

Solar Powering Your Community

Deploying Solar on Schools



Powered by

SunShot

U.S. Department of Energy



Powered by

SunShot

U.S. Department of Energy

Alex Winn

The Solar Foundation

awinn@solarfound.org

(202) 540-5348

About the SunShot Solar Outreach Partnership

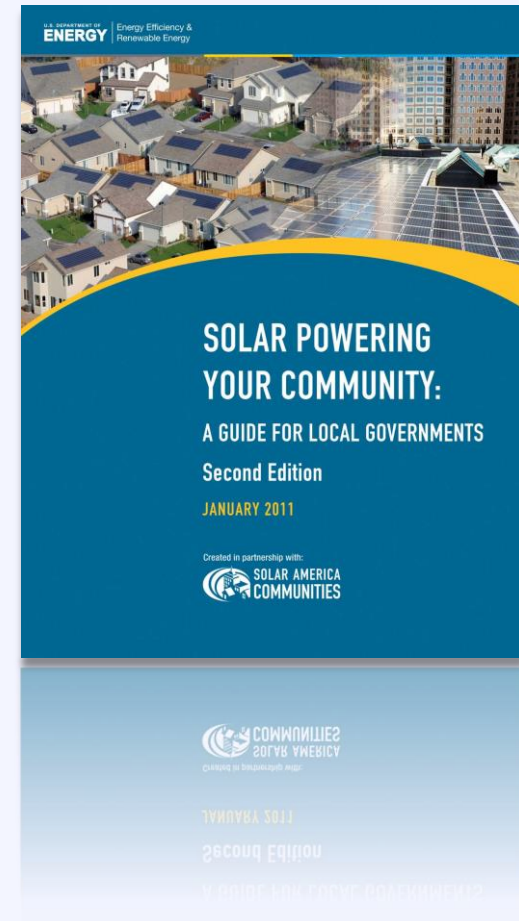
- Increase installed capacity of solar electricity in U.S. communities
- Streamline and standardize **permitting and interconnection processes**
- Improve **planning and zoning codes/regulations** for solar electric technologies
- Increase access to **solar financing options**

About the SunShot Solar Outreach Partnership

Resource Solar Powering Your Community Guide

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

www.energy.gov



About the SunShot Solar Outreach Partnership

Technical Support

- 'Ask an Expert' Live Web Forums
- 'Ask an Expert' Web Portal
- Peer Exchange Facilitation
- In-Depth Consultations
- Customized Trainings



www.solaroutreach.org

Poll

What is your experience with solar?

Solar Technologies



Solar Photovoltaic (PV)



Solar Hot Water



Concentrated Solar Power

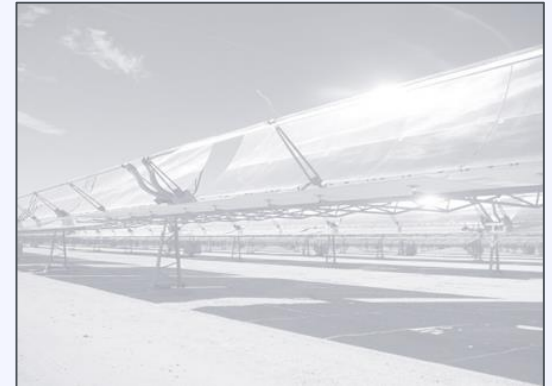
Solar Technologies



Solar Photovoltaic (PV)



Solar Hot Water



Concentrated Solar Power

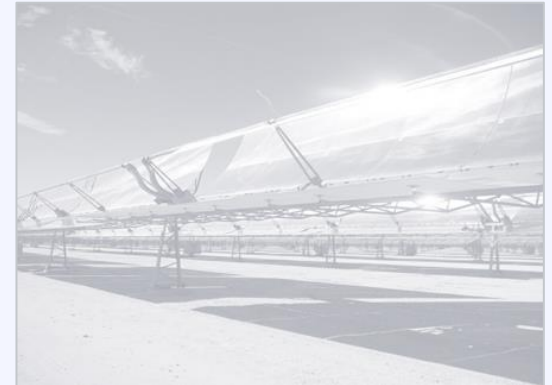
Solar Technologies



Solar Photovoltaic (PV)

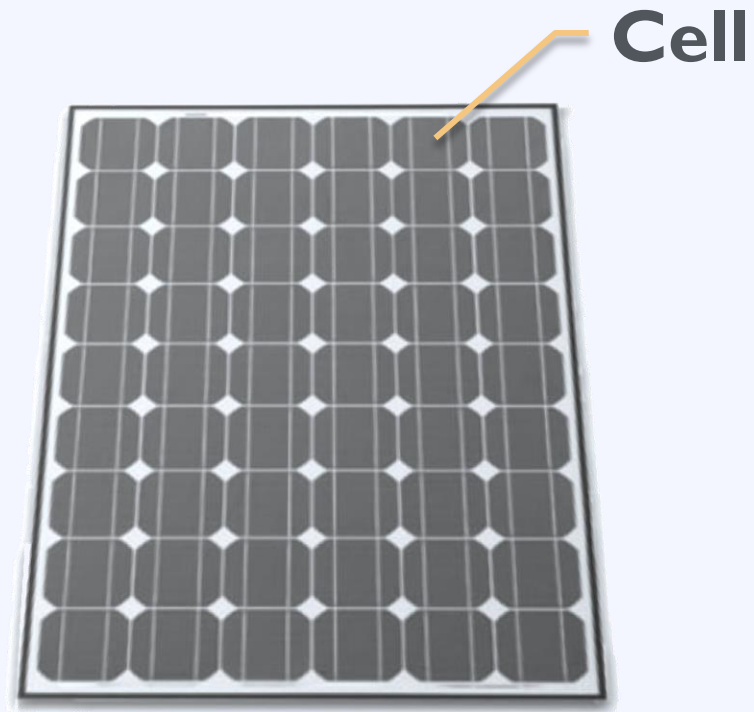


Solar Hot Water



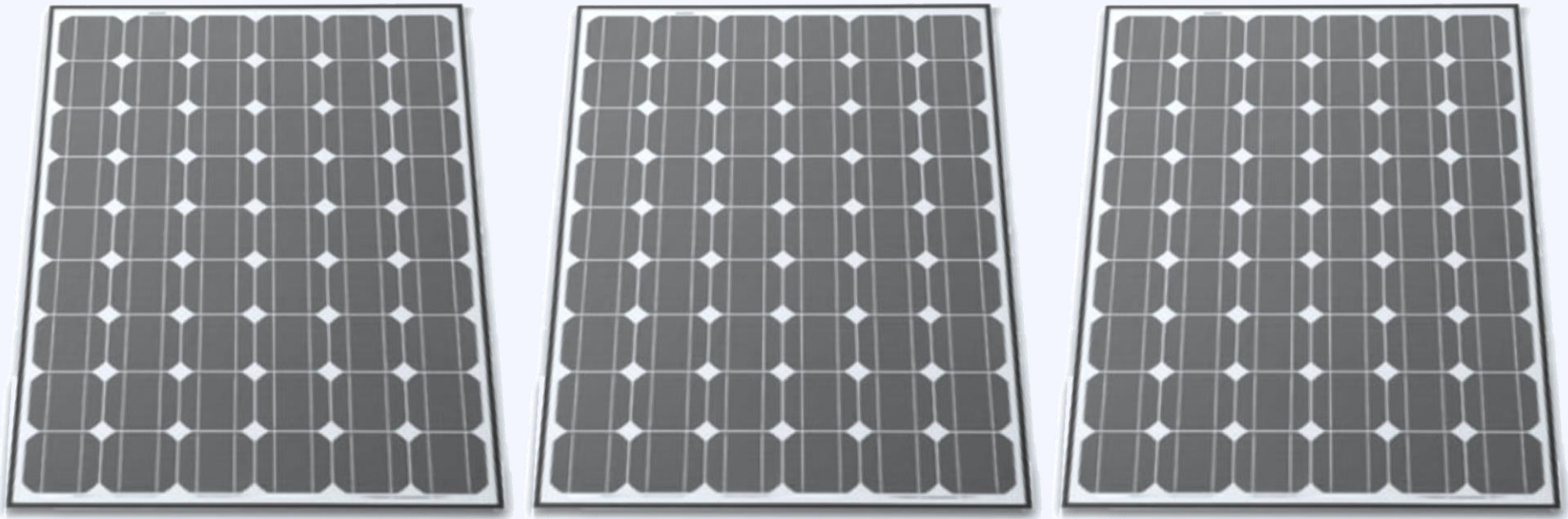
Concentrated Solar Power

Some Basic Terminology



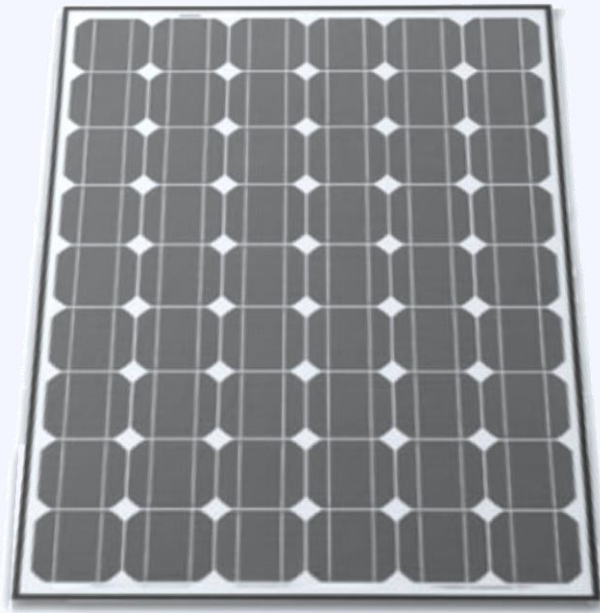
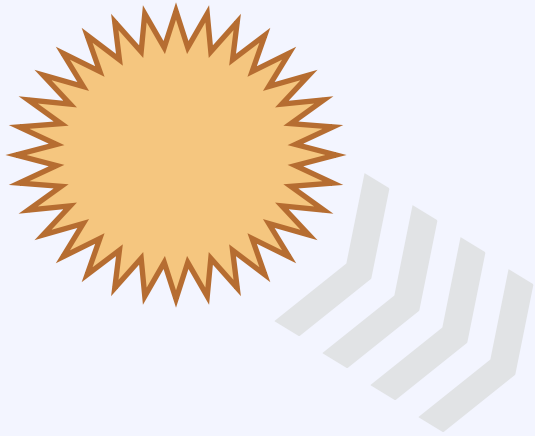
Panel / Module

Some Basic Terminology



Array

Some Basic Terminology



Production
Kilowatt-hour (kWh)

Capacity / Power
kilowatt (kW)

