

# **NY-Sun PV Trainers Network**

# Intro to Solar Policy

(Abridged Version)

Slides Prepared by the

**NY-Sun PV Trainers Network** 

Presenters: Adam Schnell and Justin Strachan

#### **NY-Sun Initiative**

- Significantly expand installed solar capacity
- Attract private investment
- Enable sustainable development of a robust industry
- Create well-paying skilled jobs
- Improve the reliability of the electric grid
- Reduce air pollution
- Make solar available to all New Yorkers that want it

Statewide Goal of 3 GW

\$961 Million Total Budget

Stimulate the Market Place

Reduce Soft Costs

#### About the PV Trainers Network

The NY-Sun PV Trainers Network aims to lower the installation cost and expand adoption of solar PV systems throughout the state.

training.ny-sun.ny.gov

# Agenda

1. Introduction to Solar PV & an Intro to Solar Soft Costs

2. Federal, State, and Utility Policy Drivers

3. Making your Community Solar Ready

4. Developing Solar Policy For Your Community

# Introduction to Solar: Technology



**Solar Photovoltaic (PV)** 

Electricity

Residential Commercial



**Solar Hot Water** 

Hot Water Space Heating

> Residential Commercial

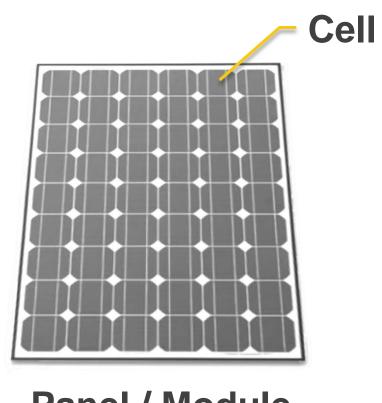


**Concentrated Solar Power** 

Electricity

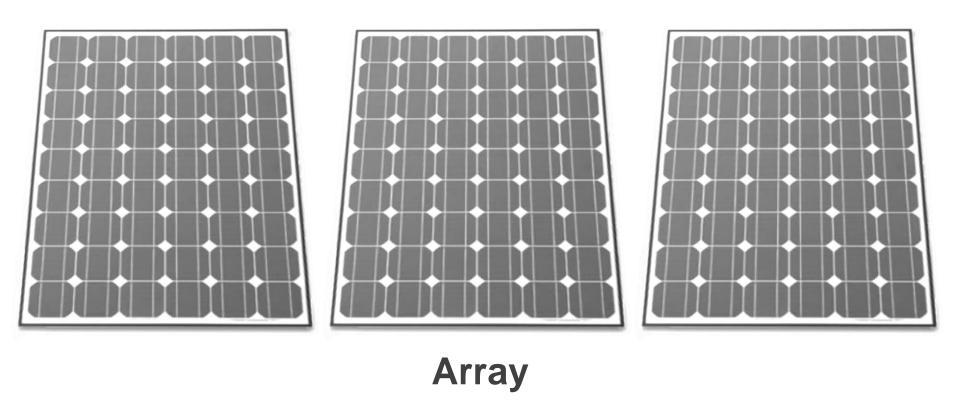
Commercial

# Some Basic Terminology

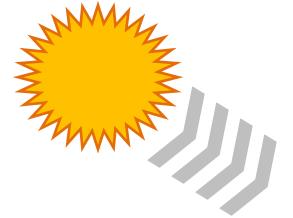


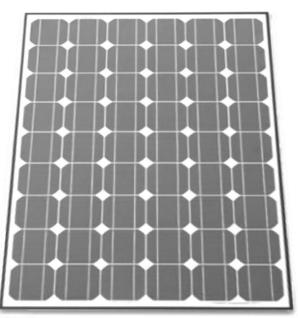
Panel / Module

# Some Basic Terminology



# Some Basic Terminology

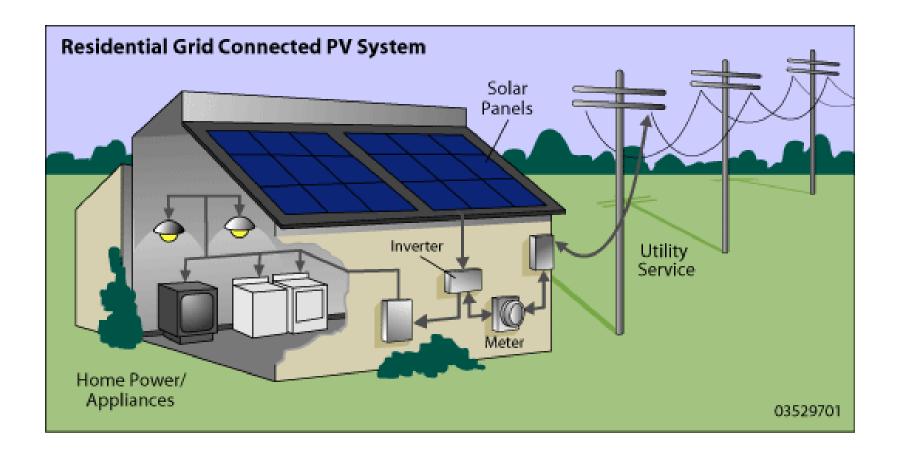




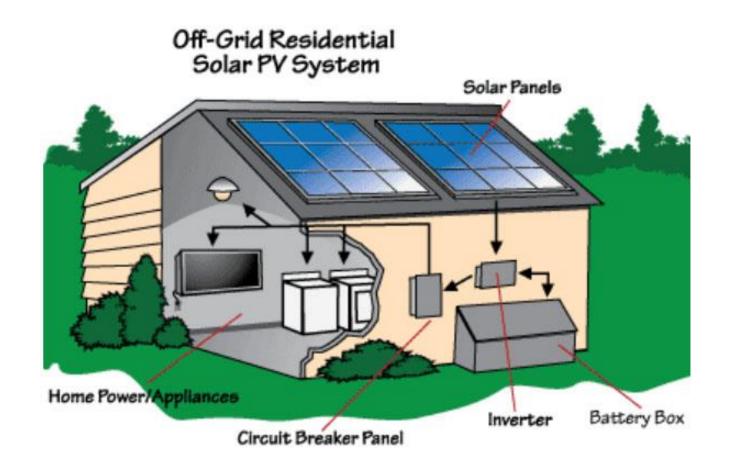
Capacity / Power kilowatt (kW)

