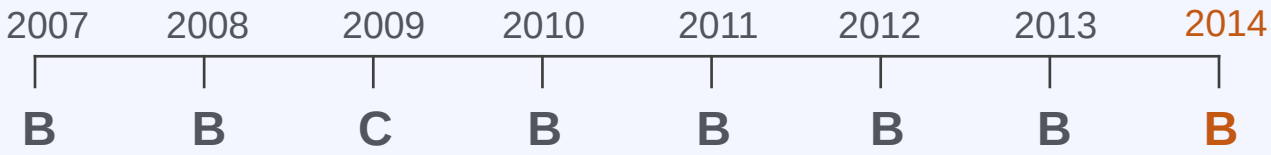
Resource **Freeing the Grid**

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

http://freeingthegrid.org/



Net Metering: Iowa



Net Excess Credit Value
Retail Rate
Carried Over Indefinitely

Applicable Utilities
IOUs Only

System Capacity Limit
500 KW

REC Ownership
Not Addressed

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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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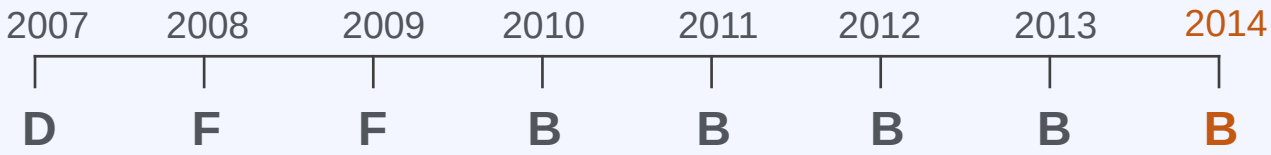
	Net Metering	Interconnection	Solar Access

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: Iowa

B



Applicable Technologies
All DG renewables

Applicable Utilities
IOUs
Lynn County REC

System Capacity Limit
10 MW

Bonus
Electronic Application
Standardized Process

Powered by SunShot U.S. Department of Energy

Source: Freeing the Grid

A Policy Driven Market

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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

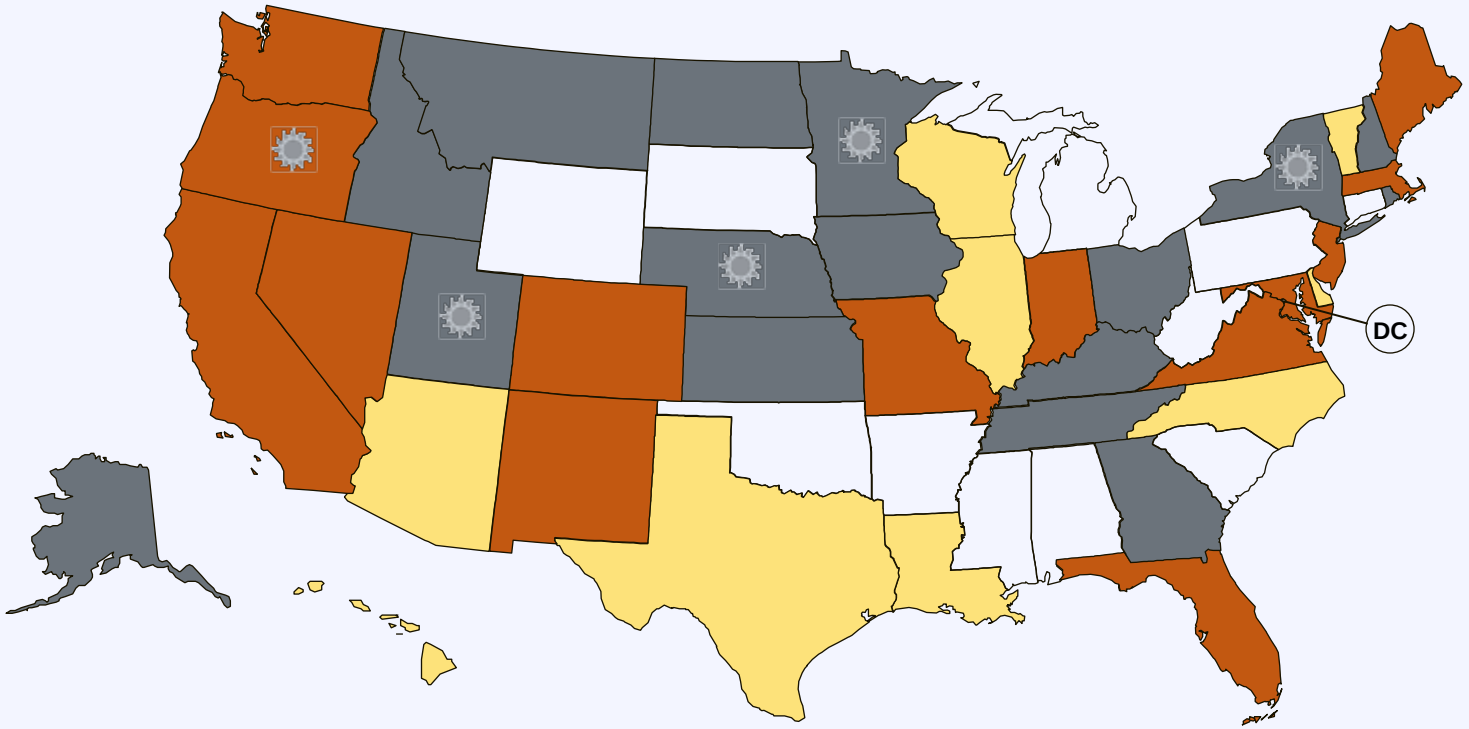
Source: Google Earth

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)

Solar Access in Iowa

Obtaining an Easement:

- Homeowners can obtain voluntary easements from neighbors
- Court-ordered easements are also available

Municipal Actions:

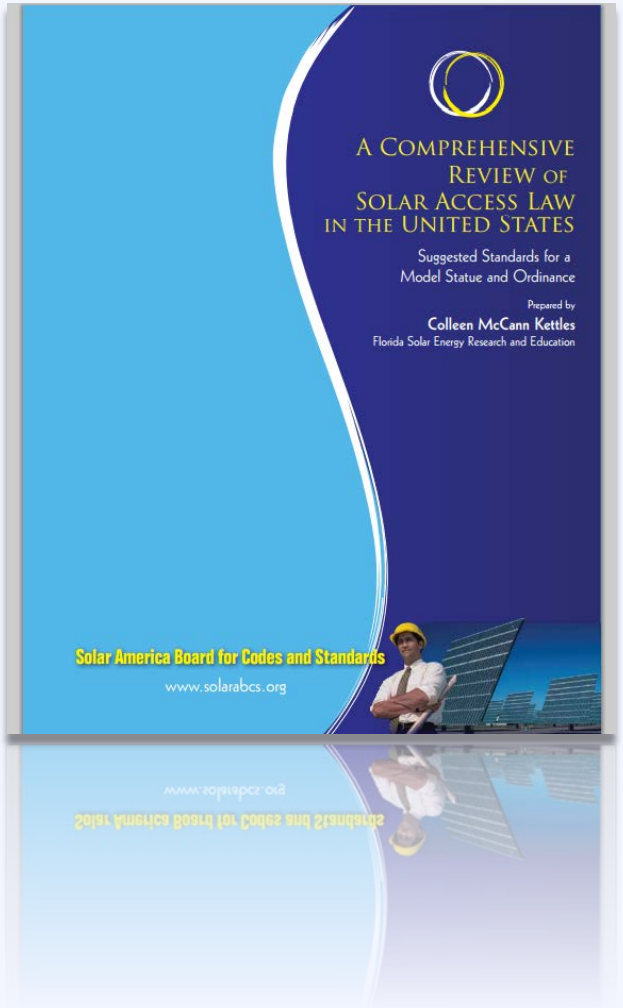
- Establish solar access regulatory boards
- Pass ordinances prohibiting restrictive subdivision rules regarding solar

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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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

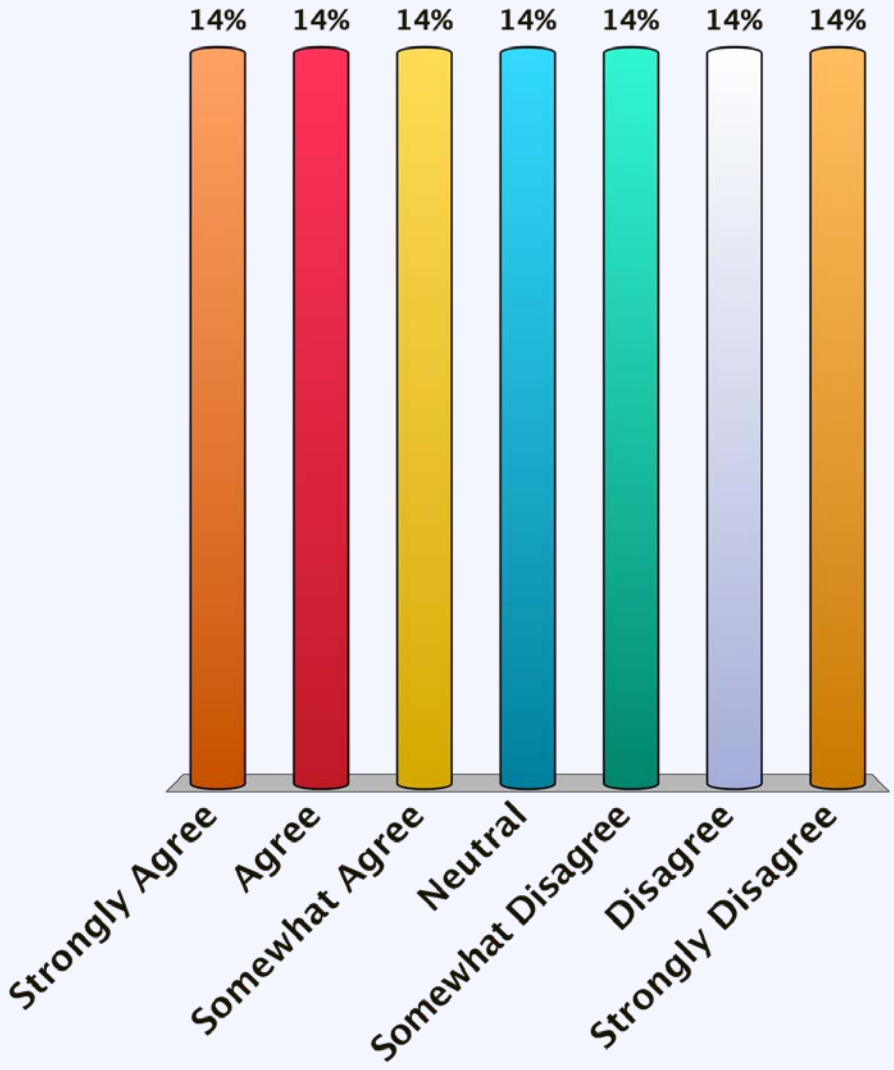
Visioning & goal setting

Effective Solar Permitting Process

Solar Market Development Tools

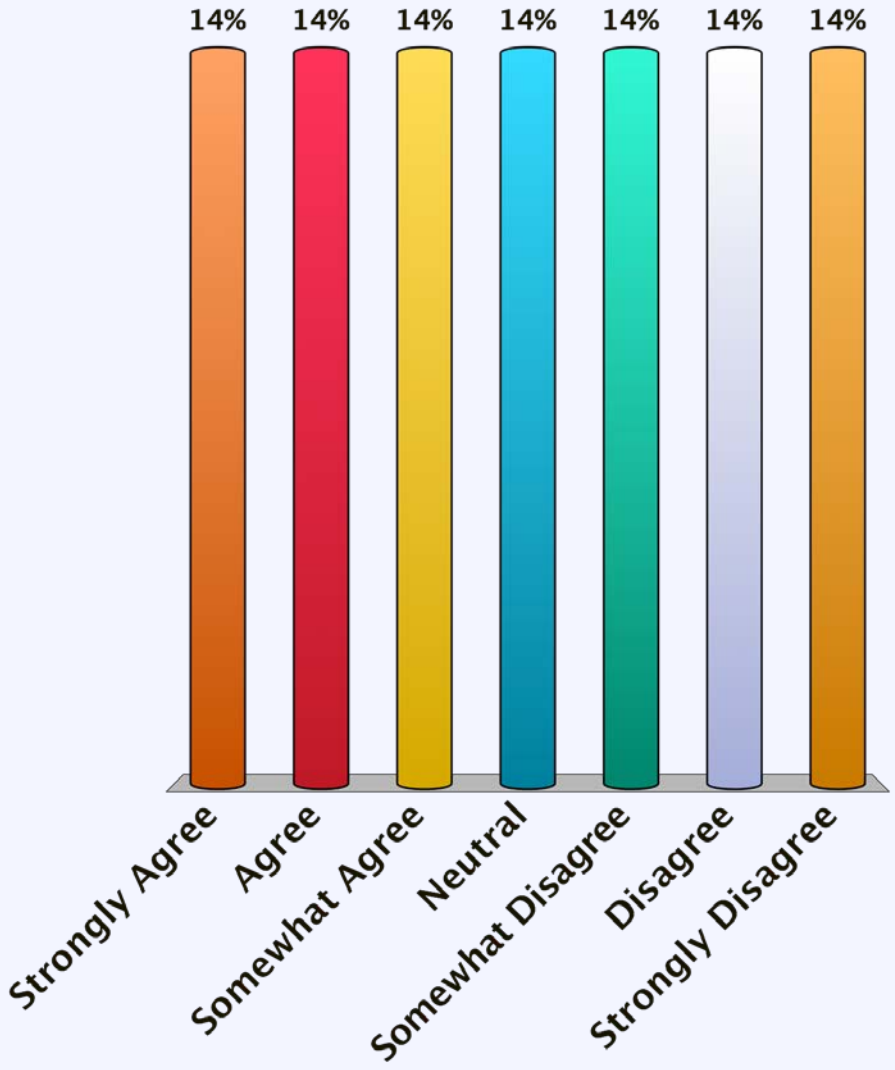
Solar advances your energy goals

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



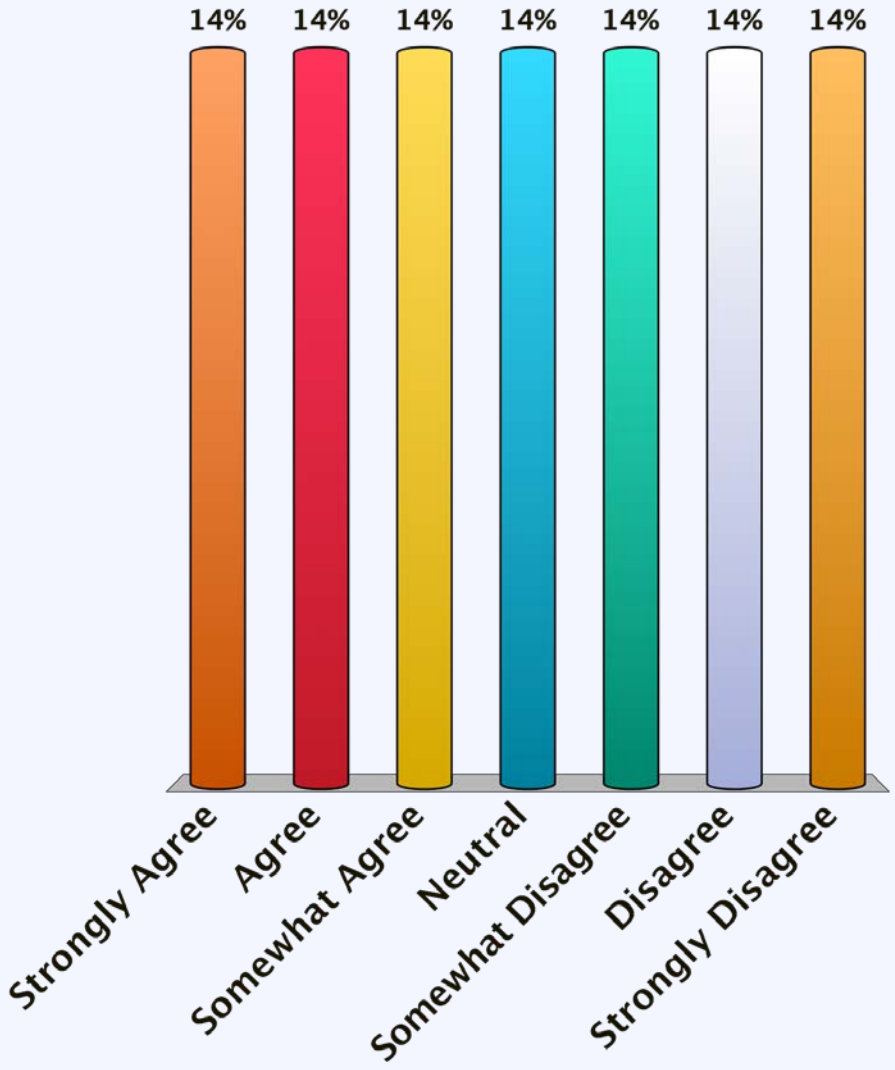
Solar advances your economic development goals

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

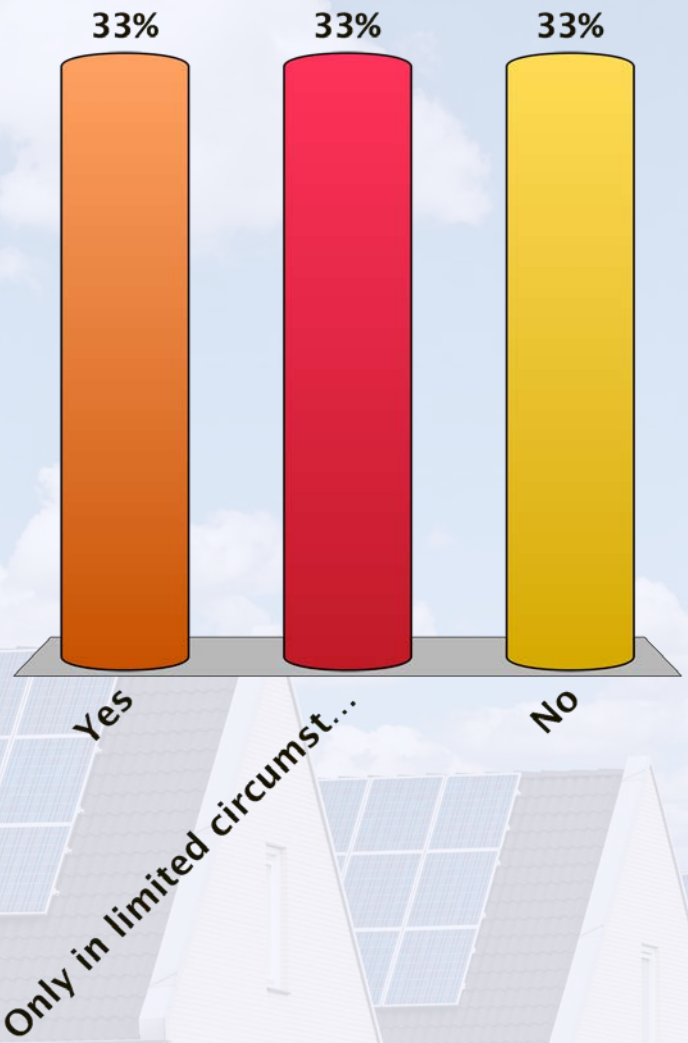
Is solar on residential rooftops appropriate for your community?

