



Solar Energy Regulation

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Overview

- What is solar energy?
- Examples
- Benefits
- Planning
- Regulatory options
- Access and siting
- Incentives



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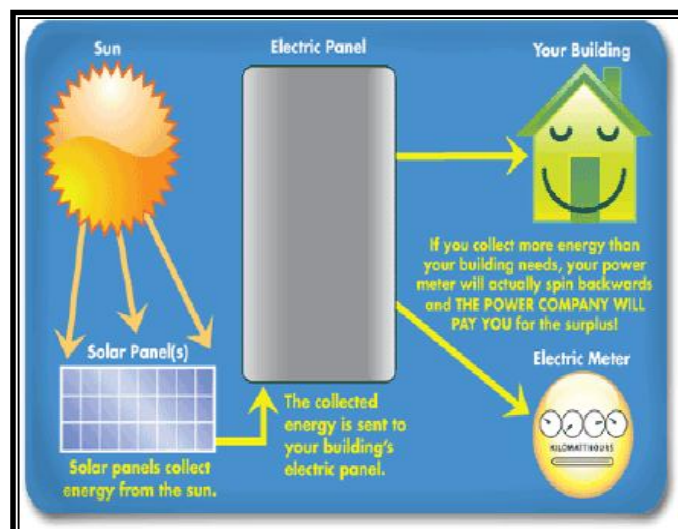
Solar or Photovoltaic (PV)

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What is solar/PV?

- Technology that converts sunlight into electricity
- Primarily used for grid-connected electricity
- A single module can power an emergency telephone
- A house or power plant requires modules be arranged in multiples as arrays

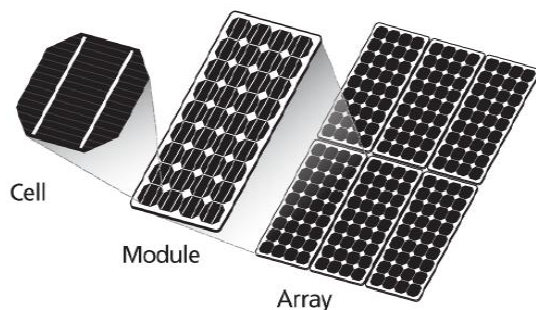


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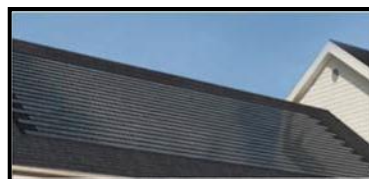
Terms to enlighten

- Solar collectors: devices or systems that use solar radiation as energy source for generation of electricity or transfer of stored heat
 - Cell: basic element of PV system
 - Module/Panel: multiple cells electrically connected
 - Array: multiple modules/panels connected to create system



Terms continued...

- Roof-Mount: panels installed directly on roof or rack system
 - Solar shingles: PV cells designed to look like asphalt shingles
- Ground-Mount System: specialized racking system anchored to ground and wired to connect to building
 - Accessory Use: subordinate to primary use or building, located on same lot
- Azimuth: orientation (true south is optimal)



Examples

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Residential roof-mounted



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Pole mounted solar collectors



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Solar bus huts

No external wiring to the electric distribution network



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Commercial roof arrays



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Long Island Solar Farm

- Largest solar power plant in Eastern United States
- Annually generates 44 million KW-hours
 - Equivalent to annual usage of ~4,500 homes
- 200 acre site
- 164,312 panels



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Suffolk County “power lots”

- Over 60,000 modules on newly built carports
- 17 MW generated
 - Enough to power ~1,850 homes
- On right: H. Lee Dennison Building, Hauppauge
 - 1.75 MW generated
 - 7,737 modules on 24 arrays



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Skidmore College, Saratoga Springs

- One of largest solar arrays in state
- 6,950 ground-mounted solar panels spanning eight acres of land



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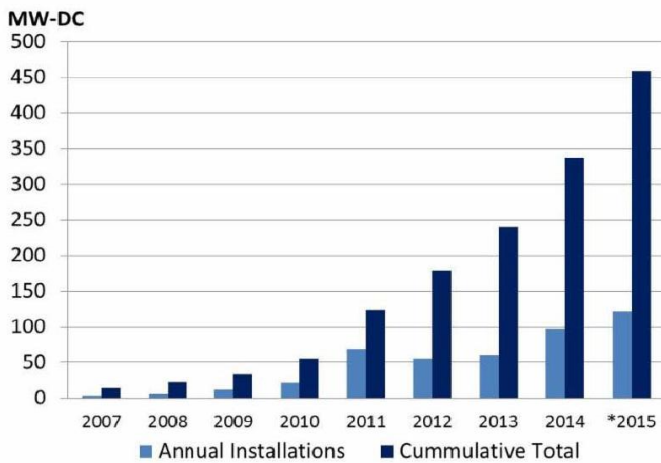