**Production** *Kilowatt-hour (kWh)* 

# System Components



# System Components



#### Scale



Residence 5-10 kW



Factory
1 MW+



**Office** 50 – 500 kW



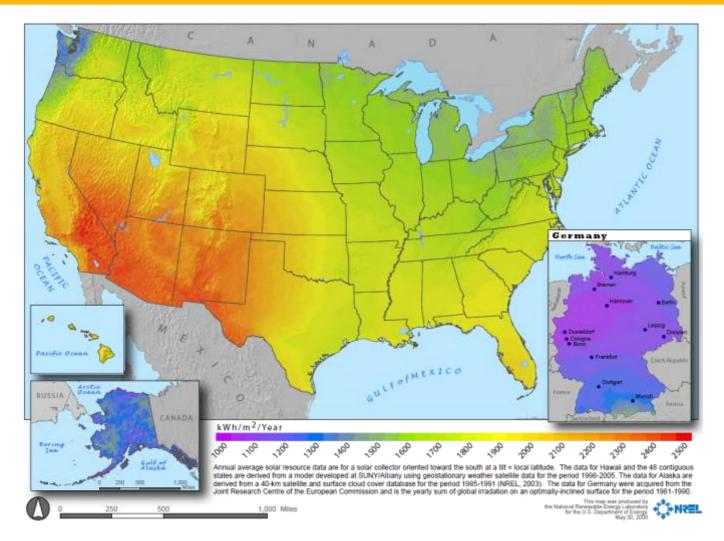
# System Types

Roof Mount **Ground Mount** 

Parking Canopy



# Not Enough Sun in NY?



Source: National Renewable Energy Laboratory

### Ownership Options for Solar

# Direct Ownership

Third-Party Ownership

### Direct Ownership

#### Cost

Installed cost

Maintenance

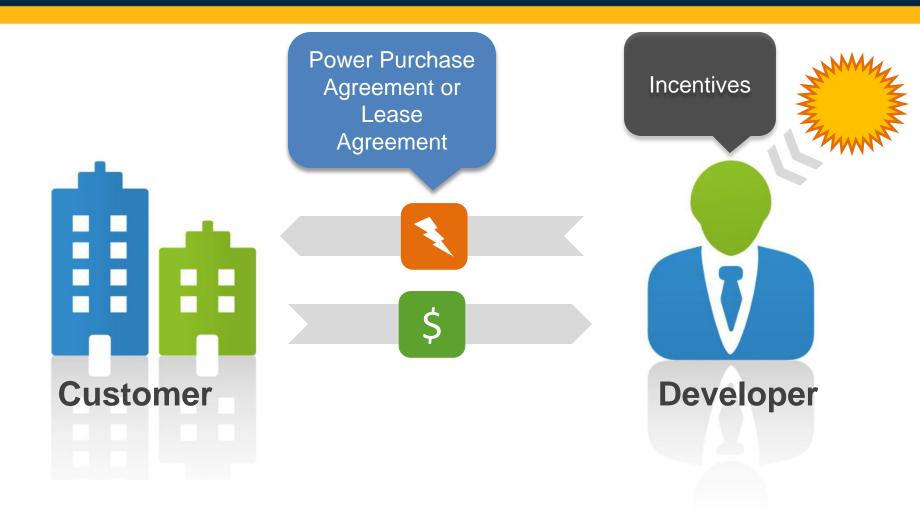
Customer bears risk
 Direct incentive

#### Benefit

+ Avoided energy cost

+ Excess generation

# Third Party Ownership



# Third Party Ownership

#### Cost

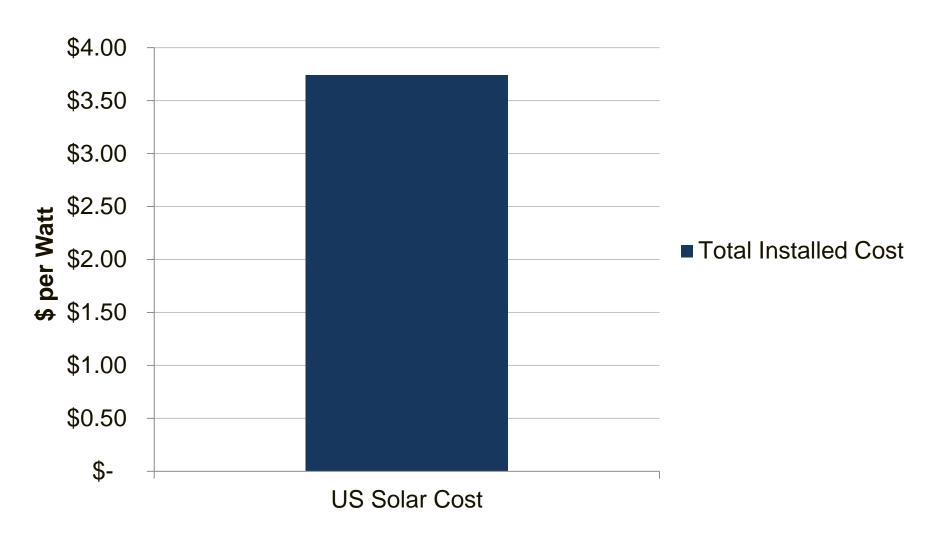
- Investor needs higher ROI
- Must be addressed when selling home