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

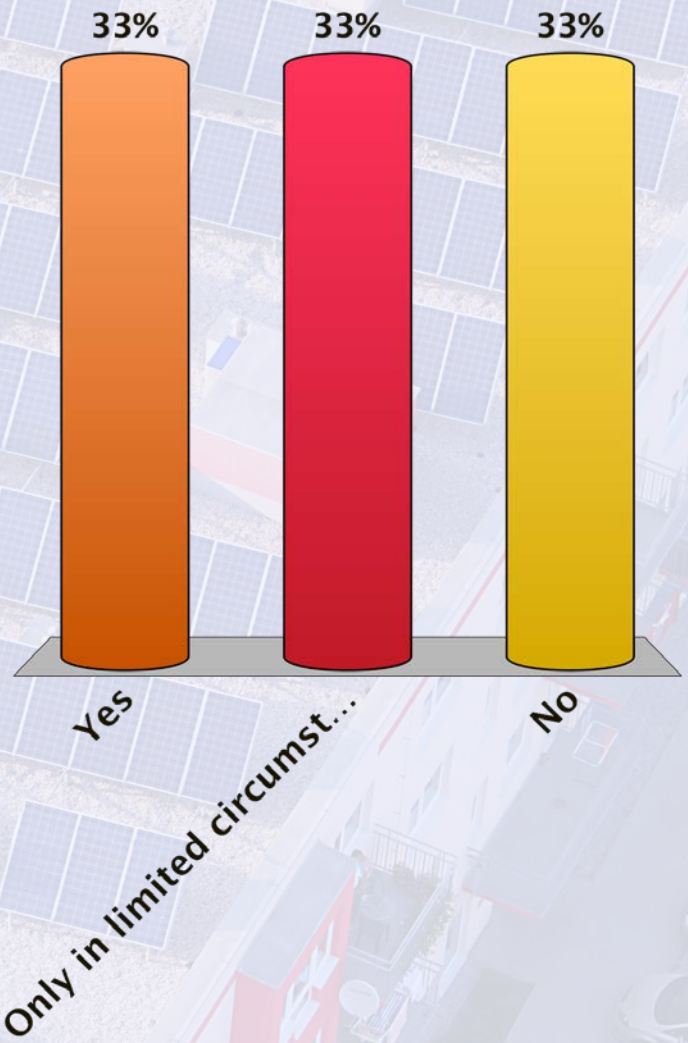
Poll

Is solar on commercial rooftops appropriate for your community?

A. Yes

B. Only in limited circumstances

C. No



Visioning: Scales & Contexts

Poll

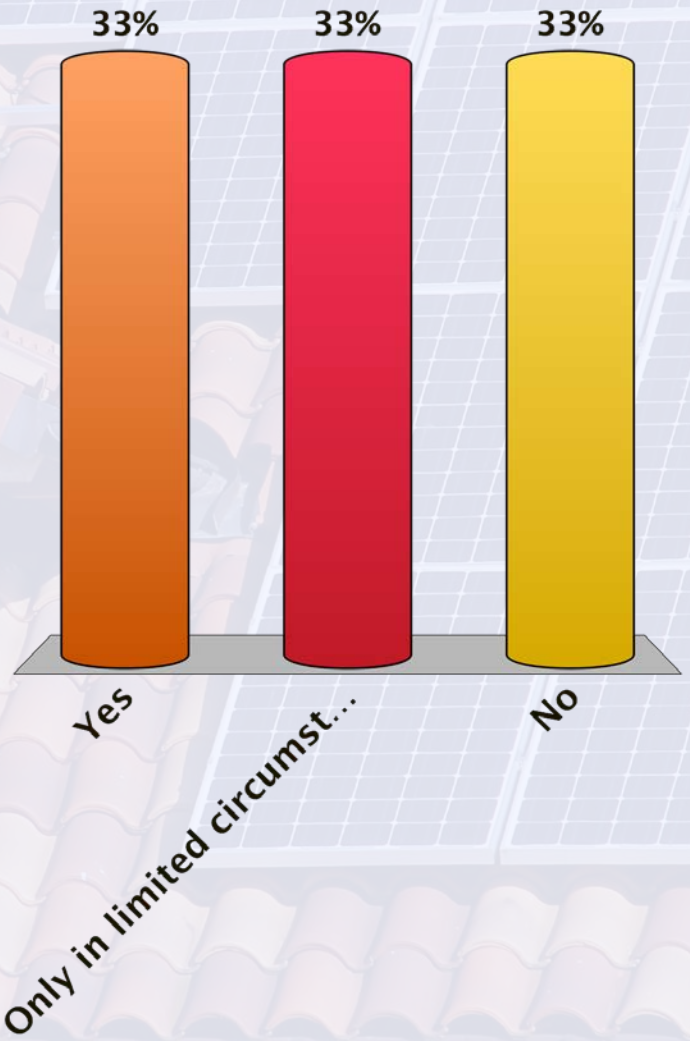
Is solar on historic structures appropriate for your community?

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

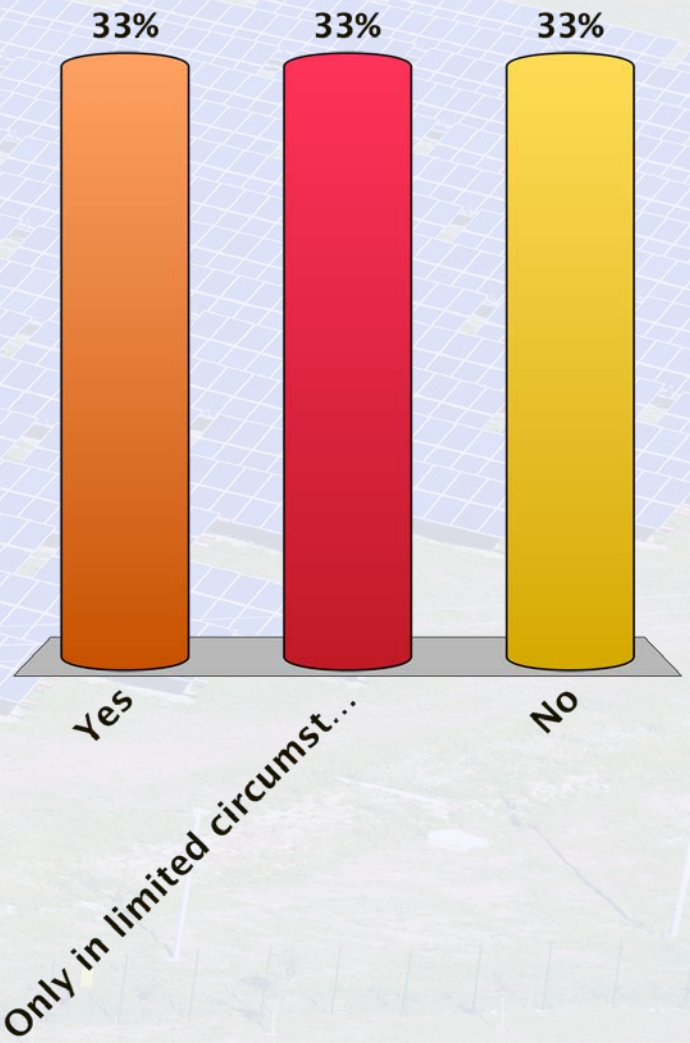
Poll

Is solar on brownfields appropriate for your community?

A. Yes

B. Only in limited circumstances

C. No



Visioning: Scales & Contexts

Poll

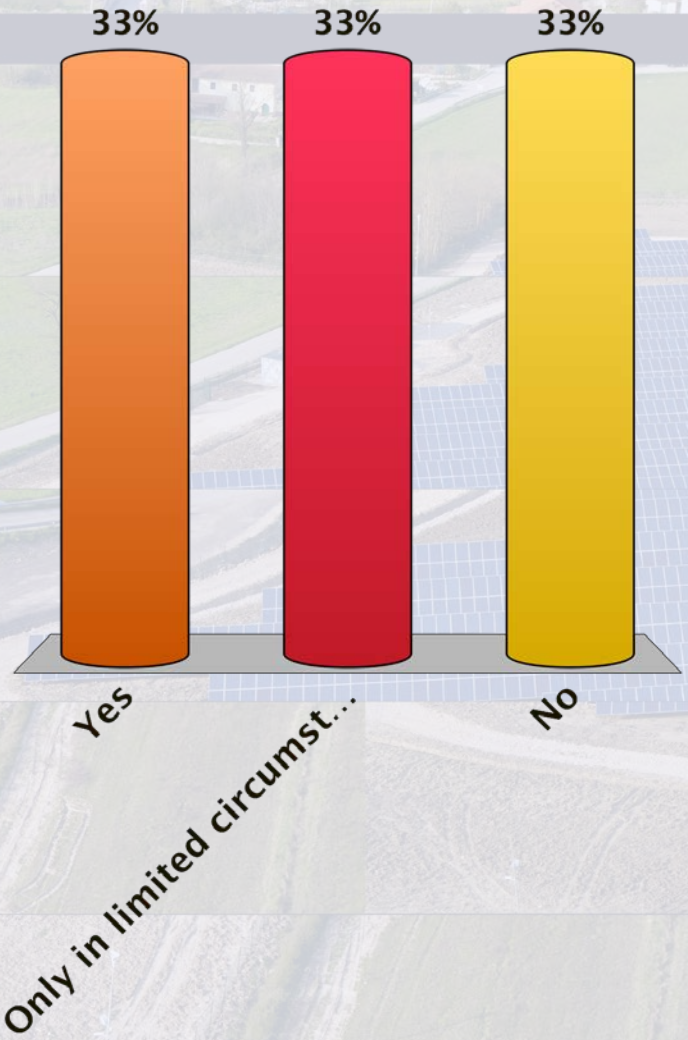
Is solar on greenfields appropriate for your community?

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

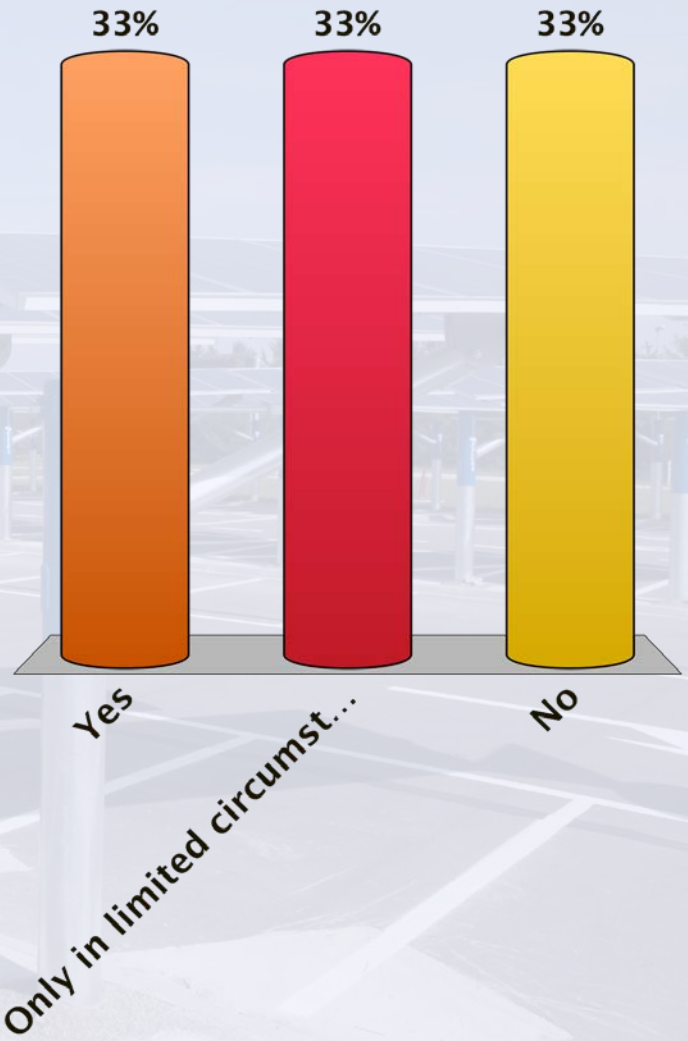
Is solar on parking lots appropriate for your community?

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

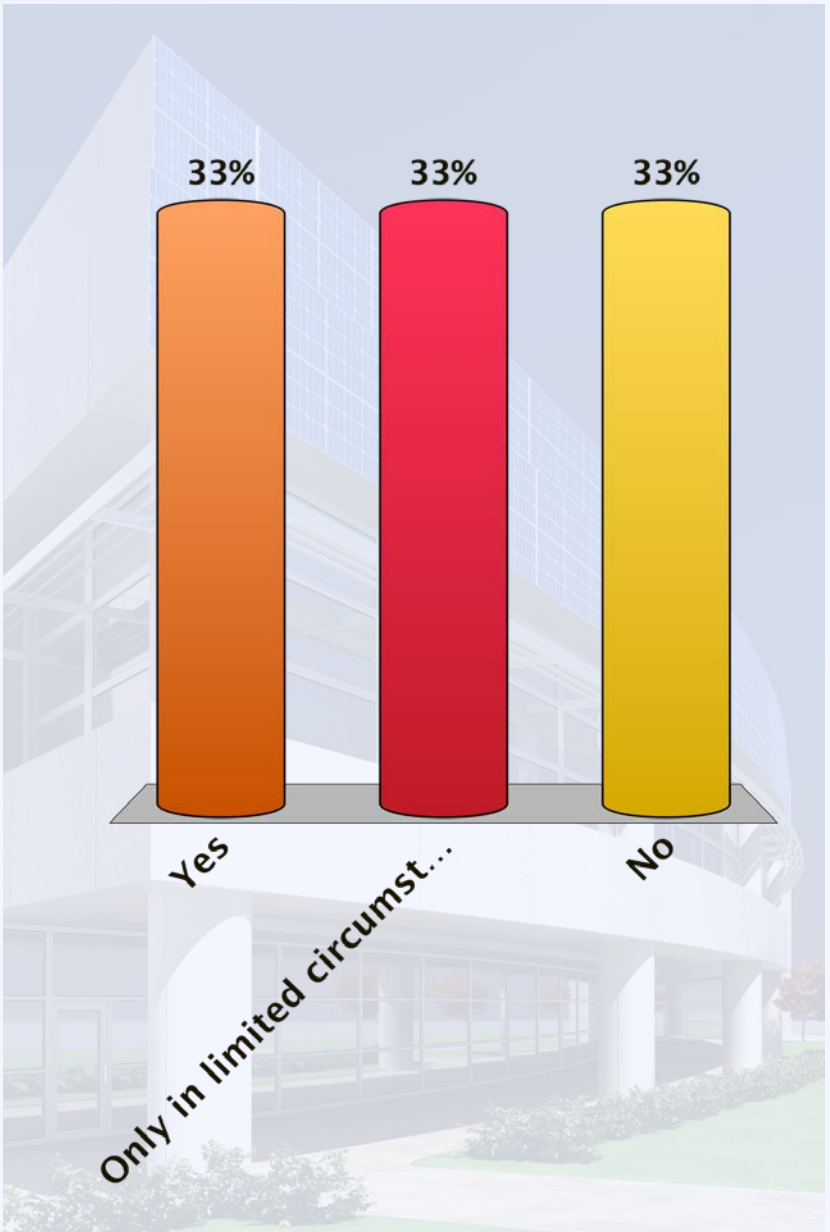
Is building-integrated solar appropriate for your community?

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

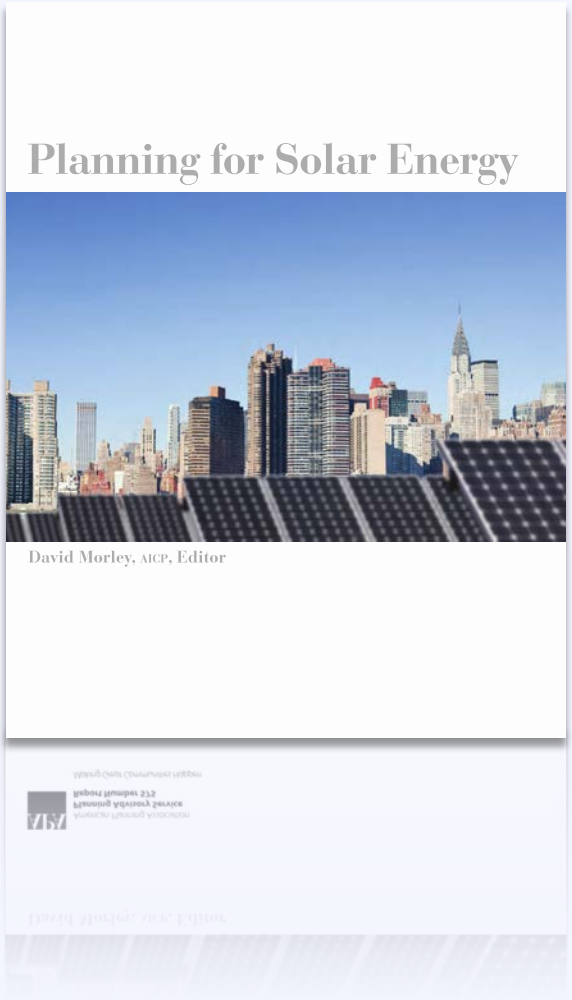
Source: American Planning Association

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

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

Powered by SunShot U.S. Department of Energy

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: 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

Update Building Code

Solar Ready Construction:

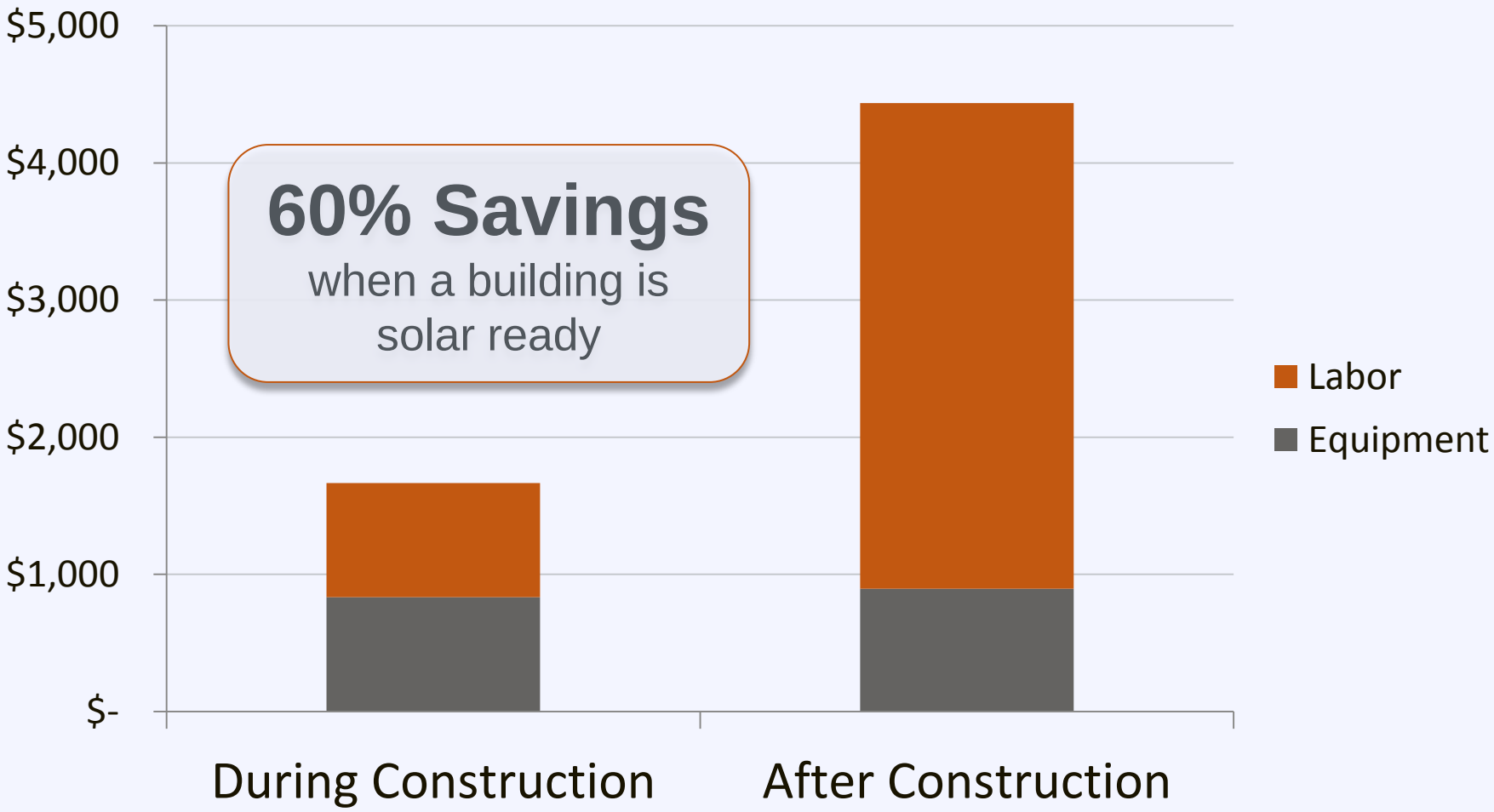
Preparing a building for solar at the outset can help make future solar installations easier and more cost effective.

