

# Sustainable CUNY New York State Solar Map and Portal Smart DG-Hub



# Solar Energy Costs = Traditional Energy Costs

## Strategy

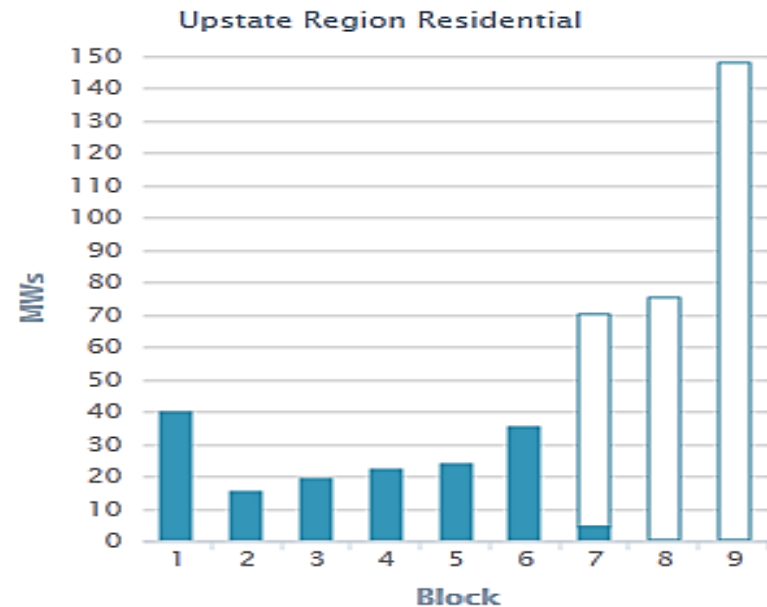
Reduce soft costs

**64 %**  
of the total  
residential  
installed  
system price

- Customer Acquisition
- Financing & Contracting
- Permitting & Inspection
- Interconnection
- Installation & Performance
- Operations & Maintenance

Sustainable CUNY Focus

Declining Federal, State  
and Local Incentives to  
Stimulate the Market

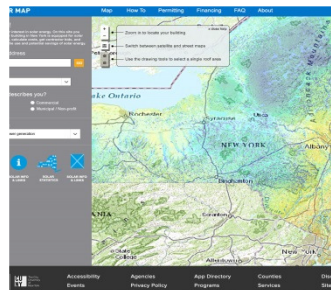


# NYSOLAR SMART



## Solar Infrastructure

- Permitting
- Zoning
- Grid Analysis
- Policy Support
- Installer Roundtable



## Mapping the Way

- One stop Portal
- Solar Maps
- Data Analytics
- Roadmaps



## Accessing Solar

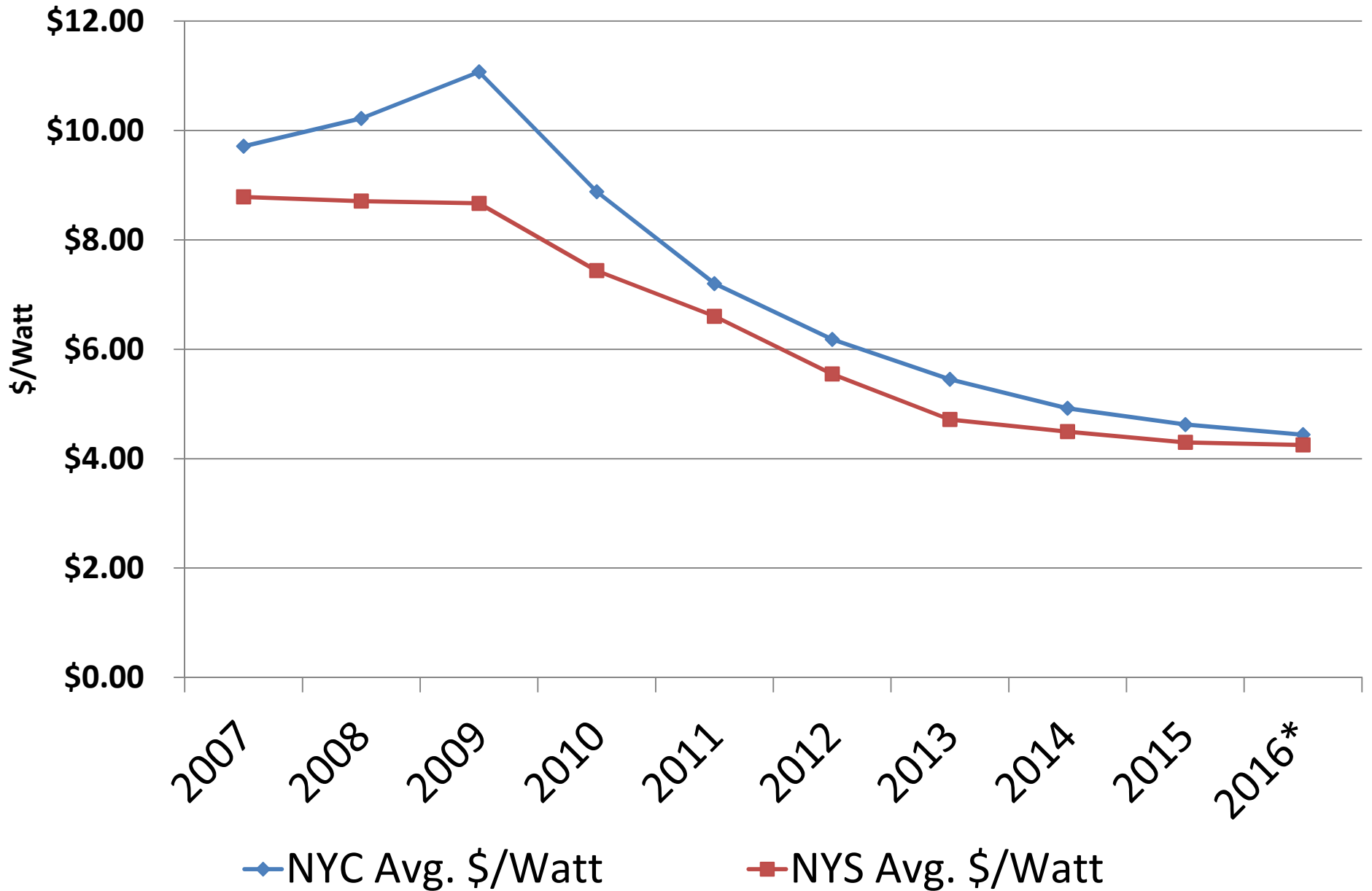
- Group Purchasing
- Community Shared Solar
- Education
- NY Solar Summit