#### **Benefit**

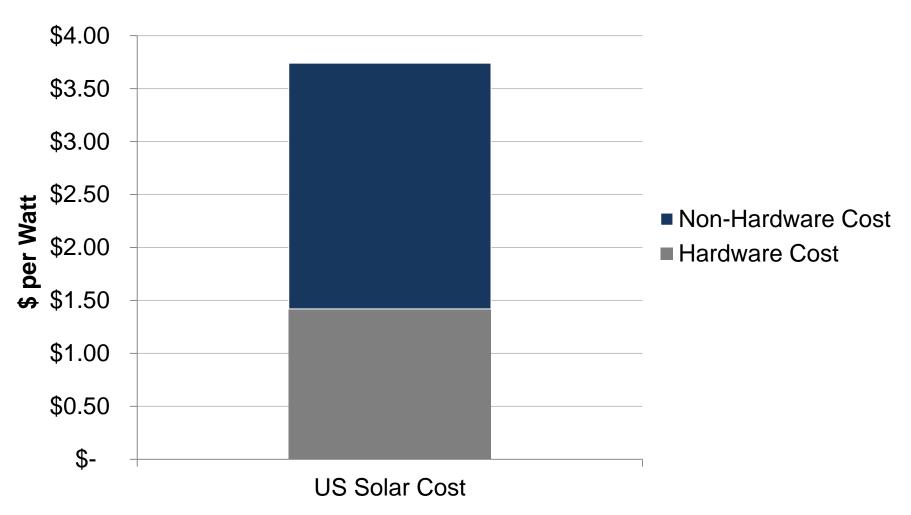
- + No upfront cost
- + No O&M costs

+ Low risk

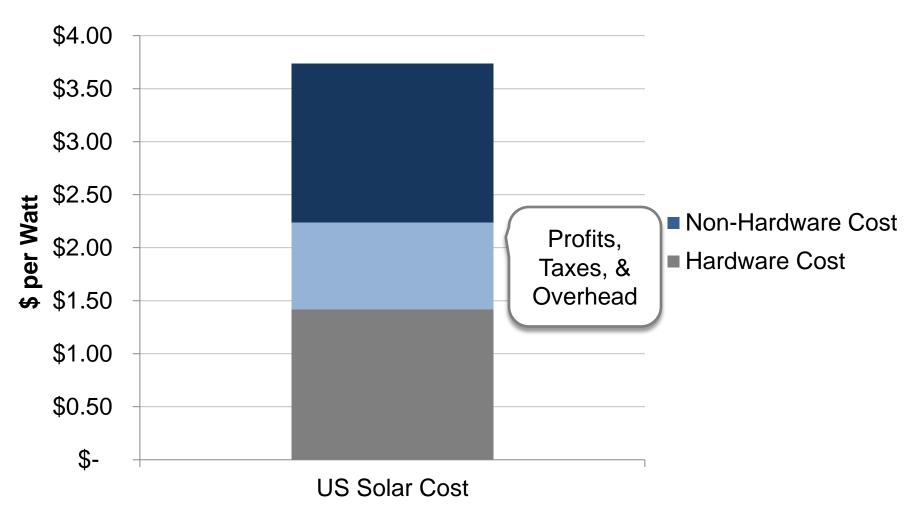
+ Predictable payments



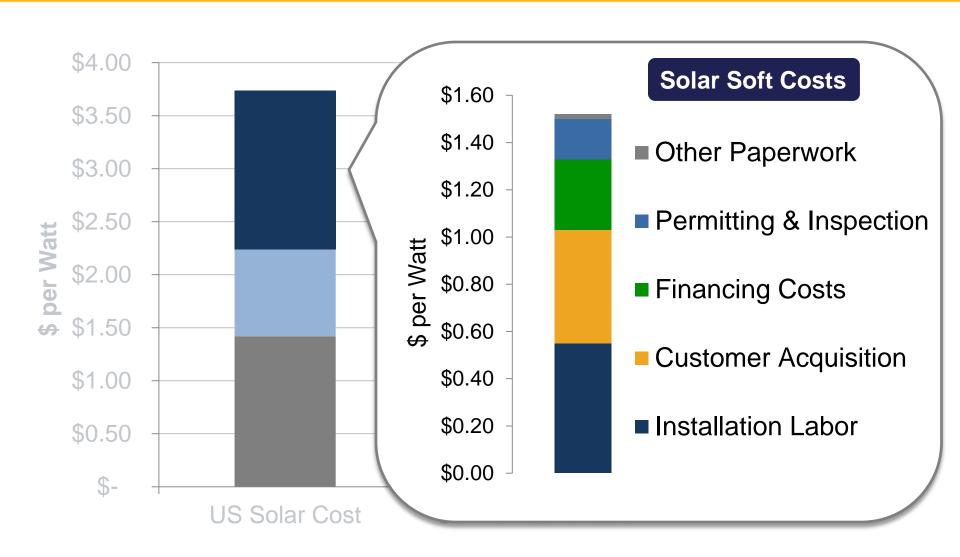
Source: Solar Market Insight Report 2014 Q3, Average of Q1, Q2 and Q3 Residential PV System Pricing (\$/W)



Source: Solar Energy Industry Association



Source: Solar Energy Industry Association



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1. Introduction to Solar PV & an Intro to Solar Soft Costs

2. Federal, State, and Utility Policy Drivers

3. Making your Community Solar Ready

4. Developing Solar Policy For Your Community

#### Policies & Incentives

Federal

Investment Tax Credit State & Utility

Solar Tax Credit

NY-Sun Incentive Program

**Net Metering** 

Local

Planning & Zoning

Permitting

Market Development

Financing

# Policies & Incentives

Federal

Investment Tax Credit State & Utility

Solar Tax Credit

NY-Sun Incentive <u>Program</u>

Net Metering

Local

Planning & Zoning

Permitting

Market
Development

Financing

#### Investment Tax Credit

**Type:** Tax Credit

Eligibility: For-Profit Organization, Homeowner

Value: 30% of the installation

**Term:** Expires Dec. 31 2016 (for commercial it drops to 10%)

### Policies & Incentives

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#### Residential Solar Tax Credit

**Type:** Tax Credit

#### **Eligibility:**

- Homeowner: 25kW
- Condo association or cooperatives: 50 kW

Value: 25% of the system cost or \$5,000

### NY-Sun Incentive Program: MW Block

Type: Cash incentive

#### **Structure & Eligibility**

#### Three Regions:

- Con Edison (New York City and South Westchester)
- Long Island
- Upstate (the rest of New York State)