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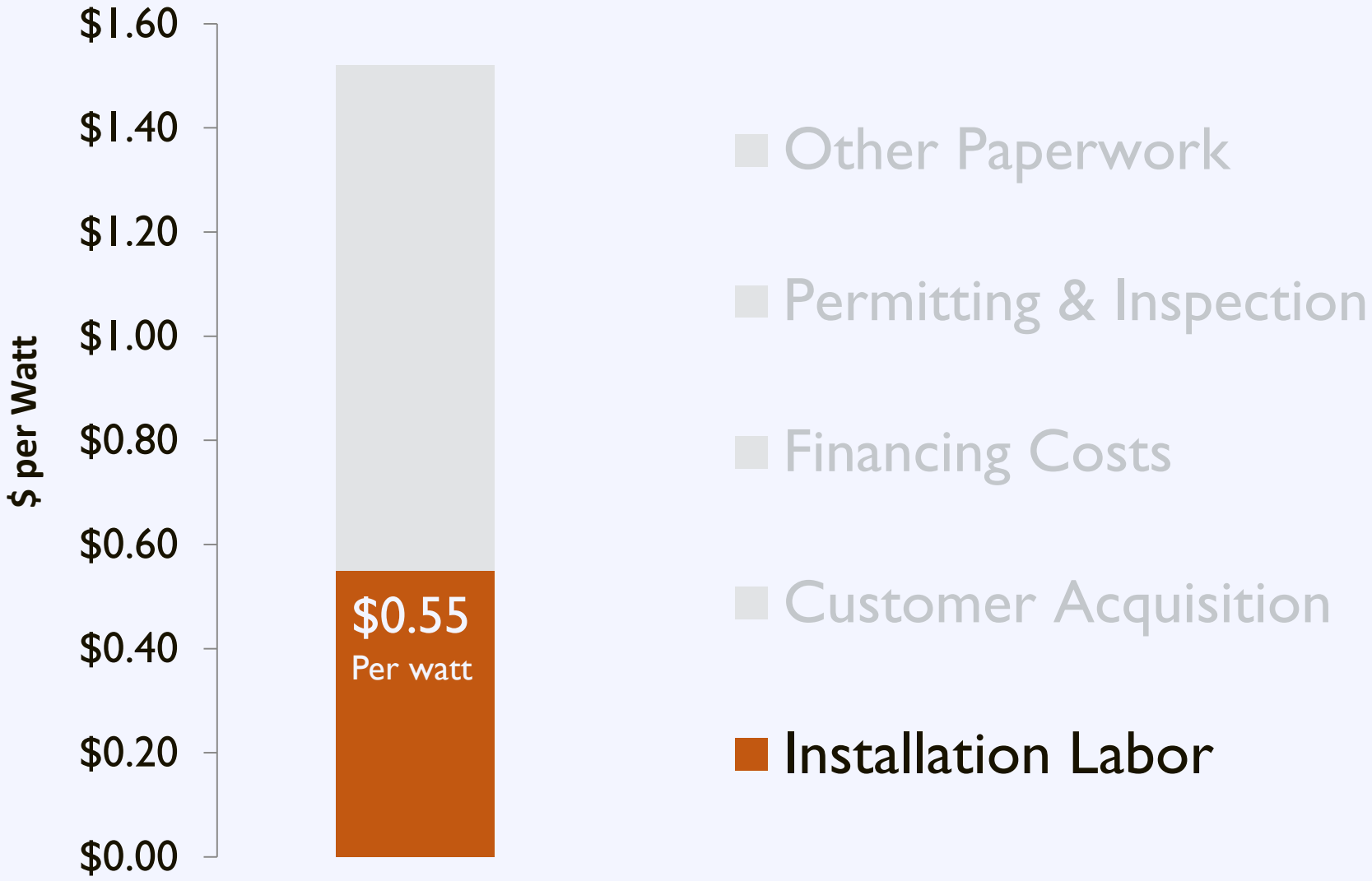
Source: Solar Ready: An Overview of Implementation Practices [Draft]. NREL, Feb. 18, 2011.

Installation Soft Costs



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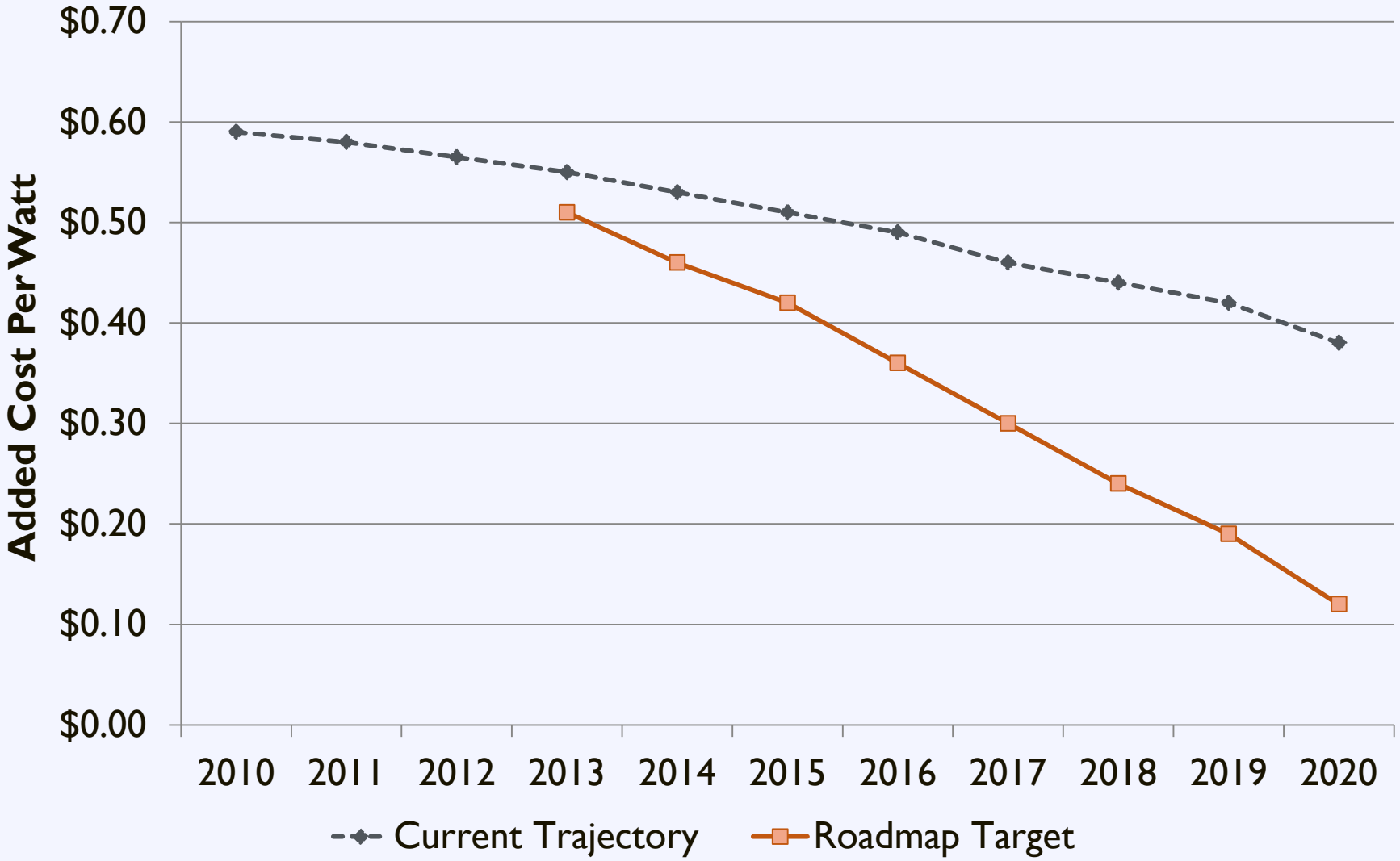
Installation Labor Roadmap



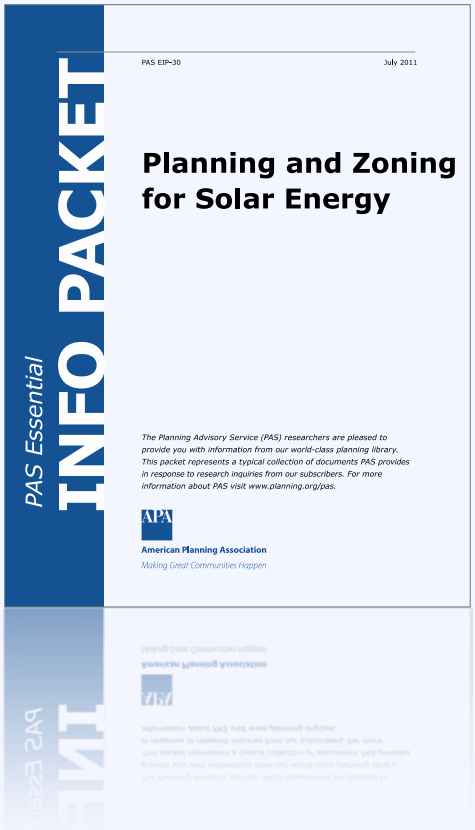
Source: NREL (http://www.nrel.gov/docs/fy13osti/59155.pdf)

Development Regulations

Resource **Planning and Zoning for Solar Energy**

This Essential Info Packet provides example development regulations for solar

planning.org/research/solar



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U.S. Department of Energy

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

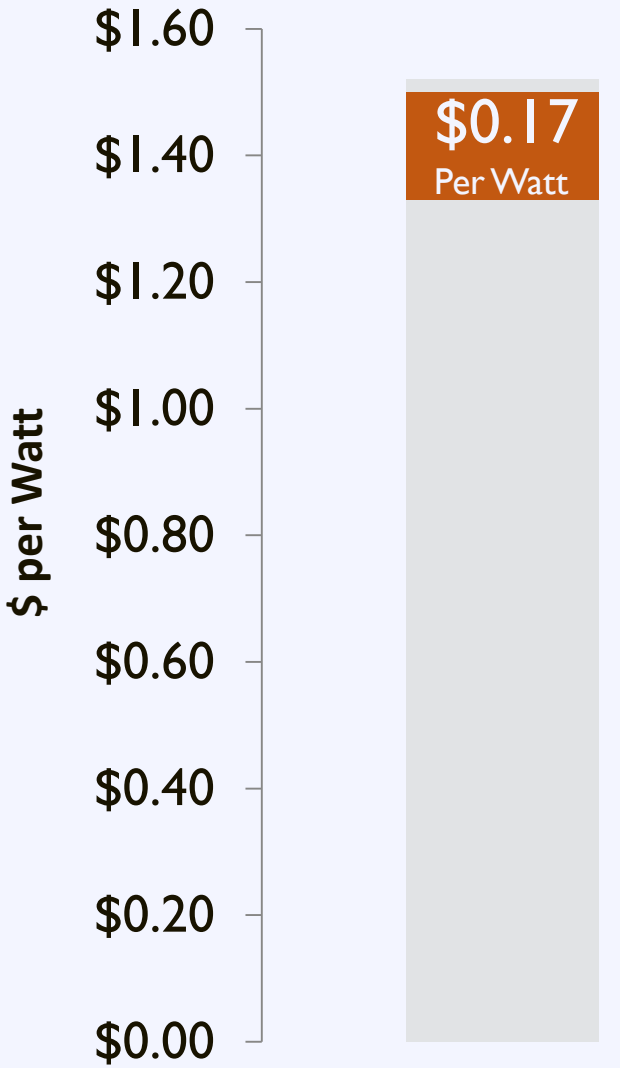
with unique zoning and permitting requirements

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

Consumer Challenges

Source: Forbes

Regulatory Barriers



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

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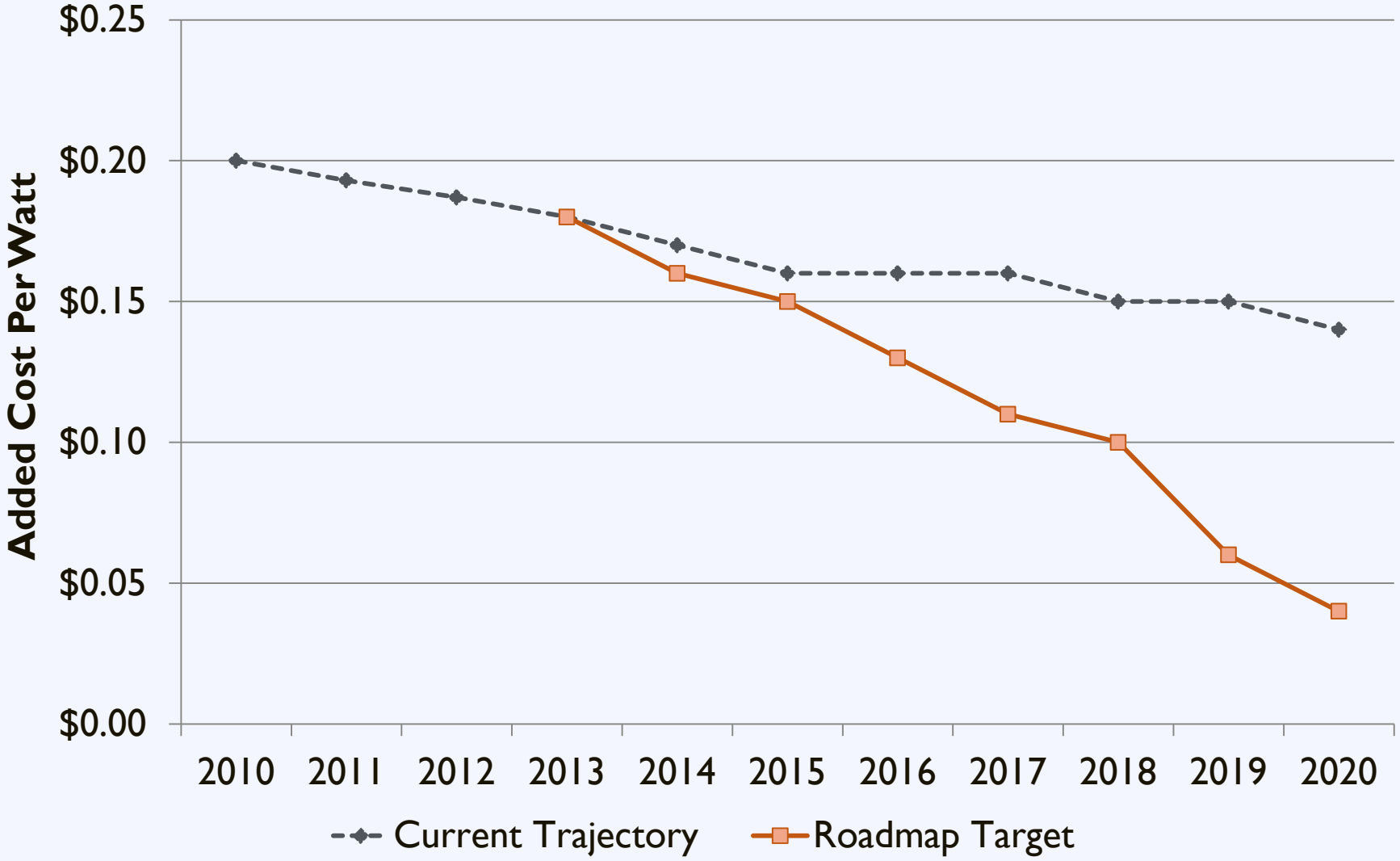
Planning & Permitting Roadmap



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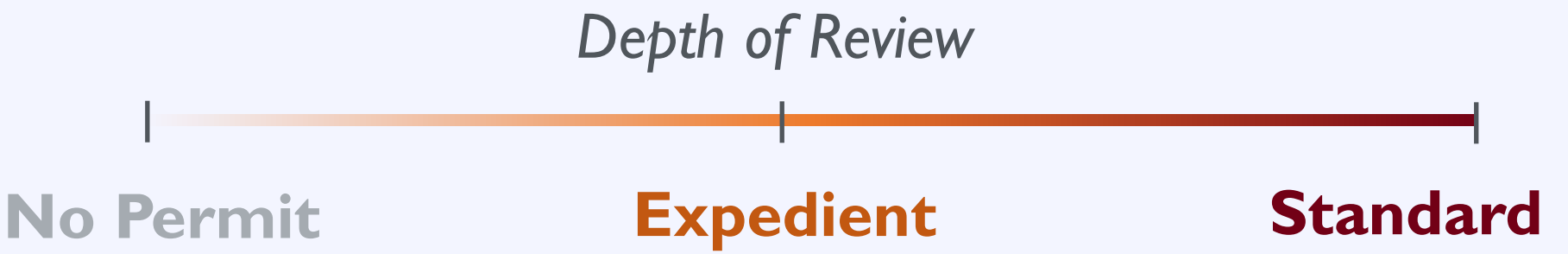
Expedited Review