Benefits

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NYS SOLAR GROWTH



* 2015 figures through July 20, 2015

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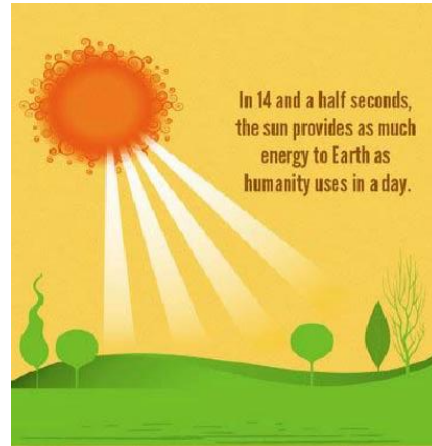


NYSolar Smart is a strategic effort led by Sustainable CUNY of the City University of New York that supports Federal, State and NYC solar initiatives to strategically remove barriers to large scale solar deployment.



Why solar/PV?

- No consumption of natural resources
- No pollutants generated
- Sustainable
- Low cost



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Financial benefits

- Sunshine is free
- Rapidly falling prices have made solar more affordable than ever
 - Average price of completed PV system has dropped by 33% since 2011
- Tax Implications
 - System owner may benefit from federal and state tax credits, incentives and through net metering receive credit for excess energy produced
- Installation of PV system may increase property value
- Home energy savings
 - 7kW system (south-facing) can typically offset 70-80% of electricity needs
 - Two-panel PV water system saves about 2,800 kWh of electricity annually

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Prepare for solar development in your community

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Establish clear goals

- Use visioning process to integrate solar into:
 - Comprehensive plan
 - Green infrastructure plan
 - Climate change plan
 - Energy plan
- If community desires solar, reduce obstacles to planning approvals and/or permitting

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Adopt solar language in code(s)

- Clearly define types of solar collectors and identify those desired in your community
- Benefits
 - Reduce risk of unwanted or inappropriate development
 - Increase project conformity and likelihood that collective community solar desires will be met
 - Increase development opportunity for property owners, both residential and commercial

Clearly define permitting process

- Review existing permit process for inefficiencies
- Consider fair permitting fee
 - Residential: fixed flat fee or set dollar amount/Watt
 - Commercial: rate for staff time + additional review costs
- Adoption of NY Unified Solar Permit
 - Checklist to ensure that systems fall within certain parameters and comply with local and state codes
 - In revision

Regulatory Options

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Local planning and zoning authority

- Comprehensive plan
- Regulations
 - Zoning
 - Site plan review
 - Special use permit
- Review elements
 - Access to solar energy
 - Casting shadows
 - Blocking view sheds
 - Causing glare
 - Rain run-off



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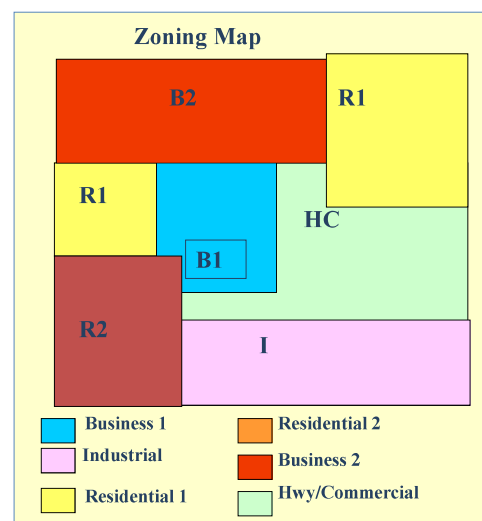


Comprehensive plan

- Expression of a municipality's goals and recommended actions to achieve those goals
- Outline for orderly growth, providing continued guidance for decision-making
- Document focusing on immediate and long-range protection, enhancement, growth and development