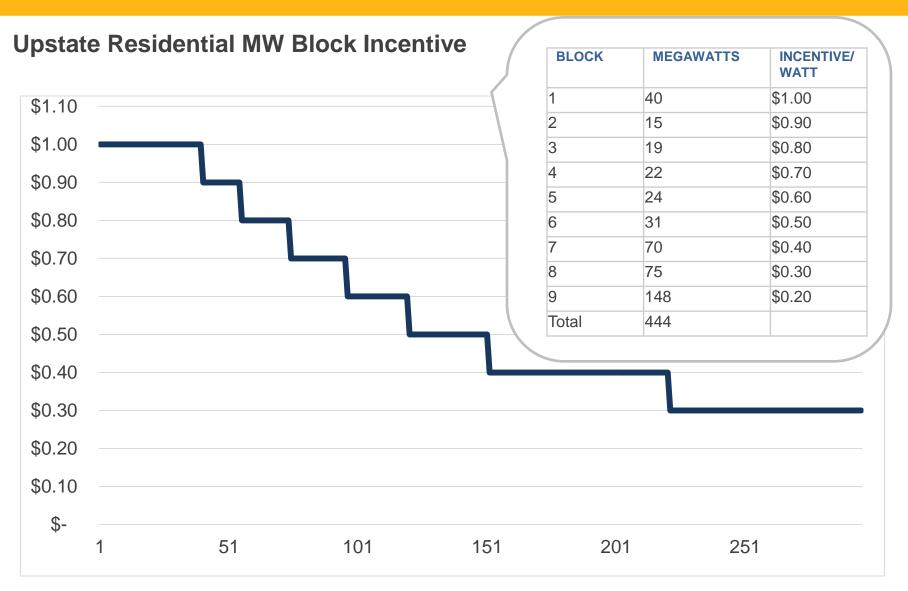
#### Three Sectors:

- Residential: up to 25 kW
- Small Non-residential: up to 200 kW
- Large Non-residential: > 200 kW (available 2015)

Value: Determined by declining megawatt blocks

Availability: Dec 29, 2023 or until funds run out

# NY-Sun Incentive Program: MW Block



# NY-Sun Incentive Program

Series of low-interest loan options

Green Jobs, Green New York - NYSERDA:

- On-bill recovery loans
- Residential smart energy loan
- Small commercial participation loan

For more information: www.nyserda.ny.gov

# Net Metering

- Allows customers generating electricity from Solar PV to send extra electricity not being used onsite back into the electric grid in exchange for net metering credits on their utility bill.
- These net metering credits can be used to offset future electricity use.



# Remote Net Metering

- Allows eligible non-residential customers to apply their net metering credits to offset the electricity usage of other properties they own or lease thereby reducing electricity costs
- Eligible properties must be:
  - Under the same customer account name
  - Within the same utility
  - Within the same NYISO zone



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#### Policies & Incentives

- 3 Steps to prepare for solar development:
- 1. Establish solar **goals** in planning process
- 2. Adopt solar **code** language
- Define a clear & simple permitting process by adopting NYS Unified Solar Permit

Program

Net Metering

Interconnection
Standards

Feed-in Tariff

Local

Planning & Zoning

Permitting

Market
Development

Financing



# Goals Planning Process

#### **Goal Setting**

How does a local government define what types of solar installations are right for their community?



# Goals Set Solar Specific Goals

- How closely does solar help meet existing community goals?
- What scales and contexts are appropriate?
- How much development is possible within the appropriate scales and contexts?



# Goals Integrate Solar Goals in Plans

### **Communitywide Comprehensive Plan**

Neighborhood Plans

**Corridor Plans** 

Special District Plans

Green Infrastructure Plans

**Energy Plan** 

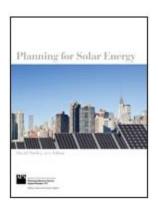
Climate Action Plan



### Where to Start

#### Resource





Solar planning fundamentals for public officials and engaged citizens

www.planning.org/research/solar

#### **In-Depth Workshop**

Land Use Planning for Solar Energy

#### **One-on-One Assistance**

- ✓ Facilitate visioning process
- ✓ Integrate goals into plans
- ✓ Review options for public investment

# 2 Code Zoning Code Framework

Section	Topics to Address		
Definitions	Define technologies		
Applicability	Principal vs. accessory use/structure		
Dimensional Standards	<ul><li>Height</li><li>Size</li></ul>	<ul><li>Setbacks</li><li>Lot coverage</li></ul>	
Design Standards	<ul><li>Signage</li><li>Disconnect</li></ul>	<ul><li>Screening</li><li>Fencing</li></ul>	

Source: American Planning Association

# **Update**

# Code Zoning Code-Small Scale

#### **Small Solar:**

- Permitted as accessory use
- Minimize visibility if feasible
- Requirements:
  - District height
  - Lot coverage
  - Setback





# Code Zoning Code-Large Scale

## **Large Solar:**

- Allowed for primary use in limited locations
- Requirements:
  - Height limits
  - Lot coverage
  - Setback
  - Fencing and Enclosure



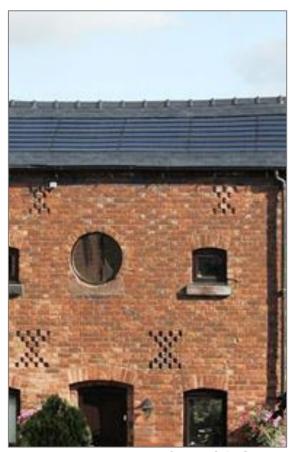
# **Update**

# Code Zoning Code Historic Districts

### Prevent permanent loss of "character defining" features

### Possible design requirements

- Ground mounted
- Flat roof with setback
- Panels flush with roof
- Blend color
- Building Integrated PV (BiPV)