Expedited Review

Depth of Review

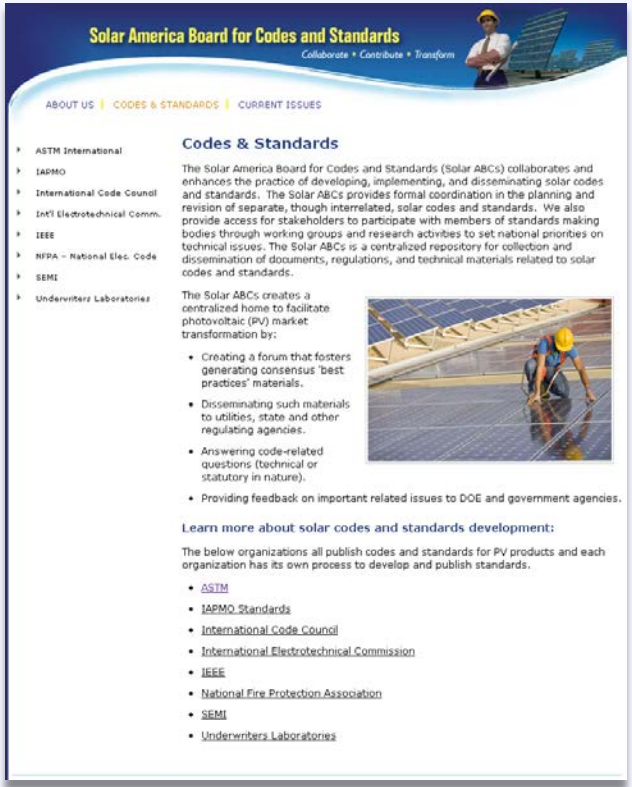
Expedient	**Expedient**	**Standard**
Within established design parameters		Outside of established design parameters
Impacts are well understood		Review necessary to understand impacts
Quick, Easy, Cheap		Flexible

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



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Expedited Review

Depth of Review

Expedient | **Expedient** | **Standard**

Within established design parameters

Outside of established design parameters

1-1. Example Design Criteria:

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

Review necessary to understand impacts

Flexible

Expedited Review

No Permit Required

Only interconnection agreement required

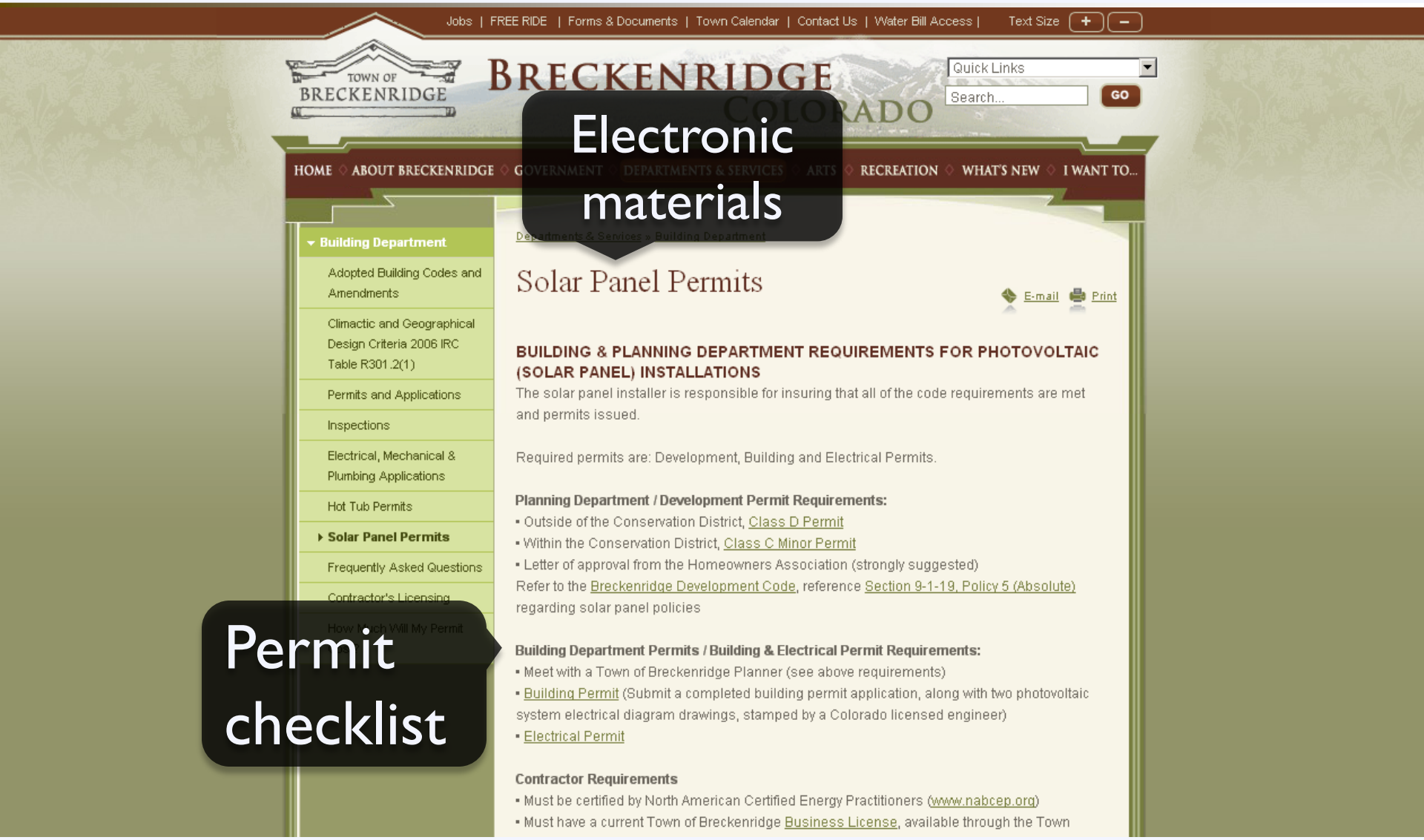
Cost-Based Recovery Fees

Residential
Flat Fees

Commercial
Fee Calculator

Fee = (Est. Staff Time x Rate) + Additional Review

Transparent process



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Source: Breckenridge, CO (http://www.townofbreckenridge.com/index.aspx?page=694)

Agenda

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2:00 – 2:20	State of the Local Solar Market
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Effective Local Solar Policy

Local Solar Policy

Understanding solar financing

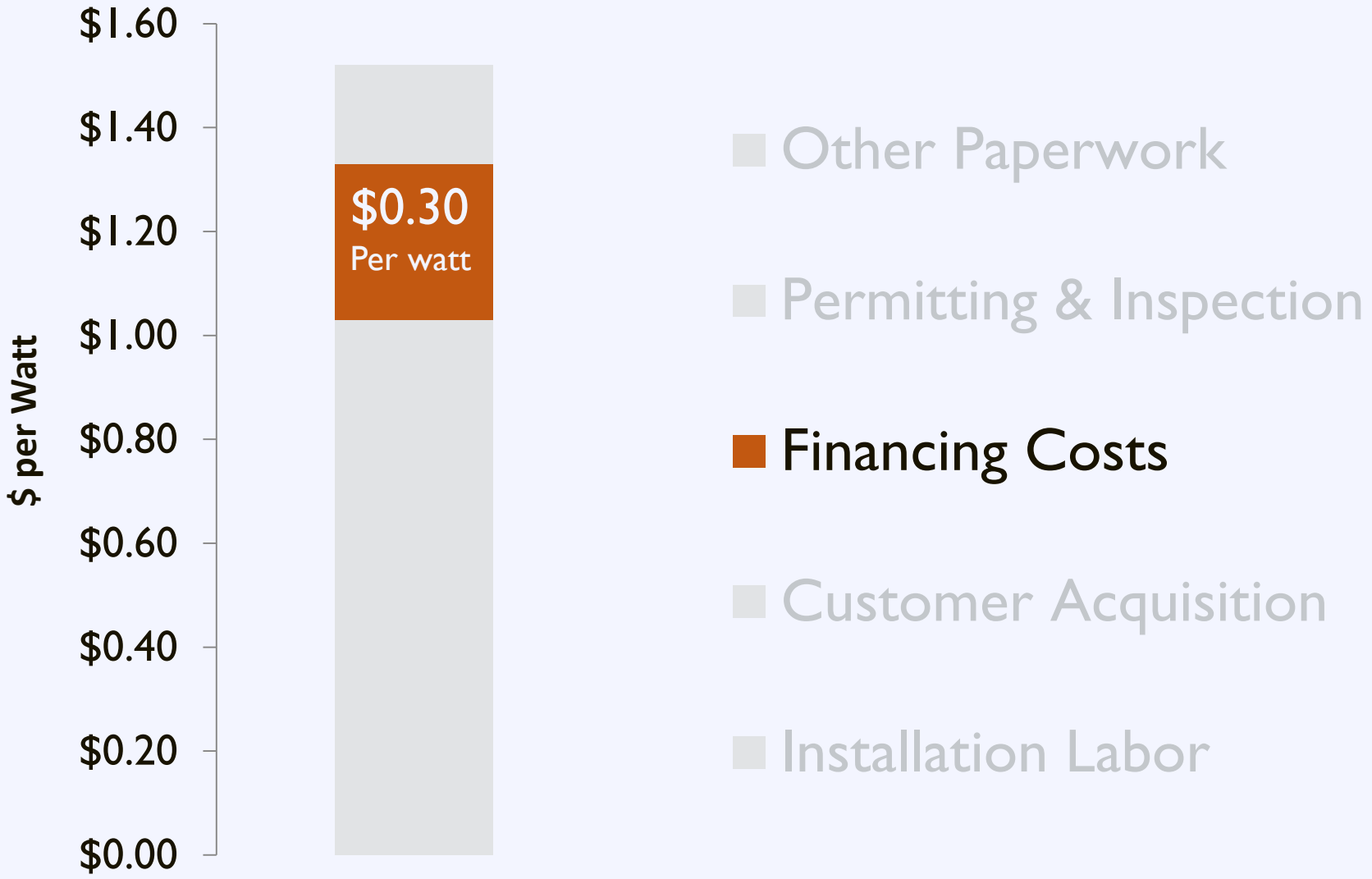
Expanding financing options

Addressing customer acquisition

Solar Market Development Tools

Effective Solar Permitting Process

Third Party Ownership



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The Solar Equation

Cost

+ Installed Cost

+ Maintenance

- Direct Incentive

Benefit

+ Avoided Energy Cost

+ Excess Generation

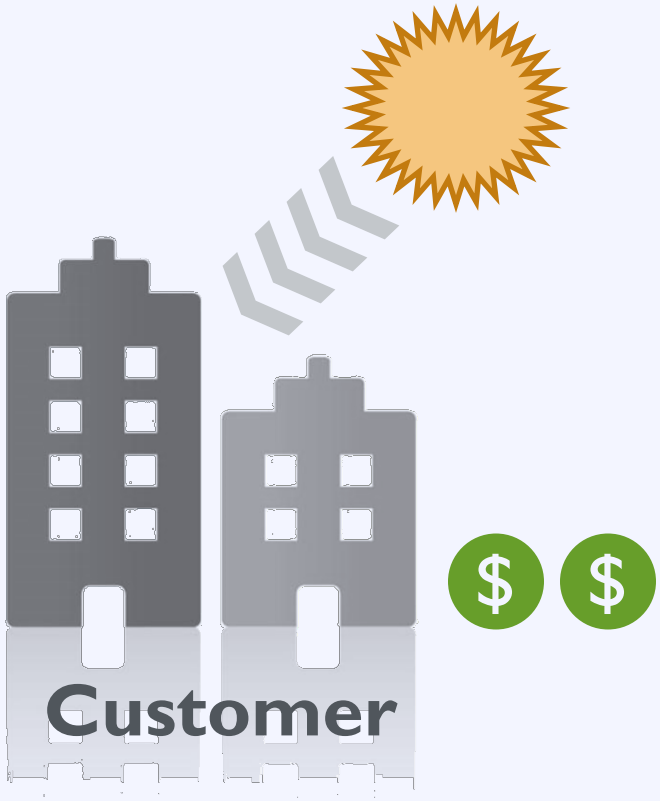
+ Performance Incentive

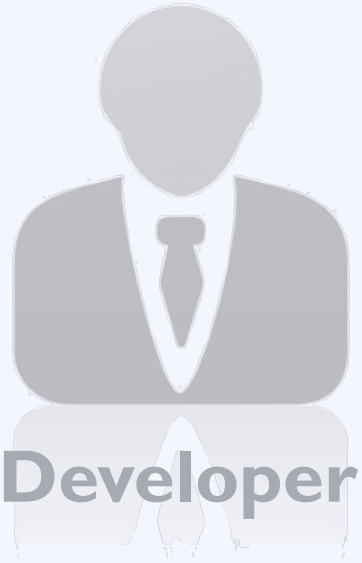
Ownership Options for Solar

Direct Ownership

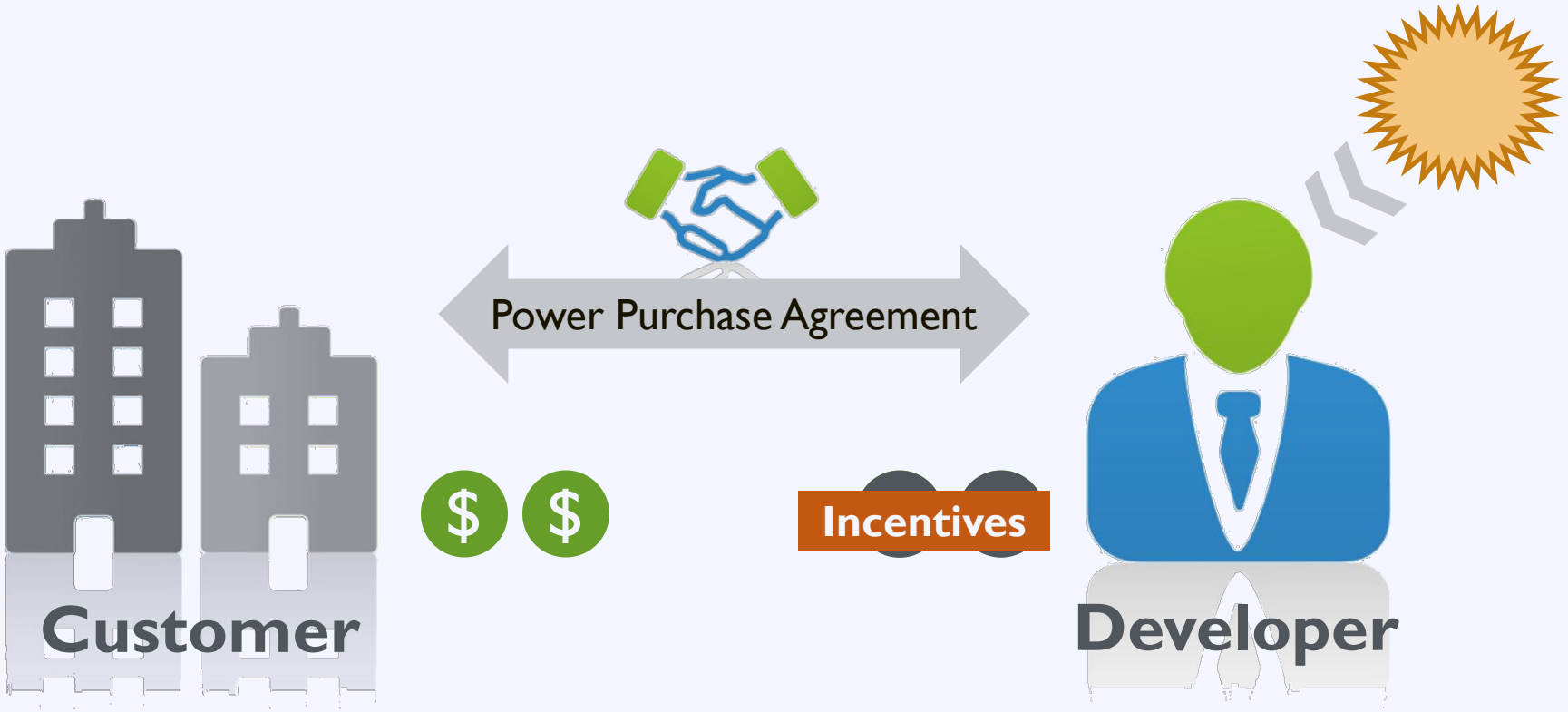
Third-Party Ownership

Direct Ownership

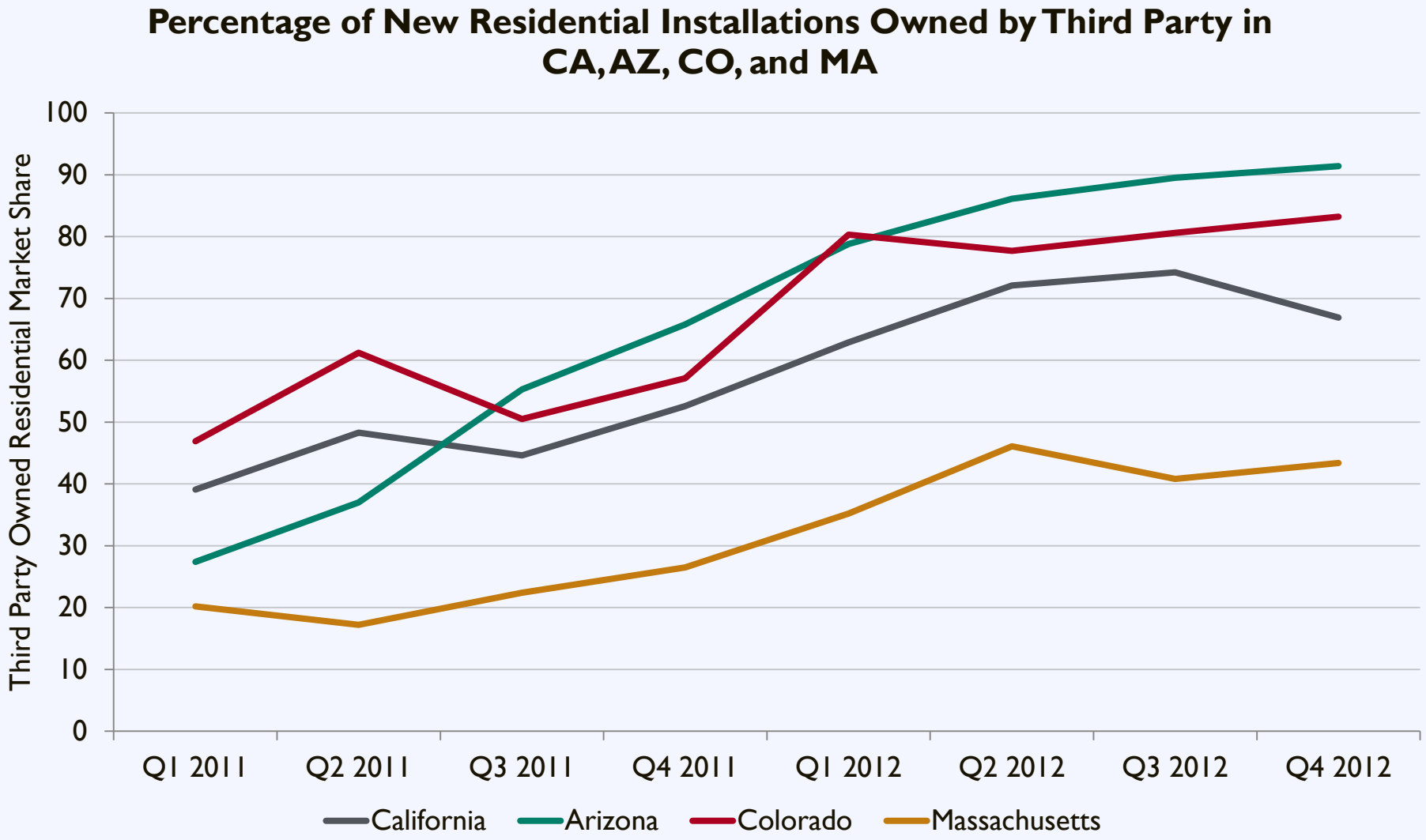




Third Party Ownership



Third Party Ownership



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U.S. Department of Energy

Source: GTM Research/ Solar Energy Industries Association, *U.S. Solar Market Insight 2012 Year-in-Review*