Some Basic Terminology



Residence
5 kW



Factory
1 MW+

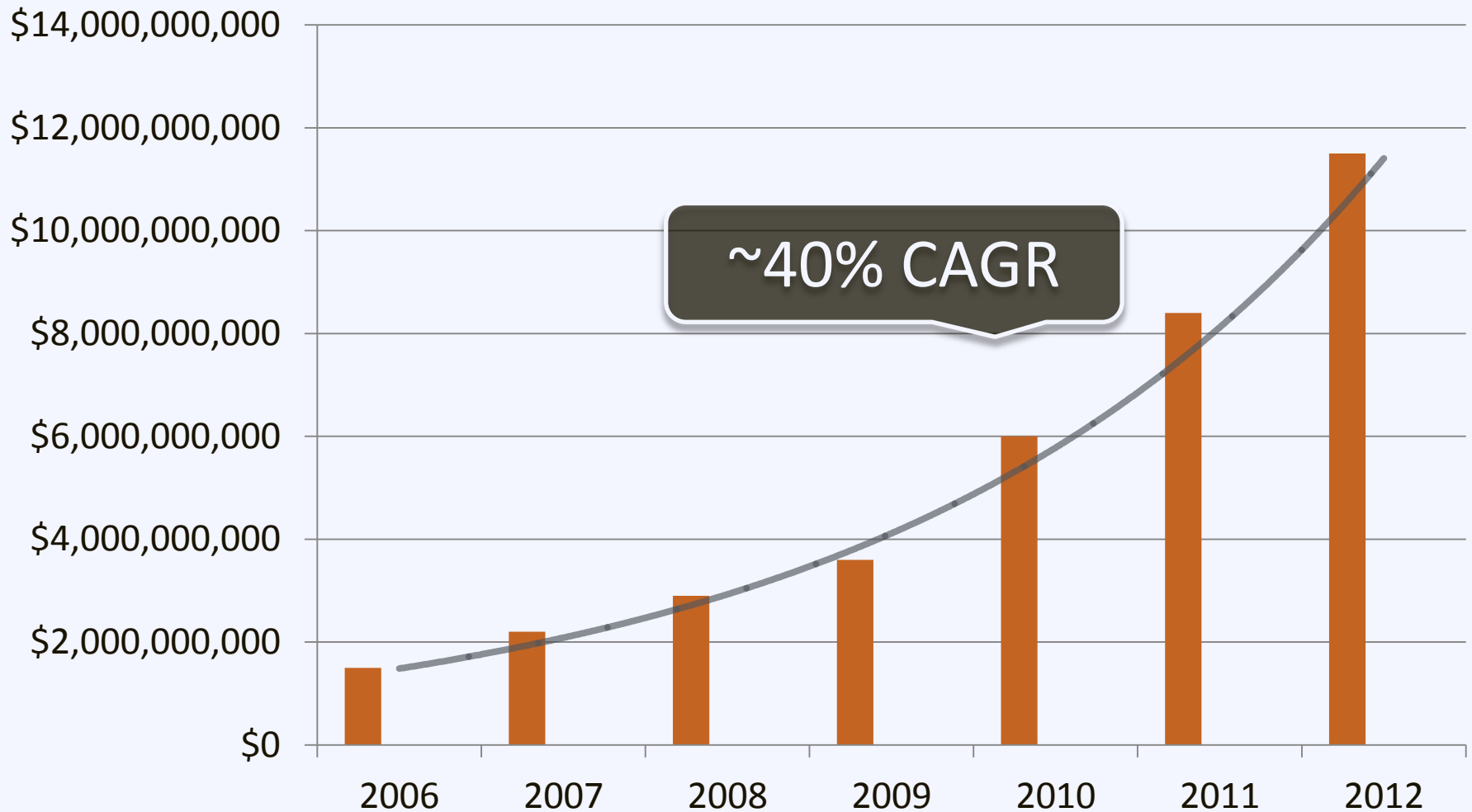


Office
50 – 500 kW

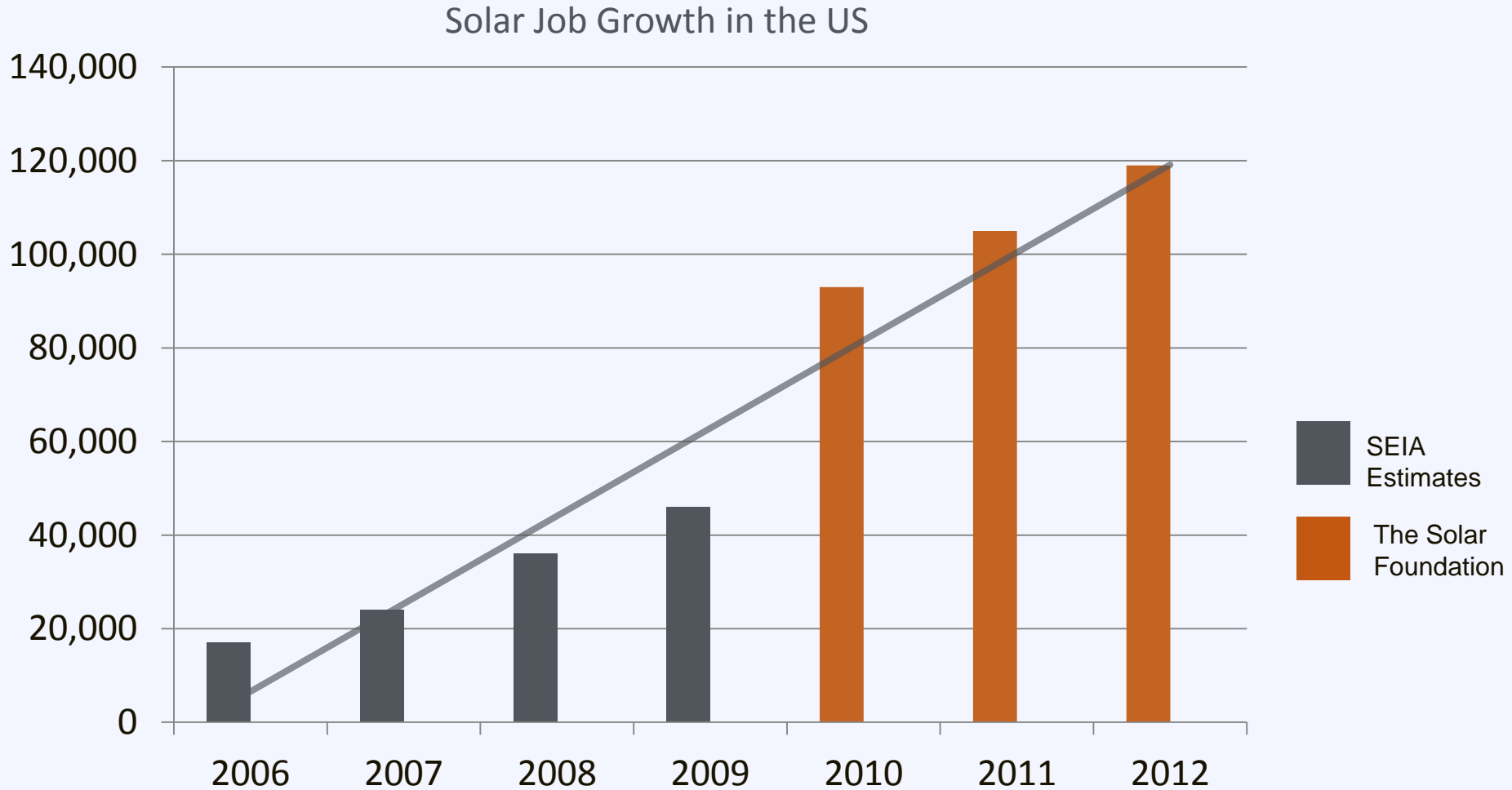


Utility
2 MW+

Benefit: Economic Growth

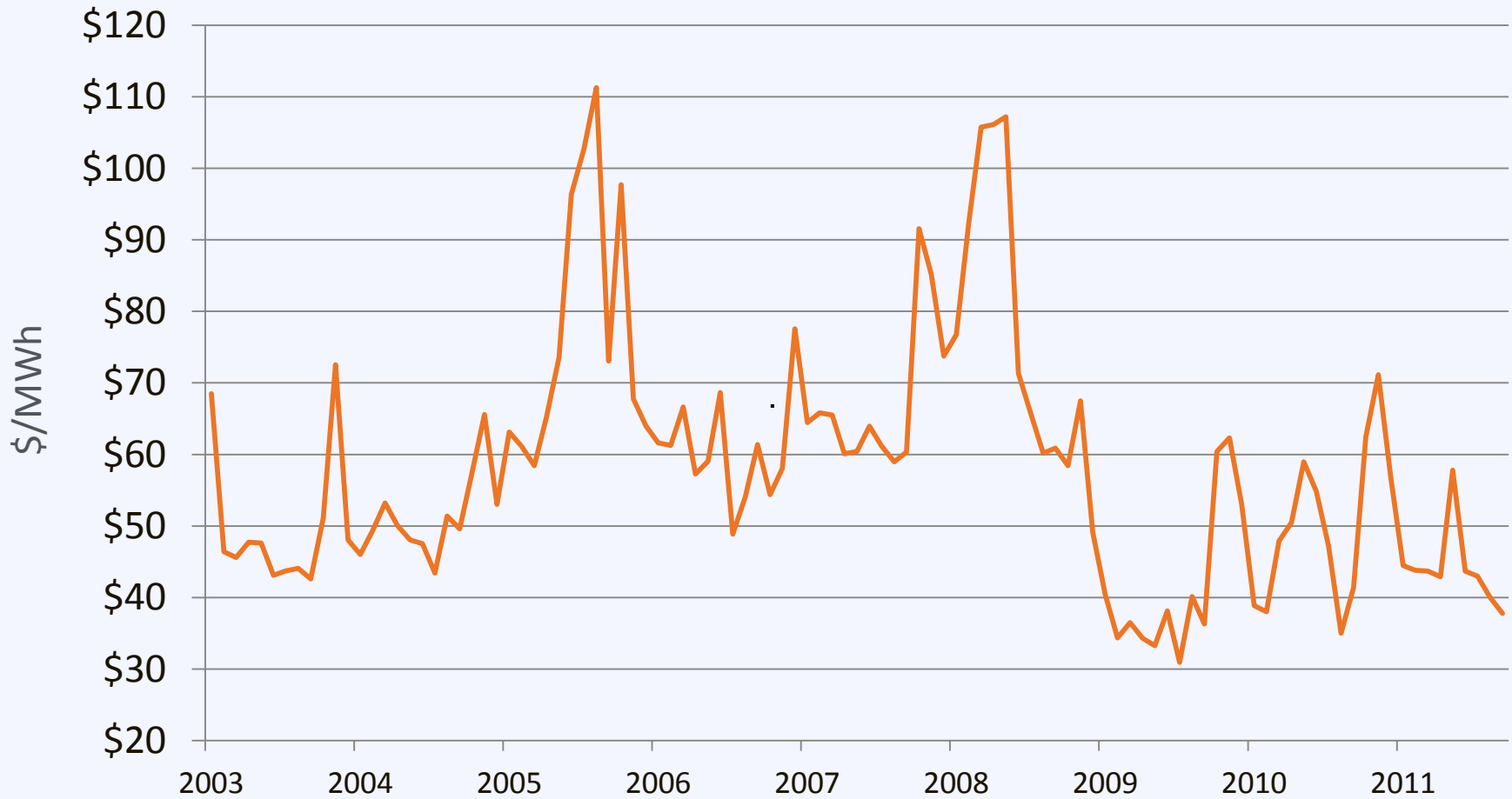


Benefit: Job Growth



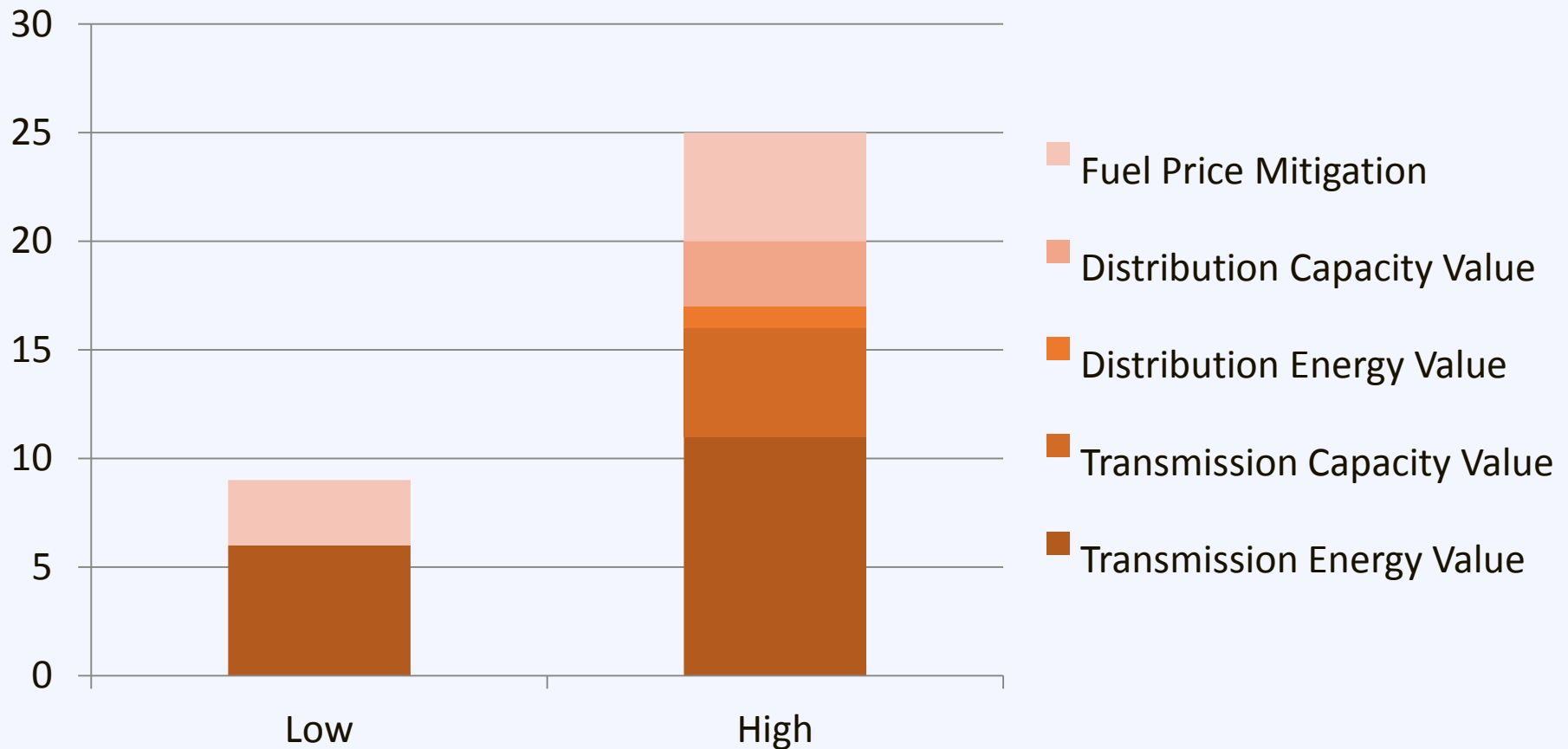
Benefit: Stabilize Energy Prices

Boston Area Average Wholesale Price



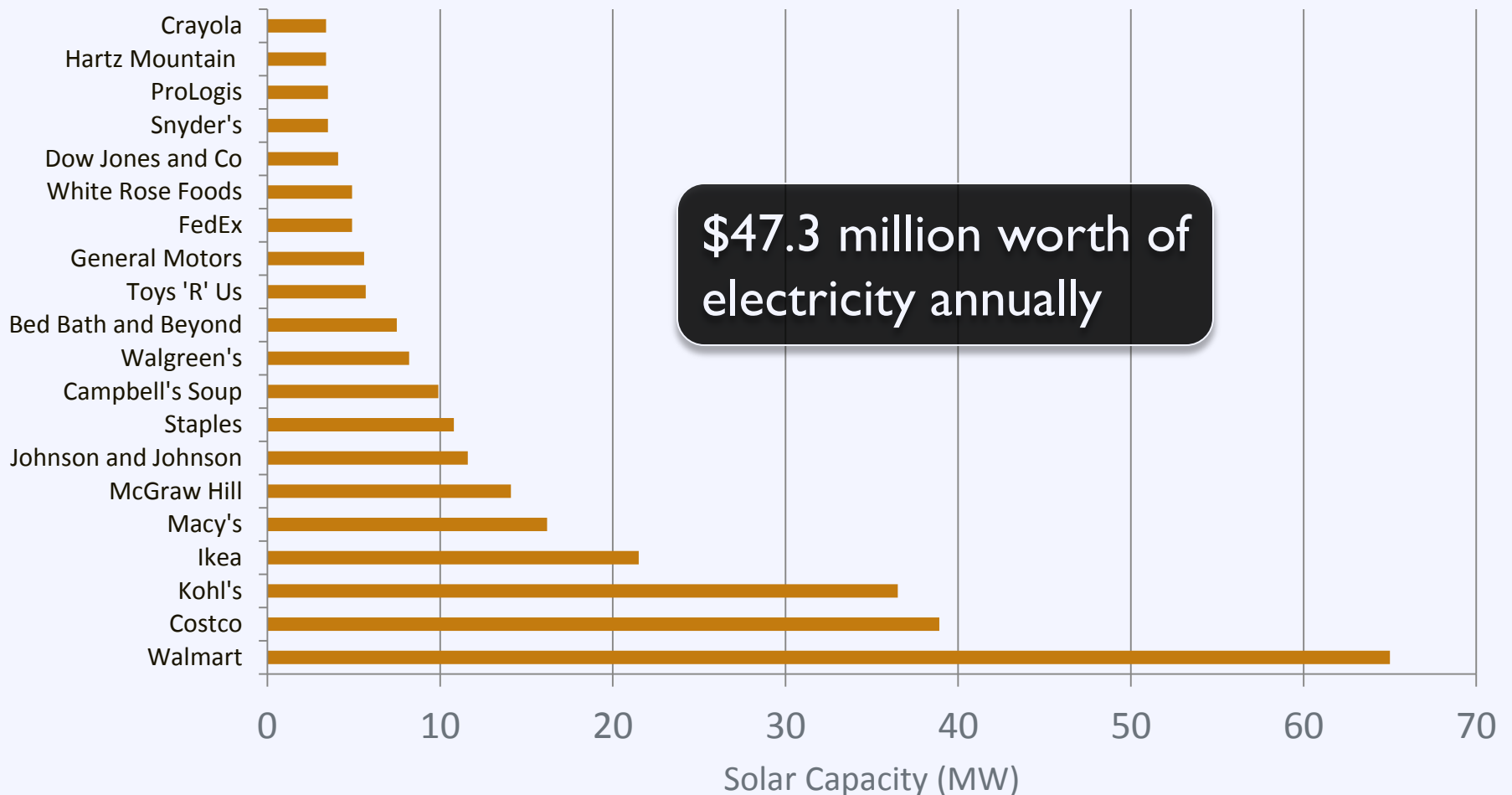
Benefits: Valuable to Utilities

Value to the utility is **10 to 25 cents** beyond the value of the electricity



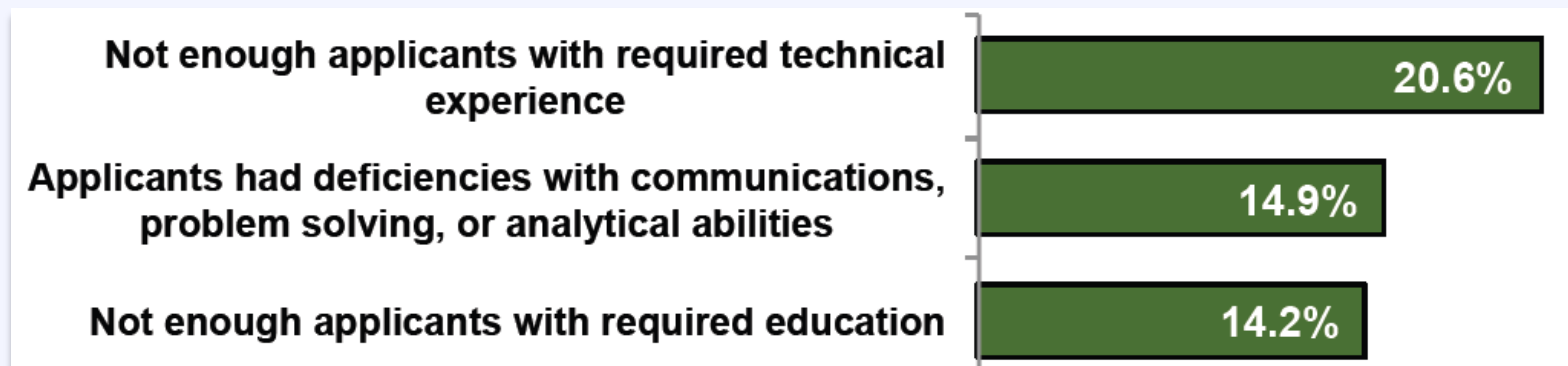
Benefit: Smart Investment for Business

Top 20 Companies by Solar Capacity



The Future Solar Workforce

