Solar Powering Your Community

Introduction to Community Solar

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Meister Consultants Group, Inc.
ICMA Conference Presenter

ICMA 100th ANNUAL CONFERENCE
Charlotte Mecklenburg County
SEPTEMBER • 14-17 • 2014

Solar Powering Your Community

Introduction to Community Solar

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U.S. Department of Energy

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

NORTH CAROLINA
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

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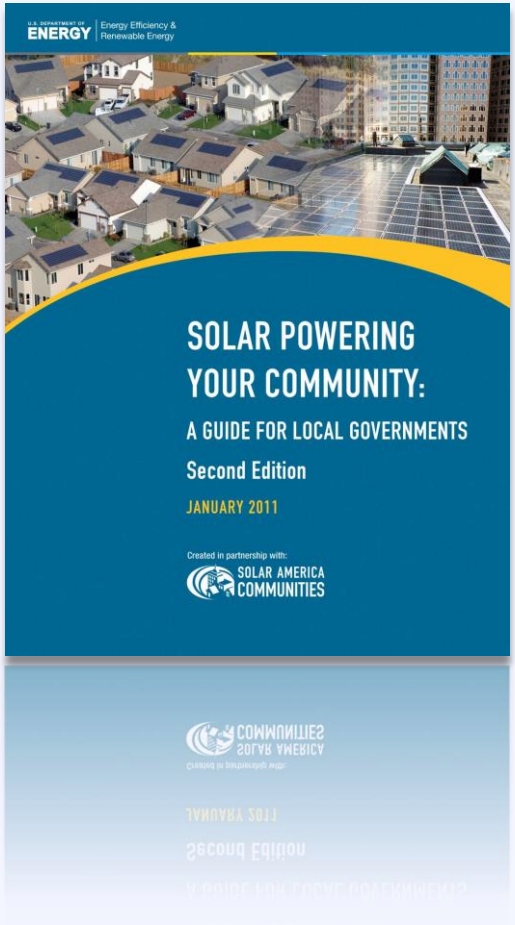
Email solar-usa@iclei.org to request a 20 minute consultation

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



Technical Resources

Resource **SunShot Solar Resource Center**

- Case Studies
- Fact Sheets
- How-To Guides
- Model Ordinances
- Technical Reports
- Sample Government Docs

www4.eere.energy.gov/solar/sunshot/resource_center

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Complimentary Services

Technical Resources

Regional Workshops

One to One Assistance

Receive customized technical support on implementation of smart solar policy

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

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

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Workshop Goals

- Familiarize you with U.S. solar market and solar incentives
- Provide a background on community solar
- Identify workshop participant future needs and resource requirements

Agenda

Solar 101

- Introductions
- Technology and Market Overview

Models and Incentives

- Special Purpose Entity
  - Participant-owned
  - Third-party managed
- Utility-sponsored

Tools

- Oregon Community Decision-Making Tool
- NREL Community Solar Tool

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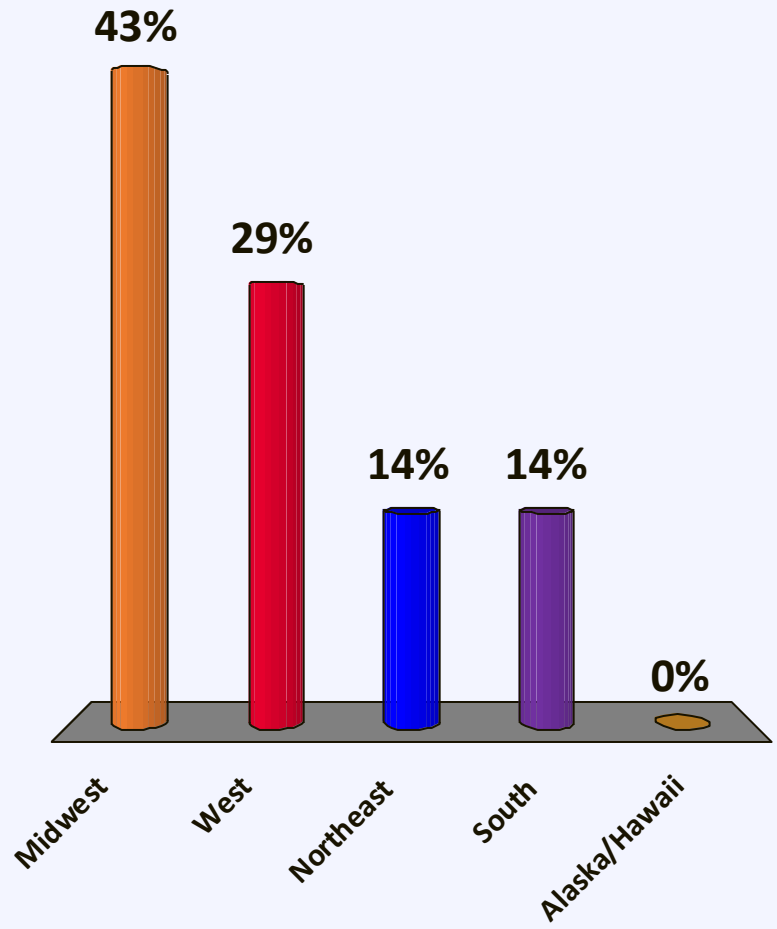
- Oregon Community Solar Decision Support Tool

We want to get to know you better

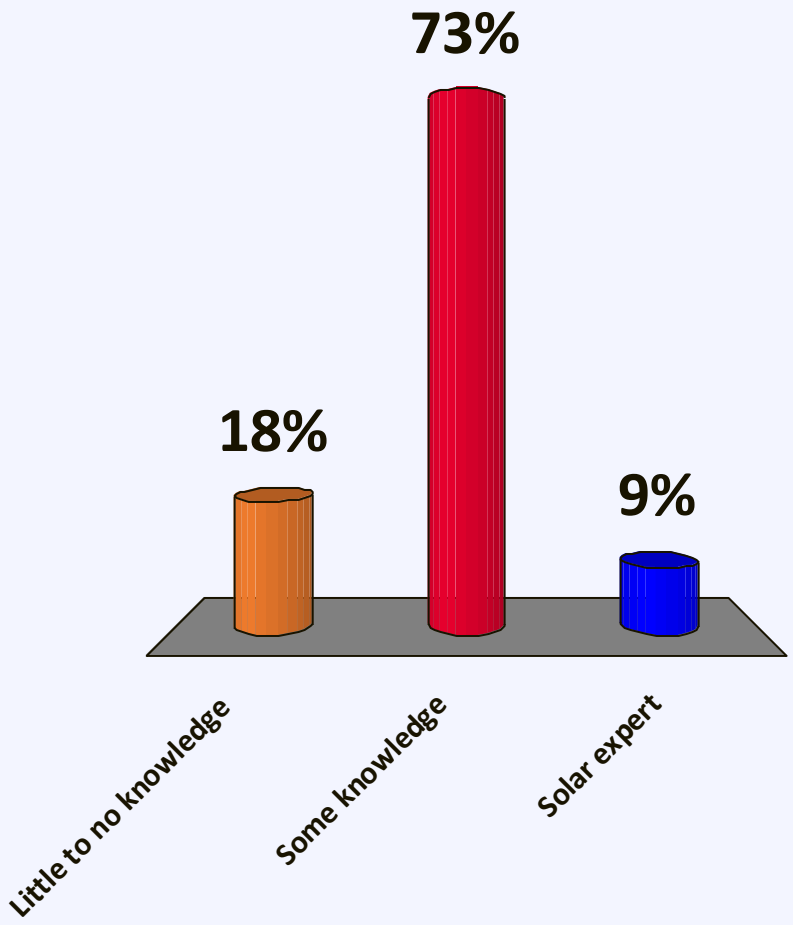
Where are you from?

A. Midwest
B. West
C. Northeast
D. South
E. Alaska/Hawaii



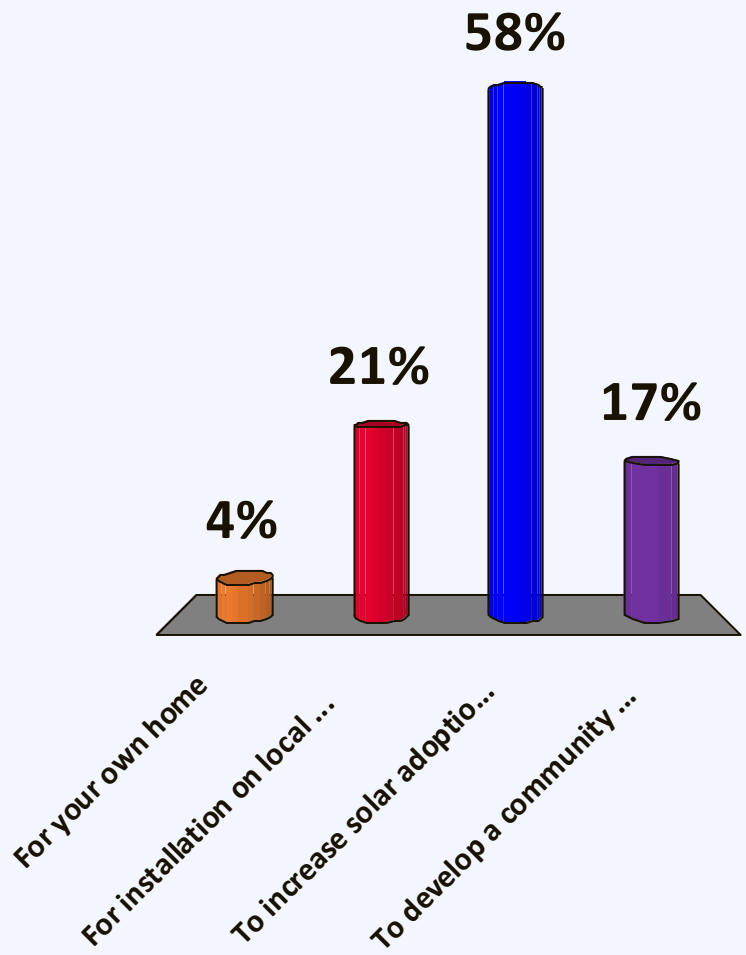
How familiar are you with solar?

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



Why are you interested in solar?

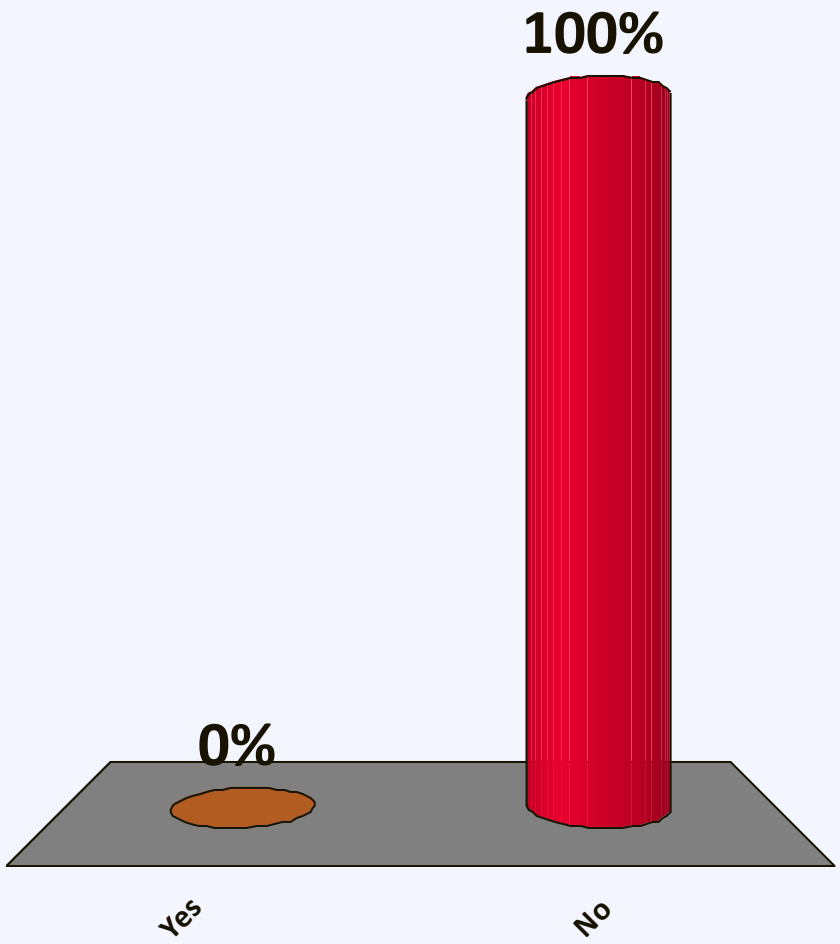
A. For your own home
B. For installation on local government buildings
C. To increase solar adoption in your community
D. To develop a community solar installation



Do you have solar on your home?

