

K-Solar

Helping NYS Schools
Reduce Energy Costs by Going Solar

Solar Site Assessment



**New York Power
Authority**

Generating more than electricity

K-Solar Webinar Series

- This webinar is the second in a series of three
 1. Solar Incentives and Ownership Options
 1. Audience: All school district stakeholders
 2. Compare solar economics for direct ownership and third party ownership options
 2. Solar Site Assessment
 1. Audience: District facility managers
 2. Solar feasibility and applying for a free site survey
 3. Solar Development and Contract Terms
 1. Audience: District business managers
 2. Solar power purchase agreements

Webinar Goals

- Answer four key questions you may have:
 1. What is the solar questionnaire?
 2. How is site suitability determined?
 3. How much space is needed for solar panels?
 4. How does the PV system work with my electric utility?

The New York Power Authority (NYPA)

- Largest state public power organization in the United States
- Uses no taxpayer funds in its operations
- Provides wholesale power throughout New York State and the neighboring states as required by law
- Provides in the form of generation and market power purchases, about 25% of New York State's electricity
- Active in energy efficiency and clean energy technologies, financing over \$1.9 billion in projects at customer sites



The K-Solar Program

- K-Solar is an aggregated purchasing program to increase the solar buying power of schools throughout New York State
 - NYPA supplies free feasibility study
 - NYPA managed competitive procurement
 - NYSERDA incentives and federal tax credits
 - SED expedited permitting process



Solar Site Assessment

- In order to do a preliminary analysis of the technical and economic feasibility of solar energy on your school district's buildings, open property or parking lots, a solar questionnaire must be completed.
- Upon receipt of the completed questionnaire, NYPA will perform the analysis at no cost to the school district.
- If your site is suitable, it can be added to a statewide solar RFP.

Questionnaire Information Needed

- Information to gather BEFORE you take the survey:
 - Electric bills for the past 12 months
 - Age of roof
 - Type of roof
 - Alternate locations you would like to consider
- Free site survey can be obtained by registering on the NYPA website

Selecting a location



Solar site assessment questionnaire

NYPA Solar PV Questionnaire

Energy Use Information

You will now be asked a series of questions regarding the site where you think a solar power system may be feasible.

***21. Who is your electric utility for this site?**

***22. Do you want this solar project to power more than one building or facility?**

- Yes
- No
- Don't Know

Energy bill analysis

Your electricity charges

These charges are for the electricity you used (supply) and getting that electricity to you (delivery). Rates are based on a 30 day period. When your billing period is more or less than 30 days, we prorate your bill accordingly.

Electricity you used during this 29 day billing period from Dec 01, 2009 to Dec 30, 2009	
Rate: EL1 Residential or Religious	Meter# 7030113
We measure your electricity by how many kilowatt hours (kWh) you use. One kWh will light a 100 watt bulb for 10 hours.	
Dec 30, 09 actual reading	19209
Dec 01, 09 actual reading	<u>-18956</u>
Your electricity use	253 kWh

► Your supply charges

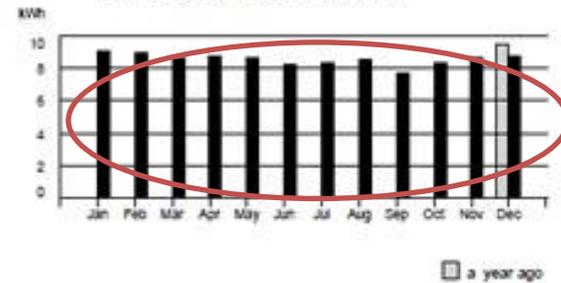
Supply 253 kWh @7.4862¢/kWh	\$18.94
Charge for the electricity supplied to you by Con Edison.	
Merchant function charge	\$1.29
Charge associated with promoting electricity, credit and collection related activities and uncollectible accounts.	
GRT & other tax surcharges	\$0.49
Taxes on Con Edison gross receipts from sales of utility services and other tax surcharges.	
Total supply charges	\$20.72

Your total electricity supply cost for this bill is 8.2¢ per kWh. You can compare this price with those offered by energy services companies (ESCOs). For a list of ESCOs, visit www.PowerYourWay.com or call 1-800-780-2884.