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

Ownership Options for Solar

Direct Ownership

Third-Party Ownership

Solar lending products to enable direct ownership

Engage Local Lenders

Fewer than **5%**

of the

6,500 banks in the US

are

actively financing solar PV projects

Ownership Options for Solar

Direct Ownership

Third-Party Ownership

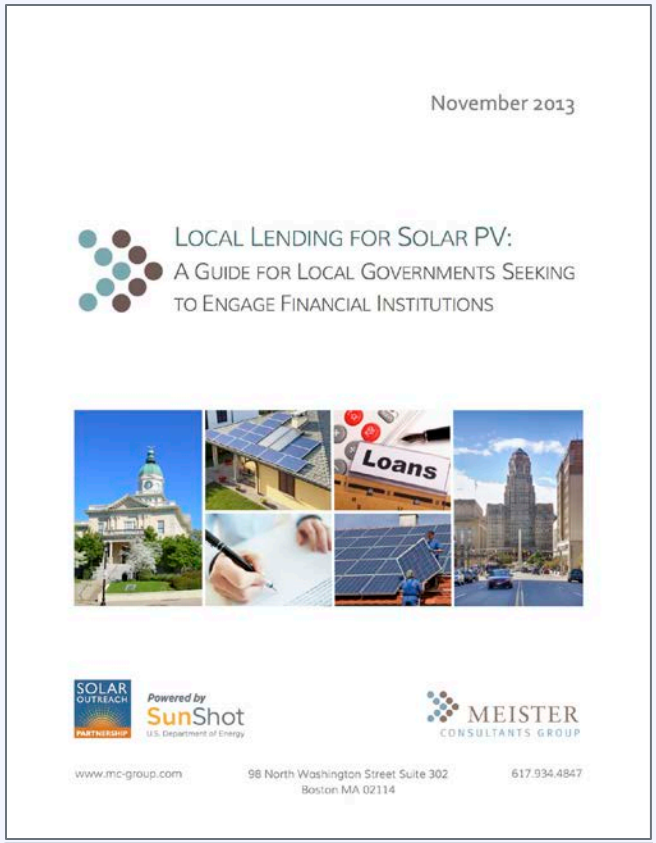
Expand direct ownership options by engaging local lenders

Solarize: 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 washington
a program of northwest seed

solarize portland

solarize pendleton oregon

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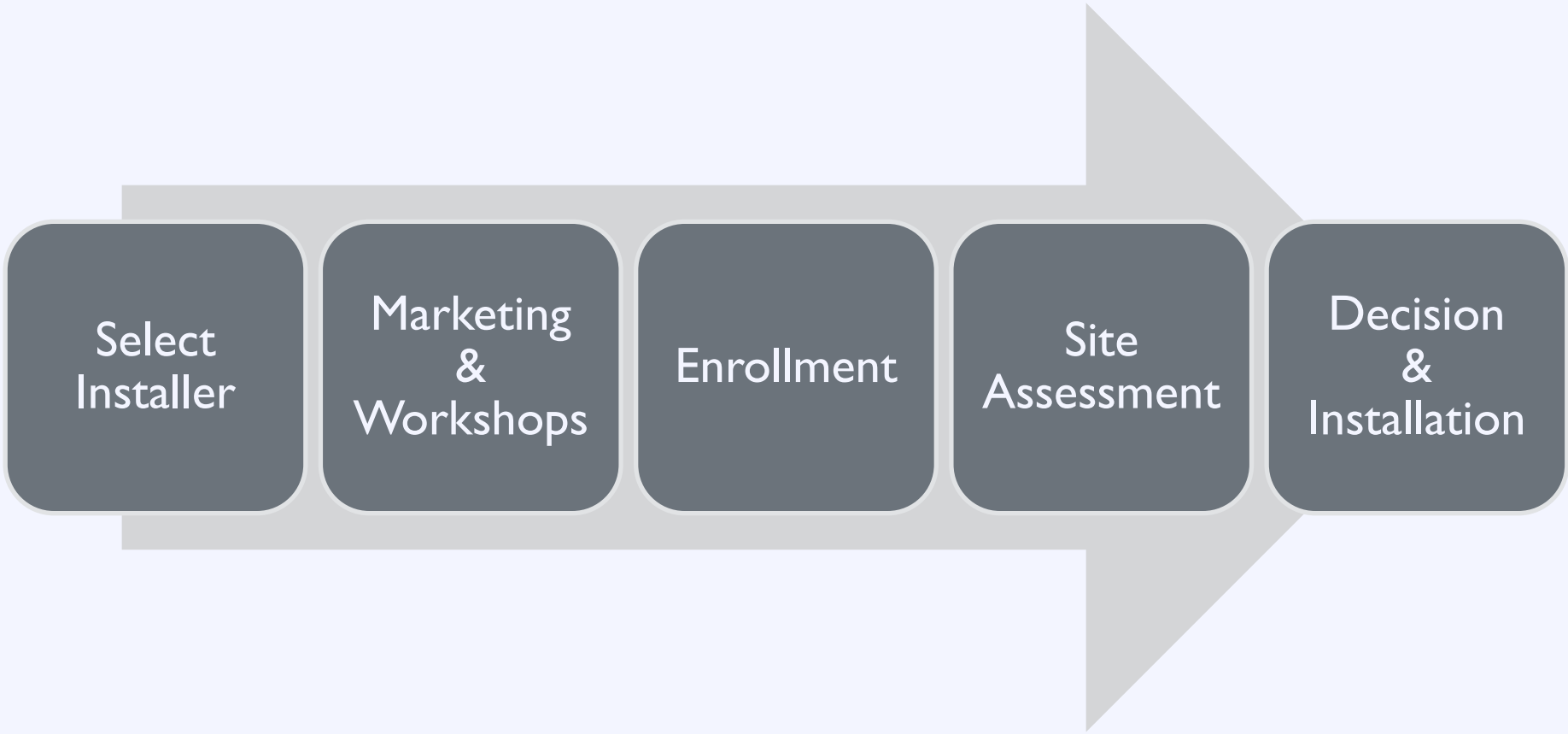
The Solarize Program

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

Solarize: Partnership

Program Sponsor	Community ties Technical knowledge
Solar Contractor	Solar installations Volume discounts
Citizen Volunteers	Campaign support Neighborhood outreach
Community Residents	Program participation Word of mouth

Solarize: Process

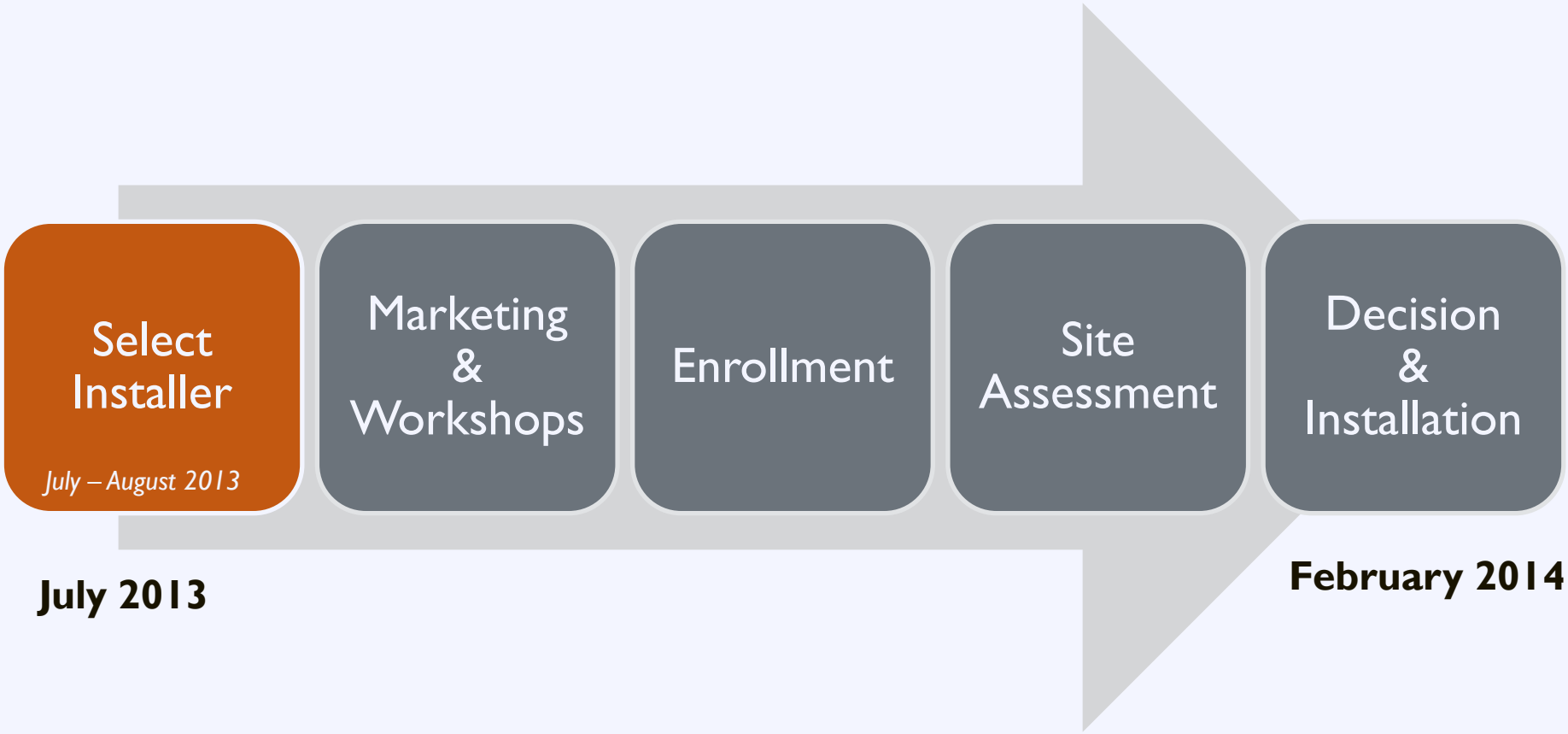


Solarize Plano: Case Study

Plano, Texas

Population: 272,000

Solarize Plano: Case Study



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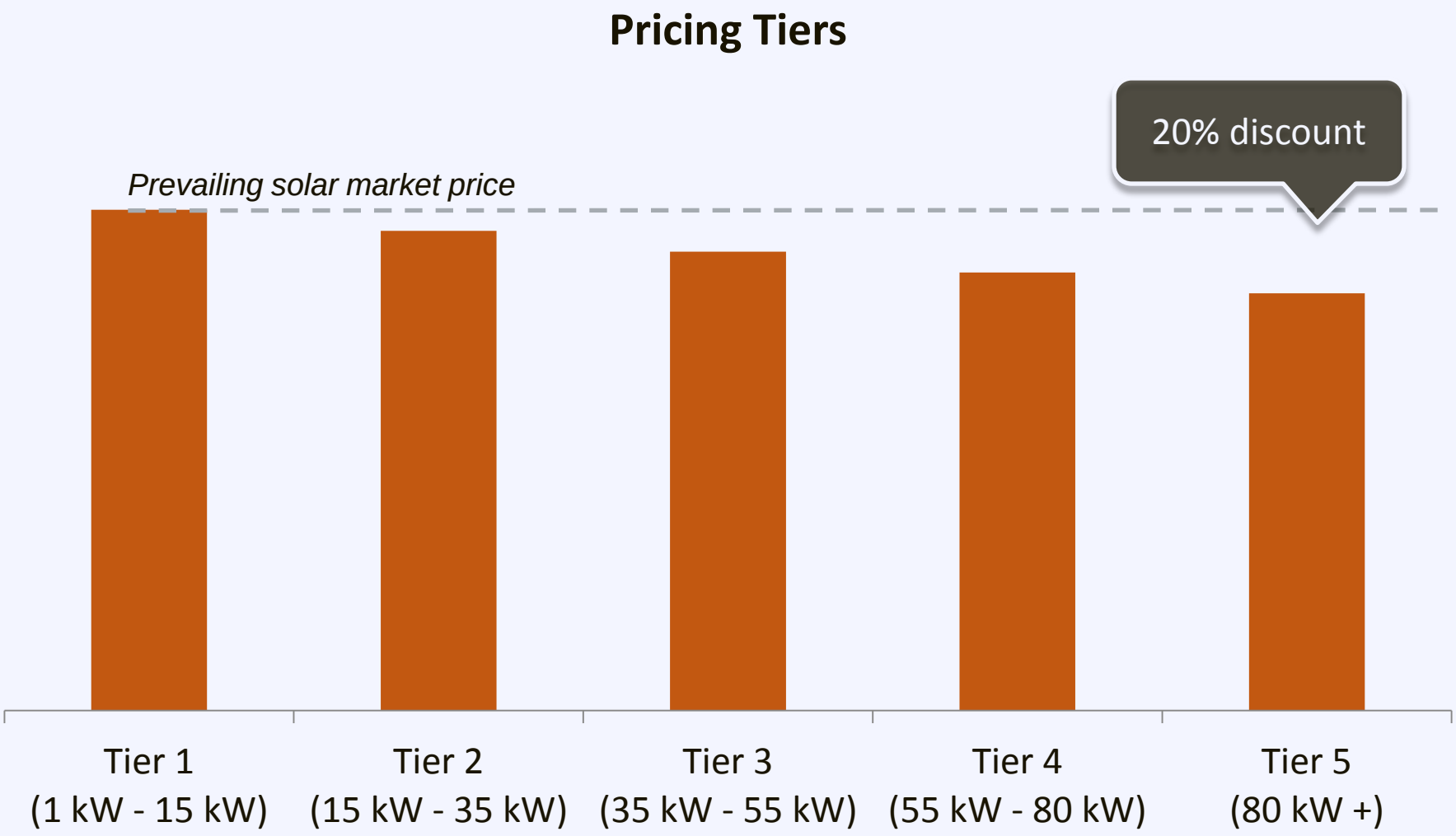

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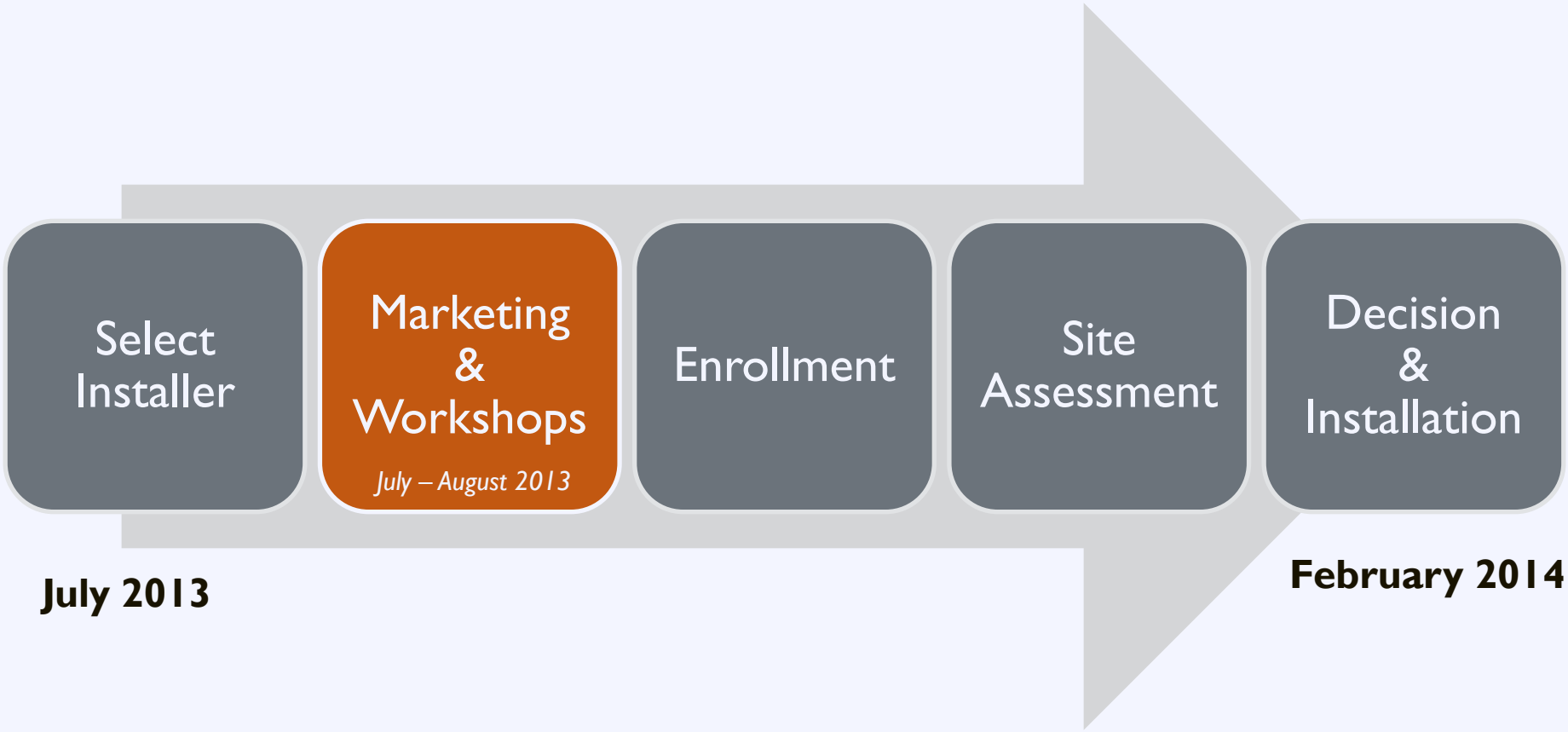
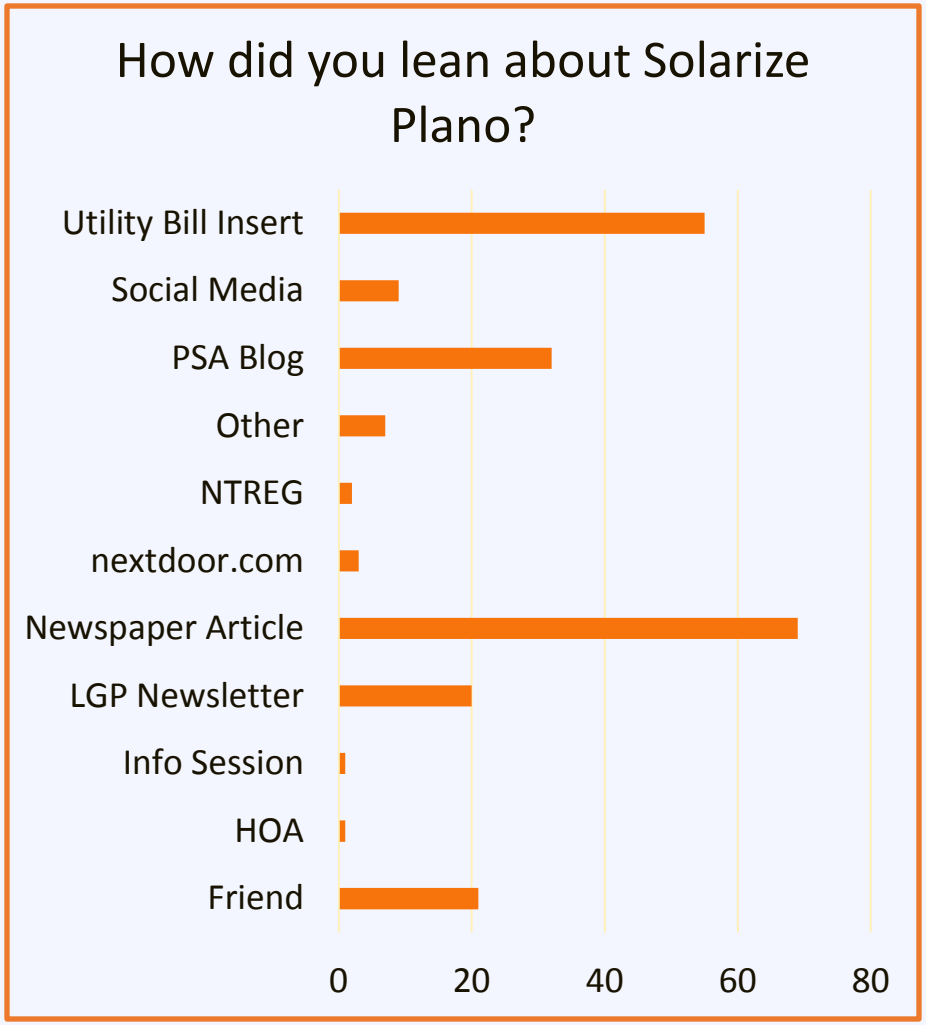