## Resiliency

- Smart DG Hub
- Solar-plus-storage
- Critical Facility Support

# Weighted Avg. Installed Cost NYC - NYS



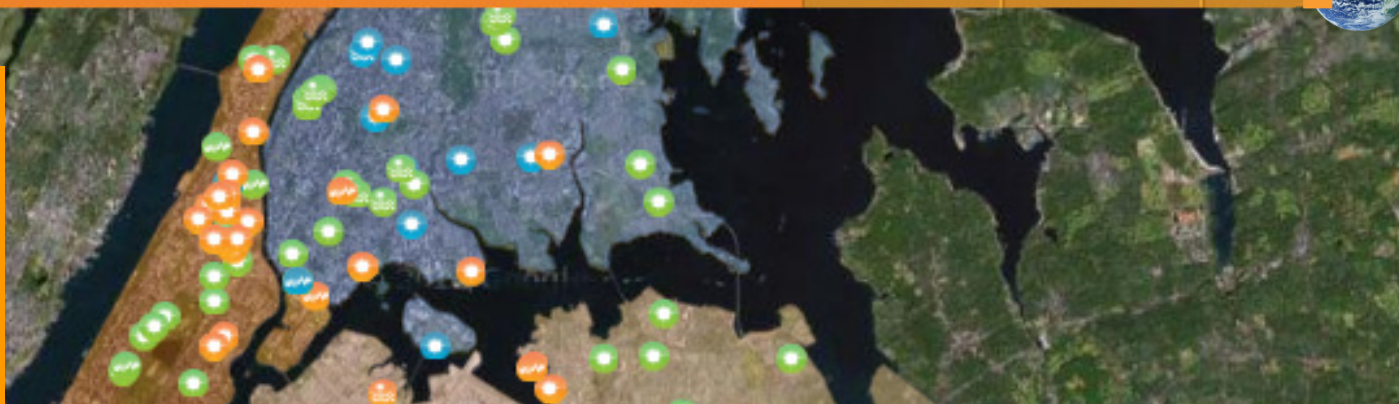


## NYC SOLAR MAP

- Showcases existing installations

## TOOLS

- LiDAR based PV potential for every rooftop in NYC
- Marketing tool for industry , i.e. customer acquisition
- Planning tool for utility
- Calculator



### Calculator Output

#### Cost\*

System Size	45.38 kW-DC
Total System Cost, Before Incentives	\$272,280
Cost After All Incentives and Taxes	\$133,629

#### Financial Metrics

Payback Period	17 yrs
Net Present Value	-\$53,234
Internal Rate of Return	4%
Levelized Cost of Electricity w/Incentives	0.29 \$/kWh

#### Electricity Bill Savings

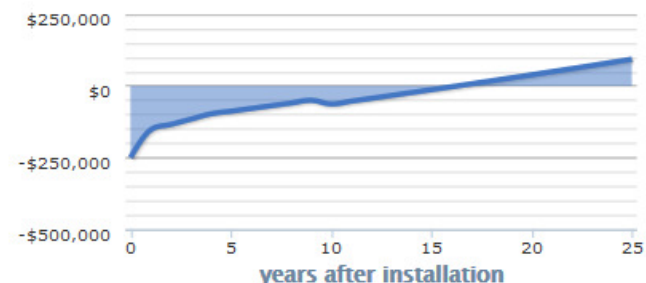
Energy Production	46,642 kWh/yr
Savings	\$9,795/yr

#### Environmental Impact

CO2 Emissions Reductions	32,113 lbs/yr
Trees Planted Equivalent	86 trees

**Located in Carroll Gardens, Park Slope, Cobble Hill, Red Hook, Gowanus or the Columbia Street District?** You are eligible for Solarize CB6 offering assistance and discounts on going solar. Click [here](#) to learn more.

#### Cumulative Net Cash Flow



#### Incentives

NYSERDA/LIPA Incentives	\$22,500
Federal Tax Credit	\$74,934
NY State Tax Credit	\$5,000
NYC Property Tax Abatement	\$49,956
MACRS + 50% Bonus Depreciation in Year 1	\$0

#### Steps for Installing Solar in NYC

#### Get a Quote from a Solar Installer

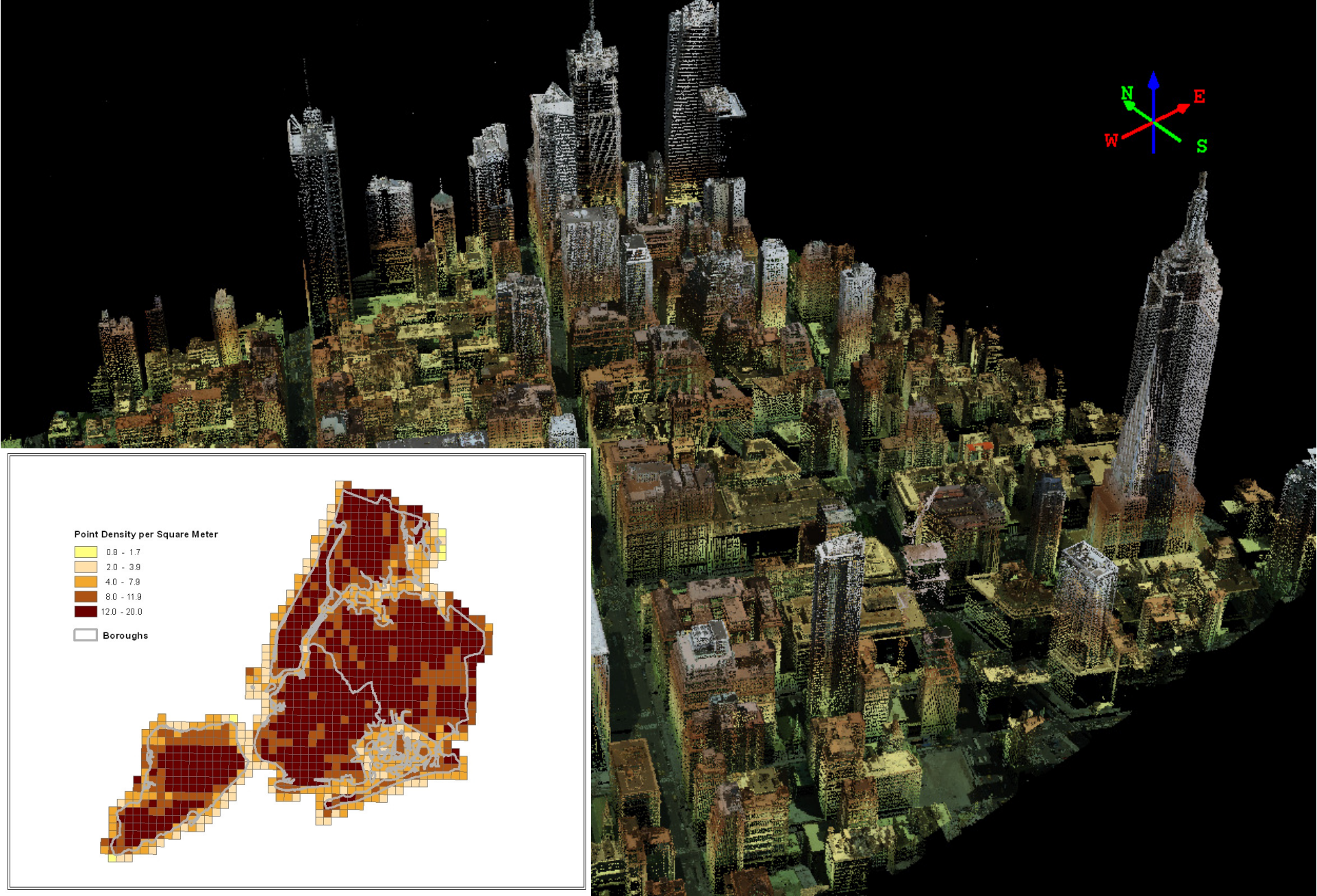
\*Note: A solar lease or power purchase agreement can reduce your upfront cost to zero! Ask your installer for details.