SBC/RPS charges @0.3004¢/kWh	\$0.76
The System Benefits Charge/Renewable Portfolio Standard charges fund New York State renewable energy, environmental and other related public policy programs.	
Temporary NY State Surcharge @0.3794¢/kWh	\$0.96
Covers new fees imposed by the state.	
GRT & other tax surcharges	\$2.01
See earlier definition.	
Total delivery charges	\$43.06
► Your sales tax	
Sales tax @4.5000%	\$2.87
Tax collected on behalf of New York State and/or your locality.	
Total sales tax	\$2.87

►► **Total electricity charges \$66.65**

Your average daily electricity use

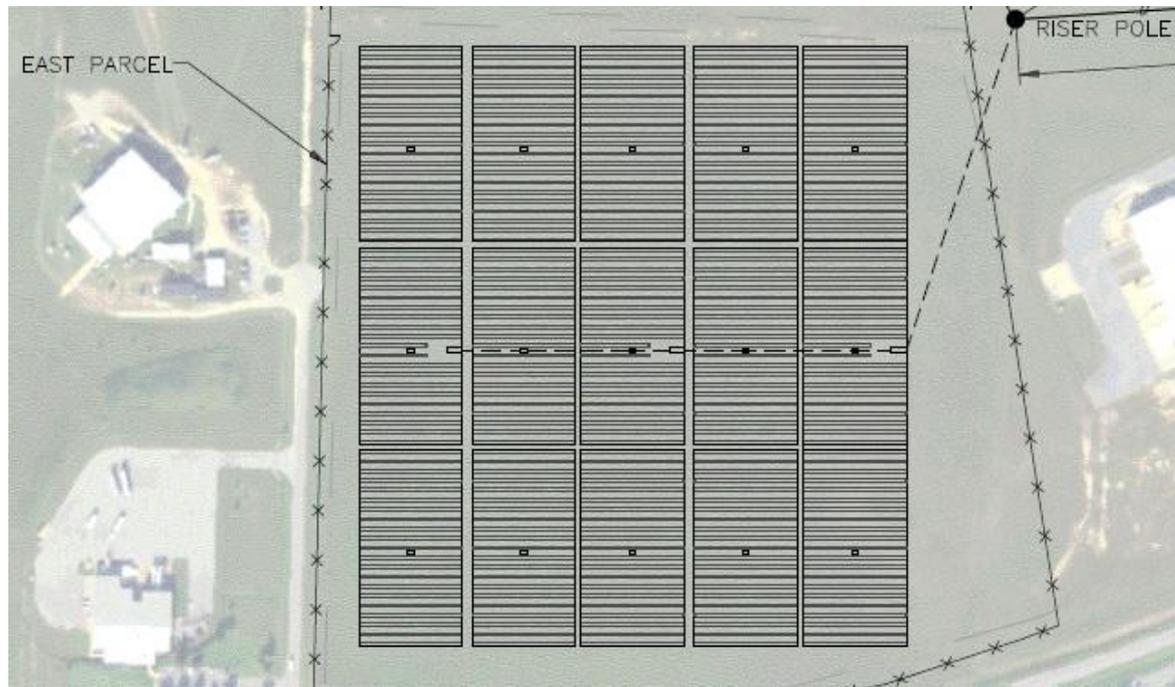


Review your typical monthly usage for the year. Consider what portion of this you might like a solar system to offset.



Preliminary system design

- Information from the questionnaire will be used to determine a preliminary solar array layout.



Preliminary site assessment report



PRELIMINARY SITE ASSESSMENT FOR PV SYSTEM INSTALLATION

Public Entity Name

Site Location Name

Site Address

System Type (Rooftop, etc.)

