



NYSERDA

Clean Energy in your Community

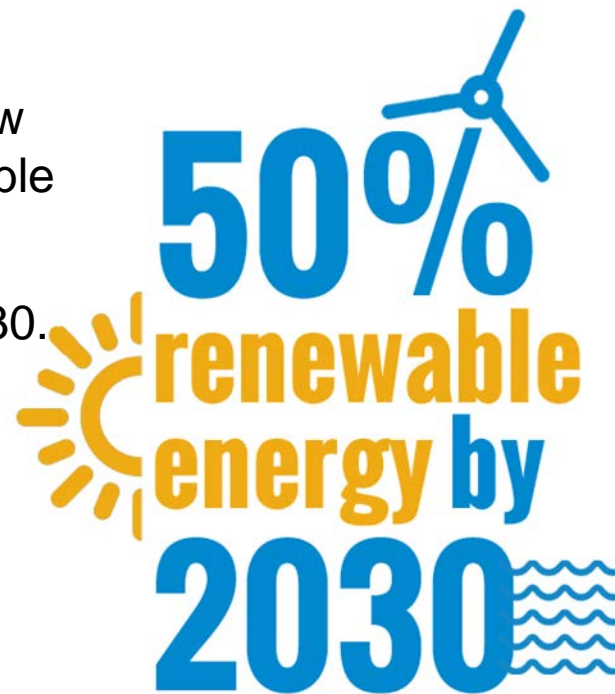
Houtan Moaveni

Senior Advisor to the President for Strategy and Clean Energy Siting
NYS DG Interconnection Ombudsman

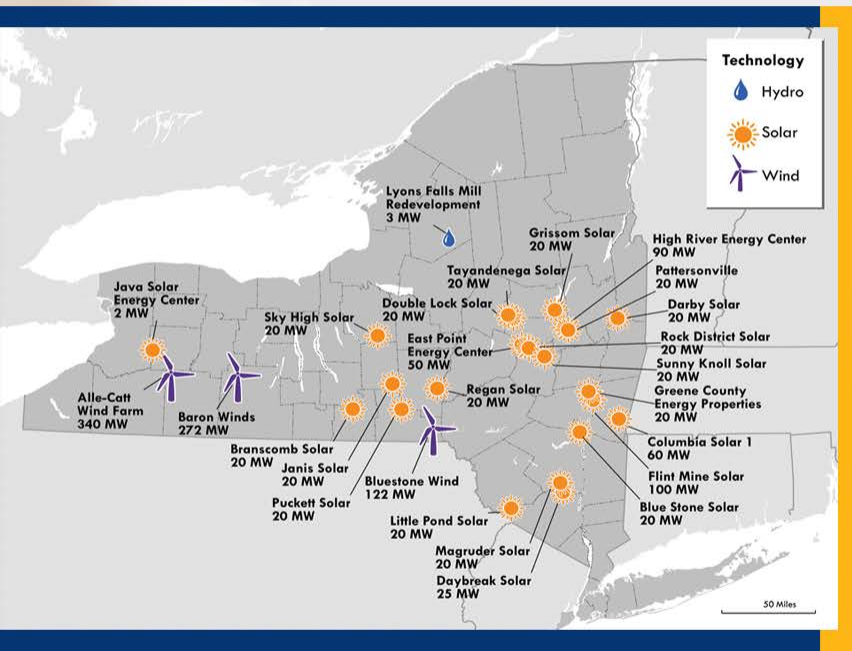
November 14, 2018

New York Energy Policy

- Reforming the Energy Vision (REV) is Governor Andrew Cuomo's strategy to build a clean, resilient and affordable energy system for all New Yorkers.
- Clean Energy Standard: 50% renewable energy by 2030.
- Clean Energy Fund (CEF)
 - 10-year, \$5 billion funding commitment
 - Reshapes NY's energy efficiency, renewable energy and energy innovation programs
 - Reduces the cost of clean energy
 - Accelerates the adoption of energy efficiency to reduce load
 - Increases renewable energy to meet demand
 - Mobilizes private investment in clean energy



NYSERDA 2017 Large-Scale Renewable Awards



\$1.4 billion

single largest commitment to renewable energy by a state in the U.S.

26 large-scale renewable energy projects across New York

- > **22** solar farms
- > **3** wind farms; one features energy storage
- > **1** hydroelectric facilities

Generate enough energy to power **more than 430,000 homes**

Reduce carbon emissions by **1.6 million metric tons**, equivalent to taking nearly **340,000 cars off the road**