- Introducing school-aged students to solar industry could inspire them to pursue STEM-oriented careers
- Environmental based education programs have a positive effect on critical thinking skills
- Students who participated in hands-on projects in science classes received higher science scores

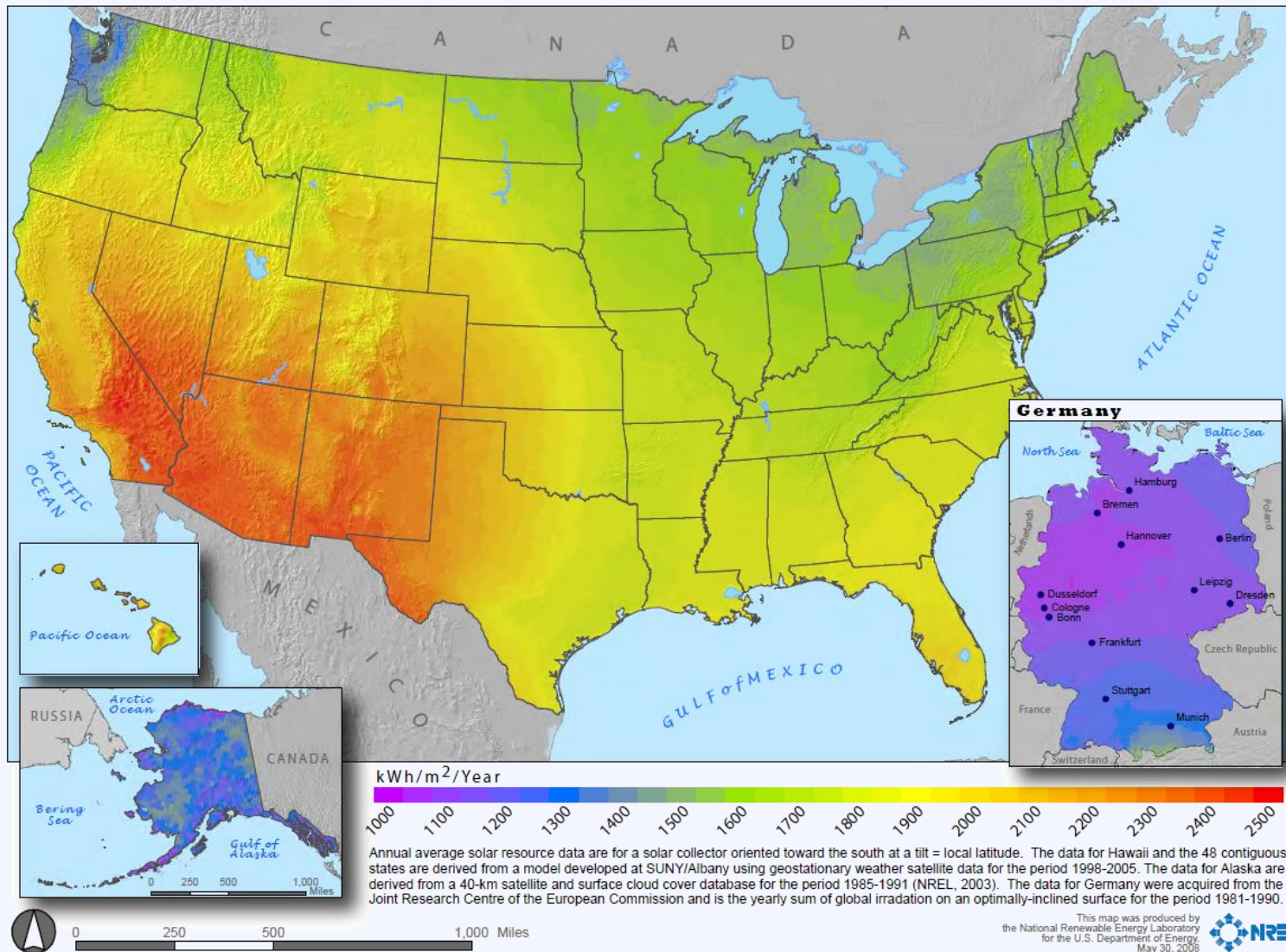


*Ernst, Julie Athman and Monroe, Martha. 2004. Environmental Education Research

**"The Nations Report Card. Science 2011: National Assessment of Educational Progress at Grade 8." *National Center for Education Statistics*. U.S. Department of Education, May 2012.

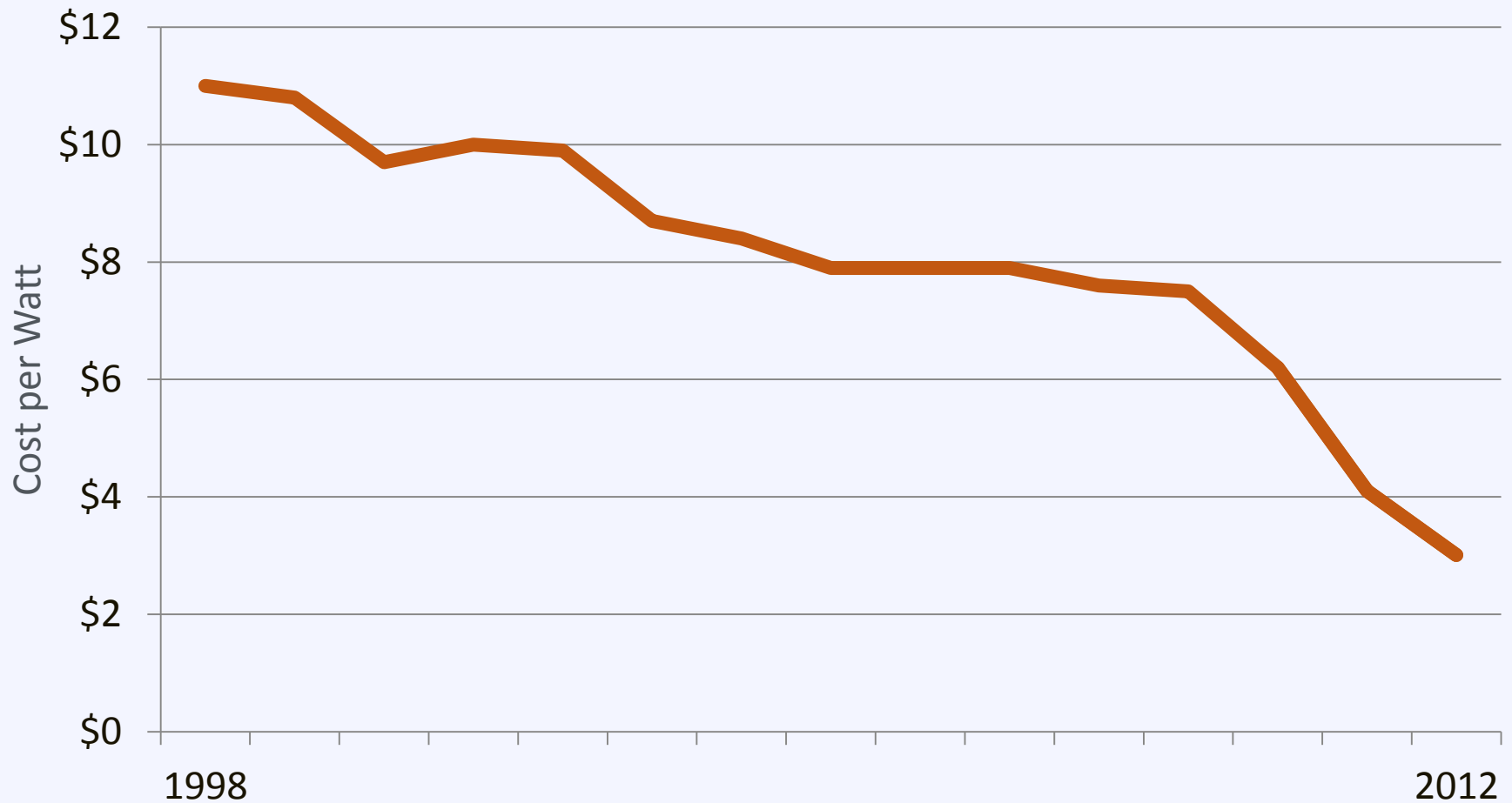
***The Solar Foundation, "National Solar Jobs Census 2012," November 2012.