Approximate System Size

System Specifications (DC to AC De-rate, Tilt, Azimuth)

Expected Monthly Energy Generation



Month	kWh	\$	Month	kWh	\$
Jan			July		
Feb			Aug		
Mar			Sep		
April			Oct		
May			Nov		
June			Dec		
			Annual		

CO₂ Emissions Saved

Feasibility Comments

Site suitability

1. Site selection
2. Site layout and accessibility
3. Shading and obstructions
4. Connection to electric grid supply

Ideal locations

ROOFTOP:

Cleared roofs with minimal slope (>500 sq. ft.)



GROUND-MOUNT:

Open, fairly flat land which is underutilized



CARPORT:

Parking garages or parking lots
(These are generally more expensive)



Rooftop considerations

- Roof area
- Age of roof
- Upcoming roof replacement schedule
- Type of roof surface (flat, sloped, membrane, metal, shingle, tile, etc.)
- HVAC or other equipment that may shade the solar array



Field considerations

- Available land area
- Type of land
- Slope and orientation of terrain
- Property zoning
- Community concerns / historical use
- Flooding or wetland restrictions
- Geotechnical soil analysis
- Plant or Animal Species of Concern (ESA)



Carport considerations

- Available area
- Existing underground utilities
- Parking spot alignment
- Impact on parking facility management, such as snow removal
- Aesthetic concerns
- Parking / special needs/ temporary parking
- These are generally more expensive than other solar options



Impact of shading

- Shading refers to any obstructions casting shadows on a significant portion of the solar panels for more than an hour or two each day. Shading can significantly reduce the solar energy output. Possible sources of shading are:
 - Trees
 - Nearby buildings
 - Nearby hills
 - Equipment on the roof



Determining Space Requirements: Commercial system classification

Small



Medium



Large



Power (kW-DC)

50 to 200

200 to 500

500 to 2000

Array Area (ft²)

5,000 to 20,000

20,000 to 50,000

> 50,000

Bronx HS of Science
(34 kW)

Retail Building
(400 kW)

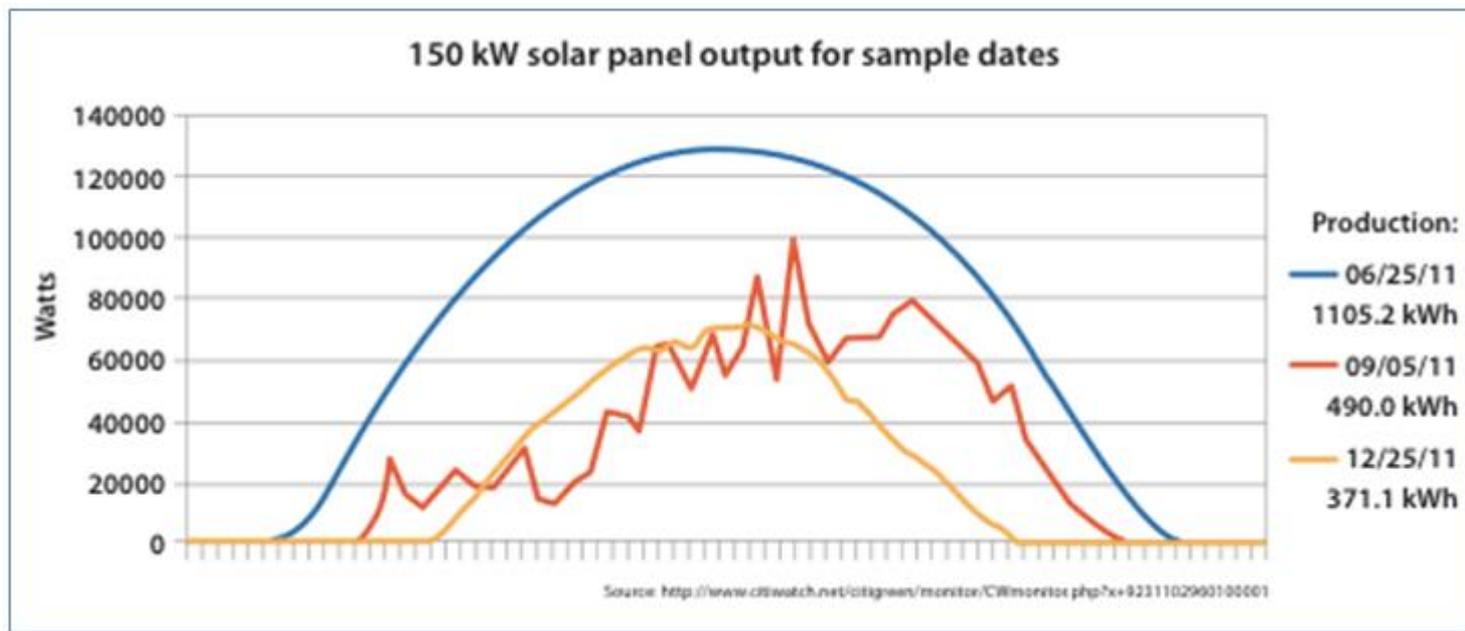
SUNY Buffalo (750 kW)