NYC Fire Code rules may require a smaller system than estimated.

[GO TO MAP](#) >>



# 15 Billion Points of LIDAR Data in NYC





State View

Enter your address

or Jump to

New York State

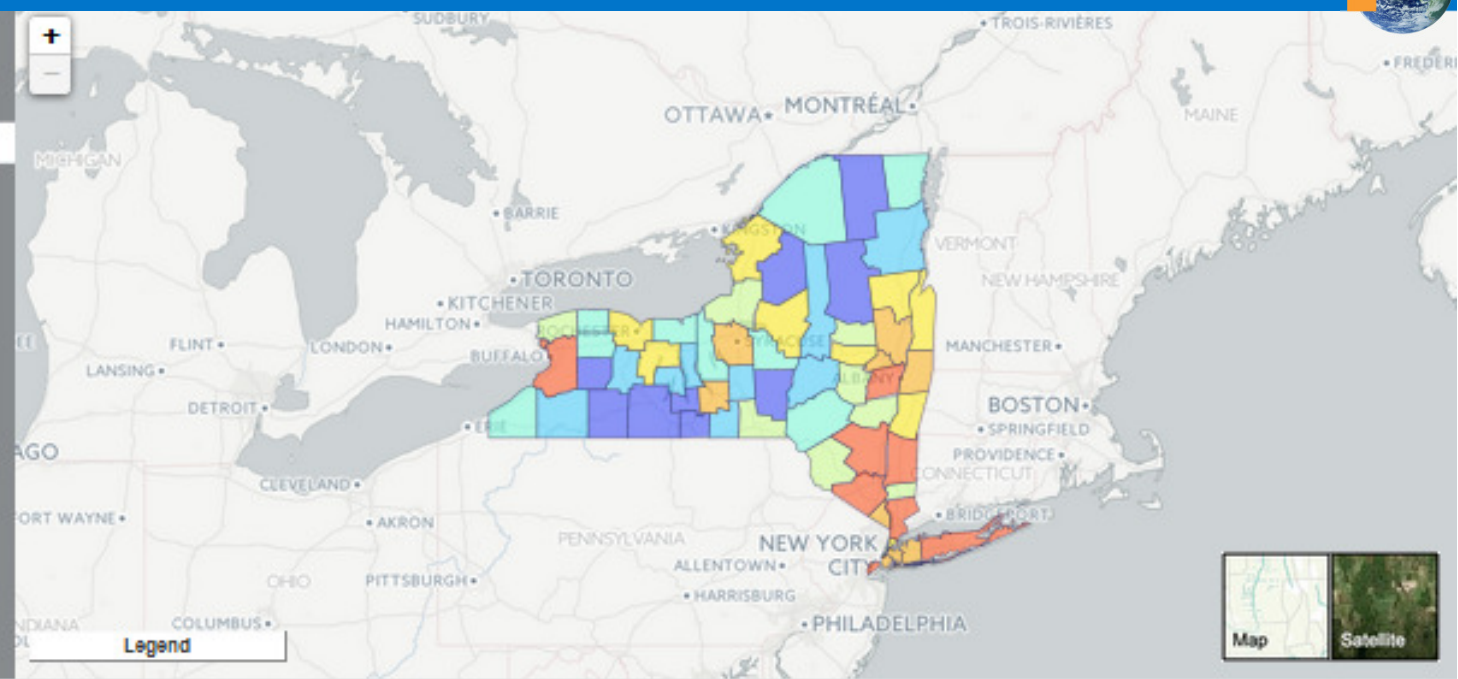
Which best describes you?

- Residential
- Commercial
- Installer
- Municipal / Non-profit

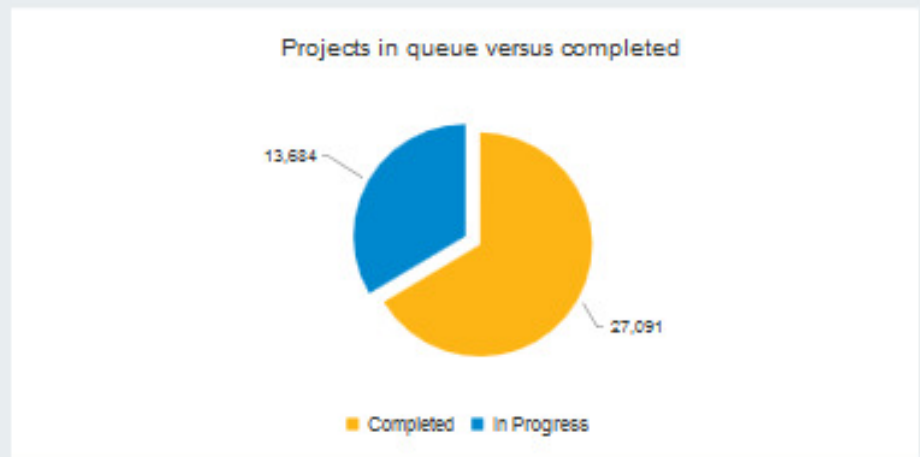
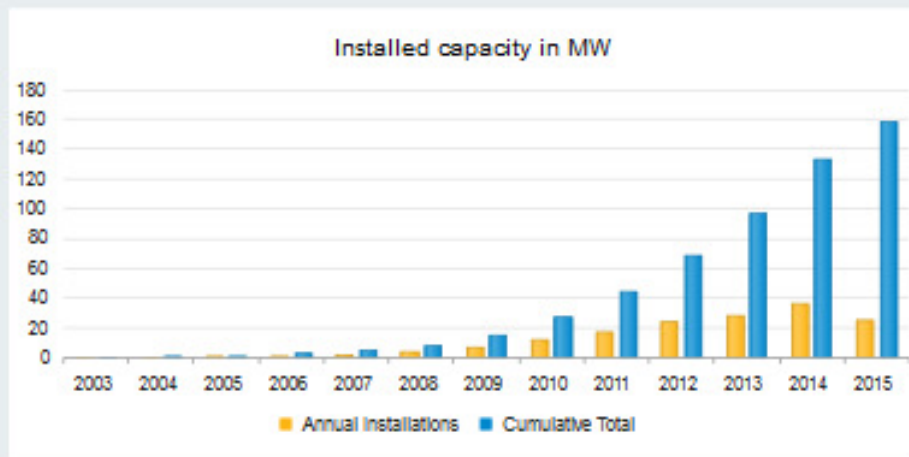
Available map layers

Installed Capacity by County

- Calculator In Your Area
- Solar Statistics
- Advanced Tools



Solar Statistics for New York State



The solar charts/graphs shown here are based on the partial data that was available at the time and may not include all statistics