Create **over 3,000** short- and long-term **well-paying jobs**

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

Reduce Soft Costs

Approx. \$1 Billion Total Budget

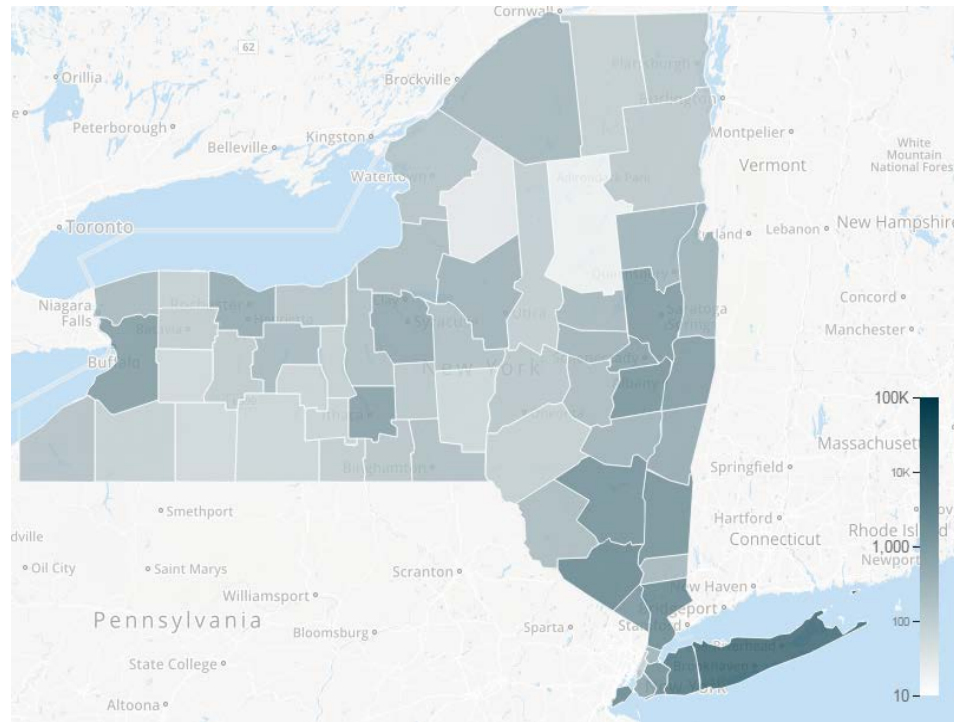
Self-Sustaining Market

Statewide Goal of 3 GW by 2023

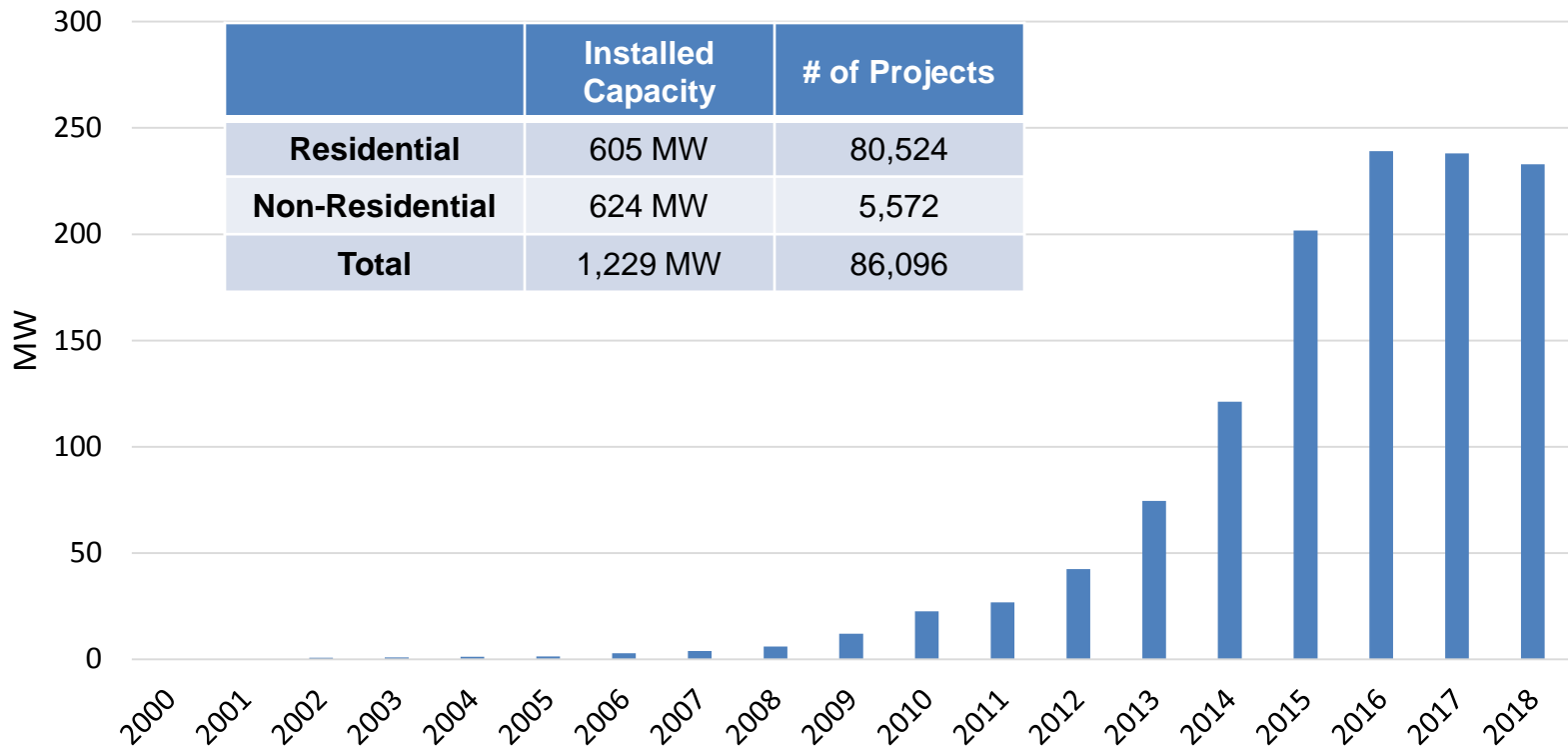
NY-Sun Program Activity to Date

Completions by County

- 1,229 MW installed statewide with NYSERDA support
 - 605 MW of residential PV (80,524 projects)
 - 624 MW of non-residential PV (5,572 projects)
- 926 MW currently in NY-Sun pipeline
- Installations all 62 counties and in 1,681 different zip codes



MW Installed Statewide by Year

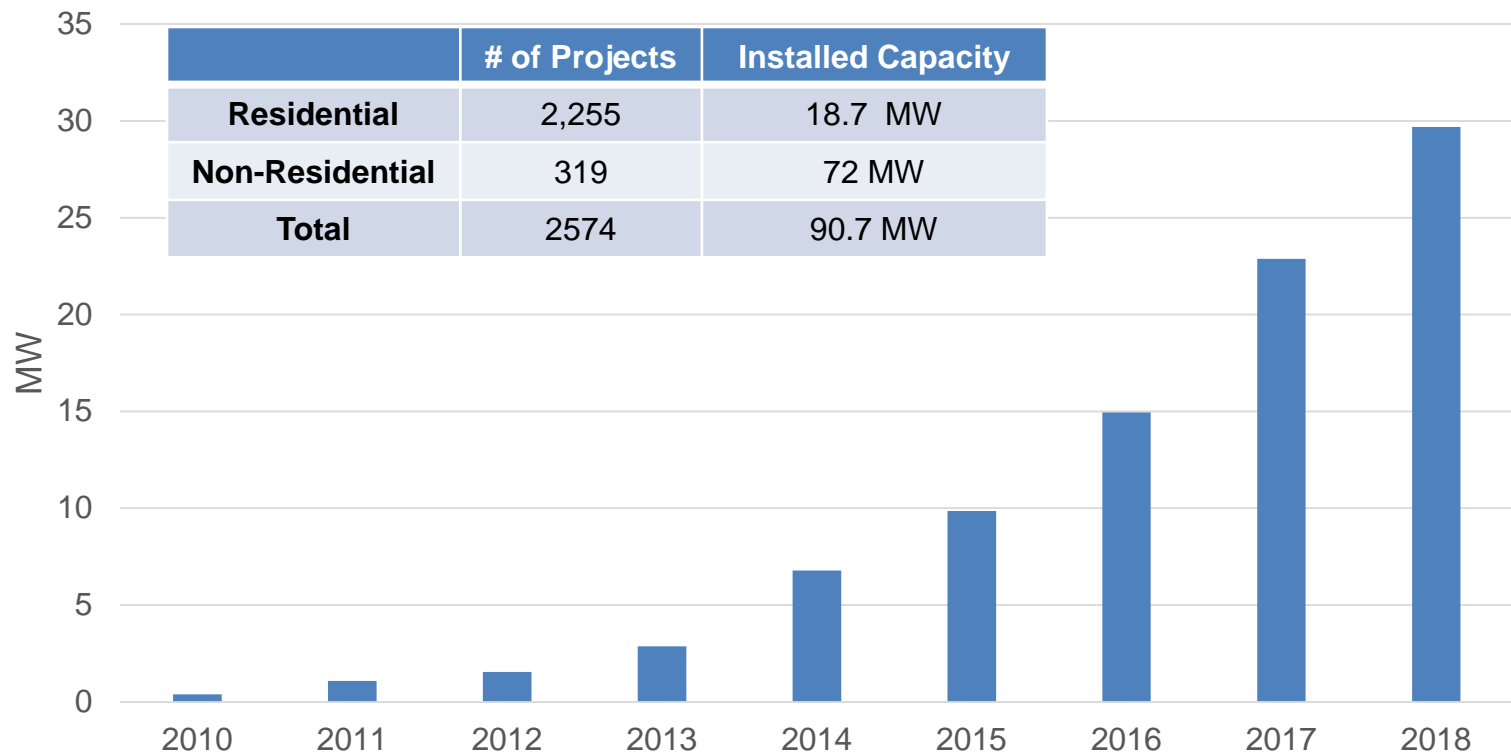


OpenNY Data as of 10/16/18



NEW YORK
STATE OF
OPPORTUNITY.
NYSERDA

MW Installed in Genesee/Finger Lakes Region by Year



OpenNY Data as of 10/16/18

Genesee, Livingston, Monroe, Ontario, Orleans, Seneca, Wayne, Wyoming, Yates



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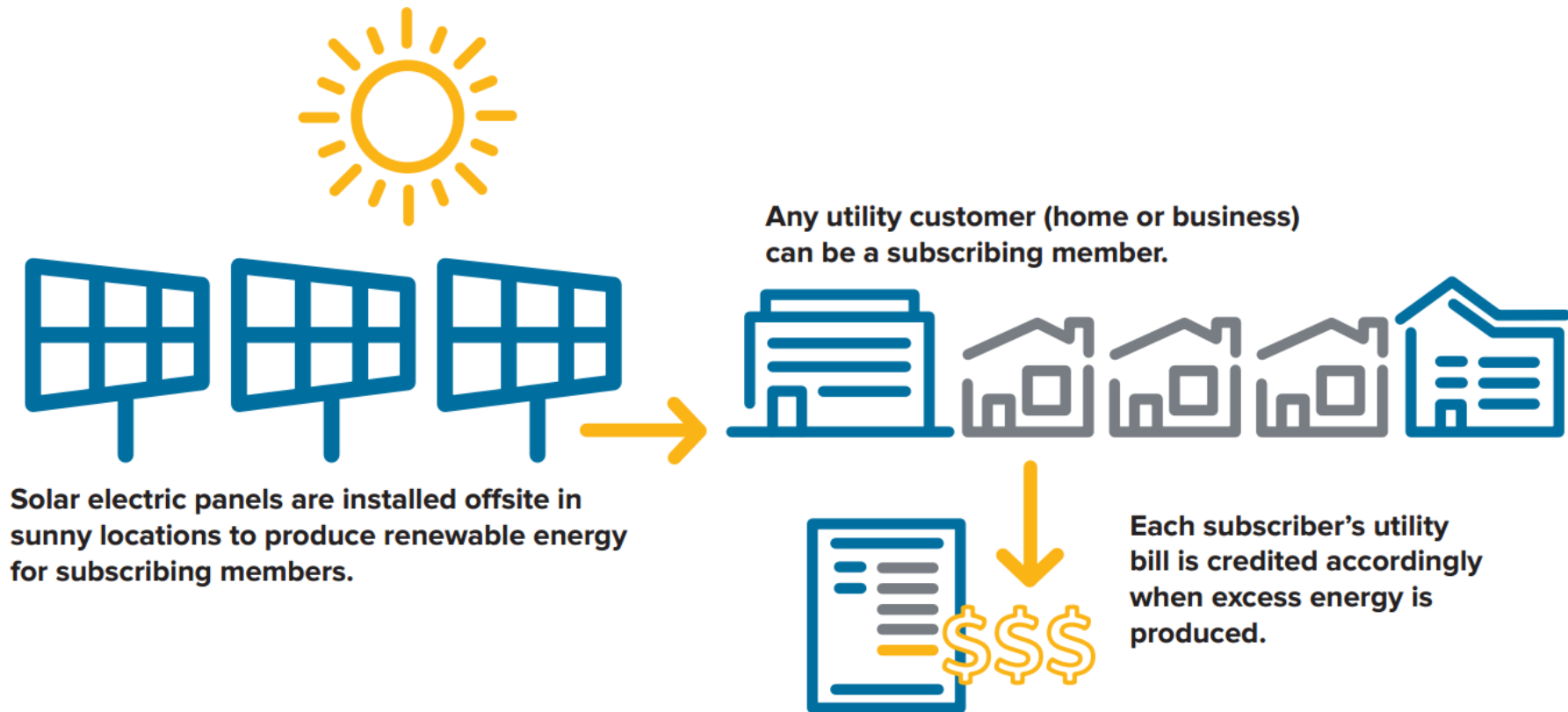
Community Solar in New York