Fact: Solar works across the US



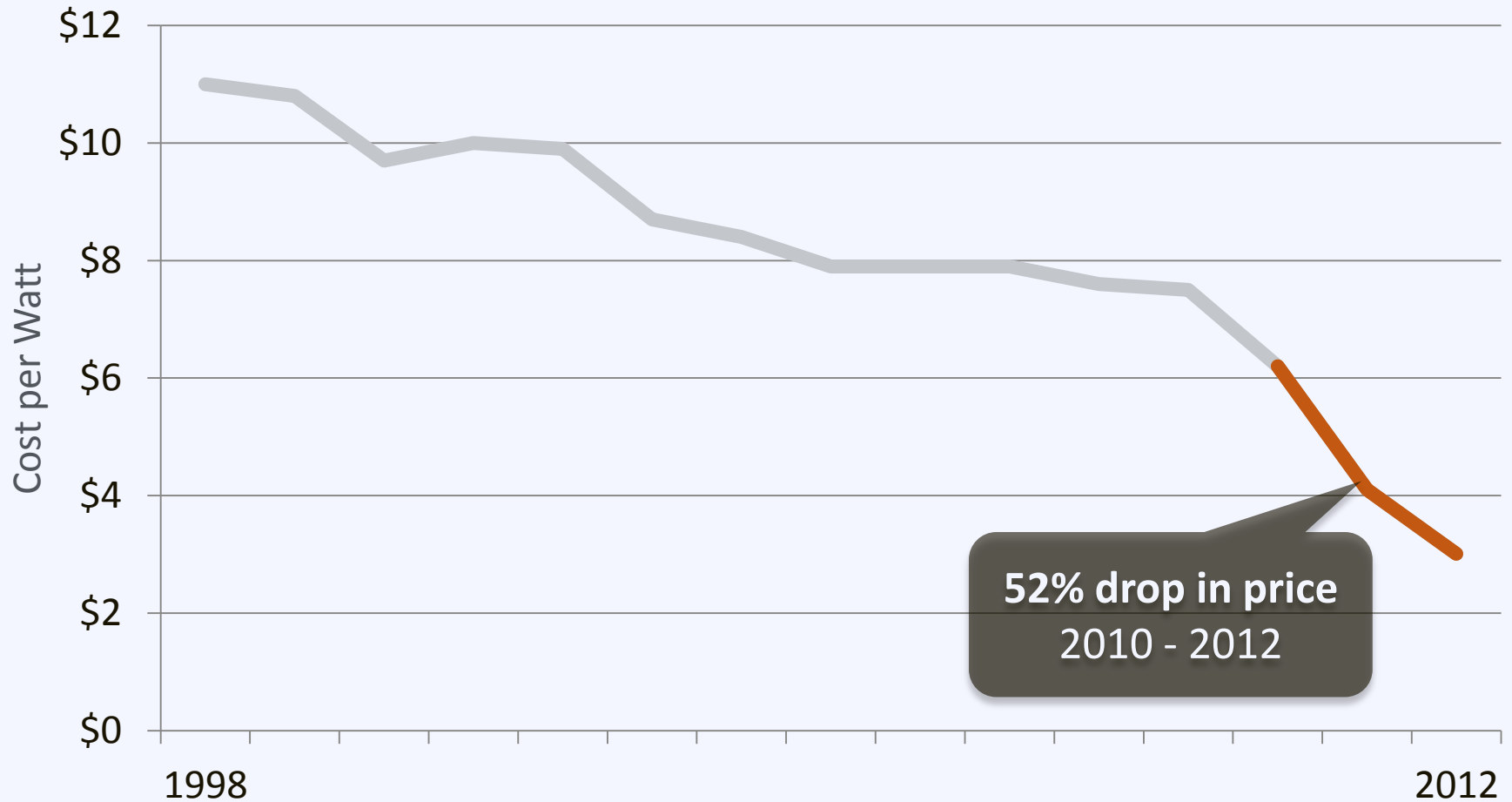
Solar Market: Trends

US Average Installed Cost for Behind-the-Meter PV



Solar Market: Trends

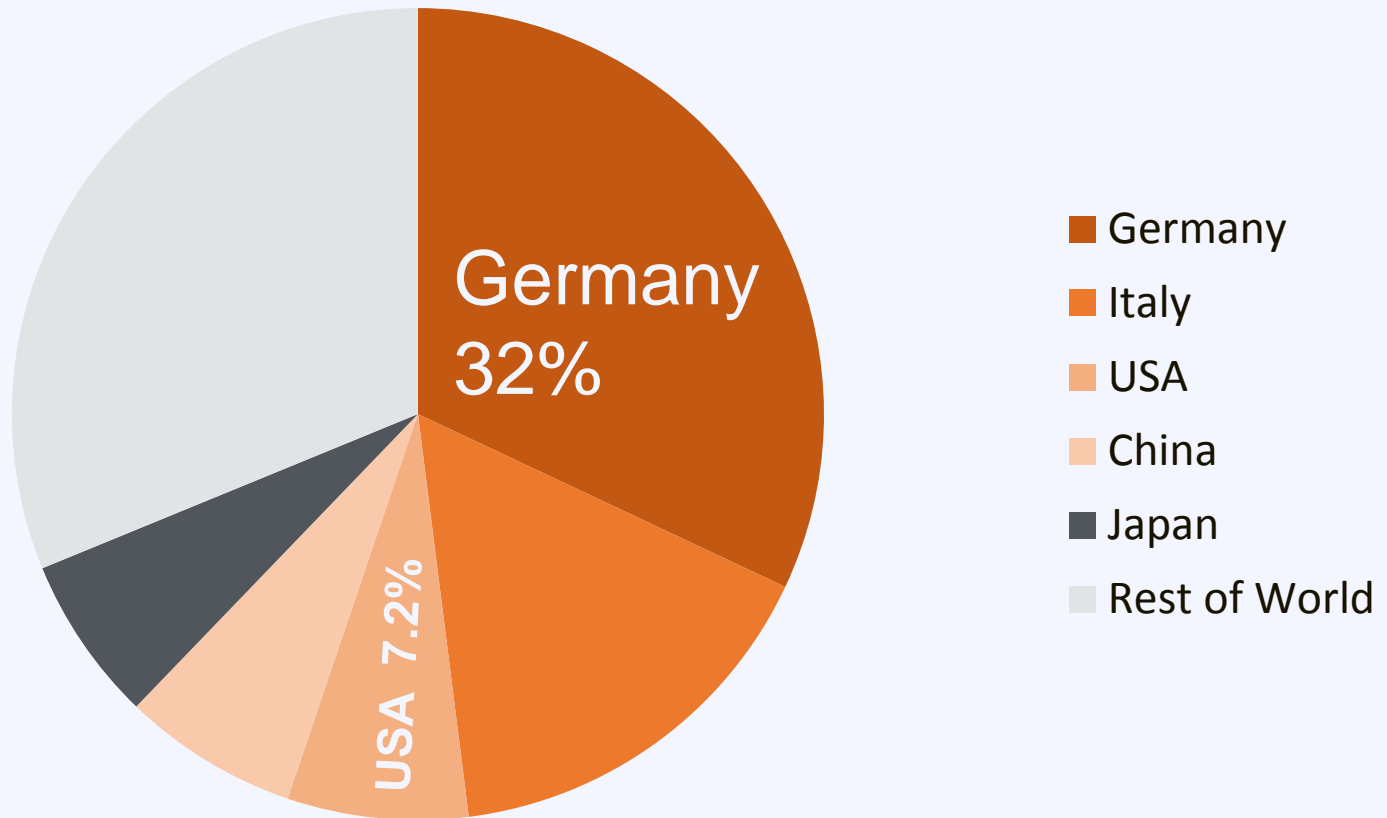
US Average Installed Cost for Behind-the-Meter PV



**52% drop in price
2010 - 2012**

Installed Capacity

Top 5 Countries Solar Operating Capacity (2012)