Determining space requirements

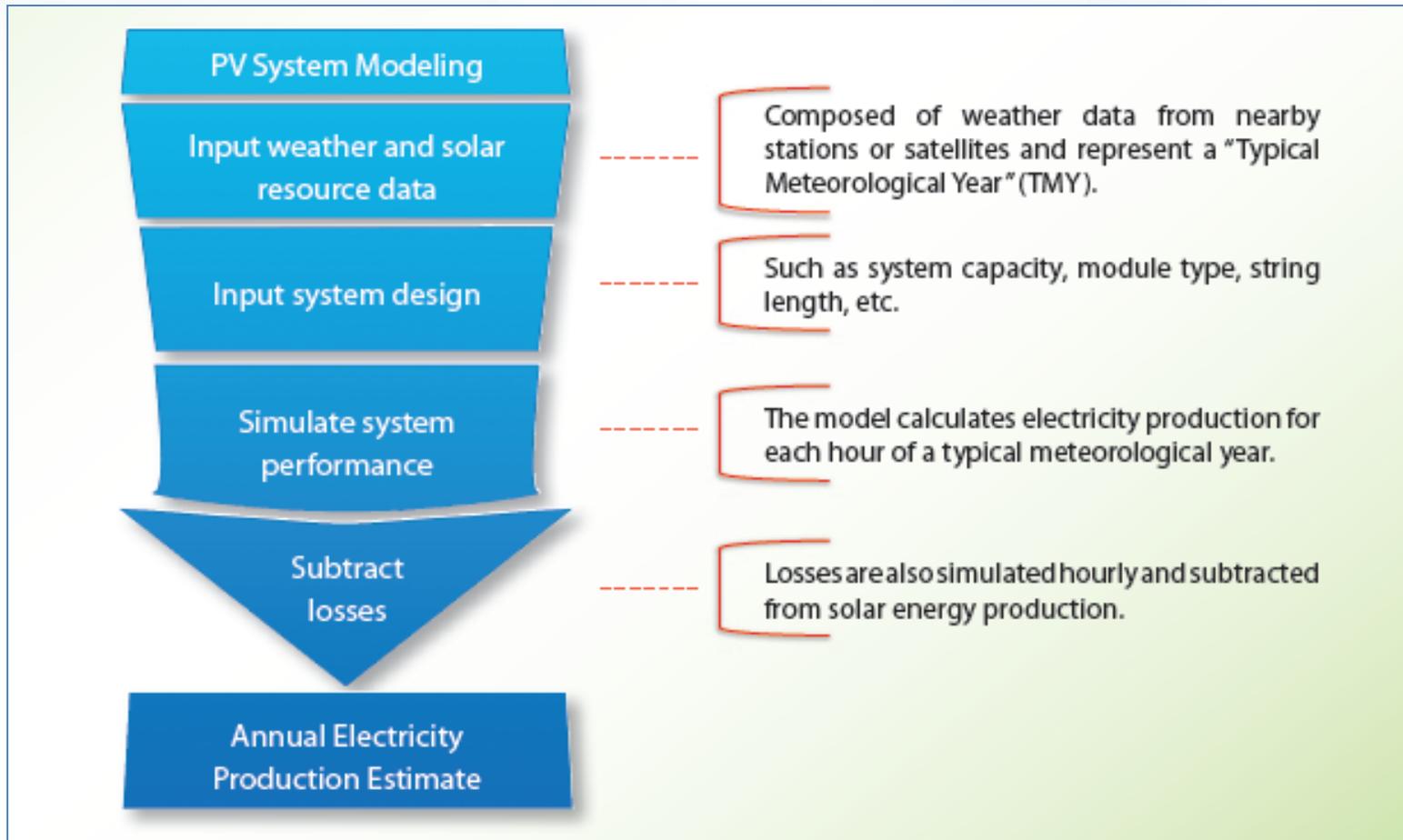
- Solar power: 1 kW requires between 75 and 200 square feet of roof space
- Solar energy: between 1,000 and 1,250 kWh generated per year for each kW of solar PV installed
- Example: the average school uses 55,000 kWh of electrical energy per year:
 - To generate this amount with solar PV you would need:
 - 44 to 55 kW of solar PV
 - 3,300 to 11,000 square feet of roof space
 - Or 1/10th to ¼ of a football field

