

Solar Photovoltaic (PV) Systems

Covered Products

Solar Photovoltaic Systems that convert sunlight into electricity.

Background

Photovoltaic panels (modules) use sunlight for the creation of electricity that can be used to power lighting, plug loads, cooling systems and any other component with the goal of diminishing use of fossil fuels.

These modules are part of a designed PV system that includes inverters, balance of system components, and interconnections to an electrical distribution system. Photovoltaic modules are available at various price points, efficiency levels and power ratings (wattage); hence, each application for PV must be analyzed to decide which technology and system design for that application is the most appropriate.

Definitions

Active solar systems directly convert solar energy into electricity or require electricity transfer energy (electric or thermal) from one location to another.

Passive solar systems use specific site locations, design or building materials that take advantage of the sun's position and availability to provide direct heating or lighting, or to store heat in thermal mass.

Photovoltaic (PV): The technology of converting sunlight into direct current electricity with the use of semiconductor material.

Photovoltaic Cell: An electronic device that converts the energy of light directly into electricity through the photovoltaic effect. A photovoltaic cell is also referred to as a solar cell.

Photovoltaic Panel (Module): A packaged interconnected assembly of photovoltaic cells or solar cells.

Photovoltaic Array: A linked collection of photovoltaic or solar modules which are in turn made of multiple interconnected photovoltaic or solar cells.

Photovoltaic String: A group of modules connected in series.

Building Integrated Photovoltaic (BIPV): Solar cells integrated into building components such as siding or roofing shingles.

Solar Trackers: A movable device for tracking and orienting a solar photovoltaic module toward the sun.

LEED (Leadership in Energy and Environmental Design): An internationally recognized green building certification system, providing third-party verification that a building or community was designed and built using strategies intended to improve performance in metrics such as energy savings, water efficiency, CO2 emissions reduction, improved indoor environmental quality, and stewardship of resources and sensitivity to their impacts.

The New York State Energy Research and Development Authority (NYSERDA) offers objective information and analysis, innovative programs, technical expertise, and funding to help New Yorkers increase energy efficiency, save money, use renewable energy, and reduce reliance on fossil fuels. <https://www.nyserda.ny.gov/>

PSEG Long Island: A regulated utility delivering gas and electric services that contracts with Long Island Power Authority (LIPA) to manage LIPA's electric system and clean energy programs.

Standard Setting and Certifying Programs

The Institute of Electrical and Electronics Engineers (IEEE - read I-Triple-E) is an international non-profit, professional organization for the

advancement of technology related to electricity. It has the most members of any technical professional organization in the world, with more than 395,000 members in around 150 countries. It develops global standards in a broad range of industries, including: power and energy, biomedical and healthcare, information technology, telecommunication, transportation, nanotechnology, information assurance.

The International Electrotechnical Commission (IEC) is the world's leading organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

Underwriters Laboratories (UL) is an independent product safety certification organization that has been testing products and writing standards for safety for more than a century. UL's worldwide family of companies and network of service providers includes 68 laboratory, testing and certification facilities serving customers in 102 countries.

The North American Board of Certified Energy Practitioners (NABCEP) is the organization providing certification for PV and solar thermal installation. Designed to raise industry standards and promote consumer confidence, NABCEP offers certification and certificate programs to renewable energy professionals throughout North America.

The International Brotherhood of Electrical Workers (IBEW) is a non-profit labor organization that represents approximately 820,000 active members and retirees who work in a wide variety of fields, including utilities, construction, telecommunications, broadcasting, manufacturing, railroads and government.

Specifications

- Affected entities shall procure PV Systems which include PV panels or modules, that are designed and specified on a case-by-case basis. The design and specifications include the following minimum requirements:

Compliance with these standards and listings as applicable.

- IEC Standard 61215 (testing of crystalline silicon modules)
- IEC Standard 61646 (testing of thin film modules)
- IEC Standard 61730 (safety testing for PV Modules)
- UL 1703 (flat plate)
- IEEE 1262 (flat plate)
- 25-year 80% minimum rated power performance guarantee.
- Minimum efficiency ratings.
 - 18% for all crystalline silicon
 - 6% for all thin film (often part of BIPV units)
- Minimum 5-year product warranty.

Affected entities are encouraged to:

- Select systems that are installed by a qualified contractor certified as an installer by NABCEP, UL or an IBEW Journeyman. (Note: using a NYSERDA-approved installer may be required to obtain incentives.)
- Purchase higher efficiency units when available.
- Provide routine inspection (recommended yearly at a minimum) as well as cleaning and servicing per manufacturer's recommendations.
- Install production monitoring equipment that will allow quantification of savings.
- Investigate available government and private funding sources, many of which will be in the form of loans repaid with savings realized by converting to renewable energy source.
 - Affected entities that are: (i) investor-owned utility customers, are encouraged to contact NYSERDA and (ii) LIPA customers, are encouraged to contact PSEG Long Island, for guidance and any incentives that may apply to solar PV systems. Check NYSERDA's website for current offerings:

<https://www.nyserda.ny.gov/> (Note: using a NYSERDA-approved installer may be required to obtain incentives)

- Affected entities are encouraged to refer to NY-Sun program manuals and other, then current, NYSERDA and PSEG funding opportunities, all of which evolve over time.
- Reduce the State's carbon footprint by procuring local or regional products.
 - For projects registered with a LEED rating system, some contribution to the achievement of credits may be realized in purchasing units that are manufactured within 500 miles of the project site.

Packaging

Packaging shall comply with Environmental Conservation Law section 37-0205. Packaging shall not contain inks, dyes, pigments, adhesives, stabilizers, or any other additives to which any lead, cadmium, mercury, or hexavalent chromium is intentionally added or contain incidental concentrations of lead, cadmium, mercury or hexavalent chromium which together are greater than 100 parts per million by weight (0.01%).

New York State encourages affected entities to adopt the following in order of preference when purchasing items that come in packaging:

- Items that do not need packaging, or the packaging is part of the product.
- Items that come in reusable packaging.
- Items that come in bulk packaging.
- Items that come in innovative packaging that reduces the amount of packaging.
- Items that come in packaging that remains the property of the supplier and does not become the property of the end user under any circumstance or condition. The vendor shall certify that the packaging

material will be reused, recycled, or composted, and managed in compliance with applicable local, state, and federal laws.

- Items that come in packaging that maximizes recycled or biodegradable (compostable) content and/or meets or exceeds the minimum post-consumer content level for packaging in the U.S. Environmental Protection Agency Comprehensive Procurement Guidelines. Biodegradable products should only be used in areas where a composting facility exists that accept the material.
- Items that come in Packaging that is recyclable or biodegradable (compostable). Biodegradable products should only be used in areas where a composting facility exists and will accept the material.