Community Solar in New York



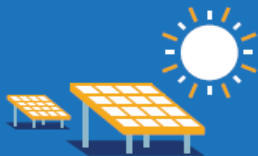
Community Solar: How it Works



How Community Solar Works



1



Solar panels are installed at a site in your community.

2



The clean energy is then fed into the local power grid.

3



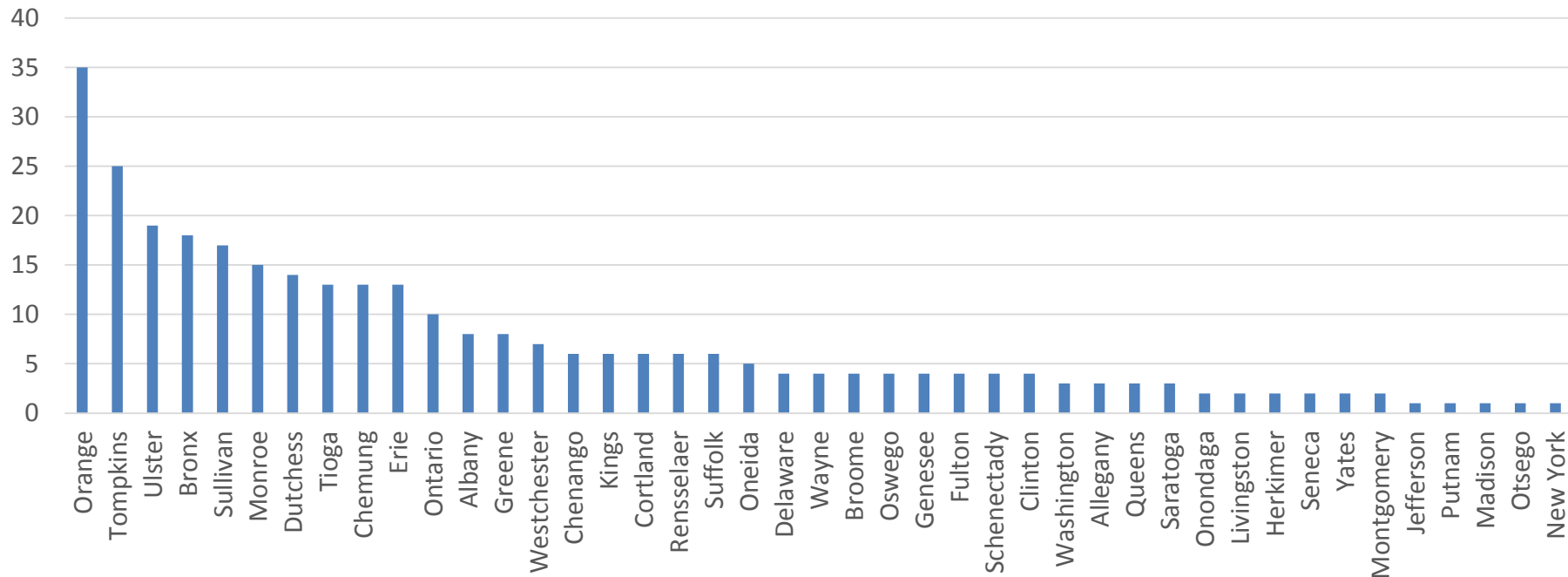
You continue to get electricity from your utility, with no need to install or maintain panels on your home or property.

4



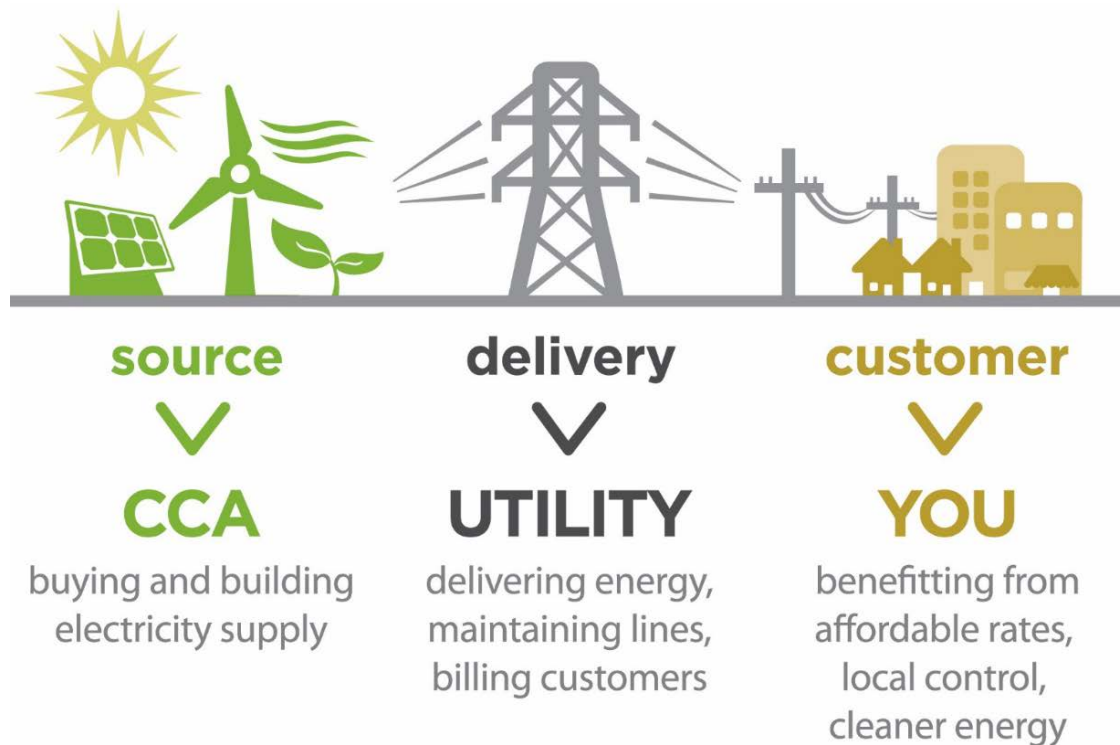
As a program participant, you receive credits on your electric bill at no cost to you.