A. Yes

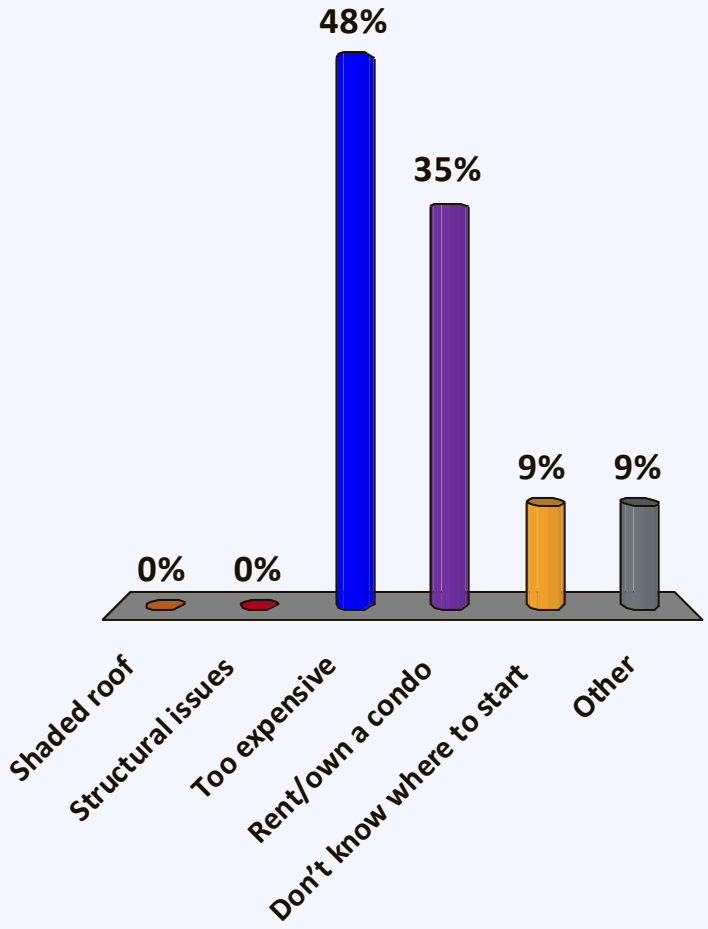
B. No



If you answered no…

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



Solar Technologies

Solar Photovoltaic (PV)

Solar Hot Water

Concentrated Solar Power

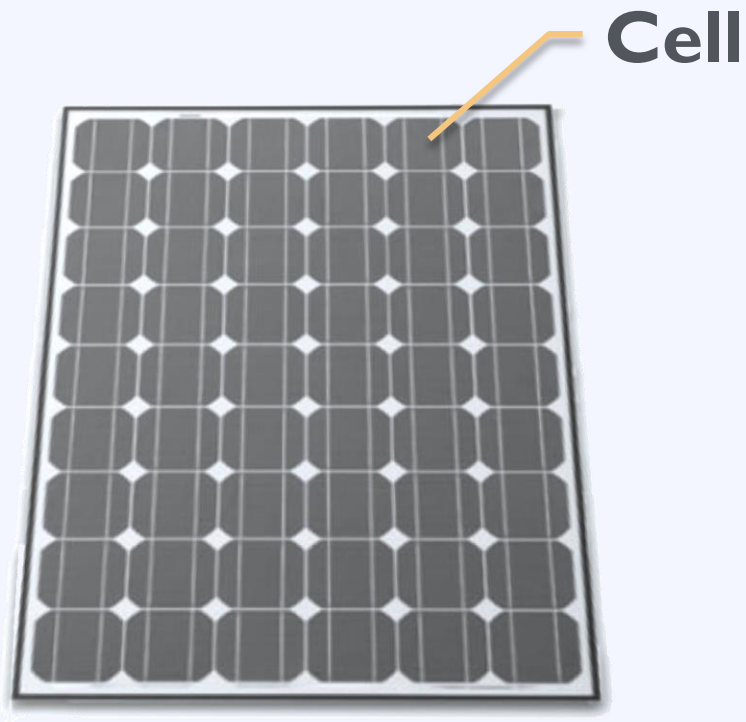
Solar Technologies

Solar Photovoltaic (PV)

Solar Hot Water

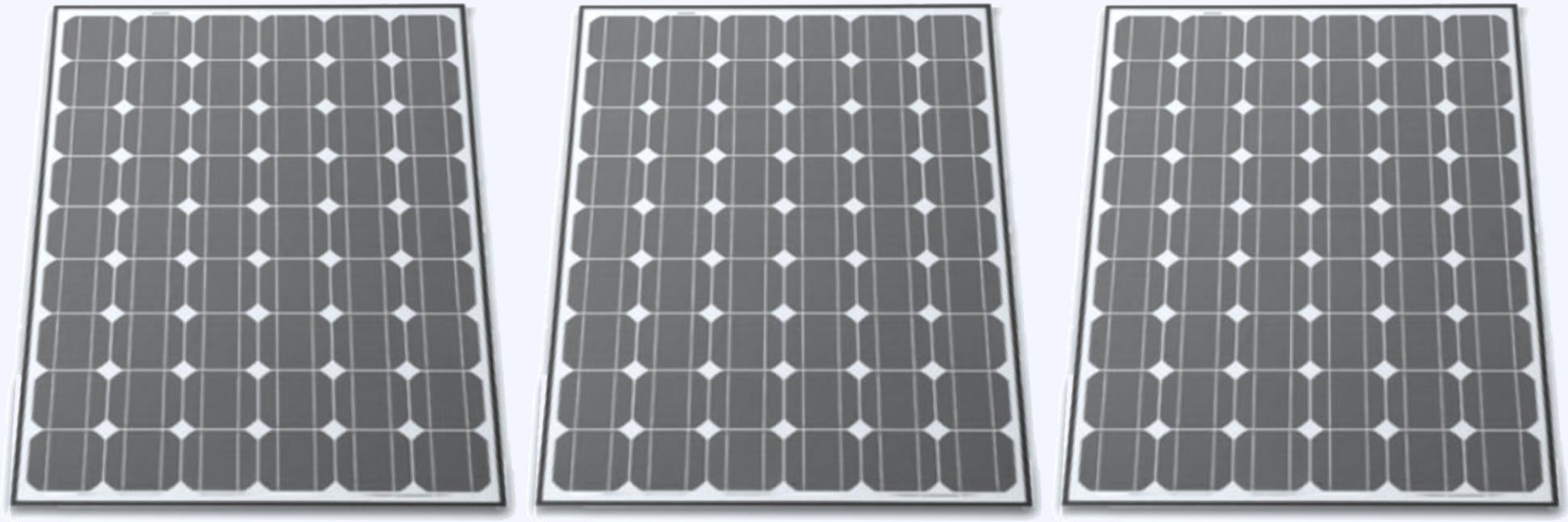
Concentrated Solar Power

Some Basic Terminology



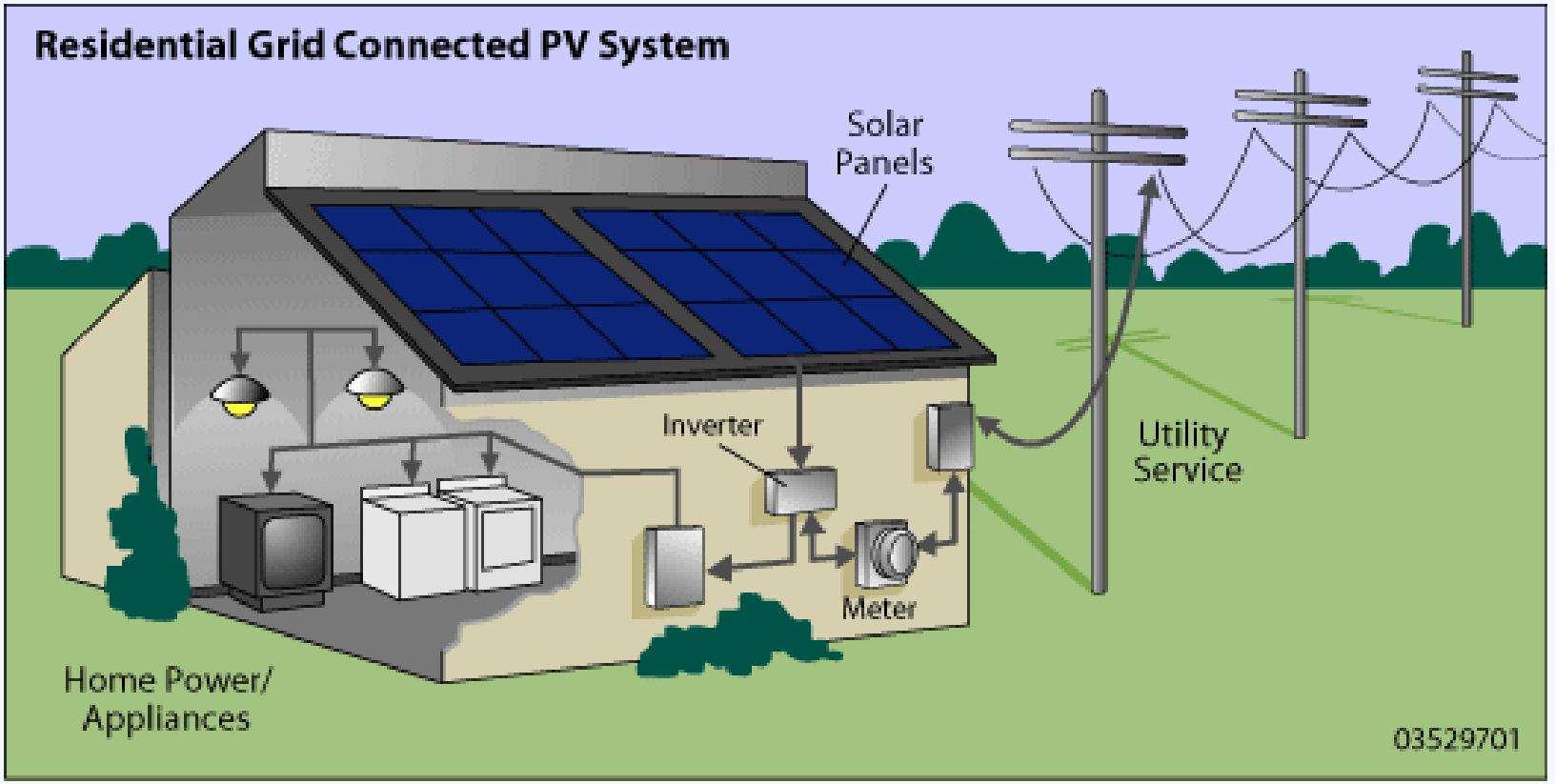
Panel / Module

Some Basic Terminology

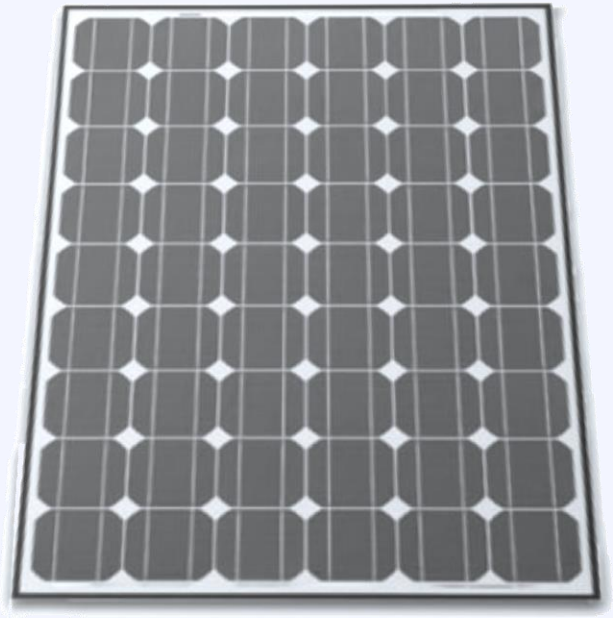


Array

System Components



Some Basic Terminology



Capacity / Power

kilowatt (kW)

Production

Kilowatt-hour (kWh)