Installed Capacity

Total installed solar
capacity in the US

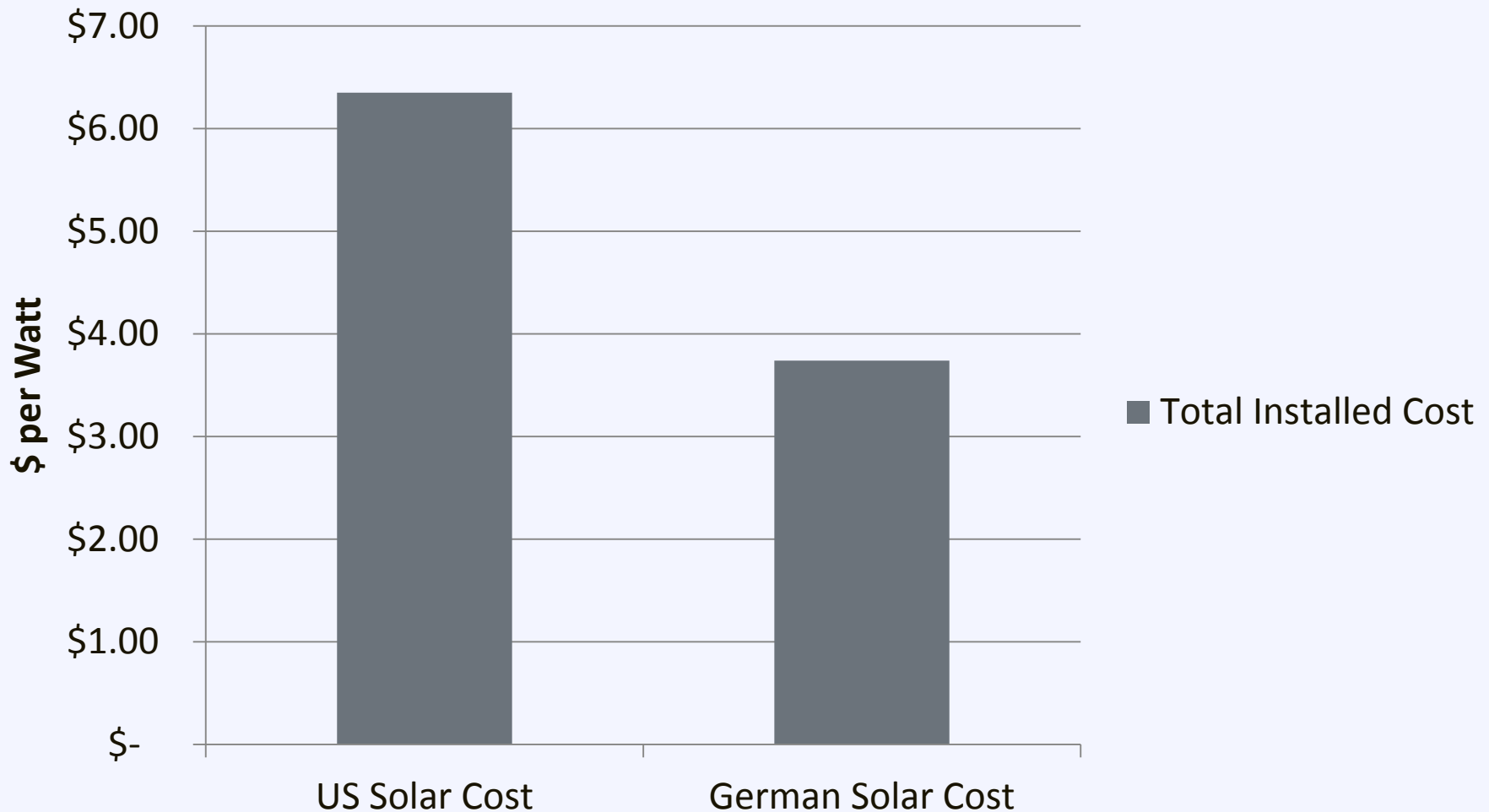
7.7 GW

Capacity installed in
Germany in 2012
alone

7.6 GW

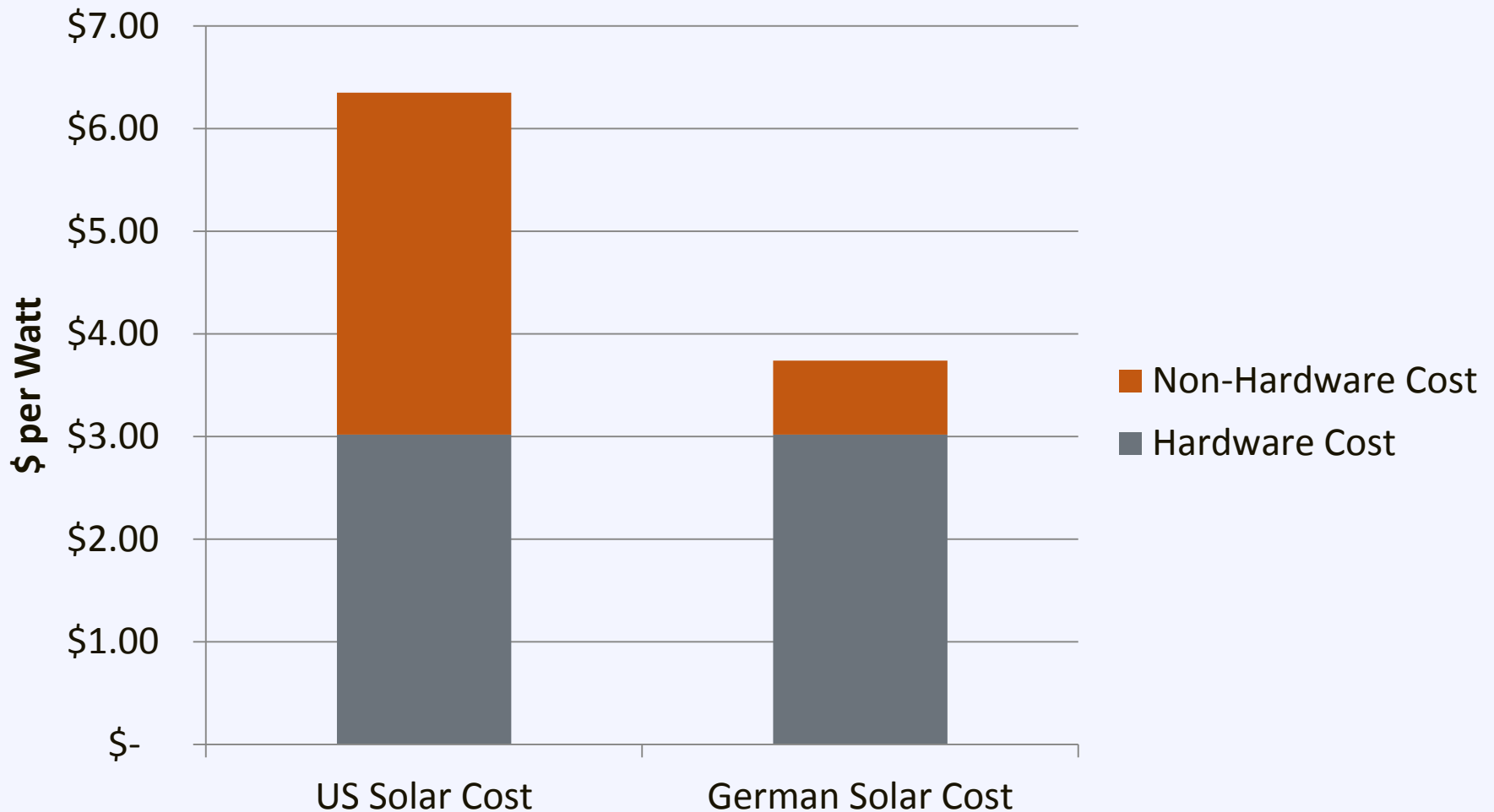
The Cost of Solar in the US

Comparison of US and German Solar Costs



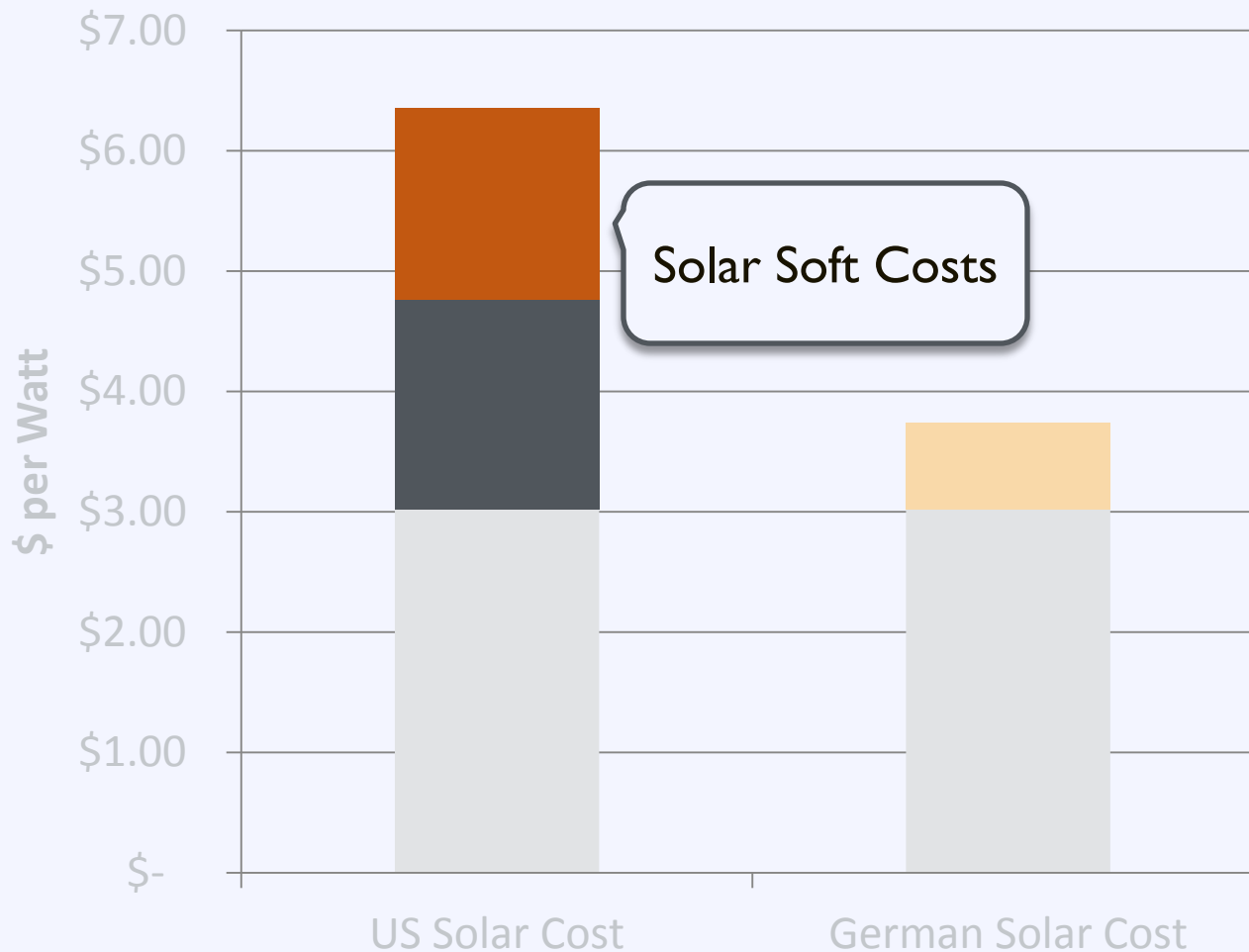
The Cost of Solar in the US

Comparison of US and German Solar Costs

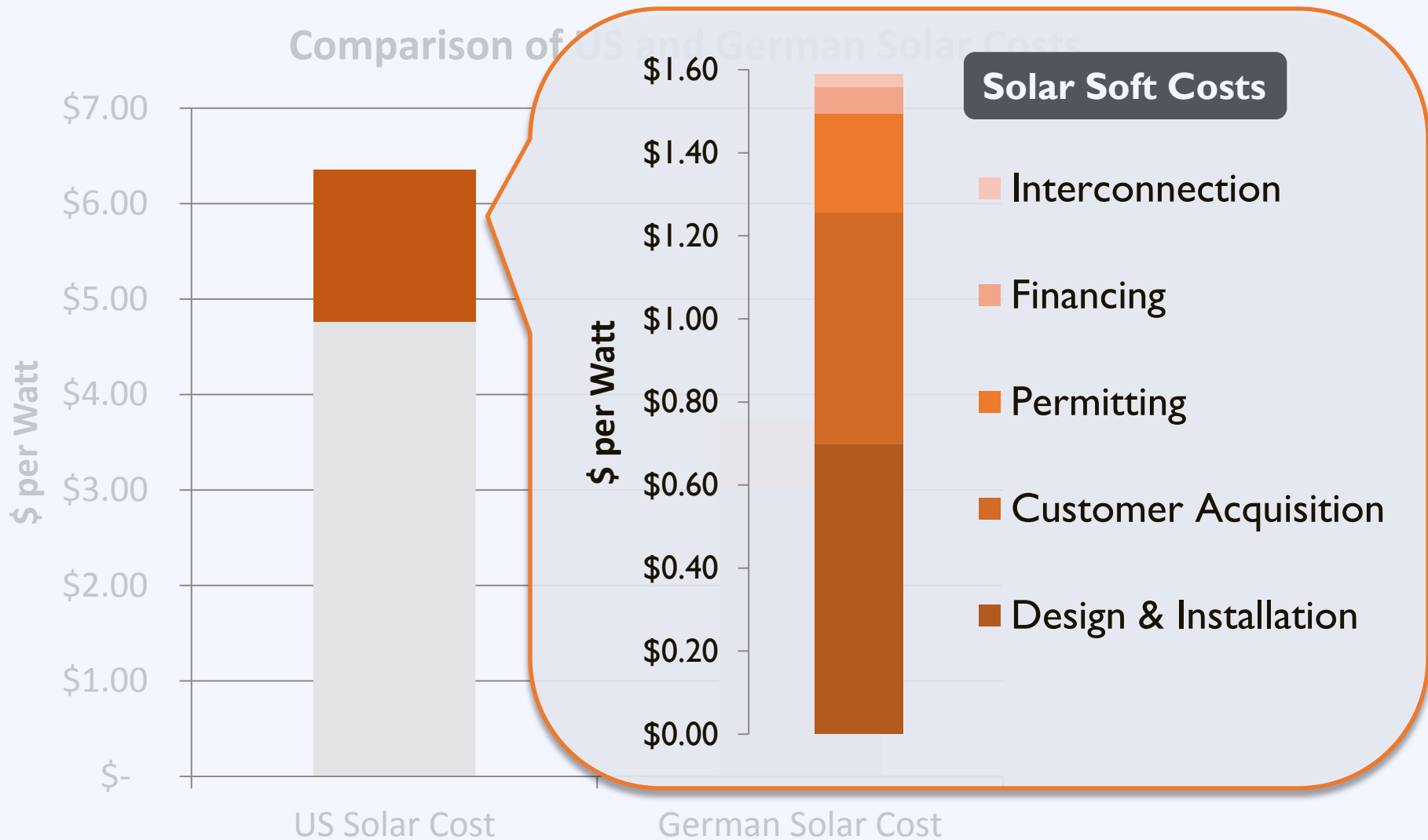


The Cost of Solar in the US

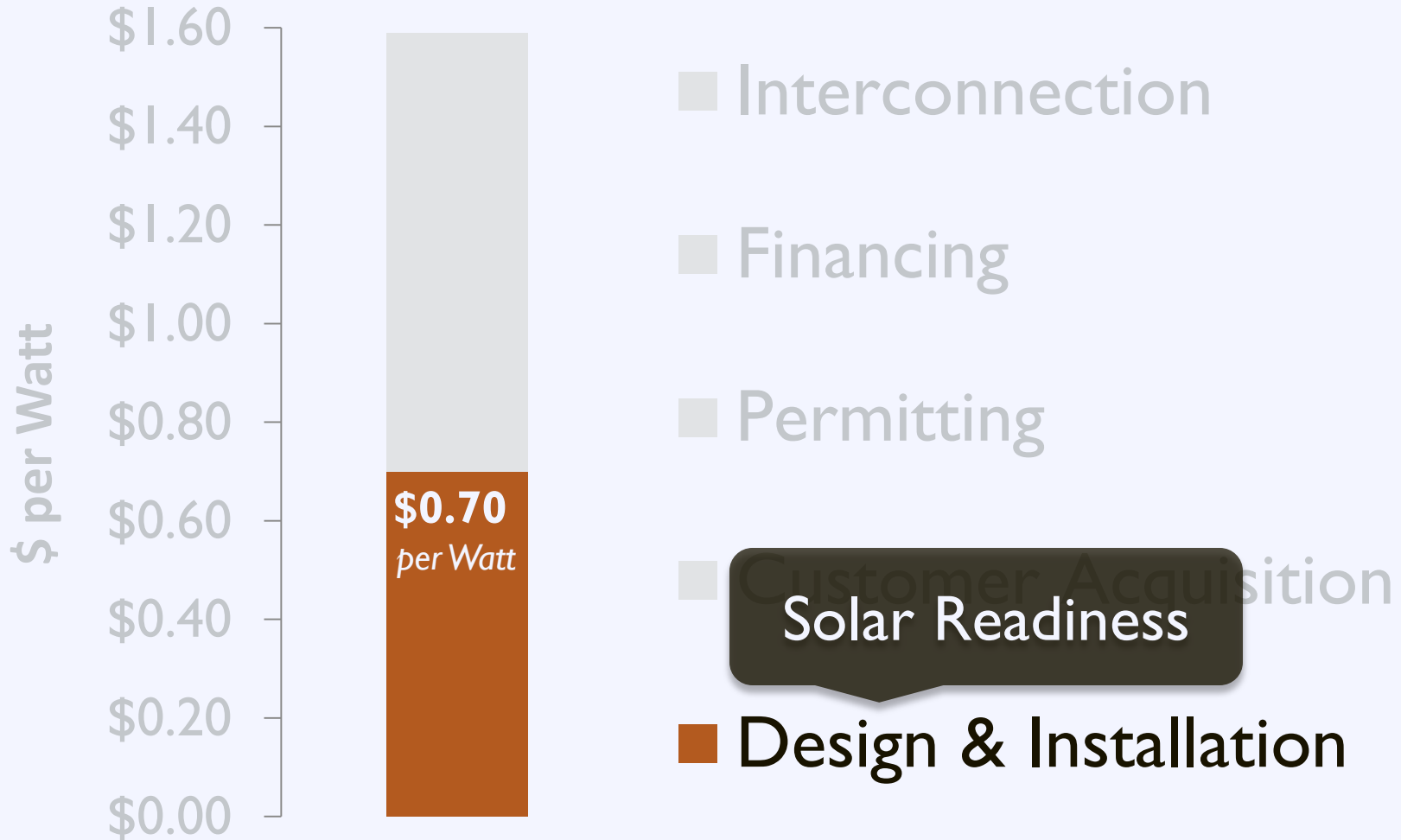
Comparison of US and German Solar Costs



The Cost of Solar in the US