Number of Proposed CDG Projects



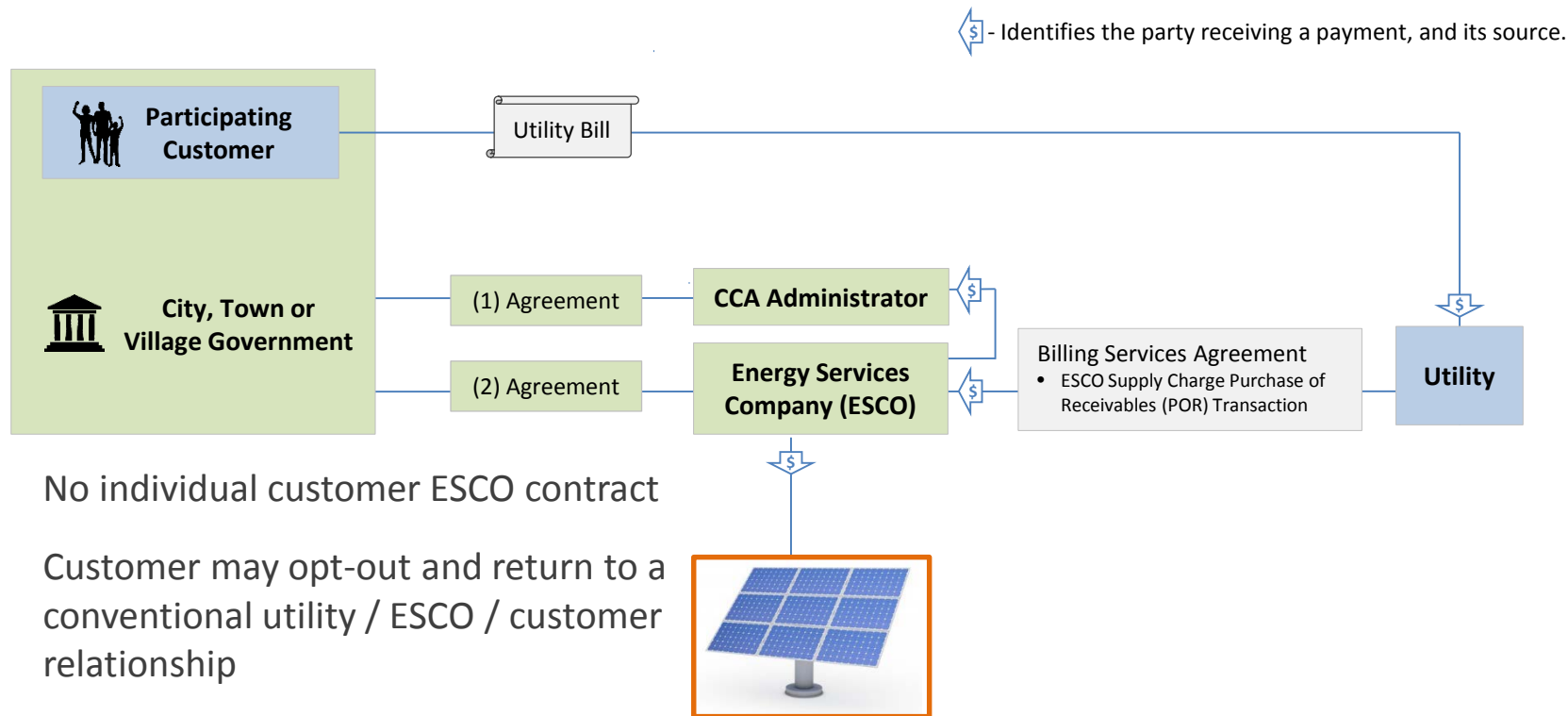
- There are proposed community solar projects in 42 counties
- Orange, Tompkins, and Ulster Counties have the most proposed projects
- The average project size is about 2 MW AC

Community Choice Aggregation: How It Works



Community Choice Aggregation (CCA) Model

The following graphic depicts possible contractual relationships between the parties involved in CCA:



The New York Solar Guidebook and Technical Assistance for Local Governments



NY Solar Guidebook for Local Government



Chapter 1 - Solar PV Permitting and Inspecting in NYS

Chapter 2 - Roof Top Access and Ventilation Requirements

Chapter 3 - State Environmental Quality Review (SEQR)

Chapter 4 - NYS's Real Property Tax Law § 487

Chapter 5 - Solar Payment-In-Lieu-of-Taxes Toolkit

Chapter 6 - Using Special Use Permits and Site Plan Regulations

Chapter 7 - Solar Installations in Agricultural Districts

Chapter 8 - Landowner Considerations for Solar Land Leases

Chapter 9 - Decommissioning Solar Panel Systems

Chapter 10 - Model Solar Energy Local Law

Chapter 11 – Municipal Solar Procurement Toolkit

Technical Assistance for Local Governments

NYSERDA offers local governments free one-on-one assistance on:

1. Adopting a Payment-In-Lieu-Of-Taxes (PILOT) law and agreement
2. Completing the SEQR process for large solar installations
3. Planning and Zoning for Solar
 - Adopting a Model Solar Energy Law
 - Siting PV in Agricultural Districts and agricultural areas
 - Updating master plans and zoning regulations
4. Municipal Solar Procurement
5. Permitting and Inspections
 - Adopting and implementing the Unified Solar Permit
 - Technical consulting to relieve administrative burdens

Clean Energy Siting Homepage

Clean Energy Siting for Local Governments

[New York State Solar Guidebook](#)

[New York Wind Energy Guide](#)

[Article 10](#)

[Technical Assistance and Support](#)

[Clean Energy Siting Email List](#)

Clean Energy Siting for Local Governments

NYSERDA offers several resources to help local governments understand how to manage responsible clean energy development in their communities. These resources include step-by-step instructions and tools to guide the implementation of clean energy, including permitting processes, property taxes, siting, zoning, and more. If you have a question on clean energy siting in your community, or need help with a chapter of the Guidebook, email cleanenergyhelp@nyserda.ny.gov and we'll respond to you within 24 hours. For more hands-on support, learn more about our free [training and technical assistance opportunities](#).

Stay up-to-date with the latest about Clean Energy Siting. [Join our email list](#) for local government officials.

The entire Solar Guidebook is available for download here

Ask the team any question by sending an email to cleanenergyhelp@nyserda.ny.gov

Municipalities can request technical assistance here

Municipal Procurement

Procurement Options

Direct Purchase

- The municipality pays for construction of and owns the solar project.
- The primary financial benefit of direct ownership is the low-cost capital that municipalities can obtain through bonding or other forms of lending.
- Often, this advantage is outweighed by the tax benefits of third-party ownership.

Third Party Ownership

- Solar developer finances the cost of the project, owns the system, responsible for operation and maintenance.
- Developers are able to claim 30% Federal Investment Tax Credit & 5 year Accelerated Depreciation.
- Municipality purchases the energy.
- The financial package offered through third-party ownership is frequently better than that of direct ownership.

Land Lease

- Allows the municipality to lease unused land to a solar developer.
- Under a land lease the municipality does not have to purchase the energy that is generated, but will receive lease payments from the developer.
- Local residents and businesses may purchase the renewable energy and take advantage of utility bill savings

Brownfields / Landfills / Repurposed Lands



Solar Procurement Process



NY-Sun Municipal Solar Host Toolkit

The toolkits consists of:

- Template RFP
- Template Lease Agreement
- Model Solar Law for Counties subject to County Law 215

REQUEST FOR PROPOSALS

Leasing Municipal Land for Solar Development

Jurisdiction Name

Jurisdiction Address

Issue Date

Proposals Due By:

Technical Assistance for Local Governments on Municipal Solar Procurement

NY-Sun offers free assistance:

- Evaluating sites and reviewing utility Hosting Capacity Maps
- Assisting on drafting Request for Proposals
- Helping on evaluating proposals that are received
- Comparing lease agreements with the Model Lease Template