System Types

Roof Mount

Ground Mount

Parking Canopy

Some Basic Terminology

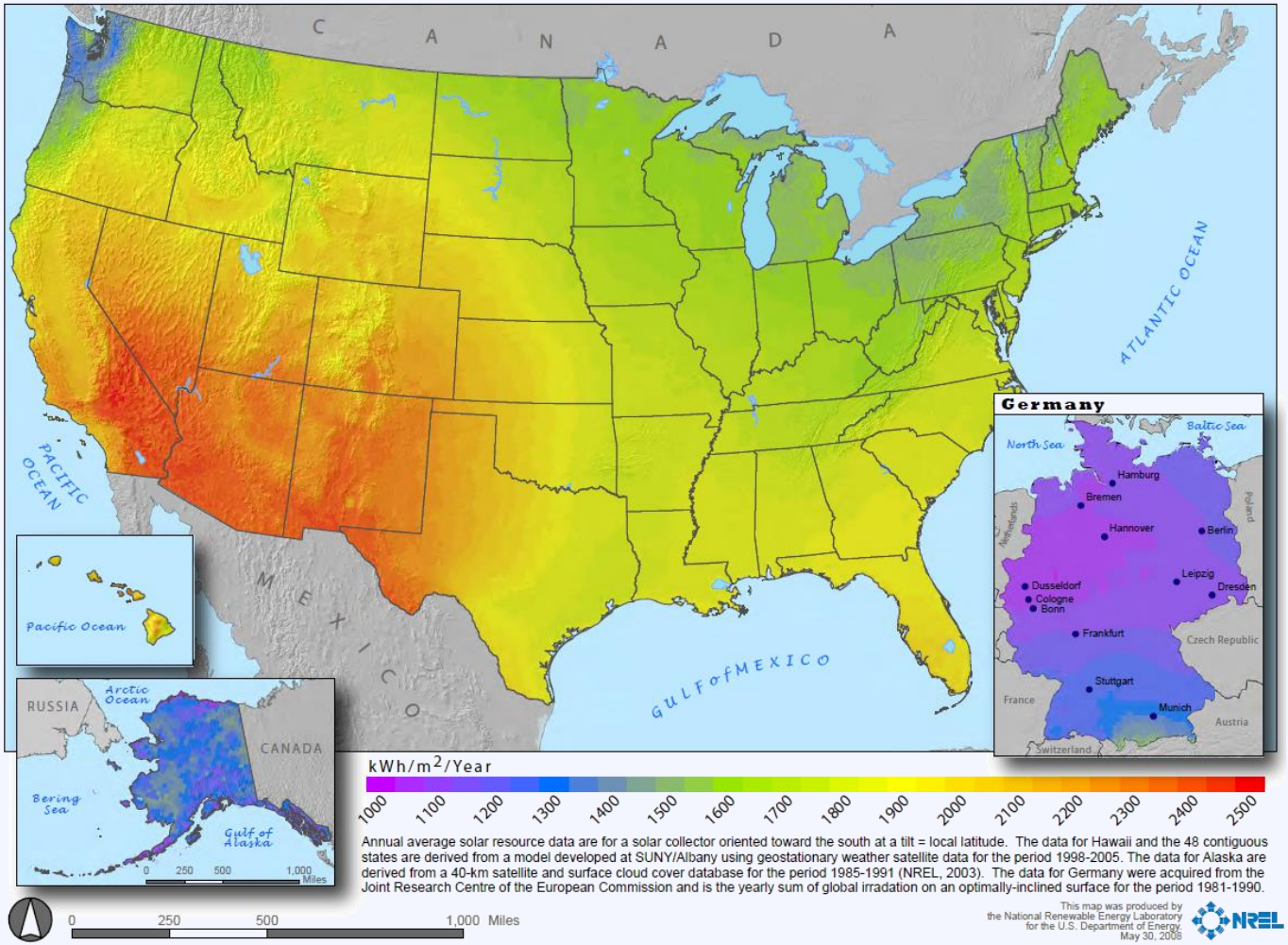
Residence
5 kW

Factory
1 MW+

Office
50 – 500 kW

Utility
2 MW+

Solar Resource in US & Germany



Source: National Renewable Energy Laboratory

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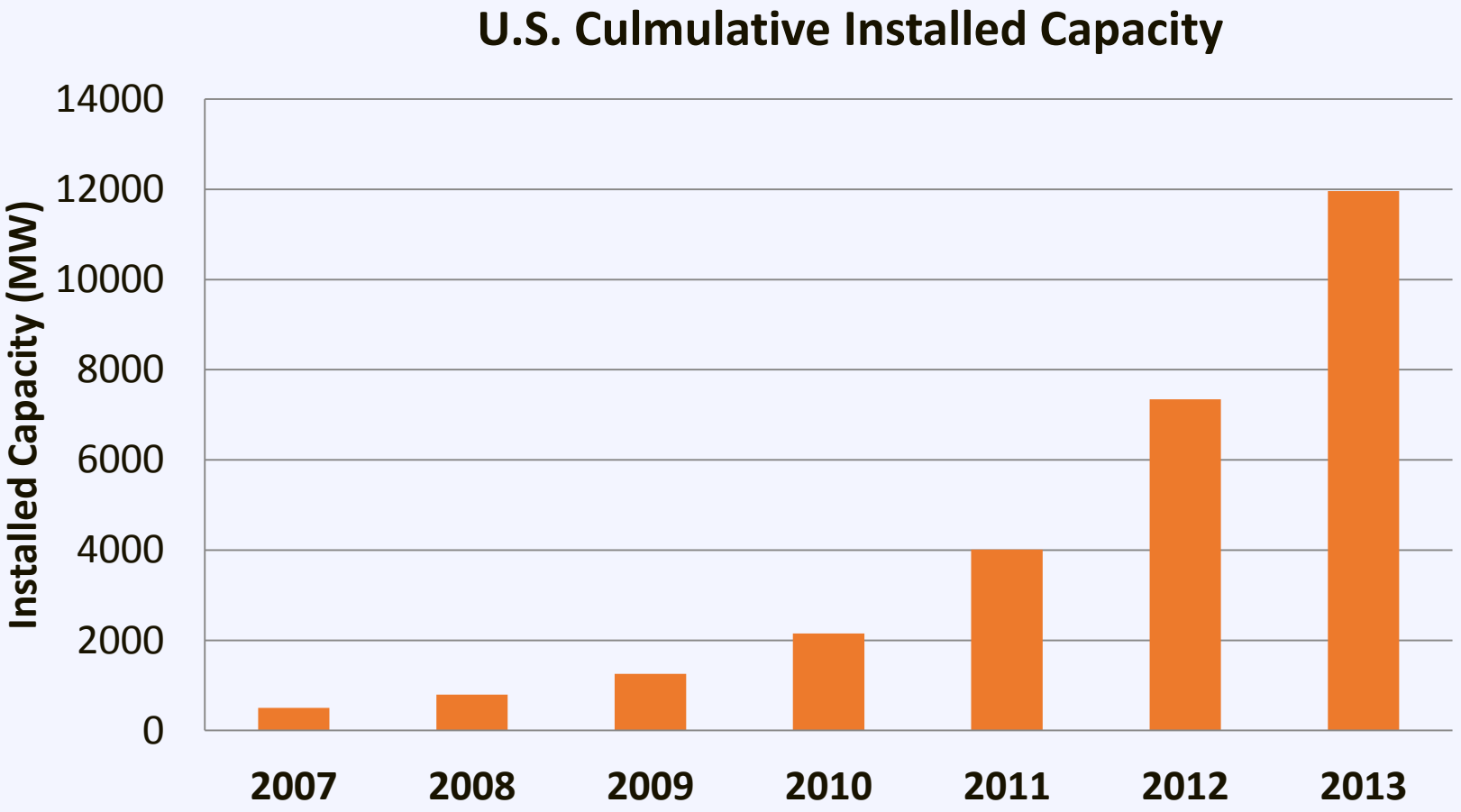
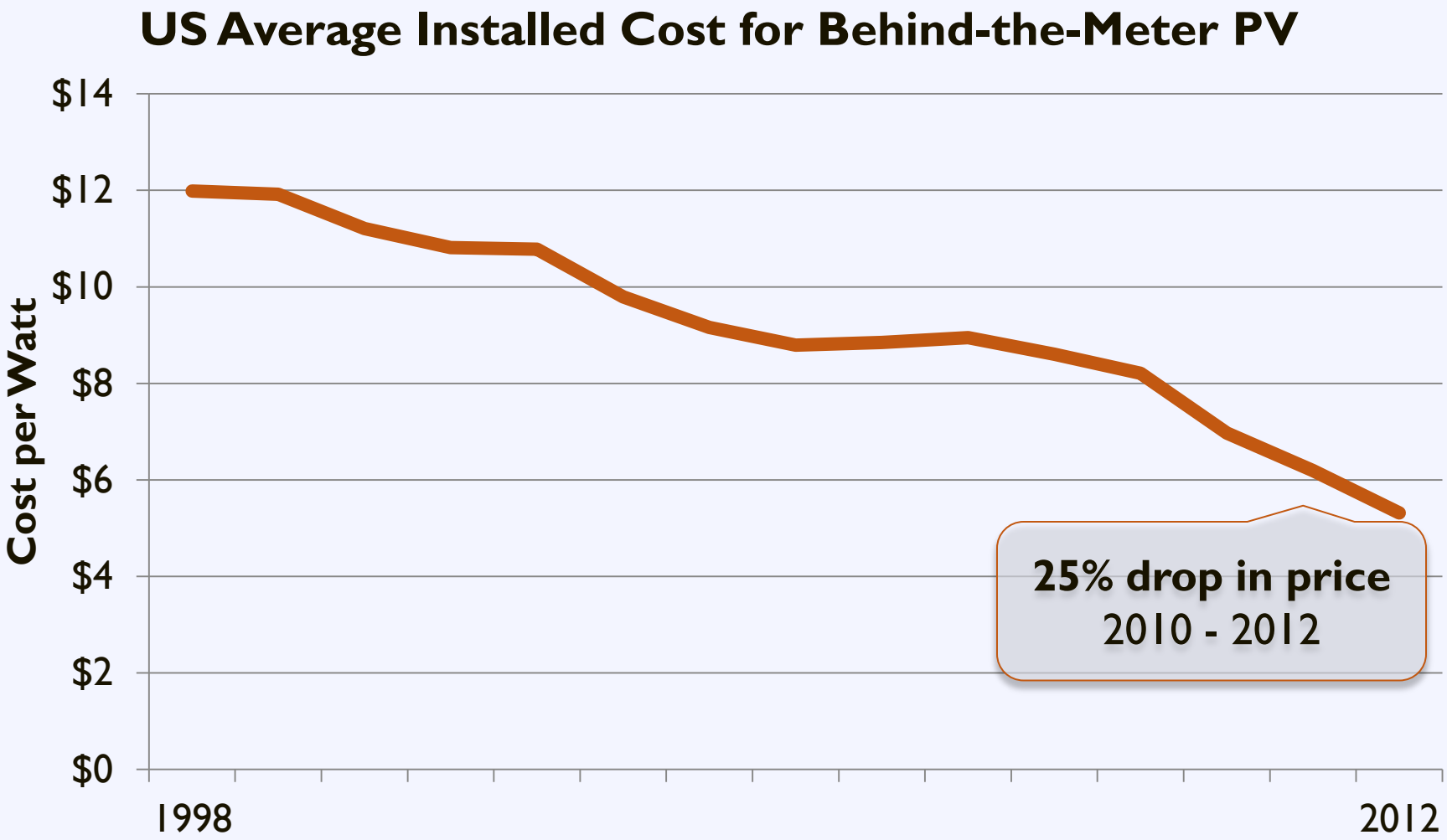
U.S. Department of Energy

Cumulative US PV Capacity



Source: *US Solar Market Trends, IREC*

The Cost of Solar PV



Available Incentives

Federal	Investment Tax Credit	Accelerated Depreciation
State & Utility	Renewable Portfolio Standard	Net Metering