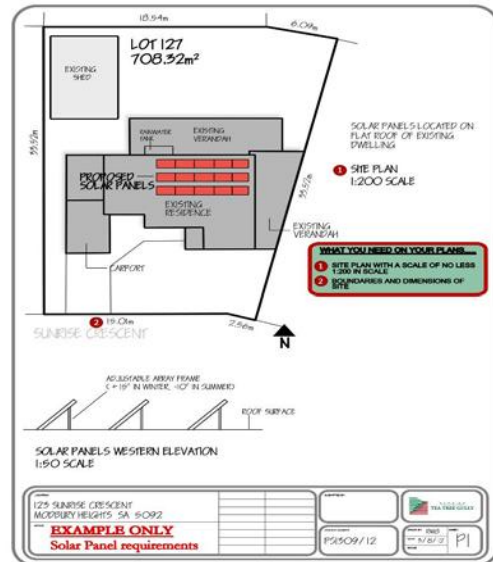
Zoning

- Regulates use, density, and placement of structures on a parcel
 - Ground-mounted structures may have dimensional restrictions
- Original intent to prevent fire hazards and other threats to health and safety
- Municipalities with zoning must have a zoning board of appeals

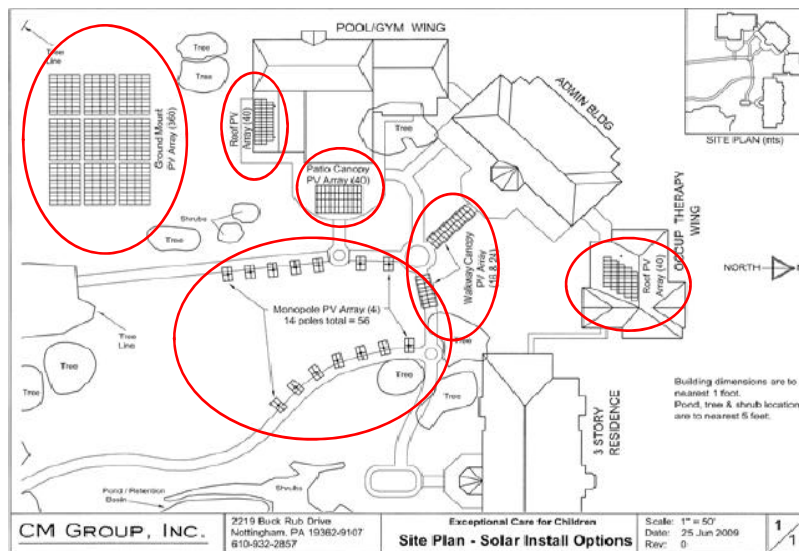


Site plan review

- Rendering, drawing, or sketch with project's proposed design and layout on a single parcel
- Proposal must be in accordance with comprehensive plan
- Zoning not necessary



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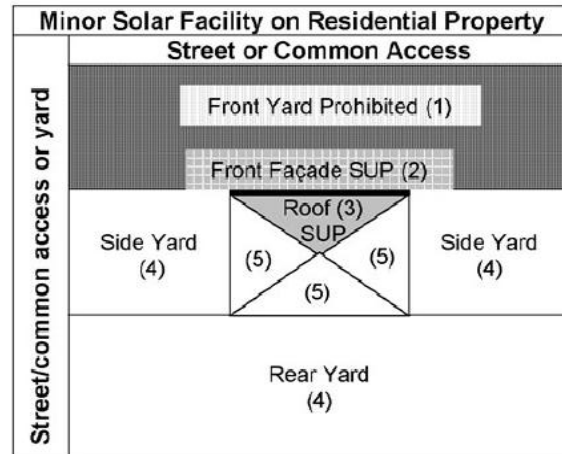


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Special use permit

- Use allowed by zoning
 - Subject to additional requirements or conditions
- Use will not adversely effect neighborhood if conditions are met
- Designed to assure that use is in harmony with zoning



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Decommissioning

- Some municipalities address abandonment, decommissioning or “cessation of activity” within their regulations
- For example, “Must ensure site will be restored to useful, nonhazardous condition, including completion time frame for complete removal of collectors, mounts and other associated equipment and facilities”
- Some require decommissioning plans, especially for commercial scale projects

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Decommissioning

Town of Tonawanda §215-182 Abandonment or Decommissioning

- A. **Unsafe, inoperable, and/or abandoned solar energy systems and solar energy systems for which a special use permit has expired shall be removed by the owner.** A solar energy system shall be deemed abandoned when it fails to produce energy for at least one (1) year.
- B. **For all utility-scale solar energy systems,** the applicant shall submit a decommissioning plan for review and approval as part of the special use permit application. The decommissioning plan shall identify the anticipated life of the project, method and process for removing all components of the solar energy system and returning the site to its pre-existing condition, and estimated decommissioning costs, including any salvage value.

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Firefighter Safety

Firefighters must often access roofs for fire suppression and heat and smoke ventilation

With sun, 120-600 volts of energized DC current could be in the array, conduits, and grid tied system.