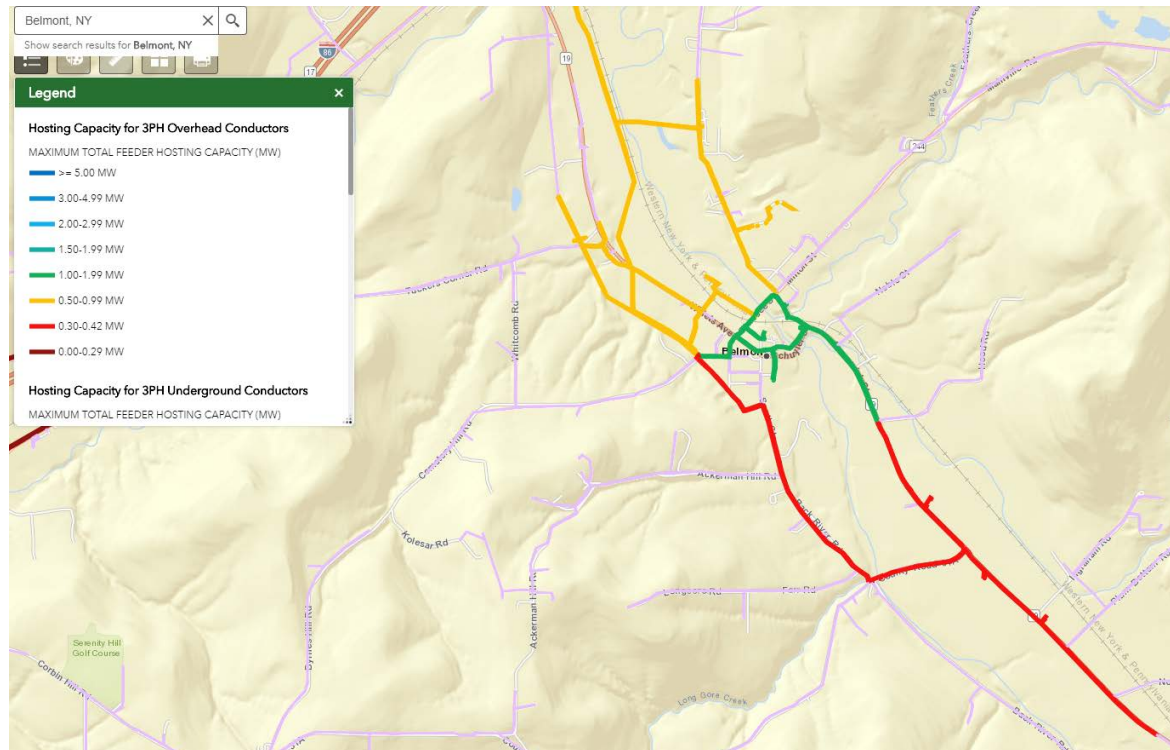
Solar Planning & Zoning

What Is the Model Solar Energy Law?

- This Model Law is an “all-inclusive” ordinance and is intended to provide a thorough review of all aspects of solar energy systems that could be regulated.
- The Model Law gives municipalities flexibilities to choose the options that work best in some cases.
- Municipalities should review this model law, examine their local situation, and adopt the regulations that make the most sense for their municipality, deleting, modifying, or adding other provisions as appropriate.

What Should Municipalities Do Before Drafting a Local Solar Energy Law?

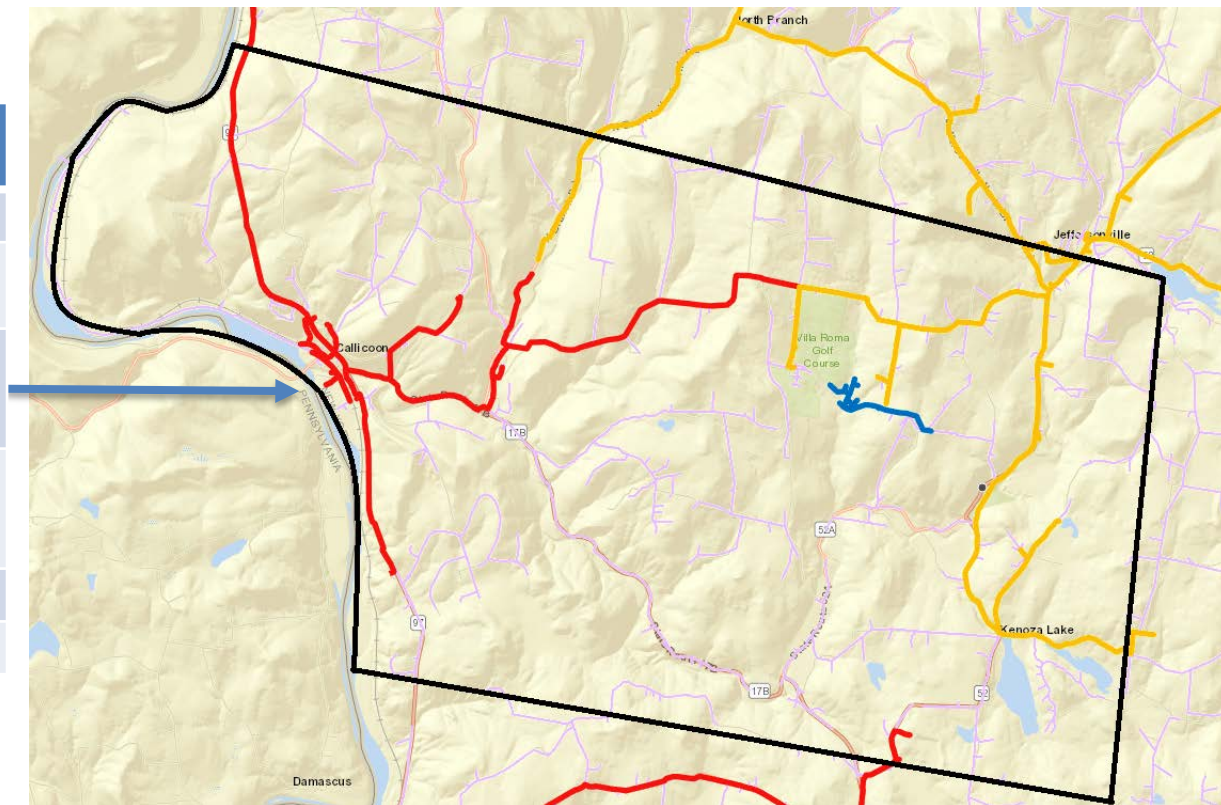
1. Municipalities should first review the available Hosting Capacity maps to learn if the development of solar energy systems is economic and possible.



Example Substation

Hosting Capacity for 3PH Overhead Conductors:

Number of Phases	3
Nominal Voltage (kV)	12.47
Minimum total Feeder Hosting Capacity (MW)	0.14
Maximum Total Feeder Hosting Capacity (MW)	0.49
Installed D.G. (MW)	0.15
Queued D.G. (MW)	3.84



What Should Municipalities do Before Drafting a Local Solar Energy Law?

2. Amend the comprehensive plan concurrently as developing a solar law to include a strategy for municipal-wide solar development.
3. Conduct outreach with the community to gather all available ideas, identify divergent groups and views, and secure support from the entire community.
4. Create a working group that will conduct meetings on a community wide basis and studies to determine whether existing policies, plans, and land use regulations require amendments to remove barriers to and facilitate solar energy development goals.

Contents

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- **Section 2: Statement of Purpose**
- **Section 3: Definitions**
- **Section 4: Applicability**
- **Section 5: General Requirements**
- **Section 6: Permitting Requirements for Tier 1 Solar Energy Systems**
- **Section 7: Permitting Requirements for Tier 2 Solar Energy Systems**
- **Section 8: Permitting Requirements for Tier 3 Solar Energy Systems**
- **Section 9: Safety**
- **Section 10: Permit Time Frame and Abandonment**
- **Section 11: Enforcement**
- **Section 12: Severability**

Section 1: Authority

- This Solar Energy Local Law is adopted pursuant to [Select one: sections 261-263 of the Town Law / sections 7-700 through 7-704 of the Village Law / sections 19 and 20 of the City Law and section 20 of the Municipal Home Rule Law] of the State of New York
- Which authorize the [Village/Town/City] to adopt zoning provisions that advance and protect the health, safety and welfare of the community, and, in accordance with the [Village/Town/City] law of New York State, **“to make provision for, so far as conditions may permit, the accommodation of solar energy systems and equipment and access to sunlight necessary therefor.”**

Section 2: Statement of Purpose

1. To take advantage of a safe, abundant, renewable and non-polluting energy resource;
2. To decrease the cost of electricity to the owners of residential and commercial properties, including single-family houses;
3. To increase employment and business development in the [Village/Town/City], to the extent reasonably practical, by furthering the installation of Solar Energy Systems;
4. To mitigate the impacts of Solar Energy Systems on environmental resources such as important agricultural lands, forests, wildlife and other protected resources, and;
5. To create synergy between solar and other stated goals of the community pursuant to the municipality's comprehensive plan.

Section 3: Definitions

System Energy System Classifications

- Tier 1 Solar Energy System:
 - Roof-Mounted
 - Building-Integrated
- Tier 2 Solar Energy System: Ground-Mounted systems that generate up to 110% of the electricity consumed on the site over the previous 12 months.
 - Either capacity-based (up to 25 kW AC) or physical size-based (up to 4,000 sq. ft.).
- Tier 3 Solar Energy System: Not included in the list for Tier 1 and Tier 2 Solar Energy System.

