Solar Powering Your Community Addressing Soft Costs and Barriers





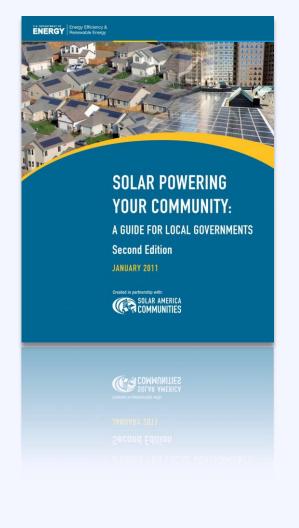
- Increase installed capacity of solar electricity in U.S. communities
- Streamline and standardize permitting and interconnection processes
- Improve planning and zoning codes/regulations for solar electric technologies
- Increase access to solar financing options



Resource Solar Powering Your Community Guide

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

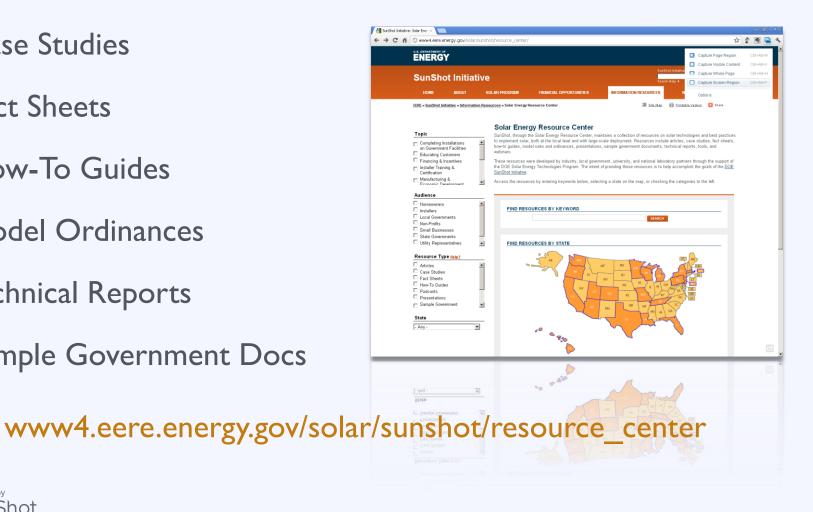
www.energy.gov





Sunshot Resource Center Resource

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





Technical Support

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

	U.3. DEPARTMENT OF ENERGY								
ve Web Forums	SunShot Initiative						SunShot Initiative SEARCH Search Help >		
	HOME	ABOUT	SOLAR PROGRAM	FINANCIAL OPPORTUNITIES	INFORMATION	RESOURCES	NEWS	EVENTS	
eb Portal	EERE » SunShot	Initiative » Info	rmation Resources » Solar Energy I Ask an Expert	Resource Center		Jite Map	응 Printable Version	Share	
			July 30, 2012				QUESTIONS BY TOPIC		
cilitation ations ngs		Our community just added a dozen 240 watt panels to			t panels to	All Topics			
		our courthouse annex. I was planning on 240 watt max from the panels, but the inverters are of a lower wattage, 200.				Completing Installations on Government Facilitie (1)			
			Is this common across all applications?				Educating Customers (0)		
			A. First, we recommend using a professional PV system designer and installer. If I understand the question correctly, the answer is yes, inverters are typically sized at 10-20% below the maximum capacity of the PV panel array. This is because a PV system rarely, if ever, operates at its maximum capacity because of clouds, temperature, dust, inverter efficiency losses, etc. Real-wold performance should be taken into account when designing a PV system may a so a smaller inverter capacity is			Financing & Incentives (5) Installer Training & Certification (1) Manufacturing & Economic Development (0)			
			usually used to match actual PV system output and because larger inverters are more expensive. In some climates, however, it might make sense to spend the extra money on a larger capacity inverter. A larger capacity inverter will run cooler and last longer and leaves the PV system owner the potential opportunity to expand the size of the PV array without having to rejache the inverter with two of a larger capacity. I have also read about sizing inverters larger in order to be able to take advantage of "edge of cloud" effects—which is really cool and really geeky. See this from <u>Bill Brooks</u> .				Market Analysis (1) Organizing Solar Initiatives (0) Performance of Solar Technologies (2)		
							Permitting & Inspection Processes (0) Planning & Zoning (8)		
		_				Planning &	Zoning (8)	_	
www.solaroutre			tokan ena occur kine Reingung a PC system outpat and becaus lagar marters are now ur on the praticipant of PC system outpat and becaus lagar marters are now provide the provide the provide the provide the setting the setting of the provide the provide the provident approximation of the provident and laws the PV system output his potential sponting to each and the logar PV array without hange to reproce the marter with one of a langer capacity instance of the read about sizing investors larger in order to be able to take advantage of video of cloud" effects—which is ready cool and really greaty. See this thom the fibritian cloud" effects—which is ready cool and really greaty. See this thom the fibritian			Planning & Zoning (8)			
						Permitting & Inspection Processes (0)			
	1.1					Performance of Solar Technologies (2)			
	ach	.0							
				O · · · ·					