**CALCULATOR**



**IN YOUR AREA**



**MAP  
LAYERS**



**SOLAR  
STATISTICS**



**ADVANCED  
TOOLS**

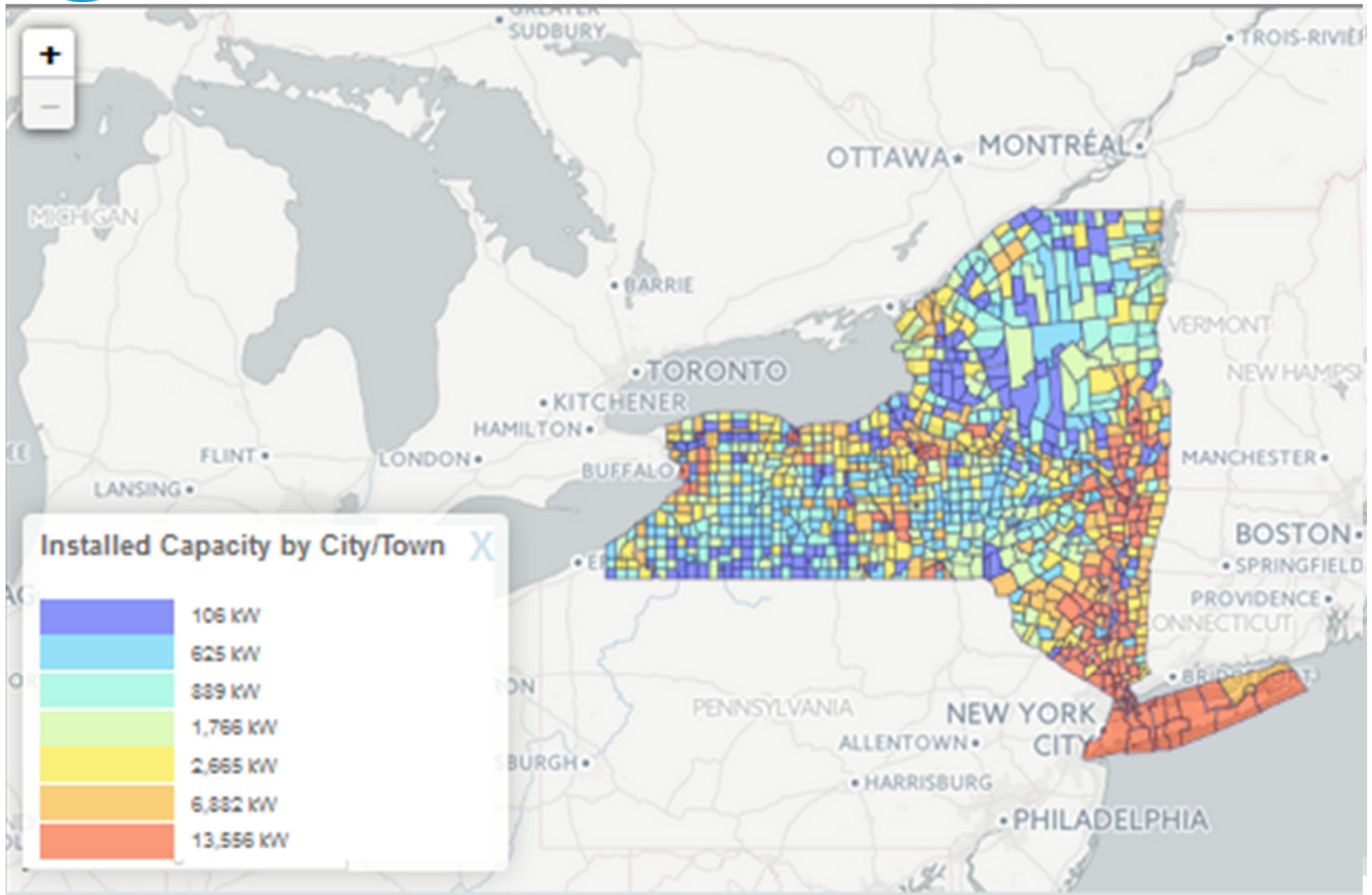
NY SOLAR MAP

# PORTAL





# Visualize the Solar Market





# View solar market growth, potential, and prices



## Solar Statistics for New York State

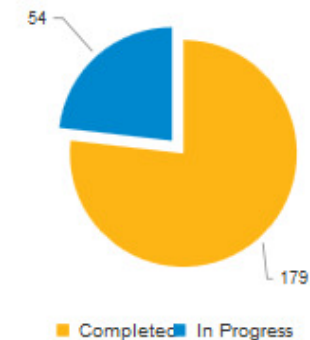
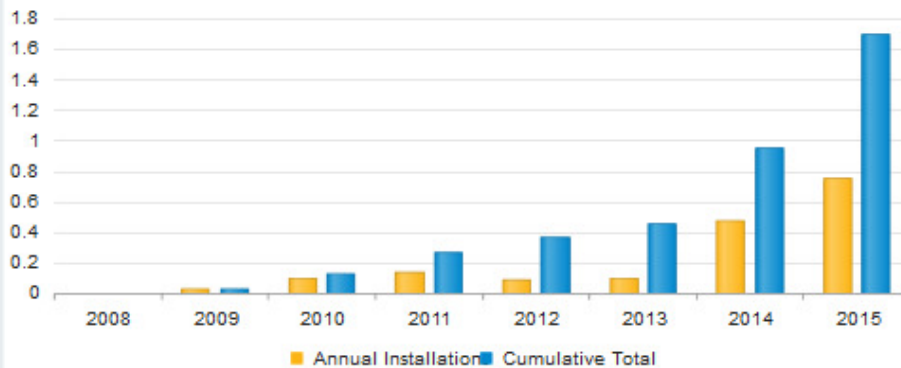
Total installed capacity in MW

Status of Solar Projects

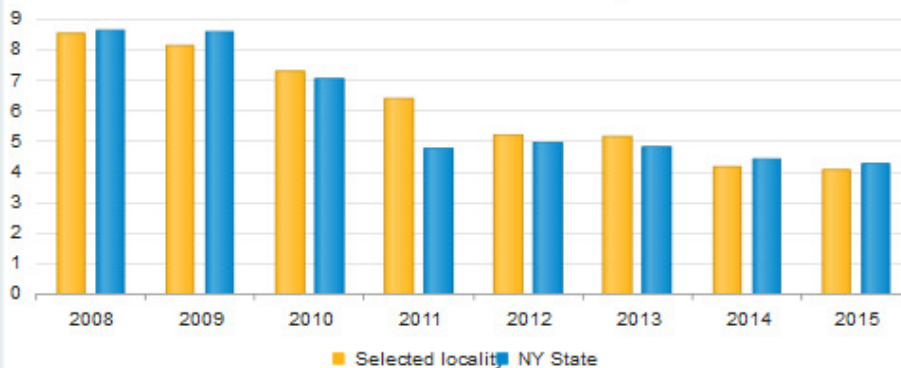
## Solar Statistics for Kingston

Total installed capacity in MW

Status of Solar Projects



Local cost/watt vs state average



Installed capacity by sector in MW



The solar charts/graphs shown here are based on the partial data that was available at the time and may not include all statistics



IN YOUR AREA

# Find local solar programs, processes, incentives, and resources



**City/Town View**

Enter your address

or jump to

Which best describes you?

Residential  Commercial

Installer  Municipal / Non-profit

Available map layers

Calculator

In Your Area

Solar Statistics

Advanced Tools

## In Your Area - Troy

### [NYS Unified Solar Permit](#)

Adopting the NYSUSP helps reduce costs for solar projects by streamlining municipal permitting processes and support the growth of clean energy jobs across the state. Here is a list of Unified Solar Permit adopters.

### [NYSERDA Economic Development Growth Extension \(EDGE\) Program](#)

The Economic Development Growth Extension (EDGE) Program offers regionally based access to NYSERDA's energy efficiency and research/development programs. Regional Outreach Contractors (ROCs) encourage economic growth through outreach to commercial, institutional, municipal, industrial and residential customers.