At night, even spot lights of fire apparatus can generate some voltage.

Emergency disconnect should be turned off before firefighters approach conduits, collectors, or arrays.



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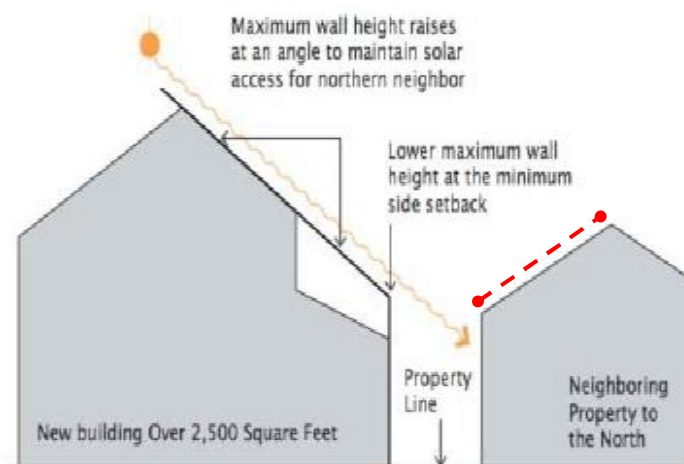
Access & Siting

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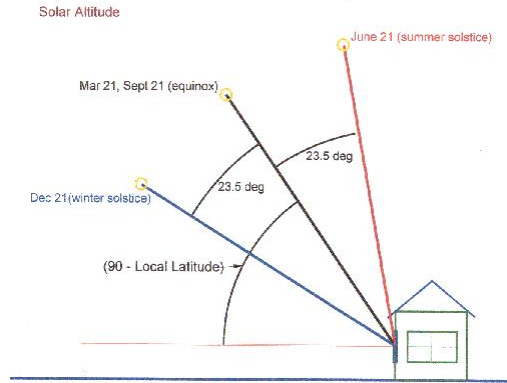
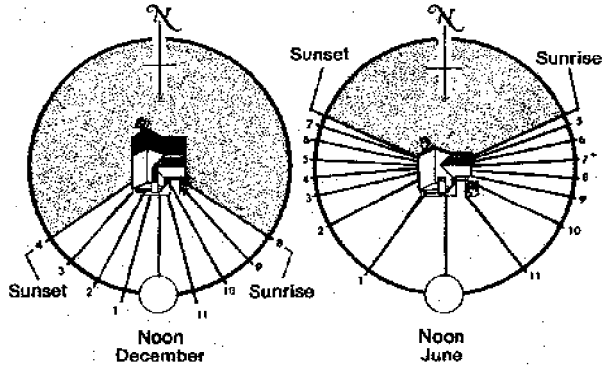
Access

- Access: ability of one property to receive sunlight across property lines without obstruction
 - Calculated using sun path diagram
- Shading: shade from vegetation or building on adjoining properties



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The NY Solar Map and Portal, when launched in September by Sustainable CUNY, will allow New Yorkers to see their roof's solar potential, connect with local solar opportunities, and visualize market data. [NY Solar Map and Portal Preview](#)

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Compatibility with neighborhood character

- Do not negatively impact adjacent uses
- Visually compatible
 - For example, potential impact includes glare or reflection, which might be nuisance to other property owner or impair visibility of motor vehicle drivers
- Use sensitivity especially areas containing unique architectural styles or historic structures



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Historic sites

- Avoid primary facade
- Low-profile panels
 - Solar shingles laminates, glazing, or similar materials should not replace original or historic materials
 - Avoid installation in windows, on walls, siding, and shutters
 - Panels should be flat and not alter slope of roof
- Must be reversible



Solar panels on a historic home in Cambridge, Massachusetts

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Minimize visibility

- Panels and mechanical equipment should be as unobtrusive as possible from public thoroughfare
- Compatible in color to established roof materials
- Aim for below and behind parapet walls and dormers, or on rear-facing roofs



Solar friendly access provisions

- Prohibition of conditions, covenants, and restrictions:
 - Prevent homeowners' associations from barring or placing undue burden on installation of solar energy systems
- Solar easements
 - Agreement with adjacent landowner(s) to ensure sunlight reaches property
- Other regulations in planning and zoning process that preserve solar access

Town of Elmira

- New development 10+ acres may be designed so maximum number of buildings shall receive direct sunlight sufficient for solar
- Buildings and vegetation sited and maintained so that direct sunlight reaches southern exposure of greatest number of buildings
 - Solar azimuths of -45° (east of due south) to $+45^{\circ}$ (west of due south)
 - Highest densities south-facing; lower densities north-facing
 - Roads oriented on east-west axis
 - Buildings sited as close to north lot line(s) as possible; tall buildings sited north of shorter ones and buffered from adjacent development