For more information email: solar-usa@iclei.org



Poll Who's in the room?



Poll What is your experience with solar?



Workshop Goal

Enable local governments to replicate successful solar practices, incorporate solar in the planning process, and expand local adoption of solar energy



Explore benefits

and

Overcome barriers



Activity: Identifying Benefits

What is the greatest benefit solar can bring to your community? [Blue Card]

Right Now

During Session

After Break



Powered by

U.S. Department of Energy







Activity: Addressing Barriers

What is the greatest barrier to solar adoption in your community? [Red Card]

Right Now

During Session

After Break





Group discussion

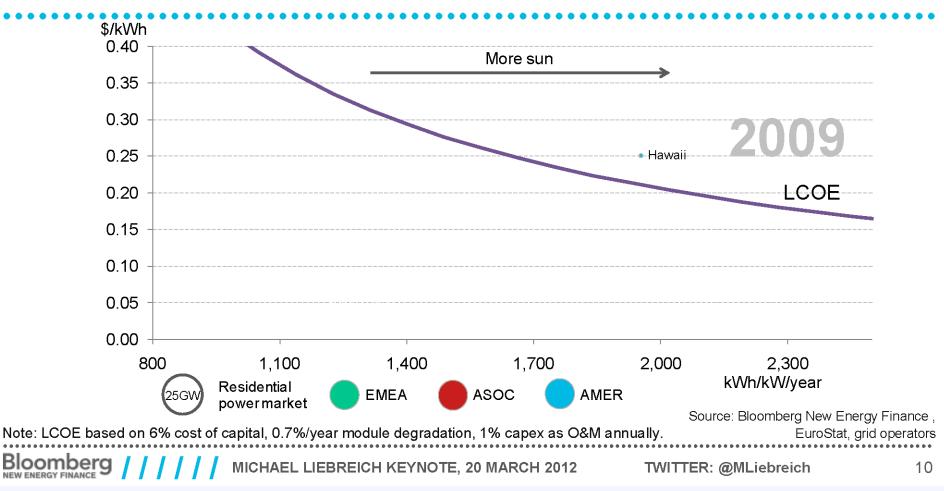


Installed Costs are Falling





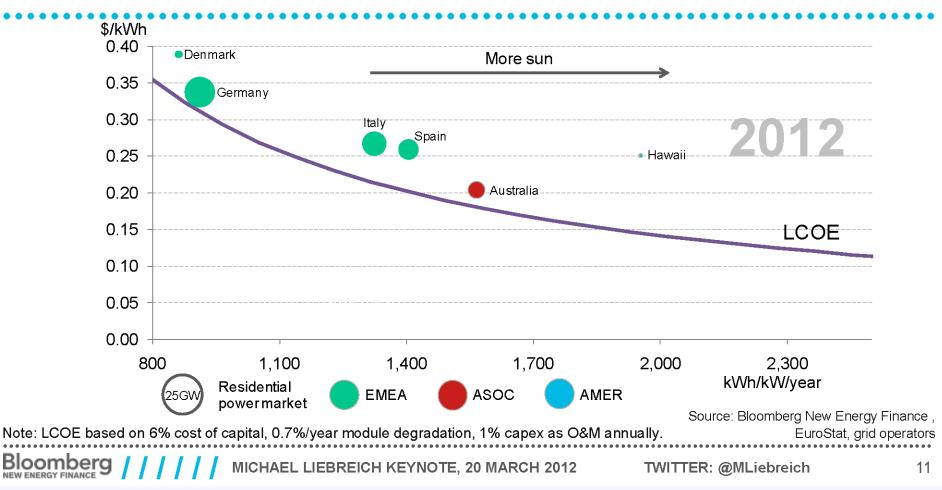
RESIDENTIAL PV PRICE PARITY





Source: Bloomberg New Energy Finance Summit, Michael Liebreich Keynote, 20 March 2012; Bloomberg New Energy Finance, "Reconsidering the Economics of Photovoltaic Power"