Source: SolarCentury

# 2 Code Solar Ready Construction

## **Solar Ready Construction:**

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

# Solar Ready Construction

## **Encourage 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

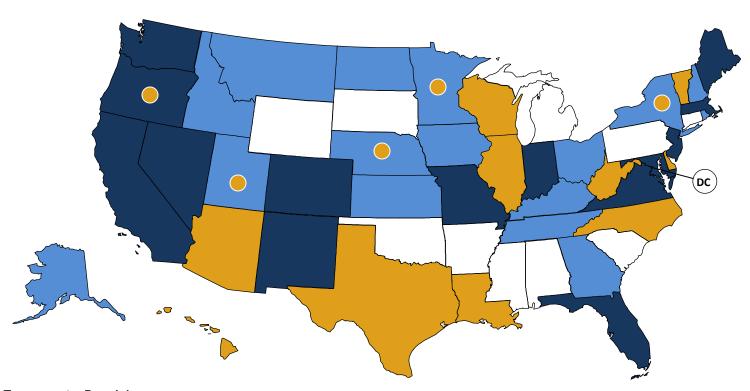
NREL: Solar Ready Buildings Guide- Contains a checklist for municipalities

# Code Solar Access Laws

#### **Solar Access Laws:**

- Increase the likelihood that properties will receive sunlight
- Protect the rights of property owners to install solar
- 3. Reduce the risk that systems will be shaded after installation

# Code Solar Access Laws



- Solar Easements Provision
- Solar Rights Provision
- Solar Easements and Solar Rights Provisions

Local option to create solar rights provision

Source: DSIRE

# Update Code

## Code Zoning Code Resources

# Model Small-Scale Solar Siting Ordinance

Columbia Law School

web.law.columbia.edu

Department of Energy
Rooftop Solar Challenge II
NYS Model Solar Zoning Ordinance

NYSolar Smart Release- 2015 TBD Center for Climate Change Law at Columbia Law School Model Small-Scale Solar Siting Ordinance Last updated Summer 2012 Please send comments to Shelley Welton, swelto@law.columbia.edu

Model Small-Scale Solar Siting Ordinance By Danielle Sugarman

Center for Climate Change Law at Columbia Law School

#### 1. Purpose & Inten

A. Solar energy is a renewable and non-polluting energy resource that can prevent fossil fuel emissions and reduce a municipality's energy load. Energy generated from solar energy systems can be used to offset energy demand on the grid where excess solar power is generated.

B. The use of solar energy equipment for the purpose of providing electricity and energy for heating and/or cooling is a priority and is a necessary component of the [Town/City/Village's] current and long-term sustainability agenda.\(^1\)

C. The ordinance aims to promote the accommodation of solar energy systems and equipment and the provision for adequate sunlight and convenience of access necessary therefor.<sup>2</sup>

#### 2. Definitions

#### ACCESSORY STRUCTURE

A structure, the use of which is customarily incidental and subordinate to that of the principal building and is attached thereto, and is located on the same lot or premises as the principal building.<sup>3</sup>

#### ALTERNATIVE ENERGY SYSTEMS

Structures, equipment, devices or construction techniques used for the production of heat, light, cooling, electricity or other forms of energy on site and may be attached to or separate from the principal structure.<sup>4</sup>

#### BUILDING-INTEGRATED PHOTOVOLTAIC (BIPV) SYSTEMS

A solar energy system that consists of integrating photovoltaic modules into the building structure, such as the roof or the façade and which does not alter the relief of the roof.  $^{5}$ 

<sup>2</sup> Amenia Town, Auburn City, Bedford Town, Bethlehem Town, Canandaigua Town, Glennville Town, Haverstraw Town, Hewlett Neck Village, Horseheads Town, Kent Town, Kingston City, Southold Town Southport Town

1

Albany City

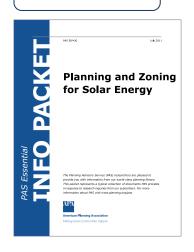
<sup>3</sup> Clinton Town, Kingston Town.

<sup>4</sup> Albion Town, Barre Town, Lackawanna City, Medina Village

<sup>5</sup> Albany City



#### Resource



#### Planning and Zoning for Solar Energy

This Essential Info Packet provides guides and model code language to help planners design a regulatory framework for solar in their communities.

www.planning.org/research/solar

#### **In-Depth Workshop**

# **Zoning for Solar (Available 2015)**

#### **One-on-One Assistance**

- ✓ Define solar goals
- ✓ Analyze existing code
- ✓ Updating code or creating ordinance



# Permit Market Challenges

# 1,550+ local jurisdictions in NY

with unique permitting requirements

Source: NREL



Depth of Review

**No Permit** 

**Expedient** 

**Discretionary** Review



## Permit Review Process

#### Depth of Review

### **Expedient**

Within established design parameters

Impacts are well understood

Quick, Easy, Inexpensive

### Discretionary Review

Outside of established design parameters

Review necessary to understand impacts

**Flexible** 



# Permit NYS Unified Solar Permit

For simple small-scale installations

Based on industry standards

Defined review timeline

Defined permit fee

Use of same plans for utility and NYSERDA applications

Developed by CUNY, NYSERDA, NYPA

NYSERDA incentive of \$2,500-5,000 for permit adoption

(Incentives extended until September 30th of 2015)



For use in all New York State counties with the exception of Nassau County and Suffolk County.

The expedited solar permitting process uses a unified permit across municipalities in New York State

A combined building and electrical permit for a grid-tied photovoltaic (PV) system will be issued pending proper completion of forms, submission of approved plans and approval by municipality. All applicants must submit:

- 1. Unified Solar Permit for Small-Scale Photovoltaic Systems Eligibility Checklist - STEP 2
- 2. One (1) set of plans (number may vary by municipality) that include:
- · Site Plan showing location of major components of solar system and other equipment on roof or legal accessory structure. This plan should represent relative location of components at site, including, but not limited to, location of array, existing electrical service location, utility meter, inverter location, system orientation and tilt angle. This plan should show access and pathways that are compliant with New York State Fire Code, if applicable.
- · One-Line or 3-Line Electrical Diagram. The electrical diagram required by NYSERDA for an incentive application and/or utility for an interconnection agreement can be used here.
- · Specification Sheets for all manufactured components. If these sheets are available electronically, a web address will be accepted in place of an attachment, at the discretion of the municipality.
- · All diagrams and plans must include the following: (a) Project address, section, block and lot number of the property; (b) Owner's name, address and phone number; (c) Name, address and phone number of the person preparing the plans; and (d) System capacity in kW-DC.
- 3. Unified Solar Permit for Small-Scale Photovoltaic Systems Application STEP 3
- 4. Permit Fee Amount

#### Permit Review and Inspection Timeline

Permit determinations will be issued within 14 days upon reciept of complete and accurate applications. The municipality will provide feedback within 7 days of receiving incomplete or inaccurate applications. If an inspection is required, a single inspection should be sufficient and will be provided within 7 days of inspection request.