Federal Incentives

Investment Tax Credit

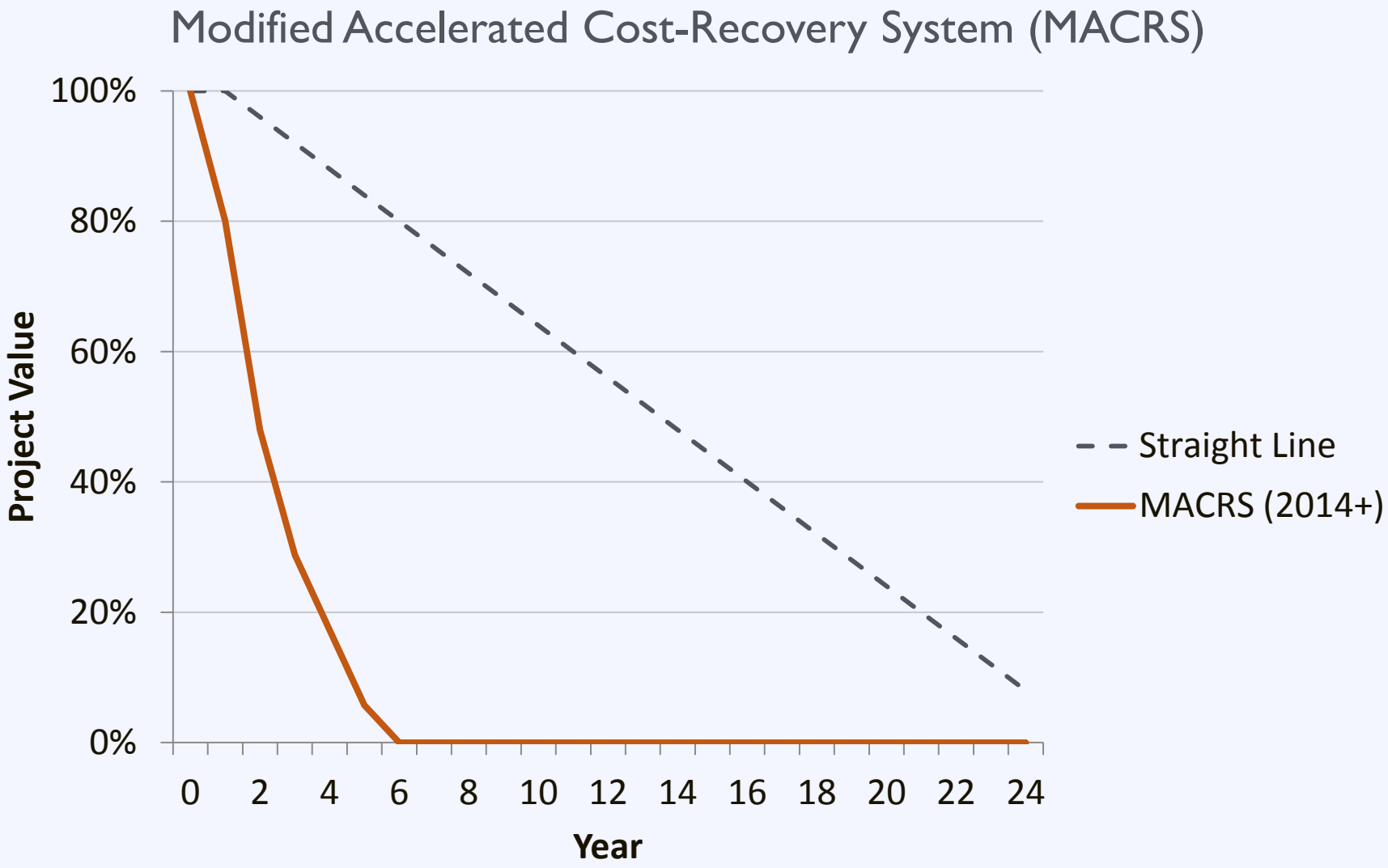
Type: Tax Credit

Eligibility: For-Profit Organization

Value: 30% of the installation cost

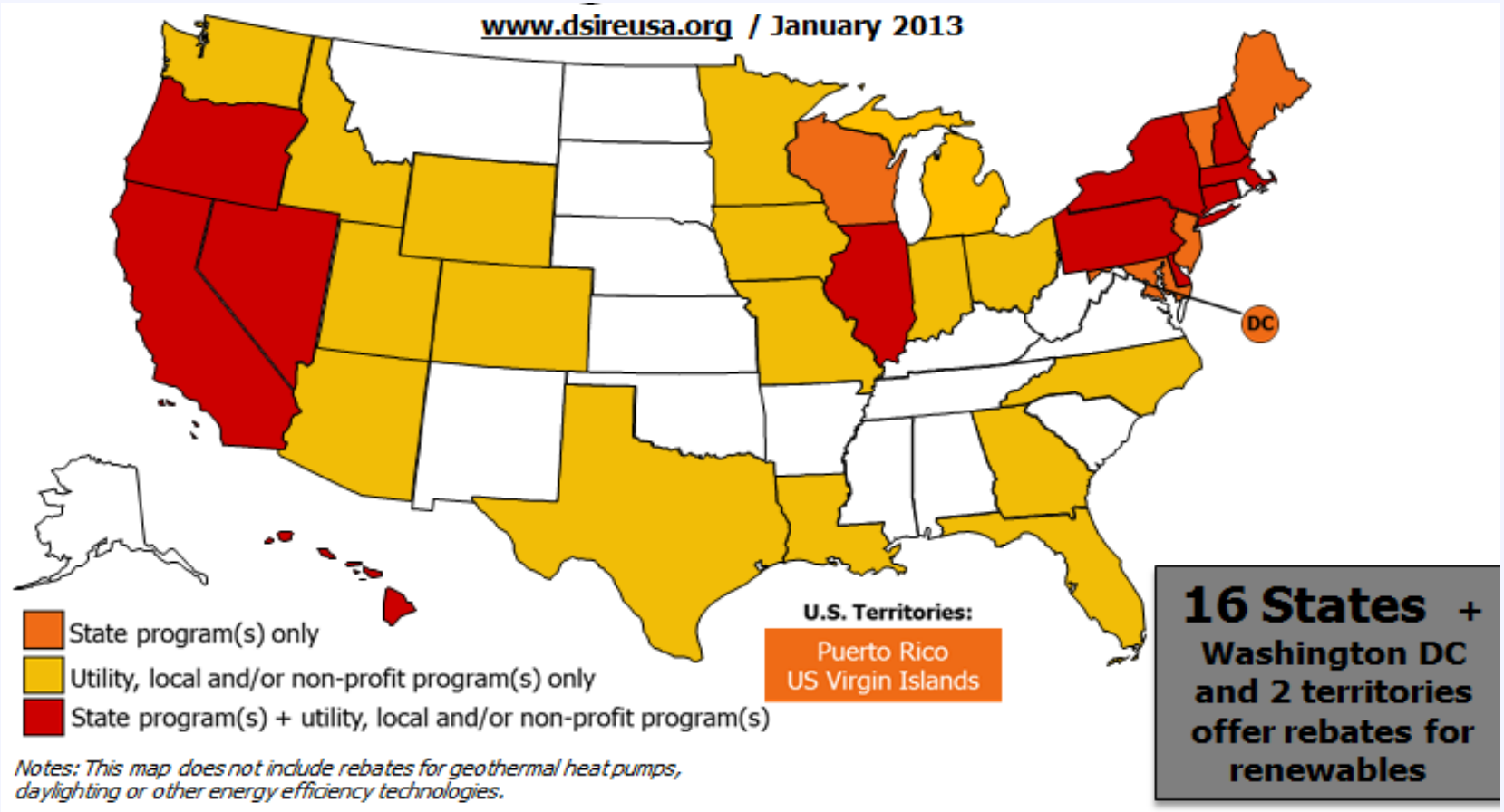
Availability: Through 2016

Accelerated Depreciation



State and Utility Incentives

Solar Rebates



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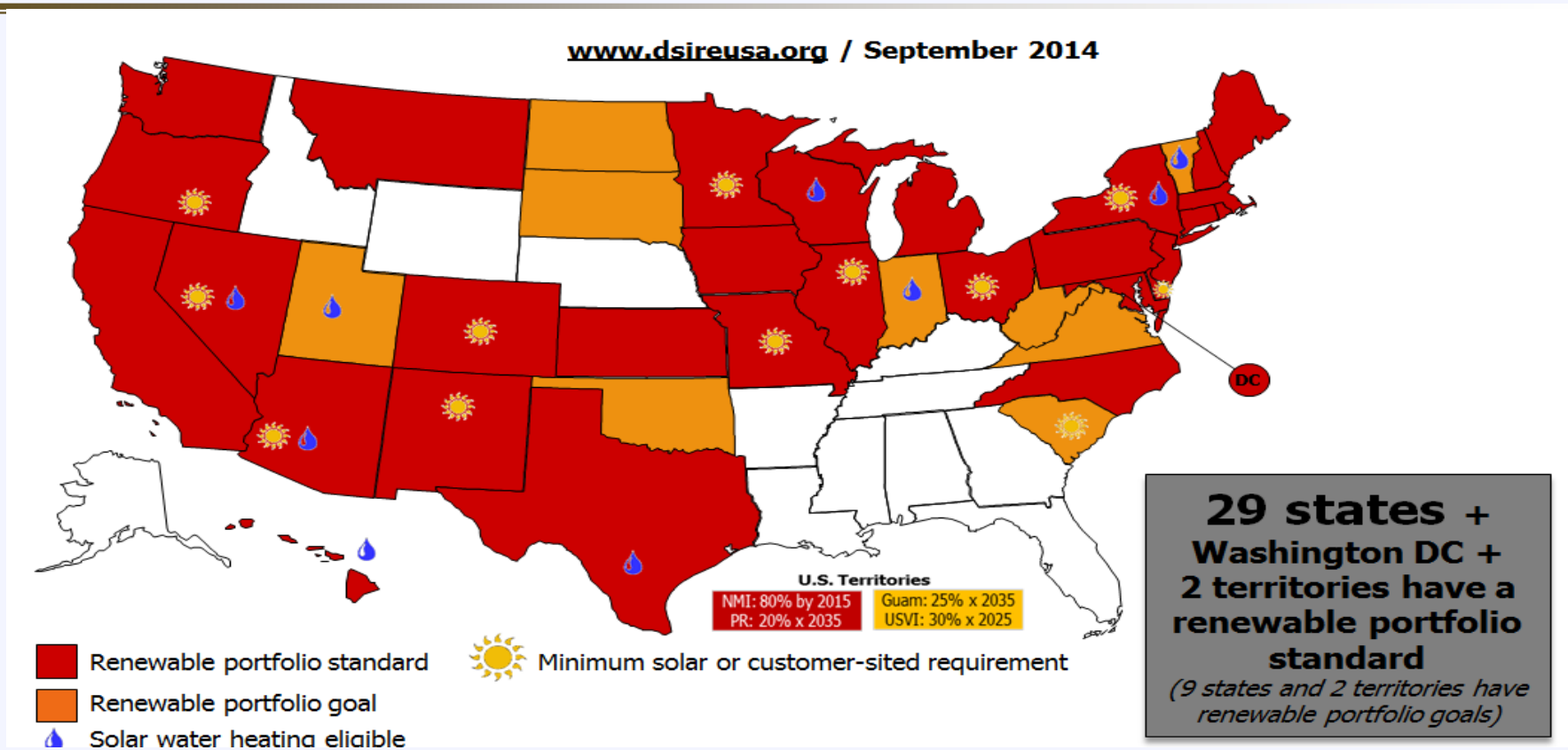
Source: Database for State Incentives for Renewables & Efficiency (DSIRE), January 2013

Solar Renewable Energy Credits (SRECs)

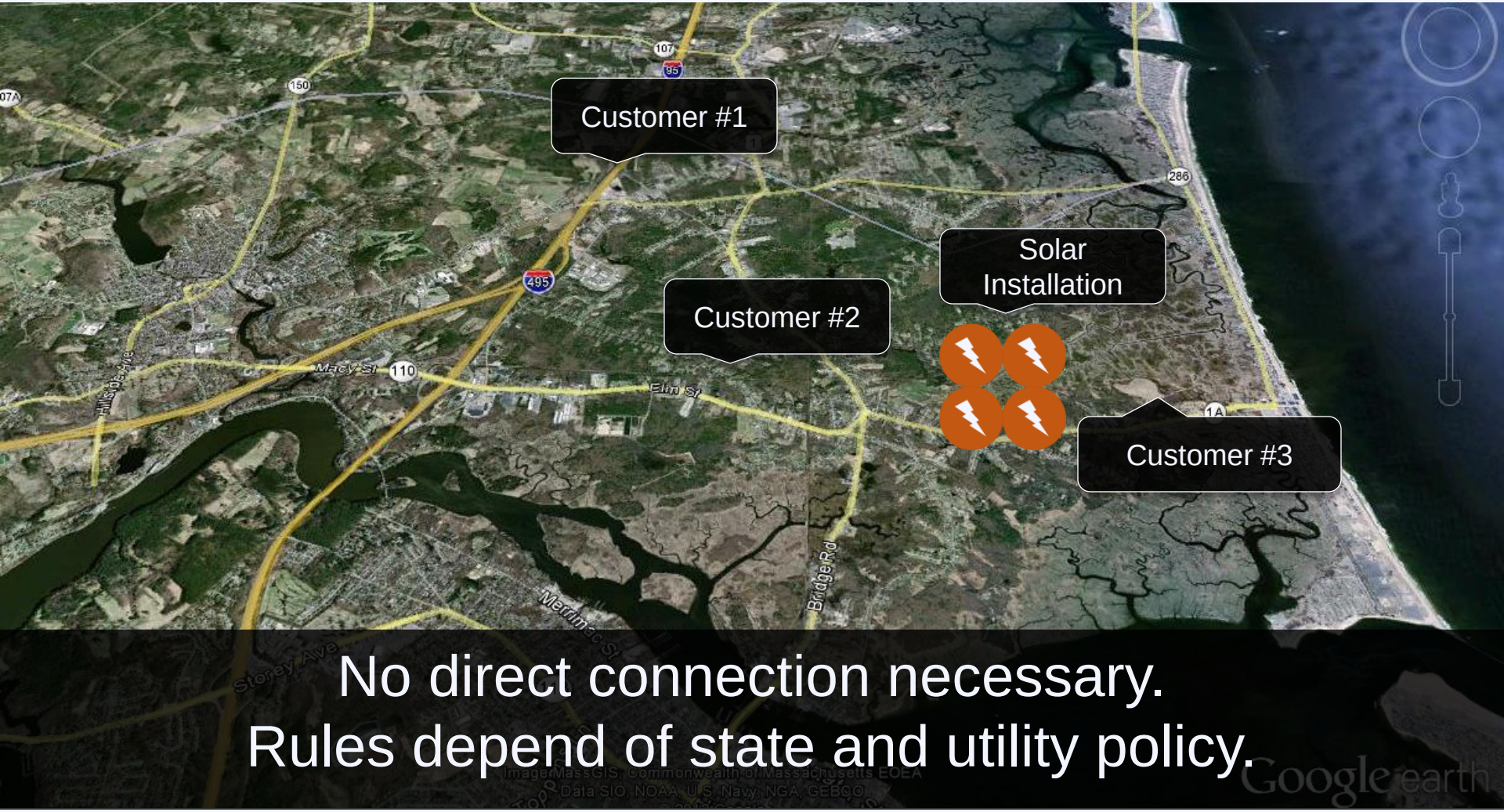


- Tradable credits for the green attributes of solar energy
- Prices, markets and policies vary by state
  - Solar targets in some states

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.