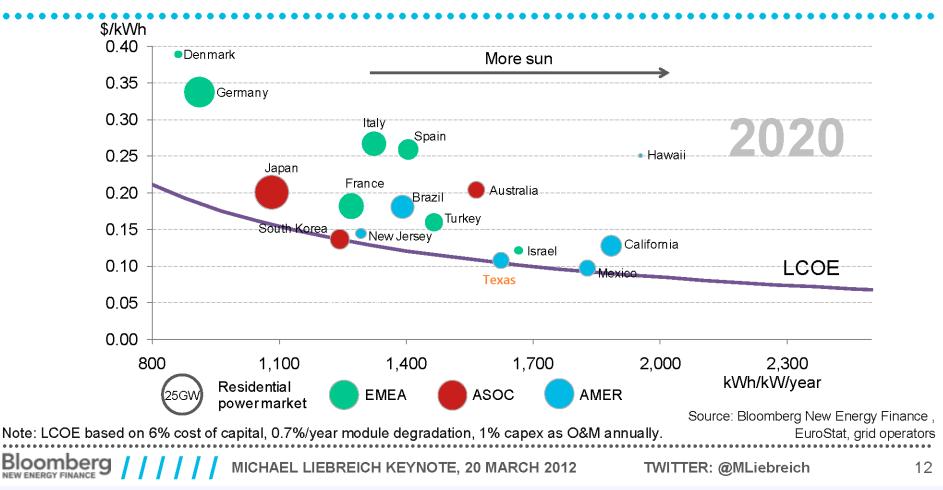
RESIDENTIAL PV PRICE PARITY





Source: Bloomberg New Energy Finance Summit, Michael Liebreich Keynote, 20 March 2012; Bloomberg New Energy Finance, "Reconsidering the Economics of Photovoltaic Power"

