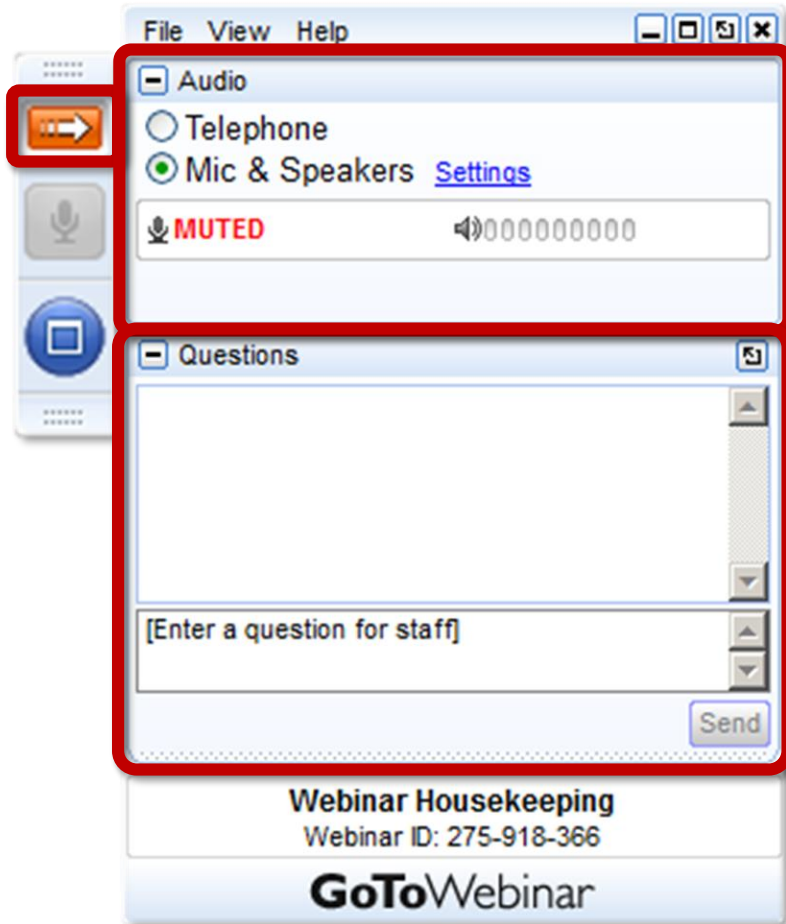


# Using Weatherization Assistance Program (WAP) Funds for Low-Income Solar

January 11, 2018



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Celebrating 15 Years of State Leadership

# Clean Energy States Alliance



Illinois Department of Commerce & Economic Opportunity



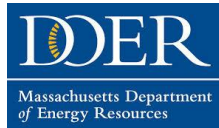
NYSERDA



Maryland Energy Administration



Department of Commerce  
Innovation is in our nature.



Wisconsin Office of Energy Innovation



Office of the People's Counsel  
District of Columbia  
Advocating, Protecting and Educating DC Consumers



# Sustainable Solar Education Project

A project to provide information to state and municipal officials on strategies to ensure distributed solar

- Remains consumer friendly
- Benefits low- and moderate-income households



The project is managed by the Clean Energy States Alliance (CESA) and is funded through the U.S. Department of Energy Solar Energy Technologies Office.



# Sustainable Solar Education Project Resources

The project offers a variety of free resources on solar equitability and consumer protection:

- Guides
- Webinars
- Monthly e-newsletter
- In-person workshops



[www.cesa.org/projects/sustainable-solar](http://www.cesa.org/projects/sustainable-solar)

# Panelists

- **Joshua Olsen**, Lead Policy Advisor for Technical Operations at the Office of Weatherization and Intergovernmental Programs at the U.S. Department of Energy
- **Monisha Shah**, Energy Analyst at the National Renewable Energy Laboratory





# Weatherization Assistance Program

## Solar Approval, Regulations and Considerations

# Enabling Legislation and Regulation

*“...to increase the **energy efficiency** of dwellings owned or operated by low-income persons, reduce their total residential energy expenditures, and improve their **health and safety**, especially low-income persons who are particularly vulnerable such as the elderly, the handicapped, and children.”*

**Energy Conservation in Existing Buildings Act of 1976  
(Title IV of the Energy Conservation and Production Act),  
Public Law 94-385, August 14, 1976.**

- The Department of Energy administers the program and creates policies to interpret the regulations and assist the Grantees in administering the funds in accordance with the Congressional intent.



# Renewable Energy Systems Allowed by Regulation

- The installation of renewable energy technologies is specifically authorized by 42 USC §6865(c), *et.seq.*, which was passed as a part of the Energy Policy Act of 2005. Rules implementing the statute were effective on August 21, 2006.