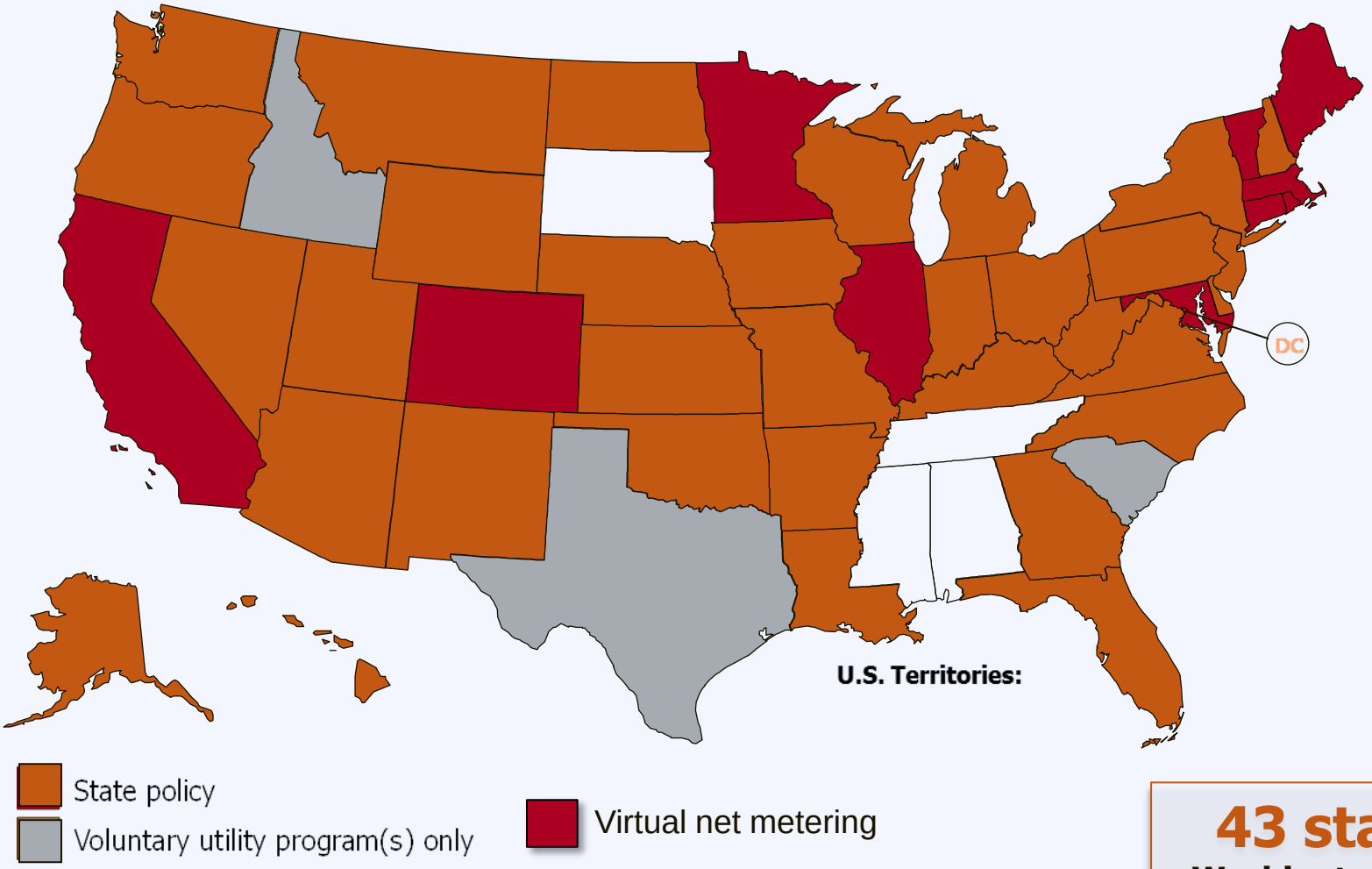
Virtual Net Metering



Virtual Net Metering

Allows net metering credits produced by one solar system to be allocated to multiple utility accounts, even if the system is off-site.

Net Metering Policies



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

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U.S. Department of Energy

Source: Modified from DSIRE's 2013 Net Metering Map. (2014).

Agenda

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- Introductions
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Models and Incentives

- Special Purpose Entity
  - Participant-owned
  - Third-party managed
- Utility-sponsored

Tools

- NREL Community Solar Scenario Tool
- Oregon Decision-Support Tool

Solar Development

National study found that…

22-27% of residential roofs were suitable for on-site solar

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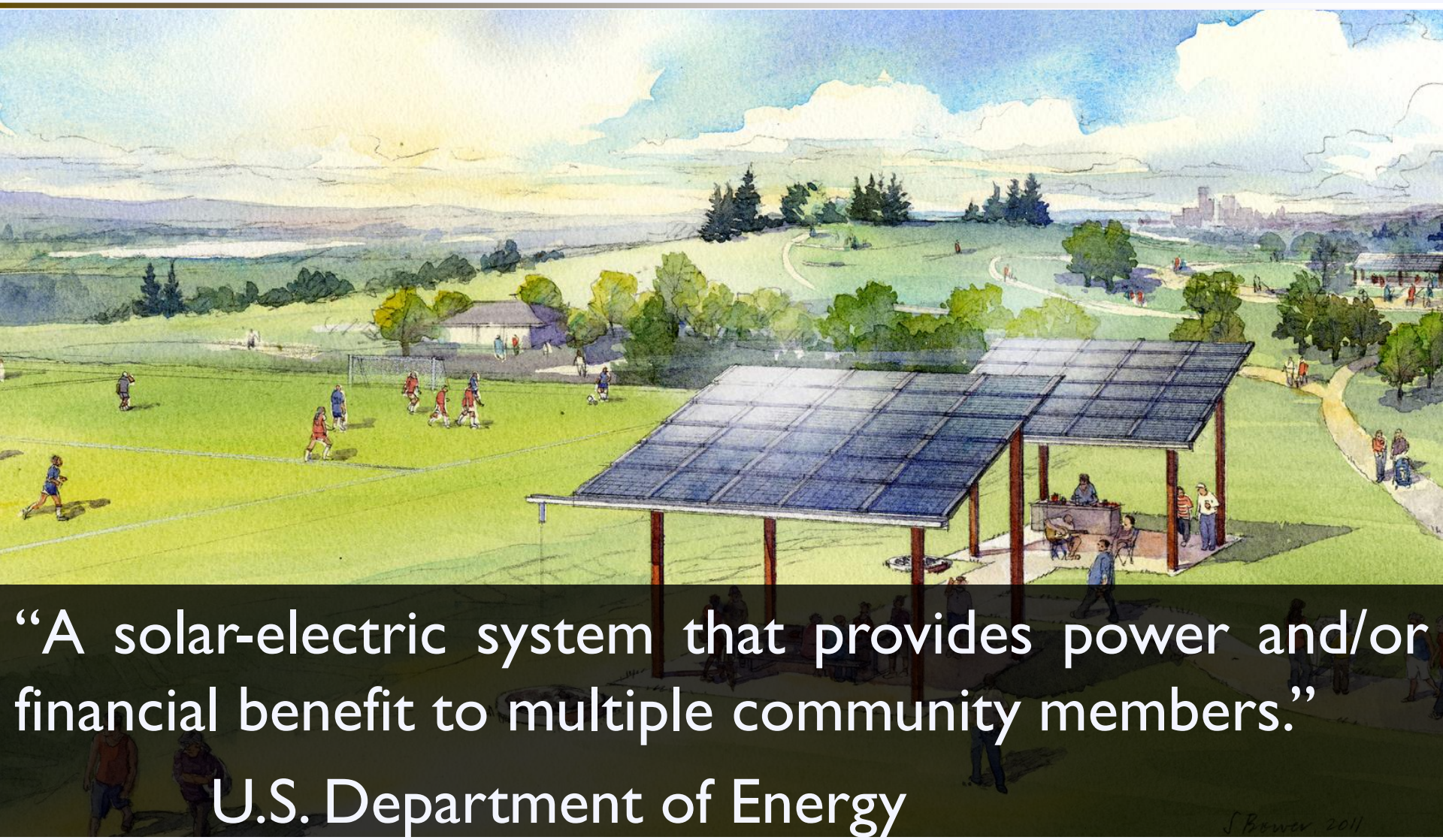
U.S. Department of Energy

National Renewable Energy Laboratory (NREL). A Guide to Community Shared Solar: Utility, Private and Non-Profit Project Development. Prepared for the Sunshot Initiative. May 2012.

Community Ownership



"A solar-electric system that provides power and/or financial benefit to multiple community members."

U.S. Department of Energy

Powered by SunShot
U.S. Department of Energy

Source: Seattle City Light

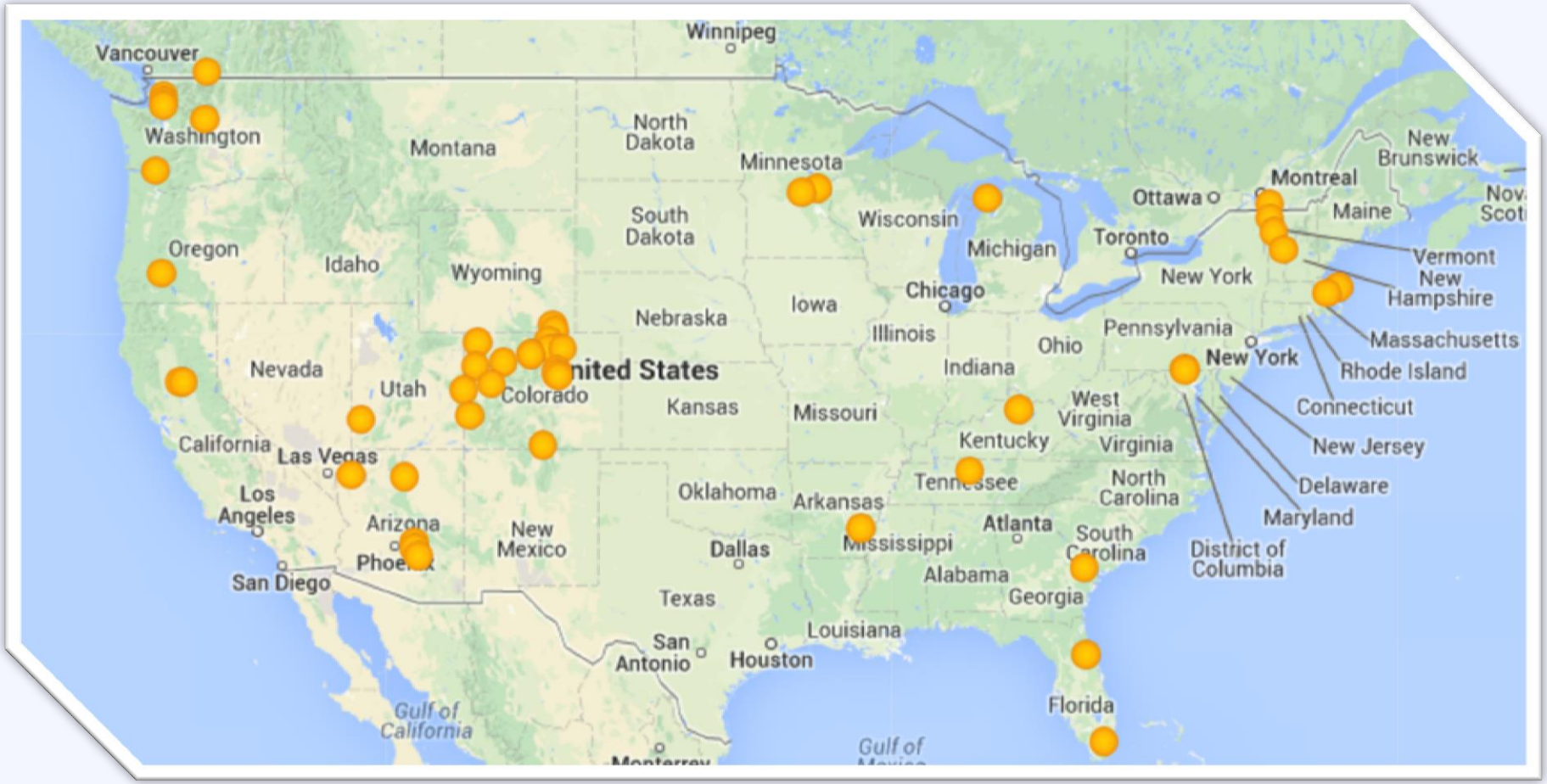
What Is Community Solar?