Solarize Plano: Case Study

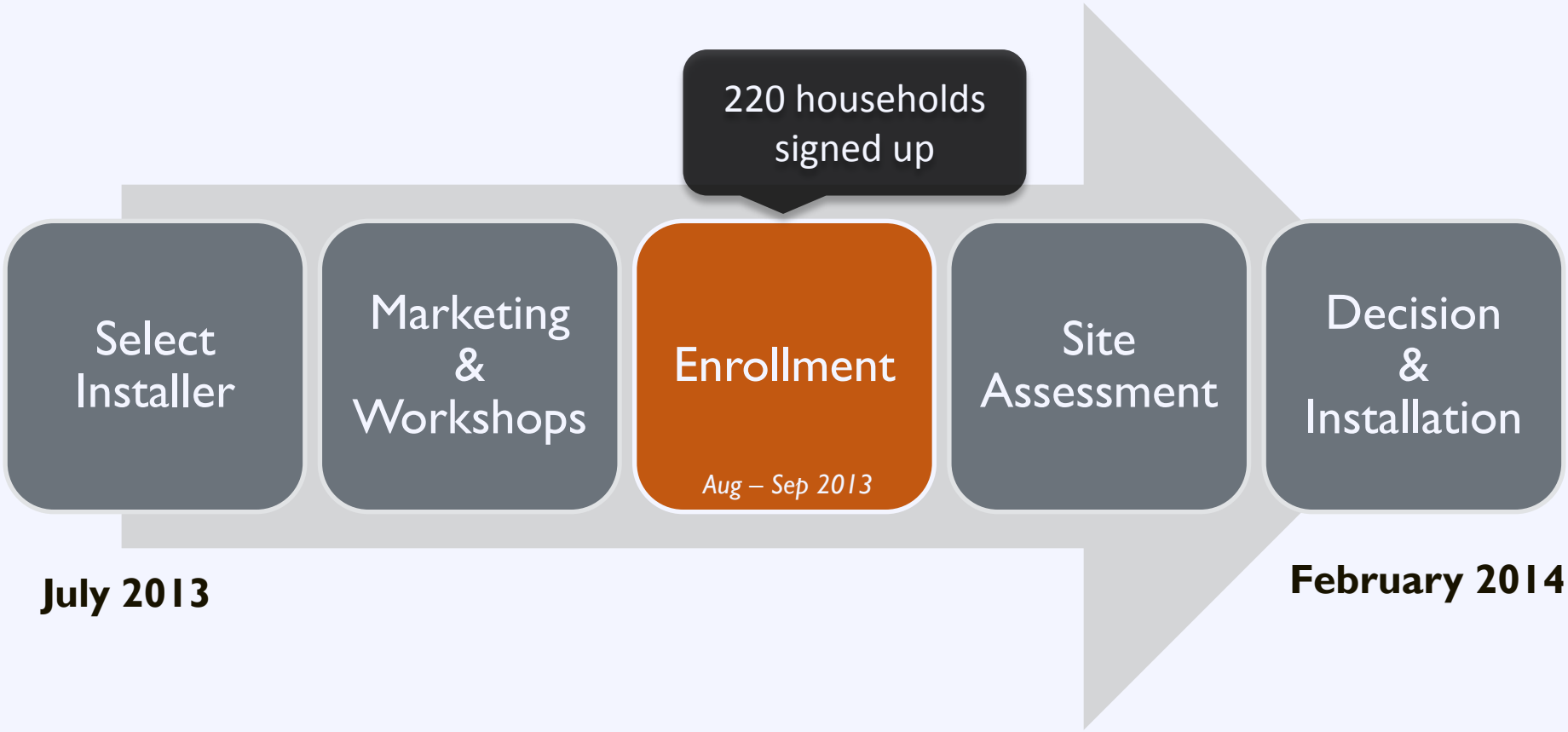
Marketing Strategy:

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



Source: Solarize Plano & NCTCOG

Solarize Plano: Case Study



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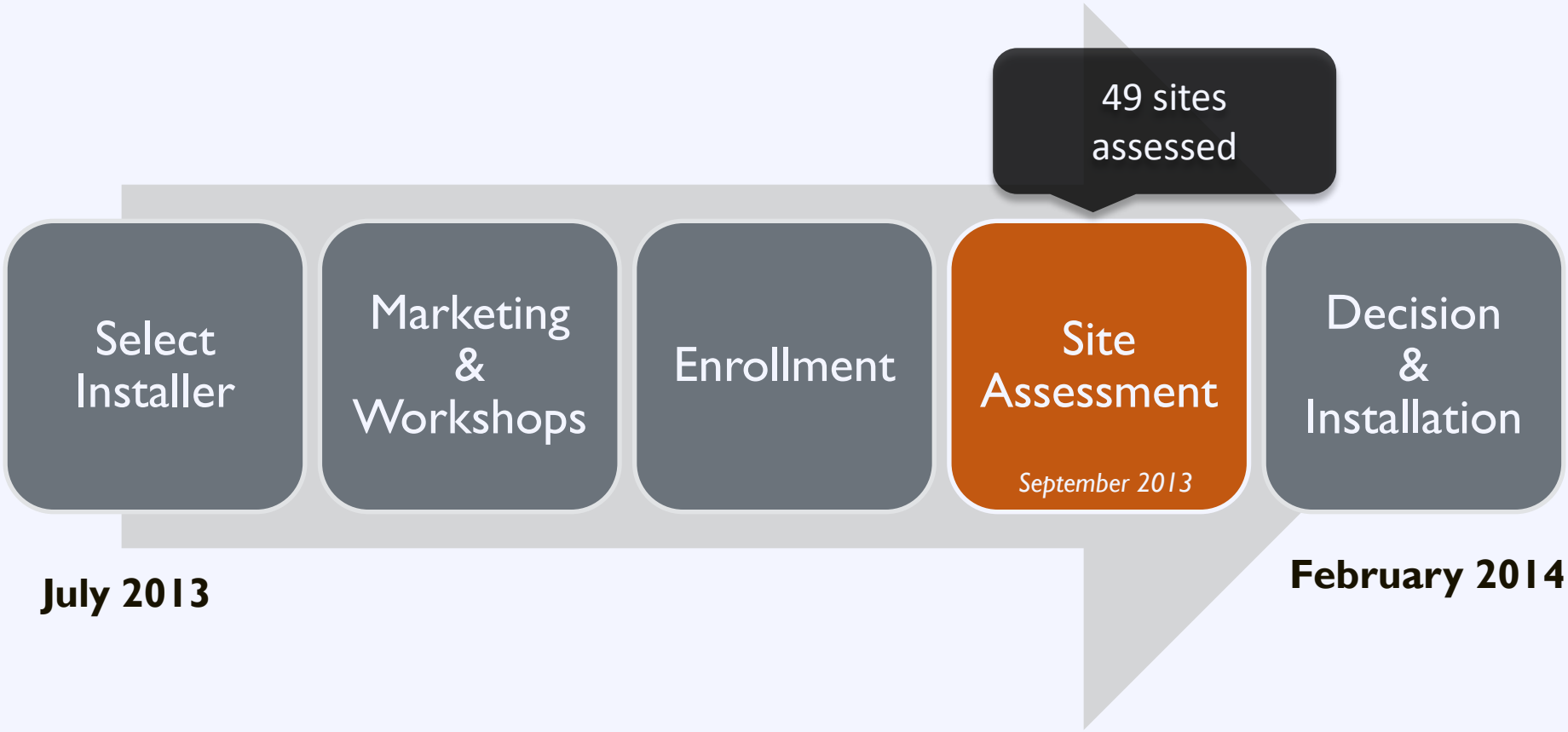
Solarize Plano: Case Study



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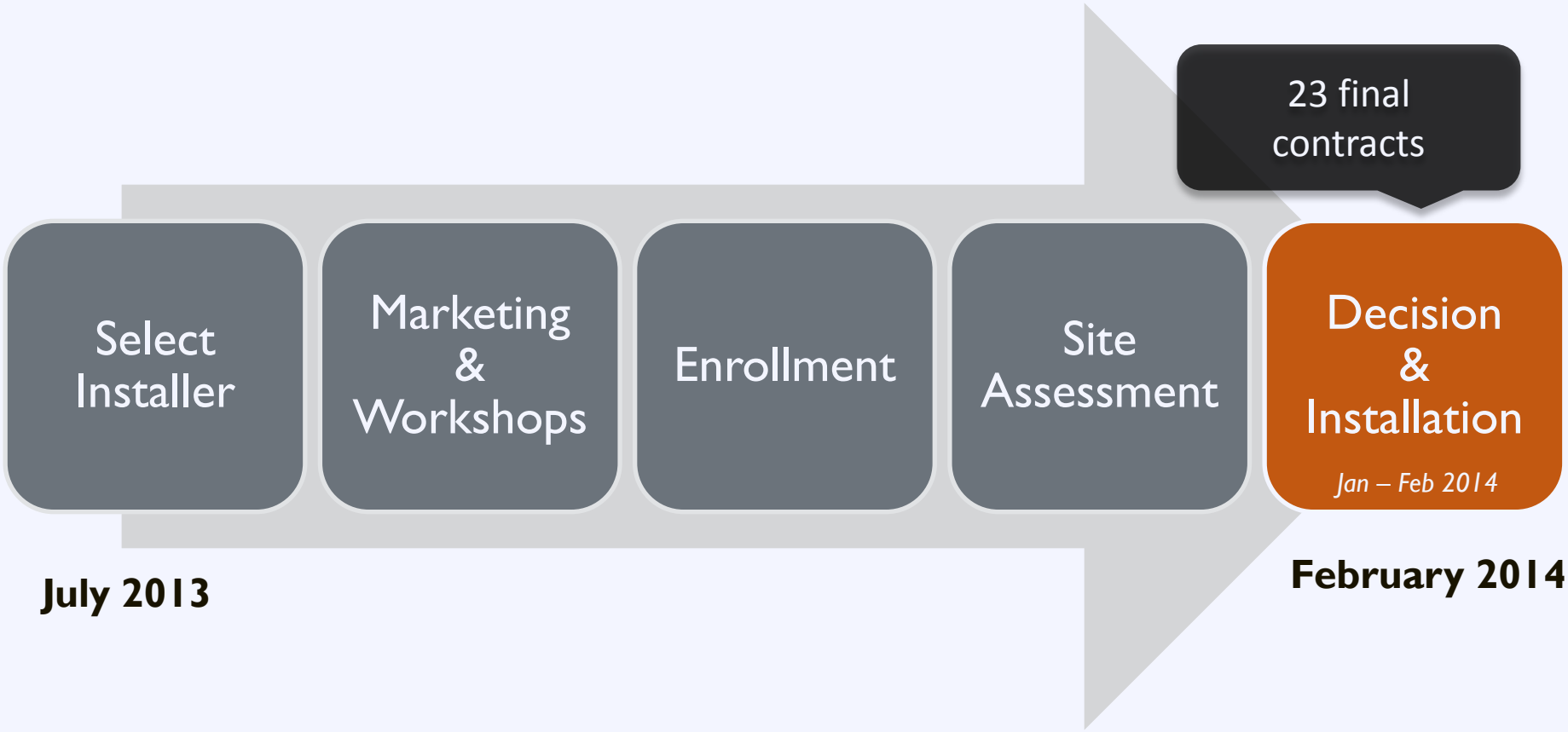

Solarize Plano: Case Study

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

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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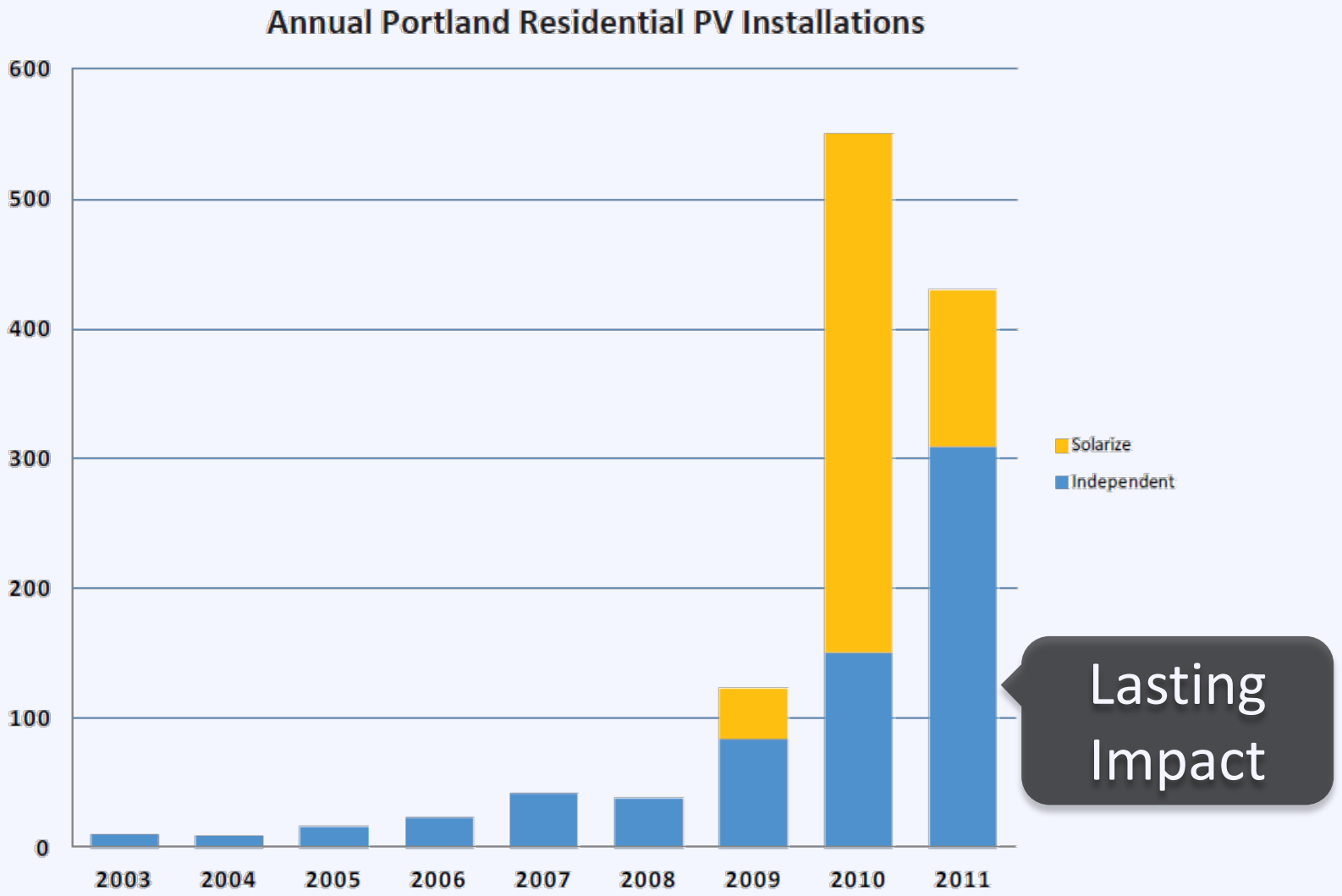
U.S. Department of Energy

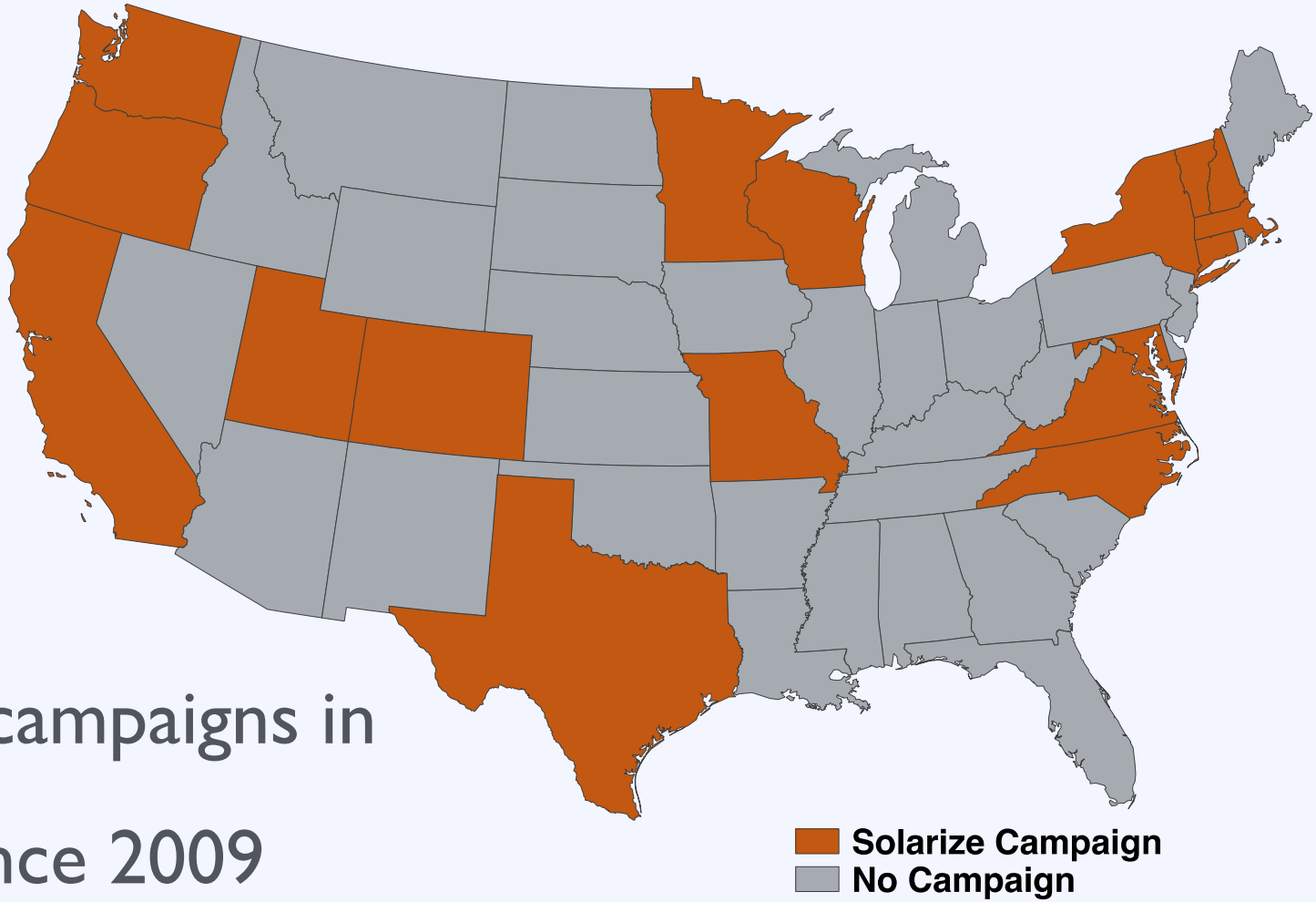
Source: NYU Stern and Yale School of Forestry – Peer Effects in the Diffusion of Solar Panels