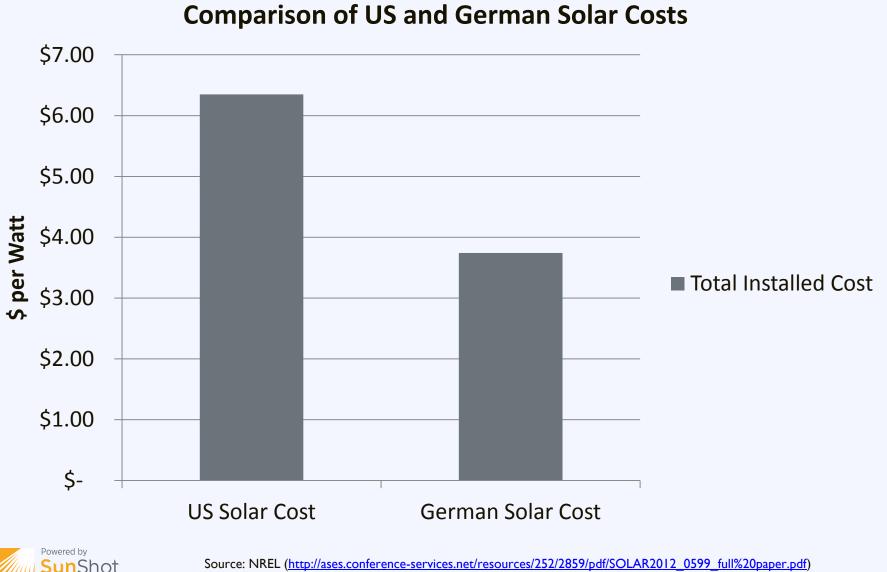
RESIDENTIAL PV PRICE PARITY



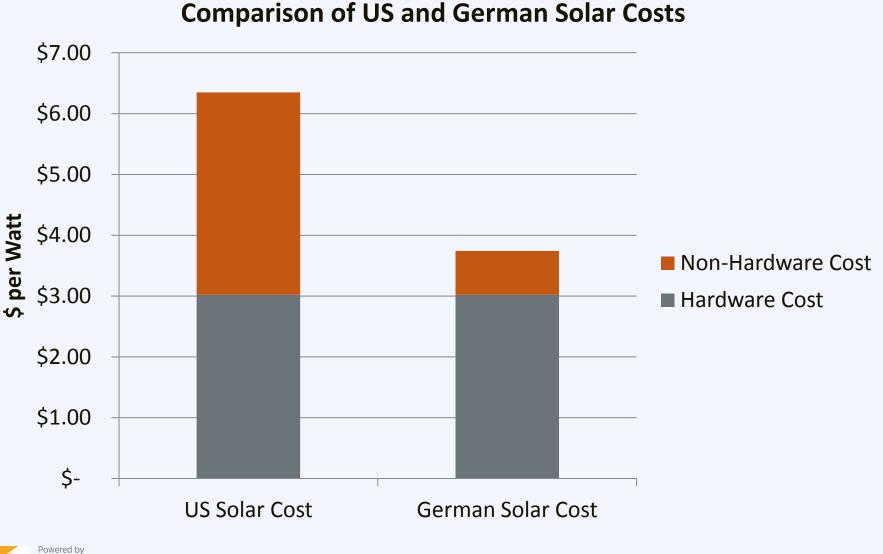


Source: Bloomberg New Energy Finance Summit, Michael Liebreich Keynote, 20 March 2012; Bloomberg New Energy Finance, "Reconsidering the Economics of Photovoltaic Power"

U.S. Department of Energy

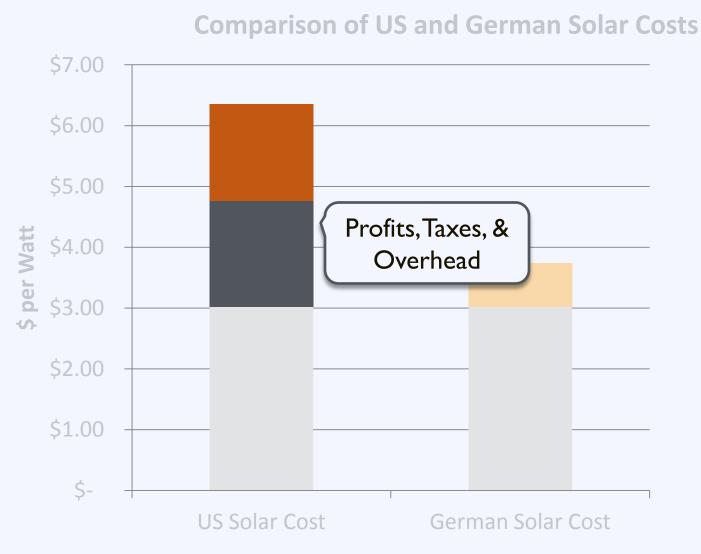


(http://www.nrel.gov/docs/fy12osti/53347.pdf) (http://www.nrel.gov/docs/fy12osti/54689.pdf)



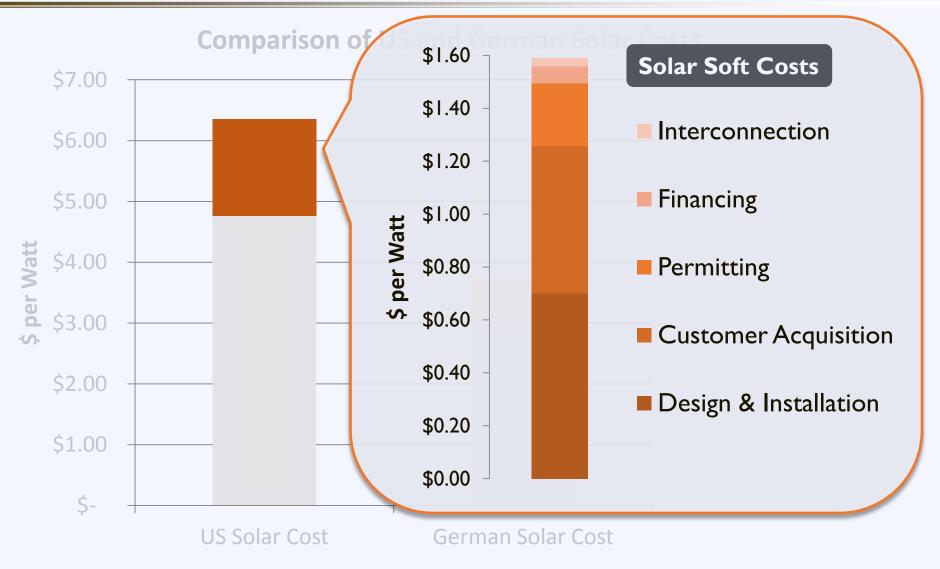
U.S. Department of Energy

Source: NREL (http://ases.conference-services.net/resources/252/2859/pdf/SOLAR2012_0599_full%20paper.pdf) (http://www.nrel.gov/docs/fy12osti/53347.pdf) (http://www.nrel.gov/docs/fy12osti/54689.pdf)