The NY-Sun Initiative, a dynamic public-private partnership, will drive growth of the solar industry and make solar technology more affordable for all New Yorkers.

Visit ny-sun.ny.gov for more information on the NY-Sun Initiative.











# Simplify Permit Where to Start

#### Resource



#### **NY-SUN Unified Solar Permit**

The expedited solar permitting process uses a unified permit across municipalities in New York State.

ny-sun.ny.gov

#### **In-Depth Workshop**

Adopting the NY Unified Solar Permit

#### **One-on-One Assistance**

- ✓ Review existing permit process
- ✓ Adopt the NY Unified Solar Permit
- ✓ Determining fair permit fees

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1. Introduction to Solar PV & an Intro to Solar Soft Costs

2. Federal, State, and Utility Policy Drivers

3. Making your Community Solar Ready

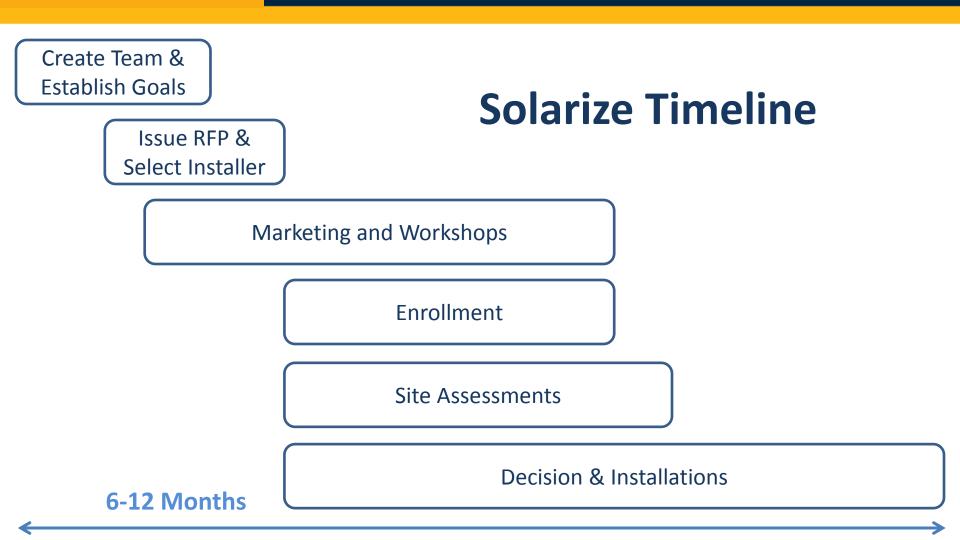
4. Programs to Grow Your Solar Market

# What is Solarize?

- Group purchasing for residential Solar PV
- Program normally run by community organization or local govt agency
- Addresses:
  - High upfront cost
     Group Purchase
  - Complexity
     Community Education
  - Customer Inertia
     Limited-time offer
- Low implementation cost: \$5,000 \$10,000
- Quick turn-around: 9 Months
- Long-term impact: Sustainable ecosystem

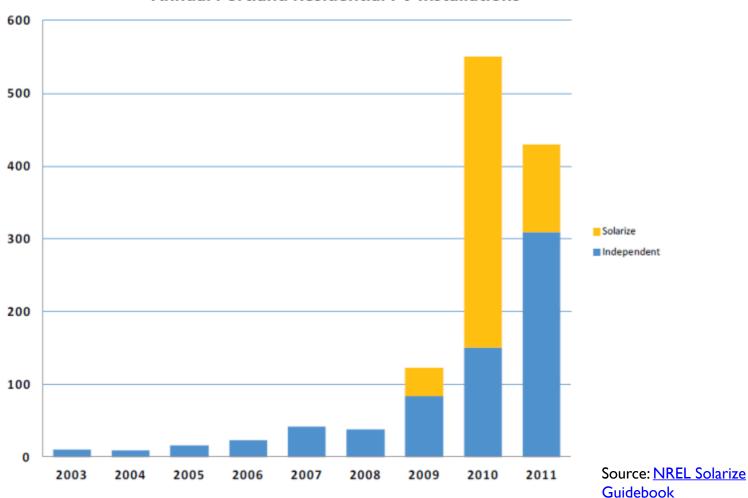


# Solarize Solarize: Process



# 1 Solarize The Network Effect

#### **Annual Portland Residential PV Installations**

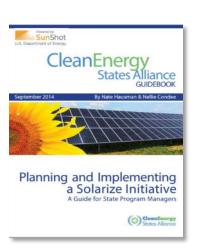


# Solarize Where to Start

#### Resource

Planning &
Implementing a
Solarize Initiative: A
Guide for State
Program Managers

http://www.cesa.org



The Solarize Guidebook



www.nrel.gov

#### **NY-Sun Services**

#### **PV Trainers Network**

- Workshop: Introduction to Solarize
- https://training.nysun.ny.gov/coursesworkshops

#### **Community Solar NY**

- Funding and support to assist communities with rolling out solarize campaigns
- Visit: http://ny-sun.ny.gov/Get-Solar/Community-Solar

# Policies & Incentives

Federal

Investment Tax Credit

Accelerated Depreciation

State & Utility

Solar Tax Credit

NY-Sun Incentive Program

**Two Popular Options** to promote solar adoption:

- 1. Run a **Solarize** campaign for homeowners
- Implement PACE financing for businesses

Local

Planning & Zoning

Permitting

Market Development

Financing



# PACE What is PACE?

## **Property Assessed Clean Energy (PACE)**

Local governments finance the up-front costs of energy improvements to properties, which are repaid through a special assessment on the property owner's tax bill.