Ownership and access

Ownership options

- Direct: Residential customer owned system
 - Customer incurs all costs
 - Customer avoids energy costs
 - Net metering excess generation credits back to grid
 - Direct incentives through NY-Sun paid to your contractor
 - 30% Federal Income Tax Income Credit, 25% NY State Tax Credit not to exceed \$5,000 for your Primary Residence
- Third-Party: Power purchase agreement between customer and developer
 - Investor receives 30% Federal Income Tax Credit, and Five Year accelerated depreciation. Customer receives 25% NY State Income Tax Credit
 - No upfront cost to customer, or costs operate and maintain system
 - Predictable payments, long term contracts

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Group purchasing

- Often called "solar bulk purchase," "solar group purchase," "SunShare," or "Solarize"
- Consortium based on 'economy of scale'
- Helps guide homeowners as they purchase solar systems together
- NYSolar Smart Program, Sustainable CUNY
 - Solarize Huntington, Solarize Brooklyn CB6 and SunShares

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Community distributed generation

- Governor's Reforming the Energy Vision or REV Initiative
 - Community Shared Renewables Program
- www.governor.ny.gov/news/governor-cuomo-announces-expanded-access-renewable-energy-millions-new-yorkers
- Phase I (10/19/15-4/30/16): Limited to projects that either...
 1. Site where it provides greatest locational benefits to larger power grid;
or
 2. $\geq 20\%$ of participants/customers are low-moderate income
- Phase II (5/1/16): No restrictions
 - Available throughout entire utility service territories

Incentives

NY-SUN initiative

- Nearly \$1 billion commitment from governor
- Brings together and expands existing programs administered by NYS Energy Research and Development Authority (NYSERDA), Long Island Power Authority (LIPA), and New York Power Authority (NYPA), to ensure coordinated and well-funded solar energy expansion plan
- Long-term funding certainty that will boost existing businesses and attract new investments to NY from global solar companies for greater economic growth
- Will significantly expand deployment of state's solar capacity
- Transform NY's solar industry to sustainable, subsidy-free sector

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K-Solar

- Component of NY-SUN
- Partnership between NYPA and NYSERDA
- Program helps school districts utilize solar by providing free services
 - Researches potential cost savings and negotiates purchasing agreements
- www.nypa.gov/k-solar/



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NYS rebates and incentives

- Net metering for photovoltaics and wind technologies
- Distributed generation rule applies to residential systems ≤ 25 kW
- Interconnection agreement and application filed with customer's utility
- NY's investor-owned utilities must offer net metering on first-come, first-served basis to residents that install PV or other renewable generation system ≤ 25 kW
 - Farms and businesses may net meter systems ≤ 2 MW

NYS real property tax exemptions

- NYS has a real property tax exemption
Form RP 787 from NYS Department of Taxation and Finance.
- http://www.tax.ny.gov/pdf/current_forms/orpts/rp487_fill_in.pdf
- Local governments and school districts may opt out and include the PV system in the assesment. Below is a list of those that have opted out
- <http://www.tax.ny.gov/research/property/legal/localop/487opt.htm>
- NYC has a real property tax abatement program
- http://www.nyc.gov/html/dob/html/sustainability/solar_panels.shtml

NY-Sun solar Incentives

- Residential and Small Commercial systems up to 200KW
- <http://ny-sun.ny.gov/For-Installers/Megawatt-Block-Incentive-Dashboard>
- Commercial & Industrial Systems up to 2MW
- <http://ny-sun.ny.gov/For-Installers/CI-Megawatt-Block-Incentive-Structure-and-Dashboard>

NY-Sun sales tax exemptions

- NYS also offers a statewide sales tax exemption on solar systems.
- Local and county government solar sales tax rates are listed below
- http://www.tax.ny.gov/pdf/publications/sales/pub718cs.pdf?_ga=1.41831329.2042903433.1419280618

PV Trainers Network

- Home: <https://training.ny-sun.ny.gov/>
- Calendar: <https://training.ny-sun.ny.gov/training-events-calendar/range.listevents/>
- Resources: <https://training.ny-sun.ny.gov/resources>
- “Ask the expert:” <https://training.ny-sun.ny.gov/technical-assistance/ask-the-expert?view=ticket&layout=open>

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Contact information

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- (518) 473-3355 Training Unit
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www.dos.ny.gov/lg/lut/index.html

NYS Energy Research & Development Authority

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