Tier 1 Roof-Mounted Solar Energy System



Tier 1 Roof-Mounted Solar Energy System



Tier 1 Building-Integrated Solar Energy System



Tier 2 Ground-Mounted Solar Energy System



Tier 3 Ground-Mounted Solar Energy System



Tier 3 Ground-Mounted Solar Energy System



Section 6: Tier 1 Systems Permitting Requirements

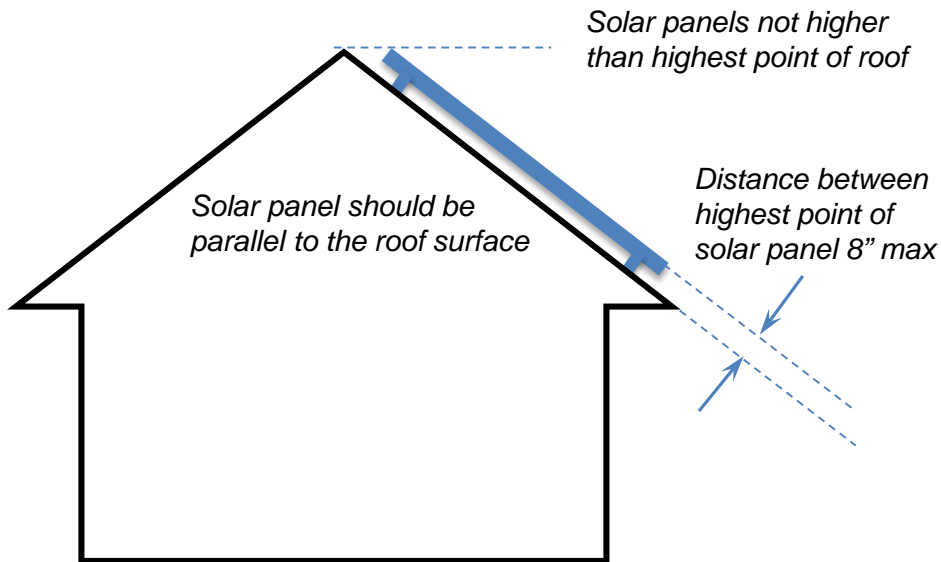
Roof-Mounted

- Incorporate designs that address placement and tilt of solar panels on pitched roof:
 - On **pitched roofs**, the solar panels shall be mounted with a max 8" between roof surface and highest point of solar system, solar panels shall be parallel to roof surface they are mounted on/ attached to, and solar panels shall not extend beyond highest point of roof surface.
 - Solar panels on **flat roofs** shall not extend beyond surrounding parapet, or more than 24" above flat roof surface, whichever is higher.
- **Glare** – All solar panels shall have anti-reflective coating(s)

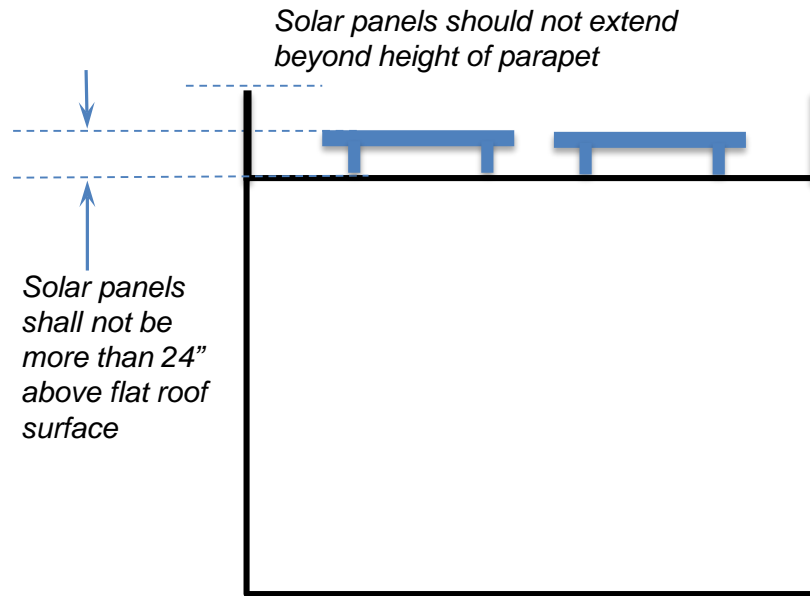


Section 6: Tier 1 Design Requirements

Pitched Roof



Flat Roof



Section 7: Tier 2 Systems Permitting Requirements

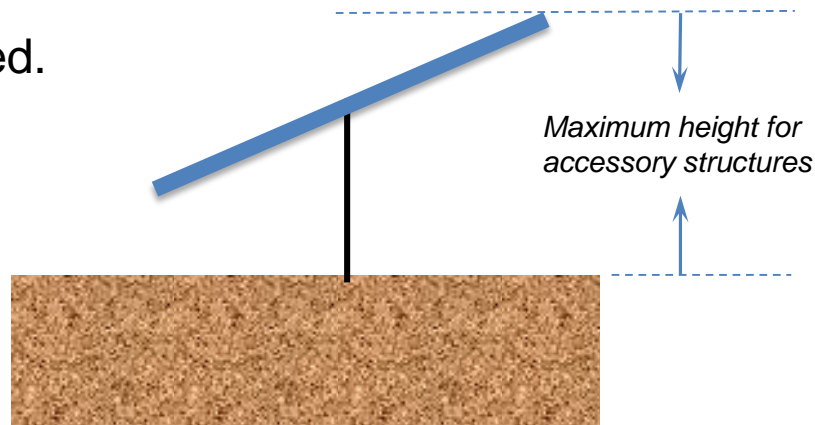
- **Glare** - All solar panels shall have anti-reflective coating(s).
- **Screening & Visibility** - Views shall be minimized from adjacent properties to the extent reasonably practicable.
- **Lot size** - Comply with the existing lot size requirement specified for accessory structures within the underlying zoning district.

Section 7: Tier 2 Height Requirements

Height (select from the following options):

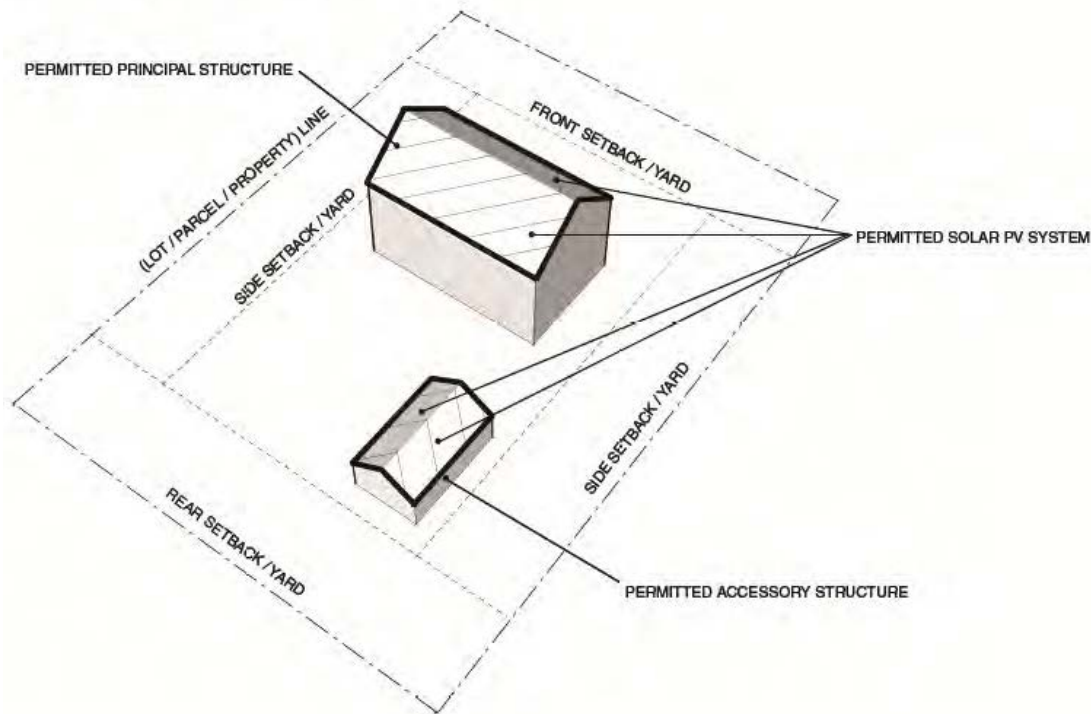
- Subject to the maximum height for accessory structures.
- Follow the height limitations suggested.

Zoning District (reference only)	Height
Residential Low Density	10'
Residential High Density	10'
Commercial / Business	15'
Light Industrial	15'
Heavy Industrial	15'
Agricultural / Residential	15'



Section 7: Tier 2 Setbacks

Subject to the setback requirement of accessory structures within the underlying zoning district



Section 8: Tier 3 Systems Permitting Requirements

Process for Approval

- Choose which zoning district(s) to permit systems.
- Applications shall be reviewed for completeness within 10 business days.
- Applications shall be subject to a public hearing and a notice shall be published in the official newspapers 5 days in advance.
- Referred to the [County Planning Department] pursuant to General Municipal Law § 239-m as required.
- Upon closing the public hearing, the reviewing board shall have 62 days to take action on the application. The 62-day period may be extended.