# PACE Commercial PACE in NY

### **Energize NY Commercial Program:**

- NY passed enabling legislation in 2009
- Managed by the Energy Improvement Corporation (EIC)
- Offered to commercial properties in participating municipalities
- Repayments collected by municipalities via property tax charge
- PACE granted senior lien status
- 14 municipalities have signed on
- Improvements must have savings to investment ratio >1
- To participate:
  - Pass the Local Law
  - Sign the Municipal Agreement (IMA)
  - Formally request membership from EIC

## Energize NY Finance Model



**Energize NY Finance** offered to property owner



Building
within municipal
boundaries





**CAPITAL FLOW** 



Bond payments



Bank Trustee
For Energy
Improvement Corp

Pledged Municipal Payments



Special Tax "Charge" payments

Municipal Tax Receiver

# PACE Where to Start

#### Resource



#### **Energize NY**

Energize NY Finance leverages PACE (Property Assessed Clean Energy) financing to help commercial and non-profit property owners undertake deep energy improvements.

energizeny.org

#### **NY-Sun PV Trainers Network Services**

- Workshop: Expanding Commercial Solar Financing Options with a PACE Program
- https://training.nysun.ny.gov/courses-workshops

One-on-One Assistance

- ✓ Establish a PACE district
- ✓ Design a cost-effective program
- ✓ Support program administration

# Want to Learn More?

Target Audience	PV Trainers Network Workshop
Code Officials & Inspectors	Solar PV Permitting and Inspection Methods
First Responders	Safety and Fire Considerations for Solar PV
Plan Examiners, Engineers & Architects	Solar PV for Engineers and Architects
Administrators	Introduction to Solarize: Stimulating Local Solar Market Growth
	Expanding Commercial Solar with a PACE Program
Code Officials & Plan Examiners	Streamlining Solar Permitting
Planners	Land Use Permitting for Solar
	Zoning for Solar Energy

## Next Steps: What else can communities do?

Attend a training

Host an event

Request one-on-one assistance

Visit: <a href="https://training.ny-sun.ny.gov">https://training.ny-sun.ny.gov</a>

Contact us: <a href="mailto:info@training.ny-sun.ny.gov">info@training.ny-sun.ny.gov</a>









# **Pricing Tiers**

Base Price: 16% discount

**Lowest Tier:** 24% discount

PV Panel	Efficiency	Warranty	Inverter	< 50 kW	50-100 kW	101+ kW
Trina 255	15.9%	10-yr product, 25-yr performance	Solar Edge	<b>\$3.55</b> per watt	<b>\$3.40</b> per watt	<b>\$3.25</b> per watt
SolarWorld 280	16.7%	10-yr product, 25-yr performance	Solar Edge	\$3.60	\$3.45	\$3.30
Ben-Q (AC module)	18.1%	10-yr product, 25-yr performance	Built-in micro- inverter	\$3.70	\$3.55	\$3.40







Over 650 people attended nine community workshops and a Solar Open House event.







More than 1,100 people viewed the workshop presentation materials online.





Social media and local networks help spread the word.

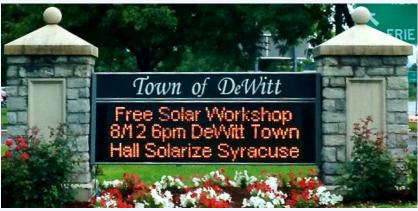
440+ followers on Facebook – and counting.



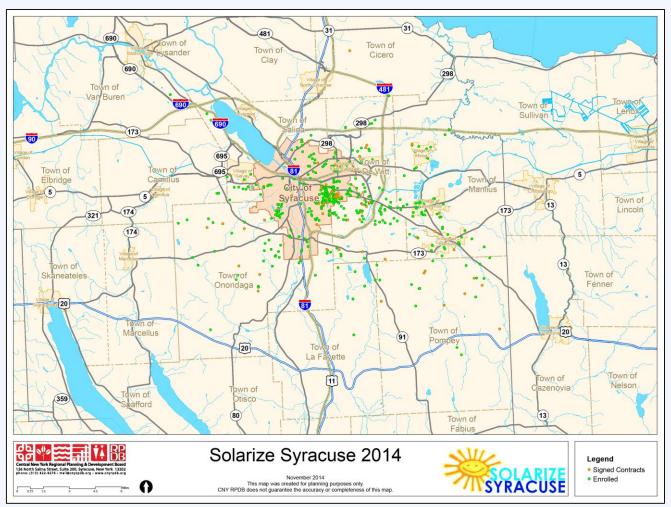


Media coverage and municipal support are critical success factors.





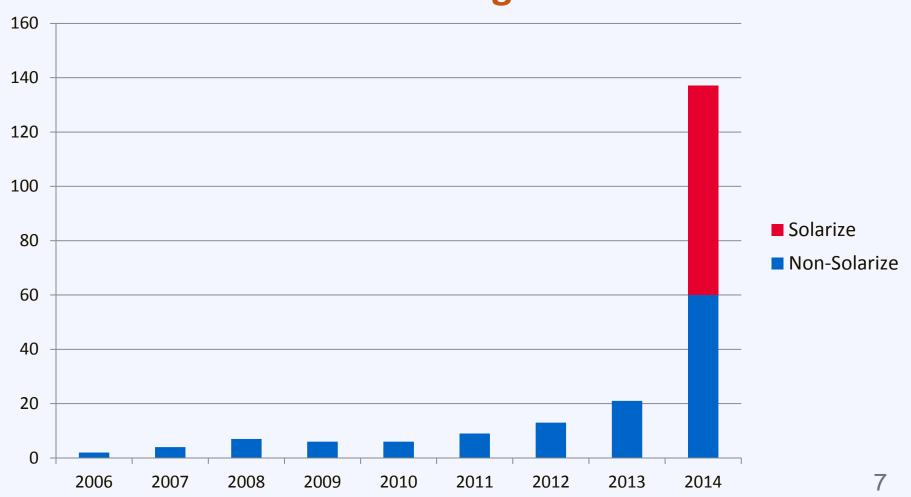




- Solarize Syracuse target area included 8 municipalities
- 500 enrolled for free site assessment (green dots)
- 77 signed contracts to install solar PV (orange dots)
- 530 kW of new solar capacity
- More than doubled the amount of residential solar in the target area



# Residential Solar Projects by Year in Solarize Target Area



### **Solar Market Impact**

Market Area/Time Period	# of Projects	kW	\$/W
Solarize Syracuse/June-Nov 2014	77	530	\$3.25
Onondaga County/June-Nov 2014	45	419	\$4.05
Onondaga County/Jan-May 2014	15	128	\$4.45
Oswego County/June-Nov 2014	29	250	\$4.16 6%
Oswego County/Jan-May 2014	4	40	\$4.41
Madison County/June-Nov 2014	16	185	\$4.05 2%
Madison County/Jan-May 2014	4	34	\$4.12





### **Economic Development Impact**



3 new jobs and \$1.7+ million new investment in local communities.