Should I size the system to meet all of our energy needs?

A solar PV system cannot reliably supply a building on its own, as production varies with available sunlight.



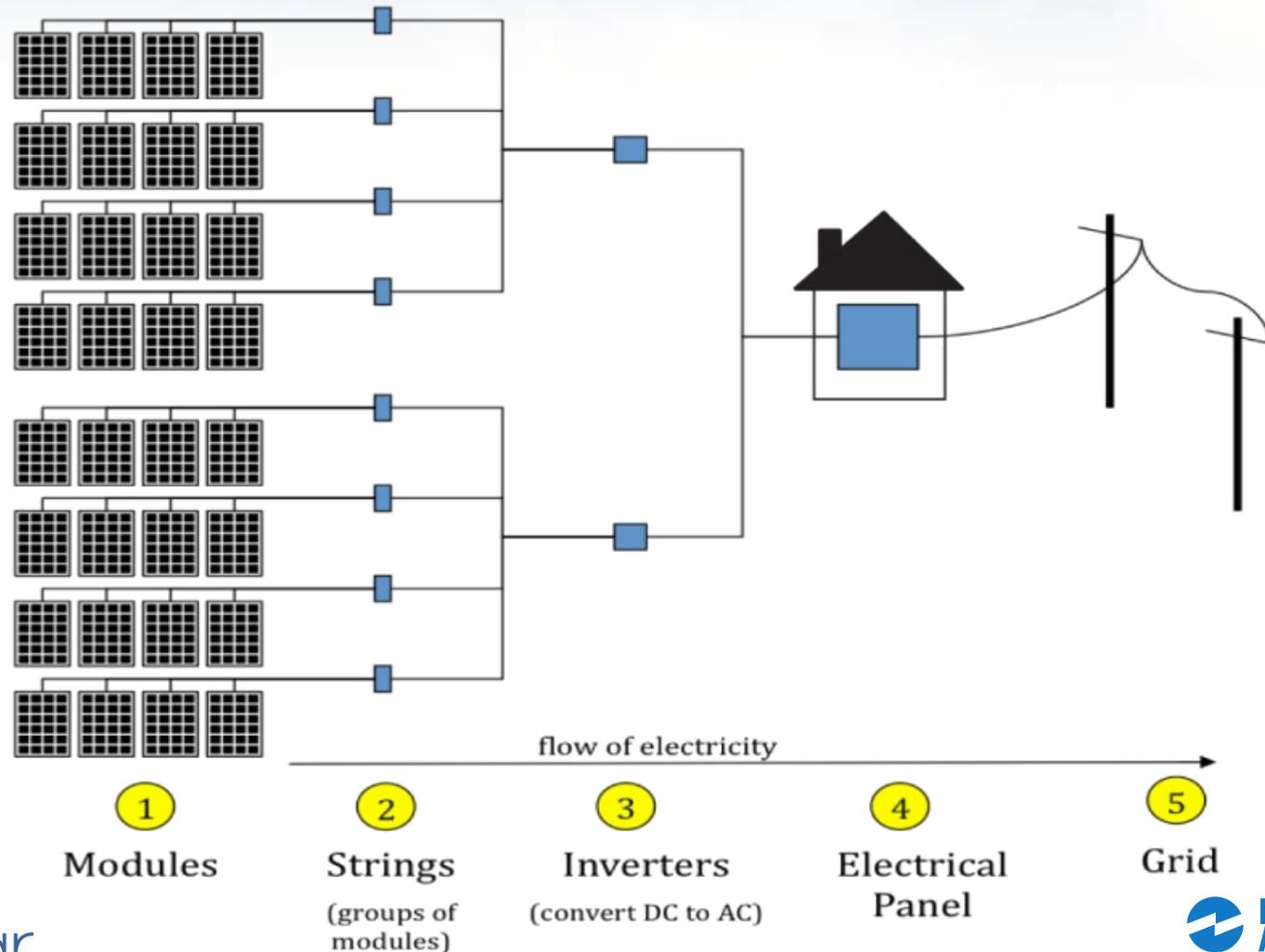
Estimating energy production



Solar Photovoltaics (PV) 101



What makes up a solar PV system?



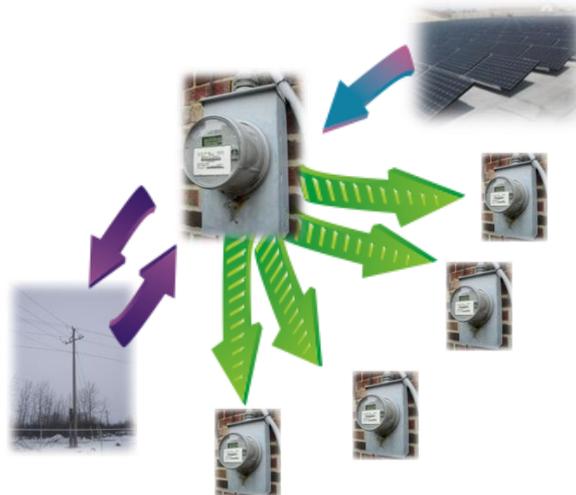
Connecting your PV system

- The point of interconnection is typically the building switchgear or electrical panel. Your local electric utility will need to approve the solar developer's drawings before installation.
- A new electrical meter may be required. Your local utility will provide this meter.



What is net metering? Remote net metering?

- Net metering:
 - Use electric grid as a “bank account”
 - Electric meter runs “backwards” when not using solar output
- Remote net metering
 - Single project can offset multiple electric meters “remotely”

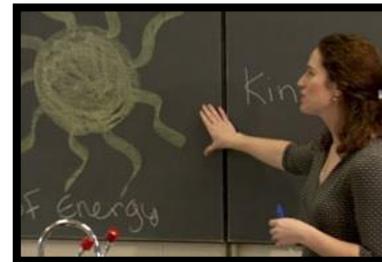


For additional information

- NYPA K-Solar website link: www.nypa.gov/K-Solar
 - Includes registration for program, pre-recorded webinars and FAQ
- NYSERDA website link: <http://ny-sun.ny.gov/>
 - Information on solar incentives
- Contact us:
 - solar@nypa.gov
 - 914-681-6431

A Sister Program

- **Community Solar NY:**
 - **K-Solar Schools are Community Solar Hubs**
 - Showcase solar and tell your story
 - Help Solarize your neighborhood
 - Host events and spread the word
 - Find the Solar Champions in your community
 - Make clean energy a part of your classroom education
 - Funding and resources from NYSERDA
 - **Contact: Max Joel, Program Manager, NYSERDA**
 - 212-971-5342 ext. 3035
 - max.joel@nysERDA.ny.gov





New York Power Authority

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