*From 10 CFR 440:*

...

*(4) The expenditure of financial assistance provided under this part for labor, weatherization materials, and related matters for a renewable energy system shall not exceed an average of \$3,000 per dwelling unit.*

# Appendix A

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- Attached to the WAP regulations
- Defines what measures are presumptively allowed for use within the WAP
- Last updated in 2002
- *Renewables are not included in the approved measures list*
- This means that renewables must be approved on a grantee-by-grantee basis

# Grantee Solar Approval Process

- Submit a request to the DOE project officer
    - Request must include an analysis of potential solar programs and demonstrate cost effectiveness
      - Analysis must be based on accurate inputs for your state
      - The DOE Solar SIR tool can be used for this analysis
  - Include Solar PV as a measure in your energy modeling software and submit sample analyses to DOE for review and approval
  - Incorporate the inclusion of a Solar Pilot Program in your Annual Plan Submission to DOE
  - NEPA Review (WAP is exploring a blanket approval)
- \* All approvals are being issued on a “pilot” basis

# Project Solar Approval Process

- Detailed analysis of the individual project including:
  - Accurate cost data and justification
  - Leverage or buy-down funding information
  - SIR analysis
  
- Considerations
  - Panel Maintenance
  - Inverter lifespan
  - Community Solar issues such as client benefit allocation
  - S-REC rate lock
  - Historic Preservation Issues
  - Multifamily Financing over multiple Program Years

# Relevant Regulatory Concepts

- Saving to Investment Ratio
  - Each individual measure must have an SIR greater than 1
  - The entire package of measures must have an SIR greater than 1
- 6500.00 Average Cost Per Unit (7100.00 in 2016)
- 3000.00 Average Cost Per Renewable Energy System (3545.00 in 2016)

# The Economics

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- 7100.00 Average Cost Per Unit Limit
- 3545.00 Average Cost Per Renewable System Limit
- $SIR > 1$
  
- Additional Funding will likely be needed
  
- WAP dollars can be combined with other funds.

# Leveraged Funding

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Two categories of leveraged funding:

- Public-Good
- Owner Investment/Buy-Down
- Two different sets of rules

# Public-Good Funds

- A “public-good” source doesn’t have a specific building in mind. A leveraged source has funds available for the public at large that WAP then directs to projects that meets the funding source requirements/needs AND results in enhanced/cost effective projects being implemented by WAP. Treated much like a discount or a sale price
- For example, if a utility is putting \$3000 toward a PV system, leaving \$2000 to be paid by WAP, only \$2000 is entered into the SIR calculation.
- There is no requirement for the “package of measures to equal 1” before the “sale price” is applied.



# Buy Down

- In a “buy down” – the funding source is also the direct beneficiary of the additional DOE funds, usually the building owner, and WAP does not direct which project the funds are attributed to. Funds are garnered for a specific building/project.
  - The “bought-down” measure must be included in the SIR qualified package of measures pre-buy down.
  - WAP will contribute the funding level that meets the SIR cost for the individual measure in question
  - Not allowed in Single Family dwellings

# Basic Funding Scenarios

- Multifamily Project – 100 unit building
  - Total potential WAP dollars available to spend on renewable system: Approximately \*\$350,000
  - Building Owner can Buy-Down cost of the system if the total package of Wx measures has a positive SIR
  - Leverage dollars can be used to “discount” the cost of the system
- Single Family Home
  - Total Potential WAP funding for renewable system: \*\$3500
  - No buy-down allowed
  - Leveraged funds can be used to discount the system cost

\*The average cost concept means that funding levels for a single system could be higher than the \$3500 limit if other systems in the Grantee production cycle bring the average cost across all projects down to the allowable level

# Relevant Documents

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- WAP Memorandum 024: The Use of Solar PV in the WAP
- WPN 16-5: Multifamily Weatherization
  
- <https://energy.gov/eere/wipo/weatherization-program-guidance>



# Characterizing the Cost-Effectiveness of Solar: Solar SIR

Monisha Shah

Senior Energy Analyst

January 11, 2018

# WAP Approval Process for Solar

- RE allowed in WAP, Energy Policy Act 2005, up to \$3598/HH
- Solar PV not included in Appendix A list of approved technologies
- WAP Memo 024: states interested in using WAP funds for solar:
  - First, must get approval to add PV to their list of approved technologies with a general SIR analysis (our topic today)
  - Second, conduct detailed energy audit and SIR analysis for the EE measures and proposed PV system in a specific pilot project(s)

# What is an SIR?

- **Savings to Investment Ratio (SIR) calculates whether a PV system owner recovers its investment through electricity savings and federal and state incentives**
- **NREL has built an analysis tool to calculate the SIR for a residential PV system in all 50 states using the following formula:**