## Solarize CNY: Regional Approach

### **Solarize Syracuse 2014:**

- 6 partners
- 8 municipalities covered
- 242,000 population
- 10 community events
- 650 attendees (65 per event)
- 500 enrollees
- 77 projects (15% of enrollees)
- 530 kW (7 kW avg. size)

#### **Solarize Central NY 2015:**

- 20+ local partners
- 150 municipalities covered
- 795,000 population
- 40 60 community events
- 2,500 attendees (~50 per event)
- 2,000 enrollees
- 400 projects (20% of enrollees)
- 4,000 kW (10 kW avg. size)





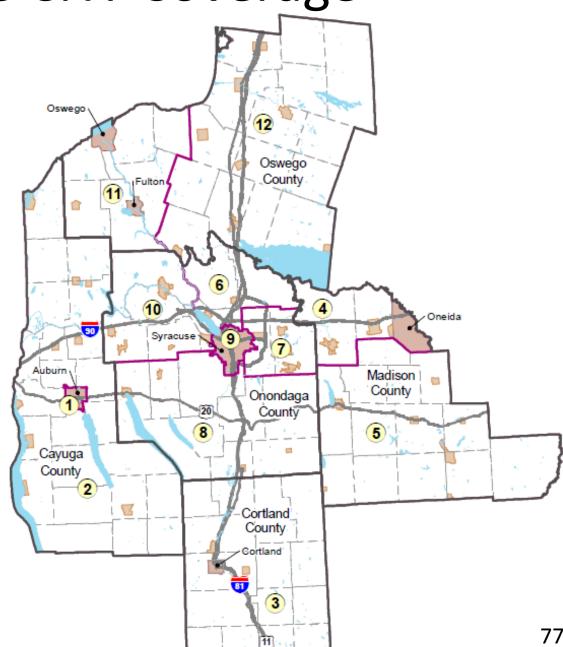
Solarize CNY Coverage

# Campaign Territories and Local Partners:

- Central New York's five counties divided into 12 "campaign territories"
- Each territory will have one or more "local partners"
- CNY RPDB will be the regional project manager
- Program will be open to homeowners and businesses in all five counties







# **New Program Elements/Focus**

- 1. More small commercial customers including farms, not-for-profit organizations and multi-family properties
- 2. Automated customer outreach tools
- 3. Streamlined data management to keep track of customers through the process
- 4. Greater customer choice more installers (teams of installers?)



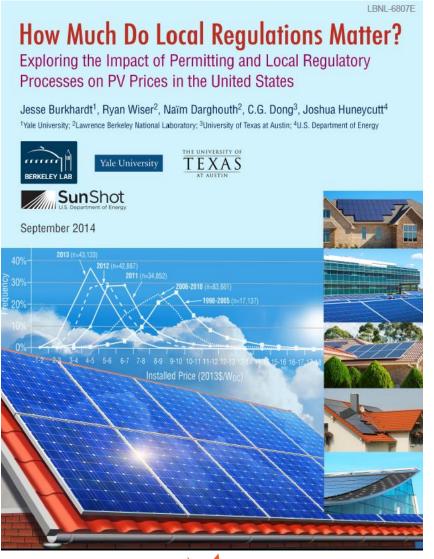


### What's Next?

- I. Submit Community Solar NY applications (one per "campaign territory"): January 30, 2015 DONE
- NYSERDA awards announced: mid-February 2015
   DONE
- 3. Identify additional local partners: Now
- 4. Begin organizational planning: Now
- 5. Installer selection: March 2015
- 6. Launch campaign: April 2015
- 7. Outreach meetings: Spring/Summer 2015
- 8. Customer enrollment deadline: September 2015



## Streamlined Solar Permitting



So far, the CNY RPDB has assisted

#### 21 Central NY municipalities

to adopt NYSERDA's streamlined permit:

1.Baldwinsville V. 11.Minoa V.

2.Dewitt T. 12. Montezuma T.

3. Hamilton V. 13. Morrisville V.

4.Lafayette T. 14.Oswego C.

5.Lebanon T. 15.Owasco T.

6.Lenox T.

7.1 incoln T.

8.Liverpool V.

9. Marcellus T.

10. Minetto T.

16.Parish T.

17. Parish V.

18. Pompey T.

19. Sennett T.

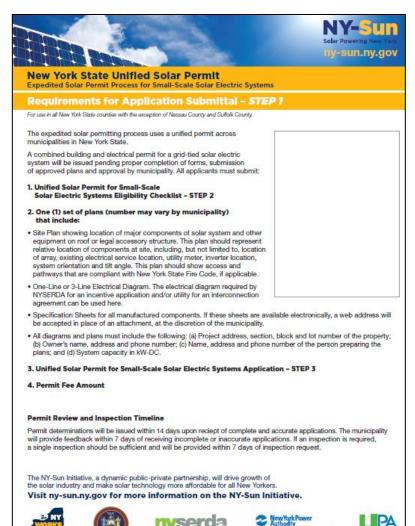
20.Skaneateles T.

21.Tully V.





## Permitting and Solarize



NYS Unified Solar Permit are eligible to receive \$2,500 grant
The CNY RPDB taking the lead to assist municipalities, and can submit the application

paperwork to NYSERDA

Communities that adopt the

Grant can be used for <u>any</u>
 <u>purpose</u>, including the
 installation of solar on
 municipal property or as
 incentives given to
 homeowners or businesses to
 install solar on their property









## Thank You!

Questions?

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