Requirements for Approval

1. Underground Requirements
2. Vehicular Paths
3. Signage
4. Glare
5. Lighting
6. Tree-cutting
7. Decommissioning
8. Site Plan Application
9. Special Use Permit Standards
10. Ownership Changes

Section 8.B-C: Tier 3 Permitting Requirements

1. **Underground Requirements** - On-site utility lines shall be placed underground as permitted by the serving utility.
2. **Vehicular paths** - minimize the extent of impervious materials and soil compaction.



Section 8.C-G: Tier 3 Permitting Requirements

3. Signage

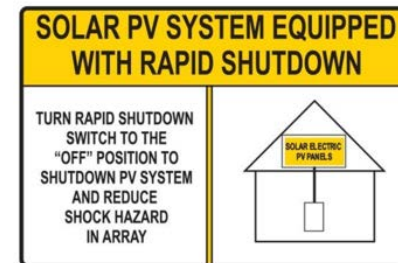
- Displaying the manufacturer's name, safety information, emergence contact, and equipment specification information, within an area no more than 8 square feet.
- Comply with the NEC for warning signs.



4. Glare - All solar panels shall have anti-reflective coating(s).

5. Lighting - Limited to that minimally required for safety and shall be reasonably shielded or downcast from abutting properties.

6. Tree-cutting - Minimize removal of existing trees larger than 6 inches in diameter.



Section 8.H: Tier 3 Decommissioning

- Decommissioning is required when a system is abandoned, and/or not producing electricity for a period of 1 year.
- Applicant shall provide a decommissioning **plan** that includes the **cost** and **time** of removing the Solar Energy System, and the plan to repair damage caused to the property.
- Financial security
 - In cash, bond, or security formats reasonably acceptable to the [Village/Town/City].
 - In amount be 125% of the cost of removal and restoration, with an escalator of 2% annually for the life of the solar energy system.
 - The decommissioning amount shall be reduced by the estimated salvage value of the system.
- The security is forfeited in the event of default, and shall remain in full force and effect until restoration of the property is completed.

Section 8.I: Tier 3 Site Plan Requirements

- Property lines and physical features of site.
- Proposed changes to landscape, grading, vegetation, lighting etc.
- A one, or three-line electrical diagram showing layout, equipment components and associated National Electric Code compliant mechanisms.
- Equipment specification sheet for proposed panels, significant components, mounting system and inverter.
- General information including name, address, and contact info of system installer and owner/operator.
- Name, address, phone number and signature of the project applicant and owners, demonstrating their consent to the use of the property for the Solar Energy System.
- Zoning district designation.
- Property Operation and Maintenance Plan.
- Erosion and sediment control and storm water management plans.
- Signed and sealed engineering documents by a NYS Licensed Professional Engineer, or Registered Architect.

Section 8.J: Tier 3 Special Use Permit Standards

Lot size (select from the following options):

- Subject to the lot size requirement of the underlying zoning district.
- Follow the suggested lot size requirement for each zoning district.

Height (select from the following options):

- Subject to the height limitations of the underlying zoning district.
- Follow the suggested height limits for each zoning district.

Zoning District	Lot size	Height
Residential Low Density	≥ 2 acres	15 feet
Residential High Density	--	--
Commercial / Business	≥ 5 acres	20 feet
Light Industrial	N/A	20 feet
Heavy Industrial	N/A	20 feet
Agricultural/ Residential	≥ 5 acres	20 feet

Key:

--: Not Allowed

N/A: Not
Applicable



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Section 8.J: Tier 3 Special Use Permit Standards

Setbacks (select from the following options):

- Subject to the setback requirement of the underlying zoning district.
- Follow the suggested setback requirement for each zoning district.

Zoning District	Front	Side	Rear
Residential Low Density	100'	100'	100'
Residential High Density	--	--	--
Commercial / Business	30'	15'	25'
Light Industrial	30'	15'	25'
Heavy Industrial	30'	15'	25'
Agricultural / Residential	30'	15'	25'

Section 8.J: Tier 3 Special Use Permit Standards

Lot coverage

- Calculation Methodology: the following surface areas shall be included in the calculations for lot coverage includes:
 - 1) Foundation systems
 - 2) All mechanical equipment of Solar Energy System
 - 3) Paved access roads
- Lot coverage, defined as above, shall not exceed the maximum lot coverage requirement of the underlying zoning district.

Section 8.J: Tier 3 Special Use Permit Standards

Fencing - a minimum 7-foot-high fence as required by National Electrical Code (NEC) with a self-locking gate.



Section 8.J: Tier 3 Special Use Permit Standards

Screening & Visibility

1. Systems <10 acres in size

- Have views minimized from adjacent properties *to the extent reasonably practicable*.
- Using architectural features, earth berms, landscaping or other screening methods.

2. Systems ≥10 acres in size (designated as Type I actions in SEQR)

- Could use the same assessment as the visual impact assessment required for SEQR to analyze visual impacts on public roadways and adjacent properties.
- A line-of-sight analysis shall be provided, a digital viewshed report is optional.



What should be included in the screening & landscaping plan?

- Locations, elevations, height, plant species, and/or materials that will be used to mitigate any adverse aesthetic effects.

Section 8.J: Tier 3 Agricultural Resource Protection

- 1) Protect Prime Farmland and Farmland of Statewide Importance. Municipalities can choose options to address their specific concerns.
- 2) Follow the construction requirements of the New York State Department of Agriculture and Markets.
- 3) Provide native perennial vegetation and foraging habitat beneficial to game birds, songbirds, and pollinators.



NYS Real Property Tax Law § 487

NYS Real Property Tax Law § 487

- Provides a 15-year real property tax exemption for renewable energy systems
- Jurisdictions may choose to “opt out” of the RPTL § 487 exemption
 - However, opting out will make solar projects uneconomic
 - RPTL § 487 does not allow partial opt-outs (e.g. to tax only large projects)
 - Jurisdictions that opt out of the RPTL § 487 exemption may opt back in by passing a local law or resolution
- Jurisdictions that do not opt out of the RPTL § 487 exemption may issue PILOT agreements, which allow jurisdictions to generate revenue “in-lieu-of” taxes

The PILOT Toolkit

1. Model PILOT Law/Resolution

- Provides a legal template for jurisdictions that wish to establish a formulaic, jurisdiction-wide PILOT agreement process with solar developers

2. Model PILOT Agreement

- Provides a customizable draft contract to be negotiated and signed between a jurisdiction and a solar developer

3. PILOT Calculator

- Provides guidance on appropriate PILOT rates, for both an entire jurisdiction and for an individual solar project

4. Property Tax Calculator

- Provides assistance for taxing jurisdictions considering the assessed value of solar projects larger than 1MW.

Solar Project Economics

Solar Project Economics: A Snapshot

Expenses

1. Upfront
 - Construction + Interconnection
2. Recurring
 - Annual O&M
 - Land lease
 - Insurance
 - Inverter Replacement
 - Customer Acquisition & Management
 - Other Expenses