Individuals benefit directly from energy and/or other benefits from system installed in their utility territory

Group purchase program (Solarize)

Crowd-funding (Solar Mosaic)

Community Solar in the U.S.



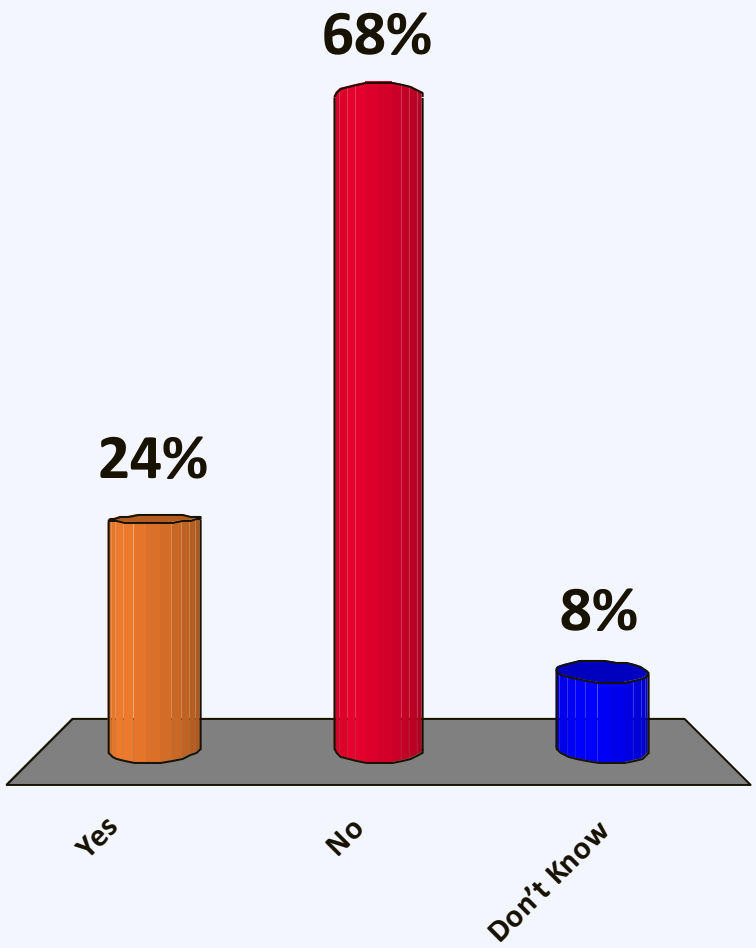
Source: http://www.sharedrenewables.org/index.php?option=com_projects&view=display&Itemid=2

Are there community solar projects in your community?

A. Yes

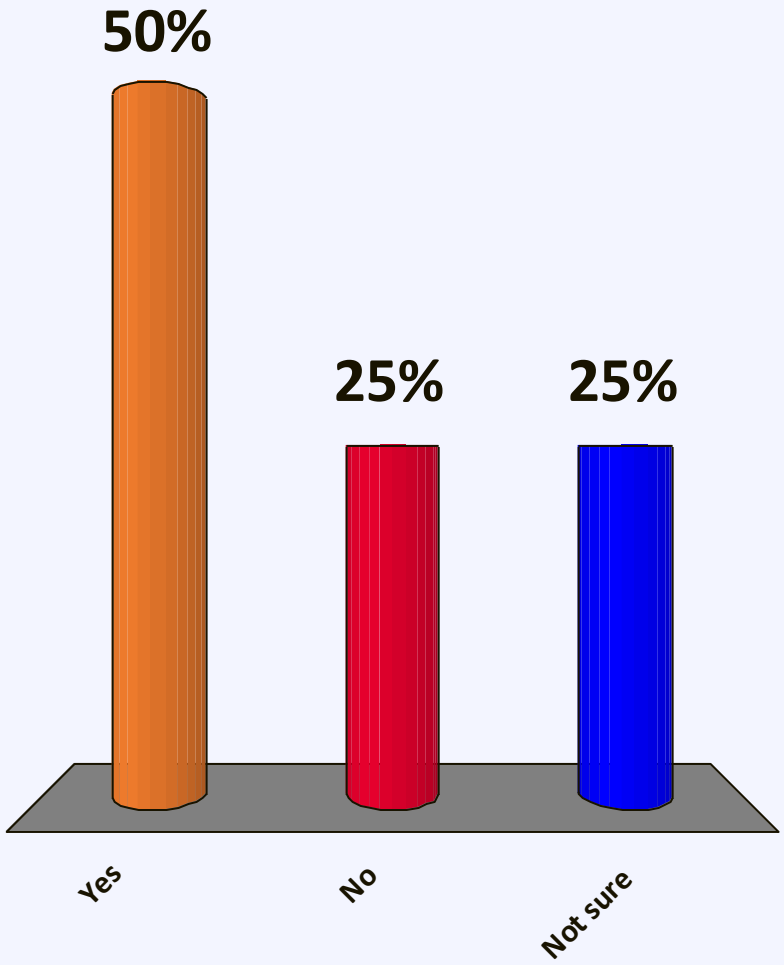
B. No

C. Don't Know



Has your community expressed interest in community solar?

A. Yes
B. No
C. Not sure

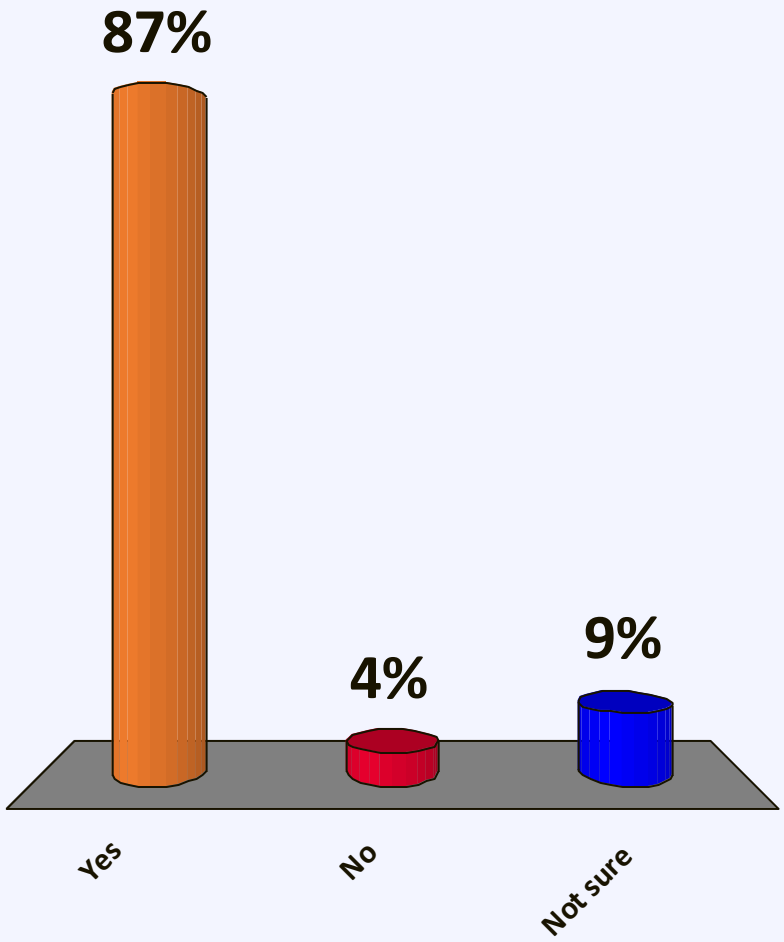


Does your local government own space that can support a community solar project?

A. Yes

B. No

C. Not sure



Community Solar Models

- Special-purpose entity
  - Participant-owned
  - Third-party model
- Utility-sponsored or managed

Models

Special Purpose Entity (SPE)

- Participant-owned
- Third party

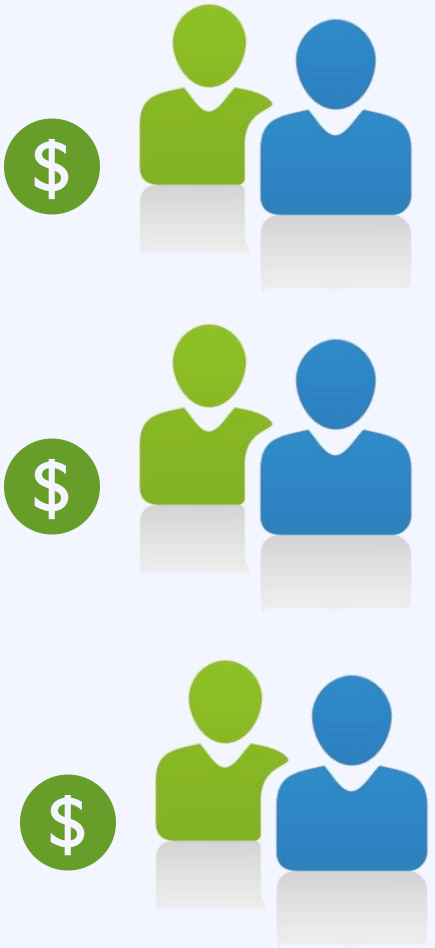
Utility Sponsored Ownership

SPE: Participant Ownership

- Private entity or special purpose entity (e.g., LLC) is formed by organizing participants for the purposes of developing a Community Solar project
- Private entity owns or leases property on which the PV system will be installed
- Participants realize a return on investment and benefit from net metering credits and/or SRECs generated by the system

Community: Participant Ownership

Solar Installation



Community: Participant Ownership

Solar Installation

Participant Ownership

Benefits

- Access to multiple revenue streams
- Opportunity to reduce system costs through multiple incentives

Drawbacks

- Legally complex
- SEC Regulations
- Sufficient tax appetite
- Incentive and policy availability

Participant vs. Third Party Ownership

Participant

- Access to multiple revenue streams
- Tax and SEC complexities
- O&M costs

Third Party

- Third party handles O&M costs
- Internal tax and legal expertise
- Higher ROI required
- May receive REC credits

SEC and Tax Policy

Tax	• Passive tax appetite for ITC and MARCS
SEC	• Limits on unaccredited investors for SEC filing exemptions
Local	• Legal and procedural nuances

Case Study: EcoVillage Ithaca

- 50 kW PV system
- Ground mount
- Condo association installed with 15-year loan from residents
  - $6/W, System cost $300,000
  - $100,000 post-incentives
- Serves 55% of load of 30 homes
  - Operational April 2011

Photo Credit to Home Power

Case Study: EcoVillage Ithaca

No Virtual Metering	→	Conversion to master metering for complex
Co-op now responsible for billing and metering of residents	→	Sub-metering equipment installation
Aggregated meter subject to commercial rate	→	Demand charge incentivized off-peak usage