Center for Economic Growth: Michael Lobsinger, 518-465-8975 x238, michael@ceg.org

Peter Lion, 518-465-8975 x234, peterl.@ceg.org

### [National Grid: Distributed Generation](#)

Customers interested in interconnecting a DG system to the National Grid's Electric Power System (EPS) must ensure their compliance with the Interconnection Tariff. Read these pages for an outline the general interconnection process and offer some additional guidance and recommendations here.



### [Solarize Troy](#)

Solarize is a bulk purchase of solar equipment and installation services. By working together with many households interested in buying solar, Solarize Troy aims to get better prices on better equipment. This process has been used successfully around the



Street View

Enter your address

25 Main St, Yonkers, NY 10701, USA

or jump to

New York State

Which best describes you?

- Residential
- Commercial
- Installer
- Municipal / Non-profit

Available map layers

Installed Capacity by County



Calculator In Your Area Solar Statistics Advanced Tools



Solar Potential Calculator

Solar Potential Calculator

1. Solar System Assumptions

Building / User Type: Commercial

System Size (kW DC): 34.93

Average monthly electricity cost: \$3,990.00

Default \$ / Watt System Cost: \$4.30

Financing Type: Cash

RESET

\* financing options can change your required upfront cost (see below) to adjust payment type.

+ Open Advanced Assumptions

2. Output

6 Warburton Ave, Yonkers	
Optimal System Size (kW DC)	34.93
<i>(2,376 square feet out of 2,376 usable square feet)</i>	
Payback Period	8 years
Annual Savings	\$8,811
Net Cost After Incentives & Taxes	\$56,937

GET A QUOTE

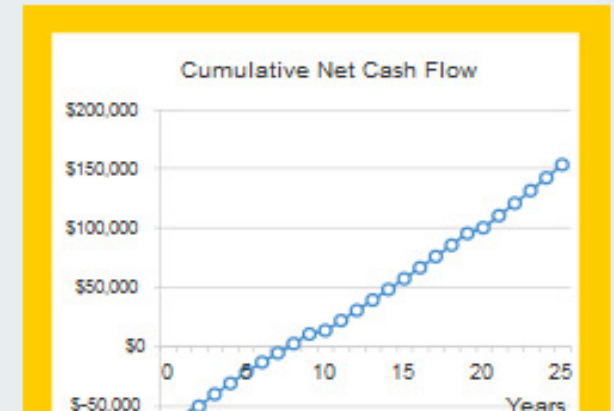
DOWNLOAD REPORT

+ Open Cost Details

Assumptions

Charts

More Charts << >>



The solar charts/graphs shown here are based on the partial data that was available at the time and may not include all statistics



Street View

Enter your address

26 Minuet lane |  
 26 Minuet Ln, Kingston, NY 12401, US  
 Ulster

Which best describes you?

Residential  Commercial  
 Installer  Municipal / Non-profit

Available map layers

Installed Capacity

> Add your system to the map

Calculator In Your Area Solar Statistics Advanced Tools



Solar Potential Calculator

1. Solar System Assumptions

Building / User Type *i* Residential  
 Approximate Monthly Electricity Bill \$225.00  
 Financing Type *i* Cash

RESET

\* financing options can change your required upfront cost (see below) to adjust payment type.

+ Open Advanced Assumptions

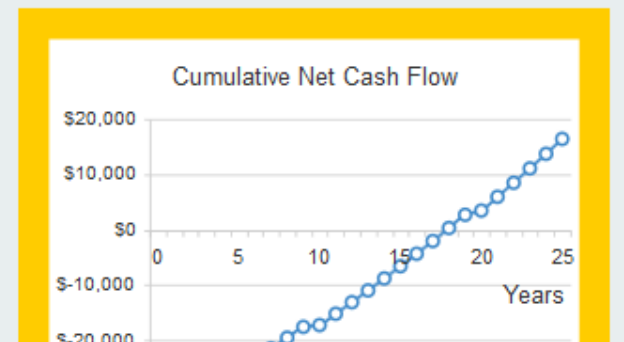
2. Output

Optimal System Size (kW DC)	11.21
<i>(763 square feet out of drawn 763 square feet)</i>	
Payback Period	18 years
Annual Savings	\$2,149
Out-of-Pocket Cost	\$53,906
Net Cost After Incentives & Taxes	\$33,984

GET A QUOTE DOWNLOAD REPORT

Charts

<<Previous Next>>



The solar charts/graphs shown here are based on the partial data that was available at the time and may not include all statistics

# Analytics Assess Potential



# Trigger Action



### Solar Calculator

**Assumptions**

Residential  
Electricity Bill: \$225.00  
Cash

**2. Output**

Optimal System Size (kW DC)	11.21
<i>(763 square feet out of drawn 763 square feet)</i>	
Payback Period	18 years
Annual Savings	\$2,149
Out-of-Pocket Cost	\$53,906
Net Cost After Incentives & Taxes	\$33,984

**Charts**

<< Previous

**GET A QUOTE** **DOWNLOAD REPORT**

**Congratulations! There is a Solarize program, in your area**

The Solarize approach allows groups of homeowners or businesses to work together to collectively increase demand through a creative limited-time offer to join the campaign. Learn more about

**Connect me with my local Solarize program**

I want to

- Select a few solar installers from a list.
- Have up to three solar installers contact me.

**Next Step →**



## Find a Solar Installer

- See installers who are participating in the NY Solar Map system to install solar in your area.
- See installers who have installed solar in your area.

### Filter Solar Installers by(optional):

- Type of Project  ALL  Residential and Small Commercial  Large Commercial
- Type of Solar  All  Solar  Solar with Battery Storage

Show a List of Installers

Proposed Solar Building/Ground Mount Location

Building Owner

Solar Project Details

Review and Submit

Select your solar install type:

Residential (single family / 1-4 family homes)

Do you own or rent?

Own

If known, how old is your roof?

5-10 years

What access is there to your roof?

Other

How would you evaluate the condition of your roof? (select all that apply)

Holding up well considering age

Have there been any recent changes to your roof or the surrounding area that would shade it?

No

If known, how much electricity did you use on your primary meter over the last 12 months, in kilowatt-hours (kWh)?

18000

← Prev

Next →

# Installer Sign Up for Solar Connect



I use only NABCEP Certified PV Installation Professionals\*

Yes  No

Counties where I've installed PV\*

4 checked ▾

Counties where I'm willing to work\*

11 checked ▾

Services I provide\*

5 checked ▾

Type of Projects I Work With\*

Check All  
 Uncheck All

Financing Options installer offer

Search...

Password\*

Solar PV – Install

Confirm Password\*

Solar PV and Battery Storage - Install

Solar PV – Repair & Maintenance

Don't Send me email alerts on new leads

Solar Water Heater System – Install

I accept terms of use

Solar Water Heater – Repair

Submit Query

Website\*

www.testsolarinstaller.com







# PORTAL

NY Solar Map > [Interconnection](#) > [Net Metering](#)

## UNDERSTANDING NET METERING

Net metering is a utility rate structure and billing mechanism that allows consumers with alternative energy systems, such as solar and wind, to transfer electricity they do not use back into the grid in exchange for credits on their utility bills.

As part of the NYSolar Smart program, Sustainable CUNY formed the NYS Net Metering & Interconnection Working Group that includes the majority of NY's major electric utility companies. The working group created the below videos and FAQs to help you understand more about how net metering works and its effect on your electric bill once you install a solar PV system.