Mitigate Soft Costs

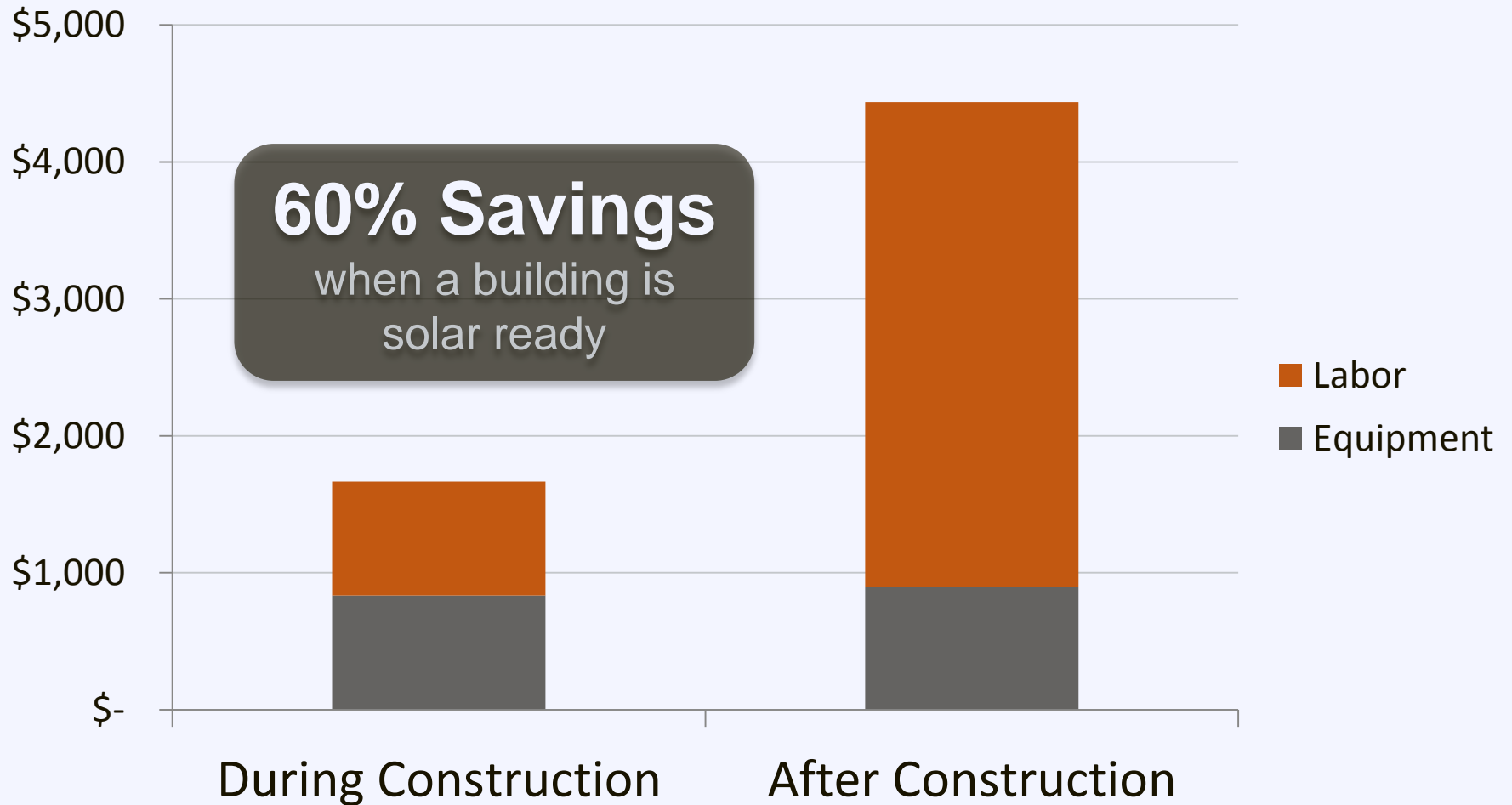


Solar Readiness

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

Solar Readiness



Solar Readiness

Resource NREL

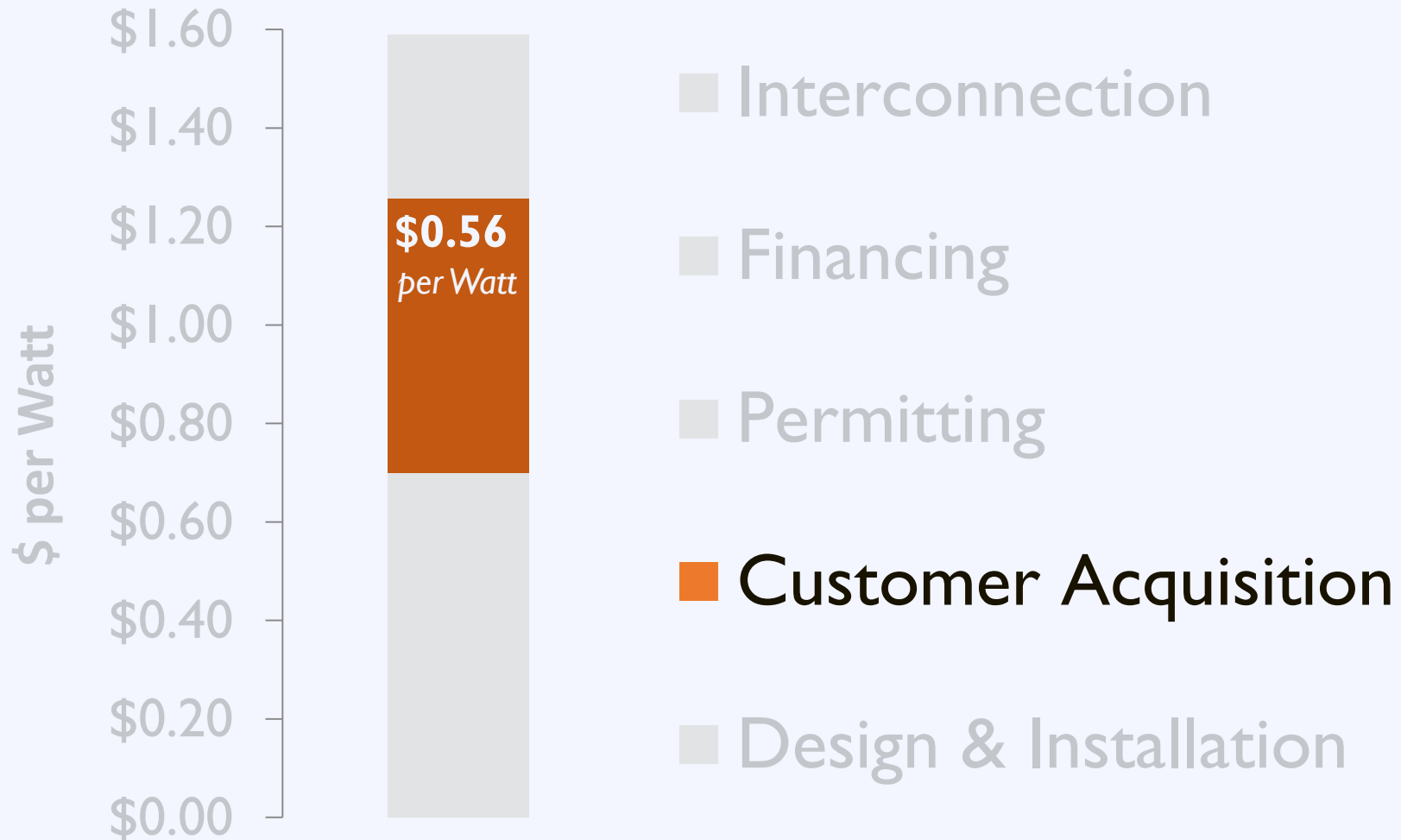
Creating a solar ready guide for buildings:

- Legislation
- Certification programs
- Stakeholder Education

www.nrel.gov



Mitigate Soft Costs



Customer Acquisition

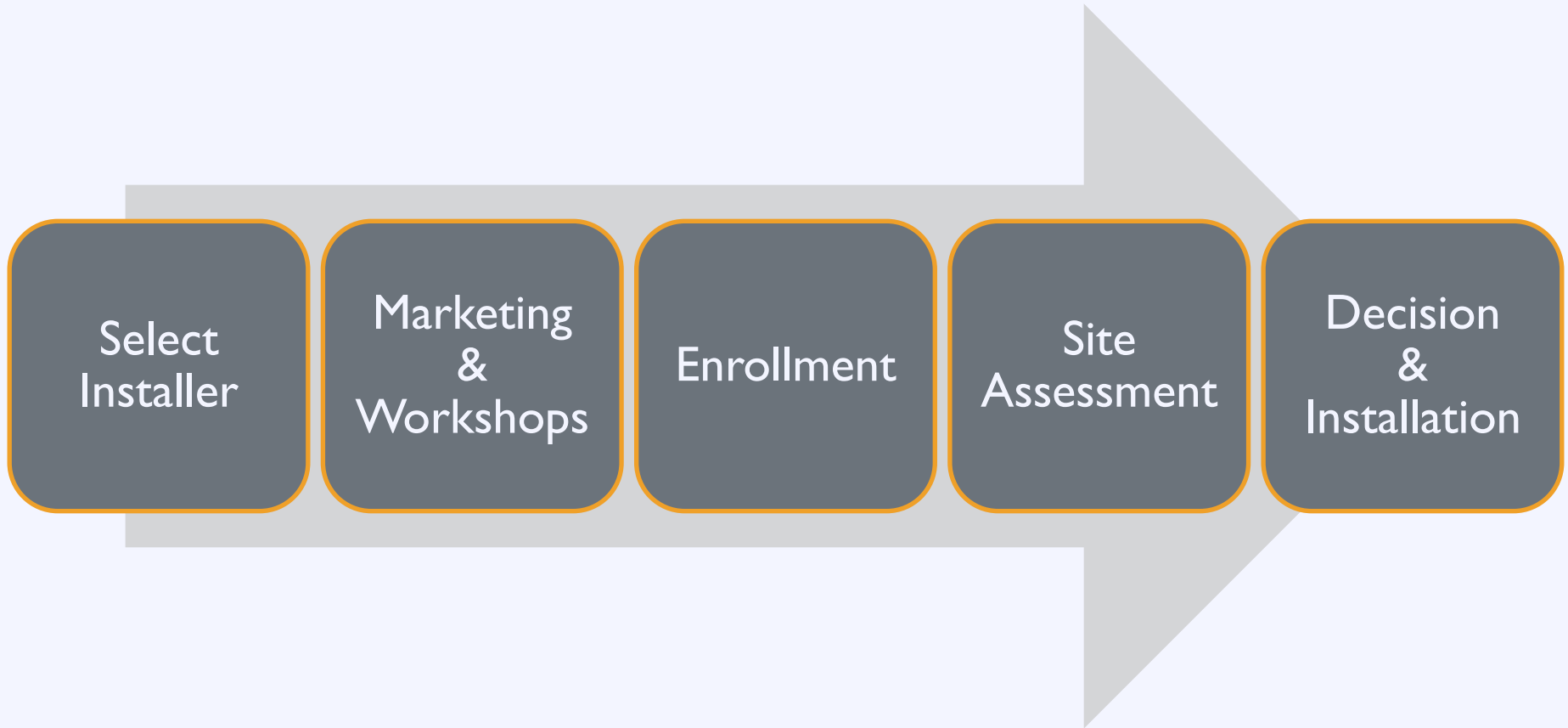


Solarize
Group Purchasing

solarize portland →



Solarize: Process



Solarize: Advantages

Benefits to Local Government:

Low implementation cost: \$5,000 - \$10,000

Quick turn-around: 9 Months

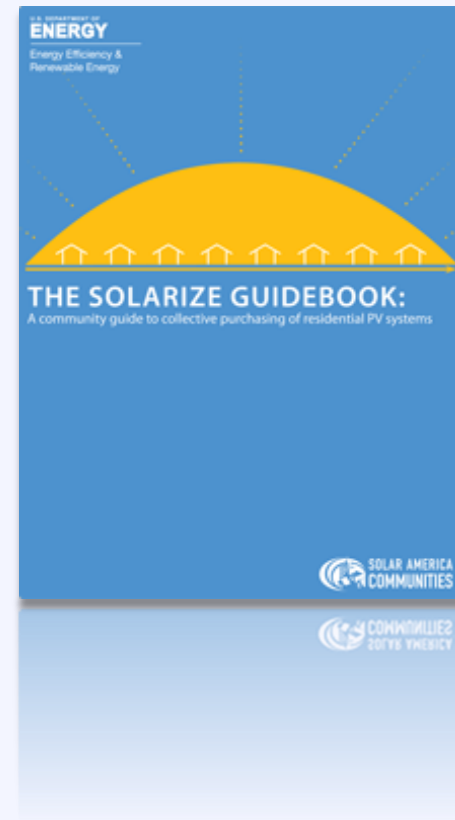
Long-term impact: Sustainable ecosystem

Solarize: Resources

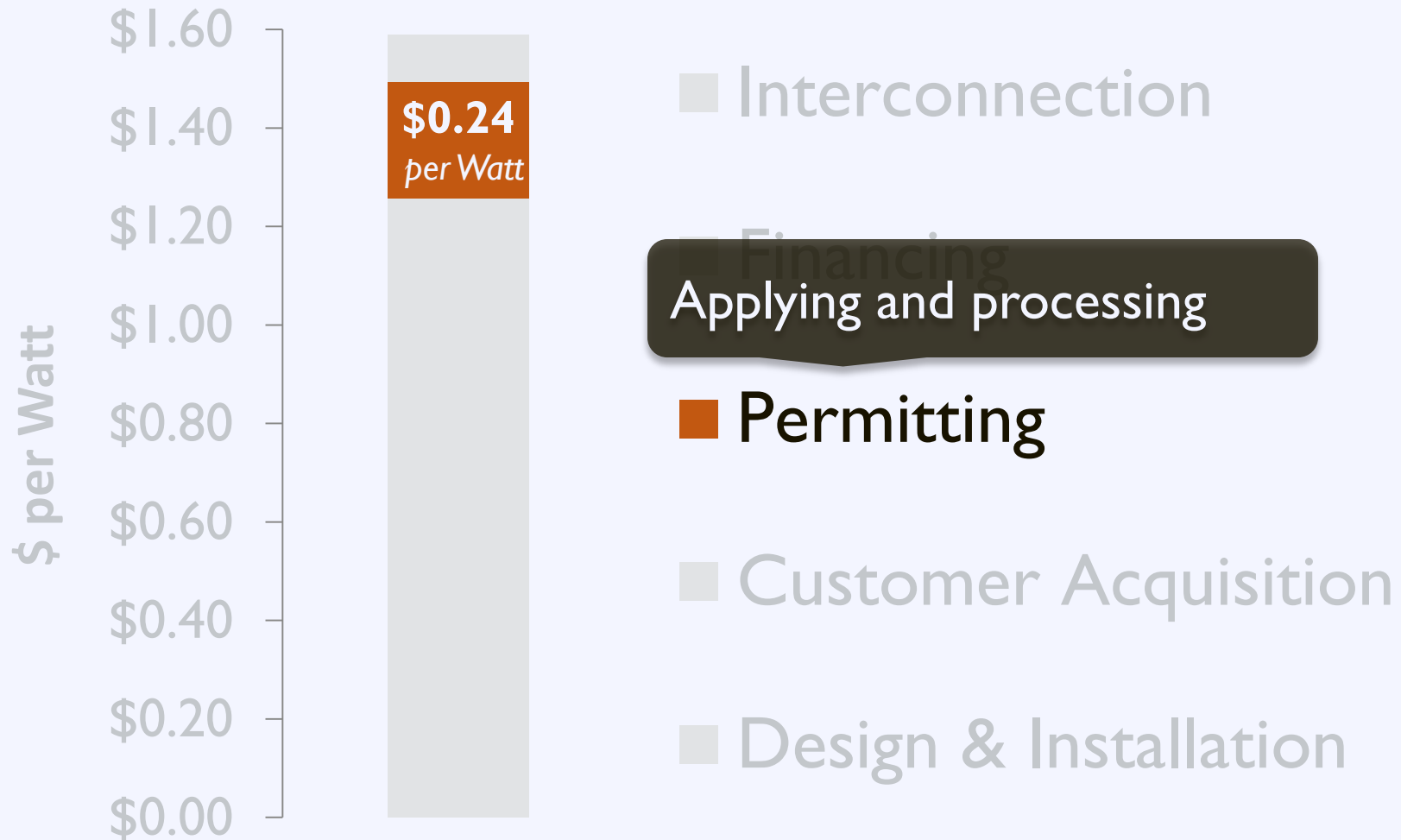
Resource The Solarize Guidebook

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

www.nrel.gov



Mitigate Soft Costs

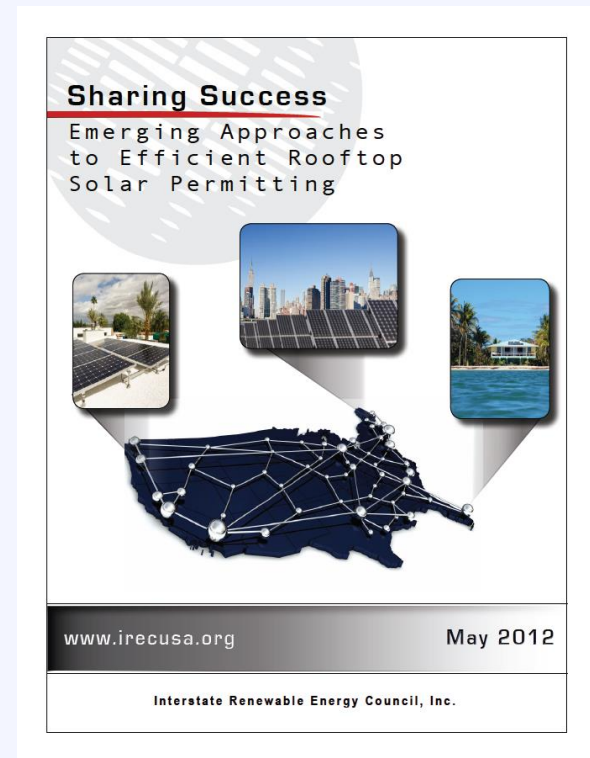


Permitting

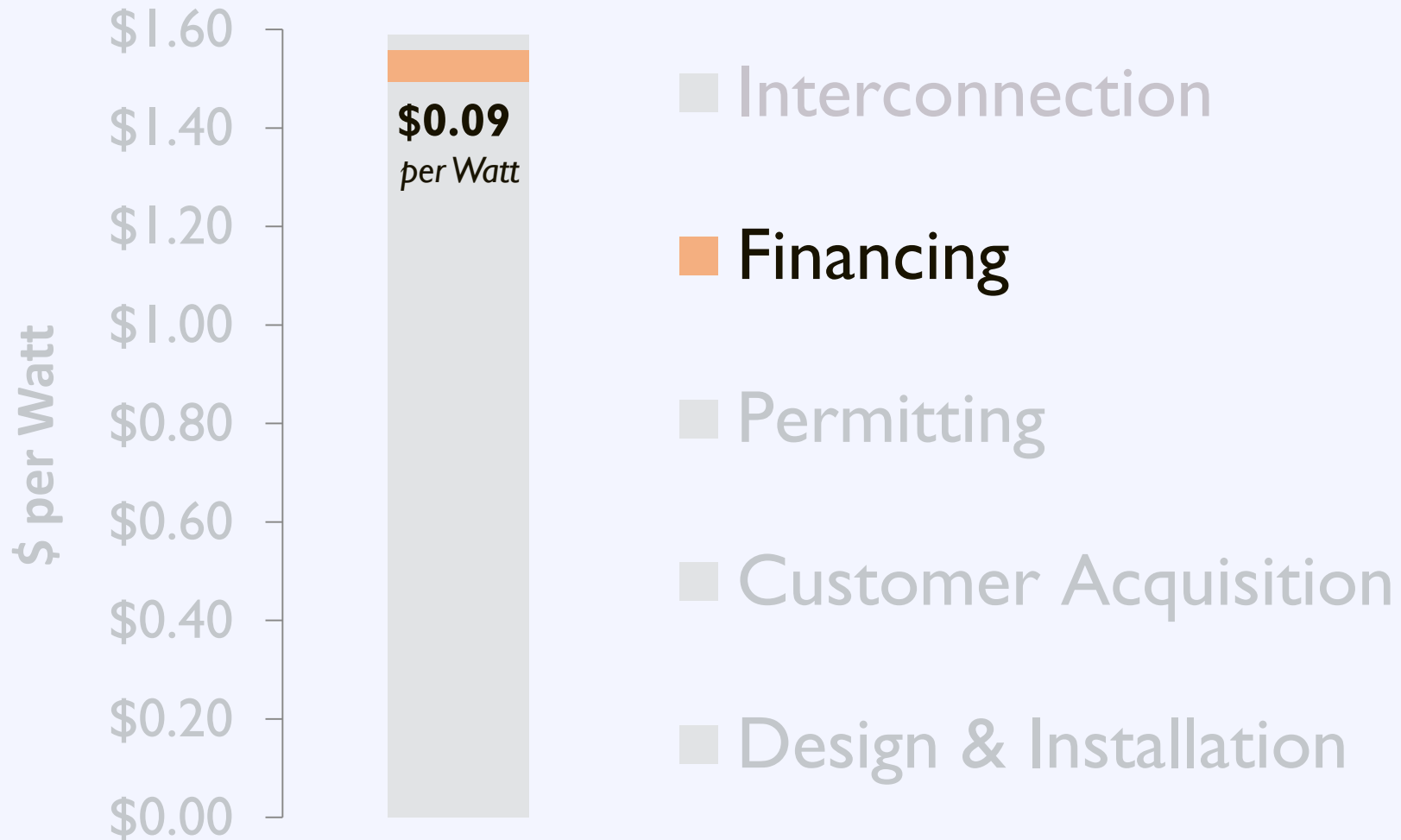
Resource **Sharing Success**

Provides a detailed discussion on how both solar installers and municipalities can do their part to enable effective improvements to permitting processes.