Savings to Investment  
Ratio for PV Systems



Lifetime Present Value of: **1)** Electricity bill savings **2)** O&M costs, **3)** State incentives, if any (\$/kWh)

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**1)** Upfront PV system investment **2)** tax credit, if any, **3)** state grant

- **The tool is designed to allow stakeholders the ability to explore the cost-effectiveness of solar in their communities**
- **Link to NREL's SIR Analysis Tool: [www.nrel.gov/solar/assets/docs/sir.xlsx](http://www.nrel.gov/solar/assets/docs/sir.xlsx)**

# How is the Electricity Savings Calculation made?

Savings on  
your  
Electricity  
Bill

=

$\Sigma$

(

State Average Annual  
Electricity Production of  
Residential PV System

X

Average State Residential  
Electricity Rate)

– Annual O&M Costs

+ Annual State Incentives

)

# Customize Your Own Assumptions

	A	B	C	D	E
1	<b>Model Inputs</b>				
2	<i>System Details</i>				
3	Cost per Watt (DC-STC):			\$3.00	?
4	Analysis period (years)			30	?
5	Degradation rate (per year)			0.50%	?
6	<i>Market Assumptions</i>				
7	Electric and O&M rate escalation			2.3%	?
8	O&M costs (\$ per kW/yr)			\$20	?
9	Discount rate			3.0%	
10	<i>Incentives</i>				
11	Investment tax credit (% total cost)			30%	
12	Production-based incentive (\$/kWh)			\$0.00	
13	Years of incentive (years)				?
14	Other incentive (\$/W)			\$0.00	
15	Proposed System Size (kW):			5.00	
16	Total Purchase Price:			\$ 15,000	
17					
18	<b>Custom SIR Analysis</b>				
19	Capacity Factor			15%	
20	Electric Rate			\$0.11	
21	SIR			0.96	
22					

Each state can customize any of the assumptions in the grey cells on the “Summary” tab, including:

- System and O&M costs, analysis period, discount and escalation rates
- Federal and state incentives,
- State solar resource (capacity factor) and average electricity rate



# Default Assumptions

Category	Assumptions
Net Metering Credits	Assumes customers receive full net-metering credit at the state residential average electricity prices from EIA.
System Costs	Default residential PV system price range of residential of \$2/W-\$4/W based on costs reported in both the NREL Benchmark Report and the GTM report for distributed PV systems.
System Lifetime	PV system useful life is estimated to have a range between 25 - 40 years based on research from NREL.
System O&M Costs	Default O&M costs and degradation rate from NREL technical report
State Capacity Factors	Average Residential state-level capacity factors are based on NREL internal analysis for the ReEDS model
State Residential Electricity Rates	Default electricity escalation rate based on EIA AEO 2016, National Average Residential End-Use Electricity Price increase from 2015-2040.
Discount Rate	A 3% social discount rate was assumed to capture the time value of the savings over the lifetime of the system.

# Options for Improving SIR

- ITC (tax appetite) – need a for-profit partner
- Leveraged Funds (see slide below for the detailed description), lower \$/W cost
- Other incentives
  - Production-based incentive (\$/kWh)
  - SRECs
  - Other incentives (\$/kW)
- Feed-in tariff
  - Could be higher than retail rate
- High vs. standard efficiency panels
  - Panel efficiency vs. cost
- O&M cost
  - Contracted vs in-house

# Leveraging

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For questions regarding this tool please contact:

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[www.nrel.gov](http://www.nrel.gov)



# Q&A

- **Joshua Olsen**, Lead Policy Advisor for Technical Operations at the Office of Weatherization and Intergovernmental Programs at the U.S. Department of Energy
- **Monisha Shah**, Energy Analyst at the National Renewable Energy Laboratory
- **Nate Hausman**, Project Director, Clean Energy States Alliance (moderator)



U.S. DEPARTMENT OF  
**ENERGY**



# Upcoming Webinars



## **Using Low Income Home Energy Assistance Program (LIHEAP) Funds for Low-Income Solar**

Tuesday, January 16, 1-2pm ET

## **Follow-Up Discussion: Using Federal Low-Income Energy Assistance Programs for Solar** *(for state & municipal officials only)*

Tuesday, January 25, 1-2pm ET

## **Financing Solar Projects for Public and Affordable Housing**

Thursday, February 15, 1-2pm ET

## **Solar+Storage for Public and Affordable Housing**

Thursday, February 22, 1-2pm ET

Read more and register at [www.cesa.org/webinars](http://www.cesa.org/webinars)

# Contact Information

## SUSTAINABLE SOLAR EDUCATION PROJECT

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