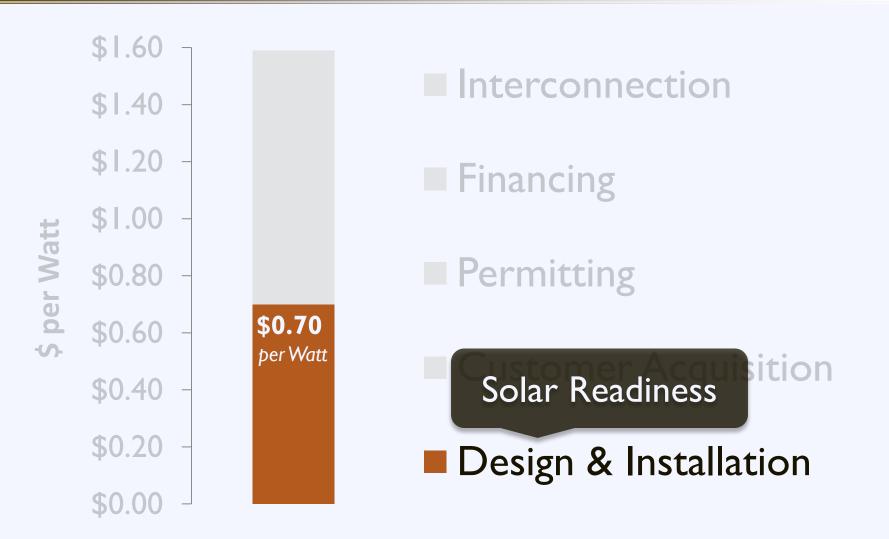
Source: NREL (http://ases.conference-services.net/resources/252/2859/pdf/SOLAR2012_0599_full%20paper.pdf) (http://www.nrel.gov/docs/fy12osti/53347.pdf) (http://www.nrel.gov/docs/fy12osti/54689.pdf)





Source: NREL (http://ases.conference-services.net/resources/252/2859/pdf/SOLAR2012_0599_full%20paper.pdf) (http://www.nrel.gov/docs/fy12osti/53347.pdf) (http://www.nrel.gov/docs/fy12osti/54689.pdf)

Mitigate Soft Costs



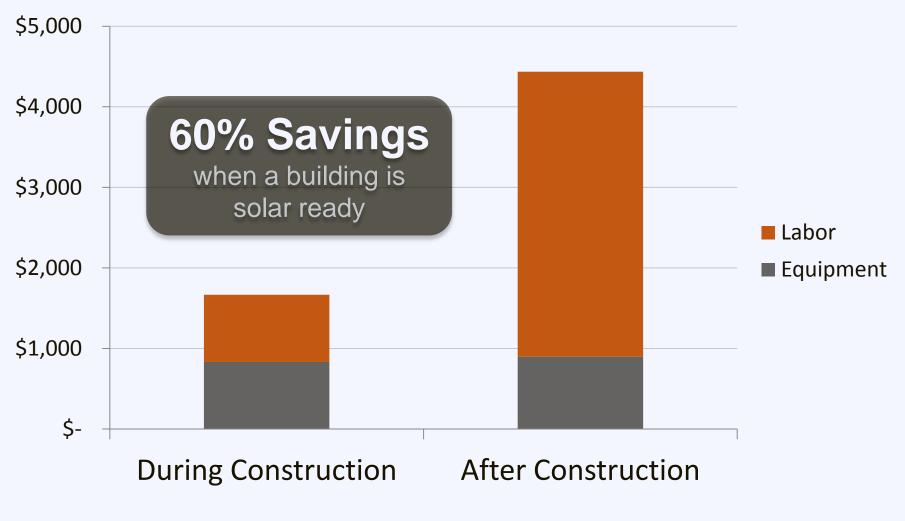


Source: NREL (http://www.nrel.gov/docs/fy12osti/54689.pdf)

Require builders to:

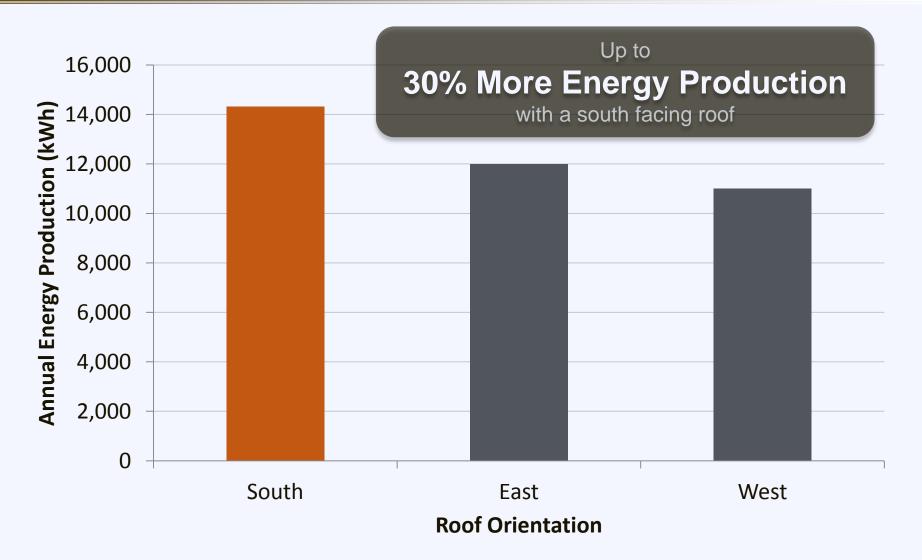
- ✓ Minimize rooftop equipment
- \checkmark Plan for structure orientation to avoid shading
- \checkmark Install a roof that will support the load of a solar array
- ✓ Record roof specifications on drawings
- \checkmark Plan for wiring and inverter placement







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





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

Resource NREL

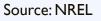
Creating a solar ready guide for buildings:

- Legislation
- Certification programs
- Stakeholder Education

www.nrel.gov







Mitigate Soft Costs



Interconnection

Financing

Permitting

Customer Acquisition

Design & Installation



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

Customer Acquisition

SOLARIZE MASS

Solarize Group Purchasing

solarize portland





Solarize: Advantages

Benefits to Local Government:

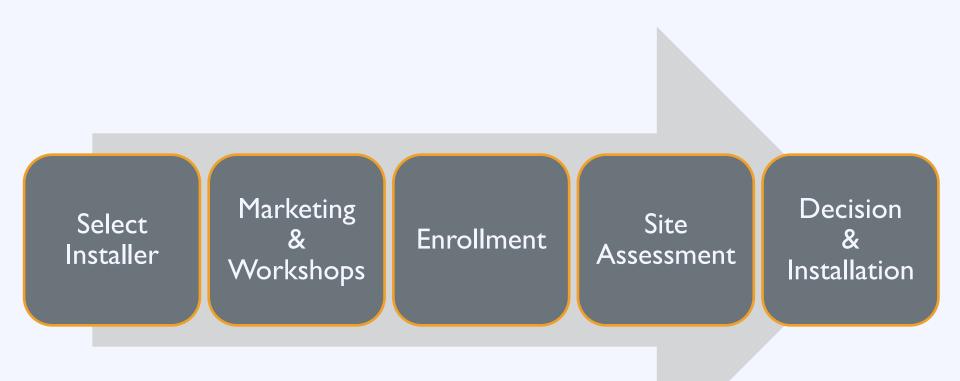
Low implementation cost: \$5,000 - \$10,000

Quick turn-around: 9 Months

Long-term impact: Sustainable ecosystem



Solarize: Process





Solarize: Case Study

75 new installations totaling 403 kW

30% reduction in installation costs

575% increase in residential installations



Solarize: Resources

Resource The Solarize Guidebook

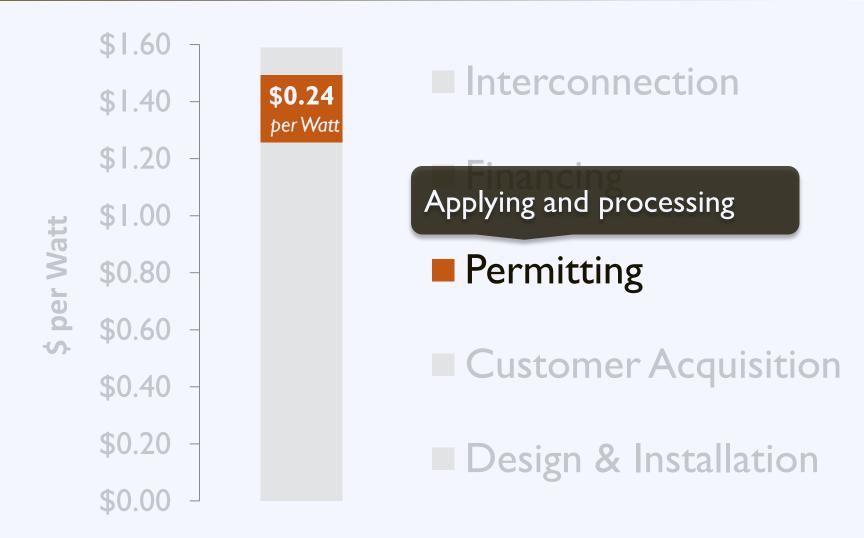
A roadmap for project planners and solar advocates who want to create their own successful Solarize campaigns.