Solarize: Lasting Impact



Source: NREL

Solarize: National Growth



Over 150 campaigns in

17 states since 2009

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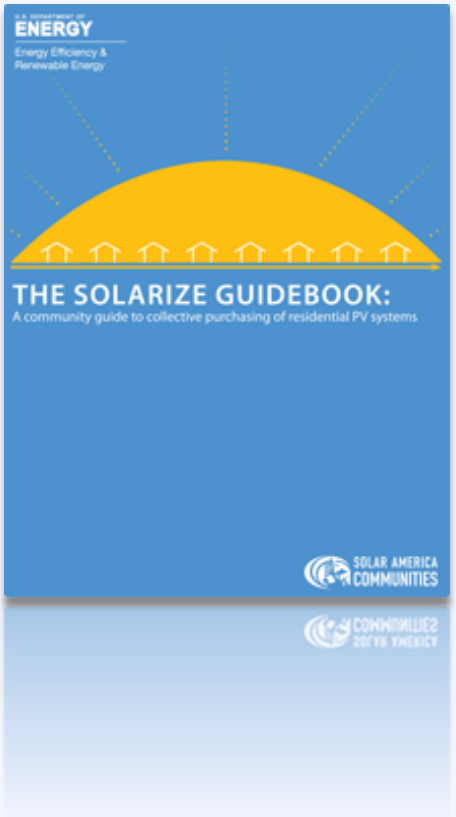
U.S. Department of Energy

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



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Iowa Solar Workshop

September 24, 2014

Warren McKenna -- Farmers Electric Cooperative
wmckenna@feckalona.com

The Walk

AEE Dealer Conference in AZ -- 1st annual – **2007**

Greensburg Greentown in KS -- Site visit after Tornado

RMI and SEI in CO, (Small is Profitable) -- Site visit

Make It Right in LA, -- New Orleans housing -- Site visit

Sierra Club Iowa and Heinrich Boll Stiftung -- Iowa Speaking Tour

- German Cooperatives, Dr. Andreas Wieg, Michael Diestel

Bakken Fields in ND -- The End of Easy Oil – Site visit

Germany, -- 25x25.org week long tour from Frankfurt to Berlin

- RE Site visits to the Reichstag for politics and policy

SOLAR 2013 – Baltimore MD -- Presentation – Progressive Utility

- Lonnie Gamble, MUM Sustainable Living Center, Fairfield IA

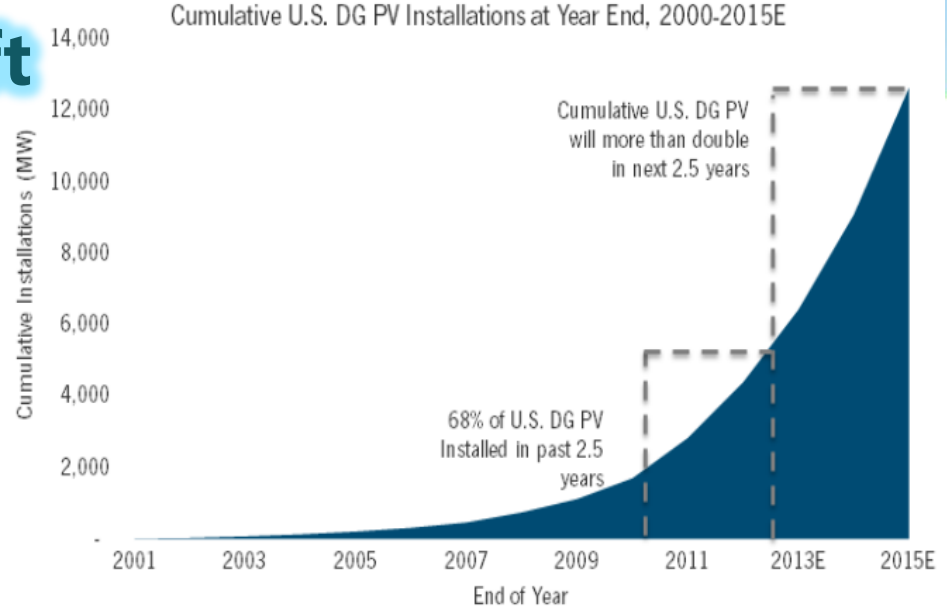
State Agriculture and Rural Leaders 2013 -- Speaker

- Legislative Ag Chairs Summit XII | Vancouver, British Columbia

Financing and Scaling Solar in North America -- Pocantico Center, NY – **2014**

Iowa Solar Energy Trade Association (ISETA) – founding Board Member

Solar Energy Paradigm Shift

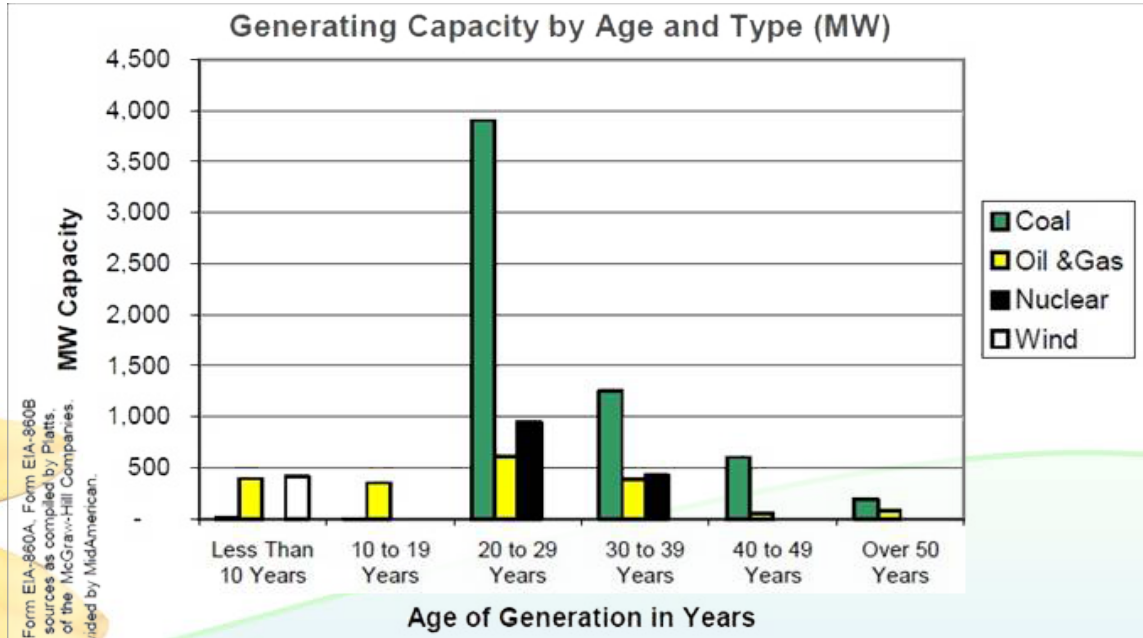


FERC Chair Jon Wellinghoff:

Solar 'Is Going to Overtake Everything'

Geothermal, wind, and other resources will supplement solar, Wellinghoff said.

Chart: GTM Research/SEIA U.S. Solar Market Insight



Farmers Electric Cooperative Vision – 25x25

- 25% reduction of outside energy purchased by 2025
  - Measurement, Monitoring, Analysis -- 3%
  - Energy Efficiency and Conservation -- 7%
  - **Renewable Energy** **-- 15%**
- Performance based energy model for long term sustainability
  - Low line loss, high load factor, high reliability
- Money flows and stays within the community!!!

RENEWABLE ENERGY GOALS (15%)

- Solar Schools
- Site Based Solar
- Community Solar
- Solar Farm
- Off-grid Solar

15% Renewable Energy Goal

15% reached with Iowa Wind and local Solar by year end 2014

Outside -- 50% power real-time MISO market (27% Iowa wind)

5% Iowa wind credits

Inside -- Solar 10% kWhrs -- 30% peak demand

Solar Schools

50 KW Iowa Mennonite School

Site Based -- Farm and Residential

- **Incentive Feed In Rate**
  - Separately metered -- buy all / sell all -- to net usage
  - Capped at monthly usage -- 6 cents for overproduction
  - Term limit -- 10 year guarantee
  - Current rate .10 cents

- **Easy Interconnect**
  - One page form
  - $ 350 service connection fee
  - $ -3.00 Green Power Project participation







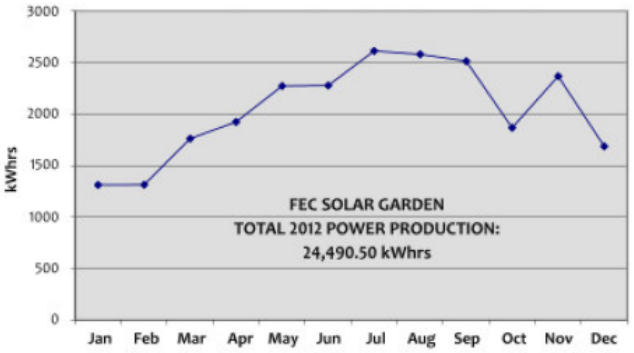

Community Solar Garden

- Very very popular program!!!
- Production shown on Bill.
- Credits averages
  $ 3.50/mod/mnth
- 10 module max ownership
- Separate input rate
- Certificate of ownership with mod serial # issued

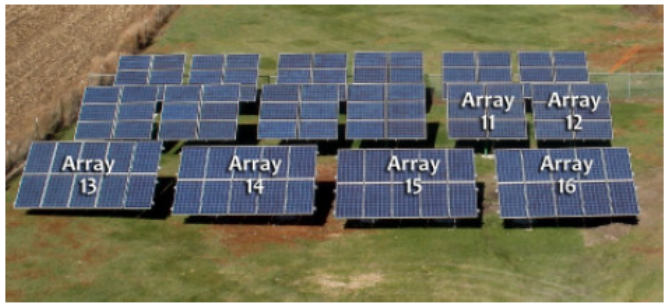
FEC Community SOLAR GARDEN

January 9, 2013

The Farmers Electric community-owned solar garden has now had one full year of generating clean, renewable power for FEC customers. The graph (right) shows power production throughout the year. We were especially pleased with the solar garden's mid-summer performance. Its maximum production often occurred during periods of peak demand. Offsetting the "peak" helps keep our wholesale power rates steady.



Six new arrays added in 2012



During 2012, the solar garden expanded to 112 modules on 16 arrays. Many of the new modules came online in November ... which explains that month's spike in production (shown above).

Owners of the 52 new modules are listed below ...

Arrays 11 & 12
West Union Mennonite Church (12 modules)

Array 13
John Mast
Larry Schrock
Laurel Schlabaugh
Donovan Bender
Kenneth J. Egli
Trent & Tami Yoder
David & Wanda Beachy
Wilmer & Trish Yoder
Galen Yoder (2)

Array 14
Mike & Chris Brenneman (4)
The Water Shop (4)
James Graham (2)

Array 15
Ed Gingerich (2)
Jon Gingerich (2)
Linton Weaver (2)
John Schrock (4)

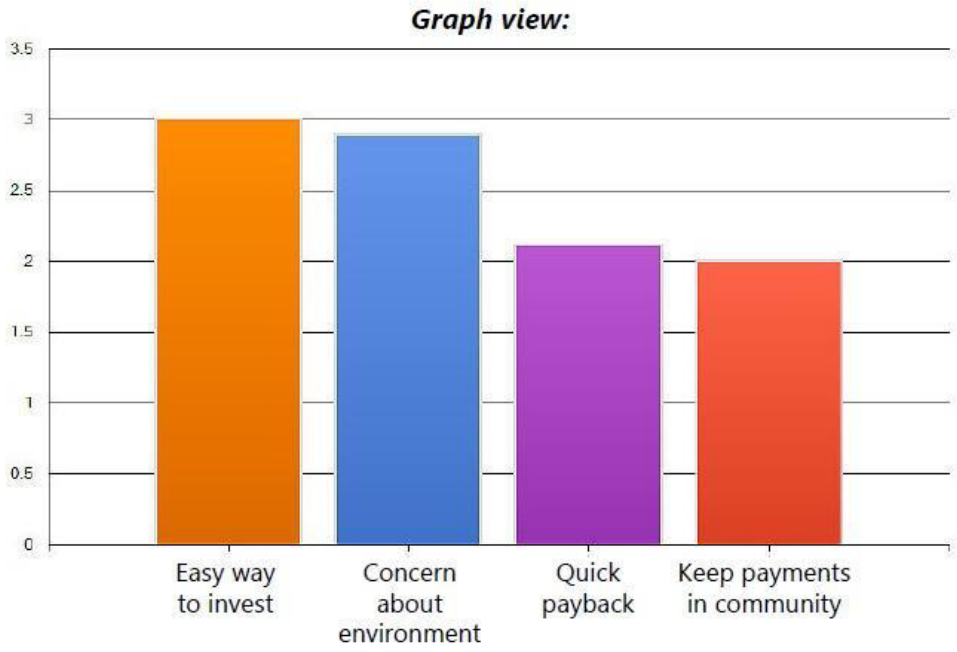
Array 16
Melvin Schulz (3)
Ken Bender (5)
low-income acc't.
low-income acc't.

FEC Customer Survey

Decision to purchase

FEC Community SOLAR GARDEN

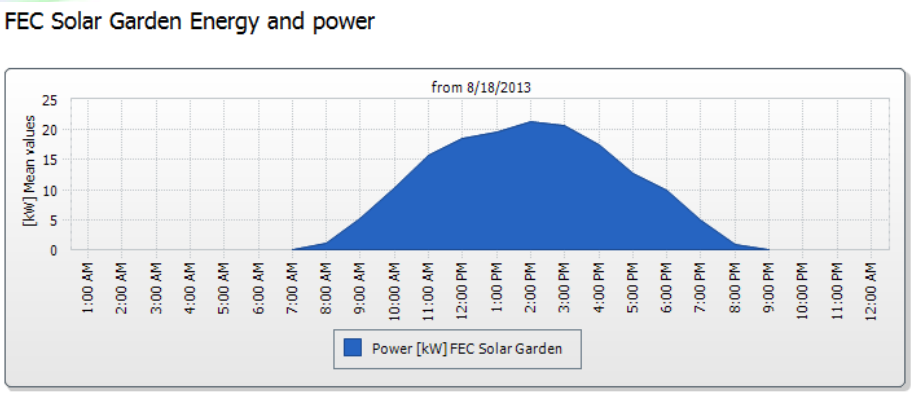
1. **Easy way to invest**
2. **Concern about environment**
3. **Quick payback**
4. **Keep payments in community**

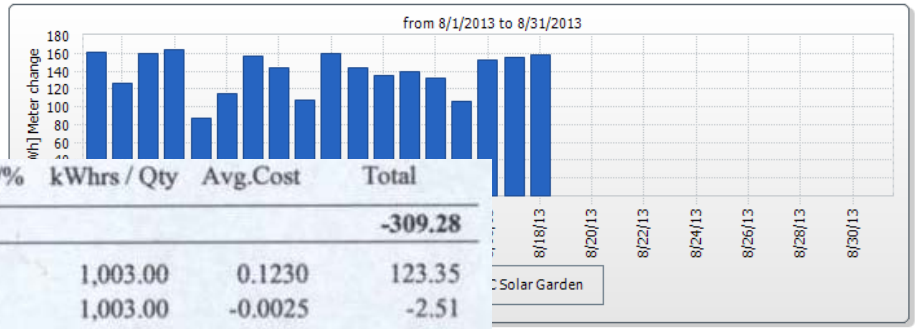


Billing Credits (FEC model)

kWhrs to $ and measurement, monitoring, billing

- There is a CONNECTION between what you use and what you generate
- Customers want to maximize their generation benefit by watching their usage