Case Study: Brewster, Mass. Community Solar

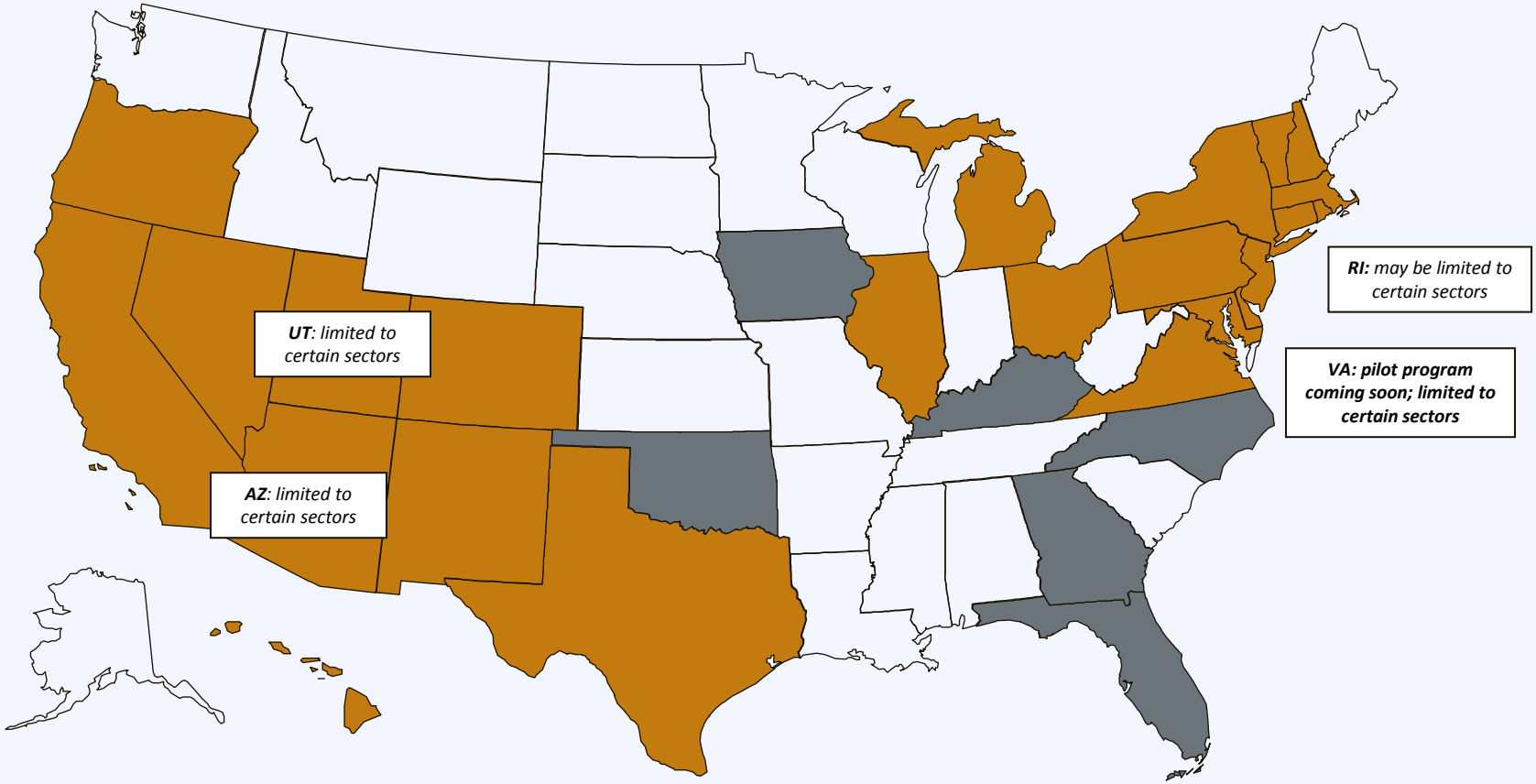
- 346 kW brownfield installation
- Municipal lease awarded to My Generation Energy
- 5-year virtual net-metering agreements
- 50 members
  - Over half unaccredited investors

Photo credit: Enphase energy

Meister Consultants Group. Cambridge Community Shared Solar PV on Municipal Property Report. Prepared for the Rooftop Solar Challenge. February 2013.

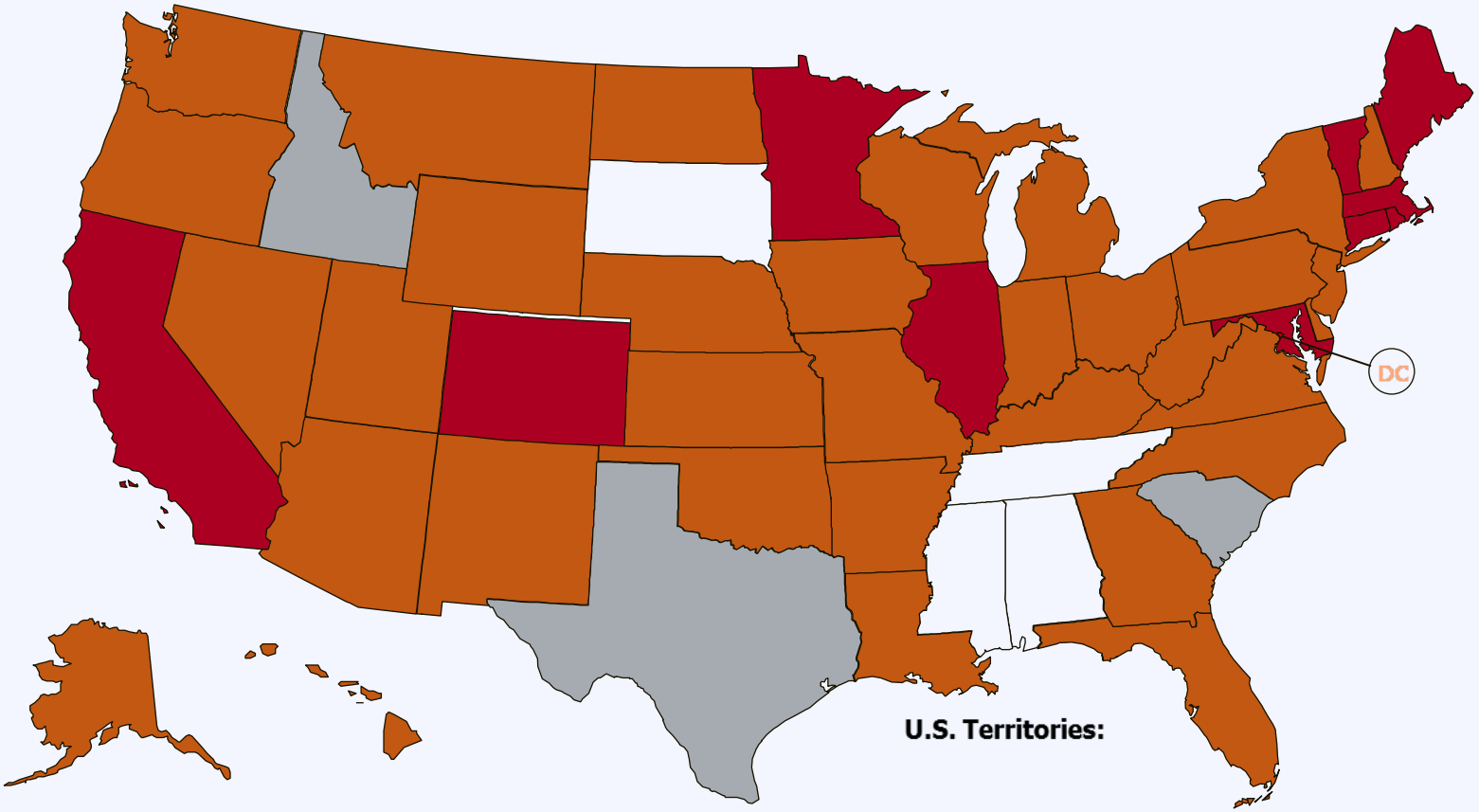
Third Party Ownership: State Policy

www.dsireusa.org / February 2013



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.

Net Metering



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

Source: Modified from DSIRE's 2013 Net Metering Map. (2014).

Brewster Community Solar Garden

Brewster	Members	My Generation Energy
		
Lease Payments, Alternative use of vacant land	Guaranteed $1400 in savings, Clean Energy	SREC Revenue, Ownership payments

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U.S. Department of Energy

Brewster Community Solar Garden

Photo credit: Brewster Community Solar Garden

- ✓ Lease/PPAs OK
- ✓ Virtual Net Metering
- ✓ Motivated Municipal Staff
- ✓ Experienced Third-Party Developer
- ✓ SREC Credits

Brewster Community Solar Garden

Benefits

- Limited upfront cost
- No O&M costs
- Transferable "shares"
- Predictable payments
- Tax benefits
- Lease revenue

Drawbacks

- Sufficient tax investors
- Not possible in all states
- Higher ROI required

Models

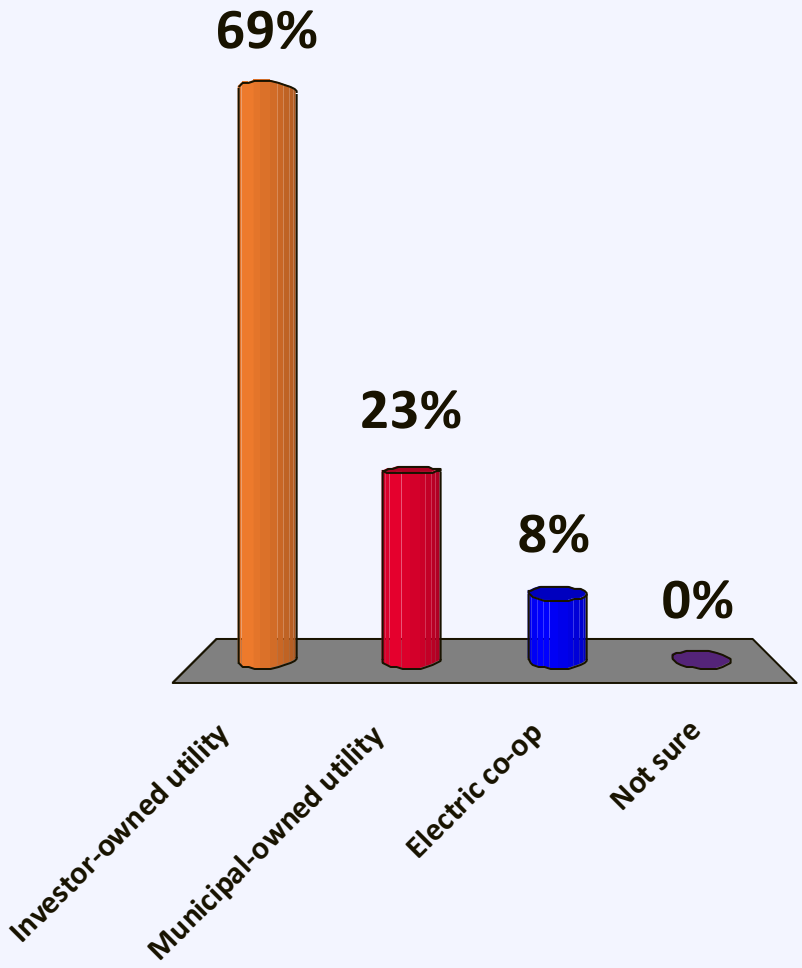
Special Purpose Entity (SPE)

- Participant-owned
- Third party

Utility Sponsored Ownership

What kind of electric utility is in your community?

A. Investor-owned utility
B. Municipal-owned utility
C. Electric co-op
D. Not sure



Utility Sponsored Ownership

- Utility owns or retains a third party to own and manage a PV system on its behalf
- Utility allows its customers to purchase a right to the benefits of the PV system
- No "ownership" by utility customers, but they can benefit from net metering credits or as a "green power" purchase
- Frequently administered by Municipal Utilities

Community: Utility Model

Utility Model

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U.S. Department of Energy

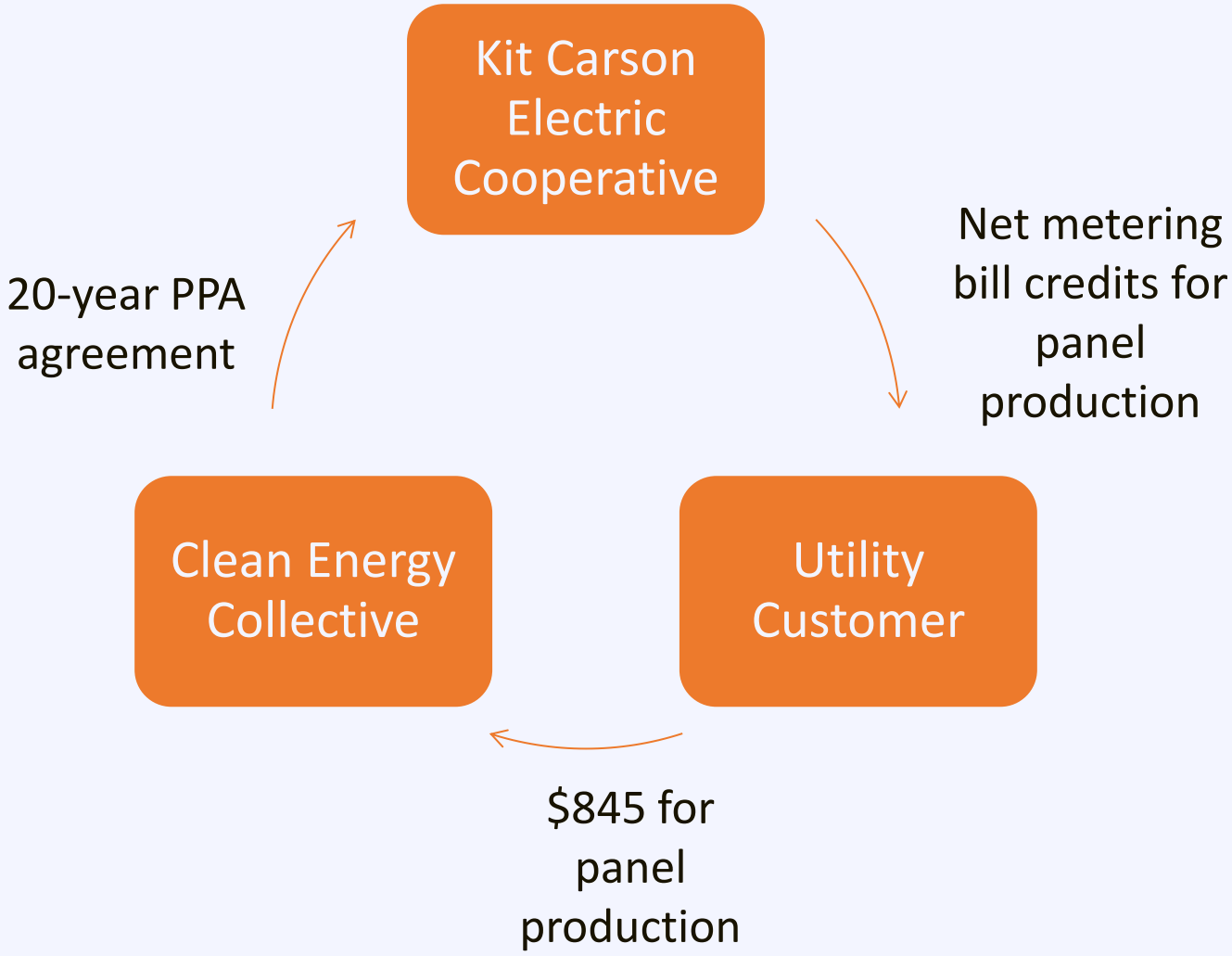
Solar Outreach Partnership. Bringing Down the Cost of Solar Through Community Shared Solar Slide Deck. 2012.