### RESIDENTIAL NET METERING



[Frequently Asked Questions: Residential](#)

### COMMERCIAL NET METERING



[Frequently Asked Questions: Commercial](#)

*Once you click play, you can go to the bottom right corner of the video to click the expand icon for a full screen view.*



## YONKERS SOLAR PERMITTING GUIDE

NY Solar Map > [Permitting and Zoning](#) > [Interactive Guides](#) > [Yonkers](#)

Welcome to the New York State Solar Online Permitting Process Guide! [Sustainable CUNY](#) worked with the city of Yonkers to develop this web-accessible, interactive tool tailored specifically for solar PV installers working in Yonkers. This interactive Guide will tailor the permitting process for your specific project

### Yonkers Solar Permitting Guide

1-Is your system size 12kw or less?

Yes  No

2-Is your insurance up-to-date?

Yes  No

3-Do you have a Home Improvement License?

Yes  No

PERSONALIZE GUIDE

This solar guide was last updated on: 10/23/2015



State View

Enter your address

or Jump to

New York State

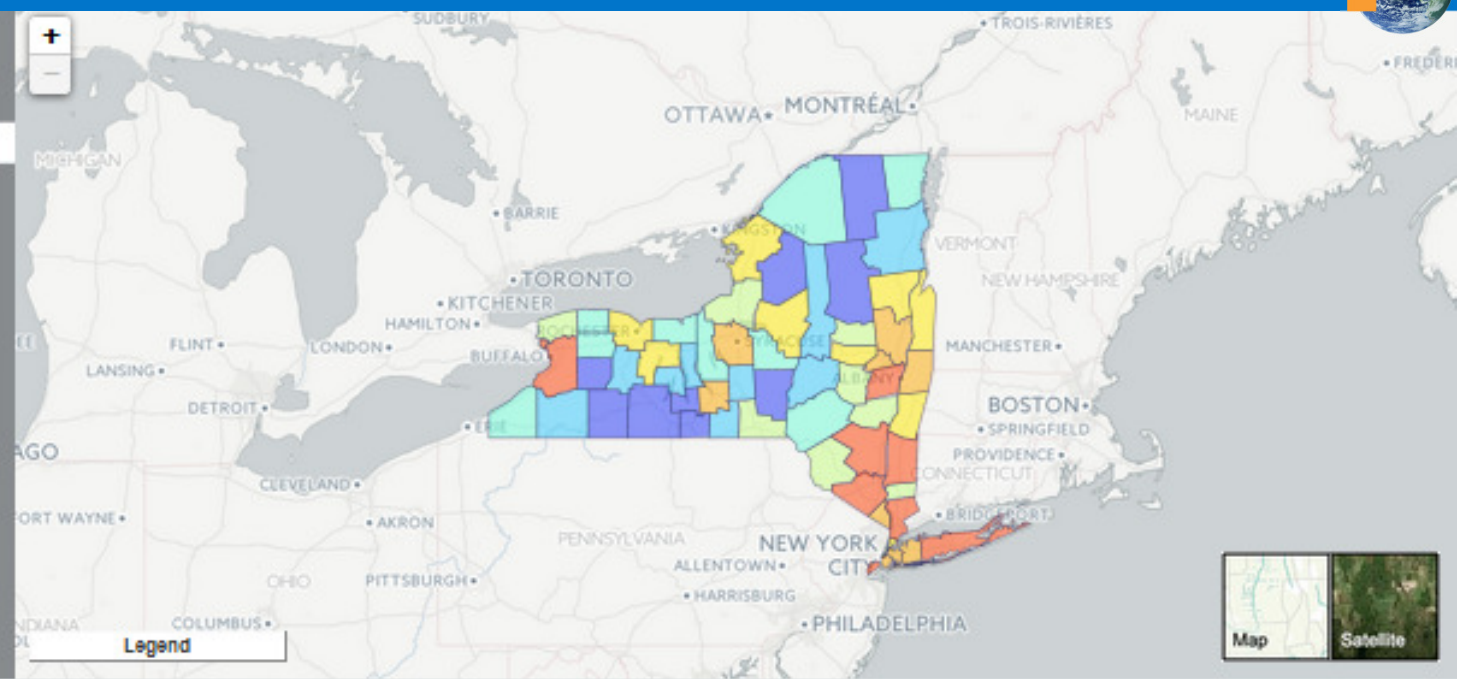
Which best describes you?

- Residential
- Commercial
- Installer
- Municipal / Non-profit

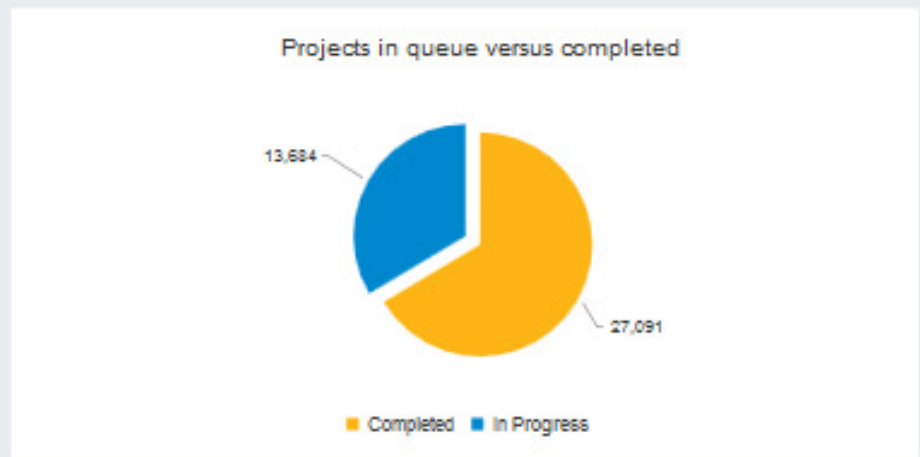
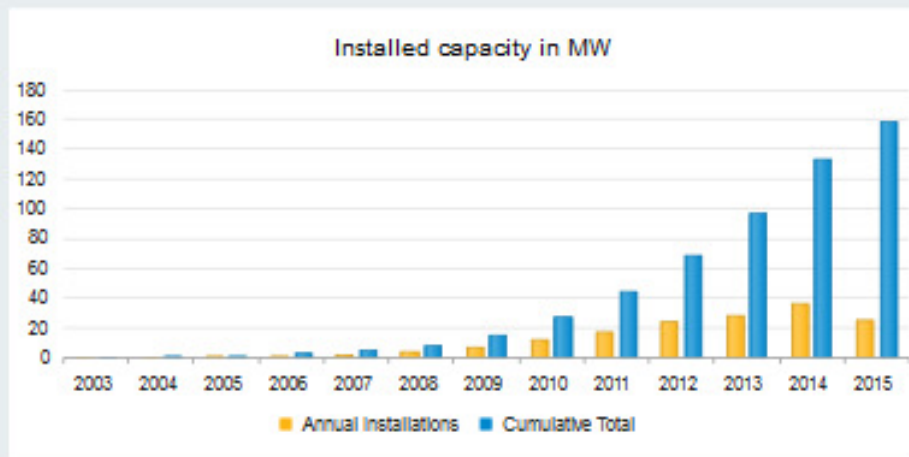
Available map layers