www.nrel.gov





Mitigate Soft Costs





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

The Permitting Process: Challenges

Local permitting processes add on average



to the installation cost of residential PV

Due to permitting difficulties

I in 3 Installers Avoid

selling in an average of 3.5 jurisdictions



Source: SunRun; Clean Power Finance

Expedited Permitting

Solar Permitting Best Practices:

 \checkmark Fair flat fees

✓ Electronic or over-the-counter issuance

Standardized permit requirements

\checkmark Electronic materials



Expedited Permitting

Solar Permitting Best Practices:

- \checkmark Training for permitting staff in solar
- \checkmark Removal of excessive reviews
- \checkmark Reduction of inspection appointment windows
- ✓ Utilization of standard certifications

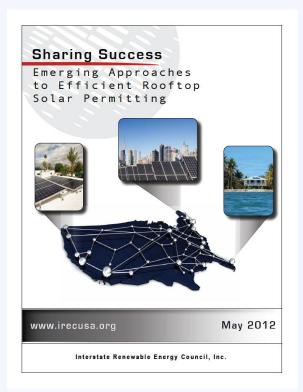


Permitting

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



Interstate Renewable Energy Council, Inc.

www.irecusa.org

May 2012



Mitigate Soft Costs



Interconnection



Permitting

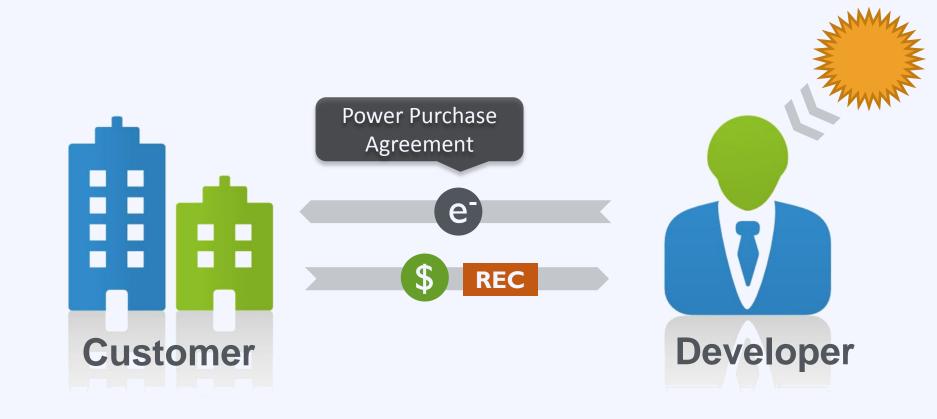
Customer Acquisition

Design & Installation



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

Third Party Ownership





Third Party Ownership

Pros

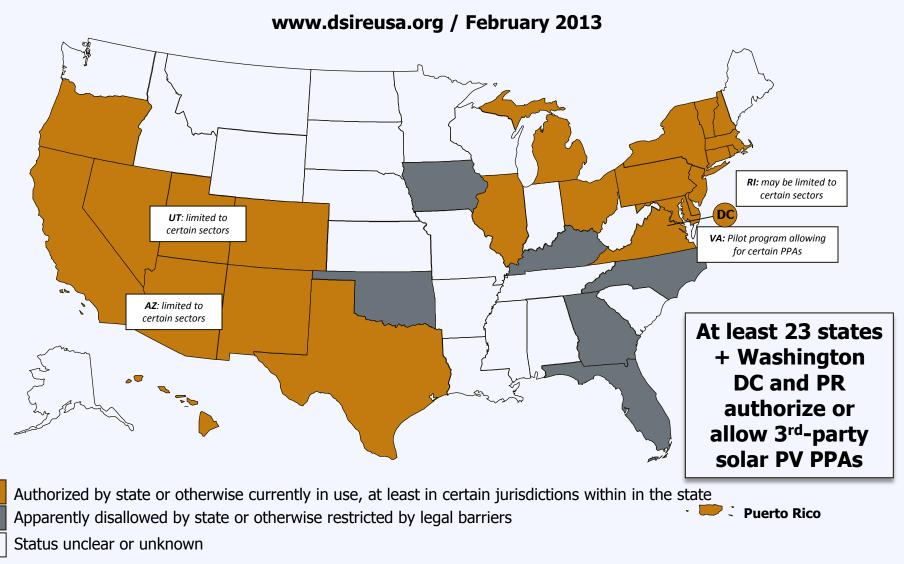
- No upfront cost
- No O&M costs
- Low risk
- Predictable payments
- No need to deal with RECs

Cons

- Market electricity price risk
- Opportunities may be limited in some locations
- Don't keep RECs



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



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?