Case Study: Taos, NM
Kit Carson Electric Cooperative

Photo credit: Clean Energy Collective

- Agreement with Clean Energy Collective
- 98.7 kW solar canopy project at Taos Charter School
- Net metering bill credits for utility customers
- Online in 2012

Kit Carson Electric Cooperative



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U.S. Department of Energy

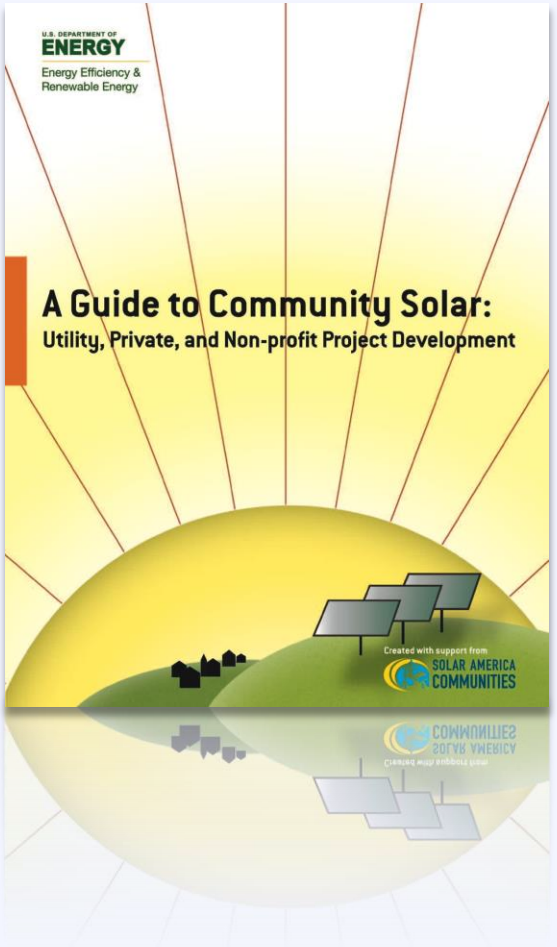
Logan, J.R. The Taos Community Solar Garden Prepares to Bloom. The Taos News. July 31, 2012.

Community: Resources

Resource **A Guide to Community Solar**

A resource for community organizers and local government leaders who want to develop community solar projects.

www.nrel.gov



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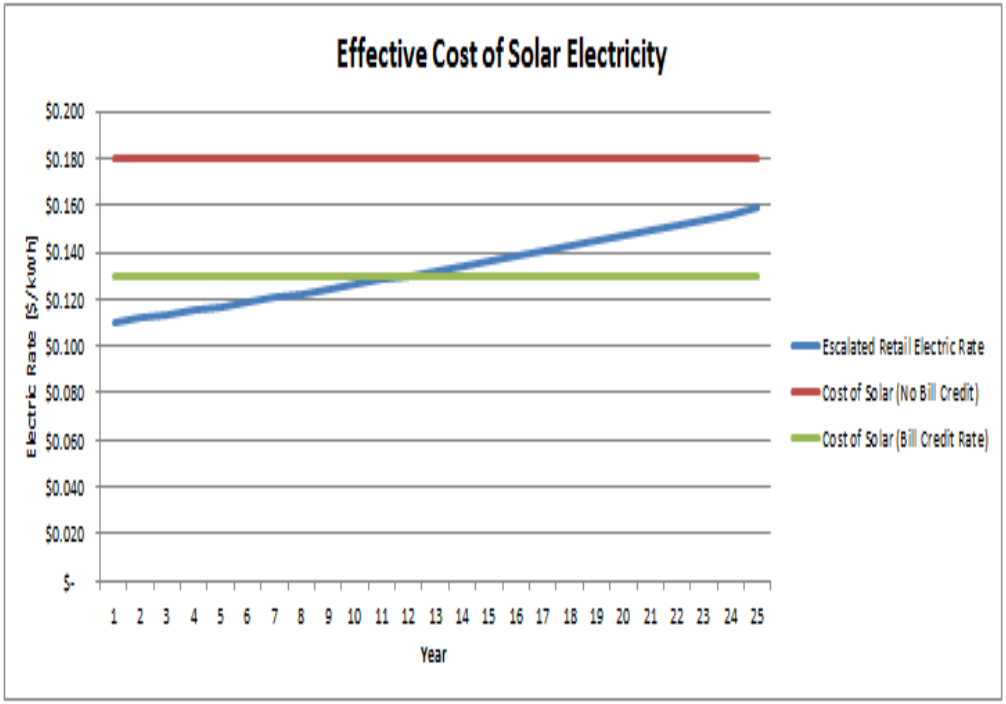
- Oregon Community Solar Decision-Support Tool

NREL Community Solar Scenario Tool



- Spreadsheet model
- Utility and Participant Impacts
- Targeted audience of small utilities
- Nationally applicable
- Utility-sponsored model

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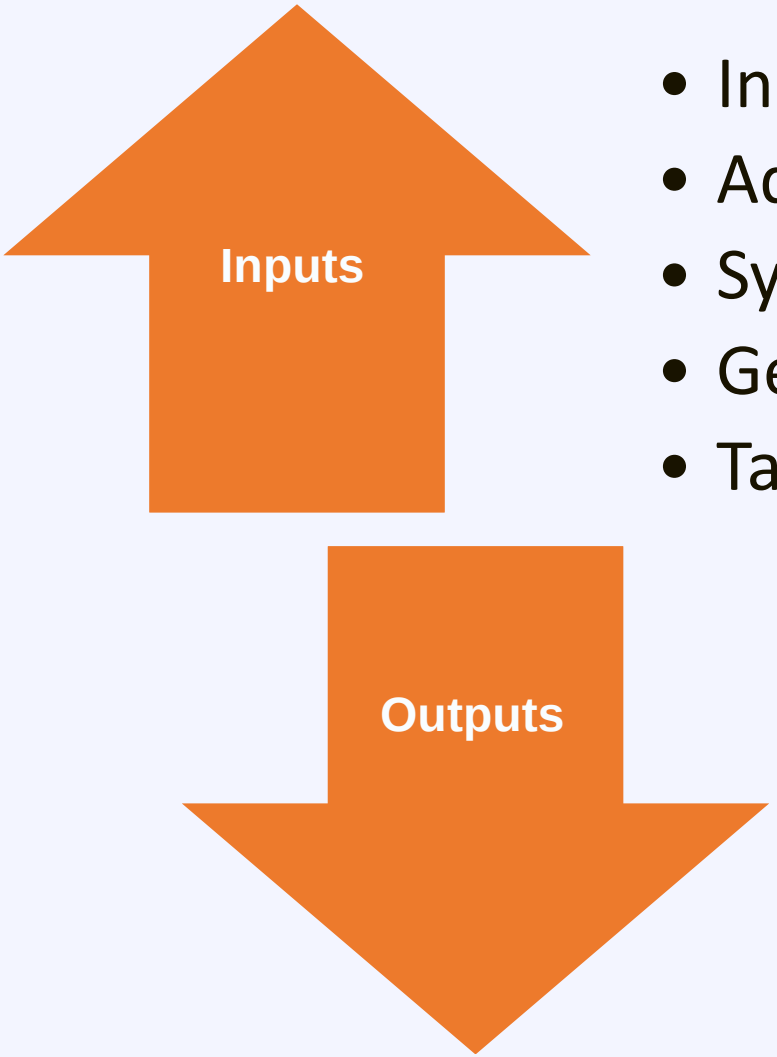
http://www.nrel.gov/tech_deployment/tools_community_solar.html

Inputs and Outputs

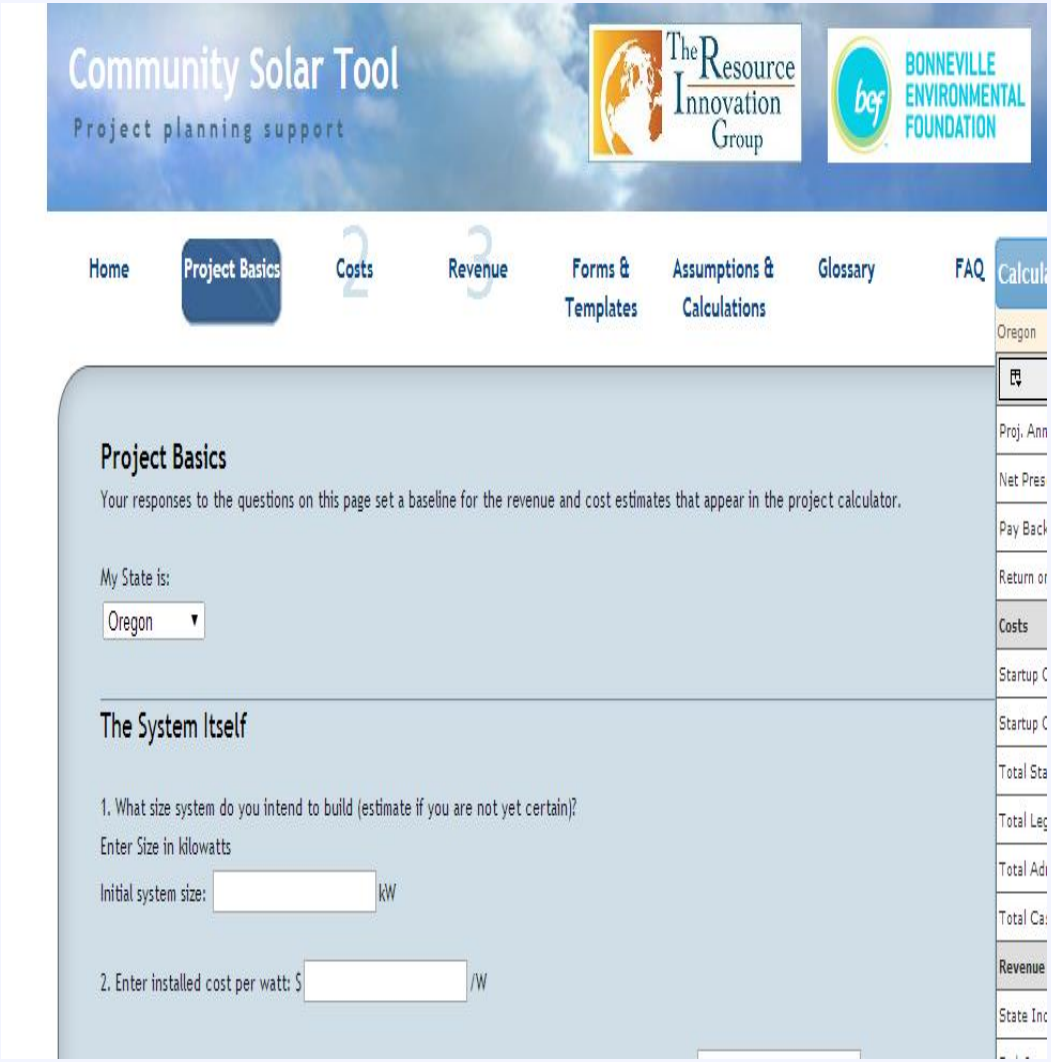


- Incentives
- Administrative Costs
- System Information
- Geographical Information
- Tax-filing status

- Annual Program Costs
- Subscriber Share Costs/Benefits
- Lifetime System Generation
- Lifetime Electricity Costs

Decision Support Tool

- Tailored for WA, OR, MT, ID
- Decision support tool
  - Key questions and considerations
  - Considering approaches
- Targeted for local governments or utilities with limited internal expertise
- Online Portal: http://communitysolartool.b-e-f.org/



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Questions?