Installed Capacity by County

- Calculator In Your Area
- Solar Statistics
- Advanced Tools



Solar Statistics for New York State

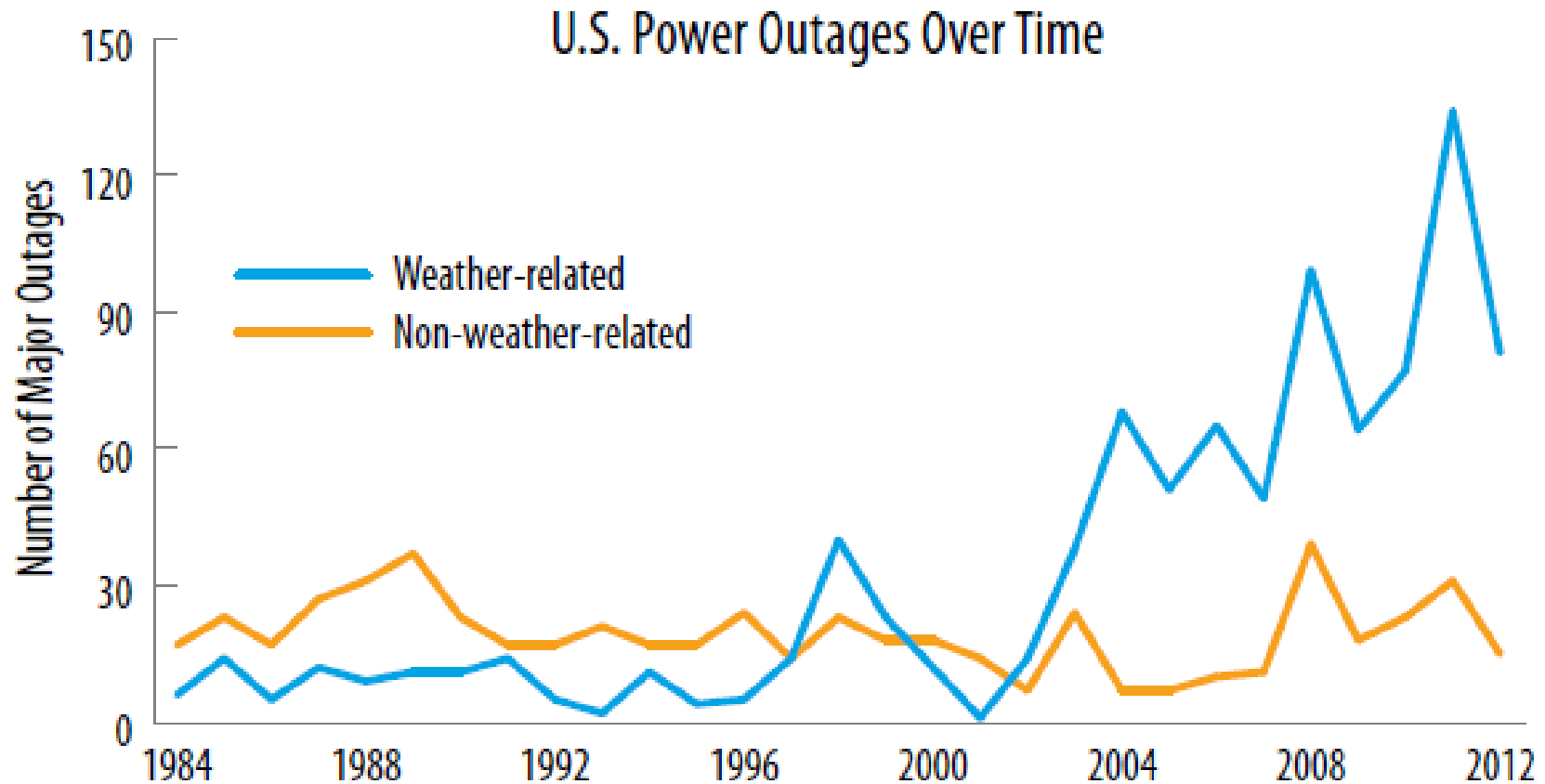


The solar charts/graphs shown here are based on the partial data that was available at the time and may not include all statistics

# The Need for Resilient Solar



## Increasing Grid Disruptions



Source: *Blackout: Extreme Weather, Climate Change and Power Outages*. (Kenward & Raja 2014)

# Hurricane Sandy



The New York Times

N.Y. / Region

Search All NYTimes.com

WORLD U.S. N.Y. / REGION BUSINESS TECHNOLOGY SCIENCE HEALTH SPORTS OPINION ARTS STYLE TRAVEL JOBS REAL ESTATE AUTOS

UPDATED October 30, 2012

f FACEBOOK t TWITTER g+ GOOGLE+ ✉ E-MAIL + SHARE

## A Close Look at Power Failures in New York City 5:45 P.M. ET Nov. 8

Hurricane Sandy knocked out power to hundreds of thousands of people in the area. Data updated every 15 minutes.

### Sandy Fast Facts

- Outages: 5 million NY & NJ residences
- \$52 billion in economic losses



Photo: Iwan Baan/New York Magazine

# State of NYC Solar PV During Recovery



## Solar in affected area in 2012:

- 5,500 kW
- 281 installations
- Nearly 50% of NYC installations

Estimated untapped solar energy per day after the storm:

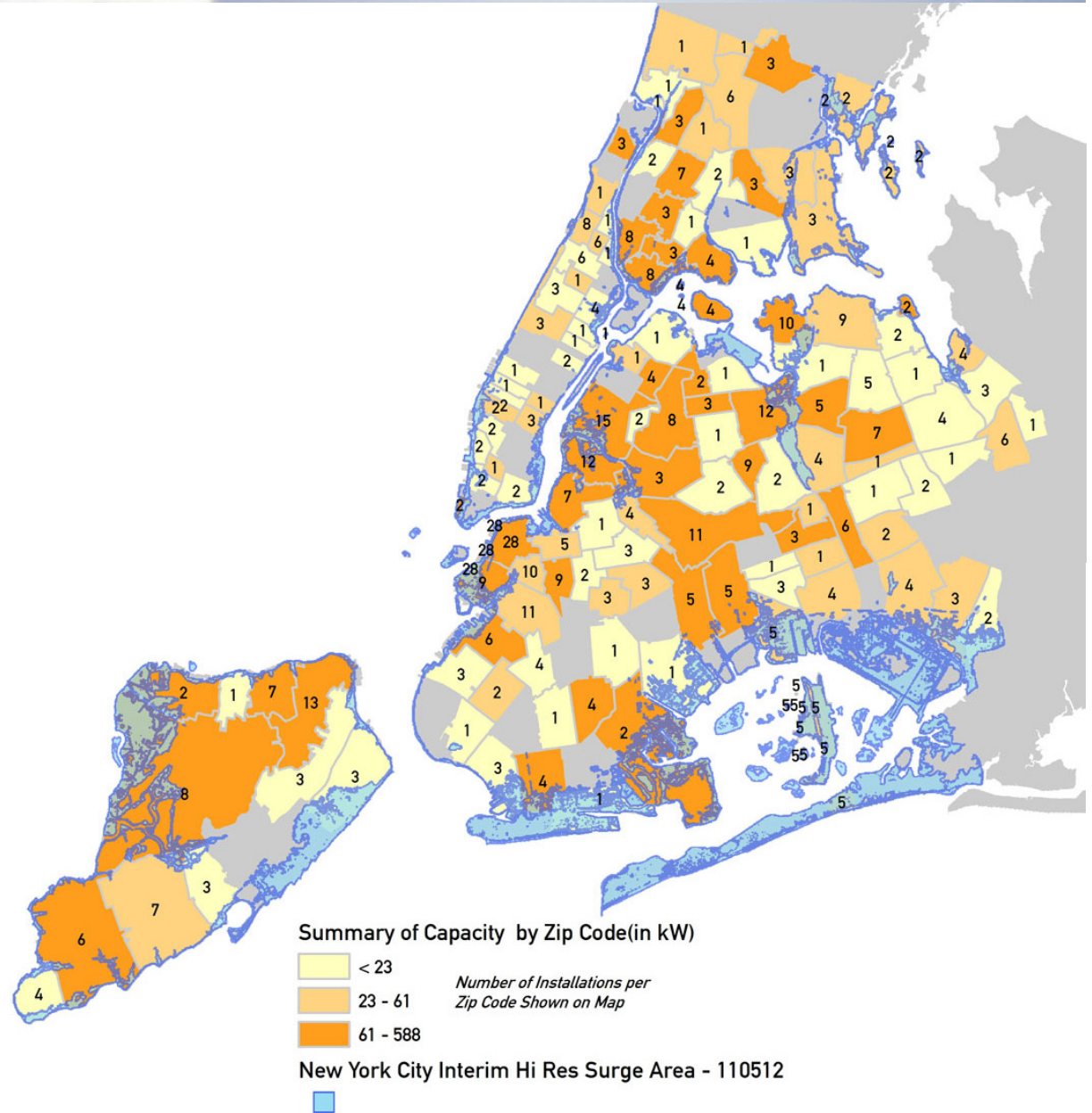
**6,500 kWh**

## Solar in affected area in 2015:

- 15,500 kW
- 1,571 installations

Solar arrays in NYC with daylight emergency power plug via SMA inverter in 2015:

**177**



# CUNY Smart Distributed Generation Hub



CUNY  
U.S DOE  
U.S. DOD/ MIT  
Homeland Security  
NREL  
Mayor's Office  
NYSERDA  
NYC EDC  
NYC OEM  
GSA  
FEMA  
Con Edison  
New York Power Authority  
LIPA (PSEG-LI)  
NYC DOB  
FDNY  
TSEC  
GE Global Research  
IBM  
City of Boston  
Meister Consultants Group

Hardware  
Technologies

Policy &  
Legal

**Smart  
DG  
Hub**

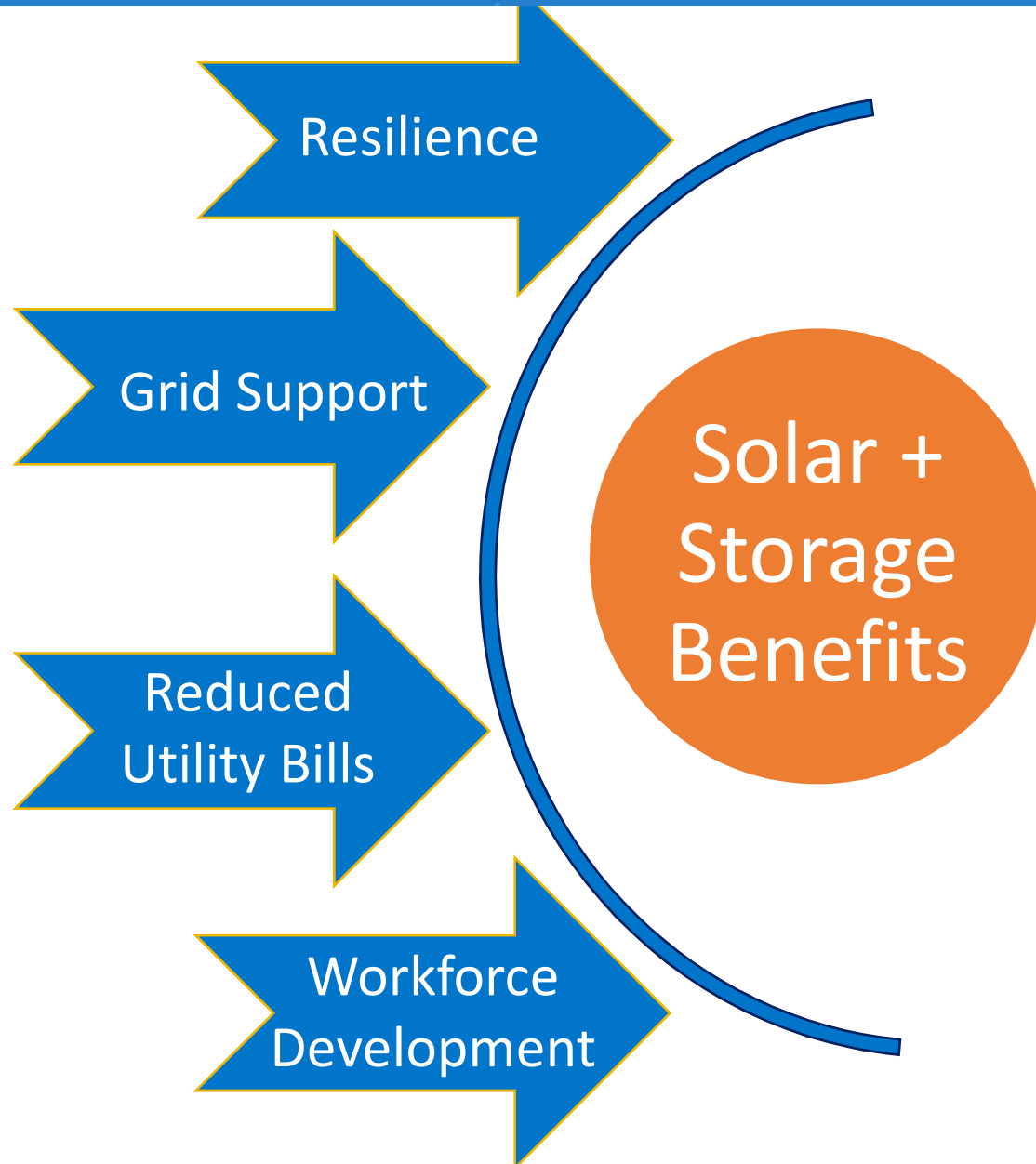
Software  
Technologies

Economics  
& Finance

NY-BEST  
EPRI  
SEPA  
SMA  
Pataki-Cahill

Demand Energy  
SolarCity  
SunPower  
First Solar  
Princeton Power

# Demand and Growth



**U.S. solar-plus-storage market value in 2014:**  
*\$42 million*

**Projected Growth by 2018:**  
*\$1 billion*

Source: Greentech Media



# Smart DG Hub Resilient Solar 3-Year Plan



## Survey & Research

- Survey to determine soft costs
- Stakeholder interviews to develop roadmap

Y1

## Tools & Outreach

- New layers on the Solar Map
- Resilient PV Solar Calculator
- Installer and code official training

Y2

Y3

## Resources & Roadmap

- Fact sheets, model guidelines for design and permitting
- Roadmap for Resilient Solar

[laurie.reilly@cuny.edu](mailto:laurie.reilly@cuny.edu)  
Sustainable CUNY