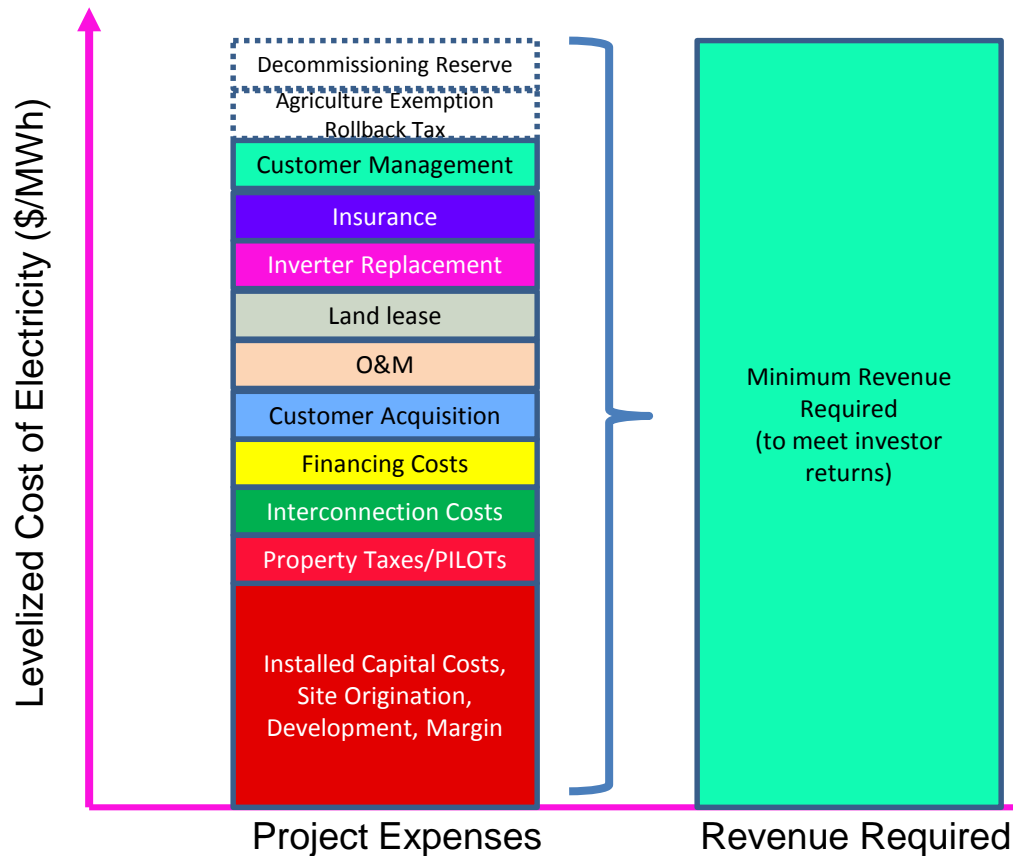
Revenue

1. Electricity Sales

Incentives

1. Federal investment tax credit
2. NY-Sun incentive

Project Expenses and Required Revenue



*not to scale

The PILOT Calculator

Calculator 1

- Calculator 1 estimates PILOT rates as a percentage of solar project compensation
- This calculator is best for setting PILOT rates jurisdiction-wide
- Users 1) input project capacity and 2) select the project's utility
- The calculator produces a range of rates as a percentage of project compensation
- Red shading indicates that projects may not be financially viable at that PILOT rate

Property Tax Model (DRAFT)

Operating Model

Project Assumptions - YELLOW REQUIRES INPUT		
General Project Assumptions		
AC System Size (Alternating Current)	[MW _{AC}]	2.00
Region Specific Assumptions		
Active Utility Region		NYSEG
Year-1 Compensation for Electricity Generation	[\$/kWh]	\$0.094

% of Compensation	PILOT (\$/MW)	Total System PILOT
1.0%	\$1,700	\$3,400
1.5%	\$2,500	\$5,000
2.0%	\$3,300	\$6,600
2.5%	\$4,100	\$8,200
3.0%	\$5,000	\$10,000
3.5%	\$5,800	\$11,600
4.0%	\$6,600	\$13,200
4.5%	\$7,400	\$14,800
5.0%	\$8,200	\$16,400

Calculator 2

- Calculator 2 estimates PILOT rates based on an individual project's revenue and expenses
- This calculator is best for setting a PILOT rate for an individual project
- This calculator considers all aspects of solar project economics and allows for a high degree of customization
- Users can choose to accept the default rates for many inputs, but are encouraged to enter data specific to the project in question
- Calculator 2 estimates PILOT rates based on the net present value (NPV) of a project's unlevered cash flow that achieves a specified pre-tax internal rate of return

Sample Annual PILOT rates

- This table displays sample PILOT rates generated by Calculator One for a typical 2 MW AC solar project in each utility service territory.
- The “Low” and “High” rates represent 1% and 3% of the compensation solar projects receive for the electricity they generate.

	Low (\$/MW AC)	High (\$/MW AC)
Central Hudson	\$2,600	\$7,600
Orange & Rockland	\$3,200	\$9,500
National Grid	\$1,700	\$5,100
NYSEG	\$1,700	\$5,000
Con Edison	\$3,700	\$11,100
Rochester Gas & Electric	\$1,700	\$5,000

Assessment Methodologies & Solar Property Tax Calculator

How Property is Assessed*

1. Market approach

- ☐ Assessor compares property to similar properties that have recently sold
- ☐ Typically used to value residential, vacant, and farm properties

2. Cost approach

- ☐ Assessor calculates the cost to replace a structure with a similar one using today's labor and material prices
- ☐ Subtract depreciation
- ☐ Add the market value of the land
- ☐ Used to value industrial, special purpose and utility properties

3. Income approach

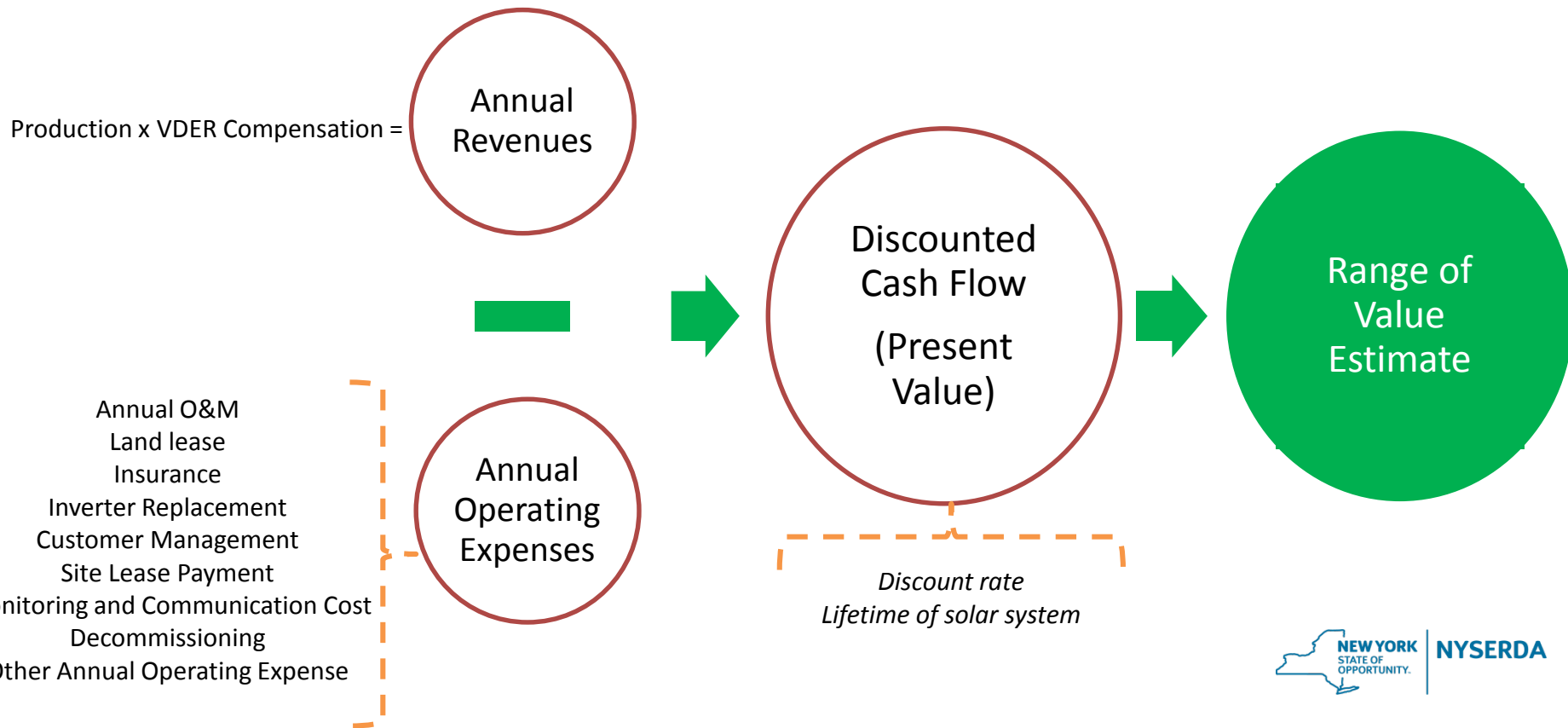
- ☐ Assessor analyzes how much income a property (such as an apartment building) will produce if rented
- ☐ Takes into account:
 - ☐ operating expenses
 - ☐ insurance
 - ☐ maintenance costs
 - ☐ financing terms
 - ☐ amount expected to be earned



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*Source: NYS Department of Tax & Finance

How Property Tax Calculator Works





Thank you

For additional questions, please contact me at:

Houtan.Moaveni@nyserda.ny.gov