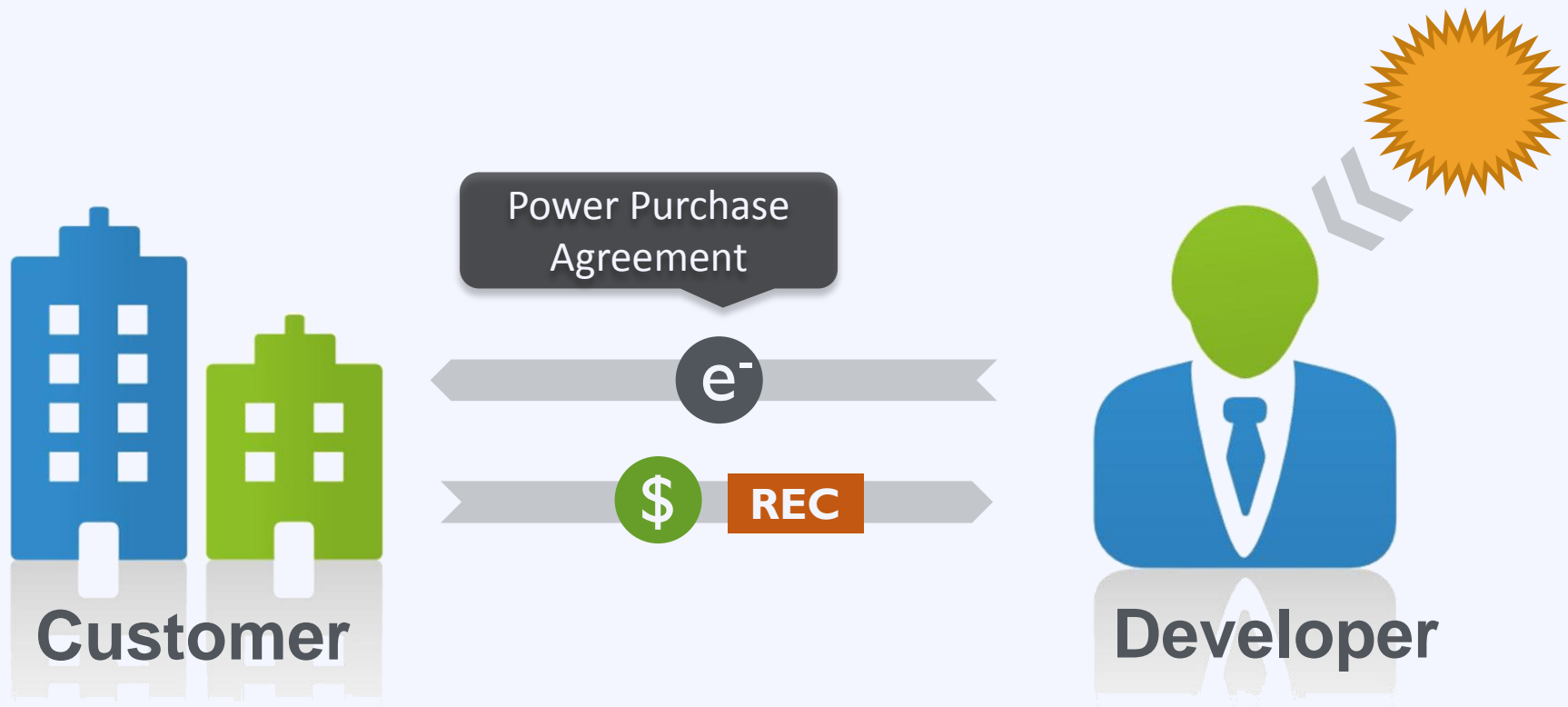
www.irecusa.org



Mitigate Soft Costs

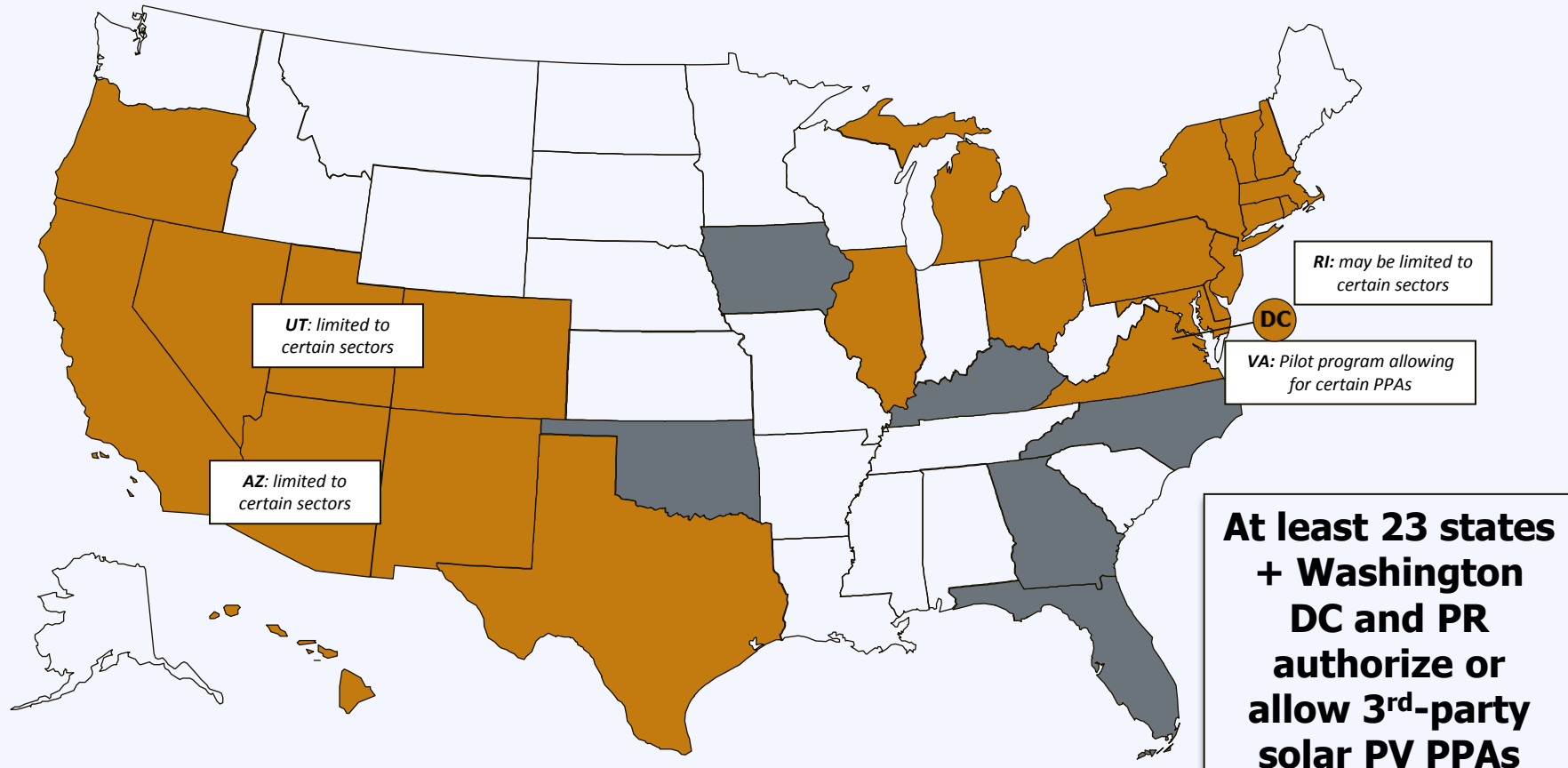


Third Party Ownership



3rd-Party Solar PV Power Purchase Agreements (PPAs)

www.dsireusa.org / February 2013



- Authorized by state or otherwise currently in use, at least in certain jurisdictions within in the state
- Apparently disallowed by state or otherwise restricted by legal barriers
- Status unclear or unknown

 Puerto Rico

Note: This map is intended to serve as an unofficial guide; it does not constitute legal advice. Seek qualified legal expertise before making binding financial decisions related to a 3rd-party PPA. See following slides for additional important information and authority references.

Qualified Energy Conservation Bonds

- What?

 - Tax credit or direct payment subsidy

- Why?

 - Subsidy lowers the effective cost of capital

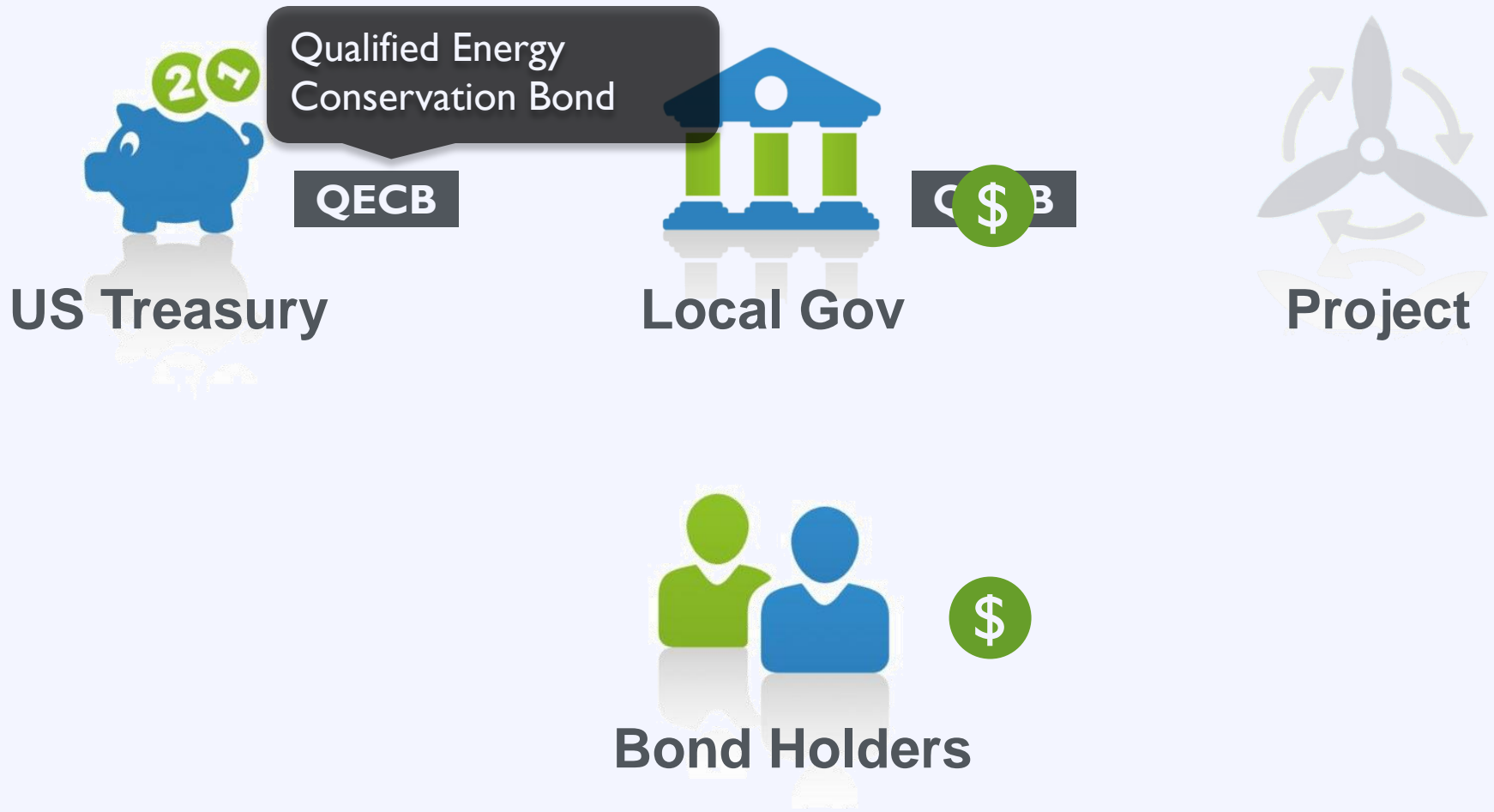
- Relevance?

 - Can be used for certain renewable energy facilities (including solar)

- How?

 - State allocation or automatic allocation

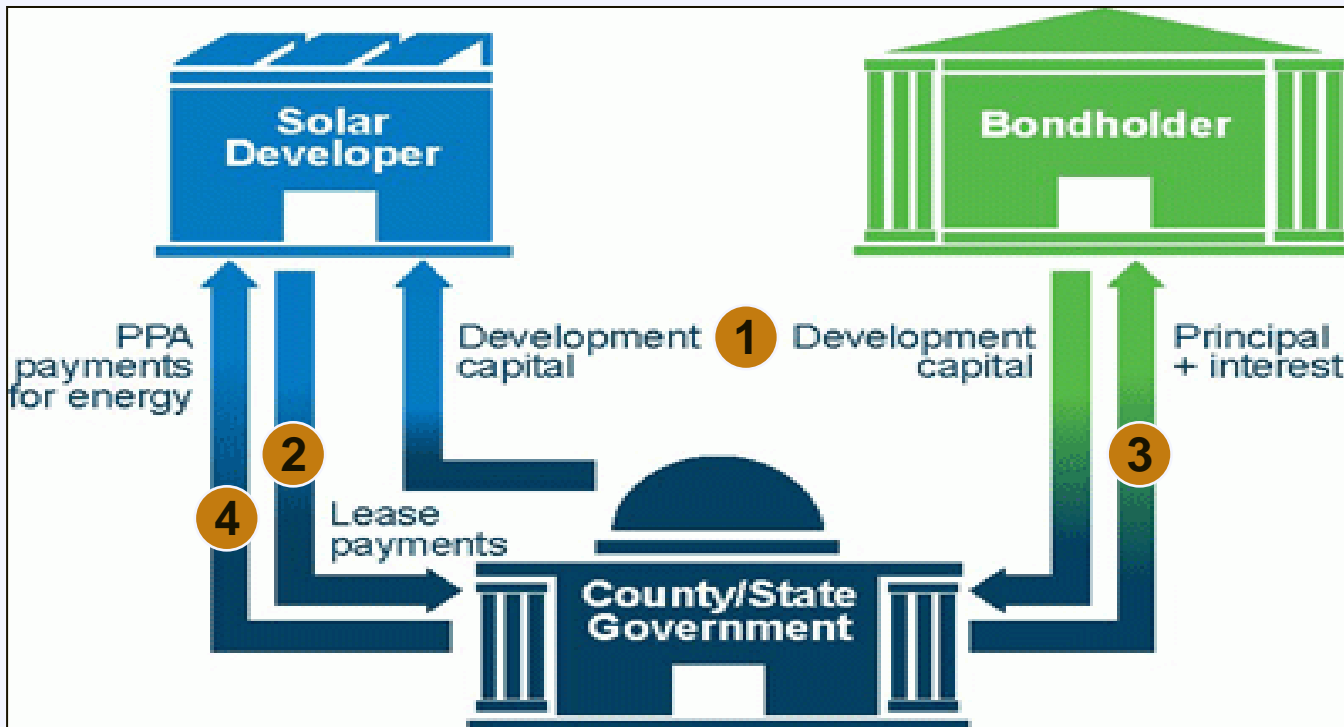
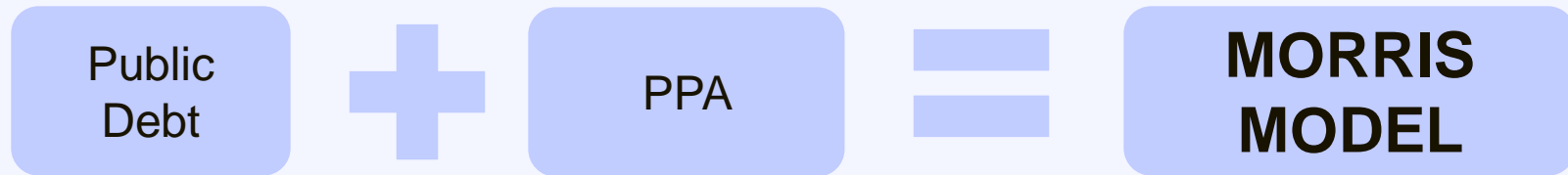
Qualified Energy Conservation Bond



Qualified Energy Conservation Bond



Innovative: Morris Model

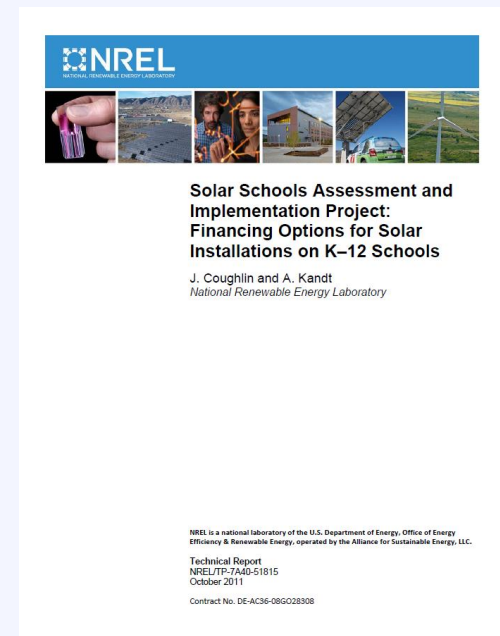


Solar Schools

Resource **Sharing Success**

Provides a detailed discussion on various financing options to support solar installations on school facilities.

<http://www.nrel.gov/docs/fy12osti/51815.pdf>



THE BDR Memorial

The Brian D. Robertson Memorial Solar Schools Fund is working to support the charitable donation and installation of solar energy systems on 20,000 K-12 schools in the United States by 2020, enhancing and enriching the energy education of future generations.



<http://SolarSchoolsFund.org>



Powered by

SunShot

U.S. Department of Energy

Alex Winn

The Solar Foundation

awinn@solarfound.org

(202) 540-5348