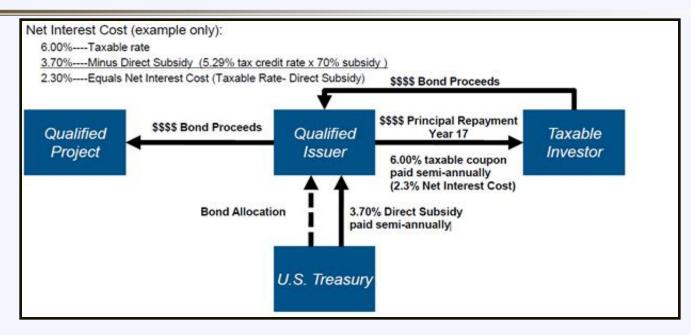
Can be used for certain renewable energy facilities (including solar)

How?

State allocation or automatic allocation



Qualified Energy Conservation Bonds



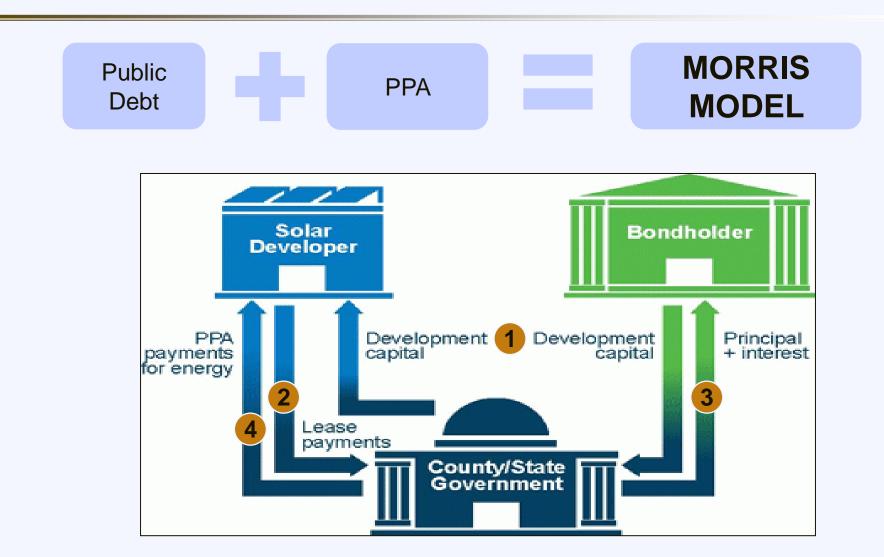
- Texas' \$252m allocation untouched (as of 9/2012)
- Local Sub-allocations:
 - Houston City \$23.37m
 - Harris County \$16.89m

Info on QECBs and Application: www.brb.state.tx.us/QECB/QECB.aspx



Source: National Association of State Energy State Energy Officials: State Financing Energy Resources.; Energy Programs Consortium QECB Memo, September 2012.

Innovative: Morris Model





Source: NREL . 2011. Financing Solar PV at Government Sites with PPAs and Public Debt

Replication of Morris Model

- Renewable Energy Law
 Renewable Portfolio Standard; RECs; tax credits; incentives
- Legality of PPA Model
- Laws Governing Public Contracts

PPAs require multi-year contracting (≥15 years)

Laws Governing Bond Issuance

Best when streamlined (no vote required)

Laws Governing Procurement

Best when gov can consider certain criteria other than price



Activity: Identifying Benefits

What is the greatest benefit solar can bring to your community? [Blue Card]

Right Now

During Session

After Break



Write answer on card







[Results from Survey]



Activity: Addressing Barriers

What is the greatest barrier to solar adoption in your community? [Red Card]

Right Now

During Session

After Break



Write answer on card







[Results from Survey]



Activity: Next Steps

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







Philip Haddix

phaddix@solarfound.org 202.469.3743