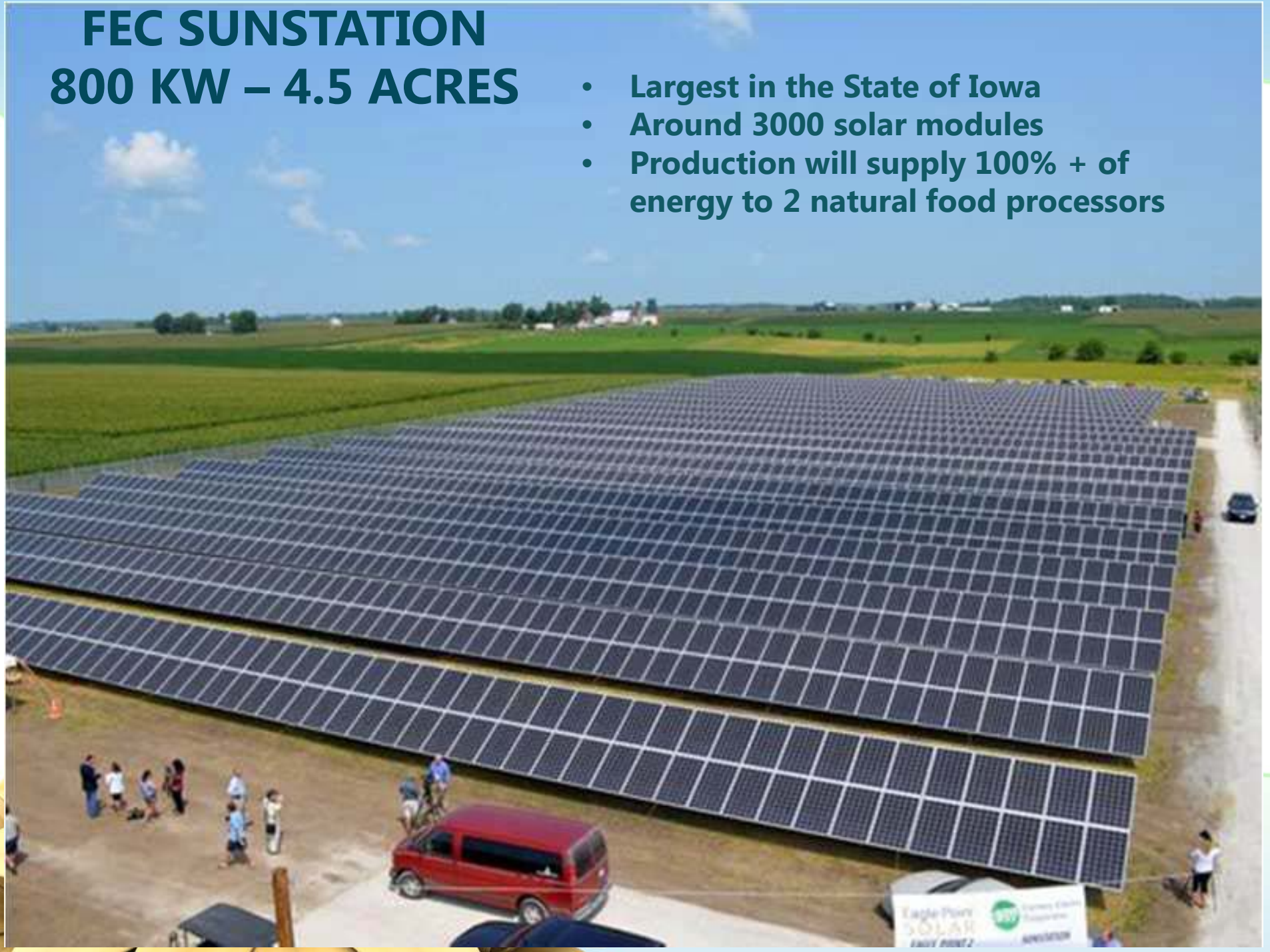




Ref. No.	Code	Descriptions	Dates	X/%	kWhrs / Qty	Avg.Cost	Total
	PB	**Previous Balance**					**-309.28**
1483	MM	Main Meter	7/28/12 8/26/12		1,003.00	0.1230	123.35
1483	EC	Energy Cost Adjustment	7/28/12 8/26/12		1,003.00	-0.0025	-2.51
113695565	EC	Energy Cost Adjustment	7/29/12 8/29/12		872.00	-0.0025	-2.18
113695565	MS	Meter Subtract	7/29/12 8/29/12		872.00	0.1150	100.28
	SC1	Meter Charge	7/30/12 8/30/12		1.00	17.5000	17.50
	LOI	Local Option Sales Tax Iowa County	7/30/12 8/30/12		164.53	0.0100	1.65
	GP30	Green Power Program	7/30/12 8/30/12		1.00	3.0000	3.00
	PD	Payments	9/19/12 9/19/12		1.00	-200.0000	-200.00
113695517	SW	Solar-Wind Meter	7/29/12 8/29/12		337.00	-0.2000	-67.40
113695559	SL	Solar Garden Meter	7/29/12 8/29/12		36.12	-0.1250	-4.51
						Current Month Subtotal :	**-30.82**
						Account Balance (Previous + Current) :	**-$340.10**

FEC SUNSTATION
800 KW – 4.5 ACRES

- Largest in the State of Iowa
- Around 3000 solar modules
- Production will supply 100% + of energy to 2 natural food processors



3.6 Million Invested in Solar

The real **Genius** in the RE part of our vision is in the fact that the Cooperative only owns **10 modules** of the **thousands of modules** installed on its electric system.

No investment or debt on our balance sheet due to RE.

ZERO!

Iowa Solar Energy Trade Association

Go to -- IowaSETA.org -- and join

Networking

Tours

Training

Newsletter

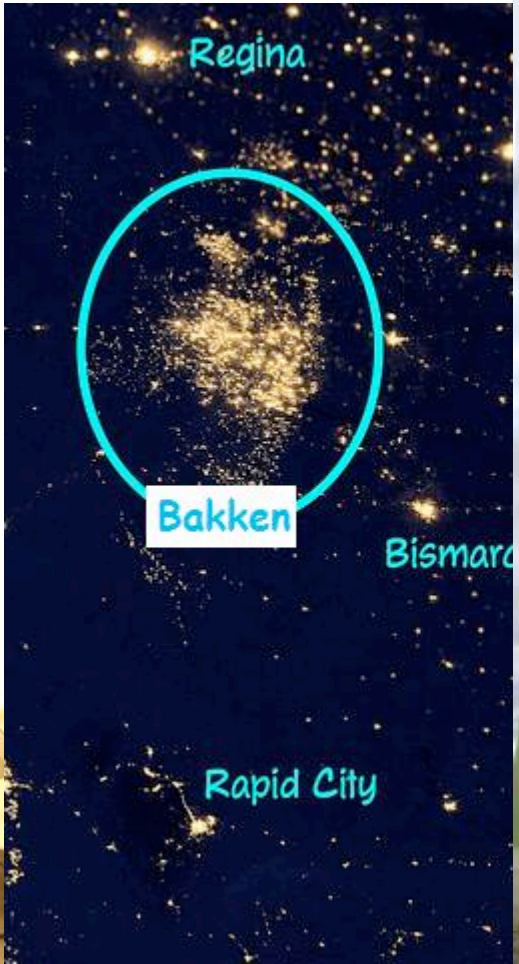
Policy

To plan for the future we need:

- Reliable policy
- Brave politicians!!!!!!
- Long term framework and targets
- Reasonable budgets
- Bankable projects
- Local individual action plans with strong community networks

Soren Hermansen, Samso Island Denmark,
MUM Lecture Series http://new.livestream.com/mum/Hermansen


Meditation Center
Solar Photovoltaic Panels
Energy Cottage
Solar Thermal Panels
Photo taken from top of 10 kW wind tower


Regina
Bakken
Bismarc
Rapid City


153
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171
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Links isst er!


Duluth
Minneapolis
St. Paul

What is your Solar Vision?

THANK YOU

Historic City Hall Renovation

Photovoltaic Installation

City of West Des Moines

Iowa Solar Workshop

September 24, 2014

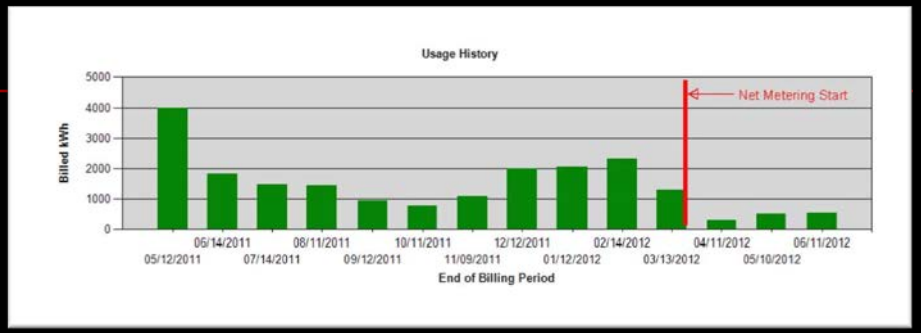
Project Context

- The Town of Valley Junction was incorporated in 1893 and became the City of West Des Moines in 1938 and is now home to over 150 distinctive stores, restaurants, and independent businesses, each with its own unique character. Valley Junction has become one of Central Iowa's most unique attractions.
- Valley Junction is one of the original Main Street Iowa communities, managed by the Historic Valley Junction Foundation. Valley Junction also has the designation of an Iowa Cultural District and is one of the communities participating in the Iowa Great Places program.

Project Description

- This photovoltaic installation was part of a intensive historic renovation of the original City Hall & Fire Station building for Valley Junction
- Project intent was to provide a demonstration on the possibilities of incorporating sustainable construction within a historic structure.
- Renovation included implementing sustainable upgrades on the building shell, mechanical, electrical and plumbing system and the integration of renewable energy systems (geothermal and photovoltaic)
- Total project costs 1.8 million. Construction costs of $950,000. The majority of the project was funding by grant dollars (13 different funding sources)
- LEED Platinum Certification in 2013

Photovoltaic System



- 5 KW array
- Ballast system
- 10 degree pitch on panels
- Micro inverters for each row of panels
- Original estimate on energy production: System would supply 18% of the building needs.
- Actual tracking is showing 30 to 35% of the building need are supplied by system.

Project Approach: PV a Viable Choice

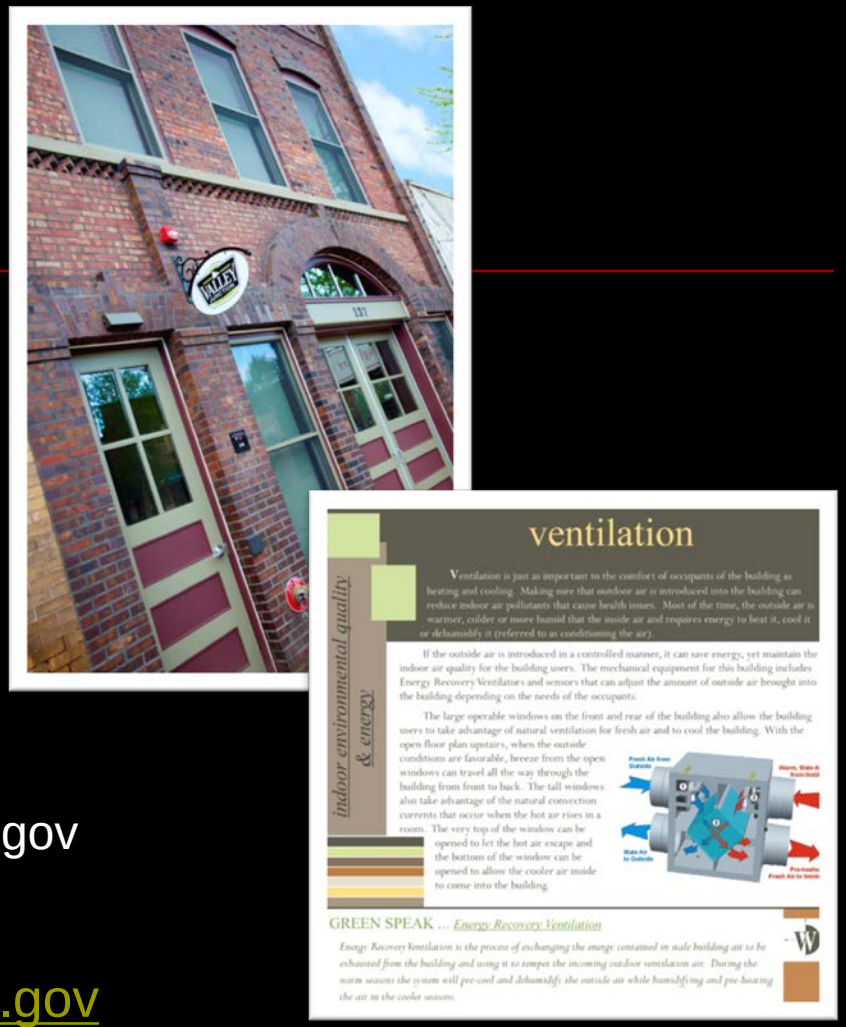
- First, reduce heat loss
  - Adding insulation @ roof and floor slab
  - Window and door replacement
  - Masonry wall repair and tuck-pointing
- Secondly, increase systems performance
  - Right size system to needs, including ducts
  - High efficiency equipment and fixtures
  - Advanced controls
- Third, add renewable energy sources

Hurdles

- Existing building
  - Roof membrane replacement
  - Roof structure reinforcement
- Historic Building
  - Listed on National Register
  - PV system could not be visible
  - Resulted in a shallow pitch installation – often blocked by snow
  - Entire roof area could not be covered to avoid visible fall protection system
- Installation issues
  - Vendor closed doors
  - Contractor not knowledgeable on installation methods
  - Confusion on metering and emergency shutoff requirements

Thank You!

- Please visit
  - 137 5th Street, WDM
  - Visitors Center on Main Floor
  - Open during most special events
- Questions?
  - Linda Schemmel, AIA
    - 515-222-3620
    - Linda.Schemmel@wdm.iowa.gov
- More Information
  - City Website: www.wdm.iowa.gov
    - About Us/Striving After Sustainable Solutions/LEED Certified Buildings in West Des Moines



Agenda

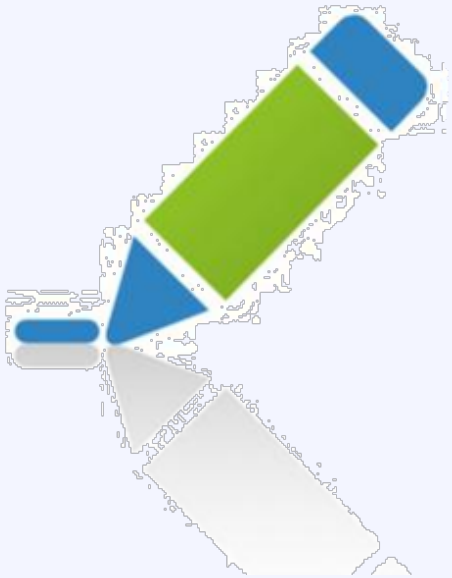
1:40 – 2:00	Putting Solar Energy on the Local Policy Agenda
2:00 – 2:20	State of the Local Solar Market
2:20 – 2:50	Federal, State, and Utility Policy Drivers
2:50 – 3:00	*Break*
3:00 – 3:30	Planning for Solar: Getting Solar Ready
3:30 – 4:00	Solar Market Development Tools
4:00 – 4:30	Solar in Iowa: A Local Perspective
4:30 – 4:50	Developing Solar Policy For Your Community
4:50 – 5:00	Next Steps

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.

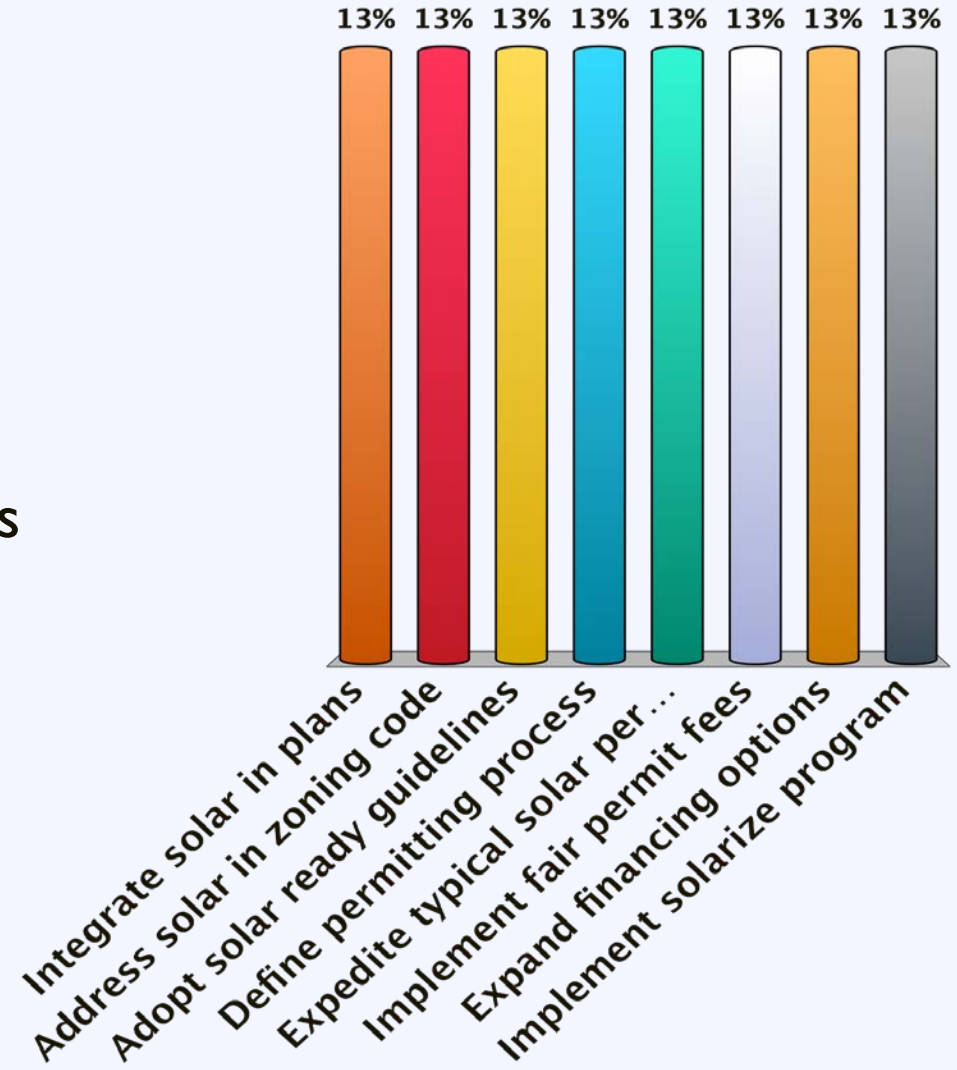


Activity: Solar in Your Community

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.

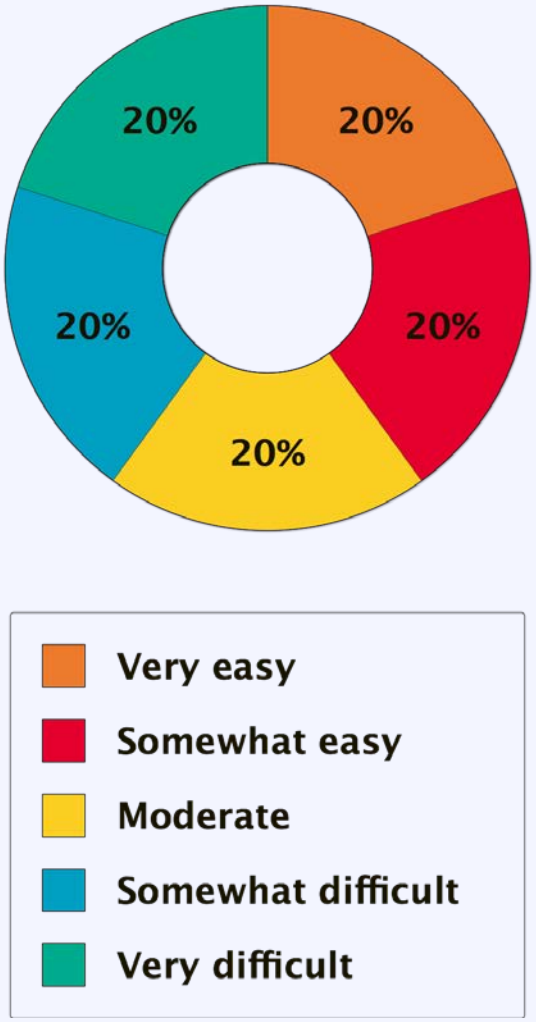
Which "best practice" did you select to pursue first?

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? [Colored Index Card]

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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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U.S. Department of Energy

Chad Laurent

Meister Consultants Group

chad.laurent@mc-group.com

Autumn Proudlove

NC Clean Energy Technology Center

afproudl@ncsu.edu

Ryan Cook

Meister Consultants Group

ryan.cook@mc-group.com